Appendix A Consultation

Notice of Study Commencement
Baden and New Hamburg Water and Wastewater System Servicing Review

The Region of Waterloo (Region) has initiated a Servicing Review to assess the current water and wastewater systems that serve the communities of Baden, New Hamburg and Foxboro Green and assess current and future servicing needs.

The Study will review existing conditions and provide recommendations related to the capacity and quality of the supply from the existing water supply system and the capacity and condition of the wastewater treatment and collection system based on current industry standards and new technologies. The recommendations of this review may include the need for upgrades to existing infrastructure or the provision of new infrastructure.

How is this Study being undertaken?

This Study is being undertaken to fulfill the requirements of Phases 1 and 2 of the Municipal Class Environmental Assessment document (October 2000, as amended in 2007, 2011 and 2015), which is an approved process under the Ontario Environmental Assessment Act.

How can I participate in this Study?

The Region encourages the public to participate in the Study planning process and learn more by:

- Signing up to the email contact list to receive project notices
- Attending the Public Consultation Centres (PCCs) during the Study to review information and provide feedback to the project team on the issues and opportunities, potential options, the decision-making process, recommended solutions, and next steps.

If you would like more information on the Study, or would like to be added to the contact list, please contact:

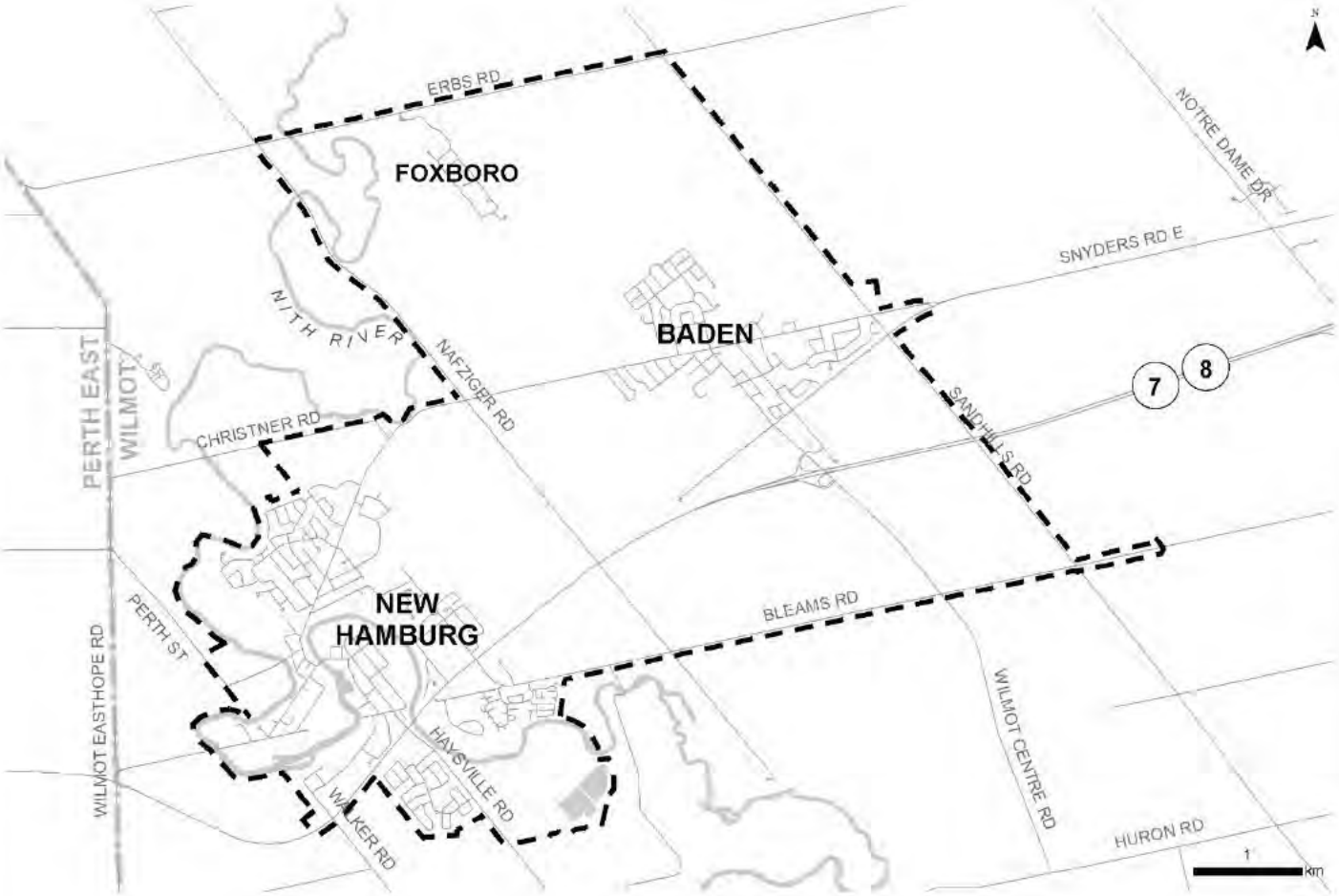
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Jeff Paul, P.Eng.
Project Manager
Stantec Consulting Ltd.
Phone: 519-675-6604
Email: Jeff.Paul@stantec.com

All comments and information received from individuals, stakeholder groups and agencies regarding this project are being collected under the authority of the "Municipal Act" to assist the Region of Waterloo in making a decision. Under the "Municipal Act", personal information such as name, address, telephone number, and property location that may be included in a submission becomes part of the public record. Questions regarding the collection of this information should be directed to Kaoru Yajima at the Region of Waterloo.

This Notice was first issued on February 3, 2020.

Figure 1: Study Area Map



Notice of Virtual Public Consultation Centre #1
Baden and New Hamburg Water and Wastewater System Servicing Review

The Region of Waterloo (Region) has initiated a Servicing Review to assess the current water and wastewater systems that serve the communities of Baden, New Hamburg and Foxboro Green and assess current and future servicing needs.

The Study will review existing conditions and provide recommendations related to the capacity and quality of the supply from the existing water supply system and the capacity and condition of the wastewater treatment and collection system based on current industry standards and new technologies. The recommendations of this review may include the need for upgrades to existing infrastructure or the provision of new infrastructure.

How is this Study being undertaken?

This Study is being undertaken to fulfill the requirements of Phases 1 and 2 of the Municipal Class Environmental Assessment document (October 2000, as amended in 2007, 2011 and 2015), which is an approved process under the Ontario Environmental Assessment Act.

How can I participate in this Study?

A Public Consultation Centre (PCC) is being held online through the Region's YouTube channel to enable you to review the process that will be followed for the project, introduce the project and detail why it's being completed, and provide background information on the Baden and New Hamburg Water and Wastewater Systems. More detailed project information is also available at the links below. We encourage all those who are interested to review the information and contact a member of the project team if you have any questions, comments, or would like to provide input on the study. The PCC materials will be available on the Region's YouTube channel and the Region's website starting Tuesday, June 1, 2021.

Where: https://www.youtube.com/regionofwaterloo

https://www.regionofwaterloo.ca/CurrentWaterProjects/

Please contact one of the following team members if you have any questions or comments or would like to be added to the project mailing list. You can also fill out the comment sheet on the Region's website and provide that to one of the following team members by Thursday, July 1, 2021.

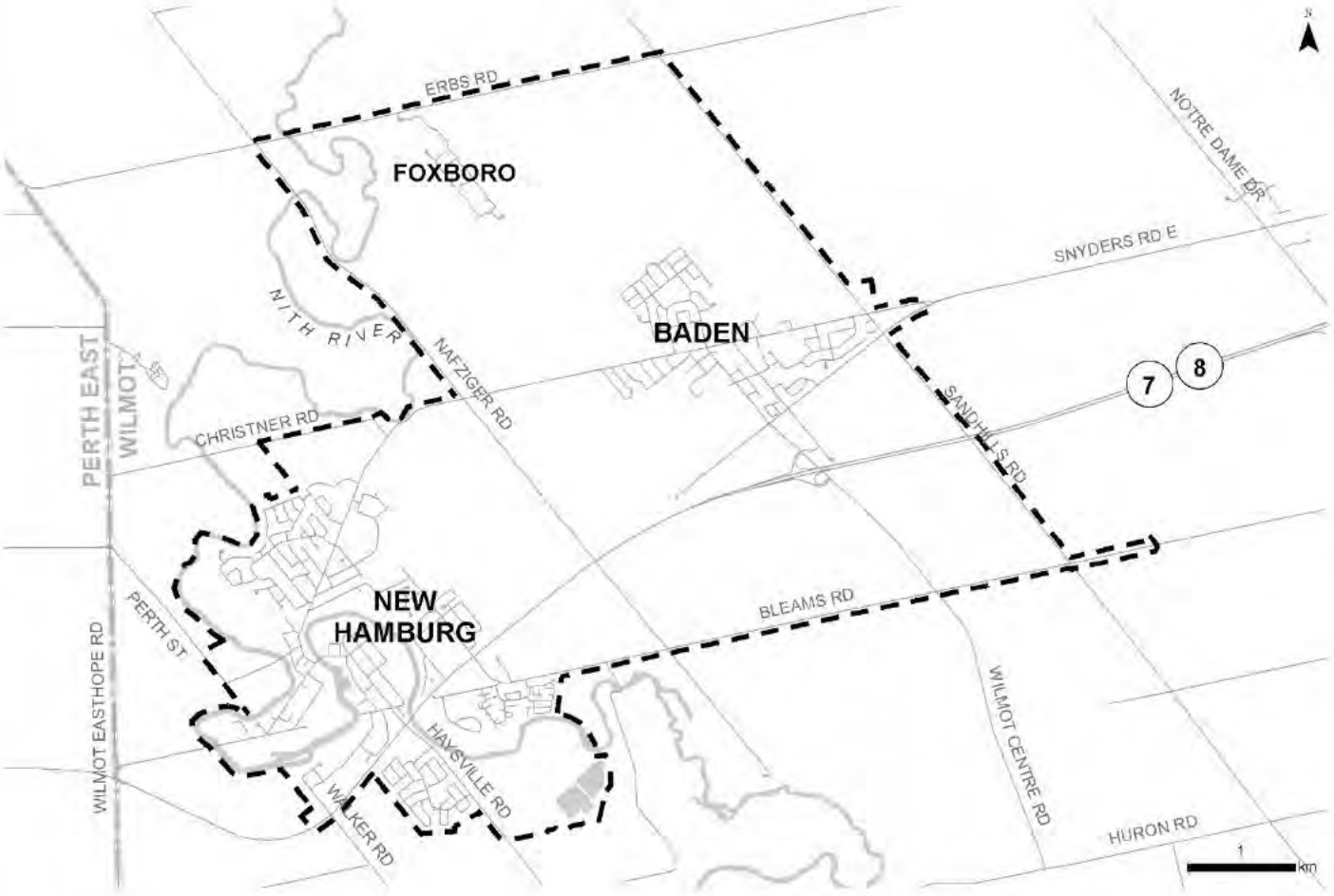
Kaoru Yajima
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Project Manager
Stantec Consulting Ltd.
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All comments and information received from individuals, stakeholder groups and agencies regarding this project are being collected under the authority of the "Municipal Act" to assist the Region of Waterloo in making a decision. Under the "Municipal Act", personal information such as name, address, telephone number, and property location that may be included in a submission becomes part of the public record. Questions regarding the collection of this information should be directed to Kaoru Yajima at the Region of Waterloo.

This Notice was first issued on May 26, 2021.

Figure 1: Study Area Map



Notice of Virtual Public Consultation Centre #2
Baden and New Hamburg Water and Wastewater System Servicing Review

The Region of Waterloo (Region) has initiated a Servicing Review to assess the current water and wastewater systems that serve the communities of Baden, New Hamburg and Foxboro Green and assess current and future servicing needs.

The Study has reviewed existing conditions related to the capacity and quality of the supply from the existing water supply system and the capacity and condition of the wastewater treatment and collection system, has evaluated alternative solutions and options, and has identified preliminary recommendations based on current industry standards and new technologies. Preliminary recommendations are being presented at Public Consultation Centre (PCC) #2 for stakeholder review and comment.

This Study is being undertaken to fulfill the requirements of Phases 1 and 2 of the Municipal Class Environmental Assessment document (October 2000, as amended in 2007, 2011 and 2015), which is an approved process under the Ontario Environmental Assessment Act.

How can I participate in this Study?

A second PCC is being held online through the Region's YouTube channel to present the preliminary recommendations related to the future capacity and quality of the supply from the existing water supply system and the future capacity and condition of the wastewater treatment and collection system. Additional information and background on the study can be found on the Region's website or at the links below. We encourage all those who are interested to review the information and contact a member of the project team if you have any questions, comments, or would like to provide input on the study. The PCC materials will be available as follows:

Where: https://www.youtube.com/regionofwaterloo
https://www.regionofwaterloo.ca/CurrentWaterProjects/

When: Tuesday, December 7, 2021 to Wednesday, January 12, 2022

Please contact one of the following team members if you have any questions or comments or would like to be added to the project mailing list. You can also fill out the comment sheet on the Region's website and provide that to one of the following team members by Wednesday January 12, 2022.

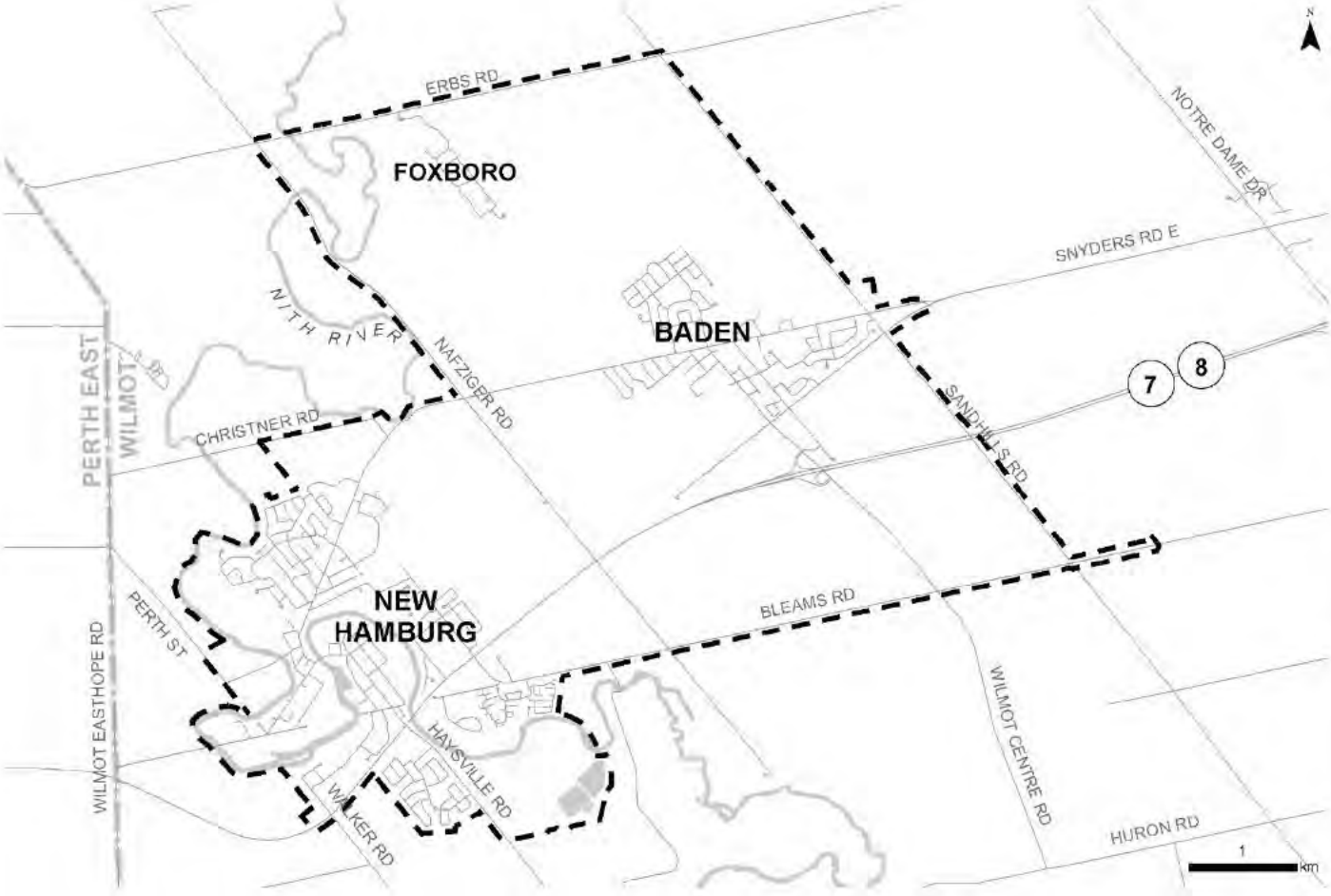
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Jeff Paul, P.Eng.
Project Manager
Stantec Consulting Ltd.
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All comments and information received from individuals, stakeholder groups and agencies regarding this project are being collected under the authority of the "Municipal Act" to assist the Region of Waterloo in making a decision. Under the "Municipal Act", personal information such as name, address, telephone number, and property location that may be included in a submission becomes part of the public record. Questions regarding the collection of this information should be directed to Kaoru Yajima at the Region of Waterloo.

This Notice was first issued on Wednesday, December 1, 2021.

Figure 1: Study Area Map



Notice of Virtual Public Consultation Centre #3
Baden and New Hamburg Water and Wastewater System Servicing Review

The Region of Waterloo (Region) has initiated a Servicing Review to assess the current water and wastewater systems in the communities of Baden, New Hamburg and Foxboro Green and assess current and future needs. Alternative solutions have been developed and were evaluated. The following Preliminary Preferred Alternatives are being presented at Public Consultation Centre (PCC)#3 for public review and comment:

1. Increasing water storage capacity at the New Hamburg Water Treatment Plant.
2. Upgrading the Baden Pump Station and construction of a new forcemain and connecting directly to the New Hamburg Wastewater Treatment Plant.
3. Connecting Foxboro Green to the Baden sewer and water supply system.

This Servicing Review is being undertaken to fulfill the requirements of Schedule B projects, following Phases 1 and 2 of the Municipal Class Environmental Assessment (October 2000, as amended in 2007, 2011 and 2015), which is an approved process under the Ontario Environmental Assessment Act.

How can I participate in this Study?

This PCC#3 is being held online through the Region's YouTube channel to present the preliminary preferred alternatives related to the future water supply system and wastewater treatment and collection system. Additional information and background on the study can be found on the Region's website or at the links below. We encourage all those who are interested to review the information and contact a member of the project team if you have any questions, comments, or would like to provide input on the study. The PCC materials will be available as follows:

Where: https://www.youtube.com/regionofwaterloo
https://www.regionofwaterloo.ca/CurrentWaterProjects/

When: Tuesday, June 7, 2022 to Thursday, July 7, 2022

Please contact one of the following team members if you have any questions or comments or would like to be added to the project mailing list. You can also fill out the comment sheet on the Region's website and provide that to one of the following team members by Thursday, July 7, 2022.

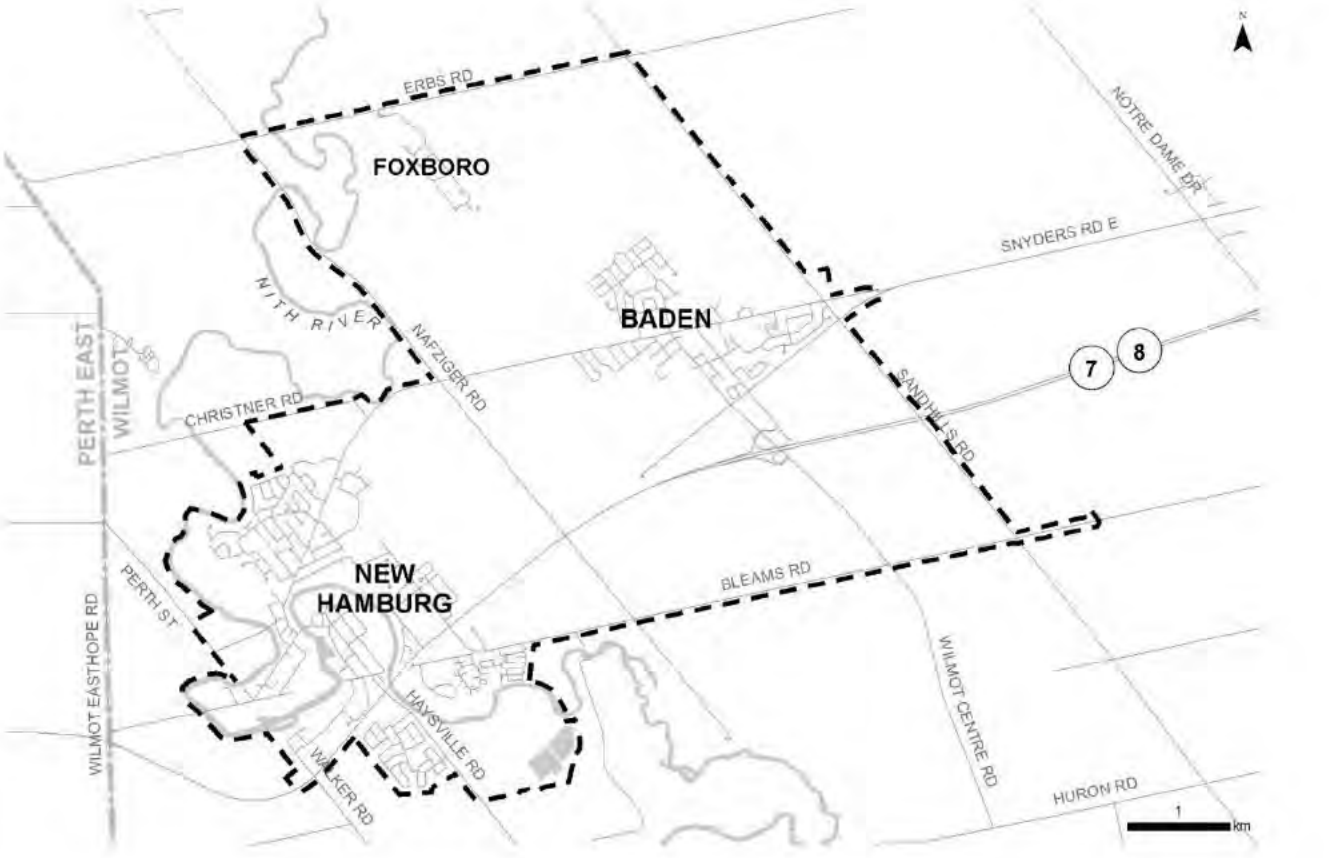
Kaoru Yajima
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Jeff Paul, P.Eng.
Project Manager
Stantec Consulting Ltd.
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All comments and information received from individuals, stakeholder groups and agencies regarding this project are being collected under the authority of the "Municipal Act" to assist the Region of Waterloo in making a decision. Under the "Municipal Act", personal information such as name, address, telephone number, and property location that may be included in a submission becomes part of the public record. Questions regarding the collection of this information should be directed to Kaoru Yajima at the Region of Waterloo.

This Notice was first issued on Tuesday, May 31, 2022.

Figure 1: Study Area Map



Region of Waterloo
Baden - New Hamburg Water and Wastewater Servicing Review
Stakeholder List

Contact	Company/Organization	Job Title	Street	City	Postal Code	Telephone	Email	Comments
DEVELOPPERS								
Jessie Ha Kong	Cachet Developments	Land Development Manager	361 Connie Crescent	Concord	L54K 5R2	416-704-8358	jess e@cachetdevelopments.com	416-704-8353
	Dietrich Engineering						mail@dietricheng.com	
Jodie Honderich	Morningside Condominium Corporation	Office Manager	10 Homestread Place	New Hamburg	N3A 1G2	519-668-2748	jodie@morningside.ca	
Patrick George	Badenview Developments Inc.	President	5093 Fountain Street North	Breslau	N0B 1M0	519-648-2285	gaoffice@gamasonry.com	
Stewart Good	Newdale Farm Inc.	Owner	3466 Bleams Road	New Hamburg	N3A 2J7	519-272-4757	scgood@cyg.net	519-662-4094 (don t know what is home & cell #)
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Michael Kilgore	Ministry of Transportation	Corridor Management Planner	659 Exeter Road	London	N6E 1L3	2269-973-7021	m chael.k lgo e@onta o.ca	MTO Representation for EA - only send notices f needed
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SPECIAL INTEREST GROUPS								
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Maria Kyveris	Waterloo Region Home Builders Association	President	625 King Street East Suite 1C	K tchener	N2G4V4	519-404-3971	maria.kyveris@rogers.com	
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UTILITIES								
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Janet Cleghorn	Bell Canada		575 Riverbend Drive, Floor 2	K tchener	N2K 3S3		janet.cleghorn@bell.ca	
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Greig Cameron	Kitchener-Wilmot Hydro	Vice President of Engineering & IT	301 Victoria Street South P.O. Box 9010	K tchener	N2G 4L2	519-745-4771 #209	gcame on@kwhyd o.ca	
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	Canadian National Railway						ER-P l -W @	
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Randy Taylor	Goderich-Exeter Railway Company Lim ted		101 Shakespeare Street 2nd Floor	Stratford	N5A 3W5	519-271-4441 #4Cell 519-2	randy.taylor@railamerica.com	
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Property Manager	Foxboro Communitiy	Property Manager						
PUBLIC								
Lloyd Sheiner	Morningside Adult Lifestyle Commun ty - Sheiner Group	President & CEO						

Region of Waterloo
Baden - New Hamburg Water and Wastewater Servicing Review
Stakeholder List

Contact	Company/Organization	Job Title	Street	City	Postal Code	Telephone	Email	Comments
Pierre Côté	Morningside Adult Lifestyle Commun ty							
Brad Trussler	Mattamy Homes							
Steve Voisin	Voisin Developments							
Greg Voisin	Voisin Developments							
				Wilmot				
Richard Toogood	Chair, Service & Equipment committee							
Jason Cabral	MTE Consultants Inc	Project Manager		K tchener	N2B3X9			
Steve Peterson	MTE Consultants Inc	Director, Land Development / Engineering Representativ		K tchener	N2B3X9			
Matt Ninomiya	Wa ter Fedy	Land Develoment Practice Lead Civ l		K tchener	N2M1A1			

Project Contact Sheet

Organization	Name	Project Role	Email
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	Mark Jeffery	Technical Support	mark.jeffery@wilmot.ca
Region of Waterloo	Kaoru Yajima	Regional Representative	KYajima@regionofwaterloo.ca

Region of Waterloo

Baden and New Hamburg Water and Wastewater System Servicing Review

Virtual Public Consultation Centre #1
Tuesday June 1, 2021

Stantec

Goals of PCC#1

Welcome!

The Goals of this Virtual Public Consultation Centre:

- **Provide an overview of the process that will be followed for the project**
- **Introduce the project and the reasons why it is being done**
- **Provide background information on the Baden and New Hamburg Water and Wastewater Systems**
- **Answer any questions you may have and provide an opportunity to get involved in the project**

Comments received during this study will be used to identify a recommended approach for current and future water and wastewater infrastructure needs of the communities of Baden and New Hamburg

Project Overview

What are we doing?

We are assessing the current water supply and wastewater treatment systems that serve the communities of Baden and New Hamburg. This study will look to assess infrastructure needs for future growth approved under the Region's Official Plan and consider any outcomes from the new ROP review currently underway. This study excludes the local watermain and sewer extensions which are the responsibility of Wilmot Township.

Why are we doing it?

We are taking steps now to ensure we are ready to meet the future needs of Baden and New Hamburg through examination of the Region's infrastructure. We will also explore any opportunities for the Foxboro Green community.

What does it mean to you?

Current and future needs may require the construction of new water supply and wastewater infrastructure, or upgrades to existing facilities, which may also need land acquisition. This is your opportunity to get involved with the planning process.



Region of Waterloo

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Municipal Class Environmental Assessment Process

This System Servicing Review will be completed to satisfy the first two phases of the Municipal Class EA process for projects which will be identified through the study.

We are here

Virtual Public Consultation Centre #1

Phase 1

Identify the problem/ opportunity.

Virtual Public Consultation Centre #2

Phase 2A

Develop and evaluate alternative solutions. Identify recommended solution.

Virtual Public Consultation Centre #3

Phase 2B

Confirm and present preferred solution and potential environmental impacts and proposed mitigation measures.

Continuous Stakeholder Engagement

30-day public review period

Region of Waterloo

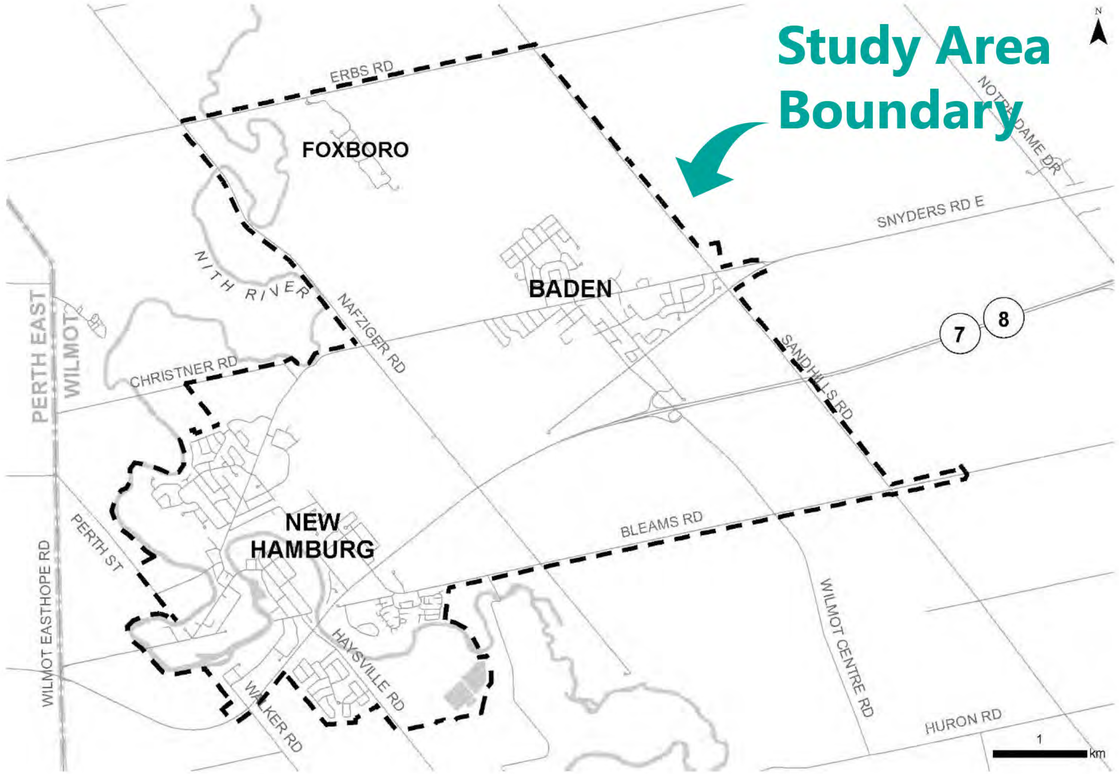
Stantec

Project Background

The communities of Baden and New Hamburg are currently serviced by a two-tier water and wastewater system by Wilmot Township and the Region.

This System Servicing Review will assess the Region's portion of the current water and wastewater systems that serve the study area. The Review of the current and future infrastructure needs within the community will be based on:

- The Region's 2011 Master Plan Update
- The 2015 Region Official Plan (ROP) and consider any outcomes from the new ROP Review underway
- The Township of Wilmot's 2019 Official Plan
- The recommendations from the Region's 2018 Wastewater Treatment Master Plan
- Current development applications



This study considers the water supply and wastewater requirements for the whole study area for the Region's assets.

Problem and Opportunity Statement

The Region of Waterloo is expected to continue to grow as identified in the Region Official Plan. These changes will lead to an increased demand for water, and increased production of wastewater.

This System System Servicing review will assess the current state of Region's assets in the communities of Baden, New Hamburg and Foxboro Green and identify preferred solutions to ensure it is able to service the identified growth.

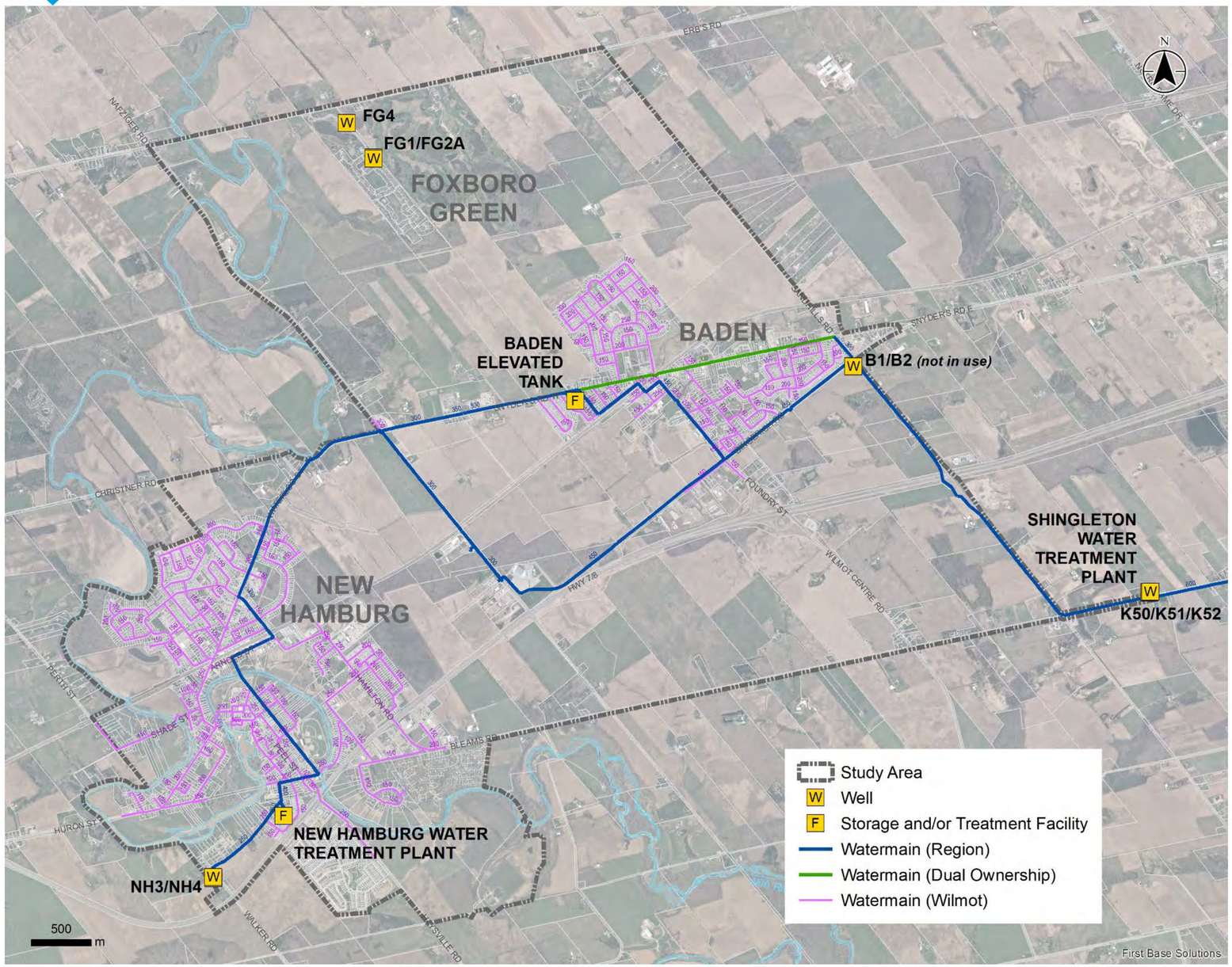


Do you agree with the problem/ opportunity statement? Are there any other considerations?

Region of Waterloo

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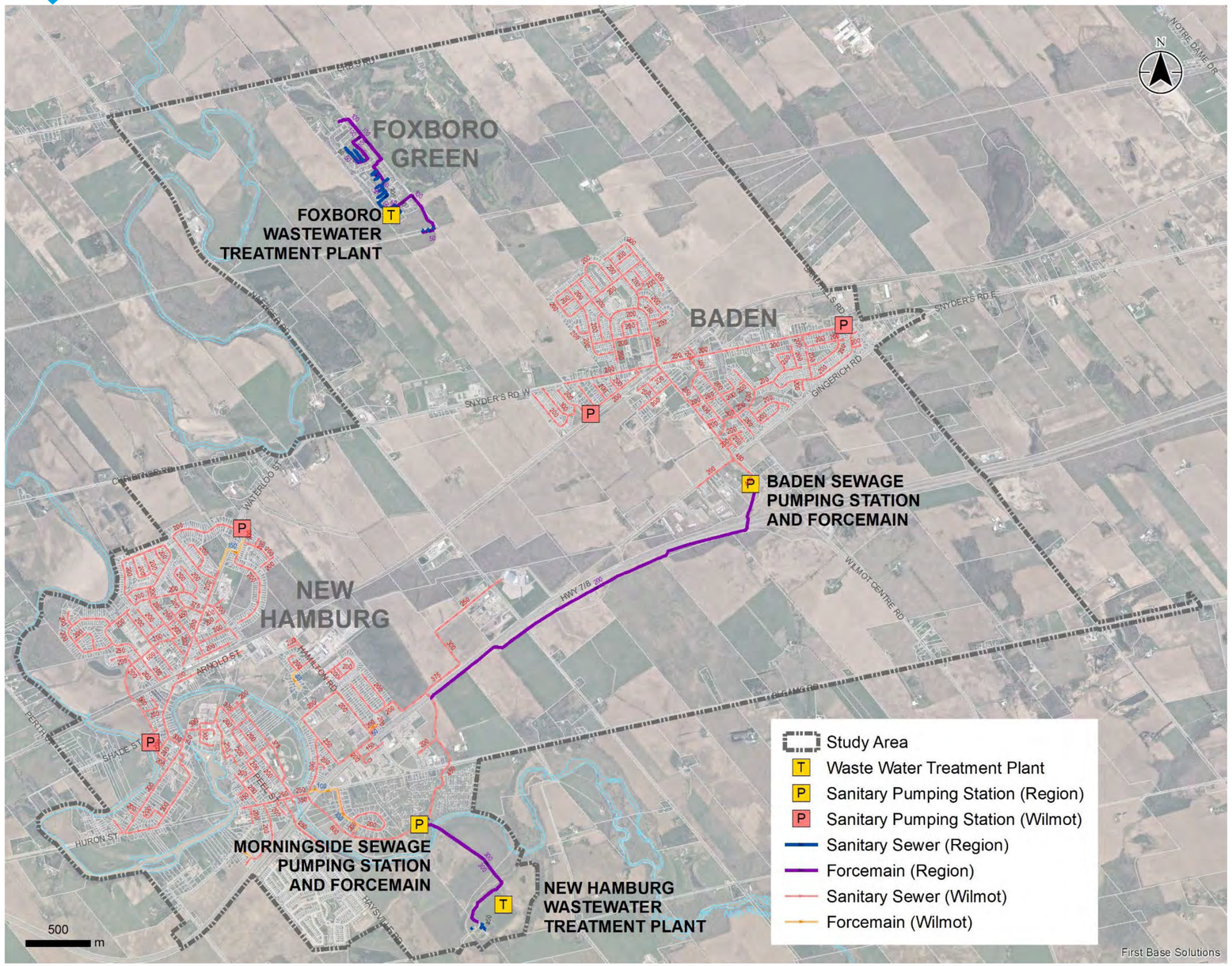
Existing Water Supply System



This map provides an overview of the Existing Water System that serves the communities of Baden, New Hamburg and Foxboro Green.

The Region's water infrastructure is shown in blue and yellow.

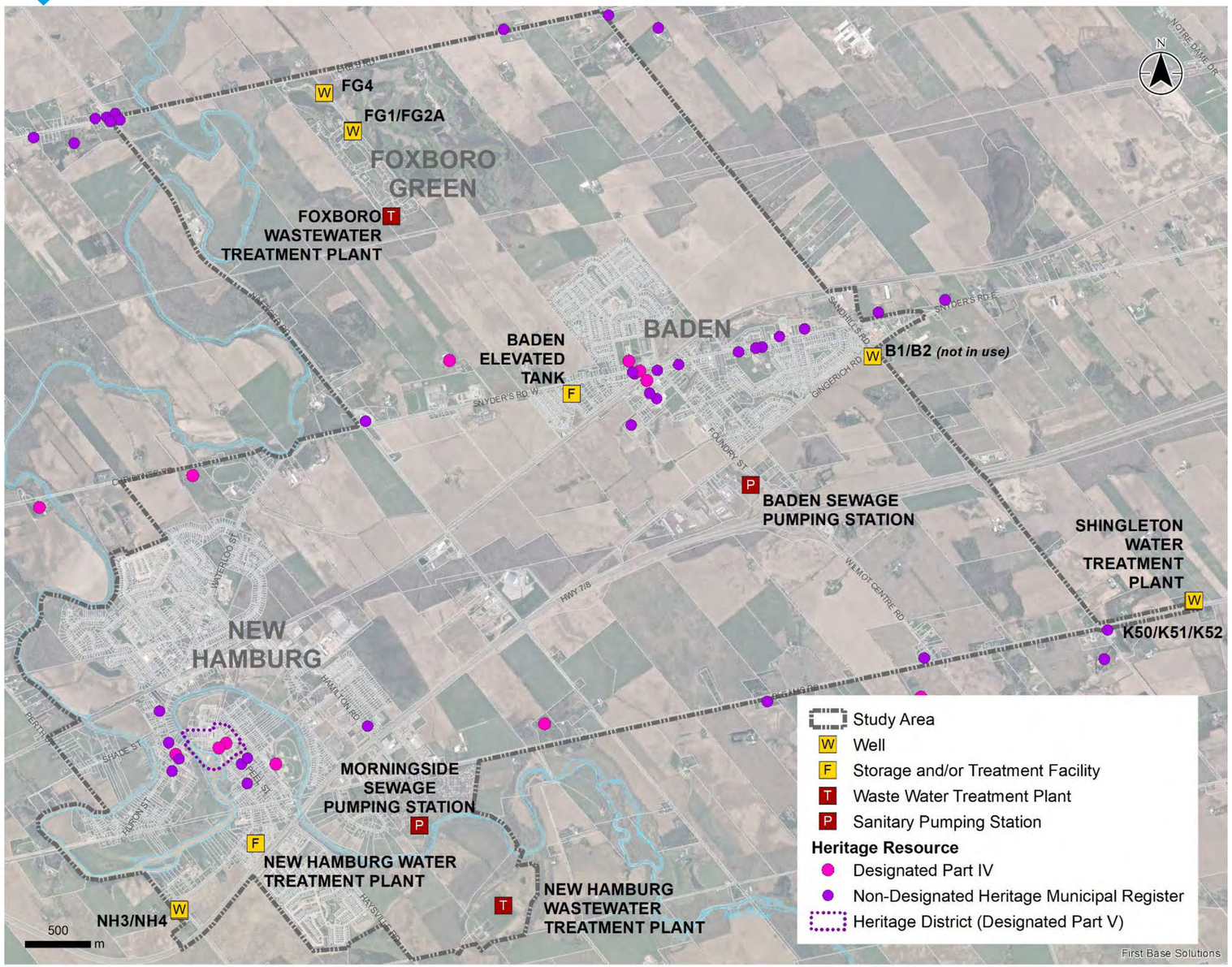
Existing Wastewater System



This map provides an overview of the Existing Wastewater System that serves the communities of Baden, New Hamburg and Foxboro Green.

The Region's wastewater infrastructure is shown in blue, purple and yellow.

Archaeology & Cultural Heritage



This map provides a high-level overview of the archeological and cultural heritage resources present within the study area, including individual heritage resources that are designated under Part IV of the Ontario Heritage Act, resources that are listed on the Municipal Heritage Register, and the New Hamburg Heritage Conservation District.

A more detailed assessment of these resources will be undertaken once proposed infrastructure is identified.

Next Steps

Review Background Information	Collect data, review existing conditions and identify project constraints and opportunities.
Public Consultation Centre #1	Introduce the project. ★
Develop and Evaluate Alternatives	Develop and evaluate alternatives to address current and future servicing needs.
Public Consultation Centre #2	Obtain input on preferred alternatives. ★
Identify Preferred Alternative	Identify preferred alternative, develop and evaluate the design of the preferred alternative.
Public Consultation Centre #3	Present preferred alternative. ★
Draft Final Report	Finalize Draft Final Report and publish for 30 day public review ★

Region of Waterloo Council

★ An opportunity for the public to provide input

Thank you for your participation!

Get engaged!

We are still at the beginning of the Baden and New Hamburg Water and Wastewater System Servicing Review. Do you have questions, comments, or want to stay up to date?

Please contact:

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More information, including copies of project notices, comment sheet and Public Consultation Centre materials like a transcript of this virtual presentation can be found at:

https://www.regionofwaterloo.ca/waterprojects

Region of Waterloo

Stantec

Public Consultation Centre Presentation Transcript

Slide 1 – Title Slide

Hello and thank you for joining us for Baden and New Hamburg Water and Wastewater System Servicing Review Virtual Public Consultation Centre number 1 (or PCC).

Slide 2 - Welcome

The Goals of this Virtual Public Consultation Centre is to provide an overview of the process that will be followed for the project, introduce the project and detail why it's being completed, and provide background information on the Baden and New Hamburg Water and Wastewater Systems. This Virtual Public Consultation Centre also provides you with an opportunity to get involved in the project and aims to answer any questions the public or stakeholders may have.

A PDF of this presentation including a transcript and additional information on the project is available on the Region of Waterloo's website if you'd like to review it in more detail. A link to the website is provided in the video description below.

We encourage you to review the information and contact a member of the project team by phone or email if you have any questions or would like to provide your thoughts to the project team. Comments received during this study will be used to identify a recommended approach for current and future water and wastewater infrastructure needs the communities of Baden, New Hamburg and Foxboro Green. Contact information is provided at the end of this presentation and on the Region of Waterloo's website.

Slide 3 – Project Overview

To better understand the project, we ask the following three questions:

1. what are we doing,

2. why are we doing it, and

3. what does it mean to you?

To answer the first question, the Region is assessing the current water and wastewater treatment systems that serve the communities of Baden and New Hamburg. This study will look to assess infrastructure needs for future growth approved under the Region's Official Plan and consider any outcomes from the new ROP review currently underway. This study excludes the local watermain and sewer extensions which are the responsibility of Wilmot Township.

Why are we doing it? The Region is taking steps now to ensure the regional Water and Wastewater System is ready to meet the future servicing needs of the Baden and New

Hamburg communities through the Region's infrastructure. The Region will also be exploring alternative servicing opportunities for the Foxboro Green community.

What does it mean to you? Current and future servicing needs may require the construction of new water supply and wastewater infrastructure, or upgrades to existing facilities, which may also need land acquisition. This is your opportunity to get involved with the planning process. What are some of the key factors important to you that should be taken into account during this study? Let us know by filling out a comment form available on the Region's website and providing the form to a project team contact, as listed at the end of this presentation or on the Region of Waterloo's website.

Slide 4 - The Municipal Class Environmental Assessment Process

The Municipal Class Environmental Assessment, or EA process, is a five-phase planning process that is approved under the Ontario Environmental Assessment Act. All Municipalities in Ontario are required to complete a Municipal Class EA when planning infrastructure projects. This Municipal Servicing review will be completed to satisfy the first two phases of the Municipal Class EA process for projects which will be identified through the study.

These steps include:

- identifying the problem or opportunity;
- developing and evaluating alternative solutions and identifying recommended solution; and,
- Confirm and present preferred solution and potential environmental impacts and proposed mitigation measures.

We are currently in Phase 1 of the study. The second and third virtual public consultation centres will take place during Phase 2, where we will provide more information on the evaluation of alternative solutions and preliminary recommended water distribution and wastewater treatment infrastructure for public review and comment.

Following the confirmation of the preferred solution and the presentation of potential environmental impacts and proposed mitigation measures, a Project File Report will be prepared to summarize the decision-making process for the public and stakeholders. A 30-day review period will be provided for the public and stakeholders to review and comment.

Slide 5 – Project Background

The study area for Baden and New Hamburg Water and Wastewater System Servicing Review includes the communities of New Hamburg, Baden, and Foxboro, as illustrated by the map on the slide. The communities of Baden and New Hamburg are currently serviced by a two-tier water and wastewater system operated by the Region, in

partnership with the Township of Wilmot, who operates the watermains. There are currently 6 locations that provide water services to Baden and New Hamburg and 5 locations that provide wastewater services.

This System Servicing Review will assess the Region's portion of the current water and wastewater systems that serve the study area. The Review of the current and future infrastructure needs within the community will be based on:

- The Region's 2011 Master Plan Update
- The 2015 Region Official Plan (ROP) and consider any outcomes from the new ROP Review underway
- The Township of Wilmot's 2019 Official Plan
- The recommendations from the Region's 2018 Wastewater Treatment Master Plan; and,
- Current development applications

This study considers the water supply and wastewater requirements for the whole study area for the Region's assets.

Slide 6 – Problem and Opportunity Statement

The Region of Waterloo is expected to continue to grow as identified in the Region Official Plan. These changes will lead to an increased demand for water, and increased production of wastewater. This System System Servicing review will assess the current state of Region's assets in the communities of Baden, New Hamburg and Foxboro Green and identify preferred solutions to ensure it is able to service the identified growth.

Do you agree with the problem/opportunity statement? Are there any other considerations? Let us know by filling out a comment form available on the Region's website and providing the form to a project team contact, as listed at the end of this presentation or on the Region of Waterloo's website.

Slide 7 – The Existing Water System

There are a total of ten wells and two storage and/or treatment facilities within the study area. The following map provides an overview of the Existing Water System that serves the communities of Baden, New Hamburg and Foxboro Green by illustrating the exact locations of the wells, storage and/or treatment facilities, as well as the local watermain system. The Region's water infrastructure is show in blue and yellow.

Slide 8 – The Existing Wastewater System

There are a total of six sanitary pumping stations and two wastewater treatment plants within the study area. The following map provides an overview of the Existing Wastewater System that serves the communities of Baden, New Hamburg and Foxboro Green by illustrating the exact locations of sanitary pumping stations and wastewater treatment plants within the study area, as well as the local sanitary sewers and force main system. The Region's wastewater infrastructure is shown in purple and yellow.

Slide 9 – Archaeology & Cultural Heritage

This map provides a high-level overview of the archeological and cultural heritage resources present within the study area, including individual heritage resources that are designated under Part IV of the Ontario Heritage Act, resources that are listed on the Municipal Heritage Register, and the New Hamburg Heritage Conservation District.

A more detailed assessment of these resources will be undertaken once proposed infrastructure is identified.

Slide 10 – Next Steps

Following this PCC, the Project Team will review input on the information presented. We will continue with our environmental investigations and development of alternative solutions for water distribution and wastewater treatment infrastructure, including potential new facility locations. These findings and preferred alternatives will be presented at our second PCC for public and stakeholder review and comment.

Following PCC #2, the preferred alternative will be identified, and the Project Team will work to develop and evaluate the design of the preferred alternative. The preferred alternative will be presented for public and stakeholder review and comment at the third and final PCC.

Feedback received as part of PCC #3 will be used to finalize the draft final report. The draft final report will then be published for 30 days to allow for public review before going before Regional Council.

Slide 11 – Questions

Thank you for your participation in the Baden and New Hamburg Water and Wastewater System Servicing Review Virtual Public Consultation Centre. We are still at the beginning of the Baden and New Hamburg Water and Wastewater System Servicing Review and look forward to presenting the public and stakeholders with more information as the project progresses.

Do you have any questions about the information presented here? Would you like more information on the alternatives or evaluation process? There are many ways to get in touch with the project team:

- You can fill out a comment sheet available on the Region's website, and return via mail or email to a member of the project team; or
- You can contact a project team member directly by email, telephone, or mail at the addresses listed.

As a reminder, more information, including copies of project notices and Public Consultation Centre materials like a transcript of this virtual presentation can be found at **www.regionofwaterloo.ca/waterprojects.**

Comment Sheet

Contact Information (optional, but required if you would like a response or to be added to the study mailing list):

Name/Organization:

Mailing Address:

E-mail:

1. **What are some of the key factors important to you that should be taken into account during this Study? (Refer to Slide 3)**

2. **Do you agree with the problem/opportunity statement? Are there any other considerations?**

3. Do you have any other questions or comments you would like to share with the project team?

Please email the completed form to a member of the study team by July 1, 2021:

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Stantec Consulting Ltd.
Jeff Paul, P.Eng.
Project Manager
Stantec Consulting Ltd.
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Email: Jeff.Paul@stantec.com

All comments and information received from individuals, stakeholder groups, and agencies regarding this project are being collected under the authority of the Municipal Act to assist the Region of Waterloo in making a decision. Under the Municipal Act, personal information such as name, address, telephone number, and property location that may be included in a submission becomes part of the public record. Questions regarding the collection of this information should be directed to Kevin Dolishny at the Region of Waterloo.

Baden and New Hamburg Water and Wastewater System Servicing Review

Virtual Public Consultation Centre #2

December 7, 2021

Region of Waterloo

Public Consultation Centre #2

Welcome!

The Goals of this Virtual Public Consultation Centre#2 (PCC#2):

- Provide an overview of the project
- Provide an update on the Study since PCC #1
- Present the Preliminary Water and Wastewater Servicing Alternatives for the communities of Baden, New Hamburg and Foxboro Green
- Provide an opportunity for you to learn about the project and get involved

Comments received during this study will be used to identify a recommended approach for current and future water and wastewater infrastructure needs of the communities of Baden, New Hamburg and Foxboro Green.

Region of Waterloo Stantec C3 WATER

Project Overview

What are we doing?

We are assessing the current water supply and wastewater treatment systems that serve the communities of Baden and New Hamburg. This study will look to assess infrastructure needs for future growth approved under the Region's Official Plan (ROP) and consider any outcomes from the new ROP review currently underway. This study excludes the local watermain and sewer extensions which are the responsibility of Wilmot Township.

Why are we doing it?

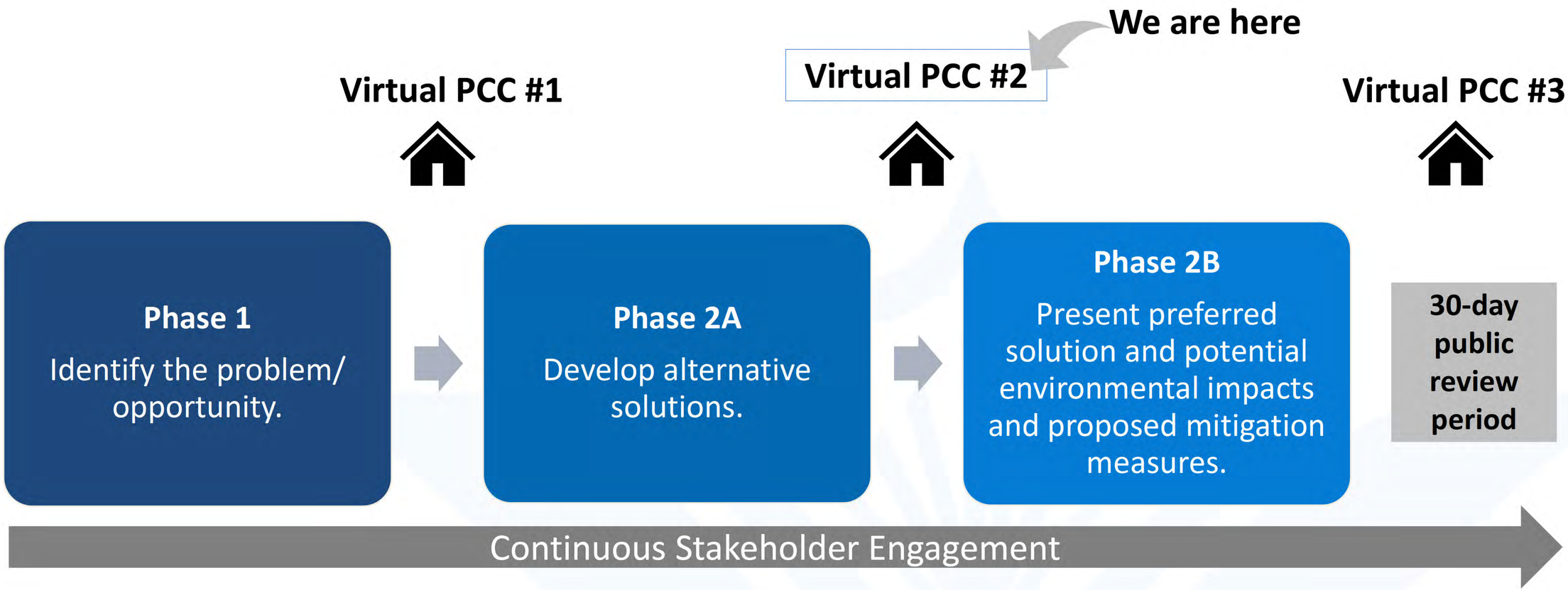
We are taking steps now to ensure we are ready to meet the future needs of Baden and New Hamburg through examination of the Region's infrastructure. We will also explore any opportunities for the Foxboro Green community.

What does it mean to you?

Current and future needs may require the construction of new water supply and wastewater infrastructure, or upgrades to existing facilities, which may also need land acquisition. This is your opportunity to get involved with the planning process.

Municipal Class Environmental Assessment Process

This System Servicing Review will be completed to satisfy the first two phases of the Municipal Class EA process for projects which will be identified through the study.



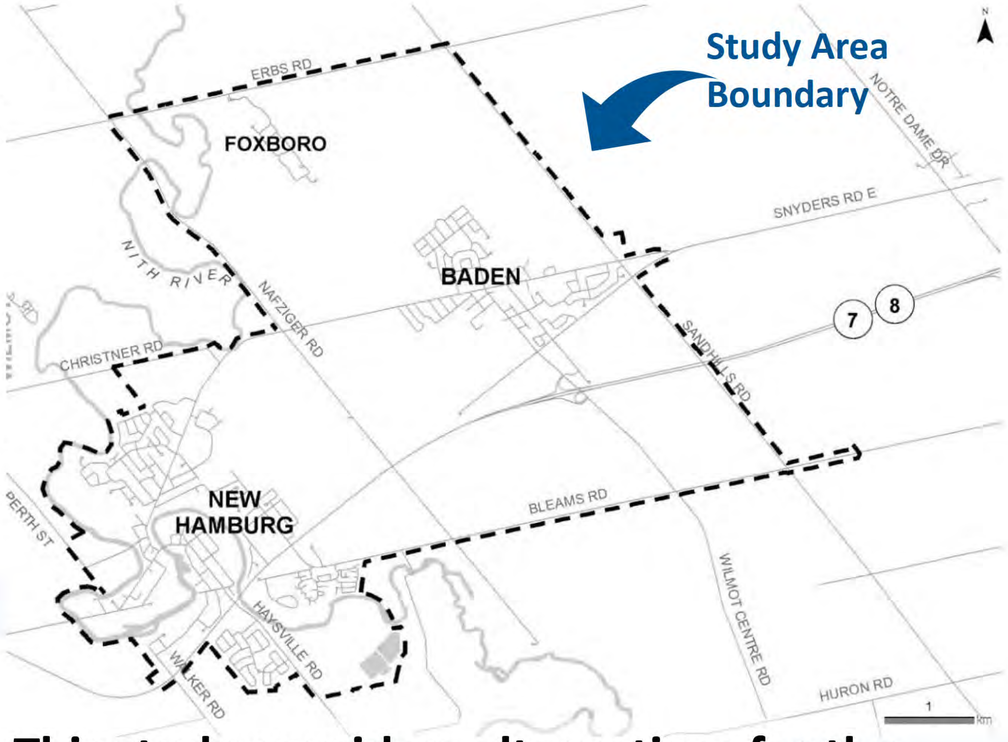
Region of Waterloo
Stantec
C3 WATER

Goals of Public Consultation Centre #2

The communities of Baden and New Hamburg are currently serviced by a two-tier water and wastewater system by Wilmot Township and the Region.

This System Servicing Review will assess the Region's portion of the current water and wastewater systems that serve the study area. The review of the current and future infrastructure needs within the community will be based on:

- Waterloo Region's 2011 Master Plan Update
- 2015 Region Official Plan (ROP) and consider any outcomes from the new ROP Review underway
- Township of Wilmot's 2019 Official Plan
- Region's 2018 Wastewater Treatment Master Plan
- Current development applications

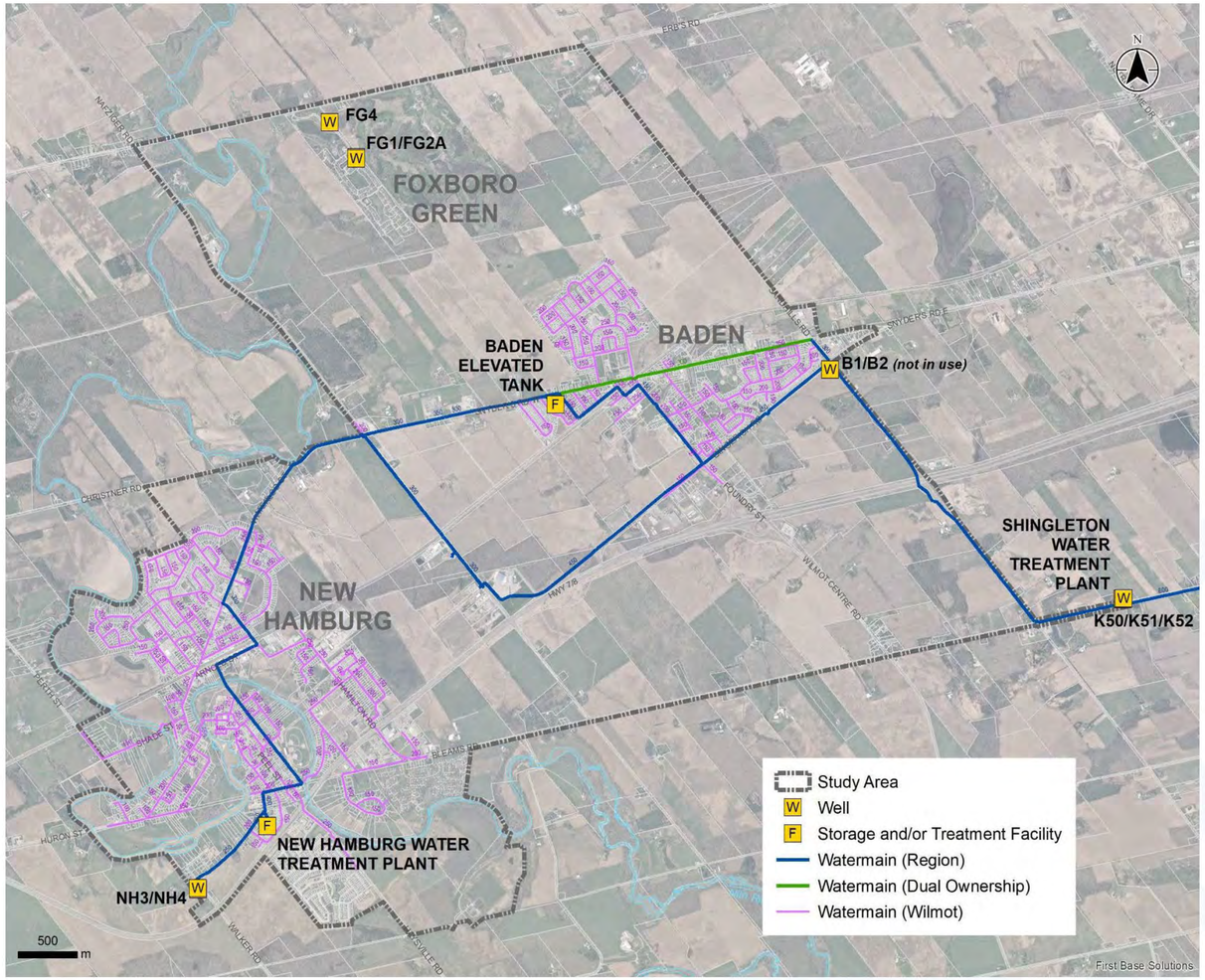


This study considers alternatives for the Region's assets under three main categories: 1) Water supply, 2) Wastewater, 3) Foxboro Green.

The Region is working with the Township to develop alternatives.

Region of Waterloo Stantec C3 WATER

1. Existing Water Supply System



Existing Conditions:

- Supply from the New Hamburg and the K50 wells has sufficient water supply capacity under existing and future conditions.
- Reliance on the K50 wells is a issue if they are off-line for any reason.
- Water storage is sufficient for existing conditions but under future conditions, additional storage is required by approximately 4,000 cubic meters.
- Foxboro Green is supplied by a water treatment plant but its assets are aging.

Key Issues to be Addressed:

- Water Supply Redundancy
- Water Storage

Alternative Solutions – Water Supply (WS)

The following Alternative Solutions have been developed to address the key issues identified for water supply:

Water Supply Redundancy:

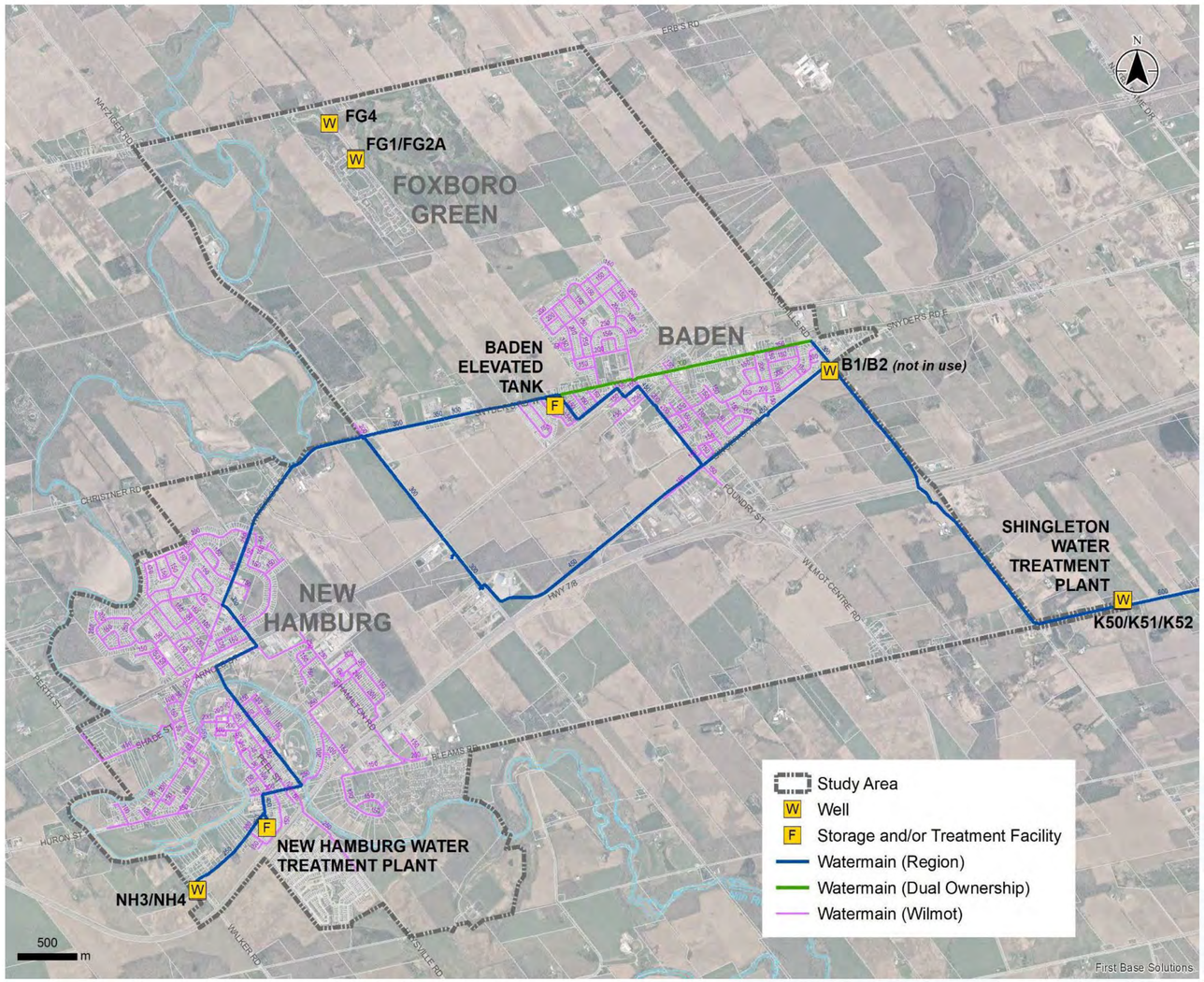
- Alternative WR1 - Do nothing
- Alternative WR2 - Actuated Valve at Shingletown (allows water to reverse flow under emergency conditions)*

* Alternative WR2 is being examined under another study

Future Water Storage:

- Alternative WS1 - Do nothing
- Alternative WS2 - Provide increased storage at the New Hamburg Water Treatment Plant
- Alternative WS3 – Provide new storage at the Baden Wells site
- Alternative WS4 - Provide new storage at the Shingleton/K50 Wells site
- Alternative WS5 - Combination of any of the above

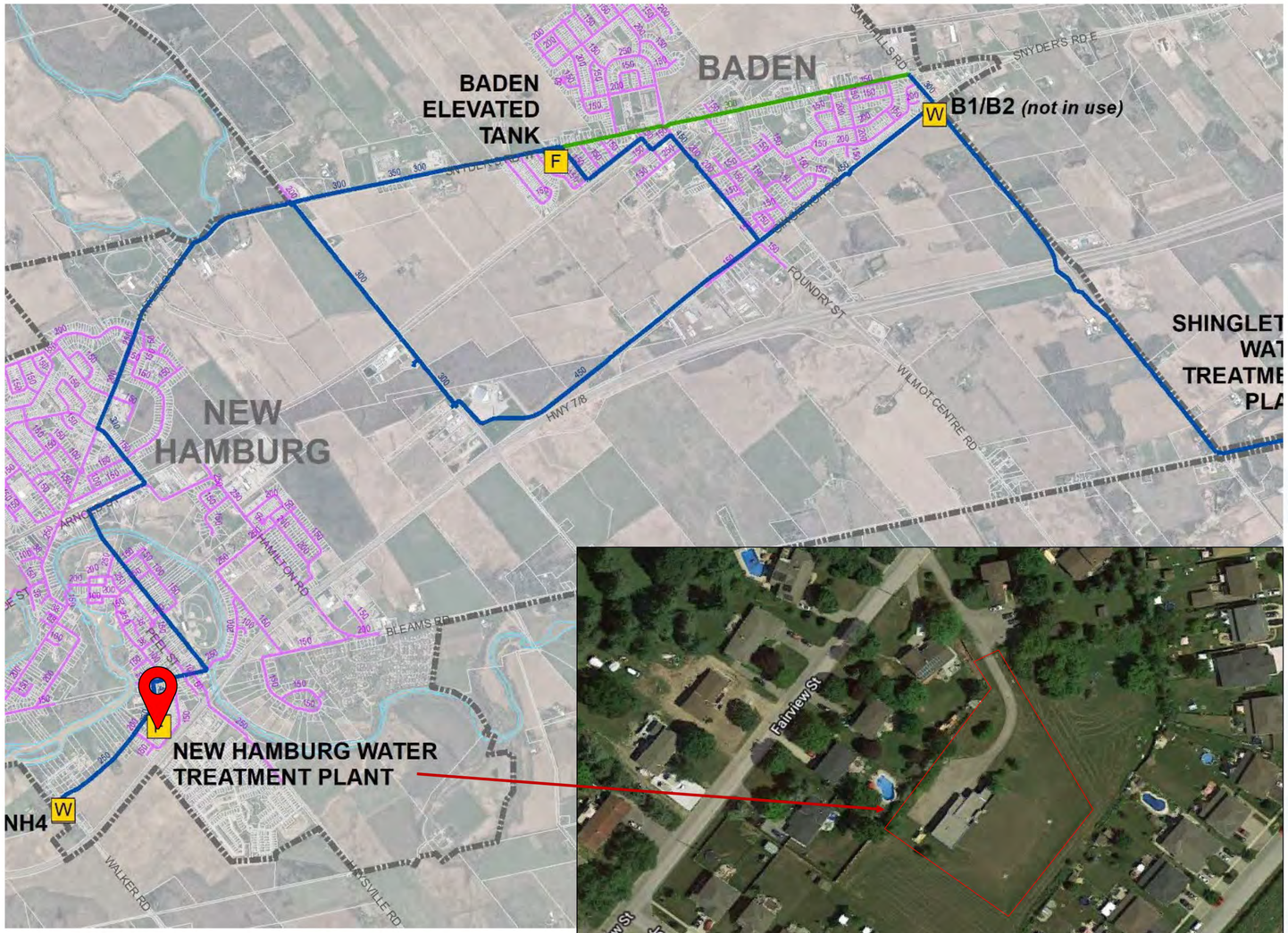
Alternative WS1 – Do Nothing



This alternative does not include any upgrades and would not meet the overall intent of the study but is used for comparison purposes.

Region of Waterloo Stantec C3 WATER

Alternative WS2 – Increased Storage at New Hamburg Water Treatment Plant



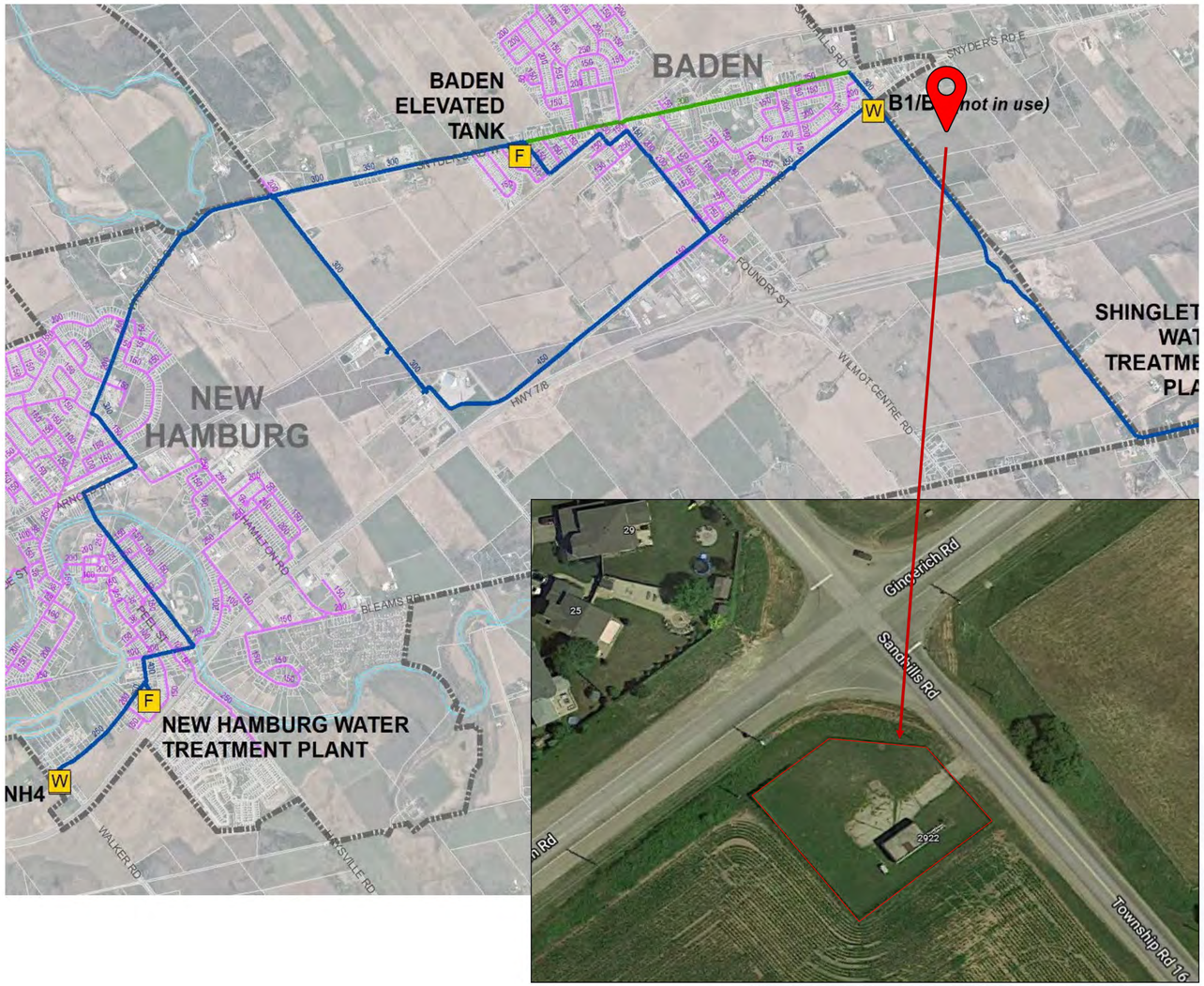
This alternative includes increasing the existing underground concrete storage at the New Hamburg Water Treatment Plant.

Considerations

- Accommodates future demand peaks
- Requires increased flow from Baden to allow refill of the New Hamburg Water Treatment Plant reservoir during high demand periods
- Possible site/land limitations

Region of Waterloo Stantec C3 WATER

Alternative WS3 – New Storage at Baden Well Sites



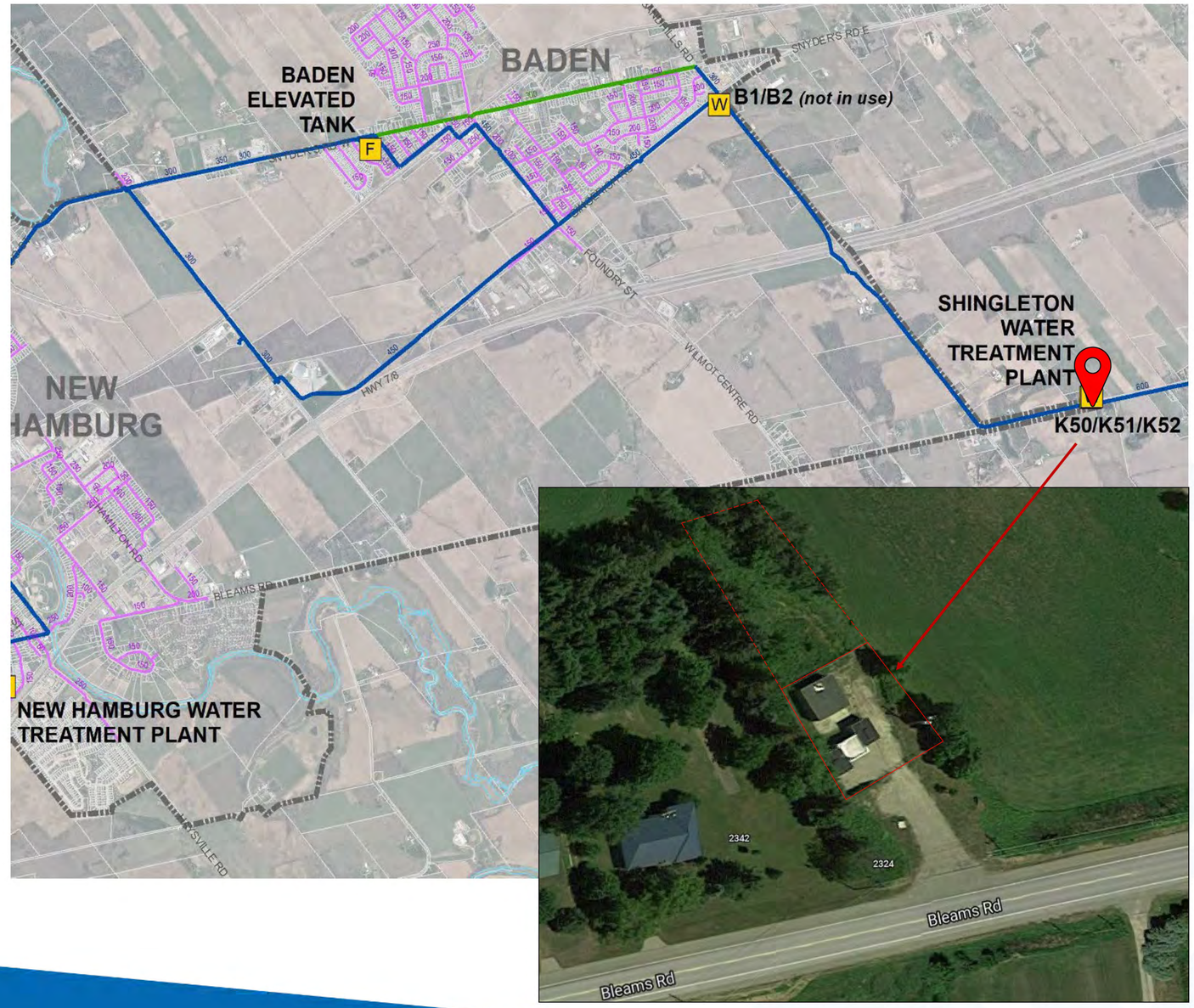
This alternative includes a new underground concrete reservoir and pump station at the former Baden well site to be fed by the K50 Wells.

Considerations

- Potential to re-use old Baden well property
- Provides ability to supplement water supply from the Baden Elevated Tank during periods of high demand
- Re-pumping required with new pumping station – not energy efficient
- Possible site/land limitations

Region of Waterloo
Stantec
C3 WATER

Alternative WS4 – New Storage at Shingleton/k50 Wells



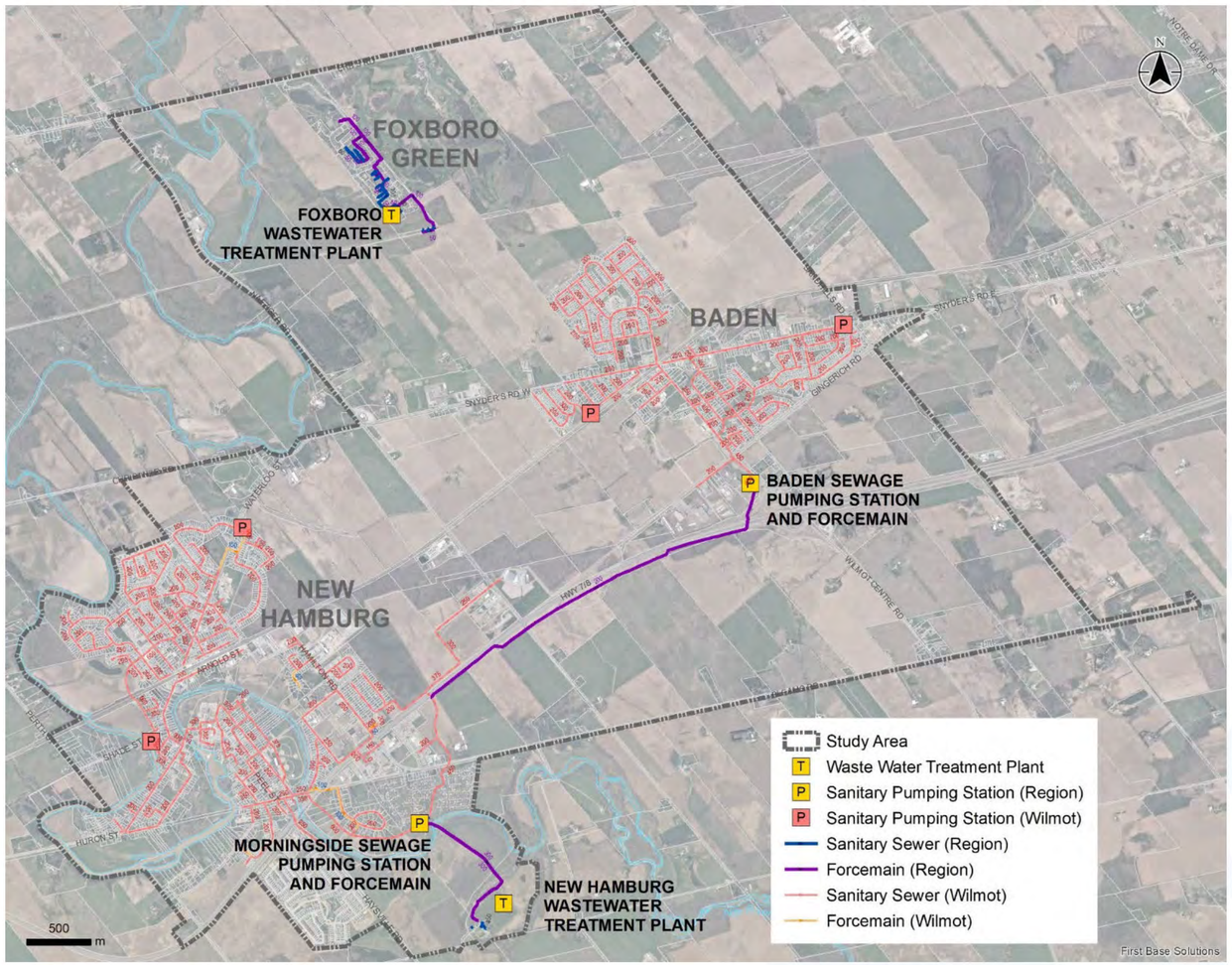
This alternative includes a new underground concrete reservoir at the Shingleton/ K50 Wells site.

Considerations

- Supplements the Baden Elevated Tank during periods of high demand
- Possible alignment with future manganese treatment and storage requirements
- New Pumping Station required
- Site/land limitations and additional area is required
- Potential for linkage with Mannheim well supply

Region of Waterloo Stantec C3 WATER

2. Existing Wastewater System



Existing Conditions:

- New Hamburg Wastewater Treatment Plant has sufficient capacity for the study area.
- Morningside Pumping Station is sufficient for existing conditions
- Baden Pumping Station and associated forcemains is under capacity for future growth demands for the study area.
- Foxboro wastewater treatment plant has sufficient capacity but requires optimization

Key Issues to be Addressed:

- Future Pumping Station and Forcemain Capacity

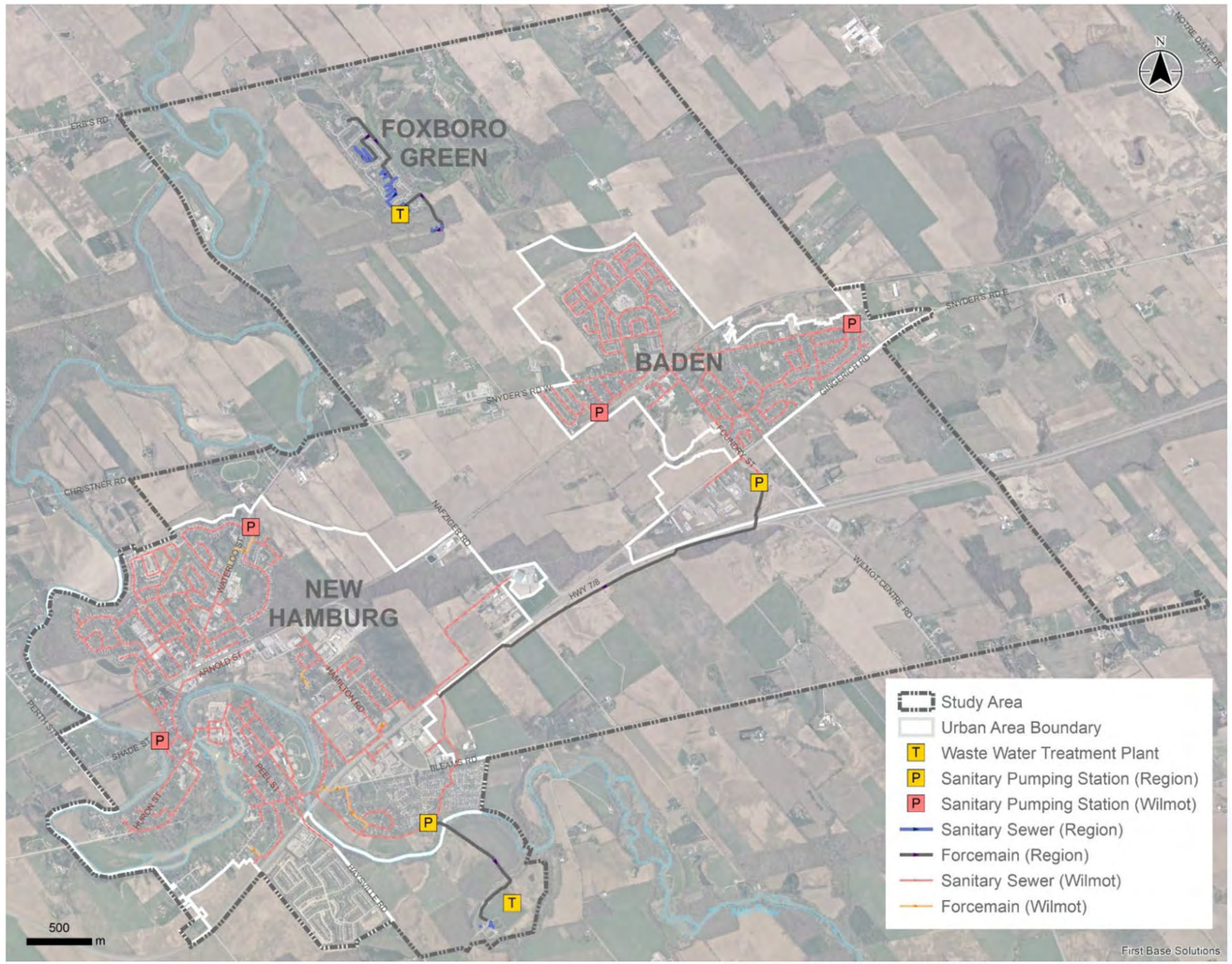
Alternative Solutions – Wastewater (WW)

The following Alternative Solutions have been developed to address the key issues identified for wastewater collection:

Future Pumping Station and Forcemain Capacity:

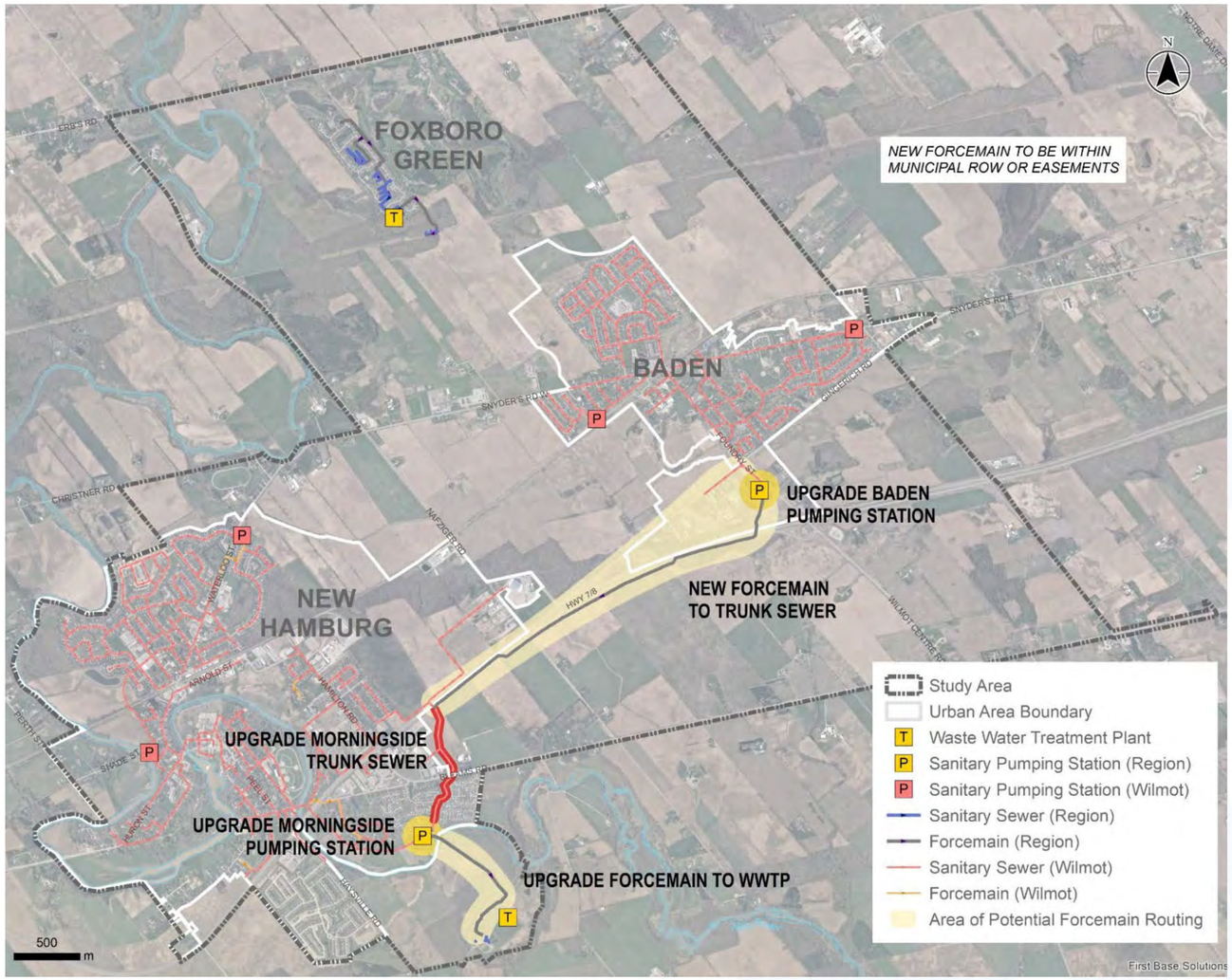
- Alternative WW1 - Do nothing
- Alternative WW2 - Upgrade system and maintain existing configuration
- Alternative WW3 - Upgrade system and convey directly to Morningside Pump Station
- Alternative WW4 - Upgrade system and convey directly to New Hamburg Wastewater Treatment Plant

Alternative WW1 – Do Nothing



This alternative does not include any upgrades and would not meet the overall intent of the study but is used for comparison purposes.

Alternative WW2 – Upgrade System and Maintain Existing Configuration



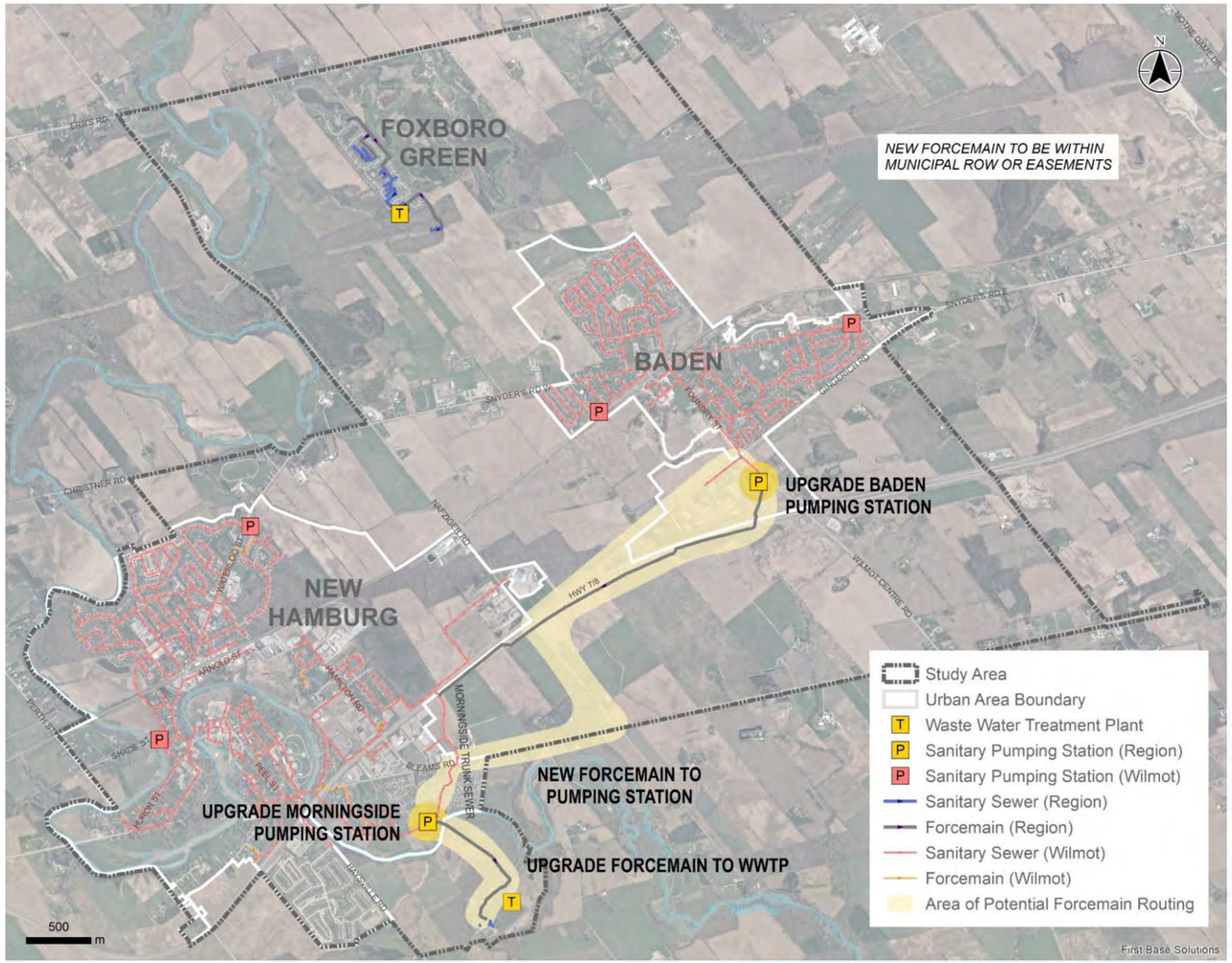
This alternative includes:

- Upgrades to the Baden Pumping Station
- New forcemain from Baden Pumping Station connecting to Morningside Trunk Sewer
- Upgrades to the Morningside Trunk Sewer
- Upgrades to the Morningside Pumping Station
- Upgrades to the forcemain from the Morningside Pumping Station to the New Hamburg Wastewater Treatment Plant

Shown is one possible example of the connection.

Region of Waterloo Stantec C3 WATER

Alternative WW3 – Upgrade System and Convey Directly to Morningside Pump Station



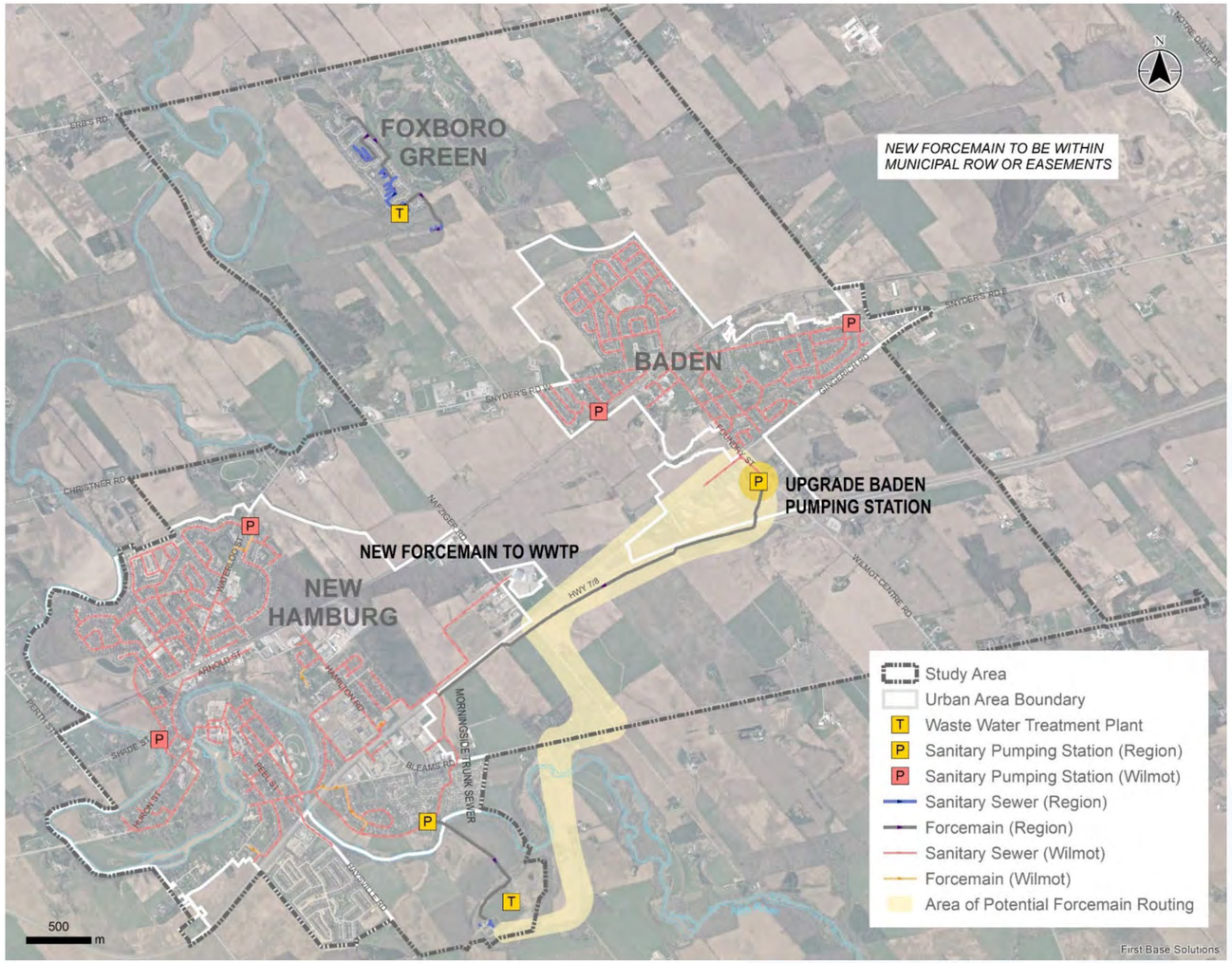
This alternative includes:

- Upgrades to the Baden Pumping Station
- New forcemain bypassing the Morningside Trunk Sewer and connecting directly to the Morningside Pumping Station
- Upgrades to the Morningside Pumping Station
- Upgrades to the forcemain from Morningside Pumping Station to the New Hamburg Wastewater Treatment Plant

Shown is one possible example of the connection.

Region of Waterloo Stantec C3 Water

Alternative WW4 – Upgrade System and Convey Directly to New Hamburg Wastewater Treatment Plant



This alternative includes:

- Upgrades to the Baden Pumping Station
- New forcemain bypassing the Morningside Pumping Station and connecting directly to the New Hamburg Wastewater Treatment Plant.

Shown is one possible example of the connection.

Region of Waterloo Stantec C3 WATER

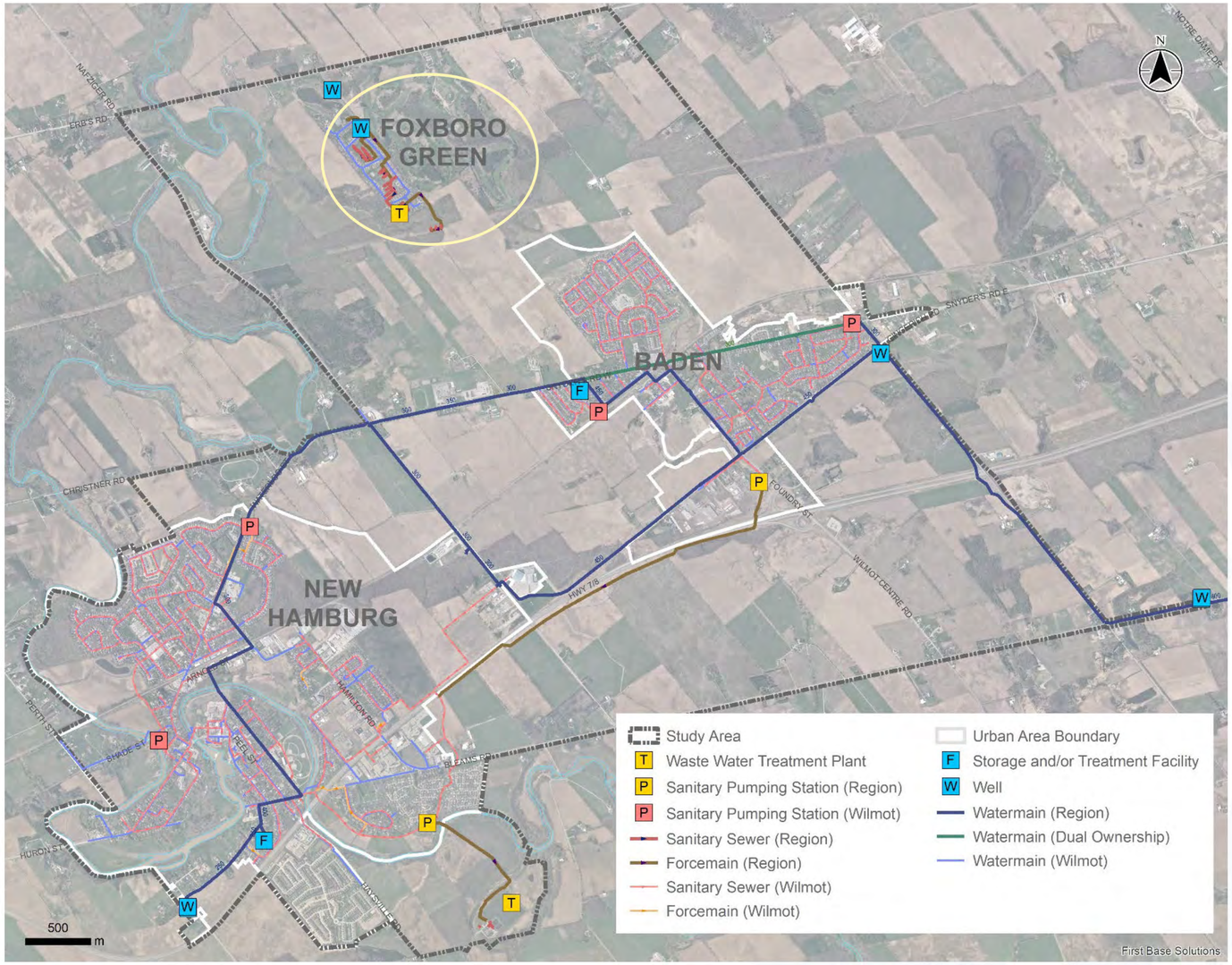
Foxboro Green - Water Supply & Wastewater Servicing Needs

The Foxboro Green community is supplied by a system of wells and a treatment plant, while wastewater services is provided by a wastewater treatment plant. The capacity is adequate, but the Region has identified major infrastructure upgrades/replacements in the near future due to asset age and improvement needs. Therefore, now is a good opportunity to review the future servicing for Foxboro Green.

The following Alternative Solutions have been developed to address the key issues identified for water supply and wastewater servicing needs:

- Alternative F1 - Do nothing and carry out necessary upgrades
- Alternative F2 - Provide connection to the existing Baden sewer and water supply system using existing road allowances.
- Alternative F3 - Provide connection to the existing Baden sewer and water supply system using a direct route.
- Alternative F4 - Provide connection to the existing New Hamburg sewer and water supply system using existing road allowances.

Alternative F1 – Do Nothing

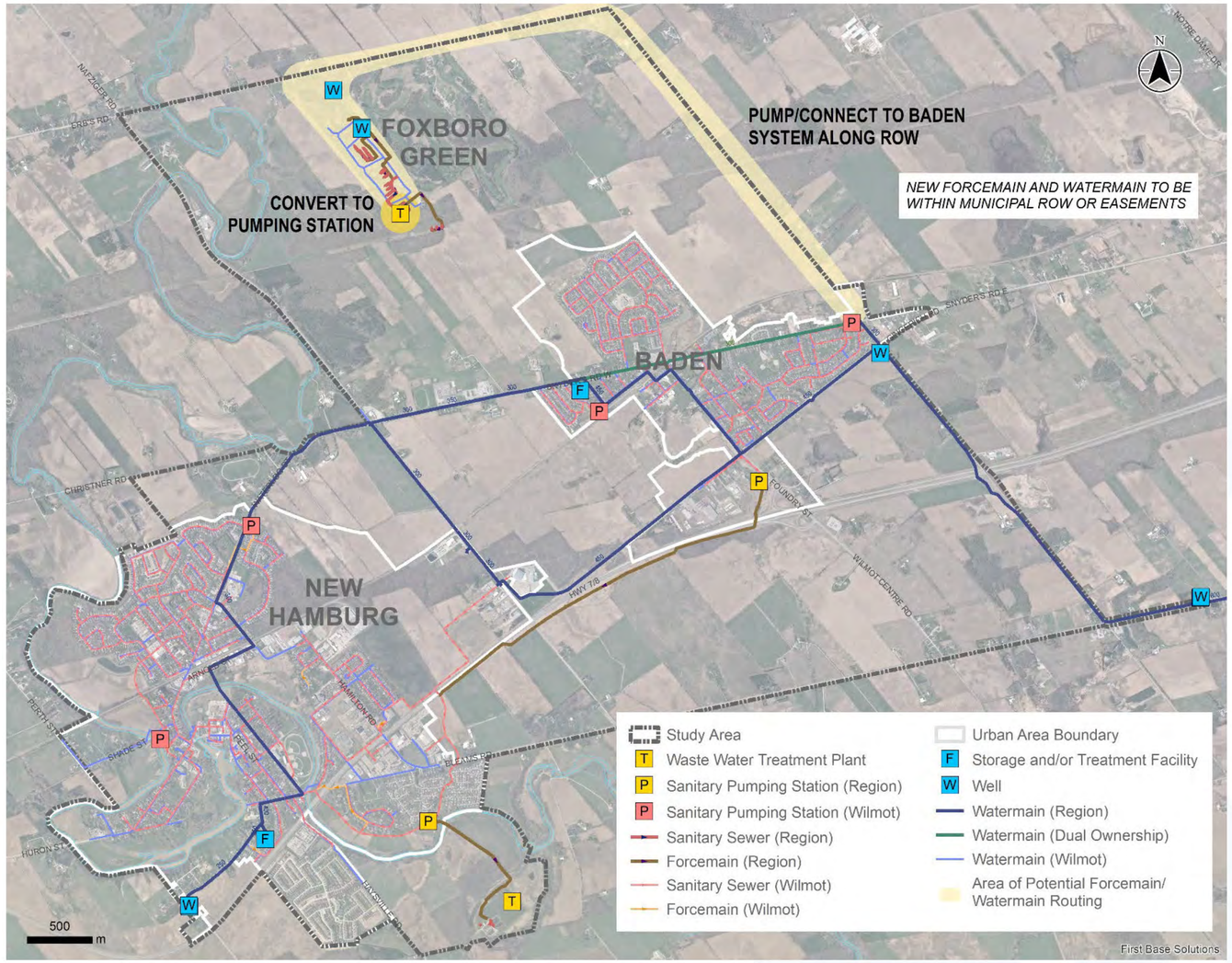


Under this alternative, Foxboro Green would continue to utilize their existing wastewater and water treatment systems.

In the immediate future, the Region has identified the need for extensive asset upgrades and/or replacements to the supply wells, water treatment plant, as well as optimization improvements to the wastewater treatment plant.

Region of Waterloo Stantec C3 Water

Alternative F2 – Connect Foxboro to Baden on Existing Road Allowances



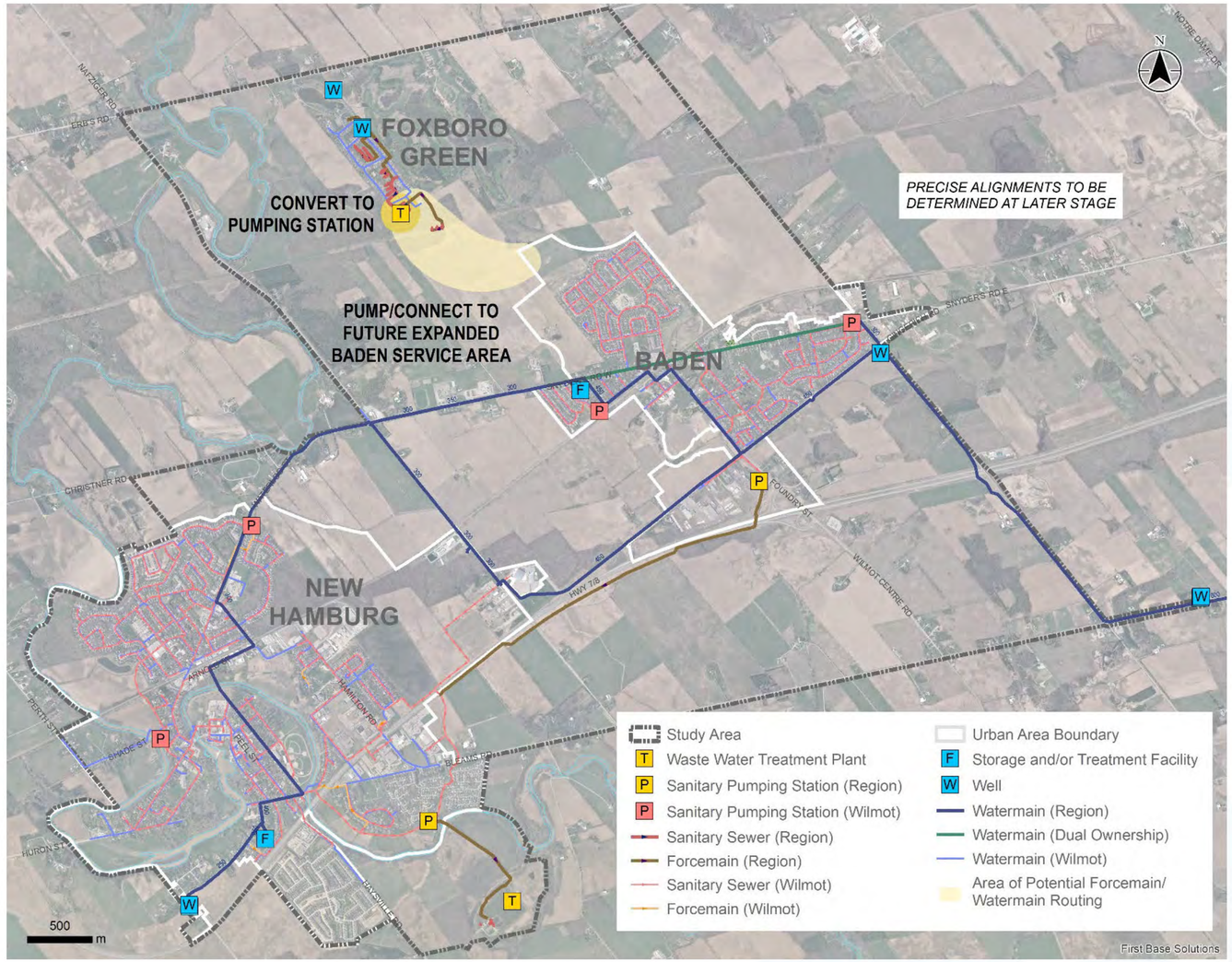
Under this alternative, Foxboro Green would be connected to the Baden sewer and water supply system.

The routing of the sewer and watermain connection would follow existing road allowances.

Shown is one possible example of the connection.

Region of Waterloo Stantec C3 WATER

Alternative F3 – Connect Foxboro to Baden using a Direct Route



Under this alternative, Foxboro Green would be connected to the Baden sewer and water supply system by a more direct route.

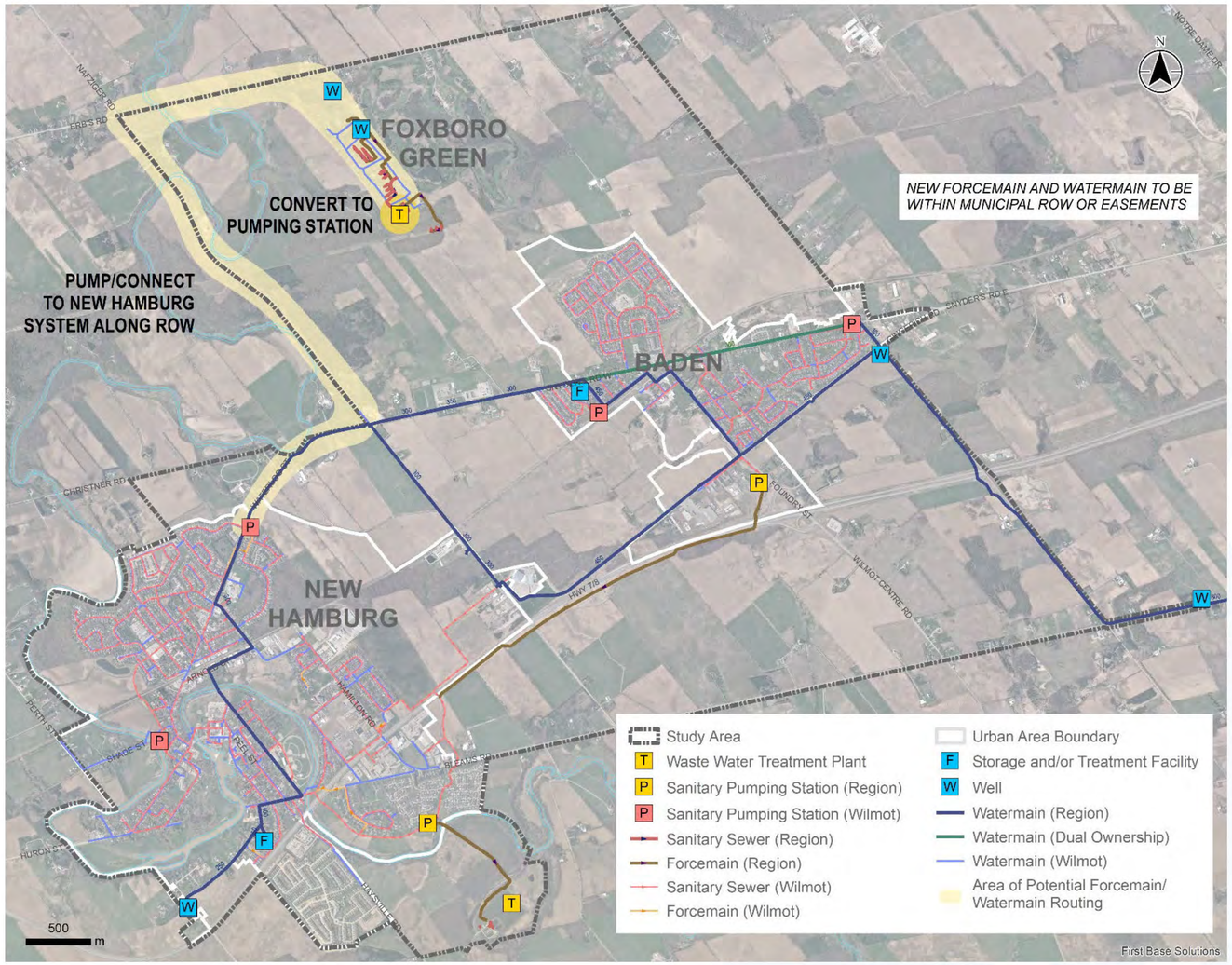
The routing of the sewer and watermain connections could be within the corridors across new developments lands, under future roads.

Alternatively, a separate route using easements is a consideration.

Shown is one possible example of the connection.

Region of Waterloo Stantec C3 WATER

Alternative F4 – Connect Foxboro to New Hamburg on Existing Road Allowances



Under this alternative, Foxboro Green would be connected to the New Hamburg sewer and water supply system.

The routing of the sewer and watermain connection would follow existing road allowances.

Shown is one possible example of the connection.

Region of Waterloo Stantec C3 WATER

Next Steps

Review Background Information	•Collect data, review existing conditions and identify project constraints and opportunities
Public Consultation Centre #1	•Introduce the project
Develop and Evaluate Alternatives	•Develop and evaluate alternatives to address current and future servicing needs
Public Consultation Centre #2	•Obtain input on alternatives
Identify Preferred Alternative	•Identify preferred alternatives, develop and evaluate the design of the preferred alternatives
Public Consultation Centre #3	•Present preferred alternatives
Prepare Report	•Prepare report and publish for 30-day public review

We are here

An opportunity for the public to provide input

Region of Waterloo Stantec C3 Water

Thank you for your participation!

We want your feedback

Do you have questions, feedback, comments, or want to stay up to date on what's being evaluated as part of this project?

Please contact:

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More information, including copies of project notices, comment sheet and Public Consultation Centre materials like a transcript of this virtual presentation can be found at:

https://www.regionofwaterloo.ca/waterprojects

Region of Waterloo Stantec C3 WATER

Public Consultation Centre #2 Presentation Transcript

Slide 1 – Title Slide

Hello and thank you for joining us for Baden and New Hamburg Water and Wastewater System Servicing Review Virtual Public Consultation Centre number 2 (or PCC).

Slide 2 – Goals of PCC #2

The purpose of this PCC is to provide an overview of the project, provide an update on the Study since the first Public Consultation Centre, and, present the preliminary water and wastewater servicing alternatives under consideration for the communities of Baden, New Hamburg, and Foxboro Green. This Virtual Public Consultation Centre provides you with an opportunity to learn about and get involved in the project and aims to answer any questions you may have.

A PDF of this presentation including this transcript and additional information on the project is available on the Region of Waterloo's website if you would like to review it in more detail. A link to the website is provided in the video description below.

We encourage you to review the information and contact a member of the project team by phone or email or through the project comment sheet available on the Region's website if you have any questions or would like to provide your thoughts to the project team. Contact information is provided at the end of this presentation and on the Region of Waterloo's website.

Comments received during this study will be used to identify a recommended approach for current and future water and wastewater infrastructure needs of the communities of Baden, New Hamburg, and Foxboro Green.

Slide 3 – Project Overview

To better understand the project, we ask the following three questions:

1. what are we doing,

2. why are we doing it, and

3. what does it mean to you?

To answer the first question, we are assessing the current water supply and wastewater treatment systems that serve the communities of Baden and New Hamburg. This study will look to assess infrastructure needs for future growth approved under the Region's Official Plan (ROP) and consider any outcomes from the new ROP review currently underway. This study excludes the local watermain and sewer extensions which are the responsibility of Wilmot Township.

Why are we doing it? We are taking steps now to ensure we are ready to meet the future needs of Baden and New Hamburg through examination of the Region's infrastructure. We will also explore any opportunities for the Foxboro Green community.

What does it mean to you? Current and future needs may require the construction of new water supply and wastewater infrastructure, or upgrades to existing facilities, which may also need land acquisition. This is your opportunity to get involved with the planning process.

Slide 4 - The Municipal Class Environmental Assessment Process

The Municipal Class Environmental Assessment, or EA process, is a five-phase planning process that is approved under the Ontario Environmental Assessment Act. All Municipalities in Ontario are required to complete a Municipal Class EA when planning infrastructure projects. This Municipal Servicing review will be completed to satisfy the first two phases of the Municipal Class EA process for projects which will be identified through the study.

These steps include:

- identifying the problem or opportunity;
- developing and evaluating alternative solutions; and,
- identifying and presenting the preferred solution and potential environmental impacts and proposed mitigation measures.

We are currently in Phase 2A of the study. Following the confirmation of the preferred solution (after the third Public Consultation Centre) and the presentation of potential environmental impacts and proposed mitigation measures, a Project File Report will be prepared to summarize the decision-making process for the public and stakeholders. A 30-day review period will be provided for the public and stakeholders to review and comment on the Report.

Slide 5 – Goals of Public Consultation Centre #2

The study area for Baden and New Hamburg Water and Wastewater System Servicing Review includes the communities of New Hamburg, Baden, and Foxboro Green, as illustrated by the map on the slide. The communities of Baden and New Hamburg are currently serviced by a two-tier water and wastewater system by Wilmot Township and the Region.

This System Servicing Review will assess the Region's portion of the current water and wastewater systems that serve the study area. The review of the current and future infrastructure needs within the community will be based on:

- The Region's 2011 Master Plan Update

- The 2015 Region Official Plan and consider any outcomes from the new official plan review currently underway
- The Township of Wilmot's 2019 Official Plan
- The recommendations from the Region's 2018 Wastewater Treatment Master Plan; and,
- Current development applications

This study considers alternatives for the Region's assets under three main categories: 1) Water supply, 2) Wastewater, 3) Foxboro Green. The Region is working with the Township to develop alternatives.

Slide 6 – Existing Water Supply System

The following map provides an overview of the Existing Water System that serves the communities of Baden, New Hamburg, and Foxboro Green. The Region's water infrastructure is show in blue and yellow. Existing conditions of the water supply system are as follows.

The New Hamburg and the K50 wells provide sufficient water supply capacity under existing and future conditions, however, reliance on the K50 wells is an issue if they are off-line for any reason as they supply a majority of the future water supply needs.

Water storage is sufficient for existing conditions but under future conditions, additional storage is required of approximately 4,000 cubic meters.

As for the community of Foxboro Green, it is currently supplied by a water treatment plant, however, the plants assets are aging which demonstrates high operation and maintenance costs.

Taking these existing conditions into consideration, the intent of this EA with regard to water supply is to address the following key issues:

- Water Supply Redundancy
- Water Storage

Slide 7 – Alternative Solutions – Water Supply (WS)

The following Alternative Solutions have been developed to address the key issues identified for water supply:

With regard to Water Supply Redundancy, there are two identified alternatives:

- Alternative WR1 - Do nothing
- Alternative WR2 - Actuated Valve at Shingletown (allows water to reverse flow under emergency conditions)*

* Alternative WR2 is being examined under another study

With regard to Future Water Storage, there are five identified alternatives:

- Alternative WS1 - Do nothing
- Alternative WS2 - Provide increased storage at the New Hamburg Water Treatment Plant
- Alternative WS3 – Provide new storage at the Baden Wells site
- Alternative WS4 - Provide new storage at the Shingleton/K50 Wells site
- Alternative WS5 - Combination of any of the above

Slide 8 – Alternative Water Storage Solution 1: Do Nothing (WS1)

The first alternative water storage solution involves doing nothing. This alternative does not include any upgrades and would not meet the overall intent of the study but is used for comparison purposes.

Slide 9 – Alternative Water Storage Solution 2: Increased Storage at New Hamburg Water Treatment Plant (WS2)

The second alternative water storage solution involves increasing the existing underground concrete storage at the New Hamburg Water Treatment Plant. Considerations for this solution are as follows. This increase in storage would help to accommodate future demand peaks. This solution would, however, require increased flow from Baden to allow refill of the New Hamburg Water Treatment Plant reservoir during high demand periods. There are possible site/land limitations related to this solution.

Slide 10 – Alternative Water Storage Solution 3: New Storage at Baden Well (WS3)

The third alternative water storage solution includes creating a new underground concrete reservoir and pump station at the former Baden well site to be fed by the K50 Wells. Considerations for this solution are as follows. This option presents an opportunity to re-use the Baden well property. This solution also provides ability to supplement water supply from the Baden Elevated Tank during periods of high demand. This solution would, however, require re-pumping of water with a new pumping station and would not be energy efficient. There are possible site/land limitations related to this solution.

Slide 11 – Alternative Water Storage Solution 4: New Storage at Shingleton/K50 Wells (WS4)

The fourth alternative water storage solution includes a new underground concrete reservoir at the Shingleton/ K50 Wells site. Considerations for this solution are as follows. This solution would supplement the Baden Elevated Tank during periods of high

demand and allows for possible alignment with future manganese treatment and storage requirements. A new Pumping Station would be required as part of this solution. There are possible site/land limitations related to this solution and additional area is required to accommodate the new underground concrete reservoir.

This solution does, however, provide potential for linkage with the Mannheim well supply.

Slide 12 – Existing Wastewater System

The following map provides an overview of the Existing Wastewater System that serves the communities of Baden, New Hamburg, and Foxboro Green. The Region's wastewater infrastructure is shown in blue, purple, and yellow. Existing conditions of the wastewater supply system are as follows.

The New Hamburg Wastewater Treatment Plant has sufficient capacity for the study area. The Morningside Pumping Station is also sufficient for existing conditions. As for the Baden Pumping Station and associated forcemains, these assets are under capacity for future growth demands within the study area. The Foxboro wastewater treatment plant has sufficient capacity, but it requires optimization.

Taking these existing conditions into consideration, the intent of this EA is to address the following key issues:

- Future Pumping Station; and,
- Forcemain Capacity.

Slide 13 – Alternative Solutions – Wastewater (WW)

The following Alternative Solutions have been developed to address the key issues identified for wastewater collection.

Regarding future pumping station and forcemain capacity solutions, four alternatives have been identified:

- Alternative WW1 - Do nothing
- Alternative WW2 - Upgrade system and maintain existing configuration
- Alternative WW3 - Upgrade system and convey directly to the Morningside Pump Station
- Alternative WW4 - Upgrade system and convey directly to New Hamburg Wastewater Treatment Plant

Slide 14 – Alternative Wastewater Solution 1: Do Nothing

The first alternative wastewater solution involves doing nothing. This alternative does not include any upgrades and would not meet the overall intent of the study but is used for comparison purposes.

Slide 15 – Alternative Wastewater Solution 2: Upgrade System and Maintain Existing Configuration

The second alternative wastewater solution involves upgrading the system and maintaining the existing configuration. This alternative includes:

- Upgrades to the Baden Pumping Station
- A New forcemain from Baden Pumping Station connecting to Morningside Trunk Sewer
- Upgrades to the Morningside Trunk Sewer
- Upgrades to the Morningside Pumping Station
- Upgrades to the forcemain from the Morningside Pumping Station to the New Hamburg Wastewater Treatment Plant

The area for potential Forcemain routing on this slide is shown shaded in yellow. The forcemains would be placed in an existing road allowance or easement, however, there are multiple potential paths that the forcemains could follow. Shown on the slide is one possible example of the connection.

Slide 16 – Alternative Wastewater Solution 3: Upgrade System and Convey Directly to Morningside Pump Station

The third alternative wastewater solution involves upgrading the system and conveying directly to the Morningside pump station. This alternative includes:

- Upgrades to the Baden Pumping Station
- New forcemain bypassing the Morningside Trunk Sewer and connecting directly to the Morningside Pumping Station
- Upgrades to the Morningside Pumping Station
- Upgrades to the forcemain from Morningside Pumping Station to the New Hamburg Wastewater Treatment Plant

The area for potential forcemain routing is shown shaded in yellow on this slide. Similar to the previous alternative, the forcemain would be constructed within the yellow shaded area within existing municipal road allowances, rights-of-ways, or easements. Shown is just one possible example of the future connection.

Slide 17 – Alternative Wastewater Solution 4: Upgrade System and Convey Directly to New Hamburg Wastewater Treatment Plant

The fourth alternative wastewater solution involves upgrading the system and conveying directly to the New Hamburg Wastewater Treatment Plant. This alternative includes:

- Upgrades to the Baden Pumping Station
- New forcemain bypassing the Morningside Pumping Station and connecting directly to the New Hamburg Wastewater Treatment Plant

The area for potential forcemain routing on this slide is shown shaded in yellow. Similar to previous alternatives, the forcemain would be constructed within the yellow shaded area within existing municipal road allowances, rights-of-ways, or easements. Shown on the slide is just one possible example of the future connection.

Slide 18 – Foxboro Green - Water Supply & Wastewater Servicing Needs

The Foxboro Green community is supplied by a system of wells and a treatment plant, while wastewater services is provided by a wastewater treatment plant. The capacity is adequate, but the Region has identified major infrastructure upgrades/replacements in the near future due to asset age and improvement needs. Therefore, now is a good opportunity to review the future servicing for Foxboro Green.

The following Alternative Solutions have been developed to address the key issues identified for water supply and wastewater servicing needs:

- Alternative F1 - Do nothing and carry out necessary upgrades
- Alternative F2 - Provide connection to the existing Baden sewer and water supply system using existing road allowances.
- Alternative F3 - Provide connection to the existing Baden sewer and water supply system using a direct route.
- Alternative F4 - Provide connection to the existing New Hamburg sewer and water supply system using existing road allowances.

Slide 19 – Alternative F1 – Do Nothing

The first alternative involves doing nothing. Under this alternative, Foxboro Green would continue to utilize their existing wastewater and water treatment systems.

In the immediate future, the Region has identified the need for extensive asset upgrades and/or replacements to the supply wells, water treatment plant, as well as optimization improvements to the wastewater treatment plant.

Slide 20 – Alternative F2 – Connect Foxboro to Baden using Existing Road Allowances

Under the second alternative, Foxboro Green would be connected to the Baden sewer and water supply system. The routing of the sewer and watermain connections would follow existing road allowances. The area for potential routing is shaded in yellow and shown is one possible example of the connection.

Slide 21 – Alternative F3 – Connect Foxboro to Baden using a Direct Route

Under the third alternative, Foxboro Green would be connected to the Baden sewer and water supply system by a more direct route. The routing of the sewer and watermain

connections could be within the corridors across new developments lands, under future roads. Alternatively, a separate route using easements is a consideration.

The area for potential routing is shaded in yellow. Shown is one possible example of the connection.

Slide 22 – Alternative Foxboro Solutions F4 – Connect Foxboro to New Hamburg on Existing Road Allowances

Under the fourth alternative, Foxboro Green would be connected to the New Hamburg sewer and water supply system. The routing of the sewer and watermain connection would follow existing road allowances. The area for potential routing is shaded in yellow and shown is one possible example of the future connection.

Slide 23 – Next Steps

Following this PCC, the Project Team will review input on the information presented. We will continue with our environmental investigations and assessment of alternative solutions for water and wastewater servicing, including potential new facility and forcemain locations. The project team will identify preferred alternatives and will develop and evaluate the design of the preferred alternatives. This evaluation and the preferred alternatives will be presented at our third PCC for public and stakeholder review and comment.

Feedback received as part of PCC #3 will be used to prepare the servicing report, otherwise known as the Project File Report. The report will be published for 30 days to allow for public review before going before Regional Council.

Slide 24 – Questions

We thank you for your participation in the Baden and New Hamburg Water and Wastewater System Servicing Review Virtual Public Consultation Centre #2. We are midway through the project and look forward to hearing from you.

Do you have questions, feedback, comments, or want to stay up to date on what's being evaluated as part of this project?

There are many ways to get in touch with the project team:

- You can fill out a comment sheet available on the Region's website, and return via mail or email to a member of the project team; or
- You can contact a project team member directly by email, telephone, or mail at the addresses listed.

As a reminder, more information, including copies of project notices and Public Consultation Centre materials like a transcript of this virtual presentation can be found at **www.regionofwaterloo.ca/waterprojects**.

Baden and New Hamburg Water and Wastewater System Servicing Review
Virtual Public Consultation Centre #2
Tuesday, December 7, 2021 to Wednesday, January 12, 2022

Comment Sheet

Contact Information (optional, but required if you would like a response or to be added to the study mailing list):

Name/Organization:

Mailing Address:

E-mail:

1. Do you have any questions or comments you would like to share with the project team?

Please email the completed form to a member of the study team by Wednesday, January 12, 2022:

Region of Waterloo
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Jeff Paul, P.Eng.
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Email: Jeff.Paul@stantec.com

All comments and information received from individuals, stakeholder groups, and agencies regarding this project are being collected under the authority of the Municipal Act to assist the Region of Waterloo in making a decision. Under the Municipal Act, personal information such as name, address, telephone number, and property location that may be included in a submission becomes part of the public record. Questions regarding the collection of this information should be directed to Kaoru Yajima at the Region of Waterloo.

Baden and New Hamburg Water and Wastewater System Servicing Review

Virtual Public Consultation Centre #3

June 7, 2022

Region of Waterloo

Public Consultation Centre #3

Welcome!

The goals of this final Public Consultation Centre (PCC#3):

- Provide an overview of the project
- Provide an update on the study since PCC #2
- Present the Preferred Alternative Solutions for the Water and Wastewater Servicing for the communities of Baden, New Hamburg and Foxboro Green
- Provide an opportunity for you to learn about the project and get involved

Comments received during this study will be used to develop the recommended approach for current and future water and wastewater infrastructure needs of the communities of Baden, New Hamburg and Foxboro Green.

Project Overview

What are we doing?

We are assessing the current water supply and wastewater treatment systems that serve the communities of Baden and New Hamburg. This study will look at the current and future infrastructure needs for the community. This study excludes the local watermain and sewer extensions which are the responsibility of Wilmot Township.

Why are we doing it?

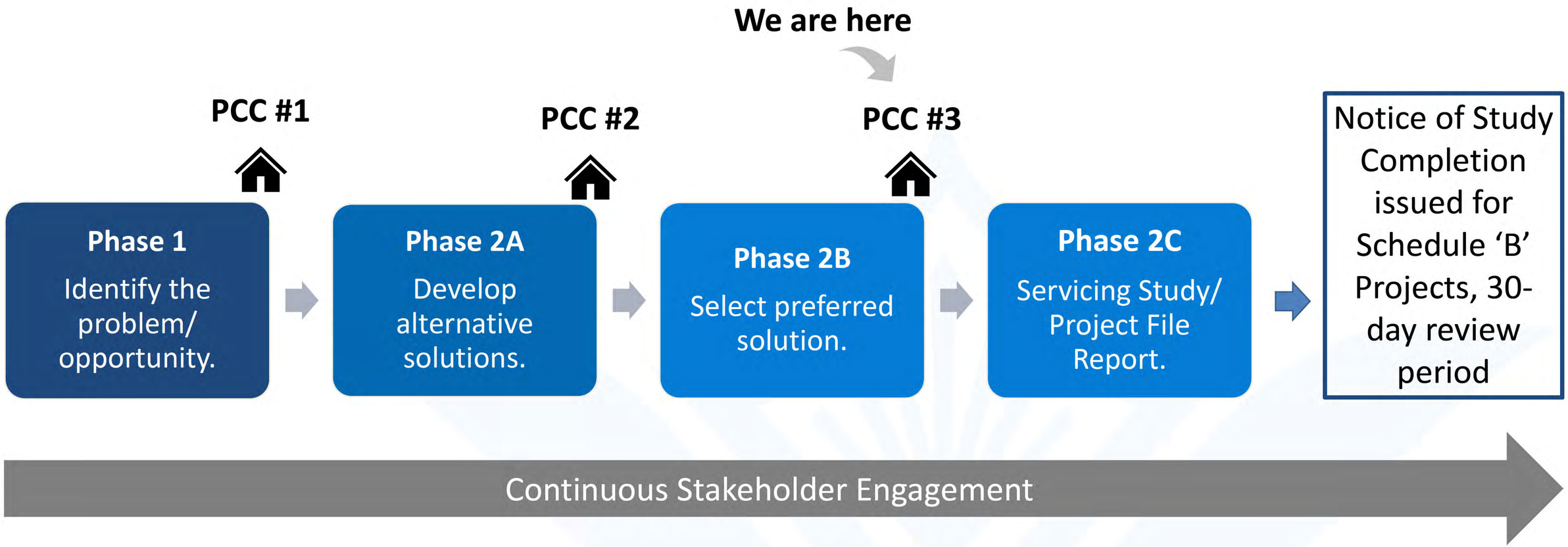
We are taking steps now to ensure we are ready to meet the future needs of Baden and New Hamburg through examination of the Region's infrastructure. We will also explore any opportunities for the Foxboro Green community.

What does it mean to you?

Current and future needs may require the construction of new water supply and wastewater infrastructure, or upgrades to existing facilities, which may also need land acquisition. This is your opportunity to get involved with the planning process.

Municipal Class Environmental Assessment Process

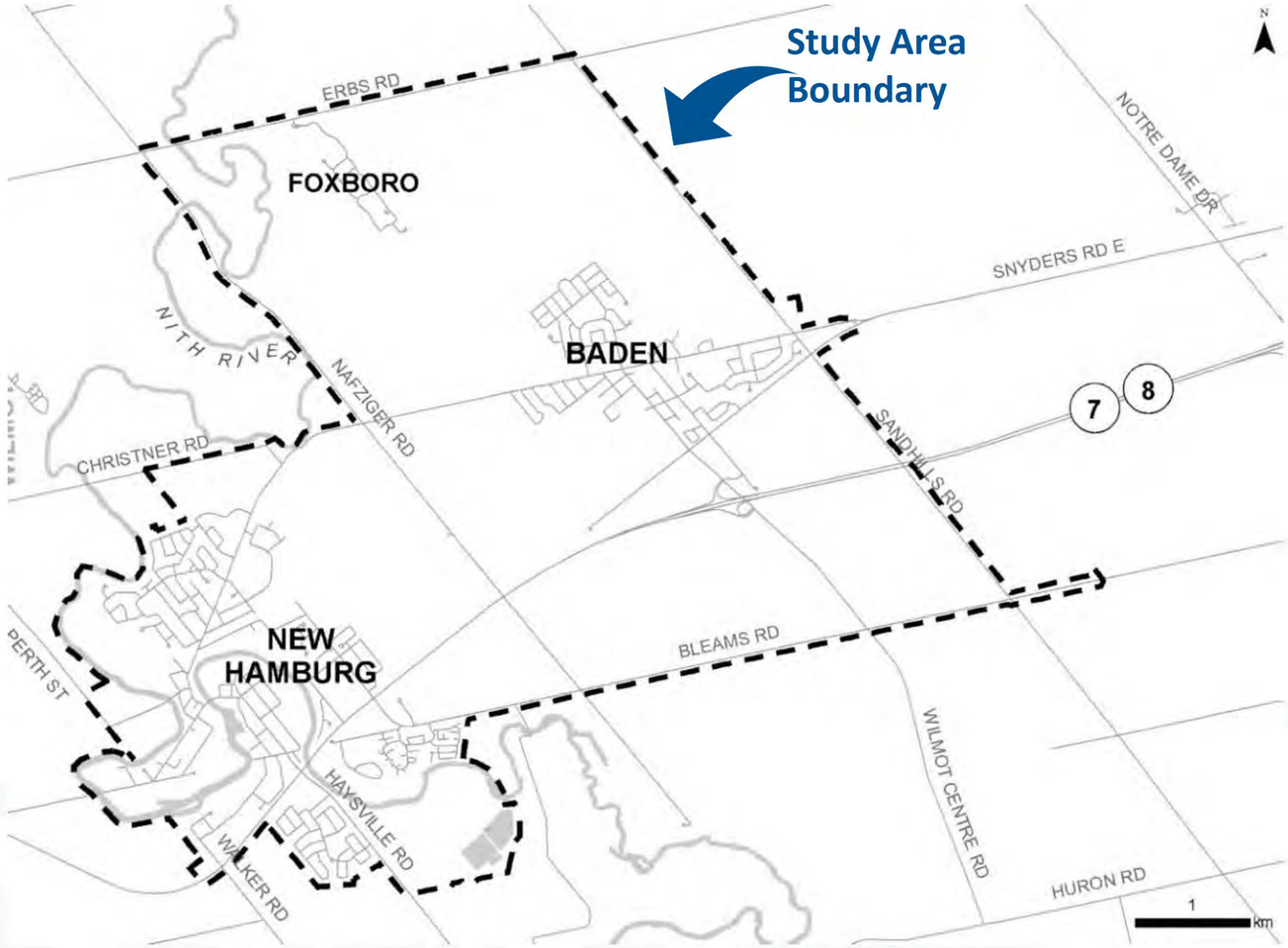
This Servicing Review will be completed to satisfy the first two phases of the Municipal Class EA process for projects which will be identified through the study.



Findings Presented in Previous Consultation

In PCC#2, the following areas requiring further study were presented:

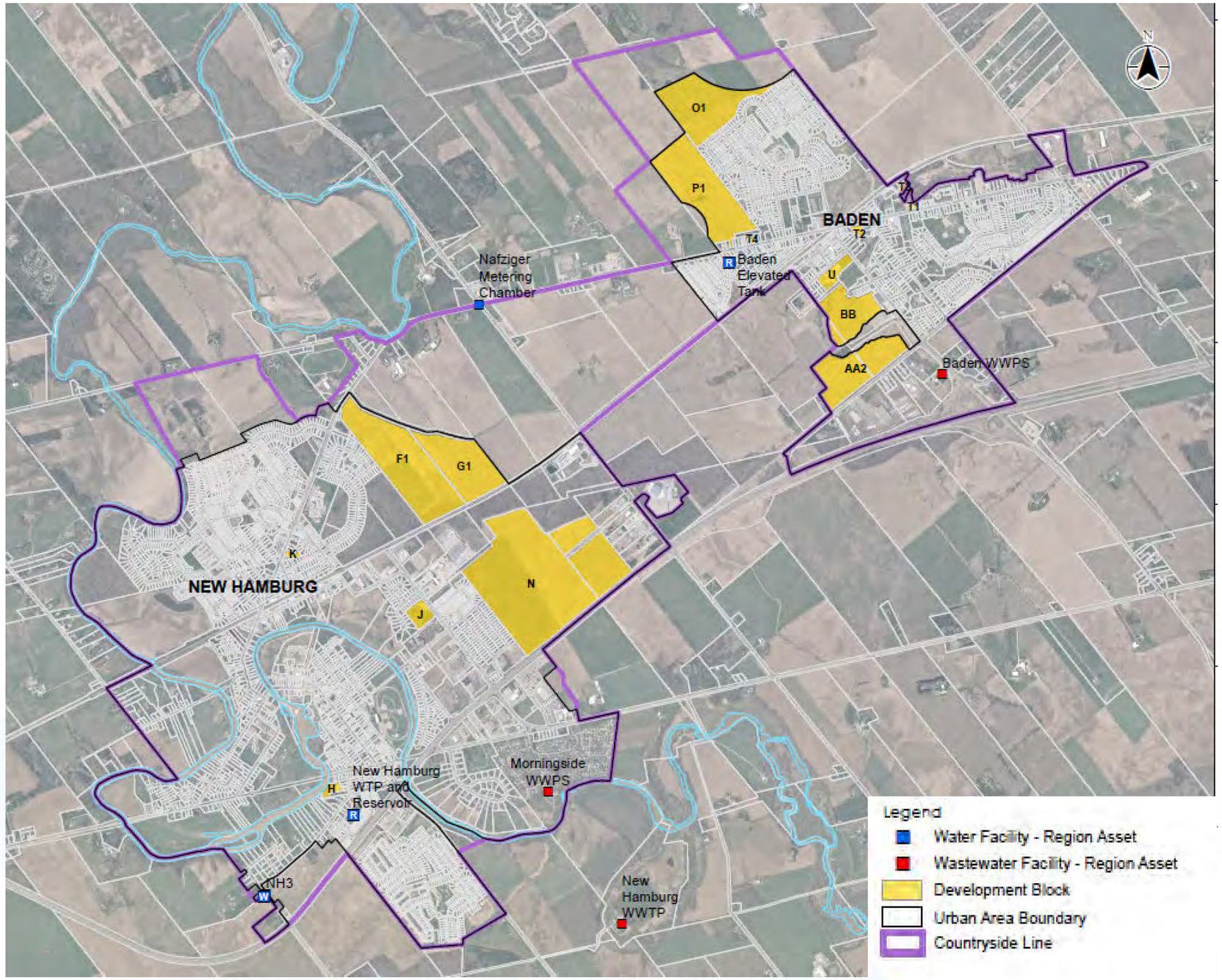
- Need for Future Water Storage
- Need for Wastewater Servicing in Baden
- Need to consider the future Water and Wastewater Servicing for the Foxboro Community



Evaluation of Needs

The study considered the future requirements of water and wastewater servicing for both the existing community as well as planned growth within the Urban Area Boundary under the current Official Plan.

Shown in yellow are development areas in the Official Plan.



Review of Alternative Solutions Presented at PCC#2

Requirement for Future Water Storage:

- Alternative WS1 - Do nothing
- Alternative WS2 - Provide increased storage at the New Hamburg Water Treatment Plant
- Alternative WS3 - Provide new storage at the Baden Wells site
- Alternative WS4 - Provide new storage at the Shingleton/K50 Wells site

Future Wastewater Servicing in Baden:

- Alternative WW1 - Do nothing
- Alternative WW2 - Upgrade system and maintain existing configuration
- Alternative WW3 - Upgrade system and convey directly to Morningside Pump Station
- Alternative WW4 - Upgrade system and convey directly to New Hamburg Wastewater Treatment Plant

Future Water and Wastewater Servicing for the Foxboro Green Community:

- Alternative F1 - Do nothing and carry out necessary upgrades
- Alternative F2 - Provide connection to the existing Baden sewer and water supply system using existing road allowances
- Alternative F3 - Provide connection to the existing Baden sewer and water supply system using a direct route
- Alternative F4 - Provide connection to the existing New Hamburg sewer and water supply system using existing road allowances

Evaluation of Alternative Solutions

The alternative solutions have been evaluated based on their performance against the following criteria categories:

- **Natural:** protecting significant natural and physical elements of the environment.
- **Social:** evaluates potential effects on residents, neighbourhoods, businesses, historical/archaeological and heritage components.
- **Technical:** considers compliance with regulations and policies, as well as the technical suitability and other engineering aspects.
- **Financial:** addresses the potential -servicing costs.

Legend for Evaluation Scoring

Graphic	Rating	Description
	5	Very well aligned with criteria
	4	Well aligned with criteria
	3	Somewhat aligned with criteria
	2	Not well aligned with criteria
	1	Low alignment with criteria

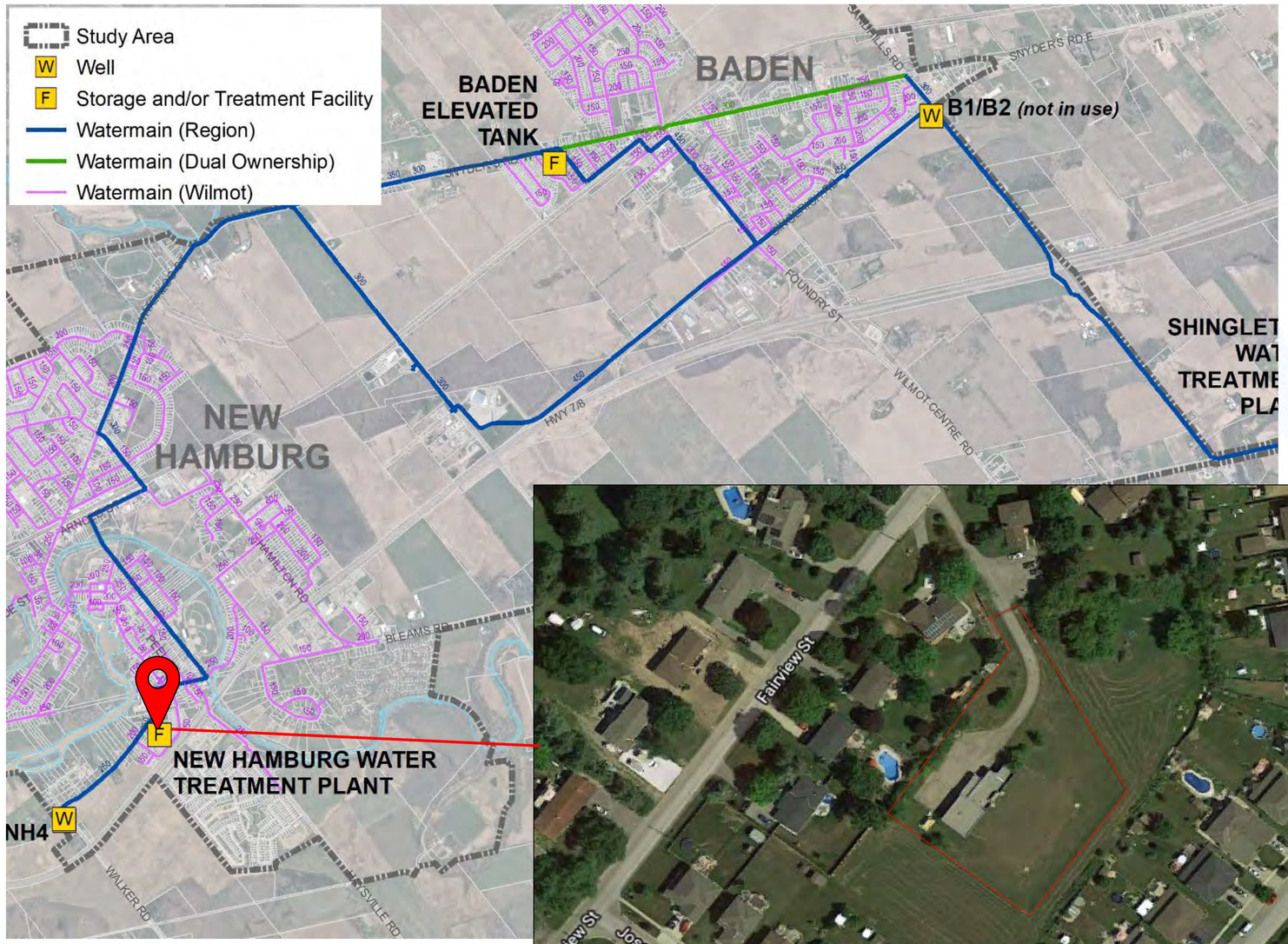
Evaluation of Alternative Solutions – Water Storage (WS)

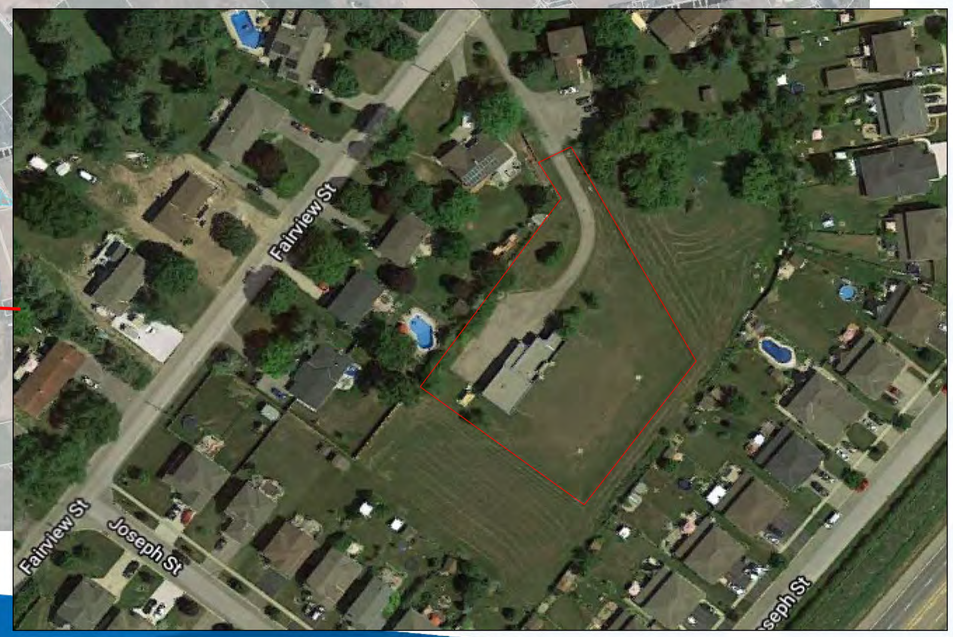
Factors and Criteria	Alternative WS1 – Do Nothing	Alternative WS2 – Provide increased storage at the New Hamburg Water Treatment Plant	Alternative WS3 – Provide new storage at the Baden Wells site	Alternative WS4 – Provide new storage at the Shingletown/K50 Wells site
ENVIRONMENTAL				
SOCIAL				
TECHNICAL				
FINANCIAL **Provides low lifecycle costs** • Minimize capital, operation and maintenance (life cycle) costs over a 50-year period.	• Estimated Capital Cost: $0 • Estimated 50-Year Lifecycle Costs: $0 	• Estimated Initial Capital Cost: $4M • Estimated 50-Year Lifecycle Costs: $4.3M 	• Estimated Initial Capital Cost: $4.9M • Estimated 50-Year Lifecycle Costs: $7.0M 	• Estimated Initial Capital Cost: $4.9M • Estimated 50-Year Lifecycle Costs: $6.1M 
SUMMARY	**Not Recommended (does not address problems identified)**	**Preferred**	**Moderately Preferred**	**Moderately Preferred**



Region of Waterloo Stantec C3 WATER

Preliminary Preferred Alternative – Increased Storage at New Hamburg Water Treatment Plant



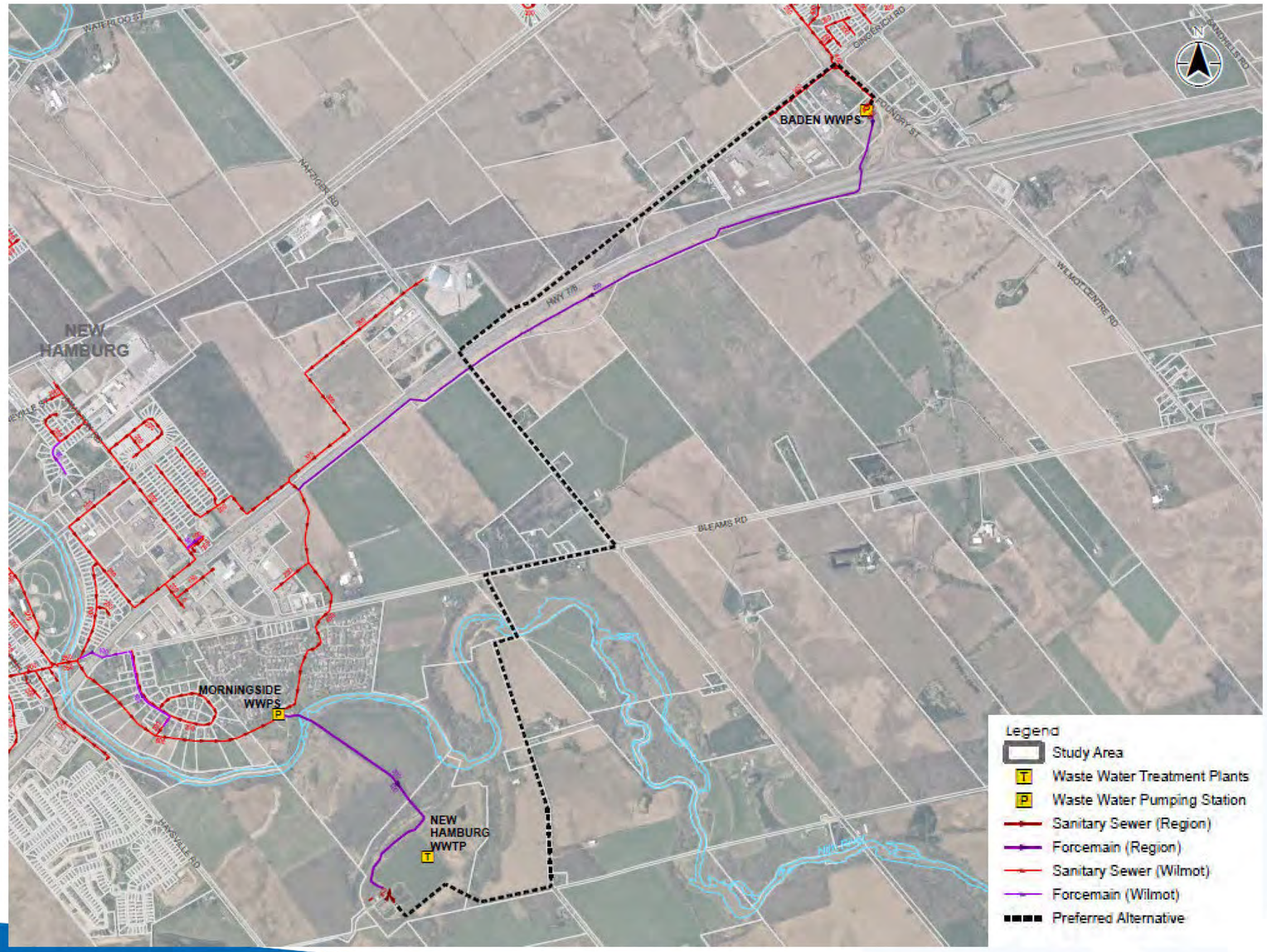


- Meets long term capacity requirements.
- Provides redundancy with existing New Hamburg reservoir.
- Can be accommodated within existing property, although existing open space site will be fenced off to the public.
- Construction will result in temporary noise impacts to nearby-properties and increased truck traffic.

Evaluation of Alternative Solutions – Wastewater Servicing in Baden (WW)

Factors and Criteria	Alternative WW1 – Do Nothing	Alternative WW2 – Upgrade system and maintain existing configuration	WW3 – Upgrade system and convey directly to Morningside Pump Station	Alternative WW4 – Upgrade system and convey directly to New Hamburg Wastewater Treatment Plant
ENVIRONMENTAL				
SOCIAL				
TECHNICAL				
FINANCIAL **Provides low lifecycle costs** • Minimize capital, operation and maintenance (life cycle) costs over a 50-year period.	• Estimated Initial Capital Cost: $1.2M • Estimated 50-Year Lifecycle Costs: $17.7M	• Estimated Initial Capital Cost: $16.1M • Estimated 50-Year Lifecycle Costs: $33.3M	• Estimated Initial Capital Cost: $13.4M • Estimated 50-Year Lifecycle Costs: $30.1M	• Estimated Initial Capital Cost: $11M • Estimated 50-Year Lifecycle Costs: $27.3M
SUMMARY	**Not Recommended (does not address problems identified)**	**Least Preferred**	**Moderately Preferred**	**Preferred**

Preliminary Preferred Alternative – Upgrade System and Convey Directly to New Hamburg Wastewater Treatment Plant



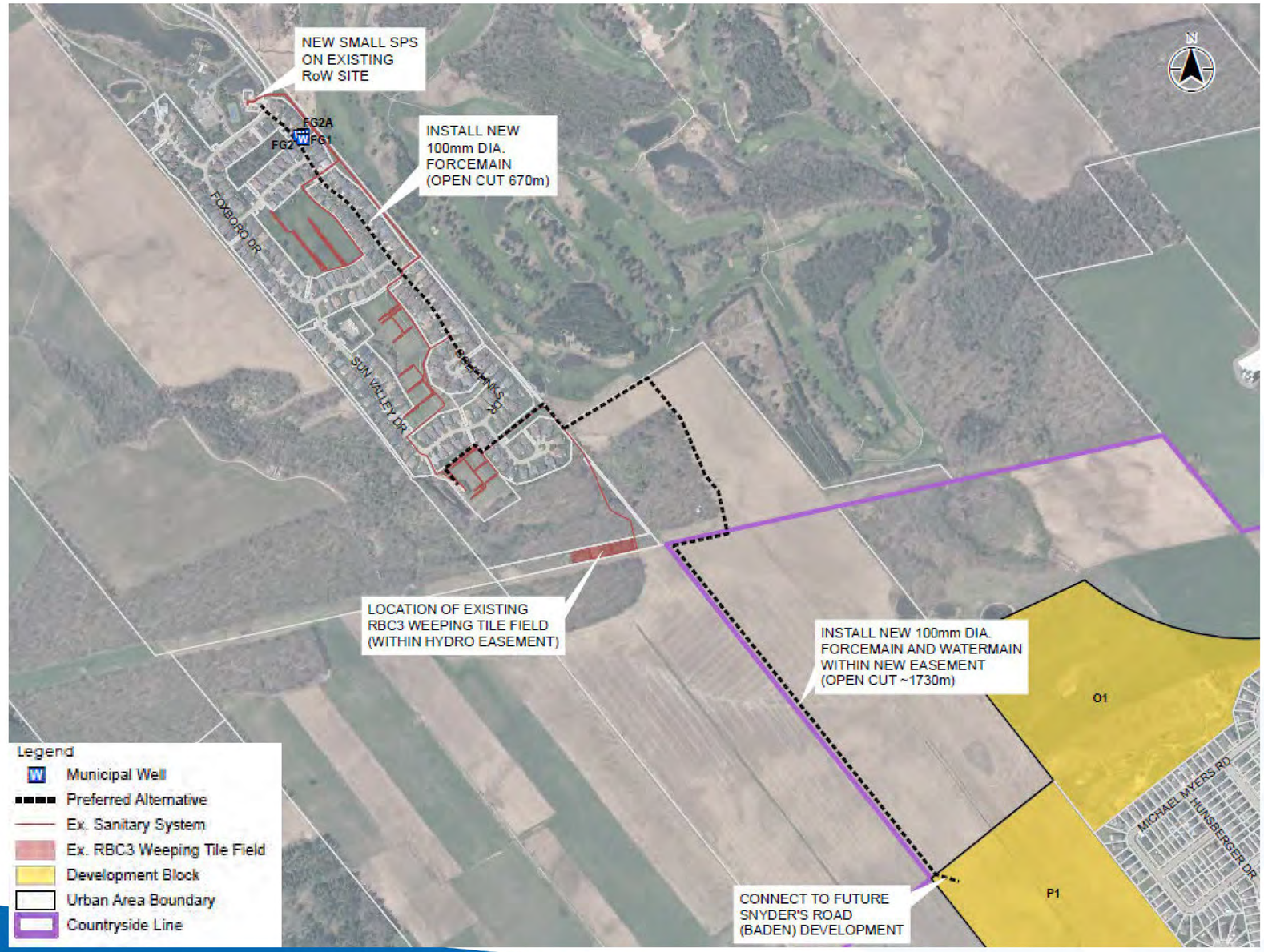
- Includes upgrades to the Baden Wastewater Pumping Station and a new forcemain (buried pipe) from the Baden Pumping Station to the New Hamburg Wastewater Treatment Plant.
- Alignment options for the forcemain were reviewed and shown is the recommended
- The alignment avoids complex construction in the Morningside retirement community.
- Crossing the Nith River would be accomplished by attaching the pipe to the existing bridge.
- Optimizes existing infrastructure investments and requires least amount of infrastructure.
- Easements/property access agreements will be required to accommodate new infrastructure.

Evaluation of Alternative Solutions – Foxboro Green

Factors and Criteria	Alternative F1 – Do Nothing	Alternative F2 – Connect Foxboro to Baden via Existing Right-of-Ways	Alternative F3 – Connect Foxboro to Future Expand Baden Service Area using a Direct Route	Alternative F4 – Connect Foxboro to New Hamburg via Right-of-Ways
ENVIRONMENTAL				
SOCIAL				
TECHNICAL				
FINANCIAL **Provides low lifecycle costs** • Minimize capital, operation and maintenance (life cycle) costs over a 50-year period.	• Estimated Initial Capital Cost: $7.7M • Estimated 50-Year Lifecycle Costs: $35.1M	• Estimated Initial Capital Cost: $7.6M • Estimated 50-Year Lifecycle Costs: $17.7M	• Estimated Initial Capital Cost: $3.0M • Estimated 50-Year Lifecycle Costs: $9.9M	• Estimated Initial Capital Cost: $8.4M • Estimated 50-Year Lifecycle Costs: $19.0M
SUMMARY	**Least Preferred**	**Moderately Preferred**	**Preferred**	**Moderately Preferred**

Region of Waterloo Stantec C3 WATER

Preliminary Preferred Alternative– Connect Foxboro Green to Baden using a Direct Route



- Provides Foxboro Green with reliable water supply (by Baden supply system) and wastewater services (through the Baden-New Hamburg wastewater collection system).
- Road closures in the Foxboro Green community may be required during construction.
- Forcemain location would require agreements with property owners and stakeholders.

Region of Waterloo Stantec C3 WATER

Proposed Projects Addressed by this Study

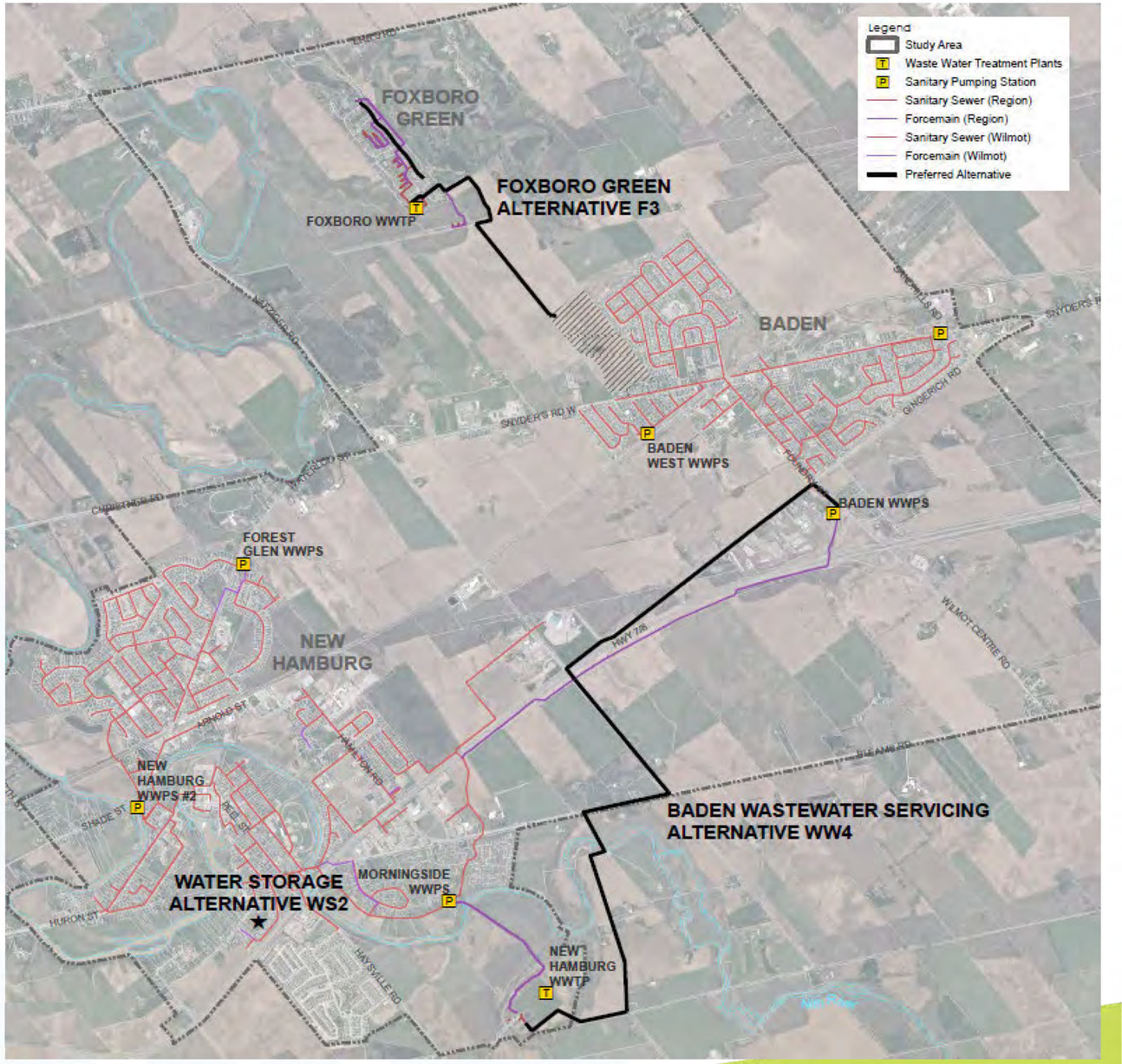
In summary, the following projects are proposed:

1. Increasing water storage at the New Hamburg Water Treatment Plant.

2. Upgrading the Baden Pumping Station and new forcemain connecting directly to the New Hamburg Wastewater Treatment Plant.

3. Connect Foxboro Green to the Baden water supply system; also connect to the Baden-New Hamburg wastewater system.

The Schedule B Municipal Class EA study requirements will be deemed complete following the 30-day public review period of the Servicing Study/Project File Report. The Region may then proceed to the design phase and tender for construction.



Next Steps

Continuous Stakeholder Engagement

Review Background Information	•Collect data, review existing conditions and identify project constraints and opportunities
Public Consultation Centre #1	•Introduce the project
Develop and Evaluate Alternatives	•Develop and evaluate alternatives to address current and future servicing needs
Public Consultation Centre #2	•Obtain input on alternatives
Identify Preferred Alternative	•Identify preferred alternatives, develop and evaluate the design of the preferred alternatives
Public Consultation Centre #3	•Present preliminary preferred alternatives
Servicing Study/Project File Report (Summer/Fall 2022)	•Publish for 30-day public review
Future (late 2022/2023)	•Proceed to design and tender for construction

We are here

Represents an opportunity for the public to provide input

Region of Waterloo Stantec C3 Water

Thank you for your participation!

We want your feedback

Do you have questions, feedback, comments, or want to stay up to date on what's being evaluated as part of this project?

Please contact:

Kaoru Yajima, P.Eng.
Sr. Engineer, Water Services
Region of Waterloo
150 Frederick Street, 7th Floor
Kitchener, Ontario N2G 4J3
Tel: 519-575-4757 ext. 3349
Email: kyajima@regionofwaterloo.ca

Jeff Paul, P.Eng.
Project Manager
Stantec Consulting Ltd.
171 Queens Ave #600
London, ON N6A 5J7
Tel: 519-675-6604
Email: Jeff.Paul@stantec.com

More information, including copies of project notices, comment sheet and Public Consultation Centre materials like a transcript of this virtual presentation can be found at:

https://www.regionofwaterloo.ca/waterprojects

Region of Waterloo Stantec C3 Water

Public Consultation Centre #3 Presentation Transcript
June 7, 2022

Slide 1 – Title Slide

Hello and thank you for joining us for Baden and New Hamburg Water and Wastewater System Servicing Review Virtual Public Consultation Centre (or PCC) number 3.

Slide 2 – Welcome and Goals of Final PCC

The purpose of this PCC is to provide an overview of the project, provide an update on the Study since the second Public Consultation Centre, and to present the Preferred Alternative Solutions for the Water and Wastewater Servicing for the communities of Baden, New Hamburg, and Foxboro Green. This Virtual Public Consultation Centre provides you with an opportunity to learn about and get involved in the project and aims to answer any questions you may have.

A PDF of this presentation, including this transcript and additional information on the project, is available on the Region of Waterloo's website if you would like to review it in more detail. A link to the website is provided at the end of this presentation.

We encourage you to review the information and contact a member of the project team by phone, email or through the project comment sheet available on the Region's website if you have any questions or would like to provide your thoughts to the project team. Contact information is provided at the end of this presentation and on the Region of Waterloo's website.

Comments received during this phase of the study will be used to confirm the preferred approach for water and wastewater infrastructure needs of the communities of Baden, New Hamburg, and Foxboro Green.

Slide 3 – Project Overview

To better understand the project, we ask the following three questions:

1. what are we doing,

2. why are we doing it, and

3. what does it mean to you?

To answer the first question, we are assessing the current water supply and wastewater treatment systems that serve the communities of Baden and New Hamburg. This study will look to assess infrastructure needs for future growth approved under the Region's Official Plan (ROP) and consider any outcomes from the new ROP review currently underway. This study excludes the local watermain and sewer extensions which are the responsibility of Wilmot Township.

Why are we doing it? We are taking steps now to ensure we are ready to meet the future needs of Baden and New Hamburg through examination of the Region's infrastructure. We will also explore any opportunities for the Foxboro Green community.

What does it mean to you? Current and future needs may require the construction of new water supply and wastewater infrastructure, or upgrades to existing facilities, which may also need land acquisition. This is your opportunity to get involved with the planning process.

Slide 4 - The Municipal Class Environmental Assessment Process

This Servicing Review is being undertaken in accordance with the Master Planning Process, as outlined in the Municipal Class Environmental Assessment document. As such, the Study will address Phases 1 and 2 of the Environmental Assessment process to fulfill the requirements for the recommended Schedule B projects identified.

These steps include:

- identifying the problem or opportunity;
- developing and evaluating alternative solutions; and,
- identifying and presenting the preferred solution and potential environmental impacts and proposed mitigation measures.

We are currently in Phase 2B of the study. Following the confirmation of the preferred solution (after this Public Consultation Centre), a Servicing Study / Project File Report will be prepared to summarize the decision-making process for the public and stakeholders and document the potential environmental impacts and proposed mitigation measures. A 30-day review period will be provided for the public and stakeholders to review and comment on the report.

Slide 5 – Findings Presented in Previous Consultation

The study area for Baden and New Hamburg Water and Wastewater System Servicing Review includes the communities of New Hamburg, Baden, and Foxboro Green, as illustrated by the map on the slide. The communities of Baden and New Hamburg are currently serviced by a two-tier water and wastewater system by Wilmot Township and the Region.

This System Servicing Review will assess the Region's portion of the current water and wastewater systems that serve the study area. As presented at PCC#2, the following areas requiring further study were presented:

1) Need for Future Water Storage
2) Need for Wastewater Servicing in Baden

3) Need to consider the future Water and Wastewater Servicing for the Foxboro Green Community

Slide 6 – Evaluation of Needs

The study considered the future requirements of water and wastewater servicing for both the existing community as well as planned growth within the Urban Area Boundary under the current Official Plan. This map provides an overview of the existing and planned growth within the Urban Area Boundary under the Official Plan. These development blocks are included as part of the assessment of the current and future water and wastewater systems that service the communities of Baden, New Hamburg, and Foxboro Green, and help to identify the existing servicing constraints.

Slide 7 – Alternative Solutions Presented at PCC #2

The following Alternative Solutions were presented at PCC#2 regarding Water Storage, Wastewater Servicing, and Water and Wastewater Servicing for Foxboro Green.

There are four identified alternatives for Future Water Storage:

- Alternative WS1 - Do nothing
- Alternative WS2 – Provide increased storage at the New Hamburg Water Treatment Plant
- Alternative WS3 – Provide new storage at the Baden Wells site
- Alternative WS4 – Provide new storage at the Shingleton/K50 Wells Site

There are four identified alternatives for Future Wastewater Servicing in Baden:

- Alternative WW1 - Do nothing
- Alternative WW2 – Upgrade system and maintain existing configuration
- Alternative WW3 – Upgrade system and convey directly to Morningside Pump Station
- Alternative WW4 – Upgrade system and convey directly to New Hamburg Wastewater Treatment Plant

There are four identified alternatives for the Future Water and Wastewater Servicing for the Foxboro Green Community:

- Alternative F1 - Do nothing and carry out necessary upgrades
- Alternative F2 – Provide connection to the existing Baden sewer and water supply system using existing road allowances
- Alternative F3 – Provide connection to the existing Baden sewer and water supply system using a direct route

- Alternative F4 – Provide connection to the existing New Hamburg sewer and water supply system using existing road allowances

More information on these alternatives can be viewed in PCC #2 which is contained on the Region of Waterloo's website.

Slide 8 – Evaluation of Alternative Solutions

The alternative solutions have been evaluated based on their performance against the following criteria categories:

- **Natural** – protecting significant natural and physical elements of the environment.
- **Social** – evaluates potential effects on residents, neighbourhoods, businesses, historical/archaeological and heritage components.
- **Technical** – considers compliance with regulations and policies, as well as the technical suitability and other engineering aspects.
- **Financial** – addresses the potential effect on servicing costs.

The right side of the screen displays the legend for evaluation scoring used to evaluate the alternative solutions against the criteria. The scoring uses a rating system:

1- Low alignment with criteria
2- Not well aligned with criteria
3- Somewhat aligned with criteria
4- Well aligned with criteria
5- Very well aligned with criteria.

Slide 9 – Evaluation of Alternative Solutions – Water Storage

This slide presents the results of the evaluation of the Water Storage alternative solutions.

The evaluation determined that Alternative WS1 is not recommended as it does not address the problems identified in the Servicing Study. Alternatives WS3 & WS4 are Moderately Preferred. Alternative WS2 was identified as the Preferred Solution.

Slide 10 – Preliminary Preferred Alternative – Increased Storage at New Hamburg Water Treatment Plant

Alternative WS2 provides increased storage at the New Hamburg Water Treatment Plant and is selected as the Preliminary Preferred Alternative Solution for the following reasons:

- Meets long term capacity requirements to service projected population growth
- Provides redundancy with existing New Hamburg reservoir
- Can be accommodated within the existing Water Treatment Plant and reservoir property boundary, although existing open space will need to be fenced off to the public
- Construction will result in temporary impacts such as noise impacts to nearby residential properties and increased truck traffic through the community

Slide 11 – Evaluation of Alternative Solutions – Wastewater Servicing in Baden

This slide presents the results of the evaluation of the Wastewater Servicing in Baden alternative solutions.

The evaluation determined that Alternative WW1 is not recommended as it does not address problems identified in the Servicing Study. Alternative WW2 is the Least Preferred, Alternative WW3 is Moderately Preferred, and Alternative WW4 – Upgrade system and convey directly to the New Hamburg Wastewater Treatment Plant is the Preferred Solution.

Slide 12 – Preliminary Preferred Alternative – Upgrade System and Convey Directly to New Hamburg Wastewater Treatment Plant

Alternative WW4 proposes to upgrade the system and convey flows directly to the New Hamburg Wastewater Treatment Plant and is selected as the Preliminary Preferred Alternative Solution. This alternative includes upgrades to the Baden Wastewater Pumping Station and a new forcemain (buried pipe) from the Baden Pumping Station to the New Hamburg Wastewater Treatment Plant. Alignment options for the forcemain were reviewed and the alignment shown is the recommended route. Considerations for this alternative include:

- The alignment avoids the complex construction in the Morningside retirement community.
- Crossing the Nith River would be accomplished by attaching the pipe to the existing bridge.
- Optimizes existing infrastructure investments and requires the least amount of infrastructure upgrades.
- Easements/property access agreements will be required to accommodate new infrastructure, but these easement requirements are limited.

Slide 13 – Evaluation of Alternative Solutions – Foxboro Green

This slide presents the results of the evaluation of Water and Wastewater Servicing for the Foxboro Green Community alternative solutions.

The evaluation determined that Alternative F1 is the least preferred due to technical and cost considerations. Alternatives F2 & F4 are Moderately Preferred, and Alternative F3 – Connect Foxboro Green to Future Expand Baden Service Area using Direct Route is the Preferred Solution.

Slide 14 – Preliminary Preferred Alternative – Connect Foxboro Green to Baden using a Direct Route

Alternative F3 proposes to connect Foxboro Green to the Baden community by a direct route. This connection involves extension of the water and wastewater services (pipes) from the south limit of the Foxboro Green community to the edge of the current growth boundary of Baden. Further connection of Foxboro Green will be within services in the future development parcel known as the Snyder's Road development. This option was selected as the Preliminary Preferred Alternative Solution with the following considerations:

- Provides Foxboro Green with reliable water supply (by Baden supply system) and wastewater services (through the Baden-New Hamburg wastewater collection system).
- Road closures in the Foxboro Green community may be required during construction.
- Forcemain location would require agreements with multiple property owners and stakeholders.

Slide 15 – Proposed Projects Addressed by this Study

In summary, the following projects are proposed as a result of this System Servicing Study:

1. Increasing water storage capacity at the New Hamburg Water Treatment Plant.
2. Upgrading the Baden Pumping Station and new forcemain connecting directly to the New Hamburg Wastewater Treatment Plant.
3. Connecting Foxboro Green to the Baden water supply system; also connect to the Baden-New Hamburg wastewater system.

The Schedule B Municipal Class EA study requirements will be deemed complete following the 30-day public review period of the Servicing Study / Project File Report. The Region may then proceed to the design phase and tender for construction.

Slide 16 – Next Steps

Following this PCC, the Project Team will review input received on the information presented and will confirm the Preferred Alternative Solutions.

Feedback received as part of PCC #3 will be used to prepare the Servicing Study/Project File Report. The report will be available for a minimum of 30 days to allow for public review.

Slide 17 – Questions

We thank you for your participation in the Baden and New Hamburg Water and Wastewater System Servicing Review Virtual Public Consultation Centre #3. We look forward to hearing from you.

Do you have questions, feedback, comments, or want to stay up to date on what's being evaluated as part of this project?

There are many ways to get in touch with the project team:

- You can fill out a comment sheet available on the Region's website, and return via mail or email to a member of the project team; or
- You can contact a project team member directly by email, telephone, or mail at the addresses listed.

As a reminder, more information, including copies of project notices and Public Consultation materials like a transcript of this virtual presentation can be found at **www.regionofwaterloo.ca/waterprojects**.

Baden and New Hamburg Water and Wastewater System Servicing Review
Virtual Public Consultation Centre #3
Tuesday, June 7, 2022 to Thursday, July 7, 2022

Comment Sheet

Contact Information (optional, but required if you would like a response or to be added to the study mailing list):

Name/Organization:

Mailing Address:

E-mail:

1. **Do you have any questions or comments you would like to share with the project team? (Please use as many sheets as necessary)**

Please email the completed form to a member of the study team by Thursday, July 7, 2022:

Region of Waterloo
Kaoru Yajima, P.Eng.
Sr. Engineer, Water Services
Region of Waterloo
150 Frederick Street, 7th Floor
Kitchener, Ontario N2G 4J3
Tel: 519-575-4757 ext. 3349
Email: kyajima@regionofwaterloo.ca

Stantec Consulting Ltd.
Jeff Paul, P.Eng.
Project Manager
Stantec Consulting Ltd.
171 Queens Ave #600
London, ON N6A 5J7
Tel: 519-675-6604
Email: Jeff.Paul@stantec.com

All comments and information received from individuals, stakeholder groups, and agencies regarding this project are being collected under the authority of the Municipal Act to assist the Region of Waterloo in making a decision. Under the Municipal Act, personal information such as name, address, telephone number, and property location that may be included in a submission becomes part of the public record. Questions regarding the collection of this information should be directed to Kaoru Yajima at the Region of Waterloo.

AGENCY CORRESPONDENCE

Baden and New Hamburg
Water and Wastewater System Servicing Review
Agency/Utility Comment Tracking

Contact Information	Comment	Response/Commitment to Carry Forward
Trevor Heywood Resource Planner Grand River Conservation Authority 519-621-2763 ext. 2292 theywood@grandriver.ca	The study area contains the Nith River, watercourses, floodplains, slope hazards and wetlands. As the Class EA may propose measures that have the potential to impact these regulated features, the GRCA wishes to stay involved as the EA process moves forward.	T.H. added as main contact for GRCA
Transport Canada EnviroOnt@tc.gc.ca Environmental Assessment Program, **Ontario Region** **Transport Canada / Government of Canada / 4900 Yonge St., Toronto, ON M2N 6A5** **EnviroOnt@tc.gc.ca / Facsimile : (416) 952-0514 / TTY: 1-888-675-6863**	Please note Transport Canada **does not** require receipt of all individual or Class EA related notifications. We are requesting project proponents self-assess if their project: 1. Will interact with a federal property and/or waterway by reviewing the Directory of Federal Real Property, available at at www.tbs-sct.gc.ca/dfrp-rbif/; **and** 2. Will require approval and/or authorization under any Acts administered by Transport Canada* available at http://www.tc.gc.ca/eng/acts-regulations/menu.htm. Projects that will occur on federal property prior to exercising a power, performing a function or duty in relation to that project, will be subject to a determination of the likelihood of significant adverse environmental effects, per Section 82 of the *Impact Assessment Act, 2019*. If the aforementioned does not apply, the Environmental Assessment program should not be included in any further correspondence and future notifications will not receive a response. If there is a role under the program, correspondence should be forwarded *electronically* to: EnviroOnt@tc.gc.ca with a **brief description of Transport Canada's expected role**.	Project was self assessed and determined that Transport Canada did not need to be included on any further correspondence. Updated contact list accordingly.

Contact Information	Comment	Response/Commitment to Carry Forward
David Secord **Senior Project Manager** **Corridor Management Section** **Ministry of Transportation** **659 Exeter Road, London, ON N6E 1L3** **Phone:226-980-8915**	Please add my name to the contact list to participate as MTO representation in the Study.	D.S. added as MTO contact for EA.
Joseph Harvey | Heritage Planner (A) Heritage, Tourism and Culture Division | Programs and Services Branch | Heritage Planning Unit **Ministry of Heritage, Sport, Tourism and Culture Industries** **401 Bay Street** **17th Floor, Suite 1700** **Toronto, ON M7A 0A7** **613.242.3743** Joseph.Harvey@ontario.ca	Provided MHSTCI comment letter dated February 26, 2021. This letter provided advice on how to incorporate consideration of cultural heritage in the master planning process by outlining the technical cultural heritage studies and the level of detail required to address cultural heritage in master plans. Advised that, in accordance with the MCEA, cultural heritage resources should be identified early in the process in order to determine known and potential resources and potential impacts. In regards to cultural heritage resources the Master Plan Document should; - identify existing baseline environmental conditions, - identify expected environmental impacts and, - include measures to mitigate potential negative impacts. In regards to archaeological resources, if the EA project area exhibits archaeological potential, then an archaeological assessment (AA) should be undertaken by an archaeologist licensed under the Ontario Heritage Act and submitted for MHSTCI review prior to the completion of the master plan. In regards to built heritage resources and cultural heritage landscapes, the Master Plan document should: - Describe the existing baseline cultural heritage conditions - Identify preliminary potential project-specific impacts	Continue to consult MHSTCI. Advise MHSTCI whether any technical heritage studies will be completed this master plan and provide them to MHSTCI before issuing a Notice of Completion.

Contact Information	Comment	Response/Commitment to Carry Forward
	- Recommend measures to avoid or mitigate potential negative impacts Where a known or potential built heritage resource or cultural heritage landscape may be directly and adversely impacted, and where it has not yet been evaluated for Cultural Heritage Value or Interest (CHVI), completion of a Cultural Heritage Evaluation Report (CHER) is required to fully understand its CHVI and level of significance Environmental Assessment Reporting - Please advise MHSTCI whether any technical heritage studies will be completed for this master plan and provide them to MHSTCI before issuing a Notice of Completion. Please continue to consult MHSTCI through the master plan process.	
Barb Slattery, EA/Planning Coordinator Ministry of the Environment, Conservation and Parks **Project Review Unit, Environmental Assessment Branch** **(365) 366-8185**	Provided with Notice of Completion Wording, Proponent's Introduction To The Delegation Of Procedural Aspects Of Consultation With Aboriginal Communities, Client's Guide to Preliminary Screening for Species at Risk, and Consideration of Climate Change in Environmental Assessment in Ontario.	
Chirag Shah Metrolinx Chirag.shah@metrolinx.com 416-202-3411	Does this work have any interfaces with Metrolinx / GO Transit stations or projects that you are aware of at this time?	**Email Response June 13, 2022:** I apologize for my delayed response - At this time, we have not identified any overlap with Metrolinx / GO Transit stations or projects. I've provided the link to the virtual Public Consultation Centre #3 presentation slides below; page 15 of the presentation presents a map of the study area with the proposed projects to be addressed by this study,

Contact Information	Comment	Response/Commitment to Carry Forward
		including the preferred routes for the infrastructure. https://www.regionofwaterloo.ca/en/living-here/resources/Documents/water/projects/water/BADEN-New-Hamburg-Water-and-Wastewater-System-Servicing-Review/WS2022JuneSlidesBadenNewHamburgWaterAndWastewaterSSR_PCC3_DOCS4065945.pdf If you identify any overlap with your stations or projects, or have any questions at all, please don't hesitate to let myself or a member of the project team aware and we can arrange for further discussions.
Trevor Heywood Resource Planner Grand River Conservation Authority theywood@grandriver.ca	**June 22, 2022:** We wish to offer the following comments: 1. For Alternative WS2, the New Hamburg Water Treatment Plant at 389 Fairview Street, New Hamburg is not regulated by the GRCA, and we have no comment. 2. Alternative WW4 traverses multiple features, including Baden Creek, the Nith River, other unnamed tributaries and their associated floodplains, riverine slopes and wetlands. While certain construction methods could mitigate any concerns, we will re-iterate the general principles from our December 29, 2021 letter, which should be addressed at a high level in the Project File Report: a. In general, natural hazards should be avoided to the extent possible, and where unavoidable, intrusions on significant natural features or hydrologic or ecological functions are minimized, with restoration and enhancement measures incorporated into the design. b. Structures and grading across watercourses and in floodplains should be done to limit adverse hydraulic or fluvial impacts, and ensure there is no loss of flood storage.	

Contact Information	Comment	Response/Commitment to Carry Forward
	c. Infrastructure in the proximity of erosion hazards or wetlands should be done using trenchless technology to avoid potential impacts. Any at-grade work within erosion hazards or wetlands may require a supporting geotechnical investigation and environmental impact study, respectively. 3. Alternative F3 does not appear to be proposed within any features, but there may features present that are not currently captured by our mapping. We request that any natural heritage inventory work includes a focused examination around the south end of Foxboro Green and the north end of 1012 Snyder's Road West to confirm the extent of watercourses and wetlands.	

From: Kaoru Yajima
To: "Secord, David (MTO)"; Paul, Jeff
Cc: Paula Hohner; Davidson, Moira
Subject: RE: Region of Waterloo - Baden and New Hamburg Water and Wastewater System Servicing Review
Date: Thursday, February 4, 2021 5:37:46 PM

Hello David,

Thanks for getting back to us. We will certainly add you to the project notice list.

Regards,
Kaoru

(Moira, Paula, please take note to add David to the contact list)

From: Secord, David (MTO) <David.Secord@ontario.ca>
Sent: February 4, 2021 9:09 AM
To: Kaoru Yajima <KYajima@regionofwaterloo.ca>; jeff.paul@stantec.com
Cc: [redacted]
Subject: FW: Region of Waterloo - Baden and New Hamburg Water and Wastewater System Servicing Review

Good Morning
Please add my name to the contact list to participate as MTO representation in the Study.
Thanks,
Dave

David Secord
Senior Project Manager
Corridor Management Section
Ministry of Transportation
659 Exeter Road, London, ON N6E 1L3
Phone:226-980-8915

From: Davidson, Moira <Moira.Davidson@stantec.com>
Sent: February-03-21 4:02 PM
Cc: Kaoru Yajima <KYajima@regionofwaterloo.ca>; Hohner, Paula <Paula.Hohner@stantec.com>; Paul, Jeff <jeff.paul@stantec.com>
Subject: Region of Waterloo - Baden and New Hamburg Water and Wastewater System Servicing Review

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

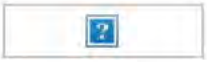
Good Afternoon,

Please find attached the Notice of Commencement for the Baden and New Hamburg Water and Wastewater System Servicing Review. Please feel free to contact a member of the project team identified on the attached Notice if you have any questions or concerns.

Moira Davidson BES
Urban Planner
she/her

~~Direct: 519-585-7295~~
Cell: 289 244-8222
Moira.Davidson@stantec.com

Stantec
100-300 Hagey Boulevard
Waterloo ON N2L 0A4





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From:	Harvey, Joseph (MHSTCI)
To:	Paul, Jeff
Cc:	Barboza, Karla (MHSTCI); Davidson, Moira; Kaoru Yajima
Subject:	File 0013687: Region of Waterloo - Baden and New Hamburg Water and Wastewater System Servicing Review
Date:	Friday, February 26, 2021 4:21:02 PM
Attachments:	2021-02-26_WaterlooBadenNewHamburg-WaterWastewater-MHSTCI-Ltr.pdf

Jeff Paul,

Please find attached MHSTCI's comments on the above referenced undertaking. Do not hesitate to contact me with any questions or concerns.

Regards,

Joseph Harvey | Heritage Planner (A)
Heritage, Tourism and Culture Division | Programs and Services Branch | Heritage Planning Unit
Ministry of Heritage, Sport, Tourism and Culture Industries
401 Bay Street
17th Floor, Suite 1700
Toronto, ON M7A 0A7
613.242.3743
Joseph.Harvey@ontario.ca

From:	Paul, Jeff
To:	Davidson, Moira
Cc:	Hohner, Paula
Subject:	FW: Baden New Hamburg Servicing Update Study - Acknowledgement
Date:	Monday, March 8, 2021 1:34:27 PM
Attachments:	Baden and New Hamburg.docx A Proponent"s Introduction to the Delegated Aspects of Consultation with....pdf Client Guide to Preliminary Screening-May 2019.pdf MOECC Guide - Climate Change in EA - Rev 0 - Oct 2017.pdf Notice of Completion Wording 08-28.docx

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Moira,

Can you take a read through and let me know if there are any issues here. Can you also file this in the electronic file.

Thanks,

Jeff Paul P.Eng.
Managing Principal

Direct: 519 675-6604
Mobile: 519 319-5806
Fax: 519 645-6575
jeff.paul@stantec.com

Stantec
600-171 Queens Avenue
London ON N6A 5J7

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From: Slattery, Barbara (MECP) <barbara.slattery@ontario.ca>
Sent: Monday, March 8, 2021 12:27 PM
To: Kaoru Yajima <KYajima@regionofwaterloo.ca>; Paul, Jeff <jeff.paul@stantec.com>
Cc: Del Villar Cuicas, Joan (MECP) <Joan.DelVillarCuicas@ontario.ca>
Subject: Baden New Hamburg Servicing Update Study - Acknowledgement

With best regards to all,

Barb Slattery, EA/Planning Coordinator
Ministry of the Environment, Conservation and Parks
Project Review Unit, Environmental Assessment Branch
(365) 366-8185

We want to hear from you. How was my service? You can provide feedback at 1-888-745-8888.

Administration Centre: 400 Clyde Road, P.O. Box 729 Cambridge, ON N1R 5W6
Phone: 519-621-2761 Toll free: 1-866-900-4722 Fax: 519-621-4844 www.grandriver.ca

February 4, 2021

Kaoru Yajima
Project Manager
Region of Waterloo
150 Frederick Street
Kitchener ON N2G 4J3
kyajima@regionofwaterloo.ca

Re: Municipal Class Environmental Assessment
Baden and New Hamburg Water and Wastewater System Servicing Review
Township of Wilmot

Dear Kaoru Yajima,

The Grand River Conservation Authority (GRCA) has received the Notice of Commencement for the above-noted Class Environmental Assessment (Class EA).

The study area contains the Nith River, watercourses, floodplains, slope hazards and wetlands (see our web GIS mapping at https://maps.grandriver.ca/web-gis/public/). As the Class EA may propose measures that have the potential to impact these regulated features, the GRCA wishes to stay involved as the EA process moves forward.

Please include the GRCA on the project mailing list. If you have any questions or require additional information, please contact me at 519-621-2763 ext. 2292 or theywood@grandriver.ca.

Sincerely,

Trevor Heywood
Resource Planner
Grand River Conservation Authority

Attachment

c.c. Jeff Paul, Stantec

Ministry of Heritage, Sport, Tourism and Culture Industries

Programs and Services Branch
401 Bay Street, Suite 1700
Toronto, ON M7A 0A7
Tel: 613.242.3743

Ministère des Industries du Patrimoine, du Sport, du Tourisme et de la Culture

Direction des programmes et des services
401, rue Bay, Bureau 1700
Toronto, ON M7A 0A7
Tél: 613.242.3743

Ontario

February 26, 2021 EMAIL ONLY

Jeff Paul, P.Eng.
Project Manager
Stantec Consulting Ltd.
Jeff.Paul@stantec.com

MHSTCI File	**:**	**0013687**
Proponent	**:**	**Region of Waterloo**
Subject	**:**	**Notice of Study Commencement – Master Plan**
Project	**:**	**Baden and New Hamburg Water and Wastewater System Servicing Review**
Location	**:**	**Communities of Baden, New Hamburg and Foxboro Green, The Region of Waterloo**

Dear Jeff Paul:

Thank you for providing the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) with the Notice of Study Commencement for this project. MHSTCI's interest in this master plan relates to it's mandate of conserving Ontario's cultural heritage, which includes archaeological resources, built heritage resources and cultural heritage landscapes.

MHSTCI understands that master plans are long range plans which integrate infrastructure requirements for existing and future land use with environmental assessment planning principles. The Municipal Class Environmental Assessment (MCEA) outlines a framework for master plan and associated studies which should recognize the planning and esign Process of this Class EA, and should incorporate the key principles of successful environmental assessment planning identified in Section A.1.1. The master planning process will, at minimum, address Phases 1 and 2 of the Planning and Design Process of the MCEA.

This letter provides advice on how to incorporate consideration of cultural heritage in the above-mentioned master planning process by outlining the technical cultural heritage studies and the level of detail required to address cultural heritage in master plans. In accordance with the MCEA, cultural heritage resources should be identified early in the process in order to determine known and potential resources and potential impacts.

Master Plan Summary
The Region of Waterloo (Region) has initiated a Servicing Review to assess the current water and wastewater systems that serve the communities of Baden, New Hamburg and Foxboro Green and assess current and future servicing needs. This Study is being undertaken to fulfill the requirements of Phases 1 and 2 of the Municipal Class Environmental Assessment document (October 2000, as amended in 2007, 2011 and 2015), which is an approved process under the Ontario Environmental Assessment Act.

Identifying Cultural Heritage Resources
MHSTCI understands that the final public notice for the master plan could become the notice of completion for the Schedule B and C MCEAs within it and that this approach would likely result in extensive documentation should the master plan include numerous Schedule C MCEA undertakings. In regards to cultural heritage resources the Master Plan Document should;

- identify existing baseline environmental conditions,
- identify expected environmental impacts and,
- Include measures to mitigate potential negative impacts.

Archaeological Resources
Any undertakings as part of the master plan should be screened using the MHSTCI *Criteria for Evaluating Archaeological Potential* and *Criteria for Evaluating Marine Archaeological Potential* to determine if an archaeological assessment is needed. If the EA project area exhibits archaeological potential, then an archaeological assessment (AA) should be undertaken by an archaeologist licensed under the Ontario Heritage Act and submitted for MHSTCI review prior to the completion of the master plan.

Built Heritage Resources and Cultural Heritage Landscapes
A Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment will be undertaken for the entire study area during the planning phase and will be summarized in the EA Report. This study will:

1. Describe the existing baseline cultural heritage conditions within the study area by identifying all known or potential built heritage resources and cultural heritage landscapes, including a historical summary of the study area. MHSTCI has developed screening criteria that may assist with this exercise: *Criteria for Evaluating for Potential Built Heritage Resources and Cultural Heritage Landscapes*.

2. Identify preliminary potential project-specific impacts on the known and potential built heritage resources and cultural heritage landscapes that have been identified. The report should include a description of the anticipated impact to each known or potential built heritage resource or cultural heritage landscape that has been identified.

3. Recommend measures to avoid or mitigate potential negative impacts to known or potential built heritage resources and cultural heritage landscapes. The proposed mitigation measures are to inform the next steps of project planning and design.

Where a known or potential built heritage resource or cultural heritage landscape may be directly and adversely impacted, and where it has not yet been evaluated for Cultural Heritage Value or Interest (CHVI), completion of a Cultural Heritage Evaluation Report (CHER) is required to fully understand its CHVI and level of significance. The CHER must be completed as part of the final EA report. If a potential resource is found to be of CHVI, then a Heritage Impact Assessment (HIA) will need to be undertaken and included in the final EA report. Our Ministry's *Info Sheet #5: Heritage Impact Assessments and Conservation Plans* outlines the scope of HIAs. Please send the HIA to MHSTCI for review and make it available to local organizations or individuals who have expressed interest in review.

While some cultural heritage landscapes are contained within individual property boundaries, others span across multiple properties. For certain cultural heritage landscapes, it will be more appropriate for the CHER and HIA to include multiple properties, in order to reflect the extent of that cultural heritage landscape in its entirety.

Community input should be sought to identify locally recognized and potential cultural heritage resources. Sources include, but are not limited to, municipal heritage committees, community heritage registers, historical societies and other local heritage organizations.

Cultural heritage resources are often of critical importance to Indigenous communities. Indigenous communities may have knowledge that can contribute to the identification of cultural heritage resources, and we suggest that any engagement with Indigenous communities includes a discussion about known or potential cultural heritage resources that are of value to them.

Environmental Assessment Reporting
Technical cultural heritage studies are to be undertaken by a qualified person who has expertise, recent experience, and knowledge relevant to the type of cultural heritage resources being considered and the nature of the activity being proposed. Please advise MHSTCI whether any technical heritage studies will be completed for this master plan and provide them to MHSTCI before issuing a Notice of Completion.

Thank you for consulting MHSTCI on this project. Please continue to do so through the master plan process and contact me with any questions or clarification.

Sincerely,

Joseph Harvey
Heritage Planner
joseph.harvey@ontario.ca

Copied to: Kaoru Yajima, Project Manager, Region of Waterloo
Moira Davidson BES, Urban Planner, Stantec

It is the sole responsibility of proponents to ensure that any information and documentation submitted as part of their EA report or file is accurate. MHSTCI makes no representation or warranty as to the completeness, accuracy or quality of the any checklists, reports or supporting documentation submitted as part of the EA process, and in no way shall MHSTCI be liable for any harm, damages, costs, expenses, losses, claims or actions that may result if any checklists, reports or supporting documents are discovered to be inaccurate, incomplete, misleading or fraudulent.

Please notify MHSTCI if archaeological resources are impacted by EA project work. All activities impacting archaeological resources must cease immediately, and a licensed archaeologist is required to carry out an archaeological assessment in accordance with the *Ontario Heritage Act* and the Standards and Guidelines for Consultant Archaeologists.

If human remains are encountered, all activities must cease immediately and the local police as well as the Registrar, Burials of the Ministry of Government and Consumer Services must be contacted. In situations where human remains are associated with archaeological resources, MHSTCI should also be notified to ensure that the site is not subject to unlicensed alterations which would be a contravention of the *Ontario Heritage Act*.

From:	Trevor Heywood
To:	Kaoru Yajima; Paul, Jeff
Cc:	Hohner, Paula; Davidson, Moira
Subject:	RE: Region of Waterloo - Baden and New Hamburg Water and Wastewater System Servicing Review
Date:	Thursday, February 4, 2021 11:01:03 AM
Attachments:	image001.png 2021-02-04 Baden-NewHamburg WWW GRCA ack.pdf GRCA Map.pdf

Hi Kaoru,

Please see our acknowledgement attached. Thanks,

Trevor Heywood
Resource Planner
Grand River Conservation Authority
theywood@grandriver.ca

From: Davidson, Moira <Moira.Davidson@stantec.com>
Sent: Wednesday, February 3, 2021 4:02 PM
Cc: Kaoru Yajima <KYajima@regionofwaterloo.ca>; Hohner, Paula <Paula.Hohner@stantec.com>; Paul, Jeff <jeff.paul@stantec.com>
Subject: Region of Waterloo - Baden and New Hamburg Water and Wastewater System Servicing Review

Good Afternoon,

Please find attached the Notice of Commencement for the Baden and New Hamburg Water and Wastewater System Servicing Review. Please feel free to contact a member of the project team identified on the attached Notice if you have any questions or concerns.

Moira Davidson BES
Urban Planner
she/her

~~Direct: 519-585-7295~~
Cell: 289 244-8222
Moira.Davidson@stantec.com

Stantec
100-300 Hagey Boulevard
Waterloo ON N2L 0A4

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From: Richard Toogood
To: Davidson, Moira
Cc: Kaoru Yajima; Hohner, Paula; Paul, Jeff
Subject: Re: Region of Waterloo - Baden and New Hamburg Water and Wastewater System Servicing Review
Date: Wednesday, February 3, 2021 4:19:06 PM

Many thanks for keeping us in the loop. Look forward to working with you on this project.

Richard Toogood
Chair, Service & Equipment committee

> On Feb 3, 2021, at 4:02 PM, Davidson, Moira <Moira.Davidson@stantec.com> wrote:
>
> Good Afternoon,
>
> Please find attached the Notice of Commencement for the Baden and New Hamburg Water and Wastewater System Servicing Review. Please feel free to contact a member of the project team identified on the attached Notice if you have any questions or concerns.
>
> **Moira Davidson** BES
> Urban Planner
> she/her
>
> ~~Direct: 519 585 7295~~
> Cell: 289 244-8222
> Moira.Davidson@stantec.com
>
> Stantec
> 100-300 Hagey Boulevard
> Waterloo ON N2L 0A4
>
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> **Please consider the environment before printing this email.**
>
> <NOC_BadenNewHamburg_W&WW_EA_20210201_fnl.pdf>

From:	EnviroOnt
To:	Davidson, Moira
Cc:	Kaoru Yajima
Subject:	Transport Canada response: Region of Waterloo - Baden and New Hamburg Water and Wastewater System Servicing Review
Date:	Wednesday, February 3, 2021 6:21:27 PM
Attachments:	NOC_BadenNewHamburg_W&WW_EA_20210201_fnl.pdf

Greetings,

Thank you for your correspondence.

Please note Transport Canada **does not** require receipt of all individual or Class EA related notifications. We are requesting project proponents self-assess if their project:

1. Will interact with a federal property and/or waterway by reviewing the Directory of Federal Real Property, available at at www.tbs-sct.gc.ca/dfrp-rbif/; **and**
2. Will require approval and/or authorization under any Acts administered by Transport Canada* available at http://www.tc.gc.ca/eng/acts-regulations/menu.htm.

Projects that will occur on federal property prior to exercising a power, performing a function or duty in relation to that project, will be subject to a determination of the likelihood of significant adverse environmental effects, per Section 82 of the *Impact Assessment Act, 2019*.

If the aforementioned does not apply, the Environmental Assessment program should not be included in any further correspondence and future notifications will not receive a response. If there is a role under the program, correspondence should be forwarded *electronically* to: EnviroOnt@tc.gc.ca with a **brief description of Transport Canada's expected role**.

*Below is a summary of the most common Acts that have applied to projects in an Environmental Assessment context:

- ***Canadian Navigable Waters Act (CNWA)*** – the Act applies primarily to works constructed or placed in, on, over, under, through, or across navigable waters set out under the Act. The Navigation Protection Program administers the CNWA through the review and authorization of works affecting navigable waters. Information about the Program, CNWA and approval process is available at: http://www.tc.gc.ca/eng/programs-621.html. Enquiries can be directed to NPPONT-PPNONT@tc.gc.ca or by calling (519) 383-1863.

- ***Railway Safety Act (RSA)*** – the Act provides the regulatory framework for railway safety, security, and some of the environmental impacts of railway operations in Canada. The Rail Safety Program develops and enforces regulations, rules, standards and procedures governing safe railway operations. Additional information about the Program is available at: https://www.tc.gc.ca/eng/railsafety/menu.htm. Enquiries can be directed to RailSafety@tc.gc.ca or by calling (613) 998-2985.

- ***Transportation of Dangerous Goods Act (TDGA)*** – the transportation of dangerous goods by

air, marine, rail and road is regulated under the TDGA. Transport Canada, based on risks, develops safety standards and regulations, provides oversight and gives expert advice on dangerous goods to promote public safety. Additional information about the transportation of dangerous goods is available at: https://www.tc.gc.ca/eng/tdg/safety-menu.htm. Enquiries can be directed to TDG-TMDOntario@tc.gc.ca or by calling (416) 973-1868.

- ***Aeronautics Act*** – Transport Canada has sole jurisdiction over aeronautics, which includes aerodromes and all related buildings or services used for aviation purposes. Aviation safety in Canada is regulated under this Act and the Canadian Aviation Regulations (CARs). Elevated Structures, such as wind turbines and communication towers, would be examples of projects that must be assessed for lighting and marking requirements in accordance with the CARs. Transport Canada also has an interest in projects that have the potential to cause interference between wildlife and aviation activities. One example would be waste facilities, which may attract birds into commercial and recreational flight paths. The *Land Use In The Vicinity of Aerodromes* publication recommends guidelines for and uses in the vicinity of aerodromes, available at: https://www.tc.gc.ca/eng/civilaviation/publications/tp1247-menu-1418.htm. Enquires can be directed to tc.aviationservicesont-servicesaviationont.tc@tc.gc.ca or by calling 1 (800) 305-2059 / (416) 952-0230.

Please advise if additional information is needed.

Thank you,

Environmental Assessment Program, Ontario Region
Transport Canada / Government of Canada / 4900 Yonge St., Toronto, ON M2N 6A5
EnviroOnt@tc.gc.ca / Facsimile : (416) 952-0514 / TTY: 1-888-675-6863

Programme d'évaluation environnementale, Région de l'Ontario
Transports Canada / Gouvernement du Canada / 4900, rue Yonge, Toronto, ON, M2N 6A5
EnviroOnt@tc.gc.ca / télécopieur: (416) 952-0514

From: Davidson, Moira [mailto:Moira.Davidson@stantec.com]
Sent: Wednesday, February 03, 2021 4:02 PM
Cc: Kaoru Yajima <KYajima@regionofwaterloo.ca>; Hohner, Paula <Paula.Hohner@stantec.com>; Paul, Jeff <jeff.paul@stantec.com>
Subject: Region of Waterloo - Baden and New Hamburg Water and Wastewater System Servicing Review

Good Afternoon,

Please find attached the Notice of Commencement for the Baden and New Hamburg Water and Wastewater System Servicing Review. Please feel free to contact a member of the project team identified on the attached Notice if you have any questions or concerns.

From:	Barboza, Karla (MHSTCI)
To:	Davidson, Moira
Cc:	Kaoru Yajima; Paul, Jeff; Hohner, Paula; Harvey, Joseph (MHSTCI)
Subject:	RE: Notice of Virtual Public Consultation Centre #2 - Region of Waterloo - Baden and New Hamburg Water and Wastewater System Servicing Review
Date:	Tuesday, November 30, 2021 8:17:13 AM

Good morning Moira,

Hope this email finds you well. Thanks for sending the PIC notice for the above-referenced project to the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI).

Could you please give us a status update of technical cultural heritage studies, if any?

Thanks again,
Karla

Karla Barboza MCIP, RPP, CAHP | (A) Team Lead, Heritage
Ministry of Heritage, Sport, Tourism and Culture Industries
Heritage, Tourism and Culture Division | Programs and Services Branch | Heritage Planning Unit
T. 416. 660.1027 | Email: karla.barboza@ontario.ca

From: Davidson, Moira <Moira.Davidson@stantec.com>
Sent: November-29-21 5:21 PM
Cc: Kaoru Yajima <KYajima@regionofwaterloo.ca>; Paul, Jeff <jeff.paul@stantec.com>; Hohner, Paula <Paula.Hohner@stantec.com>
Subject: Notice of Virtual Public Consultation Centre #2 - Region of Waterloo - Baden and New Hamburg Water and Wastewater System Servicing Review

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Good Afternoon,

Please find attached the Notice of Virtual Public Consultation Centre #2 for the Baden and New Hamburg Water and Wastewater System Servicing Review. A Public Consultation Centre (PCC) is being held online through the Region's YouTube channel to enable you to review the process that will be followed for the project, introduce the project and detail why it's being completed, and provide background information on the Baden and New Hamburg Water and Wastewater Systems. The PCC materials will be available on the Region's YouTube channel and the Region's website starting Tuesday, December 7, 2021 until Wednesday, January 12, 2022.

Please contact a member of the project team identified on the attached Notice if you have any questions, comments, or concerns or visit https://www.regionofwaterloo.ca/CurrentWaterProjects/ for more information.

Moira Davidson BES
Urban Planner
she/her

Cell: 289 244-8222

From:	Lang, Sarah
To:	chirag.shah@metrolinx.com
Subject:	RE: Notice of Virtual Public Consultation Centre #3 - Region of Waterloo, Baden and New Hamburg Water and Wastewater System Servicing Review
Date:	Monday, June 13, 2022 4:20:00 PM

Hi Chirag,

I apologize for my delayed response - At this time, we have not identified any overlap with Metrolinx / GO Transit stations or projects. I've provided the link to the virtual Public Consultation Centre #3 presentation slides below; page 15 of the presentation presents a map of the study area with the proposed projects to be addressed by this study, including the preferred routes for the infrastructure.

https://www.regionofwaterloo.ca/en/living-here/resources/Documents/water/projects/water/BADEN-New-Hamburg-Water-and-Wastewater-System-Servicing-Review/WS2022JuneSlidesBadenNewHamburgWaterAndWastewaterSSR_PCC3_DOCS4065945.pdf

If you identify any overlap with your stations or projects, or have any questions at all, please don't hesitate to let myself or a member of the project team aware and we can arrange for further discussions.

Thank you!

Sarah Lang
Environmental Planner
sarah.lang@stantec.com

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From: Chirag Shah <Chirag.Shah@Metrolinx.com>
Sent: Tuesday, May 31, 2022 1:35 PM
To: Lang, Sarah <Sarah.Lang@stantec.com>
Subject: RE: Notice of Virtual Public Consultation Centre #3 - Region of Waterloo, Baden and New Hamburg Water and Wastewater System Servicing Review

Hi,

Does this work have any interfaces with Metrolinx / GO Transit stations or projects that you are aware of at this time?

Thank you

Chirag Shah, P.Eng., PMP
T: 416.202.3411 C: 416.458.5063

From: Lang, Sarah <Sarah.Lang@stantec.com>
Sent: May 31, 2022 9:46 AM
Cc: Kaoru Yajima <KYajima@regionofwaterloo.ca>; Paul, Jeff <jeff.paul@stantec.com>; Hohner, Paula <Paula.Hohner@stantec.com>
Subject: Notice of Virtual Public Consultation Centre #3 - Region of Waterloo, Baden and New Hamburg Water and Wastewater System Servicing Review

You don't often get email from sarah.lang@stantec.com. Learn why this is important

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Hello,

Please find the attached Notice of Virtual Public Consultation Centre (PCC) #3 for the Baden and New Hamburg Water and Wastewater System Servicing Review. A PCC is being held online through the Region's YouTube channel to present the preliminary preferred alternatives related to the future water supply system and wastewater treatment and collection system. The PCC materials will be available on the Region's YouTube channel and website starting Tuesday, June 7, 2022 until Thursday, July 7, 2022.

Please contact a member of the project team identified on the attached Notice if you have any questions, comments, or concerns, or visit https://www.regionofwaterloo.ca/CurrentWaterProjects/ for more information.

Thank you,

Sarah Lang
Environmental Planner
sarah.lang@stantec.com

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From:	Hohner, Paula
To:	secondarylanduse@hydroone.com
Cc:	Paul, Jeff; Kaoru Yajima; Kocher, Michael
Subject:	Baden and New Hamburg Water and Wastewater System Servicing - crossing of HONI Transmission Line
Date:	Monday, May 30, 2022 1:00:44 PM
Attachments:	Baden - NewHamburg water and wastewater system servicing review -Notice PCC3 .pdf 165640324_TM5_Baden_Preferred_NoSub.pdf

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The Region of Waterloo (Region) has initiated a Servicing Review to assess the current water and wastewater systems that serve the communities of Baden, New Hamburg and Foxboro Green and assess current and future servicing needs. This Study is being undertaken to fulfill the requirements of Phases 1 and 2 of the Municipal Class Environmental Assessment process, which is approved under the Ontario Environmental Assessment Act.

The Study has reviewed existing conditions related to the capacity and quality of the supply from the existing water supply system and the capacity and condition of the wastewater treatment and collection system, has evaluated alternative solutions and options, and has identified preliminary preferred alternatives resulting in 3 projects, including:

1. Increasing water storage capacity at the New Hamburg Water Treatment Plant.
2. Upgrading the Baden Pumping Station and construction of a new forcemain bypassing the Morningside Pumping Station and connecting directly to the New Hamburg Wastewater Treatment Plant.
3. Connecting Foxboro to the Baden sewer and water supply system.

The attached drawing provides an overview of Project 3, that involves the new forcemain and watermain crossing the HONI transmission line south of the community of Foxboro. The Region is requesting guidance from HONI in terms of design criteria and permit requirements. The design phase is anticipated to commence in the fall 2022, with construction commencing in the fall 2023.

We have also attached the notice for our third and final Public Information Centre held virtually from Tuesday, June 7, 2022 to Thursday, July 7, 2022 here: https://www.youtube.com/regionofwaterloo https://www.regionofwaterloo.ca/CurrentWaterProjects/

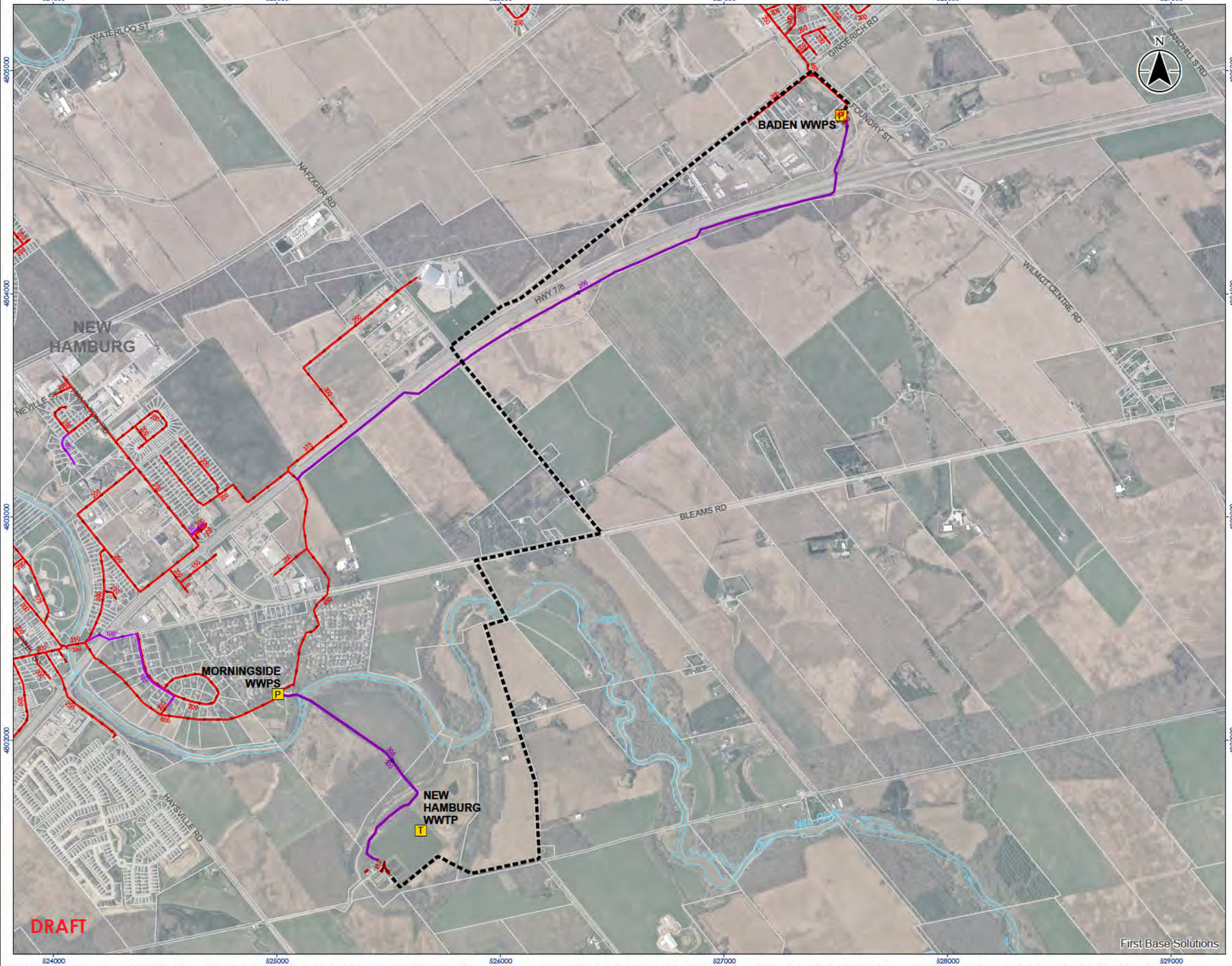
We respectfully ask for your comments by Thursday, July 7, 2022.

Thank you
Paula

Paula Hohner, MScPl, MCIP, RPP
Associate, Senior Environmental Planner
Environmental Team Lead - Transportation
Stantec
600-171 Queens Avenue London ON N6A 5J7
Mobile: 226-926-6682
paula.hohner@stantec.com

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Legend

- Study Area
- Waste Water Treatment Plants
- Waste Water Pumping Station
- Sanitary Sewer (Region)
- Forcemain (Region)
- Sanitary Sewer (Wilmot)
- Forcemain (Wilmot)
- Preferred Alternative

0 500 1 000 m

1:17 500 (At original document size of 11x17)

Notes

1 Coordinate System: NAD 1983 UTM Zone 17N
2 Contains information provided by the Region of Waterloo and information licensed under the Open Government Licence – Ontario
3 Spring 2018 orthoimagery from Region of Waterloo web map service

Project Location
Wilmot Township

165640324 REVA
Prepared by KDB on 2022-05-05

Client/Project
REGION OF WATERLOO
BADEN - NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
2

DRAFT

Title
New Hamburg Wastewater Servicing WW4 Preferred Alternative

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Notice of Virtual Public Consultation Centre #3
Baden and New Hamburg Water and Wastewater System Servicing Review

The Region of Waterloo (Region) has initiated a Servicing Review to assess the current water and wastewater systems in the communities of Baden, New Hamburg and Foxboro Green and assess current and future needs. Alternative solutions have been developed and were evaluated. The following Preliminary Preferred Alternatives are being presented at Public Consultation Centre (PCC)#3 for public review and comment:

1. Increasing water storage capacity at the New Hamburg Water Treatment Plant.
2. Upgrading the Baden Pump Station and construction of a new forcemain and connecting directly to the New Hamburg Wastewater Treatment Plant.
3. Connecting Foxboro Green to the Baden sewer and water supply system.

This Servicing Review is being undertaken to fulfill the requirements of Schedule B projects, following Phases 1 and 2 of the Municipal Class Environmental Assessment (October 2000, as amended in 2007, 2011 and 2015), which is an approved process under the Ontario Environmental Assessment Act.

How can I participate in this Study?

This PCC#3 is being held online through the Region's YouTube channel to present the preliminary preferred alternatives related to the future water supply system and wastewater treatment and collection system. Additional information and background on the study can be found on the Region's website or at the links below. We encourage all those who are interested to review the information and contact a member of the project team if you have any questions, comments, or would like to provide input on the study. The PCC materials will be available as follows:

Where: https://www.youtube.com/regionofwaterloo
https://www.regionofwaterloo.ca/CurrentWaterProjects/

When: Tuesday, June 7, 2022 to Thursday, July 7, 2022

Please contact one of the following team members if you have any questions or comments or would like to be added to the project mailing list. You can also fill out the comment sheet on the Region's website and provide that to one of the following team members by Thursday, July 7, 2022.

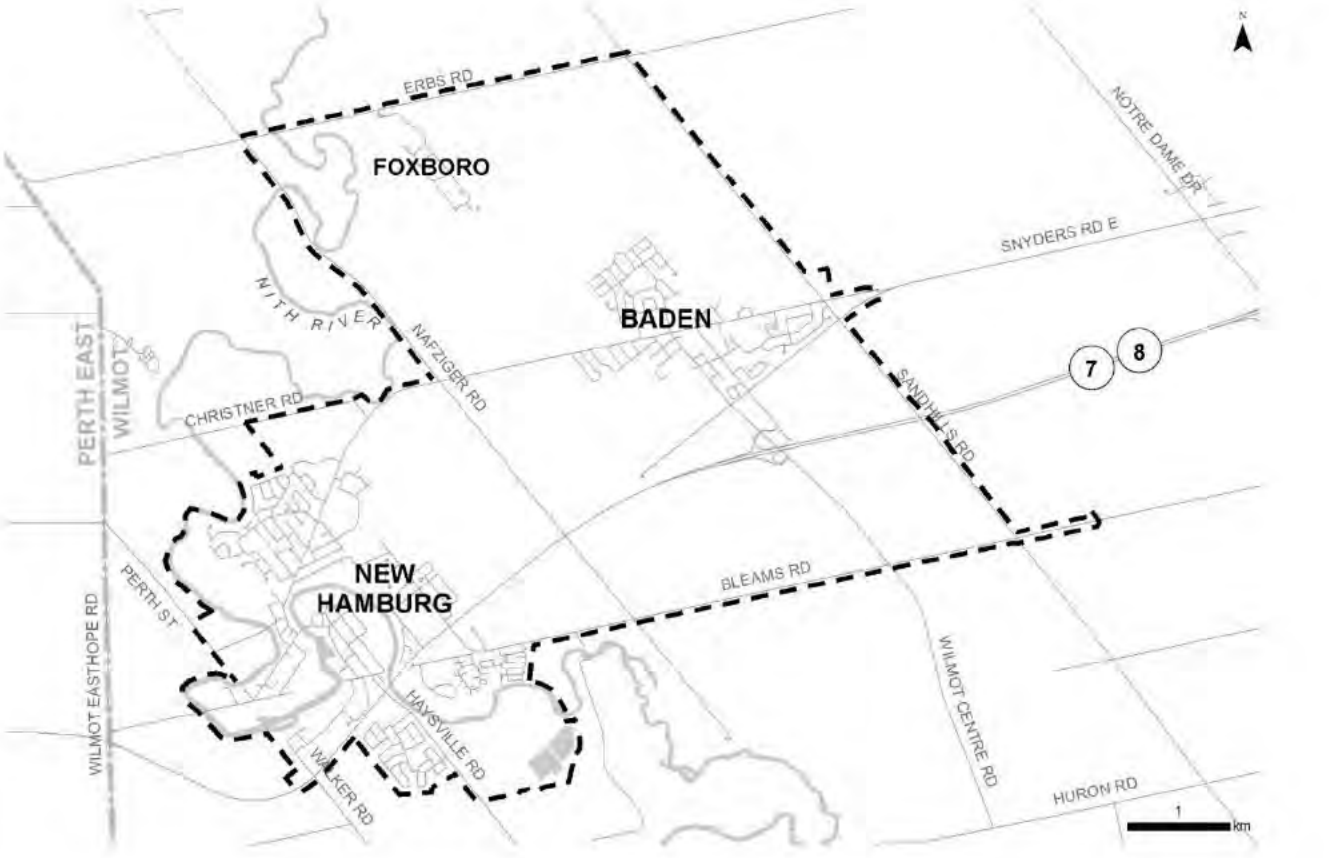
Kaoru Yajima
Project Manager
Region of Waterloo, Water Services
Phone: 519-575-4757 x 3349
Email: kyajima@regionofwaterloo.ca

Jeff Paul, P.Eng.
Project Manager
Stantec Consulting Ltd.
Phone: 519-675-6604
Email: Jeff.Paul@stantec.com

All comments and information received from individuals, stakeholder groups and agencies regarding this project are being collected under the authority of the "Municipal Act" to assist the Region of Waterloo in making a decision. Under the "Municipal Act", personal information such as name, address, telephone number, and property location that may be included in a submission becomes part of the public record. Questions regarding the collection of this information should be directed to Kaoru Yajima at the Region of Waterloo.

This Notice was first issued on Tuesday, May 31, 2022.

Figure 1: Study Area Map



From:	Hohner, Paula
To:	Kilgore, Michael (MTO)
Cc:	Paul, Jeff; Kaoru Yajima; Kocher, Michael
Subject:	RE: New Hamburg - Hwy 7 Forcemain - EA Study
Date:	Monday, May 30, 2022 1:00:30 PM
Attachments:	Baden - NewHamburg water and wastewater system servicing review -Notice PCC3 .pdf 165640324_TM5_Baden_Preferred_NoSub.pdf

Hi Michael,
Thank you for your email response and assistance with this project. As discussed on the phone a little while ago, the Region of Waterloo (Region) has initiated a Servicing Review to assess the current water and wastewater systems that serve the communities of Baden, New Hamburg and Foxboro Green and assess current and future servicing needs. This Study is being undertaken to fulfill the requirements of Phases 1 and 2 of the Municipal Class Environmental Assessment process, which is approved under the Ontario Environmental Assessment Act.

The Study has reviewed existing conditions related to the capacity and quality of the supply from the existing water supply system and the capacity and condition of the wastewater treatment and collection system, has evaluated alternative solutions and options, and has identified preliminary preferred alternatives resulting in 3 projects, including:

1. Increasing water storage capacity at the New Hamburg Water Treatment Plant.
2. Upgrading the Baden Pumping Station and construction of a new forcemain bypassing the Morningside Pumping Station and connecting directly to the New Hamburg Wastewater Treatment Plant.
3. Connecting Foxboro to the Baden sewer and water supply system.

The attached drawing provides an overview of Project 2 showing the location of the new forcemain crossing Highway 7/8 between New Hamburg and Baden. The Region is requesting guidance from the Ministry in terms of design criteria and permit requirements. The design phase is anticipated to commence in the fall 2022, with construction commencing in the fall 2023.

We have also attached the notice for our third and final Public Information Centre held virtually from Tuesday, June 7, 2022 to Thursday, July 7, 2022 here: https://www.youtube.com/regionofwaterloo https://www.regionofwaterloo.ca/CurrentWaterProjects/

Please let me know if you need anything further.

Thank you,
Paula

Paula Hohner, MScPl, MCIP, RPP
Associate, Senior Environmental Planner
Environmental Team Lead - Transportation
Stantec
600-171 Queens Avenue London ON N6A 5J7
Mobile: 226-926-6682
paula.hohner@stantec.com

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From: Kilgore, Michael (MTO) <Michael.Kilgore@ontario.ca>
Sent: Thursday, May 5, 2022 2:59 PM

To: Hohner, Paula <Paula.Hohner@stantec.com>
Subject: New Hamburg - Hwy 7 Forcemain - EA Study

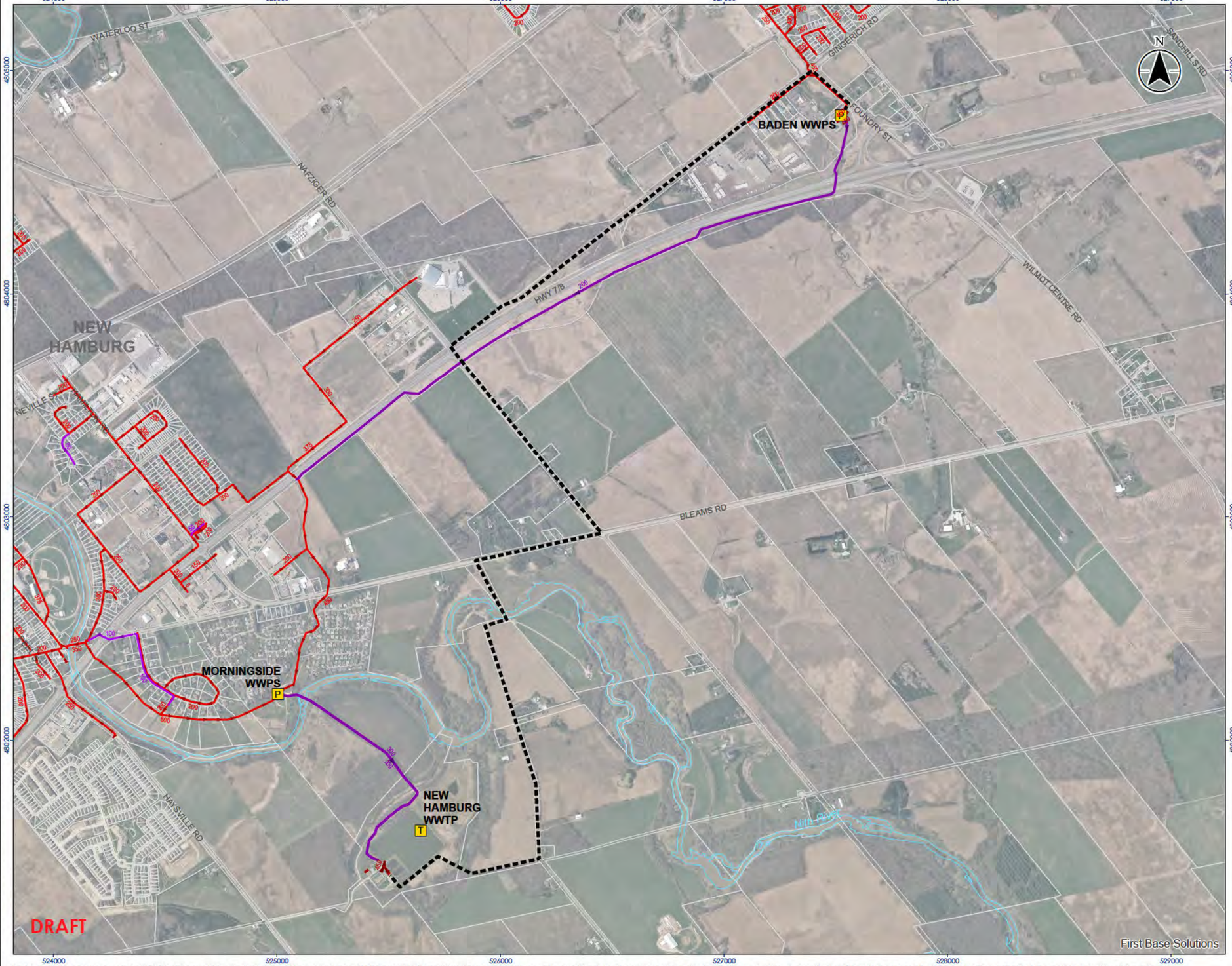
Hi Paula,

I was nice chatting with you. Thank you for reaching out to me with regards to the proposed work the Region of Waterloo has along 7 in New Hamburg. As discussed, please feel free to send me information and a description of the proposed EA study taking place, and I will compose some formal comments from the Ministry for you.

Thank you,

Ministry of Transportation - Corridor Management Planner (A)
Highway Corridor Management Section
659 Exeter Rd. London, ON N6E 1L3
Telephone: 226-973-7021 Fax: 519-873-4228
E-mail: Michael.Kilgore@ontario.ca

Ontario



Stantec

Legend

- Study Area
- Waste Water Treatment Plants
- Waste Water Pumping Station
- Sanitary Sewer (Region)
- Forcemain (Region)
- Sanitary Sewer (Wilmot)
- Forcemain (Wilmot)
- Preferred Alternative

0 500 1 000 m

1:17 500 (At original document size of 11x17)

Notes

1 Coordinate System: NAD 1983 UTM Zone 17N
2 Contains information provided by the Region of Waterloo and information licensed under the Open Government Licence – Ontario
3 Spring 2018 orthoimagery from Region of Waterloo web map service

Project Location
Wilmot Township

165640324 REVA
Prepared by KDB on 2022-05-05

Client/Project
REGION OF WATERLOO
BADEN - NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
2

DRAFT

Title
New Hamburg Wastewater Servicing WW4 Preferred Alternative

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Notice of Virtual Public Consultation Centre #3
Baden and New Hamburg Water and Wastewater System Servicing Review

The Region of Waterloo (Region) has initiated a Servicing Review to assess the current water and wastewater systems in the communities of Baden, New Hamburg and Foxboro Green and assess current and future needs. Alternative solutions have been developed and were evaluated. The following Preliminary Preferred Alternatives are being presented at Public Consultation Centre (PCC)#3 for public review and comment:

1. Increasing water storage capacity at the New Hamburg Water Treatment Plant.
2. Upgrading the Baden Pump Station and construction of a new forcemain and connecting directly to the New Hamburg Wastewater Treatment Plant.
3. Connecting Foxboro Green to the Baden sewer and water supply system.

This Servicing Review is being undertaken to fulfill the requirements of Schedule B projects, following Phases 1 and 2 of the Municipal Class Environmental Assessment (October 2000, as amended in 2007, 2011 and 2015), which is an approved process under the Ontario Environmental Assessment Act.

How can I participate in this Study?

This PCC#3 is being held online through the Region's YouTube channel to present the preliminary preferred alternatives related to the future water supply system and wastewater treatment and collection system. Additional information and background on the study can be found on the Region's website or at the links below. We encourage all those who are interested to review the information and contact a member of the project team if you have any questions, comments, or would like to provide input on the study. The PCC materials will be available as follows:

Where: https://www.youtube.com/regionofwaterloo
https://www.regionofwaterloo.ca/CurrentWaterProjects/

When: Tuesday, June 7, 2022 to Thursday, July 7, 2022

Please contact one of the following team members if you have any questions or comments or would like to be added to the project mailing list. You can also fill out the comment sheet on the Region's website and provide that to one of the following team members by Thursday, July 7, 2022.

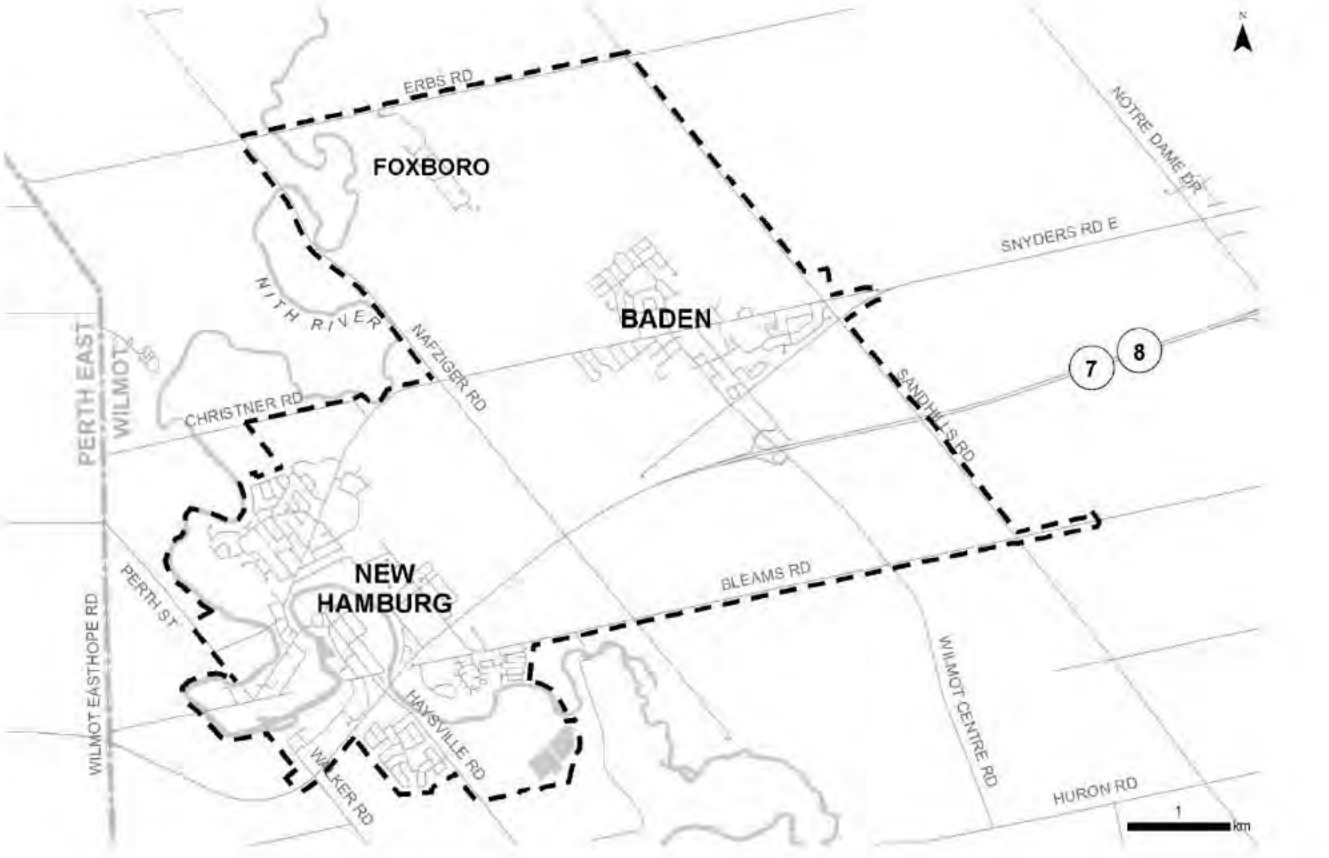
Kaoru Yajima
Project Manager
Region of Waterloo, Water Services
Phone: 519-575-4757 x 3349
Email: kyajima@regionofwaterloo.ca

Jeff Paul, P.Eng.
Project Manager
Stantec Consulting Ltd.
Phone: 519-675-6604
Email: Jeff.Paul@stantec.com

All comments and information received from individuals, stakeholder groups and agencies regarding this project are being collected under the authority of the "Municipal Act" to assist the Region of Waterloo in making a decision. Under the "Municipal Act", personal information such as name, address, telephone number, and property location that may be included in a submission becomes part of the public record. Questions regarding the collection of this information should be directed to Kaoru Yajima at the Region of Waterloo.

This Notice was first issued on Tuesday, May 31, 2022.

Figure 1: Study Area Map



From: Lang, Sarah
Cc:

of Waterloo, Baden and New Hamburg Water and Wastewater System Servicing Review
Date: Tuesday, May 31, 2022 9:46:00 AM
Attachments: Baden - NewHamburg water and wastewater system servicing review -Notice PCC3 .pdf

---

Hello,

Please find the attached Notice of Virtual Public Consultation Centre (PCC) #3 for the Baden and New Hamburg Water and Wastewater System Servicing Review. A PCC is being held online through the Region's YouTube channel to present the preliminary preferred alternatives related to the future water supply system and wastewater treatment and collection system. The PCC materials will be available on the Region's YouTube channel and website starting Tuesday, June 7, 2022 until Thursday, July 7, 2022.

Please contact a member of the project team identified on the attached Notice if you have any questions, comments, or concerns, or visit https://www.regionofwaterloo.ca/CurrentWaterProjects/ for more information.

Thank you,

Sarah Lang
Environmental Planner
sarah.lang@stantec.com

Stantec

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Please consider the environment before printing this email.

Ministry of Transportation

Operations Office
Corridor Management Section
West Region

659 Exeter Road
London, Ontario N6E 1L3
Telephone: (226) 973-7021
Facsimile: (519) 873-4228

Ministère des Transports

Bureau du génie
Section de gestion des couloirs routiers
Région de l'Ouest

659, chemin Exeter
London (Ontario) N6E 1L3
Téléphone: (226) 973-7021
Télécopieur:(519) 873-4228

Ontario

August 4, 2022

Stantec
600-171 Queens Avenue
London, Ontario
N6A 5J7

Attn: Jeff Paul, P. Eng, Project Manager – Stantec Consulting

RE: MTO Comments – Baden and New Hamburg Water and Wastewater System Servicing Review

The Ministry of Transportation (MTO) has the following comments pertaining to the Baden and New Hamburg water and wastewater system servicing study. The Conceptual Designs have been considered in accordance with the requirements of the *Public Transportation and Highway Improvement Act* (PTHIA), MTO's Highway Corridor Management Manual (HCMM) and all related policies.

Overview

The current force main serves as a connection between the Baden Wastewater Pumping Station and the New Hamburg Wastewater Treatment Plant. The existing Morningside Force main runs parallel to and crosses Highway 7/8. The current water and wastewater systems requires upgrades to the existing water supply system, and capacity to the wastewater treatment system.
Options include, upgrading the Baden Pumping Station and construction of a new force main bypassing the Morningside Pumping Station and connecting directly to the Baden sewer and water supply system.

MTO Permits

Any proposal crossing the designated highway limits will require MTO review and approval (Encroachment Permit). Any portion of the proposal outside the highway designated limits but within MTO's Permit Control Area will require MTO review and approval (Building and Land Use Permit)

To assist with selecting a preferred route and as conditions of permits, the following shall be considered:

- The crossing shall remain outside the functional area of an intersection and cross perpendicular to Highway 7/8.

- Any parallel running lines shall be outside the Highway property limits. Note highway widenings associated with municipal development applications such as Badenview Subdivision should be considered.
- Highway 7/8 is Classified as Freeway, enhanced depths for crossings of 3m below bottom of ditch and 5m below C/L grade are required.
- Impacts to potential MTO Highway expansion.
- Limited to trenchless installation and method supported by a Geotechnical Investigation Report.
- When crossing Highway 7/8, the force main will need to be installed inside of a casing filled with non-shrinkable grout from ditch line to ditch line.
- Detailed site drawings, including offset dimensions from MTO property limits and vertical profile information (cross section) at crossing location.
- Proposed construction access to the work area. Note, direct highway access will not be permitted, alternative access shall be secured.
- Duration of crossing work, Traffic staging and detour signage drawings
- Timing of work, and conflict with MTO Capital Construction project (2024-2025).
- In conjunction with a permit, a legal agreement will need to be executed between the Municipality and the MTO, outlining the legal requirements for cost responsibilities associated with future works of this sewer.

Thank you for pre-consulting and presenting the Concept Plans associated with the EA. Considering the aforementioned MTO conditions of permit, I anticipate further discussions to assist with concluding a preferred running line and crossing.

Yours truly,



Michael Kilgore
Corridor Management Officer
Corridor Management Office, West Region
Cell: 226-973-7021
E-mail: Michael.Kilgore@ontario.ca

Grand River Conservation Authority

Administration Centre: 400 Clyde Road, P.O. Box 729 Cambridge, ON N1R 5W6

Phone: 519-621-2761 Toll free: 1-866-900-4722 Fax: 519-621-4844 www.grandriver.ca

December 29, 2021

Kaoru Yajima
Water Services
Region of Waterloo
150 Frederick Street, 7th Floor
Kitchener ON N2G 4J3
kyajima@regionofwaterloo.ca

Jeff Paul
Project Manager
Stantec
171 Queens Avenue, Unit 600
London ON N6A 5J7
jeff.paul@stantec.com

Re: Municipal Class Environmental Assessment
Baden and New Hamburg Water and Wastewater System Servicing Review
Township of Wilmot

Dear Mr. Yajima and Mr. Paul,

The Grand River Conservation Authority (GRCA) has received the Virtual Public Consultation Centre 2 materials for the above-noted Class Environmental Assessment (Class EA). We offer some general comments about the proposed alternatives.

Features

Below are lists of regulated features present in the proposed alternative sites. While we have provided some static maps, these features can also be viewed on our web-GIS (https://maps.grandriver.ca/web-gis/public/?theme=MYP) or downloaded for use in desktop GIS applications (https://data.grandriver.ca/).

Water Supply

- WS2 and WS3 are not regulated by the GRCA.
- There is a watercourse present in the area of WS4.

Wastewater

- There are multiple watercourses, floodplains, erosion hazards and wetlands along the potential routing for WW2 – WW4.

Foxboro Green Water Supply and Wastewater

- F2 and F4 would be adjacent to some wetlands and require some watercourse and floodplain crossings. F4 would also by within erosion hazards.
- There are watercourses and wetlands in the vicinity of F3.

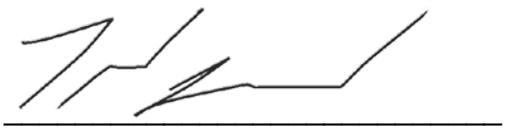
Comments

1. Water and wastewater services must meet GRCA's public infrastructure policies, where applicable.
    a. In general, natural hazards should be avoided to the extent possible, and where unavoidable, intrusions on significant natural features or hydrologic or ecological functions are minimized, with restoration and enhancement measures incorporated into the design.
    b. Structures and grading across watercourses and in floodplains should be done to limit adverse hydraulic or fluvial impacts, and ensure there is no loss of flood storage.
    c. Infrastructure in the proximity of erosion hazards or wetlands should be done using trenchless technology to avoid potential impacts. Any at-grade work within erosion hazards or wetlands may require supporting a geotechnical investigation and environmental impact study, respectively.

2. We understand the Township of Wilmot is currently undertaking a Class EA for the Morningside Sanitary Trunk Sewer. Some of the alternatives proposed through their Class EA could significantly impact some regulated features, and we have provided comments to them in that regard.

The GRCA would appreciate the opportunity to provide more detailed comments on the preferred alternatives. If you have any questions or require additional information, please contact me at 519-621-2763 ext. 2292 or theywood@grandriver.ca.

Sincerely,



Trevor Heywood
Resource Planner
Grand River Conservation Authority

Attachments

From: Kaoru Yajima
To: Trevor Heywood; Paul, Jeff
Cc: Hohner, Paula
Subject: RE: Baden and New Hamburg Water and Wastewater System Servicing Review
Date: Thursday, December 30, 2021 6:13:03 PM

Hello Trevor,

Thanks for passing on GRCA's comments on the PCC#2 material the Baden-NH water and wastewater servicing review.

We'll make sure we incorporate these considerations in the next steps of the review.

On the point of the Township's Morningside EA, we have the PM for the EA on our project team and are in close discussions with how the WW alternatives would be integrated with this study. The have shared GRCA's previous comments on their alternatives with out team.

Regards,
Kaoru

From: Trevor Heywood <theywood@grandriver.ca>
Sent: December 29, 2021 5:38 PM
To: Kaoru Yajima <KYajima@regionofwaterloo.ca>; Paul, Jeff <jeff.paul@stantec.com>
Subject: Baden and New Hamburg Water and Wastewater System Servicing Review

Hey Kaoru, Jeff,

Please see our comments attached in response to PCC 2. Regards,

Trevor Heywood
Resource Planner
Grand River Conservation Authority

theywood@grandriver.ca
www.grandriver.ca | Connect with us on social media



Map Centre (UTM NAD83 z17): 525,493 91 4,806,460.52

This map is not to be used for navigation | 2020 Ortho (ON)

Grand River Conservation Authority

Date: Dec 29, 2021
Author: TH

Baden and New Hamburg Water and Wastewater System

F2 and F4

Legend

- Regulation Limit (GRCA)
- Regulated Watercourse (GRCA)
- Regulated Waterbody (GRCA)
- Wetland (GRCA)
- Floodplain (GRCA)
  - Engineered
  - Estimated
  - Approximate
  - Special Policy Area
- Slope Valley (GRCA)
  - Steep
  - Oversteep
  - Steep
- Slope Erosion (GRCA)
  - Oversteep
  - Toe
- Lake Erie Flood (GRCA)
- Lake Erie Shoreline Reach (GRCA)
- Lake Erie Dynamic Beach (GRCA)
- Lake Erie Erosion (GRCA)
- Parcel - Assessment (MPAC/MNRF)

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0 170 340 680 1,020 Metres

N

NAD 1983 UTM Zone 17N

Scale: 28,078



Grand River Conservation Authority

Date: Dec 29, 2021

Author: TH

Baden and New Hamburg Water and Wastewater System

F3

Legend

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- Regulated Watercourse (GRCA)
- Regulated Waterbody (GRCA)
- Wetland (GRCA)
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NAD 1983 UTM Zone 17N

Scale: 8,135

Map Centre (UTM NAD83 z17): 525,394 31 4,806,549.83

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Grand River Conservation Authority

Date: Dec 10, 2021
Author: TH

Baden and New Hamburg Water and Wastewater System

WS4

Legend

- Regulation Limit (GRCA)
- Regulated Watercourse (GRCA)
- Regulated Waterbody (GRCA)
- Wetland (GRCA)
- Floodplain (GRCA)
  - Engineered
  - Estimated
  - Approximate
  - Special Policy Area
- Slope Valley (GRCA)
  - Steep
  - Oversteep
  - Steep
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  - Oversteep
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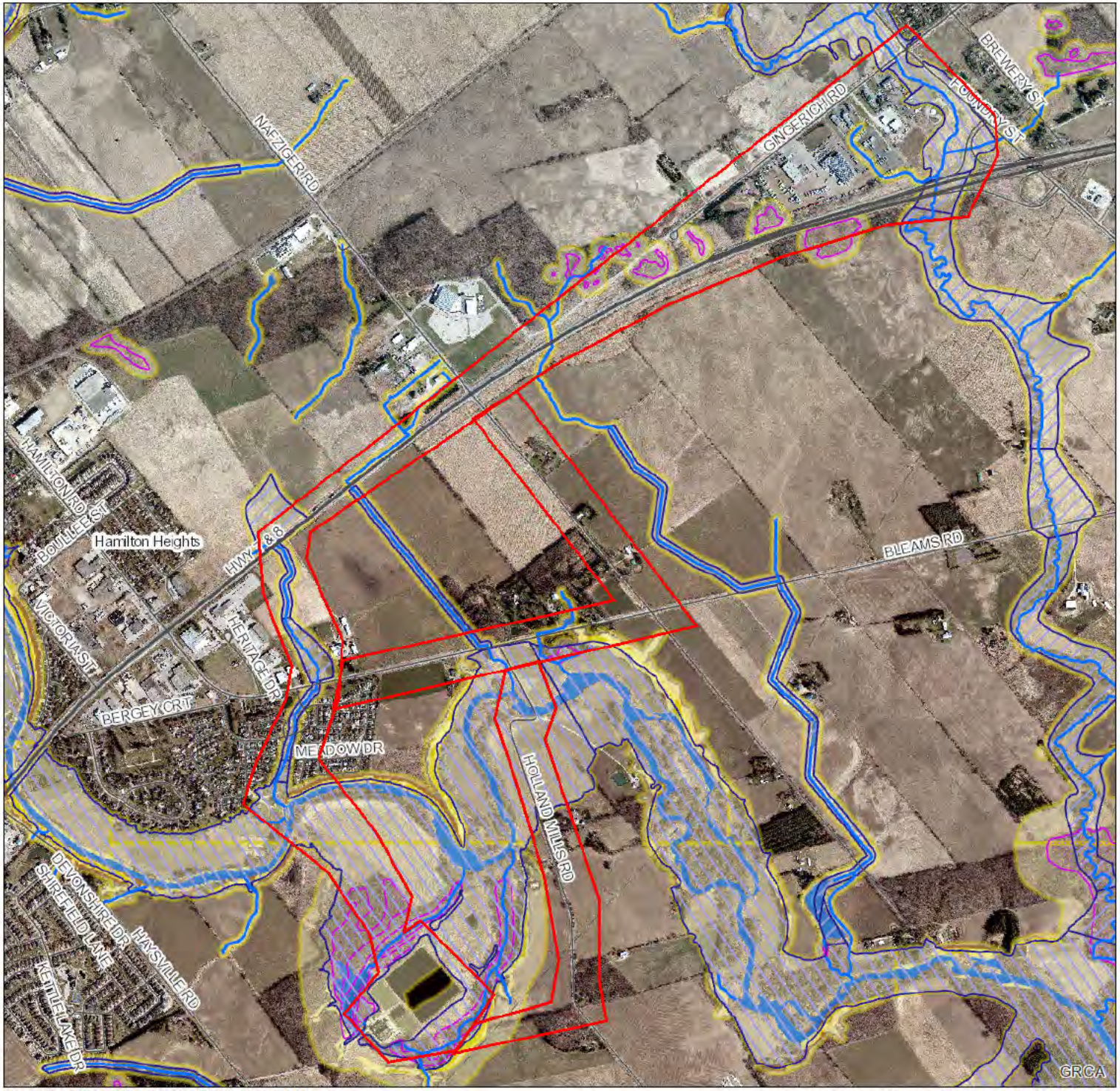
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Scale: 1,223

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Map Centre (UTM NAD83 z17): 526,112.35 4,803,174.47

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Grand River Conservation Authority

Date: Dec 29, 2021

Author: TH

Baden and New Hamburg Water and Wastewater System

WW2-4

Legend

- Regulation Limit (GRCA)
- Regulated Watercourse (GRCA)
- Regulated Waterbody (GRCA)
- Wetland (GRCA)
- Floodplain (GRCA)
  - Engineered
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0 125 250 500 750 Metres

N

NAD 1983 UTM Zone 17N

Scale: 20,655

From:	Paul, Jeff
To:	Hohner, Paula; Lang, Sarah
Subject:	FW: Baden and New Hamburg Water and Wastewater System Servicing Review
Date:	Wednesday, June 22, 2022 4:14:30 PM
Attachments:	2022-06-22 Baden-NewHamburg WWW GRCA comment.pdf

See attached.

Jeff Paul P.Eng.
Managing Senior Principal

Mobile: 519 319-5806
jeff.paul@stantec.com

Stantec
600-171 Queens Avenue
London ON N6A 5J7

From: Trevor Heywood <theywood@grandriver.ca>
Sent: Wednesday, June 22, 2022 3:57 PM
To: Kaoru Yajima <KYajima@regionofwaterloo.ca>; Paul, Jeff <jeff.paul@stantec.com>
Cc: 'Jane Gurney' <JGurney@regionofwaterloo.ca>
Subject: Baden and New Hamburg Water and Wastewater System Servicing Review

Hey Kaoru, Jeff,

Please see our comments attached in response to the PCC3 materials.

Regards,

Trevor Heywood, B.Sc.(Env.)
Resource Planner
Grand River Conservation Authority

400 Clyde Road, PO Box 729
Cambridge, ON N1R 5W6
Phone: 519-621-2763 ext. 2292
Email: theywood@grandriver.ca
www.grandriver.ca | Connect with us on social media

Administration Centre: 400 Clyde Road, P.O. Box 729 Cambridge, ON N1R 5W6
Phone: 519-621-2761 Toll free: 1-866-900-4722 Fax: 519-621-4844 www.grandriver.ca

June 22, 2022

Kaoru Yajima
Senior Engineer
Region of Waterloo
150 Frederick Street, 7th Floor
Kitchener ON N2G 4J3
kyajima@regionofwaterloo.ca

Jeff Paul
Project Manager
Stantec
171 Queens Avenue, Unit 600
London ON N6A 5J7
jeff.paul@stantec.com

Re: Baden and New Hamburg Water and Wastewater System Servicing Review
Township of Wilmot

Dear Mr. Yajima and Mr. Paul,

The Grand River Conservation Authority (GRCA) has received the Public Consultation Centre 3 materials for the above-noted Class Environmental Assessment (Class EA).

We understand that the preferred alternatives are as follows:

- **Water Supply**: WS2 – Increase storage at New Hamburg Water Treatment Plant
- **Wastewater**: WW4 – Upgrade system and convey directly to New Hamburg Wastewater Treatment Plant
- **Foxboro Green Water Supply and Wastewater**: F3 – Connection to Baden and water supply and wastewater systems via direct routing

We wish to offer the following comments:

1. For Alternative WS2, the New Hamburg Water Treatment Plant at 389 Fairview Street, New Hamburg is not regulated by the GRCA, and we have no comment.

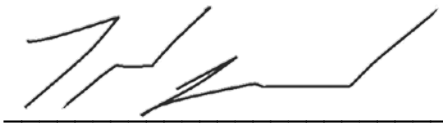
2. Alternative WW4 traverses multiple features, including Baden Creek, the Nith River, other unnamed tributaries and their associated floodplains, riverine slopes and wetlands. While certain construction methods could mitigate any concerns, we will re-iterate the general principles from our December 29, 2021 letter, which should be addressed at a high level in the Project File Report:

a. In general, natural hazards should be avoided to the extent possible, and where unavoidable, intrusions on significant natural features or hydrologic or ecological functions are minimized, with restoration and enhancement measures incorporated into the design.
b. Structures and grading across watercourses and in floodplains should be done to limit adverse hydraulic or fluvial impacts, and ensure there is no loss of flood storage.
c. Infrastructure in the proximity of erosion hazards or wetlands should be done using trenchless technology to avoid potential impacts. Any at-grade work within erosion hazards or wetlands may require a supporting geotechnical investigation and environmental impact study, respectively.

3. Alternative F3 does not appear to be proposed within any features, but there may features present that are not currently captured by our mapping. We request that any natural heritage inventory work includes a focused examination around the south end of Foxboro Green and the north end of 1012 Snyder's Road West to confirm the extent of watercourses and wetlands.

The GRCA appreciates the opportunity to comment on the final Project File Report. If you have any questions or require additional information, please contact me at 519-621-2763 ext. 2292 or theywood@grandriver.ca.

Sincerely,



Trevor Heywood
Resource Planner
Grand River Conservation Authority

Encl. Resource Mapping

cc: Jane Gurney, Region of Waterloo



Grand River Conservation Authority

Date: Jun 22, 2022
Author: TH

Baden and New Hamburg Water and Wastewater System

WW4

Legend

- Regulation Limit (GRCA)
- Regulated Watercourse (GRCA)
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- Lake Erie Dynamic Beach (GRCA)
- Lake Erie Erosion (GRCA)
- Parcel - Assessment (MPAC/MNRF)

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0 125 250 500 750 Metres

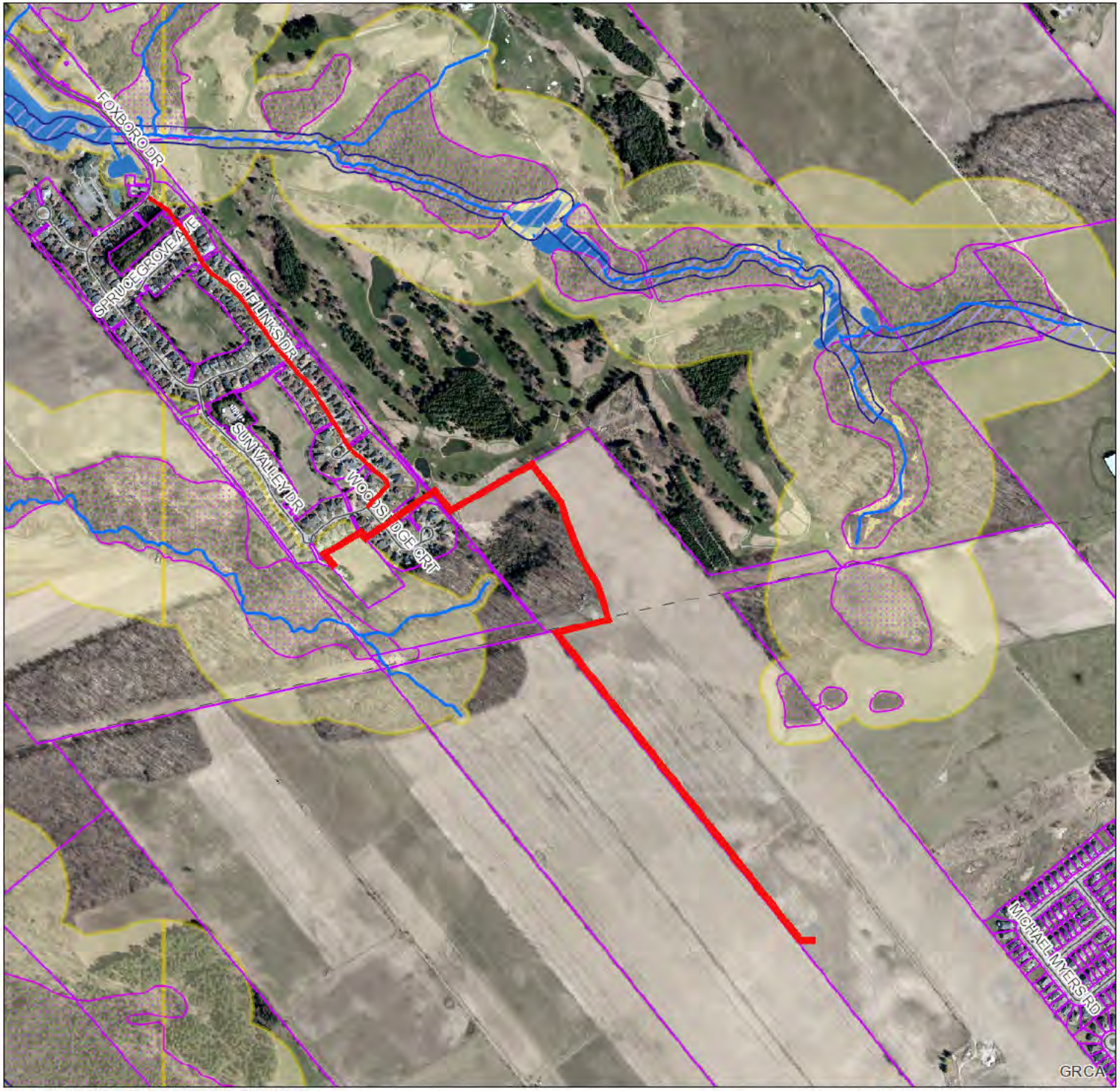
N

NAD 1983 UTM Zone 17N

Scale: 20,497

Map Centre (UTM NAD83 z17): 526,409 63 4,803,080.36

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Grand River Conservation Authority

Date: Jun 22, 2022
Author: TH

Baden and New Hamburg Water and Wastewater System

F3

Legend

- Regulation Limit (GRCA)
- Regulated Watercourse (GRCA)
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inistry of the Environment, Conservation and Parks

Ministère de l'Environnement, de la Protection de la nature et des Parcs

Environmental Assessment Branch

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135 St. Clair Avenue W
Toronto ON M4V 1P5
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365-366-8185
Via email only

March 8, 2021

Kaoru Yajima
Region of Waterloo

Jeff Paul
Stantec

Re: Response to Notice of Commencement
Baden, New Hamburg Servicing Review (Master Plan)

This letter is in response to the Notice of Commencement for the Baden, New Hamburg Servicing Review issued by the Region of Waterloo. The Ministry of the Environment, Conservation and Parks (MECP) acknowledges that the Region County will follow the master planning process in accordance with the MEA Class EA in order to assess the current water and wastewater systems that serve the communities of Baden, New Hamburg and Foxboro Green and assess current and future servicing needs.

In the completion of this Master Plan, it is expected that the Region will document how it has considered impacts to source protection, climate change adaptation and mitigation and impacts to species at risk and their habitats. Resources to assist in meeting these expectations are included with this letter

The Crown has a legal duty to consult Aboriginal communities when it has knowledge, real or constructive, of the existence or potential existence of an Aboriginal or treaty right and contemplates conduct that may adversely impact that right. Before authorizing this project, the Crown must ensure that its duty to consult has been fulfilled where such a duty is triggered. Although the duty to consult with Aboriginal Peoples is a duty of the Crown, the Crown may delegate procedural aspects of this duty to project proponents while retaining oversight of the consultation process.

Your proposed project may have the potential to affect Aboriginal or treaty rights protected under Section 35 of Canada's *Constitution Act* 1982. Where the Crown's duty to consult is triggered in relation to your proposed project**, the MECP is delegating the procedural aspects of rights-based consultation to you through this letter.** The Crown intends to rely on the delegated consultation process in discharging its duty to consult and maintains the right to participate in the consultation process as it sees fit.

Based on information you have provided to date and the Crown`s preliminary assessment you are required to consult with the following communities who have been identified as potentially affected by your proposed project:

- Mississaugas of the Credit First Nation
- Six Nations (both Elected Council and Haudenosaunee Confederacy Chiefs Council)

Steps that you may need to take in relation to Aboriginal consultation for your proposed project are outlined in the "Code of Practice for Consultation in Ontario's Environmental Assessment Process" which can be found at the following link: https://www.ontario.ca/document/consultation-ontarios-environmental-assessment-process Additional information related to Ontario's Environmental Assessment Act is available online at: www.ontario.ca/environmentalassessments

You must contact the Director of Environmental Approvals and Permissions Branch under the following circumstances after discussions with the communities identified by MECP:

- Aboriginal or treaty rights impacts are identified to you by the communities
- You have reason to believe that your proposed project may adversely affect an Aboriginal or treaty right
- Consultation has reached an impasse
- A Part II Order request or elevation request is expected

The Director of the Environmental Assessment and Permissions Branch can be notified either by email with the subject line "Potential Duty to Consult" by mail, email or fax at the addresses provided below:

Email:	enviropermissions@ontario.ca Subject: Potential Duty to Consult
Fax:	416-314-8452
Address:	Environmental Approvals and Permissions Branch 135 St. Clair Avenue West, 1st Floor Toronto, ON, M4V 1P5

The MECP will then assess the extent of any Crown duty to consult and will consider whether additional steps should be taken, including what role you will be asked to play in them.

Royal Assent was given on July 22nd to Bill 197 which made changes to the provincial environmental assessment process. Proponents are still required to submit a Notice of Completion providing a minimum 30-day period during which documentation may be reviewed and comment and input can be submitted to the Proponent.

Now however, the Notice of Completion is to advise that outstanding concerns are to be directed to the proponent for a response, and that in the event there are outstanding concerns regarding **potential adverse impacts to constitutionally protected Aboriginal and treaty rights,** Part II Order requests on those matters should be addressed in writing to:

Minister Jeff Yurek
Ministry of Environment, Conservation and Parks
777 Bay Street, 5th Floor
Toronto ON M7A 2J3
minister.mecp@ontario.ca

and

Director, Environmental Assessment Branch
Ministry of Environment, Conservation and Parks
135 St. Clair Ave. W, 1st Floor
Toronto ON, M4V 1P5
ClassEAnotices@ontario.ca

In this case, given that the EA is in the form of a Master Plan, only specific projects for which the Master Plan completes the EA process could be subject to a Part II Order request that meets the current requirements. Please note that the Region cannot proceed with any of the projects until at least 30 days after the end of the comment period provided for in the Notice of Completion. Further, the Region may not proceed after this time if:

- a Part II Order request has been submitted to the ministry regarding **potential adverse impacts to constitutionally protected Aboriginal and treaty rights**, or
- the Director has issued a Notice of Proposed order regarding some aspect of the project.

If other concerns with the Master Plan and/or EA process are made known to the minister, or determined following a review of the Master Plan, the Minister reserves the right to issue an order on his or her own initiative within a specified time period. Within the 30 days following the Notice of Completion, the Director would first issue a Notice of Proposed

Order to the Region if the Minister is considering an order for the project. At this time, the Director may request that additional information be submitted. Once the requested information has been received, the Minister will have 30 days within which to make a decision or impose conditions on your project.

If you have any questions or require clarification on any of the points provided herein, please contact me at 365-366-8185 or via email at Barbara.slattery@ontario.ca I also take this opportunity to advise you that I am retiring from the Ministry effective March 31, 2021. Ms. Joan Del Villar will be assuming the role of Regional EA Coordinator for West Central Region effective March 22, 2021 so please direct your correspondence to her attention after that date.

With best regards,



EA/Planning Coordinator
Encl.

A PROPONENT'S INTRODUCTION TO THE DELEGATION OF PROCEDURAL ASPECTS OF CONSULTATION WITH ABORIGINAL COMMUNITIES

DEFINITIONS

The following definitions are specific to this document and may not apply in other contexts:

Aboriginal communities – the First Nation or Métis communities identified by the Crown for the purpose of consultation.

Consultation – the Crown's legal obligation to consult when the Crown has knowledge of an established or asserted Aboriginal or treaty right and contemplates conduct that might adversely impact that right. This is the type of consultation required pursuant to s. 35 of the *Constitution Act, 1982*. Note that this definition does not include consultation with Aboriginal communities for other reasons, such as regulatory requirements.

Crown – the Ontario Crown, acting through a particular ministry or ministries.

Procedural aspects of consultation – those portions of consultation related to the process of consultation, such as notifying an Aboriginal community about a project, providing information about the potential impacts of a project, responding to concerns raised by an Aboriginal community and proposing changes to the project to avoid negative impacts.

Proponent – the person or entity that wants to undertake a project and requires an Ontario Crown decision or approval for the project.

I. PURPOSE

The Crown has a legal duty to consult Aboriginal communities when it has knowledge of an existing or asserted Aboriginal or treaty right and contemplates conduct that may adversely impact that right. In outlining a framework for the duty to consult, the Supreme Court of Canada has stated that the Crown may delegate procedural aspects of consultation to third parties. This document provides general information about the Ontario Crown's approach to delegation of the procedural aspects of consultation to proponents.

This document is not intended to instruct a proponent about an individual project, and it does not constitute legal advice.

II. WHY IS IT NECESSARY TO CONSULT WITH ABORIGINAL COMMUNITIES?

The objective of the modern law of Aboriginal and treaty rights is the *reconciliation* of Aboriginal peoples and non-Aboriginal peoples and their respective rights, claims and interests. Consultation is an important component of the reconciliation process.

The Crown has a legal duty to consult Aboriginal communities when it has knowledge of an existing or asserted Aboriginal or treaty right and contemplates conduct that might adversely impact that right. For example, the Crown's duty to consult is triggered when it considers issuing a permit, authorization or approval for a project which has the potential to adversely impact an Aboriginal right, such as the right to hunt, fish, or trap in a particular area.

The scope of consultation required in particular circumstances ranges across a spectrum depending on both the nature of the asserted or established right and the seriousness of the potential adverse impacts on that right.

Depending on the particular circumstances, the Crown may also need to take steps to accommodate the potentially impacted Aboriginal or treaty right. For example, the Crown may be required to avoid or minimize the potential adverse impacts of the project.

III. THE CROWN'S ROLE AND RESPONSIBILITIES IN THE DELEGATED CONSULTATION PROCESS

The Crown has the responsibility for ensuring that the duty to consult, and accommodate where appropriate, is met. However, the Crown may delegate the procedural aspects of consultation to a proponent.

There are different ways in which the Crown may delegate the procedural aspects of consultation to a proponent, including through a letter, a memorandum of understanding, legislation, regulation, policy and codes of practice.

If the Crown decides to delegate procedural aspects of consultation, the Crown will generally:

- Ensure that the delegation of procedural aspects of consultation and the responsibilities of the proponent are clearly communicated to the proponent;
- Identify which Aboriginal communities must be consulted;
- Provide contact information for the Aboriginal communities;
- Revise, as necessary, the list of Aboriginal communities to be consulted as new information becomes available and is assessed by the Crown;
- Assess the scope of consultation owed to the Aboriginal communities;

- Maintain appropriate oversight of the actions taken by the proponent in fulfilling the procedural aspects of consultation;
- Assess the adequacy of consultation that is undertaken and any accommodation that may be required;
- Provide a contact within any responsible ministry in case issues arise that require direction from the Crown; and
- Participate in the consultation process as necessary and as determined by the Crown.

IV. THE PROPONENT'S ROLE AND RESPONSIBILITIES IN THE DELEGATED CONSULTATION PROCESS

Where aspects of the consultation process have been delegated to a proponent, the Crown, in meeting its duty to consult, will rely on the proponent's consultation activities and documentation of those activities. The consultation process informs the Crown's decision of whether or not to approve a proposed project or activity.

A proponent's role and responsibilities will vary depending on a variety of factors including the extent of consultation required in the circumstance and the procedural aspects of consultation the Crown has delegated to it. Proponents are often in a better position than the Crown to discuss a project and its potential impacts with Aboriginal communities and to determine ways to avoid or minimize the adverse impacts of a project.

A proponent can raise issues or questions with the Crown at any time during the consultation process. If issues or concerns arise during the consultation that cannot be addressed by the proponent, the proponent should contact the Crown.

a) What might a proponent be required to do in carrying out the procedural aspects of consultation?

Where the Crown delegates procedural aspects of consultation, it is often the proponent's responsibility to provide notice of the proposed project to the identified Aboriginal communities. The notice should indicate that the Crown has delegated the procedural aspects of consultation to the proponent and should include the following information:

- a description of the proposed project or activity;
- mapping;
- proposed timelines;
- details regarding anticipated environmental and other impacts;
- details regarding opportunities to comment; and
- any changes to the proposed project that have been made for seasonal conditions or other factors, where relevant.

Proponents should provide enough information and time to allow Aboriginal communities to provide meaningful feedback regarding the potential impacts of the project. Depending on the nature of consultation required for a project, a proponent also may be required to:

- provide the Crown with copies of any consultation plans prepared and an opportunity to review and comment;
- ensure that any necessary follow-up discussions with Aboriginal communities take place in a timely manner, including to confirm receipt of information, share and update information and to address questions or concerns that may arise;
- as appropriate, discuss with Aboriginal communities potential mitigation measures and/or changes to the project in response to concerns raised by Aboriginal communities;
- use language that is accessible and not overly technical, and translate material into Aboriginal languages where requested or appropriate;
- bear the reasonable costs associated with the consultation process such as, but not limited to, meeting hall rental, meal costs, document translation(s), or to address technical & capacity issues;
- provide the Crown with all the details about potential impacts on established or asserted Aboriginal or treaty rights, how these concerns have been considered and addressed by the proponent and the Aboriginal communities and any steps taken to mitigate the potential impacts;
- provide the Crown with complete and accurate documentation from these meetings and communications; and
- notify the Crown immediately if an Aboriginal community not identified by the Crown approaches the proponent seeking consultation opportunities.

b) What documentation and reporting does the Crown need from the proponent?

Proponents should keep records of all communications with the Aboriginal communities involved in the consultation process and any information provided to these Aboriginal communities.

As the Crown is required to assess the adequacy of consultation, it needs documentation to satisfy itself that the proponent has fulfilled the procedural aspects of consultation delegated to it. The documentation required would typically include:

- the date of meetings, the agendas, any materials distributed, those in attendance and copies of any minutes prepared;
- the description of the proposed project that was shared at the meeting;
- any and all concerns or other feedback provided by the communities;
- any information that was shared by a community in relation to its asserted or established Aboriginal or treaty rights and any potential adverse impacts of the proposed activity, approval or disposition on such rights;

- any proposed project changes or mitigation measures that were discussed, and feedback from Aboriginal communities about the proposed changes and measures;
- any commitments made by the proponent in response to any concerns raised, and feedback from Aboriginal communities on those commitments;
- copies of correspondence to or from Aboriginal communities, and any materials distributed electronically or by mail;
- information regarding any financial assistance provided by the proponent to enable participation by Aboriginal communities in the consultation;
- periodic consultation progress reports or copies of meeting notes if requested by the Crown;
- a summary of how the delegated aspects of consultation were carried out and the results; and
- a summary of issues raised by the Aboriginal communities, how the issues were addressed and any outstanding issues.

In certain circumstances, the Crown may share and discuss the proponent's consultation record with an Aboriginal community to ensure that it is an accurate reflection of the consultation process.

c) Will the Crown require a proponent to provide information about its commercial arrangements with Aboriginal communities?

The Crown may require a proponent to share information about aspects of commercial arrangements between the proponent and Aboriginal communities where the arrangements:

- include elements that are directed at mitigating or otherwise addressing impacts of the project;
- include securing an Aboriginal community's support for the project; or
- may potentially affect the obligations of the Crown to the Aboriginal communities.

The proponent should make every reasonable effort to exempt the Crown from confidentiality provisions in commercial arrangements with Aboriginal communities to the extent necessary to allow this information to be shared with the Crown.

The Crown cannot guarantee that information shared with the Crown will remain confidential. Confidential commercial information should not be provided to the Crown as part of the consultation record if it is not relevant to the duty to consult or otherwise required to be submitted to the Crown as part of the regulatory process.

V. WHAT ARE THE ROLES AND RESPONSIBILITIES OF ABORIGINAL COMMUNITIES' IN THE CONSULTATION PROCESS?

Like the Crown, Aboriginal communities are expected to engage in consultation in good faith. This includes:

- responding to the consultation notice;
- engaging in the proposed consultation process;
- providing relevant information;
- clearly articulating the potential impacts of the proposed project on Aboriginal or treaty rights; and
- discussing ways to mitigate any adverse impacts.

Some Aboriginal communities have developed tools, such as consultation protocols, policies or processes that provide guidance on how they would prefer to be consulted. Although not legally binding, proponents are encouraged to respect these community processes where it is reasonable to do so. Please note that there is no obligation for a proponent to pay a fee to an Aboriginal community in order to enter into a consultation process.

To ensure that the Crown is aware of existing community consultation protocols, proponents should contact the relevant Crown ministry when presented with a consultation protocol by an Aboriginal community or anyone purporting to be a representative of an Aboriginal community.

VI. WHAT IF MORE THAN ONE PROVINCIAL CROWN MINISTRY IS INVOLVED IN APPROVING A PROPONENT'S PROJECT?

Depending on the project and the required permits or approvals, one or more ministries may delegate procedural aspects of the Crown's duty to consult to the proponent. The proponent may contact individual ministries for guidance related to the delegation of procedural aspects of consultation for ministry-specific permits/approvals required for the project in question. Proponents are encouraged to seek input from all involved Crown ministries sooner rather than later.

Guide

Consideration of Climate Change in Environmental Assessment in Ontario

Legislative Authority:

Environmental Assessment Act, RSO 1990, chapter E.18

ontario.ca/climatechange

Climate Change Action Plan

Ontario

Readers should check with the Client Services and Permissions Branch of the Ministry of the Environment and Climate Change to find out if there have been any revisions:

Ministry of the Environment and Climate Change
Client Services and Permissions Branch
135 St. Clair Avenue West
Toronto, Ontario M4V 1L5 Canada

Telephone: 416-314-8001
Toll Free: 1-800-461-6290
Fax: 416-314-8452
E-mail: MOECCpermissions@ontario.ca
Website: www.ontario.ca/environmentalassessments

This Guide is published as a living document that will be reviewed and revised as necessary. Readers are advised to consult the up-to-date version of Guide posted on Ontario.ca for any revisions. Any comments and suggestions for clarification are welcomed and should be sent to the Director of the Client Services and Permissions Branch at the address listed above. This Guide does not constitute legal advice. A lawyer should be consulted on questions about the application or interpretation of the laws of Ontario as they relate to matters covered by this Guide.

Under clause 31(1)(e) of the *Environmental Assessment Act*, the Minister of the Environment and Climate Change may gather, publish and disseminate information with respect to the environment or environmental assessments for the purposes of the administration and enforcement of the *Environmental Assessment Act* and its regulations. Therefore, the ministry expects that this Guide will be considered by proponents.

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Ce document est aussi disponible en français.

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1. Introduction

Environmental assessment is a planning and decision-making process used to promote environmentally responsible decision-making. In Ontario, this process is governed by the *Environmental Assessment Act.* The purpose of this Act is the betterment of the people of the whole or any part of Ontario by providing for the protection, conservation and wise management in Ontario of the environment.

The *Environmental Assessment Act* sets out a process that requires proponents to consider impacts on the environment which is broadly defined to include the natural, social, economic, cultural and built environments. The Act also ensures that interested persons have an opportunity to *comment* on undertakings that may affect them.

The Ministry of the Environment and Climate Change (ministry) has developed Codes of Practice (Codes) to provide guidance on key aspects of the environmental assessment process. The Codes include:

- Preparing and Reviewing Terms of Reference for Environmental Assessments in Ontario;
- Preparing and Reviewing Environmental Assessments in Ontario;
- Consultation in Ontario's Environmental Assessment Process;
- Using Mediation in Ontario's Environmental Assessment Process; and
- Preparing, Reviewing and Using Class Environmental Assessments in Ontario.

Together, the Codes of Practice:

- Set out the ministry's expectations for the content of a variety of environmental assessment documents and provide guidance on the roles and responsibilities of all participants in an environmental assessment process;
- Provide clear direction to proponents, environmental assessment practitioners, and other stakeholders involved in the environmental assessment process on terms of reference, environmental assessments, consultation, and mediation; and,
- Promote the transparency of government involvement and the decision-making process when projects must meet the requirements of provincial environmental assessment legislation.

This Guide is a companion to the Codes of Practice and sets out the ministry's expectations for considering climate change in the preparation, execution and documentation of environmental assessment studies and processes (see also Table 1).

This Guide also supports the province's Climate Change Action Plan by outlining how environmental assessment processes and studies can incorporate climate change impacts considerations.

This Guide covers the consideration of:

- the impacts of a project on climate change;
- the impacts of climate change on a project; and
- various means of identifying and minimizing negative impacts during project implementation.

A climate change consideration during the environmental assessment process results in an undertaking or project:

- that has taken into account alternative methods to reduce its greenhouse gas emissions and negative impacts on carbon sinks; and
- that has been planned in a manner that takes into account future changes in climate and the impacts a changing climate could have on the project.

Environmental Assessment process	Refer to this Guide	Climate Change Mitigation Consideration	Climate Change Adaptation Consideration
Environmental Assessment (i.e., "individual")	Yes	Yes	Yes
Class Environmental Assessment projects	Consult Guide if approved class environmental assessment has no climate consideration method or method does not meet ministry expectations	Consideration scaled to the significance of the project's potential environmental effects. Screening criteria, class environmental assessment methodology may support consideration.	Consideration scaled to the significance of the project's potential environmental effects Screening criteria, class environmental assessment methodology may support consideration.
Renewal / Major Amendment of Approved Class Environmental Assessments	Yes	Mitigation methods in Guide to be considered for use in approved class environmental assessment processes	Adaptation methods in Guide to be considered for use in approved class environmental assessment processes
Environmental Assessment projects under Waste, Transit, Electricity regulations	Yes	Consideration scaled to the significance of the project's potential environmental effects	Consideration scaled to the significance of the project's potential environmental effects

Table 1: Use of Guide in relation to environmental assessment processes

Planning and Climate Change Impacts in Ontario

Climate Change in Provincial Policy Statement

The directions and methods outlined in this guidance will complement and support the climate-focused policies of the 2014 Provincial Policy Statement. The 2014 Provincial Policy Statement issued under the *Planning Act* advises planning authorities of the need to consider development that reduces greenhouse gas emissions and reduces the potential risk of climate change related events like droughts or intense precipitation. A partial listing of applicable policies in the 2014 Provincial Policy Statement include:

- Policies 1.6.2, 1.6.6.7 - Encourage green infrastructure (e.g., permeable surfaces) and strengthen stormwater management requirements
- Policy 1.8 - Require the consideration of energy conservation and efficiency, reduced greenhouse gas emissions and climate change adaptation (e.g., tree cover for shade and for carbon sequestration)
- Policy 3.1.3 - Requires consideration of the potential impacts of climate change that may increase the risk associated with natural hazards (e.g., flooding due to severe weather)

For a complete description of the statements above, please refer to the 2014 Provincial Policy Statement issued under section 3 of the Planning Act.

Using This Guide

A proponent should consult this Guide when preparing a terms of reference for an environmental assessment, when preparing an environmental assessment study, or when planning projects carried out as part of a class environmental assessment or other streamlined environmental assessment process.

Proponents should seek to determine as early as possible in the environmental assessment process whether there are likely to be relevant climate change considerations associated with the project that should be addressed in more detail. The ministry expects proponents to take into account:

- the project's expected production of greenhouse gas emissions and impacts on carbon sinks (climate change mitigation); and
- resilience or vulnerability of the undertaking to changing climatic conditions (climate change adaptation);

during the assessment of alternatives to the undertaking and alternative methods of implementing the undertaking stages of the environmental assessment. In concluding an environmental assessment study, the proponent

should also include a discrete statement in their study report detailing how climate change was considered in the environmental assessment.

In some cases, particularly with projects being planned under streamlined environmental assessment processes, a proponent might conclude that an undertaking is sufficiently minor in scale and short in lifespan that a climate change consideration cannot be practically carried out or is not applicable. In this instance, the proponent should provide a rationale in the environmental assessment documentation as to why the consideration of climate change could not be completed or is not applicable.

Ontario environmental assessment processes where proponents are expected to give consideration to climate change are briefly described below.

Environmental Assessments

An environmental assessment (i.e., "individual" environmental assessment) is a term that describes both a study that is conducted to assess the potential environmental effects of a proposed undertaking, and the resulting report that includes documentation of that analysis. The environmental assessment report documents the results of the study and includes both positive and negative potential environmental effects. Key components of an environmental assessment process and of the resulting report include consultation with government agencies, Indigenous communities and the public; consideration and evaluation of alternatives; and the management of potential environmental effects. Conducting an environmental assessment promotes good environmental planning before decisions are made about proceeding with a proposal.

The first step in the application for approval to proceed with an undertaking under the *Environmental Assessment Act* is the approval of a terms of reference by the Minister of the Environment and Climate Change. The terms of reference creates a framework for the environmental assessment and acts as a roadmap for reviewers and interested parties. Once approved, the proponent relies on the terms of reference to guide the preparation of the environmental assessment. Therefore, it is critical that the terms of reference consider climate change, particularly in identifying environmental components, identifying alternatives, and describing the existing environment and potential effects of the undertaking.

The proponent can start preparing the environmental assessment when the terms of reference is approved. The planning process for an environmental assessment must be documented in its entirety in the environmental assessment report. The environmental assessment must provide a plan that sets out how and when all commitments, including impact management measures, made in the document will be fulfilled and how the proponent will report to the ministry about compliance. The environmental assessment must be submitted by the proponent to the ministry for review and approval. For greater detail on the

environmental assessment process, see the ministry's *Code of Practice: Preparing and Reviewing Environmental Assessments in Ontario*.

Streamlined Environmental Assessments

Streamlined self-assessment processes are available for certain classes of projects that are carried out routinely and have predictable environmental effects that can be readily managed. Streamlined environmental assessment processes in Ontario include those established by regulation (for electricity projects, transit projects and waste management projects) and those approved as part of a class environmental assessment.

A class environmental assessment is a planning document prepared by a proponent that must be approved under the *Environmental Assessment Act.* Once approved, the class environmental assessment serves as the process guiding document and can therefore be used to plan projects subject to the class, as defined in the document.

These streamlined processes provide an efficient, timely and environmentally responsible approach to the planning of these projects. As with environmental assessments, public notification/consultation with interested persons, government agencies and Indigenous peoples and communities is integral to these processes.

Some class environmental assessment processes may already include climate change considerations in the process of determining the potential environmental effects for any given project.

Content of This Guide

The content of this Guide is generic in nature and not dedicated to any specific type of project. The Guide provides ideas on how to incorporate climate change considerations into the environmental assessment process and documentation. It also provides examples of climate change mitigation and adaptation efforts. Case studies are provided with detailed examples of how climate change can be considered in project planning. Specifically, the Guide provides environmental assessment proponents and practitioners with:

- Several approaches to considering climate change in project planning;
- A concise and select overview of tools and methodologies from the field of climate change adaptation and project resiliency research; and
- Examples of how climate change impacts have been incorporated into project planning and how climate change vulnerability has been assessed for existing built and ecological components of the environment.

This Guide does not limit a proponent's choice of methodologies, approaches and modelling information. This Guide will be updated and amended when appropriate to reflect future policy changes or new approaches for consideration of climate change in environmental assessment.

2. Climate Change and Climate Impacts

Climate Change

The potential contribution of carbon emissions from human activities to the atmosphere's naturally-occurring greenhouse effect was first identified in the late nineteenth century. Systematic, annual monitoring of the carbon dioxide concentration in the atmosphere has been undertaken by climate researchers at the Mauna Loa Observatory in Hawaii beginning in the late 1950s. This monitoring identified that the atmospheric concentration of carbon dioxide was increasing at a gradual rate on a year-after-year basis.

Carbon dioxide is one of approximately two dozen greenhouse gases in significant concentration in the Earth's atmosphere; others include methane, nitrous oxide and certain halogenated carbon compounds. Greenhouse gases can exhibit heat-trapping properties in the earth's atmosphere and are rated according to their global warming potential over different atmospheric time frames.

The concern that rising concentrations of greenhouse gases in the atmosphere could be contributing to a rise in global mean surface temperature began to mount in the 1980s. Climate and geologic records indicate that a rapid increase in global mean surface temperature has been associated with disturbances in global climate and hydrological patterns, often with significantly varying impacts on regional climate and hydrology. Some of the phenomena associated with this form of climate disturbance include:

- Changes in the frequency, intensity and duration of precipitation, wind and heat events;
- Changes in soil moisture and permafrost;
- Changes in sea levels and polar ice cover;
- Shifts in plant growth and growing season; and
- Changes in the geographic extent of species range, habitat and forest cover.

Climate change and related extreme weather events are of concern to many segments of society and sectors of the economy. Two approaches for considering and addressing climate change in project planning are through:

- Reducing a project's impact on climate change (climate change mitigation) and

- Increasing the project's and local ecosystem's resilience to climate change (climate change adaptation).

Before knowing what mitigation or adaptation is appropriate for a project, it is important to consider and understand the potential impacts that a project may have on climate change, the potential impacts that climate change may have on a project, and the impact of the project on the local environment's resilience to climate change.

A Project's Impacts on Climate Change

In the last several decades, the relationship between human generated (anthropogenic) greenhouse gas emissions and rising greenhouse gas concentrations in the atmosphere has become more clearly understood. Most recently, the global scientific community has provided evidence that the rise of greenhouse gas emissions is influencing climate patterns, hydrology, ecosystems and ocean chemistry. Any greenhouse gas emission from a project or landscape change that affects the removal of carbon dioxide from the atmosphere or the storage of carbon on the landscape potentially contributes to global climate changes.

The ministry considers focussing efforts on reducing greenhouse gas emissions and avoiding increases in the levels of these gases in the atmosphere to be in keeping with the principle of pollution prevention and the precautionary approach.

Impacts of Climate Change on a Project

Climate change and extreme weather events are of concern to many segments of society and sectors of the economy. Impacts of climate change range from property-specific concerns such as flooding and sewer overflow or ice storm damage; regional-level issues such as changes in agricultural productivity and ecosystem resilience, to system-wide impacts on water demand and electricity consumption. Any weather event related to climate change that exerts an influence on a project may be considered an impact of climate change on a project.

Many jurisdictions worldwide are implementing programs and policies that increase the adaptive capacity and resilience of human-built structures and land use activities. Planning processes for long-term projects are beginning to consider greater variation in future climate scenarios, resulting in projects that are more adaptable, more resilient and less likely to cause negative environmental effects. The ministry considers this to be a prudent and diligent approach to project planning.

3. Considering a Project's Impacts on Climate Change

Many types of projects planned through environmental assessment processes will have an impact on the atmosphere through the emission of greenhouse gases or through changes to the landscape which alter the ecosystems' ability to remove carbon dioxide from the atmosphere (e.g., changes to site and vicinity plant cover). These impacts on the atmosphere and the landscape can contribute to climate change. Landscape changes are often described in terms of carbon stocks, sinks and sources; proponents of natural resource related projects should consult Appendix B for treatment of carbon stocks as sinks versus sources.

This section provides proponents with an overview of how a proposed project's impacts on climate change may be considered in environmental assessment processes. This section is partly modelled on existing climate change guidance from the Nova Scotia Department of the Environment and the Canadian Environmental Assessment Agency (see references in Appendix D).

Proponents should include evaluation criteria, such as greenhouse gas emissions and impacts on carbon sinks, in the assessment of alternatives and alternative methods. In concluding an environmental assessment study, the proponent should also include a statement in their study report about how climate change was considered in the environmental assessment and how the preferred alternative (project) is expected to perform with climate change considered. The following approach may assist in completing the climate change consideration.

A proponent considering the potential impacts on climate change of the project (or its alternatives) could begin by assessing the expected direct greenhouse gas emissions of the project/alternatives and whether the project/alternatives will positively or negatively affect the storage of carbon or removal of carbon dioxide from the atmosphere. The proponent could undertake this consideration by addressing questions such as the following:

1. How might the project/alternatives generate greenhouse gas emissions or affect carbon storage or the removal of carbon dioxide from the atmosphere?
2. To what extent have the project/alternatives already taken into account impacts on climate change in project planning?
3. Are there alternative methods to implement the project that would reduce any adverse contributions to a changing climate?
4. How might the project/alternatives give rise to climate change impacts, positive or negative, on Indigenous people and/or communities?
5. What commitments can be made to reduce the impacts on climate change from the project over time, i.e., when the project is implemented?

Approaches to addressing these questions include:

1. How might the project/alternative generate greenhouse gas emissions or affect carbon storage or the removal of carbon dioxide from the atmosphere?

   A proponent may need to consider all direct and indirect greenhouse gas emissions that would be generated by the project, or indirectly stimulated by its implementation. A proponent may need to consider changes in local hydrology and vegetation that could result in changes to the carbon sequestration and storage capacity of a local landscape feature (e.g., wood lot, soils, shrubbery).

2. To what extent have the project/alternatives already taken into account impacts on climate change in project planning?

   A proponent may need to review existing features of the project and detail those features which may reduce greenhouse gas emissions, like energy and water efficiency measures or adaptive re-use of buildings or structures to reduce new energy or material demands. A proponent may need to identify impact management measures intended to limit the project's interference with the local landscape, plant cover, and other natural features. A proponent may wish to describe contributions to or investments in natural spaces projects that offset or mitigate the project's climate change impacts.

3. Are there alternative methods to implement the project that would reduce any adverse contributions to a changing climate?

   A proponent should consider alternative methods to project implementation in order to reduce the project's greenhouse gas emissions or any negative impacts on carbon storage or the removal of carbon dioxide from the atmosphere. This may entail aspects of the proposed project's scheduling, footprint, operation, or function. For example, a proponent could consider the scheduling and roll-out of construction activities in a way and at a time of year that would limit the negative impacts on the vegetation of the site and vicinity. A proponent may need to consult industry standards, best practices, and best available technology, in identifying alternative methods.

4. How might the project/alternatives give rise to climate change impacts, positive or negative, on Indigenous people and/or communities?

   A proponent will need to undertake special considerations where an environmental assessment project could affect Indigenous communities and interests. See description of Far North and Traditional Knowledge on pages 25-26.

5. What commitments can be made to reduce the impacts on climate change from the project over time, i.e., when the project is implemented?

   During the project planning phase, a proponent could consider near-term potential policy or technology developments that could have bearing on the project when implemented. A proponent could consider and make commitments about ongoing assessment of best practices, continual improvement, or the ability to adopt technology that will further reduce greenhouse gas emissions, especially for projects with long lifespans.

This generic approach to climate change consideration could potentially inform a variety of environmental assessment studies and processes, or be adapted to a variety of activities, proposals, and plans including those involving components of the built and natural environment.

Approaches to Considering Project Impacts on Climate Change

Many projects that are planned in accordance with the *Environmental Assessment Act* will result in the generation of greenhouse gas emissions in the construction, operation and decommissioning of the project. For example, greenhouse gas emissions like carbon dioxide could be emitted from heavy vehicles during the construction of a wastewater collection system, treatment plant, municipal road, or dam. Impacts on atmospheric levels of greenhouse gases could also occur through changes that alter the landscape's ability to store carbon or remove carbon dioxide from the atmosphere. Emissions of methane may be generated from a waste management project that involves the landfilling of organic waste.

Advancements in technology have provided greater opportunities to limit greenhouse gas emissions. For example, if a project involves a new building or structure that requires heating, cooling, and lighting, there may be an opportunity to reduce carbon emissions associated with these systems. Measures such as using low carbon and/or renewable energy sources, insulation, and even changes in the design and layout of the structure can reduce the life-time generation of carbon emissions arising from the project.

Business-as-Usual[1] vs. Climate-Focussed Approaches

A proponent has several means to demonstrate that climate change impacts have been factored into project planning. A proponent could make a comparison between two scenarios involving the same project. The first scenario would be the project's greenhouse gas emissions where climate change mitigation measures were not factored into the project design (business-as-usual). The

[1] "business-as-usual" assumes that future development trends follow those of the past and no changes in policies will take place (source: Intergovernmental Panel on Climate Change).

second scenario would be the project's greenhouse gas emissions where climate change mitigation measures were factored into the project design (climate-focussed).

Or, a proponent could rely on a comparison of the greenhouse gas emissions of the planned project to the average of similar existing facilities to demonstrate how project planning took into measures to reduce or offset greenhouse gas emissions.

Finally, a proponent could compare the greenhouse gas emissions of the preferred alternative to the other alternatives to demonstrate how the preferred alternative would lead to lower greenhouse gas emissions.

These comparisons could be detailed in a qualitative or quantitative manner.

Qualitative Consideration of the Impacts on Climate Change

A qualitative consideration of a project's potential impacts on climate change can be carried out by using the steps shown in Table 2: Qualitative Consideration of Greenhouse Gas Emissions. To begin, a proponent would consider what the project would be like if no particular regard was given to climate change mitigation measures (business-as-usual).

In step two, the proponent could review the project plan to identify any project features or planned measures that could mitigate climate change, e.g., the use of different technologies, energy efficiency, waste reduction measures, building materials, site re-vegetation, and other factors.

In step three, the proponent would document the identified features and measures and where possible, detail the avoided greenhouse gas emissions and enhancements to carbon storage that would result by implementing the project in the climate change consideration included in the environmental assessment study.

1. Consider what the project would be like if climate change mitigation was not a priority (business-as-usual).
2. Review the project as planned to identify any measures that could contribute to climate change mitigation. (climate-focussed).
3. Document any measures that could reduce or avoid greenhouse gas emissions and enhance carbon storage when the project is implemented.

Table 2: Qualitative Consideration of Project-related Greenhouse Gas Emissions

The outcome of step three is primarily expected and should be documented in a proponent's environmental assessment report. A proponent may document the outcome of all steps if needed to make the climate change consideration clearer and more meaningful to understand.

Quantitative Consideration of Impacts on Climate Change

A quantitative consideration of a project's potential impacts on climate change could be carried out in a manner similar to the qualitative consideration but with the added step of quantifying greenhouse gas emission reductions by incorporating climate change mitigation measures.

Quantifying greenhouse gas emission reductions requires some understanding of emission calculations, emission estimation factors, and the global warming potential of various greenhouse gases. References are included in Appendix C for proponents seeking approaches to quantifying project-related greenhouse gas emissions. Proponents may also draw upon information from manufacturers about project-related equipment and materials, such as energy consumption ratings, embodied energy, recycled content, and emission estimates, to characterize the project's reduced impact on climate change. Where emission factors or ratings are used, the proponent is advised to cite the source so that the results are replicable and traceable.

The ministry recognizes that the calculation or estimation of greenhouse gas emissions is difficult for many environmental assessment project types. The effort may be warranted only where emissions of carbon dioxide, methane, or other gases are significant, e.g., natural gas fired generating station or landfill, or if the proponent requires quantification of emissions for other purposes such as regulatory reporting requirements.

A quantitative consideration of a project would begin by describing and quantifying the project's greenhouse gas emissions as if the project were to be implemented with no particular regard for climate change mitigation measures (business-as-usual). The greenhouse gas emissions of the alternatives to the project or the average of similar facilities could also be used as the point of comparison.

The next step would be to describe and quantify the greenhouse gas emissions of the project where it includes all proposed climate change mitigation measures to be incorporated (climate-focussed).

The final step is to describe and quantify the potential avoided greenhouse gas emissions and improvements to carbon storage that could be achieved by implementing the project with climate change mitigation measures (see Figure 1: Quantifying Greenhouse Gas Emissions below).

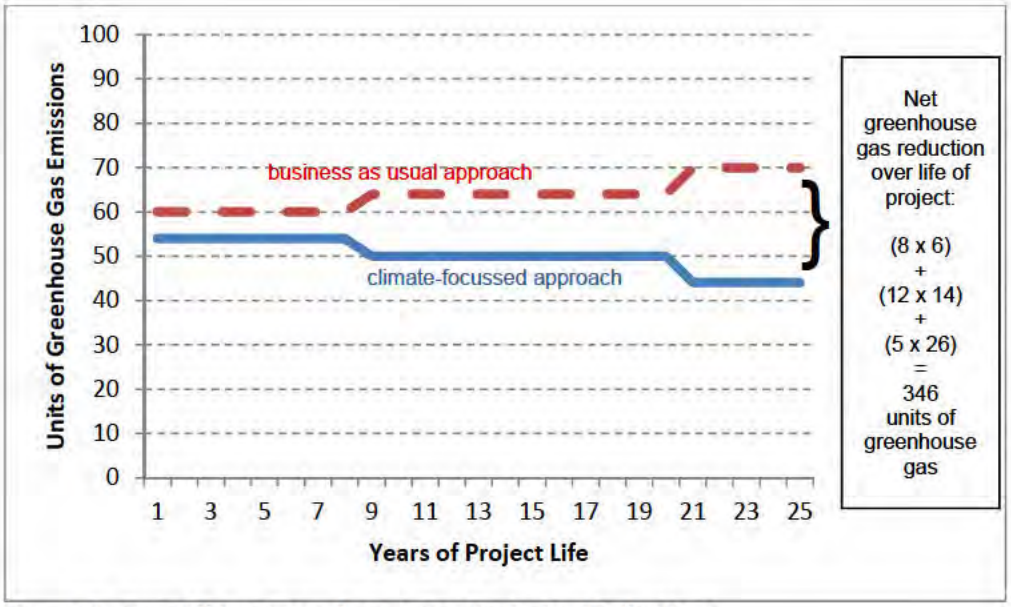


Figure 1: Quantifying Greenhouse Gas Emission Reductions

4. Considering the Impacts of Climate Change on a Project

A number of environmental assessment principles are key to successful planning and approval under the *Environmental Assessment Act.*

One principle is that an environmental assessment consider all aspects of the environment, including the interrelationships between various components of the environment. Environmental assessments typically evaluate the effects of the project on the environment. Climate change requires that environmental assessments also consider the impacts the environment (climate) could have on the project. The latter consideration helps to address any unintended risks or impacts to human health or the environment when climate impacts are added to the project's effects on the environment.

Proponents should include evaluation criteria such as extreme weather events in their screening of alternatives, and alternative methods. Proponents should also include in their study report, a statement about how climate change was considered in the environmental assessment, specifically in relation to the preferred alternative (project).

Broad Consideration of Impacts of Climate Change on a Project

Proponents could consider the potential impacts of climate change on a proposed project by addressing the following questions:

1. How vulnerable is the proposed project to a changing climate during its construction, operation, decommissioning, or post-closure?
2. Does the proposed project directly or indirectly contribute to the vulnerability or resilience of surrounding ecosystems to climate change?
3. Are there potential impacts that climate change may exert on the proposed project that may pose a risk to the environment?
4. Are there alternative methods of carrying out the proposed project that could reduce the negative impacts of climate change on the project thereby reducing the risk to the local environment?
5. Could the project, with the impacts of future climate change factored in, result in disruption to lands or waters associated with Indigenous cultural resources?

Approaches to addressing these questions could include:

1. How vulnerable is the proposed project to a changing climate during its construction, operation, decommissioning, or post-closure?

   A proponent would need to consult existing project plans and documentation, historical and present climate data, and future climate projections. The effect of variation in climate parameters such as temperature, precipitation, wind gust, or others, on the proposed project and its alternatives over time, could be considered. If any of the climate variation aggravates any of the environmental effects of the project, this should be identified in the environmental assessment study and measures considered to manage the impacts.

2. Does the proposed project directly or indirectly contribute to or diminish the resilience of surrounding ecosystems to climate change?

   The inventory of environmental features carried out as part of the environmental assessment study assists in understanding and describing the environment surrounding the project. This step will help to assess how the project may affect the surrounding environment's ability to be resilient and maintain its adaptive capacity to climate change. A proponent would need to consult historical, present, and future climate information in the area of the undertaking or project.

   Specifically, a proponent could examine the effect of projected changes in temperature, precipitation, or other features of the local environment when the project is implemented compared to if the project was not implemented. For example, could the project's alteration of local drainage patterns exacerbate impacts to water resources projected to occur with climate change? How might this affect the health and resiliency of the surrounding forest and wetlands?

3. Are there potential impacts that climate change may exert on the proposed project that may pose a risk to the environment?

   A proponent may need to review existing features of the project and detail those features which may reduce the risk of climate change. A proponent may need to consult existing project plans and documentation, and present and future climate data, to carry out such a consideration.

   In considering the impacts of climate change on a project, a proponent should be aware that the environmental effects of a project may be greater when coupled with the projected climate changes. For example, a project's demand on a local water supply may need to factor in a projected decline in water supply due to climate changes such as warmer temperatures and increased evaporation.

4. Are there alternative methods of carrying out the proposed project that could reduce the negative impacts of climate change on the project thereby reducing the risk to the local environment?

   A proponent may need to consult industry standards, best practices and best available technology in relation to existing project plans and documentation, future climate projections, and the potential environmental effects under current and changing climate conditions.

   A proponent should be aware of future climate change risks in the area of a project that may necessitate consideration of alternative methods. For example, a proponent of a storage yard with extensive paved surfaces in a location where climate change projections include more frequent and severe rain events, may need to consider alternative methods in order to reduce impervious surfaces and limit runoff to nearby water bodies.

   In order to reduce future climate-related risks to the local environment, a proponent could consider climate change adaptation measures that increase resilience of any aspect of the proposed project's design, operation and function which could be susceptible to climate variability.

5. Could the proposed project, with the impacts of future climate change factored in, result in disruption to lands or waters associated with Indigenous cultural resources.

   A proponent may need to consider whether the project coupled with climate change could exacerbate the project's anticipated environmental effects and pose additional challenges facing Indigenous communities in a particular area. Existing challenges reported by Indigenous communities include decreased availability of traditional foods and need of reliable infrastructure and transportation corridors.

Detailed Consideration of Impacts of Climate Change on a Project

Table 3: Conceptual Approach to Considering Impacts of Climate Change on a Project provides an approach for a detailed consideration of the impacts of climate change on a project in the planning stage. The project components in this example could be altered to better suit projects involving wildlife habitat, ecosystem protection, or other components of the natural environment.

The generic examples in Table 3: Conceptual Approach to Considering Impacts of Climate Change on a Project demonstrate that consideration of climate change impacts in project planning could involve many points of analysis, or interactions, for example:

COLUMN 1 Climate Variable		COLUMN 2 Generic Project Component
Temperature extremes • High • Low • Warmest / coldest period Precipitation (Rain) • Freezing rain • Intensity • Flooding return period • Wettest / driest period • Total annual Precipitation (Snow) • Snow load • Snow water equivalent Wind Speed • Extreme gusts • Gale, hurricane force winds, tornados • Fog, hail, lightning	***If the frequency, severity, or duration of any of the variables in Column 1 changes, what will be the effect on any component in Column 2?***[1,2]	Utilities • Air intake • Water intake • Drainage / wastewater • Electrical and gas • Fire and Safety • Communications • Transport (road, rail) Operations • Maintenance • Continuity • Reliability Administration • Personnel • Occupational Safety • Insurance / liability Buildings • Structural integrity • Fatigue / stress / failure

Table 3: Conceptual Approach to Considering Impacts of Climate Change on a Project

- What effect, if any, would a projected change in maximum wind gust have on project-related communications installations?
- What effect could a short-term disruption of utility services due to an extreme climate event have on project operations?
- What effect would a projected increase in certain precipitation events, fog, or snow conditions have for staff mobility, waterway navigation, access to natural resource operations, or access to equipment vital to project operation? Could any variation in a climate variable be significant enough to warrant additional project consideration?

Not all points of analysis or interactions between climate and the project need to be considered to the equivalent degree. For example, increased precipitation could be a significant concern for a roadway project. Drought, low precipitation, or low soil moisture conditions could be of greater concern to projects involving public water supplies or components of the natural environment, like forests, protected areas, or natural resource operations. Nevertheless, all climate

[1] Approach is adapted from that formulated by the Public Infrastructure Engineering Vulnerability Committee, see Appendix A. or www.pievc.ca.

[2] Neither the list of climate variables nor generic project components is meant to be exhaustive. Examples are provided for illustrative purposes.

parameters with potential to interact with a project should be defined and considered at a screening level to fully understand which interactions pose higher risk.

The projected magnitude of future climate variation would factor into the determination of which, if any, project components require greater consideration. Most importantly, proponents need to be aware of the potential of future variability of climate parameters, and what impacts, positive or negative, this variability could have on the environmental effects of a proposed project.

Proponents should also document any uncertainty related to either downscaling climate change projections to specific sites, or expected impacts to the environment or project, within the environmental assessment. For example, a proponent may not be able to precisely predict an impact because of time frame, geographic scale, complexity, or other factors. In this case, the proponent could discuss why the impact may vary, identify the expected range of impacts, and identify the level of certainty associated with the climate change consideration.

5. Outcomes of Climate Change Impacts Consideration

This section provides examples of how proponents can prepare and incorporate climate change impact considerations into their terms of reference and environmental assessment processes. The consideration of climate change impacts can also be incorporated into streamlined environmental assessment processes.

Environmental Assessments

Considering climate change in the terms of reference for an environmental assessment should commit he proponent to considering climate change impacts in related project studies prepared in support of the environmental assessment report.

Considering climate change in an environmental assessment should result in the proponent refining and documenting measures for dealing with climate change impacts as the undertaking moves toward implementation stage. Examples could include adapted design or maintenance schedules, additional studies, and revised operating procedures.

Processes that Establish or Renew Class Environmental Assessments

Considering climate change in the development or review of class environmental assessments could result in a description of how the proponent would consider climate change impacts in environmental assessments for that class of projects. For example, climate change impacts may be incorporated as criteria for evaluating alternatives to and alternative methods of implementing the undertaking.

Streamlined Environmental Assessment Processes

Considering climate change in streamlined environmental assessment processes and studies could result in the inclusion of a commitment on how the proponent will implement climate change adaptation and mitigation measures during the detailed design phase of any given project.

The consideration of climate change impacts in environmental assessments enables a proponent to demonstrate due diligence in relation to reducing the impacts of climate change in relation to the project proposal.

6. Documenting Climate Change Impacts in Environmental Assessment

Environmental assessments are able to consider and document relationships between climate change, environment, and the project, i.e.:

- the project's potential impacts on climate change; and
- the potential impact of climate change on the project.

Broadly, these climate change considerations involve:

- Reviewing the potential for a project to generate greenhouse gas emissions and affect carbon sinks;
- Assessing the vulnerability of the project to changing climatic conditions; and
- Examining the impact of a project on the environment's adaptive capacity.

The following guidance applies primarily to the preparation of individual environmental assessments, but may also be considered relevant to proponents of larger scale projects of class environmental assessment processes. Ministry reviews of assessment documentation will evaluate the extent to which climate change impacts were considered during the planning and environmental assessment processes. The documentation of a climate change considerations may vary depending on the undertaking.

Documenting Climate Change Considerations in Environmental Assessment

An environmental assessment can track and document climate change considerations like other environmental components such as air, water, and natural features. Climate change considerations could be added to the following chapters of the environmental assessment:

- Existing Environment
- Environmental Effects
- Cumulative Effects (where applicable).

The climate change consideration section would be enhanced by the inclusion of historical climate data for the study area (where available) and representation of data through charts, graphs, and tables. This will facilitate the ability of the reviewers to identify trends. Comparing historical information to future climate

projections provides a clearer understanding of the likely impacts and vulnerabilities of a project from climate change impacts. Proponents could include any of the following information for the study area in the "Existing Environment" section:

- A graph showing annual and/or monthly high and low temperatures and precipitation amounts along with projected changes based on best available climate modeling results.
- A discussion of the freeze/thaw cycles in the local area and nearby waterways and potential effect to or from the undertaking.
- A map showing the contours, location, and extent of the local floodplain based on historical flood information.

The consideration of climate change in an environmental assessment could result in a proponent including:

- An analysis of alternatives with respect to their potential contributions to climate change, as well as their potential vulnerability from the impacts of climate change.
- A consideration of climate change mitigation measures with respect to avoiding, minimizing, or offsetting impacts of the undertaking on climate change.
- A consideration of climate change impacts in any alternative screening process.

Additional Considerations

The following guidance may be relevant to proponents of either individual or class environmental assessment processes.

Existing Climate Change Strategies

Proponents may wish to draw upon or make reference to their own, or other existing climate change strategies or policies in carrying out an environmental assessment. For example, the proponent of a road project may consider including references to the jurisdiction's policies or programs aimed at reducing greenhouse gas emissions through car-pooling, or the promotion of cycling or electric vehicles. Proponents should consider whether making reference to existing climate change strategies or policies alone is sufficient as a consideration of climate change, or whether a more detailed consideration of climate change should be carried out when conducting project-specific environmental assessment studies. Documentation of the results of this consideration should be included as part of project reporting.

Regional Government Plans and Master Plans

Many regional municipalities in Ontario have developed master plans for water, sewer, transportation, and other services, and some have included reference to future climate change impacts in these plans and/or their Official Plans. Proponents are encouraged to consider master plan documents in relation to relevant project specific environmental assessment studies and processes. Proponents are encouraged to consider whether climate change impacts should be considered at a project level, i.e., beyond a consideration made within master plan documents, or whether the considerations made within the planning documents have implications for project-level planning.

Emergency Management Plans

Ontario municipalities are required to have an emergency management program under the *Emergency Management and Civil Protection Act* (EMPCPA). The EMCPA, administered by the Ministry of Community Safety and Correctional Services (MCSCS), also requires municipalities to adopt emergency response plans to describe the method by which the municipality and its agencies will respond to an emergency. MCSCS also has guidance available to assist municipalities interested in preparing an emergency plan related to a flood emergency. A municipal proponent may be able to draw upon its emergency management program or plans in documenting the consideration of climate change impacts on a project as proposed as part of an environmental assessment process.

Operation of Project, Service

In certain instances, the temporary loss of project service or function due to climate related extremes might be an acceptable project design or adaptation approach. For example, in rural areas, some roads and rights-of-way are operational on a weather-permitting or seasonal basis. A road may become impassable due to flooding or drifting snow for several weeks per year and may be temporarily closed. The risk of brief closures could be acceptable for the community that uses the road. If so, this consideration could form part of the conception of the project from the outset. Before conditions like this are applied in project planning, design, and operation, the proponent should consult with the affected community, reach a shared understanding of this risk, and document this understanding.

Conversely, if a road or right-of-way is vitally needed by a community as the principal or only route to medical care or other vital services, then the community may have little tolerance for service disruption. This would be the case whether or not the source of disruption was a weather-related event. In this instance the community's tolerance to risk of closure is low, and the road should be planned, designed, built, and operated to a very high standard.

Projects in the Far North of Ontario

Some Indigenous communities, especially in the Far North of Ontario, have already experienced significant impacts related to climate change which have affected the reliability of winter/ice roads, resulted in water quality issues, and caused community flooding. Such impacts could continue to pose challenges for communities.

The consideration of climate change impacts in project planning is particularly important in regions where climate change is projected to occur at a greater pace or extent. This includes much of northern and western Ontario, where projected surface temperature change is among the most significant of all regions of the province.

Ministry staff carrying out reviews of environmental assessment documentation will need to consider whether the proponent has taken climate change into account when developing the environmental assessment.

Factors that the ministry has considered or specified to be included in the terms of reference for environmental assessment projects in the Far North include:

- Assessment of how the proponent's construction practices, operational procedures, and the design of the undertaking, will respond to storms, flooding, drought, fires, or other severe weather events resulting from climate change.
- Assessment of how the site will be decommissioned to ensure resilience to climate change impacts.
- Discussion and assessment of whether climate change scenarios could alter the anticipated effects on the environment and affect the adaptive capacity of the ecosystem.
- Discussion and assessment of impacts of all phases and components of the project on air quality and climate change, including assessment of emission rates of greenhouse gases.
- Discussion and assessment of project's contribution to climate change related to the disturbance of the peatlands and release of carbon and other greenhouse gases.
- Description of proposed mitigation measures to avoid, offset, or minimize the contribution of the project to climate change.

Traditional Ecological Knowledge

In some cases, a proponent can reduce a project's climate change impacts on Indigenous people by working with affected Indigenous communities to identify potential climate change concerns or opportunities related to the project. A community may decide to share traditional ecological knowledge with the proponent to document knowledge regarding particular areas and relay concerns of community members. A proponent could then involve the community in

creating and implementing impact mitigation measures to address those concerns or provide for enhanced protection of the environment.

This Guide is intended to provide proponents and other interested persons with an understanding of how climate change impacts could be considered as part of an environmental assessment. The ministry regards a climate change impact consideration to be a demonstration of responsible planning and due diligence. Questions about a specific project or environmental assessment should be referred to the ministry staff assigned to the project or environmental assessment.

Those interested in information about Ontario's environmental assessment process should consult the ministry's website or contact the ministry at the address below to obtain process, consultation, and mediation guidance.

Ministry of the Environment and Climate Change
Client Services and Permissions Branch
135 St. Clair Avenue West
Toronto, Ontario M4V 1L5 Canada

Telephone: 416-314-8001
Toll Free: 1-800-461-6290
Fax: 416-314-8452
E-mail: MOECCpermissions@ontario.ca
Website: www.ontario.ca/environmentalassessments

In addition, the ministry has developed guidance materials for the following key elements of the environmental assessment process:

- Class environmental assessments
- Consultation
- Coordinating federal and provincial environmental assessment requirements
- Electricity projects
- Environmental assessments
- Glossary
- How to make a Part II Order request
- Making a hearing request
- Mediation
- Terms of reference
- Transit projects
- Waste management projects

Appendix A

Examples of Considering Climate Change Impacts in Project Planning

Overview of the Work of the Public Infrastructure Engineering Vulnerability Committee (see www.pievc.ca)

Engineers Canada, Natural Resources Canada, and partner organizations established the Public Infrastructure Engineering Vulnerability Committee (the committee) in 2005 to assess the challenge to the built environment posed by climate change. The committee includes representation from all three levels of government in Canada as well as many non-governmental organizations.

Since 2008, the committee has carried out a series of studies and the development of a protocol for assessing the vulnerability of a range of infrastructure to changing climatic conditions. The committee's approach has involved a broad and systematic review of infrastructure vulnerability to climate change.

The committee originally studied four categories of public infrastructure: buildings; roads and associated structures; storm water and wastewater systems; and water resources. Initial "scoping" studies examined the current state of each infrastructure, availability of climate data, and indicators of adaptive capacity.

The initial studies formed the basis for Engineers Canada to develop an engineering protocol, known as the PIEVC Engineering Protocol or "the Protocol". To date, it has been used to assess the vulnerability and climate risk of over 40 various types and sizes of infrastructure systems across Canada. For example, the Protocol was used to assess the vulnerability of water resources infrastructure as described in two of the case studies in Appendix A, those for the Toronto and Region Conservation Authority and the Union Water Supply System in southwestern Ontario.

One of the key challenges identified through the committee was the traditional reliance on historical data to design long-lasting, safe, and reliable infrastructure. New practices will require the accommodation of increased uncertainties because modelling results which characterize future climate are never as accurate as historical data. This creates a challenge to existing infrastructure design approaches and practices. As a first step to dealing with this challenge, the committee structured a two-part approach:

- Evaluate the vulnerability of Canada's infrastructure to the impacts of climate change from an engineering perspective; and,

- Derive key findings of the vulnerability assessment to inform the review of design, operation, and maintenance codes, standards and practices.

Based on the committee's approach, the engineering profession is developing new design and operational practices to withstand changing climate conditions – both extremes and gradual changes.

Toronto and Region Conservation Authority: Flood Control Dam Water Resources Infrastructure Assessment

Key Points of Analysis: The risks of various climate events increasing in occurrence between approximately the 1970s and 2050s and the vulnerabilities these pose to flood control dams.

The climate change analysis and projections portion of this study included the establishment of a set of climate parameters describing climatic and meteorological phenomena relevant to the geographic areas of the Claireville and G. Ross Lord flood control dams. The analysis resulted in the determination of general probability scores reflective of the occurrence of each phenomenon, both historically and in the future.

Climate parameters were selected on the basis of relevance to the region (southern Ontario) given the region's known seasonal variability. Parameter selection was also based on those with the potential to present vulnerability to the infrastructure and its components as a result of either extreme or persistent occurrences. In this evaluation, parameter usefulness was based on three factors:

- usefulness of the climate parameter in determining vulnerability;
- availability of information; and
- ability to relate this information to a probability.

In total, more than twenty parameters were selected including five-day total rainfall, heavy rain, ice storm, heat wave and hurricane/tropical storm occurrence, cold wave, freeze thaw, and snow accumulation.

The following parameters were predicted to have a greater probability of occurrence between the historical (1970s to 2000s) and future (2040s to 2070s) time periods: heat wave, heavy rain, five-day total rainfall, ice storm, and hurricane/tropical storm. The parameters: cold wave, freeze thaw, and snow accumulation were predicted to have a lower probability of occurrence, with reference to the two time periods.

Follow-up actions from the evaluation, for consideration, included:

- a review of emergency operational plans to ensure they are adequate for all types of extreme climate events – rain, snow, ice, and high winds;
- a review of backup systems by simulating various catastrophic events, e.g., a loss of electrical power plus a loss of cellphone network;
- maintaining dam-side operator's residences to minimize the travel time of operators during severe weather events; and
- developing emergency response plans for a number of climate events that have low risk of occurrence but would result in extremely severe impacts. These events are heavy long-term rainfall, ice storms, lightning, hurricane/tropical storms, and tornados.

Intensity Duration Frequency Curves – Road, Highway, Urban Drainage Design

Key Points of Analysis: Design implications for storm sewer, road, and highway drainage infrastructure from rain events of various frequencies, intensities, and durations.

When designing drainage infrastructure such as culverts, bridges, sewer systems, and roadside ditches, good estimates of peak rainfall intensity are essential. Quality rainfall data enable designers to make calculations that meet drainage capacity design standards and avoid the over- or under-design of drainage elements. Design flow rates for a particular area are typically estimated using rainfall Intensity Duration Frequency curves. The curves summarize extreme rainfall patterns for a particular location, by representing the statistical relationship of rainfall intensity corresponding to storm duration and frequency, by graph or table.

The ministry has obtained climate model results which allow the generation of Intensity Duration Frequency curves over an extensive time frame for locations throughout Ontario (see Drainage in Appendix C). Curves created using projected (future) climate conditions can be compared to curve information from the present or past to assess the significance of changes to climate on a localized basis.

Research through the University of Western Ontario has assessed the variation in Intensity Duration Frequency curves used by the City of London to account for changing climatic conditions, as the design of municipal wastewater management infrastructure (sewers, storm water management ponds or detention basins, street curbs and gutters, catchbasins, swales) is typically based on these curves.

Ontario's Ministry of Transportation has funded the development of a web-based tool that provides Intensity Duration Frequency curves for provincial highway design at any location across Ontario using up-to-date data from Environment Canada. Updating Intensity Duration Frequency curves as additional data and

new techniques become available is essential so that if or when a change in key climate variables occurs, this occurrence is reflected in a timely fashion.

Highway 407 East Extension – Effect of the Environment on the Project

Key Points of Analysis: Effect of eight climatic variables on the construction and operation of a major highway development.

As part of a Comprehensive Study Report pursuant to the former *Canadian Environmental Assessment Act* (CEAA), the Ontario Ministry of Transportation conducted an evaluation of the potential effect of the environment on the preferred route selection for the Highway 407 East Extension. CEAA requirements included the identification of likely effects, mitigation measures, and residual effects after mitigation is applied. The proponent carried out a high-level evaluation of the potential effects of the environment on the project. The evaluation was conducted in consultation with experts on climate change. Some of the climate phenomena and effects which were identified and evaluated included:

Lightning

- A potential increase in lightning strikes on light standards and other tall structures associated with highway development. Mitigation measures include back-up systems for critical electrical systems.

Hail

- Increased frequency of hail storms on the operation of the proposed highway. Mitigation measures include restrictions to operations in accordance with standard Ministry of Transportation practices.

Heavy Rain/Flooding

- Design standards for major watercourse crossing structures based on the Regional Storm event (Hurricane Hazel) to prevent potential flooding effects.

Fog

- Mitigation measures include installation of reflective markers on the roadway surface.

Drought

- Where long term effects to groundwater cannot be avoided at major fills or deep cuts, long-term engineering / foundation design measures will be undertaken as appropriate. Specific outfall control measures will be implemented for all storm water management facilities to prevent erosion of the receiving streams, with specific attention to outfalls to the deeper valleys

and at many of the high sensitivity watercourses in the eastern portion of the study area.

The proponent concluded at the outcome of the evaluation that after taking into consideration the likelihood of extreme weather and incorporating mitigation measures (some of which are described above) no residual adverse effects of the environment on the project were anticipated. After the evaluation, the proponent concluded that the probability of weather events of such extremity to cause damage or major disruption in the area of the 407 East Transportation Corridor was low.

Climate Change Risk Assessment and Vulnerability Analysis of a Municipal Water Treatment System in Southwestern Ontario

Key Points of Analysis: To assess the potential impacts of climate change on public infrastructure and to advance planning and prioritization of adaptation strategies. A case study of a municipal drinking water treatment system.

The Union Water Supply System (UWSS) is a municipal water supply system jointly owned by the Ontario municipalities of Leamington, Kingsville, Essex, and Lakeshore. Treated water from UWSS is supplied to the four owner municipalities for local distribution to residents, businesses, and the agricultural sector.

In 2012, the Ministry of the Environment and Climate Change procured the services of Engineers Canada to assess the vulnerability of the UWSS infrastructure to the potential impacts of future climate and provide recommendations for operational modifications to address potential impacts.

The primary objective of the study was to identify the areas within the current design, construction, operation, and management of the UWSS that are at an increased or decreased risk of failure and/or damage due to potential changes in climatic conditions. The study was carried out using Engineers Canada's Public Infrastructure Engineering Vulnerability Committee Protocol (version 10) and delivered recommendations for remedial action and/or further study.

The climate change analysis and projections portion of the study included the establishment of a set of climate parameters describing climatic and meteorological phenomena relevant to the geographic areas of the UWSS service area. This included: high temperature, low temperature, heat wave, cold wave, extreme diurnal temperature variability, freeze-thaw, heavy rain, sustained high temperature in winter with snow on ground, heavy 5-day total rainfall, winter rain, freezing rain, ice storm, heavy snow, snow accumulation, blowing snow/blizzard, lightning, hailstorm, hurricane/tropical storm, high wind, tornado, drought/dry period, and heavy fog. Climate parameter selection for the study was based on a parameter's potential to present vulnerability to the

infrastructure and its components as a result of either an extreme or persistent occurrence.

Future climate projections were analyzed using climate model outputs from Environment Canada's Canadian Climate Change Scenario Network Plots, the Intergovernmental Panel on Climate Change 4th Assessment Report Regional Climate Projections chapter (and others, where applicable), and scientific journal articles presenting regional and local projections and predictions.

The following interactions were assessed as having the highest risk scores for both existing and future climate conditions:

- Lightning's impact on communications, transformers, transmission lines, and data acquisition systems
- The impact of blowing snow or a blizzard on chemical storage
- The impact of lake water level on the emergency water intake

Some of the recommendations arising from the study include:

- Review the emergency response policies and procedures for various components of the UWSS
- Review the potential need for the existing emergency water intake (and potential modifications to it) to be investigated to ensure it remains functional during lower lake levels
- Accelerate modifications to older storage tanks to ensure adequate circulation of water in storage
- Investigate the condition of electrical transformers
- Continue to monitor the risks identified through the assessment, particularly as components continue to age

Appendix B

Considering Climate Change Impacts in Natural Resource Project Planning

Some projects involving natural resources, particularly forests, soils, and wetlands, may result in aspects of climate change mitigation and adaptation being undertaken in the same measure. For example, reforesting lands will result in removing carbon from the atmosphere (mitigation). The same initiative may result in a landscape better adapted to reducing the impacts of climate extremes – tree cover can provide shade and cooling for soils and buildings, and delay the rate of overland drainage from intense precipitation events (adaptation). For reasons such as this, climate change impact considerations for natural resource projects may vary somewhat from other project types. Specific variations include:

Carbon Stock

Carbon stock is the quantity of carbon in a carbon pool. Carbon pool refers to a physical component or components of the climate system where carbon is stored. Examples of carbon pools are forest biomass, wood products, soils, and the atmosphere. The carbon stock in a pool can change due to the difference between additions of carbon and losses of carbon. When the losses are larger than the additions, the carbon stock becomes smaller and the pool acts as a source to the atmosphere; when the losses are smaller than the additions, the pools acts as a sink to the atmosphere.

Climate Change Impacts Consideration

The outcome of a climate change impacts consideration for natural resource projects may include an assessment of ecological integrity and resilience as part of, or in addition to, mitigation and adaptation.

The outcome of a climate change consideration is an undertaking or project that has taken into account the means to reduce its direct greenhouse gas emissions and impacts on carbon sinks/sources, that is more resilient to projected changes in climate, and that helps to maintain the ecological integrity of the local environment through an assessment of present and future environmental impacts in the face of a changing climate.

Case Study – Climate Change Considerations in MNRF's Class Environmental Assessment Processes

The Ministry of Natural Resources and Forestry (MNRF) has identified a way in which climate change considerations may be accounted for in their class environmental processes.

Class Environmental Assessment for Parks Protected Areas and Conservation Reserves (Class EA-PPCR)

There are several ways that consideration of climate change is inherently built into the Class EA-PPCR process.

The screening criteria in Table 3.1 of MNRF's Class EA-PPCR is used to rate the potential net effect of a proposed project against criteria in the categories of:

- natural environmental considerations;
- land use, resource management considerations;
- social, cultural, and economic considerations; and,
- aboriginal considerations.

These criteria incorporate potential effects related to climate change. For example, the screening table includes evaluation of several criteria related to assessing effects of projects on ecosystem resilience and adaptive capacity, as well as effects to air and water quality, land subject to natural or human-made hazards, drainage or flooding, and permafrost.

The Class EA-PPCR provides guidance for assessing the significance of environmental effects, including elements related to consideration of climate change, such as geographic extent, duration, and frequency of effects, direct and indirect effects, and cumulative effects.

As part of the Class EA-PPCR process, mitigation must be identified to reduce effects on environmental components, including measures that would reduce effects from or on climate change. MNRF is proposing to add descriptions of typical mitigation measures to include examples of mitigation measures specific to climate change.

Additionally, the Class EA-PPCR process outlines the need for project monitoring, which allows for assessment of predicted effects with respect to acceptable outcomes, which may include effects as a result of a changing climate and the potential to identify remedial actions.

Consideration of Climate Change in the Class Environmental Assessment for Resource Stewardship and Facilities Development (Class EA-RSFD)

The screening criteria in Table 3.1 of the Class EA-RSFD are used to rate the potential net effect of a proposed project against criteria in the categories of:

- natural environmental considerations;
- land use, resource management considerations;
- social, cultural, and economic considerations; and,
- aboriginal considerations.

The criteria allow for consideration of potential effects related to climate change (e.g. air and water quality, water quantity (flows and levels, drought response), and land subject to natural or human-made hazards).

MNRF is proposing to add direction specific to climate change impacts consideration in the application of the screening criteria, e.g.,

> *"The effects of climate change are pervasive, alter the composition and function of Ontario's ecosystems, and include more frequent extreme weather events (e.g., flooding, drought, and wind storms) that compromise or destroy infrastructure with significant implications to the future health and well-being of people and their communities.*
>
> *Consideration should be given to the known and anticipated effects of climate change on a proposed project and whether the project description includes adequate mitigation and adaptation options."*

MNRF is also proposing generic examples of typical mitigation measures for use by environmental assessment project staff. The examples provide more detail in responding to paragraph 5 of subsection 14(2) of the *Environmental Assessment Act* (description of mitigation measures for undertakings subject to the class environmental assessment). The examples of mitigation measures will include those which mitigate the impacts of climate change.

Appendix C

Availability and Use of Climate Model Results

Sources of climate model results that focus on Ontario and other evaluation tools are available for climate change impacts consideration.

Ontario Climate Change Scenarios

Climate model results have been generated for Ontario and can be used in the evaluation of future climate change impacts. Data can be downloaded from various websites to construct climate scenarios, as well as data used as input variables for further downscaling.

Climate data are provided as long-term (usually 3 decades) averages or time-series at daily, monthly, seasonal, or annual scales. Long-term average climate information is available for the baseline period (1961–1990 or 1981-2010) and three future periods (2011–2040, 2041–2070, and 2071–2100), while time series are available continuously from 1960 to 2100. In addition to the typical climate variables (temperature and precipitation), extreme climate indices (i.e. heat waves, IDF curves, and droughts) are also available as well. While climate data is available at many sources, Ontario-specific high resolution regional climate data can be found at:

Ontario Climate Change Data Portal

and

Ontario Climate Change Projections

These are the two major data portals with the most up-to-date climate change information when this document was written, developed by partner academic institutions with funding from the ministry.

Canadian Climate Data and Scenarios

The Canadian Climate Data and Scenarios (CCDS) site is an interface for distributing climate change information. The goals of CCDS are to:

- Support climate change impact and adaptation research in Canada and other countries;
- Support stakeholders requiring scenario information for decision making and policy development;
- Provide access to Canadian research on the development of scenarios and adaptation research.

Scientific Literature

Proponents are encouraged to consult the peer reviewed scientific literature as a matter of good practice and due diligence. The following papers are two examples.

Gula, J. and Peltier, W.R. 2012. Dynamical downscaling over the Great Lakes Basin of North America using the WRF Regional Climate Model: The impact of the Great Lakes System on regional greenhouse warming, Jnl. of Climate, 25, (Nov.), 7723-7742, doi: 10.1175/JCLI-D-11-00388.1

Mckenney, D. W., Hutchinson, M. F., Papadopol, P., Lawrence, K., Pedlar, J. H., Campbell, K., Owen, T. (2011). Customized Spatial Climate Models for North America. *American Meteorological Society*, 1611–1622. doi:10.1175/BAMS-D-10-3132.1

Drainage Information

Information about, and tools for, generating Intensity Duration Frequency curves are available through:

Ministry of the Environment and Climate Change

AR4:A1B. Dynamically-downscaled climate projections with the PRECIS model under A1B emissions scenario, projected rainfall intensity-duration-frequency (IDF) curves and daily and hourly time series data for climate change impact assessment.

Ministry of Transportation

The IDF Curve Lookup is a web-based application provided by the Ontario Ministry of Transportation (MTO) for the purpose of retrieving Intensity-Duration-Frequency (IDF) curves.

Greenhouse Gas Emission Quantification and Reporting

Ontario Regulation and Guideline for Greenhouse Gas Emissions Reporting

Ontario filed a new Quantification, Reporting, and Verification of Greenhouse Gas Emissions Regulation O. Reg. 143/16 made under the *Climate Change Mitigation and Low-carbon Economy Act, 2016* on May 19, 2016, to support implementation of Ontario's cap and trade program. The new Quantification, Reporting and Verification of Greenhouse Gas Emissions Regulation (the "QRV Regulation") and

incorporated Guideline took effect on January 1, 2017, and applies to activities carried out by persons on and after January 1, 2017. The Guideline and QRV Regulation support the collecting and public reporting on industrial greenhouse gas emissions.

National and International

Technical Guidance on Reporting Greenhouse Gas Emissions / Facility Greenhouse Gas Emissions Reporting Environment and Climate Change Canada (December 2016)

2006 IPCC Guidelines for National Greenhouse Gas Inventories - Volume 3 -Industrial Processes and Product Use

Appendix D

Additional Resources

Published Sources of Climate Change Consideration in Project Planning, Environmental Assessment

For additional reference, approaches, and methods for incorporating climate change considerations in project planning and environmental assessment, see:

- Alberta Environment. February 2011. Guide to Preparing Environmental Impact Assessment Reports in Alberta.
- Canadian Environmental Assessment Agency. November 2003. Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners.
- Engineers Canada, Public Infrastructure Engineering Vulnerability Committee (PIEVC). November 2007. City of Portage la Prairie: Water Resources Infrastructure Assessment Phase II – Pilot Study.
- Engineers Canada, Public Infrastructure Engineering Vulnerability Committee (PIEVC). April 2008. Adapting to Climate Change: Canada's First National Engineering Vulnerability Assessment of Public Infrastructure.
- Intergovernmental Panel on Climate Change (IPCC). 2014: Summary for policymakers. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1-32.
- Ministry of Natural Resources and Ontario Centre for Climate Impacts and Adaptation Resources. 2011. A Practitioner's Guide to Climate Change Adaptation in Ontario's Ecosystems.
- Ministry of Transportation. 2012. Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions of Provincial Transportation Projects.
- Nova Scotia Environment. February 2011. Guide to Considering Climate Change in Project Development in Nova Scotia.
- Toronto and Region Conservation Authority. June 2010. National Engineering Vulnerability Assessment of Public Infrastructure to Climate Change: Toronto and Region Conservation Authority Flood Control Dam Water Resources Infrastructure Assessment.

- Warren, F.J. and Lemmen, D.S., editors (2014): Canada in a Changing Climate: Sector Perspectives on Impacts and Adaptation; Government of Canada, Ottawa, ON, 286p.

Glossary

The definitions in this glossary are intended to assist the reader in understanding the terms used in this Guide. The definitions for some of these terms were derived from the Fourth and Fifth Assessment Reports (AR4, AR5) of the Intergovernmental Panel on Climate Change (2007, 2013) and the Report of the Expert Panel on Climate Change Adaptation (2009). For terms that are also contained in the *Environmental Assessment Act*, the wording and meaning contained in the *Environmental Assessment Act* shall prevail.

adaptation
Adaptation is the process of adjustment in the built and natural environments in response to actual or expected climate change and its impacts. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate change and its impacts.

In natural resources management, adaptation seeks to address the vulnerability of species or natural systems and processes by reducing threats, enhancing resilience, engaging people, and improving knowledge.

adaptive capacity
Adaptive capacity is the ability or potential of a species or ecological system to respond successfully to climate variability and change.

alternative methods
Alternative methods of carrying out the proposed undertaking are different ways of doing the same activity. Alternative methods could include consideration of one or more of the following: alternative technologies, alternative methods of applying specific technologies, alternative sites for a proposed undertaking, alternative design methods, and alternative methods of operating facilities associated with a proposed undertaking.

carbon sink
A carbon sink is any process, activity, or mechanism that removes carbon dioxide from the atmosphere. Examples of carbon sinks include, but are not limited to, oceans, forests, soils, peatlands, and wetlands.

carbon source
A carbon source is any process, activity, or mechanism that releases carbon dioxide into the atmosphere. Carbon sources may be anthropogenic, as in the combustion of fossil fuels, or natural in origin, as when plants release carbon dioxide into the atmosphere through respiration.

carbon stock

Carbon stock is the quantity of carbon in a carbon pool. Carbon pool refers to a physical component of the climate system where carbon is stored. Examples of carbon pools are forest biomass, wood products, soils, and the atmosphere.

climate change

Climate change refers to a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer.

climate change impacts

The term "climate change impacts" refers to both a project's impacts on climate change and the impacts to a project from climate change.

impacts of climate change

The impacts of climate change refers to the consequences of climate change on natural and human systems, such as on projects and the resulting environmental effects.

impacts on climate change

Impacts on climate change refers to a project's greenhouse gas emissions and any changes to carbon sinks, i.e., changes to the landscape that alters its ability to remove carbon dioxide from the atmosphere. These project effects could lead to increased levels of greenhouse gases in the atmosphere.

environment[*]

The *Environmental Assessment Act* defines "environment" to mean:

(a) air, land or water,
(b) plant and animal life, including human life,
(c) the social, economic and cultural conditions that influence the life of humans or a community,
(d) any building, structure, machine or other device or thing made by humans,
(e) any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from human activities, or
(f) any part or combination of the foregoing and the interrelationships between any two or more of them,
in or of Ontario.

impact management measures

[*] An asterisk (*) beside a defined term indicates that the term is defined in the *Environmental Assessment Act.*

Measures which can lessen potential negative environmental effects or enhance positive environmental effects are referred to impact management measures. These measures could include mitigation, compensation, or community involvement.

mitigation (climate change)

Mitigation in the context of climate change refers to the use of measures or actions to avoid or reduce greenhouse gas emissions, to avoid or reduce impacts on carbon sinks, or to protect, enhance, or create carbon sinks.

proponent*

"Proponent" means a person who,
(a) carries out or proposes to carry out an undertaking, or
(b) is the owner or person having charge, management or control of an undertaking.

resilience

Resilience is the ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organization, and the capacity to adapt to stress and change.

terms of reference

An approved terms of reference sets out the framework for the planning and decision-making process to be followed by the proponent during the preparation of an environmental assessment. In other words, it is the proponent's work plan for what is going to be studied. The environmental assessment must be prepared in accordance with the approved terms of reference.

undertaking*

"Undertaking" means,
(a) an enterprise or activity or a proposal, plan or program in respect of an enterprise or activity by or on behalf of Her Majesty in right of Ontario, by a public body or public bodies or by a municipality or municipalities,
(b) a major commercial or business enterprise or activity or a proposal, plan or program in respect of a major commercial or business enterprise or activity of a person or persons other than a person or persons referred to in clause (a) that is designated by the regulations, or
(c) an enterprise or activity or a proposal, plan or program in respect of an enterprise or activity of a person or persons, other than a person or persons referred to in clause (a), if an agreement is entered into under section 3.0.1 in respect of the enterprise, activity, proposal, plan or program.
(Undertaking is also referred to as "project" in this Guide for brevity).

vulnerability

The degree to which components of the natural and built environment are susceptible to, and unable to withstand, the adverse impacts of climate change is referred to as vulnerability. Vulnerability is a function of the character, magnitude, and rate of climate change combined with the sensitivity and adaptive capacity of a system or thing.

Client's Guide to Preliminary Screening for Species at Risk

Ministry of the Environment, Conservation and Parks

Species at Risk Branch, Permissions and Compliance

DRAFT - May 2019

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1.0 Purpose, Scope, Background and Context

1.1 Purpose of this Guide

This guide has been created to:

- help clients better understand their obligation to gather information and complete a preliminary screening for species at risk before contacting the ministry,
- outline guidance and advice clients can expect to receive from the ministry at the preliminary screening stage,
- help clients understand how they can gather information about species at risk by accessing publicly available information housed by the Government of Ontario, and
- provide a list of other potential sources of species at risk information that exist outside the Government of Ontario.

It remains the client's responsibility to:

- carry out a preliminary screening for their projects,
- obtain best available information from all applicable information sources,
- conduct any necessary field studies or inventories to identify and confirm the presence or absence of species at risk or their habitat,
- consider any potential impacts to species at risk that a proposed activity might cause, and
- comply with the *Endangered Species Act* (ESA).

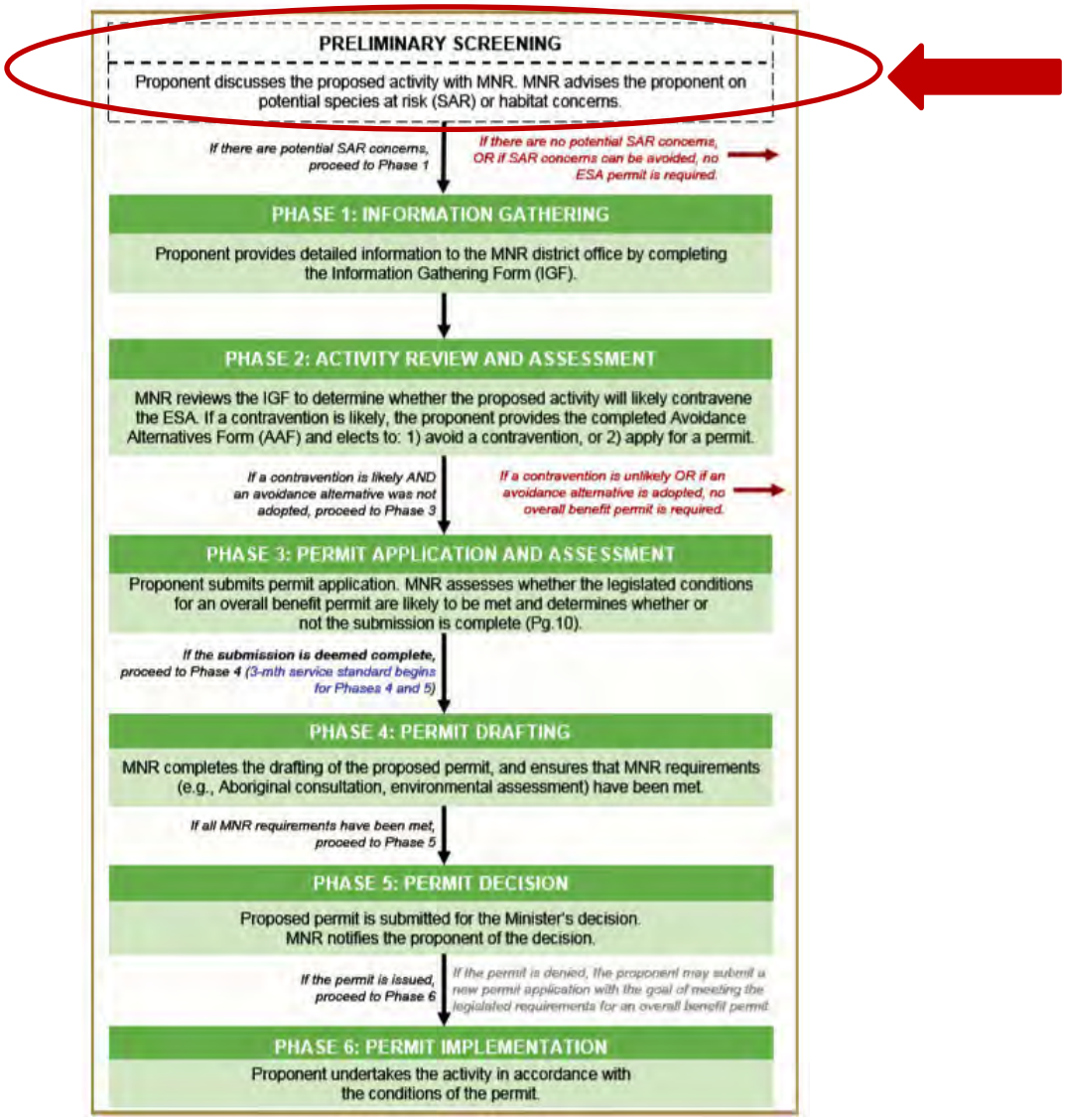
To provide the most efficient service, clients should initiate species at risk screenings and seek information from all applicable information sources identified in this guide, at a minimum, prior to contacting Government of Ontario ministry offices for further information or advice.

1.2 Scope

This guide is a resource for clients seeking to understand if their activity is likely to impact species at risk or if they are likely to trigger the need for an authorization under the ESA. It is not intended to circumvent any detailed site surveys that may be necessary to document species at risk or their habitat nor to circumvent the need to assess the impacts of a proposed activity on species at risk or their habitat. This guide is not an exhaustive list of available information sources for any given area as the availability of information on species at risk and their habitat varies across the province. This guide is intended to support projects and activities carried out on Crown and private land, by private landowners, businesses, other provincial ministries and agencies, or municipal government.

1.3 Background and Context

To receive advice on their proposed activity, clients must first determine whether any species at risk or their habitat exist or are likely to exist at or near their proposed activity, and whether their proposed activity is likely to contravene the ESA. Once this step is complete, clients may contact the ministry at SAROntario@ontario.ca to discuss the main purpose, general methods, timing and location of their proposed activity as well as information obtained about species at risk and their habitat at, or near, the site. At this stage, the ministry can provide advice and guidance to the client about potential species at risk or habitat concerns, measures that the client is considering to avoid adverse effects on species at risk or their habitat and whether additional field surveys are advisable. This is referred to as the "Preliminary Screening" stage. For more information on additional phases in the diagram below, please refer to the *Endangered Species Act Submission Standards for Activity Review and 17(2)(c) Overall Benefit Permits* policy available online at https://www.ontario.ca/page/species-risk-overall-benefit-permits. Please note: any reference to MNR in the diagram is replaced by MECP.



2.0 Roles and Responsibilities

To provide the most efficient service, clients should initiate species at risk screenings and seek information from all applicable information sources identified in this guide prior to contacting Government of Ontario ministry offices for further information or advice.

Step 1: Client seeks information regarding species at risk or their habitat that exist, or are likely to exist, at or near their proposed activity by referring to all applicable information sources identified in this guide.

Step 2: Client reviews and consider guidance on whether their proposed activity is likely to contravene the ESA (see section 3.4 of this guide for guidance on what to consider).

Step 3: Client gathers information identified in the checklist in section 4 of this guide.

Step 4: Client contacts the ministry at SAROntario@ontario.ca to discuss their preliminary screening. Ministry staff will ask the client questions about the main purpose, general methods, timing and location of their proposed activity as well as information obtained about species at risk and their habitat at, or near, the site. Ministry staff will also ask the client for their interpretation of the impacts of their activity on species at risk or their habitat as well as measures the client has considered to avoid any adverse impacts.

Step 5: Ministry staff will provide advice on next steps.

Option A: Ministry staff may advise the client they can proceed with their activity without an authorization under the ESA where the ministry is confident that:

- no protected species at risk or habitats are likely to be present at or near the proposed location of the activity; or
- protected species at risk or habitats are known to be present but the activity is not likely to contravene the ESA; or
- through the adoption of avoidance measures, the modified activity is not likely to contravene the ESA.

Option B: Ministry staff may advise the client to proceed to Phase 1 of the overall benefit permitting process (i.e. Information Gathering in the previous diagram), where:

- there is uncertainty as to whether any protected species at risk or habitats are present at or near the proposed location of the activity; or
- the potential impacts of the proposed activity are uncertain; or
- ministry staff anticipate the proposed activity is likely to contravene the ESA.

3.0 Information Sources

Land Information Ontario (LIO) and the Natural Heritage Information Centre (NHIC) maintain and provide information about species at risk, as well as related information about fisheries, wildlife, crown lands, protected lands and more. This information is made available to organizations, private individuals, consultants, and developers through online sources and is often considered under various pieces of legislation or as part of regulatory approvals and planning processes.

The information available from LIO or NHIC and the sources listed in this guide should not be considered as a substitute for site visits and appropriate field surveys. Generally, this information can be regarded as a starting point from which to conduct further field surveys, if needed. While this data represents best available current information, it is important to note that a lack of information for a site does not mean that species at risk or their habitat are not present. There are many areas where the Government of Ontario does not currently have information, especially in more remote parts of the province. The absence of species at risk location data at or near your site does not necessarily mean no species at risk are present at that location. On-site assessments can better verify site conditions, identify and confirm presence of species at risk and/or their habitats.

Information on the location (i.e. observations and occurrences) of species at risk is considered sensitive and therefore publicly available only on a 1km square grid as opposed to as a detailed point on a map. This generalized information can help you understand which species at risk are in the general vicinity of your proposed activity and can help inform field level studies you may want to undertake to confirm the presence, or absence of species at risk at or near your site.

Should you require specific and detailed information pertaining to species at risk observations and occurrences at or near your site on a finer geographic scale; you will be required to demonstrate your need to access this information, to complete data sensitivity training and to obtain a Sensitive Data Use License from the NHIC. Information on how to obtain a license can be found online at https://www.ontario.ca/page/get-natural-heritage-information.

Many organizations (e.g. other Ontario ministries, municipalities, conservation authorities) have ongoing licensing to access this data so be sure to check if your organization has this access and consult this data as part of your preliminary screening if your organization already has a license.

3.1 Make a Map: Natural Heritage Areas

The Make a Natural Heritage Area Map (available online at https://www.ontario.ca/page/make-natural-heritage-area-map provides public access to natural heritage information, including species at risk, without the user needing to have Geographic Information System (GIS) capability. It allows users to view and identify generalized species at risk information, mark areas of interest, and create and print a custom map directly from the web application. The tool also shows topographic information such as roads, rivers, contours and municipal boundaries.

Users are advised that sensitive information has been removed from the natural areas dataset and the occurrences of species at risk has been generalized to a 1-kilometre grid to mitigate the risks to the species (e.g. illegal harvest, habitat disturbance, poaching).

The web-based mapping tool displays natural heritage data, including:

- Generalized Species at risk occurrence data (based on a 1-km square grid),
- Natural Heritage Information Centre data.

Data cannot be downloaded directly from this web map; however, information included in this application is available digitally through Land Information Ontario (LIO) at https://www.ontario.ca/page/land-information-ontario.

3.2 Land Information Ontario (LIO)

Most natural heritage data is publicly available. This data is managed in a large provincial corporate database called the LIO Warehouse and can be accessed online through the LIO Metadata Management Tool at https://www.javacoeapp.lrc.gov.on.ca/geonetwork/srv/en/main.home. This tool provides descriptive information about the characteristics, quality and context of the data. Publicly available geospatial data can be downloaded directly from this site.

While most data are publicly available, some data may be considered highly sensitive (i.e. nursery areas for fish, species at risk observations) and as such, access to some data maybe restricted.

3.3 Additional Species at Risk Information Sources

- The Breeding Bird Atlas can be accessed online at http://www.birdsontario.org/atlas/index.jsp?lang=en
- eBird can be accessed online at https://ebird.org/home
- iNaturalist can be accessed online at https://www.inaturalist.org/
- The Ontario Reptile and Amphibian Atlas can be accessed online at https://ontarionature.org/programs/citizen-science/reptile-amphibian-atlas
- Your local Conservation Authority. Information to help you find your local Conservation Authority can be accessed online at https://conservationontario.ca/conservation-authorities/find-a-conservation-authority/

  Local naturalist groups or other similar community-based organizations
- Local Indigenous communities
- Local land trusts or other similar Environmental Non-Government Organizations
- Field level studies to identify if species at risk, or their habitat, are likely present or absent at or near the site.
- When an activity is proposed within one of the continuous caribou ranges, please be sure to consider the caribou Range Management Policy. This policy includes figures and maps of the continuous caribou range, can be found online at https://www.ontario.ca/page/range-management-policy-support-woodland-caribou-conservation-and-recovery

3.4 Information Sources to Support Impact Assessments

- Guidance to help you understand if your activity is likely to adversely impact species at risk or their habitat can be found online at https://www.ontario.ca/page/policy-guidance-harm-and-harass-under-endangered-species-act and https://www.ontario.ca/page/categorizing-and-protecting-habitat-under-endangered-species-act
- A list of species at risk in Ontario is available online at https://www.ontario.ca/page/species-risk-ontario. On this webpage, you can find out more about each species, including where is lives, what threatens it and any specific habitat protections that apply to it by clicking on the photo of the species.

4.0 Check-List

Please feel free to use the check list below to help you confirm you have explored all applicable information sources and to support your discussion with Ministry staff at the preliminary screening stage.

- ✓ Land Information Ontario (LIO)
- ✓ Natural Heritage Information Centre (NHIC)
- ✓ The Breeding Bird Atlas
- ✓ eBird
- ✓ iNaturalist
- ✓ Ontario Reptile and Amphibian Atlas
- ✓ List Conservation Authorities you contacted:_____

  _____
- ✓ List local naturalist groups you contacted:_____

  _____
- ✓ List local Indigenous communities you contacted:_____

  _____
- ✓ List any other local land trusts or Environmental Non-Government Organizations you contacted:_____

  _____
- ✓ List and field studies that were conducted to identify species at risk, or their habitat, likely to be present or absent at or near the site: _____

  _____
- ✓ List what you think the likely impacts of your activity are on species at risk and their habitat (e.g. damage or destruction of habitat, killing, harming or harassing species at risk):_____

  _____

FIRST NATIONS AND INDIGENOUS COMMUNITIES ENGAGEMENT CORRESPONDENCE

Contact Information	Date/Method of Communication	Comment/Concern	Response/Commitment to Carry Forward
Lonny Bomberry Six Nations of the Grand River Director 2498 Chiefswood Road, P.O. Box 5000 Ohsweken N0A 1M0 519-753-0665 lonnybomberry@sixnations.ca	Notice of Commencement Initial Email sent March 2, 2021	No comments.	
	Notice of Virtual Public Consultation #1 Initial Email sent May 25, 2021 Follow-up Email sent June 16, 2021 Follow-up Call July 8, 2021	No comments.	
	Notice of Virtual Public Consultation #2 Email Sent December 1, 2021	No comments.	
	Notice of Virtual Public Consultation #3 Email Sent May 31, 2022	No comments.	
Fawn D Sault Mississaugas of the Credit First Nation Consultation Manager, Department of Consultation and Accomodation R.R. 6, 6 First Line Rd., Unit 1 Hagersville N0A 1H0 905-768-4260 Fawn.Sault@mncfn.ca Darin Wybenga Land Use Coordinator Darin.wybenga@mncfn.ca Abby Laforme Abby.laforme@mncfn.ca Megan DeVries Megan.devries@mncfn.ca	Notice of Commencement Initial Email sent March 2, 2021	MCFN is not opposed to development, but MCFN must to be involved in development decision making. MCFN has a deep connection to its Territory and we have a stewardship responsibility for our land. By engaging with us, a project proponent can learn our perspective on how to care for this land and we can work together to shape the project to mitigate damaging effects to our land and perhaps even work to improve our environment. MCFN is the only party who shall determine whether there are impacts to our Aboriginal and treaty rights. One of the ways we require proponents to engage with us is in providing transparency during the environmental survey and archaeological assessment process. The best way to accomplish this is by having Field Liaison Representatives ("FLRs") on location while fieldwork is occurring, who can ensure that the Nation's special interests and concerns are respected and considered during fieldwork. The cultural and natural resources in question are part of MCFN's territory and heritage and it is our responsibility to ensure their protection, on behalf of the Nation. MCFN's stewardship of its territory extends through the life of any development project and beyond. DOCA has completed an initial intake review of the project communication you have provided. This file has been assigned DOCA Project 2021-0158; please use this number in all future communications. We respectfully ask you to immediately notify us if there are any changes to the project.	**Name of person or body undertaking the action or decision:** Proponent: Region of Waterloo Proponent Project Manager: Kaoru Yajima, Sr. Engineer, Water Services Region of Waterloo 150 Frederick Street, 7th Floor Kitchener, Ontario N2G 4J3 Tel: 519-575-4757 ext. 3349 Email: kyajima@regionofwaterloo.ca Consultant: Stantec Consulting Ltd. Consultant Project Manager: Jeff Paul, P.Eng., Project Manager Stantec Consulting Ltd. 171 Queens Ave #600 London, ON N6A 5J7 Tel: 519-675-6604 Email: Jeff.Paul@stantec.com **List of documents pertaining to the proposed action/decision that are available for MCFN to review:** As the project is still in it's early stages, there is currently no information that has been issued for review at this time. During the course of the project, three virtual public consultation centres (PCC) are planned during this project

Contact Information	Date/Method of Communication	Comment/Concern	Response/Commitment to Carry Forward
		The following DOCA's initial intake review of the project communication, the file has been referred to the following DOCA Units for additional follow-up. Archaeology Megan DeVries megan.devries@mncfn.ca Cultural/Historical Darin Wybenga darin.wybenga@mncfn.ca Environment Fawn Sault (Temp) fawn.sault@mncfn.ca FLR Participation Megan DeVries megan.devries@mncfn.ca We have identified the following general information as missing from your initial project communication: - Name of person or body undertaking the action or decision. - List of documents pertaining to the proposed action/decision that are available for MCFN to review. - Description of what other information is expected to become available before the proposed action/decision is undertaken. - Deadlines or filing dates pertaining to the action/decision. - The Crown or Municipal review/approval that is required for the project. - How the proposed action or decision may affect and/or benefit MCFN, its rights and territory	and notices of each will be emailed to you in advance. Information boards/presentation materials will be made available on the Region's website. We would be happy to email you the information directly if preferred. A Baden-New Hamburg Water/Wastewater System Servicing Report will be prepared at the end of this study and will summarize the background information collected, alternatives assessed and the preferred solution(s). This report will be posted to the Region's website for the MCFN to review and comment as part of the 30-day public review period. Again, we would be happy to email you the information directly if preferred. A Notice of Completion of this report will be emailed to you when it becomes available. **Description of what other information is expected to become available before the proposed action/decision is undertaken:** Cultural Heritage/Historical A desktop review of cultural heritage resources has been prepared as part of the initial stages of the project. It was determined that several resources are present within the study area including: - individual heritage resources that are designated under Part IV of the Ontario Heritage Act; - resources that are listed on the Municipal Heritage Register; and, - the New Hamburg Heritage Conservation District. Once the proposed location(s) of water and wastewater infrastructure are determined, a screening checklist and/or a Cultural Heritage Assessment Report will be completed as required. The timing of this report is unknown at this time. Archaeology A preliminary archaeological review of the study area has been prepared as part of the initial stages of the project. It was determined that portions of the study area retain potential for the identification of archaeological resources. Once the proposed

Contact Information	Date/Method of Communication	Comment/Concern	Response/Commitment to Carry Forward
			location(s) of water and wastewater infrastructure are determined, a Stage 1 Archaeological Assessment will be completed as required. The timing of this report will be determined later in the project. Environment A desktop review of available background information was conducted as part of the initial stages of the project to identify the sensitive terrestrial and aquatic features. The following features are known to occur or have the potential to occur in the study area: • Fish Habitat; • Presence of an aquatic Species of Conservation Concern (SOCC) – Rainbow Mussel; • Presence of an aquatic Species at Risk (SAR) - Silver Shiner; • Presence of a Provincially Significant Wetland (PSW) Complex; • Non-provincially significant wetlands; and, • Life Science Areas of Natural and Scientific Interest (ANSI). Once the proposed location(s) of water and wastewater infrastructure are determined, a Natural Heritage Report will be completed to review key environmental features, potential impacts, and mitigation requirements. The timing of this report will be determined later in the project. **Deadlines or filing dates pertaining to the action/decision:** The Final Report is tentatively scheduled to be presented to Region of Waterloo Council in spring of 2022. **The Crown or Municipal review/ approval that is required for the project:** Region of Waterloo Council will review/approve this study. **How the proposed action of decision may affect and/or benefit MCFN, its rights and territory** We do not anticipate impacts to MCFN rights and territory as a result of required water and wastewater infrastructure; however, we do rely on the MCFN and DOCA Units to advise the Region of Waterloo and consultant of the potential effects and/or benefits of the proposed actions upon your review of the information available.

Contact Information	Date/Method of Communication	Comment/Concern	Response/Commitment to Carry Forward
			Closing We have added the following DOCA Units to our project contact list: Megan DeVries (Archaeology/FLR Participation), Darin Wybenga (Cultural/Heritage), and Fawn Sault (Environment). We will contact you at key stages during the planning process as noted above (i.e., 3 PCCs and Notice of Completion).
	Notice of Virtual Public Consultation #1 Initial Email sent May 25, 2021 Follow-up Email sent June 16, 2021 Follow-up Call July 8, 2021	1. Once at a stage where Archaeological and Environmental studies are being undertaken, ensure MCFN representatives are on site during any ground works. 2. When study determines recommendations, ensure recommendations accompany parameters on any impacts these recommendations may have on local water bodies. MCFN would like an information package via email once proposed location(s) of water and wastewater infrastructure are determined that outlines where effluent will go and any potential impacts the recommendations will have on local water bodies.	MCFN was advised that the Baden and New Hamburg Water and Wastewater System Servicing Review is still in preliminary portions of the review. Onsite Archaeological and Environmental studies have not yet been undertaken as these will only be completed once proposed location(s) of water and wastewater infrastructure are determined. MCFN was advised that the Region of Waterloo would be in contact at this stage in the study. Additional information will be provided to MCFN once proposed location(s) of water and wastewater infrastructure are determined that outlines where effluent will go and any potential impacts the recommendations will have on local water bodies.
	Notice of Virtual Public Consultation #2 Email Sent December 1, 2021	No comments.	
	Notice of Virtual Public Consultation #3 Email Sent May 31, 2022	No comments.	
	Circulation of Stage 1 Archaeological Assessment Email to Megan DeVries July 14, 2022		**Email Sent to MNCFN July 14, 2022:** It's Kaoru, the Region of Waterloo's project manager for the captioned study. In past correspondence rec'd from Fawn Sault, it was recommended that we share any archaeological studies conducted for your review. At this point in our study we have conducted a Stage 1 study and it is attached for review. If you have any further comments, we would be grateful if you can provide them by Monday, August 14, 2022. Also, I believe the team has sent prior correspondence on our virtual public consultation centres but if you needed to refer to them, the latest video can be found here. If you have any questions, please reach out to me and Jeff (our consultant, cc'd).
		Email Received July 26, 2022:	**Email Response July 26, 2022:**

Contact Information	Date/Method of Communication	Comment/Concern	Response/Commitment to Carry Forward
		On behalf of the Mississaugas of the Credit First Nation, Department of Consultation and Accommodation, I reviewed the Stage 1 Archaeological Assessment report prepared by Stantec for the Baden-New Hamburg Water & Wastewater System Servicing project. I do not have questions or comments about the content of the report. We look forward to working together on the next steps of this project. When archaeological field-work planning commences, please contact our Archaeological Operations Supervisor Adam LaForme to coordinate Field Liaison Representative participation and subsequent report review.	Thank you for taking the time to review our report. I will ensure that your comments are documented in the project file so in the next stage, Adam is notified of any field work.
	Circulation of Cultural Heritage Report Email to Darin Wybenga July 14, 2022		**Email Sent to MNCFN July 14, 2022:** It's Kaoru, the Region of Waterloo's project manager for the captioned study. In past correspondence rec'd from Fawn Sault regarding this study, it was recommended that we share any cultural heritage studies conducted for your review. At this point in our study we have conducted an existing conditions report for cultural heritage attached for review. If you have any further comments, we would be grateful if you can provide them by Monday, August 14, 2022. Also, I believe the team has sent prior correspondence on our virtual public consultation centres but if you needed to refer to them, the latest video can be found here. If you have any questions, please reach out to me and Jeff (our consultant, cc'd).
			Email Sent to MNCFN July 26, 2022: We still have time but just wanted to check in and see if you had any questions on the Natural Heritage and Cultural Heritage memos we forwarded back on July 14. Please reach out if you have any questions.
	Circulation of Natural Heritage Report Email to Darin Wybenga July 14, 2022		It's Kaoru, the Region of Waterloo's project manager for the captioned study. In past correspondence rec'd from you regarding this study, it was recommended that we share any natural heritage studies conducted for your review. At this point in our study we have conducted a natural heritage assessment for the study area, attached for review.

Contact Information	Date/Method of Communication	Comment/Concern	Response/Commitment to Carry Forward
			If you have any further comments, we would be grateful if you can provide them by Monday, August 14, 2022. If you have any questions, please reach out to me and Jeff (our consultant, cc'd). (and sorry if the cc's to you for the other 2 reports wasn't necessary)
			Email Sent to MNCFN July 26, 2022: We still have time but just wanted to check in and see if you had any questions on the Natural Heritage and Cultural Heritage memos we forwarded back on July 14. Please reach out if you have any questions.
		Email Received July 26, 2022: Thank you for your patience. After reviewing the documentation, I have no comments or concerns regarding the Baden-New Hamburg Water and Wastewater System at this time. Please notify MCFN DOCA if any new information arises about the said project.	**Email Response July 26, 2022:** Thanks for taking time to review. We will certainly notify when new information is available
Leroy Hill Haudenosaunee Confederacy Chiefs Council Secretary 2634 6th Line Road, P.O. Box 714, Suite 600 Oshweken N0A 1M0 1749resource@gmail.com	Notice of Commencement Initial Email sent March 2, 2021	No comments.	
	Notice of Virtual Public Consultation #1 Initial Email sent May 25, 2021 Follow-up Email sent June 16, 2021 Follow-up Call July 8, 2021	No comments.	
	Notice of Virtual Public Consultation #2 Email Sent December 1, 2021	No comments.	
	Notice of Virtual Public Consultation #3 Email Sent May 31, 2022	No comments.	

From:	Kaoru Yajima
To:	"Fawn Sault"
Cc:	"Megan DeVries"; "Mark LaForme"; Paul, Jeff; Hohner, Paula; Davidson, Moira
Subject:	RE: MCFN Response to Notice of Study Commencement Baden and New Hamburg Water and Wastewater System Servicing
Date:	Friday, April 23, 2021 1:49:55 PM
Attachments:	image001.png DOCS_ADMIN-#3635278-v1-Baden-NH_SSR_-_response_to_Mississaugas_of_New_Credit_april_2021.pdf

Hello Fawn,

Further to my email below, we have prepared responses to your letter of March 30, 2021 regarding the captioned project in the attached.

Also FYI, a participation agreement for this project signed by our CPO and countersigned by Mark LaForme has been completed.

We look forward to working with you on this project.

Regards,
Kaoru

From: Kaoru Yajima
Sent: April 12, 2021 3:03 PM
To: 'Fawn Sault' <Fawn.Sault@mncfn.ca>
Cc: Megan DeVries <Megan.DeVries@mncfn.ca>; Mark LaForme <Mark.LaForme@mncfn.ca>; Paul, Jeff <jeff.paul@stantec.com>; Hohner, Paula <Paula.Hohner@stantec.com>; 'Davidson, Moira' <Moira.Davidson@stantec.com>
Subject: RE: MCFN Response to Notice of Study Commencement Baden and New Hamburg Water and Wastewater System Servicing

Hello Fawn

Thank you for your letter dated March 30, 2021 in response to the Region of Waterloo's Notice of Study Commencement of the Baden and New Hamburg Water and Wastewater Servicing Review (DOCA Project 2021-0158).

I am working with my consultant, Stantec Consulting Ltd. (cc'd), to provide responses to your request for missing information. Due to the Good Friday/Easter Monday holiday, it is taking longer that the fourteen days requested in your letter to compile responses. I just wanted to touch base to let you know we are working on it and it will be to you shortly.

Furthermore, as requested in your letter, we are informing that we have yet to receive correspondence from the indicated DOCA Units.

I look forward to working with you and MCFN on this project.

Regards,

Kaoru Yajima, P.Eng. (he/him)
Transportation and Environmental Services, Water Services
Region of Waterloo
150 Frederick Street, 7th Floor
Kitchener, Ontario, Canada N2G 4J3
tel: 1-519-575-4757 ext.3349

ROW-WAS_email signature-v3-2

From: Fawn Sault <Fawn.Sault@mncfn.ca>
Sent: March 30, 2021 11:54 AM
To: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Cc: Megan DeVries <Megan.DeVries@mncfn.ca>; Mark LaForme <Mark.LaForme@mncfn.ca>
Subject: MCFN Response to Notice of Study Commencement Baden and New Hamburg Water and Wastewater System Servicing

Dear Kaoru,

Please see the attached letter as our response to the Study Commencement of the Baden and New Hamburg Water and Wastewater System Servicing.

Miigwech,

Fawn Sault
Consultation Coordinator
Department of Consultation and Accommodation
Mississaugas of the Credit First Nation
Cell – 289-527-6580

From:	Kaoru Yajima
To:	Paul, Jeff; Hohner, Paula; Davidson, Moira
Subject:	FW: MCFN Response to Notice of Study Commencement Baden and New Hamburg Water and Wastewater System Servicing
Date:	Tuesday, March 30, 2021 12:56:13 PM
Attachments:	2021-0158 MCFN Response to Region of Waterloo Notice of Study Commencement Baden and New Hamburg.pdf

Hi Jeff,

I rec'd this response today. They require a response within 14 days, so April 12. There has been heightened awareness by the Region when dealing with requests so please read carefully. I also note that at the end of the SSR study, the question of how First Nations was consulted may likely come up so we want to keep track.

If you can have a draft response to me early next week, that would be great. The Region may have some further opinion on this letter and our response so I'll start asking internally while you prepare the draft.

If you have any other thoughts or observations, please let me know.

Kaoru

From: Fawn Sault <Fawn.Sault@mncfn.ca>
Sent: March 30, 2021 11:54 AM
To: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Cc: Megan DeVries <Megan.DeVries@mncfn.ca>; Mark LaForme <Mark.LaForme@mncfn.ca>
Subject: MCFN Response to Notice of Study Commencement Baden and New Hamburg Water and Wastewater System Servicing

Dear Kaoru,

Please see the attached letter as our response to the Study Commencement of the Baden and New Hamburg Water and Wastewater System Servicing.

Miigwech,

Fawn Sault
Consultation Coordinator
Department of Consultation and Accommodation
Mississaugas of the Credit First Nation
Cell – 289-527-6580

DEPARTMENT OF
CONSULTATION AND ACCOMMODATION

March 30,2021

VIA EMAIL

Kaoru Yajima
Project Manager
Region of Waterloo, Water Services
kyajima@regionofwaterloo.ca

Dear Kaoru,

RE: MCFN Response to Notice of Study Commencement Baden and New Hamburg Water and Wastewater System Servicing Review

Confirmation of Receipt

I am writing on behalf of the Mississaugas of the Credit First Nation ("MCFN") to acknowledge that we have received your above named communication, dated February 4,2021 .

Outline of MCFN Rights and Territory

In 1792 , the Crown and MCFN entered into Between the Lakes, No. 3 (1792) regarding the lands in which your project is situated.

The Mississaugas of the Credit First Nation are the descendants of the "River Credit" Mississaugas. The undisputed Territory of the MCFN is defined as a Territory commencing at Long Point on Lake Erie thence eastward along the shore of the Lake to the Niagara River. Then down the River to Lake Ontario, northward along the shore of the Lake to the River Rouge east of Toronto then up that river to the dividing ridges to the head waters of the River Thames then southward to Long Point, the place of the beginning. Our Territory encompasses the lands and waters that were used and occupied by our Ancestors. Territories are usually large tracts of land that reflect the breadth required for seasonal activities and habitation and changes in those movement patterns through time. Through Treaties with the Crown, MCFN agreed to share our Territory with newcomers. However, not all of MCFN's Territory has been dealt with through a Treaty.

With the exception of a small part of the Credit River, our Treaties with the Crown did not deal with the water parts of our Territory. We have not agreed to share any part of our waters with settlers. We formally gave notice to the Crown of this claim in 2016. We note that any lands that have been artificially created on our waters have also not been dealt with by any Treaty.

Like our ancestors before us, we continue to use the lands, waters, and watershed ecosystems within our Territory for a variety of livelihood, harvesting, ceremonial and spiritual purposes. We have always exercised governance functions and stewardship in order to protect our Territory, conserve the fish and wildlife that depend upon it, and ensure its ongoing ability to sustain our people. We assert that our Aboriginal and treaty rights fundamentally entitle us to continue to act as stewards of our Territory, to be involved in decisions that affect it, and to participate in the ongoing, responsible management of the resources it provides.

Duty to Consult and Accommodate

As you will know, the Crown has a constitutional duty to consult and accommodate MCFN in respect of any decisions that might affect its asserted or proven Aboriginal and/or Treaty Rights. We expect that, consistent with the Crown's constitutional duty, no approval should be issued to this project until MCFN has been sufficiently consulted and accommodated. Nothing in this letter shall be construed as to affect our Aboriginal and/or Treaty Rights and hence shall not limit any consultation and accommodation owed to MCFN by the Crown or any proponent, as recognized by section 35 of the Constitution Act, 1982.

MCFN has the right to free and informed consent prior to the approval of any project or any planning decision adversely impacting its Territory and to benefit economically from resource development within its Territory.

MCFN has formed the Department of Consultation and Accommodation ("DOCA") to represent its interests in consultation and accommodation matters. It is DOCA's mandate to ensure that we are directly involved in all planning and development that impacts the integrity of our Territory. In this regard, DOCA will assess and help alleviate impacts on our rights, land claims, and ways of life by building relationships with governments and private sector proponents. We share a mutual interest in ensuring that projects in the Territory are planned, reviewed, and developed in a manner which ensures healthy communities, ecological protection, and sustainable development for present and future generations in the Territory.

MCFN is not opposed to development, but MCFN must to be involved in development decision making. MCFN has a deep connection to its Territory and we have a stewardship responsibility for our land. By engaging with us, a project proponent can learn our perspective on how to care for this land and we can work together to shape the project to mitigate damaging effects to our land and perhaps even work to improve our environment. MCFN is the only party who shall determine whether there are impacts to our Aboriginal and treaty rights.

One of the ways we require proponents to engage with us is in providing transparency during the environmental survey and archaeological assessment process. The best way to accomplish this is by having Field Liaison Representatives ("FLRs") on location while fieldwork is occurring, who can ensure that the Nation's special interests and concerns are respected and considered during fieldwork. The cultural and natural resources in question are part of MCFN's territory and heritage and it is our responsibility to ensure their protection, on behalf of the Nation. MCFN's stewardship of its territory extends through the life of any development project and beyond.

DOCA Project Registration

DOCA has completed an initial intake review of the project communication you have provided. This file has been assigned DOCA Project 2021-0158 ; please use this number in all future communications.

We respectfully ask you to immediately notify us if there are any changes to the project.

Referral to DOCA Units

Following DOCA's initial intake review of the project communication, the file has been referred to the following DOCA Units for additional follow-up.

	Unit Identification	Primary Contact	Email Address
✔	Archaeology	Megan DeVries	megan.devries@mncfn.ca
✔	Cultural/Historical	Darin Wybenga	darin.wybenga@mncfn.ca
✔	Environment	Fawn Sault (Temp)	fawn.sault@mncfn.ca
✔	FLR Participation	Megan DeVries	megan.devries@mncfn.ca
	Governance	Mark LaForme	mark.laforme@mncfn.ca
	Economic Development	Director	SED.Director@mncfn.ca

If you have not been contacted by the indicated DOCA Units within fourteen days following receipt of this letter, please let me know.

Request for Missing Information

In order to proceed with our follow-up review, we ask you to ensure that all available information relating to the project has been transmitted to us. We have identified the following general information as missing from your initial project communication:

	Outstanding Project Information
✔	Name of person or body undertaking the action or decision.
	Contact information for the person or body undertaking the action or decision.
✔	List of documents pertaining to the proposed action/decision that are available for MCFN to review.
✔	Description of what other information is expected to become available before the proposed action/decision is undertaken.
✔	Deadlines or filing dates pertaining to the action/decision.
✔	The Crown or Municipal review/ approval that is required for the project.
✔	How the proposed action or decision may affect and/or benefit MCFN, its rights and territory.

Closing

We ask that you respond with the above requested information within fourteen days following receipt of this letter. We thank you in advance for your attention to our requirements and we look forward to working with you further to shape the planning for development in our Territory.

Sincerely,

Fawn Sault
Consultation Coordinator
fawn.sault@mncfn.ca

From:	Davidson, Moira
Bcc:	"markhill@sixnations.ca"; "lonnybomberry@sixnations.ca"; "pgeneral@sixnations.ca"; "hdi2@bellnet.ca"; "1749resource@gmail.com"; "bryan.laforme@mncfn.ca"; "Stacey.Laforme@mncfn.ca"; "Fawn.Sault@mncfn.ca"
Subject:	Notice of Virtual Public Consultation Centre #1 - Region of Waterloo - Baden and New Hamburg Water and Wastewater System Servicing Review
Date:	Wednesday, June 16, 2021 1:11:00 PM
Attachments:	NOPCC1_BadenNewHamburg_W&WW_EA.pdf

Good Afternoon,

This email is to follow up on previous emails you have received regarding the Region of Waterloo - Baden and New Hamburg Water and Wastewater System Servicing Review. The Region of Waterloo (Region) has initiated a Servicing Review to assess the current water and wastewater systems that serve the communities of Baden, New Hamburg and Foxboro Green and assess current and future servicing needs. The Study will review existing conditions and provide recommendations related to the capacity and quality of the supply from the existing water supply system and the capacity and condition of the wastewater treatment and collection system based on current industry standards and new technologies. The recommendations of this review may include the need for upgrades to existing infrastructure or the provision of new infrastructure.

At this time, you should have received a Notice of Commencement and Notice of Virtual Public Consultation Centre (PCC1) #1 related to this project. Additional project information, including the PCC #1 materials, are available on the Region's YouTube channel or at the Region's website (https://www.regionofwaterloo.ca/CurrentWaterProjects/) should you wish to review the information any further. If you have any questions, comments, or concerns regarding the Baden and New Hamburg Water and Wastewater System Servicing Review, please contact one of the following team members:

Kaoru Yajima
Project Manager
Region of Waterloo, Water Services
Phone: 519-575-4757 x 3349
Email: kyajima@regionofwaterloo.ca

Jeff Paul, P.Eng.
Project Manager
Stantec Consulting Ltd.
Phone: 519-675-6604
Email: Jeff.Paul@stantec.com

Thank you,

Moira Davidson BES
Urban Planner
she/her

~~Direct: 519 585-7295~~
Cell: 289 244-8222
Moira.Davidson@stantec.com

Stantec
100-300 Hagey Boulevard
Waterloo ON N2L 0A4

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From: Davidson, Moira
Sent: Tuesday, May 25, 2021 1:54 PM
Cc: Kaoru Yajima <KYajima@regionofwaterloo.ca>; Paul, Jeff <jeff.paul@stantec.com>; Hohner, Paula <Paula.Hohner@stantec.com>
Subject: Notice of Virtual Public Consultation Centre #1 - Region of Waterloo - Baden and New Hamburg Water and Wastewater System Servicing Review

Good Afternoon,

Please find attached the Notice of Virtual Public Consultation Centre #1 for the Baden and New Hamburg Water and Wastewater System Servicing Review. A Public Consultation Centre (PCC) is being held online through the Region's YouTube channel to enable you to review the process that will be followed for the project, introduce the project and detail why it's being completed, and provide background information on the Baden and New Hamburg Water and Wastewater Systems. The PCC materials will be available on the Region's YouTube channel and the Region's website starting Tuesday, June 1, 2021.

Please feel free to contact a member of the project team identified on the attached Notice if you have any questions, comments, or concerns or visit https://www.regionofwaterloo.ca/CurrentWaterProjects/ for more information.

Moira Davidson BES
Urban Planner
she/her

~~Direct: 519 585 7295~~
Cell: 289 244-8222
Moira.Davidson@stantec.com

Stantec
100-300 Hagey Boulevard
Waterloo ON N2L 0A4

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Please consider the environment before printing this email.

From: Lang, Sarah
Cc:

on of Waterloo, Baden and New Hamburg Water and Wastewater System Servicing Review

Date: Tuesday, May 31, 2022 9:46:00 AM
Attachments: Baden - NewHamburg water and wastewater system servicing review -Notice PCC3 .pdf

---

Hello,

Please find the attached Notice of Virtual Public Consultation Centre (PCC) #3 for the Baden and New Hamburg Water and Wastewater System Servicing Review. A PCC is being held online through the Region's YouTube channel to present the preliminary preferred alternatives related to the future water supply system and wastewater treatment and collection system. The PCC materials will be available on the Region's YouTube channel and website starting Tuesday, June 7, 2022 until Thursday, July 7, 2022.

Please contact a member of the project team identified on the attached Notice if you have any questions, comments, or concerns, or visit https://www.regionofwaterloo.ca/CurrentWaterProjects/ for more information.

Thank you,

Sarah Lang
Environmental Planner
sarah.lang@stantec.com

Stantec

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Please consider the environment before printing this email.

From:	Kaoru Yajima
To:	"Megan DeVries"
Cc:	Fawn Sault; Paul, Jeff; Hohner, Paula
Subject:	DOCA Project 2021-0158: Region of Waterloo - Baden-New Hamburg Water & Wastewater System Servicing Review study - sending Stage 1 Archeology Report for review
Date:	Thursday, July 14, 2022 9:59:06 AM
Attachments:	image001.png Baden - New Hamburg Water & Wastewater Systems Servicing Review - Arch_Stage1_Report_20220630_dft.PDF

Hello Megan,

It's Kaoru, the Region of Waterloo's project manager for the captioned study.

In past correspondence rec'd from Fawn Sault, it was recommended that we share any archaeological studies conducted for your review. At this point in our study we have conducted a Stage 1 study and it is attached for review.

If you have any further comments, we would be grateful if you can provide them by **Monday, August 14, 2022**.

Also, I believe the team has sent prior correspondence on our virtual public consultation centres but if you needed to refer to them, the latest video can be found here.

If you have any questions, please reach out to me and Jeff (our consultant, cc'd).

Regards,

Kaoru Yajima, P.Eng. (he/him)
Transportation and Environmental Services, Water Services
Region of Waterloo
150 Frederick Street, 7th Floor
Kitchener, Ontario, Canada N2G 4J3
tel: 1-519-575-4757 ext.3349

ROW-WAS_email signature-v3-2

From:	Hohner, Paula
To:	Lang, Sarah
Subject:	FW: DOCA Project 2021-0158: Region of Waterloo - Baden-New Hamburg Water & Wastewater System Servicing Review study - sending Stage 1 Archeology Report for review
Date:	Monday, August 1, 2022 10:05:42 AM
Attachments:	image001.png image002.png

For filing and insertion into FN consultation appendix for report

Paula Hohner, MScPl, MCIP, RPP
Associate, Senior Environmental Planner
Environmental Team Lead - Transportation
Stantec
600-171 Queens Avenue London ON N6A 5J7
Mobile: 226-926-6682
paula.hohner@stantec.com

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Please consider the environment before printing this email.

From: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Sent: Tuesday, July 26, 2022 9:30 AM
To: 'Marie-Annick Prevost' <Marie-Annick.Prevost@mncfn.ca>; Adam LaForme <Adam.LaForme@mncfn.ca>
Cc: Adam LaForme <Adam.LaForme@mncfn.ca>; Paul, Jeff <jeff.paul@stantec.com>; Hohner, Paula <Paula.Hohner@stantec.com>
Subject: RE: DOCA Project 2021-0158: Region of Waterloo - Baden-New Hamburg Water & Wastewater System Servicing Review study - sending Stage 1 Archeology Report for review

Hello Marie-Annick,

Thank you for taking the time to review our report.

I will ensure that your comments are documented in the project file so in the next stage, Adam is notified of any field work.

Regards,
Kaoru

From: Marie-Annick Prevost <Marie-Annick.Prevost@mncfn.ca>
Sent: July 26, 2022 9:19 AM
To: Kaoru Yajima <KYajima@regionofwaterloo.ca>; Adam LaForme <Adam.LaForme@mncfn.ca>
Cc: Adam LaForme <Adam.LaForme@mncfn.ca>
Subject: RE: DOCA Project 2021-0158: Region of Waterloo - Baden-New Hamburg Water & Wastewater System Servicing Review study - sending Stage 1 Archeology Report for review

Aanii Kaoru,

On behalf of the Mississaugas of the Credit First Nation, Department of Consultation and Accommodation, I reviewed the Stage 1 Archaeological Assessment report prepared by Stantec for the Baden-New Hamburg Water & Wastewater System Servicing project.

I do not have questions or comments about the content of the report.

We look forward to working together on the next steps of this project. When archaeological field-work planning commences, please contact our Archaeological Operations Supervisor Adam LaForme to coordinate Field Liaison Representative participation and subsequent report review.

Miigwetch,

Marie-Annick Prevost, Ph.D. (she/her)
Field archaeologist
Mississaugas of the Credit First Nation (MCFN)
Department of Consultation and Accommodation (DOCA)
4065 Highway 6 North, Hagersville, ON N0A 1H0
Cell: 905-870-5844

From: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Sent: Thursday, July 14, 2022 10:05 AM
To: Adam LaForme <Adam.LaForme@mncfn.ca>
Cc: Abby LaForme <Abby.LaForme@mncfn.ca>
Subject: FW: DOCA Project 2021-0158: Region of Waterloo - Baden-New Hamburg Water & Wastewater System Servicing Review study - sending Stage 1 Archeology Report for review

Hello Adam,

I am forwarding this email to you, based on a automated reply rec'd by Fawn.

Please let me know if you have any questions. (and sorry, I meant to write August 15, not 14 below).

Regards,
Kaoru

From: Kaoru Yajima

Sent: July 14, 2022 9:55 AM
To: 'Megan DeVries' <Megan.DeVries@mncfn.ca>
Cc: Fawn Sault <Fawn.Sault@mncfn.ca>; Paul, Jeff <jeff.paul@stantec.com>; Hohner, Paula <Paula.Hohner@stantec.com>
Subject: DOCA Project 2021-0158: Region of Waterloo - Baden-New Hamburg Water & Wastewater System Servicing Review study - sending Stage 1 Archeology Report for review

Hello Megan,

It's Kaoru, the Region of Waterloo's project manager for the captioned study.

In past correspondence rec'd from Fawn Sault, it was recommended that we share any archaeological studies conducted for your review. At this point in our study we have conducted a Stage 1 study and it is attached for review.

If you have any further comments, we would be grateful if you can provide them by **Monday, August 14, 2022**.

Also, I believe the team has sent prior correspondence on our virtual public consultation centres but if you needed to refer to them, the latest video can be found here.

If you have any questions, please reach out to me and Jeff (our consultant, cc'd).

Regards,

Kaoru Yajima, P.Eng. (he/him)
Transportation and Environmental Services, Water Services
Region of Waterloo
150 Frederick Street, 7th Floor
Kitchener, Ontario, Canada N2G 4J3
tel: 1-519-575-4757 ext.3349



From:	Kaoru Yajima
To:	"darin.wybenga@mncfn.ca"
Cc:	Fawn Sault; Paul, Jeff; Hohner, Paula
Subject:	DOCA Project 2021-0158: Region of Waterloo - Baden-New Hamburg Water & Wastewater System Servicing Review study - sending Cultural Heritage report
Date:	Thursday, July 14, 2022 10:01:22 AM
Attachments:	image001.png Baden - New Hamburg Water & Wastewater Systems Servicing Review - Cultural_Heritage_Report_20220704_dft.PDF

Hello Darin

It's Kaoru, the Region of Waterloo's project manager for the captioned study.

In past correspondence rec'd from Fawn Sault regarding this study, it was recommended that we share any cultural heritage studies conducted for your review. At this point in our study we have conducted an existing conditions report for cultural heritage attached for review.

If you have any further comments, we would be grateful if you can provide them by **Monday, August 14, 2022**.

Also, I believe the team has sent prior correspondence on our virtual public consultation centres but if you needed to refer to them, the latest video can be found here.

If you have any questions, please reach out to me and Jeff (our consultant, cc'd).

Kaoru Yajima, P.Eng. (he/him)
Transportation and Environmental Services, Water Services
Region of Waterloo
150 Frederick Street, 7th Floor
Kitchener, Ontario, Canada N2G 4J3
tel: 1-519-575-4757 ext.3349

ROW-WAS_email signature-v3-2

From:	Kaoru Yajima
To:	"Abby.LaForme@mncfn.ca"
Cc:	Paul, Jeff; Hohner, Paula
Subject:	FW: DOCA Project 2021-0158: Region of Waterloo - Baden-New Hamburg Water & Wastewater System Servicing Review study - sending natural heritage report
Date:	Thursday, July 14, 2022 10:17:36 AM
Attachments:	image001.png Baden - New Hamburg Water & Wastewater Systems Servicing Review - Natural_Heritage_Memo_20220712_fnl.PDF

Hello Abby,

There is one more email I am forwarding.

Please let me know if you have any questions. (and again I meant to write August 15, not 14 below).

Regards,
Kaoru

From: Kaoru Yajima
Sent: July 14, 2022 9:56 AM
To: 'fawn.sault@mncfn.ca' <fawn.sault@mncfn.ca>
Cc: Paul, Jeff <jeff.paul@stantec.com>; Hohner, Paula <Paula.Hohner@stantec.com>
Subject: DOCA Project 2021-0158: Region of Waterloo - Baden-New Hamburg Water & Wastewater System Servicing Review study - sending natural heritage report

Hello Fawn,

It's Kaoru, the Region of Waterloo's project manager for the captioned study.

In past correspondence rec'd from you regarding this study, it was recommended that we share any natural heritage studies conducted for your review. At this point in our study we have conducted a natural heritage assessment for the study area, attached for review.

If you have any further comments, we would be grateful if you can provide them by **Monday, August 14, 2022**.

If you have any questions, please reach out to me and Jeff (our consultant, cc'd).

(and sorry if the cc's to you for the other 2 reports wasn't necessary)

Kaoru Yajima, P.Eng. (he/him)
Transportation and Environmental Services, Water Services
Region of Waterloo
150 Frederick Street, 7th Floor
Kitchener, Ontario, Canada N2G 4J3

From:	Hohner, Paula
To:	Lang, Sarah
Subject:	FW: DOCA Project 2021-0158: Region of Waterloo - Baden-New Hamburg Water & Wastewater System Servicing Review study - sending natural heritage report
Date:	Tuesday, August 2, 2022 11:39:59 AM
Attachments:	image002.png

For filing and Project File appendices.
Thank you
Paula

Paula Hohner, MScPl, MCIP, RPP
Associate, Senior Environmental Planner
Environmental Team Lead - Transportation
Stantec
600-171 Queens Avenue London ON N6A 5J7
Mobile: 226-926-6682
paula.hohner@stantec.com

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Please consider the environment before printing this email.

From: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Sent: Tuesday, July 26, 2022 3:29 PM
To: 'Abby LaForme' <Abby.LaForme@mncfn.ca>
Cc: Mark LaForme <Mark.LaForme@mncfn.ca>; Paul, Jeff <jeff.paul@stantec.com>; Hohner, Paula <Paula.Hohner@stantec.com>
Subject: RE: DOCA Project 2021-0158: Region of Waterloo - Baden-New Hamburg Water & Wastewater System Servicing Review study - sending natural heritage report

Hello Abby,

Thanks for taking time to review.

We will certainly notify when new information is available.

Regards,
Kaoru

From: Abby LaForme <Abby.LaForme@mncfn.ca>
Sent: July 26, 2022 3:27 PM
To: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Cc: Mark LaForme <Mark.LaForme@mncfn.ca>
Subject: RE: DOCA Project 2021-0158: Region of Waterloo - Baden-New Hamburg Water & Wastewater System Servicing Review study - sending natural heritage report

Good afternoon,

Thank you for your patience.
After reviewing the documentation, I have no comments or concerns regarding the Baden-New Hamburg Water and Wastewater System at this time.
Please notify MCFN DOCA if any new information arises about the said project.

Thank you

Abby LaForme,
Acting Consultation Coordinator

Mississaugas of the Credit First Nation (MCFN)
Department of Consultation & Accommodation (DOCA)
4065 Highway 6, Hagersville, ON N0A 1H0
Ph: (905) 768 – 4260
Email: Abby.LaForme@mncfn.ca

From: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Sent: Tuesday, July 26, 2022 10:21 AM
To: Abby LaForme <Abby.LaForme@mncfn.ca>
Cc: Mark LaForme <Mark.LaForme@mncfn.ca>
Subject: RE: DOCA Project 2021-0158: Region of Waterloo - Baden-New Hamburg Water & Wastewater System Servicing Review study - sending natural heritage report

Hi Abby,

No problem at all. I've attached the Natural Heritage memo for the project.

I am also attaching the Cultural Heritage memo but would you be the reviewer for this as well?

Kaoru

From: Abby LaForme <Abby.LaForme@mncfn.ca>
Sent: July 26, 2022 10:18 AM
To: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Cc: Mark LaForme <Mark.LaForme@mncfn.ca>
Subject: RE: DOCA Project 2021-0158: Region of Waterloo - Baden-New Hamburg Water & Wastewater System Servicing Review study - sending natural heritage report

Good Morning Kaoru,

Unfortunately I cannot find the Natural Heritage memos that were sent on July 14. If you could please send again and I will review and comment ASAP.

I apologize for this inconvenience.

Thank you

Abby LaForme,
Acting Consultation Coordinator

Mississaugas of the Credit First Nation (MCFN)
Department of Consultation & Accommodation (DOCA)
4065 Highway 6, Hagersville, ON N0A 1H0
Ph: (905) 768 – 4260
Email: Abby.LaForme@mncfn.ca

From: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Sent: Tuesday, July 26, 2022 9:35 AM
To: Abby LaForme <Abby.LaForme@mncfn.ca>
Cc: 'Paul, Jeff' <jeff.paul@stantec.com>; 'Hohner, Paula' <Paula.Hohner@stantec.com>
Subject: RE: DOCA Project 2021-0158: Region of Waterloo - Baden-New Hamburg Water & Wastewater System Servicing Review study - sending natural heritage report

Hello Abby,

We still have time but just wanted to check in and see if you had any questions on the Natural Heritage and Cultural Heritage memos we forwarded back on July 14.

Please reach out if you have any questions.

Regards,
Kaoru

From: Kaoru Yajima
Sent: July 14, 2022 10:17 AM
To: 'Abby.LaForme@mncfn.ca' <Abby.LaForme@mncfn.ca>
Cc: Paul, Jeff <jeff.paul@stantec.com>; Hohner, Paula <Paula.Hohner@stantec.com>
Subject: FW: DOCA Project 2021-0158: Region of Waterloo - Baden-New Hamburg Water & Wastewater System Servicing Review study - sending natural heritage report

Hello Abby,

There is one more email I am forwarding.

Please let me know if you have any questions. (and again I meant to write August 15,

not 14 below).

Regards,
Kaoru

From: Kaoru Yajima
Sent: July 14, 2022 9:56 AM
To: 'fawn.sault@mncfn.ca' <fawn.sault@mncfn.ca>
Cc: Paul, Jeff <jeff.paul@stantec.com>; Hohner, Paula <Paula.Hohner@stantec.com>
Subject: DOCA Project 2021-0158: Region of Waterloo - Baden-New Hamburg Water & Wastewater System Servicing Review study - sending natural heritage report

Hello Fawn,

It's Kaoru, the Region of Waterloo's project manager for the captioned study.

In past correspondence rec'd from you regarding this study, it was recommended that we share any natural heritage studies conducted for your review. At this point in our study we have conducted a natural heritage assessment for the study area, attached for review.

If you have any further comments, we would be grateful if you can provide them by **Monday, August 14, 2022**.

If you have any questions, please reach out to me and Jeff (our consultant, cc'd).

(and sorry if the cc's to you for the other 2 reports wasn't necessary)

Kaoru Yajima, P.Eng. (he/him)
Transportation and Environmental Services, Water Services
Region of Waterloo
150 Frederick Street, 7th Floor
Kitchener, Ontario, Canada N2G 4J3
tel: 1-519-575-4757 ext.3349



From:	Hohner, Paula
To:	Lang, Sarah
Subject:	FW: DOCA Project 2021-0158: Region of Waterloo - Baden-New Hamburg Water & Wastewater System Servicing Review study - sending natural heritage report
Date:	Monday, August 1, 2022 10:04:42 AM
Attachments:	image001.png

For filing

Paula Hohner, MScPl, MCIP, RPP
Associate, Senior Environmental Planner
Environmental Team Lead - Transportation
Stantec
600-171 Queens Avenue London ON N6A 5J7
Mobile: 226-926-6682
paula.hohner@stantec.com

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Please consider the environment before printing this email.

From: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Sent: Tuesday, July 26, 2022 9:35 AM
To: 'Abby.LaForme@mncfn.ca' <Abby.LaForme@mncfn.ca>
Cc: Paul, Jeff <jeff.paul@stantec.com>; Hohner, Paula <Paula.Hohner@stantec.com>
Subject: RE: DOCA Project 2021-0158: Region of Waterloo - Baden-New Hamburg Water & Wastewater System Servicing Review study - sending natural heritage report

Hello Abby,

We still have time but just wanted to check in and see if you had any questions on the Natural Heritage and Cultural Heritage memos we forwarded back on July 14.

Please reach out if you have any questions.

Regards,
Kaoru

From: Kaoru Yajima
Sent: July 14, 2022 10:17 AM
To: 'Abby.LaForme@mncfn.ca' <Abby.LaForme@mncfn.ca>
Cc: Paul, Jeff <jeff.paul@stantec.com>; Hohner, Paula <Paula.Hohner@stantec.com>
Subject: FW: DOCA Project 2021-0158: Region of Waterloo - Baden-New Hamburg Water & Wastewater System Servicing Review study - sending natural heritage report

Hello Abby,

There is one more email I am forwarding.

Please let me know if you have any questions. (and again I meant to write August 15, not 14 below).

Regards,
Kaoru

From: Kaoru Yajima
Sent: July 14, 2022 9:56 AM
To: 'fawn.sault@mncfn.ca' <fawn.sault@mncfn.ca>
Cc: Paul, Jeff <jeff.paul@stantec.com>; Hohner, Paula <Paula.Hohner@stantec.com>
Subject: DOCA Project 2021-0158: Region of Waterloo - Baden-New Hamburg Water & Wastewater System Servicing Review study - sending natural heritage report

Hello Fawn,

It's Kaoru, the Region of Waterloo's project manager for the captioned study.

In past correspondence rec'd from you regarding this study, it was recommended that we share any natural heritage studies conducted for your review. At this point in our study we have conducted a natural heritage assessment for the study area, attached for review.

If you have any further comments, we would be grateful if you can provide them by **Monday, August 14, 2022**.

If you have any questions, please reach out to me and Jeff (our consultant, cc'd).

(and sorry if the cc's to you for the other 2 reports wasn't necessary)

Kaoru Yajima, P.Eng. (he/him)
Transportation and Environmental Services, Water Services
Region of Waterloo
150 Frederick Street, 7th Floor
Kitchener, Ontario, Canada N2G 4J3
tel: 1-519-575-4757 ext.3349



TRANSPORTATION AND
ENVIRONMENTAL SERVICES
Water Services
150 Frederick Street 7th Floor
Kitchener Ontario N2G 4J3 Canada
Telephone: 519-575-4400
TTY: 519-575-4608
Fax: 519-575-4452
www.regionofwaterloo.ca

April 23, 2021

Fawn Sault, Consultation Coordinator
Mississaugas of the Credit First Nation
Department of Consultation and Accommodation
4065 Hwy #6
Hagersville, ON N0A 1H0

Sent via E-mail: fawn.sault@mncfn.ca

Dear Fawn:

Subject line: **Baden and New Hamburg Water and Wastewater Servicing Review (DOCA Project 2021-0158)**

Please accept this letter in response to information requested on March 30, 2021 regarding the Baden and New Hamburg Water and Wastewater Servicing Review (DOCA Project 2021-0158). The following is provided to you to ensure you have the available information needed to complete your review:

Name of person or body undertaking the action or decision:

Proponent: Region of Waterloo
Proponent Project Manager: Kaoru Yajima, Sr. Engineer, Water Services
Region of Waterloo
150 Frederick Street, 7th Floor
Kitchener, Ontario N2G 4J3
Tel: 519-575-4757 ext. 3349
Email: kyajima@regionofwaterloo.ca

Consultant: Stantec Consulting Ltd.
Consultant Project Manager: Jeff Paul, P.Eng., Project Manager
Stantec Consulting Ltd.
171 Queens Ave #600
London, ON N6A 5J7
Tel: 519-675-6604
Email: Jeff.Paul@stantec.com

List of documents pertaining to the proposed action/decision that are available for MCFN to review:

As the project is still in it's early stages, there is currently no information that has been issued for review at this time. During the course of the project, three virtual public consultation centres (PCC) are planned during this project and notices of each will be emailed to you in advance. Information boards/presentation materials will be made available on the Region's website. We would be happy to email you the information directly if preferred.

A Baden-New Hamburg Water/Wastewater System Servicing Report will be prepared at the end of this study and will summarize the background information collected, alternatives assessed and the preferred solution(s). This report will be posted to the Region's website for the MCFN to review and comment as part of the 30-day public review period. Again, we would be happy to email you the information directly if preferred. A Notice of Completion of this report will be emailed to you when it becomes available.

Description of what other information is expected to become available before the proposed action/decision is undertaken:

<u>Cultural Heritage/Historical</u>

A desktop review of cultural heritage resources has been prepared as part of the initial stages of the project. It was determined that several resources are present within the study area including:

- individual heritage resources that are designated under Part IV of the Ontario Heritage Act;
- resources that are listed on the Municipal Heritage Register; and,
- the New Hamburg Heritage Conservation District.

Once the proposed location(s) of water and wastewater infrastructure are determined, a screening checklist and/or a Cultural Heritage Assessment Report will be completed as required. The timing of this report is unknown at this time.

<u>Archaeology</u>

A preliminary archaeological review of the study area has been prepared as part of the initial stages of the project. It was determined that portions of the study area retain potential for the identification of archaeological resources. Once the proposed

location(s) of water and wastewater infrastructure are determined, a Stage 1 Archaeological Assessment will be completed as required. The timing of this report will be determined later in the project.

Environment

A desktop review of available background information was conducted as part of the initial stages of the project to identify the sensitive terrestrial and aquatic features. The following features are known to occur or have the potential to occur in the study area:

- Fish Habitat;
- Presence of an aquatic Species of Conservation Concern (SOCC) – Rainbow Mussel;
- Presence of an aquatic Species at Risk (SAR) - Silver Shiner;
- Presence of a Provincially Significant Wetland (PSW) Complex;
- Non-provincially significant wetlands; and,
- Life Science Areas of Natural and Scientific Interest (ANSI).

Once the proposed location(s) of water and wastewater infrastructure are determined, a Natural Heritage Report will be completed to review key environmental features, potential impacts, and mitigation requirements. The timing of this report will be determined later in the project.

Deadlines or filing dates pertaining to the action/decision:

The Final Report is tentatively scheduled to be presented to Region of Waterloo Council in spring of 2022.

The Crown or Municipal review/ approval that is required for the project:

Region of Waterloo Council will review/approve this study.

How the proposed action of decision may affect and/or benefit MCFN, its rights and territory

We do not anticipate impacts to MCFN rights and territory as a result of required water and wastewater infrastructure; however, we do rely on the MCFN and DOCA Units to advise the Region of Waterloo and consultant of the potential effects and/or benefits of the proposed actions upon your review of the information available.

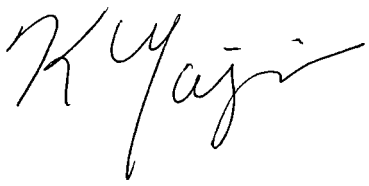
Closing

We have added the following DOCA Units to our project contact list: Megan DeVries (Archaeology/FLR Participation), Darin Wybenga (Cultural/Heritage), and Fawn Sault

(Environment). We will contact you at key stages during the planning process as noted above (i.e., 3 PCCs and Notice of Completion).

We look forward to working with you on this project. Please let us know if you are interested in discussing this project in more detail or have questions at any point during the project. We would be pleased to arrange a phone call or virtual meeting.

Sincerely,



Kaoru Yajima
Senior Engineer
kyajima@regionofwaterloo.ca
5195754757x3349

Cc: Jeff Paul, Stantec

PUBLIC / STAKEHOLDER CORRESPONDENCE

Baden and New Hamburg
Water and Wastewater System Servicing Review
Public Comment Tracking

Contact Information	Comment	Response/Commitment to Carry Forward
	02/04/2021 - Regional sewer main goes through community to a pumping station that is located close to the Nith River and then the sewage is pumped into a regional waste treatment plant on the south side of the Nith River. Owners have a significant interest in understanding how or if any planned modifications would impact the community. The owners would appreciate direct communication to provide a high level assessment of whether the region anticipates that the planned modifications would impact the community in any way.	02/05/2021 - To be included in contact list for future notifications. Owner was also advised of the following: "With a two tier system of government, some works are managed by the Region of Waterloo and some by the Township of Wilmot. In this case, the Morningside Pumping Station, the New Hamburg Wastewater Treatment Plant and the connecting force main are all managed by the Region of Waterloo. The Morningside sanitary trunk sewer (which runs through your community) is managed by the Township of Wilmot and is the subject of a concurrent Environmental Assessment. If you haven't already done so, I can put you in contact with the Township to ensure you are involved with that study as well. I can advise at this stage of the Baden and New Hamburg Water and Wastewater System Servicing Review,

Contact Information	Comment	Response/Commitment to Carry Forward
		we are working on an understanding of background conditions and have not advanced to consider if or options how to modify the system. That information will be forthcoming at future public meetings and we can discuss with you then."
	1. What are some of the key factors important to you that should be taken into account during this Study? As you are aware, our community Morningside in New Hamburg is populated by approximately 600 senior citizens who have chosen to live along the banks of the Nith River for the peace and tranquility that our location offers. We are regularly fielding calls and requests for information about the studies that the Region and the Township have recently initiated. We wish to keep an open dialogue with you and the engineers while at the same	

Contact Information	Comment	Response/Commitment to Carry Forward
	time, being able to communicate to our residents so that they stay informed and come up with solutions that will be beneficial for the Region and least disruptive for us and our residents. **2. Do you agree with the problem/opportunity statement? Are there any other considerations?** Yes we do. As previously expressed, we wish the solutions can be beneficial for the Region and its population, while being minimally disruptive to us and our residents. **3. Do you have any other questions or comments you would like to share with the project team?** No, just make sure the undersigned and Lloyd Sheiner are registered on your mailing list.	

Contact Information	Comment	Response/Commitment to Carry Forward
	Phone Call May 9, 2022: Discussed that his mother in laws property is under consideration as a possible route alignment. Was agreeable to showing the alignment through the property. He was hoping to see a markup, but was told this was just a planning exercise and it would just be a map with an alignment at this stage. Asked what construction may look like. Was informed it would be open cut, about 6-8' below the surface.	
	Email January 11, 2022: Thank you for providing the Baden and New Hamburg Water and Wastewater System Servicing Review PIC #2. We have reviewed the information presented and provide our comments, attached, for your consideration. We would appreciate the opportunity to discuss our comments further with you.	**Letter Response January 11, 2022:** **Water Supply System** Under future conditions, is there consideration for expanding the Baden Pressure Zone west of Nafziger Road? This approach would better support future development identified at the north and east limits of New Hamburg. **Wastewater System** Alternative WW2 – Upgrade System and Maintain Existing Configuration is our preferred alternative. Other alternatives appear to base future growth on the currently identified Urban Area Boundaries. Recognizing that over time, boundaries may change as growth

Contact Information	Comment	Response/Commitment to Carry Forward
		continues it is strongly recommended that servicing take gravity limits into consideration. Per the Wastewater Servicing Study For New Growth Areas Baden and New Hamburg (CRA, 2014) it is noted that Parcels L, M, and W drain by gravity to Waterloo Street to the north (identified as proposed sewer outlet beyond 2029) (Excerpt attached). Having said that, based on topography, much of Parcels L, M, and W drain towards the Ivan Gingerich Drain which bisects all of the parcels and drains west towards Parcels F and G. Based on this, the catchment area draining to the proposed trunk sewer connection at the south limit of Parcels F and G (through parcel N) via gravity is larger. As such, an upgrade to the Morningside Trunk Sewer between the Highway and the Morningside Pumping Station as identified in Alternative WW2 and as being evaluated by the Township Morningside Sanitary Trunk Sewer Class Environmental Assessment is recommended to assist in accommodating the proposed growth between New Hamburg and Baden.

Contact Information	Comment	Response/Commitment to Carry Forward
		While it may have been contemplated that Parcels L, M and W may drain south along Nafziger Rd in a future condition, the existing railroad tracks are a high point on Nafziger Road making routing wastewater to the south on Nafziger a more costly route due to greater depths of sewers. Alternative WW2 also maintains the wastewater infrastructure in a consolidated corridor which helps to minimize construction costs should there be future repairs or maintenance. This routing and alignment maximizes the use existing infrastructure while minimizing reliance on pumping stations.
	Email February 12, 2021: I am a resident of Baden, and noticed the Public Notice in the New Hamburg Independent this morning. I would like to be included in the contact list for this study.	**Email Response February 12, 2021:** Thanks for your interest in the study Brandon. We will include you in the contact list.
	Email February 16, 2021: Can you please add me to your list to receive notices and information?	**Email Response February 16, 2021:** Yes certainly, I'll have our team add you to the email list. We're just getting started so we don't have anything to present yet but will be

Contact Information	Comment	Response/Commitment to Carry Forward
		posting on our website as the study evolves. Thanks for reaching out.
	Email February 14, 2021: Could you please send me more information on this project as I see from the study area map in the New Hamburg Independent my home is included	**February 16, 2021:** Yes certainly, I'll have our team add you to the email list. We're just getting started so we don't have anything to present yet but will be posting on our website as the study evolves. Thanks for reaching out.
	Email February 7, 2021: Can you please add me to the email list for the water/waste water study that will be happening in Baden/New Hamburg?	**Email Response February 7, 2021:** Thanks for reaching out. I'll get our team to put your name on the mailing list. I'll have you listed as Joanne McCallum but if there's a change, please let us know.
	Email February 19, 2021: Please add me to the email contact list to receive public notices on this study.	**Email Response February 19, 2021:** We can certainly add you to the notification list. Thanks for reaching out.
	Email February 18, 2021: Many thanks for reaching out to us re the above study. I would appreciate very much if you would add my name to your contact list and I can distribute to those people who will be involved in this project.	**Email February 18, 2021:** We have you on our list. If there are any others who might be interested in the project, we can add them to our list, or if you could forward as material becomes available, that would be appreciated. Right now, we don't have too much to share as we're just getting started.

Contact Information	Comment	Response/Commitment to Carry Forward
	Email February 11, 2021: I saw the Notice of Study Commencement for the Baden and New Hamburg Water and Wastewater System Servicing Review and would like to be placed on the notification list on any updates and reports that are issued. Are you compiling a subscribers list? Please let me know as I have a lot of interest in the long term future in that area. And, if you could add my dad to	**Email Response February 11, 2021:** We have an emailing list so I'll have our project consultant, Stantec, add you and your father to our list. We don't have anything yet as we are still in the background stage but will be posting material on our website as the study moves along.
	Email February 12, 2021: Can you please put my email address on the contact list to receive project notices and updates. I live in Foxboro Green and am interested in the progress on this study and how it may affect our community in the future.	**Email Response February 12, 2021:** Yes certainly, I'll have our team add you to the email list. We're just getting started so we don't have anything to present yet but will be posting on our website as the study evolves.
	Comment Received June 15, 2022: I see there is a need to improve Foxboro Green water and waste water system's. Since Foxboro Green is listed on there website having 215 single detached homes in a private community with pools recreational buildings ect. They are paying condo fee's to maintain there	

Contact Information	Comment	Response/Commitment to Carry Forward
	water and wastewater systems. My question is how is this project being funded? Like the water project in St Agatha were water was supplied to that village the home owners were responsible to pay the cost? Is this project being funded by the home owners or by the tax payers of the Region of Waterloo? Please provide this funding information as I feel since I have a private residence and if my septic system fails I have to pay the costs to replace or repair it. Foxboro Green is a private community it should be funded by that community	
Waterloo Standard Condominium Corporation #365 132 Foxboro Drive Baden, ON Vice President,	**June 22, 2022:** To: The Waterloo standard Condominium Corporation #365 is serving notice of its intention to provide a 9+ page	

Contact Information	Comment	Response/Commitment to Carry Forward
	submission, via courier on Friday, June 23, 2022. The submission will include: + Our Perspective + 3 Action Items required of the Region of Waterloo, Municipality of Wilmot, and Stantec + Numerous Questions and Rationale + Summary + 4 Contact Names + Signatures of Board Officials and Heads of Affected Foxboro Committees. (approx. 13) + CC to Corporation's Property Manager and legal counsel Suggestion re.IMMEDIATE ACTION: might consider facilitating meeting date(s) for conducting forums toward understandings of our mutual positions. My name is , a resident of Foxboro Green and the Chair of an ad hoc committee formally structured by the Board to facilitate negotiations between	

Contact Information	Comment	Response/Commitment to Carry Forward
	Foxboro and the Region, Township and Stantec regarding this proposed project. The Corporation's property manager is on holiday, and thus unable to receive mailed or faxed correspondence at our office, so I am providing my home address for print communications.	
	Letter Received June 23, 2022. Letter is appended below.	A meeting was subsequently set up with Waterloo Standard Condominium Corp #365.

From:	Kaoru Yajima
To:	Paul, Jeff
Cc:	Hohner, Paula
Subject:	RE: Future Forcemain Alignment
Date:	Friday, May 6, 2022 10:27:48 AM
Attachments:	image004.png image006.png

FYI

Hi Jeff,

I called the number you provided and talked to

I also went over our plans about connecting a pipe down

I explained it was just a consideration and that no decisions have been made.

She said she will defer discussions on property to her son in law,

he requested that I call him on Monday so she can brief him ahead of time.

I'll give him a call Monday.

Kaoru

From: Paul, Jeff <jeff.paul@stantec.com>
Sent: May 5, 2022 12:45 PM
To: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Cc: Hohner, Paula <Paula.Hohner@stantec.com>
Subject: RE: Future Forcemain Alignment

Kaoru,

Was just trying to find the e-mail address when I saw your email. I searched through the stakeholder list for the EA and he hasn't registered with us. Internet search wasn't helpful on email but I think I found a 10 year old picture of him.

Sorry I couldn't be of more help.

Jeff Paul P.Eng.
Managing Senior Principal

Mobile: 519 319-5806
jeff.paul@stantec.com

Stantec
600-171 Queens Avenue

London ON N6A 5J7

From: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Sent: Thursday, May 5, 2022 12:36 PM
To: Paul, Jeff <jeff.paul@stantec.com>
Cc: Hohner, Paula <Paula.Hohner@stantec.com>
Subject: RE: Future Forcemain Alignment from Holland Mills Road to New Hamburg WWTP

Hi Jeff,

I'm going to assume you couldn't find an email which is ok. I think I will call. In preparing though, I couldn't ascertain the address from the PDF you provided. On google maps, it makes reference to Holland Mills road but no municipal address. Just wanted to see if you had something accurate for me to verbally reference to Mr. Offak. If not, I'll just go with the road name.

Thanks,
Kaoru

From: Paul, Jeff <jeff.paul@stantec.com>
Sent: May 4, 2022 4:24 PM
To: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Cc: Hohner, Paula <Paula.Hohner@stantec.com>
Subject: RE: Future Forcemain Alignment from Holland Mills Road to New Hamburg WWTP

Kaoru,

With this info, I was able to get a phone number on-line. I'm assuming it should be someone from the Region to initiate contact but let me know if you need me to do anything.





Thanks,
Jeff Paul P.Eng.
Managing Senior Principal

Mobile: 519 319-5806
jeff.paul@stantec.com

Stantec
600-171 Queens Avenue

London ON N6A 5J7

From: Harold O'Krafka <harold.okrafka@Wilmot.ca>
Sent: Wednesday, May 4, 2022 4:19 PM
To: Paul, Jeff <jeff.paul@stantec.com>
Cc: Hohner, Paula <Paula.Hohner@stantec.com>; Kocher, Michael <Michael.Kocher@stantec.com>; Kaoru Yajima <KYajima@regionofwaterloo.ca>
Subject: RE: Future Forcemain Alignment from

Yep this is what our system shows:

Regards

From: Paul, Jeff <jeff.paul@stantec.com>
Sent: Wednesday, May 4, 2022 4:09 PM
To: Harold O'Krafka <harold.okrafka@Wilmot.ca>
Cc: Hohner, Paula <Paula.Hohner@stantec.com>; Kocher, Michael <Michael.Kocher@stantec.com>; Kaoru Yajima <KYajima@regionofwaterloo.ca>
Subject: RE: Future Forcemain Alignment from

CAUTION: This email originated from outside of the organization. Do not click links or open any attachments unless you recognize the sender and know the content is safe.

Harold,

We did an ownership search for the property in question and came up with the attached. The Region would like to initiate the discussion with the owner as soon as possible. Our only issue is that Geowarehouse does not provide contact information. Is that something the Township can assist with?

Thanks,
Jeff Paul P.Eng.
Managing Senior Principal

Mobile: 519 319-5806
jeff.paul@stantec.com

Stantec
600-171 Queens Avenue
London ON N6A 5J7

From: Harold O'Krafka <harold.okrafka@Wilmot.ca>
Sent: Tuesday, May 3, 2022 10:48 AM
To: Kocher, Michael <Michael.Kocher@stantec.com>
Cc: Paul, Jeff <jeff.paul@stantec.com>; Hohner, Paula <Paula.Hohner@stantec.com>; Holmes, Hailey <Hailey.Holmes@stantec.com>
Subject: RE: Future Forcemain Alignment

Hi Michael
Sorry for not responding earlier I had looked into it and we have no records that explain the disconnect but our mapping from both MPAC and from Terranet both concur there is a gap in the unopened road allowance network.
Hopefully the land owner is co-operative nonetheless.
H

From: Kocher, Michael <Michael.Kocher@stantec.com>
Sent: Tuesday, May 3, 2022 10:44 AM
To: Harold O'Krafka <harold.okrafka@Wilmot.ca>
Cc: Paul, Jeff <jeff.paul@stantec.com>; Hohner, Paula <Paula.Hohner@stantec.com>; Holmes, Hailey <Hailey.Holmes@stantec.com>
Subject: Future Forcemain Alignment from

CAUTION: This email originated from outside of the organization. Do not click links or open any attachments unless you recognize the sender and know the content is safe.

Hi Harold,

During out meeting last week you mentioned that there may be an unopened road allowance that exists between

.

The Region's GIS navigator seems to show a disconnect between and the WWTP for this road allowance (see attached). However, I realize the GIS Navigator doesn't necessarily show legal property boundaries. Do you have any legal plans or information that might help show the unopened road allowance in this section?

Thanks
Mike

Mike Kocher P.Eng.
Practice Leader, Water

Direct: 519 585-7494
Mobile: 519 807-3464
Fax: 519 579-6733
Michael.Kocher@stantec.com

Stantec
100-300 Hagey Boulevard
Waterloo ON N2L 0A4

From: Hohner, Paula
To: Lang, Sarah
Subject: FW: Future Forcemain Alignment from
Date: Tuesday, May 17, 2022 11:27:44 AM
Attachments: image002.png
image004.png

From: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Sent: Monday, May 9, 2022 9:41 AM
To: Paul, Jeff <jeff.paul@stantec.com>
Cc: Hohner, Paula <Paula.Hohner@stantec.com>
Subject: RE: Future Forcemain Alignment from

Hello Jeff,

.

Could you add him to the project email contact list:

He wanted to see a sketch but I told him this was just a planning exercise at the moment and it would just be a map with alignment.

He also wanted to know what the construction may look like. I informed him it would be open cut, about 6-8' below the surface. I think it would be good to have some sample pictures ready of open cut in the field. Would Stantec happen to have a few good ones for the size of pipe in consideration?

Kaoru

RIVER MEADOW HOMES INC.

March 30, 2021

RE: Morningside Pumping Station and Sanitary Trunk Sewer Studies

Dear Morningside Residents,

We are writing to make you aware of two studies that are being carried out by both the Township of Wilmot and the Region of Waterloo that could impact Morningside.
As you all may know, there is a pumping station to the right of the Village Center. That pumping station belongs to the Region of Waterloo. There is also a sanitary sewer that generally follows along the creek between phase I and phases III & IV that leads to the pumping station. That sanitary sewer belongs to the Township of Wilmot.
As population grows in the Township in the north end of New Hamburg as well as in Baden, both the Township and the Region are looking at different ways to increase the capacity of the existing installations in order to accommodate anticipated growth.

These studies are in preliminary stages and information relating thereto will be available throughout the process on the websites of these public authorities. For now they have identified various options and are asking stake holders for their input. Accordingly, we as the owners of Morningside are very engaged in these discussions. We had a call with the engineer for the Township last week and discussed the objectives of the study and the various options wherein we expressed our concerns. While we have no certainty until everything is completed, the engineer advised that it is highly unlikely that the expansion of the sanitary sewer will occur by means of an excavation whereby they would be digging up our streets or your yards. They are leaning toward using modern systems where they would use technology to bore underneath essentially tunnelling rather than digging. There are also a number of alternative routes that could involve completely bypassing the village.

Rest assured that we are fully engaged in the process of making sure that any expansion occurs strictly within the legal rights of the Township and the Region and in a manner that is most beneficial and least disruptive to all of you.

We plan to regularly report to you all as to our discussions, the direction of these studies and the proposed timing in a fully transparent manner as always.

In the meantime, we hope that you are all well, getting vaccinated and looking forward to a beautiful spring in our lovely community.

Thank you

Lloyd Steiner, President
River Meadow Homes Inc.

From:

Cc: Kaoru Yajima; Hohner, Paula; Davidson, Moira
Subject: RE: Baden & New Hamburg Water / Wastewater Servicing Review
Date: Friday, February 12, 2021 9:55:11 AM
Attachments: image001.jpg

Thanks for your interest in the study . We will include you in the contact list.

Jeff Paul P.Eng.
Managing Principal

Direct: 519 675-6604
Mobile: 519 319-5806
Fax: 519 645-6575
jeff.paul@stantec.com

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From:
Sent: Friday, February 12, 2021 9:23 AM
To: Kaoru Yajima <KYajima@regionofwaterloo.ca>; Paul, Jeff <jeff.paul@stantec.com>
Subject: Baden & New Hamburg Water / Wastewater Servicing Review

Good morning Kaoru & Jeff,

I am a resident of Baden, and noticed the Public Notice in the New Hamburg Independent this morning. I would like to be included in the contact list for the study.

Thank you kindly.

Regards,



information and is for the sole use of the

From: Kaoru Yajima
To:
Cc: Paul, Jeff; Davidson, Moira; Hohner, Paula
Subject: RE: Water system review
Date: Tuesday, February 16, 2021 1:45:41 PM

Hello Dan

Yes certainly, I'll have our team add you to the email list.

We're just getting started so we don't have anything to present yet but will be posting on our website as the study evolves.

Thanks for reaching out.

Kaoru

-----Original Message-----
From:
Sent: February 16, 2021 1:07 PM
To: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Subject: Water system review

Hi Kaoru!

Can you please add me to your list to receive notices and information?

Thanks

Sent from my iPhone

From: Kaoru Yajima
To:
Cc: Paul, Jeff; Davidson, Moira; Hohner, Paula
Subject: RE: Baden and New Hamburg Water and Wastewater System Servicing Review
Date: Tuesday, February 16, 2021 10:46:20 AM

Hello

Yes certainly, I'll have our team add you to the email list.

We're just getting started so we don't have anything to present yet but will be posting on our website as the study evolves.

Thanks for reaching out.

Kaoru

From:
Sent: February 14, 2021 4:19 PM
To: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Subject: Baden and New Hamburg Water and Wastewater System Servicing Review

Hello, Kaoru,

Could you please send me more information on this project as I see from the study area map in the New Hamburg Independent my home is included.

Virus-free. www.avast.com

From: Kaoru Yajima
To:
Cc: Paul, Jeff; Davidson, Moira
Subject: RE: Water Review email list
Date: Sunday, February 7, 2021 7:19:54 PM

Thanks for reaching out.

I'll get our team to put your name on the mailing list. I'll have you listed as 'Joanne McCallum' but if there's a change, please let us know.

Regards,
Kaoru

Moira, please add Joanne to the email list, tks, Kaoru

From:
Sent: February 7, 2021 5:18 PM
To: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Subject: Water Review email list

Hello,

Can you please add me to the email list for the water/waste water study that will be happening in Baden/New Hamburg?

From: Hohner, Paula

Subject: RE: Wilmot water and waste study

Date: Friday, February 19, 2021 8:31:09 AM

We can certainly add you to the notification list.

Thanks for reaching out.

Kaoru

From:

Sent: February 19, 2021 6:46 AM

To: Kaoru Yajima <KYajima@regionofwaterloo.ca>

Subject: Wilmot water and waste study

Hi--Please add me to the e-mail contact list to receive public notices on this study.
Thank you.

From: Kaoru Yajima
To:
Cc: Paul, Jeff; Hohner, Paula; Davidson, Moira
Subject: RE: Baden and New Hamburg Water and Wastewater
Date: Thursday, February 18, 2021 12:03:59 PM

Thanks for confirming

We have you on our list. If there are any others who might be interested in the project, we can add them to our list, or if you could forward as material becomes available, that would be appreciated.

Right now, we don't have too much to share as we're just getting started.

Regards
Kaoru

From:
Sent: February 18, 2021 11:59 AM
To: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Subject: Baden and New Hamburg Water and Wastewater

Hi Kaoru,

Many thanks for reaching out to us re the above study. I would appreciate very much if you would add my name to your contact list and I can distribute to those people who will be involved in this project.

Thanks and regards,

From: Kaoru Yajima
To:
Cc: Paul, Jeff; Davidson, Moira; Hohner, Paula
Subject: RE: Notice of Study - Baden and New Hamburg
Date: Thursday, February 11, 2021 10:04:43 AM

Hello

Thanks for reaching out.

We have a emailing list so I'll have our project consultant, Stantec, add you and your father to our list (Jeff, please see that the two are added to the list).

We don't have anything yet as we are still in the background stage but will be posting material on our website as the study moves along.

Thanks,
Kaoru

From:
Sent: February 11, 2021 9:59 AM
To: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Subject: Notice of Study - Baden and New Hamburg

Kaoru,

I saw the Notice of Study Commencement for the Baden and New Hamburg Water and Wastewater System Servicing Review and would like to be placed on the notification list on any updates and reports that are issued. Are you compiling a subscribers list?

Please let me know as I have a lot of interest in the long term future in that area.

And, if you could add my dad to that list:

Many thanks,

From: Kaoru Yajima
To: Hohner, Paula; Davidson, Moira
Cc: Paul, Jeff
Subject: FW: Baden & New Hamburg Water & Wastewater System Service Review
Date: Friday, February 12, 2021 3:26:46 PM

Sorry – forgot to cc Moira and Paula
Please add Wayne to the mailing list.
Thanks
Kaoru

From: Kaoru Yajima
Sent: February 12, 2021 3:26 PM
To:
Cc: 'Paul, Jeff' <jeff.paul@stantec.com>
Subject: RE: Baden & New Hamburg Water & Wastewater System Service Review

Hello

Yes certainly, I'll have our team add you to the email list.

We're just getting started so we don't have anything to present yet but will be posting on our website as the study evolves.

Thanks for reaching out.

Kaoru

From:
Sent: February 12, 2021 2:05 PM
To: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Subject: Baden & New Hamburg Water & Wastewater System Service Review

Can you please put my email address on the contact list to receive project notices and updates. I live in and am interested in the progress on this study and how it may affect our community in the future.

From:	Paul, Jeff
To:	Hohner, Paula; Davidson, Moira
Subject:	FW: Baden and New Hamburg Water and Wastewater - Comment Sheet from Morningside
Date:	Monday, June 7, 2021 11:36:49 AM
Attachments:	image002.jpg Letter to Morningside Residents-March 30, 2021 (2).pdf

Paula / Moira,

Please note and file the comments below.

Thanks,

Jeff Paul P.Eng.
Managing Principal

Direct: 519 675-6604
Mobile: 519 319-5806
Fax: 519 645-6575
jeff.paul@stantec.com

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From:
Sent: Monday, June 7, 2021 10:45 AM
To: Kaoru Yajima <KYajima@regionofwaterloo.ca>; Paul, Jeff <jeff.paul@stantec.com>

Subject: Baden and New Hamburg Water and Wastewater - Comment Sheet from Morningside

Kaoru and Jeff,

As owner and manager of Morningside Community in New Hamburg, please find our Comment Sheet following the Virtual Public Consultation #1.

---

1. **What are some of the key factors important to you that should be taken into account during this Study?**

As you are aware, our community Morningside in New Hamburg is populated by approximately 600 senior citizens who have chosen to live along the banks of the Nith River for the peace and tranquility that our location offers. We are regularly fielding calls and requests for information about the studies that the Region and the Township have recently initiated.

We wish to keep an open dialogue with you and the engineers while at the same time, being able to communicate to our residents so that they stay informed and come up with solutions that will be beneficial for the Region and least disruptive for us and our residents.

2. **Do you agree with the problem/opportunity statement? Are there any other considerations?**

Yes we do. As previously expressed, we wish the solutions can be beneficial for the Region and its population, while being minimally disruptive to us and our residents.

3. **Do you have any other questions or comments you would like to share with the project team?**

No, just make sure the undersigned and Lloyd Sheiner are registered on your mailing list.

_____

_____

Also for your information, please find attached a copy of a letter that we sent to our residents following a call with a representative of the Township, which outlines what we learned on our call, as well as our concerns.

Please keep us appraised as to developments as soon as practical as we do not want to be caught off guard with information that is pertinent to our residents.

Thanks for your collaboration.

Pierre



From:	Hohner, Paula
To:	Davidson, Moira
Subject:	FW: Baden and New Hamburg Water and Wastewater System Servicing Review -
Date:	Thursday, February 3, 2022 4:12:52 PM
Attachments:	image0e2905.PNG image9974b6.PNG imagef67293.PNG imagee7227b.PNG imageb9f53b.PNG imagef309e1.PNG PIC2_WF_Comments_Jan11-2022_.pdf

---

Paula Hohner, MScPl, MCIP, RPP
Associate, Senior Environmental Planner
Environmental Team Lead - Transportation
Stantec
600-171 Queens Avenue London ON N6A 5J7
Phone: 519-675-6666
Mobile: 226-926-6682
paula.hohner@stantec.com

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Please consider the environment before printing this email.

From: Paul, Jeff <jeff.paul@stantec.com>
Sent: Tuesday, January 11, 2022 5:20 PM
To: Kocher, Michael <Michael.Kocher@stantec.com>; Holmes, Hailey <Hailey.Holmes@stantec.com>; Hohner, Paula <Paula.Hohner@stantec.com>; Samuel Ziemann <sam.ziemann@c3water.com>
Subject: FW: Baden and New Hamburg Water and Wastewater System Servicing Review - PIC#2 Comments -

Hello all,

Please see attached comments provided by WalterFedy on behalf of one of the landowners in the study area. We can discuss further when we meet.

Thanks,

Jeff Paul P.Eng.
Managing Principal

Direct: 519 675-6604
Mobile: 519 319-5806
Fax: 519 645-6575
jeff.paul@stantec.com

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600-171 Queens Avenue
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From: Matt Ninomiya <mninomiya@walterfedy.com>
Sent: Tuesday, January 11, 2022 2:58 PM
To: Kaoru Yajima <KYajima@regionofwaterloo.ca>; Paul, Jeff <jeff.paul@stantec.com>
Cc: Michael DeBiasio (michael@themilogroup.ca) <michael@themilogroup.ca>
Subject: Baden and New Hamburg Water and Wastewater System Servicing Review - PIC#2 Comments -

Kaoru / Jeff,
Happy New Year. Hopefully all is well.

Thank you for providing the Baden and New Hamburg Water and Wastewater System Servicing Review PIC#2. We have reviewed the information presented and provide our comments, attached, for your consideration. We would appreciate the opportunity to discuss our comments further with you.

With thanks,
matt

Matt Ninomiya, MBA, P.Eng.
Land Development Practice Lead, Civil
Partner

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WalterFedy and AEC Developments have taken the step to protect our employees and clients and have closed our offices. Employees will be working remotely and you can continue to connect with us via phone and email. Although our office is closed, we will still be working regular office hours to best serve our clients.

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From: Lang, Sarah
Cc: KYajima@regionofwaterloo.ca; Paul, Jeff; Hohner, Paula
Bcc: mail@dietricheng.com; jodie@morningside.ca; gaoffice@gamasonry.com; scgood@cyg.net;

Subject: of Waterloo, Baden and New Hamburg Water and Wastewater System Servicing Review
Date: Tuesday, May 31, 2022 9:46:00 AM
Attachments: Baden - NewHamburg water and wastewater system servicing review -Notice PCC3 .pdf

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Hello,

Please find the attached Notice of Virtual Public Consultation Centre (PCC) #3 for the Baden and New Hamburg Water and Wastewater System Servicing Review. A PCC is being held online through the Region's YouTube channel to present the preliminary preferred alternatives related to the future water supply system and wastewater treatment and collection system. The PCC materials will be available on the Region's YouTube channel and website starting Tuesday, June 7, 2022 until Thursday, July 7, 2022.

Please contact a member of the project team identified on the attached Notice if you have any questions, comments, or concerns, or visit https://www.regionofwaterloo.ca/CurrentWaterProjects/ for more information.

Thank you,

Sarah Lang
Environmental Planner
sarah.lang@stantec.com

Stantec

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Baden and New Hamburg Water and Wastewater System Servicing Review Virtual Public Consultation Centre #2

COMMENT SHEET

Name/Organization :

Mailing Address

Email :

Questions/Comments :

Water Supply System

Under future conditions, is there consideration for expanding the Baden Pressure Zone west of Nafziger Road? This approach would better support future development identified at the north and east limits of New Hamburg.

Wastewater System

Alternative WW2 – Upgrade System and Maintain Existing Configuration is our preferred alternative. Other alternatives appear to base future growth on the currently identified Urban Area Boundaries. Recognizing that over time, boundaries may change as growth continues it is strongly recommended that servicing take gravity limits into consideration. Per the Wastewater Servicing Study For New Growth Areas Baden and New Hamburg (CRA, 2014) it is noted that Parcels L, M, and W drain by gravity to Waterloo Street to the north (identified as proposed sewer outlet beyond 2029) (Excerpt attached). Having said that, based on topography, much of Parcels L, M, and W drain towards the Ivan Gingerich Drain which bisects all of the parcels and drains west towards Parcels F and G. Based on this, the catchment area draining to the proposed trunk sewer connection at the south limit of Parcels F and G (through parcel N) via gravity is larger. As such, an upgrade to the Morningside Trunk Sewer between the Highway and the Morningside Pumping Station as identified in Alternative WW2 and as being evaluated by the Township Morningside Sanitary Trunk Sewer Class Environmental Assessment is recommended to assist in accommodating the proposed growth between New Hamburg and Baden.

While it may have been contemplated that Parcels L, M and W may drain south along Nafziger Rd in a future condition, the existing railroad tracks are a high point on Nafziger Road making routing wastewater to the south on Nafziger a more costly route due to greater depths of sewers.

Alternative WW2 also maintains the wastewater infrastructure in a consolidated corridor which helps to minimize construction costs should there be future repairs or maintenance. This routing and alignment maximizes the use existing infrastructure while minimizing reliance on pumping stations.



PROJECT:

TITLE:

EXISTING TOPOGRAPHY

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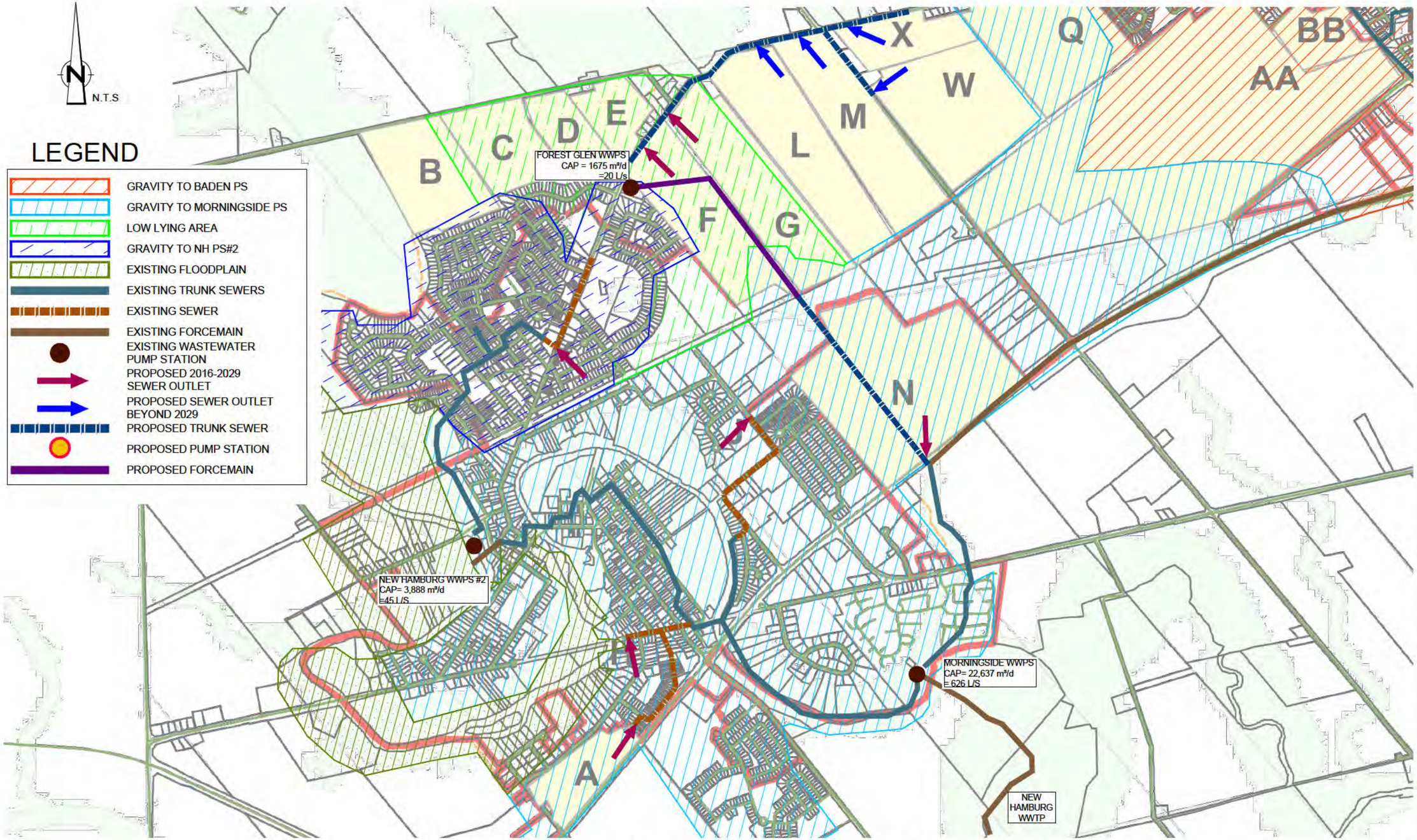
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EX_

N.T.S

LEGEND

- GRAVITY TO BADEN PS
- GRAVITY TO MORNINGSIDE PS
- LOW LYING AREA
- GRAVITY TO NH PS#2
- EXISTING FLOODPLAIN
- EXISTING TRUNK SEWERS
- EXISTING SEWER
- EXISTING FORCEMAIN
- EXISTING WASTEWATER PUMP STATION
- PROPOSED 2016-2029 SEWER OUTLET
- PROPOSED SEWER OUTLET BEYOND 2029
- PROPOSED TRUNK SEWER
- PROPOSED PUMP STATION
- PROPOSED FORCEMAIN



Alternate D - Sanitary Upgrade off Nafziger Rd with Pump Station - New Hamburg Figure 2-24
Wastewater Servicing Study for New Growth Areas in Baden and New Hamburg
Township of Wilmot

From:	Paul, Jeff
To:	Lang, Sarah
Cc:	Hohner, Paula
Subject:	FW: Comments submitted for Region of Waterloo Baden and New Hamburg water/wastewater system review PCC#3
Date:	Wednesday, June 15, 2022 1:15:56 PM

Thanks,

Jeff Paul P.Eng.
Managing Senior Principal

Mobile: 519 319-5806
jeff.paul@stantec.com

Stantec
600-171 Queens Avenue
London ON N6A 5J7

From: noreply@esolutionsgroup.ca <noreply@esolutionsgroup.ca>
Sent: Wednesday, June 15, 2022 11:09 AM
To: Kaoru Yajima <KYajima@regionofwaterloo.ca>; Paul, Jeff <jeff.paul@stantec.com>
Subject: Comments submitted for Region of Waterloo Baden and New Hamburg water/wastewater system review PCC#3

Thank you for participating in this virtual Public Consultation. We appreciate your time and value your input.

Below are your submitted comments:

- **Do you have questions or comments on this consultation material you would like to share with the project team?**
  Good morning.
  I see there is a need to improve Foxboro Green water and waste water system's.
  Since Foxboro Green is listed on there website having 215 single detached homes in a private community with pools recreational buildings ect.
  They are paying condo fee's to maintain there water and wastewater systems.
  My question is how is this project being funded?
  Like the water project in St Agatha were water was supplied to that village the home owners were responsible to pay the cost?
  Is this project being funded by the home owners or by the tax payers of the Region of Waterloo?

Please provide this funding information as I feel since I have a private residence and if my septic system fails I have to pay the costs to replace or repair it. Foxboro Green is a private community it should be funded by that community.

-
-
- **Preferred Phone Number (mobile or landline)**
- **Email Address**
- **Add my email address to the study mailing list**
  Yes
- **I have read and understood the above notice of collection of my personal information.,**
  Yes

[This is an automated email notification -- please do not respond]

From:	Paul, Jeff
To:	Lang, Sarah; Hohner, Paula
Subject:	FW: Comments submitted for Region of Waterloo Baden and New Hamburg water/wastewater system review PCC#3
Date:	Wednesday, June 22, 2022 2:12:14 PM

Jeff Paul P.Eng.
Managing Senior Principal

Mobile: 519 319-5806
jeff.paul@stantec.com

Stantec
600-171 Queens Avenue
London ON N6A 5J7

From: noreply@esolutionsgroup.ca <noreply@esolutionsgroup.ca>
Sent: Wednesday, June 22, 2022 1:29 PM
To: Kaoru Yajima <KYajima@regionofwaterloo.ca>; Paul, Jeff <jeff.paul@stantec.com>
Subject: Comments submitted for Region of Waterloo Baden and New Hamburg water/wastewater system review PCC#3

Thank you for participating in this virtual Public Consultation. We appreciate your time and value your input.

Below are your submitted comments:

- **Do you have questions or comments on this consultation material you would like to share with the project team?**
  June 22, 2022 /

  The Waterloo standard Condominium Corporation #365 is serving notice of its intention to provide a 9+ page submission, via courier on Friday, June 23, 2022.
  The submission will include:
  + Our Perspective
  + 3 Action Items required of the Region of Waterloo, Municipality of Wilmot, and Stantec
  + Numerous Questions and Rationale
  + Summary
  + 4 Contact Names
  + Signatures of Board Officials and Heads of Affected Foxboro

Committees. (approx. 13)
+ CC to Corporation's Property Manager and legal counsel

Suggestion re.IMMEDIATE ACTION: Ms. Redman, Mr. Armstrong, and Mr. Yajima might consider facilitating meeting date(s) for conducting forums toward understandings of our mutual positions.

My name is Barry Wolfe, and the Chair of an ad hoc committee formally structured by the Board to facilitate negotiations between Foxboro and the Region, Township and Stantec regarding this proposed project.

The Corporation's property manager is on holiday, and thus unable to receive mailed or faxed correspondence at our office, so I am providing my home address for print communications.

- **Name**
  Barry Wolfe
- **Organization (if applicable)**
  Waterloo Standard Condominium Corporation #365
- **Mailing address**
- **Preferred Phone Number (mobile or landline)**
- **Email Address**
- **Add my email address to the study mailing list**
  Yes
- **I have read and understood the above notice of collection of my personal information.,**
  Yes

[This is an automated email notification -- please do not respond]

Karen Redman, Chair
Region of Waterloo
150 Frederick St., Kitchener, ON.
N2G 4J3

Kaoru Yajima, Sr. Engineer
Region of Waterloo
150 Frederick St., Kitchener, ON.
N2G 4J3

Jeff Paul, Project Manager
Stantec Consulting
171 Queens Ave., London, ON,
N6A 5J7

Les. Armstrong, Mayor
Township of Wilmot
60 Snyder's Road West, Baden, ON
N3A 1A1

Andrew Martin, Mgr. Planning
&Economic Development
60 Snyder's Road West, Baden, ON
N3A 1A1

Cheryl Gordijk, Councillor Ward 2
Township of Wilmot
60 Snyder's Road West, Baden, ON
N3A 1A1

Arthur Flach, Municipal Clerk
Township of Wilmot
60 Snyder's Road West, Baden, ON
N3A 1A1

June 23, 2022

To: Chair Redman, Mayor Armstrong, et. al.,
From: Waterloo Standard Condominium Corporation #365
Re: Baden and New Hamburg Water and Wastewater System Servicing Review

"Our Perspective"

A) For the past couple of years there have been rumours that development would occur, maybe, sometime in the future, on the lands north of Baden and south of the private lands of Foxboro Green.

The rumours included the potential that connections for potable water and waste water might be considered between Foxboro Green (Waterloo Standard Condominium Corporation #365) and Baden. Rumours only.

There has been no formal communication between the Region of Waterloo, the Township of Wilmot, nor Stantec Consulting, and Foxboro Green Corporation #365.

It was a surprise to learn within the past week, that "Notice of Virtual Public Consultation Centre #3 – Baden and New Hamburg Water and Wastewater System Servicing Review" included Foxboro Green in its scope, ***and*** that the deadline for input was July 7, 2022 – about 14 business days from when the Foxboro Green Board became aware of this situation. Subsequent research indicates that, "This Notice was first issued on May 26, 2021."

There is extreme concern among Foxboro Green Corporation Board members and residents about this "consultation" process. It is our position that this process has been faulty by not *formally* notifying the Foxboro Green Board prior to the commencement of the consultation process. The onus for formal notification of affected parties rests with the Region and Township, and an obscure posting on a website is deemed by 'the Corporation' to be insufficient and inappropriate.

B) It is the position of the Foxboro Green Corporation Board that the lands, this project anticipates including, are **PRIVATE PROPERTY**.

The YouTube video, June 7, 2022, includes a slide with the sentence, "Forcemain location would require agreements with property owners and stakeholders." This appears to be an acknowledgement that negotiations would have to occur at some time in the process if the project was to progress.

A reasonable person would ask the question, "*If negotiations with property owners and stakeholders was a condition for the project's implementation, why was there no formal communication and preliminary discussions about probable negotiations with property owners and stakeholders at the earliest days of this project's conception, and how is this consultation process going to be amended?*" Foxboro Green residents are reasonable people.

Toward that end, the Foxboro Green Condominium Corporation #365 has suggestions, and many questions that need to be answered before movement may occur toward: 1) formal approval, 2) design and 3) tenders for construction.

C) The Foxboro Green Corporation Board and residents recognize that this project is a proposal to change the "**intent**" (Water System) by one of the parties to an existing Agreement and thus any existing Agreement(s) must

be either renegotiated or terminated. We are not presently opposed, *in principle*, to the proposed *changed intent* of this project and anticipate opening negotiations toward an amended Agreement.

Action Item #1

That the arbitrary consultation deadline of July 7, 2022 be postponed until after complete consultation has occurred with the Board and residents of Foxboro Green Condominium Corporation #365.

Action Item #2

That representatives (political and professional staff) of Waterloo Region, Township of Wilmot, and Stantec Consulting need to conduct a forum(s) with residents, prior to July 7, 2022, that provides a detailed overview of the Foxboro Green portion of this project and which includes detailed answers to the questions below.

Action Item #3

Because the Region "cannot preserve its intent" to retain the communal septic system including the tile fields, the Board and its counsel anticipate negotiations toward an amended Agreement.

Questions with Rationale

1) It is our understanding that the Strategic Plans for both the Region of Waterloo and the Township of Wilmot, for the implementation time period of this project, are still "under review" and have not been legally finalized. Therefore:
   a) Is it possible that the 'Urban Area Boundary' may change with implications for Foxboro Green?
   b) Is it possible that the criteria for buildings' heights, population density, etc. may change with implications for Foxboro Green?
   c) Is it possible that Regional and Municipal regulations could provide for potential development of the Foxwood Golf Course properties and / or property within Foxboro Green?
   d) What is the realistic, anticipated timeline when construction may occur to potentially implement this project?

e) What are the contingency plans for addressing disruptions within Foxboro Green for traffic flow of residents, emergency services for life and fire, etc.?

2) The preferred "Alternative F3 – connect Foxboro to Future Expand Baden Service Area using a ***Direct Route***".
Therefore:
   a) Given that Jeff Paul requested permission to access Foxboro Green private property to investigate the area consisting of wooded and wet lands between the Hydro easement and private residences, does a "direct route" include potentially installing a potable and / or waste water line "**directly**" north through this land, rather than the circuitous route around the wetlands as outlined on the maps?
   b) What are the results of the archaeological assessment report conducted on the lands in this area of private property?
   c) What are the results of the environmental assessment report conducted on the private lands in this area, including the potential for protected species such as turtles, etc. in this area of private property?

3) The proposed sketch map diagram of a forcemain line runs along Golf Links Drive.
Therefore:
   a) Why was a "direct route" along the pathway between the golf course and the rear of the homes along Golf Links Drive <u>not proposed</u> as a 'preferred' route?

4) There are presently two (2) locations where waste water is processed – north and south. The sketch map includes a dotted line which indicates the route of a "INSTALL NEW 100 mm DIA. FORCEMAIN (OPEN CUT 670m)" from the height of land at the south end of Golf Links Drive and the (north) "NEW SMALL SPS ON EXISTING RoW SITE". It also includes a second, separate, dotted line which indicates the preferred direct route from an existing RoW site in Foxboro (south) to Baden.
Therefore:
   a) Why are these waste water lines not connected?
   b) Will there be a potential need for "agreements" between the Region and home owners or the 'Corporation' regarding potential easements across private property?
   c) By what route does waste water from the proposed new SMALL SPS get out of Foxboro Green and on its way south to Baden? (see a)

d) If there is to be a "new" SPS installed at the north end, what happens to the existing facilities: i) are any structures removed, renovated for repurposing, ii) how do these changes conform to the ambiance of the existing Foxboro Green site?
e) Will there be any changes to how waste water is directed, collected, processed, pumped away that will affect present infrastructure for existing home owners and the recreation facility?
f) In the past, the Region made inquiries about 'unusual' readings for sulphur content in waste water. Do these readings have any consequences for the integrity of the concrete and materials of the processing facilities that implies new construction or renovations?

5) The sketch map includes a dotted line which indicates the route of a "INSTALL NEW 100 mm DIA. FORCEMAIN (OPEN CUT 670m)" from the height of land at the south end of Golf Links Drive and the "NEW SMALL SPS ON EXISTING RoW SITE".
Therefore:
a) It may be assumed that the existing roadway would be "destroyed". Who is responsible for restoring the existing buried services, entire roadway and accompanying private home owners' landscaping affected?

6) The sketch map includes red lines indicating the routes of the existing sanitary system. It may be reasonably expected that these existing dispersal lines and weeping tile beds will no longer be needed if waste water is pumped out to Baden for processing.
Therefore:
a) What happens to these 'redundant' buried lines? i) Will they be left in the ground to deteriorate or be removed? ii) If either left or removed, who is responsible for their future maintenance (changes in level of land for example)?
b) The Foxboro Corporation #365 contracted with the Region to maintain and service waste water systems from the north and south processing plants through the distribution and weeping tile beds as part of our tax assessment. The Corporation has had responsibility for the maintenance of the surface of all these lands, including the contracted portion overlaying the tile fields themselves. At what date, prior to design, contracting and construction is the region prepared to negotiate ownership of these lands to the corporation?

7) The project proposes that potable water will be distributed into Foxboro Green via a line from Baden.
Therefore:
   a) What will be the route of the new watermain into and through Foxboro Green?
   b) Presently Foxboro Green residents have been notified that there are "elevated" levels of salts in our potable water. Will the new line change the 'quality' of the water and its contents, and if so, how?
   c) What will happen to the existing wells on Foxboro site? If they are not to be used then all aquifer and water rights revert back to the Condominium Association. At what date, prior to design, contracting and construction is the region prepared to negotiate water rights to the corporation?
   d) What will happen to the existing water treatment facilities?
   e) In what way will the aquifer beneath Foxboro Green be used or drawn upon by the Region?
   f) Presently, the Region uses an efficient 'single billing system' which charges Foxboro Green Corporation on one bill for all our water use. Will the Region use a similar 'single billing system' or change to an 'individual user billing system'?
   g) i) If an individual user billing system is used for potable water, will the installation of water metres be required in each home and the recreation centre? ii) If yes, then which party bears the cost of those installations?

8) The existing internal system for collection of waste water and distribution of potable water is buried under existing roads which are "common ground" – the Corporation's private property.
Therefore:
   a) Will the Region be assuming responsibility for all existing potable water and waste water lines up to property lines?
   b) Which party bears the costs for connections of existing sewer / waste water lines that are proposed?
   c) Will there be fire hydrants installed through Foxboro Green?

9) "Forcemain location would require agreements with property owners and stakeholders."
Therefore:
   a) Which specific lot # or addresses of private home owners would be affected by potential "agreements"?

b) Where else might there be a need for "agreements" with 'stakeholders' in Foxboro Green?
c) If "agreements" can not be amicably negotiated with private property owners, is it the Region's process to: i) amend the project in its planning stage (NOW) to accommodate owners, ii) use expropriation or eminent domain - implying the need for the Foxboro Green Board to notify its residents of the potential need to hire lawyers individually or as a group, or as a Corporation?

Summary

1) The elected Board of Waterloo Standard Condominium Corporation #365 (Foxboro Green) has a duty to ensure that all its residents are fully knowledgeable of critical events affecting the private property of the home owners and the commonly held assets. Residents have made significant financial and emotional investments in choosing the ambiance and amenities of the Foxboro Green community. Foxboro Green is "unique" and it is our intent to maintain that.

   As indicated above, the Region of Waterloo, the Township of Wilmot and Stantec Consultants have prevented the Board from providing timely opportunities to gather information, ask questions, discuss and propose alternatives regarding this project due to their failure to 'formally notify'.

   Therefore, we hold that it is the responsibility of the Regional Chair, Karen Redman and the Township Mayor, Les Armstrong and their Councils, to direct their professional staffs to: i) impose a temporary "hold" on the consultation timelines and deadlines for this project, ii) arrange mutually agreeable places and times for "forums" to inform, consult, and respond to ALL the questions listed above as well as any other questions / concerns that may arise from 'the floor' by residents at those meetings, iii) to initiate negotiations toward agreement between the parties.

   Please refer to **Action Items #1, 2 and 3** above.

Please respond at your earliest, timely convenience. Our contact persons will include:

President Don Schafer

1st Vice-President, Cathy Grant

2nd Vice-President Cliff Robinson

Secretary Paul Knowles

Sincerely,

Don Schafer, President

Cathy Grant, 1st Vice-President

Cliff Robinson, 2nd Vice-President

Ben Cornell, Treasurer

In Norway

Jim Henderson, Board Member

Sandy Isaac, Board Member

Elizabeth King, Board Member

Richard Toogood, Services & Equip't

Keith Lyon, Ponds

Simone Beaucage, Rec'n Centre

Wayne Yantz, Potable/Waste Water

Barry Wolfe, Potable/Waste Water

Chris Wright, Grounds

Jim Cooke, Past-Treasurer

Cc: Adriana Ravar, Property Manager

Cc: Michelle Kelley, Legal Counsel

Stantec

Memo

To:	Kaoru Yajima Region of Waterloo	From:	Jeff Paul, P.Eng. Stantec, London
File:	165640324	Date:	October 21, 2022

Reference: Baden – New Hamburg Water and Wastewater System Servicing Review – Foxboro Community Servicing

1 BACKGROUND

This Technical Memorandum has been prepared to provide further documentation regarding the sanitary servicing options for the Foxboro Community in accordance with Phas 2 of the Municipal Class Environmental Assessment (Class EA) process.

Following on the release of Public Information Centre #3 (PIC 3), Stantec nd the Region received correspondence dated June 23, 2022 from Waterloo Stand d Condominium orporation #365 (Foxboro Residents) requesting additional information and outlinin various oncerns. That letter is attached as an Appendix to this report. Following on further review, a mee ing was scheduled between the Foxboro Residents, the Region of Waterloo and Stantec to discuss th project and address these concerns. That meeting was held on August 15, 2022 at the Foxb o Green Re eation Centre.

Among the issues noted, was the concern from the Foxb o sidents regarding the construction of a new sanitary forcemain along Golf Links Drive The alignm nt of this forcemain was a part of alternative F-3 which was presented in PIC #3 as the prelim nary p eferred alternative. Alternative F-3 was selected as the preferred alternative because if ranked highe t across he environmental, social, technical and financial criteria. More information on this se ction pr d in Technical Memo #5. The forcemain along Golf Links Drive is one portion of the overall serv i g strategy for the Foxboro Community outlined in Alternative F-3. Specifically, the forcemain i size at a p liminary level to be 100mm diameter and is intended to convey flows from a proposed p mping stati n in th northern portion of the Foxboro Community connecting to the gravity sanitary sewer sy tem on Golf inks Drive which in turn conveys flows to a second proposed pumping station in the southern port n of the F xboro Community. Flows are then pumped into another proposed forcemain to convey these int the g avity sewer system in Baden.

The Foxboro Residents proposed an alternative alignment for this forcemain which is parallel to the proposed alignment but with an alignment that is within the open space block east of Golf Links Drive and on the rear of the lots fronting Golf Links Drive (shown on the attached figure as Sub-Option 3ii). The purpose of this memo is to evaluate that proposed alternative alignment in comparison to the alignment previous advanced.

2 FOXBORO FORCEMAIN ALIGNMENT OPTIONS

The alignment options considered under this memo are sub-options of Alternative F3. F3 is the alternative by which flows from the Foxboro Community are conveyed to the Baden water and wastewater system by a direct route as outlined in the attached figure. The sanitary forcemain alignment options considered in this memo are labelled sub-options 3i and 3ii.

Sub-option 3i is the forcemain alignment option presented in PIC #3 and involves the construction of a new 100mm diameter sanitary forcemain along Golf Links Road. The northern end of the forcemain connects to a proposed sanitary pumping station in the location of the existing sanitary treatment system for Foxboro. The southern end of the forcemain connects to the existing sanitary sewer on Golf Links Drive in the vicinity of

Mun. No. 174 Golf Links Drive. The forcemain would be contained within the roadway of the condo corporation.

Sub-option 3ii is the forcemain alignment option suggested by the Foxboro Residents and involves the construction of a new 100mm diameter sanitary forcemain along the open space block east of Golf Links Road, continuing along the open space block between Mun. No. 166 Golf Links Drive and Mun. No. 168 Golf Links Drive and then along Golf Links Drive to connect with the existing sanitary sewer in the vicinity of Mun. No. 174 Golf Links Drive. The open space blocks noted under both options are understood to be in the ownership of the condo corporation. Portions of the open space block contain as many as four sanitary forcemains. The purpose of these forcemains are to convey flows from the existing sanitary treatment facility in the northern part of the Foxboro Community to the disposal beds which are contained in the central portion of the community. On review of the servicing drawings for the Foxboro Community, the precise alignment of these forcemains is not noted so it is unclear whether there is a clear corridor within which to construct a new forcemain.

Further investigation work (i.e. hydrovac excavation) shou d be undertaken at a subsequent design stage of this project to determine the precise location of the existin forcemains and to set the alignment of the new proposed forcemain. Given that there is redundancy within t system, it is Stantec's opinion that, in the event of a conflict with the existing forcemains, one of th four existin forcemains could be removed to allow construction of the new forcemain. Thus we can c nclu at this s age that sub-option 3ii is a viable option for further consideration.

DRAFT

3 ALIGNMENT SELECTION CR TERIA

As part of the Municipal Class EA p cess n tion criteria was established by which to determine the preferred alternative by looking at four ain criteria: Environmental, Social, Technical and Financial. That evaluation criteria was utiliz d to s lect O tion F3 as the preferred alternative. In the evaluation of sub-options 3i and 3ii, this ev luation crit ia has been employed to rate these two alternatives and to advance a preferred alternative. Th following se ion provides some further detail on how the alternatives are rated within each of these four m in criteria.

3.1 ENVIRONMENTAL

Within the Environmental criteria, the alternatives are evaluated using the following criteria:

Protects environmental features

Protect sensitive natural features and regulated areas. Minimize the potential impact from construction and operation to existing terrestrial habitats/features, vegetation, wetlands, woodlots, and steep slopes. Allow for scheduling and roll-out of construction activities in a way and at a time of year that would limit the negative impacts on the vegetation of the site and surrounding area.

Protects wildlife and species at risk

Minimize impacts to wildlife (including species at risk) or identified habitat locations for these species. Protect fisheries and aquatic health.

Allow for scheduling and roll-out of construction activities in a way and at a time of year that would limit the negative impacts on wildlife and species at risk.

Protects groundwater, streams and rivers

Protect groundwater and meets Clean Water Act requirements. Minimize impacts on the GRCA regulated floodplain.

Minimizes climate change impacts

Minimize GHG emissions and negative impacts on the land cape which may alter the ecosystems' ability to remove carbon dioxide from the atmosphere (e.g. chang s to site nd vicinity plant cover).

Prioritize energy and water conservation and efficiency meas es and/or adaptive re-use of buildings or structures to reduce new energy or material dem ds Evaluate ontributions to or investments in natural spaces that offset or mitigate the alternative's climate ch ge impacts.

3.2 SOCIAL

Within the Social criteria, the altern tives are evaluate using the following criteria:

Minimizes impacts to residents rela to noise, odour, traffic and aesthetics

Minimize noise, odour, and truck tra c affe ting the community during pumping station operation. Maintain access to and aesthetic of public spa es. Minimize negative impacts that may result due to changes to the neighbourhood characteris ics (e.g., re reational features, green space, property values).

Minimizes impacts to businesse

Maintain access for businesses during construction and operation. Minimize potential negative effects on short-term and long-term business vitality, and community growth and development.

Manages and minimizes construction impacts

Minimize noise, odour, road closures, and truck traffic affecting the community during construction.

Protects cultural heritage resources

Minimize potential impact to historical, cultural, and architecturally significant features. Minimize the potential impact to Indigenous communities.

Protects archaeological features

Minimize potential impact to archaeologically significant features. Performs the appropriate archaeological investigations as regulated by legislation in areas of archeological potential.

DRAF

Protects health and safety

Minimize the potential risk to public health and safety, particularly on downstream users (including for recreation and tourism). Minimize the potential risk to operator and maintenance staff's health and safety.

3.3 TECHNICAL

Within the Technical criteria, the alternatives are evaluated using the following criteria:

Provides reliable service

Prioritize security, reliability and robustness. Lesser likelihood of process upset or mechanical breakdown.

Meets existing and future needs

Meets the long-term capacity requirements to service the p ojected population growth in the sanitary catchment area.

Provide appropriate site access and egress for operations an maintenance per current standards and best practices.

Provide operational redundancy to allow for mainte anc and leaning of equipment and infrastructure. Minimize increases in operational and/or aintenan e complexity of the station.

Aligns with existing and planned infrastru ture

Optimize existing infrastructure invest e t including structures, tanks, and equipment.

Align with planned infrast cture pr cts in luding recommendations of the Region's 2018 Wastewater Treatment Master Plan pdate, the F undry Street sanitary Sewer Study (2010), the Baden-New Hamburg Water and Wastewater M ster Plan (2 11), and the Morningside Sewage Pump Station Capacity Assessment (2017).

Aligns with existing and future and use

Evaluate need to acquire land, easements or other access permissions for new pumping station or expansion of pumping station and forcemain.

Aligns with approval and permitting process

Minimize the complexity and time spent to obtain approvals from various regulatory agencies.

Manages and minimizes construction risks

Minimize complexity of construction and maximize ability to maintain adequate sewage pumping services during construction.

Ability to adapt to climate change

Promote resiliency to extreme weather events.

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Prioritize climate change adaptation to minimize risk associated with variation in climate parameters (temperature, precipitation, wind gusts, or other) and natural hazards (flooding, high river levels, or other).

Prioritize the surrounding area's ability to be resilient and maintain its adaptive capacity to climate change.

3.4 FINANCIAL

Within the Financial criteria, the alternatives are evaluated using the following criteria:

Provides low lifecycle costs

Minimize capital, operation and maintenance (life cycle) costs over a 50-year period.

4 EVALUATION

Sub-options 3i and 3ii have been evaluated based on thei performance against the natural, social, technical and financial criteria that were identified above. The lege d for evaluation scoring is identified in **Error! Reference source not found.** for reference. A summary of h evaluation is identified in **Error! Reference source not found.**. It is noted that each of the criteria catego s have been weighted equally in the selection of the preferred alternative.

Table 4-1: Evaluation Scoring Le en

Graphic	Rati g	Description
		Very well aligned with criteria
	4	Well aligned with criteria
	3	Somewhat aligned with criteria
	2	Not well aligned with criteria
	1	Low alignment with criteria

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Reference: **Baden – New Hamburg Water and Wastewater System Servicing Review – Foxboro Community Servicing**

Table 4-2: Baden – Foxboro Community Servicing - Summary of Evaluation

Evaluation Criteria	Sub-Option 3i	Sub-Option 3ii
Environmental		
Social		
Technical		
Financial		
Overall Sco e		Preferred Alternative 

In the evaluation of the wo sub-optio , both ranked he same under the for Environmental criteria as there was essentially no differe tiation betw en the alternatives as both were considered to have the same impacts. Sub-option 3i rank d poorly n the Social criteria, largely from the input that was provided by the Foxboro Residents. The comm nit clearly indicated that construction on Golf Links Drive proposed by sub-option 3i would have a negative on the community. The impacts of construction would impact their ability to access sidewalks and walking trails during construction. While these impacts could be mitigated through the employment of trenchless methods for construction, there would still be an impact on the community. The option of placing the forcemain along the open space block was favoured by the Foxboro Residents because it represented a lesser disruption to the community. There may still be impacts due to noise and dust as construction will still occur adjacent to existing homes, however, that impact is limited only to the homes on the east side of Golf Links Drive and not to the community as a whole. Under the financial criteria, there was no difference in lifecycle costs between the two sub-options, however there would be a small cost savings in the initial capital cost associated with a reduction in restoration costs. Sub-option 3i would involve more extensive restoration of Golf Links Drive while sub-option 3ii would involve only restoration of a pathway. Sub-option 3i had some impediment to overall pipe laying production due to the fact that the forcemain construction would need to cross individual lot private drain connections, however, sub-option 3ii may have a similar impediment as the working space is confined and may involve the removal of an existing forcemain. At a preliminary level, it is our opinion that these production factors are likely equivalent.

In the final evaluation, this memo advances sub-option 3ii (placement of the forcemain along the open space block east of Golf Links Drive) as the preliminary preferred alternative based on the scoring noted.

5 OTHER ALTERNATIVES

Through the course of the evaluation of the above noted sub-options, a further review was undertaken of the existing conveyance system within the Foxboro Community through the existing as-built drawings. That network consists of a gravity sanitary sewer system which conveys flows to the existing sanitary treatment facilities on site. There are two of these facilities located at the north and south ends of the site. Treated flow from these facilities are pumped into a network of forcemains within the community which then discharge to several sets of weeping beds which are located in the open space blocks within the community.

The potential exists that portions of the existing forcemains could be repurposed and used as the forcemain conveyance noted in the sub-options evaluated in this memo. A preliminary review indicates that the diameter of the existing forcemains would be appropriate for the purpose of the new servicing scheme and the routing is generally complimentary to the routing of the new forcemain. Some extension of the existing forcemains may be necessary as well as some interconnection of the exist ng system. More in-depth investigation would be appropriate to review the existing pipe material to determ ne if it is appropriate for the revised servicing option. As the existing forcemains are in the range of 30 ears old we also advise the Region to review pipe condition. At a minimum, a pressure test should be undert ken t ensure that the existing forcemain network is capable of withstanding pressures above the maximum op ating range of the proposed system. This memo recommends this option be investigated fu her at the pr iminary design stage.

The option of using the existing forcemain system hould be onsidered as a viable preferred alternative under the Environmental Assessment as it would ra k highly on the evaluation criteria. The final documentation in the Project File Rep t sho ld refle this as a viable alternative that can be advanced should the preliminary review revea it as via e.

6 NEXT STEPS

In order to finalize this m tter, this m mo sh uld be shared with the Foxboro residents to identify if the proposed solution addre ses their con erns and/or if there are remaining concerns. The Project File Report can then address the revis n to the p eferred alternative for the Foxboro servicing and this memo will be included as an Appendix to th rep t. As noted above, we recommend further investigation work be completed at the preliminary des n stage to evaluate the potential use of the existing forcemain network.

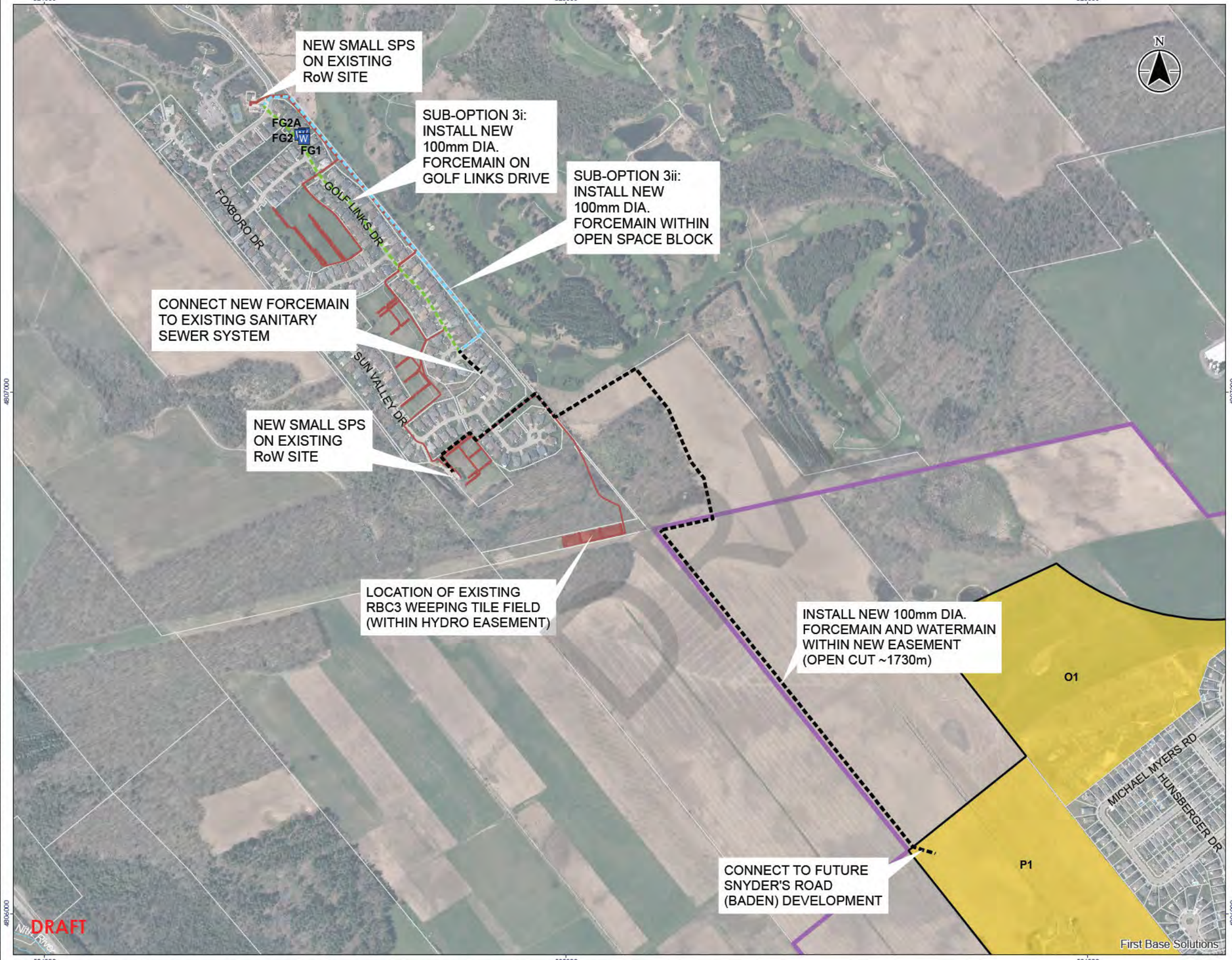
Stantec Consulting Ltd.

Jeff Paul P.Eng.
Managing Senior Principal, Water

Phone: 519 319 5806
jeff.paul@stantec.com

Attachment

DRAFT



Stantec

Legend

- Municipal Well

Preferred Sanitary Alternative

- Preferrred Alternative (Alternative 3)
- Sub-Option 3i
- Sub-Option 3ii
- Ex. Sanitary System
- Ex. RBC3 Weeping Tile Field
- Development Block
- Urban Area Boundary
- Countryside Line

0 100 200 m

1:7 500 (At original document size of 11x17)

Notes

1 Coordinate System: NAD 1983 UTM Zone 17N
2 Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario 2017
3 Orthoimagery from Region of Waterloo web map service Imagery Date 2018

Project Location
Wilmot Township

165640324 REVA
Prepared by KDB on 2022-10-21

Client/Project
REGION OF WATERLOO
BADEN – NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
1

DRAFT

Title
Foxboro Water and Wastewater Servicing F3 Preferred Alternative

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

Karen Redman, Chair
Region of Waterloo
150 Frederick St., Kitchener, ON.
N2G 4J3

Kaoru Yajima, Sr. Engineer
Region of Waterloo
150 Frederick St., Kitchener, ON.
N2G 4J3

Jeff Paul, Project Manager
Stantec Consulting
171 Queens Ave., London, ON,
N6A 5J7

Les. Armstrong, Mayor
Township of Wilmot
60 Snyder's Road West, Baden, ON
N3A 1A1

Andrew Martin, Mgr. Planning
&Economic Development
60 Snyder's Road West, Baden, ON
N3A 1A1

Cheryl Gordijk, Councillor Ward 2
Township of Wilmot
60 Snyder's Road West, Baden, ON
N3A 1A1

Arthur Flach, Municipal Clerk
Township of Wilmot
60 Snyder's Road West, Baden, ON
N3A 1A1

DRAF

June 23, 2022

To: Chair Redman, Mayor Armstrong, et. al.,
From: Waterloo Standard Condominium Corporation #365
Re: Baden and New Hamburg Water and Wastewater System Servicing Review

"Our Perspective"

A) For the past couple of years there have been rumours that development would occur, maybe, sometime in the future, on the lands north of Baden and south of the private lands of Foxboro Green.

The rumours included the potential that connections for potable water and waste water might be considered between Foxboro Green (Waterloo Standard Condominium Corporation #365) and Baden. Rumours only.

There has been no formal communication between the Region of Waterloo, the Township of Wilmot, nor Stantec Consulting, and Foxboro Green Corporation #365.

It was a surprise to learn within the past week, that "Notice of Virtual Public Consultation Centre #3 – Baden and New Hamburg Water and Wastewater System Servicing Review" included Foxboro Green in its scope, ***and*** that the deadline for input was July 7, 2022 – about 14 business days from when the Foxboro Green Board became aware of this situation. Subsequent research indicates that, "This Notice was first issued on May 26, 2021."

There is extreme concern among Foxboro Green Corporation Board members and residents about this "consultation" process. It is our position that this process has been faulty by not *formally* notifying the Foxboro Green Board prior to the commencement of the consultation process. The onus for formal notification of affected parties rests with the Region and Township, and an obscure posting on a website is deemed by 'the Corporation' to be insufficient and inappropriate.

B) It is the position of the Foxboro Green Corporation Board that the lands, this project anticipates including, are **PRIVATE PROPERTY**.

The YouTube video, June 7, 2022, includes a slide with the sentence, "Forcemain location would require agreements with property owners and stakeholders." This appears to be an acknowledgement that negotiations would have to occur at some time in the process if the project was to progress.

A reasonable person would ask the question, "*If negotiations with property owners and stakeholders was a condition for the project's implementation, why was there no formal communication and preliminary discussions about probable negotiations with property owners and stakeholders at the earliest days of this project's conception, and how is this consultation process going to be amended?*" Foxboro Green residents are reasonable people.

Toward that end, the Foxboro Green Condominium Corporation #365 has suggestions, and many questions that need to be answered before movement may occur toward: 1) formal approval, 2) design and 3) tenders for construction.

C) The Foxboro Green Corporation Board and residents recognize that this project is a proposal to change the "**intent**" (Water System) by one of the parties to an existing Agreement and thus any existing Agreement(s) must

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be either renegotiated or terminated. We are not presently opposed, *in principle*, to the proposed *changed intent* of this project and anticipate opening negotiations toward an amended Agreement.

Action Item #1

That the arbitrary consultation deadline of July 7, 2022 be postponed until after complete consultation has occurred with the Board and residents of Foxboro Green Condominium Corporation #365.

Action Item #2

That representatives (political and professional staff) of Waterloo Region, Township of Wilmot, and Stantec Consulting need to conduct a forum(s) with residents, prior to July 7, 2022, that provides a detailed overview of the Foxboro Green portion of this project and which includes detailed answers to the questions below.

Action Item #3

Because the Region "cannot preserve its intent" to retain the communal septic system including the tile fields, the Board and its counsel anticipate negotiations toward an amended Agreement.

Questions with Rationale

1) It is our understanding that the Strategic Plans for both the Region of Waterloo and the Township of Wilmot, for the implementation time period of this project, are still "under review" and have not been legally finalized. Therefore:
   a) Is it possible that the 'Urban Area Boundary' may change with implications for Foxboro Green?
   b) Is it possible that the criteria for buildings' heights, population density, etc. may change with implications for Foxboro Green?
   c) Is it possible that Regional and Municipal regulations could provide for potential development of the Foxwood Golf Course properties and / or property within Foxboro Green?
   d) What is the realistic, anticipated timeline when construction may occur to potentially implement this project?

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e) What are the contingency plans for addressing disruptions within Foxboro Green for traffic flow of residents, emergency services for life and fire, etc.?

2) The preferred "Alternative F3 – connect Foxboro to Future Expand Baden Service Area using a ***Direct Route***".
Therefore:
   a) Given that Jeff Paul requested permission to access Foxboro Green private property to investigate the area consisting of wooded and wet lands between the Hydro easement and private residences, does a "direct route" include potentially installing a potable and / or waste water line "**directly**" north through this land, rather than the circuitous route around the wetlands as outlined on the maps?
   b) What are the results of the archaeological assessment report conducted on the lands in this area of private property?
   c) What are the results of the environmental assessment report conducted on the private lands in this area, including the potential for protected species such as turtles, etc. in this area of private property?

3) The proposed sketch map diagram of a forcemain line runs along Golf Links Drive.
Therefore:
   a) Why was a "direct route" along the pathway between the golf course and the rear of the homes along Golf Links Drive <u>not proposed</u> as a 'preferred' route?

4) There are presently two (2) locations where waste water is processed – north and south. The sketch map includes a dotted line which indicates the route of a "INSTALL NEW 100 mm DIA. FORCEMAIN (OPEN CUT 670m)" from the height of land at the south end of Golf Links Drive and the (north) "NEW SMALL SPS ON EXISTING RoW SITE". It also includes a second, separate, dotted line which indicates the preferred direct route from an existing RoW site in Foxboro (south) to Baden.
Therefore:
   a) Why are these waste water lines not connected?
   b) Will there be a potential need for "agreements" between the Region and home owners or the 'Corporation' regarding potential easements across private property?
   c) By what route does waste water from the proposed new SMALL SPS get out of Foxboro Green and on its way south to Baden? (see a)

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d) If there is to be a "new" SPS installed at the north end, what happens to the existing facilities: i) are any structures removed, renovated for repurposing, ii) how do these changes conform to the ambiance of the existing Foxboro Green site?
e) Will there be any changes to how waste water is directed, collected, processed, pumped away that will affect present infrastructure for existing home owners and the recreation facility?
f) In the past, the Region made inquiries about 'unusual' readings for sulphur content in waste water. Do these readings have any consequences for the integrity of the concrete and materials of the processing facilities that implies new construction or renovations?

5) The sketch map includes a dotted line which indicates the route of a "INSTALL NEW 100 mm DIA. FORCEMAIN (OPEN CUT 670m)" from the height of land at the south end of Golf Links Drive and the "NEW SMALL SPS ON EXISTING RoW SITE".
Therefore:
a) It may be assumed that the existing roadway would be "destroyed". Who is responsible for restoring the existing buried services, entire roadway and accompanying private home owners' landscaping affected?

6) The sketch map includes red lines indicating the routes of the existing sanitary system. It may be reasonably expected that these existing dispersal lines and weeping tile beds will no longer be needed if waste water is pumped out to Baden for processing.
Therefore:
a) What happens to these 'redundant' buried lines? i) Will they be left in the ground to deteriorate or be removed? ii) If either left or removed, who is responsible for their future maintenance (changes in level of land for example)?
b) The Foxboro Corporation #365 contracted with the Region to maintain and service waste water systems from the north and south processing plants through the distribution and weeping tile beds as part of our tax assessment. The Corporation has had responsibility for the maintenance of the surface of all these lands, including the contracted portion overlaying the tile fields themselves. At what date, prior to design, contracting and construction is the region prepared to negotiate ownership of these lands to the corporation?

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7) The project proposes that potable water will be distributed into Foxboro Green via a line from Baden.
Therefore:
   a) What will be the route of the new watermain into and through Foxboro Green?
   b) Presently Foxboro Green residents have been notified that there are "elevated" levels of salts in our potable water. Will the new line change the 'quality' of the water and its contents, and if so, how?
   c) What will happen to the existing wells on Foxboro site? If they are not to be used then all aquifer and water rights revert back to the Condominium Association. At what date, prior to design, contracting and construction is the region prepared to negotiate water rights to the corporation?
   d) What will happen to the existing water treatment facilities?
   e) In what way will the aquifer beneath Foxboro Green be used or drawn upon by the Region?
   f) Presently, the Region uses an efficient 'single billing system' which charges Foxboro Green Corporation on one bill for all our water use. Will the Region use a similar 'single billing system' or change to an 'individual user billing system'?
   g) i) If an individual user billing system is used for potable water, will the installation of water metres be required in each home and the recreation centre? ii) If yes, then which party bears the cost of those installations?

8) The existing internal system for collection of waste water and distribution of potable water is buried under existing roads which are "common ground" – the Corporation's private property.
Therefore:
   a) Will the Region be assuming responsibility for all existing potable water and waste water lines up to property lines?
   b) Which party bears the costs for connections of existing sewer / waste water lines that are proposed?
   c) Will there be fire hydrants installed through Foxboro Green?

9) "Forcemain location would require agreements with property owners and stakeholders."
Therefore:
   a) Which specific lot # or addresses of private home owners would be affected by potential "agreements"?

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b) Where else might there be a need for "agreements" with 'stakeholders' in Foxboro Green?
c) If "agreements" can not be amicably negotiated with private property owners, is it the Region's process to: i) amend the project in its planning stage (NOW) to accommodate owners, ii) use expropriation or eminent domain - implying the need for the Foxboro Green Board to notify its residents of the potential need to hire lawyers individually or as a group, or as a Corporation?

Summary

1) The elected Board of Waterloo Standard Condominium Corporation #365 (Foxboro Green) has a duty to ensure that all its residents are fully knowledgeable of critical events affecting the private property of the home owners and the commonly held assets. Residents have made significant financial and emotional investments in choosing the ambiance and amenities of the Foxboro Green community. Foxboro Green is "unique" and it is our intent to maintain that.

   As indicated above, the Region of Waterloo, the Township of Wilmot and Stantec Consultants have prevented the Board from providing timely opportunities to gather information, ask questions, discuss and propose alternatives regarding this project due to their failure to 'formally notify'.

   Therefore, we hold that it is the responsibility of the Regional Chair, Karen Redman and the Township Mayor, Les Armstrong and their Councils, to direct their professional staffs to: i) impose a temporary "hold" on the consultation timelines and deadlines for this project, ii) arrange mutually agreeable places and times for "forums" to inform, consult, and respond to ALL the questions listed above as well as any other questions / concerns that may arise from 'the floor' by residents at those meetings, iii) to initiate negotiations toward agreement between the parties.

   Please refer to **Action Items #1, 2 and 3** above.

Please respond at your earliest, timely convenience. Our contact persons will include:

DRAFT

President Don Schafer

1st Vice-President, Cathy Grant

2nd Vice-President Cliff Robinson

Secretary Paul Knowles

Sincerely,

Don Schafer, President

Cathy Grant, 1st Vice-President

Cliff Robinson, 2nd Vice-President

Ben Cornell, Treasurer

In Norway

Jim Henderson, Board Member

Sandy Isaac, Board Member

Elizabeth King, Board Member

Richard Toogood, Services & Equip't

Keith Lyon, Ponds

Simone Beaucage, Rec'n Centre

Wayne Yantz, Potable/Waste Water

Barry Wolfe, Potable/Waste Water

Chris Wright, Grounds

Jim Cooke, Past-Treasurer

DRAFT

Cc: Adriana Ravar, Property Manager

Cc: Michelle Kelley, Legal Counsel

DRAF

From: Kaoru Yajima
To:
Cc: Paul, Jeff
Subject: RE: Stantec Engineers?
Date: Friday, October 21, 2022 1:30:27 PM
Attachments: rpt_TM5A_Foxboro_Forcemain_Evaluation_20221014.pdf

---

Hello Barry,

After our meeting on site, I've been working with Stantec on the proposed wastewater forcemain that would connect the new north pump station to the new south pump station. In our consultation boards, we had shown a forcemain route that runs along Golf Links road. Upon review of this, the condominium corporation had suggested a route that runs primarily down the eastern part of the property.

Stantec has developed both of these options and carried out their evaluation. Stantec is recommending the adoption of the condominium corporation's suggested route.

As we discussed, we wanted the condominium corporation to have a look at the draft technical memo before the Region proceeds with the next steps. I appreciate that there are further details that we would have to work on together but at this time in the process, we are seeking whether the condominium corporation's in general agreement with Stantec's evaluation.

I am attaching the draft for the condominium corporation's review. We have some flexibility with the schedule but was hoping we could have feedback received by Wednesday November 2.

By all means though, please let me know if you have any questions or need more time.

Thanks,
Kaoru

-----Original Message-----
From: Barry Wolfe
Sent: October 18, 2022 2:44 PM
To: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Subject: Re: Stantec Engineers?

EXTERNAL ALERT This email originated from outside the Region of Waterloo.

Thank you, Kaoru

We look forward to hearing from you.

Barry

Sent from my iPhone

> On Oct 18, 2022, at 11:34 AM, Kaoru Yajima <KYajima@regionofwaterloo.ca> wrote:
>
> Hello Barry,
>
> Sorry, I've been on site for the past while and a bit late responding to your message.
>
> Stantec has taken the information provided from our meeting and is nearly done their analysis of the route your

group has suggested. I imagine the technical work required some time on their end to develop, review and document.
>
> I am hoping to report back to you later this week after I meet with Stantec.
>
> Regards,
> Kaoru
>
>
>
> -----Original Message-----
> From: Barry Wolfe
> Sent: October 17, 2022 1:01 PM
> To: Kaoru Yajima <KYajima@regionofwaterloo.ca>; jeff.paul@stantec.com
> Cc: Barry Wolfe Sandy Isaac Keith Lyon Jim Cooke >; Janet & Jerry Elias >; Nancy Crewson ; Chris & Donna Wright Wayne & Jackie Yantz >; Grant Coffey ; Simone Beaucage ; Richard Toogood
> Subject: Re: Stantec Engineers?
>
> **EXTERNAL ALERT** This email originated from outside the Region of Waterloo.
>
>
> Hello Kaoru
>
> If memory serves me correctly, there was mention that an environmental report (or something similar) was to be submitted somewhere (provincial ministry?) near to November 2022.
>
> We're 2 weeks out from November - and no further communications since September 1st.
>
> 1) We would appreciate receiving Stantec's responses to our questions, please.
> 2) Please provide an update regarding Stantec's analysis of the Foxboro alternative route.
> 3) What is the progress status of the report, and when will Foxboro be able to preview its contents, prior to submission?
>
> Thank you,
> Barry
>
>> On Sep 1, 2022, at 11:35 AM, Kaoru Yajima <KYajima@regionofwaterloo.ca> wrote:
>>
>> Hello Barry,
>>
>> Yes, Jeff had mentioned he might send some staff over to further check the option. However I also know he and his team are able to do some of the analysis work from their office. I will forward your questions to him to let him know.
>>
>> In terms of when the report is due, there is no set date for submission Regionally or Provincially. We would like to address issues that have been raised and document the discussions prior to any submission.
>>
>> I will be in touch with you when we are closer to having the report ready.
>>
>> Regards,
>> Kaoru
>>
>> -----Original Message-----
>> From: Barry Wolfe

>> Sent: September 1, 2022 11:22 AM
>> To: Kaoru Yajima <KYajima@regionofwaterloo.ca>
>> Cc: Barry Wolfe Wayne & Jackie Yantz
>> Subject: Stantec Engineers?
>>
>> Hello Kaoru
>>
>> There have been follow-up discussions among various groups here, about “What’s up?” with the potential water linkages between Baden and Foxboro Green.
>>
>> There was an expressed interest by Pam Law and yourself to further investigate the route alternative presented by Foxboro Green.
>>
>> Instead of going along Golf Links, the alternative was to follow the pathway between the golf course and tree common grounds on Foxboro.
>>
>> To investigate the alternative route, Stantec was to send design engineers to Foxboro to do an analysis.
>>
>> 1) Is there any information that we can supply to facilitate that analysis?
>>
>> 2) Who will be Jeff Paul who will be contacting us to set dates for their visits?
>>
>> 3) Is there a time-window when might they be here to investigate?
>>
>> 4) When is the environmental report due for submission Regionally and / or Provincially?
>>
>> 5) When will that Report be ready for review by Foxboro Green prior to its submission?
>>
>> Thank you for your cooperation!
>>
>> Barry Wolfe
>

From:
To: Kaoru Yajima; Paul, Jeff
Cc: ;
;

Subject: Water & Waster Water System Review - Foxboro Green
Date: Saturday, November 12, 2022 8:10:39 PM
Attachments: 00.Nov.11.To.Region.pdf
01.Plan of Alt. F3ii) Foxboro W3 servicing scheme.pdf
02.Committee"s proposal 1B.pdf
03.option.1.jpeg
04.option.1.jpeg
05.H2O Submission to Region & Wilmot.04b copy.pdf

Hello Kaoru.

WSCC #365, Foxboro Green, has attached its sub-option 3iii) below.

Please find attached:
1) cover letter (5 pages)
2) maps/diagrams (4 pages)
3) Our original response (9 pages)
We include our original response based on the fact that there are some original items that have been discussed, but not yet mutually confirmed, and thus are still "on-the-table".

We draw your attention to:

+ Potable water supply from Baden should be 150 mm, minimum, rather than proposed 100 mm.
+ The potable water connection be made via a line that crosses Golf Links Drive via a pathway between
+ A fire hydrant be located at that spot on Golf Links Drive. (Other hydrants may be located beside present public parking spots through the community?)

+ Waste water removal to Baden is proposed at 100 mm. Our present infrastructure is larger than that. We suggest the Region review the diameter of that waste water force main.

+ All waste water collection within Foxboro Green, present gravity feed lines, be separated from Region's force main (pressurized) lines.

We believe this proposal meets the interests and needs of both Foxboro Green and the Region, and will allow us to move forward in a timely fashion.

When we receive your response, we can schedule a meeting of residents of the community.

We thank you for your ongoing cooperation!!

Sincerely,

Barry Wolfe

Caution: This email originated from outside of Stantec. Please take extra precaution.

FOXBORO GREEN

Waterloo Standard Condominium Corporation No.365

Email:

November 11, 2022

Re: Baden – New Hamburg Water & Wastewater System Review – Foxboro Community Servicing
File: 165640324

Hello: Kaoru Yajima and Jeff Paul

Thank you for your memo of October 21, 2022.

We have reviewed your memo and have comments and suggestions. We recognize that there are two systems being considered in this review, 1) the supply of potable water to Foxboro Community, and 2) removal of waste water from Foxboro Community.

We are pleased that the region has recognized the Foxboro Community's expressed values, interests and concerns They are partially reflected in the memo's selection of Option 3 and the suggestion of sub-option 3ii). (See Region map 01)

Foxboro WSCC #365 Interests

1) Minimize disruptions to Golf Links Drive (roadway & residents' access to homes).
2) Environmental, Social, Technical (as expressed in "alignment selection criteria") N.B. Technical are of high priority!
3) Eliminate any potential risk to existing waste water collection infrastructure.
   + That all existing waste water infrastructure for Foxboro WSCC #365 be separated from any force mains installed by the Region. a) Foxboro infrastructure, for waste water collection purposes, is based on a gravity feed system. b) The Region's waste water removal system is based on a pressurized, force main system. c) It is advisable, in our considered opinion, that a pressurized system and a gravity feed system) be **separated** to minimize risk.
   + That the route for that waste water force main remain/continue on that pathway and not enter onto Golf Links Drive at any point.
4) Ensure that all services provided by the upgraded infrastructure meet current standards.
5) Minimize complexity of potential legal agreements (easements, land title transfers).
6) Predictable stability to future operation costs and thus owners'/users' costs.

Waste Water System

In our contemporaneous meeting notes of August 15th, 2022, Pam Law's action items were summarized in a list that included, *"The Region will assess the viability of using the Golf Links trail as the preferred route."* Your October 21st memo confirms that that route is not just viable, but is the preferred option.

We appear to be in agreement that any waste water force mains installed by the Region should be **placed along the eastern pathway behind the homes facing onto Golf Links Drive**. The criteria being used as benchmarks have confirmed that route as the optimum choice.

> "*In the final evaluation, this memo advances sub-option 3ii (placement of the force main along the open space block east of Golf Links Drive) as the preliminary preferred alternative based on the scoring noted.*" (page 6, last paragraph)

Foxboro Green WSCC #365 has reviewed the route map describing sub-option 3ii (attached as page 8 in the memo), as well as Stantec drawings that are available to us.

It is our observation that an alternative, which we will refer to as sub-option 3iii) could be a superior alternative, for reasons we will outline below.

Our suggested alternative, sub-option 3iii) requires:

1) That the route for the waste water force main, originating from the plant at the north end of the property, follow the pathway along the open space block east of Golf Links Drive. (light blue.)
2) That the route follow the pathway south, (between the memo map blue and black) and then follow the long curve of the pathway toward the west, along the route of the existing pathway, which then culminates at the New SPS @ RBC 3 site. (see attached map #02).
3) Pressurized waste water would enter the southern collection facility, that would be retrofitted to accommodate incoming, pressurized flow, via a proposed 100 mm (?) line. (See #4 below)
4) Also entering the southern SPS collection facility would be the existing, Foxboro gravity feed, 200 mm (8") line, per Stantec drawings.
   THEREFORE: The collection of all waste water, from all existing sources in the Foxboro Community, would continue to be received – by gravity - at the northern and southern facilities, as presently exists.
   THEREFORE: The existing gravity feed infrastructure (incoming) is kept completely separated from the pressurized force mains system (outgoing).
5) An existing force main (unused as it goes to the weeping bed under the hydro easement) would follow the same route out of the southern collection facility, then follow the existing pathway out toward the east (Map 02 - dark blue dashed line).

6) That exit line would follow the long curve as the path bends toward the southwest and then south along the proposed (dashed black line to Baden. (Region map 01)

The rationale for the sub-option 3iii) includes:

1) The gravity feed and pressurized systems should be kept separate. The memo, page 7, 5 'Other Alternatives', states,

   "As the existing force mains are in the range of 30 years old, we also advise the region to review pipe condition. At a minimum, a pressure test should be undertaken to ensure that the existing force main network is capable of withstanding pressures above the maximum operating range of the proposed system."

   There is no mention of who is responsible for finding and repairing those places in the existing infrastructure that could get blown apart during a pipe test failure?

Thus, we conclude that separate systems be implemented. K.I.S.

2) Sub-option 3ii) requires installation of two 90° elbows to exit the pathway, and enter onto Golf Links Drive. These 'sharp' turns increase friction, decrease flow rate and increase tendencies to "clog", increasing risk for repairs that result in disturbances to nearby property owners, and potential repairs to the paved Golf Links roadway.
3) The use of Golf Links Drive requires clarification whether this is a private "common ground" property with an easement, or becomes Region titled property as are the existing weeping beds. Would this 70 – 100 metre stretch become a Regional Road? Reference: Stantec,
   to the weeping beds under the hydro easement.
4) The 100 mm (150 mm on Stantec drawings) pressurized force main, exiting the small pumping station at the south could follow a portion of the route of the existing line for potential cost savings.

<u>Potable Water System</u>

The source of potable water, in the existing internal system, is located at the north end of the property. The Region's proposal is to source the potable water from Baden, via a 100mm force main. This dimension is taken from the map, page 8 in the memo. (See our map 02 > red dashed lines)

Foxboro WSCC #365 anticipates that the potable water supply line would follow the same route as waste water force mains, along the pathway at the property's eastern border.

To connect to the existing Foxboro potable water infrastructure simply requires a T-connection at one spot. We suggest, on Golf Links Drive. We suggest that the incoming supply line follow the south to north border pathway, turn west along the pathway between 166 and 168 Golf Links Drive.

The Stantec drawings indicate the 150 mm WM is located toward the western (far) side of Golf Links.
NOTES:

1) There is a manhole 30A at that location that needs to be avoided.
2) The sanitary lines are 150mm.
3) The water lines into Maue Court are 100mm.
4) The existing water lines on Golf Links Drive, where the connection would be made are 150mm.

Stantec's Figure 1 showing their proposed servicing plan for Foxboro is unclear regarding the proposed diameter of the watermain supply line between Baden and Foxboro. The note on the drawing implies 100 mm but is not specific about the watermain size.

It is our considered position that the diameter of **this line needs to be 150 mm** to match the size of the existing system in our community and to provide sufficient fire flow to the community.

It is our considered position that the Region needs to meet current subdivision standards by installing the requisite number of fire hydrants throughout the community. The 150 mm lines are sufficient to supply fire hydrants according to the municipal fire department.

Caveats:
These recommendations are based on Stantec and Region of Waterloo drawings available to us. We need note that, in our experience, the reality of what infrastructure is where, does not always align with the "as built" drawings. i.e., "The shortest distance between two places sometimes has followed a meandering line."
Therefore, appropriate 'due diligence' would suggest that a variety of strategies be employed prior to excavations to confirm the locations of existing infrastructure, including street lights' wiring, landscaping irrigation lines, Bell, Gas, etc.

Conclusions

It is our understanding that:

- mutual revision of the Region's memo is a preliminary stage in the project's process,
- mutual agreement of the proposed route will occur prior to it moving "forward",
- further negotiations regarding other issues/questions as outlined in our preliminary response are still "on-the-table" for future discussions (see attached letter).

Foxboro Green WSCC #365 considers the sub-option 3iii) as presented to be a practical, simple, potentially cheaper construction alternative, when considering the benchmark criteria applied to the project, by the Region and Stantec, and meets the interests of Foxboro WSCC #365.

We have attempted to provide a response to your memo, and anticipate your comments, suggestions at your earliest convenience, as we would need to present the general outline understandings to the condo residents before too many of them leave for the winter.

Please respond at your earliest, timely convenience. Our contact persons will include:

President Cathy Grant 1st Vice-President, Sandy Isaac

2nd Vice-President, Bill Routledge Secretary, Paul Knowles

Sub-Committee Chair, Barry Wolfe

Sincerely,

Cathy Grant, President

Sandy Isaac, 1st Vice-President

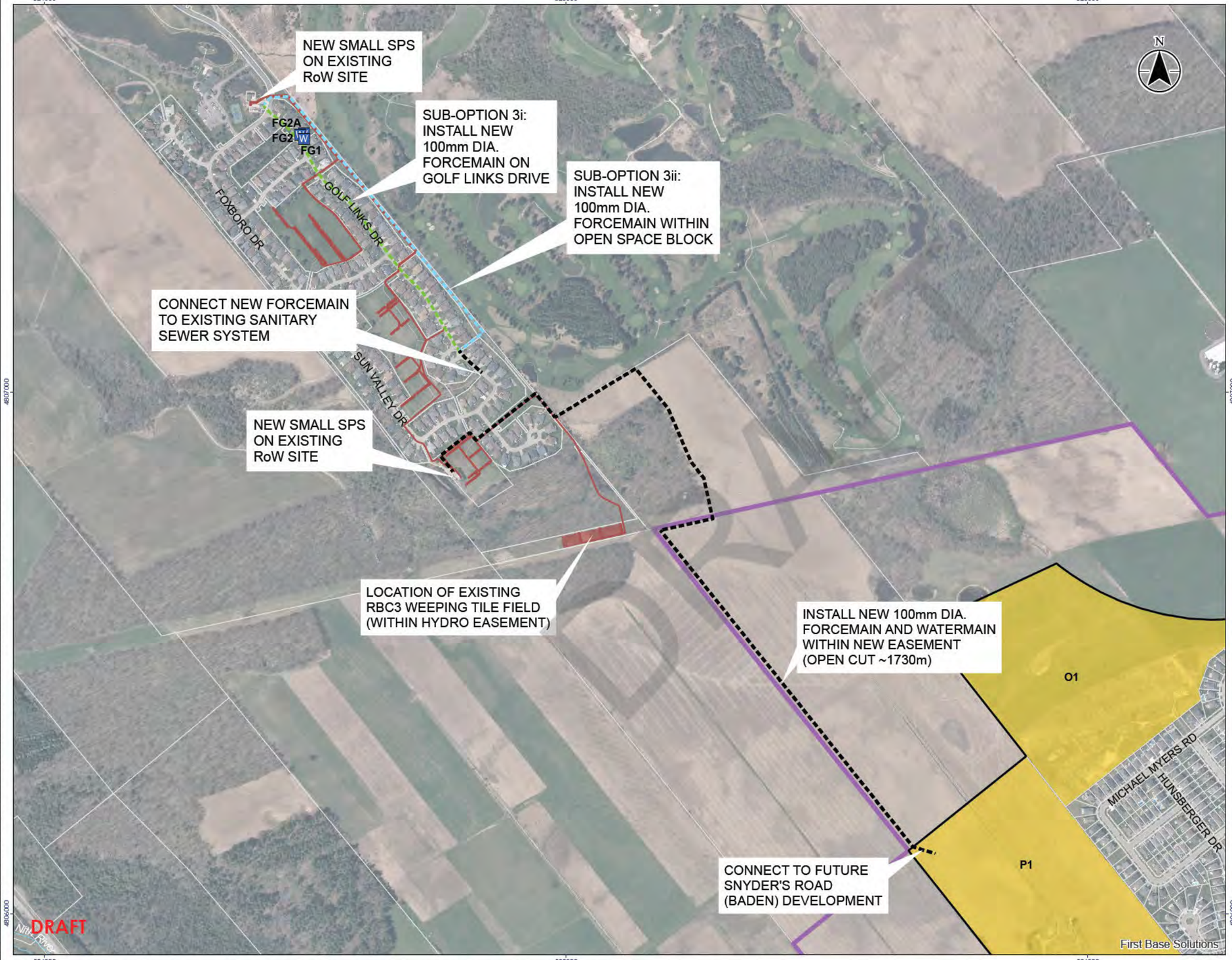
Bill Routledge, 2nd Vice-President

Paul Knowles, Secretary

Barry Wolfe, sub-committee chair

Please see attachments:

1) 4 pages - maps / diagrams
2) 9 pages - initial response from WSCC #365



Stantec

Legend

- Municipal Well

Preferred Sanitary Alternative

- Preferrred Alternative (Alternative 3)
- Sub-Option 3i
- Sub-Option 3ii
- Ex. Sanitary System
- Ex. RBC3 Weeping Tile Field
- Development Block
- Urban Area Boundary
- Countryside Line

0 100 200 m

1:7 500 (At original document size of 11x17)

Notes

1 Coordinate System: NAD 1983 UTM Zone 17N
2 Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario 2017
3 Orthoimagery from Region of Waterloo web map service Imagery Date 2018

Project Location
Wilmot Township

165640324 REVA
Prepared by KDB on 2022-10-21

Client/Project
REGION OF WATERLOO
BADEN – NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
1

DRAFT

Title
Foxboro Water and Wastewater Servicing F3 Preferred Alternative

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

Foxboro Green

Legend

2975 Erbs Rd

Google Earth

400 m

N

Karen Redman, Chair
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150 Frederick St., Kitchener, ON.
N2G 4J3

Kaoru Yajima, Sr. Engineer
Region of Waterloo
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&Economic Development
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Cheryl Gordijk, Councillor Ward 2
Township of Wilmot
60 Snyder's Road West, Baden, ON
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Arthur Flach, Municipal Clerk
Township of Wilmot
60 Snyder's Road West, Baden, ON
N3A 1A1

June 23, 2022

To: Chair Redman, Mayor Armstrong, et. al.,
From: Waterloo Standard Condominium Corporation #365
Re: Baden and New Hamburg Water and Wastewater System Servicing Review

"Our Perspective"

A) For the past couple of years there have been rumours that development would occur, maybe, sometime in the future, on the lands north of Baden and south of the private lands of Foxboro Green.

The rumours included the potential that connections for potable water and waste water might be considered between Foxboro Green (Waterloo Standard Condominium Corporation #365) and Baden. Rumours only.

There has been no formal communication between the Region of Waterloo, the Township of Wilmot, nor Stantec Consulting, and Foxboro Green Corporation #365.

It was a surprise to learn within the past week, that “Notice of Virtual Public Consultation Centre #3 – Baden and New Hamburg Water and Wastewater System Servicing Review” included Foxboro Green in its scope, ***and*** that the deadline for input was July 7, 2022 – about 14 business days from when the Foxboro Green Board became aware of this situation. Subsequent research indicates that, “This Notice was first issued on May 26, 2021.”

There is extreme concern among Foxboro Green Corporation Board members and residents about this “consultation” process. It is our position that this process has been faulty by not *formally* notifying the Foxboro Green Board prior to the commencement of the consultation process. The onus for formal notification of affected parties rests with the Region and Township, and an obscure posting on a website is deemed by ‘the Corporation’ to be insufficient and inappropriate.

B) It is the position of the Foxboro Green Corporation Board that the lands, this project anticipates including, are **PRIVATE PROPERTY**.

The YouTube video, June 7, 2022, includes a slide with the sentence, “Force main location would require agreements with property owners and stakeholders.” This appears to be an acknowledgement that negotiations would have to occur at some time in the process if the project was to progress.

A reasonable person would ask the question, “*If negotiations with property owners and stakeholders was a condition for the project’s implementation, why was there no formal communication and preliminary discussions about probable negotiations with property owners and stakeholders at the earliest days of this project’s conception, and how is this consultation process going to be amended?*” Foxboro Green residents are reasonable people.

Toward that end, the Foxboro Green Condominium Corporation #365 has suggestions, and many questions that need to be answered before movement may occur toward: 1) formal approval, 2) design and 3) tenders for construction.

C) The Foxboro Green Corporation Board and residents recognize that this project is a proposal to change the “**intent”** (Water System) by one of the parties to an existing Agreement and thus any existing Agreement(s) must

be either renegotiated or terminated. We are not presently opposed, *in principle*, to the proposed *changed intent* of this project and anticipate opening negotiations toward an amended Agreement.

Action Item #1

That the arbitrary consultation deadline of July 7, 2022 be postponed until after complete consultation has occurred with the Board and residents of Foxboro Green Condominium Corporation #365.

Action Item #2

That representatives (political and professional staff) of Waterloo Region, Township of Wilmot, and Stantec Consulting need to conduct a forum(s) with residents, prior to July 7, 2022, that provides a detailed overview of the Foxboro Green portion of this project and which includes detailed answers to the questions below.

Action Item #3

Because the Region "cannot preserve its intent" to retain the communal septic system including the tile fields, the Board and its counsel anticipate negotiations toward an amended Agreement.

Questions with Rationale

1) It is our understanding that the Strategic Plans for both the Region of Waterloo and the Township of Wilmot, for the implementation time period of this project, are still "under review" and have not been legally finalized. Therefore:
   a) Is it possible that the 'Urban Area Boundary' may change with implications for Foxboro Green?
   b) Is it possible that the criteria for buildings' heights, population density, etc. may change with implications for Foxboro Green?
   c) Is it possible that Regional and Municipal regulations could provide for potential development of the Foxwood Golf Course properties and / or property within Foxboro Green?
   d) What is the realistic, anticipated timeline when construction may occur to potentially implement this project?

e) What are the contingency plans for addressing disruptions within Foxboro Green for traffic flow of residents, emergency services for life and fire, etc.?

2) The preferred "Alternative F3 – connect Foxboro to Future Expand Baden Service Area using a ***Direct Route***".
   Therefore:
   a) Given that Jeff Paul requested permission to access Foxboro Green private property to investigate the area consisting of wooded and wet lands between the Hydro easement and private residences, does a "direct route" include potentially installing a potable and / or waste water line "**directly**" north through this land, rather than the circuitous route around the wetlands as outlined on the maps?
   b) What are the results of the archaeological assessment report conducted on the lands in this area of private property?
   c) What are the results of the environmental assessment report conducted on the private lands in this area, including the potential for protected species such as turtles, etc. in this area of private property?

3) The proposed sketch map diagram of a force main line runs along Golf Links Drive.
   Therefore:
   a) Why was a "direct route" along the pathway between the golf course and the rear of the homes along Golf Links Drive <u>not proposed</u> as a 'preferred' route?

4) There are presently two (2) locations where waste water is processed – north and south. The sketch map includes a dotted line which indicates the route of a "INSTALL NEW 100 mm DIA. FORCEMAIN (OPEN CUT 670m)" from the height of land at the south end of Golf Links Drive and the (north) "NEW SMALL SPS ON EXISTING RoW SITE". It also includes a second, separate, dotted line which indicates the preferred direct route from an existing RoW site in Foxboro (south) to Baden.
   Therefore:
   a) Why are these waste water lines not connected?
   b) Will there be a potential need for "agreements" between the Region and home owners or the 'Corporation' regarding potential easements across private property?
   c) By what route does waste water from the proposed new SMALL SPS get out of Foxboro Green and on its way south to Baden? (see a)

d) If there is to be a “new” SPS installed at the north end, what happens to the existing facilities: i) are any structures removed, renovated for repurposing, ii) how do these changes conform to the ambiance of the existing Foxboro Green site?
e) Will there be any changes to how waste water is directed, collected, processed, pumped away that will affect present infrastructure for existing home owners and the recreation facility?
f) In the past, the Region made inquiries about ‘unusual’ readings for sulphur content in waste water. Do these readings have any consequences for the integrity of the concrete and materials of the processing facilities that implies new construction or renovations?

5) The sketch map includes a dotted line which indicates the route of a “INSTALL NEW 100 mm DIA. FORCEMAIN (OPEN CUT 670m)” from the height of land at the south end of Golf Links Drive and the “NEW SMALL SPS ON EXISTING RoW SITE”.
Therefore:
a) It may be assumed that the existing roadway would be “destroyed”. Who is responsible for restoring the existing buried services, entire roadway and accompanying private home owners’ landscaping affected?

6) The sketch map includes red lines indicating the routes of the existing sanitary system. It may be reasonably expected that these existing dispersal lines and weeping tile beds will no longer be needed if waste water is pumped out to Baden for processing.
Therefore:
a) What happens to these ‘redundant’ buried lines? i) Will they be left in the ground to deteriorate or be removed? ii) If either left or removed, who is responsible for their future maintenance (changes in level of land for example)?
b) The Foxboro Corporation #365 contracted with the Region to maintain and service waste water systems from the north and south processing plants through the distribution and weeping tile beds as part of our tax assessment. The Corporation has had responsibility for the maintenance of the surface of all these lands, including the contracted portion overlaying the tile fields themselves. At what date, prior to design, contracting and construction is the region prepared to negotiate ownership of these lands to the corporation?

7) The project proposes that potable water will be distributed into Foxboro Green via a line from Baden.
   Therefore:
   a) What will be the route of the new watermain into and through Foxboro Green?
   b) Presently Foxboro Green residents have been notified that there are “elevated” levels of salts in our potable water. Will the new line change the ‘quality’ of the water and its contents, and if so, how?
   c) What will happen to the existing wells on Foxboro site? If they are not to be used then all aquifer and water rights revert back to the Condominium Association. At what date, prior to design, contracting and construction is the region prepared to negotiate water rights to the corporation?
   d) What will happen to the existing water treatment facilities?
   e) In what way will the aquifer beneath Foxboro Green be used or drawn upon by the Region?
   f) Presently, the Region uses an efficient ‘single billing system’ which charges Foxboro Green Corporation on one bill for all our water use. Will the Region use a similar ‘single billing system’ or change to an ‘individual user billing system’?
   g) i) If an individual user billing system is used for potable water, will the installation of water metres be required in each home and the recreation centre? ii) If yes, then which party bears the cost of those installations?

8) The existing internal system for collection of waste water and distribution of potable water is buried under existing roads which are “common ground” – the Corporation’s private property.
   Therefore:
   a) Will the Region be assuming responsibility for all existing potable water and waste water lines up to property lines?
   b) Which party bears the costs for connections of existing sewer / waste water lines that are proposed?
   c) Will there be fire hydrants installed through Foxboro Green?

9) “Force main location would require agreements with property owners and stakeholders.”
   Therefore:
   a) Which specific lot # or addresses of private home owners would be affected by potential “agreements”?

b) Where else might there be a need for “agreements” with ‘stakeholders’ in Foxboro Green?
c) If “agreements” can not be amicably negotiated with private property owners, is it the Region’s process to: i) amend the project in its planning stage (NOW) to accommodate owners, ii) use expropriation or eminent domain - implying the need for the Foxboro Green Board to notify its residents of the potential need to hire lawyers individually or as a group, or as a Corporation?

Summary

1) The elected Board of Waterloo Standard Condominium Corporation #365 (Foxboro Green) has a duty to ensure that all its residents are fully knowledgeable of critical events affecting the private property of the home owners and the commonly held assets. Residents have made significant financial and emotional investments in choosing the ambiance and amenities of the Foxboro Green community. Foxboro Green is “unique” and it is our intent to maintain that.

   As indicated above, the Region of Waterloo, the Township of Wilmot and Stantec Consultants have prevented the Board from providing timely opportunities to gather information, ask questions, discuss and propose alternatives regarding this project due to their failure to ‘formally notify’.

   Therefore, we hold that it is the responsibility of the Regional Chair, Karen Redman and the Township Mayor, Les Armstrong and their Councils, to direct their professional staffs to: i) impose a temporary “hold” on the consultation timelines and deadlines for this project, ii) arrange mutually agreeable places and times for “forums” to inform, consult, and respond to ALL the questions listed above as well as any other questions / concerns that may arise from ‘the floor’ by residents at those meetings, iii) to initiate negotiations toward agreement between the parties.

   Please refer to **Action Items #1, 2 and 3** above.

Please respond at your earliest, timely convenience. Our contact persons will include:

President Don Schafer

1st Vice-President, Cathy Grant

2nd Vice-President Cliff Robinson

Secretary Paul Knowles

Sincerely,

Don Schafer, President

Cathy Grant, 1st Vice-President

Cliff Robinson, 2nd Vice-President

Ben Cornell, Treasurer

Jim Henderson, Board Member

Sandy Isaac, Board Member

Elizabeth King, Board Member

Richard Toogood, Services & Equip't

Keith Lyon, Ponds

Simone Beaucage, Rec'n Centre

Wayne Yantz, Potable/Waste Water

Barry Wolfe, Potable/Waste Water

Chris Wright, Grounds

Jim Cooke, Past-Treasurer

Cc: Adriana Ravar, Property Manager

Cc: Michelle Kelley, Legal Counsel

Stantec

Memo

To:	Kaoru Yajima Region of Waterloo	From:	Jeff Paul London
Project/File:	1656-40324	Date:	November 30, 2022

Reference: Baden - New Hamburg Servicing Study
Response to Foxboro Condo Corp letter of Nov. 11, 2022

This memo is in response to the Foxboro Condo Corporation's (Foxboro) letter of November 11, 2022, and is based on our discussions. The main points in the letter are a request to extend the sanitary forcemain between the proposed northern pumping station directly to the southern pumping station and a request to upgrade the level of service in the community to provide fire protection from the municipal water supply system.

Sanitary Forcemain Alignment

The alternative in our memo of October 21, 2022 (sub-option 3ii) extended the sanitary forcemain along the route requested by the Foxboro Condo Corp and connected into the gravity sanitary sewer system on Golf Links Drive. As you are aware, connecting forcemains into gravity sewers is standard engineering practice. Having a shorter forcemain reduces the initial capital cost and also reduces operation costs as a longer forcemain increases friction losses requiring more energy to drive the flow to it's discharge point. The preferred option presented in the memo as sub-option 3ii also reviewed the downstream capacity of the gravity sanitary sewer and found this sewer to have sufficient capacity for the proposed flows. Nothwithstanding the cost advantages of this alternative, we recognize that this will require sanitary flows from the northern pumping station (facility to be owned by the Region) to enter into the gravity sewer system currently owned and operated by the condo corporation. This may require the Region to take over ownership of this section of gravity sewer and the Region may need to review the condition of this sewer

The sub-option 3iii proposed by Foxboro represents a higher cost alternative but avoids these logistical and legal issues and thus we are recommending that our recommendation be amended and sub-option 3iii be advanced as the preferred option.

Fire Protection Level of Service Upgrade

With regard to the request from Foxboro to upgrade the level of service in their community to provide fire protection from the municipal water system, we can provide the following comments.

As a part of our Servicing Study, the incoming watermain has been modelled at a preliminary level. That model concluded that a 150mm diameter watermain connected to the existing watermain on Woods Edge Court would provide sufficient flow and pressure to satisfy the normal domestic use for the homes within the Foxboro community. This sizing would need to be confirmed at the detailed design stage of the project. The model did not consider a scenario in which fire protection would be provided to the Foxboro Community as the intent of the study was to provide the same level of service as currently exists in the community. As you

are aware, a fire flow condition requires a significantly larger amount of flow than would be required for normal domestic use.

Noting that the Foxboro residents have indicated a desire to have fire protection provided by the municipal water system, the model would need to be updated to simulate a fire flow condition. While we have not run that model, we can speculate that the following may be the outcome of such an exercise:

- The incoming watermain would need to be increased in size. The Foxboro letter indicate that a 150mm watermain is sufficient to provide fire protection based on information they have received from the local fire department. While this is not an incorrect statement, it is not accurate in the case of the Foxboro Community. As you are aware, a 150mm watermain will only provide fire protection where that watermain length is short, there are minimal other demands on the system and the incoming flow and pressure is sufficient. The feed into the Foxboro community is of a length that the friction losses in a 150mm watermain will significantly degrade the flow. In addition, the coincident domestic use in Foxboro during a fire event would create additional demands on the incoming watermain. If the level of service to this community is to be increased, a much larger watermain would be required.

- The larger watermain noted in the above noted bullet may cause water age problems. As you are aware, chlorine dissipates in municipal treated water over time and thus the water must be used or evacuated from watermains within a specific time period. While the incoming watermain will be oversized for a fire event, the water may stagnate under normal flow conditions and may require automatic flushing.

- As the majority of the watermains within the Foxboro community are 150mm diameter or smaller, it is very likely that the model would indicate that some portions of the watermains in the community would need to be replaced with larger mains to satisfy a fire event scenario.

As noted above, the model would need to be updated with a fire flow event scenario to confirm any of the above points. As the mandate of the Region is to supply municipal water to the residents and to maintain a consistent level of service, it is our understanding that the responsibility and cost of upgrading of the water supply and distribution system within the Foxboro community would fall upon the Foxboro Condo Corporation as this is a private community and the distribution system is owned and operated by that Condo Corporation. If Foxboro wishes to pursue this alternative, we are available to complete the modelling work noted above and would suggest that we are engaged directly by the Condo Corp, provided the Region can confirm their agreement to that arrangement.

Please let us know if you have any questions or concerns with the above noted.

Reference: Baden - New Hamburg Servicing Study

Best regards,

STANTEC CONSULTING LTD.

Jeff Paul P.Eng.
Managing Senior Principal, Water
Phone: (519) 319-5806
jeff.paul@stantec.com

Attachment: [Attachment]

From: Kaoru Yajima
To: '
Cc: ; Paul, Jeff
Subject: RE: WSCC #365, Foxboro Green and sub-option 3iii
Date: Wednesday, December 21, 2022 4:39:05 PM
Attachments: mem_Foxboro_Response_20221221.pdf

Hello Barry,

Thanks for the wait, as well as the conversation earlier today.

I'm going to attach the response prepared by our consultant, Stantec which recommends the new option 3iii) proposed by the Foxboro Condo corp. It also mentions the rationale to not provide fire flow as I described.

Regarding your points we discussed earlier today, I provide the following.

1. On the incoming water force main from Baden, it not have been clear in our documentation but it will be a 150mm water main. Thanks for bringing that to our attention. It will be clear in our reporting as well.
2. The Region could support the water main route proposed, so the route going back north along the path and cutting through the side path to Maue Court. However you can appreciate that additional technical analysis could be conducted to ensure this is hydraulically the optimal location to tie in. I will ask our consultant to put this forward as the preferred alternative but subject to technical review in the next stage of project and if there is recommendation to change, to first discuss with the Condo corp.
3. On the request for adding one hydrant, the Region has been advised to not accept this. While the rationale you described made sense, there are legal, liability and operation and maintenance issues surrounding the single hydrant. The Region requests that the Condo corp continue to address fire flows through its current arrangement.

I am hoping this is sufficient to move on with the concept of the new water and wastewater supply, and that the Condo corp and the Region continue to work together as this project progresses. If you have any further questions, please let me know.

Regards,
Kaoru Yajima

-----Original Message-----
From: Kaoru Yajima
Sent: December 20, 2022 4:11 PM
To:

Subject: RE: WSCC #365, Foxboro Green and sub-option 3iii

Hello Barry,

I know I aimed for today to get a response to you but I will need an additional day.

I hope to get it to you tomorrow.

My apologies for this,
Kaoru

-----Original Message-----
From: Barry Wolfe
Sent: December 18, 2022 12:33 PM
To: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Cc: Barry Wolfe Cathy Grant ; Paul & Julie Knowles

Subject: WSCC #365, Foxboro Green and sub-option 3iii

EXTERNAL ALERT This email originated from outside the Region of Waterloo.

Hello Kaoru

All the best of the season to you!

Would you please provide a status report re. the Foxboro Green submission of alternative sub-option 3iii, please?

Thank you,

Barry Wolfe
Caution: This email originated from outside of Stantec. Please take extra precaution.

Attention: Ce courriel provient de l'extérieur de Stantec. Veuillez prendre des précautions supplémentaires.

Atención: Este correo electrónico proviene de fuera de Stantec. Por favor, tome precauciones adicionales.

Stantec

Memo

To:	Kaoru Yajima Region of Waterloo	From:	Jeff Paul London
Project/File:	1656-40324	Date:	December 21, 2022

Reference: Baden - New Hamburg Servicing Study
Response to Foxboro Condo Corp letter of Nov. 11, 2022

This memo is in response to the Foxboro Condo Corporation's (Foxboro) letter of November 11, 2022, in response to our TM5A dated October 21, 2022. The main points in the letter are 1. a newly proposed Sub-option 3iii to extend the sanitary forcemain between the proposed northern pumping station directly to the southern pumping station and 2. a request to upgrade the level of service in the community to provide fire protection from the municipal water supply system. Below is our evaluation and comment to these points.

1.Sanitary Forcemain Alignment

The preferred alternative identified in our memo of October 21, 2022, referred to as sub-option 3ii, extended the sanitary forcemain along the route suggested by the Foxboro Condo Corp and connected into the gravity sanitary sewer system on Golf Links Drive. Connecting forcemains into gravity sewers is standard engineering practice and, as you are aware, there are successful examples in the Region of Waterloo. A shorter forcemain reduces the initial capital cost and also reduces operation costs as a longer forcemain requires more energy to pump the flow to it's destination point. Sub-option 3ii also reviewed the capacity of the downstream gravity sanitary sewer and found it sufficient for the proposed flows. Notwithstanding the cost advantages of this alternative, we recognize that this will require sanitary flows from the northern pumping station to enter into the gravity sewer system currently owned and operated by Foxboro.

The sub-option 3iii proposed by Foxboro represents a higher cost alternative but has the advantage of avoiding various logistical issues. Therefore, we are recommending that sub-option 3iii be advanced as the preferred option.

2.Fire Protection Level of Service Upgrade

With regard to the suggestion to upgrade the level of service in Foxboro community to provide fire protection from the municipal water system, we provide the following comments.

- As a part of our Study, the proposed incoming watermain has been modelled to provide sufficient flow and pressure to satisfy the normal domestic use for the homes within the Foxboro community. The model did not consider a scenario in which fire protection would be provided to the Foxboro Community as the intent of the study was to provide the same level of service as currently exists in the community.

- In order to provide fire flow, the incoming watermain would need to be increased in size. This larger watermain can, in turn, have unintended consequences. During non-fire scenarios, in other words almost all of the time, the water in a larger watermain will move more slowly thus increasing the

Reference: Baden - New Hamburg Servicing Study

water age in the pipe. As the water age increases, decay of the water disinfectant can occur causing issue. In addition, increased water age may also result in disinfection by-products which are a known health issue.

- As the majority of the watermains within the Foxboro community are of small diameter, it is very likely that some portions of the existing watermains in the community would need to be replaced with larger mains to satisfy a fire event scenario.
- The Region has considered this situation for similar-sized communities for which they supply water to, such as Lloyd Brown and West Montrose to name a few, and they face the same issues as noted above. In those cases, the Region concluded that fire protection would not be provided.

Given the above, it is our recommendation that fire protection from the municipal water system not be provided for the Foxboro community .

Please let us know if you have any questions or concerns with the above noted.

Best regards,

STANTEC CONSULTING LTD.



Jeff Paul P.Eng.
Managing Senior Principal, Water
Phone: (519) 319-5806
jeff.paul@stantec.com

Attachment: [Attachment]

FOXBORO GREEN

Waterloo Standard Condominium Corporation #365

December 29, 2022

Kaoru Yajima, Sr. Engineer
Region of Waterloo
150 Frederick St. Kitchener, ON.,
N2G 4J3

Jeff Paul, Managing Senior Principal, Water
Stantec Consulting
171 Queens Ave.,
London, ON.,
N6A 5J7

To: Kaoru and Jeff,

Re: "Baden – New Hamburg Serving Study
Response to Foxboro Condominium Corporation letter of Nov. 11, 2022"

Thank you for your phone call, and memo referenced above, dated December 21, 2022.

It is our understanding that the Region:

1. Agrees that the WSCC No. 365 recommendation referred to as sub-option 3iii is the preferred option route for the collection of wastewater within, and removal from Foxboro Green.
2. Agrees that the proposed incoming potable water supply watermain from Baden to Foxboro will be 150mm.
3. Understands our preferred proposal to connect incoming potable water from Baden to the Foxboro pressurized system via the pathway to Golf Links Drive at approximately Maue Court, which is presently "subject to technical review" to confirm the optimum location.

The Board of Foxboro Green, WSCC No. 365, agrees in principle to the above three (3) items, as a basis for moving forward with the concept of a new water and wastewater connection.

The Board of Foxboro Green, WSCC No. 365, looks forward to continued discussion with the Region, on the many remaining aspects of the project outlined in our original submission, as we work cooperatively toward a comprehensive, legal "Agreement".

Sincerely,

Cathy Grant, President

Sandy Isaac, 1st Vice-President

William Routledge, 2nd Vice President

Paul Knowles, Secretary

Comments Received During 30-Day Review

Ministry of Citizenship and Multiculturalism

Heritage Planning Unit
Heritage Branch
Citizenship, Inclusion and Heritage Division
5th Flr, 400 University Ave
Tel.: 613.242.3743

Ministère des Affaires civiques et du Multiculturalisme

Unité de la planification relative au patrimoine
Direction du patrimoine
Division des affaires civiques, de l'inclusion et du patrimoine
Tél.: 613.242.3743

May 8, 2023 EMAIL ONLY

Kaoru Yajima
Region Project Manager
Region of Waterloo
kyajima@regionofwaterloo.ca

MCM File	**:**	**0013687**
Proponent	**:**	**Region of Waterloo**
Subject	**:**	**Municipal Class EA – Schedule B – Notice of Completion**
Project	**:**	**Baden and New Hamburg Water and Wastewater System Servicing Review**
Location	**:**	**Region of Waterloo**

Dear Kaoru Yajima:

Thank you for providing the Ministry of Citizenship and Multiculturalism (MCM) with the Notice of Completion and providing us with the opportunity to review the Project File Report (PFR) (dated, March 2023, by Stantec Consulting Ltd.) prepared for the above-referenced project.

MCM's interest in this project relates to its mandate of conserving Ontario's cultural heritage

Under the EA process, the proponent is required to determine a project's potential impact on known (previously recognized) and potential cultural heritage resources.

Project Summary
The Region of Waterloo has completed a Servicing Review to assess the current water and wastewater systems in the communities of Baden, New Hamburg and Foxboro Green and assess current and future needs. The following recommended improvements have been selected to address the needs within the Region:

- Upgrade the Baden Pump Station and construct a new forcemain connecting directly to the New Hamburg Wastewater Treatment Plant
- Connect Foxboro Green to the Baden sewer and water supply system

This Servicing Review was completed in accordance with the requirements of Schedule B projects, following Phases 1 and 2 of the Municipal Class Environmental Assessment (October 2000, as amended in 2007, 2011 and 2015), which is an approved process under the Ontario *Environmental Assessment Act.*

Comments

We have reviewed the PFR and find that due diligence has been undertaken in preparing the report by:

- Undertaking a Stage 1 archaeological assessment (AA) (under Project Information Form (PIF) number P390-0364-2022, included in Appendix H) which was found to be compliant and has been entered into the Ontario Public Register of Archaeological Reports. The Stage 1 AA recommended that a Stage 2 archaeological assessment be undertaken.
- Preparing a *Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment* (dated March 10, 2023, by Stantec Consulting Ltd., included in Appendix I) which is consistent with the requirements, guidance and standards of the Municipal Class EA and with best practice guidance prepared by MCM. The report concluded that there may be indirect impacts to the property at 3277 Bleams Road East.

We attached a table with some comments and recommendations to support the PFR's documentation of cultural heritage due diligence.

Thank you for consulting MCM on this project. If you have any questions or require clarification, please do not hesitate to contact me.

Sincerely,

Joseph Harvey
Heritage Planner
Heritage Planning Unit
joseph.harvey@Ontario.ca

Copied to: Sarah Micks, Environmental Planner, Stantec
Jeff Paul, Stantec
Paula Hohner, Stantec

It is the sole responsibility of proponents to ensure that any information and documentation submitted as part of their EA report or file is accurate. The Ministry of Citizenship and Multiculturalism (MCM) makes no representation or warranty as to the completeness, accuracy or quality of the any checklists, reports or supporting documentation submitted as part of the EA process, and in no way shall MCM be liable for any harm, damages, costs, expenses, losses, claims or actions that may result if any checklists, reports or supporting documents are discovered to be inaccurate, incomplete, misleading or fraudulent.

Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out an archaeological assessment, in compliance with Section 48(1) of the *Ontario Heritage Act*.

The *Funeral, Burial and Cremation Services Act, 2002, S.O. 2002, c.33* requires that any person discovering human remains must cease all activities immediately and notify the police or coroner. If the coroner does not suspect foul play in the disposition of the remains, in accordance with *Ontario Regulation 30/11* the coroner shall notify the Registrar, Ontario Ministry of Public and Business Service Delivery, which administers provisions of that Act related to burial sites. In situations where human remains are associated with archaeological resources, the Ministry of Citizenship and Multiculturalism should also be notified (at archaeology@ontario.ca) to ensure that the archaeological site is not subject to unlicensed alterations which would be a contravention of the *Ontario Heritage Act*.

Item No.	Report Section	Original Text	Comment
1.	4.3 (Cultural Environment) p. 27 (PDF 35)	4.3.1 Cultural Heritage Resources A desktop review was completed to identify known (listed and designated) cultural heritage resources in the study area, as shown on Figure 7. This information does not account for potential heritage resources typically considered in the EA process, such as properties/structures over 40 years of age, national historic sites, federal or United Nations Educational, Scientific and Cultural Organization (UNESCO) designations, interpretive or commemorative plaques or cultural heritage landscapes. A screening checklist and/or a Cultural Heritage Assessment Report (CHAR) will be undertaken following the selection of the recommended alternatives. 4.3.1 Archaeological Resources Archaeological potential is established by determining the likelihood that archaeological resources may be present within a study area. To aid in the evaluation of archaeological potential, the Ministry of Citizenship and Multiculturalism (MCM) considers variables, such as: proximity to registered archaeological sites, distance to various types of water sources, soil texture and drainage, glacial geomorphology, elevated topography and the general topographic variability of the area, and proximity to areas of early EuroCanadian settlement, including places of military or pioneer settlements, early transportation routes, and properties listed on the municipal register or designated under the *Ontario Heritage Act* or properties that local histories or informants have identified with possible historical events.	We recommend that a Stage 2 archaeological assessment and any further recommended assessment (e.g., Stage 3 and 4) be completed as early as possible in the detailed design phase and prior to any ground disturbing activities. Please note archaeological concerns have not been addressed until reports have been entered into the Ontario Public Register of Archaeological Reports where those reports recommend that: 1. the archaeological assessment of the project area is complete and 2. all archaeological sites identified by the assessment are either of no further cultural heritage value or interest (as per Section 48(3) of the *Ontario Heritage Act*) or that mitigation of impacts has been accomplished through excavation or an avoidance and protection strategy. We recommend replacing section 4.3 of the PFR with the following so that it aligns with the current legislation and terminology: 4.3.1 Cultural Heritage Resources: **Cultural heritage resources include archaeological resources, built heritage resources and cultural heritage landscapes.** 4.3.1 Archaeological Resources A Stage 1 archaeological assessment (AA) (Project Information Form number (PIF) P390-0364-2022) was undertaken on March 27, 2023 by Stantec Consulting Ltd. for the preliminary preferred alternatives. A Stage 1 AA consists of a review of geographic, land use and historical information for the property and the relevant surrounding area, and contacting MCM to find out whether, or not, there are any known archaeological sites on or near the property.

		Based on a preliminary review of the study area for the project, it is likely that portions of the study area will retain potential for the identification of archaeological resources. A Stage 1 archaeological assessment was undertaken following the selection of the recommended alternatives in accordance with the Ministry's 2011 Standards and Guidelines for Consultant Archaeologists which is discussed in Section 10.2.	Its purpose is to identify areas of archaeological potential and further archaeological assessment (e.g., Stage 2-4) as necessary. The Stage 1 AA is included in Appendix H. [Then include the outcomes and recommendations of the report, as in Executive Summary] 4.3.2 Built Heritage Resources and Cultural Heritage Landscapes A *Cultural Heritage Report- Existing Conditions and Preliminary Impact Assessment* was undertaken on March 10, 2023 by Stantec Consulting Ltd. for study area. This report consisted of data collection, background historic research, review of secondary source material and field review. A total of 6 potential built heritage resources and 1 recognized cultural heritage landscape were identified within or adjacent to the project area. The Cultural Heritage Report is included in Appendix I.
2.	8.1 (Evaluation Criteria) Table 7: Evaluation Criteria p. 46 (PDF 54)	Environmental Component - Social Evaluation Criteria - Protects cultural heritage Resources Description - Minimize potential impact to historical, cultural, and architecturally significant features. Minimize the potential impact to Indigenous communities. Environmental Component - Social Evaluation Criteria - Protects archaeological features Description	Cultural heritage resources include archaeological resources, built heritage resources and cultural heritage landscapes. We recommend revising Table 7 so that it aligns with our suggested revisions to PFR section 4.3 Environmental Component - Social Evaluation Criteria - ~~Protects~~ Conserves built heritage resources and cultural heritage landscapes ~~Resources~~ Description - Minimize potential impact on known (e.g., previously recognized) and potential built heritage resources and cultural heritage landscapes ~~to historical, cultural, and architecturally significant features. Minimize the potential impact to Indigenous communities~~.

		- Minimize potential impact to archaeologically significant features. Performs the appropriate archaeological investigations as regulated by legislation in areas of archaeological potential.	Environmental Component - Social Evaluation Criteria - ~~Protects~~ Conserves archaeological resources ~~features~~ Description - Minimize potential impact to archaeological~~ly~~ sites and areas of archaeological potential. ~~significant features. Performs the appropriate archaeological investigations as regulated by legislation in areas of archaeological potential.~~ We recommend revising the terminology included in Appendix F so that it aligns with our suggested revisions to PFR section 8,1 (Please see comment 5 below)
3.	11.3 (Archaeological resources – Proposed Environmental Mitigation and Monitoring Requirements) p. 75 (PDF 83)	A Stage 2 archaeological assessment will be completed during detailed design and prior to any impacts in accordance with the recommendations in the Stage 1 report. The Stage 1 report was submitted to MCM to review the presented results and accept into the Ontario Public Register of Archaeological Reports. A copy of the Stage 1 report is provided in Appendix H.	We recommend revising PFR section 11.3 to align with current legislation and terminology. A Stage 2 (and any further stages of) archaeological assessment will be completed during detailed design and prior to any ground disturbing activities. The Stage 1 report was entered into the Ontario Public Register of Archaeological Reports. A copy of the Stage 1 report is provided in Appendix H. Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out an archaeological assessment, in compliance with Section 48(1) of the *Ontario Heritage Act*. The *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 requires that any person discovering human remains must cease all activities immediately and notify the police or coroner. If the coroner does not suspect foul play in the disposition of the remains, in accordance with Ontario Regulation 30/11 the coroner

			shall notify the Registrar, Ontario Ministry of Public and Business Service Delivery, which administers provisions of that Act related to burial sites. In situations where human remains are associated with archaeological resources, the Ministry of Citizenship and Multiculturalism should also be notified (at archaeology@ontario.ca) to ensure that the archaeological site is not subject to unlicensed alterations which would be a contravention of the *Ontario Heritage Act*.
4.	11.4 (Cultural Heritage Resources – Proposed Environmental Mitigation and Monitoring Requirements) p. 75 (PDF 83)	The property located at 3277 Bleams Road (BHR-2) was determined to be situated within 50 m of planned construction activities of the new forcemain (Alternative WW4), and at risk for potential indirect vibration related impacts. The preferred option is avoidance of 3277 Bleams Road East (BHR-2) by establishing a buffer zone around the built heritage resource to avoid construction activity within 50 m. This should use appropriate preventative measures such as mapping on construction maps and temporary fencing. Staging and laydown areas should also be selected so that they are non-invasive and avoid the previously identified or potential built heritage resource or cultural heritage landscape. Where avoidance is not feasible, the alternative option should be applied. …	To align with our edits to PFR section 4.3, we recommend revising the title of Section 11.4 from "Cultural Heritage Resources" to "Built Heritage Resources and Cultural Heritage Landscapes".
5.	Appendix F (Technical Memo #5 & #5A Evaluation and Preferred Alternatives	n/a	We recommend revising Appendix F so that it aligns with our suggested revisions to PFR section 8.1 (Please see comment 2 above)

MHBC
PLANNING
URBAN DESIGN
& LANDSCAPE
ARCHITECTURE

KITCHENER
WOODBRIDGE
LONDON
KINGSTON
BARRIE
BURLINGTON

May 8, 2023

Regional Municipality of Waterloo
150 Frederick Street
Kitchener, ON N2G 4J3

Attn: Kaoru Yajima, Project Manager
Water Services

Sent via email kyajima@regionofwaterloo.ca

Dear Kaoru Yajima:

RE: Regional Municipality of Waterloo – Baden and New Hamburg Water and Wastewater System Servicing Review Submission on behalf of ,
Township of Wilmot
OUR FILE 15188 I

We are writing on behalf of our clients, , with respect to the Notice of Completion for the Baden and New Hamburg Water and Wastewater System Servicing Review ("Servicing Review").

Our clients own lands within the Township of Wilmot, .

Our clients have been monitoring the ROP Review process and provided comments to the Region with respect to ROPA #6 and prior to Regional Council's adoption in August 2022. In December 2022, we submitted comments to the Minister of Municipal Affairs and Housing ("Minister") in response to the Region Adopted ROPA #6. The request was to have our client's lands,

On April 11, 2023, the Minister issued a Notice of Decision with respect to Official Plan Amendment 6 to the Regional Municipality of Waterloo Official Plan. The Minister approved ROPA# 6, with modifications, which resulted in our client's lands being included in the New Hamburg Township Urban Area. In addition to this property, a number of other land parcels within the Township were brought into the Baden and New Hamburg Township Urban Areas.

As a result of the modified approval of ROPA#6 by the Minister, it is our opinion that the Servicing Review should not be approved as currently written and that Region should request the Minister of the Environment, Conservation and Parks to defer approval until a full assessment be completed to reflect the additional lands within the TUA's. The **scale** of lands now included within the TUA's is significant enough to affect the preferred servicing alternatives for both water and wastewater solutions. Further, the **location** of these additional TUA lands could also affect the preferred servicing solutions. The Servicing Review prepared by Stantec and C3Water Inc. note that the opinions in the document are based on conditions and information available at the time the document was published and do not take into account any subsequent changes. It is our respectful opinion that the implications of the Minister's Decision on ROPA #6 need to be considered before the Servicing Review can be finalized as they represent significant and material changes to the information relied upon in the recommendations within the Servicing Review.

In summary, the Region and Minister of Environment, Conservation and Parks should remedy the situation by:

- deferring final approval of the Servicing Review, and
- Initiating a new Municipal Class Environmental Assessment to fully address the additional lands that are now within the Baden TUA and New Hamburg TUA.

Thank you for considering our submission.

Yours truly,

MHBC



Carol Wiebe, BES
Partner

c.

MHBC
PLANNING
URBAN DESIGN
& LANDSCAPE
ARCHITECTURE

KITCHENER
WOODBRIDGE
LONDON
KINGSTON
BARRIE
BURLINGTON

May 8, 2023

Regional Municipality of Waterloo
150 Frederick Street
Kitchener, ON N2G 4J3

Attn: Kaoru Yajima, Project Manager
Water Services

Sent via email kyajima@regionofwaterloo.ca

Dear Kaoru Yajima:

RE: Regional Municipality of Waterloo – Baden and New Hamburg Water and Wastewater System Servicing Review Submission on behalf of
Township of Wilmot
OUR FILE 17303A

We are writing on behalf of our clients with respect to the Notice of Completion for the Baden and New Hamburg Water and Wastewater System Servicing Review ("Servicing Review").

Our clients have been actively involved in the ROP Review process and have made several submissions to the Region and Township regarding the settlement boundary rationalization review in 2017 and the Regional Official Plan Review for potential expansions to the Township Urban Areas. In December 2022, we submitted comments to the Minister of Municipal Affairs and Housing ("Minister") in response to the Region Adopted ROPA #6.

.

On April 11, 2023, the Minister issued a Notice of Decision with respect to Official Plan Amendment 6 to the Regional Municipality of Waterloo Official Plan. The Minister approved ROPA# 6, with modifications, which resulted in being included in the Baden Township Urban Area. In addition to this property, a number of other land parcels within the in the Township were brought into the Baden and New Hamburg Township Urban Areas.

As a result of the modified approval of ROPA#6 by the Minister, it is our opinion that the Servicing Review should not be approved as currently written and that Region should request the Minister of the Environment, Conservation and Parks to defer approval until a full assessment be completed to reflect the additional lands within the TUA's. The **scale** of lands now included within the TUA's is significant enough to affect the preferred servicing alternatives for both water and wastewater solutions. Further, the **location** of these additional TUA lands could also affect the preferred servicing solutions. The Servicing Review prepared by Stantec and C3Water Inc. note that the opinions in the document are based on conditions and information available at the time the document was published and do not take into account any subsequent changes. It is our respectful opinion that the implications of the Minister's Decision on ROPA #6 need to be considered before the Servicing Review can be finalized as they represent significant and material changes to the information relied upon in the recommendations within the Servicing Review.

In summary, the Region and Minister of Environment, Conservation and Parks should remedy the situation by:

- deferring final approval of the Servicing Review, and
- Initiating a new Municipal Class Environmental Assessment to fully address the additional lands that are now within the Baden TUA and New Hamburg TUA.

Thank you for considering our submission.

Yours truly,

MHBC



Andrea Sinclair, MUDS, BES, MCIP, RPP

c.

TOWNSHIP OF Wilmot

INFRASTRUCTURE SERVICES

60 Snyder's Road West, Baden, ON N3A 1A1

Infrastructure Services Department
T: 519-634-8444
F: 519-634-5044
Email: **engineering@wilmot.ca**

EXTERNAL MEMORANDUM

TO: Minister of the Environment, Conservation and Parks
Ministry of Environment, Conservation and Parks
777 Bay Street, 5th Floor Toronto ON,
M7A 2J3
minister.mecp@ontario.ca

Director, Environmental Assessment Branch
Ministry of Environment, Conservation and Parks
125 St. Clair Ave. W,
1st Floor Toronto ON,
M4V 1P5
EABDirector@ontario.ca

CC: Kaoru Yajima P.Eng. Sr. Engineer, Water Services Region of Waterloo

PREPARED BY: Ken Vander Wal P.Eng.

DATE: May 8, 2023

RE: Baden – New Hamburg Water and Wastewater System Servicing Review Stantec Consulting Ltd. & C3 Water Inc. March 2023

The Township has had an opportunity to review the Baden – New Hamburg Water and Wastewater System Servicing Review Project File Report, completed by Stantec Dated March 2023 as per the Notice of Study Completion posted April 5 h, 2023, noting Comments to be provided by Tuesday, May 9, 2023.

Regarding Water Supply,
5.1.4 Existing Fire Flow

> *Based on the model results, the system was able to meet the MECP fire flow requirements of 274 L/s at a residual pressure of 138 kPa in downtown Baden. Downtown New Hamburg achieved a fire flow of 214 L/s, less than the MECP fire flow of 274 L/s.*

5.1.5 Future Fire Flow

The future MECP fire flow requirement of 330 L/s for 5 hours was applied in the downtown New Hamburg commercial area. The New Hamburg reservoir drained down to the 40% full approximately 4 hours after the fire flow started. While the Baden ET continued to supply the remaining demand, the water level dropped to approximately 1 m, or 8% volume by the end of the fire flow period. Existing storage was found to be insufficient to supply the future fire flow demand.

5.1.6 Revised Future Fire Flow

Since the completion of the initial work in the servicing study, target fire flow guidelines have been revisited by the Region based on the Fire Underwriter's Survey (FUS) method and a sample of buildings in BNH.

We find it inappropriate or that there has been lack of justification provided such that the MECP Fire Flow requirement targets are no longer being used within this study. We request that this study be amended to ensure that the Regional Water Supply network and Regional Storage are adequately sized to meet the MECP fire flow requirements or that this be accommodated within a subsequent update.

8.3.1 Water Supply Alternative Solutions
Although presented at PCC #3 and evaluated in Technical Memorandum #5, the evaluation of Water Supply Alternative Solutions has been removed from this Project File Report because additional water supply is no longer required as outlined in Section 5.0.

The Township is unable to support this recommendation and request that the Regional Water Supply be revaluated to ensure MECP Fire Flow Targets are achievable.

9.2 Baden Well Decommissioning
In addition to the above improvements, it is recommended that the Baden B1 and B2 wells be decommissioned.

There appears to be little to no justification provided for the decommissioning of these wells as it pertains to the long-term supply of water to Baden New-Hamburg area. While we acknowledge the statement "*Currently the Baden-New Hamburg system is supplied by the New Hamburg wells and the K50 wells and have significant supply capacity well beyond the projected water demands within the study horizon."* The Township remains concerned with water supply for Wilmot for the longer term, particularly considering the recent changes to the Townships Official Plan. As decommissioning of these wells has no net impact on the recommendations of the EA we request this statement be removed from the recommendations until a more fulsome long-term study on water supply and revisions to the Water Supply for Fire Flows are addressed.

Regarding Wastewater Collection and Treatment System

5.2.2 Projected Average Daily Flows (Wastewater)
Table 6: Projected Peak Wet Weather Flows

We note that existing Wet Weather Flow Capacity exists for 187l/s for the Baden Pumping Station, and 248l/s within the Morningside Pumping Station.

The Township is in support of Alternative WW4 as the preferred alternative, whereby flows from the Baden WWPS bypass the Morningside WWPS and are conveyed by forcemain directly to the New Hamburg WWTP. This Alternative does not speak to increasing capacity at the Baden WWPS. Please confirm that no increase in pumping capacity or wet well capacity is required for the anticipated build out of the town of Baden including accommodating flows anticipated as per the recently completed ***Baden Trunk Sanitary Class EA***.

Regarding Figure 19: Revised Foxboro Water and Wastewater Servicing Preferred Alternative, an estimated initial capital of $2.9 million is provided. It is unclear if this solution anticipates contributing to the overall costs of the Baden Trunk Sanitary Sewer to which it will be tributary. Please confirm.

In section 5.2.3 of the EA it states “Foxboro Green WWTP is a rotating biological contactor (RBC) plant, that was constructed in 1999 within the Foxboro Green Retirement Community. The WWTP consists of three packaged RBC plants, each with a rated ADF capacity of 50 m3/day. The total rated ADF capacity of the plant is 150m^3/day.

The Current proposal would seek to eliminate this plant and absorb this capacity within the existing New Hamburg Wastewater Treatment Plant thereby removing capacity for development from the Baden New Hamburg Area however no EA is listed within section 14 proposed project list, to address the capacity within the New Hamburg Wastewater Treatment Plant for future capacity to ensure capacity remains for future development within this facility.

Summary.

The Township is in General agreement with the recommendations of the EA as it pertains to Sanitary Servicing, but requests clarification on requirements for upgrades to the Baden WWPS capacity, and the New Hamburg Wastewater Treatment Plant to allow for the forecasted future growth.

The Township is not in agreement with the reduced criteria for water supply to the Township, nor is the Township in favour of decommissioning Wells within the Township without a further evaluation of the long-term implications of removing these wells from the potential supply.

Sincerely,



Ken VanderWal P. Eng
Manager of Engineering
Infrastructure Services
Township of Wilmot
Office: 519-634-8519 x 9239
Cell: 519-778-0449

From:	Kaoru Yajima
To:	"Ken VanderWal"
Cc:	minister.mecp@ontario.ca; EABDirector@ontario.ca; Jeff Molenhuis; Harold O"Krafka; "Mark Jeffery"; Kevin Dolishny; Pam Law; Paul, Jeff
Subject:	RE: Baden – New Hamburg Water and Wastewater System Servicing Review, Stantec Consulting Ltd. & C3 Water Inc. March 2023
Date:	Wednesday, July 19, 2023 12:28:40 PM
Attachments:	image001.png image003.png RE Baden - NH Water and Wastewater Servicing Strategy MECA .msg BNH EA Review 2023.05.08.pdf

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Hello Kevin,

Thanks to the Township of Wilmot for reviewing the final report for the Region's Baden – New Hamburg Water and Wastewater System Servicing Review (SSR). Please accept my apologies for the delayed response.

The Region provides the following responses as per your letter dated May 8, 2023.

Comments on Water Supply – fire flow (S. 5.1.4, 5.1.5, 5.1.6)

See attached response to similar question from Township and Township fire department.

Comments on Water Supply –alternative solutions (S. 8.31., 9.2)

After review and modelling of the demands identified from the current and growth identified in the current Township Official Plan, 2019 for which the SSR was premised on, it was determined that there is sufficient water supply from the current sources, namely the Region's K50's well field and wells NH3 and NH4. The Baden wells have been off-line for over twenty year as they were not preferred by the public in a previous master plan. Given the time that has elapsed, there is no technical reason to leave them in service.

Please also note that based the Region intends to finish the SSR study with the original basis of the 2019 OP. This is because there are other time-sensitive projects which are necessary regardless of the new lands identified in the ROP. The Region's Planning is currently developing new planning information regarding the new approved ROP lands and once that is available, the Region will be updating the studies in the SSR. This will include a review of water demands, treatment capacity, water storage and pumping needs.

Comment on Wastewater Collection and Treatment System – Baden Sewage Pump Station (S.5.2.2, Table 6)

The preferred alternative WW4-Upgrade System and Convey Directly to New Hamburg WWTP involves the handling of the peak flows identified in Table 6. The capacity of the Baden Sewage Pump Station will therefore be increased.

Comment on Wastewater Collection and Treatment System – Foxboro Connection (Figure 19)

The capital cost for the Foxboro Alternative F3 does not include a cost for the contribution to the Baden Trunk Sanitary Sewer.

Comment on Wastewater Collection and Treatment System – Foxboro Connection and need for EA (S5.2.3)

This study is being conducted to satisfy Phases 1 and 2 of the Municipal Class EA process, thus a separate Class EA is not required. The possibility of a Foxboro connection was explored early in the study and shared with Wilmot Township staff. Upon receiving agreement, the study then proceeded to develop the 4 alternatives shown.

Moving forward, the Region intends to close the SSR study based on its original presumptions of growth identified in the 2019 Township Official Plan. Based on the approved ROP, the Region will be assessing the impact of new lands added on the water and wastewater infrastructure through further studies.

Regards,

Kaoru Yajima, P.Eng. (he/him)
Engineering and Environmental Services, Water & Wastewater Services
Region of Waterloo
150 Frederick Street, 7th Floor
Kitchener, Ontario, Canada N2G 4J3
tel: 1-519-575-4757 ext.3349

ROW-WAS_email signature-v3-2

From: Ken VanderWal <ken.vanderWal@wilmot.ca>
Sent: May 9, 2023 10:57 AM
To: minister.mecp@ontario.ca; EABDirector@ontario.ca
Cc: Kaoru Yajima <KYajima@regionofwaterloo.ca>; Jeff Molenhuis <jeff.molenhuis@wilmot.ca>; Harold Okrafka <Harold.okrafka@wilmot.ca>
Subject: Baden – New Hamburg Water and Wastewater System Servicing Review, Stantec Consulting Ltd. & C3 Water Inc. March 2023

****EXTERNAL ALERT** This email originated from outside the Region of Waterloo.**

As per the requirements of the Municipal Class EA 30-day review period comments.
Please find enclosed our comments on this EA document.

We look forward to working with the Region to explore further some of these items for resolution and a greater understanding on the impacts to the Township of Wilmot.

Sincerely

Ken VanderWal P.Eng
Manager of Engineering
Infrastructure Services | Township of Wilmot |
O:519-634-8519 x. 239
C:519-778-0449

Wilmot.ca | Twitter | Facebook | LinkedIn | YouTube

My work day may look different than your work day. Please do not feel obligated to respond out of your normal working hours.

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From:	Kaoru Yajima
To:	"Mark Jeffery"
Cc:	Rod Leeson; "Andrew Mechalko"; "Ken VanderWal"; Andrew Martin; Kevin Dolishny; Pam Law
Subject:	RE: Baden - NH Water and Wastewater Servicing Strategy MECA
Attachments:	image001.png Baden - NH Water Operational Strategy - FUS TM August 2022.PDF

Hello Mark,

It's Kaoru from the Region. My apologies on the late response to your email regarding your and the Township fire chief's comments.

During the Baden-NH Water System Servicing Review (SSR) study, after the initial fire flow calculations using the MECP guidelines were completed, we retained GM Blue Plan to revisit the original calculation of the fire flow requirements. The MECP are guidelines and in our experience with other Townships in the Region, tend to over-estimate the required flows. With the availability of better information, the FUS approach provides a more appropriate estimate of the required fire flow.

I am attaching the analysis report prepared. I realise I should have circulated during the study. However, as you see in Table 1-5 where the flows are compared to other municipalities in southern Ontario, the proposed flows are in line with other municipalities. I will be appending this response and the attached in an update to the final report.

Over the phone, you also mentioned the new approved ROP lands. The Region notes that the SSR took into account the existing 2019 Township OP only. The Region intends to finish the SSR study with this assumption as it contains other time-sensitive projects which are necessary regardless of the new lands identified in the ROP. The Region's Planning is currently developing new planning information regarding the new approved ROP lands and once that is available, the Region will be updating the study results in the SSR.

I will be responding to the Township's other letter with comments to the overall SSR in a separate response.

Regards,

Kaoru Yajima, P.Eng. (he/him)
Engineering and Environmental Services, Water & Wastewater Services
Region of Waterloo
150 Frederick Street, 7th Floor
Kitchener, Ontario, Canada N2G 4J3
tel: 1-519-575-4757 ext.3349

ROW-WAS_email signature-v3-2

From: Mark Jeffery <mark.jeffery@wilmot.ca>
Sent: May 4, 2023 9:36 AM
To: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Cc: Rod Leeson <Rod.leeson@wilmot.ca>; Andrew Mechalko <andrew.mechalko@wilmot.ca>; Ken VanderWal <ken.vanderWal@wilmot.ca>; Andrew Martin <andrew.martin@wilmot.ca>; Kevin Dolishny <KDolishny@regionofwaterloo.ca>
Subject: RE: Baden - NH Water and Wastewater Servicing Strategy MECA

****EXTERNAL ALERT** This email originated from outside the Region of Waterloo.**

Hi Karou,

Please see the comments and questions forwarded by Rod Leeson, the Township's Fire Chief.

As per our brief discussion, can you provide an explanation to his questions below? Any background information you can forward would be appreciated.

Thanks,
Mark

From: Rod Leeson <rod.leeson@wilmot.ca>
Sent: Thursday, May 4, 2023 7:35 AM
To: Mark Jeffery <mark.jeffery@wilmot.ca>
Cc: Andrew Mechalko <andrew.mechalko@wilmot.ca>
Subject: Water Servicing Strategy

Hi Mark,

I read the provided response from the region, interesting. They imply using FUS regs, who did the building stock profile calculations and what building stock did they use. FUS requires a deep dive building stock study along with Fire flow calculations to establish requirements.

I would be curious what data they used and why we were never consulted.

I'm out of town but will touch base with you Monday.

Thanks

ROD LEESON **FPO, CFEI, CCFI-C, CEMC**
Fire Chief | Township of Wilmot

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Date:	August 26, 2022	File:	622046
To:	Region of Waterloo		
From:	Julien Bell, Jody Lee – GM BluePlan		
Project:	Baden New Hamburg Water Operational Strategy		
Subject:	Fire Flow Target Analysis		

TECHNICAL MEMO

The intent of this memo is to present the recommended local and system wide fire flow targets that should be used for the Baden and New Hamburg water system

1 Background

The Region's Design Guidelines and Supplemental Specifications for Municipal Services (DGSSMS) specifies that fire flow requirements should be determined in accordance with the current issue of the Water Supply for Public Fire Protection, issued by the Fire Underwriters Survey (FUS).

Through the Baden and New Hamburg Water and Wastewater System Servicing Review that is currently ongoing, a provisional fire flow target of 330 L/s for the 2051 growth horizon has been identified using the Ministry of the Environment, Conservation, and Parks (MECP) population-based guidelines. This target is higher than the typical values used by the Region for planning studies and as such, the Region requested that additional system-specific analysis be completed using the property-based FUS methodology for determining fire flow targets to assess the local system and determine appropriate fire flow targets within the Baden and New Hamburg water system.

1.1 Fire Underwriters Survey Analysis

Fire flow capacity is a major driver for trunk water infrastructure needs and capacity sizing. The Water Supply for Public Fire Protection guide is intended for use by municipalities and consulting engineers to estimate fire flow requirements for municipal fire protection. It was developed by the FUS which is financed by the Canadian insurance industry and is a commonly used industry standard methodology for determining required fire flow for specific buildings.

The FUS methodology estimates fire flow requirements as a function of building size (finished floor area) and construction type. Reduction credits are then applied to the required fire flow based on occupancy hazard level, sprinkler system, and building separation.

A sample of 47 properties within Baden and New Hamburg were manually selected for the FUS analysis based on land use and spatial coverage. The intent was to gather a representative sample of properties across the two communities that were then used to determine typical ranges of fire flow targets for each land use. These ranges were reviewed to determine an appropriate fire flow target for each land use type. It should be noted that the calculated FUS fire flow targets are likely conservative as the site selection was biased towards larger building

footprints to ensure that the maximum fire flow requirements for the system was captured. **Table 1-1** and **Figure 1-1** present the land uses and locations of the selected properties.

Table 1-1: Analysed FUS Properties

Land Use	Number of Properties Analysed	
	Baden	New Hamburg
Industrial	2	5
Agricultural	0	1
Commercial	3	4
Institutional	1	2
Residential – Single	14	11
Residential Multi	1	3
Total	**21**	**26**

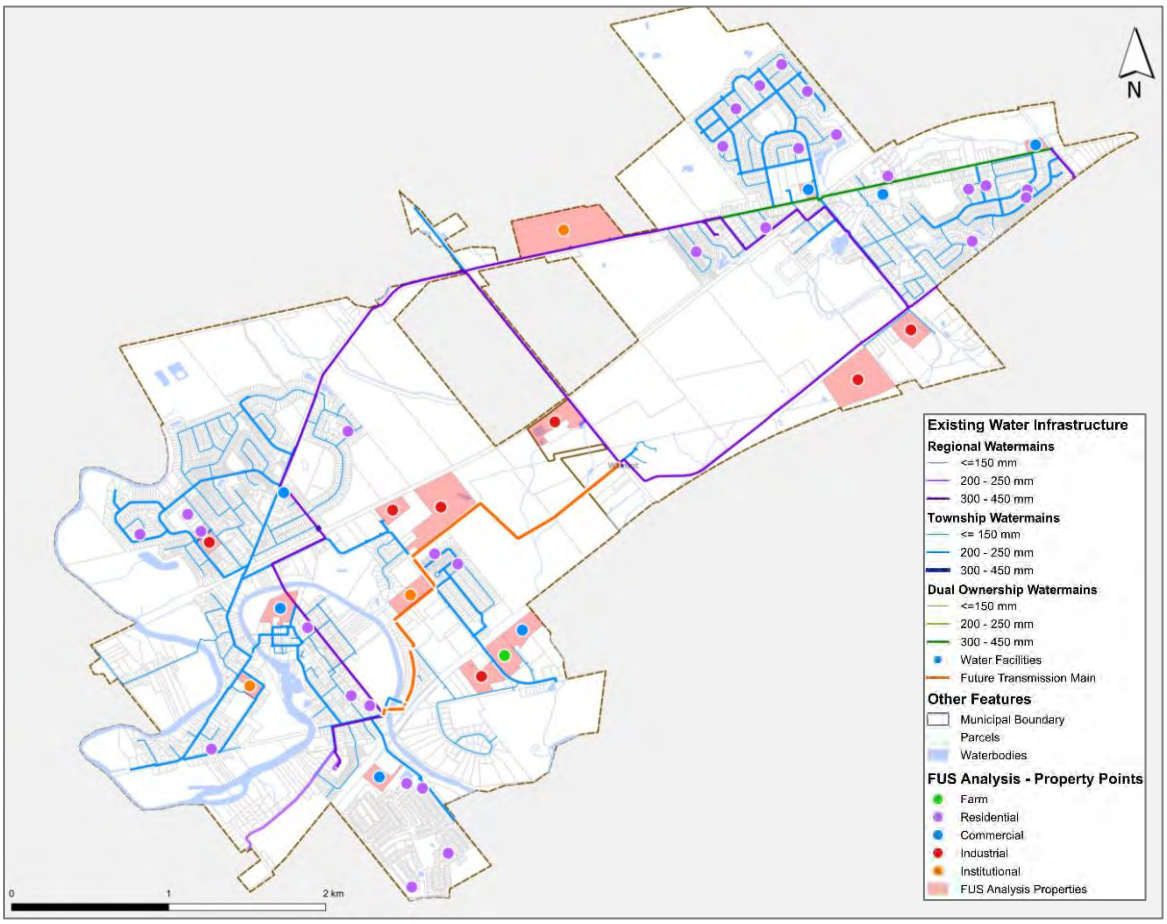


Figure 1-1: FUS Analysis Properties

The required FUS fire flows target can vary significantly depending on the assumptions made for the type of building construction, occupancy hazard level, and sprinkler systems. **Table 1-2** presents the FUS assumptions for an example property, demonstrating the potential minimum and maximum fire flow targets.

Table 1-2: FUS Example – Minimum and Maximum Range

	Minimum	Maximum
Finished Floor Area	12,500 m^2	
Construction Type	Fire-resistive	Non-combustible
Fire Hazard	Limited combustibility	Combustible
Sprinklers	Fully supervised	System
Building Separation	> 40 m	> 40 m
Fire Flow Target	**136 L/s**	**279 L/s**

Due to the uncertainty of some of the FUS parameters under the desktop analysis for the selected properties, a minimum and maximum range of fire flow targets was calculated for each property. **Table 1-3** presents the results of this analysis. A full detailed breakdown of the analysis can be found in **Appendix A**.

Table 1-3: FUS Analysis Results – Minimum and Maximum Range

Land Use	Minimum FUS	Maximum FUS	Average FUS
Commercial	47	203	106
Industrial	52	279	137
Institutional	63	265	158
Agricultural	71	156	114
Residential - Single	56	111	79
Residential - Multi	102	272	180

There is a significant range between minimum and maximum FUS requirements for all land uses, however, the most conservative fire flow targets do not exceed 280 L/s, falling short of the preliminary 330 L/s target which is based on projected need for 2051 using the MECP population-based guideline. Five out of the 47 properties that were analyzed had a maximum fire flow target greater than 250 L/s, which is a high fire flow target and is commonly used in other municipalities to represent industrial land uses. For these properties, an adjustment of a single parameter to a less conservative assumption is sufficient to reduce the fire flow target

below 250 L/s. **Table 1-4** presents the detailed FUS assumptions and parameters for these five properties, which are all located within New Hamburg.

In addition to the FUS analysis, an industry review of land use based fire flow targets within other municipalities was completed and is presented in **Table 1-5**. It should be noted that for municipalities that have adopted land-use based fire flow targets, the highest target is typically for industrial land uses and does not typically exceed 250 L/s.

Table 1-4: Detailed FUS Analysis for Properties with Maximum Target Greater than 250 L/s

ID	Municipality	Building	Name	Estimate Description	Land Use	A = Total Floor Area (m2)	Type of Construction	Fire Hazard	Sprinklers	Proximity Adjustment	FUS Target
1	New Hamburg	141 Hamilton Road	Pestell Nutrition	Maximum	Industrial	12,500	Non-Combustible	Combustible	System	0.15	**279**
				Minimum			Fire-Resistive	Limited Combustibility	Fully Supervised		**136**
2	New Hamburg	66 Hincks Street	Magnussen Home Furnishings Ltd.	Maximum	Industrial	4,370	Ordinary	Combustible	System	0.35	**255**
				Minimum			Non-Combustible	Non-Combustible	Fully Supervised		**124**
3	New Hamburg	108 Hincks Street	Multi - Apartments	Maximum	Residential - Multi	4,890	Ordinary	Limited Combustibility	No	0.2	**262**
				Minimum			Ordinary	Non-Combustible	System		**173**
4	New Hamburg	34 Captain McCallum Drive	Townhouses	Maximum	Residential - Multi	1,611	Wood	Limited Combustibility	No	0.45	**272**
				Minimum			Ordinary	Non-Combustible	No		**160**
5	New Hamburg	218 Boullee Street	Nithview Home (Nursing Home)	Maximum	Institutional	9,350	Non-Combustible	Limited Combustibility	System	0.4	**265**
				Minimum			Fire-Resistive	Non-Combustible	Fully Supervised		**144**

Table 1-5: Industry Review of Fire Flow Targets

Municipality	Source	2016 Population	Fire Flow Target (L/s)					
			Dead End	Residential – Single	Residential – Multi	Commercial	Institutional	Industrial
Town of Fort Erie	**Master Plan**	**30,710**	50	75	150	175	175	250
City of Waterloo	**Master Plan**	**104,986**	50	75	150	175	175	250
City of Hamilton	**Master Plan (Ongoing)**	**536,915**	50	75	150	150	150	250
City of Stratford	**Master Plan**	**31,465**	50	75	100	125	125	150
City of Thorold	**Master Plan**	**18,801**	50	75/ 100	150	175	175	250
City of Niagara Falls	**Model Update**	**88,071**	50	75	150	175	175	250
City of Brantford	**Master Plan**	**134,200**	50	75/125	150	175	175	250
County of Brant	**Master Plan**	**12,310**	37.9	37.9	56.8	56.8	56.8	56.8
Municipality of Thames Centre	**Master Plan**	**13,191**	-	76	76	150	150	150

2 Fire Flow Target Recommendations

Based on the balance of the FUS analysis for the 47 sample properties, and the industry review of fire flow targets for other municipalities within southern Ontario, **Table 2-1** presents the recommended land use based fire flow targets for Baden and New Hamburg. The values are generally in line with the calculated average targets, with increases for those land uses where appropriate to align more closely with the maximum calculated targets.

Table 2-1: Baden and New Hamburg Recommended Fire Flow Targets

Land Use	Recommended
Commercial	150
Industrial	250
Institutional	175
Residential - Single	75
Residential - Multi	175

It should be noted that these land use based targets will likely have more of an impact on local system sizing, while trunk infrastructure and facility sizing should be based on the highest fire flow target for each community, which is 250 L/s for Baden and New Hamburg.

A

Region of Waterloo

APPENDIX A

FUS ANALYSIS DETAILED TABLE

Region of Waterloo
Baden New Hamburg Operational Strategy
GMBP File No. 622046

Fire Underwriters Survey Analysis

Project No.	Municipality	Building	Name	Estimate Description	Land Use	A = Total Floor Area (m^2)	Type of Construction	C = Coefficient	Fire Hazard	Adjustment 1	Sprinklers	Adjustment 2	Proximity 1	Proximity 2	Proximity 3	Proximity 4	proximity 1-1	proximity 1-2	proximity 1-3	proximity 1-4	Adjustment 3	Ffbase	FF1	FF2	FF3	FF4	FF-Final	Duration	Storage
622046	New Hamburg	55 Hamilton Road	Riverside Brass & Aluminum Foundry Ltd.	Maximum	Industrial	3,900	Non-Combustible	0.8	Combustible	0	System	-0.3	No	No	No	No	0	0	0	0	0	10991	0	10991	-3297	0	128	2.00	0.92
				Minimum	Industrial		Fire-Resistive	0.6	Limited Combustibility	-0.15	Fully Supervised	-0.5										8243	-1237	7007	-3503	0	58	1.38	0.29
622046	New Hamburg	141 Hamilton Road	Pestell Nutrition	Maximum	Industrial	12,500	Non-Combustible	0.8	Combustible	0	System	-0.3	10 to 20	No	No	No	0.15	0	0	0	0.15	19677	0	19677	-5903	2952	279	3.68	3.69
				Minimum	Industrial		Fire-Resistive	0.6	Limited Combustibility	-0.15	Fully Supervised	-0.5										14758	-2214	12544	-6272	1882	136	2.00	0.98
622046	New Hamburg	66 Hincks Street	Magnussen Home Furnishings Ltd.	Maximum	Industrial	4,370	Ordinary	1	Combustible	0	System	-0.3	3 to 10	20 to 30	No	30 to 40	0.2	0.1	0	0.05	0.35	14543	0	14543	-4363	5090	255	3.32	3.04
				Minimum	Industrial		Non-Combustible	0.8	Non-Combustible	-0.25	Fully Supervised	-0.5										11635	-2909	8726	-4363	3054	124	2.00	0.89
622046	New Hamburg	1356 Nafziger Road	Nachurs Alpine Solutions	Maximum	Industrial	2,100	Non-Combustible	0.8	Rapid Burning	0.25	System	-0.3	No	No	No	No	0	0	0	0	0	8065	2016	10082	-3024	0	118	2.00	0.85
				Minimum	Industrial		Fire-Resistive	0.6	Free Burning	0.15	Fully Supervised	-0.5										6049	907	6956	-3478	0	58	1.37	0.29
622046	Baden	1473 Gingerich Road	Erb Transport Ltd.	Maximum	Industrial	6,600	Non-Combustible	0.8	Combustible	0	No	0	No	No	No	No	0	0	0	0	0	14298	0	14298	0	0	238	3.07	2.64
				Minimum	Industrial		Fire-Resistive	0.6	Limited Combustibility	-0.15	System	-0.3										10724	-1609	9115	-2735	0	106	2.00	0.77
622046	New Hamburg	70 Heritage Drive	Maple Leaf Foods	Maximum	Agricultural	5,800	Non-Combustible	0.8	Combustible	0	System	-0.3	No	No	No	No	0	0	0	0	0	13404	0	13404	-4021	0	156	2.00	1.13
				Minimum	Agricultural		Fire-Resistive	0.6	Limited Combustibility	-0.15	Fully Supervised	-0.5										10053	-1508	8545	-4272	0	71	1.57	0.40
622046	New Hamburg	220 Bergey Court	Argo/Fleet Sentry	Maximum	Industrial	3,400	Non-Combustible	0.8	Combustible	0	System	-0.3	10 to 20	20 to 30	30 to 40	No	0.15	0.1	0.05	0	0.3	10262	0	10262	-3079	3079	171	2.07	1.27
				Minimum	Industrial		Fire-Resistive	0.6	Limited Combustibility	-0.15	Fully Supervised	-0.5										7697	-1155	6542	-3271	1963	87	1.81	0.57
622046	New Hamburg	1540 Haysville Road	No Frills	Maximum	Commercial	3,100	Non-Combustible	0.8	Combustible	0	System	-0.3	No	No	No	No	0	0	0	0	0	9799	0	9799	-2940	0	114	2.00	0.82
				Minimum	Commercial		Non-Combustible	0.8	Limited Combustibility	-0.15	Standard Water Supply	-0.4										9799	-1470	8329	-3332	0	83	1.75	0.52
622046	New Hamburg	100 Heritage Drive	John Bear New Hamburg	Maximum	Commercial	2,300	Non-Combustible	0.8	Combustible	0	System	-0.3	No	No	No	No	0	0	0	0	0	8441	0	8441	-2532	0	98	1.98	0.70
				Minimum	Commercial		Non-Combustible	0.8	Limited Combustibility	-0.15	Fully Supervised	-0.5										8441	-1266	7175	-3587	0	60	1.40	0.30
622046	New Hamburg	100 Mill Street	Sobeys New Hamburg	Maximum	Commercial	3,800	Ordinary	1	Combustible	0	System	-0.3	3 to 10	No	No	No	0.2	0	0	0	0.2	13562	0	13562	-4069	2712	203	2.55	1.87
				Minimum	Commercial		Non-Combustible	0.8	Limited Combustibility	-0.15	Standard Water Supply	-0.4										10849	-1627	9222	-3689	1844	123	2.00	0.89
622046	New Hamburg	385 Waterloo Street	Dollar Haven and Discount	Maximum	Commercial	1,100	Ordinary	1	Combustible	0	System	-0.3	0 to 3	3 to 10	30 to 40	No	0.25	0.2	0.05	0	0.5	7297	0	7297	-2189	3648	146	2.00	1.05
				Minimum	Commercial		Non-Combustible	0.8	Limited Combustibility	-0.15	Standard Water Supply	-0.4										5837	-876	4962	-1985	2481	91	1.86	0.61
622046	Baden	18 Snyder's Road	Baden Village Square	Maximum	Commercial	1,500	Ordinary	1	Combustible	0	System	-0.3	3 to 10	10 to 20	No	No	0.2	0.15	0	0	0.35	8521	0	8521	-2556	2982	149	2.00	1.07
				Minimum	Commercial		Non-Combustible	0.8	Limited Combustibility	-0.15	Standard Water Supply	-0.4										6816	-1022	5794	-2318	2028	92	1.88	0.62
622046	Baden	125 Snyder's Road	Bear Bottoms Diaper Service	Maximum	Commercial	560	Ordinary	1	Combustible	0	No	0	3 to 10	3 to 10	No	No	0.2	0.2	0	0	0.4	5206	0	5206	0	2082	121	2.00	0.87
				Minimum	Commercial		Non-Combustible	0.8	Limited Combustibility	-0.15	System	-0.3										4165	-625	3540	-1062	1416	65	1.47	0.34
622046	Baden	1206 Snyder's Road	Waterloo-Oxford District Secondary School	Maximum	Institutional	11,620	Ordinary	1	Limited Combustibility	-0.15	System	-0.3	No	No	No	No	0	0	0	0	0	23715	-3557	20158	-6047	0	235	3.03	2.56
				Minimum	Institutional		Fire-Resistive	0.6	Non-Combustible	-0.25	Fully Supervised	-0.5										14229	-3557	10672	-5336	0	89	1.83	0.59
622046	New Hamburg	313 Huron Street	Holy Family School	Maximum	Institutional	2,300	Ordinary	1	Limited Combustibility	-0.15	System	-0.3	3 to 10	30 to 40	30 to 40	No	0.2	0.05	0.05	0	0.3	10551	-1583	8968	-2690	2690	149	2.00	1.08
				Minimum	Institutional		Fire-Resistive	0.6	Non-Combustible	-0.25	Fully Supervised	-0.5										6330	-1583	4748	-2374	1424	63	1.45	0.33
622046	Baden	1413 Gingerish Road	OK Tire	Maximum	Industrial	1,070	Non-Combustible	0.8	Combustible	0	No	0	10 to 20	No	No	No	0.15	0	0	0	0.15	5757	0	5757	0	864	110	2.00	0.79
				Minimum	Industrial		Fire-Resistive	0.6	Limited Combustibility	-0.15	System	-0.3										4318	-648	3670	-1101	551	52	1.28	0.24
622046	Baden	430 Snyder's Road East	Allwood Cabinet Doors & Trim	Maximum	Commercial	620	Ordinary	1	Combustible	0	No	0	30 to 40	No	No	No	0.05	0	0	0	0.05	5478	0	5478	0	274	96	1.94	0.67
				Minimum	Commercial		Non-Combustible	0.8	Limited Combustibility	-0.15	System	-0.3										4382	-657	3725	-1118	186	47	1.20	0.20
622046	New Hamburg	33 Orchard Way	Single Detached	Maximum	Residential - Single	234	Ordinary	1	Limited Combustibility	-0.15	No	0	0 to 3	0 to 3	20 to 30	30 to 40	0.25	0.25	0.1	0.05	0.65	3365	-505	2861	0	1859	79	1.68	0.48
				Minimum	Residential - Single		Ordinary	1	Non-Combustible	-0.25	No	0										3365	-841	2524	0	1641	69	1.54	0.39
622046	New Hamburg	173 Kettle Lake Drive	Single Detached	Maximum	Residential - Single	263	Ordinary	1	Limited Combustibility	-0.15	No	0	0 to 3	0 to 3	20 to 30	20 to 30	0.25	0.25	0.1	0.1	0.7	3568	-535	3033	0	2123	86	1.79	0.55
				Minimum	Residential - Single		Ordinary	1	Non-Combustible	-0.25	No	0										3568	-892	2676	0	1873	76	1.64	0.45
622046	New Hamburg	48 Devonshire Drive	Single Detached	Maximum	Residential - Single	270	Ordinary	1	Limited Combustibility	-0.15	No	0	3 to 10	10 to 20	20 to 30	No	0.2	0.15	0.1	0	0.45	3615	-542	3073	0	1383	74	1.61	0.43
				Minimum	Residential - Single		Ordinary	1	Non-Combustible	-0.25	No	0										3615	-904	2711	0	1220	66	1.48	0.35
622046	New Hamburg	7 Stonecroft Way	Single Detached	Maximum	Residential - Single	172	Ordinary	1	Limited Combustibility	-0.15	No	0	0 to 3	0 to 3	30 to 40	No	0.25	0.25	0.05	0	0.55	2885	-433	2452	0	1349	63	1.45	0.33
				Minimum	Residential - Single		Ordinary	1	Non-Combustible	-0.25	No	0										2885	-721	2164	0	1190	56	1.34	0.27
622046	New Hamburg	299 Peel Street	Single Detached	Maximum	Residential - Single	186	Ordinary	1	Limited Combustibility	-0.15	No	0	0 to 3	0 to 3	30 to 40	No	0.25	0.25	0.05	0	0.55	3000	-450	2550	0	1403	66	1.49	0.35
				Minimum	Residential - Single		Ordinary	1	Non-Combustible	-0.25	No	0										3000	-750	2250	0	1238	58	1.37	0.29
622046	New Hamburg	134 Jacob Street	Single Detached	Maximum	Residential - Single	217	Ordinary	1	Limited Combustibility	-0.15	No	0	0 to 3	0 to 3	20 to 30	No	0.25	0.25	0.1	0	0.6	3241	-486	2755	0	1653	73	1.60	0.42
				Minimum	Residential - Single		Ordinary	1	Non-Combustible	-0.25	No	0										3241	-810	2431	0	1458	65	1.47	0.34
622046	New Hamburg	340 Jacob Street	Semi Detached	Maximum	Residential - Single	335	Ordinary	1	Limited Combustibility	-0.15	No	0	3 to 10	3 to 10	No	No	0.2	0.2	0	0	0.4	4027	-604	3423	0	1369	80	1.70	0.49
				Minimum	Residential - Single		Ordinary	1	Non-Combustible	-0.25	No	0										4027	-1007	3020	0	1208	70	1.56	0.39
622046	New Hamburg	312 Bleams Court	Single Detached	Maximum	Residential - Single	220	Ordinary	1	Limited Combustibility	-0.15	No	0	0 to 3	0 to 3	30 to 40	20 to 30	0.25	0.25	0.05	0.1	0.65	3263	-489	2774	0	1803	76	1.64	0.45
				Minimum	Residential - Single		Ordinary	1	Non-Combustible	-0.25	No	0										3263	-816	2447	0	1591	67	1.51	0.37
622046	New Hamburg	69 Daniells Crescent	Single Detached	Maximum	Residential - Single	270	Ordinary	1	Limited Combustibility	-0.15	No	0	0 to 3	3 to 10	30 to 40	30 to 40	0.25	0.2	0.05	0.05	0.55	3615	-542	3073	0	1690	79	1.69	0.48
				Minimum	Residential - Single		Ordinary	1	Non-Combustible	-0.25	No	0										3615	-904	2711	0	1491	70	1.55	0.39
622046	New Hamburg	108 Hincks Street	Multi - Apartments	Maximum	Residential - Multi	4,890	Ordinary	1	Limited Combustibility	-0.15	No	0	10 to 20	30 to 40	No	No	0.15	0.05	0	0	0.2	15384	-2308	13077	0	2615	262	3.42	3.22
				Minimum	Residential - Multi		Ordinary	1	Non-Combustible	-0.25	System	-0.3										15384	-3846	11538	-3461	2308	173	2.10	1.31
622046	New Hamburg	140 Hincks Street	Multi - Apartments	Maximum	Residential - Multi	1,965	Ordinary	1	Limited Combustibility	-0.15	No	0	10 to 20	10 to 20	30 to 40	No	0.15	0.15	0.05	0	0.35	9752	-1463	8289	0	2901	187	2.30	1.54
				Minimum	Residential - Multi		Ordinary	1	Non-Combustible	-0.25	System	-0.3										9752	-2438	7314	-2194	2560	128	2.00	0.92
622046	New Hamburg	26 Ingold Avenue	Single Detached	Maximum	Residential - Single	350	Ordinary	1	Limited Combustibility	-0.15	No	0	0 to 3	0 to 3	10 to 20	30 to 40	0.25	0.25	0.15	0.05	0.7	4116	-617	3498	0	2449	99	1.99	0.71
				Minimum	Residential - Single		Ordinary	1	Non-Combustible	-0.25	No	0										4116	-1029	3087	0	2161	87	1.81	0.57
622046	New Hamburg	34 Captain McCallum Drive	Townhouses	Maximum	Residential - Multi	1,611	Wood	1.5	Limited Combustibility	-0.15	No	0	3 to 10	3 to 10	30 to 40	No	0.2	0.2	0.05	0	0.45	13245	-1987	11259	0	5066	272	3.58	3.51
				Minimum	Residential - Multi		Ordinary	1	Non-Combustible	-0.25	No	0										8830	-2208	6623	0	2980	160	2.00	1.15
622046	New Hamburg	86 Capitain McCallum Drive	Single Detached	Maximum	Residential - Single	220	Wood	1.5	Limited Combustibility	-0.15	No	0	0 to 3	0 to 3	30 to 40	30 to 40	0.25	0.25	0.05	0.05	0.6	4895	-734	4160	0	2496	111	2.00	0.80
				Minimum	Residential - Single		Ordinary	1	Non-Combustible	-0.25	No	0										3263	-816	2447	0	1468	65	1.48	0.35
622046	New Hamburg	218 Boullee Street	Nithview Home (Nursing Home)	Maximum	Institutional	9,350	Non-Combustible	0.8	Limited Combustibility	-0.15	System	-0.3	3 to 10	3 to 10	No	No	0.2	0.2	0	0	0.4	17018	-2553	14466	-4340	5786	265	3.48	3.32
				Minimum	Institutional		Fire-Resistive	0.6	Non-Combustible	-0.25	Fully Supervised	-0.5										12764	-3191	9573	-4786	3829	144	2.00	1.03
622046	Baden	134 Snyder's Road East	Vesper Springs Manor (Retirement Home)	Maximum	Residential - Multi	2,152	Ordinary	1	Limited Combustibility	-0.15	No	0	30 to 40	30 to 40	No	No	0.05	0.05	0	0	0.1	10206	-1531	8675	0	867	159	2.00	1.15
				Minimum	Residential - Multi		Ordinary	1	Non-Combustible	-0.25	System	-0.3										10206	-2551	7654	-2296	765	102	2.00	0.73
622046	Baden	58 Country Creek Drive	Single Detached	Maximum	Residential - Single	251	Ordinary	1	Limited Combustibility	-0.15	No	0	3 to 10	0 to 3	30 to 40	No	0.2	0.25	0.05	0	0.5	3485	-523	2963	0	1481	74	1.61	0.43
				Minimum	Residential - Single		Ordinary	1	Non-Combustible	-0.25	No	0										3485	-871	2614	0	1307	65	1.48	0.35
622046	Baden	79 Schneller Drive	Single Detached	Maximum	Residential - Single	276	Ordinary	1	Limited Combustibility	-0.15	No	0	0 to 3	0 to 3	20 to 30	No	0.25	0.25	0.1	0	0.6	3655	-548	3107	0	1864	83	1.74	0.52
				Minimum	Residential - Single		Ordinary	1	Non-Combustible	-0.25	No	0										3655	-914	2741	0	1645	73	1.60	0.42
622046	Baden	56 Brenneman Drive	Single Detached	Maximum	Residential - Single	294	Ordinary	1	Limited Combustibility	-0.15	No	0	0 to 3	3 to 10	20 to 30	30 to 40	0.25	0.2	0.1	0.05	0.6	3772	-566	3206	0	1924	86	1.78	0.55
				Minimum	Residential - Single		Ordinary	1	Non-Combustible	-0.25	No	0										3772	-943	2829	0	1697	75	1.63	0.44
622046	Baden	126 Charlotta Street	Single Detached	Maximum	Residential - Single	179	Ordinary	1	Limited Combustibility	-0.15	No	0	0 to 3	3 to 10	10 to 20	No	0.25	0.2	0.15	0	0.6	2943	-442	2502	0	1501	67	1.50	0.36
				Minimum	Residential - Single		Ordinary	1	Non-Combustible	-0.25	No	0										2943	-736	2208	0	1325	59	1.38	0.29
622046	Baden	31 Geiger Place	Single Detached	Maximum	Residential - Single	490	Ordinary	1	Limited Combustibility	-0.15	No	0	0 to 3	3 to 10	20 to 30	No	0.25	0.2	0.1	0	0.55	4870	-730	4139	0	2277	107	2.00	0.77
				Minimum	Residential - Single		Ordinary	1	Non-Combustible	-0.25	No	0										4870	-1217	3652	0	2009	94	1.92	0.65
622046	Baden	72 Jacob Cressman Drive	Single Detached	Maximum	Residential - Single	380	Ordinary	1	Limited Combustibility	-0.15	No	0	0 to 3	3 to 10	30 to 40	20 to 30	0.25	0.2	0.05	0.1	0.6	4289	-643	3645	0	2187	97	1.96	0.69
				Minimum	Residential - Single		Ordinary	1	Non-Combustible	-0.25	No	0										4289	-1072	3216	0	1930	86	1.79	0.55
622046	Baden	25 Goldschmidt Crescent	Single Detached	Maximum	Residential - Single	370	Ordinary	1	Limited Combustibility	-0.15	No	0	3 to 10	3 to 10	20 to 30	30 to 40	0.2	0.2	0.1	0.05	0.55	4232	-635	3597	0	1978	93	1.89	0.63
				Minimum	Residential - Single		Ordinary	1	Non-Combustible	-0.25	No	0										4232	-1058	3174	0	1746	82	1.73	0.51
622046	Baden	21 Oesch Lane	Single Detached	Maximum	Residential - Single	394	Ordinary	1	Limited Combustibility	-0.15	No	0	3 to 10	3 to 10	20 to 30	30 to 40	0.2	0.2	0.1	0.05	0.55	4367	-655	3712	0	2042	96	1.94	0.67
				Minimum	Residential - Single		Ordinary	1	Non-Combustible	-0.25	No	0										4367	-1092	3275	0	1801	85	1.77	0.54
622046	Baden	30 Erhadt Wagner Place	Single Detached	Maximum	Residential - Single	362	Ordinary	1	Limited Combustibility	-0.15	No	0	0 to 3	20 to 30	30 to 40	30 to 40	0.25	0.1	0.05	0.05	0.45	4186	-628	3558	0	1601	86	1.79	0.55
				Minimum	Residential - Single		Ordinary	1	Non-Combustible	-0.25	No	0										4186	-1046	3139	0	1413	76	1.64	0.45

Region of Waterloo
Baden New Hamburg Operational Strategy
GMBP FIle No. 622046

Fire Underwriters Survey Analysis

Project No.	Municipality	Building	Name	Estimate Description	Land Use	A = Total Floor Area (m^2)	Type of Construction	C = Coefficient	Fire Hazard	Adjustment 1	Sprinklers	Adjustment 2	Proximity 1	Proximity 2	Proximity 3	Proximity 4	proximity 1-1	proximity 1-2	proximity 1-3	proximity 1-4	Adjustment 3	Ffbase	FF1	FF2	FF3	FF4	FF-Final	Duration	Storage
622046	Baden	49 Honderich Place	Single Detached	Maximum	Residential - Single	554	Ordinary	1	Limited Combustibility	-0.15	No	0	3 to 10	3 to 10	No	No	0.2	0.2	0	0	0.4	5178	-777	4401	0	1761	103	2.00	0.74
				Minimum	Residential - Single		Ordinary	1	Non-Combustible	-0.25	No	0										5178	-1295	3884	0	1553	91	1.86	0.61
622046	Baden	40 Joseph Lichti Lane	Single Detached	Maximum	Residential - Single	288	Ordinary	1	Limited Combustibility	-0.15	No	0	0 to 3	0 to 3	20 to 30	30 to 40	0.25	0.25	0.1	0.05	0.65	3734	-560	3173	0	2063	87	1.81	0.57
				Minimum	Residential - Single		Ordinary	1	Non-Combustible	-0.25	No	0										3734	-933	2800	0	1820	77	1.66	0.46
622046	Baden	37 Forler Street	Single Detached	Maximum	Residential - Single	306	Ordinary	1	Limited Combustibility	-0.15	No	0	0 to 3	0 to 3	30 to 40	30 to 40	0.25	0.25	0.05	0.05	0.6	3848	-577	3271	0	1963	87	1.81	0.57
				Minimum	Residential - Single		Ordinary	1	Non-Combustible	-0.25	No	0										3848	-962	2886	0	1732	77	1.65	0.46
622046	Baden	115 Steifelmeyer Crescent	Single Detached	Maximum	Residential - Single	250	Ordinary	1	Limited Combustibility	-0.15	No	0	0 to 3	3 to 10	20 to 30	30 to 40	0.25	0.2	0.1	0.05	0.6	3479	-522	2957	0	1774	79	1.68	0.48
				Minimum	Residential - Single		Ordinary	1	Non-Combustible	-0.25	No	0										3479	-870	2609	0	1565	70	1.54	0.39
622046	Baden	21 Erbach Crescent	Single Detached	Maximum	Residential - Single	328	Ordinary	1	Limited Combustibility	-0.15	No	0	0 to 3	0 to 3	20 to 30	30 to 40	0.25	0.25	0.1	0.05	0.65	3984	-598	3387	0	2201	93	1.90	0.64
				Minimum	Residential - Single		Ordinary	1	Non-Combustible	-0.25	No	0										3984	-996	2988	0	1942	82	1.73	0.51

From: Kaoru Yajima
To:
Cc: Paul Jeff
Subject: RE: Baden and New Hamburg Water and Wastewater System Servicing
Date: Tuesday, July 18, 2023 10:39:40 AM
Attachments: image001.png

Hello

Thanks for submitting comments and providing your perspective on the Region's Baden-New Hamburg Water and Wastewater System Servicing Review and in particular, the proposed future water and wastewater serving for Foxboro Green. I also apologize for the great deal of time it has taken for me to respond.

After reviewing your letter, the Region has asked its consultant, Stantec Engineering Ltd for their professional evaluation. Upon evaluation, they recommend not adopting the newly proposed route and use of existing PVC forcemain for the following reasons:

- The existing PVC forcemains were constructed 30 years ago. This indicates that they were designed and constructed to a different standard than is required for sewage forcemains today. Additionally as the system was originally in private ownership, which was then transferred ownership to the Region, the forcemains were designed and built to the Ontario Building Code whereas the Region requires its infrastructure including the proposed forcemain to conform to the Region of Waterloo standards.
- The material and condition of the existing PVC pipe is unknown and would need to be verified. This would require that invasive testing be conducted to verify its location, condition and material type.

Keeping in mind that the new sewage forcemain would need to be in service for the next 50-75 years, the Region feels the proposed solution best meets the aims of the overall project. It is also pointed out that after consultation, the Foxboro Green community supports this solution.

In order to mitigate the impacts of construction from the proposed solution, the Region also intends to retain an arborist during the detailed design stage to inventory and assess the condition of all trees along the route and prepare mitigation plans to address your concerns. To the extent possible, we will have the arborist work with the design team to set a route that preserves the existing trees or recommend measures that protect the trees. Where unavoidable, we will have the arborist recommend planting of trees which can be protective similar to the existing trees. We look forward to working with you and other residents of Foxboro Green in this regard during the detailed design stage of the project.

Regards,

Kaoru Yajima, P.Eng. (he/him)
Engineering and Environmental Services, Water & Wastewater Services
Region of Waterloo
150 Frederick Street, 7th Floor
Kitchener, Ontario, Canada N2G 4J3
tel: 1-519-575-4757 ext.3349

ROW-WAS_email signature-v3-2

From:
Sent: May 10, 2023 11:10 AM
To: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Subject: Re: Baden and New Hamburg Water and Wastewater System Servicing

****EXTERNAL ALERT** This email originated from outside the Region of Waterloo.**

Hi Kaoru
Good speaking with you a few minutes ago.
I called to follow up on the email I sent to you, which is included.
I would appreciate it, if you could get back to me once you have reviewed the options which have been presented.

Thanking you in advance;

On Sun, Apr 23, 2023 at 5:45 PM wrote:

> Dear Kaoru Yajima and Jeff Paul
>
> It was a pleasure speaking with you a week ago Kaoru, since then I have detailed why sub-option 3i, 3ii and 3iii should not be used for the waste water project and sub-option 3iv should be used.
>
> We purchased our home after reviewing the natural barrier of a row of trees . The trees help protect us from misplayed shots that hit and break windows, damage siding and worse could hit someone, walking the path, enjoying their backyard, or playing with their grandchildren. The concern is if the project was to proceed using Sub-Phase 3iii, the open trench which would be dug in close proximity to the trees, could kill the trees and thus eliminate our natural barrier. I have spoken with several other neighbours who purchased their home knowing there was a natural barrier also.
> If the project was to proceed using Sub-Phase 3iii and a tree were to die, who will be held liable if someone is hit with a golf ball; the Region, the Township, Waterloo Corporation No. 365 or Foxwood Golf course. I would think it would be the Region of Waterloo and Waterloo Corporation No.365 as they gave the approval, which could change the protection from the natural barrier. Who will be liable for the repair of broken windows and damage to homes?
>
> With reference to Jeff Paul P.Eng Stantec London memo dated October 21, 2022, Jeff identifies the Alignment Selection Criteria is in error: He feels "Environmental and Social Criteria" are both well aligned for Sub-Option 3iii, however for the above reasons I feel the Evaluation Criteria for both Environmental and Social should be rated 2 or maybe a 3.
>
> HOWEVER, if the use of an existing force main was used and NO open cut was required, this would be an excellent option and the one which should be investigated and used. After reviewing the Site Plan for Forboro Green, there is a 1-100mm force main which could be decommissioned and used from the north end RBC2 to the south end RBC3 and then another which shows on the site plan to the hydro cut at the south end of Foxboro Green, which would be a more economical and less invasive way to proceed(lets call it 3iv). If for any reason 3iv is not chosen, then option 3i should be used. I believe we can withstand some minor inconvenience at the front of our homes. I would certainly not be in favour of taking a chance someone(or worse someone's grandchild) could be hurt or seriously injured from a miss played golf ball if a tree should die because of excavation.
>
> I would guess the savings from the new direct route 3iv would probably be in the neighborhood of $1.0 million to $1.5 million of the $3 million initial capital cost identified.
>
> The new route 3iv (attachment RBC2 - RBC3 below) using an existing 1-100mm force main from RBC2 would be:
> - south along the path behind the homes on the east side of Golf Links Dr.
> - to the path running west between Lots 21/124
> - cross Golf Links Drive between Lots 122/137
> - south along the path behind the homes on the west side of Golf Links Dr. and Maue Crt.
> - west along the path behind homes on the north side of Foxboro Dr.
> - south to the path between 210/211 to the RBC3.
> - from RBC3 east along the path behind the south side of Foxboro Dr.
> - along the path behind Lots 161/162 to the hydro easement at the south end of Foxboro Green.
>
> This route would eliminate most if not all of the excavation and the cost of new piping etc.
>
> For those who are skeptical of the longevity of PVC piping, I have attached a copy of an email and a copy of the life expectancy of PVC from a representative of IPEX for Ring-tite sewer pipe. On page 71 of 92 you can see they are stating the life cycle of PVC piping is a minimum of 100 years.
>
> Respectfully yours;
> A concerned resident of Foxboro Green and a Wilmot Township and Region of Waterloo tax payer.
>
> Below, email from Patrick Bergeron IPEX

Bergeron, Patrick <Patrick.Bergeron@ipexna.com> Apr 19, 2023, 4:08 PM (1 day ago)

to me

Hey ,

Great to chat with you. Page 31 of the tech manual attached has a life expectancy section. Here is the excerpt:

Longevity and Durability of PVC Pipe Systems

Studies undertaken in Europe and North America confirm that PVC has one of the longest life cycles of any sewer pipe material. These studies include: Uni-Bell PVC Pipe Association – Examination of 15 Year Old Sewer Pipe In this study a sewer pipe that had been in service for 15 years in Dallas, Texas was excavated and tested according to ASTM standards. The pipe met all current standards with the exception of the outside diameter, on which it outside the allowable tolerance by 0.002 of an inch. Wavin International – The Result of 30 Years Research into the Life of Pipe Systems This study consisted of the examination of over 26,000 metres of sewer pipe installed in some of the most difficult conditions in Europe over the last 30 years. Some of the conclusions of the study were: • PVC piping systems can be expected to last for several hundred years • Good results are possible even when the pipes are installed under extremely difficult conditions, such as cohesive clay or peat. • Even after up to 30 years service, there was no difference in the wall thickness between the "washed" portion of the pipes that carried wastewater and the "unwashed" portion near the crown of the pipes. This indicated abrasion wear was simply not an issue with these pipes. Reinhard Nowack, Thomas Hulsman – 70 Years of Experience with PVC Pipes The first PVC pipes for commercial use were produced in Germany in the mid-1930's. During this study a number of these pipes were excavated and tested. Although these pipes were pressure pipes, many of them were used in chemical transfer applications, and have not had any decrease in service properties. Some of the conclusions of this study were: • Even some of the earliest commercially produced pipes, which had a rated lifespan of only 50 years, were still performing well 70 years later. • Better machinery available today and advanced compounding means that pipes produced today will have a longer lifespan than the pipes examined in this study The fact that PVC is not affected by the aggressive chemicals commonly found in sewage (sulphides, chlorides) means that it has a virtually unlimited lifespan in these applications. A minimum life cycle of 100 years is a conservative value to use when carrying out life-cycle costing calculations.

Patrick Bergeron
Sales Representative - Mechanical

IPEX Inc.

(905) 670-7676 Office

(519) 221-0919 Cell
patrick.bergeron@ipexna.com
6810 Invader Cres Mississauga On L5T 2B6



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Caution: This email originated from outside of Stantec. Please take extra precaution.

From:	Kaoru Yajima
To:	"Steve Peterson"
Cc:	"Sarah Doze"; "Jeff Martens"; pbritton; Paul, Jeff
Subject:	RE: Baden & New Hamburg Water & Wastewater System
Date:	Wednesday, June 21, 2023 8:54:47 AM

Hi Steve,

Yes, upon review of your attached plan, they were considered in the current study.

Kaoru

From: Kaoru Yajima
Sent: June 15, 2023 8:37 AM
To: 'Steve Peterson' <SPeterson@mte85.com>
Cc: Sarah Doze <SDoze@mte85.com>; Jeff Martens <jmartens@mte85.com>; pbritton <pbritton@mhbcplan.com>
Subject: RE: Baden & New Hamburg Water & Wastewater System

Hi Steve,

Thanks for the email.

Let me check my records and get back to you.

Kaoru

From: Steve Peterson <SPeterson@mte85.com>
Sent: June 13, 2023 2:18 PM
To: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Cc: Sarah Doze <SDoze@mte85.com>; Jeff Martens <jmartens@mte85.com>; pbritton <pbritton@mhbcplan.com>
Subject: Baden & New Hamburg Water & Wastewater System

****EXTERNAL ALERT** This email originated from outside the Region of Waterloo.**

Good afternoon Kaoru

Thanks for meeting with us on May 23rd to discuss sanitary servicing for our client's properties in Baden. Our understanding from the meeting is that the three properties illustrated on the attached plan and summarized below have allocated sanitary capacity in the Baden Sanitary Pump Station & the Morningside Trunk Sewer.

- Activa Subdivision
- 1012 Snyders Road (30T-2160)
- Wilmot Woods Subdivision (30T-22061)

Can you please confirm our understanding is correct

Thanks, Steve

Steve Peterson, C.E.T. | Director, Land Development
MTE Consultants Inc.
T: 519-743-6500 x1223 | SPeterson@mte85.com

520 Bingemans Centre Drive, Kitchener, Ontario N2B 3X9
www.mte85.com | Twitter | LinkedIn | Instagram | Facebook

MTE's structural engineering team is growing again following the acquisition of Milman & Associates. Visit our website to learn more.

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From: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Sent: Thursday, May 4, 2023 10:45 AM
To: Steve Peterson <SPeterson@mte85.com>
Cc: Sarah Doze <SDoze@mte85.com>
Subject: RE: 1012 Snyder's Road & Activa Lands - Baden

Yes Steve, they will be accepted.
Kaoru

From: Steve Peterson <SPeterson@mte85.com>
Sent: May 4, 2023 10:30 AM
To: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Cc: Sarah Doze <SDoze@mte85.com>
Subject: FW: 1012 Snyder's Road & Activa Lands - Baden

****EXTERNAL ALERT** This email originated from outside the Region of Waterloo.**

Good morning Kaoru

With our meeting being pushed as late as May 23rd, our clients just want to confirm you will accept our formal comments following our meeting
Thanks, Steve

Steve Peterson, C.E.T. | Director, Land Development
MTE Consultants Inc.
T: 519-743-6500 x1223 | SPeterson@mte85.com

From: Sarah Doze <SDoze@mte85.com>

Sent: Tuesday, May 2, 2023 2:22 PM
To: Steve Peterson <SPeterson@mte85.com>
Subject: RE: 1012 Snyder's Road & Activa Lands - Baden

Hi Steve,

I know we were trying to get this scheduled within the next week, but schedules aren't lining up. Are these dates too late?

Sarah

Client First | **Right Solution** | **Work Together**
Sarah Doze
Administrative Assistant – Technical Practice
Kitchener 519-743-6500 x1390

From: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Sent: Tuesday, May 2, 2023 2:18 PM
To: Sarah Doze <SDoze@mte85.com>
Subject: RE: 1012 Snyder's Road & Activa Lands - Baden

Hi Sarah,

It's not looking good on our end for these dates.

Looking further ahead, here are a few openings:

May 15: 3:40pm – 4:15pm (perhaps too short?)
May 17: 2-3pm
May 23: 3-4pm

Would any of these work for your team?

Kaoru

From: Sarah Doze <SDoze@mte85.com>
Sent: May 2, 2023 1:38 PM
To: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Subject: RE: 1012 Snyder's Road & Activa Lands - Baden

****EXTERNAL ALERT** This email originated from outside the Region of Waterloo.**

Hi Kaoru,

Unfortunately, some of the other attendees are unavailable for those dates. Do any of the following work for you?

May 5th – 10:30-11:30am, 3-5pm

May 8th – 11am-12pm

May 9th – 11am-12pm, 2-3pm

May 10th – 9:30-10:30am, 11am-12pm

May 11th – 9-10am, 4-5pm

Thank you,
Sarah

Sarah Doze | **Administrative Assistant – Technical Practice**
MTE Consultants Inc.
T: 519-743-6500 x1390 | SDoze@mte85.com

From: Steve Peterson <SPeterson@mte85.com>
Sent: Tuesday, May 2, 2023 8:37 AM
To: 'Kaoru Yajima' <KYajima@regionofwaterloo.ca>
Cc: Jeff Martens <jmartens@mte85.com>; Sarah Doze <SDoze@mte85.com>
Subject: RE: 1012 Snyder's Road & Activa Lands - Baden

Good morning Kaoru
This is on me – I need to fill in Sarah on additional attendees on the call – we will get back to you today to firm up the meeting
Thanks, Steve

Client First | **Right Solution** | **Work Together**
Steve Peterson, C.E.T.
Director, Land Development
Kitchener 519-743-6500 x1223

From: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Sent: Tuesday, May 2, 2023 8:35 AM
To: Steve Peterson <SPeterson@mte85.com>
Cc: Jeff Martens <jmartens@mte85.com>; Sarah Doze <SDoze@mte85.com>
Subject: RE: 1012 Snyder's Road & Activa Lands - Baden

Hi Steve,

I thought Sarah was the point of contact for your request so acted accordingly with the set date.

Maybe it's better to streamline communications through one person, perhaps you?

As for comments after the deadline, that would be acceptable. I think a few days after our meeting once set is reasonable.

Regards,
Kaoru

From: Steve Peterson <SPeterson@mte85.com>
Sent: May 2, 2023 7:37 AM
To: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Cc: Jeff Martens <jmartens@mte85.com>; Sarah Doze <SDoze@mte85.com>
Subject: RE: 1012 Snyder's Road & Activa Lands - Baden

****EXTERNAL ALERT** This email originated from outside the Region of Waterloo.**

Good morning Kaoru
Thanks for providing dates – I need to follow up with our clients re availability. Two of your dates are after the May 9th date noted in the ***Notice of Study Completion –*** Can we provide our comments after May 9th

Thanks, Steve

Steve Peterson, C.E.T. | **Director, Land Development**
MTE Consultants Inc.
T: 519-743-6500 x1223 | SPeterson@mte85.com

From: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Sent: Monday, May 1, 2023 3:25 PM
To: Steve Peterson <SPeterson@mte85.com>
Cc: Jeff Martens <jmartens@mte85.com>; Sarah Doze <SDoze@mte85.com>
Subject: RE: 1012 Snyder's Road & Activa Lands - Baden

Hi Steve,

Can you let me know which works for your group? Let me know all dates that work.

May 4: 1-2pm
May 10: 2-3pm
May 11: 11am-noon

Thanks,
Kaoru

From: Steve Peterson <SPeterson@mte85.com>
Sent: April 27, 2023 9:26 AM
To: Kaoru Yajima <KYajima@regionofwaterloo.ca>
Cc: Jeff Martens <jmartens@mte85.com>; Sarah Doze <SDoze@mte85.com>

Subject: 1012 Snyder's Road & Activa Lands - Baden

****EXTERNAL ALERT** This email originated from outside the Region of Waterloo.**

Good morning Kaoru
We will be providing comments on behalf of our client on The Region's recently issued ***Baden-New Hamburg Water and Wastewater System Servicing Review***

Prior to formally submitting our comments we would like an opportunity to meet with you to discuss our concerns. Considering the May 9th deadline we are hoping we can meet next week.

MTE represents the Owner at 1012 Snyder's Road. Stantec Consulting represents Activa Developments. A plan is attached illustrating property ownership for reference. Both will be in attendance at the meeting.

If you could please provide your availability, we will coordinate a Teams meeting

Thanks, Steve

Steve Peterson, C.E.T. | Director, Land Development
MTE Consultants Inc.
T: 519-743-6500 x1223 | SPeterson@mte85.com

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Caution: This email originated from outside of Stantec. Please take extra precaution.

Attention: Ce courriel provient de l'extérieur de Stantec. Veuillez prendre des précautions supplémentaires.

Atención: Este correo electrónico proviene de fuera de Stantec. Por favor, tome precauciones adicionales.

Appendix B
Technical Memo #1 Background Review

Baden – New Hamburg Water and Wastewater System Servicing Review – Technical Memorandum #1 – Background Review





Prepared for:
Region of Waterloo

Prepared by:
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May 26, 2022

Revision	Description	Author	Quality Check	Independent Review
1	Draft	JI / SZ	JP	DM
2	Final	HH / SZ / MS	MK	JP / DM

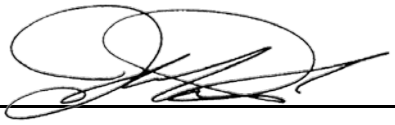
BADEN – NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW – TECHNICAL MEMORANDUM #1 – BACKGROUND REVIEW

This document entitled Baden – New Hamburg Water and Wastewater System Servicing Review – Technical Memorandum #1 – Background Review was prepared by Stantec Consulting Ltd. ("Stantec") for the account of Region of Waterloo (the "Client"). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by 

(signature)

Sam Ziemann, P.Eng.

Reviewed by 

(signature)

Jeff Paul, P.Eng.

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Abbreviations

ADF	Average Daily Flow
ANSI	Areas of Natural and Scientific Interest
BNH	Baden New Hamburg
CHAR	Cultural Heritage Assessment Report
CWA	Clean Water Act
DFO	Department of Fisheries and Oceans
EA	Environmental Assessment
ECA	Environmental Compliance Approval
ESA	Endangered Species Act
I/I	Inflow and Infiltration
masl	Metres Above Sea Level
MBR	Membrane Bioreactor
MECP	Ministry of Environment, Conservation and Parks
MHSTCI	Ministry of Heritage, Sport, Tourism and Culture Industries
MOECC	Ministry of the Environment and Climate Change
MNRF	Ministry of Natural Resources and Forestry
PRV	Pressure Reducing Valve
PSW	Provincially Significant Wetland
RBC	Rotating Biological Contactor
RMOW	Regional Municipality of Waterloo
SAR	Species at Risk
SARA	Species at Risk Act

SBR	Sequencing Batch Reactor
SCADA	Supervisory Control and Data Acquisition
SOCC	Species of Conservation Concern
SPP	Source Protection Plan
SPS	Sewage Pumping Station
TM	Technical Memorandum
UNESCO	United Nations Educational, Scientific and Cultural Organization
UV	Ultraviolet
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant

1.0 Introduction

1.1 Background and Purpose

The Region of Waterloo (Region) retained Stantec Consulting Ltd. (Stantec) and C3 Water Inc. (C3W) to complete a System Servicing Review for the New Hamburg Water and Wastewater Systems. The purpose of this Servicing Review is to evaluate the status of existing water and wastewater servicing systems in Baden – New Hamburg, provide recommendations to address existing servicing issues, and to provide the framework to meet the water / wastewater servicing needs. The study will consider planned growth for developments within the current Urban Area Boundaries for Baden, New Hamburg, and Foxboro Green, as defined in the Township of Wilmot Official Plan (2019). Planned growth will be compared and considered up to the rated capacity of existing Region infrastructure, particularly the current rated capacity of the New Hamburg WWTP and the existing water supply systems. The Baden-New Hamburg areas have a significant history of infrastructure planning studies which will be reviewed in conformance with Phase 1 and Phase 2 of the Municipal Class Environmental Assessment (EA) process.

1.2 Study Area

As shown in **Figure 1-1**, the study area for this servicing review includes the water and wastewater systems that serve the communities of Baden, New Hamburg and Foxboro within the Township of Wilmot, Region of Waterloo.

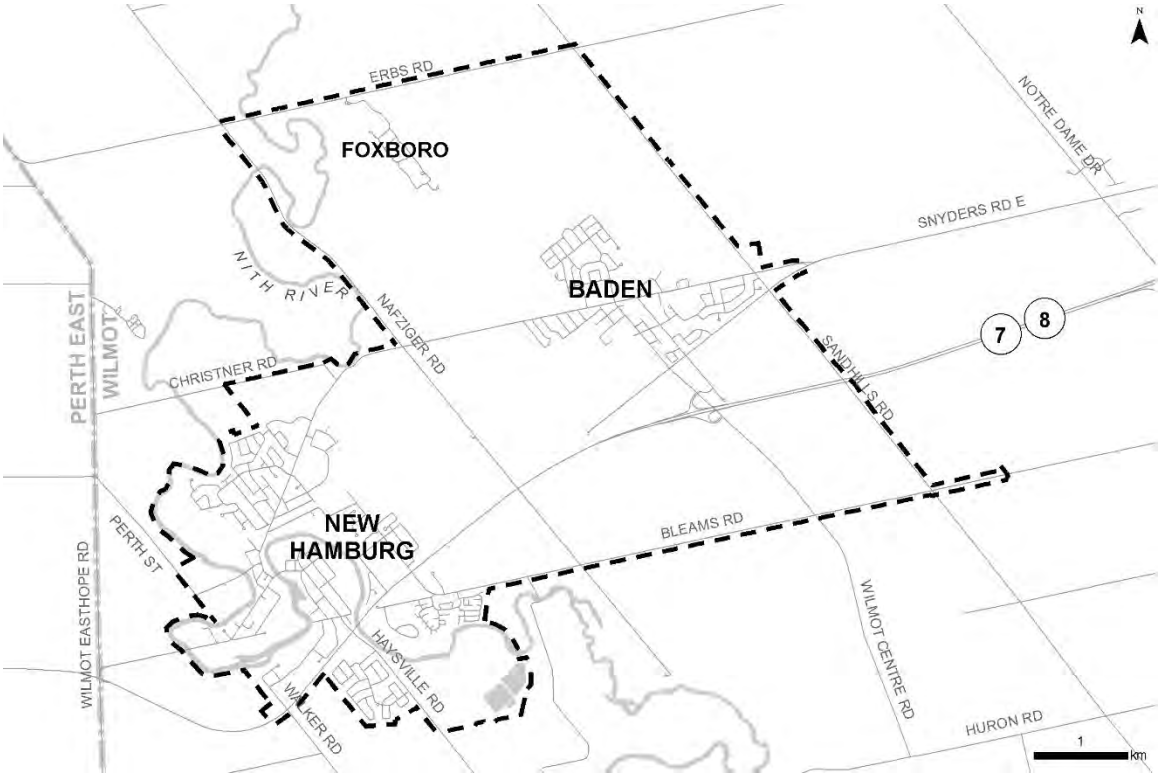


Figure 1-1: Servicing Review Study Area

1.3 Purpose of Technical Memo #1

Phase 1 of the EA process includes problem identification to establish a clear understanding of the completed studies to date and the problems and/or opportunities related to the existing water and wastewater infrastructure included in this study.

The purpose of this Technical Memorandum #1 (TM 1) is to provide the Region with a summary of the existing conditions, background studies completed to date, and a clear understanding of the problems and opportunities to be addressed through this study. TM 1 will also identify gaps in the reviewed background information and provide recommendations to address these gaps. The information provided in TM 1 has been used to assist in the development of the content for Public Consultation Centre No. 1 (PCC #1).

Phase 2 of the EA process includes the development and evaluation of alternative solutions to address the problem and/or opportunities identified, which will be presented in subsequent Technical Memoranda.

1.4 Municipal Class EA Process and Selection of Schedule

The MCEA process provides a consistent method of identifying and assessing environmental impacts, including technical, natural, cultural, and socio-economic considerations. This process is undertaken prior to modifications or additions to municipal infrastructure, to ensure that potential impacts associated with all project aspects are considered. Figure 1-2 depicts the overall MCEA process. The MCEA process was developed by the Municipal Engineers Association (MEA) to fulfill the requirements of the *Environmental Assessment Act*, R.S.O 1990, for municipal infrastructure projects, and consists of the following five (5) phases:

Phase 1: Identify the problem/opportunity

Phase 2: Identify and evaluate alternative solutions

Phase 3: Identify and examine alternative design concepts for the preferred solution

Phase 4: Formally document the planning process in an Environmental Study Report (ESR)

Phase 5: Proceed to implementation

Based on the nature and extent of the project, as well as its anticipated impacts to the surrounding environment, the MCEA document specifies four different schedules under which projects may be planned, and the assessment process required for each:

Schedule A projects are pre-approved under the MCEA, and can proceed directly to Phase 5 (implementation). Schedule A projects are limited in scale and have minimal anticipated impacts to the environment, generally including normal or emergency operational and maintenance activities.

Schedule A+ projects are pre-approved under the MCEA, although the proponent is required to advise the public of the project prior to construction activities. These types of projects are limited in scale with minimal environmental impacts, and thus require no formal documentation.

Schedule B projects are required to proceed through the first two phases of the MCEA process to identify the problem or opportunity, as well as identify and assess any reasonable/feasible Alternative Solutions and select a Preferred Solution. Proponents must also contact all relevant agencies, Indigenous Communities and affected members of the public to ensure that they are aware of the project and that their concerns are considered and addressed. A record of the process followed is also documented within a Project File or a Project File Report and filed for a 30-day public review period. If there are no significant impacts identified, and no requests are received to undertake the



project as an individual Environmental Assessment (through the Part II Order process), the project may then proceed to detail design (i.e., Phase 5).

Schedule C projects are required to proceed through all five stages of the MCEA process, as they have the potential for significant environmental effects. These projects generally include the construction of new facilities, or major expansions to existing facilities. Schedule C projects require an Environmental Study Report be completed and filed for a 30-day public review period.

The selection of the appropriate project schedule to be followed is dependent on the anticipated level of environmental impact, and at times the estimated construction costs. According to Appendix 1 of the MCEA document, Schedule B level of assessment is recommended for works that include: establishing new or expanding/replacing existing water storage facilities, and constructing a new pumping station or increasing pumping station capacity by adding or replacing equipment and appurtenances, where new equipment is located in a new building or structure. Refer to Appendix 1 of the MCEA document for a full list of recommended works for a Schedule B level of assessment.

Upon completion of the Schedule B MCEA, a Project File or Project File Report is submitted for public review for a 30-day period. A Notice of Study Completion is published in local papers and distributed to the project contact list to announce the commencement of this review period.



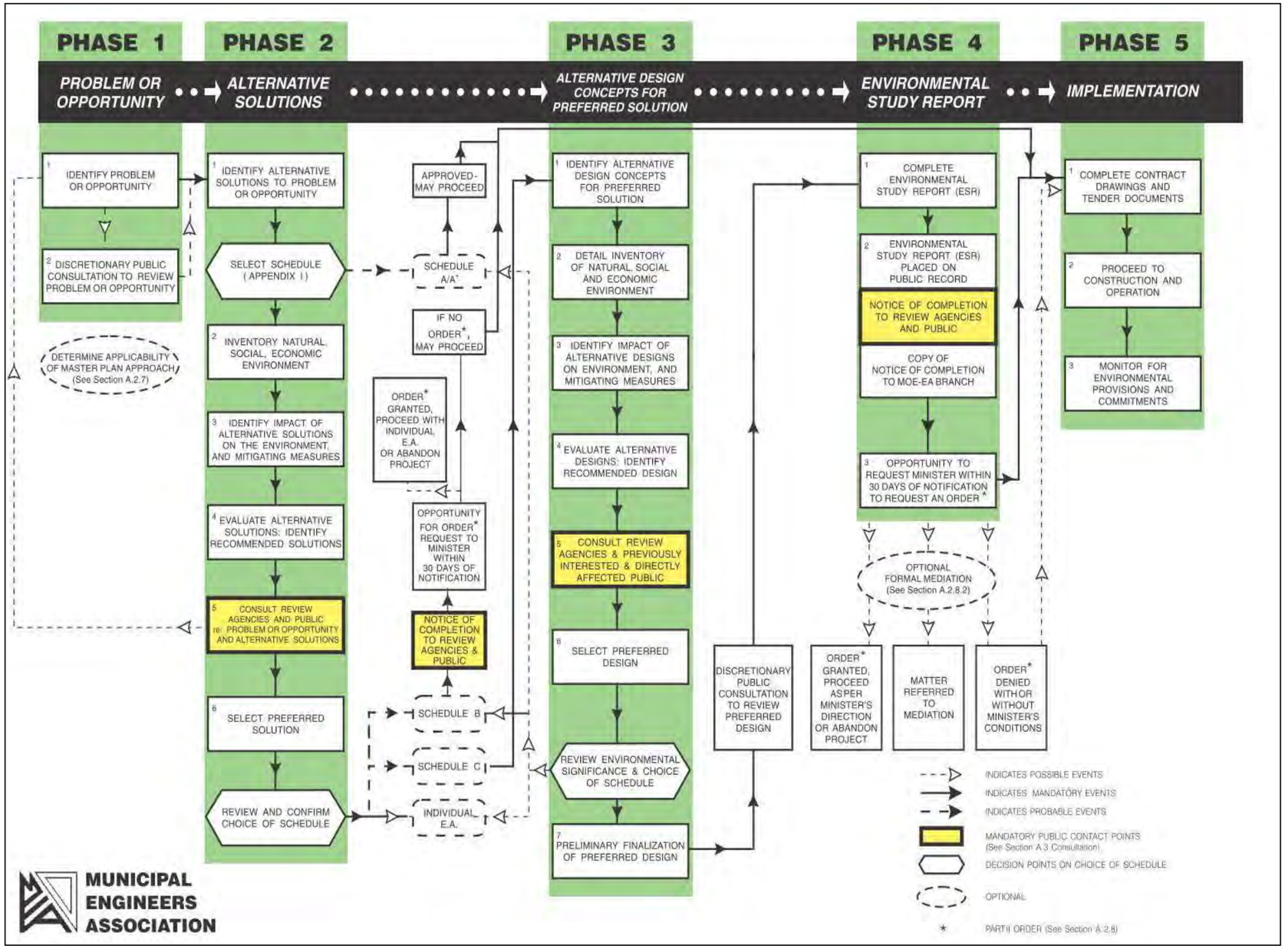


Figure 1-2: MCEA Flow Chart

2.0 Background Studies – Water Infrastructure

The following section provides summaries of previous reports that were developed for the Baden – New Hamburg water systems that are of particular relevance to this study. It should be noted that these reports were developed based on the existing infrastructure capacity and planning information available at the time of the report development, which may no longer represent current conditions. The findings and recommendations of the previous reports are summarized in order to assess which recommendations have been implemented since the time of the report development, for consideration in the current Servicing Study.

Relevant elements of the following studies are summarized in the following sections.

- Baden-New Hamburg Water and Wastewater Master Plan (2011)
- Baden-New Hamburg Water Distribution System Operating Strategy (2017)
- Shingletown Wells Iron and Manganese Treatment Upgrades – Schedule C Class EA (Ongoing)
- Baden-Wilmot Nitrate Modelling Update (Ongoing)
- Inventory, Condition, and Capital Assessment (2019)
- Morningside Sanitary Trunk Sewer Environmental Assessment – Growth Methodology Memo – Draft (GM Blueplan, Feb 8, 2021)

2.1 Baden-New Hamburg Water and Wastewater Master Plan (2011)

The 2011 Baden-New Hamburg Water and Wastewater Master Plan (2011 WWMP) was completed as a Schedule C Class Environmental Assessment (EA). The purpose of the 2011 WWMP was to update previous Master Plan and Class EA studies with recent infrastructure and population projections up to 2041 and identify strategies that ensure that an adequate amount of water can be provided to satisfy current and long-term requirements. The population projections that were used are summarized in **Table 2-1** below. Calculated water demand projections are summarized in **Table 2-2** below.

Table 2-1: 2011 WWMP – Population Projections

Area	2016	2021	2026	2029	2041 Low*	2041 High*
Residential	14,760	16,800	19,340	20,800	21,500*	26,100*
Employment	4,900	5,800	6,570	7,050	7,340*	9,300*
Population Equivalent (PE)	19,660	22,600	25,910	27,850	28,840*	35,400*
* *Unofficial projections*						

Table 2-2: 2011 WWMP – Water Demand Projections

	2006	2011	2016	2021	2026	2029	2041 (LOW)	2041 (HIGH)
Baden-New Hamburg PE Projection	15,220	16,740	19,660	22,600	25,910	27,850	28,840	35,400
Average Day Demand (m^3/d)[1]	2,773	3,050	3,582	4,118	4,721	5,075	5,255	6,450
Maximum Day Demand (m^3/d)[2]	3,980	4,377	5,140	5,909	6,775	7,282	7,541	9,256
[1]*Average Day Demand per Equivalent Capita = 182.22 L/capita/day* [2]*Maximum Day Demand per Equivalent Capita = 261.47 L/capita/day*								

2.1.1 Supply and Treatment

The following alternatives were considered to meet supply and treatment requirements:

- W-4: Modify/Expand Operational practices to supply more water from the K50 (Kitchener) Wells to Baden/New Hamburg.
- W-5: Expand/Upgrade existing groundwater supplies by reactivating the Baden Wells and provide nitrate treatment
- W-6: New groundwater well supply in either the New Hamburg (NH) Wellfield and/or the Wilmot Centre Wellfield

The following supply options based on combinations of the above were considered:

- WS-1: NH3, K50s
- WS-2: NH3, K50s, Baden Wells
- WS-3: NH3, K50s, new well NH4
- WS-4: NH3, K50s, new well K52

- WS-5: NH3, K50s, Baden Wells, new well NH4

The recommended alternative was WS-4.

2.1.2 Storage

The storage requirement projections that were used are summarized in **Table 2-3** below.

Table 2-3: 2011 WWMP – Storage Requirements

YEAR	EQUIVALENT POPULATION	FIRE FLOW (L/S)	DURATION (HRS)	TOTAL STORAGE REQUIRED (M^3)	SURPLUS/DEFICIT (M^3)
2008	15,220	236.7	3.6	5,213	2,150
2016	19,660	268.1	4.3	6,753	610
2021	22,600	299.9	4.5	7,963	- 600
2029	27,850	322.3	5.0	9,527	- 2,164
2041 (low)	28,840	327.2	5.0	9,718	- 2,355
2041 (high)	35,400	358.3	5.3	11,507	- 4,144
Note: MOE fire flows and duration were interpolated *Existing Total Storage: 7,363 m^3*					

Based on the 2011 total storage volume of 7,363 m^3, it was estimated that additional water storage would be required before 2021. The following storage options were considered:

- S-1: Expand the New Hamburg Water Treatment Plant (NHWTP) Reservoir
- S-2: Storage at Baden Wells Site
- S-3: New Location
- S-4: Combination of Above

Based on the preferred water supply option W-4, S-1 was recommended as the preferred water storage option.

2.1.3 Water Distribution

It was acknowledged that new watermains will be required between Baden and New Hamburg to service new growth. However, at the time of the 2011 WWMP, future population distribution had not yet been determined.

The south-west portion of New Hamburg experienced high pressure in low elevation areas. The following alternatives were developed for consideration:

- NHD-1: Central pressure reducing area
- NHD-2: Residential pressure reducing valves (PRVs)
- NHD-3: Hybrid

2.1.4 Summary of Recommendations

The 2011 WWMP water recommendations and current statuses are summarized in **Table 2-4**.

Table 2-4: 2011 WWMP – Recommendations and Status Updates

Study Area	Recommended	Status Update
Supply	Increase taking from the K50s following stepped increases to a maximum flow of 142 L/s to meet 2041 low demand and further to the PTTW permitted flow of 158 L/s to meet the 2041 high demand.	Testing of the well field is underway through the Region's hydrogeo group. Status to be confirmed through this study.
	Increase pumping from NH3 to well permitted flow of 41 L/s.	NH4 has been commissioned and connected to the system. NH3 and NH4 operate in a duty/standby configuration.
	Install new well K52 and connect it to existing system for supply capacity and redundancy.	Well K52 has been drilled. A project is currently underway to install a well pump and process piping. It is expected that well K52 will eventually be connected to the distribution system following treatment upgrades at the K50s facilities.
Distribution	Recommendations to be developed by the Township subject to timing of growth and development of new water sources.	
	Modify distribution system piping and valving to address high pressure issues in New Hamburg.	In 2013, a pressure reducing valve (PRV) was installed on 300mm watermain between Baden and

Study Area	Recommended	Status Update
		New Hamburg. In 2018, the PRV was commissioned.
Storage	Expand the New Hamburg WTP storage to meet 2041 fire flow requirements.	The storage at the New Hamburg WTP has not been expanded at this time. Confirmation of the storage requirement and location to be completed through this study.
	Upgrade NHWTP high lift pumping station.	New pumps were commissioned at the NHWTP in July/October 2019.

2.2 Baden-New Hamburg Water Distribution System Operating Strategy (2017)

A Baden-New Hamburg Water Distribution System Operating Strategy was completed in 2017. When Baden and New Hamburg were a single pressure zone, the Baden ET could only be filled to approximately 50-55% to avoid over pressurizing low elevation areas of New Hamburg. A PRV was installed in 2013 at the northwest corner of Nafziger Road and Snyder's Road (Nafziger PRV) to separate Baden and New Hamburg into two pressure zones. The recommendations made for interim and future operation are summarized in Error! Reference source not found..

Table 2-5: System Operating Strategy - Recommendations

Phase	Recommendation	Status
Interim	Commission Nafziger PRV to supply New Hamburg from Baden during high demand periods Supply New Hamburg by NHWTP at HGL of 396.9 metres above sea level (masl) Supply Baden by K50 wells and Baden ET at HGL of 408.6 masl Install pressure transmitter at K50s to allow wells to run off of system pressure if Baden ET is isolated	Nafziger PRV was commissioned in August 2018 Pressure sustaining setpoint (Baden to New Hamburg) of 425 kPa Reverse pilot setpoint (New Hamburg to Baden) upon negative pressure differential

Future	Install 450mm transmission main with PRV between NHWTP and Baden to fill the Baden ET from the NHWTP	Design is underway and construction is expected to begin in 2022.

2.3 Shingletown Wells Iron and Manganese Treatment Upgrades – Schedule C Class EA (Ongoing)

A Municipal Class EA is underway for iron and manganese treatment upgrades for the Shingletown Wells (K50s). The project will review and provide recommendations related to iron and manganese treatment upgrades based on current industry standards and new technologies, as well as the location of potential upgrade alternatives. Results from this ongoing EA will be considered in the development of the Baden and New Hamburg servicing review.

Current information regarding this study can be found on the Region's website for current water and wastewater projects:

https://www.regionofwaterloo.ca/en/living-here/current-projects.aspx#water

2.4 Baden-Wilmot Nitrate Modelling Update (Ongoing)

A study is currently underway with the Region and Matrix Solutions Inc. (Matrix) which involves nitrate concentration sampling of wells as well as discussion with local farmers to estimate current and future nutrient loss due to farming practices. This will lead to groundwater modelling of nitrate concentrations and assess the potential impacts of planned pumping increases. The modelling will employ the FEFLOW 3-D groundwater model developed during the Tier 3 SWP assessment completed by the Region. Demand projections developed from Baden-New Hamburg servicing review will be used for various scenarios for the groundwater modelling. One scenario that will likely be assessed is the operation of the K50 wells at their existing PTTW. Possible contingencies for water supply should the K50 wells reach a critical nitrite/nitrate concentration will be developed as part of the servicing review.

2.5 Inventory, Condition, and Capital Assessment (2019)

Multi-disciplinary inventory, condition, and capital planning (ICC) assessments were completed for the New Hamburg WTP, NH3/4 Well House, Baden ET, and Foxboro

Green WTP in 2018. Final reporting was completed in 2019. The following subsections provide a summary of the ICC recommendations.

2.5.1 New Hamburg Water Supply System

A number of upgrade recommendations were made for the New Hamburg WTP; however, a capital upgrade was recently carried out to upgrade the pump station and treated water process, piping, and equipment. The following additional recommendations were made:

- Filter system upgrade in approximately 2028 including filter system process piping and equipment, filter system air compressor and air dryer, and pressure filter tanks.
- Facility and site works upgrades in approximately 2028 including sanitary drainage piping, interior finishes, and asphalt repairs.

The NH3/NH4 Well House has recently been upgraded and no further updates have been recommended.

2.5.2 Baden Elevated Tower

The upper portions of the tower and the tank itself were not included in the assessment. No major deficiencies were noted at the Baden ET through the ICC investigations. Regular renewal of instrumentation and equipment has been recommended.

Baden ET control panels are in good condition, however, do not meet the Region supervisory control and data acquisition (SCADA) standard.

2.5.3 Foxboro Water Treatment Plant

A full facility upgrade has been recommended for the Foxboro WTP based on current asset condition and age. Conceptual design should be carried out to produce a budgetary capital estimate for facility renewal, or alternative supply options to service the Foxboro area considered.

Status Update

Through this study, a new watermain to Foxboro WTP will be considered which would allow for the existing WTP to be taken offline in the future. For this reason, the conceptual design at Foxboro WTP has been put on hold.

3.0 Background Studies – Wastewater Infrastructure

The following section provides summaries of previous reports that were developed for the Baden – New Hamburg wastewater systems that are of particular relevance to this study. It should be noted that these reports were developed based on the existing infrastructure capacity and planning information available at the time of the report development, which may no longer represent current conditions. The findings and recommendations of the previous reports are summarized in order to assess which recommendations have been implemented since the time of the report development, for consideration in the current Servicing Study.

Relevant elements of the following studies are summarized in the following sections.

- Flow Monitoring for the Sanitary Sewer Inflow/Infiltration Study (2008)
- Foundry Street Sanitary Sewer Study (2010)
- Baden-New Hamburg Water and Wastewater Master Plan Update (2011)
- Morningside Sewage Pump Station Capacity Assessment (2017)
- Morningside SPS Draw Down Testing and Reporting (2017)
- Morningside Sewage Pump Station Capacity Assessment – Draw Down Pump Test and Results (2018)
- Baden / New Hamburg Draw Down Testing and Reporting Technical Memorandum (2018)
- 2018 Wastewater Treatment Master Plan Update (2018)
- Morningside Sanitary Trunk Sewer Environmental Assessment – Growth Methodology Memo – Draft (GM Blueplan, Feb 8, 2021)

3.1 Flow Monitoring for the Sanitary Sewer Inflow/Infiltration Study (2008)

In 2008, the Township of Wilmot initiated this study by Conestoga-Rovers and Associates (CRA) due to a suspected increase of Inflow and Infiltration (I/I) flow that was leading to higher than expected flows to the New Hamburg WWTP.

The I/I Study concluded the following:

- The Baden Award Drain was not found to be connected to the sanitary sewer
- No connection of downspouts and well overflows with the sanitary sewer were found on Greenwood Drive (in Catchment Area 3)
- Substantial heavy calcite build-up was found in the sanitary sewer system that was obstructing flow and reducing capacity of sewers.

The following recommendations were provided to minimize I/I problems in this area:

Baden

- Discharge pipe at 49 Elizabeth Street to be investigated to confirm whether an illegal connection exists
- Continued flow monitoring at Waterloo-Oxford Secondary School to be completed to confirm whether schools weeping tiles or groundwater wells are connected to the sanitary sewer
- Review pump station output level at Charlotta Street pump station to prevent peak flows from surcharging the sanitary trunk sewer
- Provide proper maintenance of sanitary trunk sewer along Charlotta Street and Foundry Street.

New Hamburg

- Complete detailed investigation of both Riverside Drive and Harlew Court utilizing CCTV surveys and by-pass were pumping to identify the source of groundwater infiltration
- Raise the rim elevation at MH91 located in the south swale of Highway 7/8.

General Recommendations

- Ensure adequate inspection is maintained at new residential developments with respect to I/I control
- Consider the feasibility of creating a Township by-law requiring property owners to ensure there are no illegal connections to the public sewer as a condition of property sale
- Ensure all cases of moderate to heavy encrustation are scheduled to be cleared on a periodic basis to prevent obstruction of flow capacity.

3.2 Foundry Street Sanitary Sewer Study (2010)

In 2010, the Township of Wilmot retained MTE Consultants Inc. to conduct a sanitary sewer study to assess the capacity of the 250mm sanitary trunk sewer located on Foundry Street between Snyder's Road and Gingerich Road which was operating near capacity at the time of the report.

The study recommended a detailed design be undertaken to upgrade the Foundry Street Trunk Sanitary Sewer to a capacity of at least 134.0 L/s and that the upgrades should be completed before building permits are granted in the future catchment areas.

Three options were considered, and preliminary cost estimates were provided. The most cost-effective method of upsizing the sanitary sewer was to construct a new PVC sewer along a new alignment and abandon the existing asbestos cement pipes.

3.3 Baden-New Hamburg Water and Wastewater Master Plan Update (2011)

In 2011, AECOM was retained by the Region to update the New Hamburg Wastewater Treatment Class EA (1997) and the Baden New Hamburg Water Supply Master Plan Update (1996). The Water and Wastewater Master Plan Update (2011) provided an overall plan for the upgrade and expansion of facilities to ensure adequate water and wastewater capacity to 2041.

3.3.1 Wastewater Treatment

The evaluation of the wastewater treatment alternative solutions recommended that New Hamburg WWTP be optimized and expanded in order to meet the treatment and capacity objectives. A phased approach was taken in the original design of this facility with Phase 1 being completed in 2000. Phase 2 was planned to be completed in 2016 to provide meet capacity to 2041. Several features were incorporated into the Phase 1 design to allow for flexibility in installing additional tanks and equipment required for the eventual Phase 2 expansion.

The projected wastewater flows used in the original Phase 2 design have been determined to be outdated and therefore the Phase 2 expansion as originally planned would not meet the needs of updated projections. For this reason, a parallel process would be required to meet long term capacity requirements. A parallel membrane bioreactor (MBR) package plant system was recommended to be installed in 2028 with an expansion to a second parallel package plant in 2041.

The four phases for the implementation of this alternative are summarized in **Table 3-1**.

Table 3-1: Baden and New Hamburg Master Plan: New Hamburg WWTP Recommendations

Phase 1	Optimize New Hamburg WWTP and resolve existing SCADA programming issues in 2012 (no later 2016)
Phase 2	Upgrade/Expand as per Phase 2 of the 1996 MP expansion strategy (2018)
Re-evaluate the Master Plan update to confirm Phase 3 and 4 recommendations by approximately 2028	
Phase 3	Install a parallel package treatment plant when capacity of Phase 2 is reached to meet capacity and treatment needs: • one parallel package plant to meet 2041 low population projections (2028) • A larger or a second parallel package to meet 2041 high population projections (2034)
Phase 4 (If required)	Should effluent TP requirements require enhanced filtration, install second stage of tertiary filters as part of Phase 3 or later

Status Update

The Phase 2 expansion to New Hamburg WWTP was substantially completed in 2020, resulting in an increase of the rated average daily flow (ADF) capacity to 6,900 m^3/d and increase of the peak flow capacity to 30,360 m^3/d. With this expansion the New Hamburg WWTP has sufficient capacity to handle 2051 flows (Wastewater Master Plan, 2018).

3.3.2 Wastewater Collection

The Master Plan Update recommended that as lands are developed, a Wastewater Servicing Study be carried out by the Township of Wilmot to determine the optimal location of key trunk sewers and infrastructure based on the Region's and Township's growth spatial planning.

After a detailed review of the alternatives, it was recommended that the following improvements be made to the wastewater collection system to meet the projected 2041 capacity requirements:

- New wastewater pumping station serving to the north areas of New Hamburg
- New force mains:
    - 150 mm force main from New PS#1 to Trunk Sewer connected to NH WWPS#2 (~ 1.8 km)
    - 100 mm force main from Foxboro WWPS to various alternatives (from 3.5 to 7 km)
    - New trunk sewer connecting southwest Baden to the East Side Trunk Sewer
- Upgrade existing pumping facilities to meet projected 2041 pumping capacity requirements:
    - Baden SPS
        - 2041 Low: Require additional pumping capacity (550 m^3/d);
        - 2041 High: Require additional pumping capacity (3,800 m^3/d).
    - New Hamburg SPS#2
        - 2041 Low: Require additional pumping capacity (4,238 m^3/d);
        - 2041 High: Require additional pumping capacity (5,855 m^3/d).
    - Morningside SPS
        - 2041 Low: Require additional pumping capacity (3,500 m^3/d);
        - 2041 High: Require additional pumping capacity (8,000 m^3/d).
    - Foxboro SPS
        - convert to SPS from WWTP
        - 2041 Low: Require additional pumping capacity (1,360 m^3/d);
        - 2041 High: Require additional pumping capacity (1,510 m^3/d).
- Upgrade 200 mm force main connecting the NH WWPS #2 to the sewer system would require to 250 mm (~ 0.4 km)
- Upgrade 450 mm East Side Trunk Sewer (~1.2 km)

Status Update

Drawdown tests and capacity assessments for Baden and Morningside SPSs were completed in 2017/2018 and are summarized in the sections below. The wastewater collection system for Baden New Hamburg was reviewed in the 2018 WWTP Master Plan Update, which recommended that a more detailed study looking specifically at this system be completed in the near future. This will be completed as part of this Servicing System Review.

3.4 Morningside Sewage Pump Station Capacity Assessment (2017)

In 2017, Stantec Consulting was retained by the Region to complete a capacity review which included analysis into when a capacity increase may be required, and how additional capacity could be achieved.

The report concluded that additional equalization storage at Morningside SPS is not required based on available system storage and overflow capability. It also concluded that there is not an imminent need to increase the capacity of the SPS in the next 5 years, although a pump test was recommended to verify the hydraulic calculations.

Morningside SPS was originally designed to achieve a firm capacity of 262 L/s with the ability to replace pump impellers to achieve the projected 2041 firm capacity of 332 L/s Four (4) pumps were originally installed in the station in 1999 with one being fully replaced in 2015.

The existing pump model (Flygt CP3300) is no longer manufactured and has been replaced with an updated model. Due to the completed maintenance on the existing pumps throughout their lifecycle, replacing impellers may be difficult given their age. The report recommended that the pumps be replaced with new pumps (Model 3301HT) which can meet current and future needs. Recommendations were also provided with regards to various impeller options and resultant flow capacities should the NP 3301 model pumps be installed.

Although not imminently required, it was recommended that the Region plan for the eventual pump upgrades which will require the completion of a Schedule A+ Municipal Class EA.

3.5 Morningside SPS Draw Down Testing and Reporting (2017)

In 2017, R.V. Anderson Associates Ltd was retained by the Region of Waterloo to undertake a study to assess the current condition of the Morningside SPS force mains, FM1 and FM2, and comment on the observed station pump capacities.

The observed force main performance for both FM1 and FM2 was as expected given the age of the force mains and the typical operation of the SPS. Individual pump capacities for pumps 1, 2 and 3 were shown to be performing at or very near their expected operating conditions. Pump 4 was being repaired at the time of the report and was not tested.

Based on the various pump and force main combinations that were tested, and using the as-built information provided, the calculated C factor for each force main was estimated to be approximately 113, or slightly below the MECP guideline value of 120 for a force main of this age. The resultant pump test with all three pumps and both force mains in operation revealed a peak flow capacity of approximately 222 L/s, which is approximately 15% lower than the station's rated capacity of 262 L/s, and approximately 10% lower than the estimated value of 248 L/s from Stantec's 2017 Capacity Assessment report (refer to **Section 3.4** for a summary of this report), which assumed a C factor of 130.

The RVA report further commented that in order to achieve the station's rated capacity of 262 L/s, a C factor of approximately 150 would be required if the three existing pumps tested were utilized (i.e., no changes to pump motor or impeller size).

The report recommended some minor operational and maintenance procedures aimed at removing solids deposition with the force mains including:

- Maintaining FM1 and FM2 in the range of 0.9-1.0 m/s during dry weather periods
- Flushing force mains routinely to clear debris that has settled out of the wastewater
- Conducting further periodic drawdown tests to gauge future station performance.

3.6 Morningside Sewage Pump Station Capacity Assessment – Draw Down Pump Test and Results (2018)

This memo was completed in 2018 by Stantec Consulting Ltd. as a follow up to the Morningside SPS Draw Down Test (refer to **Section 3.5** for a summary of this report) and the Morningside Sewage Pump Station Capacity Assessment (refer to **Section 3.4** for a summary of this report). It was noted that the difference in the observed peak flow capacity (222 L/s) and the rated capacity of the station (262 L/s) may be due to several potential contributors including wear on the pump impellers, degradation of the force main pipe, sediment buildup within the force mains, and air or gas pocket entrainment in the force mains.

The memo also noted that upon further review of the contract documents (Morningside Wastewater Force main contract (Region of Waterloo Contract No. 99015, dated 1999), the acceptable pipe material listed for the project was listed as PD3408 DR17. The

inner diameter for this class of HDPE pipe is 285.7mm. Because the HDPE pipe material was used for the longest portion of the force main length (approximately 1186 m), this has a significant impact to the system curves for the force mains.

Based on the drawdown test data, the estimated C factor of 113, and updates to the force main system curves, the estimated capacities for various impeller sizes (for the recommended upgraded NP3301 pumps) were determined, as presented in **Table 3-2**.

Table 3-2: 2018 Morningside Station Capacity Assessment - Pump Upgrades

Pumps	Impeller Size	Station Capacity
3 x NN3301	330mm	207 L/s
3 x NN3301	350mm	237 L/s
3 x NN3301	370mm	267 L/s
3 x NN3301	390mm*	297 L/s*
*larger motor and electrical upgrades required.		

3.7 Baden / New Hamburg Draw Down Testing and Reporting Technical Memorandum (2018)

In 2018, RVA was retained by the Region of Waterloo to undertake a study to assess the current condition of the Baden / New Hamburg SPS force main and comment on the observed station pump capacities.

The report noted inconsistencies in design duty points; the manufacturers certified pump curve which were plotted at 49 L/s at 39.9m total dynamic head (TDH), and the station's Environmental Compliance Approval (ECA) rating of the pumps being written as 49 L/s at 29.9m TDH.

A best fit system curve was developed and was representative of a C factor of 96, indicating that the losses are greater than those expected.

From an overall station performance standpoint, the measured flow of each pump (at full speed) for Pump 2 and Pump 3 was 31 L/s and 37.5 L/s, respectively. This is

significantly less than the expected station firm capacity of 49 L/s (a difference of -36.7% and -23.5%, respectively).

Several recommendations were offered:

- Confirm assumptions made in report including force main HDPE wall thickness, and elevations
- It appeared that a valve in the third air relief valve (ARV) chamber may be inoperative, semi-annual inspection of the valves for cleaning and proper operation was recommended.
- A force main flushing program should be implemented.
- Confirm using historical SCADA data if the station ever met or exceeded the expected station firm capacity of 49 L/s.

A drawdown studies review meeting was held on Oct 8, 2020 in which the Region indicated that Pump #2 at Baden SPS was replaced with a new pump in early 2020, totally rebuilt with a new impeller along with a spare on site.

3.8 Wastewater Treatment Master Plan Update (2018)

In 2018, due to recent trends in wastewater flows and population growth, climate patterns and changes in regulatory requirements, the Region initiated a study to update the 2007 Wastewater Treatment Master Plan (WWTMP). The study was completed by Cima+ in July of 2018, in accordance with Municipal Class EA requirements and provided an overall plan for the upgrade and/or expansion of the Region's wastewater facilities until the year 2051.

3.8.1 Wastewater Treatment

The report indicated that the WWTPs included in this study (New Hamburg and Foxboro Green) are not expected to require capacity expansion upgrades prior to 2051.

The average flow to New Hamburg WWTP (4,250 m^3/day in 2016) was projected to grow to 6,870 m^3/day in 2051. This would put the WWTP at 85% of its rated capacity by 2041 and 100% of its rated capacity by 2051.

Foxboro Green WWTP is a communal treatment plant serving a single community with very little expected growth. The WWTP's rated capacity of 150 m^3/day is expected to meet the needs of the community to 2051.

Effluent quality of the WWTPs was also considered due to changing regulations with respect to wastewater treatment and effluent quality requirements. It was determined that no changes to level of treatment are expected for the New Hamburg or Foxboro

WWTPs as they meet the anticipated requirements in the Canada-Ontario Draft Action Plan for Lake Erie (Draft Action Plan).

3.8.2 Wastewater Collection

In an analysis of sewage pumping stations within the Region, it was determined that Morningside and Baden SPSs are in need of expansion, and it was recommended that these expansions take place before 2030.

The 2051 wastewater flow projection to Baden and Morningside SPSs summarized in the report are shown in **Table 3-3**.

Table 3-3: 2051 Projected Flows to Sewage Pumping Stations

SPS	Peak Wet Weather Flow (L/s)		Firm Capacity (L/s)	Year to Reach 85% Firm Capacity	Year to Reach 100% Firm Capacity
	2016	2051			
Baden	185	225	187	<2016	2021
Morningside	205	270	248	2019	2041

For the Morningside SPS, it was noted that pump replacements could provide a firm capacity of 290 L/s, which would exceed the projected 2051 flow of 272 L/s (Stantec, 2017). For the Baden SPS it was recommended that opportunities to reduce peak flows through I/I reduction should be considered.

However, since Baden SPS pumps directly to the Morningside SPS (which is then pumped to New Hamburg WWTP), upgrade and optimization options for these pumping stations are very interrelated. It was recommended that a more detailed study looking specifically at this system be completed in the near future.

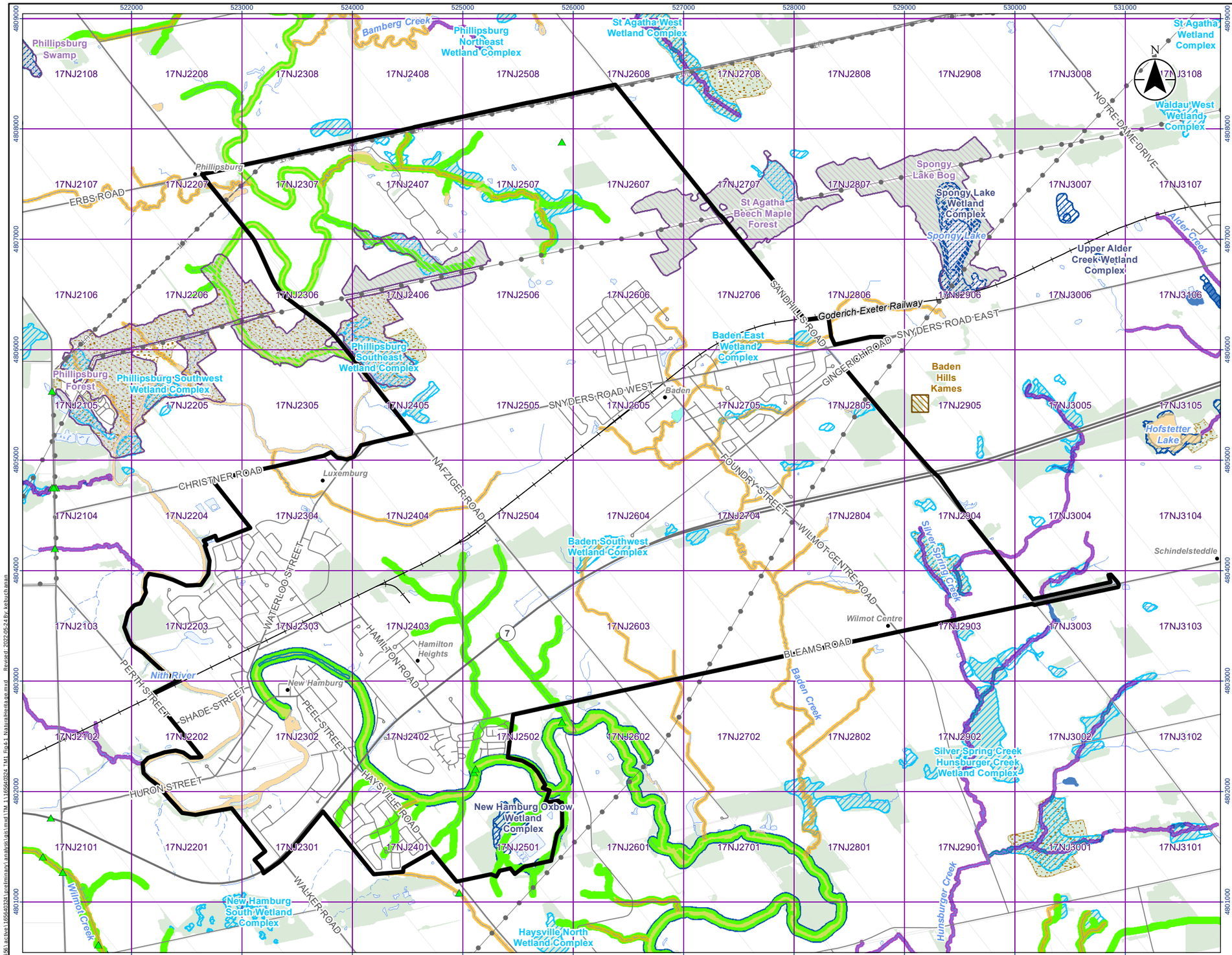
4.0 Existing Conditions

4.1 Natural Environment

A background review was conducted to identify the sensitive terrestrial and aquatic natural heritage features that are known to occur or have the potential to occur in the Study Area. These features are shown on **Figure 4-1**. The Study Area is comprised of three populated areas, including New Hamburg to the west, Baden to the east and the Foxboro Green Community to the north. The results of this natural heritage assessment will be used to inform the development and evaluation of the water and wastewater alternatives.

This natural heritage background review confirms the presence of features that may pose future constraints including:

- Fish habitat provided by unmapped or mapped watercourses such as the Nith River, Baden Creek and Silver Springs Creek and their tributaries and headwater drainage features including wetlands. Fish habitat is protected under the *Fisheries Act*. Any activities that may impact fish habitat may require review by Department of Fisheries and Oceans (DFO) and potentially authorization under the *Fisheries Act*. Restricted timing windows are determined on a project basis by Ministry of Natural Resources and Fisheries (MNRF). The following restricted activity timing windows for protection of fish by DFO can be used as guidance only:
  - Watercourses with a cold-water thermal regime: no works from October 1 to May 31 (i.e. Silver Springs Creek)
  - Watercourses with a warm-water thermal regime: no works from April 1 to June 15
- Presence of an aquatic Species of Conservation Concern (SOCC) within Baden Creek: Rainbow Mussel. SOCC should be given special consideration but are not protected by the Endangered Species Act (ESA) or Species at Risk Act (SARA). All mussel species are protected by the *Fisheries Act*. A license to collect fish from MNRF will be required to capture and relocate and fish and mussels prior to dewatering. The relocation timing window based on mussel species and habitat present restricts handling of mussels to a period when water temperatures are above 16°C, which typically occurs between June 15 and September 30 in any given year



Stantec

C3 WATER

Legend

- Fish Survey Point (ARA)
- Constructed Drain
- Thermal Regime, Cold
- Thermal Regime, Warm
- Railway
- Hydro Line
- Unknown Transmission Line
- Watercourse (Intermittent)
- Watercourse (Permanent)
- ANSI, Earth Science
- ANSI, Life Science
- Deer Wintering Area
- Waterfowl Winter Concentration Area
- Spawning Area
- Thermal Regime, Cold
- Thermal Regime, Cool
- Thermal Regime, Warm
- Aquatic Species at Risk Distribution
- Aquatic Species at Risk Critical Habitat
- Waterbody
- Wetland, Provincially Significant
- Wetland, Other Evaluated
- Wooded Area
- Lot
- 1 km UTM Grid

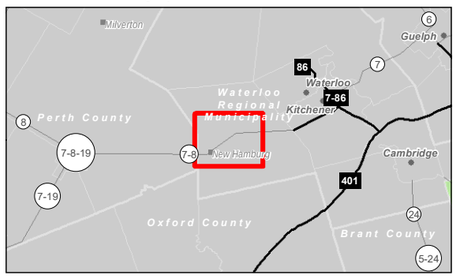
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Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2022.

Greenbelt Natural Heritage System



Project Location
Wilmot Township

165640324 REV4
Prepared by KDB on 2022-05-24

Client/Project
REGION OF WATERLOO
BADEN - NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
4-1

Title
Natural Heritage Map

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- Presence of an aquatic SAR within the Nith River: Silver Shiner. This species is protected under the ESA and SARA. Any proposed activities within its habitat will require consultation with DFO and MECP and authorizations may be required under the ESA and/or SARA. The restricted activity timing window for protection of Silver Shiner is September 15 to July 1
- The New Hamburg Oxbow Wetland Provincially Significant Wetland (PSW) Complex
- Non-provincially significant wetlands associated with the Baden East and Baden Southwest Wetland Complex, the Silver Spring Creek Hunsburger Creek Wetland Complex and the Philipsburg Wetland Complex
- St. Agatha Beech Maple Forest and Phillipsburg Forest Life Science Areas of Natural and Scientific Interest (ANSI)

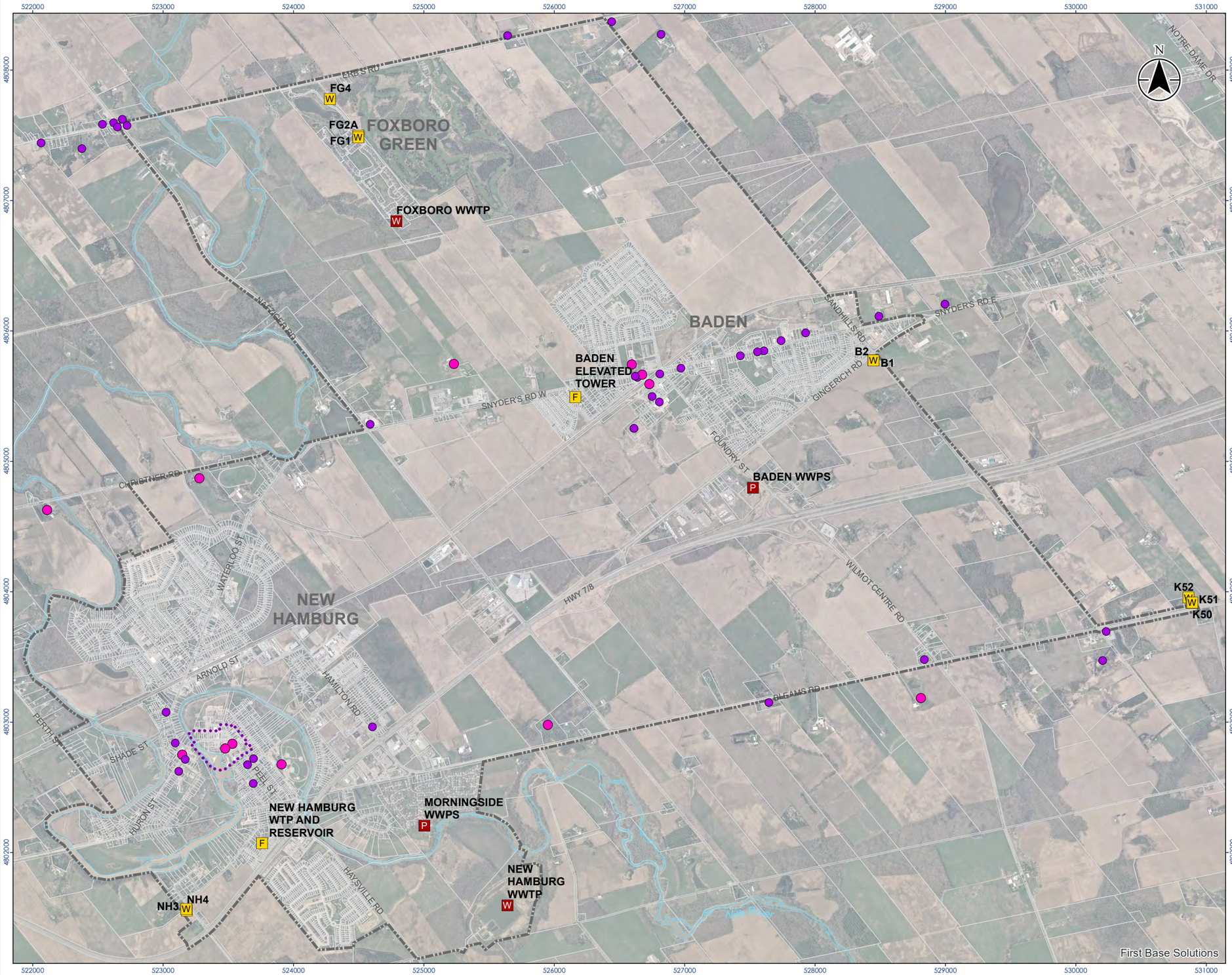
Pending an evaluation of the servicing alternatives and their impacts, further studies will be recommended to confirm the presence of the following features that may pose future constraints:

- Unmapped fish habitat including unnamed watercourses, tributaries, headwater drainage features and constructed drains
- Aquatic and terrestrial SAR and SOCC and their habitat
- Significant wildlife habitat

4.2 Cultural Environment

4.2.1 Cultural Heritage

A high-level desktop review was completed to identify known (listed and designated) cultural heritage resources in the study area, as shown on **Figure 4-2**. This information does not account for potential heritage resources typically considered in the EA process, such as properties/structures over 40 years of age, national historic sites, federal or United Nations Educational, Scientific and Cultural Organization (UNESCO) designations, interpretive or commemorative plaques or cultural heritage landscapes. As the project progresses and alternative solutions are narrowed down, the prominence of these other potential heritage resources can be assessed in the form of a screening checklist and/or a Cultural Heritage Assessment Report (CHAR).



Legend

- Study Area
- F — Storage and/or Treatment Facility
- W — Well
- W — Wastewater Treatment Plant
- P — Wastewater Pumping Station

Heritage Resource

- Designated Part IV
- Non-Designated Heritage Municipal Register
- Heritage District (Designated Part V)

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Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Contains information provided by the Region of Waterloo and information licensed under the Open Government Licence – Ontario.
3. Spring 2018 orthoimagery from Region of Waterloo web map service.

Project Location Wilmot Township	165640324 REVA Prepared by KDB on 2022-05-26

Client/Project
REGION OF WATERLOO
BADEN - NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
4-2

Title
Identified Heritage Resources

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V:\0165\active\165640324 Identify Cultural Heritage Resources\mxd\MA 1\165640324_Fig4-2_HeritageResources.mxd Revised: 2022-05-26 By: kdbuchanan

4.2.2 Archaeology

Archaeological potential is established by determining the likelihood that archaeological resources may be present within a study area. To aid in the evaluation of archaeological potential, the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) considers variables, such as: proximity to registered archaeological sites, distance to various types of water sources, soil texture and drainage, glacial geomorphology, elevated topography and the general topographic variability of the area, and proximity to areas of early Euro-Canadian settlement, including places of military or pioneer settlements, early transportation routes, and properties listed on the municipal register or designated under the Ontario Heritage Act or properties that local histories or informants have identified with possible historical events. Based on a preliminary review of the anticipated study area for the project, it is likely that portions of the study area will retain potential for the identification of archaeological resources. Pending an evaluation of the servicing alternatives and their impacts, a Stage 1 archaeological assessment should be undertaken in accordance with the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI)'s 2011 Standards and Guidelines for Consultant Archaeologists.

4.3 Socio-Economic Environment

The following sections outline the relevant planning objectives to which the Baden New Hamburg Water and Wastewater System Servicing Review EA shall have regard during the identification of alternative solutions and recommendations. An initial desktop review of the Region of Waterloo Source Protection Plan (SPP), as well as a review of the Region of Waterloo and lower-tier Official Plans indicates that the EA project will be subject to regulatory requirements as listed below.

4.3.1 Region of Waterloo Official Plan

The Region of Waterloo is an upper-tier municipality, which encompasses seven local municipalities. The Regional Official Plan is a guiding document for directing growth and change throughout the Region for the next 20 years. The plan also implements the main growth goals identified by the Regional Growth Management Strategy and sets out actions to achieve a sustainable and livable Waterloo Region. Policy intended to address local issues, unique characteristics, and objectives and goals are discussed below.

Land within the urban portion of the study area, meaning lands falling within the Urban Area Boundary for Baden and New Hamburg, are designated Built-up area or Township Greenfield Area. The overall goal for areas is to promote balanced growth and contribute to the creation of complete communities within these designations. The Regional Official Plan also requires these areas to be developed and planned to achieve or exceed a minimum density of 45 residents and jobs combined per hectare.

The Baden-New Hamburg water and wastewater system will need to be able to accommodate this target density in order to comply with Regional Official Plan policies.

There is a small portion of land located north of the Baden Urban Area Boundary and located within the Study Area that is designated Rural Areas. The Rural Areas designation identifies areas where Canada Land Inventory Class 4 to 7 soils predominate and which are typically characterized by one or more of steep slopes, environmental features and/or existing non-farm lots. The primary land uses permitted in Rural Areas designations will include agricultural uses, agriculture-related uses and secondary uses. Once alternatives for this project are narrowed down, further assessment can be completed to ensure the alternatives are located in areas compatible with Canada Land Inventory Class 4 to 7 soils.

Lands east of Foundry Street within the Study area, outside of the urban boundary, are also designated Protected Countryside. Protected Countryside identifies a broad band of permanently protected environmental features and agricultural lands. This designation contains a unique concentration of farmlands, woodlands, watercourses, river valleys and wetlands. It also includes several significant Regional Recharge Areas, which sustain some of the richest sources of groundwater in the Grand River watershed and account for a significant share of the region's water supply.

The remainder of the study area, outside of the urban boundaries, is designated Prime Agricultural Area. The Prime Agricultural Area designation identifies an area where prime agricultural lands predominate. This designation includes areas of prime agricultural lands and associated areas of Canada Land Inventory Class 4 to 7 soils, and additional areas where there is a local concentration of farms that exhibit characteristics of ongoing agriculture. Within the Prime Agricultural Area designations, all types, sizes and intensities of agricultural uses and normal farm practices will be promoted and protected in accordance with Provincial standards. The alternatives developed as part of this EA will need to be developed in a way which protects the rural character of the countryside while supporting the development of strong and prosperous rural communities.

The Regional Official Plan also sets out policies related to Land Use Compatibility. The Region will consider the adverse effects associated with the operation of municipal wastewater systems on sensitive land uses during the Environmental Assessment and development application review processes and may require the use of separation distances or other mitigation measures.

4.3.2 Township of Wilmot Official Plan

The 2019 Township of Wilmot Official Plan (Official Plan) outlines the Council's long-term policy direction to guide future development within the Township. The Official Plan outlines the criteria to be considered in evaluating development applications including

what type of servicing options are to be prioritized, and where new individual wastewater treatment systems will be permitted.

The 2019 Township of Wilmot Official Plan provides population projections up to 2031 which are summarized in **Table 4-1**.

Table 4-1: Wilmot Official Plan – Population Projections

	2006	2031
Population	17,700	28,500
Employment	6,730	10,000

The Official Plan states that new developments shall be serviced by municipal water services unless it is not feasible, and the Township will not recommend approval for development proposals in municipally serviced areas where there is insufficient capacity in the supply system. Non-residential developments that require significant quantities of water are discouraged. Water conservation will be encouraged and supported through reduction of consumption and demand management, avoidance of wasteful practices and water recycling.

Lands within the urban portion of the study area are designated a combination of Urban Residential, Urban Core Area, General Industrial, Light Industrial, Highway Commercial, Open Space, and Major Recreation. Lands located outside of the urban portion of the study area are designated a combination of Countryside, Rural Settlement Area, and Open Space.

The Township, in conjunction with the Region, will ensure that all new development is serviced by adequate and effective water, wastewater and storm water facilities in accordance with sound engineering practices and technologies that aim to protect human health and the natural environment. Although the lands within the study area are subject to specific land use polices of the Township Official Plan, public utilities such as local water supply, sewage, and drainage facilities have specialized policies and are permitted in all designations within the Township. Relating to any public utility use within the Township, said utility will be subject to any regulatory requirements, such as the provisions of the Environmental Assessment Act, through which the location of such use will be justified and the utility will be determined to be compatible with the surrounding uses.

4.3.2.1 Planned Growth Within Urban Area Boundaries

This Servicing Study will include the development blocks within the Urban Area Boundary as indicated in **Figure 4-3. Tables 4-2** and **4-3** outline the expected growth

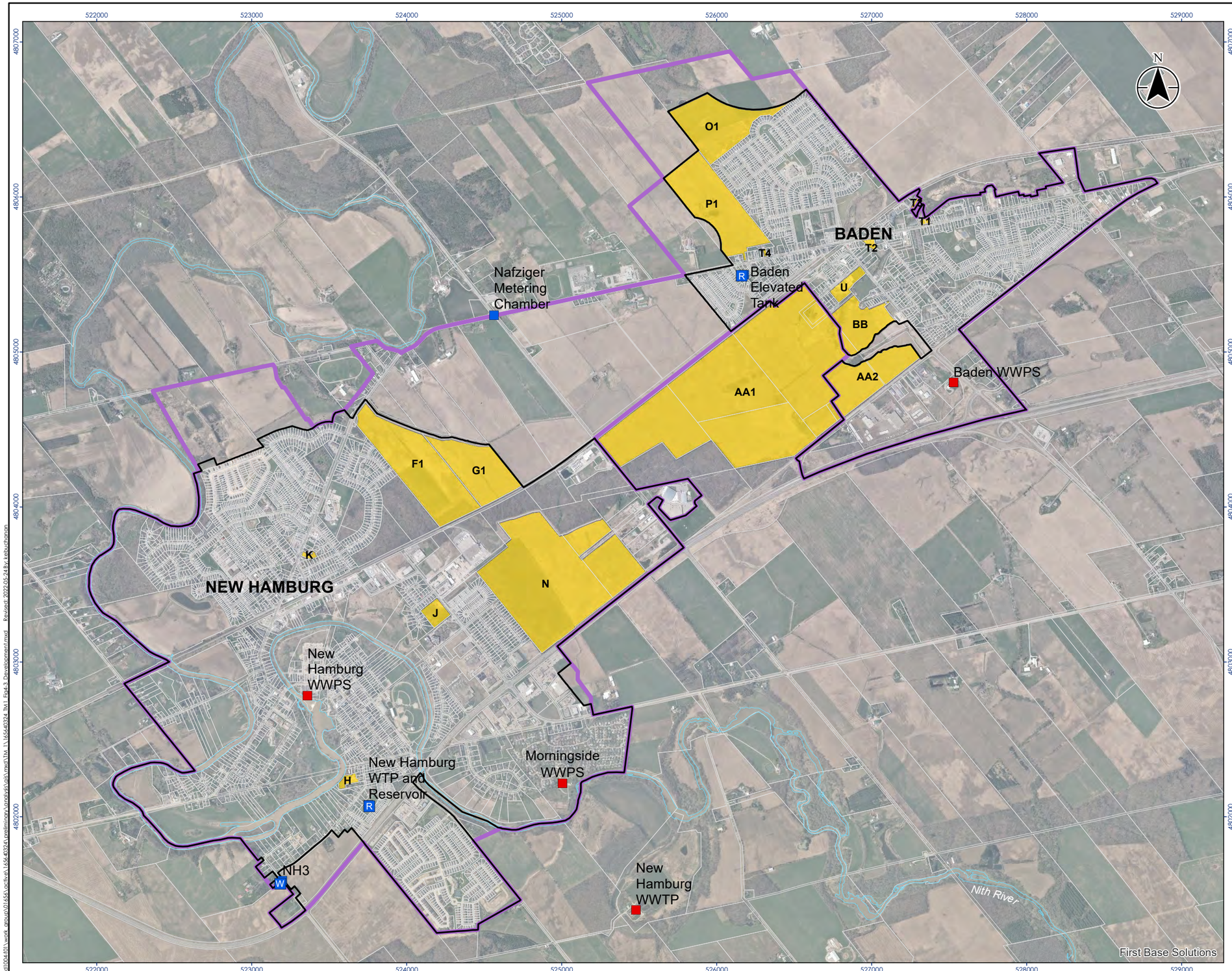
as well as the projected sanitary flows for each development block within the Urban Area Boundary.

The data provided in Tables 4-2 and 4-3 have been taken from the Morningside Sanitary Trunk Sewer EA – Growth Methodology Memo (GM Blueplan, Feb 8, 2021). A workshop was conducted on May 17, 2021 which was attended by representatives from the Region, Township, Stantec and GM Blueplan to review the flow data and underlying design criteria. The conclusion of that workshop was to use the following parameters:

- **Average sanitary dry weather flow: 275 L/cap/day** - from the Region of Waterloo Design Guidelines and Supplemental Specifications (DGSSMS) – unchanged from the Growth Methodology Memo
- **Residential population density: 2.70 people/unit** - based on the Township of Wilmot 2016 Census Data. – revised from the Growth Methodology Memo.
- **Industrial Sanitary Flow: 0.25 L/s/ha** - based on a sampling of engineering standards other local municipalities (City of London, City of Vaughan, Region of Peel and City of Markham) and in discussions with the Township this value was arrived at recognizing that the employment lands would be developed for light industrial uses. – revised from the Growth Methodology Memo.

Projected water demands were calculated using the calculated population for each development parcel as specified in Tables 4-2 and 4-3. An average water demand **207 L/cap/day** was calculated based on the average measured flow and the residential population from 2015 to 2020 reported in the Region's 2021 Water and Wastewater Monitoring Report (2021 Monitoring Report). This is based on water production and therefore includes non-revenue water (NRW). The future demand was based on the projected residential population only. The future demand was then divided between each growth parcel based on either the projected residential population or equivalent employment population.

A maximum day demand (MDD) peaking factor of **1.95** was determined based on the maximum reported peaking factor for 2015 to 2020 in the 2021 Monitoring Report. The projected water demand for each development block is summarized in Table 4-4 and 4-3 below.



Stantec

C3 WATER

Legend

- Water Facility
- Wastewater Facility
- Development Block
- Urban Area Boundary
- Countryside Line

0 500 1,000 m

1:25,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017.
3. Orthoimagery from Region of Waterloo web map service. Imagery Date, 2018.

Project Location
Wilmot
Township

165640324 REVA
Prepared by KDB on 2022-05-24

Client/Project
REGION OF WATERLOO
BADEN – NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
4-3

Title
Development Blocks within the Urban Area Boundary

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Table 4-2: Baden Population and Sanitary Flow Projections

Development Area	Development Name (if applicable)	Development Status	Maximum # of Residential Units Planned	Projected Population[1]	Average Dry Weather Flow (l/s)	Peak Wet Weather Flow (L/s)
T1	Snyder's/Brubacher (Ulmer)	Residential Intensification	n/a	15	0.05	0.16
T2	Baden Emporium	Residential Intensification	n/a	25	0.08	0.27
T3	Brubacher (LVM) (53-75 Brubacher Street)	Residential Intensification	n/a	17	0.05	0.18
T4	Miller and Keuhl (142 Snyder's Road East)	Residential Intensification	n/a	30	0.10	0.32
BB	Schmidt Estate	Designated Residential	263	729	2.32	9.84
U	n/a	Residential Intensification	n/a	129	0.41	1.88
P1	Snyder's Road	Designated Residential	392	1086	3.46	16.07
O1	Activa North	Designated Residential	430	1191	3.79	16.17
AA2	n/a	Future Employment	n/a	517	3.25	14.17
			Totals:	**3738**	**14.50**	**59.06**

1. Morningside Sanitary Trunk Sewer EA – Growth Methodology Memo (GM Blueplan, Feb 8, 2021). "Designated Residential" developments were modified from the original report to use a factor of 2.77 people/unit.

Table 4-3: New Hamburg Population and Sanitary Flow Projections

Development Area	Development Name (if applicable)	Development Status	Maximum # of Residential Units Planned	Projected Population[1]	Average Dry Weather Flow (l/s)	Peak Wet Weather Flow (L/s)
N	Badenview Dev. / New Hamburglrs Inc.	Designated Employment	n/a	2213	13.75	58.85
H	n/a	Residential Intensification	n/a	50	0.16	0.77
J	n/a	Residential Intensification	n/a	121	0.39	1.76
K	n/a	Residential Intensification	n/a	22	0.07	0.23
F1 & G1	NH Properties	Designated Residential	792	2194	6.98	31.82
			Totals:	**4600**	**21.35**	**96.72**

Table 4-4: Baden Population and Water Demand Projections

Development Area	Development Name (if applicable)	Development Status	Maximum # of Residential Units Planned	Projected Population[1]	Average Day Demand (L/s)	Maximum Day Demand (L/s)
T1	Snyder's/Brubacher (Ulmer)	Residential Intensification	n/a	15	0.02	0.05
T2	Baden Emporium	Residential Intensification	n/a	25	0.04	0.08
T3	Brubacher (LVM) (53-75 Brubacher Street)	Residential Intensification	n/a	17	0.03	0.05
T4	Miller and Keuhl (142 Snyder's Road East)	Residential Intensification	n/a	30	0.05	0.09
BB	Schmidt Estate	Designated Residential	263	729	1.17	2.29
U	n/a	Residential Intensification	n/a	129	0.21	0.41
P1	Snyder's Road	Designated Residential	392	1086	1.75	3.41
O1	Activa North	Designated Residential	430	1191	1.92	3.74
AA2	n/a	Future Employment	n/a	517	0.83	1.62
			Totals:	**3738**	**6.02**	**11.74**

1. Morningside Sanitary Trunk Sewer EA – Growth Methodology Memo (GM Blueplan, Feb 8, 2021). "Designated Residential" developments were modified from the original report to use a factor of 2.77 people/unit.

Table 4-5: New Hamburg Population and Water Demand Projections

Development Area	Development Name (if applicable)	Development Status	Maximum # of Residential Units Planned	Projected Population[1]	Average Day Demand (L/s)	Maximum Day Demand (L/s)
N	Badenview Dev. / New Hamburglrs Inc.	Designated Employment	n/a	2213	3.57	6.95
H	n/a	Residential Intensification	n/a	50	0.08	0.16
J	n/a	Residential Intensification	n/a	121	0.19	0.38
K	n/a	Residential Intensification	n/a	22	0.04	0.07
F1 & G1	NH Properties	Designated Residential	792	2194	3.53	6.89
			Totals:	**4600**	**7.41**	**14.45**

Based on the projected population growth within the Urban Area Boundaries, the projected average daily flows and peak wet weather flows are summarized for Baden SPS, Morningside SPS and New Hamburg WWTP in the following tables.

Table 4-4: Projected Average Daily Flows

	Current Average Daily Flow (L/s) [1]	Projected Additional Average Dry Weather Flow (L/s)	Total Daily Flow (L/s) (Current + Projected)
Baden	17.1	13.5	30.3
Morningside	44	34.8	78.4
New Hamburg WWTP	42.8	34.8	77.2

Table 4-5: Projected Peak Wet Weather Flows

	Peak Wet Weather Flow (L/s) (2016) [1]	Projected Additional Peak Wet Weather Flow (L/s)	Total Peak Wet Weather Flow (L/s) (Current + Projected)	Firm Capacity (L/s)[1]
Baden	185	60.0	244.1	187
Morningside	205	147.1	360.8	248
New Hamburg WWTP	205	147.1	360.8	351

1. Region of Waterloo 2018 Wastewater Treatment Master Plan (CIMA+, July 2018)

4.3.3 Grand River Source Protection Plan

In accordance with Ontario's *Clean Water Act* (*CWA*), the Region of Waterloo has enacted policies through the Grand River SPP to protect groundwater sources within the Region. The SPP policies work to reduce risk by regulating proposed and existing activities which have been identified as posing significant threats to drinking water safety. Depending on the hydrology and geology of an area, as well as potential risks posed by activities onsite, different policies under the SPP may apply to the study area.

An amendment to the MEA Class EA document (2015) requires the Class EA planning process have regard for the CWA and the policies set out in the approved SPPs. Impacts to the SPP policies will be identified through the evaluation of alternative solutions.

The Region's SPP policies may come into effect during the design and construction phases of the project, should the preferred alternative involve activities which are deemed significant threats under Ontario's *CWA* and the Grand River SPP. Such

significant threats include, but are not limited to, the storage of salt over 1 tonne, storage and handling of organic solvents and/or dense non-aqueous phase liquids. However, for these policies to apply, they must occur in relevant vulnerable areas within the study area, as identified by the 2015 Grand River Assessment Report and the SPP.

Apart from the development of new groundwater sources, which would result in the creation of new vulnerable areas, it is not anticipated that alternatives developed as part of the Baden New Hamburg Water and Wastewater System Servicing Review EA would have significant implications regarding the Region's SPP policies.

4.4 Water and Wastewater Servicing

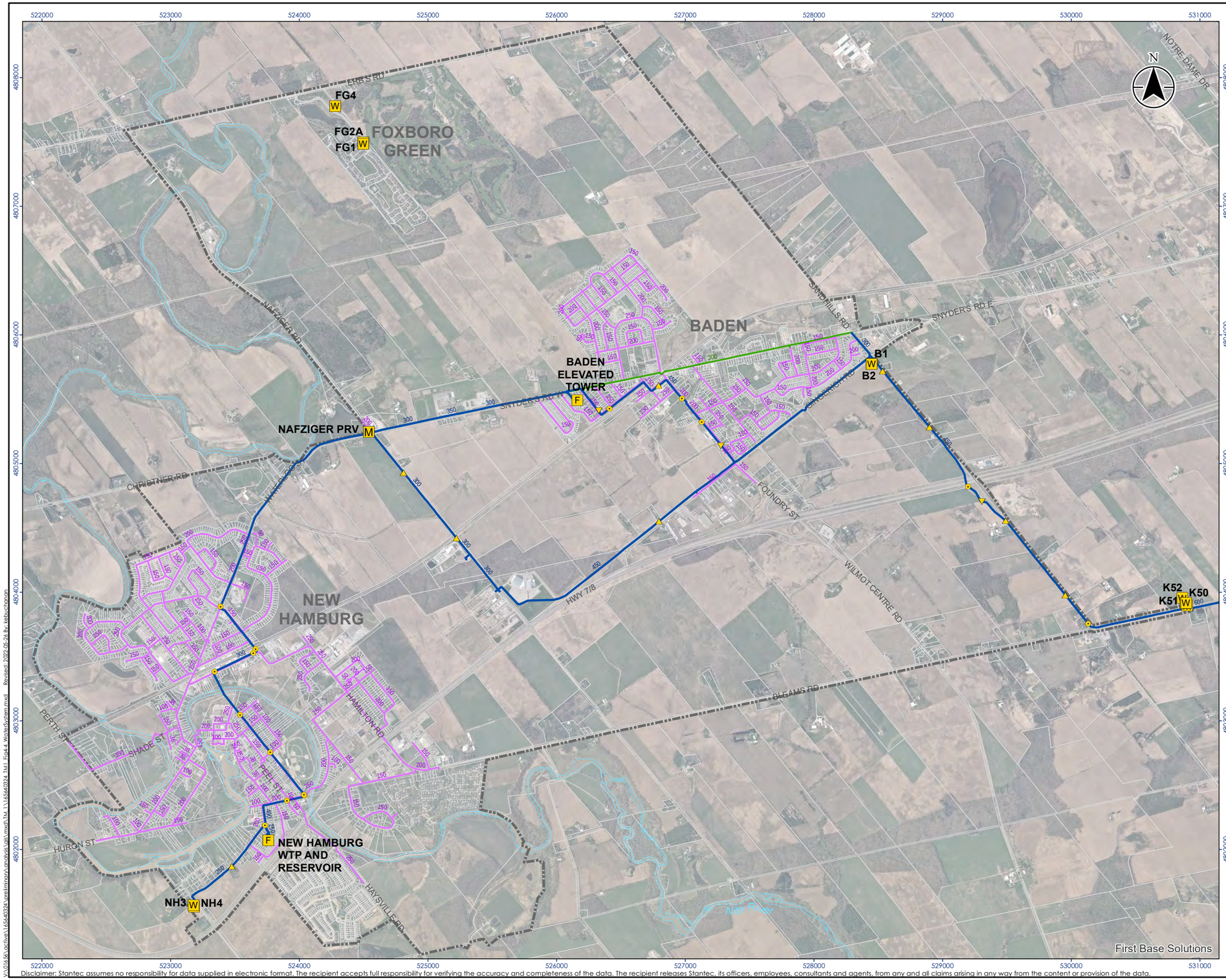
The communities of Baden and New Hamburg are situated within the Township of Wilmot in the Regional Municipality of Waterloo. The water and wastewater systems in these communities are operated as a two-tier system. The following table outlines the responsibilities of the Region and the Township in this system.

Table 4-6: Two-Tiered System: Water / Wastewater Infrastructure

Owner	Water Infrastructure	Wastewater Infrastructure
Region	• water supply • treatment storage • trunk distribution	• two raw wastewater pumping stations (Baden and Morningside) • treatment • discharge • biosolids management
Township	• water distribution • water service connections	• wastewater collection • one secondary pumping station

4.5 Water Supply Infrastructure

An overview of the Baden-New Hamburg water system is presented in **Figure 4-4** below. The following section describes the major water supply infrastructure.



Stantec

C3 WATER

Legend

- Study Area
- Storage and/or Treatment Facility
- Well
- Meter Chamber
- Air Relief
- Drain Chamber
- Valve Chamber
- Watermain (Region)
- Watermain (Dual Ownership)
- Watermain (Wilmot)

0 500 1,000 m

1:30,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Contains information provided by the Region of Waterloo and information licensed under the Open Government Licence – Ontario.
3. Spring 2018 orthoimagery from Region of Waterloo web map service.

Project Location
Wilmot Township

165640324 REVA
Prepared by KDB on 2022-05-26

Client/Project
REGION OF WATERLOO
BADEN - NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
4-4

Title
Existing Water System

First Base Solutions

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V:\0165\active\165640324\gis\mxds\Figure 4-4 WaterSystem.mxd Revised 2022-05-24 By: kbtuchanan

4.5.1 K50 Wells

The K50 Wells or Wilmot Centre Well Field (Shingletown Water Supply System) is located at 2324 Bleams Road and includes wells K50, K51 and K52, a treatment facility and a generator building. Wells K50 and K51 supply water to the Regional Integrated Urban Water Supply (IUWS) system, as well as the towns of Shingletown (Victoriaburg) and Baden. A project is currently underway to install a well pump in Well K52 to provide raw water to the Gasmer Pond as an interim measure until further treatment upgrades are completed (Section 2.1.4). The wells operate under the MECP PTTW 4874-9SGL5L with an allowable water taking of 13,651 m^3/day (158 L/s).

Well and pump information is provided in **Table 4-7**.

Table 4-7: K50 Wells Summary

Well	K50	K51	K52
Supplies	Shingletown, Baden and 87 L/s or less to IUS.		7- 10 L/s to Gasmer Pond
Diameter (m)	400	450	206
Depth (m BGS)	39.93	39.62	43.68
Pump Design Flow (L/s)	88.3	82	10
Pump Design TDH (m)	67	74.7	86.87
VFD Installed?	Yes	Yes	No

Primary and secondary disinfection are provided via free chlorine residual established using sodium hypochlorite, except for water that is delivered to the Mannheim Reservoir, where ammonium sulphate is used to establish a chloramine residual for secondary disinfection in the integrated urban water supply system.

The sodium hypochlorite system consists of two sodium hypochlorite bulk storage tanks and four 8.4 mL/s capacity metering pumps that inject into the K50 and K51 process piping. The sodium hypochlorite system is housed in the chemical building between the K50 and K51 well houses. Two chlorine residual analyzers are present in the system, serving K50 and K51 respectively.

4.5.2 New Hamburg Wells, Reservoir and Water Treatment Plant

The NHWTP is located at 389 Fairview Street in New Hamburg and consists of a treatment facility, treated water reservoir and high-lift pumps (HLPs). The NHWTP has an overall rated capacity of 3,542 m^3/day. The reservoir consists of two cells with a total combined volume of 2,414 m^3. Treated water is supplied to the New Hamburg system through three identical HLPs which are summarized in **Table 4-8** below. A new jockey pump was recently installed for supplying the New Hamburg system during low demand periods. The NHWTP pumps are currently set to maintain system pressures in New Hamburg at 445 kPa.

Table 4-8: NHWTP Pump Summary

Pump	HLP	Jockey
Quantity	1 duty, 2 standby	1
Pump Design Flow (L/s)	41	21
Pump Design TDH (m)	51	48
VFD Installed?	Yes	Yes

The NHWTP is supplied by wells NH3 and NH4. The wells operate in a duty/standby configuration under the MECP PTTW 7021-AQRK39 with an allowable flow of 3,524 m3/day (41 L/s). Well characteristics are summarized in **Table 4-9** below.

Table 4-9: NH Wells Summary

Well	NH3	NH4
Diameter (m)	250	254
Depth (m BGS)	76.2	62.48
Pump Design Flow (L/s)	40	41
Pump Design TDH (m)	80	78

The raw water from the wells is disinfected with sodium hypochlorite for primary disinfection and to oxidize and precipitate iron and manganese prior to being filtered. The sodium hypochlorite system consists of a bulk storage tank and two metering pumps that inject into the well discharge header. Chlorine residual analyzers measure free chlorine at four different locations: pre-filter, post-filter, post-reservoir storage, and facility discharge. The filtration system is comprised of three pressure filters with catalytic media used to remove precipitated iron and manganese from the water, one backwash pump, backwash holding tank, and one supernatant return pump. The treated water reservoir provides the necessary contact time to achieve primary disinfection. HLPs discharge treated water into the distribution system and can be controlled by

pressure or level of the Baden ET. Emergency power is supplied by a 150-kW portable diesel generator.

4.5.3 Foxboro Wells and Water Treatment Plant

The Foxboro WTP is located at 87 Foxboro Drive in Foxboro Green, Wilmot Township and supplies the Foxboro Green system. The Foxboro WTP is owned and operated by the Region, while the distribution system is maintained by Foxboro Green Condominium Corporation. The WTP includes a single-cell reservoir with a volume of 90 m^3 and has a rated capacity of 288 m^3/day. The Foxboro WTP HLPs are summarized in **Table 4-10**.

Table 4-10: Foxboro WTP Pump Summary

Pump	HLP
Quantity	4
Pump Design Flow (L/s)	6
Pump Design TDH (m)	74
VFD Installed?	Yes

The WTP is supplied by three wells, which are summarized in **Table 4-11**. The wells operate under the MECP PTTW 2544-BBHP4S with an allowable 7,019 m^3/day (13 L/s).

Table 4-11: Foxboro Wells Summary

Well	FG1	FG2A	FG4
Diameter (m)	200	200	150
Depth (m BGS)	67.06	67.1	55.5
Pump Design Flow (L/s)	4.5	1.77	2.3
Pump Design TDH (m)	34.5	43	

Raw water is treated at the WTP using sodium hypochlorite and filtration as needed for iron and manganese removal. The disinfection system is comprised of one bulk storage tank, two metering pumps which operate simultaneously. The filtration system consists of a reaction vessel for oxidation, two dual media filters containing sand and anthracite coal, and a 25 m^3 backwash settling tank, flow control valves, flow meter, and back flow prevention. The facility is equipped with four pressure tanks to provide distribution system pressure. Emergency power is supplied by a 125 kW portable diesel generator, permanently assigned to the site.

4.5.4 Baden Wells

The Baden Wells B1 and B2 formerly supplied the Baden-New Hamburg System and operated under MECP PTTW 94-P-2035 which expired in 2004. The wells have not been used for production since 2001 due to elevated nitrate concentrations. A nitrate study is being completed which will determine if future operation of these wells is feasible.

4.5.5 Baden Elevated Tank

The Baden ET is located in the Baden distribution system and has a maximum capacity of 5,363 m^3. It is currently supplied by wells K50 and K51. When Baden and New Hamburg were operated as a single pressure zone, due to high pressure in low elevation areas of New Hamburg, the Baden ET level could not exceed 55% (HGL of 394.6 masl). Since the commissioning of the Nafziger PRV, the Baden ET design operating HGL is 397 – 400 masl. If the ET drops below 55%, it can be supplied by the NHWTP through the Nafziger PRV. The operating range for the Baden ET is summarized in Table 4-12 below.

Table 4-12: Baden ET Operating Range

Water Level	Level (m)	Level (%)	HGL (masl)
Bottom Capacity Level (BCL)	0	0	388
55%	6.6	55	394.6
High Water Level (HWL)	12	100	400

4.5.6 Nafziger Pressure Reducing Valve

Nafziger PRV is located on the 300 mm watermain on Nafziger Road and is used to separate New Hamburg and Baden into two sperate pressure zones. The PRV was installed in 2013 and commissioned in 2018 and allows water from the K50s and the Baden ET to supply the New Hamburg system without over pressurizing the low elevation areas. The PRV can also allow flow from New Hamburg to Baden when Baden pressure drops below the pressure on the New Hamburg side. The PRV has a target setpoint of 425 kPa and has a ground elevation of 346.43 masl.

4.5.7 New Hamburg to Baden Pressure Reducing Valve

A new transmission main is planned to connect the south end of New Hamburg to Baden. The transmission main will supply flow from Baden to new Hamburg and will be controlled through a PRV. The PRV will be located east of the Nith River at the end of Riverside Drive. The intention of the PRV is to be the primary supply to New-Hamburg.

4.6 Wastewater Infrastructure

The Region's Baden and New Hamburg Wastewater System consists of the following infrastructure:

- New Hamburg WWTP
- Foxboro Green WWTP and Pumping Station
- Morningside SPS
- Baden SPS

Wastewater is collected from the Baden and New Hamburg service areas and conveyed to the New Hamburg WWTP for treatment and subsequently discharged into the Nith River.

Foxboro Green wastewater is treated at the Foxboro Green WWTP with biological treatment and denitrification, followed by discharge to a leaching bed. The Foxboro Green WWTP serves a single community and is separate from the Baden-New Hamburg system.

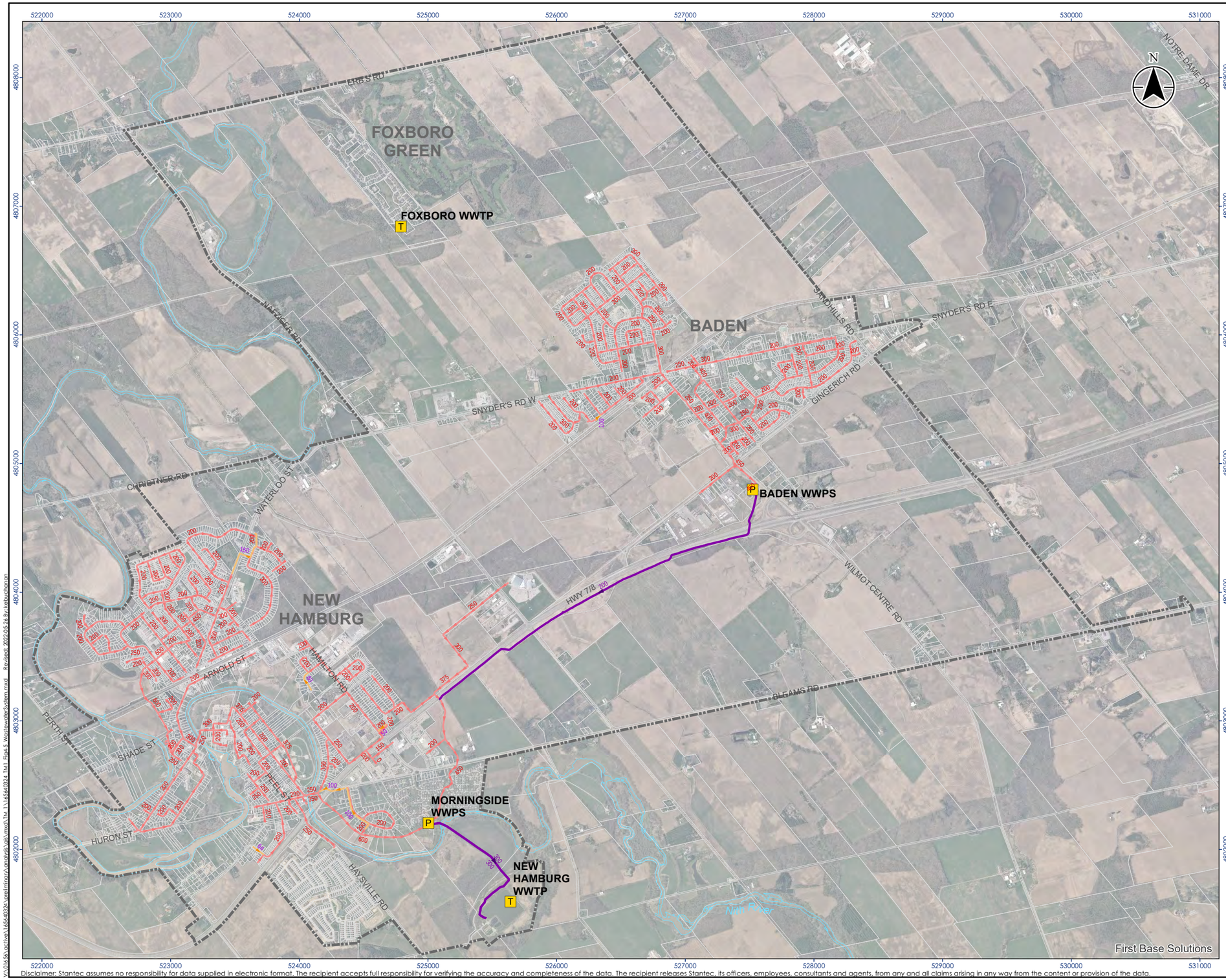
An overview of the Baden New Hamburg wastewater system is presented in **Figure 4-5**.

4.6.1 New Hamburg Wastewater Treatment Plant

The New Hamburg WWTP, constructed in 2000, provides treatment for wastewater generated in the communities of Baden and New Hamburg in the Township of Wilmot. The WWTP is a sequencing batch reactor (SBR) activated sludge facility that consists of influent works, sequencing batch reactors, tertiary sand filters, ultraviolet (UV) disinfection, aerobic sludge digestion and an emergency storage lagoon located onsite that is used for temporary storage of plant overflows during wet weather conditions. The aerobic digesters at the plant are used for both digestion and biosolids storage. Alum is added to the SBR feed channel and/or upstream of the sand filters for phosphorus removal. The New Hamburg WWTP discharges into the Nith River. An overview of the New Hamburg WWTP is presented in **Figure 4-6**.

The WWTP has recently been expanded to increase the rated ADF capacity to 6,900 m^3/d and increase the peak flow capacity to 30,360 m^3/d. It was noted in the assimilative capacity

study performed during the Class EA for plant expansion that ammonia is a limiting factor in the receiving water even with the SBR technology.



Stantec

C3 WATER

Legend

- Study Area
- T Waste Water Treatment Plants
- P Sanitary Pumping Station
- Forcemain (Region)
- Sanitary Sewer (Wilmot)
- Forcemain (Wilmot)

0 500 1,000 m

1:30,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Contains information provided by the Region of Waterloo and information licensed under the Open Government Licence – Ontario.
3. Spring 2018 orthoimagery from Region of Waterloo web map service.

Project Location
Wilmot Township

165640324 REVA
Prepared by KDB on 2022-05-26

Client/Project
REGION OF WATERLOO
BADEN - NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
4-5

Title
Existing Waste Water System

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V:\0165\active\165640324\gis\mxd\Figure 4-5 Wastewater System.mxd Revised: 2022-05-26 By: kebuchanan



Stantec

C3 WATER

Legend

- Sanitary MH (Region)
- Sanitary Sewer (Region)
- Forcemain (Region)
- Contour (1 m)
- Parcel

0 20 40 m

1:1,767 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
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Project Location
Wilmot Township

165640324 REVA
Prepared by KDB on 2022-05-26

Client/Project
REGION OF WATERLOO
BADEN - NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
4-6

Title
New Hamburg WWTP

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The New Hamburg WWTP has sufficient capacity to handle 2051 flows, and there is not currently a planned capacity upgrade prior to 2051. The existing WWTP has sufficient capacity to treat all planned development within the approved Urban Boundary Area.

The New Hamburg WWTP is operated under MECP ECA No. 9330-6G9K5B, issued on Nov. 22, 2005.

4.6.2 Foxboro Green Wastewater Treatment Plant

The Foxboro Green WWTP is a rotating biological contactor (RBC) plant, that was constructed in 1999 within the Foxboro Green Retirement Community. The WWTP consists of three packaged RBC plants, each with a rated ADF capacity of 50 m^3/day. The total rated ADF capacity of the plant is 150m^3/day. An overview of the WWTP is presented in **Figure 4-7**.

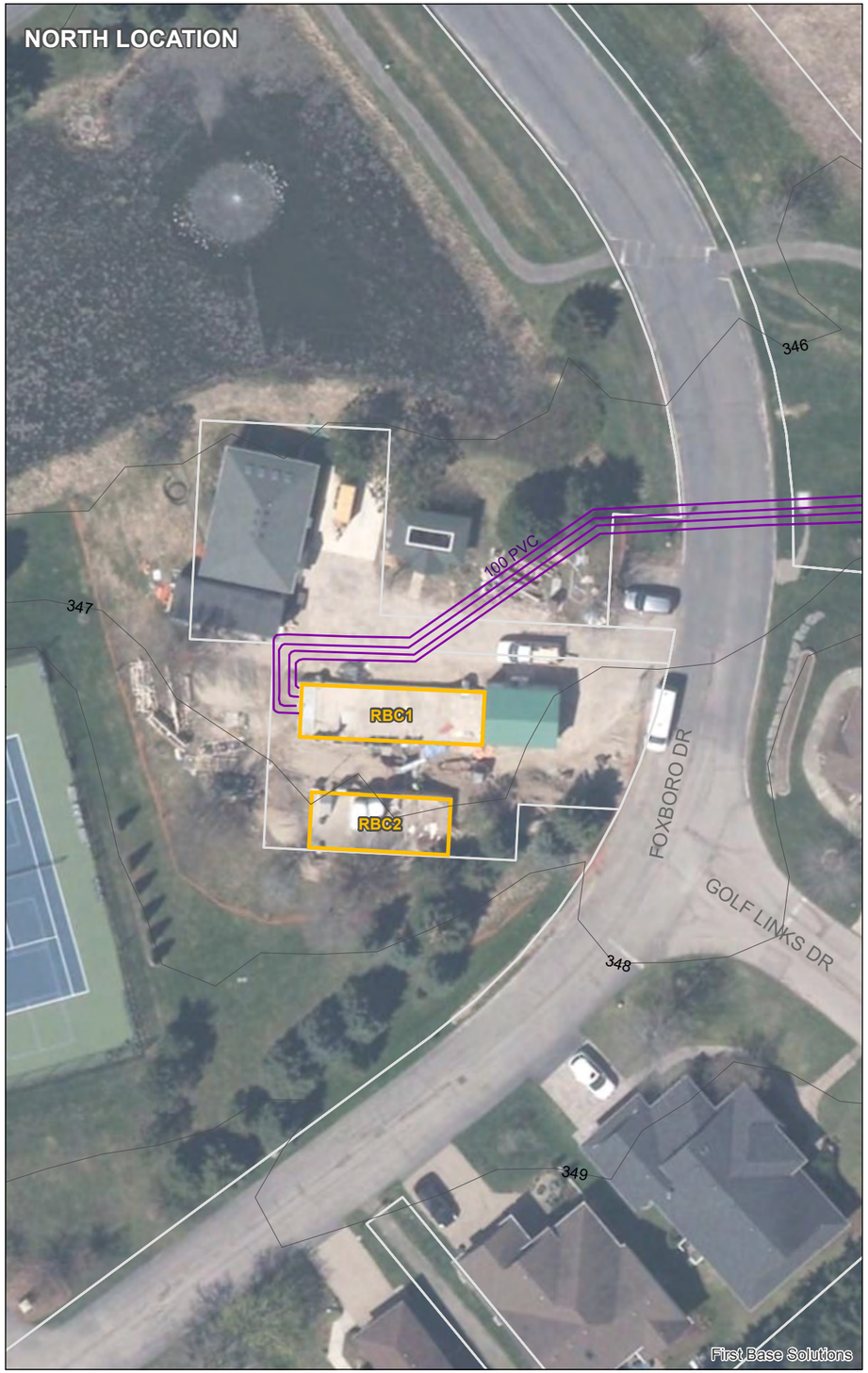
Treatment processes at the facility include:

- primary clarification
- rotating contactors
- intermediate clarification
- denitrification
- final clarification prior to discharge to seven subsurface disposal leaching beds (Leaching Beds A, B, C, D, E, F and G)

Disinfection is not required for the leaching bed system and no chemicals are used in the RBC process. Waste activated sludge (WAS) is returned to the primary settling tanks for co-thickening. Co-thickened primary sludge and WAS are hauled to the Waterloo WWTP for further treatment.

The Foxboro Green WWTP serves a single community which is not expected to see significant growth to 2051. It is therefore expected that no expansions will be necessary. Furthermore, the current WWTP has been experiencing operational challenges resulting in elevated nitrate levels in the surrounding groundwater.

The treatment plant is operated under MECP ECA No. 7201-8ZMQGA, issued on March 20, 2013.





Stantec

C3 WATER

Legend

- Sanitary Sewer (Region)
- Forcemain (Region)
- Rotating Biological Contactor
- Contour (1 m)
- Parcel

0 10 20 m

1:500 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Contains information provided by the Region of Waterloo and information licensed under the Open Government Licence – Ontario.
3. Spring 2018 orthoimagery from Region of Waterloo web map service.

Project Location
Wilmot Township

165640324 REVA
Prepared by KDB on 2022-05-26

Client/Project
REGION OF WATERLOO
BADEN - NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
4-7

Title
Foxboro WWTP

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Revised: 2022-05-26 By kabuchanan
y:\01658\active\165640324\gis\mxd\proposals\vas\mxds\NA\165640924 NA1 Fig4-7 FoxboroWWTP.mxd

4.6.3 Baden Sewage Pumping Station

Baden SPS is located at 1044 Foundry Street in Baden. Originally a wastewater treatment plant, it was converted in 2000/2001 to a dry well / wet well sewage pumping station with an equalization tank. An overview is presented in **Figure 4-8**.

The Baden SPS has a 200 mm diameter force main, which conveys flows to the 450 mm diameter Baden East Side Trunk Sewer at MH #16 located on Highway 7/8 in the Township of Wilmot. The East Side Trunk Sewer then conveys flows to the Morningside SPS, where it subsequently conveyed by force main to the New Hamburg WWTP.

The dry well is equipped with two dry pit solids handling pumps, each rated at 49 L/s and one jockey pump rated at 25 L/s. The wet well is equipped with three submersible pumps each rated at 46.7 L/s (total flow of 140 L/s with all 3 pumps running). During high flow events, flow is diverted to a 1,400 m^3 equalization tank. The tank was designed with a hatch to allow for trucking high-flow events.

The capacity of the station has been sufficient under dry conditions and most wet weather flow conditions. However, the station capacity is exceeded during very high wet weather flows. During recent high-level flow events, vacuum trucks and tankers have been brought in to haul excess wastewater to the New Hamburg WWTP. From 2017 – 2020, the Region recorded six (6) separate bypass events where wastewater was discharged to the local receiving stream. The pumping station is operated under MECP ECA No. 4162-4LKPG5, issued on June 28, 2000.

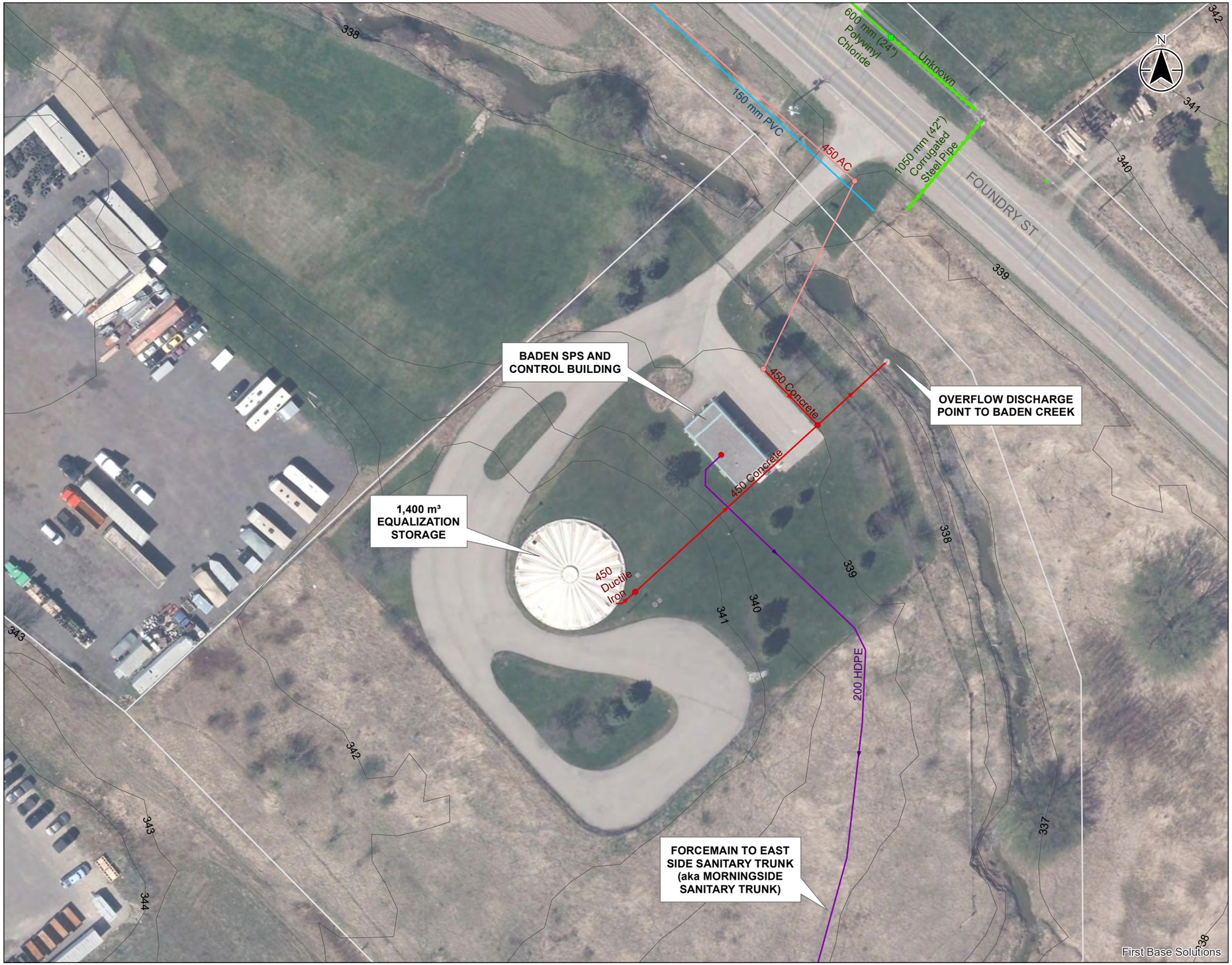
4.6.4 Morningside Sewage Pumping Station

Morningside SPS is located at 35 West Morningside Circle, in New Hamburg. The station transfers all the collection system flow from New Hamburg and Baden to the New Hamburg WWTP. An overview of the Morningside SPS is presented in Figure **4-9**.

The original design of the station was completed by Stantec (formerly, Stanley Consulting) in 1998. The station was originally designed to achieve a firm capacity of 262 L/s with the ability to replace pump impellers to achieve an increased capacity of 323 L/s.

The station is equipped with four submersible pumps (3 duty and 1 standby), each rated at 87.5 L/s. Three of the existing pumps are the original Flygt CP3300 model with a 290 mm impeller diameter and the fourth pump was replaced in 2015 with a Flygt NP 3301 model with a 330 mm impeller diameter.

These pumps are connected to a common discharge header, before splitting to two 300 mm force mains. The force mains are approximately 1,300 m in length and discharge the wastewater to the New Hamburg WWTP.The pumping station is operated under MECP ECA No. 9998-A35NNL.



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C3 WATER

Legend

- Sanitary MH (Wilmot)
- Sanitary MH (Region)
- Sanitary Sewer (Wilmot)
- Sanitary Sewer (Region)
- Forcemain (Region)
- Watermain (Wilmot)
- Catchbasin (Region)
- Culvert (Region)
- Storm Sewer (Region)
- Contour (1 m)
- Parcel

0 20 40 m

1:750 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Contains information provided by the Region of Waterloo and information licensed under the Open Government Licence – Ontario.
3. Spring 2018 orthoimagery from Region of Waterloo web map service.

Project Location
Wilmot Township

165640324 REVA
Prepared by KDB on 2022-05-26

Client/Project
REGION OF WATERLOO
BADEN - NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
4-8

Title
Baden Wastewater Pumping Station

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J:\165640324\active\165640324\reg\mapping\analysis\gis\mxds\TM1 Fig4-8 BadenWWPS.mxd Revised: 2022-05-26 By: kebuchanan

525000

WEST MORNINGSIDE CIR

RIVERVIEW PL

332

331

330

329

328

327

326

450 PVC

450 PVC

600 PVC

300 HDPE

300 HDPE

N

First Base Solutions

525000

Stantec

C3 WATER

Legend

- Sanitary MH (Wilmot)
- Sanitary Sewer (Wilmot)
- Forcemain (Region)
- Contour (1 m)
- Parcel

0 10 20 m

1:500 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Contains information provided by the Region of Waterloo and information licensed under the Open Government Licence – Ontario.
3. Spring 2018 orthoimagery from Region of Waterloo web map service.

Project Location
Wilmot Township

165640324 REVA
Prepared by KDB on 2022-05-26

Client/Project
REGION OF WATERLOO
BADEN - NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
4-9

Title
Morningside Wastewater Pumping Station

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

V:\01656\active\165640324\reg\mxd\projects\wastewater\165640324_Fig4-9_MorningsideSPS.mxd Revised: 2022-05-26 By: kdbucharan

5.0 Problem and Opportunity Statement

The Problem and Opportunity Statement for the Baden - New Hamburg Water and Wastewater System Servicing Review Municipal Class EA is as follows:

- The communities of Baden and New Hamburg are currently serviced by a two-tier water and wastewater system run by the Township and the Region. Water is supplied to Baden and New Hamburg by four (4) groundwater wells and two (2) water treatment plants. Water storage is provided by an elevated tank and an in-ground reservoir. Wastewater from the communities is conveyed by two (2) Regional pumping stations to be treated at the New Hamburg WWTP.

- This Servicing Review will assess the current Region-owned water and wastewater systems that serve the communities of Baden, New Hamburg and Foxboro Green and assess current and future servicing needs within the communities based on the Region's 2010 Official Plan, the 2011 Baden-New Hamburg Water and Wastewater Master Plan Update, the Township of Wilmot's 2019 Official Plan, previous Township Studies and recommendations from the Region's 2018 Wastewater Treatment Plan.

The purpose of this Servicing Review is to evaluate the status of existing water and wastewater servicing systems in Baden – New Hamburg, provide recommendations to address existing servicing constraints, and to provide the framework to meet the water / wastewater servicing needs for Regional infrastructure up to the treated capacity of the New Hamburg Wastewater Treatment Plant. Specifically, the Class EA is intended to provide recommendations on the following:

- Capacity, quality, and any necessary upgrades of the supply from the existing water supply system

- Capacity, condition, and any necessary upgrades of the wastewater treatment and collection system

- Current industry standards and new technologies and/or infrastructure for water and wastewater servicing

6.0 Alternative Evaluation Criteria

As part of Phase 2 of the Municipal Class EA process, reasonable and feasible solutions to address the problems and opportunities are identified and evaluated based on their ability to resolve the issues, and their impacts to the socio-economic, natural, cultural, and technical environments.

Table 6-1 describes the environmental components and evaluation criteria that will be employed during the selection of the preferred alternative solution and design concept detailed in TM #3 and TM #4.

Table 6-1: Environmental Components

Environmental Component	Description of Criteria
Environmental	Component having regard for protecting significant natural and physical elements of the environment (i.e., air, land, water, and biota), including natural heritage and environmental features and functions.
Social	Component that evaluates potential effects on residents, neighbourhoods, businesses, community character, historical/archaeological and heritage components, social cohesion, and community features.
Technical	Component that considers potential land requirements and compliance with legislated regulation and planning policies, as well as the technical suitability and other engineering aspects of the servicing options.
Financial	Component that addresses the potential effect on servicing costs.

6.1 Detailed Evaluation Criteria Components

Based on the review of background information and characterization of the study area, the criteria identified for this study are provided in **Table 6-2**.

Table 6-2: Evaluation Criteria

Environmental Component	Evaluation Criteria	Description
Environmental	Potential effects to water resources, including: • Fisheries/aquatic habitat • Species at Risk • Wetlands • Floodplains • Groundwater recharge areas and wellhead protection areas • Groundwater/water quality	Reduction or deterioration of habitat Effects of construction timing on spawning periods Changes or impacts to groundwater quality Impacts to GRCA regulated areas should be minimized Aligns with *Clean Water Act* requirements
	Potential effects to natural heritage features, including: • Significant woodlands • Significant wetlands • Environmentally sensitive areas • Environmental protection areas • Environmental conservation areas • Species at Risk	Removal or disturbance of significant trees and/or ground flora Changes in vegetation composition Reduction or deterioration of habitat Steep slopes
	Potential impacts to wildlife/migratory birds	Reduction or deterioration of habitat Effects of timing of construction on nesting periods Effects of construction timing on breeding periods Changes in vegetation composition
	Potential climate change impacts	Minimizes greenhouse gases Resiliency of alternatives to impacts due to climate change

Environmental Component	Evaluation Criteria	Description
Social	Effect on existing residences, businesses (e.g., agricultural operations) and community features	Amount and duration of disruption (e.g., noise, vibration, traffic management, access, detours) during construction. Post-construction disruption due to truck chemical deliveries/vacuum truck operations.
	Potential effect on approved/planned land uses	Compliance with Official Plan
	Public Health and Safety	Impacts to health and safety for each alternative during construction
	Potential effects on known or potential significant archaeological resources, built heritage resources and cultural landscape features	Disruption of site having significant archaeological, historical, or architectural value Protection of heritage features
Technical	Potential land requirements including land purchase and temporary/permanent easements	Number and type of properties required; amount of land required
	Constructability	Location, depth of excavation, soil conditions, rock removal, groundwater control, construction duration
	Effect on existing utilities and infrastructure (number and type of potential conflicts)	Number and type of potential conflicts
	Planned infrastructure improvements	Ability to coordinate with existing and planned infrastructure improvements Ability of the alternative to manage wet weather flows and mitigate overflow events
	Meets existing and future needs	
Financial	Estimated life cycle cost	Total project costs (design/construction)
	Property acquisition cost	Costs associated with any required property acquisitions
	Operation and maintenance costs	Costs associated with operations and maintenance

6.2 Evaluation Methodology

The framework and criteria for assessing alternative solutions are identified to determine the advantages and disadvantages with respect to the environmental, social, technical and financial components of the project. A detailed assessment of each alternative will be completed based on the criteria outlined above. A comparative evaluation matrix will be prepared and used to present the evaluation of treatment options as well as siting options.

During the initial evaluation of alternative solutions, each environmental component category listed in **Table 6-2** will be weighed equally at 25% each. Within each environmental component category, the sub-criteria(s) will be weighed as a fraction of 25%, depending on how many sub-criteria is within each environmental component category. During further Phases of the EA, there will be the option to modify the weight of each environmental component category based on feedback and the project team's determination of importance. For example, should feedback received emphasize the importance of social environmental components of the EA, the project team could modify the weight of this environmental component to be weighed higher than the other environmental components.

Once the weighing of environmental components is completed, alternative solutions will then be evaluated based on the sub-criteria and given a score of 1 to 5 as well as a symbol indicating the scoring. A rating of 1 indicates a low alignment with the criteria while a rating of 5 indicates that the alternative is very well aligned with the criteria. The following outlines the scoring matrix.

Graphic	Rating/Description
	5 – Very well aligned with criteria
	4 – Well aligned with criteria
	3 – Somewhat aligned with criteria
	2 – Not well aligned with criteria
	1 – Low alignment with criteria

7.0 Next Steps

The next steps in the Servicing System Review are outlined below:

- Finalize Technical Memo #1
- Confirm the evaluation criteria, begin the development of alternative solutions for water and wastewater infrastructure, and determine the preferred alternatives for discussion in Technical Memos #3, #4 and #5.

Appendix C
Technical Memo #2 Evaluation Criteria

Stantec

Memo

To:	Kaoru Yajima Region of Waterloo	From:	Jeff Paul London ON Office
File:	165640324	Date:	February 8, 2021

Reference: Baden – New Hamburg Water and Wastewater System Servicing Review – Technical Memorandum #2 – Evaluation Criteria

Problem and Opportunity Statement

The Problem and Opportunity Statement for the Baden - New Hamburg Water and Wastewater System Servicing Review Municipal Class EA is as follows:

> The communities of Baden and New Hamburg are currently serviced by a two-tier water and wastewater system run by the Township and the Region. There are currently 6 locations that provide water services to Baden and New Hamburg and 5 locations that provide wastewater services.
>
> This Servicing Review will assess the current water and wastewater systems that serve the communities of Baden, New Hamburg and Foxboro Green and assess current and future servicing needs within the community based on the Region's 2011 Master Plan Update, the Township of Wilmot's 2019 Official Plan, Recommendations from the Region's 2018 Wastewater Treatment Plan and current development applications.

The purpose of this Servicing Review is to evaluate the status of existing water and wastewater servicing systems in Baden – New Hamburg, provide recommendations to address existing servicing constraints, and to provide the framework to meet the water / wastewater servicing needs for the Region up to the treated capacity of the New Hamburg Wastewater Treatment Plant. Specifically, the Class EA is intended to provide recommendations on the following:

- Capacity, quality, and any necessary upgrades of the supply from the existing water supply system
- Capacity, condition, and any necessary upgrades of the wastewater treatment and collection system
- Current industry standards and new technologies and/or infrastructure for water and wastewater servicing

Alternative Solutions

As part of Phase 2 of the Municipal Class EA process, reasonable and feasible solutions to address the problems and opportunities are identified and evaluated based on their ability to resolve the issues, and their impacts to the socio-economic, natural, cultural, and technical environments.

Table 1 describes the environmental components and evaluation criteria that will be employed during the selection of the preferred alternative solution and design concept detailed in TM #3 and TM #4.

Table 1: Environmental Components

Environmental Component	Description of Criteria
Environmental	Component having regard for protecting significant natural and physical elements of the environment (i.e., air, land, water, and biota), including natural heritage and environmental features and functions.
Social	Component that evaluates potential effects on residents, neighbourhoods, businesses, community character, historical/archaeological and heritage components, social cohesion, and community features.
Technical	Component that considers potential land requirements and compliance with legislated regulation and planning policies, as well as the technical suitability and other engineering aspects of the servicing options.
Financial	Component that addresses the potential effect on servicing costs.

Detailed Evaluation Criteria Components

Based on the review of background information and characterization of the study area, the criteria identified for this study are provided in **Table 2**.

Table 2: Evaluation Criteria

Environmental Component	Evaluation Criteria	Description
Environmental	Potential effects to water resources, including: • Fisheries/aquatic habitat • Species at Risk • Wetlands • Floodplains • Groundwater recharge areas and wellhead protection areas • Groundwater/water quality	Reduction or deterioration of habitat Effects of construction timing on spawning periods Changes or impacts to groundwater quality Impacts to GRCA regulated areas should be minimized Aligns with *Clean Water Act* requirements

Reference: Baden – New Hamburg Water and Wastewater System Servicing Review – Technical Memorandum #2 – Evaluation Criteria

Environmental Component	Evaluation Criteria	Description
	Potential effects to natural heritage features, including: • Significant woodlands • Significant wetlands • Environmentally sensitive areas • Environmental protection areas • Environmental conservation areas • Species at Risk	Removal or disturbance of significant trees and/or ground flora Changes in vegetation composition Reduction or deterioration of habitat Steep slopes
	Potential impacts to wildlife/migratory birds	Reduction or deterioration of habitat Effects of timing of construction on nesting periods Effects of construction timing on breeding periods Changes in vegetation composition
	Potential climate change impacts	Minimizes greenhouse gases Resiliency of alternatives to impacts due to climate change
Social	Effect on existing residences, businesses (e.g., agricultural operations) and community features	Amount and duration of disruption (e.g., noise, vibration, traffic management, access, detours) during construction. Post-construction disruption due to truck chemical deliveries/vacuum truck operations.
	Potential effect on approved/planned land uses	Compliance with Official Plan
	Public Health and Safety	Impacts to health and safety for each alternative during construction
	Potential effects on known or potential significant archaeological resources, built heritage resources and cultural landscape features	Disruption of site having significant archaeological, historical, or architectural value Protection of heritage features
Technical	Potential land requirements including land purchase and temporary/permanent easements	Number and type of properties required; amount of land required

Environmental Component	Evaluation Criteria	Description
	Constructability	Location, depth of excavation, soil conditions, rock removal, groundwater control, construction duration
	Effect on existing utilities and infrastructure (number and type of potential conflicts)	Number and type of potential conflicts
	Planned infrastructure improvements	Ability to coordinate with existing and planned infrastructure improvements Ability of the alternative to manage wet weather flows and mitigate overflow events
	Meets existing and future needs	
Financial	Estimated capital cost	Total project costs (design/construction)
	Property acquisition cost	Costs associated with any required property acquisitions
	Operation and maintenance costs	Costs associated with operations and maintenance

Evaluation Methodology

The framework and criteria for assessing alternative solutions are identified to determine the advantages and disadvantages with respect to the environmental, social, technical and financial components of the project. A detailed assessment of each alternative will be completed based on the criteria outlined above. A comparative evaluation matrix will be prepared and used to present the evaluation of treatment options as well as siting options.

During the initial evaluation of alternative solutions, each environmental component category listed in **Table 2** will be weighed equally at 25% each. Within each environmental component category, the sub-criteria(s) will be weighed as a fraction of 25%, depending on how many sub-criteria is within each environmental component category. During further Phases of the EA, there will be the option to modify the weight of each environmental component category based on feedback and the project team's determination of importance. For example, should feedback received emphasize the importance of social environmental components of the EA, the project team could modify the weight of this environmental component to be weighed higher than the other environmental components.

Once the weighing of environmental components is completed, alternative solutions will then be evaluated based on the sub-criteria and given a score of 1 to 5 as well as a symbol indicating the scoring. A rating of 1 indicates a low alignment with the criteria while a rating of 5 indicates that the alternative is very well aligned with the criteria. The following outlines the scoring matrix.

Reference: Baden – New Hamburg Water and Wastewater System Servicing Review – Technical Memorandum #2 – Evaluation Criteria

Graphic	Rating/Description
	5 – Very well aligned with criteria
	4 – Well aligned with criteria
	3 – Somewhat aligned with criteria
	2 – Not well aligned with criteria
	1 – Low alignment with criteria

Next Steps

The next steps in the Servicing System Review are outlined below:

- Prepare for the first public consultation centre (PCC)
- Submit draft Technical Memo #1
- Finalize Technical Memo #2
- Confirm the evaluation criteria, begin the development of alternative solutions for water and wastewater infrastructure, and determine the preferred alternatives for discussion in Technical Memos #3, #4 and #5.

Stantec Consulting Ltd.

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c. Michael Kocher, Jason Isbister – Stantec
Samuel Ziemann, Dennis Mutti – C3 Water Inc.

Appendix D
Technical Memo #3 Water Infrastructure Alternatives & Water Analysis Update

Baden-New Hamburg Water and Wastewater System Servicing Review – Technical Memorandum #3 – Water Infrastructure Alternatives





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Region of Waterloo

Prepared by:
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May 19, 2022

Revision	Description	Author	Quality Check	Independent Review
1	Draft 1	Liam Connolly	Sam Ziemann	
2	Final	Liam Connolly Michelle Scott	Sam Ziemann	

BADEN-NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW – TECHNICAL MEMORANDUM #3 – WATER INFRASTRUCTURE ALTERNATIVES

SIGN OFF

This document, entitled ***Baden-New Hamburg Water and Wastewater System Servicing Review – Technical Memorandum #3 – Water Infrastructure Alternatives***, was prepared by C3 Water Inc. for the **Region of Waterloo**.

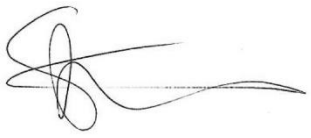
C3 Water certifies that the information contained in this report is accurate, complete and in accordance with the terms of our engagement. This assessment is based, in part, on information provided by others. Unless specifically noted, C3 Water has assumed that this information is correct, and has relied on it in the development of conclusions.

The material herein reflects C3 Water's best judgement based upon the information available at the time of preparation. Any use which a third party makes of this report or any reliance on or decisions made based on it, are the responsibilities of such third parties. C3 Water Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based upon this report.

Prepared by 

(signature)

Liam Connolly, C3 Water Inc.

Reviewed by 

(signature)

Sam Ziemann, P.Eng., C3 Water Inc.

Reviewed by 

(signature)

Jeff Paul, P.Eng., Stantec Consulting Inc.

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Abbreviations

EA	Environmental Assessment
ET	Elevated Tank
IUS	Integrated Urban Water Supply
NHWTP	New Hamburg Water Treatment Plant
PRV	Pressure Reducing Valve
PSV	Pressure Sustaining Valve
PTTW	Permit to Take Water
WTP	Water Treatment Plant

1.0 Introduction

Stantec and C3 Water Inc. (C3W) were retained by The Region of Waterloo (Region) to carry out updates to the 2011 Baden-New Hamburg Water and Wastewater System Servicing Review (SSR). This update will build upon the 2011 Master Plan to develop a servicing plan up to 2031 that will accommodate population growth in the Baden-New Hamburg system within the current urban boundaries. The current boundaries are shown in Figure 2-4. This technical memorandum presents the water system analysis that was completed under current and future system conditions to identify constraints within the system, and present alternatives to be considered to accommodate future growth.

2.0 Background

An overview of the Baden-New Hamburg (BNH) water distribution network is shown in

Figure 2-1 below. The system is supplied by two (2) sources; the Wilmot Centre well field and the New Hamburg wells via the New Hamburg Water Treatment Plant (NH WTP). The Wilmot Centre well field (also known as the Shingletown well field) consists of wells K50, K51, and K52. Well K52 was brought online in 2021 and currently feeds the Gasmier Pond. While it is planned to have K52 act as a backup capacity in the future, the well is not currently supplying the BNH distribution system. The permit to take water (PTTW) for these wells is currently 158 L/s (13,638 m^3/day). Water from these wells supplies both the BNH system and the Integrated Urban System (IUS). The K50 wells are connected to Baden by a 450mm transmission line and fills the Baden elevated tower (ET). The K50 wells also fill the Mannheim Reservoir via the Shingletown pressure sustaining valve (PSV). The Mannheim reservoir is also supplied by the Mannheim wells and the Mannheim WTP.

The New Hamburg water supply consists of wells NH3 and NH4, with a total Permit to Take Water (PTTW) of 41 L/s (3,543 m^3/day). Water from the wells is pumped to the New Hamburg Water Treatment Plant (NH WTP) and treated with high-pressure filters for iron and manganese removal. Chlorine dosing occurs before the water is discharged into the NH reservoir. Horizontal split case centrifugal pumps utilize the reservoir to supply water into the New Hamburg water system. The station consists of one duty and two standby pumps, each with a rated capacity of 41 L/s. A jockey pump has been recently installed at the NH pump station to supply minimum night time flows.

The Baden well field is located in the Town of Baden and consists of wells B1 and B2. However, these wells have not been operational since the 1990's due to high levels of nitrates in the groundwater. The Baden well capacities have not been taken into consideration as part of this analysis. This project will provide a recommendation on the long-term use of the well and site.

In 2019 the BNH distribution system was split into two separate pressure zones. The purpose of the zone split was to protect low-lying areas of the New Hamburg system while utilizing the full capacity of the ET. The New Hamburg and Baden Zones are separated by the Nafziger pressure reducing valve (PRV) on Snyder's Road, near the intersection of Nafziger Road. The PRV allows water into New Hamburg when pressure drops in New Hamburg during periods of high demand. The Baden system works at the HGL provided by the ET with a top water level (TWL) of 400m, while the New Hamburg system works at a target pressure of 390.8m.

The Foxboro system is located north of the Baden-New Hamburg system and is currently supplied by the Foxborough WTP. Due to significant asset upgrades required at the Foxborough WTP, the option of connecting the Foxboro system to Baden will be considered.

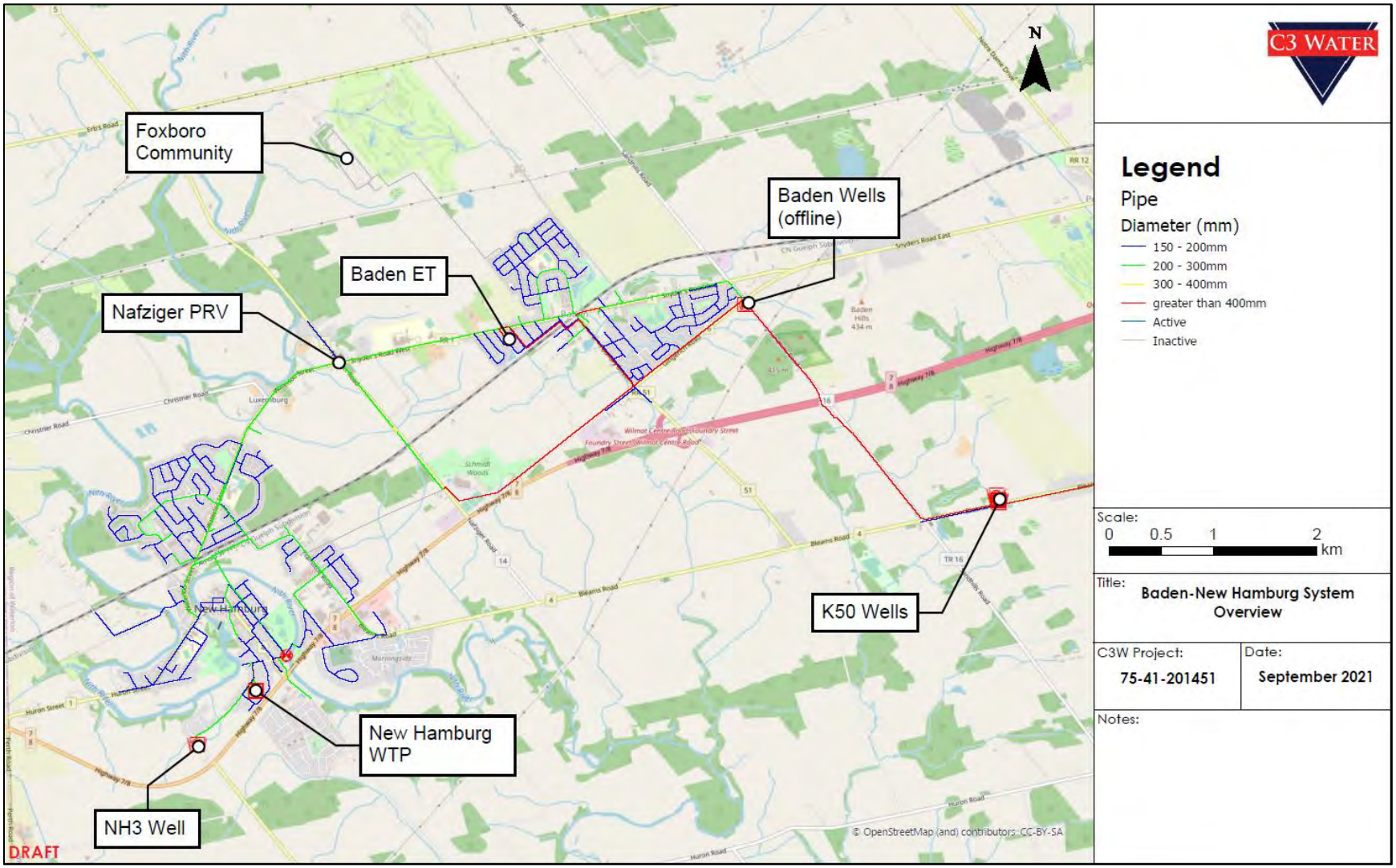


Figure 2-1 Overview of the Baden-New Hamburg Distribution System.

2.1 Projected Growth

Future population projections for Baden-New Hamburg were generated based on the lands within the Urban Boundary as defined by the current Official Plan for the Township of Wilmot and the current Regional Official Plan for the Region of Waterloo. Future development blocks are presented in Figure 2-2. Unit counts and land areas for the development blocks within the Urban Boundary were derived from the Growth Methodology Memo, dated February 8, 2021 by GM BluePlan. A population density of 2.77 people/unit was used as per the Region's wastewater monitoring report dated June 2020. Growth areas outside of the Urban Boundary were not considered in this analysis.

Demand calculations were based on an average daily demand (ADD) of 207 L/cap/day. This value was calculated based on the average Baden-New Hamburg water supply and residential population for 2015 to 2020 reported in the Region's 2021 Water and Wastewater Monitoring Report (2021 Monitoring Report). For comparison, the Baden New-Hamburg model was last updated, using 2018 data, to have an ADD of 34.6 L/s. Based on a 2018 residential population on 14,361, this equates to an average demand of 208 L/cap/day. The Region Design Guidelines and Supplemental Specifications (DGSSMS) states an average day demand of 225 L/cap/day. This value was found to be overly conservative for Baden-New Hamburg, based on historical data reported in the 2021 Monitoring Report. A summary of the average water supply for 2010 to 2020 as reported in the 2021 Monitoring Report is provided in Figure 2-2 below. The 2015 to 2020 average of 207 L/cap/day was found to be a realistic value based on historical water supply.

As the 207 L/cap/day is based on residential population only, the future demand was calculated based on the total residential growth only. The future demand was then divided between each growth parcel based on either the projected residential population or equivalent employment population. As the 207 L/cap/day was based on historical production data, and not billed-consumed data, this value accounts for non-revenue water (NRW) as well.

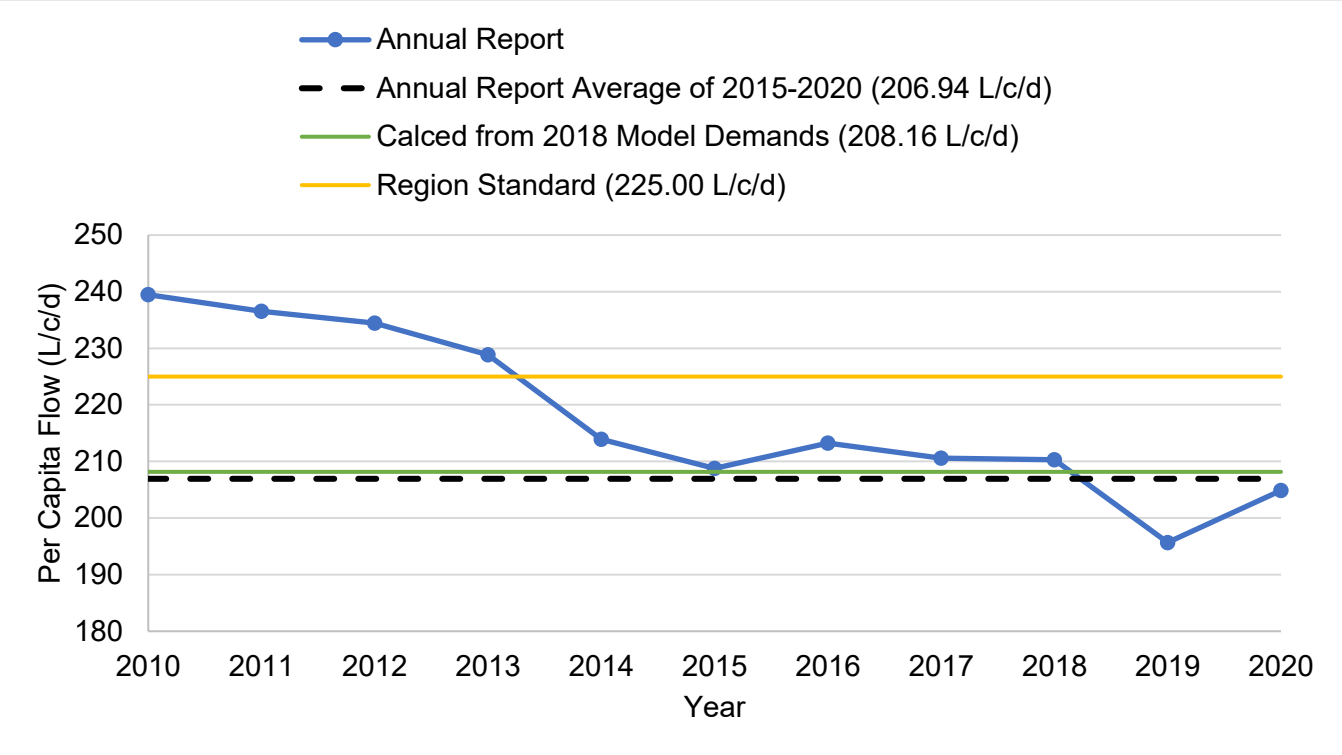


Figure 2-2 Average Demand Analysis

The maximum day demand (MDD) peaking factor of **1.95** was determined based on the maximum reported peaking factor for 2015 to 2020 in the 2021 Monitoring Report. For comparison, the MDD peaking factor used for the 2018 model update was 1.6. The MDD peak factors from the 2021 Monitoring Report for 2010 to 2020 are presented in Figure 2-3 below. The peaking factor has been trending upwards since 2016. As such, 1.95 is considered to be a conservative and realistic peaking factor. The peaking factor of 1.95 was used for future and existing MDD model scenarios. This results in an existing MDD of 67 L/s which is in line with the 2020 MDD recorded in the 2021 Monitoring Report.

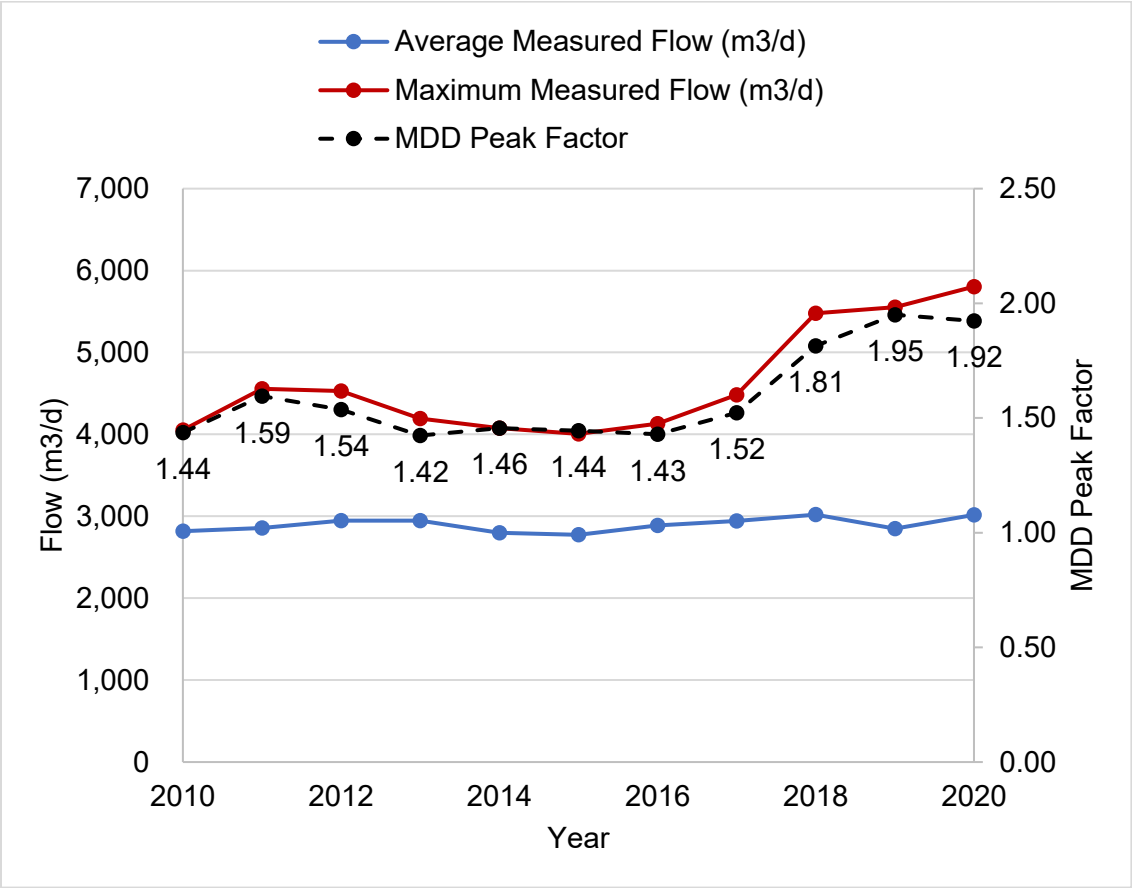


Figure 2-3 MDD Peak Factor Analysis (2021 Monitoring Report)

A summary of the future demands in Baden and New Hamburg is presented in Table 2-1. Growth areas are shown in Figure 2-4 below.

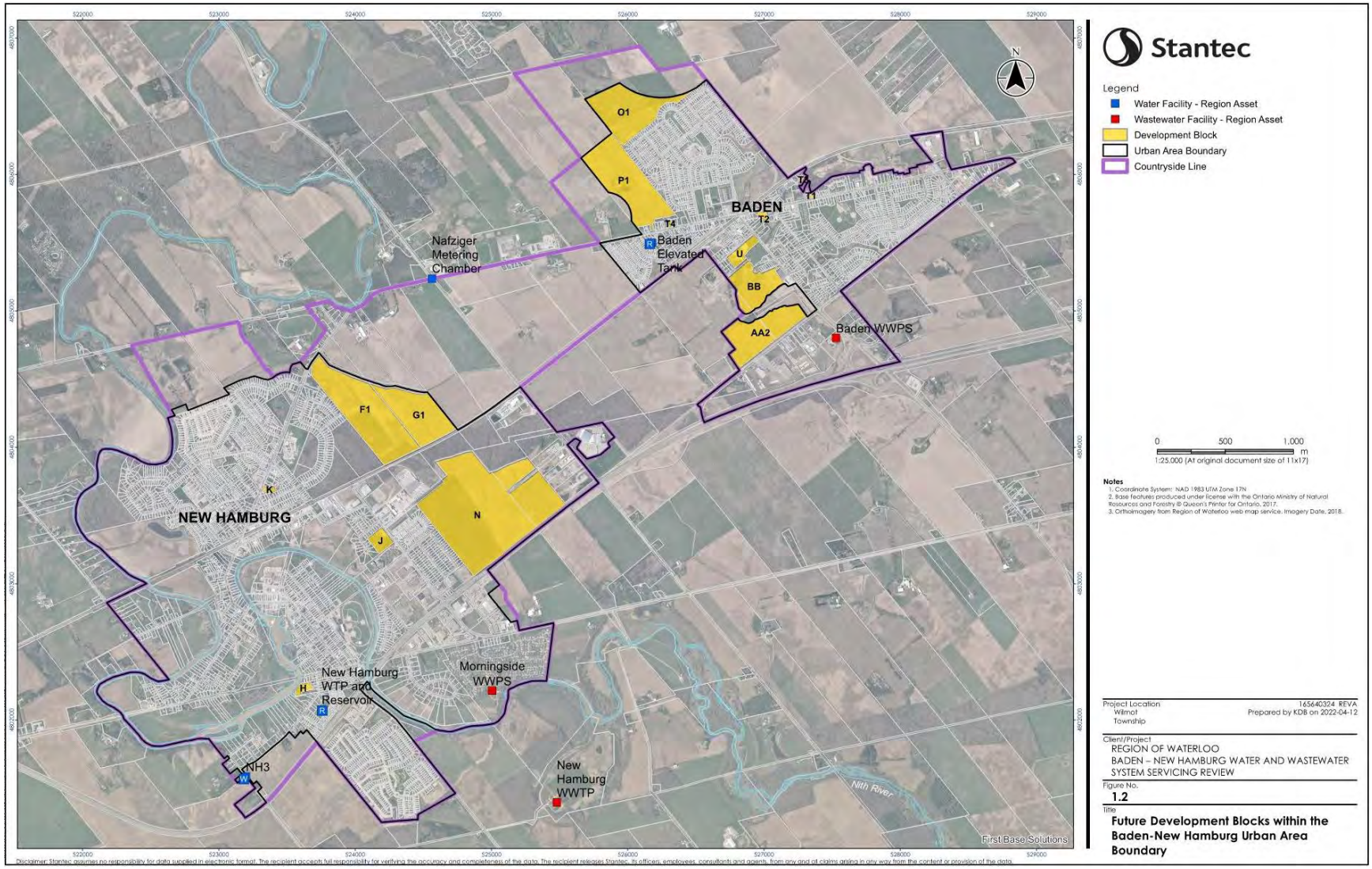


Figure 2-4 Future Development Blocks in Baden-New Hamburg

Table 2-1 Future Development Demands in Baden-New Hamburg.

Town	Development Block	ADD (L/s)	MDD (L/s)
Baden	T1	0.02	0.05
	T2	0.04	0.08
	T3	0.03	0.05
	T4	0.05	0.09
	BB	1.17	2.29
	U	0.21	0.41
	P1	1.75	3.41
	O1	1.92	3.74
	AA2	0.83	1.62
	Baden Total:	**6.02**	**11.74**
New Hamburg	N	3.57	6.95
	H	0.08	0.16
	J	0.19	0.38
	K	0.04	0.07
	F1 & G1	3.53	6.89
	New Hamburg Total:	**7.41**	**14.45**
	Grand Total:	**13.43**	**26.19**

3.0 Model Updates

3.1 Mannheim Well System

The BNH hydraulic model was provided by the Region in InfoWater Pro format, dated 2021-03-17. As part of the hydraulic analysis, additional elements were imported to the BNH model from the Region's IUS model, dated May 12, 2021. The Mannheim village, Mannheim WTP and reservoir, K20 wells, and K90 wells were imported to the BNH model. Well K22 is currently offline due to high turbidity and was kept offline for the analysis. The Mannheim system is separated from the BNH system by the Shingletown PSV at the intersection of Bleams Road and Queen Street.

3.2 Pipe Length Updates

The Region raised a concern over incorrect pipe lengths in the InfoWater Pro database in the BNH model. A procedure was provided by the Region on July 6, 2021 to update the InfoWater

Pro database from the latest Regional watermain GIS data. This update was completed on existing pipes.

3.3 Future Baden-New Hamburg Connection and PRV

A second watermain connection between Baden and New Hamburg is currently under design at the South end of the system along a future road allowance that will provide a feed from the NH WTP to Baden. The NH WTP will pump into the Baden pressure zone at the target HGL of 400m. New Hamburg will be primarily supplied through a new PRV chamber at the South end of Jacob Street in New Hamburg. The Nafziger PRV will provide backup supply for New Hamburg. The new PRV chamber is proposed to include a 100mm PRV which will act as duty 1, and will operate at the existing New Hamburg HGL of 390.8m. A 300mm PRV in the same chamber will act as duty 2 at an approximate HGL of 387.8m. The existing Nafziger PRV will act as duty 3 at an estimated HGL of 385.8m. The new connection between the two systems was active in the future conditions model scenarios. Existing watermain connections from the NH WTP discharge piping into the New Hamburg distribution system were disconnected in future model scenarios and New Hamburg was supplied only through PRVs. Under the new configuration, future development area “N” will be serviced by the Baden pressure zone.

3.4 Foxboro

The Foxboro water system was added to the BNH model. An existing model of the Foxboro system did not exist, so pipes and nodes were modelled based on a site servicing plan drawing completed by Stantec, dated February 1994. Elevations for the Foxboro nodes were extracted from the LiDAR-derived Ontario Digital Terrain Model (DTM), project name “OMAFRA Lidar 2016-18”. The DTM was obtained from Ontario GeoHub.

Demands within Foxboro were determined using hourly flow data obtained from SCADA. Hourly average flows were provided for the year of 2019, from which a demand pattern was created and applied to the nodes within the development. A peaking factor of 1.6 x ADD was also applied to the Foxboro nodes for MDD demands based on SCADA data. The peak hour was based on a peaking factor of 1.7 x MDD, or 2.7 x ADD.

3.5 Growth Demands

The future demands as presented in Section 2.1 were added to future scenarios of the BNH model. Each development block was assigned a new node in the system and connected to the existing system at the locations shown in Figure 2-4. Watermains within developments were not considered for the purposes of this analysis as this level of detail is not required for the assessment of the overall system capacity.

4.0 Evaluation Criteria

System performance was evaluated based on MECP and Regional design guidelines as outlined below:

- System pressures shall be within the preferred operational range of 345 kPa (50 psi) – 550 kPa (80 psi) under average and maximum day conditions, or 275 kPa (40 psi) – 690 kPa (100 psi) under minimum and peak hour conditions, per the Region's DGSSMS,
- Fire flow criteria were based on MECP guidelines. Details on fire flow calculations are provided in Appendix A.
    - Fire flow under existing MDD conditions of 274 L/s for 4.5 hrs should be sustained in downtown areas of Baden and New Hamburg per MECP, based on an existing combined population of 20,500,
    - A fire flow under future conditions of 331 L/s for 5 hrs should be sustained in downtown areas of Baden and New Hamburg per MECP, based on a projected combined population of 28,900
    - It should be noted that the Region is completing an internal review of fire flow requirements in parallel with this assessment. Therefore, the fire flow requirements may be updated based on the Region's findings and recommendations.
- Treated water storage must meet MECP design guidelines. This is further explored in Section 5.2.

5.0 Desktop Analysis

5.1 Supply and Demand

The BNH system is currently supplied by the New Hamburg wells and the K50 wells with a combined total PTTW of 199 L/s. Existing and future demands are compared to available supply in Figure 5-1 below. The full PTTW is being carried forward as the system supply capacity due to the redundant wells that have been built at both locations. New Hamburg's existing MDD is 42.1 L/s which is greater than the capacity of the of the NH wells (41 L/s). Baden, with a smaller population, has a smaller MDD at 25.1L/s. The PTTW at the K50's is 158 L/s. Currently up to 87 L/s of the K50s water is sent to the Mannheim but the full 158 L/s PTTW is available for BNH if needed. Foxboro demands have been included in the future Baden ADD and MDD demands, with an ADD of 1.2 L/s and a MDD of 2.3 L/s.

The future MDD of the total BNH system was less than the existing total PTTW by approximately 103 L/s, indicating that the existing available supply is sufficient to meet future demands.

As discussed, the Baden Wells are not currently used due to water quality concerns. The Region has advised that these wells are not being considered for the purposes of existing

water supply redundancy. As water supply under future demand conditions is not expected to exceed the existing available supply from the K50s and the NH Wells, it is not expected that the Baden Wells will be required in the future to meet system demands. If it is found that the Baden Wells are not needed to supply system demands, the source water protection requirements for a potable water at this location could be released.

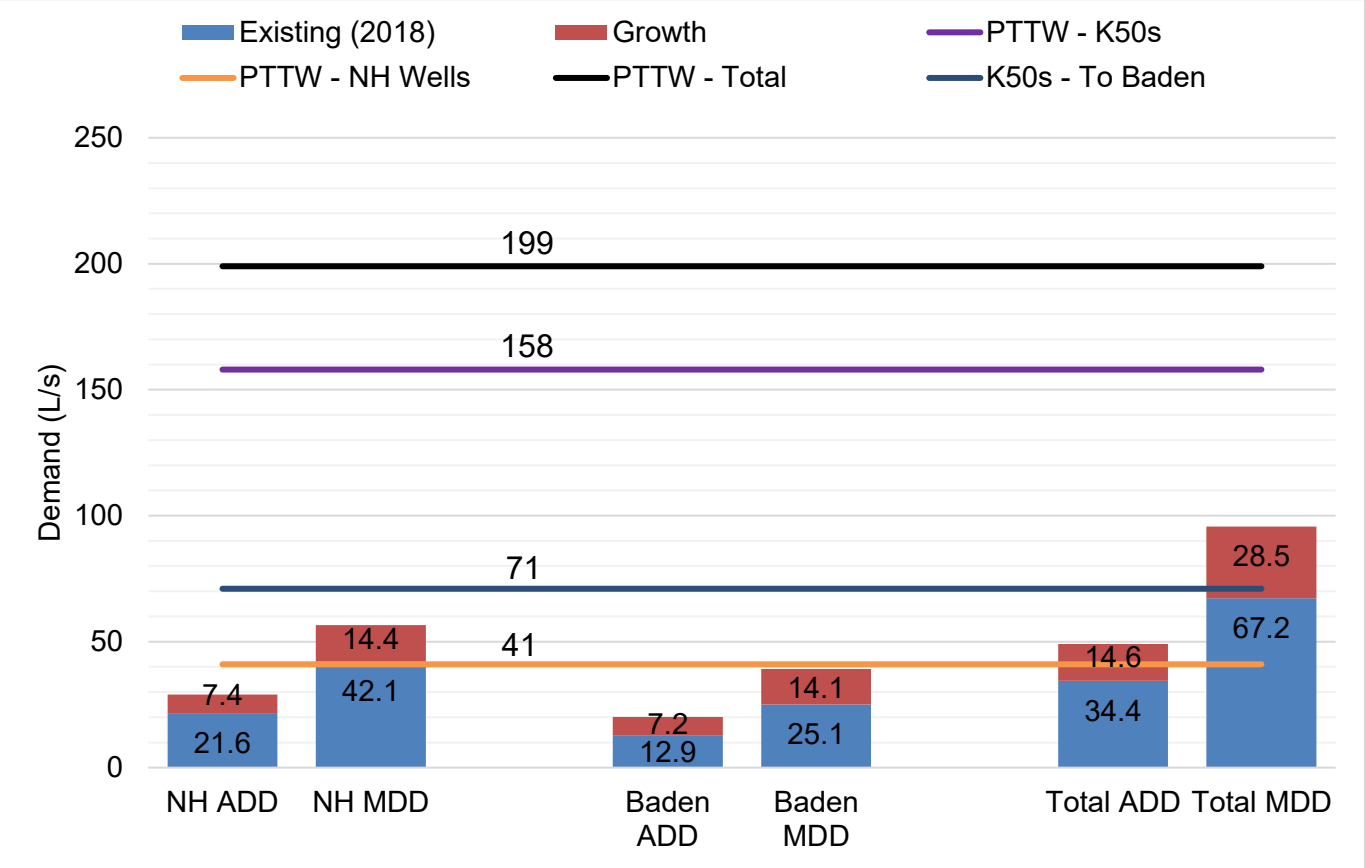


Figure 5-1 Summary of Demands and Available Supply in BNH

5.2 Storage

Storage requirements for treated water are determined from the MECP Design Guidelines for Drinking Water Systems. The total required water storage is equal to the sum of A + B + C. These are defined as;

- A is fire storage
  - Existing: 274 L/s for 4.5 hrs
  - Future: 331 L/s for 5 hours,
- B is equalization storage (25% of the maximum day demand), and
- C is emergency storage (25% of A + B).

The existing storage in the BNH system is comprised of the Baden ET and the NH Reservoir with storage volumes of 5,400 m^3 and 2,414 m^3, respectively, based on the Region's Drinking Water Works Permit (DWWP).

The full volume of the NH Reservoir cannot be utilized for supplying the distribution system. A small portion of the reservoir volume much be maintained for achieving adequate chlorine contact time. Additionally, the reservoir is maintained above a certain level due to hydraulic limitations of the existing pump station related to required net positive suction head (NPSH) of the pumps. The existing process control narrative (PCN) for the NH pump station states a pump shutoff set point at a reservoir level of 40% full. As such, an available volume of 1,448 m^3 was used for the NH Reservoir.

Figure 5-2 summarizes the existing and future storage requirements for the system. The existing storage requirements exceeded the available storage by 356 m^3. The future storage requirements exceeded the existing available storage by 3,412 m^3. Therefore, additional storage capacity is required to meet existing and future requirements.

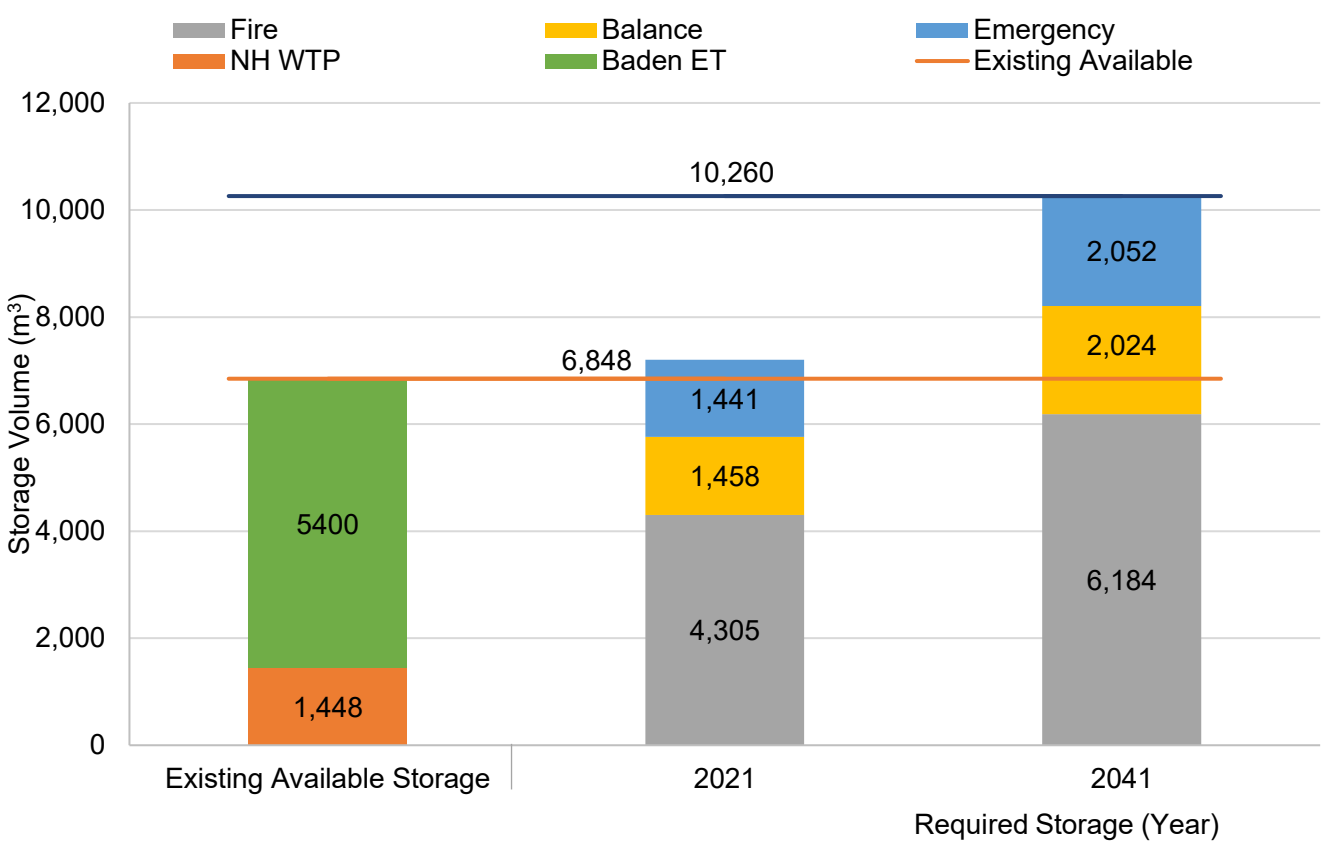


Figure 5-2 Existing and Future Storage Requirements in Baden-New Hamburg.

5.3 Well Water Quality

The Baden wells have been out of service since the mid 1990's due to the presence of nitrates in the water. These conditions continue to persist today. Since the projected future demands

do not exceed the capacity of currently operating wells, and because of the complexity and high cost of treating nitrates, the Baden wells are not being considered as a feasible water source alternative.

There are currently no water quality concerns at the K50 wells or the New Hamburg wells.

6.0 Model Analysis

The updated InfoWater Pro model was used to assess the BNH system under existing and future conditions.

6.1 Existing System

6.1.1 Existing Pressure

The minimum and maximum pressure throughout the BNH system under existing conditions are presented in Figure 6-1 and Figure 6-2 below, respectively. The pressures were found to largely be within the preferred operational limits of 345 – 550 kpa (50 – 80 psi), with some nodes slightly exceeding the upper preferred limit. The maximum pressure observed in Baden and NH was 595 kPa (86 psi) under ADD conditions, and the minimum pressure observed was 352 kPa (51 psi) under MDD conditions. While some nodes exceeded the preferred operational range for typical operating conditions, they were still within the minimum and peak hour allowable range of 275 – 690 kPa (40-100 psi) and are considered acceptable.

One exception to the pressure results discussed above is along the transmission main from the K50 wells to Baden, the highest elevation in the model reaches 389 m. This means that under normal operating conditions, at an HGL of 400 m, this high point is consistently below the minimum allowable operating pressure of 138 kPa (20 psi). Since there are no service connections in the area this pressure is acceptable to transfer water.

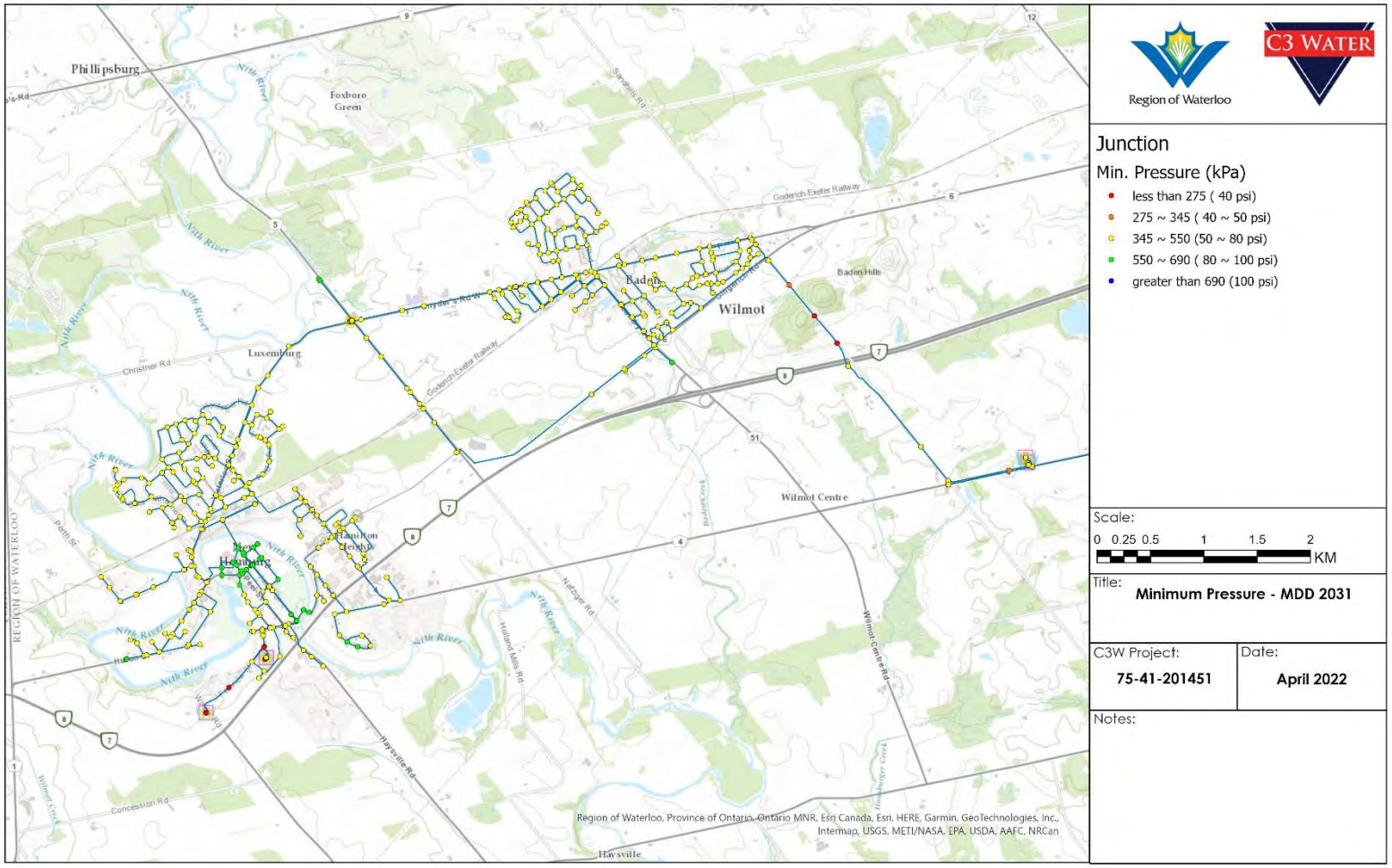


Figure 6-1 Minimum System Pressures Under Existing Maximum Day Conditions.

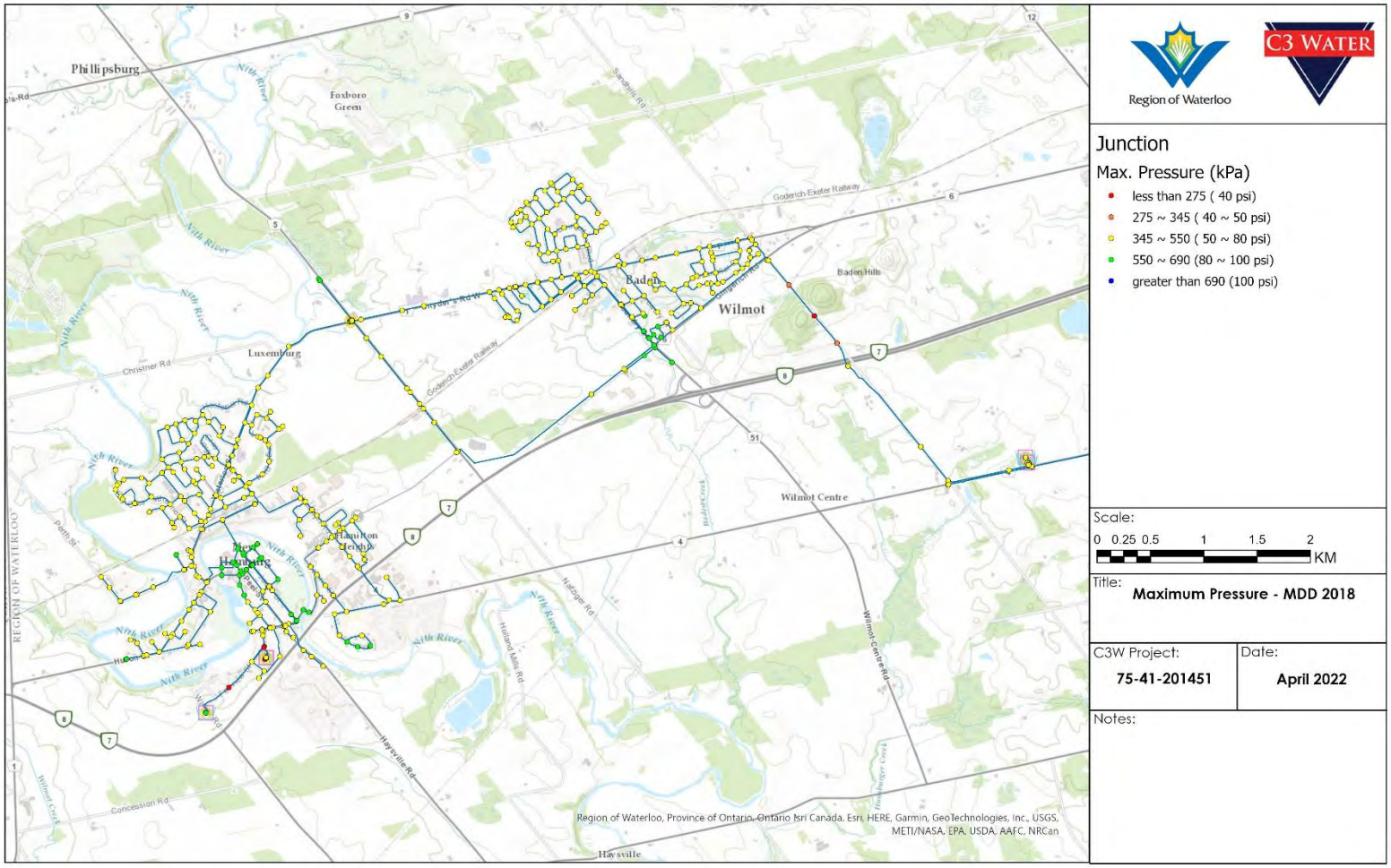


Figure 6-2 Maximum System Pressures Under Existing Average Day Conditions.

6.1.2 Existing Fire Flow

Based on the model results, the system was able to meet the MECP fire flow requirements of 274 L/s at a residual pressure of 138 kPa in downtown Baden. Downtown New Hamburg achieved a fire flow of 214 L/s, less than the MECP fire flow of 274 L/s. The New Hamburg pumps were limited to two pumps running at a maximum flow of 60 L/s each based on their curves, for a total of 120 L/s of available flow from the NH WTP. Flow from the NH Reservoir was also limited by a minimum water level of 40%. Flow is also provided to New Hamburg through the Nafziger PRV.. As such, it was found that the available fire flow in New Hamburg was limited by the available storage and pumping capacity at the NH WTP and capacity constraints of the system. The available fire flows at key locations are listed in Table 6-1. The tank levels for both the New Hamburg reservoir and Baden ET during a fire is illustrated in Figure 6-3 below.

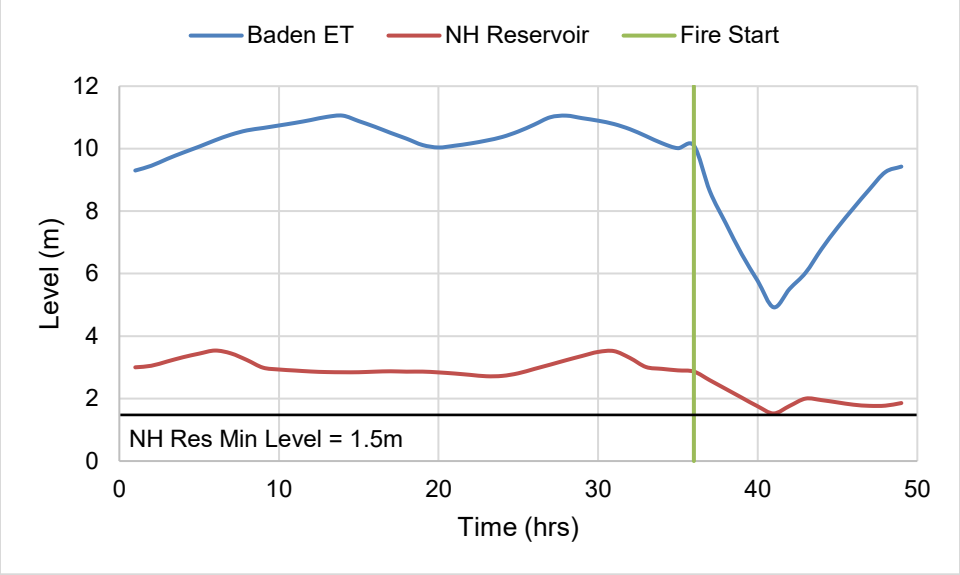


Figure 6-3 BNH Tank Levels – Existing MDD + Fire in New Hamburg

Available fire flow results are shown in Figure 6-4 below. The available fire flow was above 150 L/s in most areas of the system and dropped below 80 L/s on dead-end watermains.

Important fire flow locations have been identified below in Figure 6-6. A summary of available fire flows at key locations throughout the two towns is shown in Table 6-1. It can be seen that the target MECP fire flow guideline was met at all key Baden locations but was not met at any of the key New Hamburg locations.

Table 6-1 Available Fire Flows at Key Locations in Baden and New Hamburg – Existing MDD

Baden		
Building	**Location**	**Available Flow (L/s)**
Downtown Core	18 Snyder's Rd. E	587
Baden Public School	155 Livingston Blvd.	352
New Hamburg		
Building	**Location**	**Available Flow (L/s)**
Downtown Core	Huron St. at Peel St.	214
Forest Glen Public School	437 Waterloo St.	210
Nithview Retirement Home	200 Boulee St.	168
New Hamburg Community Centre	251 Jacob St	222

6.1.3 Headloss

System headloss under existing MDD conditions is presented in Figure 6-7 below. Headloss throughout the system was found to be below 1 m/km at all locations.

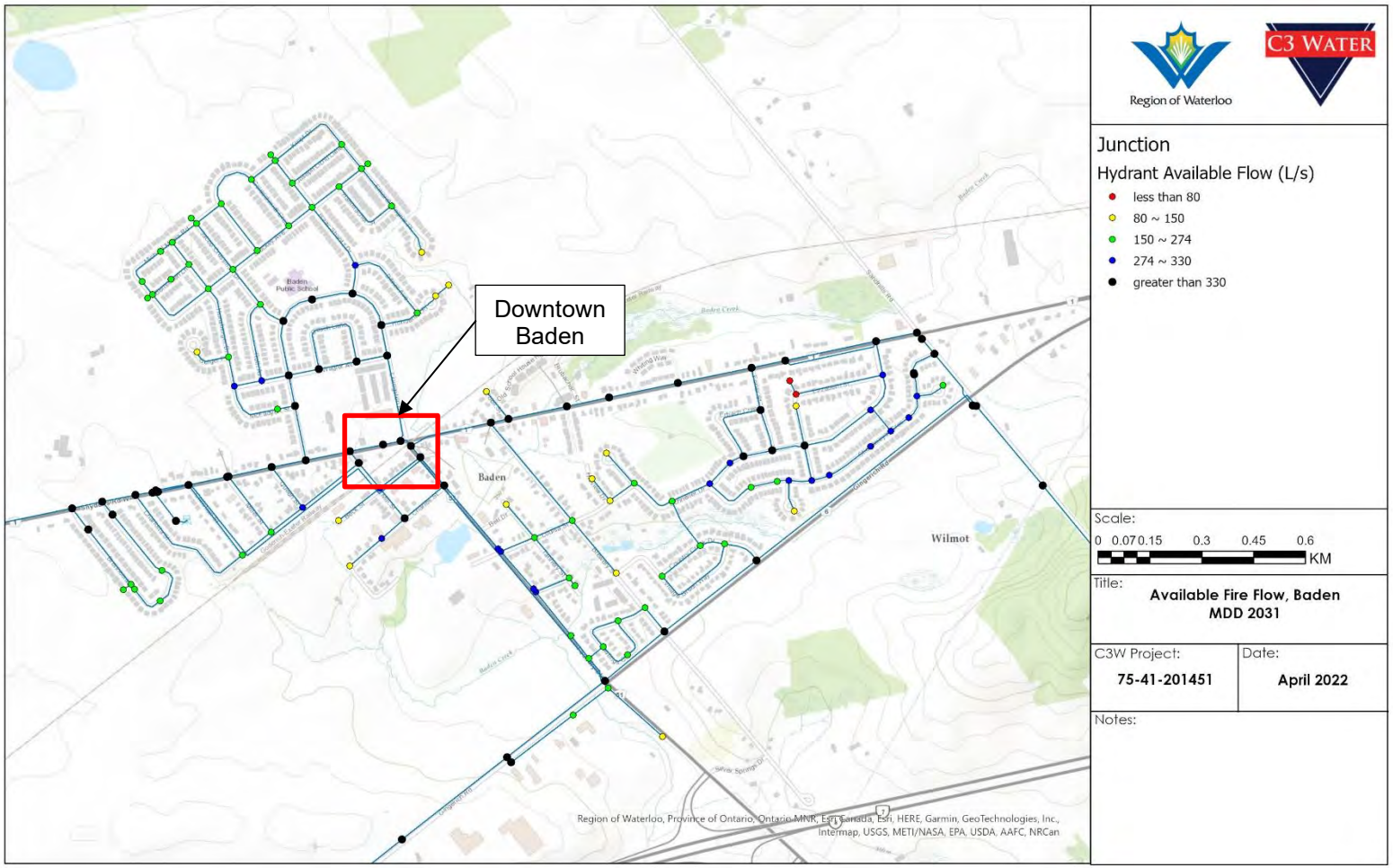


Figure 6-4 Available Fire Flows Under Existing Maximum Day Conditions, Baden (12:00 PM).

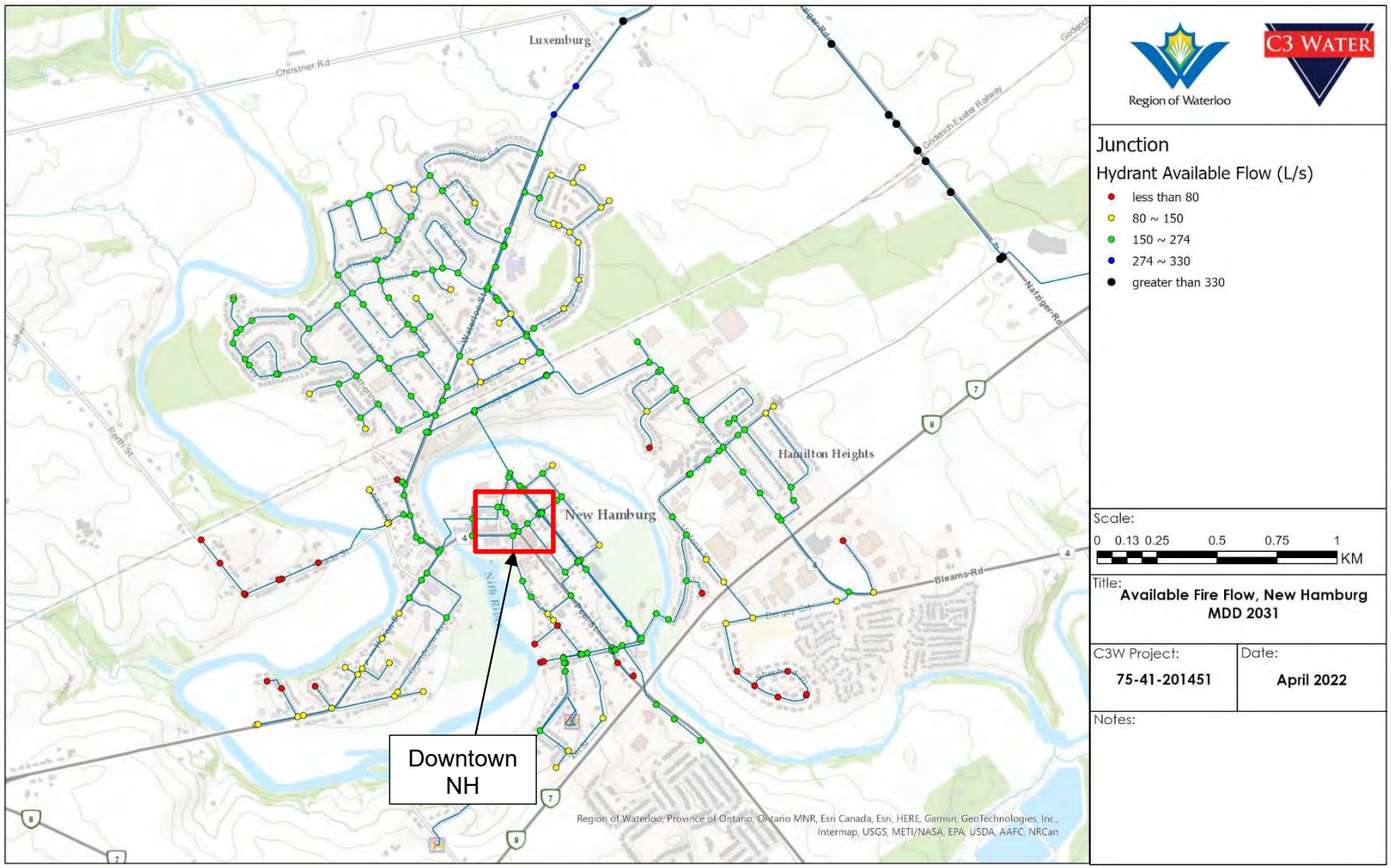


Figure 6-5 Available Fire Flows Under Existing Maximum Day Conditions, New Hamburg (12:00 pm)

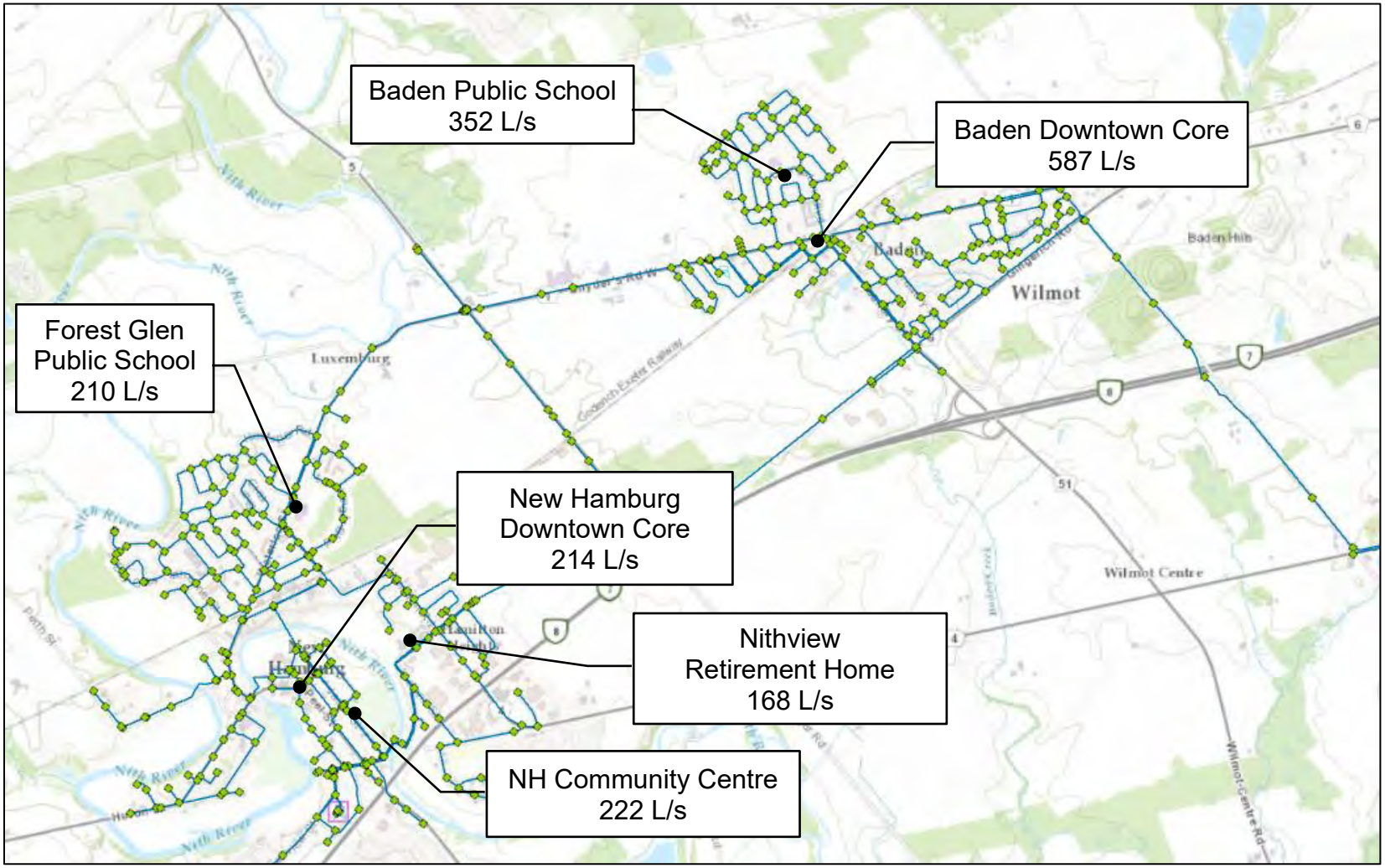


Figure 6-6 Key Fire Flow Locations in Baden and New Hamburg

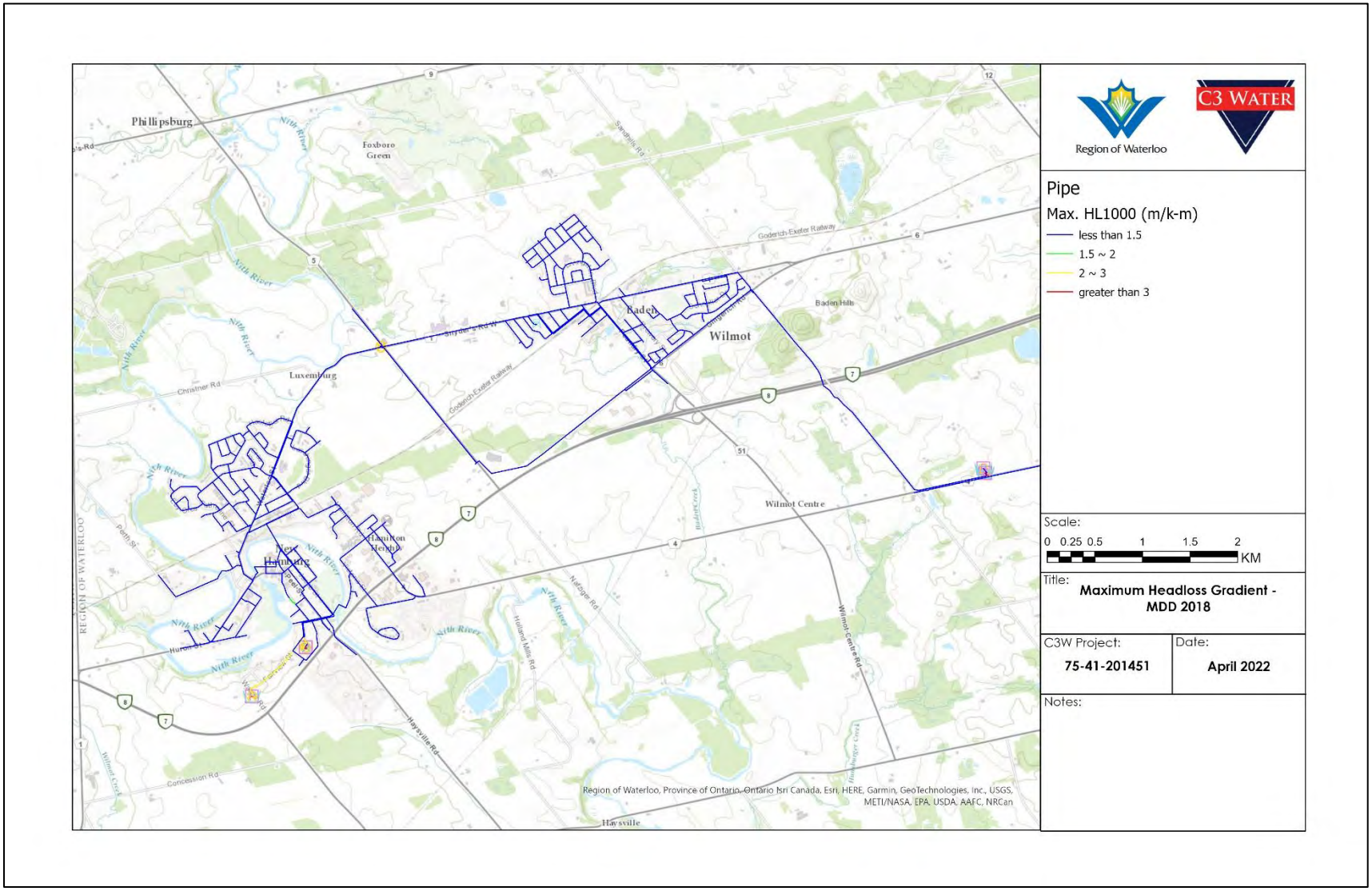


Figure 6-7 Maximum Headloss Gradient Under Existing Maximum Day Conditions.

6.2 Future System

The model was run under future demand conditions. In addition to future demands, planned infrastructure changes were included in the future system analysis. This consisted of the new transmission main connecting the south ends of Baden–New Hamburg that will serve as a primary supply link between the towns. The new transmission line will supply water from the NH WTP to the Baden ET with a new PRV chamber on Jacob Street to supply New Hamburg.

6.2.1 Future Pressure

Minimum and maximum pressures within the system remained within the outlined criteria under future demand conditions, as seen in Figure 6-8 and Figure 6-9 below.

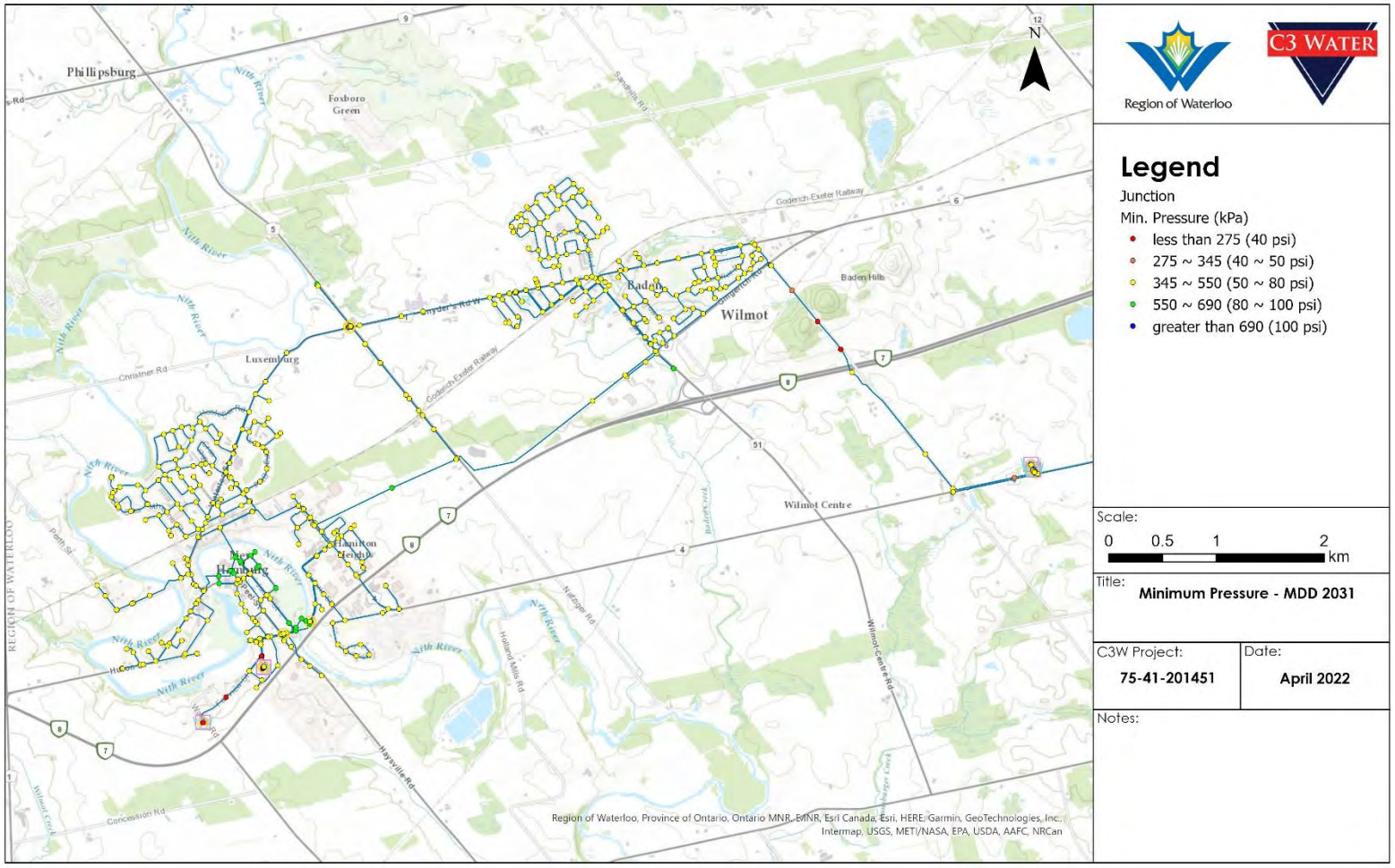


Figure 6-8 Minimum System Pressures Under Future Maximum Day Conditions.

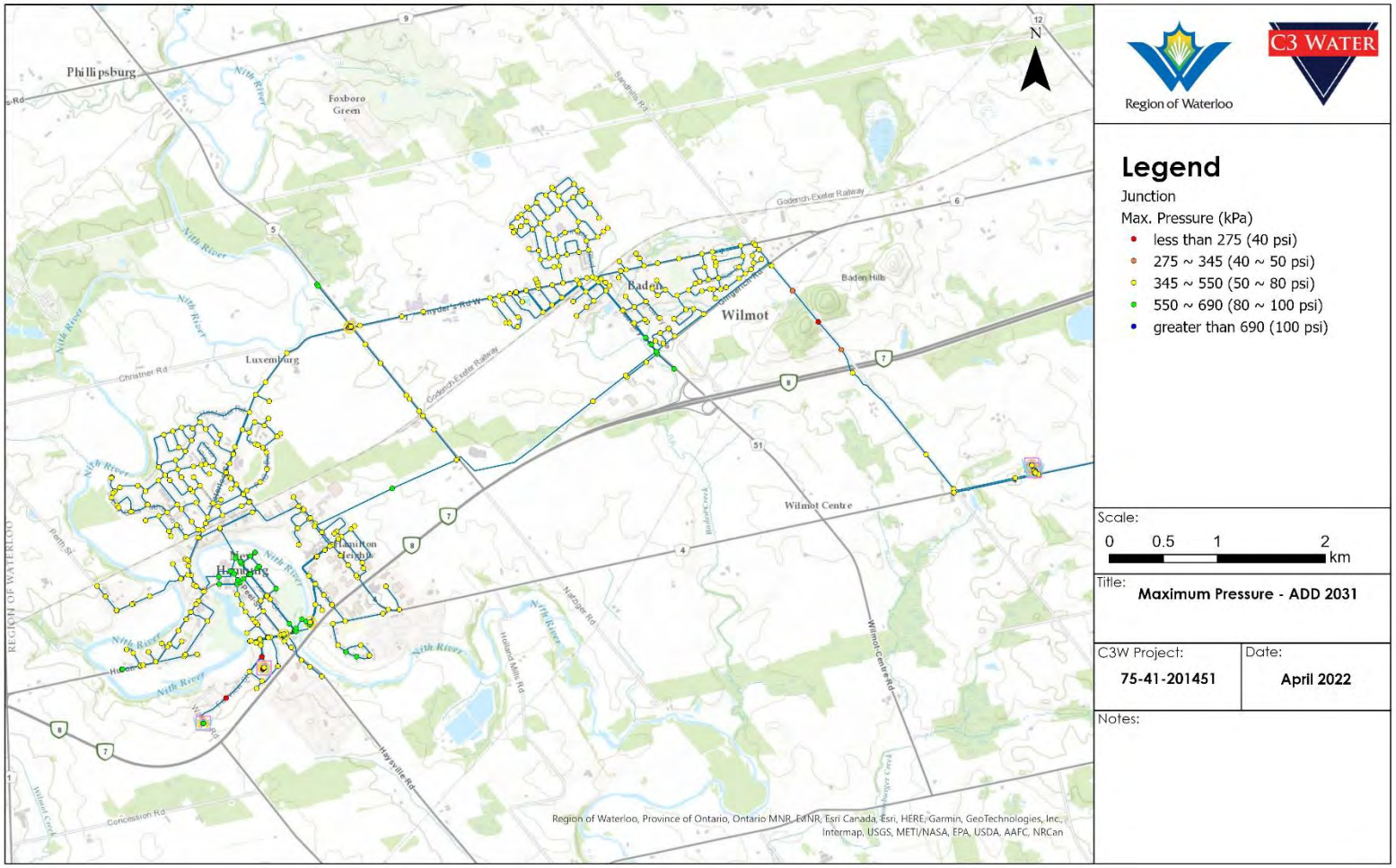


Figure 6-9 Maximum System Pressures Under Future Average Day Conditions.

6.2.2 Future Fire Flow

Fire flow constraints were seen in the model under future demand conditions. With the future Baden-New Hamburg connection, the booster pumping station at the NH WTP was controlled by the level of the Baden ET. Under future MDD conditions, the New Hamburg Reservoir maintained an adequate water level under normal operating conditions, as seen in Figure 6-10.

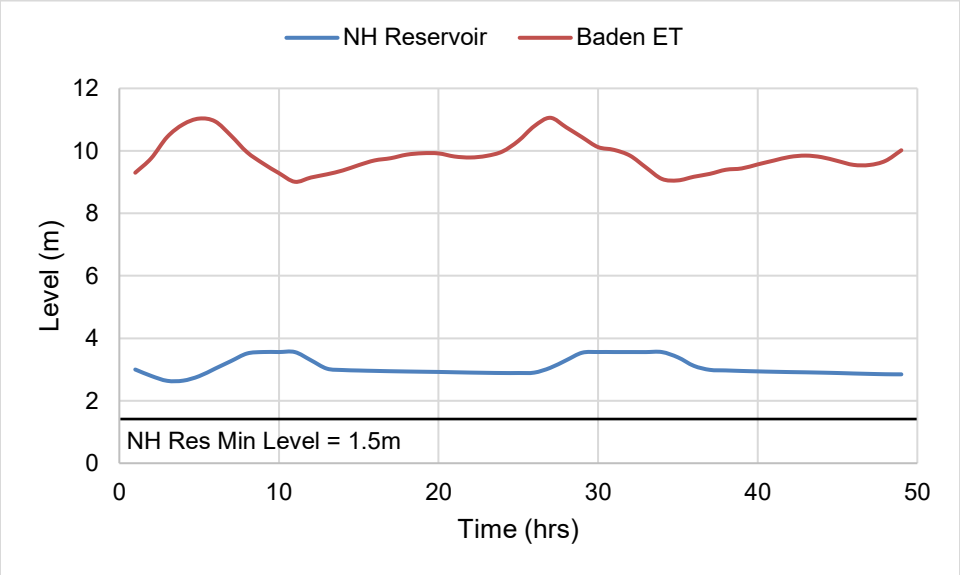


Figure 6-10 BNH Tank Levels – Future MDD

The future MECP fire flow requirement of 330 L/s for 5 hours was applied in the downtown New Hamburg commercial area. The New Hamburg reservoir drained down to the 40% full approximately 4 hours after the fire flow started. While the Baden ET continued to supply the remaining demand, the water level dropped to approximately 1 m, or 8% volume by the end of the fire flow period. This is illustrated in Figure 6-11. Existing storage was found to be insufficient to supply the future fire flow demand.

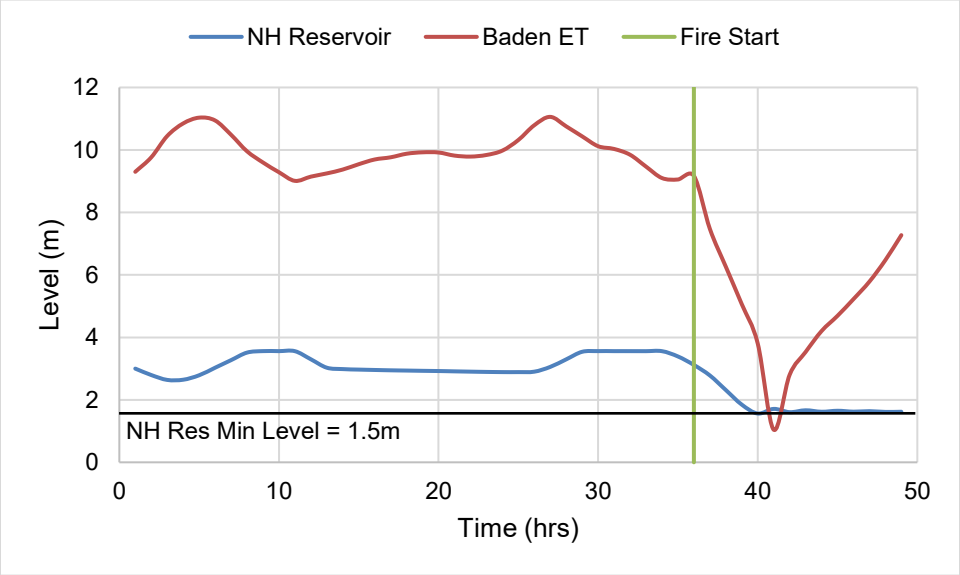


Figure 6-11 BNH Tank Level – Future MDD + Fire in New Hamburg

Fire flow results at key locations under future demand conditions are presented in Table 6-2 below. Locations are shown in Figure 6-6. Under future conditions, the MECP fire flow of 330 L/s was achieved only in Baden locations. Locations within New Hamburg saw an increase in available fire flow compared to existing conditions. This can be attributed to the new transmission main connection between New Hamburg and Baden providing additional capacity. Existing storage and pump capacity was found to be insufficient under existing and future conditions to supply the required fire flow in New Hamburg.

Table 6-2 Available Fire Flows at Key Locations in Baden and New Hamburg – Future MDD

Baden		
Building	**Location**	**Available Flow (L/s)**
Downtown Core	18 Snyder's Rd. E	575
Baden Public School	155 Livingston Blvd.	342
New Hamburg		
Building	**Location**	**Available Flow (L/s)**
Downtown Core	Huron St. at Peel St.	313
Forest Glen Public School	437 Waterloo St.	303
Nithview Retirement Home	200 Boulee St.	233
New Hamburg Community Centre	251 Jacob St	229

6.2.3 Headloss

System headloss under future MDD conditions is presented in Figure 6-14below. Headloss throughout the system was found to be below 1 m/km at all locations.

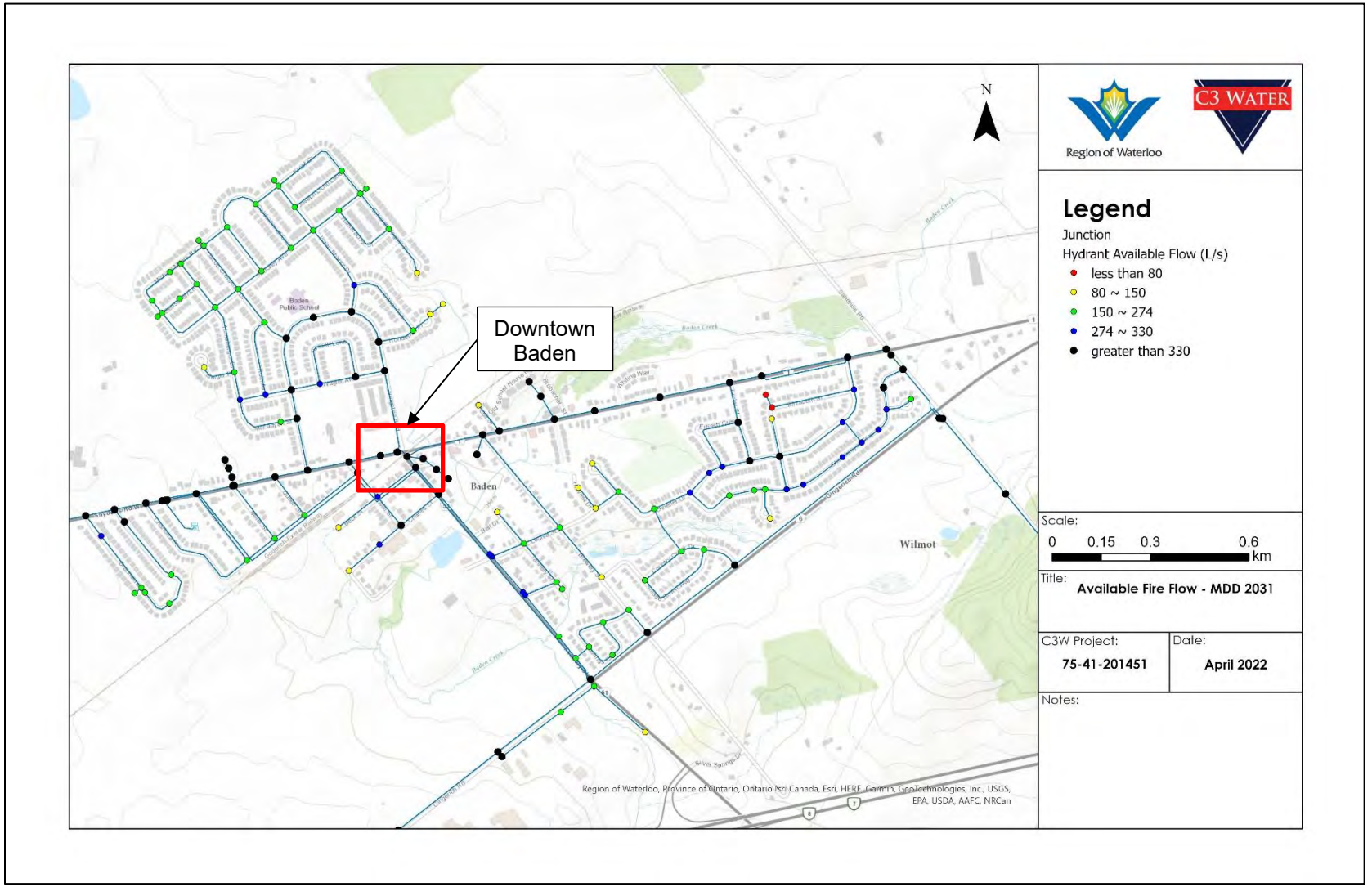


Figure 6-12 Available Fire Flows Under Future Maximum Day Conditions, Baden (12:00 pm)

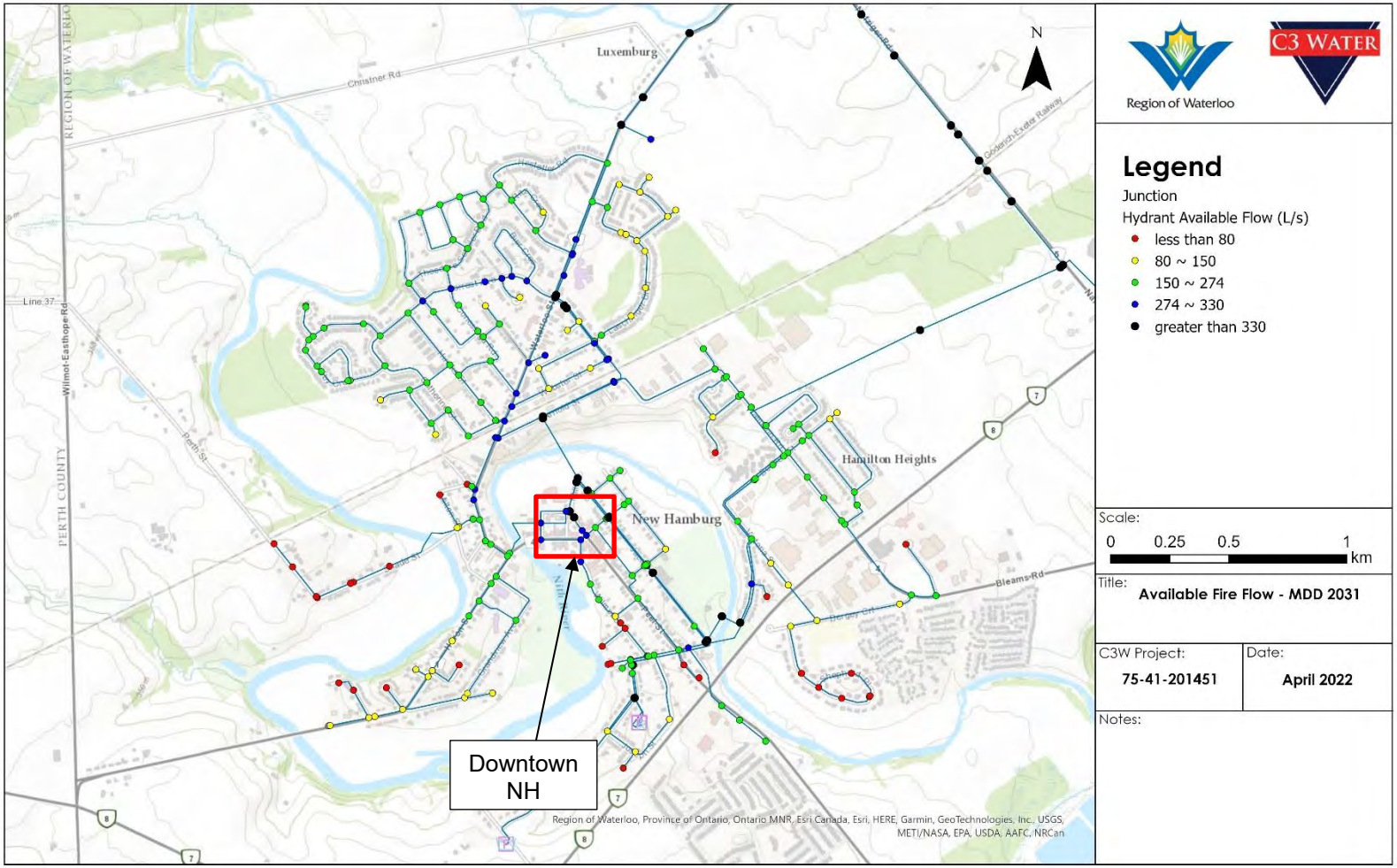


Figure 6-13 Available Fire Flows Under Future Maximum Day Conditions, New Hamburg (12:00 pm)

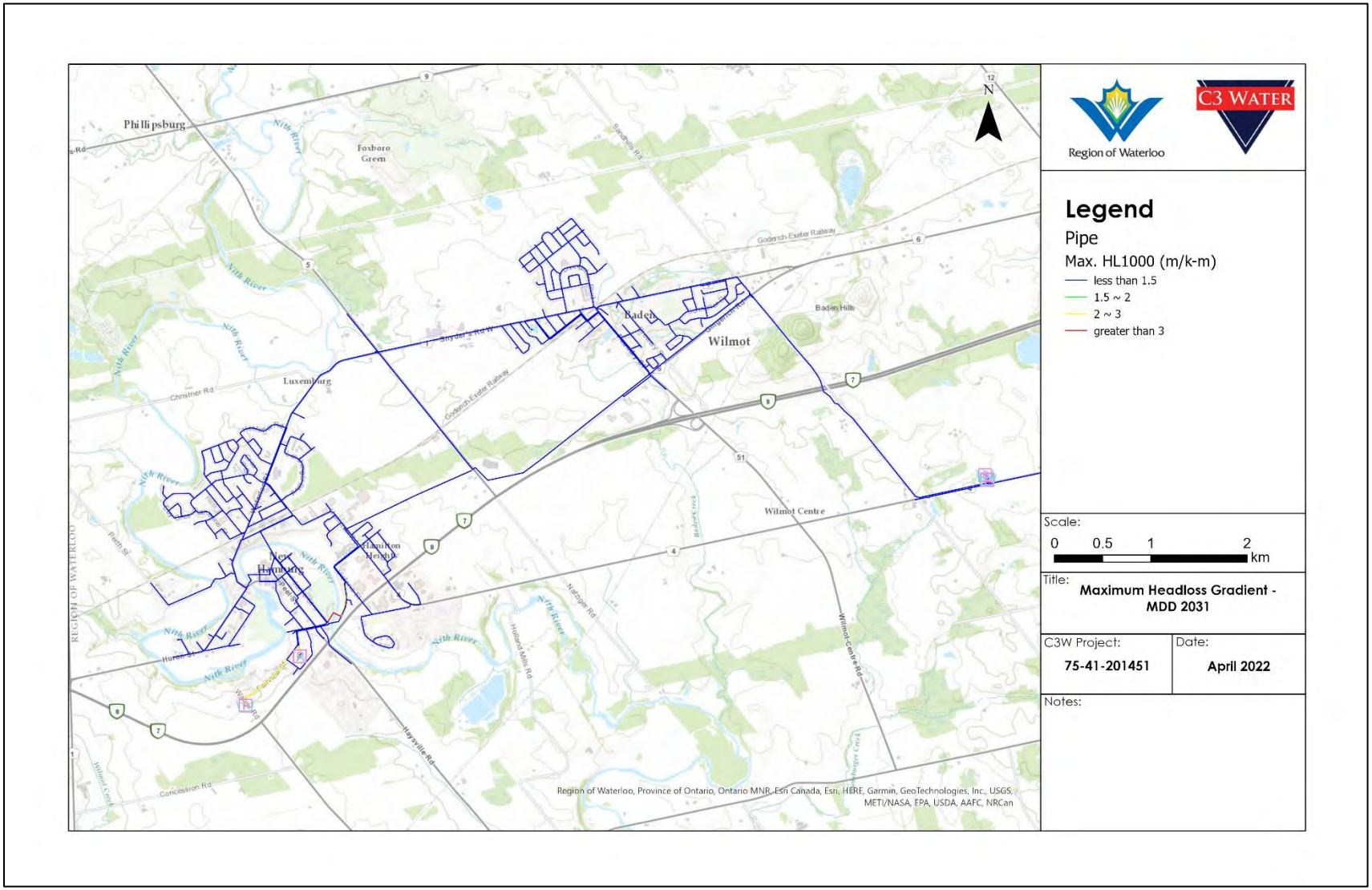


Figure 6-14 Maximum Headloss Under Future Maximum Day Conditions.

7.0 Development of Alternatives

To accommodate future growth, additional treated water storage is required to meet MECP requirements and to satisfy system demands. Three storage alternatives have been explored, as well as additional redundancy alternatives

7.1 Water Storage Alternatives

Based on the storage assessment in Section 5.2, approximately 3,412 m^3 of additional storage is required to meet future requirements. The following alternatives were explored:

1. WS1 – Do Nothing
2. WS2 – Expanded storage at NH WTP and upgrade the NH pump station
    - Update existing pumps with vertical turbines to increase usable volume of existing reservoir from 60% to 100% of total existing volume (1.5 ML to 2.4 ML usable volume within existing reservoir)
    - Install additional reservoir with 2.5 ML of usable storage volume
    -
3. WS3 – Added storage at Baden wells
    - New reservoir with 3.4 ML usable volume
4. WS4 – Added storage at K50 wells
    - New reservoir with 3.4 ML usable volume

7.1.1 WS1 – Do Nothing

This alternative does not include any facility or equipment upgrades and would not meet the overall intent of the study. However, it is used for comparison purposes.

7.1.2 WS2 – Expanded Storage at NH WTP

The WTP in New Hamburg includes a 2.4 ML in-ground treated water reservoir, however, the existing usable volume is approximately 1.5 ML, based on the hydraulic limitations of the horizontal split-case pumps. For this storage alternative, an additional 2.5 ML would be installed at the New Hamburg reservoir and the existing pumps would be replaced with vertical turbines to increase the usable volume of the existing reservoir to 2.4 ML. In total, the usable volume at the New Hamburg reservoir would be increased by approximately 3.4 ML, compared to existing conditions. This satisfies MECP storage requirements. The New Hamburg WTP site is shown in Figure 7-1.



Figure 7-1 New Hamburg WTP Site and Fence Line

Current site limitations may require the acquisition of additional land to provide sufficient area for a larger reservoir. The benefits of additional storage at the NH WTP would be the proximity to New Hamburg and the ability to provide peak flows or fire flows. Additional pumping capacity would be considered to help access the increased storage and supply local demands.

7.1.3 WS3 – Added Storage at Baden Wells

The Baden wells site is a second possible location for new treated water storage. A new 3.4 ML in-ground reservoir would satisfy MECP storage requirements. Because the Baden wells are not being considered for local supply in this assessment, the reservoir would be filled from the Baden water distribution system. A new booster pumping station would be required to boost water into the system.
This is likely the least efficient method of storage as re-pumping would be required. The Baden wells site is shown in Figure 7-2.



Figure 7-2 Baden Wells Site and Fence Line

Similar to the New Hamburg WTP site, current site limitations may require the acquisition of additional land to accommodate the area required for a new reservoir.

7.1.4 WS4 – Added Storage at K50 Wells

The third storage alternative considered is the K50 well site. Under this alternative a new 3.4 ML in-ground reservoir would be installed to satisfy future storage requirements. This reservoir would be filled by the K50 wells. A new booster pumping station would be required to pump water from the reservoir into the distribution system. The K50 well site is shown in Figure 7-3. The K50s are currently undergoing an Environmental Assessment to investigate the addition of Iron and Manganese treatment. As part of this study, onsite treated water storage may be required and could be combined with the needs of this study.



Figure 7-3 K50 Wells Site and Fence Line.

While additional area may be required to accommodate the new reservoir, the K50 site currently only uses a portion of the total land owned by the Region. The dashed fence line in Figure 7-3 represents land acquisition that would be occurring as part of the recommendations from the EA.

7.1.5 Combination Storage

There is a possibility to provide storage from a combination of two or three identified locations. This option may remove the requirement for land purchase if smaller reservoirs can be added to multiple sites.

7.2 Supply Redundancy Alternatives

As discussed in Section 5 and shown in Figure 5-1 there is significant available water supply at the combination of the K50s and the NH wells. The future MDD of 95.7 L/s is less than half of the total supply capacity 199 L/s. With additional storage provided, additional redundancy will be built into the system to provide peak demands and potential short term supply interruptions. It should be noted that a portion of the K50s supply is sent to the east to supply Mannheim demands and fill the Mannheim Reservoir, but the full supply capacity at the K50s is available for the BNH system, if needed.

The Baden New Hamburg system is highly dependent on the K50s as they provide about 80% of the system's available supply. If the K50 wells are offline for an extended

duration, supply to Baden New Hamburg would be a significant concern and challenge. The following alternate supply options have been discussed.

7.2.1 Connection to Mannheim Well System

A potential redundancy alternative is to supply water from the Mannheim village and the Mannheim wells to Shingletown through a hydraulically actuated back feed line in the Shingletown valve chamber. The Mannheim well system has significant capacity and supplies the Mannheim Reservoir. In an emergency water could be reversed and sent to the west to Baden. There are limitations such as the HGL of the Mannheim system and the ability to bypass the Shingletown PSV which will be investigated as part of the evaluation process.

The Singleton PSV could be opened to feed Shingletown from Mannheim during high demand events. This scenario provides redundancy to the system.

7.2.2 Connection to the Erb Street System

Connecting the BNH system to the Erb Street watermains was considered as a redundancy alternative. However, due to water quality concerns of mixing chlorinated and chloraminated water, as well as the extensive construction required to bridge the distance between these systems, the alternative is no longer being considered.

7.3 Foxboro Connection

The community of Foxboro located north of Baden is currently undergoing a review of its water supply. At present, a retrofit of the Foxboro WTP is required to continue operation. The capacity of the Foxboro wells has also been in decline and additional supply options need to be explored. This presents the opportunity to connect Foxboro to the BNH system. The following alternatives are being considered:

1. F1 – Do Nothing (Upgrade and Maintain the Existing Foxboro WTP)
2. F2 – Connection to Baden using existing road allowances
3. F3 – Connect to Baden using a direct route
4. F4 – Connection to New Hamburg using existing road allowances

7.3.1 F1 – Do Nothing

Under this alternative, Foxboro would continue to be serviced by the existing Foxboro WTP with no connection to the BNH system. However, the Region has identified the need for significant equipment upgrades or replacement in the immediate future.

7.3.2 F2 – Connection to Baden Using Existing Road Allowances

This alternative would see Foxboro using existing allowances between community and Baden. This aligns with the proposed sanitary servicing alternative and would see watermains installed in conjunction with a new sanitary service line. An example of this route is shown in Figure 7-4.

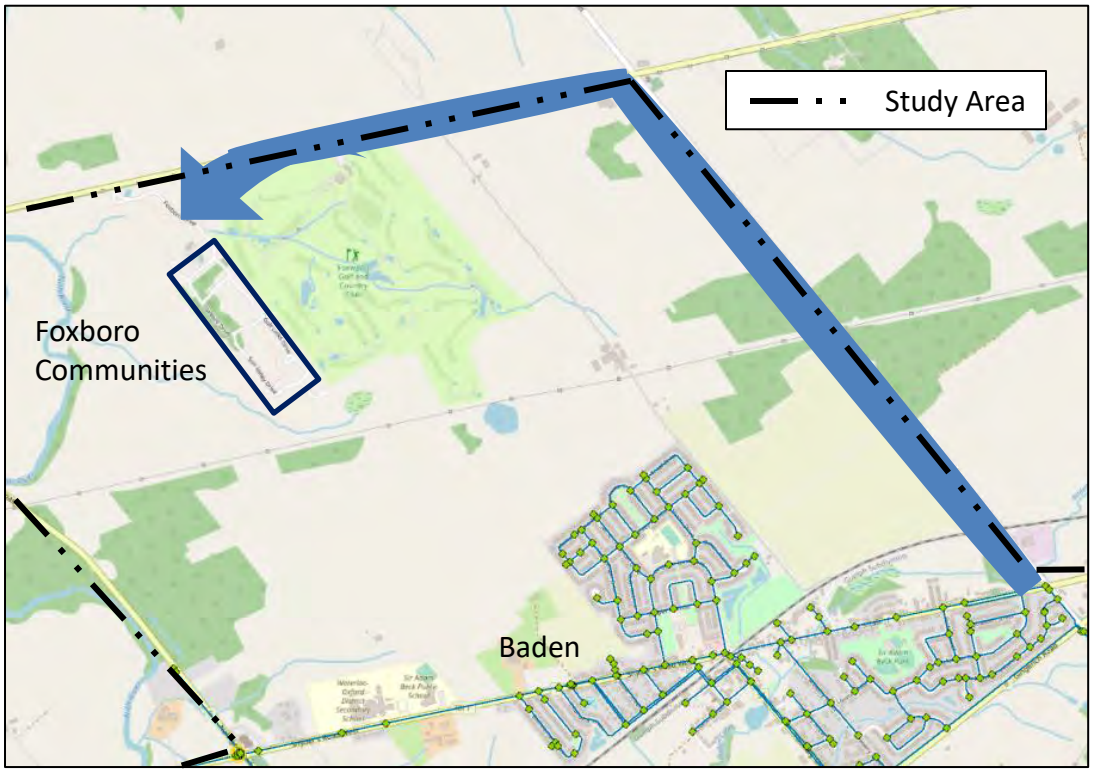


Figure 7-4 Possible Connection to Baden Using Road Allowances

7.3.3 F3 – Connect to Baden Using a Direct Route

Lands between Foxboro and Baden are being considered for development. This presents the option of providing a direct connection between Baden and Foxboro via a new watermain connected to the south end of Foxboro, as shown in Figure 7-5.

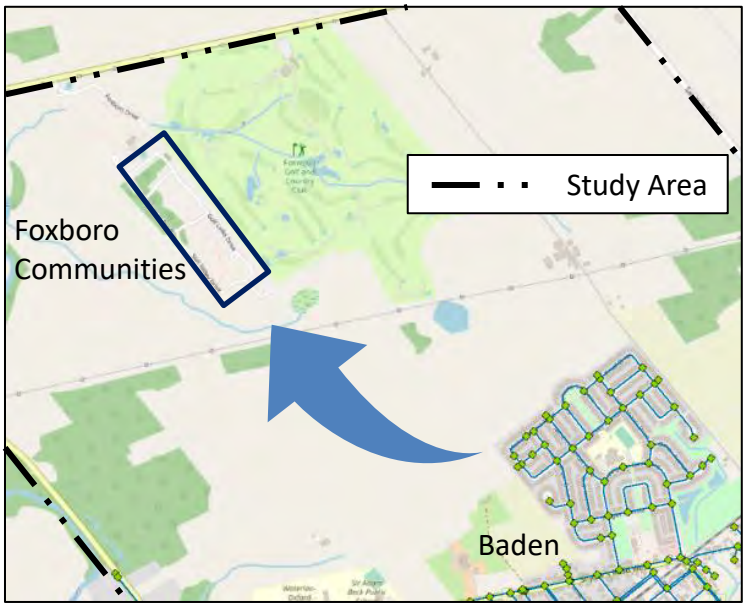


Figure 7-5 Connection Point Between Foxboro and Baden

7.3.4 F4 – Connection to New Hamburg Using Existing Road Allowances

This alternative would see Foxboro using existing allowances between community and Baden. This aligns with the proposed sanitary servicing alternative and would see watermains installed in conjunction with a new sanitary service line. An example of this route is shown in Figure 7-6.

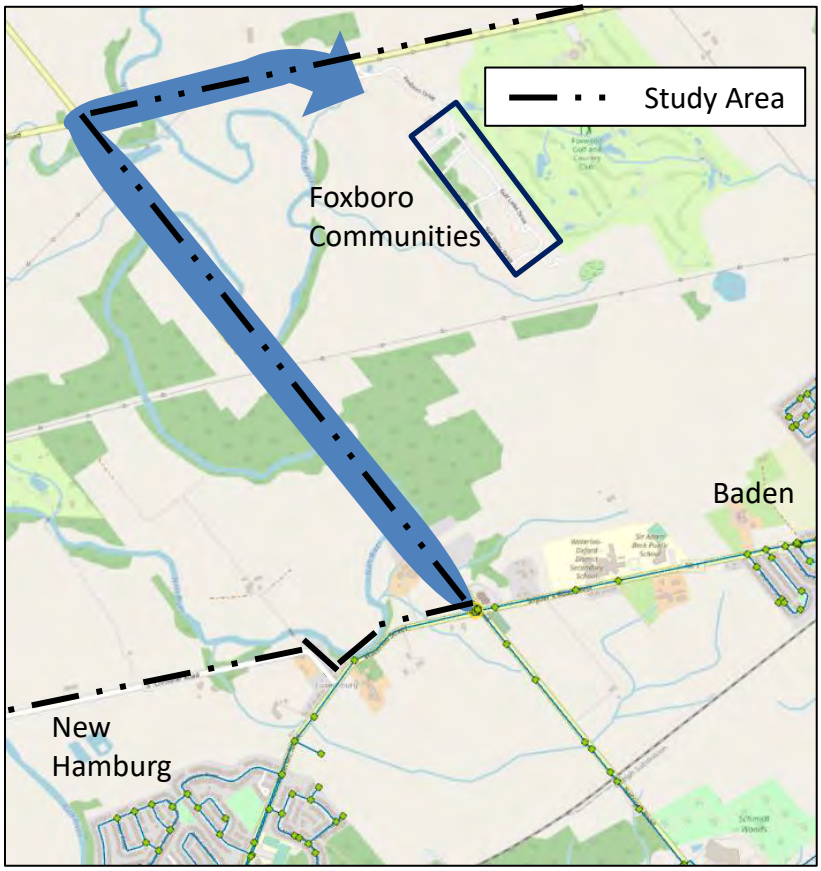


Figure 7-6 Possible Connection to New Hamburg Using Road Allowances

7.4 Alternatives Summary

The block diagram in Figure 7-7 summarizes both the storage alternatives and redundancy alternatives explored in this report.

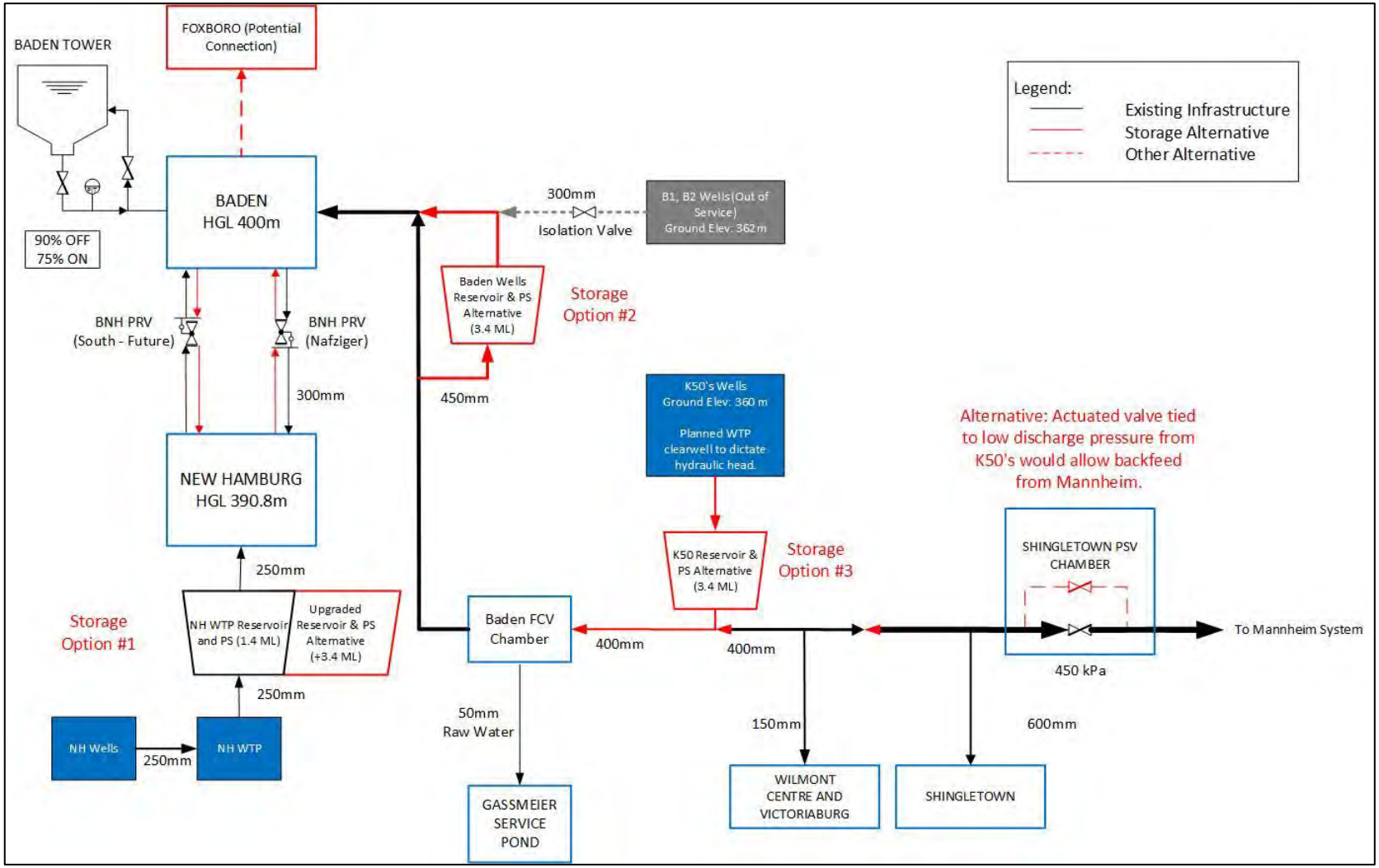


Figure 7-7 Block Diagram of the BNH System with Storage and Redundancy Alternatives

8.0 Conclusions and Recommendations

This analysis of the existing water demonstrated:

- Existing water supply capacity is sufficient to meet existing and future demands.
- Existing available storage does not meet the existing or future storage requirements based on MECP storage and fire flow guidelines. Additional storage of approximately 3.4 ML is required to meet future requirements.

To meet future demand requirements, the following storage alternatives were developed:

1. Do nothing.
2. Expanded storage at NH WTP,
    a. Increase usable volume by 3.4 ML
        i. Install additional reservoir with 2.5 ML usable volume
        ii. Upgrade pump station to increase usable volume of existing reservoir and pumping capacity
3. Added storage at Baden wells,
    a. New reservoir with 3.4 ML usable volume
    b. Requires new pumping station
4. Added storage at K50 wells.
    a. New reservoir with 3.4 ML usable volume
    b. Requires new pumping station

The following alternatives were developed for supplying the Foxboro System:

1. Do nothing (maintain existing Foxboro WTP)
2. Connection from Baden to Foxboro using existing road allowances.
3. Direct connection between Foxboro and Baden.
4. Connection from New Hamburg to Foxboro using existing road allowances.

APPENDIX A

Fire Flow

Fire Flow Calculations

MOECP Design Guidelines for Drinking Water Systems (2008) provides suggested fire flows for small municipalities in Ontario. Table 8.1 below outlines the suggested flow at various populations:

Table 8-1: Fire Flow Requirements

EQUIVALENT POPULATION[1]	SUGGESTED FIRE FLOW (L/s)	DURATION (HOURS)
500 – 1 000	38 (10 ft/s)	2
1 000	64 (17 ft/s)	2
1 500	79 (21 ft/s)	2
2 000	95 (25 ft/s)	2
3 000	110 (29 ft/s)	2
4 000	125 (33 ft/s)	2
5 000	144 (38 ft/s)	2
6 000	159 (42 ft/s)	3
10 000	189 (50 ft/s)	3
13 000	220 (58 ft/s)	3
17 000	250 (66 ft/s)	4
27 000	318 (84 ft/s)	5
33 000	348 (92 ft/s)	5
40 000	378 (100 ft/s)	6

Note [1]: When determining the fire flow allowance for commercial or industrial areas, it is recommended that the area occupied by the commercial/industrial complex be considered at an equivalent population density to the surrounding residential lands.

	Population				
	2011	**2016**	**2021**	**Growth**	**Total Population (2041)**
Baden	4,500	4,940	5,380	3,738	9,118
New Hamburg	12,000	13,595	15,190	4,600	19,790
Total		18,535	20,570	8,338	**28,908**

Through interpolation, a flow of 330 L/s is required under future conditions to satisfy MOECP requirements.

Appendix E
Technical Memo #4 Wastewater Infrastructure Alternatives

Baden – New Hamburg Water and Wastewater System Servicing Review – Technical Memorandum #4 – Wastewater Infrastructure Alternatives

Prepared for:
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June 24, 2022

Revision	Description	Author	Quality Check
R0	Draft	JI	MK / JP
R1	Final	JI/HH	JP

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Reviewed by 

(signature)

Mike Kocher, P.Eng.

Approved by 

(signature)

Jeff Paul, P.Eng.

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Abbreviations

ADF	Average Daily Flow
ANSI	Areas of Natural and Scientific Interest
BNH	Baden New Hamburg
CHAR	Cultural Heritage Assessment Report
CWA	Clean Water Act
DFO	Department of Fisheries and Oceans
EA	Environmental Assessment
ECA	Environmental Compliance Approval
ESA	Endangered Species Act
I/I	Inflow and Infiltration
masl	Metres above sea level
MBR	Membrane Bioreactor
MECP	Ministry of Environment, Conservation and Parks
MHSTCI	Ministry of Heritage, Sport, Tourism and Culture Industries
MOECC	Ministry of the Environment and Climate Change
MNRF	Ministry of Natural Resources and Forestry
PRV	Pressure Reducing Valve
PSW	Provincially Significant Wetland
RBC	Rotating Biological Contactor
RMOW	Regional Municipality of Waterloo
SAR	Species at Risk
SARA	Species at Risk Act

SBR	Sequencing Batch Reactor
SCADA	Supervisory Control and Data Acquisition
SOCC	Species of Conservation Concern
SPP	Source Protection Plan
WWPS	Wastewater Pumping Station
TM	Technical Memorandum
UNESCO	United Nations Educational, Scientific and Cultural Organization
UV	Ultraviolet
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant

1.0 Background

The Region of Waterloo (Region) retained Stantec Consulting Ltd. (Stantec) and C3 Water Inc. (C3W) to complete a System Servicing Review for the New Hamburg Water and Wastewater Systems. The purpose of this Servicing Review is to evaluate the status of existing water and wastewater servicing systems in Baden – New Hamburg, provide recommendations to address existing servicing constraints, and to provide the framework to meet the water / wastewater servicing needs.

Phase 1 of the System Servicing Review included problem identification to identify and establish a clear understanding of the completed studies to date and the problems and/or opportunities related to the existing water and wastewater servicing systems in Baden – New Hamburg. Technical Memorandum #1 (TM 1), which was previously submitted, provided a summary of the background information related to the project. Virtual Public Consultation Centre No. 1 (PCC #1) was held online starting on June 1, 2021, to provide the public and stakeholders background information on the study and the opportunity to provide input early in the project.

The following Problem Statement was developed as part of Phase 1:

The communities of Baden and New Hamburg are currently serviced by a two-tier water and wastewater system run by the Township and the Region. There are currently six (6) locations that provide water services to Baden and New Hamburg (K50 Wells, New Hamburg Wells, Reservoir and Water Treatment Plant, Foxboro Wells and Water Treatment Plant, Baden Wells, Baden Elevated Tank, and Nafziger Pressure Reducing Valve) and five (5) locations that provide wastewater services (New Hamburg WWTP, Foxboro Green WWTP and Pumping Station, Morningside WWPS, Baden WWPS, and New Hamburg WWPS No. 2).

This Servicing Review will assess the current water and wastewater systems that serve the communities of Baden, New Hamburg and Foxboro Green and assess current and future servicing needs within the community based on the Region's 2011 Master Plan Update, the Township of Wilmot's 2019 Official Plan, Recommendations from the Region's 2018 Wastewater Treatment Master Plan and current development applications.

Phase 2 of the EA process includes the development and evaluation of alternative solutions to address the problem or opportunity. The purpose of TM 4 is to present the wastewater alternative solutions developed to address the problem statement.

1.1 Study Area

As shown in **Figure 1-1**, the study area for this servicing review includes the wastewater systems that serve the communities of Baden, New Hamburg and Foxboro within the Township of Wilmot, Region of Waterloo.

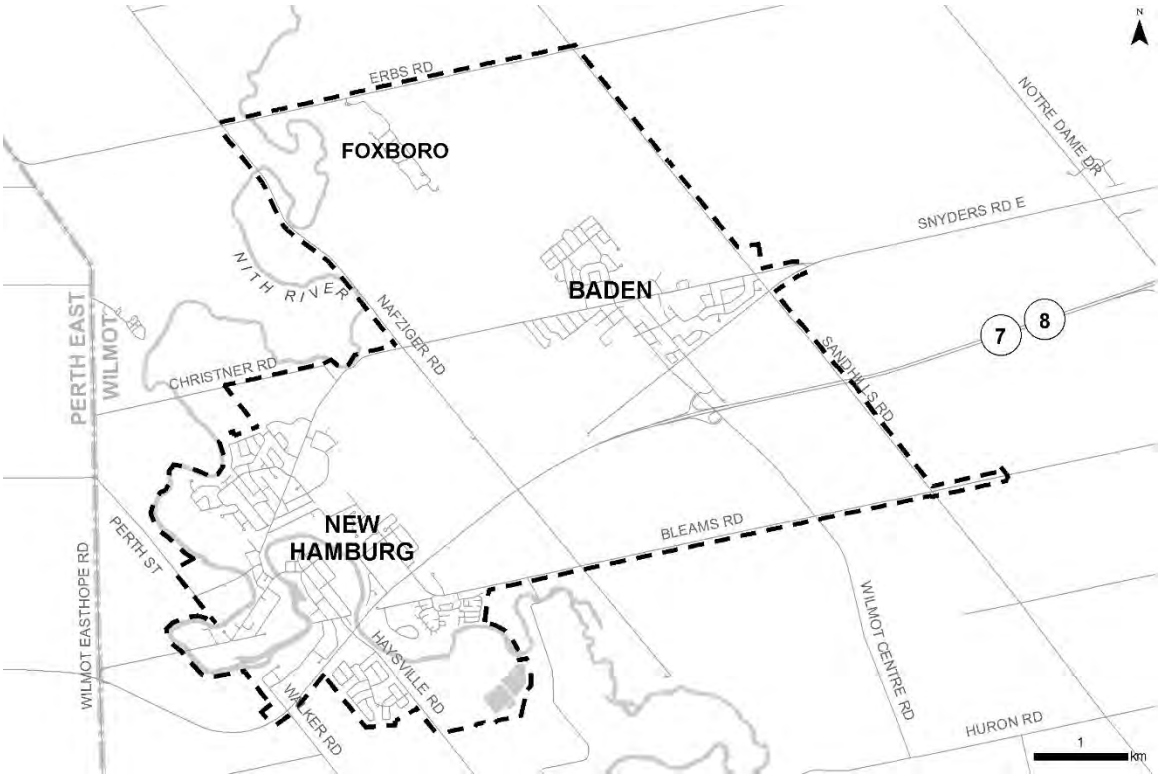


Figure 1-1: Servicing Review Study Area

1.2 Existing Wastewater System

Regionally owned and operated wastewater infrastructure within the study area include:

- New Hamburg WWTP
- Foxboro WWTP
- Morningside WWPS
- Baden WWPS

Wastewater is collected from the Baden and New Hamburg service areas and conveyed to the New Hamburg WWTP for treatment and subsequently discharged into the Nith

River. An in-depth description of system operations is provided in Section 4.1 of this report.

Wastewater from the community of Foxboro Green is treated at the Foxboro WWTP with biological treatment and denitrification, followed by discharge to existing leaching beds located within the Foxboro Green community. The Foxboro WWTP serves a single community and is separate from the Baden-New Hamburg system.

The New Hamburg WWTP is located south of New Hamburg and was recently expanded by the Region. As outlined in Section 1.3, the New Hamburg WWTP is expected to have sufficient capacity for future growth. The Baden WWPS and Morningside WWPS and their associated forcemains have sufficient capacity for existing conditions but are under capacity with future growth demands.

1.3 Projected Growth

This servicing study will include the development blocks within the Urban Area Boundary as indicated in Figure 2-1. A summary of the projected growth flow is provided in the tables below. Further information on these projections can be found in Tech Memo #1 – Background Review. Note that these flow projections assume that the current system configuration is maintained, that is that all Baden WWPS flows are conveyed through the Morningside WWPS, before discharging to the New Hamburg WWTP. Table 2-1 presents the projected average daily flows (ADFs) for the major Region facilities impacted by future growth.

Table 2-1: Projected Average Daily Flows

	Current ADF (L/s) [1]	Projected Additional ADF (L/s)	Total Daily Flow (L/s) (Current + Projected)	Rated Capacity (NH WWTP – ADF) (L/s)
Baden WWPS	17.07	13.50	30.33	-
Morningside WWPS	44	34.85	78.42	-
New Hamburg WWTP	42.82	34.85	77.25	79.86

As shown in Table 2-1, the New Hamburg WWTP is expected to have sufficient average day flow (ADF) rated capacity to accommodate the future growth planned within the Baden and New Hamburg Urban Area Boundaries. As a result, the treatment capacity of the New Hamburg WWTP was not reviewed further as part of this study.

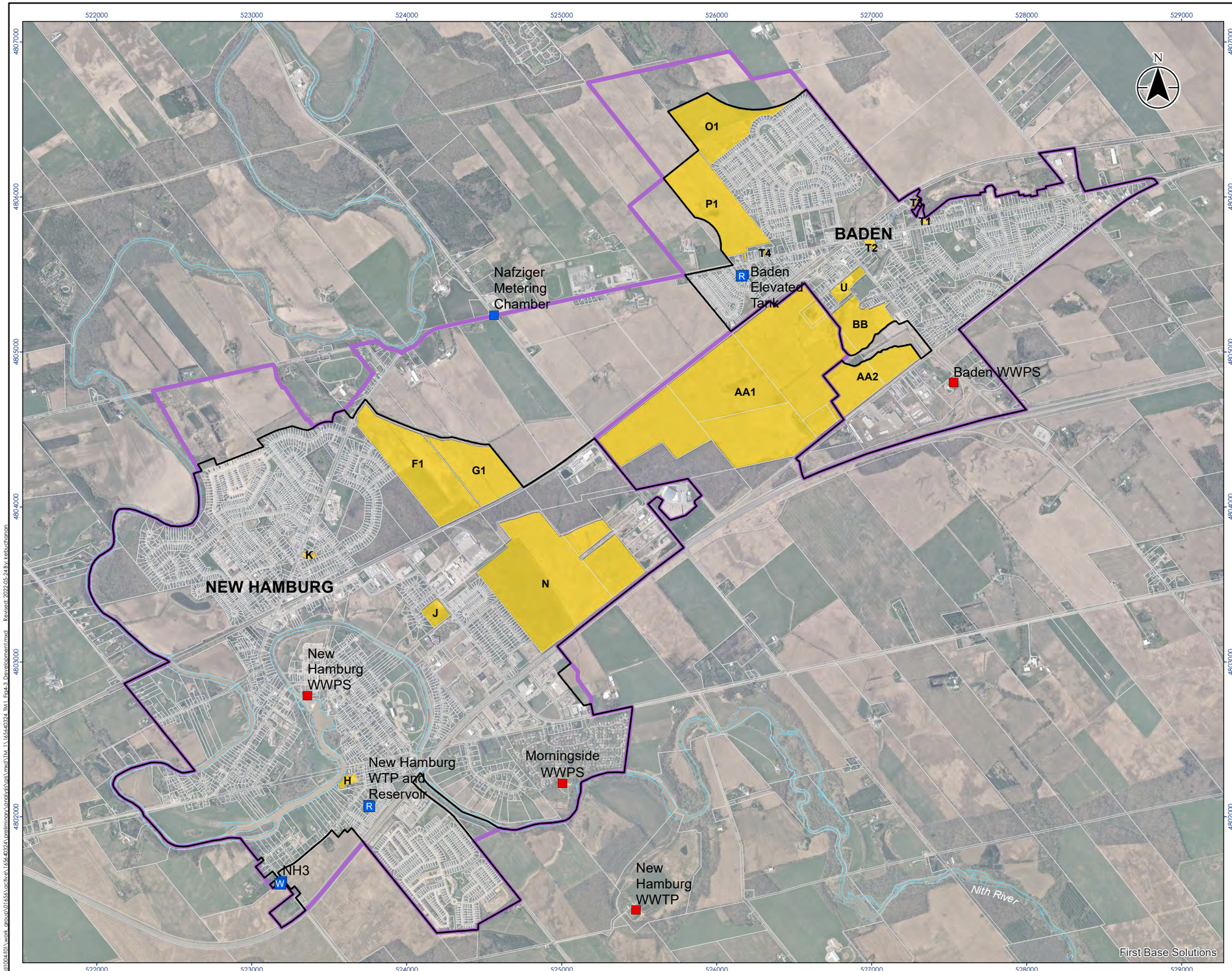
Table 2-2 presents the projected peak wet weather flows (WWFs) for each facility.

Table 2-2: Projected Peak Wet Weather Flows

	Peak WWF (L/s) (2016) [1]	Projected Additional Peak WWF (L/s)	Total Peak WWF (L/s) (Current + Projected)	PS Firm Capacity (L/s)[2]	Rated Capacity (NH WWTP – Peak WWF) (L/s)
Baden WWPS	185	59.87	244.06	187	-
Morningside WWPS	205	147.13	360.78	248	-
New Hamburg WWTP	205	147.13	360.78	-	351

1. Region of Waterloo 2018 Wastewater Treatment Master Plan (CIMA+, July 2018)

2. Note – Baden WWPS Firm Capacity includes both the station's mainline firm pumping capacity (max 49 L/s) plus peak flow pumping capacity to the existing onsite storage system (~ 138 L/s). Flows above the Baden WWPS Firm Capacity are handled with trucking.



Legend

- Water Facility
- Wastewater Facility
- Development Block
- Urban Area Boundary
- Countryside Line

0 500 1,000 m

1:25,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017.
3. Orthoimagery from Region of Waterloo web map service. Imagery Date, 2018.

Project Location
Wilmot
Township

165640324 REVA
Prepared by KDB on 2022-05-24

Client/Project
REGION OF WATERLOO
BADEN – NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
1-2

Title
Development Blocks within the Urban Area Boundary

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\\cd1004101\work_group\v0\165640324\active\165640324 preliminary\Concepts\Maps\mxd\Fig1-2 Development.mxd Revised: 2022-05-24 By: kbshannon

2.0 Evaluation Criteria

As part of Phase 2 of the Municipal Class EA process, reasonable and feasible solutions to address the issues and opportunities are identified and evaluated based on their ability to address them, and their impacts to the socio-economic, natural, cultural, and technical environments.

Table 3-1 provides a summary of the environmental components and evaluation criteria that will be employed during the selection of the preferred alternative solution.

Table 3-1: Environmental Components and Evaluation Criteria

Environmental Component	Evaluation Criteria
Environmental	• Protects environmental features • Protects wildlife and species at risk • Protects groundwater, streams and rivers • Minimizes climate change impacts
Social	• Minimizes impacts to residents related to noise, odour, traffic and aesthetics • Minimizes impacts to businesses • Manages and minimizes construction impacts • Protects cultural heritage features • Protects archeological features • Protects health and safety
Technical	• provides reliable service • Meets existing and future needs • Aligns with existing and planned infrastructure • Aligns with existing and future land use • Aligns with approval and permitting process • Manages and minimizes construction risks • Ability to adapt to climate change
Financial	• Provides low lifecycle costs

Further information can be found in TM #2 – Evaluation Criteria. These evaluation criteria will be applied to each alternative during the detailed evaluation process to be completed as part of the next phase of the project. The following outlines the various wastewater alternative solutions that are under consideration for the project.

3.0 Alternative Solutions – Wastewater

In order to address the above Problem/Opportunity statement the following alternatives were identified:

Future Pumping Station and Forcemain Capacity

- Alternative WW1 - Do Nothing
- Alternative WW2 - Upgrade System and Maintain Existing Configuration
- Alternative WW3 - Upgrade System and Convey Directly to Morningside WWPS
- Alternative WW4 - Upgrade System and Convey Directly to New Hamburg WWTP

The “do nothing” alternative maintains the status quo and is included as a comparative benchmark for the other identified alternatives. This alternative does not meet the original objectives of the study and should not be selected as the preferred alternative.

In addition to the above Alternatives, consideration was given to the future servicing of the Foxboro Green community, due to the high operational and maintenance costs and complexity of its existing wastewater treatment facility. Additional capital upgrades have also been identified for the facility in order to meet treatment requirements. Drinking water for the community is also supplied by existing groundwater wells that are showing declining capacity.

The following Alternative Solutions have been developed to address the key issues identified for water supply and wastewater servicing needs for the Foxboro community:

- Alternative F1 - Do Nothing
- Alternative F2 - Provide Connection to Existing Baden Infrastructure Using Existing Road Allowances
- Alternative F3 - Provide Connection to Baden Using a Direct Route

  Alternative F4 - Provide Connection to Existing New Hamburg Infrastructure Using Existing Road Allowances

4.0 Evaluation of Alternatives

The following sections provide details on each of the alternatives being considered to meet the needs as described in the Problem/Opportunity statement.

Common to Alternatives WW2, WW3 and WW4 is the need to upgrade the Baden WWPS. Although the capacity of the station is sufficient under existing conditions in dry weather conditions, the capacity is being exceeded during significant wet weather events. This has resulted in the need to call in vacuum trucks and tankers to haul excess wastewater to the New Hamburg WWTP during recent high wet weather flows.

4.1 Alternative WW1 - Do nothing

This alternative does not include any upgrades to the existing Region wastewater assets within the system. The following tables outline the ability of the Baden WWPS, Morningside WWPS and the New Hamburg WWTP to manage average day flow and peak wet weather flows under future conditions.

Table 4-1: Alternative WW1 – Pumping Station Impacts Under DWF Conditions

	Current ADF (L/s) [1]	Projected Additional ADF (L/s)	Total Daily Flow (L/s) (Current + Projected)	PS Firm Capacity (L/s)[2]	PS DWF Capacity / Deficit (L/s)	Able to Manage DWFs?
Baden WWPS	17.07	13.50	30.33	49	18.67	✓
Morningside WWPS	44	34.85	78.42	248	169.58	✓

1. Region of Waterloo 2018 Wastewater Treatment Master Plan (CIMA+, July 2018)
2. Baden WWPS Firm Capacity consists of 49 L/s through the forcemain, and 138 L/s being handled by the storage element.

Table 4-2: Alternative WW1 – Pumping Station Impacts Under WWF Conditions

	Peak WWF (L/s) (2016) [1]	Additional Peak WWF (L/s)	Total Peak WWF (L/s) (Current + Projected)	PS Firm Capacity (L/s)[2]	PS WWF Capacity / Deficit (L/s)	Able to Manage WWFs?
Baden WWPS	185	59.87	244.06	187	(57.06)	X
Morningside WWPS	205	87.26[a]	292.26	248	(44.26)	X

1. Region of Waterloo 2018 Wastewater Treatment Master Plan (CIMA+, July 2018)

2. Baden WWPS Firm Capacity consists of 49 L/s through the forcemain, and 138 L/s being handled by the storage element.

a. Additional peak WWF from Baden WWPS conveyed to Morningside WWPS is limited to 49 L/s, based on capacity of existing Baden WWPS forcemain.

Table 4-3: WW1 - New Hamburg WWTP Impacts Under DWF and WWF Conditions

	ADF (L/s)	Able to manage DWF's?	Total Peak WWF (L/s)	Able to manage WWF's?
New Hamburg WWTP	78.42	✓	292.26	✓

1. New Hamburg WWTP ADF rated capacity is 6,900 M3/day (converted to 79.86 L/s)

2. New Hamburg WWTP PWWF rated capacity is 30,360 m3/day (converted to 351 L/s)

A flow diagram for Alternative WW1 is shown below:

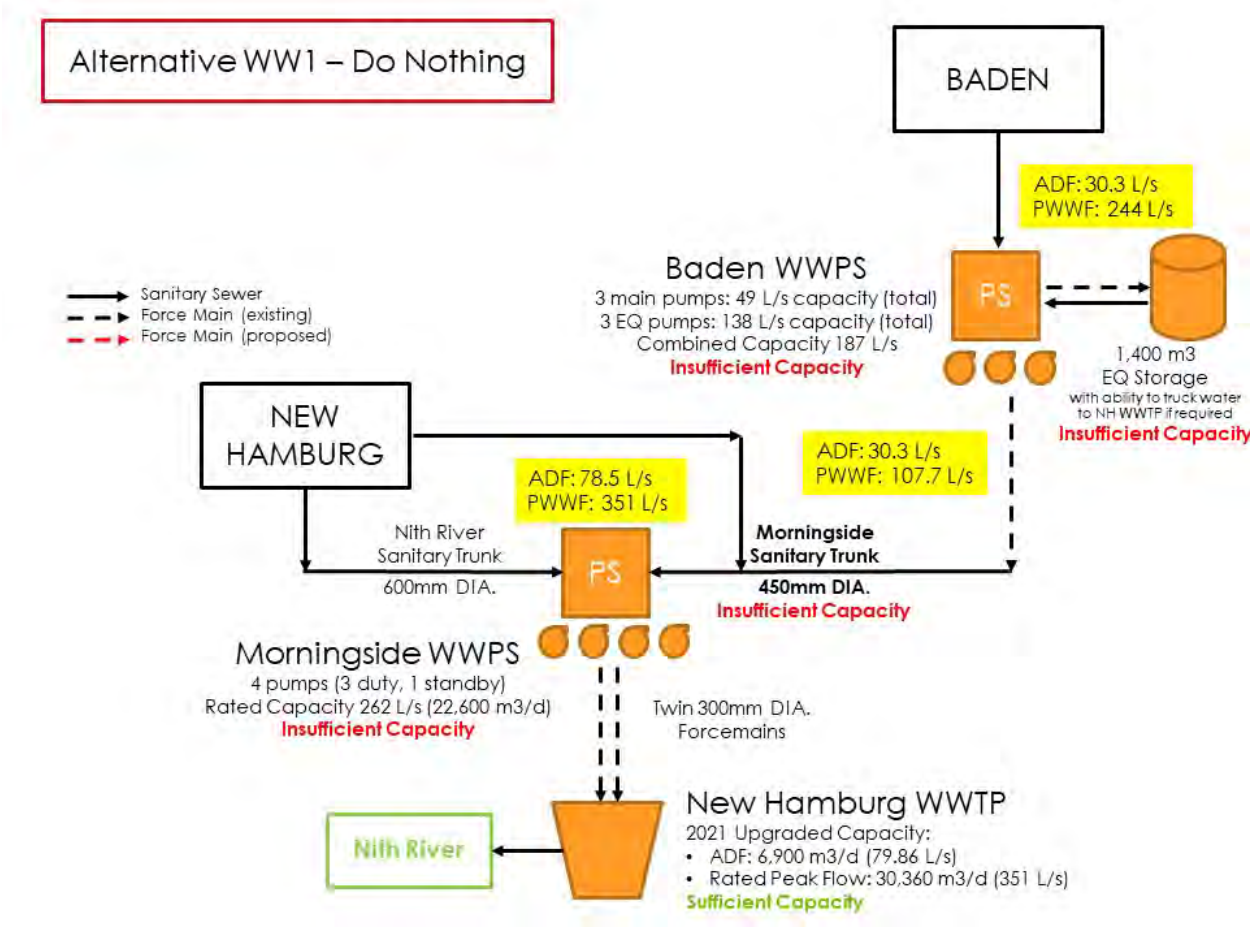
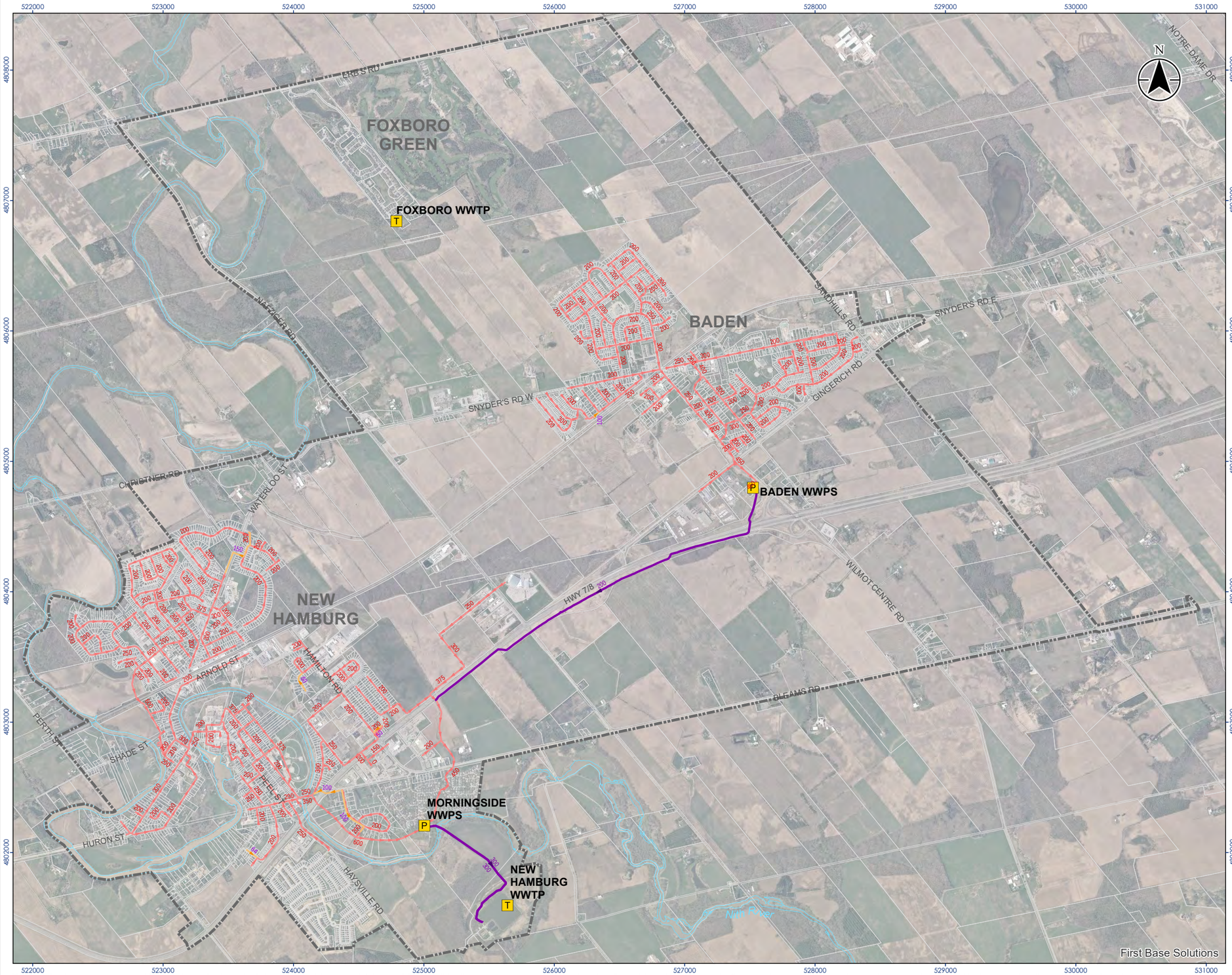


Figure 4-1: Alternative WW1 - Do Nothing (Flow Diagram)

- A maximum of 49 L/s can currently be conveyed from the Baden WWPS (through single forcemain).
- Historically the Morningside WWPS received approximately 156 L/s of WWF from the existing New Hamburg service area.
- Under the Do Nothing Scenario, both the firm capacity of the Baden WWPS and the Morningside WWPS would be exceeded, therefore this is not a feasible alternative for consideration.

This alternative does not include any upgrades and would not meet the overall intent of the study but is used for comparison purposes.



Stantec

C3 WATER

Legend

- Study Area
- T Waste Water Treatment Plants
- P Sanitary Pumping Station
- Forcemain (Region)
- Sanitary Sewer (Wilmot)
- Forcemain (Wilmot)

0 500 1,000 m

1:30,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Contains information provided by the Region of Waterloo and information licensed under the Open Government Licence – Ontario.
3. Spring 2018 orthoimagery from Region of Waterloo web map service.

Project Location
Wilmot Township

165640324 REVA
Prepared by KDB on 2022-05-26

Client/Project
REGION OF WATERLOO
BADEN - NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
4-2

Title
Existing Waste Water System

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V:\0165\active\165640324\gis\mxd\Figure 4-2 Existing Wastewater System.mxd Revised: 2022-05-26 By: kebuchanan

4.2 Alternative WW2 - Upgrade System and Maintain Existing Configuration

This alternative maintains the existing wastewater system configuration and provides the upgrades and new infrastructure required to meet the future needs of Baden New Hamburg.

The following tables outline the ability of the Baden WWPS, Morningside WWPS and New Hamburg WWTP to manage average day flow and peak wet weather flows under this Alternative.

Table 4-4:Alternative WW2 – Pumping Station Impacts Under DWF Conditions

	Current ADF (L/s) [1]	Projected Additional ADF (L/s)	Total Daily Flow (L/s) (Current + Projected)	Upgraded PS Firm Capacity (L/s)[2]	PS DWF Capacity / Deficit (L/s)	Able to Manage DWFs?
Baden WWPS	17.07	13.50	30.33	108	18.67	✓
Morningside WWPS	44	34.85	78.42	351	272.58	✓

1. Region of Waterloo 2018 Wastewater Treatment Master Plan (CIMA+, July 2018)
2. Baden WWPS Upgrade Firm Capacity consists of 108 L/s through the forcemain

Table 4-5: Alternative WW2 – Pumping Station Impacts Under WWF Conditions

	Peak WWF (L/s) (2016) [1]	Additional Peak WWF (L/s)	Total Peak WWF (L/s) (Current + Projected)	Upgraded PS Firm Capacity (L/s)[2]	PS WWF Capacity / Deficit (L/s)	Able to Manage WWFs?
Baden WWPS	185	59.87	244.06	244.06	0	✓
Morningside WWPS	205	146	351	351	0	✓

1. Region of Waterloo 2018 Wastewater Treatment Master Plan (CIMA+, July 2018)
2. Baden WWPS Upgrade Firm Capacity would consist of 108 L/s through the forcemain, and 136 L/s being handled by the storage element.

Table 4-6: WW2 - New Hamburg WWTP Impacts Under DWF and WWF Conditions

	ADF (L/s)	Able to manage DWF's?	Total Peak WWF (L/s)	Able to manage WWF's?
New Hamburg WWTP	78.42	✓	351	✓

1. New Hamburg WWTP ADF rated capacity is 6,900 m^3/day (converted to 79.86 L/s)
2. New Hamburg WWTP PWWF rated capacity is 30,360 m^3/day (converted to 351 L/s)

A flow diagram for Alternative WW2 is shown below:

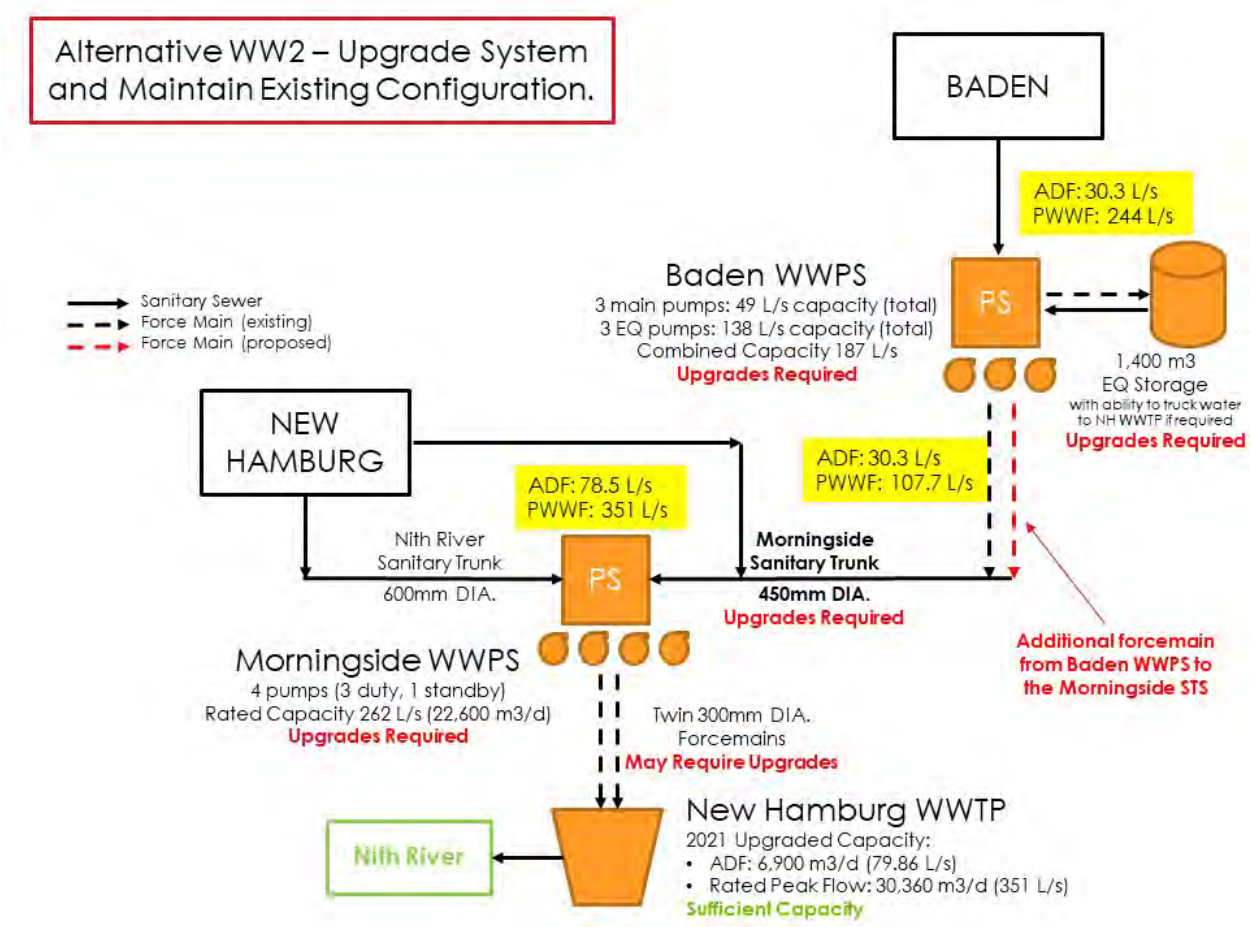


Figure 4-3: Alternative WW2 - Upgrade System and Maintain Existing Configuration (Flow Diagram)

This alternative includes the addition of a new forcemain which would run alongside the existing 200 mm forcemain connecting Baden WWPS to the Morningside Trunk Sewer. The forcemain would be approximately 3.5 km long and would be sized to handle some of the additional projected PWWF from Baden. Additional routing options may also be considered for one or both of the forcemains if this option was selected as the preferred alternative.

Under this alternative, the peak velocity through the twin 300 mm dia. forcemains between Morningside WWPS and the New Hamburg WWTP would be approximately 2.8 m/s. This is on the high range of acceptable forcemain velocities. For example, the Kitchener Pumping Station Design Manual recommend a velocity between 0.8 and 2.5 m/s, and the MECP Design Guidelines for Sewage Works recommends a maximum of 3.0 m/s. Depending on the maximum forcemain velocity that would be acceptable to the Region of Waterloo, this may result in upgrades being required to the existing Morningside WWPS forcemain.

The Baden New Hamburg WWTP has a rated PWWF capacity of 351 L/s, which limits the amount of additional PWWF that can be sent to the Morningside WWPS (and subsequently New Hamburg WWTP) to 58.74 L/s. Baden WWPS would have to be upgraded to have the capacity to pump the additional 58.74 L/s of PWWF and must contain a storage element capable of handling the remaining of 136.32 L/s of future PWWF.

Morningside WWPS currently has a firm capacity of 248 L/s and would require major upgrades to increase capacity to meet the projected PWWF of 351 L/s.

This alternative would result in the following capital projects:

1) Upgrades to the Baden Pumping Station and Storage.
2) New forcemain from Baden Pumping Station connecting to Morningside Trunk Sewer.
3) Upgrades to the Morningside Trunk Sewer (by Township).
4) Upgrades to the Morningside Pumping Station.
5) Possible upgrades to the twin forcemains connecting the Morningside WWPS to the New Hamburg WWTP.

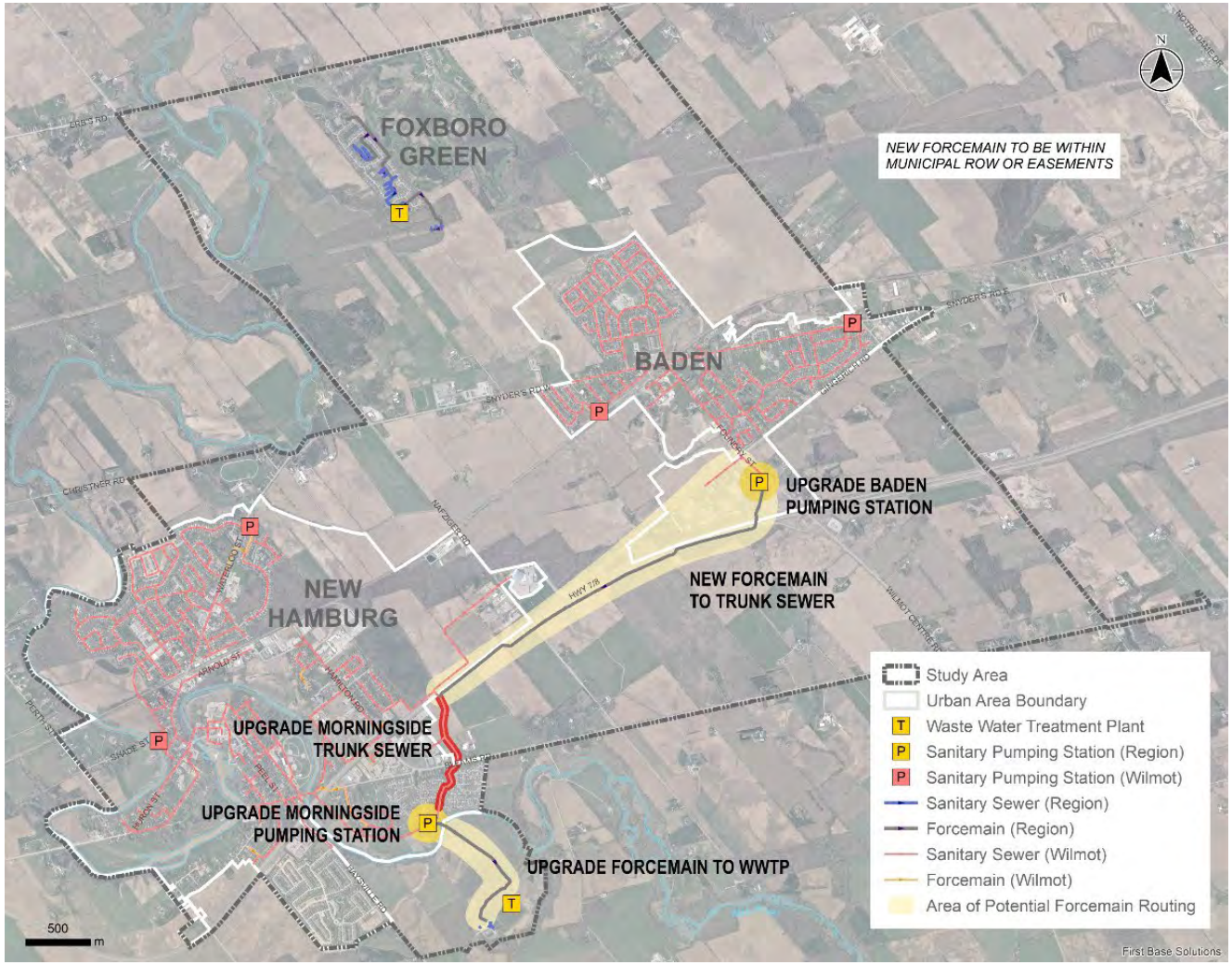


Figure 4-4: Alternative WW2 - Upgrade System and Maintain Existing Configuration (Aerial)

4.3 Alternative WW3 - Upgrade System and Convey Flows Directly to Morningside WWPS

This alternative allows for the conveyance of wastewater flow from the Baden WWPS directly to the Morningside WWPS.

Dry and wet weather flows to the Baden WWPS, Morningside WWPS and the New Hamburg WWTP would remain the same as Alternative WW2.

Alternative WW3 involves many of the same upgrades along the conveyance path as noted in alternative WW2, however, the key difference being that Morningside Trunk Sewer would not require upgrades since the forcemain from the Baden WWPS would run parallel to the Morningside Trunk Sewer and discharge directly to the Morningside WWPS. A flow diagram for Alternative WW3 is shown below:

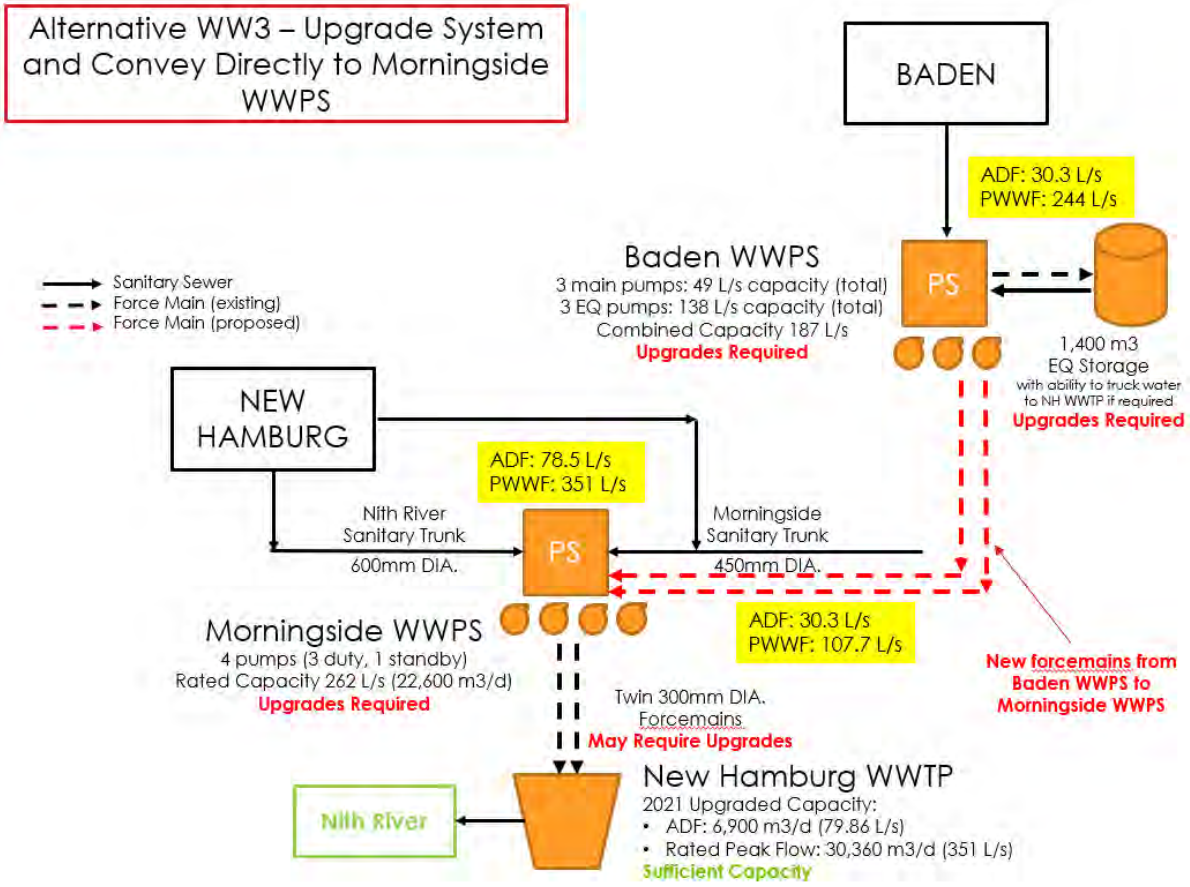


Figure 4-5: Alternative WW3 - Upgrade System and Convey Flows Directly to Morningside WWPS (Flow Diagram)

The connection would be approximately 5.1 km, with final routing to be determined as design of the system progresses. The forcemains would be sized to accommodate the PWWF of 107.7 L/s from Baden WWPS. The remainder of the PWWF to Baden WWPS would be handled by an upgraded storage element onsite.

This alternative would result in the following capital projects:

1) Upgrades to the Baden Pumping Station and Storage.
2) New forcemain from Baden Pumping Station connecting to Morningside Pumping Station.
3) Major upgrades to the Morningside Pumping Station.
4) Possible upgrades to the twin forcemains connecting the Morningside WWPS to the New Hamburg WWTP. These twin forcemain are noted to be at the limit of their capacity under future conditions. The need to replace them would be based on actual flows and determined as growth progresses.

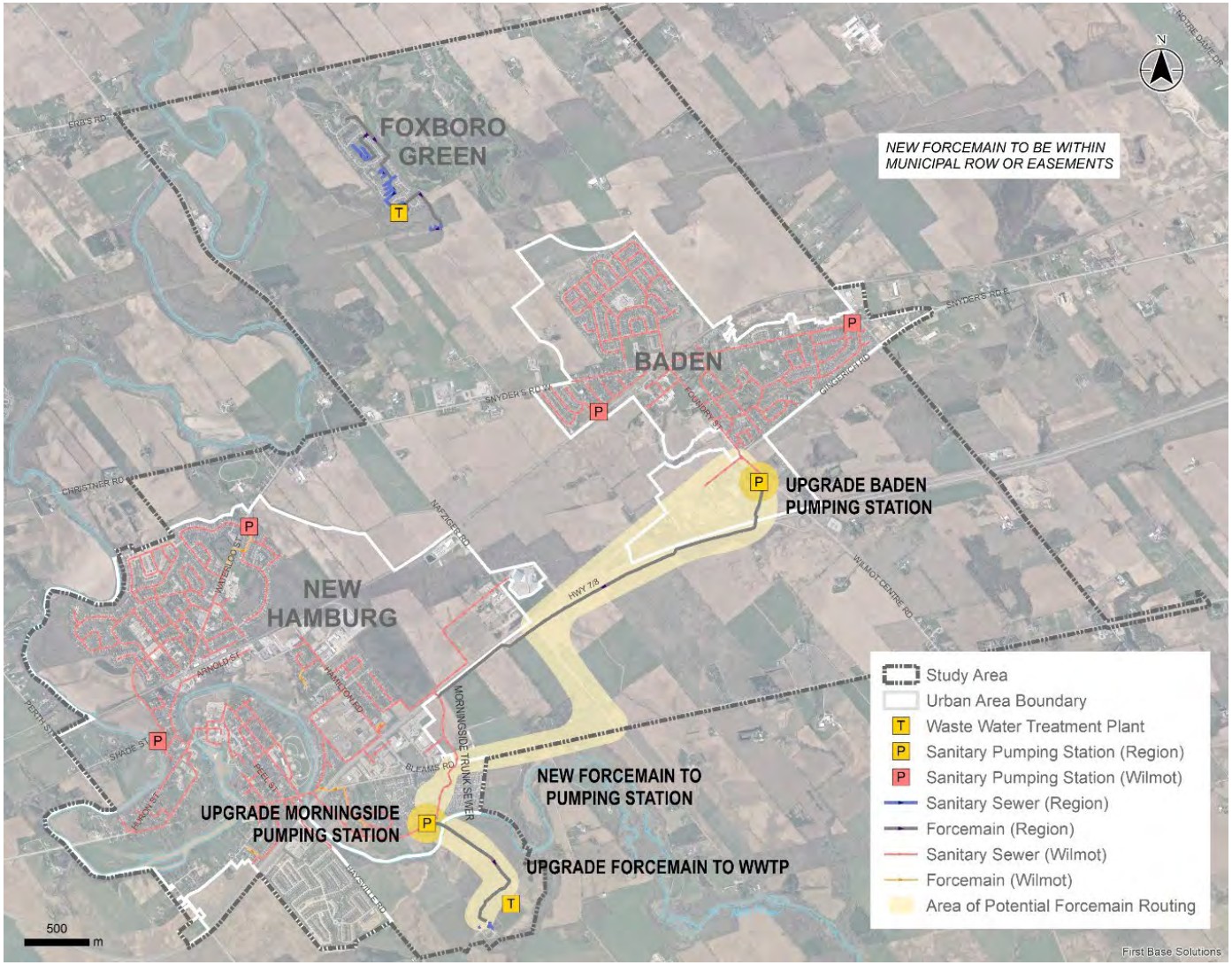


Figure 4-6: Alternative WW3 - Upgrade System and Convey Flows Directly to Morningside WWPS

4.4 Alternative WW4 - Upgrade System and Convey Flows Directly to New Hamburg WWTP

This alternative allows for the conveyance of wastewater flow from the Baden WWPS directly to the New Hamburg WWTP.

The following tables outline the ability of the Baden WWPS, Morningside WWPS and New Hamburg WWTP to manage average day flow and peak wet weather flows under this Alternative.

Table 4-7: Alternative WW4 – Pumping Station Impacts Under DWF Conditions

	Current ADF (L/s) [1]	Projected Additional ADF (L/s)	Total Daily Flow (L/s) (Current + Projected)	Upgraded PS Firm Capacity (L/s)[2]	PS DWF Capacity / Deficit (L/s)	Able to Manage DWFs?
Baden WWPS	17.07	13.50	30.33	108	18.67	✓
Morningside WWPS	26.93	21.35	48.09	255.26	207.17	✓

1. Region of Waterloo 2018 Wastewater Treatment Master Plan (CIMA+, July 2018)
2. Baden WWPS Upgrade Firm Capacity consists of 108 L/s through the forcemain,

Table 4-8: Alternative WW4 – Pumping Station Impacts Under WWF Conditions

	Peak WWF (L/s) (2016) [1]	Additional Peak WWF (L/s)	Total Peak WWF (L/s) (Current + Projected)	Upgraded PS Firm Capacity (L/s)[2]	PS WWF Capacity / Deficit (L/s)	Able to Manage WWFs?
Baden WWPS	185	59.87	244.06	244.06	0	✓
Morningside WWPS	156	87.26	243.26	243.26	0	✓

1. Region of Waterloo 2018 Wastewater Treatment Master Plan (CIMA+, July 2018)
2. Baden WWPS Upgrade Firm Capacity would consist of 108 L/s through the forcemain, and 136 L/s being handled by the storage element.

Table 4-9: WW4 - New Hamburg WWTP Impacts Under DWF and WWF Conditions

	ADF (L/s)	Able to manage DWF's?	Total Peak WWF (L/s)	Able to manage WWF's?
New Hamburg WWTP	78.42	✓	351	✓

A flow diagram for Alternative WW4 is shown below:

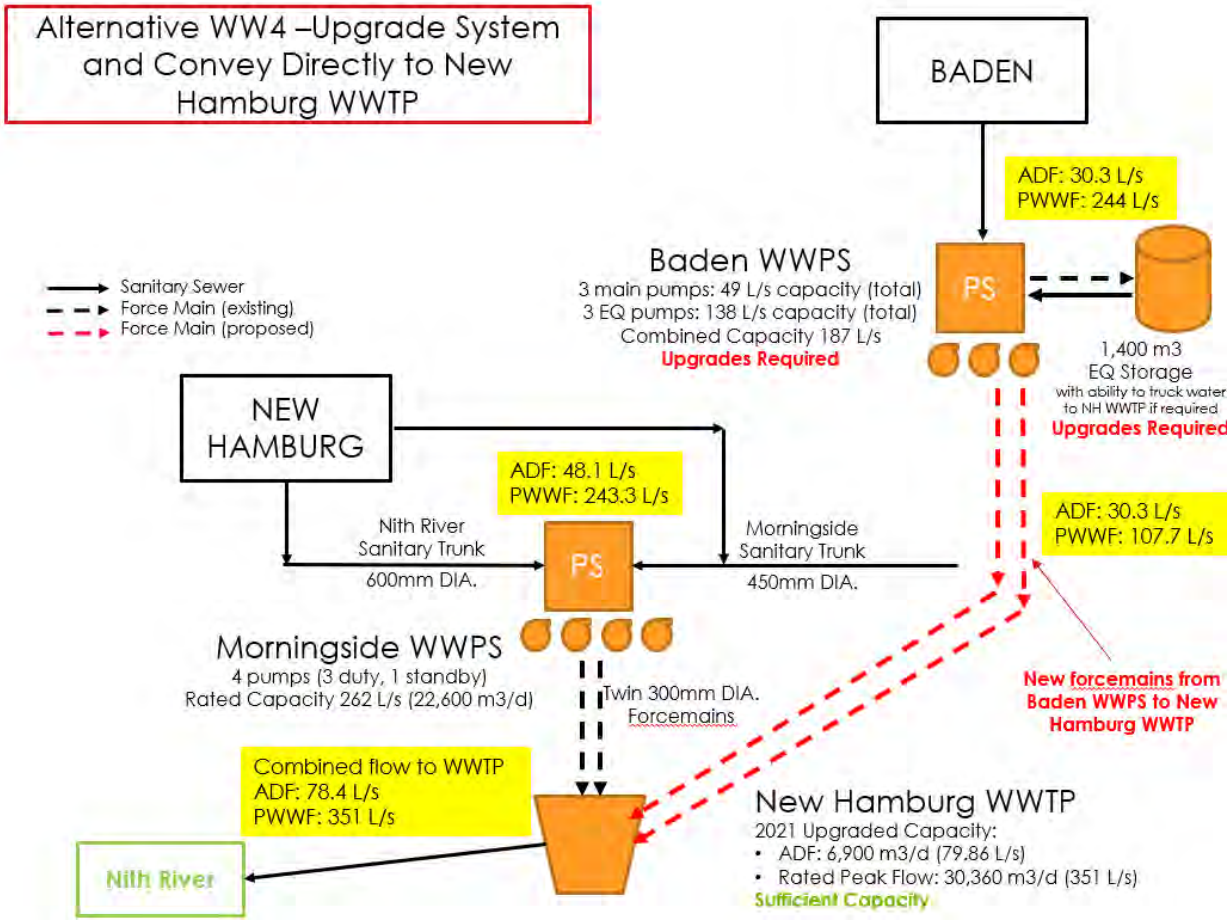


Figure 4-7: Alternative WW4 - Upgrade System and Convey Flows Directly to New Hamburg WWTP (Flow Diagram)

This alternative would result in the following capital projects:

1) Upgrades to the Baden Pumping Station and Storage.
2) New forcemain(s) from Baden WWPS connecting to the New Hamburg WWTP.

3) Upgrades to the Headworks at New Hamburg WWTP to accommodate the new forcemain.

The upgrades required at Baden WWPS would be the same as in Alternatives WW2 and WW3. Due to the maximum PWWF that can be sent to the New Hamburg WWTP, 107 L/s of PWWF flow can be sent to the WWTP, and the Baden storage capacity would be designed to handle the remaining 148 L/s.

Upgrades would not be required at Morningside WWPS under this alternative.

The new forcemains would be installed within municipal ROW and potentially within easements with an approximate length of 6 km. The exact routing would be determined as design progresses if this alternative is selected as the preferred alternative.

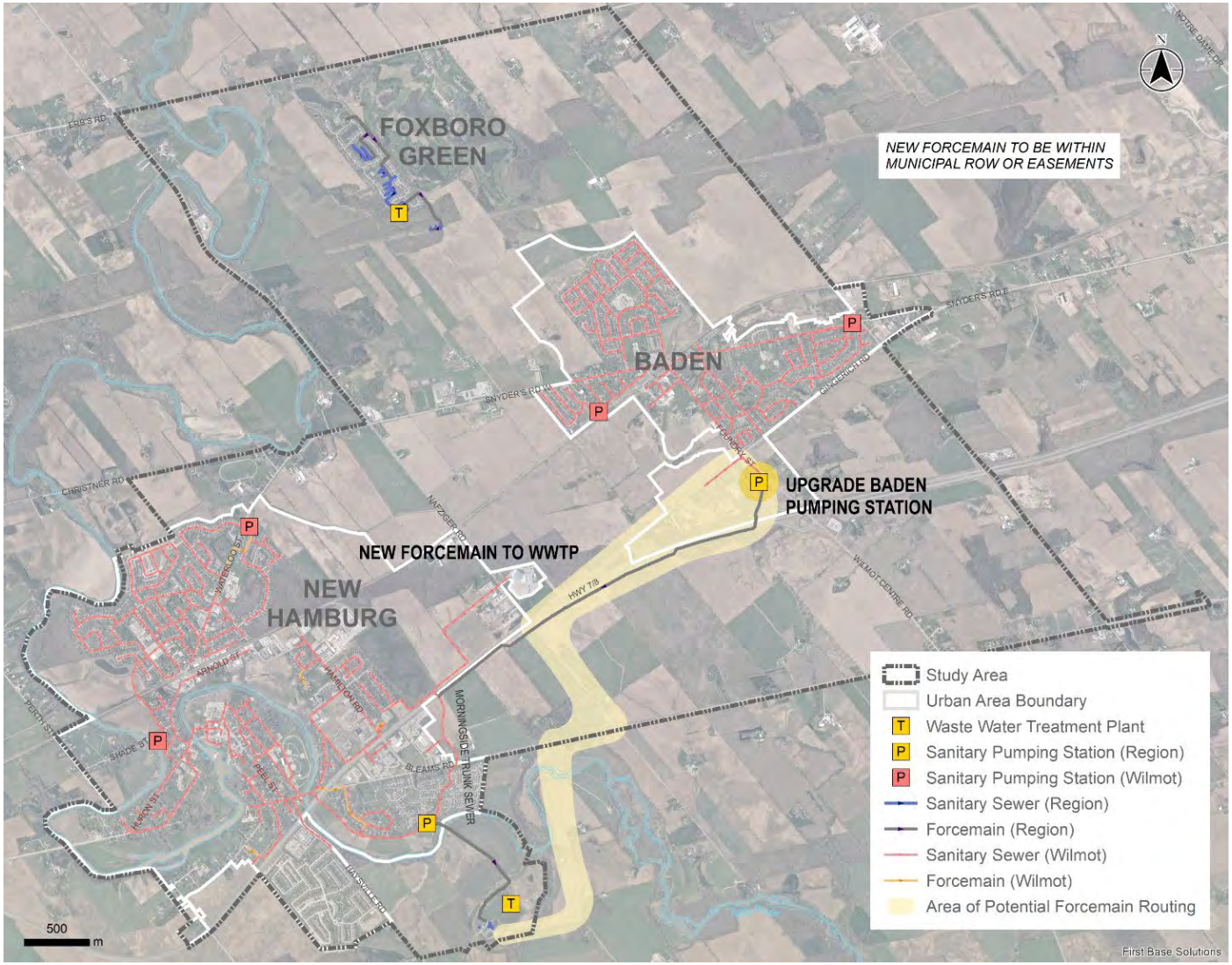


Figure 4-8: Alternative WW4 - Upgrade System and Convey Flows Directly to New Hamburg WWTP (Aerial)

4.5 Summary of System Wide Alternatives

The following table summarizes the capital projects that are anticipated to be required for each of the WW system-wide alternatives:

Table 4-10: Capital Projects / Upgrades Required for WW1, WW2, WW3 and WW4.

	Alternative WW1 **Do Nothing**	**Alternative WW2** **Upgrade System and Maintain Existing Configuration**
Capital Projects / Upgrades Required	• Not Applicable • System has insufficient capacity for future flows	• Upgrades to the Baden Pumping Station and Storage • New forcemain from Baden Pumping Station connecting to Morningside Trunk Sewer • Upgrades to the Morningside Trunk Sewer • Upgrades to the Morningside Pumping Station • Possible upgrades to the twin forcemains connecting the Morningside WWPS to the New Hamburg WWTP
	Alternative WW3 **Upgrade System and Convey Flows Directory to Morningside WWPS**	**Alternative WW4** **Upgrade System and Convey Flows Directly to New Hamburg WWTP**
	• Upgrades to the Baden Pumping Station and Storage • New forcemain from Baden Pumping Station connecting to Morningside Trunk Sewer • Upgrades to the Morningside Pumping Station • Possible upgrades to the twin forcemains connecting the Morningside WWPS to the New Hamburg WWTP	• Upgrades to the Baden Pumping Station and Storage • New forcemain from Baden Pumping Station connecting to the New Hamburg WWTP • Upgrades to the Headworks at New Hamburg WWTP to accommodate the new forcemain.

4.6 Foxboro Alternative F1 - Do Nothing

The Foxboro WWTP existing average daily flow and capacity are summarized in the following table.

Table 4-11: Foxboro WWTP Flows

	Existing ADF (m^3/d)	Existing ADF (converted to L/s)	Plant Rated Capacity (m^3/d)	Plant Rated Capacity (converted to L/s)
Foxboro WWTP	110	1.27	150	1.74

It is anticipated that the peak wet weather flow rate that would be required from a new pumping station servicing the Foxboro Green community would be in the order of 5 - 6 L/s peak flow with typical wet well storage attenuation. Additional equalization storage could be explored during design to reduce peak discharge flow to the Baden system if required.

There is no significant growth expected within the Foxboro Green community, and due to the relatively low flowrates, Alternatives F1, F2, F3 and F4 will have very little impact on the WW Alternatives presented earlier in this report. The additional ADF and peak flow is expected to be manageable at either Baden WWPS or Morningside WWPS, depending on the final overall system solution (Alternatives WW1-WW4). The New Hamburg WWTP was also confirmed to have sufficient capacity available to treat the additional flow from the Foxboro community.

As such the following alternatives will be evaluated in more detail during the next stage of the assignment to determine the greatest cost/benefit option in comparison to maintaining operations at the Foxboro WWTP moving forward.

For the wastewater system, the following opportunities and constraints will be considered in the evaluation of alternatives as part of this assignment:

- High operations and maintenance costs associated with maintaining the Foxboro WWTP and related infrastructure.
- Existing concerns with elevated nitrated levels within the surrounding groundwater system, which may be partially contributed from the wastewater treatment system. Recent upgrades at the Foxboro WWTP have improved effluent water quality and lowered nitrate values, however, the Foxboro WWTP continues to be unable to consistently meet effluent solids objectives.
- Significant asset renewal requirements in the near future, with the remaining RBC identified for replacement in the next five (5) years.

Under Alternative F1, Foxboro Green would continue to utilize their existing wastewater and water treatment systems, as illustrated in Figure 4-9.

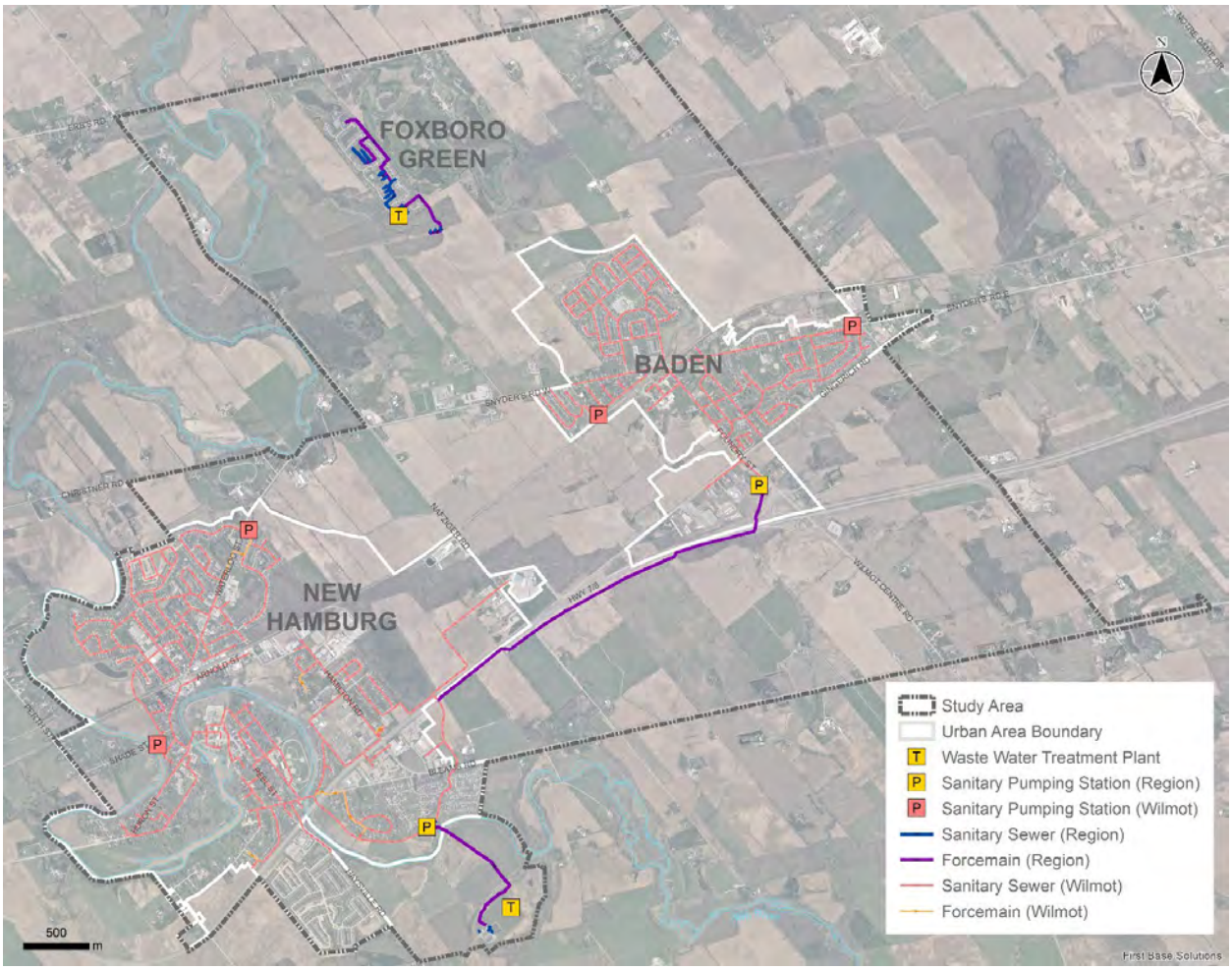


Figure 4-9: Alternative F1 - Do Nothing

4.7 Foxboro Alternative F2 - Provide Connection to Existing Baden Infrastructure Using Existing Road Allowances

Under this alternative, Foxboro Green would be connected to the Baden sewer and water supply system. The routing of the sewer and watermain connection would follow existing road allowances.

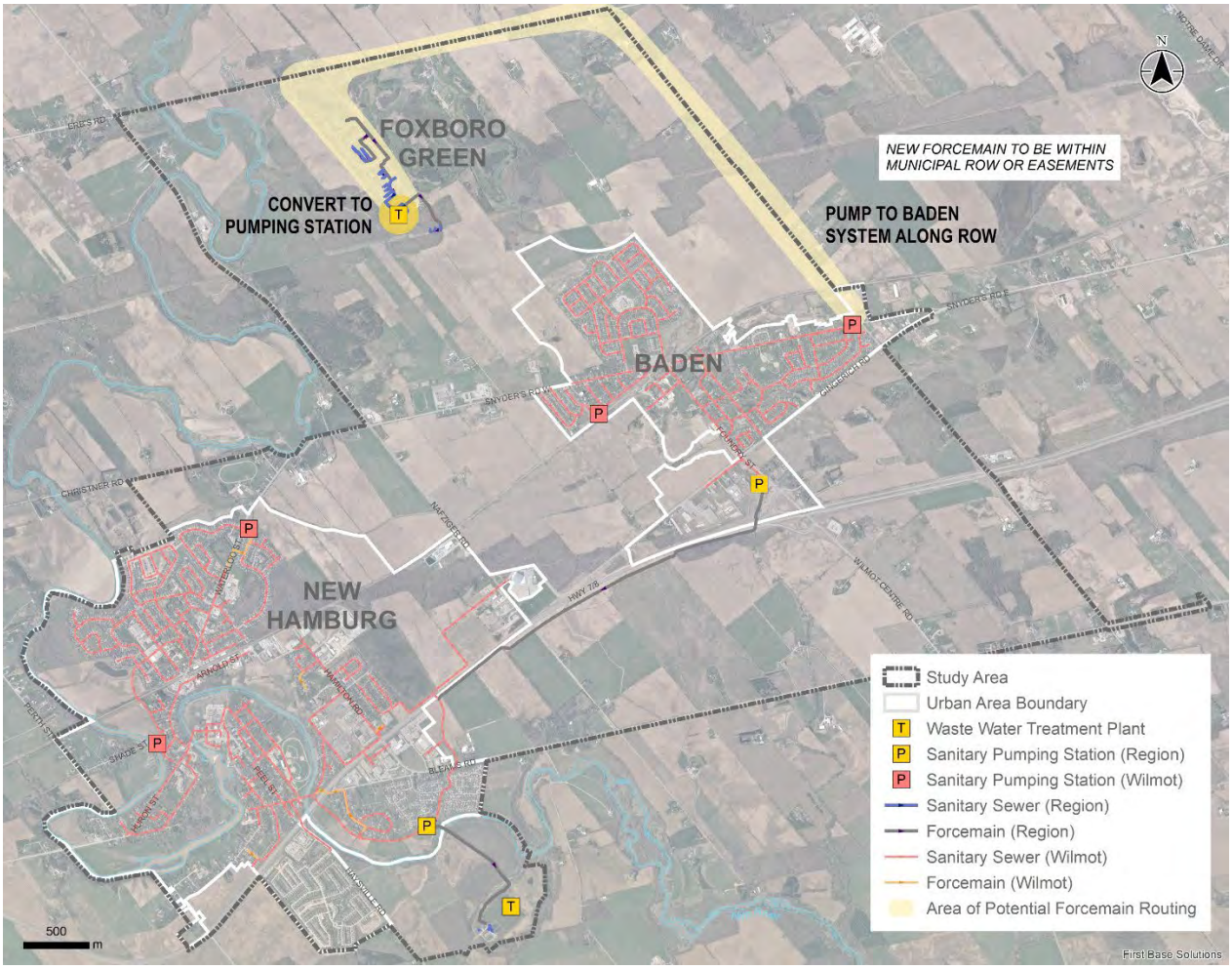


Figure 4-10: Alternative F2 - Provide connection to existing Baden infrastructure using existing road allowances.

4.8 Foxboro Alternative F3 - Provide Connection to Baden Using a Direct Route

Under this alternative, Foxboro Green would be connected to the Baden sewer and water supply system. The routing of the sewer and watermain connections would be within the corridors across new development and agricultural lands. Preferably these alignments would be along future roads.

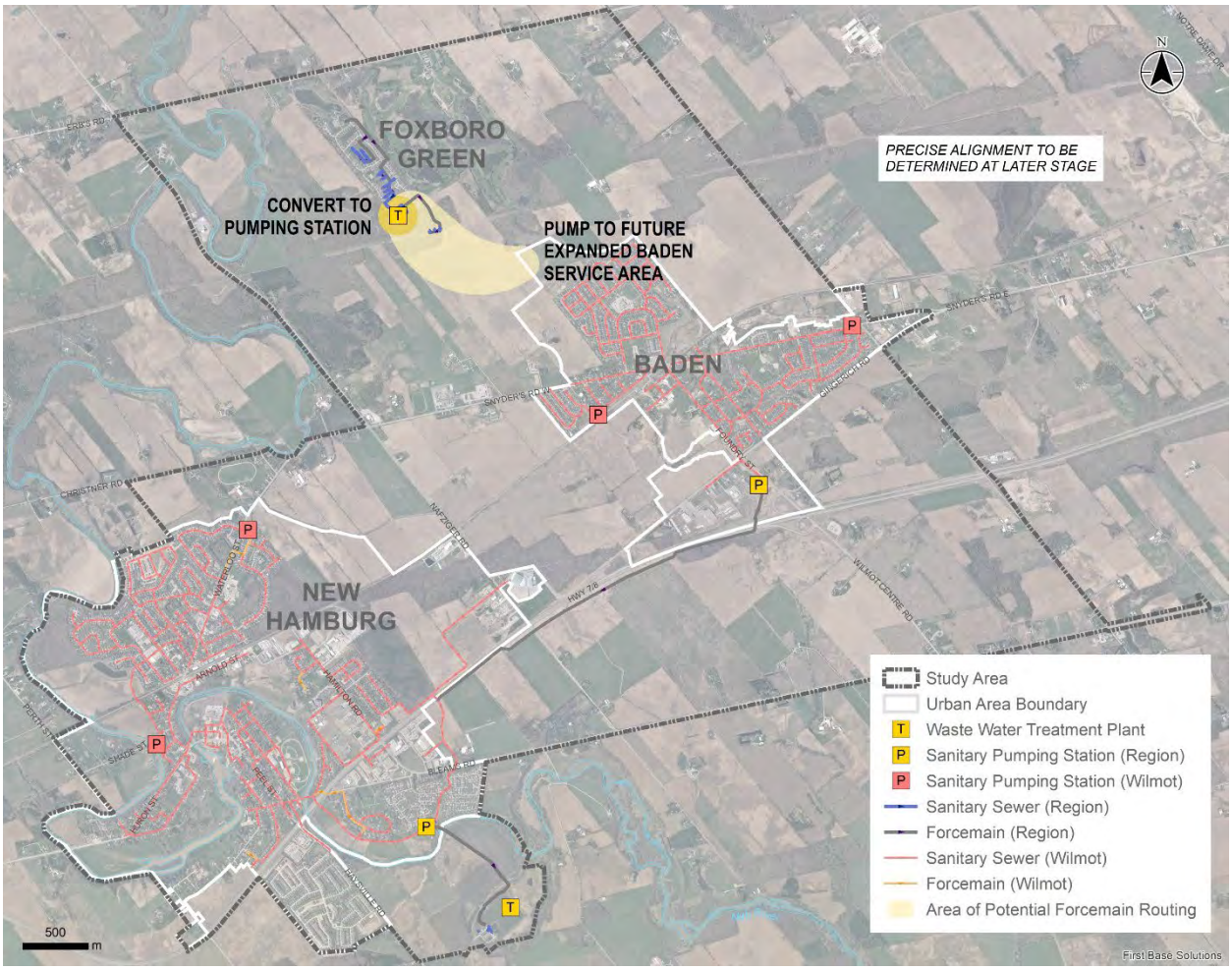


Figure 4-11: Alternative F3 - Provide connection to Baden using a direct route.

4.9 Alternative F4 - Provide Connection to Existing New Hamburg Infrastructure Using Existing Road Allowances

Under this alternative, Foxboro Green would be connected to the New Hamburg sewer and water supply system. The routing of the sewer and watermain connection would follow existing road allowances.

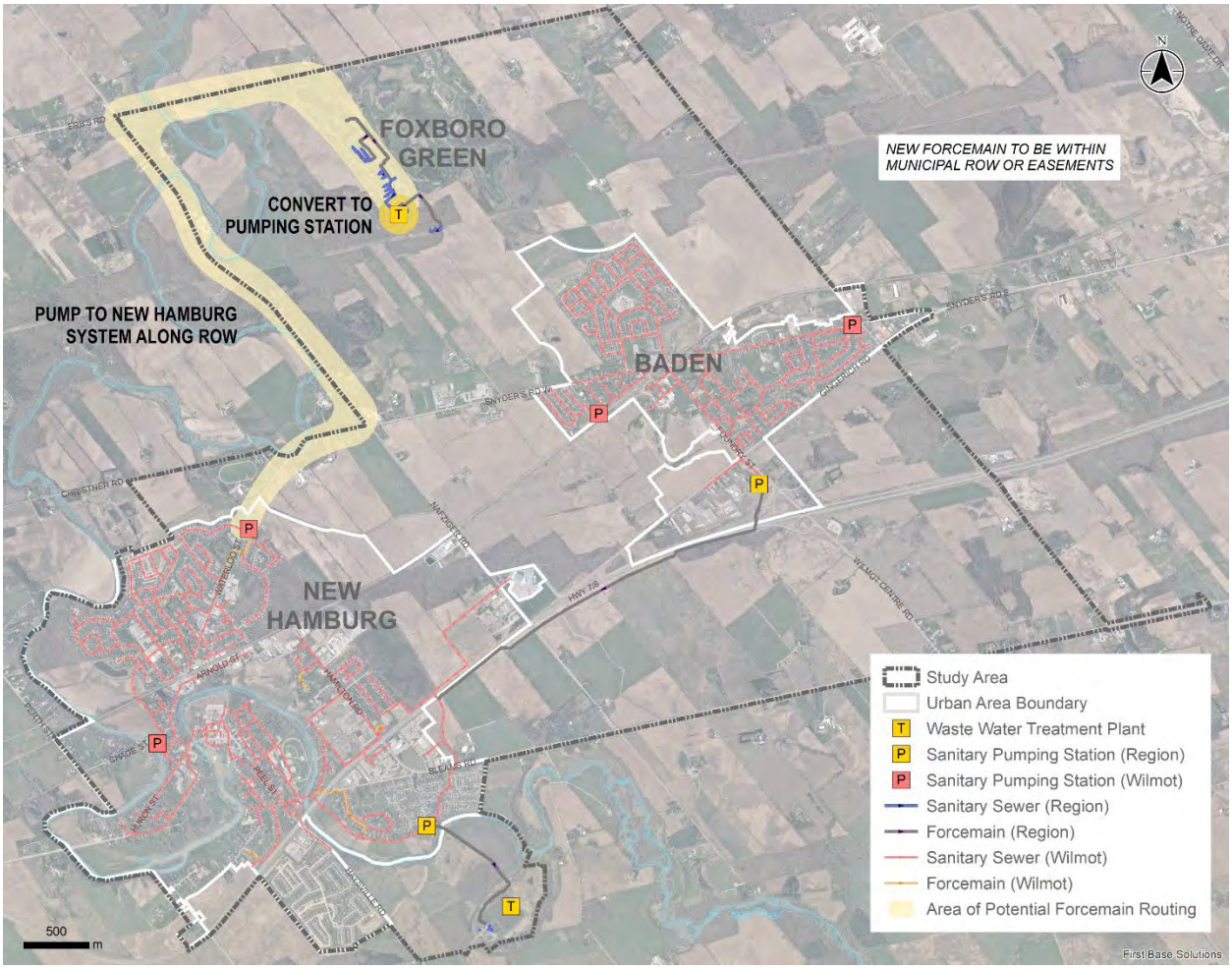


Figure 4-12: Alternative F4 - Provide connection to existing New Hamburg infrastructure using existing road allowances

5.0 Conclusions and Recommendations

An analysis of the current wastewater infrastructure showed that upgrades will be required to meet the future servicing needs of the Baden – New Hamburg community.

In order to meet these needs, the following Alternatives have been developed:

- The following Alternative Solutions have been developed to address the key issues identified for wastewater servicing needs for the Baden and New Hamburg communities:
    - Alternative WW1 - Do Nothing
    - Alternative WW2 - Upgrade System and Maintain Existing Configuration
    - Alternative WW3 - Upgrade System and Convey Directly to Morningside WWPS
    - Alternative WW4 - Upgrade System and Convey Directly to New Hamburg WWTP
- The following Alternative Solutions have been developed to address the key issues identified for water supply and wastewater servicing needs for the Foxboro community:
    - Alternative F1 - Do Nothing
    - Alternative F2 - Provide Connection to Existing Baden Infrastructure Using Existing Road Allowances.
    - Alternative F3 - Provide Connection to Baden Using a Direct Route
    - Alternative F4 - Provide Connection to Existing New Hamburg Infrastructure Using Existing Road Allowances

6.0 Next Steps

The next steps in the Servicing System Review are outlined below:

- Obtain feedback on Technical Memo's #3 and #4 (Water and Wastewater Alternatives) from the Region and key stakeholders.
- Finalize Technical Memo's #3 and #4 (Water and Wastewater Alternatives).
- Present the Alternatives to the public as part of Public Consultation Centre #2.
- Obtain feedback from the public for consideration during the evaluation of alternatives.
- Evaluate the alternatives and select the preferred alternatives as part of Technical Memo #5.
- Present the preferred alternatives to the public at Public Consultation Centre #3.

Appendix F
Technical Memo #5 & #5A Evaluation and Preferred Alternatives

Baden – New Hamburg Water and Wastewater System Servicing Review – TM #5 – Development and Evaluation of Alternatives

Prepared for:
Region of Waterloo

Prepared by:
Stantec Consulting Ltd.

June 15, 2022

Revision	Description	Author	Quality Check	Independent Review
1	Draft	HH / MS	JP	

TECHNICAL MEMORANDUM #5 – DEVELOPMENT AND EVALUATION OF ALTERNATIVES

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Appendix G Baden – New Hamburg Wastewater Preferred Alternative Hydraulic Analysis

1.0 Introduction

This Technical Memorandum has been prepared to document the methodology and results of the evaluation of water and wastewater servicing alternatives for the communities of Baden, New Hamburg and Foxboro Green in accordance with Phase 2 of the Municipal Class Environmental Assessment (Class EA) process.

The purpose of the Servicing Review is to evaluate the status of existing water and wastewater servicing systems in Baden – New Hamburg and Foxboro Green, provide recommendations to address existing servicing constraints, and to provide the framework to meet the current and future water / wastewater servicing needs.

Phase 1 of the Class EA and the System Servicing Review included problem identification to identify and establish a clear understanding of the completed studies to date and the problems and/or opportunities related to the existing water and wastewater servicing systems in Baden – New Hamburg. Technical Memorandum #1 (TM 1), which was previously submitted, provided a summary of the background information related to the project. Virtual Public Consultation Centre No. 1 (PCC #1) was held online starting on June 1, 2021, to provide the public and stakeholders background information on the study and the opportunity to provide input early in the project.

Phase 2 of the EA process included the development and evaluation of alternative solutions to address the problem or opportunity. Alternative solutions were developed and analyzed for Baden – New Hamburg Water Servicing, Baden – New Hamburg Wastewater Servicing, Foxboro Green Water and Wastewater Servicing. Technical Memorandum #3 (TM3), addressing the water servicing, and Technical Memorandum #4 (TM4), addressing the wastewater servicing, were previously submitted and provided a summary in detail of the servicing alternatives.

The alternative solutions developed for Baden – New Hamburg and Foxboro Green water and wastewater servicing are summarized in Table 1-1, Table 1-2, and Table 1-3 below.

Table 1-1: Baden - New Hamburg Water Supply Alternatives

Alternative	Description
WS1: Do Nothing	• This alternative does not include any facility or equipment upgrades and would not meet the overall intent of the study.
WS2: Expanded Storage at New Hamburg WTP	• This alternative involves increasing the New Hamburg reservoir storage capacity by 3.4 ML, from the current 2.4 ML (1.5 ML usable) to 4.9 ML, to satisfy MECP storage requirements through 2041. This will be achieved by a combination of increasing the usable capacity of the existing reservoir to 2.4 ML and installing an additional 2.5 ML. A pumping station upgrade would be required.
WS3: Added Storage at Baden Wells	• This alternative involves the implementation of a new 3.4 ML in-ground reservoir at the Baden wells site. The reservoir would be filled from the Baden water distribution system. A new booster pumping station would be required.
WS4: Added Storage at K50 Wells	• This alternative involves the implementation of a new 3.4 ML in-ground reservoir at the K50 well site. The reservoir would be filled by the K50 wells. A new booster pumping station would be required.

Table 1-2: Baden - New Hamburg Wastewater Alternatives

Alternative	Description
WW1: Do Nothing	• This alternative does not include any upgrades to the existing Region wastewater assets within the system. • Under this scenario, both the firm capacity of the Baden WWPS and the Morningside WWPS would be exceeded. Accordingly, this is not a feasible alternative for consideration as it does not meet the overall intent of the study.
WW2: Upgrade System and Maintain Existing Configuration	• This alternative maintains the existing wastewater system configuration and provides the upgrades and new infrastructure required to meet the future needs of Baden – New Hamburg. • This alternative includes the following projects: o the construction/upgrade of the Baden Pumping Station o the addition of a new forcemain which would run alongside the existing 200 mm forcemain connecting Baden Pumping Station to Morningside Trunk Sewer. o the construction of a new Morningside Trunk Sewer o the construction/upgrade of Morningside Pumping Station. o the potential construction of a new forcemain parallel to the existing forcemain from the Morningside Pumping Station to the New Hamburg WWTP.
WW3: Upgrade System and Convey Directly to Morningside WWPS	• This alternative allows for the conveyance of wastewater flow from the Baden WWPS directly to the Morningside WWPS. • This alternative includes the following projects:

Alternative	Description
	o the construction/upgrade of the Baden Pumping Station o the addition of a new forcemain which would run alongside the existing 200 mm forcemain and connect directly to the Morningside Pumping Station. o the construction/upgrade of Morningside Pumping Station. o the potential construction of a new forcemain parallel to the existing forcemain from the Morningside Pumping Station to the New Hamburg WWTP.
WW4: Upgrade System and Convey Directly to New Hamburg WWTP	• This alternative allows for the conveyance of wastewater flow from the Baden WWPS directly to the New Hamburg WWTP. • This alternative includes the following projects: o the construction/upgrade of the Baden Pumping Station o installation of new twin forcemains which would connect the Baden Pumping Station to the New Hamburg WWTP, bypassing Morning WWPS altogether.

Table 1-3: Foxboro Green Water and Wastewater Alternatives

Alternative	Description
F1: Do Nothing	• Foxboro Green would continue to utilize their existing water system. This option would include significant equipment upgrades or replacement at the Foxboro WTP which would be required in the immediate future. • Foxboro Green would continue to utilize their existing wastewater treatment system. This alternative does not address concerns regarding elevated nitrate levels within the surrounding groundwater system, inability of the WWTP to continually meeting effluent solids objectives, or the significant asset renewal requirements at the WWTP in the near future.
F2: Provide Connection to Existing Baden Infrastructure Using Existing Road Allowances	• Foxboro Green would be connected to the Baden water supply system via existing road allowances. • Foxboro Green would be connected to the Baden sanitary sewer system via existing road allowances.
F3: Provide Connection to Baden Using a Direct Route	• Foxboro Green would be connected to the Baden water supply system within corridors across new development and agricultural lands. • Foxboro Green would be connected to the Baden sanitary sewer system within corridors across new development and agricultural lands.
F4: Provide Connection to the Existing New Hamburg Infrastructure Using Existing Road Allowances	• Foxboro Green would be connected to the New Hamburg water supply system through existing road allowances. • Foxboro Green would be connected to the New Hamburg sanitary sewer system through existing road allowances.

2.0 Environmental Reviews

As part of the Municipal Class EA process, a review of existing environmental conditions within the study area has been undertaken. These environmental reviews build upon the study area characterization undertaken within Technical Memorandum #2 and provide a more detailed environmental inventory associated with the servicing alternatives. These reviews are used to evaluate impacts of the servicing alternatives, to identify preliminary preferred alternatives, and to identify environmental mitigation measures, where required.

2.1 Natural Heritage

Background documents and information sources were consulted to identify natural heritage features for the study area, including Land Information Ontario database, the Township of Wilmot Official Plan, and the Region of Waterloo Official Plan. For potential occurrences of species at risk or provincially rare species, the following sources were consulted for recent records in the vicinity of the study area:

- Natural Heritage Information Centre (NHIC) Biodiversity Explorer database (MNRF 2020b)
- Atlas of the Mammals of Ontario (Dobbyn 1994)
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2019)
- Ontario Breeding Bird Atlas (Cadman et al. 2007)
- eBird Online Database (eBird 2020)
- iNaturalist Database (iNaturalist 2020)
- Fisheries and Oceans Canada – Aquatic Species at Risk Map (DFO 2020)
- Species at Risk Public Registry (Environment and Climate Change Canada 2020)
- Species at Risk in Ontario List (MECP 2020)

The natural heritage background review confirmed the presence of features that may pose constraints to development, including:

- Fish habitat provided by mapped watercourses including the Nith River, Baden Creek and Silver Springs Creek and their tributaries and headwater drainage features including wetlands. Fish habitat is protected under the *Fisheries Act*. Any activities that may impact fish habitat may require review by DFO and potentially

authorization under the *Fisheries Act*. Restricted timing windows are determined on a project basis by MNRF.

- Presence of an aquatic SOCC within Baden Creek: Rainbow Mussel. All mussel species are protected by the *Fisheries Act* (1985). A license to collect fish from MNRF will be required to capture and relocate and fish and mussels prior to dewatering.
- Presence of an aquatic SAR within the Nith River: Silver Shiner. This species is protected under the ESA and SARA. Any proposed activities within its habitat will require consultation with DFO and MECP and authorizations may be required under the ESA and/or SARA.
- The New Hamburg Oxbow Wetland Provincially Significant Wetland (PSW) Complex.
- Non-provincially significant wetlands associated with the Baden East and Baden Southwest Wetland Complex, the Silver Spring Creek Hunsburger Creek Wetland Complex and the Philipsburg Wetland Complex.
- St. Agatha Beech Maple Forest and Phillipsburg Forest Life Science ANSIs

2.1.1 Baden – New Hamburg Water Servicing

Alternative WS1

Wildlife, species at risk, groundwater, streams and rivers would remain in their current conditions, as no construction would be completed.

Alternative WS2

Construction can occur within the existing disturbed/developed land which would protect environmental features, wildlife and species at risk, and groundwater, streams and rivers. The project site does not fall within a designated wetland area, regulatory floodplain or regulatory watercourse.

This alternative requires the construction of a new pump station and reservoir, which will create GHG emissions. The GHG emissions associated with the operation of the pump station and reservoir are not expected to increase from existing conditions. This alternative has the ability to reuse/adapt existing infrastructure, providing a high potential to reduce GHG emissions compared to WS3 and WS4.

Alternative WS3

Construction can occur within the existing disturbed/developed land which would protect environmental features, wildlife and species at risk, and groundwater, streams and

rivers. The project site does not fall within a designated wetland area, regulatory floodplain or regulatory watercourse.

This alternative requires the construction of a new pump station and reservoir, which will create GHG emissions. The energy loss associated with filling the reservoir and re-pumping into the distribution system is expected to create GHG emissions.

Alternative WS4

Construction would occur within Grand River Conservation Authority (GRCA) regulation limit and would impact the GRCA regulated watercourse on site. The project site features existing terrestrial habitats/features, vegetation/woodlots and steep slopes adjacent to a watercourse. This project has high potential to impact aquatic habitat or species within the area. The project site does not fall within a designated wetland area, and species of risk have not been identified within the area.

This alternative requires the construction of a new pump station, well pumps and reservoir, which will create GHG emissions. The energy loss associated with filling the reservoir and re-pumping into the distribution system is expected to create GHG emissions.

2.1.2 Baden – New Hamburg Wastewater Servicing

Based on the review of the background data, when reviewing the wastewater alternatives, the following were considered.

Alternative WW1

Wildlife, species at risk, groundwater, streams and rivers would remain in their current conditions, as no construction would be completed.

Alternative WW2

Construction can occur within the existing right-of-way to protect environmental features, wildlife and species at risk, and groundwater, streams and rivers. Further, construction can be scheduled during a time of year to limit negative impacts on surrounding vegetation. The New Hamburg Oxbow Wetland Complex and the Nith River may be impacted when upgrading the forcemain from the Morningside WWPS to the New Hamburg WWTP. Further, portions of the proposed construction pass through wooded areas. This alternative has the ability to reuse/adapt existing infrastructure, providing a high potential to reduce GHG emissions.

Alternative WW3

Construction can occur within the existing right-of-way to protect environmental features, wildlife and species at risk, and groundwater, streams and rivers. Further,

construction can be scheduled during a time of year to limit negative impacts on surrounding vegetation. The New Hamburg Oxbow Wetland Complex and the Nith River may be impacted when upgrading the forcemain from the Morningside WWPS to the New Hamburg WWTP. Further, portions of the proposed construction pass through wooded areas. This alternative has the ability to reuse/adapt existing infrastructure while also including new infrastructure, providing a moderate potential to reduce GHG emissions.

Alternative WW4

The majority of construction can occur within the existing right-of-way to protect environmental features, wildlife and species at risk, and groundwater, streams and rivers. However, segments of construction occur outside the right-of-way through woodlots, and include a crossing of the Nith River. Construction can be scheduled during a time of year to limit negative impacts on surrounding vegetation and aquatic SAR. All potential impacts will be mitigated to the greatest extent possible. This alternative includes construction of entirely new infrastructure, providing a low potential to reduce GHG emissions.

2.1.3 Foxboro Green Water and Wastewater Servicing

Based on the review of the background data, when reviewing the Foxboro Green Servicing alternatives, the following were considered.

Alternative F1

Construction activities would be confined to upgrades to existing facilities so impacts to wildlife, species at risk, groundwater, streams and rivers are anticipated to be minimal.

Alternative F2

Construction can occur within the existing right-of-way to protect environmental features. Creek crossings at the north ends of Foxboro and Baden contain aquatic SAR. Construction can be scheduled seasonally to limit negative impacts on surrounding vegetation and aquatic SAR. All potential impacts will be mitigated to the greatest extent possible.

Alternative F3

For Alternative F3, construction would be more disruptive to natural features as the route is not within an existing right-of-way. An ANSI Life Sciences area is located south of Foxboro (Philipsburg Forest – Regional Significance). A regionally significant wetland and GRCA Regulation Limit area exist south of Foxboro, which can be avoided depending on forcemain and watermain routing. Construction can be scheduled seasonally to reduce impacts on surrounding vegetation. All potential impacts will be mitigated to the greatest extent possible.

Alternative F4

Construction can occur within the existing right-of-way to protect environmental features. A creek crossing at the north end of Foxboro and two (2) Nith River crossings are aquatic SAR distribution areas. This route also crosses GRCA slope areas/floodplains and regulation limit. Construction can be scheduled seasonally to limit negative impacts on surrounding vegetation and aquatic SAR. All potential impacts will be mitigated to the greatest extent possible.

2.2 Social

2.2.1 Community Impacts/Health and Safety

There are no public health or safety concerns associated with the alternative locations. There exists potential to create noise, odour, road closures and truck traffic which are considered in this evaluation. There is also the potential for road closures during construction which may impact local businesses and residents. The extent of disruption will be dependent upon the alternative implemented.

2.2.2 Archaeology

Based on a preliminary desktop review of the study area, it is likely that portions of the study area will retain potential for the identification of archeological resources. A Stage 1 Archaeological Assessment should be undertaken in accordance with the Ministry of Heritage, Sport, Tourism and Cultural Industries (MHSTCI)'s 2011 Standards and Guidelines for Consultant Archeologists. This work will be undertaken once the preferred alternative has been selected and will form a part of this servicing study.

2.2.3 Built Cultural Heritage

Based on a desktop review of cultural heritage resources in the study area to identify known cultural heritage resources. As the project progresses, cultural heritage resources can be assessed in the form of a screening checklist and/or a Cultural Heritage Assessment Report.

In accordance with the guidance provided by the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI), the Criteria for Evaluating Potential for Built Cultural Heritage Resources and Cultural Heritage Landscape checklist will be undertaken once the preferred alternative has been selected and will form a part of this servicing study.

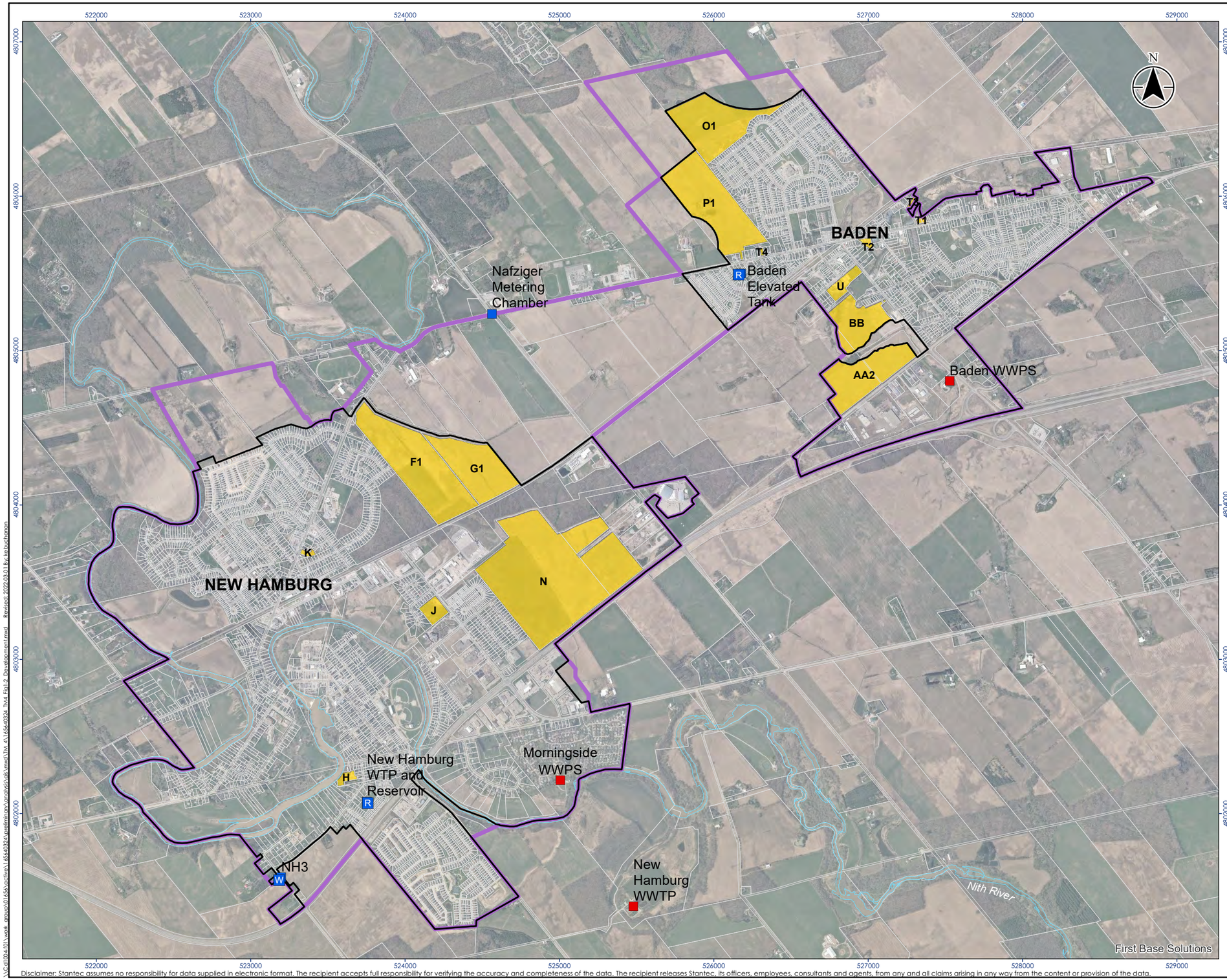
2.2.4 Socio-Economic Environment

The Region of Waterloo Official Plan is a guiding document for directing growth and change throughout the Region for the next 20 years. Land within the urban portion of the study area, meaning lands falling within the Urban Boundary for Baden and New

Hamburg, are designated built-up area or Township Greenfield Area. The overall goal for these areas is to promote balanced growth and contribute to the creation of complete communities. The Plan requires these areas to be developed and planned to achieve or exceed a minimum density of 45 residents and jobs combined per hectare. Refer to Figure 2-1 for future development blocks within the Baden-New Hamburg Urban Area Boundary.Figure 2-1: Future Development Blocks within the Baden-New Hamburg Urban Area Boundary The Baden-New Hamburg water and wastewater system will need to be able to accommodate this target density. Lands located within the study area include designated Rural Areas, Urban Areas, Protected Countryside, and Prime Agricultural Area.

The 2019 Township of Wilmot Official Plan outlines the Council's long-term policy direction to guide future development within the Township. The Official Plan outlines the criteria to be considered in evaluating development applications including where new individual wastewater treatment systems will be permitted. Further, the Official Plan states that new developments shall be serviced by municipal water services unless this is not considered feasible, and the Township will not recommend approval for development proposals in the municipally serviced areas where there is insufficient capacity in the supply system. Lands within the urban portion of the study area include a combination of Urban, Residential, Urban Core Area, General Industrial, Light Industrial, Highway Commercial, Open Space, and Major Recreation. Lands located outside the urban portion of the study area are designated a combination of Countryside, Rural Settlement Area, and Open Space.

The Township, in conjunction with the Region, will ensure that all new development is serviced by adequate and effective water, wastewater and storm water facilities.



Stantec

Legend

- Water Facility - Region Asset
- Wastewater Facility - Region Asset
- Development Block
- Urban Area Boundary
- Countryside Line

0 500 1,000 m

1:25,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017.
3. Orthoimagery from Region of Waterloo web map service. Imagery Date, 2018.

Project Location
Wilmot
Township

165640324 REVA
Prepared by KDB on 2022-03-01

Client/Project
REGION OF WATERLOO
BADEN – NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
2-1

Title
Future Development Blocks within the Baden-New Hamburg Urban Area Boundary

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

C:\Users\kbuchanan\Documents\Projects\165640324\Preliminary Analysis\Maps\Mxd's\Mxd 4\165640324_Mxd4_Fig1-2_DevBlocksment.mxd Revised: 2022-03-01 By: kbuchanan

2.2.4.1 Baden – New Hamburg Water Servicing

Alternative WS1

Infrastructure would remain in its current state. Public health and safety, archeological features, and cultural heritage features would remain in their current state as no construction is required.

Alternative WS2

This alternative is expected to maintain green space once landscape is restored above new reservoir, however, this alternative has the potential to impact the areas aesthetic as existing open space site will be fenced off to the public where the new reservoir is installed. The project area for this alternative does not include any identified cultural heritage features. The project area has low potential to impact archaeological features in as this project would take place in existing disturbed/developed land. Land acquisition is not expected to be required for this alternative. Alternative WS2 is associated with the highest potential to create noise, and odour during construction due to proximity of existing residential properties. No anticipated road closures are required during construction.

This alternative has the highest potential to improve fire protection in high density areas. The additional reservoir volume is expected to minimize potential risk to public health and safety by improving the chlorine contact time. There are no anticipated impacts to operator health and safety compared to existing operations.

Alternative WS3

This alternative is expected to maintain green space and site aesthetic once landscape is restored above new reservoir. The project area for this alternative does not include any identified cultural heritage features. The project area has low potential to impact archaeological features in as this project would take place in existing disturbed/developed land. Land acquisition may be required to accommodate new infrastructure. This project has low potential for impact to noise and odour to local residents during construction as there are no residential properties located directly adjacent to project site. No anticipated road closures are required during construction.

This alternative has moderate potential to improve fire protection in high density areas. The additional reservoir volume may increase system water age and decrease chlorine residual, increasing potential risk to public health and safety. The new facility has the potential to impact to operator health and safety due to the additional labour and processes that will be required to run the facility.

Alternative WS4

This alternative is expected to maintain green space and site aesthetic once landscape is restored above new reservoir. The project area for this alternative does not include any identified cultural heritage features. The project area has low potential to impact archaeological features in as this project would take place in existing disturbed/developed land. Land acquisition may be required to accommodate new infrastructure. This project has moderate potential for noise and odour to local residents during construction as there are a few residential properties located near the project site. No anticipated road closures are required during construction.

This alternative has moderate potential to improve fire protection in high density areas. The additional reservoir volume is expected to minimize potential risk to public health and safety by improving the chlorine contact time. There are no anticipated impacts to operator health and safety compared to existing operations.

2.2.4.2 Baden – New Hamburg Wastewater Servicing

Based on the review of the background data, when reviewing the wastewater alternatives, the following were considered.

Alternative WW1

Infrastructure would remain in its current state. Public health and safety, archeological features, and cultural heritage features would remain in their current state as no construction is required.

Alternative WW2

There exists potential for construction-related impacts to one (1) listed heritage resource; a Cultural Heritage Assessment Report is required to determine impacts and mitigation requirements. Further, there exists moderate potential for impacts to archeological features in undisturbed project areas, particularly at the river crossing. Space constraints exist along the Morningside STS corridor which may require land acquisition. Alternative WW2 is associated with the highest potential to create noise, odour, road closures and truck traffic due to proximity of existing infrastructure to nearby neighbourhoods, most notably the construction of a trunk sanitary sewer through the Morningside Retirement Community.

Alternative WW3

There exists potential for construction-related impacts to one (1) designated heritage resource; a Cultural Heritage Assessment Report is required to determine impacts and mitigation requirements. Further, there exists moderate potential for impacts to archeological features in undisturbed project areas, particularly at the river crossing. New infrastructure will be constructed within the municipal right-of-way and existing

easements, this alternative is not anticipated to require additional land. Alternative WW3 is associated with a high potential to create noise, odour, road closures and truck traffic due to proximity of existing infrastructure to nearby neighbourhoods, most notably the construction of a sanitary forcemain through the Morningside Retirement Community.

Alternative WW4

There exists potential for construction-related impacts to one (1) designated heritage resource; a Cultural Heritage Assessment Report is required to determine impacts and mitigation requirements. Further, there exists moderate potential for impacts to archeological features in undisturbed project areas, particularly at the river crossing. A portion of the construction will require land acquisition to accommodate new infrastructure, for the portion of the forcemain between Holland Mills Road and the New Hamburg WWTP. This alternative has the potential for the greatest number of permits required as the proposed infrastructure crosses a watercourse and travels through private property. Alternative WW4 is associated with the lowest potential to create noise, odour, road closures and truck traffic as the proposed location for the new forcemain is away from residential neighbourhoods.

2.2.4.3 Foxboro Green Water and Wastewater Servicing

Based on the review of the background data, when reviewing the Foxboro Green Servicing alternatives, the following were considered.

Alternative F1

Construction activities would be confined to upgrades to existing facilities so there would be no impacts to public health and safety, archeological features, and cultural heritage features. There would be limited impacts to the Foxboro community due to noise, odour and aesthetics during construction of these upgrades, but these impacts would likely be minor.

Alternative F2

There exists potential for construction-related impacts to two (2) heritage resources located on Erbs Road and one (1) heritage resource located on Sandhills Road. New infrastructure will be located within the municipal right-of-way – no additional land is required. Impacts such as noise, odour and aesthetics are anticipated during construction due to the amount of infrastructure needed and passing through the Foxboro community, however, retiring WWTP and WTP would reduce traffic, noise, odour etc. related to ongoing operations.

Alternative F3

As this alternative is not located within existing road allowances, the forcemain location would require agreements with multiple property owners and stakeholders (Hydro

corridor, Snyder's Road developer, Foxboro community). Impacts such as noise, odour and aesthetics are anticipated during construction due to the amount of infrastructure needed, however, retiring WWTP and WTP would reduce traffic, noise, odour etc. related to ongoing operations.

Alternative F4

There exists potential for construction-related impacts to a cluster of heritage resources located at Erbs Road and Nafziger Road intersection, and one (1) located at Snyders Road West and Nafziger Road intersection. New infrastructure will be located within the municipal right-of-way and thus no additional land is required. Impacts such as noise, odour and aesthetics are anticipated during construction due to the amount of infrastructure needed and passing through the Foxboro community, however, retiring WWTP and WTP would reduce traffic, noise, odour etc. related to ongoing operations.

3.0 Technical

3.1 Constructability

Construction requirements for each alternative will vary.

3.1.1.1 Baden – New Hamburg Water Servicing

Alternative WS1

This alternative does not meet the storage requirements to service the projected population growth. Further, this alternative does not align with the Baden-New Hamburg Water and Wastewater Master Plan (2011).

Alternative WS2

This alternative has a high potential to meet the long-term capacity requirements to service the projected population growth in Baden-New Hamburg. Existing infrastructure is easily accessible and appropriate site access for operations and maintenance would be provided. This alternative does not involve significant modifications to existing operations and is not expected to increase operational and/or maintenance complexity. This alternative requires some new construction/infrastructure but existing process piping and well pump infrastructure may be used to fill reservoir. The existing pump station would require upgrades to access the additional storage and optimize the usable volume of the existing reservoir. The additional reservoir on site is expected to improve facility operational redundancy and provide high potential for the existing WTP, wells and pump station to remain operational during construction. The proximity of adjacent residential properties increases construction complexity as retaining wall will likely be required during excavation. This alternative aligns with the Baden-New Hamburg Water and Wastewater Master Plan (2011) and the proposed feedermain connection between Baden and New Hamburg.

Alternative WS3

This alternative has a high potential to meet the long-term capacity requirements to service the projected population growth in Baden-New Hamburg. Proposed infrastructure would be easily accessible and appropriate site access for operations and maintenance would be provided. This alternative has moderate potential to provide reliability/ robustness, as system depends on new infrastructure required to fill reservoir and pump back into system. This alternative is expected to increase operational and/or maintenance complexity. Existing operations are not expected to be impacted during the construction period as existing facilities at this site are not currently in use. Lack of existing residential properties or other buildings near the project site, are expected to

reduce construction complexity. This alternative requires new construction/infrastructure including process piping to fill the reservoir and a new pump station to access the storage. The additional reservoir location within the system is expected to improve system redundancy.

Alternative WS4

This alternative has a high potential to meet the long-term capacity requirements to service the projected population growth in Baden-New Hamburg. Proposed infrastructure would be easily accessible and appropriate site access for operations and maintenance would be provided. This alternative requires new construction/infrastructure, but existing process piping may be to be used to fill reservoir. The existing well pumps would need to be upgraded and a new pump station would be required.

This alternative is expected to increase operational and/or maintenance complexity compared to existing operations at the K50s site. Existing operations are expected to be impacted during the construction period as K50 wells would likely need to remain offline during excavation. The adjacent water body and GRCA regulation limit and GRCA watercourse within site are expected to increase construction complexity. The additional reservoir location within the system is expected to improve system redundancy but does not improve redundancy for water distribution between K50s site and the Baden network. This alternative aligns with planned treatment upgrades at the K50s site.

3.1.1.2 Baden – New Hamburg Wastewater Servicing

Based on the review of the background data, when reviewing the wastewater alternatives, the following were considered.

Alternative WW1

This alternative does not meet the long-term capacity requirements to service the projected population growth or provide operational redundancy. Further, this alternative does not align with the Region's 2018 Wastewater Treatment Master Plan Update, the Foundry Street Sanitary Sewer Study (2010), the Baden-New Hamburg Water and Wastewater Master Plan (2011), or the Morningside Sewage Pump Station Capacity Assessment (2017).

Alternative WW2

This alternative has a high potential to meet the long-term capacity requirements to service the projected population growth in Baden-New Hamburg. Existing infrastructure is easily accessible and appropriate site access for operations and maintenance would be provided. The increased infrastructure results in increased operational and/or maintenance complexity. While there is potential to optimize existing infrastructure investments, this alternative requires some new construction/infrastructure. This

alternative aligns with the Region's 2018 Wastewater Treatment Master Plan Update, the Foundry Street Sanitary Sewer Study (2010), the Baden-New Hamburg Water and Wastewater Master Plan (2011), and the Morningside Sewage Pump Station Capacity Assessment (2017). There is a low potential to minimize complexity of construction due to multiple facilities requiring improvements, and low potential to maintain adequate sewage pumping services during construction associated with alternative WW2.

Alternative WW3

This alternative has a high potential to meet the long-term capacity requirements to service the projected population growth in Baden-New Hamburg. Existing infrastructure is easily accessible and appropriate site access for operations and maintenance would be provided. The increased infrastructure results in increased operational and/or maintenance complexity. While there is potential to optimize existing infrastructure investments, this alternative requires some new construction/infrastructure. This alternative aligns with the Region's 2018 Wastewater Treatment Master Plan Update, the Foundry Street Sanitary Sewer Study (2010), the Baden-New Hamburg Water and Wastewater Master Plan (2011), and the Morningside Sewage Pump Station Capacity Assessment (2017). There is a low potential to minimize complexity of construction due to multiple facilities requiring improvements, and moderate potential to maintain adequate sewage pumping services during construction associated with alternative WW3.

Alternative WW4

This alternative has a high potential to meet the long-term capacity requirements to service the projected population growth in Baden-New Hamburg. There exists potential for site access for operations and maintenance to be less accessible, however, there is potential for reduced operational and/or maintenance complexity as this alternative proposes less infrastructure upgrades. Alternative WW4 requires some new construction but avoids significant construction within an urban area of New Hamburg. This alternative aligns with the Region's 2018 Wastewater Treatment Master Plan Update, the Foundry Street Sanitary Sewer Study (2010), the Baden-New Hamburg Water and Wastewater Master Plan (2011), and the Morningside Sewage Pump Station Capacity Assessment (2017). There is a high potential to minimize complexity of construction as this alternative is a direct route and does not require multiple facility upgrades, and high potential to maintain adequate sewage pumping service during construction as entirely new infrastructure will be constructed.

3.1.1.3 Foxboro Green Water and Wastewater Servicing

Based on the review of the background data, when reviewing the Foxboro Green Servicing alternatives, the following were considered.

Alternative F1

This alternative meets the long-term wastewater capacity requirements to service the population of Foxboro. There is limited operational redundancy when RBCs are out of service for repair. There are significant asset renewal requirements associated with alternative F1 as the remaining RBC is identified for replacement within the next five (5) years.

The existing and short-term needs are expected to be met once imminent upgrades at the WTP are completed. More significant upgrades would be required at the WTP for long-term operation. Significant asset renewal requirements, immediate to maintain short-term operation and near term to maintain long-term operation, are associated with this alternative.

Alternative WW1 does not align with the Region's 2018 Wastewater Treatment Master Plan Update, the Foundry Street Sanitary Sewer Study (2010), the Baden-New Hamburg Water and Wastewater Master Plan (2011), or the Morningside Sewage Pump Station Capacity Assessment (2017).

Alternative F2

This alternative has a high potential to meet the long-term capacity requirements for Foxboro Green, and provides appropriate site access for operations and maintenance. The existing WWTP and WTP can remain operational during forcemain and watermain construction. This alternative eliminates the need for significant upgrades at the Foxboro WWTP and WTP, however, new infrastructure would be required for forcemain construction, watermain construction, conversion of Foxboro WWTP to WWPS and conversion of Foxboro WTP to WBS. No significant forcemain/watermain closures would be expected during construction. Alternative F2 aligns with the Region's 2018 Wastewater Treatment Master Plan Update, the Foundry Street Sanitary Sewer Study (2010), the Baden-New Hamburg Water and Wastewater Master Plan (2011), and the Morningside Sewage Pump Station Capacity Assessment (2017).

Several construction risks exist. One (1) stream crossing is required at the north end of Foxboro, one (1) railway crossing is required on Sandhills Road, and Erbs Road has power lines on both sides of the road including high voltage power lines on the south side. The forcemain and watermain would pass near existing wetlands along Erbs Road, which may be susceptible to flooding.

Alternative F3

This alternative has a high potential to meet the long-term capacity requirements for Foxboro Green. The forcemain would be located within easements outside the urban boundary in a difficult location to maintain, however, less maintenance is expected with a shorter length of forcemain compared to F2 and F4. The existing WWTP and WTP can remain operational during forcemain and watermain construction. This alternative

eliminates the need for significant upgrades at the Foxboro WWTP and WTP, however, new infrastructure would be required for forcemain construction, watermain construction, conversion of Foxboro WWTP to WWPS and conversion of Foxboro WTP to WBS. Fewer materials will be required due to the significantly shorter length of infrastructure. No significant forcemain/watermain closures would be expected during construction, however, timing of implementation would be reliant on build-out of the Snyder's Road development. Alternative F3 aligns with the Region's 2018 Wastewater Treatment Master Plan Update, the Foundry Street Sanitary Sewer Study (2010), the Baden-New Hamburg Water and Wastewater Master Plan (2011), and the Morningside Sewage Pump Station Capacity Assessment (2017). The location of this alternative is near GRCA wetland and regulation limit areas which may be susceptible to flooding.

Alternative F4

This alternative has a high potential to meet the long-term capacity requirements for Foxboro Green, and provides appropriate site access for operations and maintenance. The existing WWTP and WTP can remain operational during forcemain and watermain construction. This alternative eliminates the need for significant upgrades at the Foxboro WWTP and WTP, however, new infrastructure would be required for forcemain construction, watermain construction, conversion of Foxboro WWTP to WWPS and conversion of Foxboro WTP to WBS. No significant forcemain/watermain closures would be expected during construction. Alternative F4 aligns with the Region's 2018 Wastewater Treatment Master Plan Update, the Foundry Street Sanitary Sewer Study (2010), the Baden-New Hamburg Water and Wastewater Master Plan (2011), and the Morningside Sewage Pump Station Capacity Assessment (2017).

Several construction risks exist. One (1) stream crossing and two (2) Nith River crossings are required. The forcemain and watermain would pass near existing wetlands along Nafziger Road, which may be susceptible to flooding. Erbs Road has power lines on both sides of the road including high voltage power lines on the south side.

3.2 Economic

Capital cost estimates and 50-year lifecycle cost estimates were prepared for each of the alternatives. These cost estimates are considered Class IV or planning level estimates, and generally include:

- Building, mechanical equipment, etc.
- Approximate 'per metre' costs for forcemain and watermain installation

Baden – New Hamburg Wastewater Alternative WW4 and Foxboro Green Water and Wastewater Alternative F3 contain non-Region owned properties for which property

acquisition costs may be incurred. The cost estimates for each of the alternatives are shown in Table 3-1, Table 3-2 and Table 3-3, below:

Table 3-1: Cost Estimates for Baden-New Hamburg Water Supply Alternatives

Alternative	Cost Estimate
WS1: Do Nothing	• Estimated capital cost: $0 • Estimated 50-year Lifecycle Costs: $0
WS2: Expanded Storage at New Hamburg WTP	• Estimated initial capital cost: $7.1M • Estimated 50-year lifecycle cost: $7.4M
WS3: Added Storage at Baden Wells	• Estimated initial capital cost: $7.2M • Estimated 50-year lifecycle cost: $9.4M
WS4: Added Storage at K50 Wells	• Estimated initial capital cost: $7.2M • Estimated 50-year lifecycle cost: $8.4M

Table 3-2: Cost Estimates for Baden-New Hamburg Wastewater Alternatives

Alternative	Cost Estimate
WW1: Do Nothing	• Estimated initial capital cost: $1.8M • Estimated 50-year lifecycle cost: $23M
WW2: Upgrade System and Maintain Existing Configuration	• Estimated initial capital cost: $20.5M • Estimated 50-year lifecycle cost: $42.8M
WW3: Upgrade System and Convey Directly to Morningside WWPS	• Estimated initial capital cost: $17.1M • Estimated 50-year lifecycle cost: $38.7M

Alternative	Cost Estimate
WW4: Upgrade System and Convey Directly to New Hamburg WWTP	• Estimated initial capital cost: $14.2M • Estimated 50-year lifecycle cost: $35.2M

Table 3-3: Cost Estimates for Foxboro Green Water Supply and Wastewater Alternatives

Alternative	Cost Estimate
F1: Do Nothing	• Estimated initial capital cost: $7.9M • Estimated 50-year lifecycle cost: $42.1M
F2: Provide Connection to Existing Baden Infrastructure Using Existing Road Allowances	• Estimated initial capital cost: $9.3M • Estimated 50-year lifecycle cost: $21.9M
F3: Provide Connection to Baden Using a Direct Route	• Estimated initial capital cost: $3.7M • Estimated 50-year lifecycle cost: $12.3M
F4: Provide Connection to the Existing New Hamburg Infrastructure Using Existing Road Allowances	• Estimated initial capital cost: $10.1M • Estimated 50-year lifecycle cost: $23.5M

4.0 Evaluation Summary and Preliminary Preferred Alternative

The alternatives have been evaluated based on their performance against the natural, social, technical and financial criteria that were identified within Technical Memorandum #2. The legend for evaluation scoring is identified in Table 4-1 for reference. A summary of the evaluation is identified in Table 4-2, Table 4-4, and Table 4-5. The full analysis is found in Appendix A, Appendix B and Appendix C. It is noted that environmental categories have been weighted equally in the selection of the preferred alternative.

Table 4-1: Evaluation Scoring Legend

Graphic	Rating	Description
	5	Very well aligned with criteria
	4	Well aligned with criteria
	3	Somewhat aligned with criteria
	2	Not well aligned with criteria
	1	Low alignment with criteria

4.1 Baden – New Hamburg Water Servicing

A summary of the evaluation table for Baden-New Hamburg Water Servicing is provided in Table 4-2.

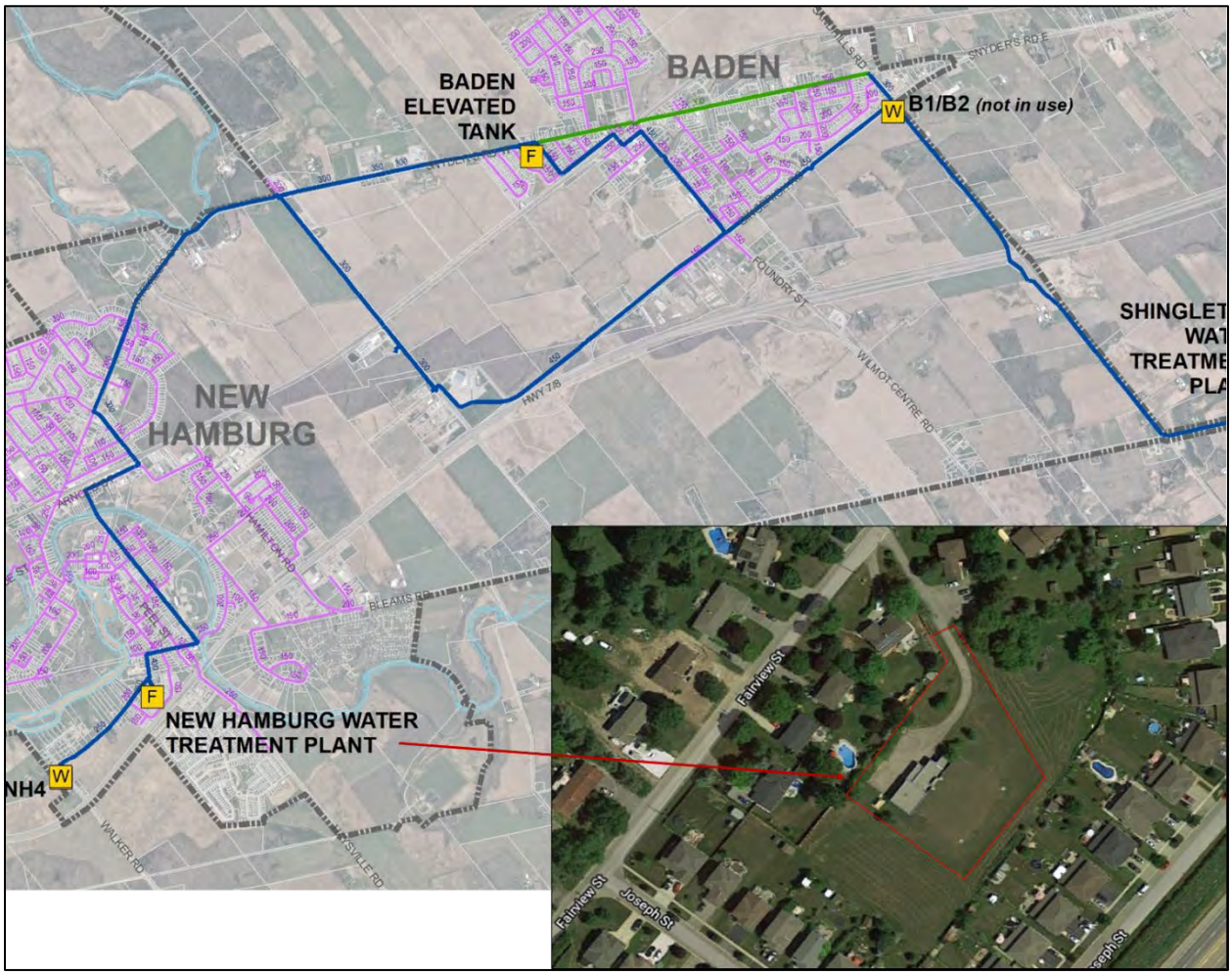
Table 4-2: Baden – New Hamburg Water Servicing Summary of Evaluation

Evaluation Criteria	WS1	WS2	WS3	WS4
Environmental				
Social				
Technical				
Financial				
Overall Score	Not Recommended 	Preferred Alternative 	Moderately Preferred 	Moderately Preferred 

Alternative WS2 (New storage at NH WTP) has been identified as the preliminary preferred alternative, subject to confirmation following the PCC and stakeholder review. Of the alternatives evaluated, this alternative had the most favorable score for the environmental and technical criteria. Apart from the "Do Nothing" alternative WS1, this alternative had the lowest financial impact. One of the key reasons that WS2 is the preferred alternative for additional storage is its proximity to downtown New Hamburg, where fire flow protection is most needed. Additionally, this alternative makes use of existing infrastructure and does not significantly change existing operations, minimizing the impact of GHGs as well as operator and public health and safety. This alternative aligns with the Baden-New Hamburg Water and Wastewater Master Plan (2011).

The preferred alternative was tested in the Region's water model and the results are presented in Appendix D.

Figure 4-1: Baden - New Hamburg Preferred Alternative WS2 Map



4.1.1 Other Considerations

In addition to the proposed storage improvements recommended at the NH WTP under WS2, other opportunities for improvement were considered in combination with the new Baden-New Hamburg feedermain and pressure reducing valve (PRV) currently under design. To improve looping and connectivity in NH once the future NH to Baden transmission main and PRV are built, the following watermain upgrades have been identified. The proposed PRV location provides an excellent primary feed from the Baden- New Hamburg Feedermain and works well in combination with the proposed upgrades at the NH WTP. Although existing water system is capable of handling both existing and future maximum day demand (MDD) plus fire flow (FF), there is areas of high velocity in the older New Hamburg downtown distribution system. The hydraulic analysis for these watermain upgrades is presented in Appendix E.

Table 4-3: Proposed Watermain Upgrades

#	Location	Existing Material	Length (m)	Existing Diameter (mm)	Proposed Upgrade	Justification
1	Nith River Crossing from Riverside Dr. to Jacob St.	PVC/ Asbestos Cement	190	250	300mm PVC	Increase capacity/reduce headloss at a key supply point into downtown NH.
2	Riverside Drive	Asbestos Cement	380	200	300mm PVC	Increase capacity/reduce headloss.
3	Wilmot St., Peel St., Huron Pl., Boullee St., King St.	Cast Iron	880	100	150mm PVC	Small diameter cast iron replacement to improve localized capacity constraints.

4.2 Baden – New Hamburg Wastewater Servicing

A summary of the evaluation table for Baden-New Hamburg Wastewater Servicing is provided in Table 4-4.

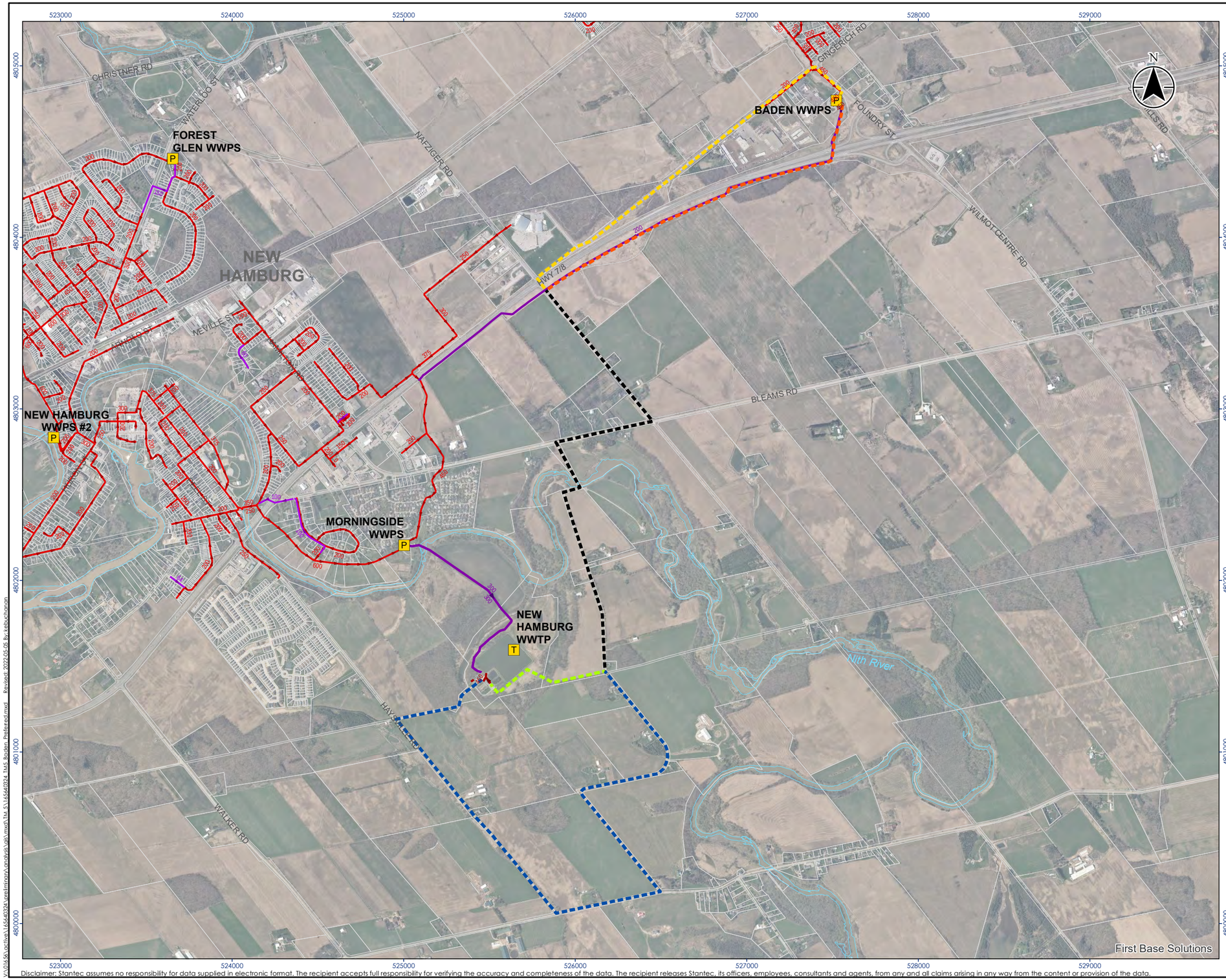
Table 4-4: Baden – New Hamburg Wastewater Servicing Summary of Evaluation

Evaluation Criteria	WW1	WW2	WW3	WW4
Environmental				
Social				
Technical				
Financial				
Overall Score	Not Recommended 	Least Preferred 	Moderately Preferred 	Preferred Alternative 

Alternative WW4 has been identified as the preliminary preferred alternative, subject to confirmation following the PCC and stakeholder review. This alternative has the highest potential to minimize impacts such as noise, odour and road closures as the new forcemain route is not located near residential neighbourhoods. No impacts to business operations during construction are anticipated. This alternative has the highest potential to provide reliable service as it includes the least amount of infrastructure, which decreases the probability of mechanical breakdown. Alternative WW4 has a high potential to meet the long-term capacity requirements for Baden-New Hamburg, high potential to improve operational redundancy, potential to reduce operational and/or maintenance complexity of infrastructure and does not require multiple facility upgrades. As entirely new infrastructure will be constructed, there is high potential to maintain adequate sewage pumping service during construction. This alternative provides the greatest increase in flow capacity, promoting the greatest amount of resiliency to extreme weather events and minimizes risk associated with variation in climate parameters. Finally, in comparison with WW2 and WW3, WW4 has the lowest financial estimated cost for both initial capital and 50-year lifecycle costs.

Figure 4-2 shows the forcemain sub-option routing associated with WW4. Sub-options 4A and 4C have been selected as the preferred routing. The current forcemain routing aligns with sub-option 4B, however, Region Operations staff have indicated that there are difficulties accessing appurtenances along this route. Furthermore, with the route paralleling a provincial highway, the construction and approvals become more difficult. Sub-option 4A would involve the purchase of a construction easement and permanent easement for the forcemain along smaller township roads, with simpler construction and permitting, and would result in more accessible appurtenances. As such, sub-option 4A was selected over 4B. The emergency laneway from Gingerich to the Wilmot Recreation Complex (WRC) will remain accessible for emergency vehicles during construction in the event access from Nafziger Rd is unavailable, the easements will be purchased prior to start of construction, and the WRC private laneway and Township road will be restored following forcemain construction. Timing of the work will be coordinated with WRC staff as the alignment may disturb the soccer fields, thus construction will occur during the field use off season. Two alignment options were considered to connect from Highway 7/8 to the New Hamburg WWTP. Sub-option 4C is approximately 700 m in length, requires the purchase of an easement, and requires an Oxbow creek crossing. Sub-option 4D is approximately 2860 m in length and requires an Oxbow creek crossing. Sub-option 4C was selected as the preferred alternative due to the significantly shorter, and thus more economically feasible, forcemain length. The final preferred alignment for WW4 is shown in Figure 4-3.

A preliminary hydraulic analysis for the preferred alternative was completed, including initial pump selections and development of system and pump curves. A summary of the preliminary hydraulic analysis is provided in Appendix G.



Legend

- Study Area
- Waste Water Treatment Plants
- Waste Water Pumping Station
- Sanitary Sewer (Region)
- Forcemain (Region)
- Sanitary Sewer (Wilmot)
- Forcemain (Wilmot)

Preferred Alternative

- Alternative 4
- Sub-Option 4A
- Sub-Option 4B
- Sub-Option 4C
- Sub-Option 4D

0 500 1,000 m

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Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
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3. Spring 2018 orthoimagery from Region of Waterloo web map service.

Project Location
Wilmot Township

165640324 REVA
Prepared by KDB on 2022-05-05

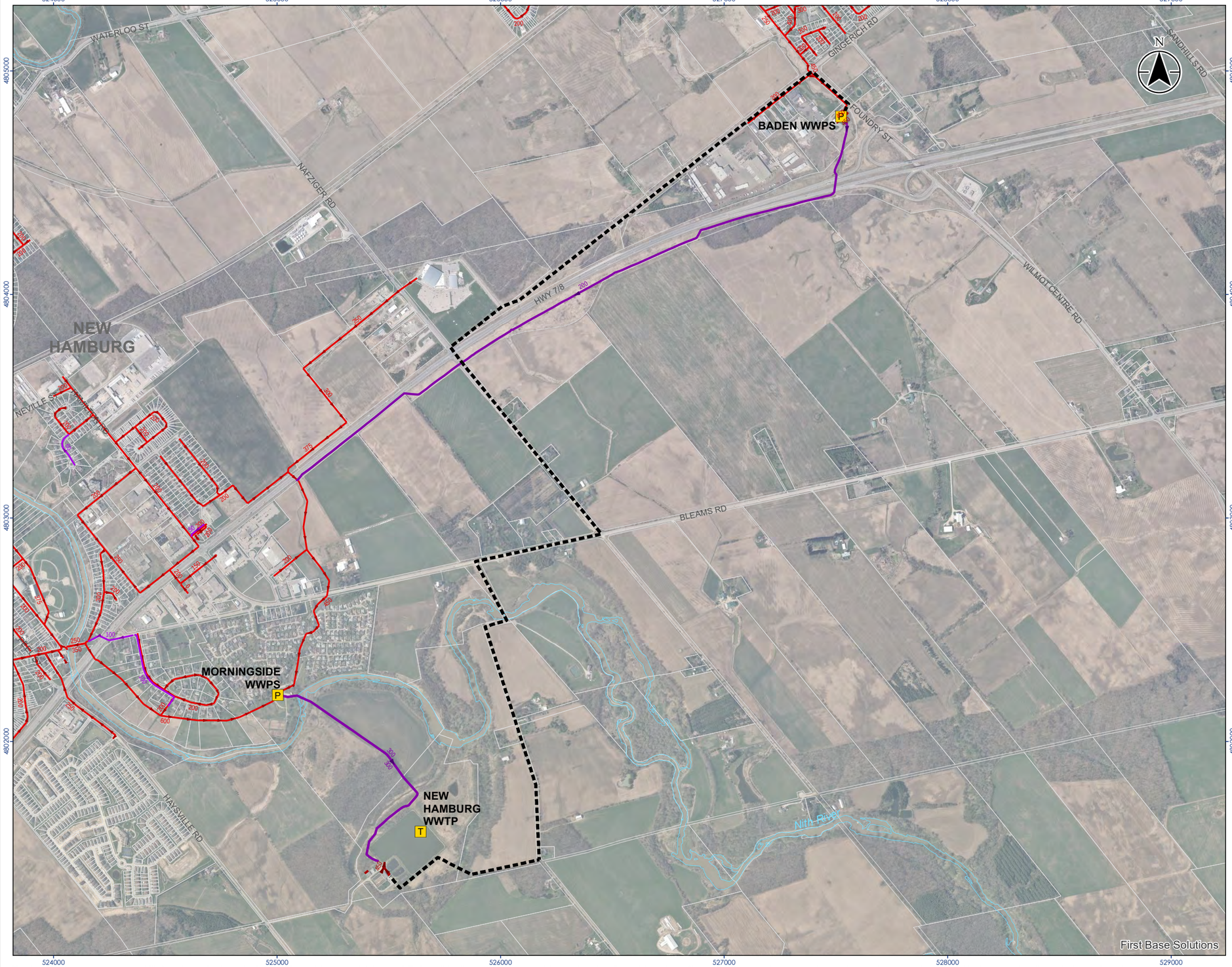
Client/Project
REGION OF WATERLOO
BADEN - NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
4-2

Title
Baden-New Hamburg W**W4 Sub-Option** Alternative**s**

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Legend

- Study Area
- T — Waste Water Treatment Plants
- P — Waste Water Pumping Station
- Sanitary Sewer (Region)
- Forcemain (Region)
- Sanitary Sewer (Wilmot)
- Forcemain (Wilmot)
- Preferred Alternative

0 500 1,000 m

1:17,500 (At original document size of 11x17)

Notes

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Project Location
Wilmot Township

165640324 REVA
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REGION OF WATERLOO
BADEN - NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
4-3

Title
Baden-New Hamburg WWW4 Preferred Alternative

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4.3 Foxboro Green Water and Wastewater Servicing

A summary of the evaluation table for Foxboro Green Water and Wastewater Servicing is provided in Table 4-5.

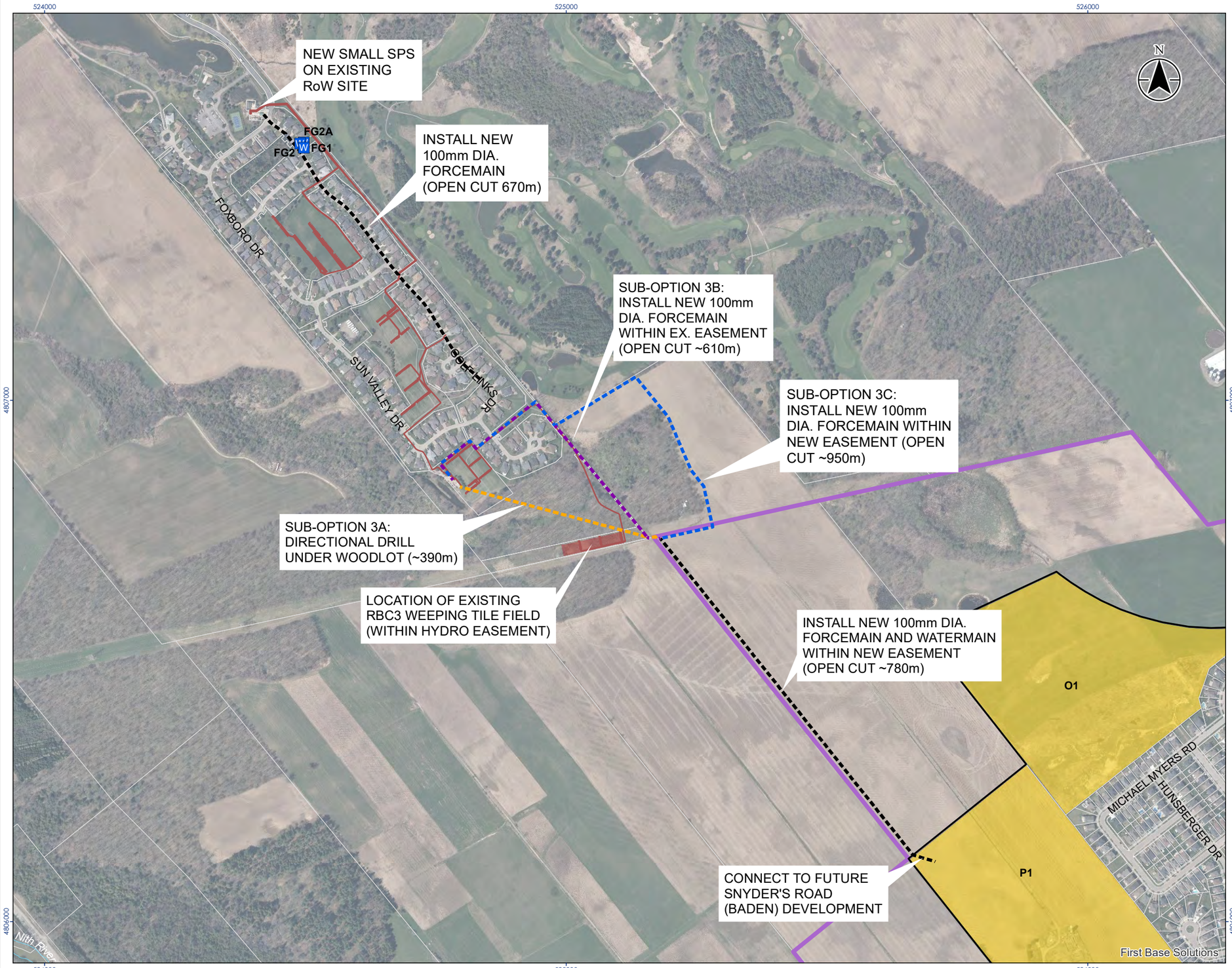
Table 4-5: Foxboro Green Water and Wastewater Servicing Summary of Evaluation

Evaluation Criteria	F1	F2	F3	F4
Environmental				
Social				
Technical				
Financial				
Overall Score	Not Recommended 	Moderately Preferred 	Preferred Alternative 	Least Preferred 

Alternative F3 has been identified as the preliminary preferred alternative, subject to confirmation following the PCC and stakeholder review. This alternative alleviates concerns regarding Foxboro WWTP's inability to consistently meet effluent solids objectives and elevated nitrate levels within the surrounding groundwater system. The new forcemain and watermain would be significantly shorter than in alternatives F2 and F4, resulting in less material for construction and lower construction costs. However, a new wastewater pumping station would be required in Baden. Alternative F3 is less disruptive to the Foxboro community, as construction will not occur within the residential neighbourhood. The location of the new forcemain and watermain is not anticipated to impact noise, odour or aesthetics for the Foxboro community, though there is potential for significant disruption during construction. There are no identified built heritage resources within the site. Alternative F3 provides a high potential to meet the long-term capacity requirements for both water and wastewater. The existing WTP and WWTP can remain operational during construction. As a result of increased flow capacity, alternative F3 promotes resiliency to extreme weather events and minimizes risk associated with variation in climate parameters. Finally, in comparison with F1, F2 and

F4, alternative F3 has a significantly lower estimated cost for both initial capital and 50-year lifecycle costs.

Figure 4-4 shows the forcemain and watermain sub-option routing associated with F3. Sub-option 3A would involve installing the forcemain and watermain by directionally drilling under the woodlot. The required pipe length was estimated to be 390 m. Sub-option 3B involves purchasing an easement and installing the watermain and forcemain by open-cut method through the woodlot. The required pipe length was estimated to be 610 m. Sub-option 3C involves purchasing an easement to the east of the woodlot and installing the watermain and forcemain by open-cut method. The required length was estimated to be 950 m. Sub-option 3C has been selected as the preferred routing, as it does not disturb the natural heritage features in the woodlot and uses an open-cut method which is typically less risky and more cost effective than directional drill. The final preferred alignment for alternative F3 is shown in Figure 4-5.



Stantec

Legend

- Municipal Well

Preferred Sanitary Alternative

- Alternative 3
- Sub-Option 3A
- Sub-Option 3B
- Sub-Option 3C
- Ex. Sanitary System
- Ex. RBC3 Weeping Tile Field
- Development Block
- Urban Area Boundary
- Countryside Line

0 100 200 m
1:7,500 (At original document size of 11x17)

Notes
1. Coordinate System: NAD 1983 UTM Zone 17N
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Project Location
Wilmot Township

165640324 REVA
Prepared by KDB on 2022-05-05

Client/Project
REGION OF WATERLOO
BADEN – NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
4-4

Title
Foxboro **Green Water and Wastewater Servicing Sub-Option Alternatives**

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524000 525000 526000

4807000

NEW SMALL SPS ON EXISTING RoW SITE

INSTALL NEW 100mm DIA. FORCEMAIN (OPEN CUT 670m)

FG2A FG2 FG1

FOXBORO DR

SUN VALLEY DR

SHELENKS DR

LOCATION OF EXISTING RBC3 WEEPING TILE FIELD (WITHIN HYDRO EASEMENT)

INSTALL NEW 100mm DIA. FORCEMAIN AND WATERMAIN WITHIN NEW EASEMENT (OPEN CUT ~1730m)

CONNECT TO FUTURE SNYDER'S ROAD (BADEN) DEVELOPMENT

O1

P1

MICHAEL MYERS RD

HUNSBERGER DR

Nith River

First Base Solutions

4806000

N

Stantec

Legend

- Municipal Well
- Preferred Alternative
- Ex. Sanitary System
- Ex. RBC3 Weeping Tile Field
- Development Block
- Urban Area Boundary
- Countryside Line

0 100 200 m

1:7,500 (At original document size of 11x17)

Notes

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Project Location
Wilmot Township

165640324 REVA
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REGION OF WATERLOO
BADEN – NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
4-5

Title
Foxboro Water and Wastewater Servicing
F3 Preferred Alternative

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5.0 Next Steps

The evaluation of Water and Wastewater Servicing Alternatives and the Preliminary Preferred Alternatives will be presented to the public and stakeholders for review and comment at Public Consultation Centre #3 scheduled for June 2022. Following any necessary revisions to the evaluation based on stakeholder feedback, the design team will move forward with further natural, cultural and archaeological heritage assessments for the preferred alternatives and the and all information will be compiled into a Project File Report. The Project File Report will document the Class EA process, identify any identified environmental impacts, as well as associated mitigation measures and commitments to carry forward through design and construction.

Appendix A

Complete Evaluation of Baden Water Supply Alternative Solutions

Factors and Criteria	Alternative WS1 – Do Nothing	Alternative WS2 – Provide increased storage at the New Hamburg Water Treatment Plant	Alternative WS3 – Provide new storage at the Baden Wells site	Alternative WS4 – Provide new storage at the Shingletown/K50 Wells site
ENVIRONMENTAL				
Protects environmental features • Protect sensitive natural features and regulated areas. Minimize the potential impact from construction and operation to existing terrestrial habitats/features, vegetation, wetlands, woodlots, and steep slopes. Allow for scheduling and roll-out of construction activities in a way and at a time of year that would limit the negative impacts on the vegetation of the site and surrounding area.	• Environmental features would remain in their current conditions, as no construction/upgrades are completed.	• High potential to protect sensitive natural features, as improvements to occur within an open grass area that has already been disturbed/developed. • Low potential to impact existing terrestrial habitats/features, vegetation, woodlots, and steep slopes. • Does not fall within a designated wetland area.	• High potential to protect sensitive natural features, as improvements to occur within an open grass area that has already been disturbed/developed. • Low potential to impact existing terrestrial habitats/features, vegetation, woodlots, and steep slopes. • Does not fall within a designated wetland area.	• Low potential to protect sensitive natural features and regulated area. Improvements would occur within Grand River Conservation Authority (GRCA) regulation limit and would impact the GRCA regulated watercourse on site. • High potential to impact existing terrestrial habitats/features, vegetation/woodlots, steep slopes (adjacent to watercourse). • Does not fall within regulated wetland area.
Protects wildlife and species at risk • Minimize impacts to wildlife (including species at risk) or identified habitat locations for these species. Protect fisheries and aquatic health. • Allow for scheduling and roll-out of construction activities in a way and at a time of year that would limit the negative impacts on wildlife and species at risk.	• Wildlife and species at risk would remain in their current condition, as no construction/upgrades are completed.	• High potential to protect wildlife as improvements to occur within an area that has already been disturbed. • No aquatic habitat or species identified within the area. • No species at risk identified within the area.	• High potential to protect wildlife as improvements to occur within an area that has already been disturbed. • No aquatic habitat or species identified within the area. • No species at risk identified within the area.	• Low potential to protect wildlife as improvements occur within GRCA regulation limit, and GRCA watercourse. • High potential to impact aquatic habitat or species within the area. • No species at risk identified within the area.
Protects groundwater, streams and rivers • Protect groundwater and meets Clean Water Act requirements. Minimize impacts on the GRCA regulated floodplain.	• Groundwater, streams, and rivers would remain in their current conditions, as no construction/upgrades are completed.	• High potential to protect groundwater, streams, and rivers. Improvements would not occur on regulatory floodplain, or nearby a watercourse.	• High potential to protect groundwater, streams, and rivers. Improvements would not occur on regulatory floodplain, or nearby a watercourse.	• Moderate potential to protect groundwater, streams, and rivers. Improvements would not occur on regulatory floodplain but would occur nearby a GRCA regulated watercourse.
Minimizes climate change impacts	• Low potential to reduce GHG emissions as infrastructure	• Potential to reduce GHG emissions and negative impacts on	• Potential to reduce GHG emissions and negative impacts on	• Potential to reduce GHG emissions and negative impacts on the

Factors and Criteria	Alternative WS1 – Do Nothing	Alternative WS2 – Provide increased storage at the New Hamburg Water Treatment Plant	Alternative WS3 – Provide new storage at the Baden Wells site	Alternative WS4 – Provide new storage at the Shingletown/K50 Wells site
• Minimize GHG emissions and negative impacts on the landscape which may alter the ecosystems' ability to remove carbon dioxide from the atmosphere (e.g. changes to site and vicinity plant cover). • Prioritize energy and water conservation and efficiency measures and/or adaptive re-use of buildings or structures to reduce new energy or material demands. Evaluate contributions to or investments in natural spaces that offset or mitigate the alternative's climate change impacts	would remain in current conditions.	the landscape as in ground reservoir, existing ground cover would be restored. • No additional hydraulic energy loss compared to existing operations. • Reduced GHG emissions as existing pump station building would be used, and potential to make use of existing reservoir materials and well pumps. • Additional distribution system pumps are required, which will create GHG emissions.	the landscape as in ground reservoir, existing ground cover would be restored. • New pump station would be required, which will create GHG emissions. • Energy loss to fill reservoir and re-pump water into system.	landscape as in ground reservoir, existing ground cover would be restored • Energy loss as reservoir is filled from well pump and re-boosted from distribution pumps • Existing well pumps may need to be replaced and new pump station required, which will create GHG emissions.
ENVIRONMENTAL				
SOCIAL				
Minimizes impacts to residents related to noise, odour, traffic and aesthetics • Minimize noise, odour, and truck traffic affecting the community during pumping station operation. Maintain access to and aesthetics of public spaces. Minimize negative impacts that may result due to changes to the neighbourhood characteristics (e.g., recreational features, green space, property values).	• Low potential to minimize impacts to residents related to noise, odour, traffic, and aesthetics as infrastructure would remain in current conditions.	• Underground reservoir maintains green space. Potential to impact aesthetic as existing open space site will be fenced off to the public. • No anticipated impacts/changes to noise, odour or traffic at site. • Additional pump capacity at existing pump station not expected to significantly increase traffic for operations.	• Underground reservoir, maintains open green space and site aesthetic. • No anticipated impacts to noise at existing site. • Additional maintenance required for booster pumps and reservoir instrumentation may increase traffic. • Septic tank may be required on site which will impact odour.	• Underground reservoir maintains open green space and site aesthetic. • Not anticipated to impact noise or odour at existing site. • Additional maintenance required for booster pumps and reservoir instrumentation may increase traffic. • Filter system being added at this site expected to increase O&M traffic to a higher extent than the reservoir.

Factors and Criteria	Alternative WS1 – Do Nothing	Alternative WS2 – Provide increased storage at the New Hamburg Water Treatment Plant	Alternative WS3 – Provide new storage at the Baden Wells site	Alternative WS4 – Provide new storage at the Shingletown/K50 Wells site
Minimizes impacts to businesses • Maintain access for businesses during construction and operation. Minimize potential negative effects on short-term and long-term business vitality, and community growth and development.	• No impacts to business operations during construction are anticipated. • High potential for negative effects on short-term and long-term business vitality, community growth and development as existing infrastructure may not have sufficient capacity pending Region review.	• No impacts to businesses and business operations anticipated during construction. • Will improve short-term and long-term business vitality and community growth and development through increase water supply.	• No impacts to businesses and business operations anticipated during construction • Will improve short-term and long-term business vitality and community growth and development through increase water supply.	• No impacts to businesses and business operations anticipated during construction • Will improve short-term and long-term business vitality and community growth and development through increase water supply.
Manages and minimizes construction impacts • Minimize noise, odour, road closures, and truck traffic affecting the community during construction.	• No construction required as infrastructure would remain in existing conditions.	• High potential for noise impacts to nearby adjacent residential properties during construction. • Increased truck traffic would be routed through residential community during construction. • No anticipated road closures required during construction.	• Low potential for noise impacts to local residents. No residential properties located directly adjacent to project site. • Increased truck traffic in the area is anticipated during construction. • No anticipated road closures required during construction.	• Low potential for major noise impacts to local residents. • Nearby residential properties located in the area surrounding the project site could experience temporary noise impacts as a result of construction. • Increased truck traffic in the area is anticipated during construction. • No anticipated road closures required during construction.
Protects cultural heritage features • Minimize potential impact to historical, cultural, and architecturally significant features. Minimize the potential impact to Indigenous communities.	• No anticipated impacts to cultural heritage features as no construction is required.	• No anticipated impacts to cultural heritage features.	• No anticipated impacts to cultural heritage features.	• No anticipated impacts to cultural heritage features.
Protects archaeological features • Minimize potential impact to archaeologically significant features. Performs the appropriate archaeological investigations as regulated by	• No anticipated impacts to archaeological features as no construction required.	• No anticipated impacts to archeological features as no undisturbed areas would be disturbed through selection of this alternative.	• No anticipated impacts to archeological features as no undisturbed areas would be disturbed through selection of this alternative.	• High potential to impact archaeological features in undisturbed areas in project area; Stage 1-2 Archaeological Assessment required to confirm.

Factors and Criteria	Alternative WS1 – Do Nothing	Alternative WS2 – Provide increased storage at the New Hamburg Water Treatment Plant	Alternative WS3 – Provide new storage at the Baden Wells site	Alternative WS4 – Provide new storage at the Shingletown/K50 Wells site
legislation in areas of archeological potential.				
Protects health and safety • Minimize the potential risk to public health and safety, particularly on downstream users (including for recreation and tourism). Minimize the potential risk to operator and maintenance staff's health and safety.	• Low potential to minimize public health and safety as existing infrastructure may not have sufficient capacity pending Region review, and future development may overload the system. • Does not meet future fire flow requirements.	• High potential to improve fire protection in high density area. • Increases chlorine contact time. • No anticipated impacts to operator health and safety compared to existing operations.	• Moderate potential to improve fire protection. • Potential to increase water age and decrease chlorine residual. • Potential impacts to operator health and safety if chemical storage is required on site.	• Moderate potential to improve fire protection. • Increases chlorine contact time. • No anticipated impacts to operator health and safety compared to existing operations.
SOCIAL				
TECHNICAL				
Provides reliable service • Prioritize security, reliability and robustness. Lesser likelihood of process upset or mechanical breakdown.	• Low potential to provide a reliable service as existing infrastructure cannot take on additional capacity	• Existing process piping and pump infrastructure to be used to fill reservoir and pump into system. • High potential to provide redundancy/ robustness with existing NH reservoir. • High potential to provide a reliable pump station and well operation required to utilize storage.	• Moderate potential to provide reliability/ robustness, as system depends on new infrastructure required to fill reservoir and pump back into system.	• Existing process piping infrastructure may be used. • Moderate potential to provide a reliable pump station and well operation required to utilize storage. • No redundancy for water distribution between K50s site and the Baden network.
Meets existing and future needs • Meets the long-term capacity requirements to service the projected population growth in the sanitary catchment area. • Provide appropriate site access and egress for operations and maintenance per current standards and best practices. • Provide operational redundancy to allow for	• May not meet long-term capacity requirements to service the projected population growth or provide operational redundancy.	• Anticipated to meet long term capacity requirements to service projected population growth. • Provides appropriate site access from existing WTP and reservoir. • Redundancy with existing NH reservoir improves overall system redundancy as well as operational redundancy as one reservoir may be taken offline for maintenance/cleaning while the other remains online, allowing the wells, WTP and pump station to continue to operate.	• Anticipated to meet long term capacity requirements to service projected population growth. • Provides appropriate site access from existing well site. • Increases operational complexity to fill reservoir and re-pump to system. • Significantly impact on operations and maintenance at site.	• Anticipated to meet long term capacity requirements to service projected population growth. • Potential for land acquisition to be required for reservoir. • Improves site redundancy as on-site storage would allow K50 wells to be periodically offline while maintaining supply to system through new pump station. • Moderate increases to operational complexity to re-pump from reservoir to system. • Moderate impact on operations and maintenance at site.

Factors and Criteria	Alternative WS1 – Do Nothing	Alternative WS2 – Provide increased storage at the New Hamburg Water Treatment Plant	Alternative WS3 – Provide new storage at the Baden Wells site	Alternative WS4 – Provide new storage at the Shingletown/K50 Wells site
maintenance and cleaning of equipment and infrastructure. • Minimize increases in operational and/or maintenance complexity of the station.		• Not expected to significantly impact existing operations and maintenance at site.		
Aligns with existing and planned infrastructure • Optimize existing infrastructure investment including structures, tanks, and equipment. • Align with planned infrastructure projects including recommendations of the Baden-New Hamburg Water and Wastewater Master Plan (2011).	• Does not optimize existing infrastructure. • Does not align with Region's Baden-New Hamburg Water and Wastewater Master Plan (2011).	• High potential to utilize components of the existing reservoir infrastructure. • Aligns with proposed feedermain connection between New Hamburg and Baden. • Upgrades to existing pump station required.	• Low potential to utilize existing infrastructure as Baden wells are not currently operational. • New pump station required to utilize storage at this location.	• Pump infrastructure upgrades required to utilize storage at this location. • Upgrades at this site align with planned treatment upgrades. • Timeline to be confirmed.
Aligns with existing and future land use • Evaluate need to acquire land for new pumping station or expansion of pumping station and ownership requirements.	• Does not require additional land as infrastructure will remain in current conditions.	• Anticipated to have sufficient land within existing WTP and reservoir property boundary.	• Potential for property acquisition to be required for reservoir.	• Potential for property acquisition to be required for reservoir.
Aligns with approval and permitting process • Minimize the complexity and time spent to obtain approvals from various regulatory agencies.	• Does not require approvals or permits as no improvements will be completed.	• Site plan approval required. • Building permits required. • ESA inspections may be required. • Dewatering approval required.	• Site plan approval required. • Building permits required. • ESA inspections may be required. • Dewatering approval required.	• GRCA permitting required for improvements within GRCA regulation limit and GRCA watercourse. • Site plan approval required. • Building permits required. • ESA inspections may be required. • Dewatering approval required.
Manages and minimizes construction risks • Minimize complexity of construction and maximize ability to maintain adequate water supply services during construction.	• No impacts to services as no improvements are proposed.	• High potential for existing reservoir and WTP to remain operational during construction. • High potential for existing NH wells to remain in operation during construction.	• High potential for existing operations to be maintained, as Baden wells are not currently operational. • No directly adjacent residential properties.	• Low potential for Shingletown well field to be operational during construction. • Increased complexity as retaining wall may be required during construction due to adjacent water body.

Factors and Criteria	Alternative WS1 – Do Nothing	Alternative WS2 – Provide increased storage at the New Hamburg Water Treatment Plant	Alternative WS3 – Provide new storage at the Baden Wells site	Alternative WS4 – Provide new storage at the Shingletown/K50 Wells site
		• Increased complexity as retaining wall likely required during construction, which has potential to impact surrounding residential properties. • Potential for reservoir foundation to impact surrounding residential properties.		
Ability to adapt to climate change • Promote resiliency to extreme weather events. Prioritize • climate change adaptation to minimize risk associated with variation in climate parameters (temperature, precipitation, wind gusts, or other) and natural hazards (flooding, high river levels, or other). • Prioritize the surrounding area's ability to be resilient and maintain its adaptive capacity to climate change.	• Does not promote resiliency to extreme weather events or minimize risk associated with variation in climate parameters.	• Potential for site access impacts as a result of a flooding event. • Reduce site runoff coefficient. • Increased storage improves resiliency to water supply.	• Reduce site runoff coefficient. • Increased storage improves resiliency to water supply.	• Potential to be impacted in future due to climate change as a regulated watercourse is on site. • Reduce site runoff coefficient. • Increased storage improves resiliency to water supply.
TECHNICAL				
FINANCIAL				
Provides low lifecycle costs • Minimize capital, operation and maintenance (life cycle) costs over a 50-year period.	• Estimated Capital Cost: $0 • Estimated 50-Year Lifecycle Costs: $0	• Estimated Initial Capital Cost: $7.1M • Estimated 50-Year Lifecycle Costs: $7.4M	• Estimated Initial Capital Cost: $7.2M • Estimated 50-Year Lifecycle Costs: $9.4M	• Estimated Initial Capital Cost: $7.2M • Estimated 50-Year Lifecycle Costs: $8.4M
FINANCIAL				
SUMMARY				

Factors and Criteria	Alternative WS1 – Do Nothing	Alternative WS2 – Provide increased storage at the New Hamburg Water Treatment Plant	Alternative WS3 – Provide new storage at the Baden Wells site	Alternative WS4 – Provide new storage at the Shingletown/K50 Wells site
Alternative Ranking	**Least Preferred** (Does not address Fire Flow storage deficiency) 	**Preferred** 	**Moderately Preferred** 	**Moderately Preferred** 

Graphic	Rating	Description
	5	Very well aligned with criteria
	4	Well aligned with criteria
	3	Somewhat aligned with criteria
	2	Not well aligned with criteria
	1	Low alignment with criteria

Appendix B

Complete Evaluation of Baden Wastewater Alternative Solutions

Factors and Criteria	Alternative WW1 – Do Nothing	Alternative WW2 – Upgrade system and maintain existing configuration	WW3 – Upgrade system and convey directly to Morningside Pump Station	Alternative WW4 – Upgrade system and convey directly to New Hamburg Wastewater Treatment Plant
ENVIRONMENTAL				
Protects environmental features • Protect sensitive natural features and regulated areas. Minimize the potential impact from construction and operation to existing terrestrial habitats/features, vegetation, wetlands, woodlots, and steep slopes. Allow for scheduling and roll-out of construction activities in a way and at a time of year that would limit the negative impacts on the vegetation of the site and surrounding area.	• Environmental features would remain in their current conditions, as no construction/upgrades are completed.	• High potential to protect environmental features as construction can occur within the existing right-of-way. • High potential to schedule construction during time of year that will limit negative impacts on surrounding vegetation. • Low potential to protect New Hamburg Oxbow Wetland Complex when upgrading forcemain from Morningside Pumping Station to the New Hamburg Wastewater Treatment Plant. • Moderate potential to protect woodlots as portions of construction are proposed through wooded area	• High potential to protect environmental features as construction can occur within the existing right-of-way. • High potential to schedule construction during time of year that will limit negative impacts on surrounding vegetation. • Low potential to protect New Hamburg Oxbow Wetland Complex when upgrading forcemain from Morningside Pumping Station to the New Hamburg Wastewater Treatment Plant. • Moderate potential to protect woodlots as portions of construction are proposed through wooded area	• Moderate potential to protect environmental features as segments of construction may occur outside the right-of-way, and across a watercourse. All potential impacts will be mitigated to the greatest extent possible. • High potential to schedule construction during time of year that will limit negative impacts on surrounding vegetation. • High potential to protect New Hamburg Oxbow Wetland Complex as new forcemain is proposed to be constructed adjacent to the feature. • Moderate potential to protect woodlots as portions of construction are proposed through wooded area
Protects wildlife and species at risk • Minimize impacts to wildlife (including species at risk) or identified habitat locations for these species. Protect fisheries and aquatic health. • Allow for scheduling and roll-out of construction activities in a way and at a time of year that would limit the negative impacts on wildlife and species at risk.	• Wildlife and species at risk would remain in their current conditions, as no construction/upgrades are completed.	• Moderate potential to protect wildlife and species at risk as the majority of features can occur within the existing right-of-way, however, there exists the possibility for impacts at the New Hamburg Oxbow Wetland Complex when upgrading the forcemain from Morningside PS to NH WWTP. All potential impacts will be mitigated to the greatest extent possible.	• High potential to protect wildlife and species at risk as features can occur within the existing right-of-way.	• Moderate potential to protect wildlife and species at risk, as segments of construction may occur outside the right-of-way, and across a watercourse. All potential impacts will be mitigated to the greatest extent possible.

Factors and Criteria	Alternative WW1 – Do Nothing	Alternative WW2 – Upgrade system and maintain existing configuration	WW3 – Upgrade system and convey directly to Morningside Pump Station	Alternative WW4 – Upgrade system and convey directly to New Hamburg Wastewater Treatment Plant
Protects groundwater, streams and rivers • Protect groundwater and meets Clean Water Act requirements. Minimize impacts on the GRCA regulated floodplain.	• Groundwater, streams and rivers would remain in their current conditions, as no construction/upgrades are completed.	• Moderate potential to protect groundwater, streams and rivers as the majority of features can occur within the existing right-of-way, however, impacts at the New Hamburg Oxbow Wetland Complex when upgrading the forcemain from Morningside PS to NH WWTP. All potential impacts will be mitigated to the greatest extent possible.	• High potential to protect groundwater, streams and rivers as features can occur within the existing right-of-way.	• Moderate potential to protect groundwater, streams and rivers, as construction may occur outside the right-of-way, and across a watercourse. All potential impacts will be mitigated to the greatest extent possible.
Minimizes climate change impacts • Minimize GHG emissions and negative impacts on the landscape which may alter the ecosystems' ability to remove carbon dioxide from the atmosphere (e.g. changes to site and vicinity plant cover). • Prioritize energy and water conservation and efficiency measures and/or adaptive re-use of buildings or structures to reduce new energy or material demands. Evaluate contributions to or investments in natural spaces that offset or mitigate the alternative's climate change impacts	• Low potential to reduce GHG emissions as infrastructure would remain in current conditions.	• Moderate potential to reduce GHG emissions and negative impact to landscapes as this option has the ability to reuse/adapt existing buildings or structures, but requires tunnelling.	• Moderate potential to reduce GHG emissions and negative impact to landscapes as this option reuses/adapts some existing buildings or structures, while also include new infrastructure.	• Low potential to reduce GHG emissions and negative impact to landscapes as this option constructs new infrastructure.
ENVIRONMENTAL				
SOCIAL				

Factors and Criteria	Alternative WW1 – Do Nothing	Alternative WW2 – Upgrade system and maintain existing configuration	WW3 – Upgrade system and convey directly to Morningside Pump Station	Alternative WW4 – Upgrade system and convey directly to New Hamburg Wastewater Treatment Plant
Minimizes impacts to residents related to noise, odour, traffic and aesthetics • Minimize noise, odour, and truck traffic affecting the community during pumping station operation. Maintain access to and aesthetics of public spaces. Minimize negative impacts that may result due to changes to the neighbourhood characteristics (e.g., recreational features, green space, property values).	• Low potential to minimize impacts to residents related to noise, odour, traffic and aesthetics as infrastructure would remain in current conditions.	• Low potential to minimize impacts such as noise, odour and aesthetics as this route would remain close to residential neighbourhoods and a retirement community. The new forcemain would be constructed within the existing right of way of Highway 7/8 and would travel alongside the existing road. Impacts to traffic are not anticipated.	• Moderate potential to minimize impacts such as noise, odour and aesthetics as some of this route would remain close to residential neighbourhoods. The new forcemain would be constructed within the existing right of way of Highway 7/8, and along a municipal side road. Impacts to traffic are not anticipated.	• High potential to minimize impacts such as noise, odour and aesthetics as the new forcemain route is not located near residential neighbourhoods and avoids the local retirement community. The new forcemain would be constructed away from the neighbourhoods, along right-of-ways where possible. Impacts to traffic are not anticipated.
Minimizes impacts to businesses • Maintain access for businesses during construction and operation. Minimize potential negative effects on short-term and long-term business vitality, and community growth and development.	• No impacts to business operations during construction are anticipated. • High potential for negative effects on short-term and long-term business vitality, community growth and development as existing infrastructure does not have sufficient capacity.	• No impacts to business operations during construction are anticipated. • Low potential for negative effects on long-term business vitality, community growth and development.	• No impacts to business operations during construction are anticipated. • Low potential for negative effects on long-term business vitality, community growth and development.	• No impacts to business operations during construction are anticipated. • Low potential for negative effects on long-term business vitality, community growth and development.
Manages and minimizes construction impacts • Minimize noise, odour, road closures, and truck traffic affecting the community during construction.	• No construction required as infrastructure would remain in existing conditions.	• Low potential to minimize impacts of construction due to proximity of existing infrastructure to nearby neighbourhoods. Upgrades to Pumping Stations and Morningside Trunk Sewer has potential to create noise, odour, road closures and truck traffic. • New forcemain would be constructed adjacent to Highway 7/8. Construction of the new forcemain is not anticipated to affect the community.	• Moderate potential to minimize impacts of construction noise, odour, road closures, and truck traffic as fewer upgrades to infrastructure nearby neighbourhoods is required. • New forcemain would be constructed adjacent to Highway 7/8, and adjacent to a municipal side road. There is low potential for this new construction to affect the community.	• High potential to minimize impacts of construction noise, odour, road closures and truck traffic as the new forcemain. • New forcemain is proposed to be constructed away from residential neighbourhoods.

Factors and Criteria	Alternative WW1 – Do Nothing	Alternative WW2 – Upgrade system and maintain existing configuration	WW3 – Upgrade system and convey directly to Morningside Pump Station	Alternative WW4 – Upgrade system and convey directly to New Hamburg Wastewater Treatment Plant
Protects cultural heritage features • Minimize potential impact to historical, cultural, and architecturally significant features. Minimize the potential impact to Indigenous communities.	• Protects cultural heritage features as no construction required.	• Potential to impact 1 listed heritage resource; a Cultural Heritage Assessment Report is required to determine impacts and mitigation requirements.	• Potential to impact 1 Designated heritage resource; a Cultural Heritage Assessment Report is required to determine impacts and mitigation requirements.	• Potential to impact 1 Designated heritage resource; a Cultural Heritage Assessment Report is required to determine impacts and mitigation requirements.
Protects archaeological features • Minimize potential impact to archaeologically significant features. Performs the appropriate archaeological investigations as regulated by legislation in areas of archeological potential.	• Protects archaeological features as no construction required.	• Moderate potential to impact archaeological features in undisturbed areas in project area, specifically at river crossing; Stage 1-2 Archaeological Assessment required to confirm.	• Moderate potential to impact archaeological features in undisturbed areas in project area, specifically at river crossing; Stage 1-2 Archaeological Assessment required to confirm.	• Moderate potential to impact archaeological features in undisturbed areas in project area, specifically at river crossing; Stage 1-2 Archaeological Assessment required to confirm.
Protects health and safety • Minimize the potential risk to public health and safety, particularly on downstream users (including for recreation and tourism). Minimize the potential risk to operator and maintenance staff's health and safety.	• Low potential to minimize public health and safety as existing infrastructure does not have sufficient capacity, and future development may overload the system.	• Moderate potential to minimize public health and safety as upgrades would be completed to pumping stations and forcemains to accommodate additional capacity.	• Moderate potential to minimize public health and safety as upgrades would be completed to pumping stations and forcemains to accommodate additional capacity.	• Moderate potential to minimize public health and safety as new forcemains would be constructed to accommodate additional capacity.
SOCIAL				
TECHNICAL				
Provides reliable service • Prioritize security, reliability and robustness. Lesser likelihood of process upset or mechanical breakdown.	• Low potential to provide a reliable service as existing infrastructure cannot take on additional capacity.	• Moderate potential to provide reliable services. Alternative includes greatest number of infrastructure (Baden Pumping Station (PS), forcemain from Baden PS to Morningside Trunk Sewer (TS), Morningside TS, Morningside PS, forcemain from Morningside PS to New Hamburg Wastewater Treatment Plant) which increases possibility of mechanical breakdown.	• Moderate potential to provide reliable service. Alternative includes high number of infrastructure (Baden Pumping Station, forcemain from Baden PS to Morningside PS, Morningside PS, forcemain from Morningside PS to New Hamburg Wastewater Treatment Plant) which increases possibility of mechanical breakdown.	• High potential to provide reliable service. Alternative includes the least amount of infrastructure (Baden Pumping Station, forcemain from Baden PS directly to New Hamburg Wastewater Treatment Plant) which decreases possibility of mechanical breakdown.

Factors and Criteria	Alternative WW1 – Do Nothing	Alternative WW2 – Upgrade system and maintain existing configuration	WW3 – Upgrade system and convey directly to Morningside Pump Station	Alternative WW4 – Upgrade system and convey directly to New Hamburg Wastewater Treatment Plant
Meets existing and future needs • Meets the long-term capacity requirements to service the projected population growth in the sanitary catchment area. • Provide appropriate site access and egress for operations and maintenance per current standards and best practices. • Provide operational redundancy to allow for maintenance and cleaning of equipment and infrastructure. Minimize increases in operational and/or maintenance complexity of the station.	• Does not meet long-term capacity requirements to service the projected population growth or provide operational redundancy.	• High potential to meet the long-term capacity requirements to service projected population growth. • Provides appropriate site access for operations and maintenance, as some infrastructure already exists and is easily accessible. • Does not improve operational redundancy to allow for maintenance and cleaning of equipment as there is numerous infrastructure that needs to be functioning to provide services. • Increases operational and/or maintenance complexity of the infrastructure due to increased infrastructure.	• High potential to meet the long-term capacity requirements to service projected population growth. • Provides appropriate site access for operations and maintenance, as some infrastructure already exists and is easily accessible. • Moderate potential to improve operational redundancy to allow for maintenance and cleaning of equipment as this alternative requires less existing infrastructure to provide services. • Increases operational and/or maintenance complexity of the infrastructure due to increased infrastructure.	• High potential to meet the long-term capacity requirements to service projected population growth. • Potential for site access for operations and maintenance to be less accessible. • High potential to improve operational redundancy to allow for maintenance and cleaning of equipment as this alternative provides entirely new infrastructure and a new service route. • Potential to reduce operational and/or maintenance complexity of the infrastructure as this alternative is a direct route and utilizes less existing infrastructure.

Factors and Criteria	Alternative WW1 – Do Nothing	Alternative WW2 – Upgrade system and maintain existing configuration	WW3 – Upgrade system and convey directly to Morningside Pump Station	Alternative WW4 – Upgrade system and convey directly to New Hamburg Wastewater Treatment Plant
Aligns with existing and planned infrastructure • Optimize existing infrastructure investment including structures, tanks, and equipment. • Align with planned infrastructure projects including recommendations of the Region's 2018 Wastewater Treatment Master Plan Update, the Foundry Street sanitary Sewer Study (2010), the Baden-New Hamburg Water and Wastewater Master Plan (2011), and the Morningside Sewage Pump Station Capacity Assessment (2017).	• Does not optimize existing infrastructure. • Does not align with Region's 2018 Wastewater Treatment Master Plan Update, the Foundry Street sanitary Sewer Study (2010), the Baden-New Hamburg Water and Wastewater Master Plan (2011), and the Morningside Sewage Pump Station Capacity Assessment (2017) to upgrade and/or expand the Region's wastewater facilities prior to 2051.	• Moderate potential to optimize existing infrastructure investments including structure, tanks and equipment. This alternative requires some new construction/infrastructure. • Aligns with the Region's 2018 Wastewater Treatment Master Plan Update, the Foundry Street sanitary Sewer Study (2010), the Baden-New Hamburg Water and Wastewater Master Plan (2011), and the Morningside Sewage Pump Station Capacity Assessment (2017) to upgrade and/or expand the Region's wastewater facilities prior to 2051. • Expansion of Morningside PS may not be desirable at this time as upgrades were recently completed.	• Moderate potential to optimize existing infrastructure investments including structure, tanks and equipment. This alternative requires some new construction/infrastructure. • Aligns with the Region's 2018 Wastewater Treatment Master Plan Update, the Foundry Street sanitary Sewer Study (2010), the Baden-New Hamburg Water and Wastewater Master Plan (2011), and the Morningside Sewage Pump Station Capacity Assessment (2017) to upgrade and/or expand the Region's wastewater facilities prior to 2051. • Expansion of Morningside PS may not be desirable at this time as upgrades were recently completed. • Existing Highway 7/8 forcemain can be used as-is for future growth in New Hamburg.	• High potential to optimize existing infrastructure investments including structure, tanks and equipment. This alternative requires some new construction/infrastructure but avoids significant construction within urban New Hamburg area. • Aligns with the Region's 2018 Wastewater Treatment Master Plan Update, the Foundry Street sanitary Sewer Study (2010), the Baden-New Hamburg Water and Wastewater Master Plan (2011), and the Morningside Sewage Pump Station Capacity Assessment (2017) to upgrade and/or expand the Region's wastewater facilities prior to 2051. • Existing Highway 7/8 forcemain can be used as-is for future growth in New Hamburg.
Aligns with existing and future land use • Evaluate need to acquire land for new pumping station or expansion of pumping station and ownership requirements.	• Does not require additional land as infrastructure will remain in current conditions.	• Is not anticipated to require additional land, as upgrades will occur to existing facilities, and new infrastructure will be constructed within the municipal right-of-way. • However, significant constructability challenges and space constraints exist along the Morningside STS corridor which may require land acquisition.	• Is not anticipated to require additional land as upgrades will occur to existing facilities, and new infrastructure will be constructed within the municipal right-of-way and existing easements.	• A portion of the construction will require land acquisition to accommodate new infrastructure, for the portion of forcemain between Holland Mills Road and the New Hamburg WWTP.

Factors and Criteria	Alternative WW1 – Do Nothing	Alternative WW2 – Upgrade system and maintain existing configuration	WW3 – Upgrade system and convey directly to Morningside Pump Station	Alternative WW4 – Upgrade system and convey directly to New Hamburg Wastewater Treatment Plant
Aligns with approval and permitting process • Minimize the complexity and time spent to obtain approvals from various regulatory agencies.	• Does not require approvals or permits as no improvements will be completed.	• Potential for fewer permits required as improvements will be completed to existing infrastructure, and new infrastructure will occur within the right-of-way. • Watercourse crossing required to upgrade Morningside SPS forcemain.	• Potential for fewer permits required as improvements will be completed to existing infrastructure, and new infrastructure will occur within the right-of-way. • Watercourse crossing required to upgrade Morningside SPS forcemain.	• Potential for greatest number of permits required as proposed infrastructure crosses a watercourse and travels through private property. • Consultation with MECP and DFO would be required.
Manages and minimizes construction risks • Minimize complexity of construction and maximize ability to maintain adequate sewage pumping services during construction.	• No impacts to services as no improvements are proposed.	• Low potential to minimize complexity of construction due to multiple facilities requiring improvements, and new construction requirements. • Low potential to maintain adequate sewage pumping services during construction.	• Low potential to minimize complexity of construction due to multiple facilities requiring improvements, and new construction requirements. • Moderate potential to maintain adequate sewage pumping services during construction as some of the new construction bypasses facilities.	• High potential to minimize complexity of construction as the new infrastructure is a direct route and does not require multiple facility upgrades. • High potential to maintain adequate sewage pumping services during construction as entirely new infrastructure will be constructed.
Ability to adapt to climate change • Promote resiliency to extreme weather events. Prioritize • climate change adaptation to minimize risk associated with variation in climate parameters (temperature, precipitation, wind gusts, or other) and natural hazards (flooding, high river levels, or other). • Prioritize the surrounding area's ability to be resilient and maintain its adaptive capacity to climate change.	• Does not promote resiliency to extreme weather events or minimize risk associated with variation in climate parameters.	• Promotes resiliency to extreme weather events and minimizes risk associated with variation in climate parameters as a result of increased flow capacity.	• Promotes resiliency to extreme weather events and minimizes risk associated with variation in climate parameters as a result of increased flow capacity.	• Promotes greatest amount of resiliency to extreme weather events and minimizes risk associated with variation in climate parameters as a result of the greatest increase in flow capacity.
TECHNICAL				
FINANCIAL				
Provides low lifecycle costs • Minimize capital, operation and maintenance (life cycle) costs over a 50-year period.	• Estimated Initial Capital Cost: $1.8M • Estimated 50-Year Lifecycle Costs: $23M	• Estimated Initial Capital Cost: $20.5M • Estimated 50-Year Lifecycle Costs: $42.8M	• Estimated Initial Capital Cost: $17.1M • Estimated 50-Year Lifecycle Costs: $38.7M	• Estimated Initial Capital Cost: $14.2M • Estimated 50-Year Lifecycle Costs: $35.2M

Factors and Criteria	Alternative WW1 – Do Nothing	Alternative WW2 – Upgrade system and maintain existing configuration	WW3 – Upgrade system and convey directly to Morningside Pump Station	Alternative WW4 – Upgrade system and convey directly to New Hamburg Wastewater Treatment Plant
FINANCIAL				
SUMMARY				
Factors and Criteria	**Alternative WW1 – Do Nothing**	**Alternative WW2 – Upgrade system and maintain existing configuration**	**WW3 – Upgrade system and convey directly to Morningside Pump Station**	**Alternative WW4 – Upgrade system and convey directly to New Hamburg Wastewater Treatment Plant**
	Not Recommended 	**Least Preferred** 	**Moderately Preferred** 	**Preferred** 

Graphic	Rating	Description
	5	Very well aligned with criteria
	4	Well aligned with criteria
	3	Somewhat aligned with criteria
	2	Not well aligned with criteria
	1	Low alignment with criteria

Appendix C

Complete Evaluation of Foxboro Alternative Solutions

Factors and Criteria	Alternative F1 – Do Nothing	Alternative F2 – Connect Foxboro to Baden via Existing Right-of-Ways	Alternative F3 – Connect Foxboro to Future Expand Baden Service Area using a Direct Route	Alternative F4 – Connect Foxboro to New Hamburg via Right-of-Ways
ENVIRONMENTAL				
Protects environmental features • Protect sensitive natural features and regulated areas. Minimize the potential impact from construction and operation to existing terrestrial habitats/features, vegetation, wetlands, woodlots, and steep slopes. Allow for scheduling and roll-out of construction activities in a way and at a time of year that would limit the negative impacts on the vegetation of the site and surrounding area.	• Environmental features would generally remain in their current conditions, as no construction/upgrades are completed. • Recent upgrades to the Foxboro WWTP have helped to improve denitrification and reduce effluent nitrates discharged from the Foxboro WWTP to weeping tile systems. • Foxboro WWTP has had reliability issues over time due to frequent maintenance shutdowns, resulting in impacted effluent quality.	• High potential to protect environmental features as construction can occur within the existing right-of-way. • High potential to schedule construction during time of year that will reduce impacts on surrounding vegetation. • Aquatic species at risk/creek crossings at north ends of Foxboro and Baden.	• Low potential to protect environmental features as construction will not occur within an existing right-of-way. • Low potential to protect woodlots as portions of construction are proposed through wooded area/ ANSI area south of Foxboro (Phillipsburg Forest – Regional Significance). • High potential to schedule construction during time of year that will reduce impacts on surrounding vegetation. • Existing regionally significant wetland south of Foxboro, could be avoided depending on route. • Surface vegetation can be restored after construction.	• High potential to schedule construction during time of year that will reduce impacts on surrounding vegetation. • High potential to protect environmental features as construction can occur within the existing right-of-way. • Nith River crossings on both Nafziger Road and Erbs Road (aquatic species at risk distribution area). • Crosses GRCA slope areas.
Protects wildlife and species at risk • Minimize impacts to wildlife (including species at risk) or identified habitat locations for these species. Protect fisheries and aquatic health. • Allow for scheduling and roll-out of construction activities in a way and at a time of year that would limit the negative impacts on wildlife and species at risk.	• Wildlife and species at risk would remain in their current conditions, as no construction/upgrades are completed.	• High potential to protect wildlife and species at risk as features can occur within the existing right-of-way. • Aquatic species at risk/creek crossing at north ends of Foxboro and Baden.	• Existing aquatic species at risk area, could be avoided depending on route. • Existing regionally significant wetland south of Foxboro, could be avoided depending on route. • Existing ANSI woodlot south of Foxboro, could be avoided depending on route. • Not within existing Road allowance, construction more disruptive to existing ecosystem compared to WW2 and WW4.	• Moderate potential to protect wildlife and species at risk as features can occur within the existing right-of-way. • Nith River crossings on both Nafziger Road and Erbs Road (aquatic species at risk distribution area) and creek crossing at north end of Foxboro. All potential impacts will be mitigated to the greatest extent possible.

Factors and Criteria	Alternative F1 – Do Nothing	Alternative F2 – Connect Foxboro to Baden via Existing Right-of-Ways	Alternative F3 – Connect Foxboro to Future Expand Baden Service Area using a Direct Route	Alternative F4 – Connect Foxboro to New Hamburg via Right-of-Ways
Protects groundwater, streams and rivers • Protect groundwater and meets Clean Water Act requirements. Minimize impacts on the GRCA regulated floodplain.	• Groundwater, streams and rivers would remain in their current conditions, as no construction/upgrades are completed. • Existing concerns with elevated nitrate levels within the surrounding groundwater system would remain. • Foxboro WWTP is unable to consistently meet effluent solids objectives.	• High potential to protect groundwater, streams and rivers as features can occur within the existing right-of-way. • Creek crossing at north ends of Foxboro and Baden. • Would alleviate concerns with elevated nitrate levels within the surrounding groundwater system. • Would alleviate concerns with Foxboro WWTP's inability to consistently meet effluent solids objectives.	• Existing GRCA Regulation limit area, could be avoided depending on route. • Would alleviate concerns with elevated nitrate levels within the surrounding groundwater system. • Would alleviate concerns with Foxboro WWTP's inability to consistently meet effluent solids objectives.	• Moderate potential to protect groundwater, streams and rivers as features can occur within the existing right-of-way. • Crosses GRCA estimated floodplains. • GRCA regulation limit crossing north of Foxboro. • Would alleviate concerns with elevated nitrate levels within the surrounding groundwater system. • Would alleviate concerns with Foxboro WWTP's inability to consistently meet effluent solids objectives.
Minimizes climate change impacts • Minimize GHG emissions and negative impacts on the landscape which may alter the ecosystems' ability to remove carbon dioxide from the atmosphere (e.g. changes to site and vicinity plant cover). • Prioritize energy and water conservation and efficiency measures and/or adaptive re-use of buildings or structures to reduce new energy or material demands. Evaluate contributions to or investments in natural spaces that offset or mitigate the alternative's climate change impacts	• Low potential to reduce GHG emissions as infrastructure would remain in current conditions. • Requires ongoing maintenance, chemical delivery etc. to Foxboro.	• Moderate potential to reduce GHG emissions and negative impact to landscapes as this option has the ability to reuse/adapt some existing buildings or structures, while also constructing new infrastructure. • Eliminates GHGs associated with maintaining and operating the Foxboro WWTP and WTP • Requires road repaving.	• Moderate potential to reduce GHG emissions and negative impact to landscapes as this option reuses/adapts some existing buildings or structures, while also constructing new infrastructure. • Forcemain would be shorter, however new WWPS would be required in Foxboro. Potentially less material for construction and less energy loss compared to F2 and F4 due to shorter route. • Existing groundcover expected to be restored after installation. • Eliminates GHGs associated with maintaining and operating the Foxboro WWTP and WTP.	• Moderate potential to reduce GHG emissions and negative impact to landscapes as this option reuses/adapts some existing buildings or structures, while also constructing new infrastructure. • Eliminates GHGs associated with maintaining and operating the Foxboro WWTP and WTP. • Requires road re-paving.
ENVIRONMENTAL				

Factors and Criteria	Alternative F1 – Do Nothing	Alternative F2 – Connect Foxboro to Baden via Existing Right-of-Ways	Alternative F3 – Connect Foxboro to Future Expand Baden Service Area using a Direct Route	Alternative F4 – Connect Foxboro to New Hamburg via Right-of-Ways
SOCIAL				
Minimizes impacts to residents related to noise, odour, traffic and aesthetics • Minimize noise, odour, and truck traffic affecting the community during pumping station operation. Maintain access to and aesthetics of public spaces. Minimize negative impacts that may result due to changes to the neighbourhood characteristics (e.g., recreational features, green space, property values).	• Low potential to minimize impacts to residents related to noise, odour, traffic and aesthetics as infrastructure would remain in current conditions.	• Low potential to minimize impacts such as noise, odour and aesthetics as this route would pass through the Foxboro residential neighbourhood. The new forcemain and watermain would be constructed within the existing right of way of Erbs Road and Sandhills Road. Impacts to traffic would be short term during construction. • Retiring WWTP and WTP operations would reduce traffic, noise etc. related to ongoing operations. • Forcemain and watermain maintenance could occasionally impact noise, odour, traffic, or aesthetics.	• Low potential to minimize impacts such as noise, odour and aesthetics during construction due to amount of infrastructure needed. • Retiring WWTP and WTP would reduce traffic, noise, odour etc. related to ongoing operations. • May impact existing green space and property values required for forcemain route. • Forcemain not expected to impact noise, odour, traffic or aesthetics. • Would require agreements with multiple property owners and stakeholders.	• Low potential to minimize impacts such as noise, odour and aesthetics during construction due to amount of infrastructure needed and passing through the Foxboro residential community. The new forcemain and watermain would be constructed within the existing right of way of Erbs Road, Nafziger Road and Waterloo Street. Impacts to traffic would be short term during construction. • Retiring WWTP and WTP would reduce traffic, noise, odour etc. related to ongoing operations. • Forcemain maintenance may occasionally impact noise, odour, traffic or aesthetics.
Minimizes impacts to businesses • Maintain access for businesses during construction and operation. Minimize potential negative effects on short-term and long-term business vitality, and community growth and development.	• No impacts to business operations during construction are anticipated.	• Road closures during construction may impact local businesses. • Road closures during construction may impact local residents. • Low potential for negative effects on long-term business vitality, community growth and development.	• Low impact to businesses as route does not involve existing road allowances	• Road closures during construction may impact local businesses. • Road closures during construction may impact local residents. • Low potential for negative effects on long-term business vitality, community growth and development.
Manages and minimizes construction impacts • Minimize noise, odour, road closures, and truck traffic affecting the community during construction.	• No construction required as infrastructure would remain in existing conditions.	• Low potential to minimize impacts of construction due to proximity of existing infrastructure to nearby neighbourhoods. Potential to create noise, odour, road closures and truck traffic. • New forcemain would be constructed along Erbs Road and Sandhills Road.	• Road closures in the Foxboro community may be required during construction. May impact local businesses. • Overall, significant disruption to Foxboro community based on amount of infrastructure needed. • Less impact on existing roads compared to alternatives F2 and F4.	• Road closures required during construction. May impact local businesses. • Overall, significant disruption to Foxboro community based on amount of infrastructure needed.

Factors and Criteria	Alternative F1 – Do Nothing	Alternative F2 – Connect Foxboro to Baden via Existing Right-of-Ways	Alternative F3 – Connect Foxboro to Future Expand Baden Service Area using a Direct Route	Alternative F4 – Connect Foxboro to New Hamburg via Right-of-Ways
Protects cultural heritage resources • Minimize potential impact to historical, cultural, and architecturally significant features. Minimize the potential impact to Indigenous communities.	• Protects cultural heritage features as no construction required.	• Potential for construction-related impacts to 2 heritage resources located on Erbs Road and 1 heritage resource located on Sandhills Road; a Cultural Heritage Assessment Report is required to determine impacts and mitigation requirements.	• No identified built heritage resources within project area. • Potential for impacts to cultural heritage landscape.	• Potential for construction-related impacts to a cluster of heritage resources located at Erbs Road/Nafziger Rd. intersection and 1 located at Snyder's Rd W and Nafziger Rd intersection; a Cultural Heritage Assessment Report is required to determine impacts and mitigation requirements.
Protects archaeological features • Minimize potential impact to archaeologically significant features. Performs the appropriate archaeological investigations as regulated by legislation in areas of archeological potential.	• Protects archaeological features as no construction required.	• High potential to impact archaeological features in undisturbed areas in project area; Stage 1-2 Archaeological Assessment required to confirm.	• High potential to impact archaeological features in agricultural fields and undisturbed areas; Stage 1-2 Archaeological Assessment required to confirm.	• High potential to impact archaeological features in undisturbed areas; Stage 1-2 Archaeological Assessment required to confirm.
Protects health and safety • Minimize the potential risk to public health and safety, particularly on downstream users (including for recreation and tourism). Minimize the potential risk to operator and maintenance staff's health and safety.	• Public health and safety would remain at its current risk level as no construction/upgrades are completed. • This option provides the highest control of chlorine residual in Foxboro area • Risk of operational failure at WTP. Water truck supply available for back-up in this case. • Highest potential risk to operation and maintenance staff's health and safety • WTP requires reservoir inspection if maintaining in future.	• Moderate potential to minimize public health and safety risk as Foxboro WWTP would be converted to a WWPS and forcemains to alleviate groundwater concerns. • Less control over chlorine residual and water age in Foxboro area. • Reduces potential risk to operation and maintenance staff's health and safety compared to alternative F1.	• Moderate potential to minimize public health and safety risk as Foxboro WWTP would be converted to a WWPS and forcemains to alleviate groundwater concerns. • Less control over chlorine residual and water age in Foxboro area. • Reduces potential risk to operation and maintenance staff's health and safety compared to alternative F1.	• Moderate potential to minimize public health and safety risk as Foxboro WWTP would be converted to a WWPS and forcemains to alleviate groundwater concerns. • Less control over chlorine residual and water age in Foxboro area. • Reduces potential risk to operation and maintenance staff's health and safety compared to alternative F1.
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TECHNICAL				

Factors and Criteria	Alternative F1 – Do Nothing	Alternative F2 – Connect Foxboro to Baden via Existing Right-of-Ways	Alternative F3 – Connect Foxboro to Future Expand Baden Service Area using a Direct Route	Alternative F4 – Connect Foxboro to New Hamburg via Right-of-Ways
Provides reliable service • Prioritize security, reliability and robustness. Lesser likelihood of process upset or mechanical breakdown.	• Existing RBCs are subject to frequent breakdown and maintenance issues • Level of treatment provided by RBCs is moderate • Reliable water supply to Foxboro. Water trucks available as back-up if process failure occurs.	• Moderate potential to provide reliable wastewater services. Alternative includes construction of one (1) new WWPS and moderate length forcemain to Baden. • Moderate potential to provide reliable water supply to Foxboro. Water trucks available as back-up if main break occurs.	• Moderate potential to provide reliable wastewater services. Alternative includes the greatest number of new infrastructure pieces which increases possibility of mechanical breakdown. • Shorter length of forcemain compared to F2 and F4, expect less maintenance. • Forcemain within easements and outside urban boundary could end up in difficult location to assess/maintain. • May have site access challenges depending on route of watermain through existing properties. • Moderate potential to provide reliable water supply to Foxboro. Water trucks available as back-up if main break occurs. • Main break is less likely to occur compared to alternatives F2 and F4 due to shorter distance.	• Moderate wastewater potential to provide reliable services. Alternative includes construction of one (1) new WWPS and long length of forcemain to New Hamburg. • Moderate potential to provide reliable water supply to Foxboro. Water trucks available as back-up if main break occurs.
Meets existing and future needs • Meets the long-term capacity requirements to service the projected population growth in the sanitary catchment area. • Provide appropriate site access and egress for operations and maintenance per current standards and best practices. • Provide operational redundancy to allow for maintenance and cleaning of equipment and infrastructure. Minimize increases in operational and/or maintenance complexity of the station.	• Meets long-term wastewater capacity requirements to service population of Foxboro, where no significant growth is expected. • Limited Operational Redundancy when RBCs are out of service for repair. • Existing and short-term needs expected to be met once imminent upgrades at WTP are completed. • More significant upgrades required at WTP for long-term operation.	• High potential to meet the long-term capacity requirements. • Provides appropriate site access for operations and maintenance, as some infrastructure already exists and is easily accessible. • Existing WWTP can remain operational during forcemain construction. • Existing WTP can remain operation during watermain construction.	• High potential to meet the long-term capacity requirements. • High potential to meet the long-term capacity requirements. • Forcemain and watermain within easements and outside urban boundary could end up in difficult location to assess/maintain. • Existing WWTP can remain operational during forcemain construction. • Existing WTP can remain operation during watermain construction.	• High potential to meet the long-term capacity requirements. • Provides appropriate site access for operations and maintenance, as some infrastructure already exists and is easily accessible. • Existing WWTP can remain operational during forcemain construction. • Existing WTP can remain operation during watermain construction.

Factors and Criteria	Alternative F1 – Do Nothing	Alternative F2 – Connect Foxboro to Baden via Existing Right-of-Ways	Alternative F3 – Connect Foxboro to Future Expand Baden Service Area using a Direct Route	Alternative F4 – Connect Foxboro to New Hamburg via Right-of-Ways
	• More upgrades and maintenance required at WTP compared to other alternatives. • Filter and pump lifecycle 20-25 years. • Water truck can be used for redundancy during upgrades.			
Aligns with existing and planned infrastructure • Optimize existing infrastructure investment including structures, tanks, and equipment. • Align with planned infrastructure projects including recommendations of the Region's 2018 Wastewater Treatment Master Plan Update, the Foundry Street sanitary Sewer Study (2010), the Baden-New Hamburg Water and Wastewater Master Plan (2011), and the Morningside Sewage Pump Station Capacity Assessment (2017).	• Does not optimize existing infrastructure. • Does not align with Region's 2018 Wastewater Treatment Master Plan Update, the Foundry Street sanitary Sewer Study (2010), the Baden-New Hamburg Water and Wastewater Master Plan (2011), and the Morningside Sewage Pump Station Capacity Assessment (2017) to upgrade and/or expand the Region's wastewater facilities prior to 2051. • Significant asset renewal requirements in the near future with the remaining RBC identified for replacement in the next five (5) years. • Significant asset renewal requirements both immediate to maintain short-term operation of the WTP as well as near term upgrades to maintain long-term operation.	• Eliminates need for significant upgrades at Foxboro WWTP and WTP. • New infrastructure required for forcemain construction and conversion of Foxboro WWTP to WWPS. • New infrastructure required for watermain construction and conversion of Foxboro WTP to WBS. • Aligns with the Region's 2018 Wastewater Treatment Master Plan Update, the Foundry Street sanitary Sewer Study (2010), the Baden-New Hamburg Water and Wastewater Master Plan (2011), and the Morningside Sewage Pump Station Capacity Assessment (2017) to upgrade and/or expand the Region's wastewater facilities prior to 2051.	• Eliminates need for significant upgrades at Foxboro WWTP and WTP. • New infrastructure and associated materials required for forcemain construction, conversion of Foxboro WWTP to WWPS, and construction of a new WWPS in Baden. • New infrastructure required for watermain construction and conversion of Foxboro WTP to WBS. • Less materials required for shorter length of infrastructure. • Timing for implementation would be reliant on build-out of Snyder's Road development. • Aligns with the Region's 2018 Wastewater Treatment Master Plan Update, the Foundry Street sanitary Sewer Study (2010), the Baden-New Hamburg Water and Wastewater Master Plan (2011), and the Morningside Sewage Pump Station Capacity Assessment (2017) to upgrade and/or expand the Region's wastewater facilities prior to 2051.	• Eliminates need for significant upgrades at Foxboro WWTP and WTP. • New infrastructure required for forcemain construction and conversion of Foxboro WWTP to WWPS. • New infrastructure required for watermain construction and conversion of Foxboro WTP to WBS. • Aligns with the Region's 2018 Wastewater Treatment Master Plan Update, the Foundry Street sanitary Sewer Study (2010), the Baden-New Hamburg Water and Wastewater Master Plan (2011), and the Morningside Sewage Pump Station Capacity Assessment (2017) to upgrade and/or expand the Region's wastewater facilities prior to 2051.

Factors and Criteria	Alternative F1 – Do Nothing	Alternative F2 – Connect Foxboro to Baden via Existing Right-of-Ways	Alternative F3 – Connect Foxboro to Future Expand Baden Service Area using a Direct Route	Alternative F4 – Connect Foxboro to New Hamburg via Right-of-Ways
Aligns with existing and future land use Evaluate need to acquire land for new pumping station or expansion of pumping station and ownership requirements.	• Does not require additional land as infrastructure will remain in current conditions.	• Does not require additional land as upgrades will occur to existing facilities, and new infrastructure will be constructed within the municipal right-of-way.	• Does not align with existing road allowances. • Forcemain location would require agreements with multiple property owners and stakeholders (Hydro corridor, Snyder's Road developer, Foxboro community) • Expected to align with future developments.	• Does not require additional land as upgrades will occur to existing facilities, and new infrastructure will be constructed within the municipal right-of-way.
Aligns with approval and permitting process • Minimize the complexity and time spent to obtain approvals from various regulatory agencies.	• Does not require approvals or permits as no improvements will be completed.	• Potential for fewer permits required as improvements will be completed to existing infrastructure, and new infrastructure will occur within the right-of-way. • Building permit and communication with MECP required for decommissioning WWTP. • GRCA permitting required for forcemain route.	• Building permit and communication with MECP required for decommissioning WWTP. • Approvals for land requirements may be challenging as route is not within existing road allowance. • Potential for greatest number of permits required as proposed infrastructure crosses a woodlot and travels through private property.	• Potential for fewer permits required as improvements will be completed to existing infrastructure, and new infrastructure will occur within the right-of-way. • Building permit and communication with MECP required for decommissioning WWTP. • GRCA permitting required for forcemain route – one (1) stream crossing and two (2) Nith River crossings
Manages and minimizes construction risks • Minimize complexity of construction and maximize ability to maintain adequate sewage pumping services during construction.	• No impacts to services as no improvements are proposed.	• Foxboro WWTP could remain operational during construction. • No significant forcemain/watermain closures expected to be required during construction. • Railway crossing required on Sandhills Road. • Erbs Road has power lines on both sides of the road including high voltage power lines on the south side. • Moderate potential to minimize complexity of construction due to construction of one (1) new facility, Foxboro WWPS, and forcemain construction.	• Low potential to minimize complexity of construction due to multiple facilities requiring improvements, and new construction requirements. • Foxboro WWTP could remain operational during construction – no impact to ability to maintain adequate sewage pumping services during construction.	• Foxboro WWTP could remain operational during construction. • No significant forcemain/watermain closures expected to be required during construction. • Two (2) river crossings required. • Erbs Road has power lines on both sides of the road including high voltage power lines on the south side. • Moderate potential to minimize complexity of construction due to construction of one (1) new facility, Foxboro WWPS, and forcemain construction.
Ability to adapt to climate change	• Does not promote resiliency to extreme weather events or	• Promotes resiliency to extreme weather events and minimizes risk	• Promotes resiliency to extreme weather events and minimizes risk	• Promotes resiliency to extreme weather events and minimizes risk

Factors and Criteria	Alternative F1 – Do Nothing	Alternative F2 – Connect Foxboro to Baden via Existing Right-of-Ways	Alternative F3 – Connect Foxboro to Future Expand Baden Service Area using a Direct Route	Alternative F4 – Connect Foxboro to New Hamburg via Right-of-Ways
• Promote resiliency to extreme weather events. • Prioritize climate change adaptation to minimize risk associated with variation in climate parameters (temperature, precipitation, wind gusts, or other) and natural hazards (flooding, high river levels, or other). • Prioritize the surrounding area's ability to be resilient and maintain its adaptive capacity to climate change.	minimize risk associated with variation in climate parameters.	associated with variation in climate parameters as a result of increased flow capacity. • Stream crossing at north ends of Foxboro and Baden. • Forcemain passes near existing wetlands on Erbs Road – may be susceptible to flooding.	associated with variation in climate parameters as a result of increased flow capacity. • May be near river crossing depending on routing. • May be near GRCA wetland and GRCA regulation limit areas, susceptible to flooding.	associated with variation in climate parameters as a result of increased flow capacity. • Stream crossing at north end of Foxboro, and Nith River crossings on Erbs Road and Nafziger Road. • Forcemain passes near existing wetlands on Nafziger Road – may be susceptible to flooding.
TECHNICAL				
FINANCIAL				
Provides low lifecycle costs • Minimize capital, operation and maintenance (life cycle) costs over a 50-year period.	<u>Foxboro Wastewater System</u> • Estimated Initial Capital Cost: $1M • Estimated 50-Year Lifecycle Costs: $30.3M <u>Foxboro Water System</u> • Estimated Initial Capital Cost: $6.9M • Estimated 50-Year Lifecycle Costs: $11.8M <u>Foxboro Combined</u> • Estimated Initial Capital Cost: $7.9M • Estimated 50-Year Lifecycle Costs: $42.1M	<u>Foxboro Wastewater System</u> • Estimated Initial Capital Cost: $5.9M • Estimated 50-Year Lifecycle Costs: $17.8M <u>Foxboro Water System</u> • Estimated Initial Capital Cost: $3.4M • Estimated 50-Year Lifecycle Costs: $4.1M <u>Foxboro Combined</u> • Estimated Initial Capital Cost: $9.3M • Estimated 50-Year Lifecycle Costs: $21.9M	<u>Foxboro Wastewater System</u> • Estimated Initial Capital Cost: $2.9M • Estimated 50-Year Lifecycle Costs: $10.9M <u>Foxboro Water System</u> • Estimated Initial Capital Cost: $0.8M • Estimated 50-Year Lifecycle Costs: $1.4M <u>Foxboro Combined</u> • Estimated Initial Capital Cost: $3.7M • Estimated 50-Year Lifecycle Costs: $12.3M	<u>Wastewater System</u> • Estimated Initial Capital Cost: $6.8M • Estimated 50-Year Lifecycle Costs: $19.3M <u>Water System</u> • Estimated Initial Capital Cost: $3.3M • Estimated 50-Year Lifecycle Costs: $4.2M <u>Combined</u> • Estimated Initial Capital Cost: $10.1M • Estimated 50-Year Lifecycle Costs: $23.5M
FINANCIAL				
SUMMARY				

Baden and New Hamburg Water and Wastewater Servicing Review
Evaluation of Foxboro Alternative Solutions
June 15, 2022

Factors and Criteria	Alternative F1 – Do Nothing	Alternative F2 – Connect Foxboro to Baden via Existing Right-of-Ways	Alternative F3 – Connect Foxboro to Future Expand Baden Service Area using a Direct Route	Alternative F4 – Connect Foxboro to New Hamburg via Right-of-Ways
	Not Recommended	**Moderately Preferred**	**Preferred**	**Least Preferred**

Graphic	Rating	Description
	5	Very well aligned with criteria
	4	Well aligned with criteria
	3	Somewhat aligned with criteria
	2	Not well aligned with criteria
	1	Low alignment with criteria

Appendix D

Baden – New Hamburg WS2 Preferred Alternative Hydraulic Analysis

Water storage alternative WS2 was tested in the water model under future demand conditions. The future transmission main from NH to Baden was considered for this analysis. The transmission main will create a direct connection between the NH WTP and the Baden ET. NH will primarily be supplied through a proposed 150mm pressure reducing valve (PRV) off of the transmission main into the NH system at Riverside Drive. A larger 300mm PRV is proposed at the same location to meet fire flow and other emergency demands. The existing Nafziger PRV will also supply the NH system from the north under emergency conditions.

For this analysis, the reservoir volume at the NH WTP was increased from 2,414 m^3 to 4,860 m^3. With the existing infrastructure at the NH PS, the reservoir has a minimum operating level of 40% full (usable volume of 1,448 m^3). As part of this alternative, it is recommended that the pump station is upgraded such that the entire volume of the existing reservoir can be used. Additionally, it is recommended that an additional usable volume of 2,446 m^3 is installed to meet the MECP guidelines for available storage under future conditions. The proposed storage for this alternative is summarized in Table 5-1 below.

To be able to access the additional storage and meet existing and future fire flow requirements, it is recommended that the NH PS capacity is increased. Based on the modelling analysis, a firm capacity of approximately 230 L/s was suitable to meet the future MECP fire flow requirement in NH of 331 L/s for 5 hours. The proposed pump capacity for this alternative is summarized in Table 5-2 below.

Table 5-1: WS2 NH Reservoir Upgrades

Existing	Proposed
2.4 ML (1.5 ML usable)	2.4 ML + additional 2.5 ML (4.9 ML total usable)

Table 5-2: WS2 NH Pump Station Upgrades

Existing Firm Capacity	Proposed Firm Capacity
80 L/s @ 50m	230 L/s

The NH Reservoir has a top water level (TWL) of approximately 349m and the base of the reservoir is approximately 345m. The Baden Elevated Tank (ET) has a TWL of 400m. At 50% full, the HGL at the Baden ET is approximately 394m. As such, the static head lift required by the pumps would be approximately 45-55m. Major and minor losses between the NH Reservoir and Baden ET should also be considered when

selecting upgraded pumps for the NH PS. A complete demand profile and NH well capacities should be considered when selecting the appropriate pump capacities.

D.1 Fire Flow Analysis

A steady-state (SS) fire flow analysis was completed ay key locations within the system under future MDD conditions with the proposed upgrades at the NH Reservoir and PS. The locations are shown in Figure 5-1 and fire flow results are summarized in Table 5-3 below. The MECP requirement of 331 L/s was met in both Baden and NH, but was not met at all key locations in NH. Based on these results, the system storage and pump capacity with the WS2 upgrades were sufficient to meet the MECP requirement, although the 331 L/s cannot necessarily be met at all locations due to watermain capacity constraints in the system. The available fire flow results in NH were improved further by upgrading select watermains and is discussed in Appendix F.

Table 5-3: WS2 - Available Fire Flow at Key Locations – Future MDD

Baden		
Building	**Location**	**Available Flow (L/s)**
Downtown Core	18 Snyder's Rd. E	577
Baden Public School	155 Livingston Blvd.	344
New Hamburg		
Building	**Location**	**Available Flow (L/s)**
Downtown Core	Huron St. at Peel St.	342
Forest Glen Public School	437 Waterloo St.	325
Nithview Retirement Home	200 Boulee St.	240
New Hamburg Community Centre	251 Jacob St	221

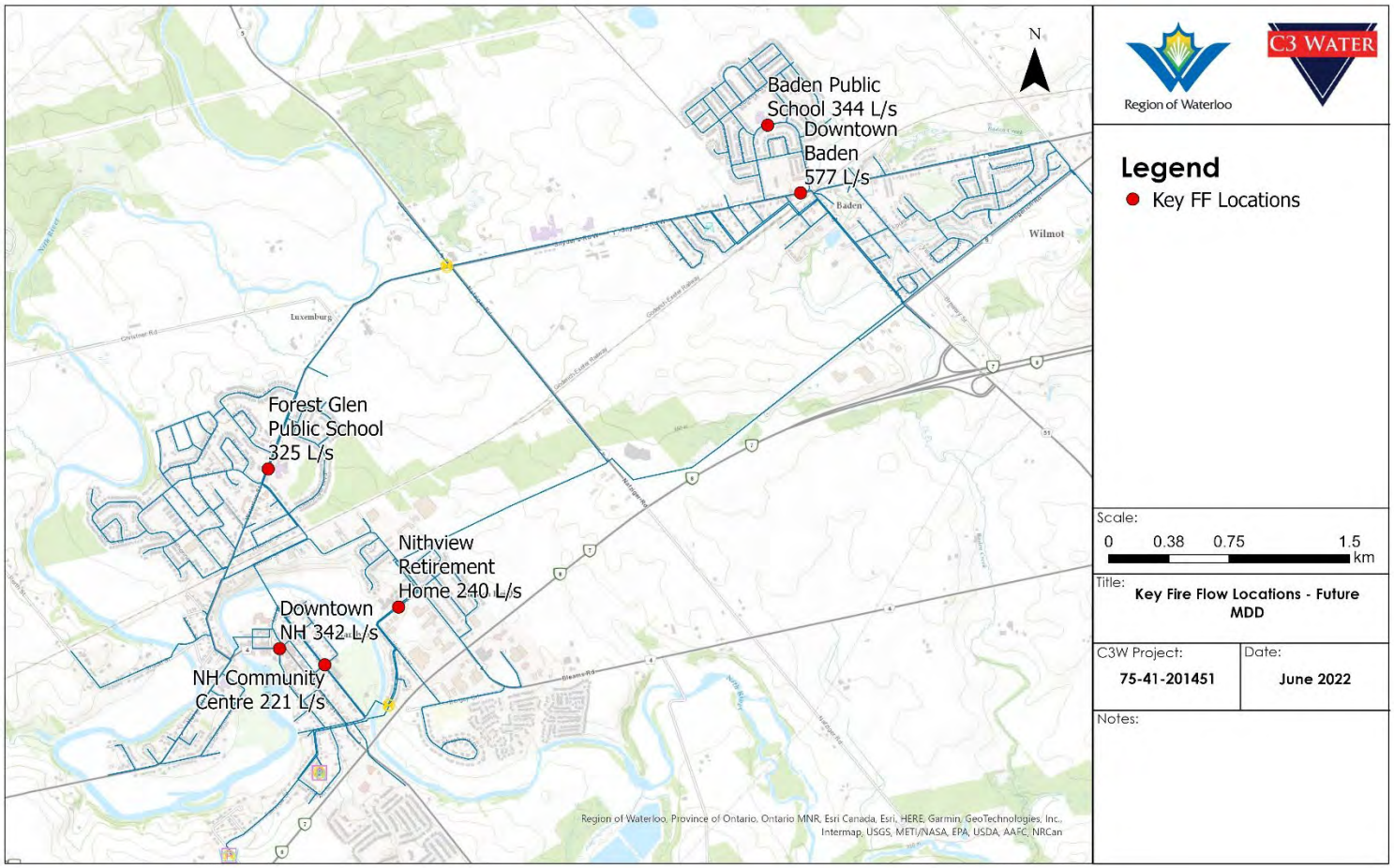


Figure 5-1: WS2 -Available Fire Flow - Key Locations – Future MDD

D.1.1 Baden Fire

An extended period simulation (EPS) scenario was modelled with a 331 L/s 5-hour duration fire flow in downtown Baden with the proposed upgrades at the NH Reservoir and PS. The discharge flows at the NH PS and at the K50s is presented in Figure 5-2 below. The flow presented for the K50s is the flow that passed through the Baden FCV and does not include flow to the east towards the Shingletown valve. The maximum discharge flow at the NH PS was 185 L/s while the K50s ran at their permit to take water (PTTW) of 157 L/s. During the peak flow, the Shingletown valve closed such that all of the flow from the K50s was being supplied to the BNH system.

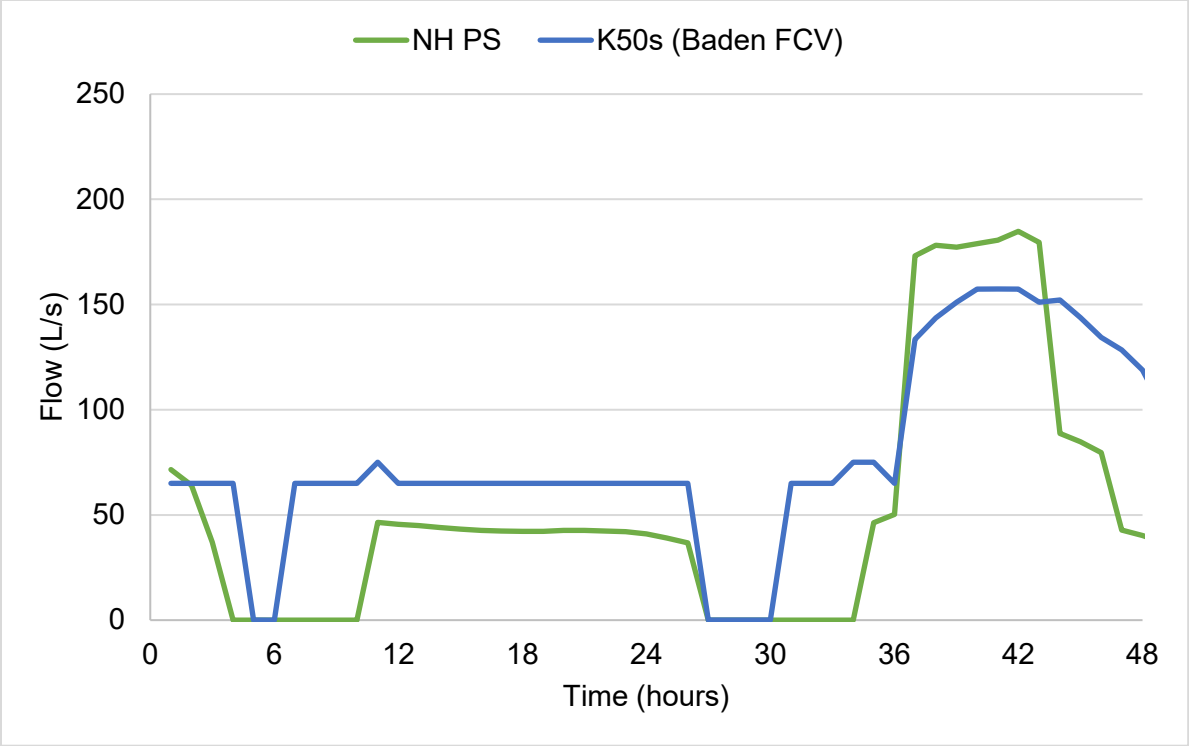


Figure 5-2: Pump Station Flows - WS2 – Baden Fire Flow (331 L/s 5-hrs) - Future MDD

The Baden Elevated Tank (ET) and NH Reservoir levels are presented in Figure 5-3 below. The fire flow did not cause either of the tanks to drain completely but the NH reservoir had a minimum level of 16% full while the Baden ET had a minimum level of 15% full.

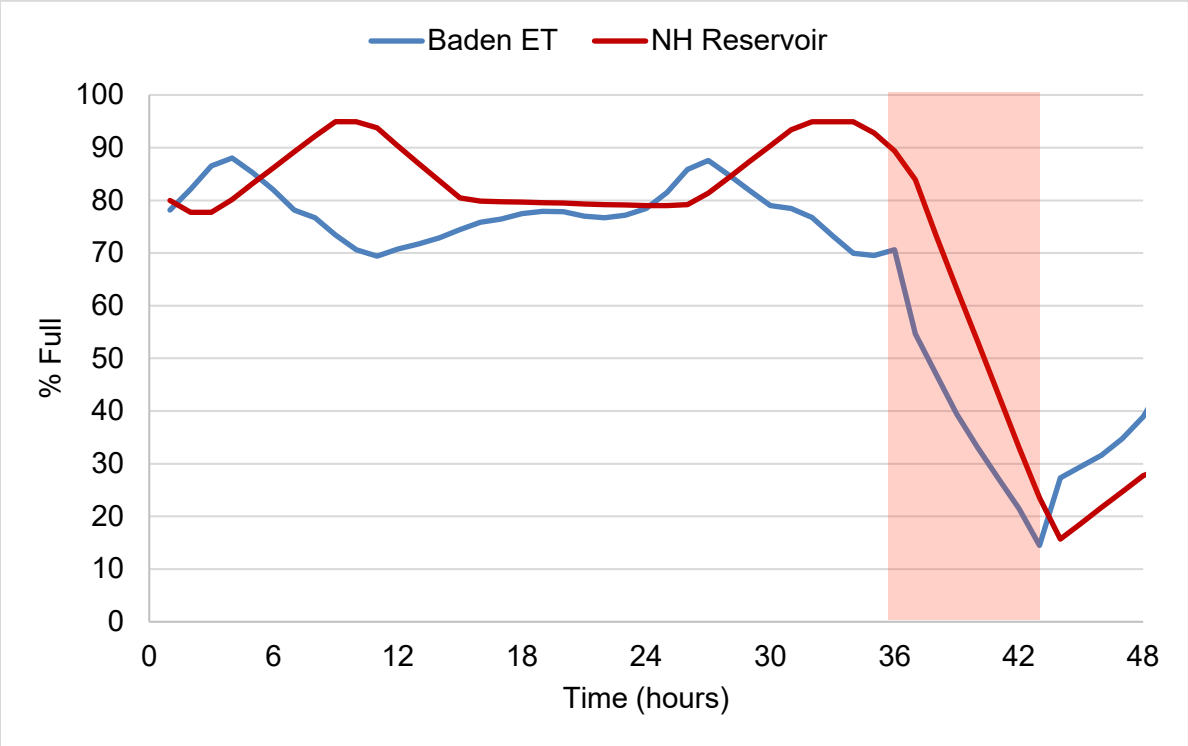


Figure 5-3: Tank Levels - WS2 – Baden Fire Flow (331 L/s 5-hrs) - Future MDD

The minimum pressure results in Baden during the fire are presented in Figure 5-4 below. With the proposed upgrades at the NH WTP, the pressure in Baden was maintained above 138 kPa.

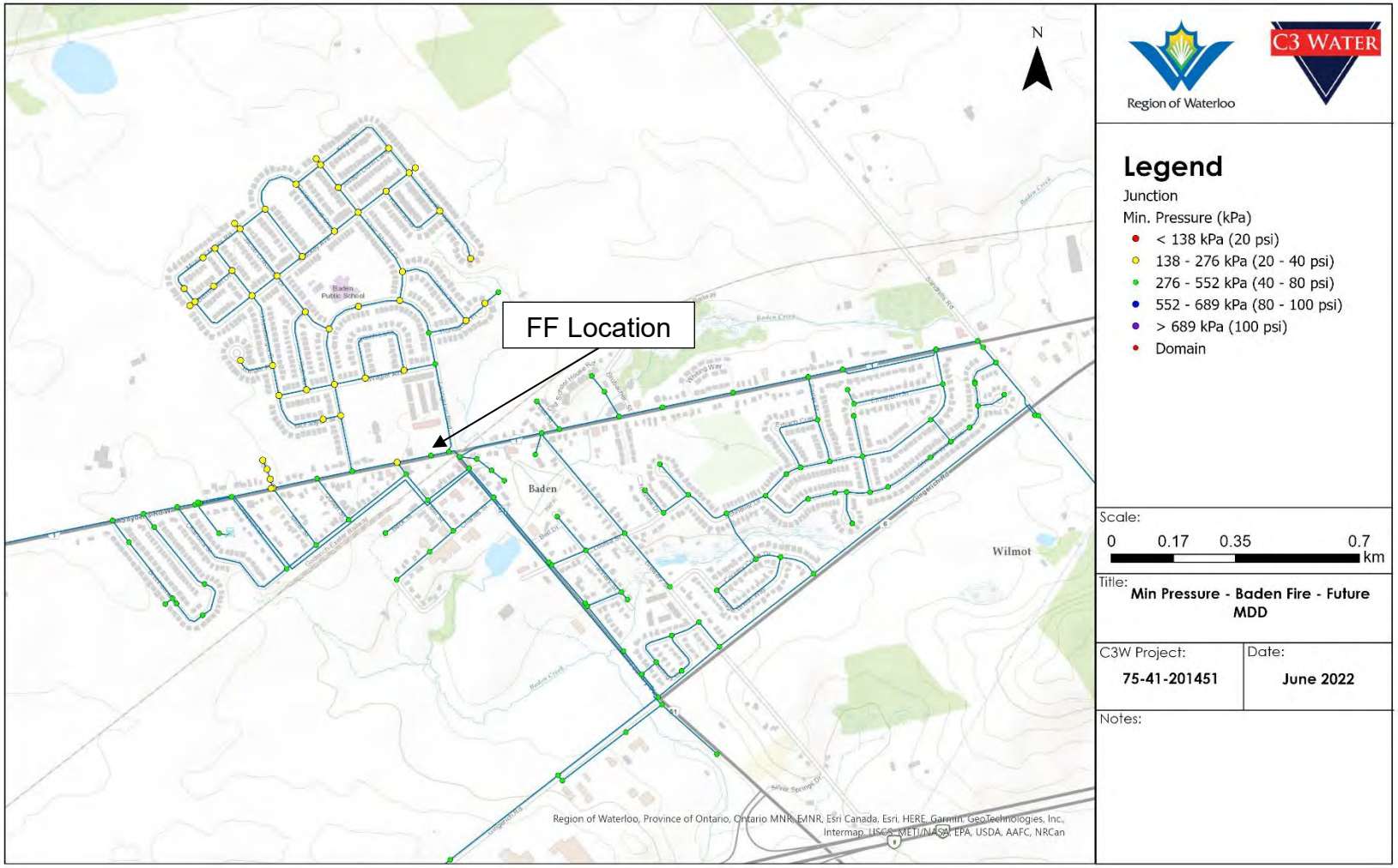


Figure 5-4: Minimum Pressure - WS2 – Baden Fire Flow (331 L/s 5-hrs) - Future MDD

D.1.2 New Hamburg Fire

An EPS scenario was modelled with a 331 L/s 5-hour duration fire flow in downtown New Hamburg with the proposed upgrades at the NH Reservoir and PS. The discharge flows at the NH PS and at the K50s is presented in Figure 5-5 below. The maximum discharge flow at the NH PS was 230 L/s while the K50s ran just below their permit to take water (PTTW) at 149 L/s. During the maximum flow at the NH PS, the maximum discharge pressure was 513 kPa (398 m HGL).

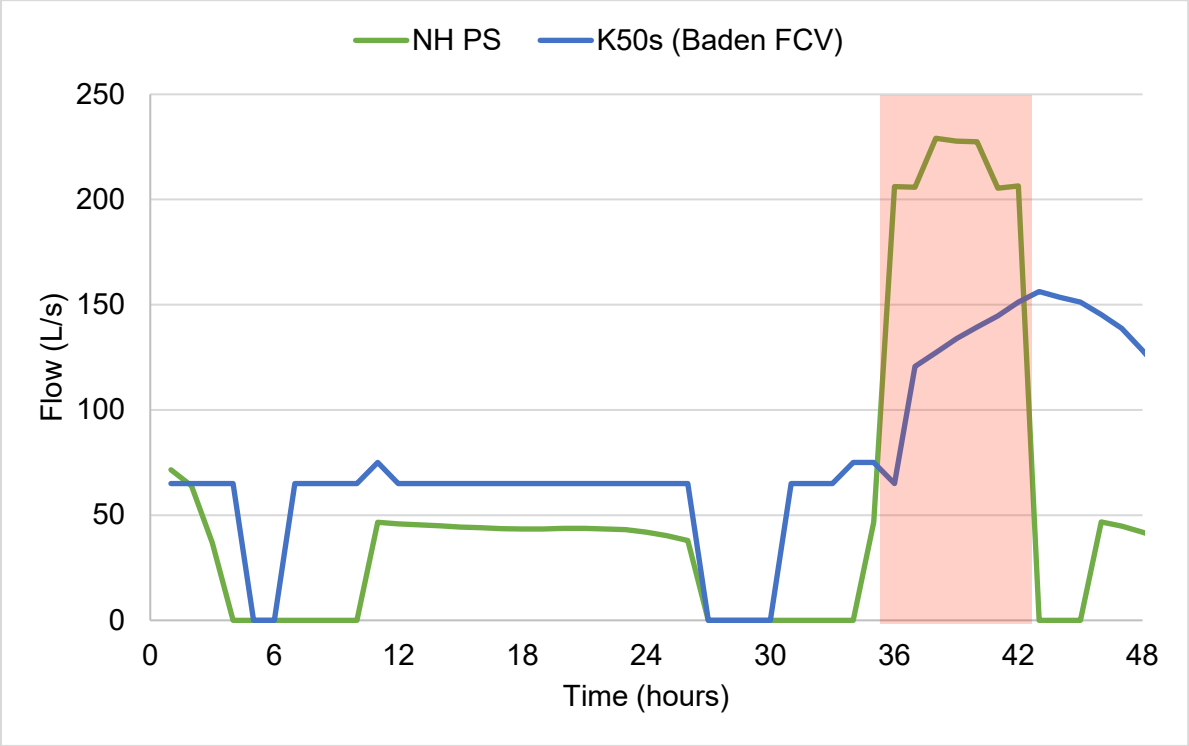


Figure 5-5: Pump Station Flows - WS2 – NH Fire Flow (331 L/s 5-hrs) - Future MDD

The flow through the existing and future PRVs into NH are presented in Figure 5-6 below. The 150mm PRV on the future NH transmission main supplied the NH MDD throughout the 48-hour duration. During the fire flow, the proposed 300mm PRV and the Nafziger PRV opened with a maximum flow of 216 L/s and 112 L/s, respectively.

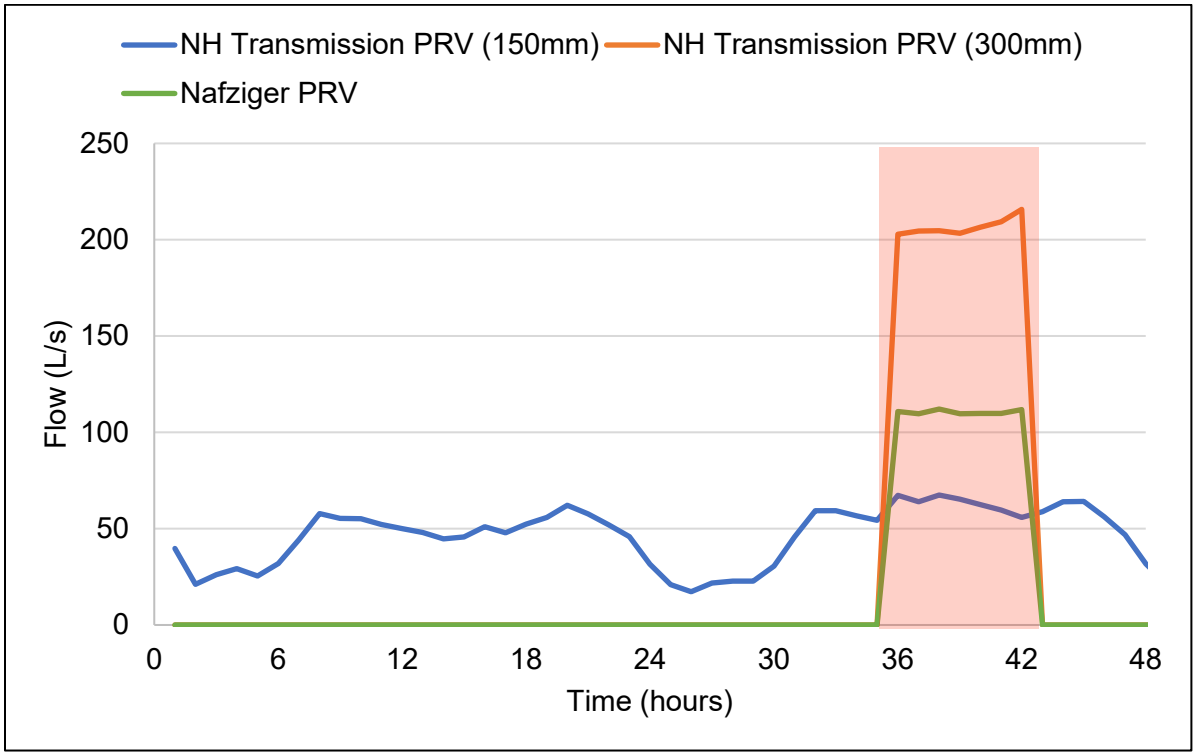


Figure 5-6: NH PRV Flows - WS2 – NH Fire Flow (331 L/s 5-hrs) - Future MDD

The Baden Elevated Tank (ET) and NH Reservoir level are presented in Figure 5-6 below. The fire flow drained the NH reservoir to less than 5% full while the Baden ET had a minimum level of 28% full.

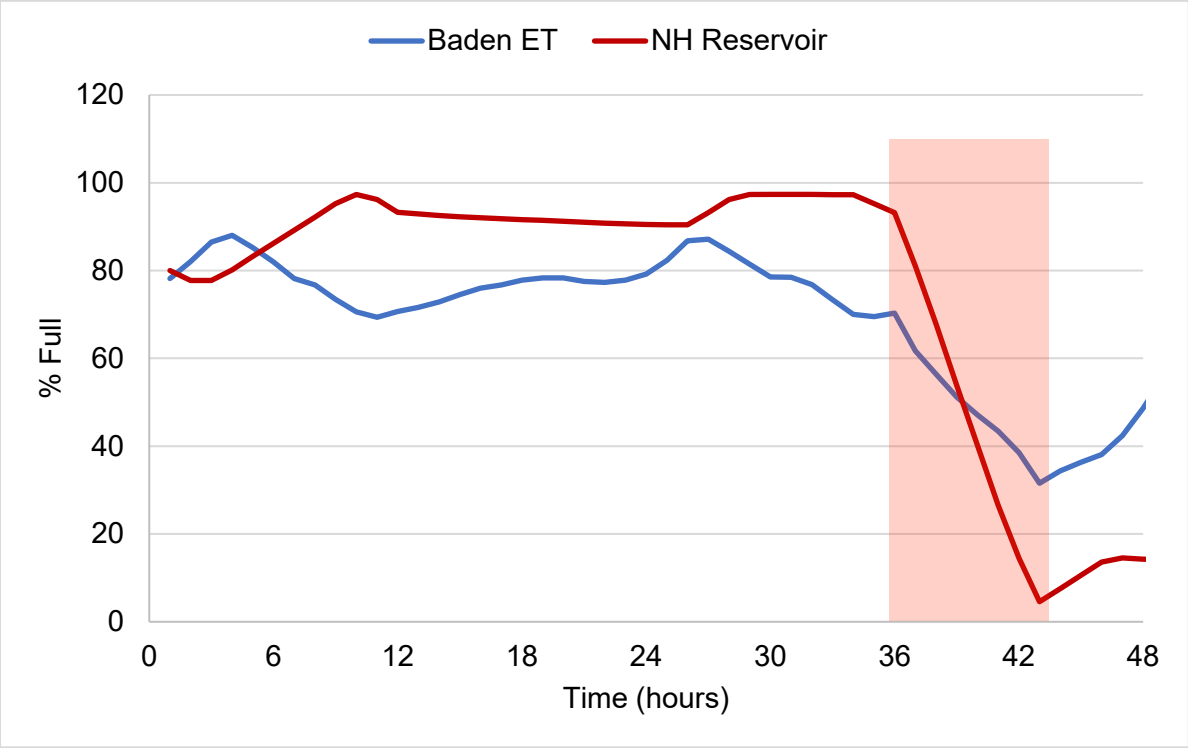


Figure 5-7: Tank Levels - WS2 – NH Fire Flow (331 L/s 5-hrs) - Future MDD

The minimum pressure results during the NH FF are presented in Figure 5-8 below. The pressure was maintained above 138 kPa at the fire flow location with the increased storage and pumping capacity at the NH WTP. The minimum pressure in NH was 132 kPa at the high elevation point (336m) on Wilmot Street. This minimum pressure result was found to be improved and was maintained above 138 kPa when watermain upgrades were modelled in NH and is discussed in Appendix F.

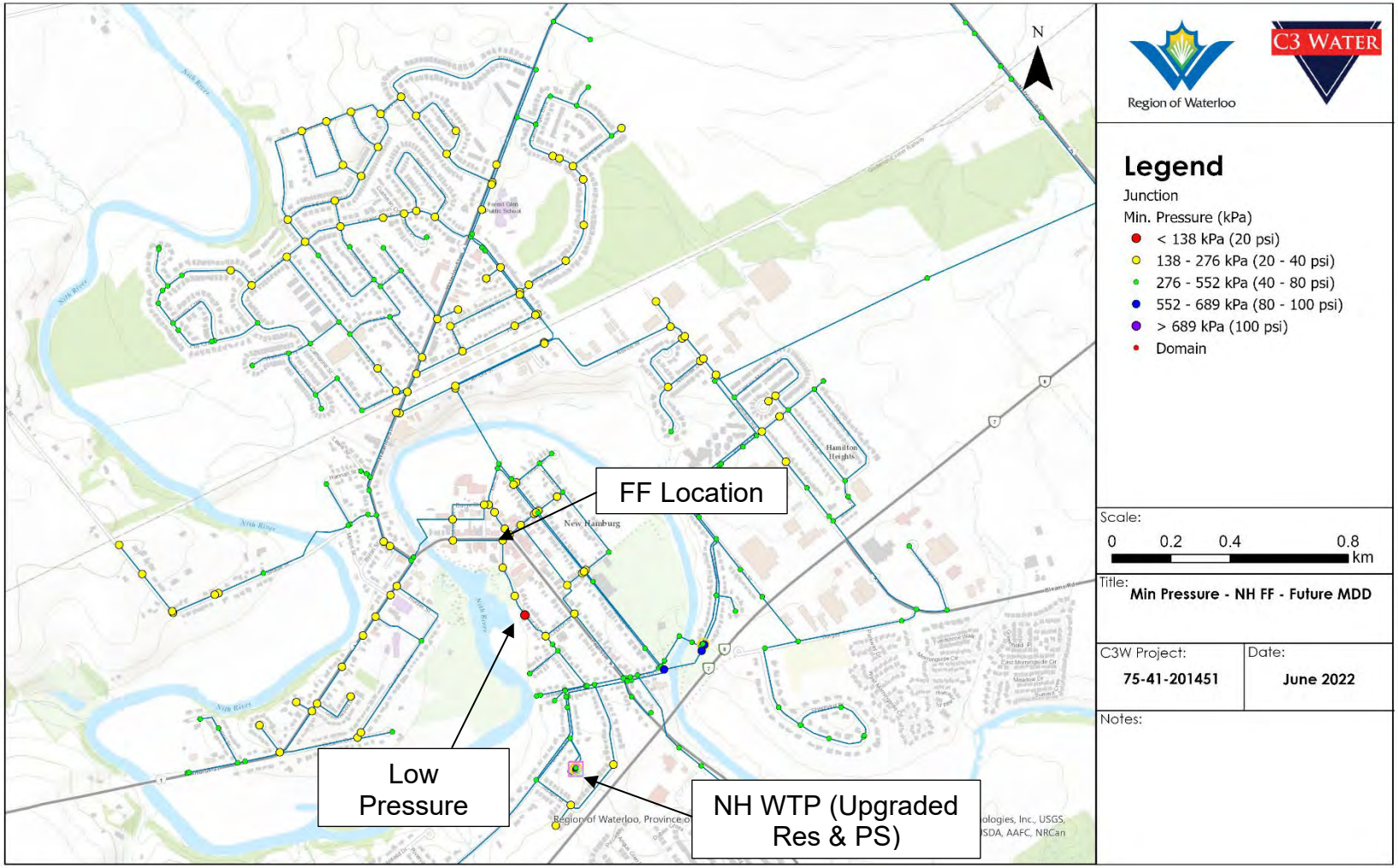


Figure 5-8: Minimum Pressure - WS2 – NH Fire Flow (331 L/s 5-hrs) - Future MDD

D.2 Pressure Analysis

The minimum pressure results under future MDD conditions with the upgraded PS and Reservoir at the NH WTP is shown in Figure 5-9 below. The minimum pressures within the Baden and New Hamburg distribution systems were maintained above 345 kPa, with the exception of the transmission main from the K50s to Baden.

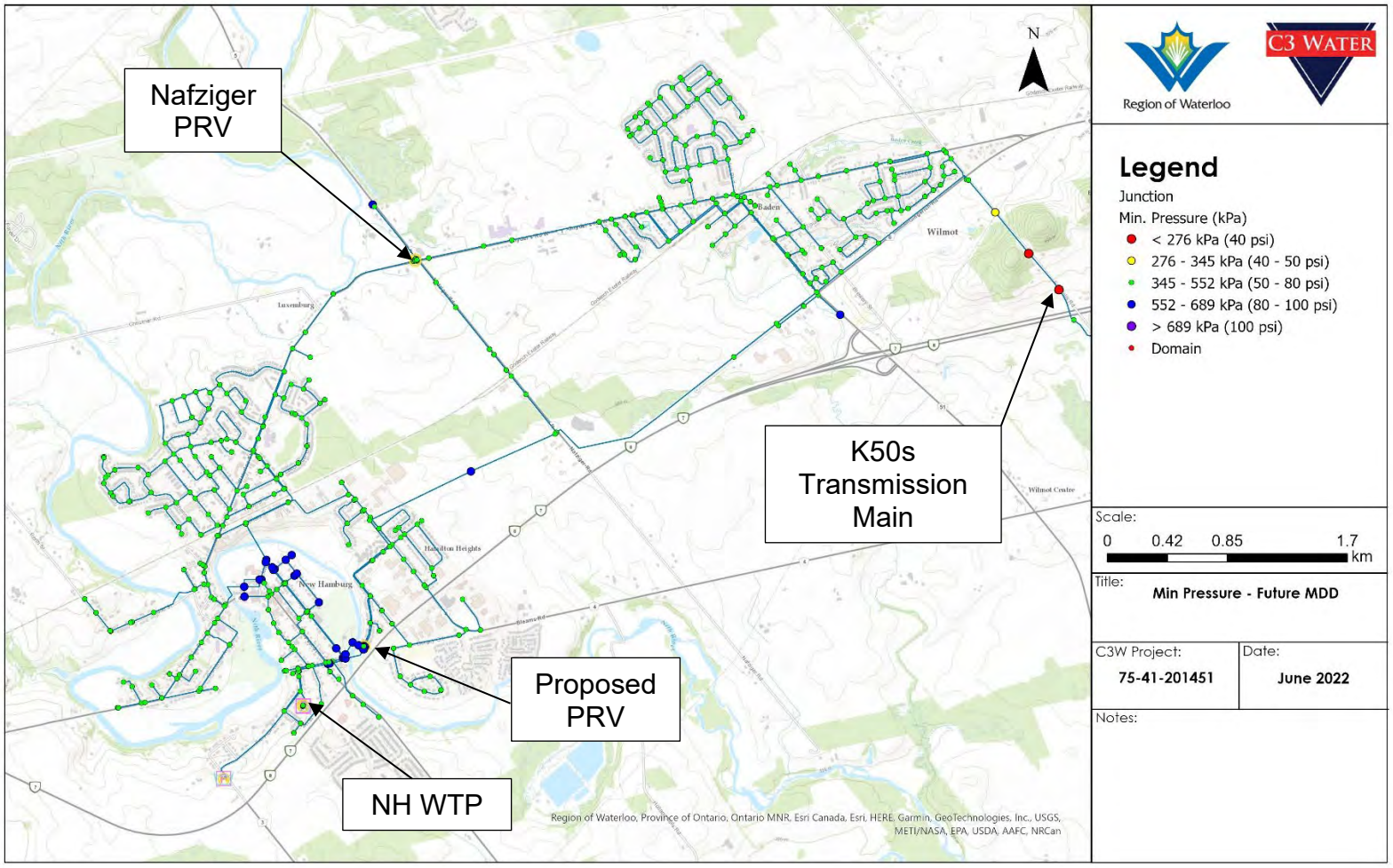


Figure 5-9: Minimum Pressure - WS2 - Future MDD

Appendix E

Baden – New Hamburg Water Distribution System – Other Considerations

An analysis of the water distribution system was completed under future demand conditions to identify any opportunities for improvement. An overview of the pipe diameters in NH are presented in Figure 5-11 below. There are a range of existing pipe materials in New Hamburg. The cast iron watermains are highlighted in Figure 5-12 below. Cast iron watermains often contribute to hydraulic limitations in distribution systems as cast iron is prone to tuberculation on the inner pipe walls over time which increases roughness and reduces capacity.

With the proposed New Hamburg transmission main, under normal operating conditions, the NH demand will be supplied through the proposed 150mm PRV at the south west end of Riverside Drive. To the east, the proposed PRV is connected to a 200mm asbestos cement watermain on Riverside Drive, installed in 1958. To the west, the proposed PRV is connected to the existing 250mm Nith River crossing into downtown New Hamburg from Riverside Drive to Jacob Street. The river crossing watermain is noted in the model as being PVC material installed in 1999 from the proposed PRV chamber to the north side of the river and asbestos cement installed in 1958 from the north side of the river to Jacob Street.

A headloss analysis was completed under future MDD conditions and NH results are presented in Figure 5-13 below. The headloss in the 250mm river crossing exceeded 3m/km and the 200mm Riverside Drive watermain exceeded 2m/km under future MDD conditions.

The velocity and headloss results within the 250mm river crossing watermain are presented in Figure 5-10 below. The headloss through the watermain surpassed 2m/km when the flow was above approximately 33 L/s, which is expected to be exceeded under both existing and future MDD conditions.

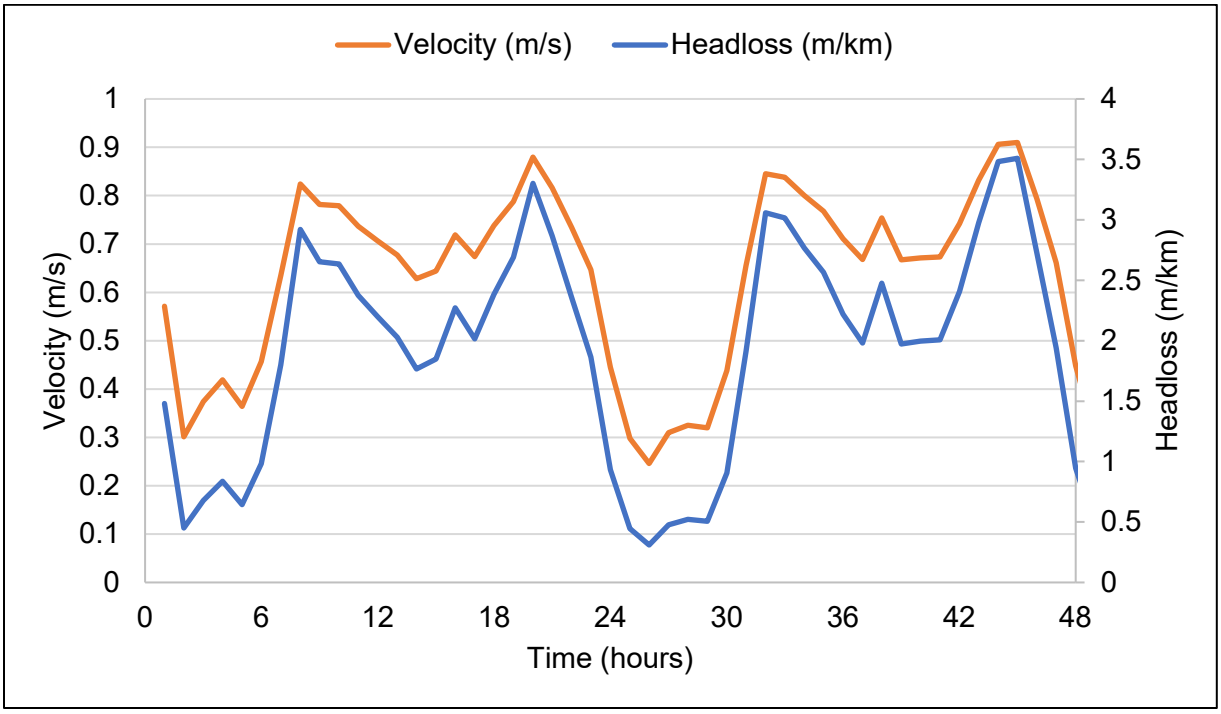


Figure 5-10: Velocity & Headloss – 250mm Nith River Crossing (Riverside Dr to Jacob St) - Future MDD

Based on the existing watermain sizes and materials and the headloss analysis, select watermains have been identified for upgrades to improve system connectivity. These are summarized in Figure 5-11 below and shown in Table 5-4 below.

Table 5-4: Proposed Watermain Upgrades

#	Location	Existing Material	Length (m)	Existing Diameter (mm)	Proposed Upgrade	Justification
1	Nith River Crossing from Riverside Dr. to Jacob St.	PVC/ Asbestos Cement	190	250	300mm PVC	Increase capacity/reduce headloss at a key supply point into downtown NH.
2	Riverside Drive	Asbestos Cement	380	200	300mm PVC	Increase capacity/reduce headloss.
3	Wilmot St., Peel St., Huron Pl., Boullee St., King St.	Cast Iron	880	100	150mm PVC	Small diameter cast iron replacement to improve localized capacity constraints.

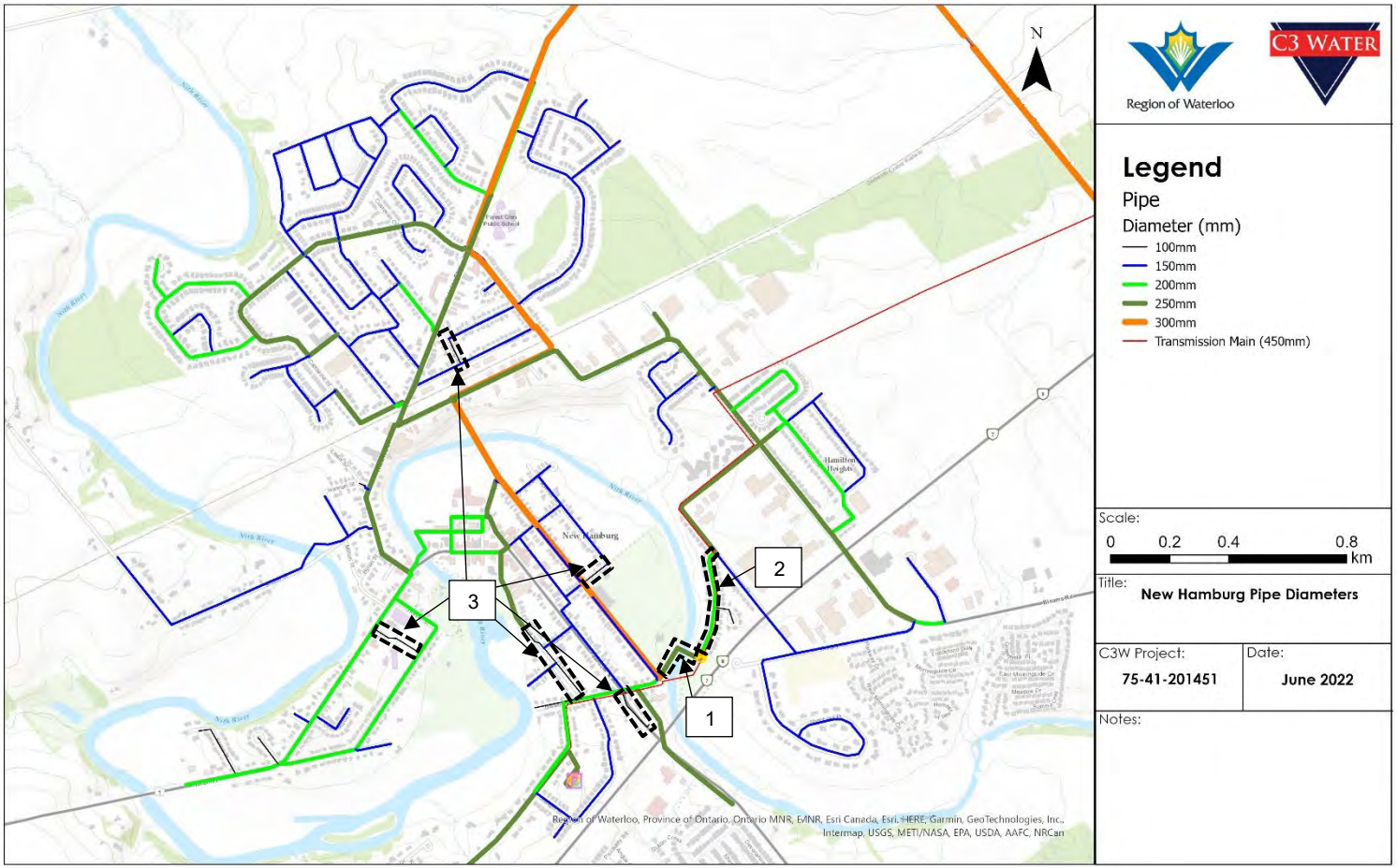


Figure 5-11: New Hamburg Pipe Diameters

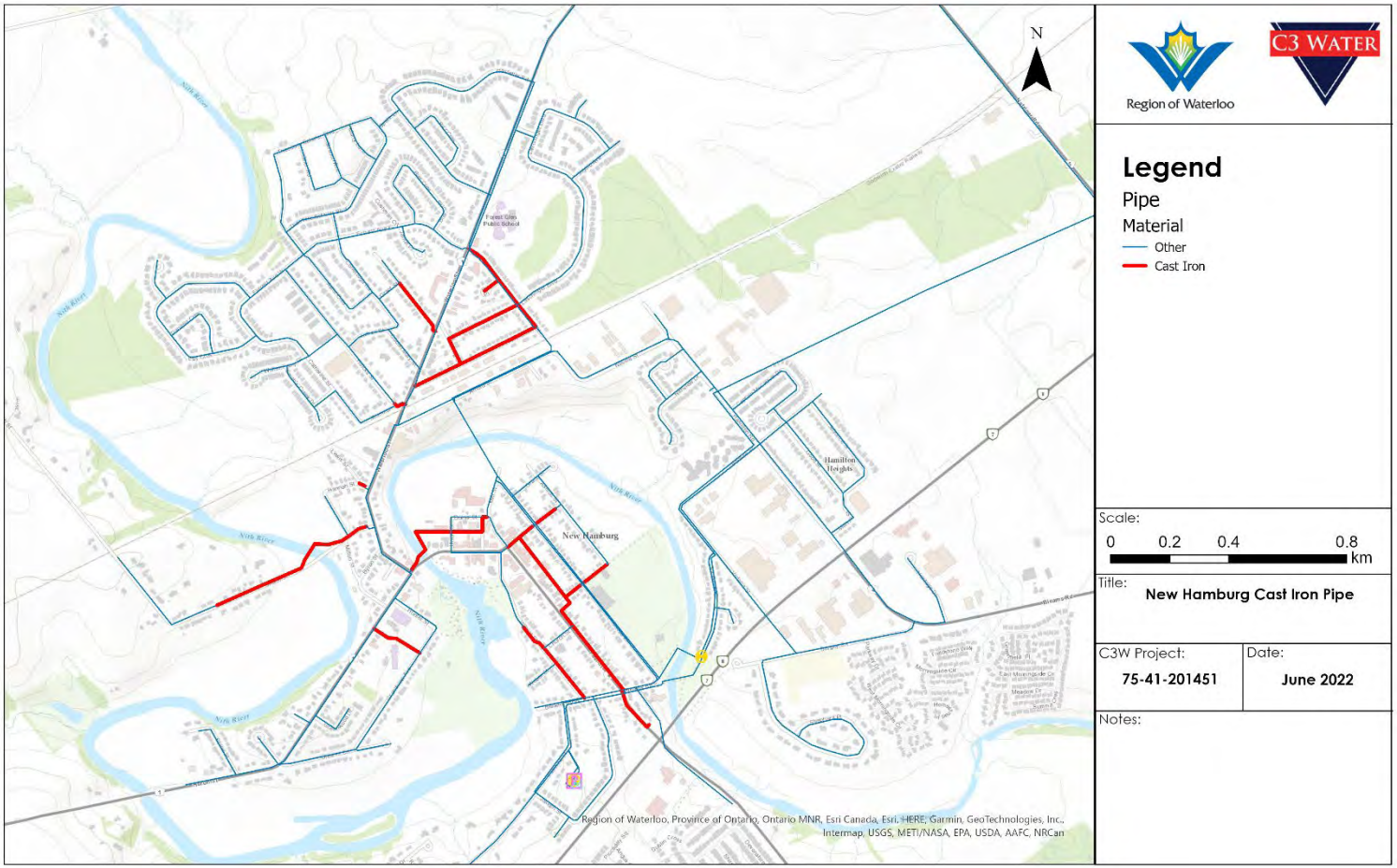


Figure 5-12: New Hamburg Cast Iron Watermains

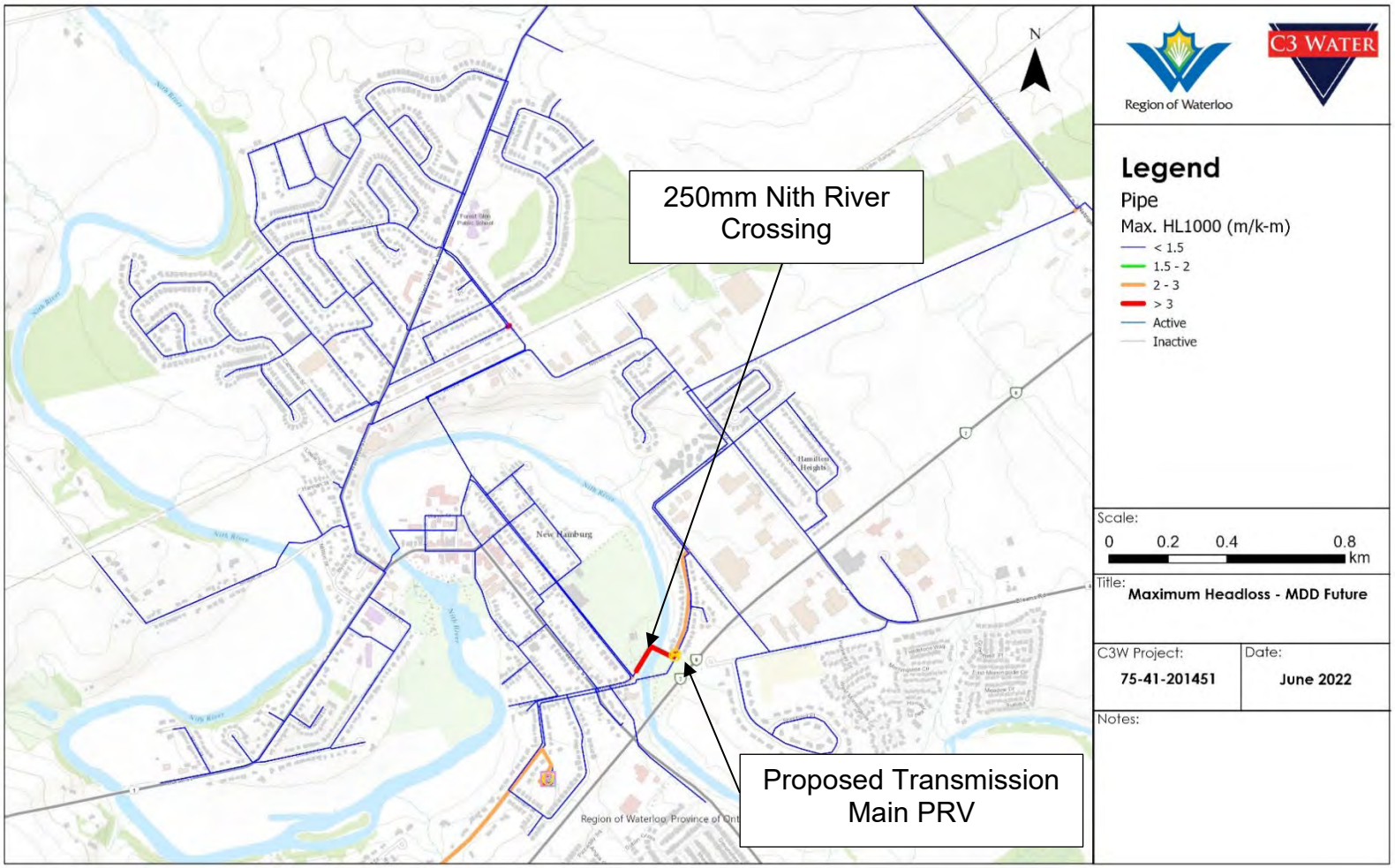


Figure 5-13: Maximum Headloss - Future MDD – Existing Watermains

The proposed watermain upgrades summarized in Table 5-4 above were modelled under future MDD conditions. The headloss results are presented in Figure 5-14 below. With the watermain upgrades, the headloss was below 2m/km throughout NH.

A fire flow analysis at key NH locations was completed under future MDD pre- and post-watermain upgrades conditions and the results are presented in Table 5-5 below. For this analysis, the proposed WS2 upgrades at the NH WTP were included in the model. The proposed watermain upgrades were found to improve the available fire flow at all key NH locations. The fire flow was most significantly improved at the Nithview Retirement Home.

Table 5-5: New Hamburg Key Locations – Available Fire Flow – Future MDD

		Available Flow (L/s)	
Building	**Location**	**Pre-Upgrades**	**Post-Upgrades***
Downtown Core	Huron St. at Peel St.	342	393
Forest Glen Public School	437 Waterloo St.	325	358
Nithview Retirement Home	200 Boulee St.	240	341
New Hamburg Community Centre	251 Jacob St	221	250

**Summarized in Table 5-4*

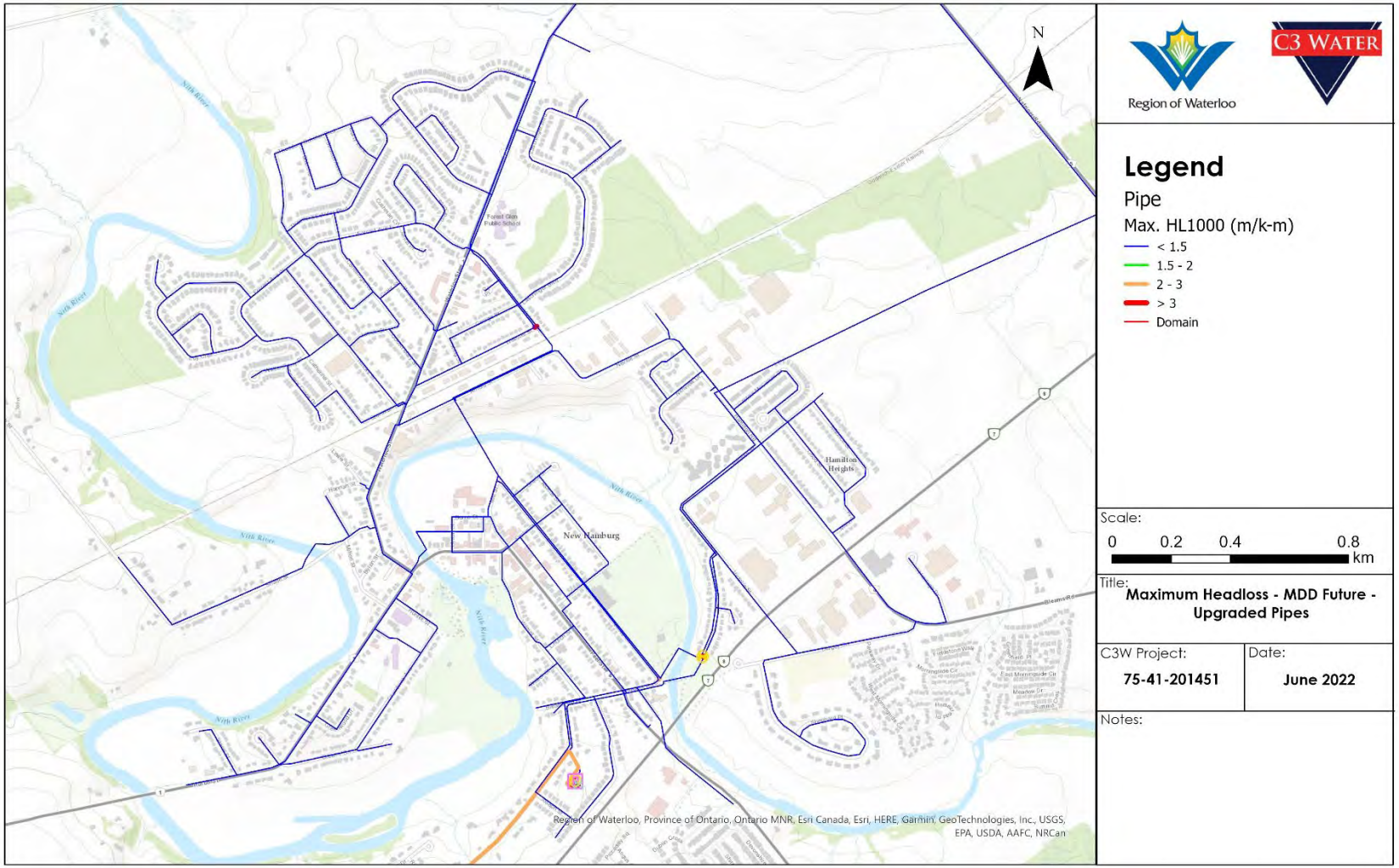


Figure 5-14: Maximum Headloss - Future MDD – Upgraded Watermains

An EPS fire flow analysis was completed with the upgraded watermains and a 331 L/s 5-hour duration fire flow in downtown NH. For this analysis, the proposed WS2 upgrades at the NH WTP were included in the model. The minimum pressure results are presented in Figure 5-15 below. It can be seen that with the upgraded watermains, the minimum pressure was maintained above 275 kPa at all locations in NH. It was discussed in Appendix E.1.2 that without the watermain upgrades, the minimum pressure in NH fell below 138 kPa.

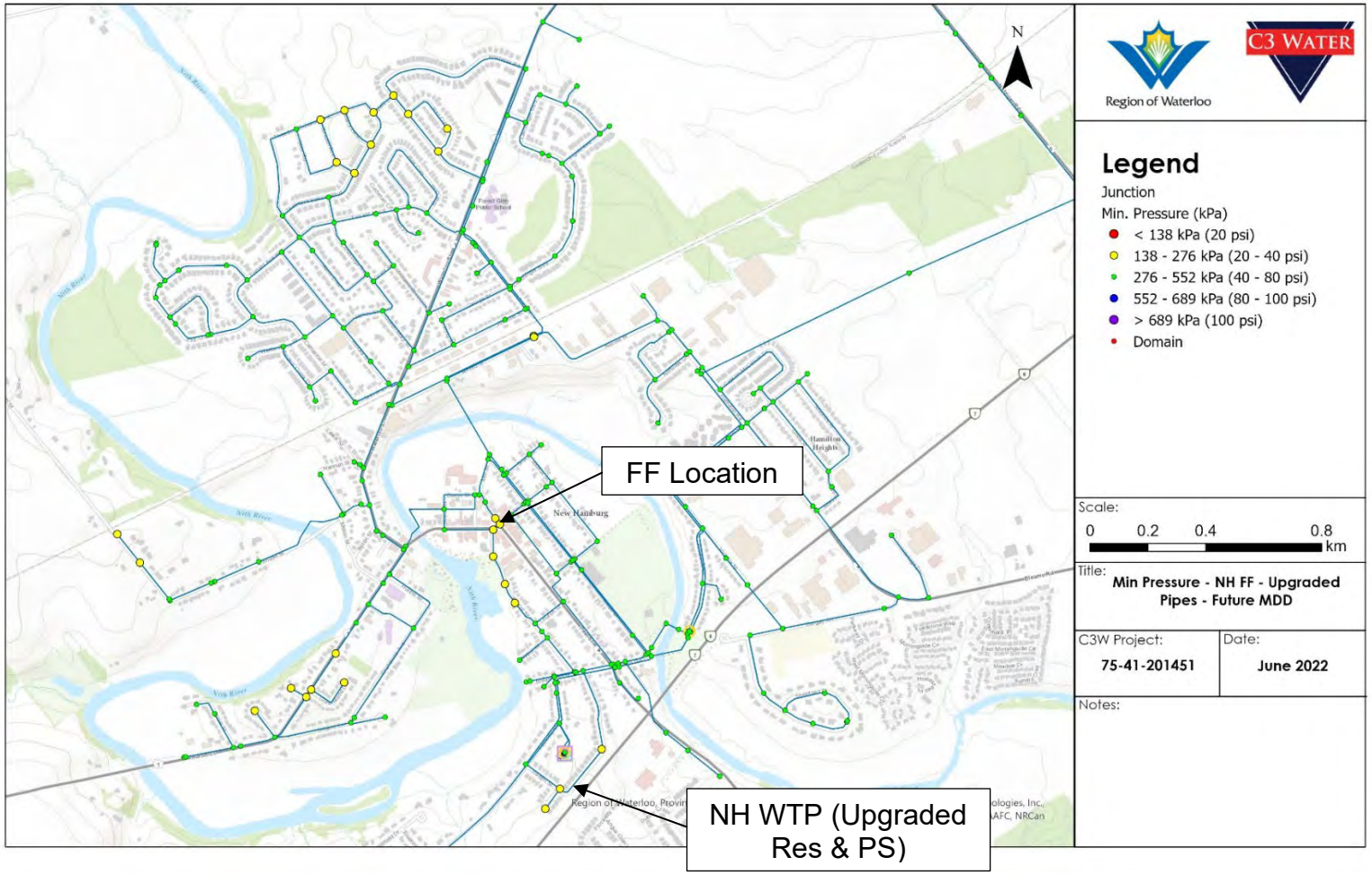


Figure 5-15: Minimum Pressure - WS2 – NH Fire Flow (331 L/s 5-hrs) - Future MDD – Upgraded Pipes

Appendix F

Foxboro Green F3 Preferred Alternative Hydraulic Analysis - Water

The proposed F3 watermain connection to the Foxboro system was modelled under future MDD conditions. The Foxboro community has ground elevations ranging from approximately 348-361m. At the Baden hydraulic grade line (HGL) of 400m (based on the Baden ET top water level (TWL)), this equates to pressures ranging from 382-510 kPa, which is within the preferred operating range. As such, the existing HGL of the Baden system is expected to be suitable for the Foxboro system and a pressure reducing valve (PRV) or booster pump station are not expected to be required to implement this alternative.

A 150mm watermain was modelled from the existing 200mm watermain on Bettschen Lane to the 150mm watermain loop on Golf Links Drive. An overview of the proposed connection is shown in Figure 5-15 below. The exact watermain routing and connection point have not been established at this time.

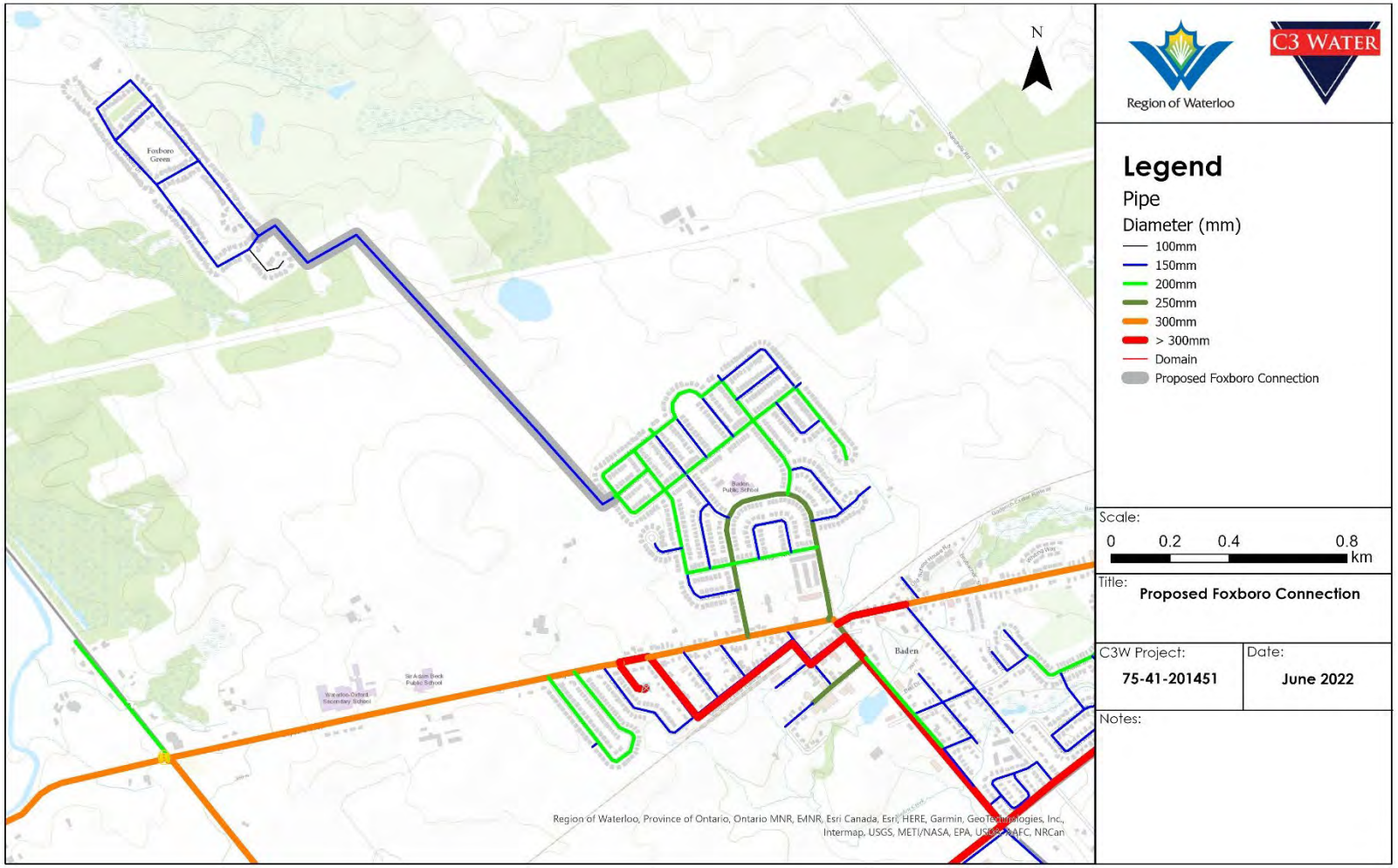


Figure 5-16: Proposed Foxboro Connection (F3)

F.1 Linear Capacity Analysis

The headloss and velocity results in the proposed 150mm Foxboro connection under future MDD conditions are presented in Figure 5-16 below. The velocity did not exceed 0.25 m/s at the headloss was below 1 m/km. The maximum overall headloss through the watermain was 0.9m at a total length of approximately 1.7km.

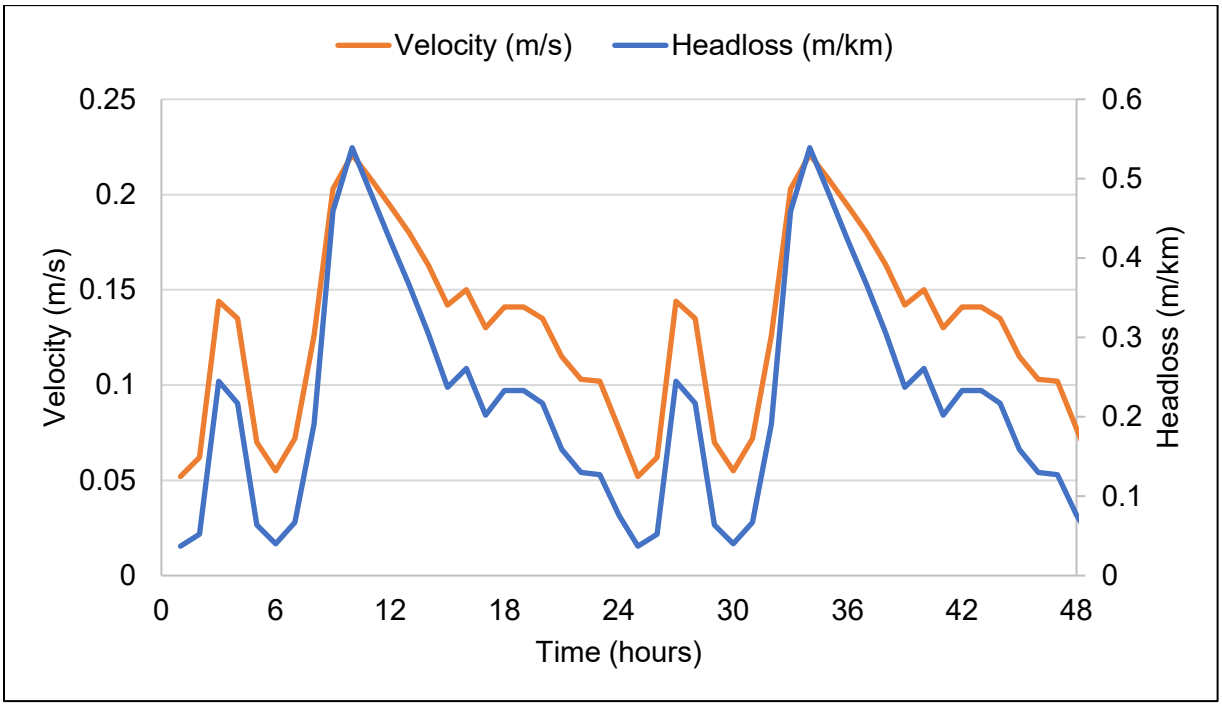


Figure 5-17: Velocity & Headloss – 150mm Foxboro Connection - Future MDD

F.2 Pressure Analysis

The minimum pressure results within the Foxboro system under future MDD conditions are presented in Figure 5-17 below. The minimum pressure was 343 kPa at an elevation of 361m and occurred when the Baden ET was at a level of approximately 70% full.

The maximum pressure results are presented in Figure 5-18 below. The maximum pressure was 501 kPa at an elevation of 348m.

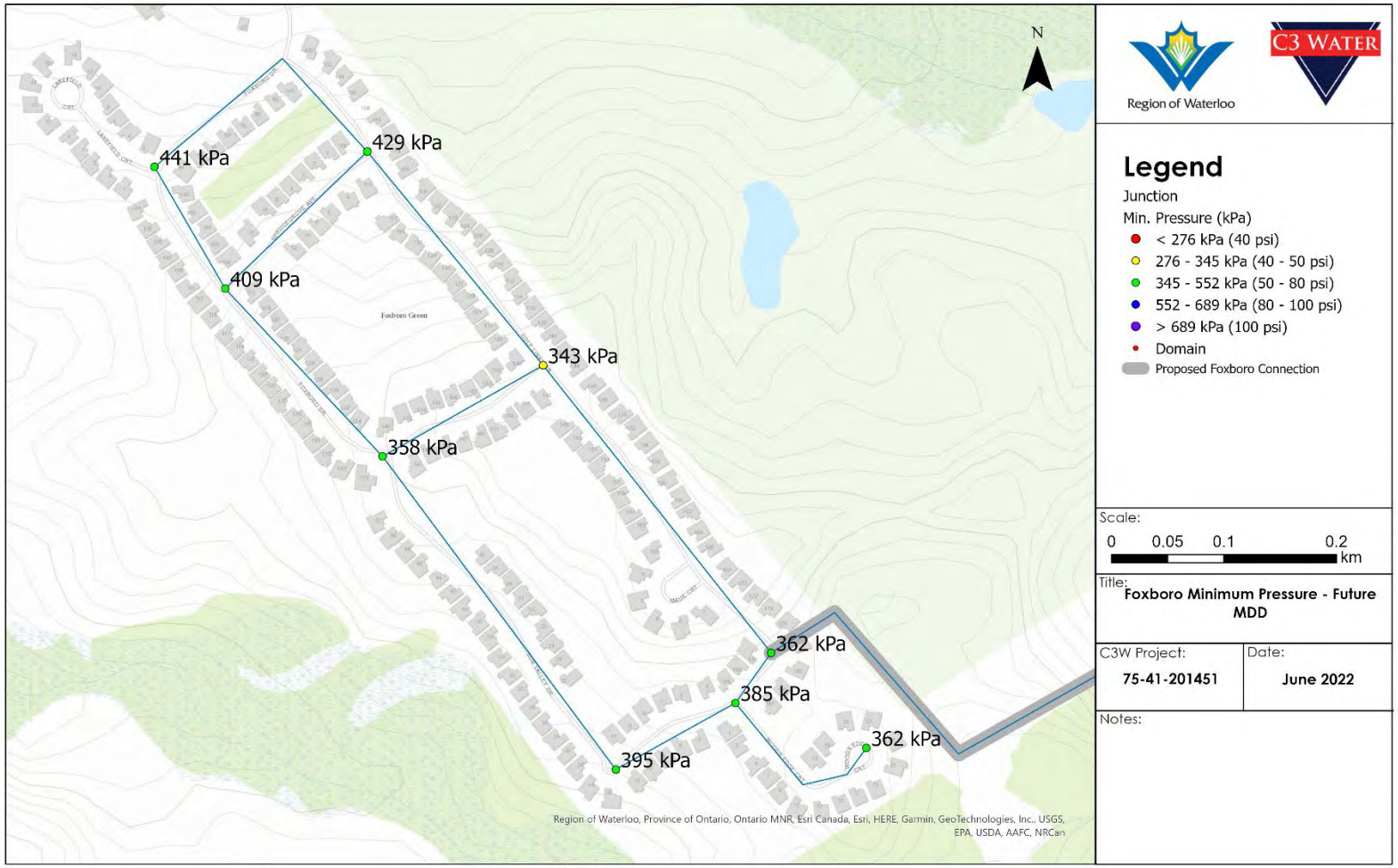


Figure 5-18: Foxboro Minimum Pressure – F3 - Future MDD

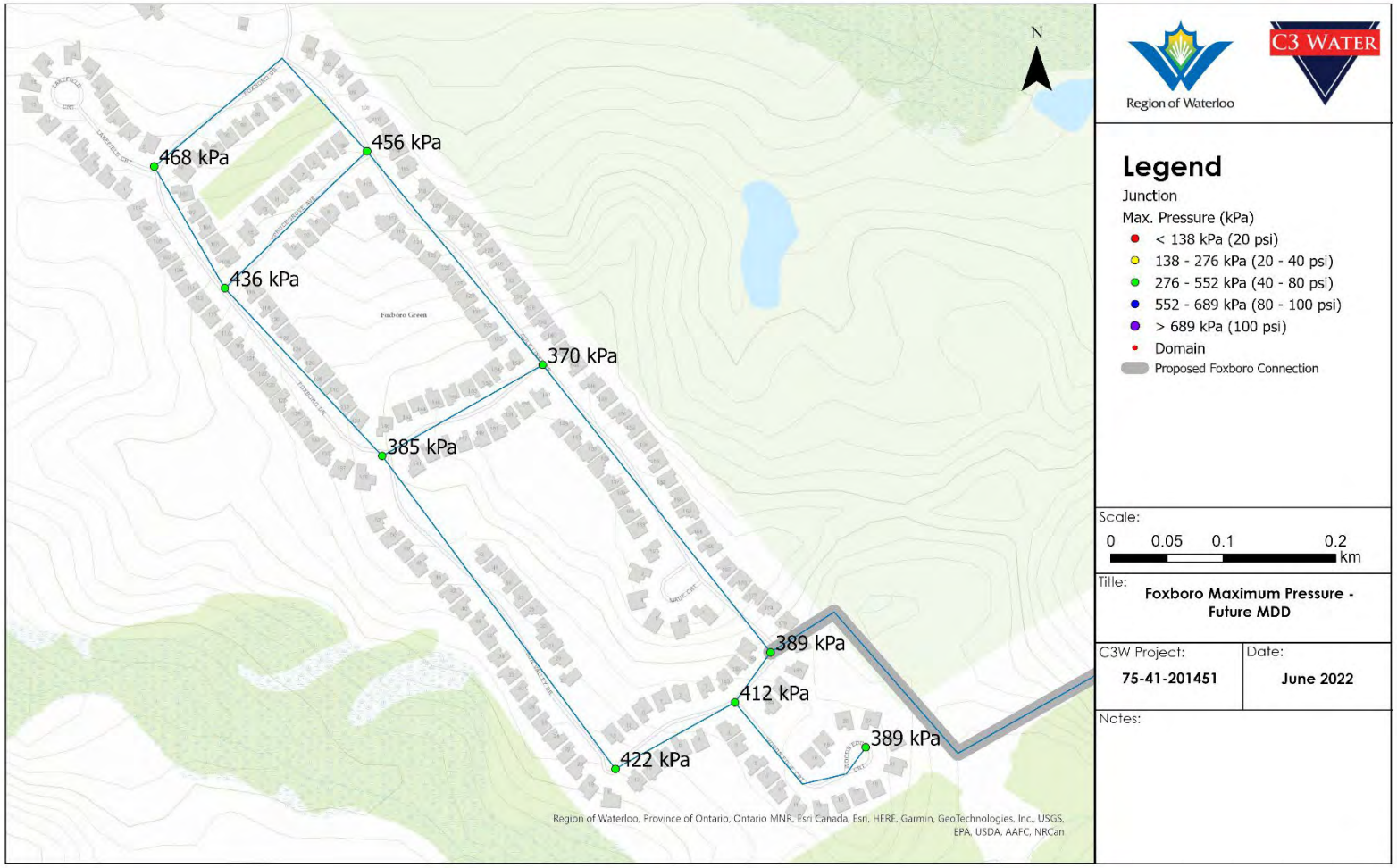


Figure 5-19: Foxboro Maximum Pressure – F3 - Future MDD

F.3 Water Age Analysis

The water age was considered for this proposed connection. Water age is related to water quality, but there are several other factors that impact water quality. Water age modelling was completed under ADD conditions. Based on the model results, the maximum water age at the F3 connection in Foxboro was approximately 9 hours higher than the F3 connection to the Baden system. The water within the Foxboro system was found to age by approximately 18 hours. As such, the maximum water age within Foxboro is expected to be approximately 27 hours higher than the northern end of the Baden system under ADD conditions. It is recommended that water quality sampling is completed in the Baden system at the proposed connection point to Foxboro to determine if chlorine dosing is required to maintain acceptable residual levels within Foxboro.

Appendix G

Baden – New Hamburg WW4 Preferred Alternative Hydraulic Analysis

System curves were developed for the preliminary preferred alternative WW4 with twinned 250 mm (10”) forcemains connecting the Baden WWPS to the New Hamburg WWTP. A duty point of 55.5 L/s and 34.9 m TDH was used for preliminary pump selection. Figure 5-20 and Figure 5-21 display the system curve for an individual forcemain and the system curve for the dual forcemains, respectively, with the preliminary pump curve.

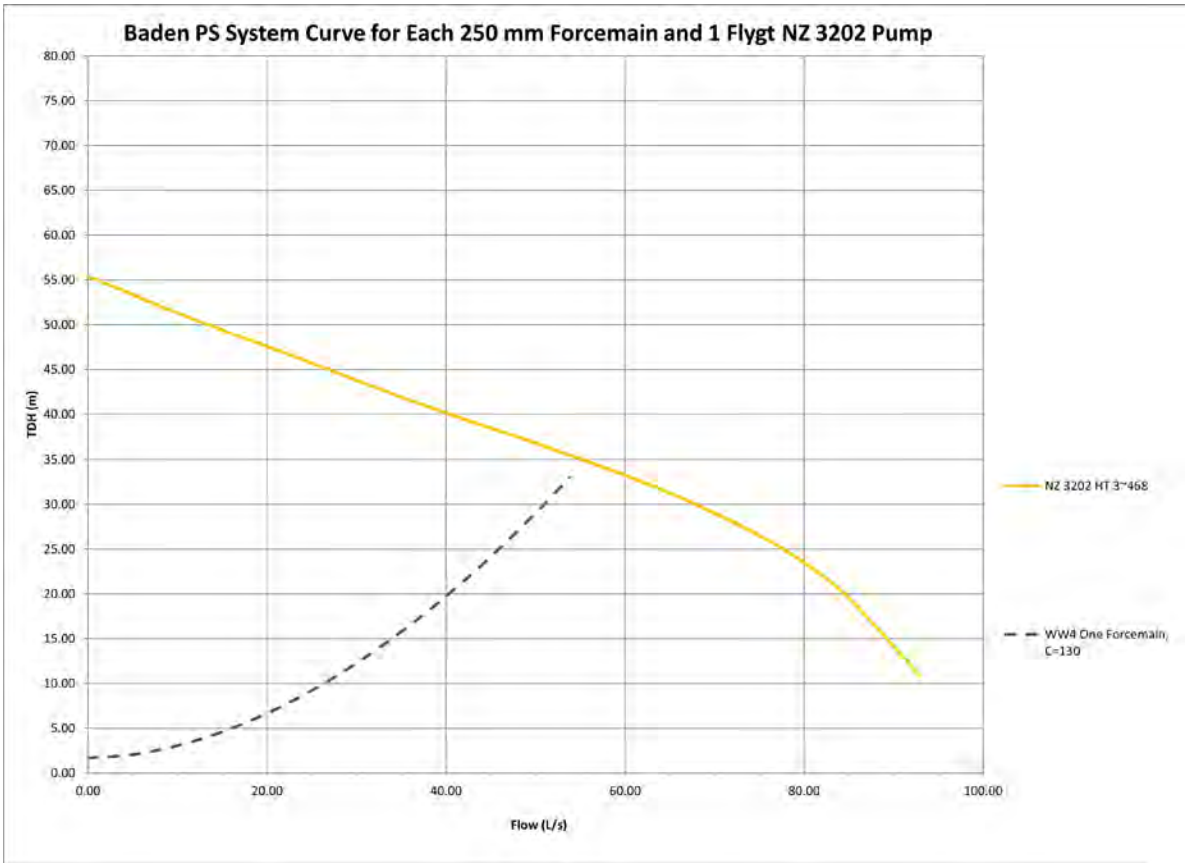


Figure 5-20: Baden PS System Curve, Individual 250 mm Forcemain with 1 Flygt NZ 3202 Pump

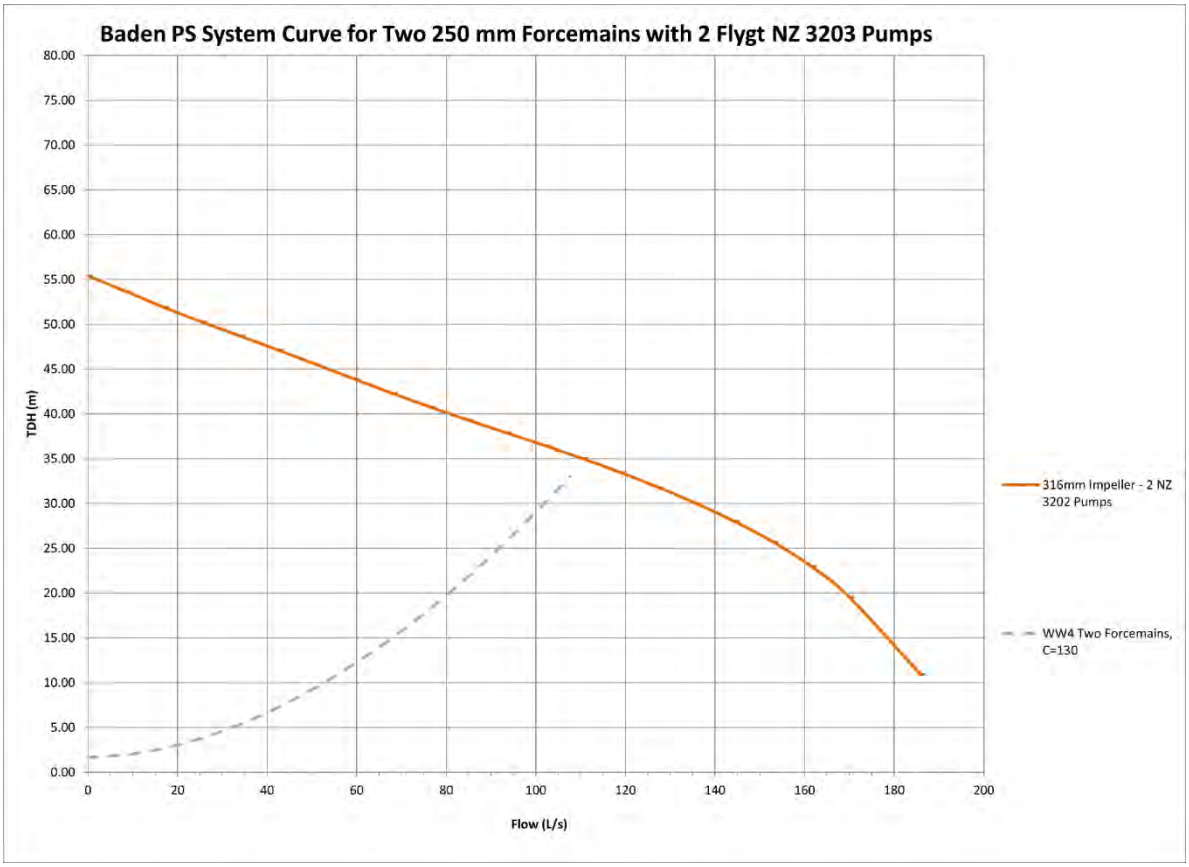


Figure 5-21: Baden PS System Curve, Dual 250 mm Forcemain with 2 Flygt NZ 3202 Pumps

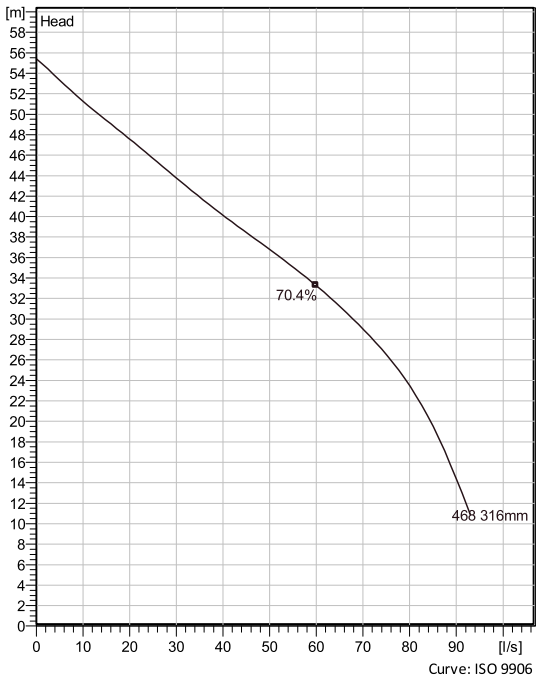
NZ 3202 HT 3~ 468

Patented self cleaning semi-open channel impeller, ideal for pumping in waste water applications. Modular based design with high adaptation grade.

Technical specification



Curves according to: Water, pure Water, pure [100%],4 °C,1 kg/dm³,1.569 mm²/s



Curve: ISO 9906

Configuration

Motor number
N3202.830 30-29-4IE-D IE3 44hp

Installation type
Z - Horizontal Permanent, Dry

Impeller diameter
316 mm

Discharge diameter
100 mm

Pump information

Impeller diameter
316 mm

Discharge diameter
100 mm

Inlet diameter
200 mm

Maximum operating speed
1785 1/min

Number of blades
2

Max. fluid temperature
40 °C

Materials

Impeller
Hard-Iron ™

Project		**Created by**	Kevin Vitone		
Block	0	**Created on**	3/30/2022	**Last update**	3/30/2022

NZ 3202 HT 3~ 468

Technical specification

Motor - General

Motor number N3202.830 30-29-4IE-D IE3 44hp	**Phases** 3~	**Rated speed** 1785 1/min	**Rated power** 33 kW
ATEX approved CSA	**Number of poles** 4	**Rated current** 40 A	**Stator variant** 3
Frequency 60 Hz	**Rated voltage** 600 V	**Insulation class** H	**Type of Duty** S1
Version code 830			

Motor - Technical

Power factor - 1/1 Load 0.84	**Motor efficiency - 1/1 Load** 94.5 %	**Total moment of inertia** 0.438 kg m²	**Starts per hour max.** 30
Power factor - 3/4 Load 0.78	**Motor efficiency - 3/4 Load** 94.7 %	**Starting current, direct starting** 330 A	
Power factor - 1/2 Load 0.66	**Motor efficiency - 1/2 Load** 94.0 %	**Starting current, star-delta** 110 A	

Project		**Created by**	Kevin Vitone		
Block	0	**Created on**	3/30/2022	**Last update**	3/30/2022

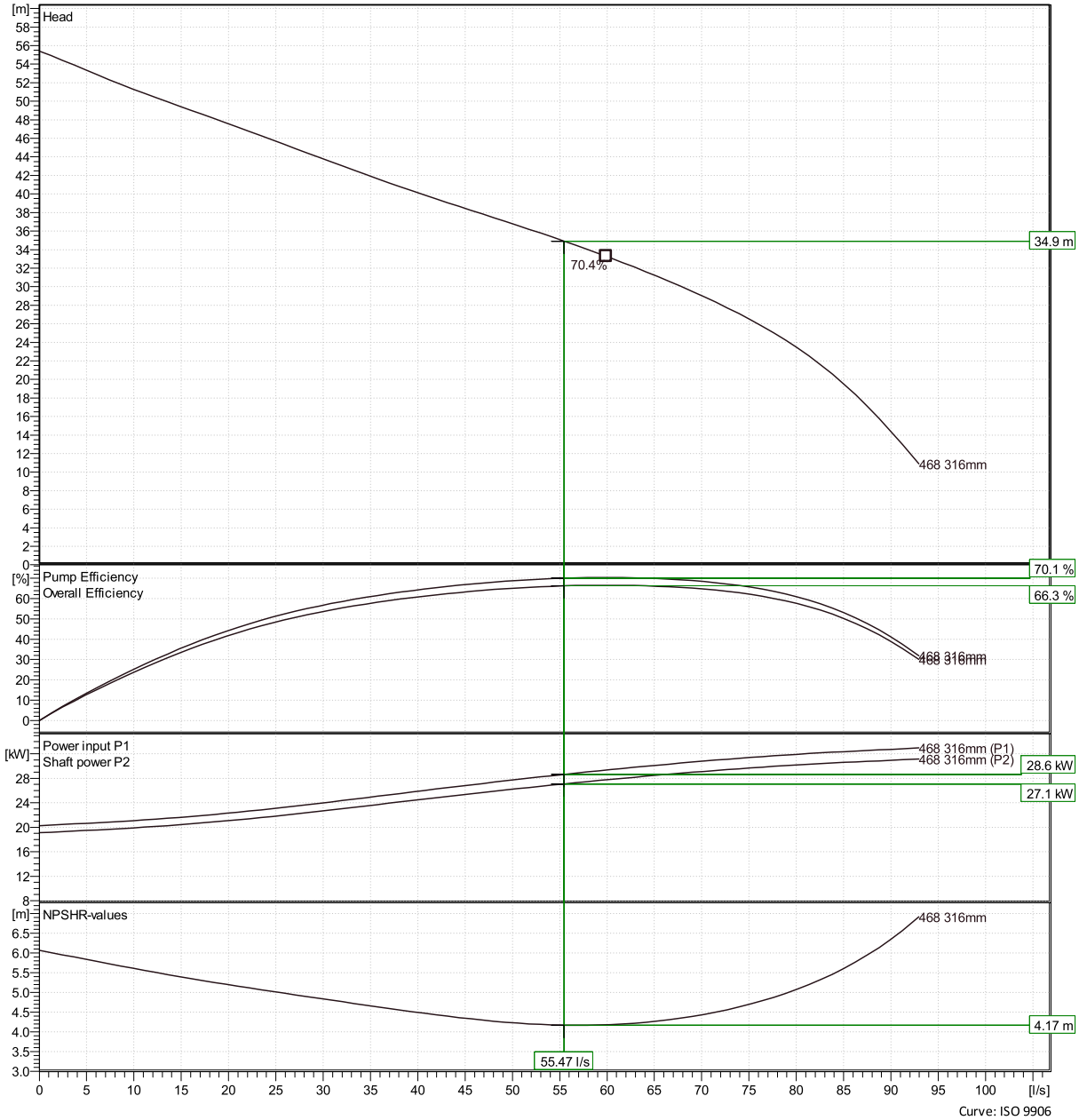
NZ 3202 HT 3~ 468

Performance curve

Duty point

Flow	Head
55.5 l/s	34.9 m

Curves according to: Water, pure Water, pure [100%],4 °C,1 kg/dm³,1.569 mm²/s



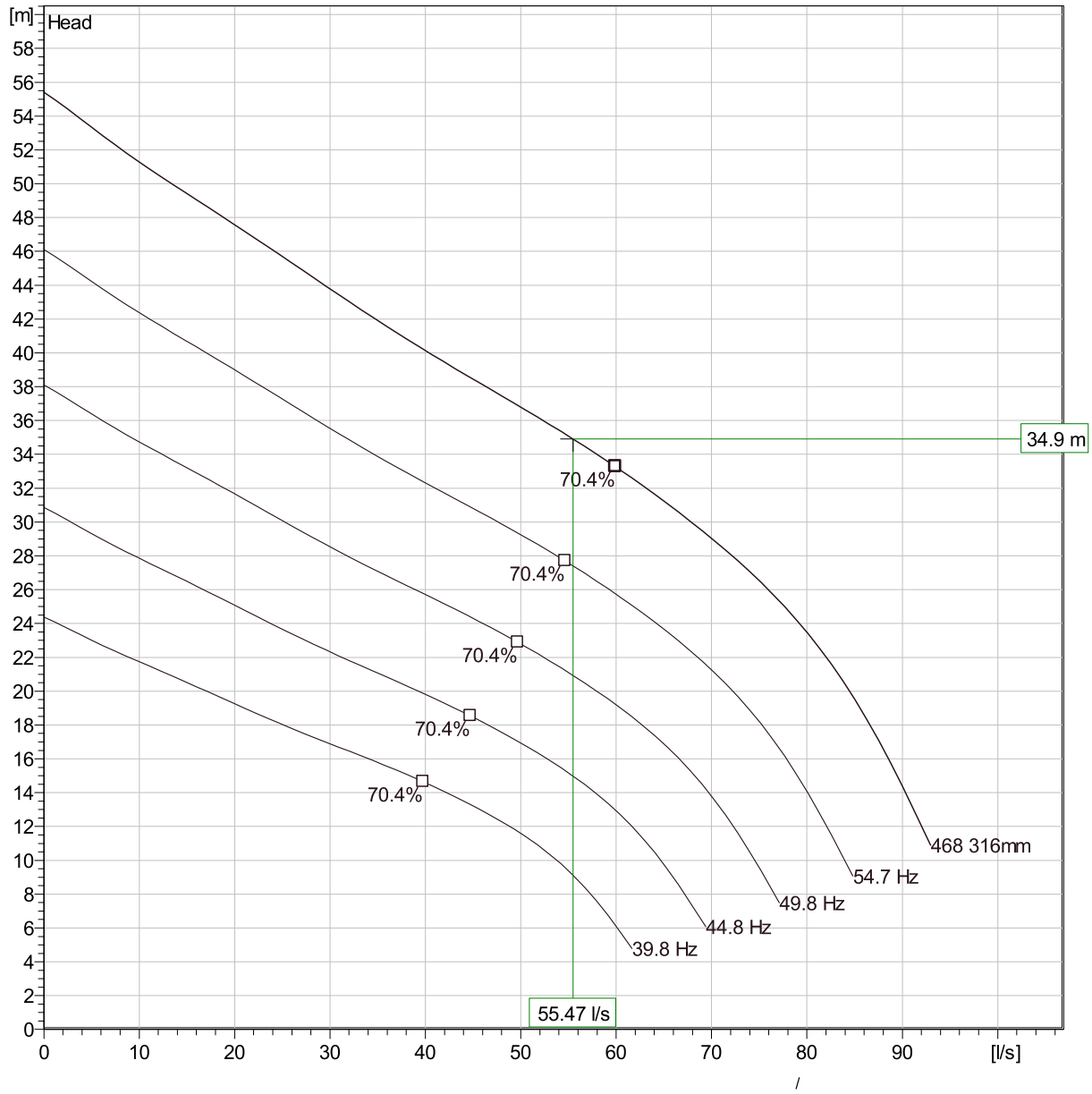
Curve: ISO 9906

0		Created on	Kevin Vitone 3/30/2022	Last update	3/30/2022

NZ 3202 HT 3~ 468

Duty Analysis

Curves according to: Water, pure [100%] ; 4°C; 1kg/dm³; 1.569mm²/s



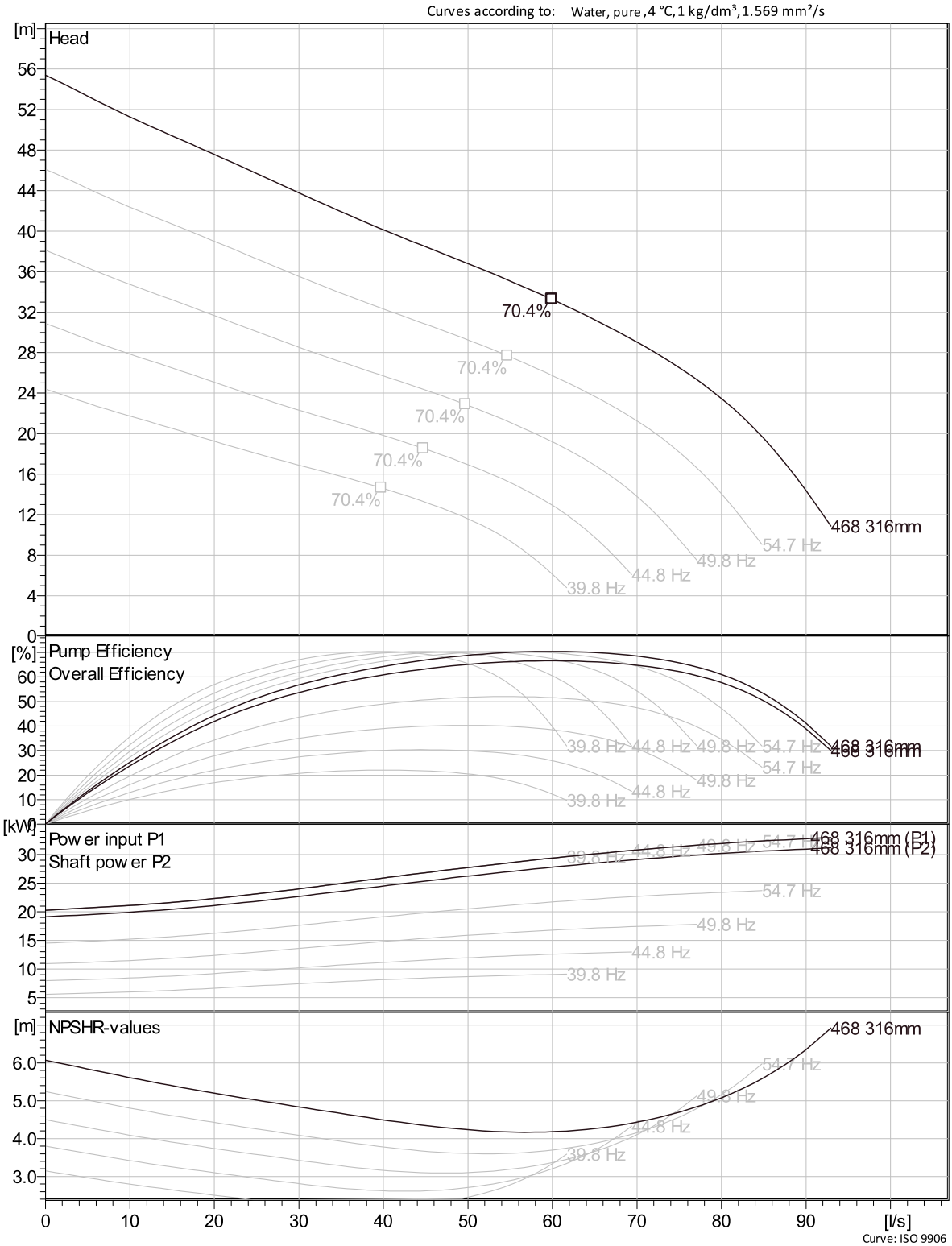
Operating characteristics

Pumps / Systems	Flow	Head	Shaft power	Flow	Head	Shaft power	Hydr.eff.	Spec. Energy	NPSHre
	l/s	m	kW	l/s	m	kW		kWh/l	m
1	55.5	34.9	27.1	55.5	34.9	27.1	70.1 %	0.000143	4.17

Project		**Created by**	Kevin Vitone		
Block		**Created on**	3/30/2022	**Last update**	3/30/2022

NZ 3202 HT 3~ 468

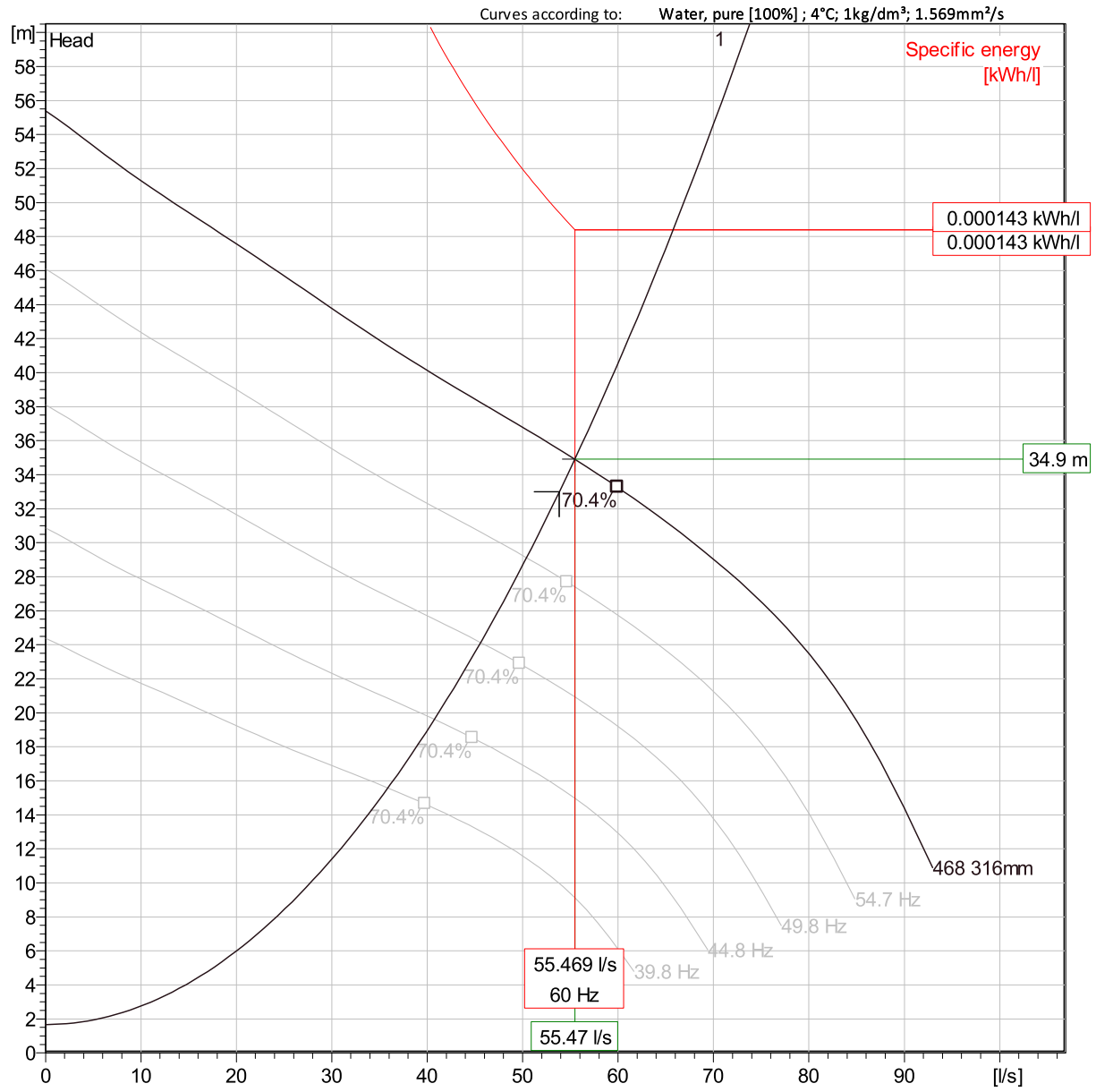
VFD Curve



Project		**Created by**	Kevin Vitone		
Block	0	**Created on**	3/30/2022	**Last update**	3/30/2022

NZ 3202 HT 3~ 468

VFD Analysis



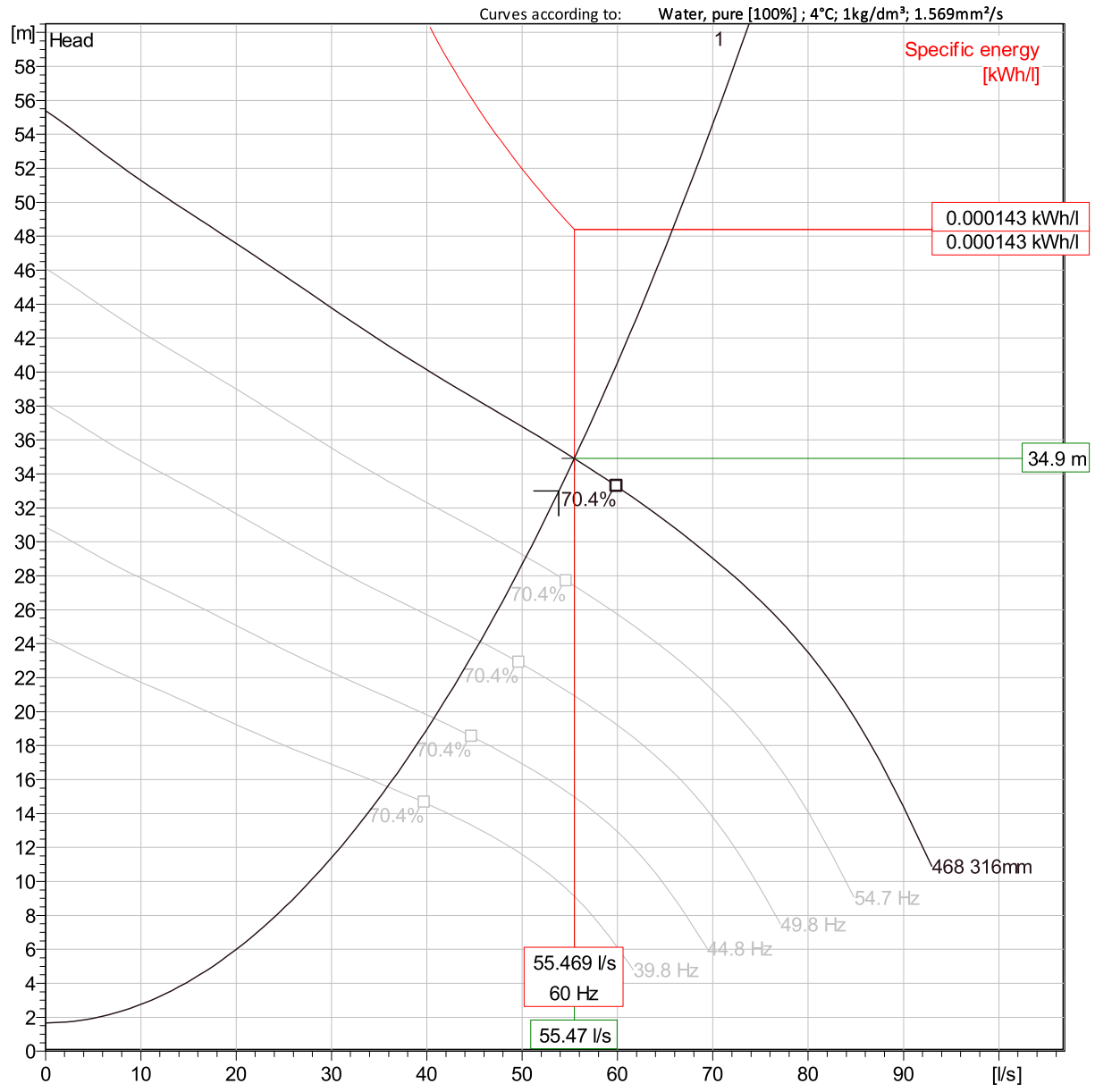
Operating Characteristics

Pumps / Systems	Frequency	Flow	Head	Shaft power	Flow	Head	Shaft power	Hydr.eff.	Specific energy	NPSHre
		l/s	m	kW	l/s	m	kW		kWh/l	m
1	60 Hz	55.5	34.9	27.1	55.5	34.9	27.1	70.1 %	0.000143	4.17
1	54.7 Hz	50.4	29.1	20.5	50.4	29.1	20.5	70.1 %	0.000153	3.6
1	49.8 Hz	45.6	24.1	15.4	45.6	24.1	15.4	70 %	0.000164	3.09
1	44.8 Hz	40.8	19.6	11.2	40.8	19.6	11.2	70 %	0.000177	2.62

Project		**Created by**	Kevin Vitone		
Block	0	**Created on**	3/30/2022	**Last update**	3/30/2022

NZ 3202 HT 3~ 468

VFD Analysis



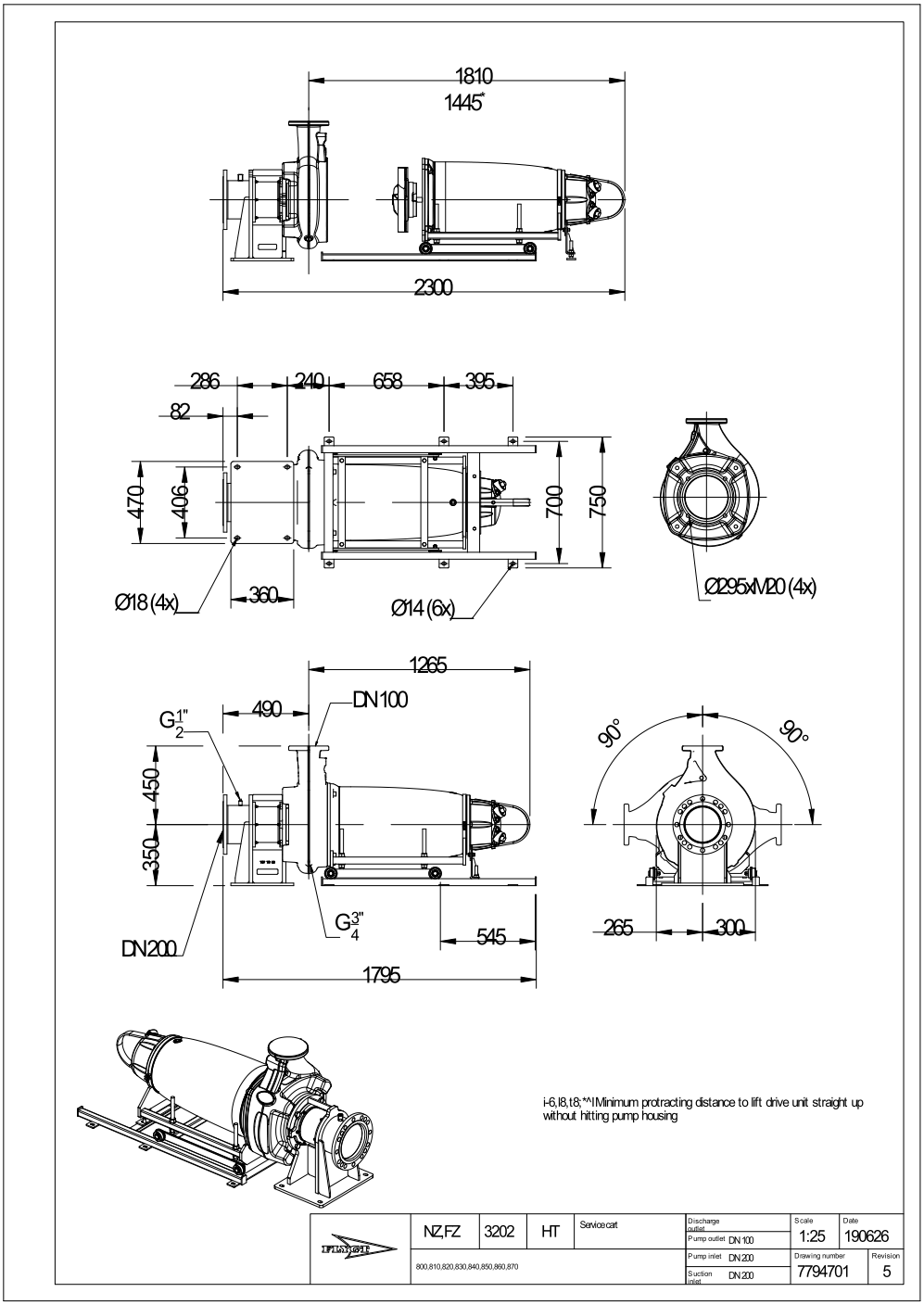
Operating Characteristics

Pumps / Systems	Frequency	Flow	Head	Shaft power	Flow	Head	Shaft power	Hydr.eff.	Specific energy	NPSHre
		l/s	m	kW	l/s	m	kW		kWh/l	m
1	39.8 Hz	35.9	15.6	7.85	35.9	15.6	7.85	69.9 %	0.000194	2.17

Project		**Created by**	Kevin Vitone		
Block	0	**Created on**	3/30/2022	**Last update**	3/30/2022

NZ 3202 HT 3~ 468

Dimensional drawing



Project		**Created by**	Kevin Vitone
Block	0	**Created on**	3/30/2022 **Last update** 3/30/2022

Stantec

Memo

To:	Kaoru Yajima Region of Waterloo	From:	Jeff Paul, P.Eng. Stantec, London
File:	165640324	Date:	October 21, 2022

Reference: Baden – New Hamburg Water and Wastewater System Servicing Review – Foxboro Community Servicing

1 BACKGROUND

This Technical Memorandum has been prepared to provide further documentation regarding the sanitary servicing options for the Foxboro Community in accordance with Phase 2 of the Municipal Class Environmental Assessment (Class EA) process.

Following on the release of Public Information Centre #3 (PIC #3), Stantec and the Region received correspondence dated June 23, 2022 from Waterloo Standard Condominium Corporation #365 (Foxboro Residents) requesting additional information and outlining various concerns. That letter is attached as an Appendix to this report. Following on further review, a meeting was scheduled between the Foxboro Residents, the Region of Waterloo and Stantec to discuss the project and address these concerns. That meeting was held on August 15, 2022 at the Foxboro Green Recreation Centre.

Among the issues noted, was the concern from the Foxboro Residents regarding the construction of a new sanitary forcemain along Golf Links Drive. The alignment of this forcemain was a part of alternative F-3 which was presented in PIC #3 as the preliminary preferred alternative. Alternative F-3 was selected as the preferred alternative because if ranked highest across the environmental, social, technical and financial criteria. More information on this selection is provided in Technical Memo #5. The forcemain along Golf Links Drive is one portion of the overall servicing strategy for the Foxboro Community outlined in Alternative F-3. Specifically, the forcemain is sized at a preliminary level to be 100mm diameter and is intended to convey flows from a proposed pumping station in the northern portion of the Foxboro Community connecting to the gravity sanitary sewer system on Golf Links Drive which in turn conveys flows to a second proposed pumping station in the southern portion of the Foxboro Community. Flows are then pumped into another proposed forcemain to convey these into the gravity sewer system in Baden.

The Foxboro Residents proposed an alternative alignment for this forcemain which is parallel to the proposed alignment but with an alignment that is within the open space block east of Golf Links Drive and on the rear of the lots fronting Golf Links Drive (shown on the attached figure as Sub-Option 3ii). The purpose of this memo is to evaluate that proposed alternative alignment in comparison to the alignment previous advanced.

2 FOXBORO FORCEMAIN ALIGNMENT OPTIONS

The alignment options considered under this memo are sub-options of Alternative F3. F3 is the alternative by which flows from the Foxboro Community are conveyed to the Baden water and wastewater system by a direct route as outlined in the attached figure. The sanitary forcemain alignment options considered in this memo are labelled sub-options 3i and 3ii.

Sub-option 3i is the forcemain alignment option presented in PIC #3 and involves the construction of a new 100mm diameter sanitary forcemain along Golf Links Road. The northern end of the forcemain connects to a proposed sanitary pumping station in the location of the existing sanitary treatment system for Foxboro. The southern end of the forcemain connects to the existing sanitary sewer on Golf Links Drive in the vicinity of

Mun. No. 174 Golf Links Drive. The forcemain would be contained within the roadway of the condo corporation.

Sub-option 3ii is the forcemain alignment option suggested by the Foxboro Residents and involves the construction of a new 100mm diameter sanitary forcemain along the open space block east of Golf Links Road, continuing along the open space block between Mun. No. 166 Golf Links Drive and Mun. No. 168 Golf Links Drive and then along Golf Links Drive to connect with the existing sanitary sewer in the vicinity of Mun. No. 174 Golf Links Drive. The open space blocks noted under both options are understood to be in the ownership of the condo corporation. Portions of the open space block contain as many as four sanitary forcemains. The purpose of these forcemains are to convey flows from the existing sanitary treatment facility in the northern part of the Foxboro Community to the disposal beds which are contained in the central portion of the community. On review of the servicing drawings for the Foxboro Community, the precise alignment of these forcemains is not noted so it is unclear whether there is a clear corridor within which to construct a new forcemain.

Further investigation work (i.e. hydrovac excavation) should be undertaken at a subsequent design stage of this project to determine the precise location of the existing forcemains and to set the alignment of the new proposed forcemain. Given that there is redundancy within the system, it is Stantec's opinion that, in the event of a conflict with the existing forcemains, one of the four existing forcemains could be removed to allow construction of the new forcemain. Thus we can conclude at this stage that sub-option 3ii is a viable option for further consideration.

3 ALIGNMENT SELECTION CRITERIA

As part of the Municipal Class EA process, an evaluation criteria was established by which to determine the preferred alternative by looking at four main criteria: Environmental, Social, Technical and Financial. That evaluation criteria was utilized to select Option F3 as the preferred alternative. In the evaluation of sub-options 3i and 3ii, this evaluation criteria has been employed to rate these two alternatives and to advance a preferred alternative. The following section provides some further detail on how the alternatives are rated within each of these four main criteria.

3.1 ENVIRONMENTAL

Within the Environmental criteria, the alternatives are evaluated using the following criteria:

Protects environmental features

Protect sensitive natural features and regulated areas. Minimize the potential impact from construction and operation to existing terrestrial habitats/features, vegetation, wetlands, woodlots, and steep slopes. Allow for scheduling and roll-out of construction activities in a way and at a time of year that would limit the negative impacts on the vegetation of the site and surrounding area.

Protects wildlife and species at risk

Minimize impacts to wildlife (including species at risk) or identified habitat locations for these species. Protect fisheries and aquatic health.

Allow for scheduling and roll-out of construction activities in a way and at a time of year that would limit the negative impacts on wildlife and species at risk.

Protects groundwater, streams and rivers

Protect groundwater and meets Clean Water Act requirements. Minimize impacts on the GRCA regulated floodplain.

Minimizes climate change impacts

Minimize GHG emissions and negative impacts on the landscape which may alter the ecosystems' ability to remove carbon dioxide from the atmosphere (e.g. changes to site and vicinity plant cover).

Prioritize energy and water conservation and efficiency measures and/or adaptive re-use of buildings or structures to reduce new energy or material demands. Evaluate contributions to or investments in natural spaces that offset or mitigate the alternative's climate change impacts.

3.2 SOCIAL

Within the Social criteria, the alternatives are evaluated using the following criteria:

Minimizes impacts to residents related to noise, odour, traffic and aesthetics

Minimize noise, odour, and truck traffic affecting the community during pumping station operation. Maintain access to and aesthetics of public spaces. Minimize negative impacts that may result due to changes to the neighbourhood characteristics (e.g., recreational features, green space, property values).

Minimizes impacts to businesses

Maintain access for businesses during construction and operation. Minimize potential negative effects on short-term and long-term business vitality, and community growth and development.

Manages and minimizes construction impacts

Minimize noise, odour, road closures, and truck traffic affecting the community during construction.

Protects cultural heritage resources

Minimize potential impact to historical, cultural, and architecturally significant features. Minimize the potential impact to Indigenous communities.

Protects archaeological features

Minimize potential impact to archaeologically significant features. Performs the appropriate archaeological investigations as regulated by legislation in areas of archeological potential.

Protects health and safety

Minimize the potential risk to public health and safety, particularly on downstream users (including for recreation and tourism). Minimize the potential risk to operator and maintenance staff's health and safety.

3.3 TECHNICAL

Within the Technical criteria, the alternatives are evaluated using the following criteria:

Provides reliable service

Prioritize security, reliability and robustness. Lesser likelihood of process upset or mechanical breakdown.

Meets existing and future needs

Meets the long-term capacity requirements to service the projected population growth in the sanitary catchment area.

Provide appropriate site access and egress for operations and maintenance per current standards and best practices.

Provide operational redundancy to allow for maintenance and cleaning of equipment and infrastructure. Minimize increases in operational and/or maintenance complexity of the station.

Aligns with existing and planned infrastructure

Optimize existing infrastructure investment including structures, tanks, and equipment.

Align with planned infrastructure projects including recommendations of the Region's 2018 Wastewater Treatment Master Plan Update, the Foundry Street sanitary Sewer Study (2010), the Baden-New Hamburg Water and Wastewater Master Plan (2011), and the Morningside Sewage Pump Station Capacity Assessment (2017).

Aligns with existing and future land use

Evaluate need to acquire land, easements or other access permissions for new pumping station or expansion of pumping station and forcemain.

Aligns with approval and permitting process

Minimize the complexity and time spent to obtain approvals from various regulatory agencies.

Manages and minimizes construction risks

Minimize complexity of construction and maximize ability to maintain adequate sewage pumping services during construction.

Ability to adapt to climate change

Promote resiliency to extreme weather events.

Prioritize climate change adaptation to minimize risk associated with variation in climate parameters (temperature, precipitation, wind gusts, or other) and natural hazards (flooding, high river levels, or other).

Prioritize the surrounding area's ability to be resilient and maintain its adaptive capacity to climate change.

3.4 FINANCIAL

Within the Financial criteria, the alternatives are evaluated using the following criteria:

Provides low lifecycle costs

Minimize capital, operation and maintenance (life cycle) costs over a 50-year period.

4 EVALUATION

Sub-options 3i and 3ii have been evaluated based on their performance against the natural, social, technical and financial criteria that were identified above. The legend for evaluation scoring is identified in **Error! Reference source not found.** for reference. A summary of the evaluation is identified in **Error! Reference source not found.**. It is noted that each of the criteria categories have been weighted equally in the selection of the preferred alternative.

Table 4-1: Evaluation Scoring Legend

Graphic	Rating	Description
	5	Very well aligned with criteria
	4	Well aligned with criteria
	3	Somewhat aligned with criteria
	2	Not well aligned with criteria
	1	Low alignment with criteria

Reference: **Baden – New Hamburg Water and Wastewater System Servicing Review – Foxboro Community Servicing**

Table 4-2: Baden – Foxboro Community Servicing - Summary of Evaluation

Evaluation Criteria	Sub-Option 3i	Sub-Option 3ii
Environmental		
Social		
Technical		
Financial		
Overall Score		Preferred Alternative 

In the evaluation of the two sub-options, both ranked he same under the for Environmental criteria as there was essentially no differentiation between the alternatives as both were considered to have the same impacts. Sub-option 3i ranked poorly on the Social criteria, largely from the input that was provided by the Foxboro Residents. The community clearly indicated that construction on Golf Links Drive proposed by sub-option 3i would have a negative on the community. The impacts of construction would impact their ability to access sidewalks and walking trails during construction. While these impacts could be mitigated through the employment of trenchless methods for construction, there would still be an impact on the community. The option of placing the forcemain along the open space block was favoured by the Foxboro Residents because it represented a lesser disruption to the community. There may still be impacts due to noise and dust as construction will still occur adjacent to existing homes, however, that impact is limited only to the homes on the east side of Golf Links Drive and not to the community as a whole. Under the financial criteria, there was no difference in lifecycle costs between the two sub-options, however there would be a small cost savings in the initial capital cost associated with a reduction in restoration costs. Sub-option 3i would involve more extensive restoration of Golf Links Drive while sub-option 3ii would involve only restoration of a pathway. Sub-option 3i had some impediment to overall pipe laying production due to the fact that the forcemain construction would need to cross individual lot private drain connections, however, sub-option 3ii may have a similar impediment as the working space is confined and may involve the removal of an existing forcemain. At a preliminary level, it is our opinion that these production factors are likely equivalent.

In the final evaluation, this memo advances sub-option 3ii (placement of the forcemain along the open space block east of Golf Links Drive) as the preliminary preferred alternative based on the scoring noted.

5 OTHER ALTERNATIVES

Through the course of the evaluation of the above noted sub-options, a further review was undertaken of the existing conveyance system within the Foxboro Community through the existing as-built drawings. That network consists of a gravity sanitary sewer system which conveys flows to the existing sanitary treatment facilities on site. There are two of these facilities located at the north and south ends of the site. Treated flow from these facilities are pumped into a network of forcemains within the community which then discharge to several sets of weeping beds which are located in the open space blocks within the community.

The potential exists that portions of the existing forcemains could be repurposed and used as the forcemain conveyance noted in the sub-options evaluated in this memo. A preliminary review indicates that the diameter of the existing forcemains would be appropriate for the purpose of the new servicing scheme and the routing is generally complimentary to the routing of the new forcemain. Some extension of the existing forcemains may be necessary as well as some interconnection of the existing system. More in-depth investigation would be appropriate to review the existing pipe material to determine if it is appropriate for the revised servicing option. As the existing forcemains are in the range of 30 years old, we also advise the Region to review pipe condition. At a minimum, a pressure test should be undertaken to ensure that the existing forcemain network is capable of withstanding pressures above the maximum operating range of the proposed system. This memo recommends this option be investigated further at the preliminary design stage.

The option of using the existing forcemain system should be a considered as a viable preferred alternative under the Environmental Assessment as it would rank highly on the evaluation criteria. The final documentation in the Project File Report should reflect this as a viable alternative that can be advanced should the preliminary review reveal it as viable.

6 NEXT STEPS

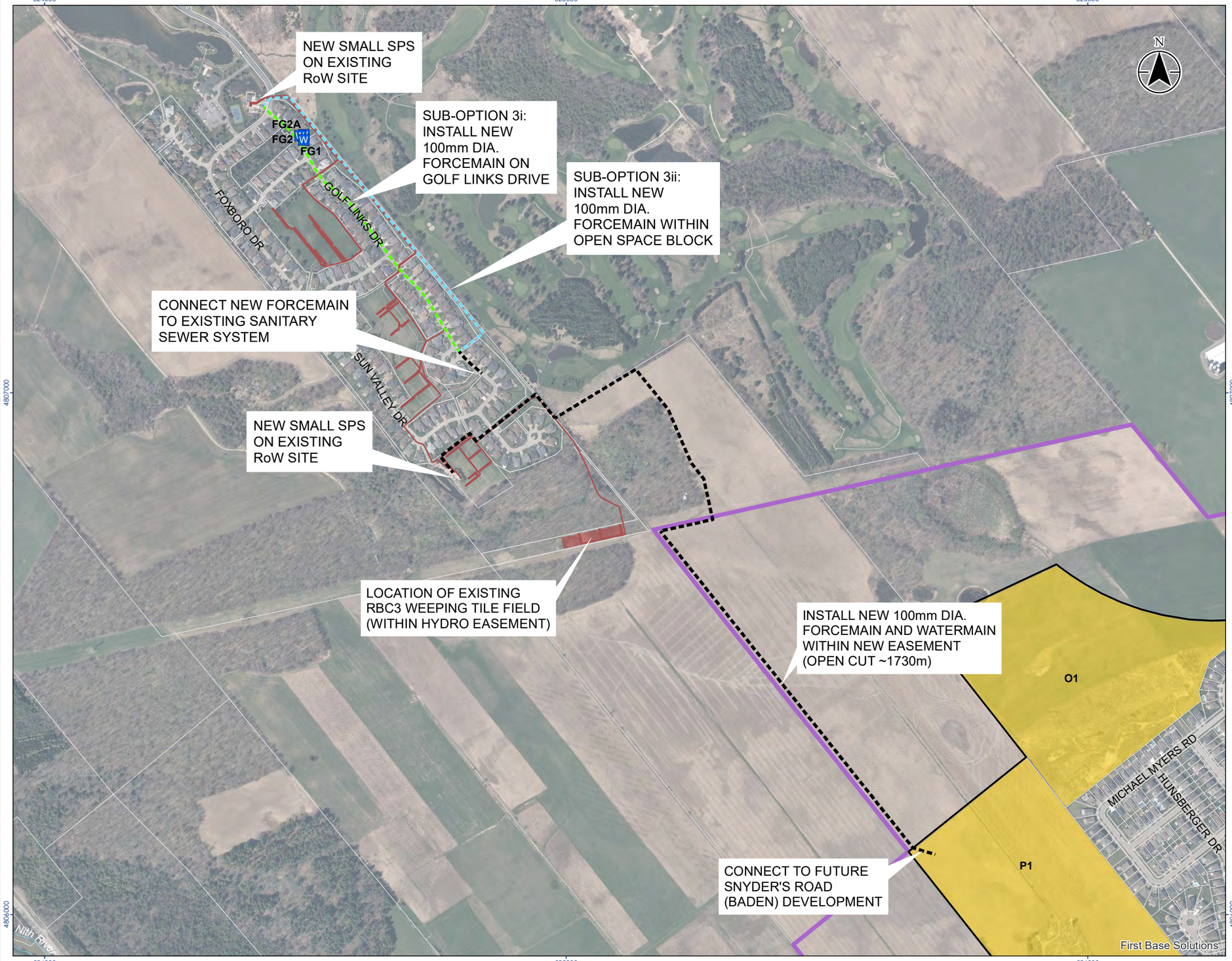
In order to finalize this matter, this memo should be shared with the Foxboro residents to identify if the proposed solution addresses their concerns and/or if there are remaining concerns. The Project File Report can then address the revision to the preferred alternative for the Foxboro servicing and this memo will be included as an Appendix to this report. As noted above, we recommend further investigation work be completed at the preliminary design stage to evaluate the potential use of the existing forcemain network.

Stantec Consulting Ltd.

Jeff Paul P.Eng.
Managing Senior Principal, Water

Phone: 519 319 5806
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Attachment



Stantec

Legend

- W Municipal Well

Preferred Sanitary Alternative

- Preferrred Alternative (Alternative 3)
- Sub-Option 3i
- Sub-Option 3ii
- Ex. Sanitary System
- Ex. RBC3 Weeping Tile Field
- Development Block
- Urban Area Boundary
- Countryside Line

0 100 200 m
1:7,500 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017.
3. Orthoimagery from Region of Waterloo web map service. Imagery Date, 2018.

Project Location
Wilmot Township

165640324 REVA
Prepared by KDB on 2022-10-21

Client/Project
REGION OF WATERLOO
BADEN – NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
1

DRAFT

Title
Foxboro Water and Wastewater Servicing
F3 Preferred Alternative

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

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June 23, 2022

To: Chair Redman, Mayor Armstrong, et. al.,
From: Waterloo Standard Condominium Corporation #365
Re: Baden and New Hamburg Water and Wastewater System Servicing Review

"Our Perspective"

A) For the past couple of years there have been rumours that development would occur, maybe, sometime in the future, on the lands north of Baden and south of the private lands of Foxboro Green.

The rumours included the potential that connections for potable water and waste water might be considered between Foxboro Green (Waterloo Standard Condominium Corporation #365) and Baden. Rumours only.

There has been no formal communication between the Region of Waterloo, the Township of Wilmot, nor Stantec Consulting, and Foxboro Green Corporation #365.

It was a surprise to learn within the past week, that "Notice of Virtual Public Consultation Centre #3 – Baden and New Hamburg Water and Wastewater System Servicing Review" included Foxboro Green in its scope, ***and*** that the deadline for input was July 7, 2022 – about 14 business days from when the Foxboro Green Board became aware of this situation. Subsequent research indicates that, "This Notice was first issued on May 26, 2021."

There is extreme concern among Foxboro Green Corporation Board members and residents about this "consultation" process. It is our position that this process has been faulty by not *formally* notifying the Foxboro Green Board prior to the commencement of the consultation process. The onus for formal notification of affected parties rests with the Region and Township, and an obscure posting on a website is deemed by 'the Corporation' to be insufficient and inappropriate.

B) It is the position of the Foxboro Green Corporation Board that the lands, this project anticipates including, are **PRIVATE PROPERTY**.

The YouTube video, June 7, 2022, includes a slide with the sentence, "Forcemain location would require agreements with property owners and stakeholders." This appears to be an acknowledgement that negotiations would have to occur at some time in the process if the project was to progress.

A reasonable person would ask the question, "*If negotiations with property owners and stakeholders was a condition for the project's implementation, why was there no formal communication and preliminary discussions about probable negotiations with property owners and stakeholders at the earliest days of this project's conception, and how is this consultation process going to be amended?*" Foxboro Green residents are reasonable people.

Toward that end, the Foxboro Green Condominium Corporation #365 has suggestions, and many questions that need to be answered before movement may occur toward: 1) formal approval, 2) design and 3) tenders for construction.

C) The Foxboro Green Corporation Board and residents recognize that this project is a proposal to change the "**intent**" (Water System) by one of the parties to an existing Agreement and thus any existing Agreement(s) must

be either renegotiated or terminated. We are not presently opposed, *in principle*, to the proposed *changed intent* of this project and anticipate opening negotiations toward an amended Agreement.

Action Item #1

That the arbitrary consultation deadline of July 7, 2022 be postponed until after complete consultation has occurred with the Board and residents of Foxboro Green Condominium Corporation #365.

Action Item #2

That representatives (political and professional staff) of Waterloo Region, Township of Wilmot, and Stantec Consulting need to conduct a forum(s) with residents, prior to July 7, 2022, that provides a detailed overview of the Foxboro Green portion of this project and which includes detailed answers to the questions below.

Action Item #3

Because the Region "cannot preserve its intent" to retain the communal septic system including the tile fields, the Board and its counsel anticipate negotiations toward an amended Agreement.

Questions with Rationale

1) It is our understanding that the Strategic Plans for both the Region of Waterloo and the Township of Wilmot, for the implementation time period of this project, are still "under review" and have not been legally finalized. Therefore:
   a) Is it possible that the 'Urban Area Boundary' may change with implications for Foxboro Green?
   b) Is it possible that the criteria for buildings' heights, population density, etc. may change with implications for Foxboro Green?
   c) Is it possible that Regional and Municipal regulations could provide for potential development of the Foxwood Golf Course properties and / or property within Foxboro Green?
   d) What is the realistic, anticipated timeline when construction may occur to potentially implement this project?

e) What are the contingency plans for addressing disruptions within Foxboro Green for traffic flow of residents, emergency services for life and fire, etc.?

2) The preferred "Alternative F3 – connect Foxboro to Future Expand Baden Service Area using a ***Direct Route***".
   Therefore:
   a) Given that Jeff Paul requested permission to access Foxboro Green private property to investigate the area consisting of wooded and wet lands between the Hydro easement and private residences, does a "direct route" include potentially installing a potable and / or waste water line "**directly**" north through this land, rather than the circuitous route around the wetlands as outlined on the maps?
   b) What are the results of the archaeological assessment report conducted on the lands in this area of private property?
   c) What are the results of the environmental assessment report conducted on the private lands in this area, including the potential for protected species such as turtles, etc. in this area of private property?

3) The proposed sketch map diagram of a forcemain line runs along Golf Links Drive.
   Therefore:
   a) Why was a "direct route" along the pathway between the golf course and the rear of the homes along Golf Links Drive <u>not proposed</u> as a 'preferred' route?

4) There are presently two (2) locations where waste water is processed – north and south. The sketch map includes a dotted line which indicates the route of a "INSTALL NEW 100 mm DIA. FORCEMAIN (OPEN CUT 670m)" from the height of land at the south end of Golf Links Drive and the (north) "NEW SMALL SPS ON EXISTING RoW SITE". It also includes a second, separate, dotted line which indicates the preferred direct route from an existing RoW site in Foxboro (south) to Baden.
   Therefore:
   a) Why are these waste water lines not connected?
   b) Will there be a potential need for "agreements" between the Region and home owners or the 'Corporation' regarding potential easements across private property?
   c) By what route does waste water from the proposed new SMALL SPS get out of Foxboro Green and on its way south to Baden? (see a)

d) If there is to be a "new" SPS installed at the north end, what happens to the existing facilities: i) are any structures removed, renovated for repurposing, ii) how do these changes conform to the ambiance of the existing Foxboro Green site?
e) Will there be any changes to how waste water is directed, collected, processed, pumped away that will affect present infrastructure for existing home owners and the recreation facility?
f) In the past, the Region made inquiries about 'unusual' readings for sulphur content in waste water. Do these readings have any consequences for the integrity of the concrete and materials of the processing facilities that implies new construction or renovations?

5) The sketch map includes a dotted line which indicates the route of a "INSTALL NEW 100 mm DIA. FORCEMAIN (OPEN CUT 670m)" from the height of land at the south end of Golf Links Drive and the "NEW SMALL SPS ON EXISTING RoW SITE".
Therefore:
a) It may be assumed that the existing roadway would be "destroyed". Who is responsible for restoring the existing buried services, entire roadway and accompanying private home owners' landscaping affected?

6) The sketch map includes red lines indicating the routes of the existing sanitary system. It may be reasonably expected that these existing dispersal lines and weeping tile beds will no longer be needed if waste water is pumped out to Baden for processing.
Therefore:
a) What happens to these 'redundant' buried lines? i) Will they be left in the ground to deteriorate or be removed? ii) If either left or removed, who is responsible for their future maintenance (changes in level of land for example)?
b) The Foxboro Corporation #365 contracted with the Region to maintain and service waste water systems from the north and south processing plants through the distribution and weeping tile beds as part of our tax assessment. The Corporation has had responsibility for the maintenance of the surface of all these lands, including the contracted portion overlaying the tile fields themselves. At what date, prior to design, contracting and construction is the region prepared to negotiate ownership of these lands to the corporation?

7) The project proposes that potable water will be distributed into Foxboro Green via a line from Baden.
Therefore:
   a) What will be the route of the new watermain into and through Foxboro Green?
   b) Presently Foxboro Green residents have been notified that there are "elevated" levels of salts in our potable water. Will the new line change the 'quality' of the water and its contents, and if so, how?
   c) What will happen to the existing wells on Foxboro site? If they are not to be used then all aquifer and water rights revert back to the Condominium Association. At what date, prior to design, contracting and construction is the region prepared to negotiate water rights to the corporation?
   d) What will happen to the existing water treatment facilities?
   e) In what way will the aquifer beneath Foxboro Green be used or drawn upon by the Region?
   f) Presently, the Region uses an efficient 'single billing system' which charges Foxboro Green Corporation on one bill for all our water use. Will the Region use a similar 'single billing system' or change to an 'individual user billing system'?
   g) i) If an individual user billing system is used for potable water, will the installation of water metres be required in each home and the recreation centre? ii) If yes, then which party bears the cost of those installations?

8) The existing internal system for collection of waste water and distribution of potable water is buried under existing roads which are "common ground" – the Corporation's private property.
Therefore:
   a) Will the Region be assuming responsibility for all existing potable water and waste water lines up to property lines?
   b) Which party bears the costs for connections of existing sewer / waste water lines that are proposed?
   c) Will there be fire hydrants installed through Foxboro Green?

9) "Forcemain location would require agreements with property owners and stakeholders."
Therefore:
   a) Which specific lot # or addresses of private home owners would be affected by potential "agreements"?

b) Where else might there be a need for "agreements" with 'stakeholders' in Foxboro Green?
c) If "agreements" can not be amicably negotiated with private property owners, is it the Region's process to: i) amend the project in its planning stage (NOW) to accommodate owners, ii) use expropriation or eminent domain - implying the need for the Foxboro Green Board to notify its residents of the potential need to hire lawyers individually or as a group, or as a Corporation?

Summary

1) The elected Board of Waterloo Standard Condominium Corporation #365 (Foxboro Green) has a duty to ensure that all its residents are fully knowledgeable of critical events affecting the private property of the home owners and the commonly held assets. Residents have made significant financial and emotional investments in choosing the ambiance and amenities of the Foxboro Green community. Foxboro Green is "unique" and it is our intent to maintain that.

   As indicated above, the Region of Waterloo, the Township of Wilmot and Stantec Consultants have prevented the Board from providing timely opportunities to gather information, ask questions, discuss and propose alternatives regarding this project due to their failure to 'formally notify'.

   Therefore, we hold that it is the responsibility of the Regional Chair, Karen Redman and the Township Mayor, Les Armstrong and their Councils, to direct their professional staffs to: i) impose a temporary "hold" on the consultation timelines and deadlines for this project, ii) arrange mutually agreeable places and times for "forums" to inform, consult, and respond to ALL the questions listed above as well as any other questions / concerns that may arise from 'the floor' by residents at those meetings, iii) to initiate negotiations toward agreement between the parties.

   Please refer to **Action Items #1, 2 and 3** above.

Please respond at your earliest, timely convenience. Our contact persons will include:

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Sincerely,

Don Schafer, President

Cathy Grant, 1st Vice-President

Cliff Robinson, 2nd Vice-President

Ben Cornell, Treasurer

In Norway
Jim Henderson, Board Member

Sandy Isaac, Board Member

Elizabeth King, Board Member

Richard Toogood, Services & Equip't

Keith Lyon, Ponds

Simone Beaucage, Rec'n Centre

Wayne Yantz, Potable/Waste Water

Barry Wolfe, Potable/Waste Water

Chris Wright, Grounds

Jim Cooke, Past-Treasurer

Cc: Adriana Ravar, Property Manager

Cc: Michelle Kelley, Legal Counsel

Appendix G
Natural Heritage Memo

Stantec

Memo

To:	Paula Hohner	From:	Jordan Brooks Laura Marshall
	Stantec, London Office		Stantec, Waterloo Office
File:	165640324	Date:	July 12, 2022

Reference: Natural Heritage Assessment for the New Hamburg Water and Wastewater System Servicing Municipal Class Environmental Assessment

1 INTRODUCTION

The Region of Waterloo (Region) has retained Stantec Consulting Ltd. (Stantec) and C3 Water Inc. (C3W) to complete a System Servicing Review for the New Hamburg Water and Wastewater System. The purpose of this Servicing Review is to evaluate the status of existing water and wastewater servicing systems in Baden – New Hamburg, provide recommendations to address existing servicing constraints, and to provide the framework to meet the water / wastewater servicing needs for the Region to 2041.

A natural heritage background review was completed for the Servicing Review Study Area in November, 2020 (Stantec 2020). Subsequent to the completion of the background review, preferred alternative solutions were developed for each of three individual projects (i.e., Baden – New Hamburg Water Servicing, Baden – New Hamburg Wastewater Servicing, and Foxboro Green Water and Wastewater Servicing) (**Figure 1, Attachment A**). This memo provides an update to the background data review for the Servicing Review Study Area and the results of a one-day field investigation conducted to identify sensitive terrestrial and aquatic natural heritage features within approximately 120 m of the preferred alternative for each of the three projects, which are referred to as the "project Study Areas" (**Figure 1, Attachment A**).

2 METHODS

2.1 BACKGROUND REVIEW

Stantec completed a background review of natural heritage features and species, including designated natural areas, fish communities and fish habitat, and records of Species at Risk (SAR) and Species of Conservation Concern (SOCC). The following information sources were access for information about natural features:

- Land Information Ontario (LIO) database (NDMNRF 2022a)
- Grand River Conservation Authority's (GRCA) GRIN mapping tool (GRCA 2022)
- Township of Wilmot Official Plan (Township of Wilmot 2019)

Data was compiled in a GIS database to support mapping and data query requirements of the natural heritage assessment.

For this assessment, SAR are defined as species that are listed as Endangered or Threatened on the Species at Risk in Ontario List. SOCC are defined as species that are classified as Special Concern provincially or federally or ranked as S1-S3 in the Ministry of Northern Development, Mines, Natural Resources and Forestry's (NDMNRF) Natural Heritage Information Centre (NHIC) database. The following sources were consulted for recent (1990-present) records of SAR and SOCC in the Servicing Review Study Area:

- Natural Heritage Information Centre (NHIC) Biodiversity Explorer database (NDMNRF 2022b)
- Atlas of the Mammals of Ontario (Dobbyn 1994)
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2019)
- Ontario Breeding Bird Atlas (Cadman et al. 2007)
- eBird Online Database (eBird 2022)
- iNaturalist Database (iNaturalist 2022)
- Fisheries and Oceans Canada (DFO) – Aquatic Species at Risk Map (DFO 2022)
- Species at Risk Public Registry (Environment and Climate Change Canada 2022)
- Species at Risk in Ontario List (MECP 2022)

Many of these resources do not note the exact locations of a species occurrence; for example, NHIC records are reported within 1 square kilometre (km²) grid squares, while atlases records are generally reported within 10 km² grid squares. As such, these records are used as an indicator of potential occurrence in the Servicing Review Study Area.

2.2 FIELD INVESTIGATIONS

A single visit was completed on June 9, 2022 to describe the characteristics of the natural environment and verify the presence of suitable SAR and SOCC habitat and aquatic habitat potentially affected by the preferred alternative for each of the following individual projects:

- Baden – New Hamburg Water Servicing
- Baden – New Hamburg Wastewater Servicing
- Foxboro Green Water and Wastewater Servicing

For the field investigations, a 120 m Study Area was delineated around the preferred alternative for each of the three projects (i.e., the project Study Areas). Site access was granted at the New Hamburg Waste Water Treatment Plant and the Foxboro Condominium Community, otherwise surveys were conducted within the right-of-way of existing roadways.

The field investigation on June 9 confirmed the present of woodlands and wetlands documented in the background review and identified other features such as grasslands (e.g., hay fields, pastures and fallow fields) that may provide wildlife habitat. The field investigation did not include a comprehensive vegetation community assessment using Ecological Land Classification (ELC) and as such, individual communities are not described. Observations of SAR and SOCC were recorded if encountered. Terrestrial habitats were also assessed for their suitability to support wildlife SAR identified in the background review, and habitat features such as potential snag trees or hibernation sites were recorded if encountered.

Aquatic habitat assessments were completed at the Nith River and Baden Creek, and mapped tributaries potentially affected by the preferred alternatives were assessed for their suitability to support fish and fish habitat. The assessments included descriptions of the morphological characteristics of the watercourses (i.e., widths, depths, substrates), in-situ water quality, and available fish habitat.

Aquatic habitat assessments were completed at the Nith River, Baden Creek, and mapped tributaries potentially affected by the preferred alternatives. The assessments were completed to determine the suitability to support fish and fish habitat and included descriptions of the morphological characteristics of the watercourses (i.e., widths, depths, substrates, cover) and in-situ water quality.

3 RESULTS

3.1 BACKGROUND DATA

3.1.1 Physical Environment

The Servicing Review Study Area is in Ecoregion 6E (Lake Simcoe-Rideau Ecoregion), and more specifically the Ecodistrict of 6E-1 (Stratford). This Ecodistrict consists of smooth clay areas and gently rolling till moraines, known as the Stratford Till Plain and the Oxford Till Plain. The land use in this Ecodistrict is predominately agriculture with cropland constituting a large portion of the land cover (44%). Other land uses include gravel pits, quarries, and settlement areas. Sixteen percent (16%) of the Ecodistrict remains as natural cover and includes forests and wetlands (Henson and Brodribb 2005).

3.1.2 Vegetation

The Servicing Review Study Area is within the Niagara section of the Deciduous Forest Region (Rowe 1972). This section covers the Ontario peninsula which is enclosed by lakes Ontario, Erie, and Huron. Forest communities are dominated by broadleaved trees that are common to both the Great Lakes-St. Lawrence and Deciduous Forest Regions. They consist of beech and sugar maple, together with basswood, red maple, red oak, white oak, and bur oak.

3.1.3 Designated Natural Heritage Features

The following NDMNRF designated natural features and environmental planning designations are located within the Servicing Review Study Area, some of which are located in or adjacent to the project Study Areas (**Figure 2, Attachment A**):

- GRCA Regulation Limit (Ontario Regulation 150/06) and floodplain of the Nith River, Baden Creek and associated tributaries

- GRCA regulated features (Ontario Regulation 150/06), including the Nith River, Baden Creek and associated tributaries, floodplain and wetlands
- The New Hamburg Oxbow Wetland Provincially Significant Wetland (PSW) Complex
- St. Agatha Beech Maple Forest and Phillipsburg Forest Life Science Areas of Natural and Scientific Interest (ANSI)
- Deer wintering area identified in the Phillipsburg Forest ANSI/Phillipsburg Wetland Complex
- Environmentally constrained Lands associated with the Nith River Corridor (Map 4.2 of the Township of Wilmot Official Plan)
- Environmentally constrained Lands associated with Baden Creek and its tributaries, and the Baden Wetland Complex (Map 4.1 of the Township of Wilmot Official Plan)
- Non-provincially significant wetlands associated with the Baden East and Baden Southwest Wetland Complex and the Silver Spring Creek Hunsburger Creek Wetland Complex
- Non-provincially significant wetlands associated with the Philipsburg Wetland Complex

3.1.4 Fish and Fish Habitat

The Servicing Review Study Area is located in the Grand River watershed and the following sub-watersheds that include tributaries with a range of flow regimes and thermal regimes, and constructed drains:

- Baden Creek
- Nith River
- Silver Springs Creek

Based on available background data (NDMNRF 2022a; GRCA 2022) most of the watercourses in the Servicing Review Study Area have a warmwater thermal regime. One exception is Silver Springs Creek in the southeast segment of the Servicing Review Study Area, which has a coldwater thermal regime (NDMNRF 2022a; GRCA 2022). Silver Springs Creek is not in or adjacent to the project Study Areas.

There are records of 22 fish species from the Nith River (NDMNRF 2022a). The species identified in the NDMNRF data are common and widespread in southern Ontario and classified as Not at Risk (NAR). There are records of aquatic species at risk in the Servicing Review Study Area (DFO 2022; NDMNRF 2022b), which are discussed below.

3.1.5 Significant Species (SAR and SOCC)

A review of the background information identified ten terrestrial SAR and eleven SOCC with records that overlap with the Servicing Review Study Area (**Table 1**). An assessment of suitable habitat for terrestrial SAR and SOCC is detailed in **Attachments B-1 and B-2**.

Table 1: Background Review of Terrestrial SAR and SOCC in the Servicing Review Study Area

Common Name	Latin Name	Provincial S-rank[1]	SARO[2] Status	SARA[3] Schedule 1 Status	Source
SAR					
Butternut	*Juglans cinerea*	S3?	END	END	MECP 2022
Bank Swallow	*Riparia riparia*	S4B	THR	THR	NDMNRF 2022b Cadman et al 2007
Barn Swallow	*Hirundo rustica*	S4B	THR	THR	Cadman et al 2007 eBird 2022 iNaturalist 2022
Bobolink	*Dolichonyx oryzivorous*	S4B	THR	THR	NDMNRF 2022b Cadman et al 2007 eBird 2022
Chimney Swift	*Chaetura pelagica*	S4B, S4N	THR	THR	eBird 2022
Eastern Meadowlark	*Sturnella magna*	S4B	THR	THR	NDMNRF 2022b Cadman et al 2007
Red-headed Woodpecker	*Melanerpes erythrocephalus*	S3	END	END	Cadman et al 2007 iNaturalist 2022
Eastern Small-footed Myotis	*Myotis leibii*	S2S3	END	-	Dobbyn 1994 MECP 2022
Little Brown Myotis	*Myotis lucifugus*	S3	END	END	Dobbyn 1994 MECP 2022
Tricolored Bat	*Perimyotis subflavus*	S3?	END	END	Dobbyn 1994 MECP 2022
SOCC					
Green Dragon	*Arisaema dracontium*	S3	SC	SC	NDMNRF 2022b
Western Chorus Frog (Great Lakes – St. Lawrence pop.)	*Pseudacris triseriata*	S3	NAR	THR	Ontario Nature 2019
Snapping Turtle	*Chelydra serpentina*	S3	SC	SC	NDMNRF 2022b Ontario Nature 2019 iNaturalist 2022

Common Name	Latin Name	Provincial S-rank[1]	SARO[2] Status	SARA[3] Schedule 1 Status	Source
Midland Painted Turtle	*Chrysemys picta marginata*	S4	-	SC	iNaturalist 2022
Eastern Milksnake	*Lampropeltis triangulum*	S3	NAR	SC	Ontario Nature 2019 iNaturalist 2022
Caspian Tern	*Hydroprogne caspia*	S3B	NAR	NAR	eBird 2022
Common Nighthawk	*Chordeiles minor*	S4B	SC	THR	Cadman et al 2007
Eastern Wood-pewee	*Contopus virens*	S4B	SC	SC	NDMNRF 2022b Cadman et al 2007
Peregrine Falcon	*Falco peregrinus*	S3B	SC	SC	iNaturalist 2022
Wood Thrush	*Hylocichla mustelina*	S4B	SC	THR	Cadman et al 2007
Monarch	*Danaus plexippus*	S4B, S2N	SC	SC	iNaturalist 2022

[1] Subnational Rank (S-rank): conservation status of a species or community within a province (NatureServe 2022).
[2] Species at Risk in Ontario
[3] *Species at Risk Act*

A review of the background databases identified two aquatic SAR and two SOCC (**Table 2**) in the Servicing Review Study Area. An assessment of suitable habitat for aquatic SAR and SOCC is detailed in **Attachments B-1 and B-2**.

Table 2: Records of Aquatic SAR and SOCC in the Servicing Review Study Area

Common Name	Scientific Name	Provincial S-rank	SARO Status	SARA Schedule 1	Source
SAR					
Black Redhorse	*Moxostoma duquesni*	S2	THR	THR	DFO 2022
Silver Shiner	*Notropis photogenis*	S2/S3	THR	THR	DFO 2022 NDMNRF 2022b
SOCC					
Northern Sunfish (Great Lakes – Upper St. Lawrence pop.)	*Lepomis peltastes*	S3	SC	SC	DFO 2022
Rainbow Mussel	*Villosa iris*	S2/S3	SC	SC	DFO 2022 NDMNRF 2022b

3.2 FIELD INVESTIGATIONS

3.2.1 Terrestrial Habitat

Vegetation Communities

The scope of the single field visit on June 9 did not include a comprehensive vegetation community assessment using Ecological Land Classification (ELC) and as such, individual communities are not described. A general description of the communities present within the project Study Areas is provided below. Treed communities and wetlands generally corresponded with the Wooded Areas and Wetlands shown on **Figure 2 (Attachment A)**.

- Deciduous forest communities composed of maple, beech and oak species
- Mixed forest communities composed of cedar, tamarack and aspen species
- Deciduous hedgerow communities comprised of buckthorn species and Manitoba maple
- Deciduous thicket communities composed of willow and buckthorn species
- Meadow communities composed of graminoid and forb species
- Agriculture communities including annual row crop and fallow field
- Residential and commercial communities

Habitat Assessment

The purpose of the terrestrial habitat assessment was to identify natural and anthropogenic vegetation and wildlife habitat features potentially affected by the three projects and evaluate their significance. The work included identification of suitable habitat for potential SAR and candidate Significant Wildlife Habitat (SWH) features including habitat for SOCC.

Species at Risk

The habitat assessment determined that suitable habitat is present or potentially present in project Study Areas for the following SAR:

- Plants: Butternut
- Fish: Silver Shiner and Black Redhorse
- Birds: Barn Swallow, Bobolink, Chimney Swift, Eastern Meadowlark and Red-Headed Woodpecker
- Mammals: Small-footed Myotis, Little Brown Myotis and Tri-colored Bat

Barn Swallow was the only SAR observed during June 9, 2022 field investigations. It was observed within the 120 m field investigation Study Area for the Baden-New Hamburg Water Servicing project; however, nests were not observed. The SAR habitat assessment is provided in **Attachment B-1**.

Significant Wildlife Habitat

Wildlife habitat is defined as an area where plants, animals and other organisms live, including areas where species concentrate at a vulnerable point in their life cycle, and areas that are important to migratory and non-migratory species (MNR 2000). SWH is grouped into four categories according to the Significant Wildlife Technical Guide (MNR 2000) and the Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF 2015) in the following categories:

1. Seasonal concentration areas
2. Animal movement corridors
3. Rare vegetation communities or specialized habitats
4. Habitats of species of conservation concern

Candidate SWH identified in the three Study Areas during the June 9, 2022 field investigation is provided in **Table 3** and illustrated in **Figure 3 to Figure 5 (Attachment A)**.

Table 3: Significant Wildlife Habitat Assessment

Habitat Type (MNRF 2015)	Habitat Description	Assessment of Candidate SWH
Seasonal Concentration Areas		
Deer Wintering congregation areas and deer yards	Deer yards are mapped by MNRF	Significant habitat for deer wintering areas is present in the Phillipsburg Forest ANSI (NDMNRF 2022a). The Foxboro Green Water and Wastewater Servicing project is in close proximity to this ANSI; however, the deer wintering area does not intersect with the project Study Areas.
Colonially-nesting bird breeding habitat (bank and cliff)	Eroding banks, sandy hills, steep slopes, rock faces or piles. Cliff faces. Does not include disturbed soil areas such as berms, embankments, oil or aggregate stockpiles	Cliff Swallow nesting activity was confirmed on the bridge where Holland Mills Road intersects the Nith River (south of Bleams Road East) in the Baden-New Hamburg Wastewater Servicing Study Area. Approximately 20 active nests were observed on either side of the bridge (approximately 40 active nests in total). However, bridges are not considered candidate SWH. A Barn Swallow Kiosk is present within the Baden-New Hamburg

Habitat Type (MNRF 2015)	Habitat Description	Assessment of Candidate SWH
		Wastewater Servicing Study Area just west of the Holland Mills Road bridge over the Nith RIver; however, the kiosk was inactive at the time of Stantec's June 9, 2022 field investigation. Barn Swallows were observed at multiple locations in the Servicing Review Study Area during field investigations, but active nesting was not confirmed.
Colonially – nesting bird breeding habitat (trees/shrubs)	Dead trees in large marshes and lakes, flooded timber, and shrubs, with nests of Great Blue Heron, Great Egret, Green Heron, or Black-crowned Night-Heron	Identified during the background review as potentially present; however, suitable habitat was not observed in the project Study Areas.
Bat maternity colonies	Mixed and deciduous forests and swamps with large diameter dead or dying trees with cavities	**Candidate habitat for bat maternity colonies exists within the Wooded Areas in the Baden-New Hamburg Wastewater Servicing Study Area and the Foxboro Green Water and Wastewater Servicing project Study Areas.**
Reptile hibernacula	Rock piles or slopes, stone fences, crumbling foundations	Identified during the background review as potentially present; however, no suitable habitat was observed in the project Study Areas.
Turtle wintering area	Permanent waterbodies and large wetlands with sufficient dissolved oxygen; man-made ponds are not considered SWH.	Identified during the background review as potentially present; however, no suitable habitat was observed in the project Study Areas.
Specialized Habitat for Wildlife		
Bald Eagle and Osprey nesting, foraging and perching habitat	Treed communities adjacent to rivers, lakes, ponds, and other wetlands with stick nests of Bald Eagle or Osprey	Identified during the background review as potentially present; however, no suitable habitat was observed in the project Study Areas.
Turtle nesting areas	Exposed soil, including sand and gravel in open sunny areas in proximity to wetlands	Identified during the background review as potentially present; however, no suitable habitat was observed in the project Study Areas.
Seeps and springs	Any forested area with groundwater at surface within the headwaters of a stream or river system	Identified during the background review as potentially present; however, no suitable habitat was observed in the project Study Areas.

Habitat Type (MNRF 2015)	Habitat Description	Assessment of Candidate SWH
Amphibian breeding habitat (woodland and wetland)	Treed uplands with vernal pools, and wetland ecosites	**Candidate habitat is present within the Baden-New Hamburg Wastewater Servicing Study Area and the Foxboro Green Water and Wastewater Servicing Study Area.**
Habitat for Species of Conservation Concern		
Open country bird breeding habitat	Large grasslands and fields (>30ha) with two or more of the following species; Upland Sandpiper, Grasshopper Sparrow, Vesper Sparrow, Northern Harrier, Savannah Sparrow OR with nesting Short-eared Owls	Grassland habitat (several fallow fields) were identified within the Baden-New Hamburg Wastewater Servicing Study Area. Savannah Sparrow and Vesper Sparrow were identified in these areas during field investigations on June 9, 2022. However, these habitats are less than 30ha in size and do not qualify as candidate SWH.
Special Concern and provincially rare (S1-S3) wildlife	An assessment of habitat for special concern and provincially rare wildlife is included in **Attachment B-2**.	**Suitable habitat for Eastern Wood-pewee, Wood Thrush, Common Nighthawk, Monarch, Midland Painted Turtle, Snapping Turtle, Rainbow Mussel, Northern Sunfish and Green Dragon was identified within the Servicing Review Study Area.** **Eastern Wood-Pewee, Snapping Turtle were observed in the Baden-New Hamburg Wastewater Servicing Study Area on June 9, 2022.**

Based on results from the field investigation, there is candidate SWH for the following wildlife within the project Study Areas:

- **Baden – New Hamburg Water Servicing**
  - None
- **Baden - New Hamburg Wastewater Servicing Study Area**
  - Bat maternity colonies in forest and swamp communities
  - Amphibian breeding habitat in wetlands and vernal pools
  - Habitat for Special Concern and provincially rare species

- **Foxboro Green Water and Wastewater Servicing Study Area**
  - Bat maternity colonies in forest and swamp communities
  - Amphibian breeding habitat in wetlands and vernal pools
  - Habitat for Special Concern and provincially rare species

3.3 FISH AND FISH HABITAT

Descriptions of watercourses in each of the three project Study Areas are provided below. In-situ water quality data from the June 9, 2022 field investigation are summarized in Table 4.

Baden - New Hamburg Water Servicing Study Area

There are no mapped watercourses in the Study Area and no surface water features were identified during the June 2022 field investigations.

Baden - New Hamburg Wastewater Servicing Study Area

The preferred alternative for the Baden-New Hamburg Wastewater Servicing project crosses three mapped watercourses and there are two additional mapped surface water features within the Study Area (**Figure 4, Attachment A**). Within the Study Area, watercourses crossed by the preferred alternative are within the GRCA's regulation limits.

1. Baden Creek

Baden Creek has a permanent flow regime, a warmwater thermal regime, and supports a diverse baitfish community (NDMNRF 2022b). Baden Creek flows south and is a tributary to the Nith River.

At the proposed crossing location, Baden Creek exhibited riffle-pool-run morphology, with a wetted width ranging from 2 m (riffle) to 5 m (pool) and depths ranging from 0.05 m (riffle) to 0.7 m (pool). Baden Creek has an average bankfull width of 4 m and a bankfull depth of 0.5 m. Substrates consisted of sand, cobble, clay, gravel, silt, and boulder. The creek banks were primarily well vegetated, with some small areas vulnerable to erosion, actively eroding, and depositional. Fish cover was abundant and provided by in-stream vegetation (sage pondweed), cobble, undercut banks, woody debris, and overhanging vegetation. Riparian vegetation consisted of grasses, Manitoba maple, shrub willow, and asters. Creek Chub were observed within the watercourse during the June 9, 2022 field investigation. The drainage ditch on the south side of Gingerich Road drains into Baden Creek and exhibited some limited flow during the field visit, however it is unlikely to directly support fish habitat due to physical barriers including a steep gradient at the confluence with Baden Creek.

2. Nith River

The Nith River is a permanent, warm water feature that supports a diverse sport and bait fish community (NDMNRF 2022b). Within the Study Area, the Nith River is mapped critical habitat for the Threatened Silver Shiner (DFO 2022). Additionally, there are records of the Threatened Black Redhorse within the Study Area (DFO 2022).

Within the vicinity of the proposed crossing location, the Nith River exhibits riffle-pool-run morphology. At the time of the field investigation, the wetted width ranged from 20 m (riffle) to 30 m (pool) and water depths ranged from 0.2 m (riffle) to 1.1 m (pool). At the bridge crossing on Holland Mills Road (preferred alternative) the Nith River has a bankfull width of 28 m and a bankfull depth of 1.2 m. Substrates consisted of clay, cobble, boulder, and silt. Banks at the bridge were primarily armored with boulder and cobble, with some areas of active erosion immediately upstream of the bridge and some areas vulnerable to erosion. Cover for fish was provided by boulder, cobble, woody debris, and overhanging vegetation. Riparian vegetation consisted of trees, shrubs, and grasses.

The Nith River supports Silver Shiner and Black Redhorse. Provincially regulated habitat and federally regulated Critical Habitat for Silver Shiner includes the wetted width of the river, riparian habitat within the meander belt of the river, and an additional 30 m of riparian habitat beyond the meander belt (DFO 2020).

3. Tributaries to the Nith River

There is a mapped tributary on the west side of Holland Mills Road, that flows into the Nith River from the north near the proposed location of the Nith River crossing. The unnamed tributary has an intermittent flow regime (NDMNRF 2022a).

The tributary had run morphology with an average wetted width of 1 m and an average depth of 0.1 m. Bankfull width was 2.2 m and bankfull depth was 0.4 m. Substrates consisted of clay, silt, cobble, gravel, and sand. Banks were primarily protected with vegetation, with some areas vulnerable to erosion and a small amount of active erosion near the confluence with the Nith River. Fish cover was abundant and was provided by woody debris, emergent vegetation (grasses), undercut banks, and overhanging vegetation. Riparian vegetation consisted of Manitoba maple and grasses. Although no fish were observed, there were no barriers to fish passage from the Nith River. This tributary is within the Silver Shiner Critical Habitat area of the Nith River.

There is a mapped watercourse located approximately 200 m east of Highway 7 and Nafziger Road that is crossed by the preferred alternative. The mapped tributary is a tiled drainage feature (NDMNRF 2022a) and there is no visible surface water feature. In the absence of a surface water feature, the mapped watercourse does not directly support fish habitat.

4. New Hamburg Wastewater Treatment Plan Outflow

The outlet from the New Hamburg Wastewater Treatment Plant (WWTP) flows into the New Hamburg Oxbow Wetland Complex. The oxbow is mapped as Northern Sunfish habitat (DFO 2022). Northern Sunfish is a Special Concern species.

During the June 9, 2022 field investigation, Common Carp (*Cyprinus carpio*), Fathead Minnow (*Pimephales promelas*), and Creek Chub (*Semotilus atromaculatus*) were observed in the vicinity of the outlet of the WWTP.

Foxboro Green Water and Wastewater Servicing Study Area

There is one mapped intermittent tributary to the Nith River within the Foxboro Green Study Area. The tributary is mapped by DFO as supporting Rainbow Mussel (*Villosa iris*), a Special Concern species. On June 9, 2022 there was no visible channel at the location of the mapped watercourse and the location was

characterized by damp soils and semi-aquatic vegetation (cattail, *Phragmites*). The watercourse would not directly support fish or provide habitat for Rainbow Mussel within the project Study Area.

Within the project Study Area, the mapped tributary is within the GRCA's regulation limit; however, the preferred alternative does not cross the tributary.

Table 4: In-situ Water Quality Data in watercourses crossed by the preferred alternative for the Baden-New Hamburg Wastewater Servicing project; June 9, 2022

Watercourse	Time	Air Temp (°C)	Water Temp (°C)	Dissolved Oxygen (mg/L)	Conductivity (µs/cm)	pH
Baden Creek	13:00	18	18.5	9.7	682	7.88
Nith River	11:10	15	18.6	7.9	619	7.65
WWTP Outlet	10:20	13	16.7	7.2	1986	6.82

4 PROJECT DESCRIPTIONS

The preferred alternative for each project is as follows:

Baden – New Hamburg Water Servicing

Expanded Storage at New Hamburg Water Treatment Plant: This alternative involves increasing the New Hamburg reservoir storage capacity by 3.4 ML, from the current 2.4 ML (1.5 ML usable) to 4.9 ML, to satisfy MECP storage requirements through 2041. This will be achieved by a combination of increasing the usable capacity of the existing reservoir to 2.4 ML and installing an additional 2.5 ML. A pumping station upgrade would be required.

Baden – New Hamburg Wastewater Servicing

Upgrade System and Convey Directly to New Hamburg WWTP: This alternative allows for the conveyance of wastewater flow from the Baden WWPS directly to the New Hamburg WWTP. This alternative includes the following projects:

- Construction/upgrade of the Baden Pumping Station
- Installation of new twin forcemains which would connect the Baden Pumping Station to the New Hamburg WWTP, bypassing Morning WWPS altogether.

Foxboro Green Water and Wastewater Servicing

Provide Connection to Baden Using a Direct Route: Foxboro Green would be connected to the Baden water supply system within corridors across new development and agricultural lands. Foxboro Green would be connected to the Baden sanitary sewer system within corridors across new development and agricultural lands.

5 PRELIMINARY MITIGATION RECOMMENDATIONS

5.1 STANDARD MITIGATION

The following standard mitigation measures and best practices are recommended to reduce potential impacts to natural heritage features during construction:

- Delineate the work areas with tree protection fencing prior to construction to reduce impacts to adjacent natural features.
- Wash, refuel and/or service equipment a minimum of 30 m from drainage features and wetlands to reduce the risk of deleterious substances from entering the features. Check machinery regularly for fluid leaks.
- Develop a clean equipment protocol to prevent the spread of highly invasive species such as Phragmites during construction.
- Develop a Spill Management Plan and have it on site for implementation in the event of an accidental spill. Keep an emergency spill kit on site.
- Maintain erosion and sediment control measures until the restoration measures have been assessed and determined to be secure and stable.
- Stabilize and re-vegetate areas of disturbed/exposed soil, as soon as practicably possible with native seed mixes and woody vegetation.

5.2 EROSION AND SEDIMENT CONTROL

An erosion and sediment control (ESC) plan will be developed and employed during construction to reduce the risk of erosion and the entry of sediment into drainage features and wetlands. Mitigation included in the plan will include the following measures:

- Implement project-specific temporary ESC measures per prior to starting work (e.g., silt fence and/or sediment logs).
- Keep additional ESC materials available on site to provide a contingency supply in the event of an emergency.
- Monitor and maintain erosion and sediment controls, as required. Controls are to be removed only after the soils of the construction area have stabilized and vegetation cover has re-established.
- Stabilize materials requiring stockpiling (fill, topsoil, etc.) and keep a safe distance (> 30 m) from drainage features and wetlands.

5.3 PROTECTION OF FISH

Fish and fish habitat protection measures will be developed during detail design, and will include the following:

- General mitigation measures as listed above
- An erosion and sediment control plan
- Timing restrictions for in-water work, if required
- A fish rescue/relocation plan, if required
- Additional measures as imposed by SAR permits, if required

5.4 PROTECTION OF MIGRATORY BIRDS

The federal *Migratory Birds Convention Act* (MBCA) provides legal protection of migratory birds and their nests in Canada. Construction timing must consider restrictions imposed by the MBCA. To avoid damaging or disturbing bird nests and contravening the MBCA, the timing of any vegetation clearing will occur outside of the primary nesting period (i.e., the period when the percent of total nesting species is greater than 10% based on Environment Canada's Nesting Calendars and the period for which due diligence mitigation measures are generally recommended).

The primary nesting period (PNP) identified for southern Ontario is April 1 - August 31, although nesting also infrequently occurs outside of this period (Environment Canada 2014). Vegetation removal during this core nesting period is not recommended; however, if required, a nest survey may be carried out by a qualified person in simple habitats such as an urban park, a vacant lot with few possible nest sites, a previously cleared area, or a structure (ECCC 2019). If a migratory bird nest is located within the work area at any time, a no-disturbance buffer will be delineated. This buffer will be maintained for the entire duration of the nest activity, which will be determined using periodic checks by the avian biologist. The radius of the buffer generally varies from 5 m - 60 m depending on the sensitivity of the nesting species. Work will not resume within the nest buffer until the nest is confirmed to be no longer active.

The recommended timing restrictions will also protect SAR and SOCC birds; however, there may be species specific timing restrictions that will also be considered. For example, the restricted period for Bobolink and Eastern Meadowlark is specified in regulations issued under the *Endangered Species Act* as May 1 to July 31, although active nests and SAR habitat are protected at any time.

5.5 PROTECTION OF WIDLIFE

The following mitigation measures are recommended to avoid impacts to wildlife during construction:

- To reduce risk of harm to individual bats, removal of suitable bat maternity roost trees (trees greater than 10 cm diameter at breast height) will not occur during the active roosting season (between April 1 and October 1).

- A visual search of the work area will be conducted before work commences each day, particularly for the period when most wildlife is active (generally April 1 to October 31). Visual inspections will locate and avoid snakes, turtles and other ground dwelling wildlife such as small mammals. Visual searches will include inspection of machinery and equipment left in the work area overnight prior to starting equipment.

- If wildlife is encountered, work at that location will stop, and the animal(s) will be permitted reasonable time to leave the work area on their own.

- Contractors will be made aware of the turtle nesting period (May 15 to September 15) and potential for turtle nesting during construction. Sediment fencing will be installed along the limits of the work zone to reduce the potential for turtles to enter the construction area. If possible, installation of sediment fencing will occur before May 15 or after September 15 (i.e., outside of turtle nesting season) to restrict the movement of nesting turtles into the work zone. If installation of fencing occurs during the turtle nesting season, it is recommended that the area be searched for evidence of turtles or nests prior to installation of fencing. Further specifications for reptile exclusion fencing will follow Best Practices Technical Note – Reptile and Amphibian Exclusion Fencing (MNR 2013) and Best Management Practices for Mitigating the Effects of Road Mortality on Amphibian and Reptile Species at Risk in Ontario (MNRF 2016). The exclusion fencing is to be maintained around the work area for the duration of the turtle nesting activity period and checked daily to identify any repairs that may be needed. Fencing will be repaired immediately.

- If a nesting turtle is encountered during construction at any time, the turtle will not be disturbed. Work in the area must stop until the turtle has completed nesting and/or vacated the area. The nest site will be noted and a biologist or other qualified professional will be contacted for direction. Turtle nests are protected under the Fish and Wildlife Conservation Act (FWCA); therefore, and nests will not be disturbed.

- Sediment and erosion control measures, such as fencing or blanket, utilized on the site during construction will avoid products with plastic mesh due to risk of entanglement of snakes or other wildlife.

- Observations of species at risk or species of conservation concern (e.g., snapping turtle or midland painted turtle) will be reported to Ministry of Environment, Conservation and Parks (MECP) and NDMNRF within 48 hours. Species at risk will not be handled, harassed, or moved in any way, unless they are in immediate danger.

6 PERMITTING CONSIDERATIONS

6.1 FISHERIES AND OCEANS CANADA

6.1.1 Fisheries Act

The federal *Fisheries Act* (1985) is the primary legislation governing fish and fish habitat in Canada. The *Fisheries Act* defines fish habitat as "…*waters frequented by fish and any other areas on which fish depend directly or indirectly in order to carry out their life processes including spawning grounds and nursery, rearing, food supply and migration areas*." The fish and fish habitat protection provisions of the *Fisheries Act* apply to all fish and fish habitat in Canada. The Act prohibits activities that result in the death of fish or the harmful alteration, disruption or destruction (HADD) of fish habitat unless authorized by the Minister of Fisheries, Oceans and the Canadian Coast Guard. If it is determined that the death of fish or HADD of fish habitat is unavoidable as part of the project, an authorization under the *Fisheries Act* may be required.

Design plans are necessary to determine the potential for the death of fish or HADD of fish habitat and if DFO review under the *Fisheries Act* is required.

6.1.2 Species at Risk Act

The federal *Species at Risk Act*, 2002 (SARA) protects wildlife species listed as extirpated, endangered, or threatened under Schedule 1 of the Act from harm, harassment, killing or capture or collection. SARA also prohibits the damage or destruction of the residence of listed species, and the destruction of their critical habitat. SARA protections also extend to migratory birds and some SAR on non-federal land and to aquatic SAR. Permits for prohibited activities may be issued under Section 73 of the SARA.

Design plans are necessary to determine if a SAR Permit may be needed for work at the Nith River due to the presence of Black Redhorse and Silver Shiner. In addition to species presence, the Nith River is identified as Critical Habitat for Silver Shiner, which includes the meader belt of the river and an additional 30 m of riparian habitat beyond the meander belt.

6.2 GRAND RIVER CONSERVATION AUTHORITY

6.2.1 Conservation Authorities Act

The Grand River Conservation Authority (GRCA) administers a regulation made under Section 28 of the provincial *Conservation Authorities Act*, known as *Development, Interference with Wetlands and Alterations to Shorelines and Watercourses* (Ontario Regulation 150/06). The GRCA implements the regulation by issuing permits for works in or near watercourses, valleys, wetlands, or shorelines, when required. Regulated areas are associated with drainage features and/or wetlands in the following Study Areas:

- Baden – New Hamburg Wastewater Servicing
- Foxboro Green Water and Wastewater Servicing

Detailed construction plans for the projects must be assessed to identify specific GRCA permitting requirements.

6.3 MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS

6.3.1 Endangered Species Act

The provincial *Endangered Species Act* (ESA) prohibits the killing, harming, harassing, capturing or taking of a living member of a species listed as Threatened, Endangered or Extirpated by the Species at Risk in Ontario (SARO) list (Ontario Regulation 230/08) (Section 9), or the damage to habitat of similarly designated species (Section 10). A permit may be issued under Section 17(2) of the ESA or eligible activities can be registered under Ontario Regulation 242/08 to authorize work that is otherwise prohibited.

Table 5 provides a list of SAR that have the potential to occur within the Baden-New Hamburg Wastewater Servicing Study Area and the Foxboro Green Water and Wastewater Servicing Study Area associated within the alignment of the preferred alternatives.

Table 5: SAR potentially occurring within projects study areas within the project Study Areas*

Species	Baden-New Hamburg Wastewater Servicing Study Area (yes/no)	Foxboro Green Water and Wastewater Servicing Study Area (yes/no)
Barn Swallow	Yes	Yes
Bobolink	Yes	No
Eastern Meadowlark	Yes	No
Chimney Swift	Yes	No
Red-headed Woodpecker	Yes	Yes
Eastern Small-footed Myotis	Yes	Yes
Little Brown Myotis	Yes	Yes
Tricoloured Bat	Yes	Yes
Butternut	Yes	No
Black Redhorse	Yes	No
Silver Shiner	Yes	No

* there is no natural habitat for SAR in the Baden – New Hamburg Water Servicing Study Area (although Barn Swallow and Chimney Swift, bats may use anthropogenic features)

Barn Swallow was the only SAR previously identified in the desktop background review observed within the Baden-New Hamburg Water Servicing Study Area on June 9, 2022. Within the Baden-New Hamburg Wastewater Servicing Study Area, Silver Shiner and Black Redhorse are present in the Nith River (NDMNRF 2022b; DFO 2022). Detailed construction plans will be assessed to identify potential impacts to protected SAR and their habitats.

If suitable habitat for protected SAR cannot be avoided, field habitat assessments and/or species use surveys will be conducted to determine if SAR or their habitat are present. If SAR and their habitat are not present, no further mitigation or authorization is required. If SAR or their habitat is present, site specific authorization and mitigation requirements will be identified.

Authorization (e.g., permit vs. registration) and additional mitigation requirements is determined in consultation with the MECP.

7 POTENTIAL FUTURE SURVEY REQUIREMENTS

Upon the availability of detailed design plans, the following assessments may be required to conduct an impact assessment and refine mitigation measures for the projects:

Baden – New Hamburg Water Servicing

Natural areas and habitats were not identified in the project Study Area; therefore, additional assessments of natural features are not likely required. If anthropogenic structures such as buildings or culverts will be disturbed, it may be necessary to screen them for presence / absence of bird nests, bats or other wildlife.

Baden – New Hamburg Wastewater Servicing

The following surveys for birds, bats and vegetation are recommended where property access was not available on June 9, 2022 and other areas that may be impacted by the project.

- Endangered bat surveys – Removal of suitable bat maternity roost trees may require species use surveys to determine if SAR bats are present and to identify requirements under the Endangered Species Act
- Grassland bird surveys - Several fallow fields and pastures were identified in the Baden - New Hamburg Wastewater Servicing Study Area. These do not meet the criteria for SWH, but presence/absence surveys may be needed for Bobolink/Eastern Meadowlark
- Invasive species survey – There is an abundance of Phragmites in this protect Study Area, and further surveys may be needed to understand where Phargmites and other potentially problematic invasive species occur so that they can be managed during construction.
- Turtle basking surveys - No turtle nesting or overwintering habitat was observed, but snapping turtles and are present within this project Study Area.
- Amphibian surveys – Suitable breeding habitat was identified; therefore, surveys may be required to determine habitat use.
- Butternut surveys / health assessments – Butternut may occur in wooded or open areas. Presence / absence should be determined prior to tree removals; if present a butternut health assessment may be required to support authorizations under the Endangered Species Act.
- Vegetation inventory – Inventory is recommended within the Critical Habitat area for Silver Shiner (i.e., the meander belt with + 30 m) at the proposed Nith River crossing location, to support SAR permit applications.
- Wildlife use of structures - If anthropogenic structures such as buildings or culverts will be disturbed, it may be necessary to screen them for presence / absence of bird nests, bats or other wildlife.

Foxboro Green Water and Wastewater Servicing

The following surveys for birds, bats and vegetation are recommended south of the condominiums (parallel to the woodlot and south of the woodlot through the agricultural fields). Access to the area was restricted on June 9, 2022.

- Endangered bat surveys – Removal of suitable bat maternity roost trees may require species use surveys to determine if SAR bats are present and to identify requirements under the *Endangered Species Act.*
- Invasive species survey – Phragmites was obaserved in this project Study Area, and further surveys may be needed to understand where Phargmites and other potentially problematic invasive species occur so that they can be managed during construction.
- Turtle basking surveys - no turtle nesting or overwintering habitat was observed, but snapping turtles and are present within the Foxboro Green Water and Wastewater Servicing Study Area.
- Barn Swallow presence/ absence survey – there was an inactive kiosk on Holland Mills Road. The kiosk should be checked if work is scheduled to occur during the BARS window (May 1 to August 31).
- Amphibian surveys – suitable breeding habitat was identified; therefore, surveys may be required.
- Butternut surveys / health assessments – Butternut may occur in wooded or open areas. Presence / absence should be determined prior to tree removals; if present a butternut health assessment may be required to support authorizations under the *Endangered Species Act*.
- Wildlife use of structures - If anthropogenic structures such as buildings or culverts will be disturbed, it may be necessary to screen them for presence / absence of bird nests, bats or other wildlife.

8 SUMMARY AND CONCLUSIONS

The field investigation conducted on June 9, 2022 confirmed that there is potential habitat for SAR and SOCC within the Baden-New Hamburg Wastewater Servicing and Foxboro Green Water and Wastewater Servicing Study Areas. The field investigation also confirmed the following presence SAR/SOCC within the project Study Areas: Barn Swallow, Eastern Wood-pewee and Snapping Turtle.

Forested areas present in the Baden-New Hamburg Wastewater Servicing and Foxboro Green Water and Wastewater Servicing Study Areas provide suitable habitat for two bird SOCC (Eastern Wood-pewee and Wood Thrush). Eastern Wood-pewee was confirmed present within the Baden-New Hamburg Wastewater Servicing Study Area on June 9. However, forested habitats within the Servicing Review Study Area are unlikely to support Red-headed Woodpecker.

Potential SAR habitat for Bobolink and Eastern Meadowlark is present in agricultural communities within the Baden-New Hamburg Wastewater Servicing Study Area. Site-level assessments would be required to confirm the presence or absence of these species. Barn Swallow and Snapping Turtle were both confirmed present in the Baden-New Hamburg Wastewater Servicing Study Area during the site investigations on June 9.

Reference: Natural Heritage Assessment for the New Hamburg Water and Wastewater System Servicing Municipal Class Environmental Assessment

There are a number of large diameter trees (greater than 10 cm diameter at breast height) in the Baden-New Hamburg Wastewater Servicing and Foxboro Green Water and Wastewater Servicing Study Areas that could potentially function as bat maternity roost trees for bat SAR (**Figure 3 and 4, Attachment A**). Site-level assessments would be required to confirm suitability of the trees as bat maternity roost habitat if there are anticipated impacts.

Although not observed, Butternut may be present in wooded or open areas and areas impacted by the project should be assessed to determine presence / absence of this SAR.

Detailed construction plans for the preferred site will be required to assess and identify potential impacts, refine standard and site-specific mitigation recommendations, and determine requirements for authorization under the relevant federal (*Fisheries Act, SARA*) and provincial (*Conservation Authorities Act, ESA)* legislation.

Thank you.

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Attachments: Attachment A - Figures
Attachment B - SAR and SOCC Habitat Suitability Assessment

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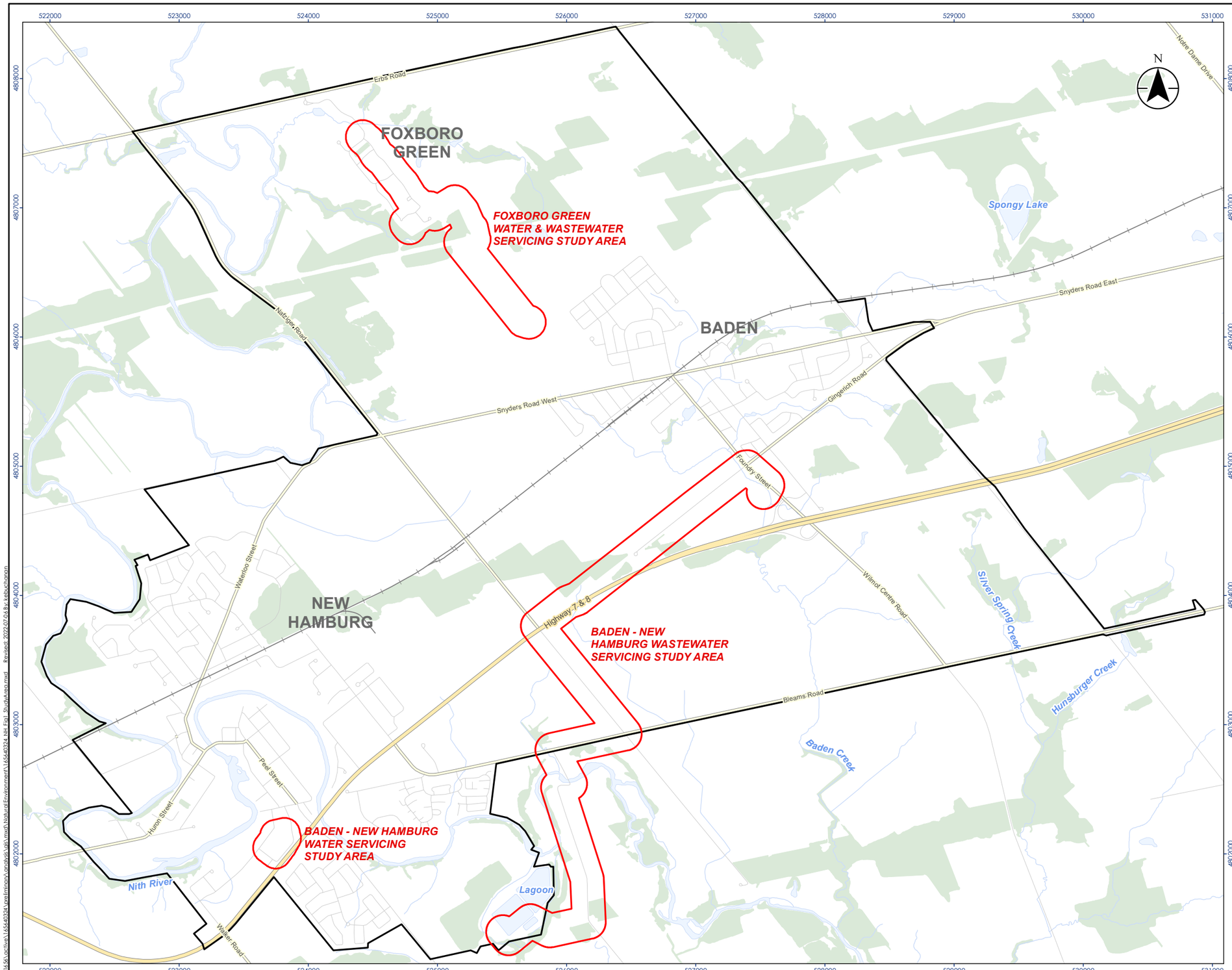
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ATTACHMENT A

Figures



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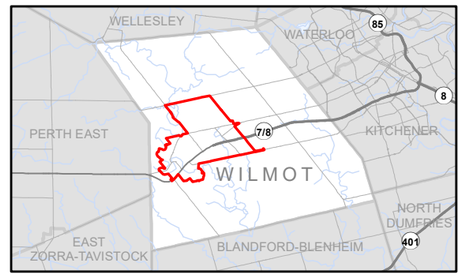
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- Servicing Review Study Area

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Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
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Project Location
Wilmot Township

165640324 REVA
Prepared by KDB on 2022-07-06

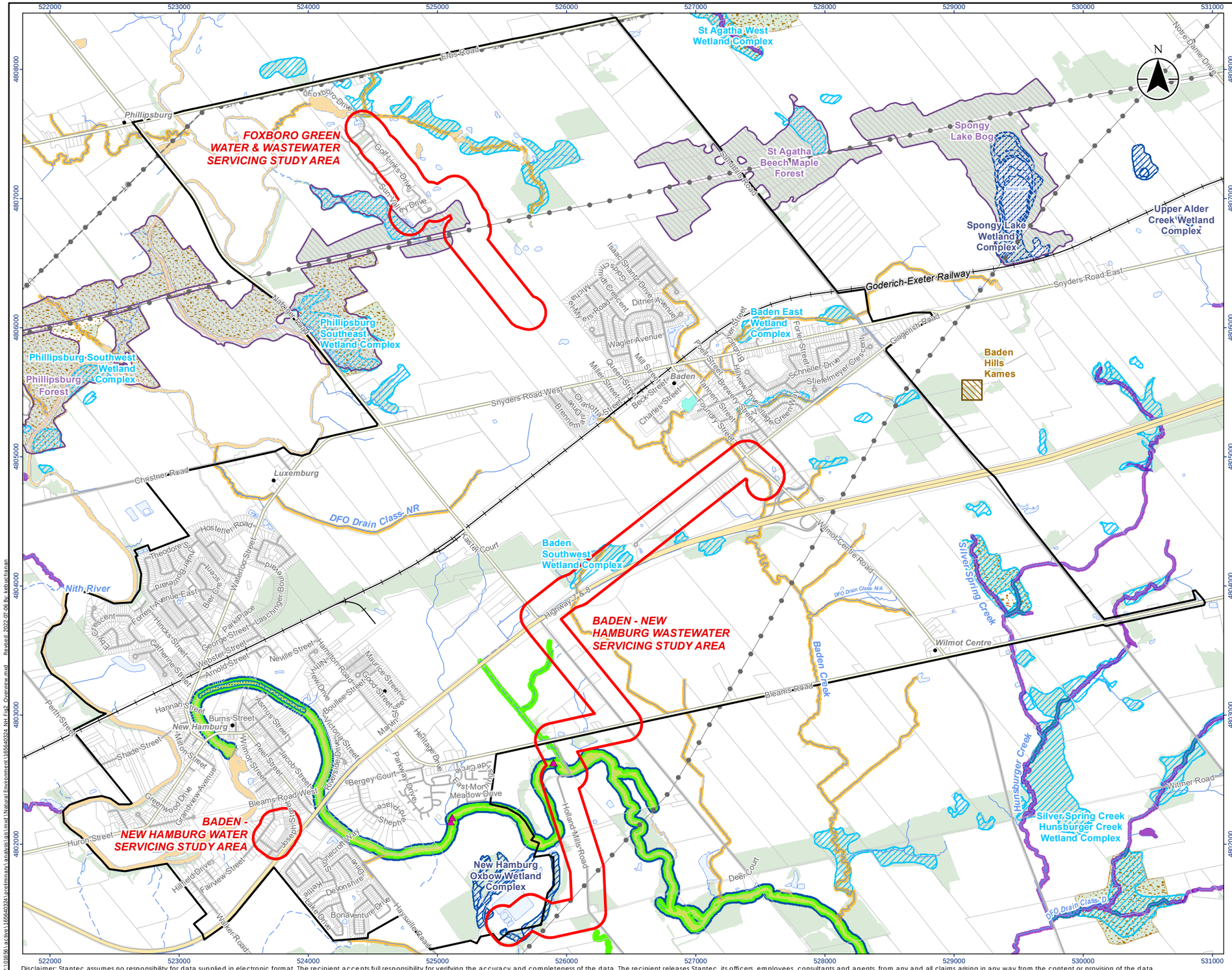
Client/Project
REGION OF WATERLOO
BADEN - NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
1

Title
Project Location

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Legend

- Study Area
- Servicing Review Study Area
- NDMNRF Fish Survey Point (ARA)
- Constructed Drain
- Watercourse (Permanent)
- Watercourse (Intermittent)
- ANSI, Earth Science
- ANSI, Life Science
- Deer Wintering Area
- Waterfowl Winter Concentration Area
- Spawning Area
- Thermal Regime, Cold
- Thermal Regime, Cool
- Thermal Regime, Warm
- Aquatic Species at Risk Distribution
- Aquatic Species at Risk Critical Habitat
- Waterbody
- Wetland, Provincially Significant
- Wetland, Other Evaluated
- Wooded Area
- Railway
- Hydro Line
- Unknown Transmission Line
- Parcel Fabric

Notes

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Project Location
Wilmot Township

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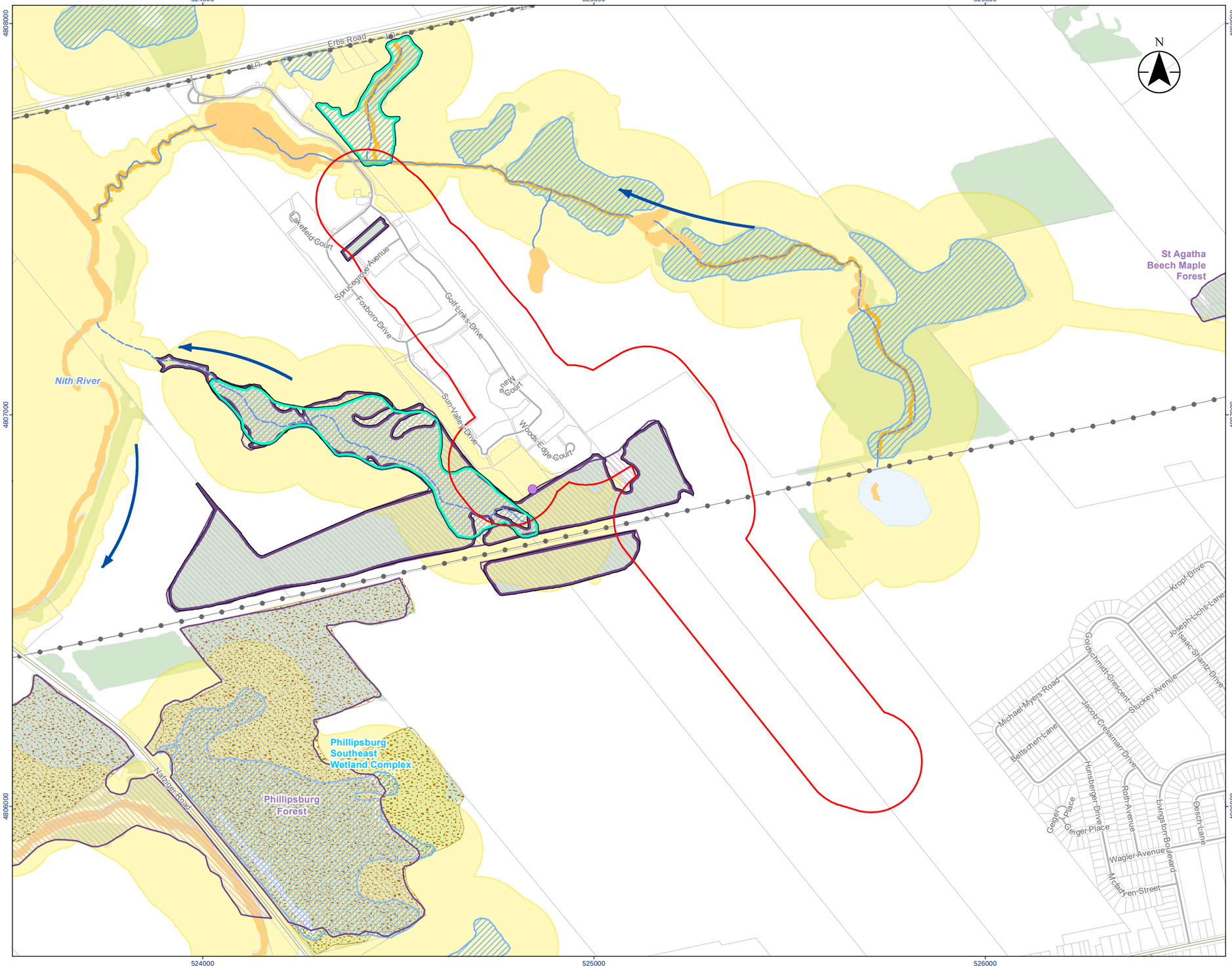
Client/Project
REGION OF WATERLOO
BADEN - NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
2

Title
Natural Heritage Background Data

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Legend

- Study Area

Wildlife Habitat

- Suitable Bat Tree
- Candidate Amphibian Breeding Habitat
- Candidate Bat Maternity Colony

Other Natural Heritage Data

- Flow Direction
- Watercourse (Permanent)
- Watercourse (Intermittent)
- Thermal Regime, Warm
- ANSI, Life Science
- Deer Wintering Area
- Waterbody
- Wetland, Other Evaluated
- Wooded Area
- GRCA Regulation Limit

0 0.6 km

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Notes

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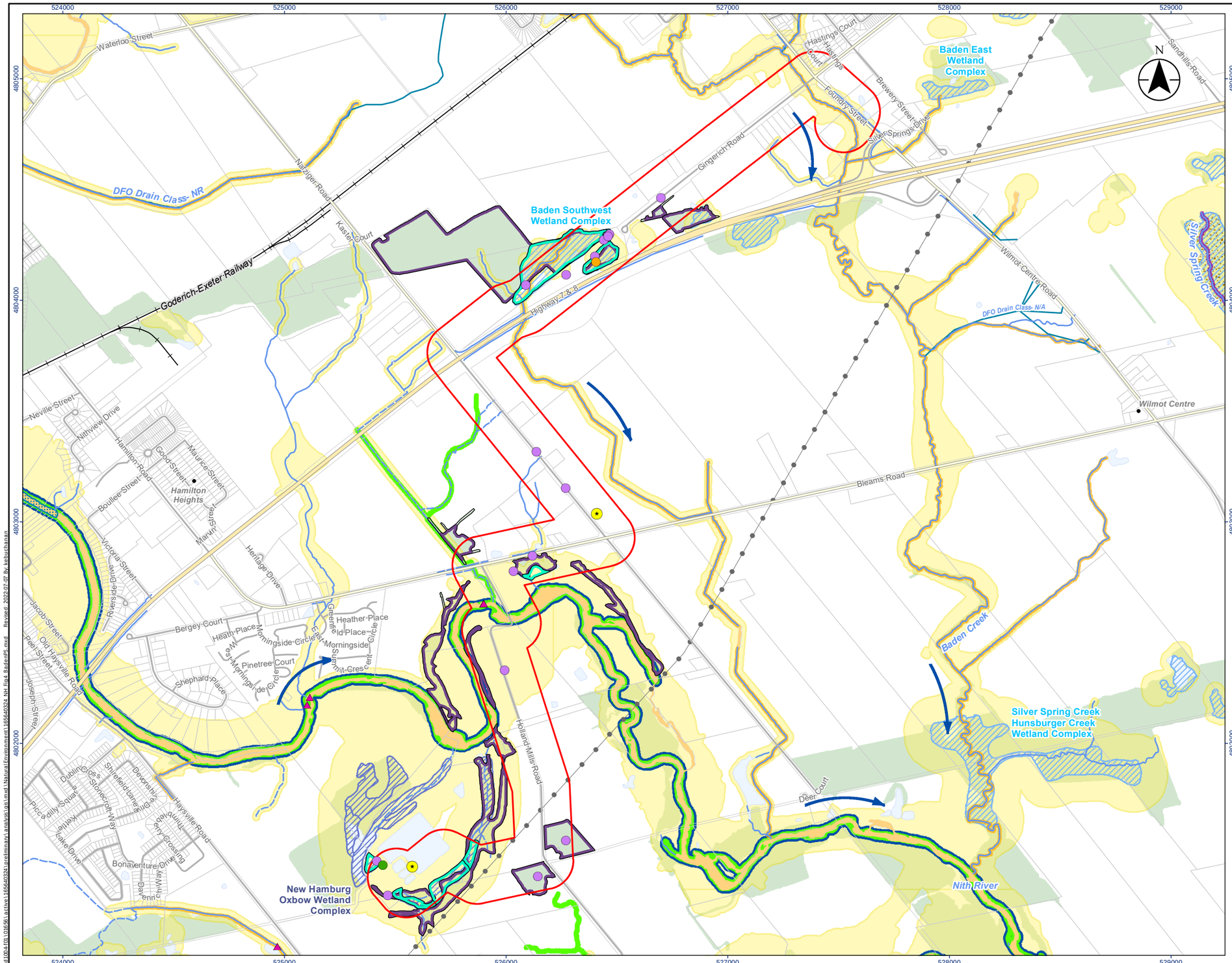
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REGION OF WATERLOO
BADEN - NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
3

Title
Natural Heritage Data for the Preferred Alternative (Foxboro Green Water and Wastewater Servicing Project)

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Stantec

Legend

- Study Area

Species at Risk Observation (2022)

- Barn Swallow

Species of Conservation Concern Observation (2022)

- Eastern Wood-pewee (EAWP)
- Snapping Turtle

Wildlife Habitat

- Suitable Bat Tree
- Candidate Amphibian Breeding Habitat
- Candidate Bat Maternity Colony

Other Natural Heritage Data

- NDMNRF Fish Survey Point (ARA)
- Flow Direction
- Constructed Drain
- Watercourse (Permanent)
- Watercourse (Intermittent)
- Thermal Regime, Cold
- Thermal Regime, Warm
- Deer Wintering Area
- Spawning Area
- Aquatic Species at Risk Distribution (DFO)
- Aquatic Species at Risk Critical Habitat (DFO)
- Waterbody
- Wetland, Provincially Significant
- Wetland, Other Evaluated
- Wooded Area
- GRCA Regulation Limit

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Notes

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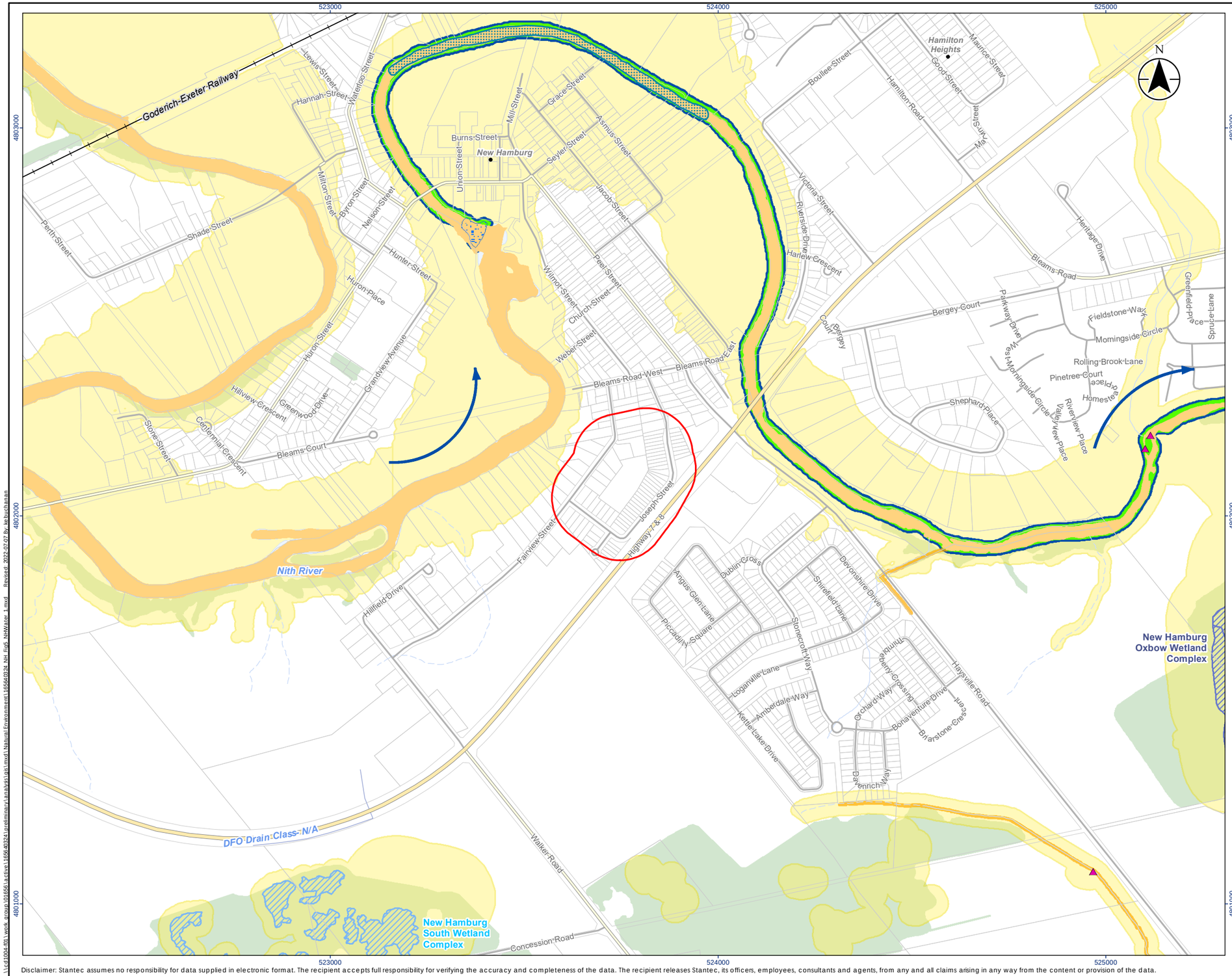
Client/Project
REGION OF WATERLOO
BADEN - NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
4

Title
Natural Heritage Data for the Preferred Alternative (Baden - New Hamburg Wastewater Servicing Project)

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Stantec

Legend

- Study Area

Other Natural Heritage Data

- NDMNRF Fish Survey Point (ARA)
- Flow Direction
- Constructed Drain
- Watercourse (Permanent)
- Watercourse (Intermittent)
- Thermal Regime, Warm
- Waterfowl Winter Concentration Area
- Spawning Area
- Aquatic Species at Risk Distribution (DFO)
- Aquatic Species at Risk Critical Habitat (DFO)
- Waterbody
- Wetland, Provincially Significant
- Wetland, Other Evaluated
- Wooded Area
- GRCA Regulation Limit

0 0.6 km

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Notes
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Project Location
Wilmot
Township

165640324 REV4
Prepared by KDB on 2022-07-07

Client/Project
REGION OF WATERLOO
BADEN - NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
5

Title
Natural Heritage Data for the Preferred Alternative (Baden - New Hamburg Water Servicing Project)

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ATTACHMENT B

SAR and SOCC Habitat Suitability Assessments

Attachment B-1: Species at Risk Habitat Assessment for the Project Study Areas

Species	Habitat Preference	Habitat Potential in the Project Study Areas
PLANTS		
Butternut	Found in a variety of habitats throughout Southern Ontario, including woodlands and hedgerows (Farrar, 1995).	**Suitable Habitat Present.** Butternut has the potential to occur in forested and open areas in the Study Area.
FISH		
Silver Shiner	Silver Shiners prefer moderate to large size streams with swift currents that are free of weeds and have clean gravel or boulder bottoms. They live in schools and feed on crustaceans and adult flies that fall in the water or fly just above the surface (MECP 2021a).	**Suitable Habitat Present.** Current DFO SAR data (DFO 2022) include this species in the Nith River downstream of the Reservoir Dam in New Hamburg. These reaches of the Nith River provide suitable foraging, rearing, spawning and overwintering habitat for Silver Shiner. General Habitat Protections under the ESA apply; however, the provincially regulated habitat includes not only the watercourse and habitat elements therein, but also the riparian and floodplain areas adjacent to occupied reaches.
Black Redhorse	Pools and riffles in rivers and streams, typically less than 2 meters in depth (MECP 2021b).	**Suitable Habitat Present.** Current DFO SAR data (DFO 2022) include this species in the Nith River downstream of the Reservoir Dam in New Hamburg. These reaches of the Nith River provide suitable foraging, rearing, spawning and overwintering habitat for Black Redhorse.
BIRDS		
Bank Swallow	Bank Swallows excavate nests in exposed earth banks along watercourses and lakeshores, roadsides, stockpiles of soil, and the sides of sand and gravel pits (Falconer et al., 2016). Any suitable habitat may be present if stockpiles of soil are present or in areas of sand/gravel extraction.	**Habitat Absent.** Riparian areas likely not suitable to support nesting activities.
Barn Swallow	Nest on walls or ledges of barns and other human-made structures such as bridges, culverts or other buildings; forages in open areas for flying insects (COSEWIC 2011a).	**Suitable Habitat Present.** Human-made structures in the Study Area have the potential to provide nesting habitat for Barn Swallow, especially barns, bridges and cement box culverts. Foraging habitat is available over watercourses, wetlands and agricultural fields in the Study Area.
Bobolink	Nests primarily in forage crops with a mixture of grasses and broad-leaved forbs, predominantly hayfields and pastures (COSEWIC 2010).	**Suitable Habitat Potentially Present.** Agricultural areas in the Study Area may provide potential nesting habitat for Bobolink if agricultural crops consist of hay or agriculture lands are used for pasture.

Attachment B-1: Species at Risk Habitat Assessment for the Project Study Areas

Species	Habitat Preference	Habitat Potential in the Project Study Areas
Chimney Swift	Chimney Swift uses chimneys for roosting and breeding, and less commonly, nest in large hollow trees (Cadman et al. 2007).	**Suitable Habitat Potentially Present.** Older buildings in the Study Areas may provide suitable chimney structures for nesting Chimney Swifts. Although less common, large hollow trees may also provide nesting habitat for this species.
Eastern Meadowlark	Meadows, hayfields and pastures; also, other open habitat types including mown lawn (COSEWIC 2011b). Prefers large (~5 ha), low-lying wet grasslands with abundant litter (COSEWIC 2011b).	**Suitable Habitat Potentially Present.** Agricultural areas in the Study Areas may provide potential nesting habitat for Eastern Meadowlark if agricultural crops consist of hay or agriculture lands are used for pasture.
Red-Headed Woodpecker	In woodlands and woodland edges, sometimes on golf courses and cemeteries. Requires dead trees for nesting and perching. Feeds on acorns and beech nuts (MECP 2022)	**Suitable Habitat Potentially Present.** The Study Area intersects with a large continuous tract of woodland northeast of the Wilmot Recreation Complex. There may be suitable dead trees for nesting purposes as well as mature oak and beech to provide ample foraging opportunities for Red-headed Woodpecker, but detailed field surveys would be required to confirm presence.
MAMMALS		
Small-footed Myotis	Small-footed myotis hibernate in caves and abandoned mines in winter, and roost under rocks, in rock outcrops, buildings, under bridges, or in caves, mines, or hollow trees in the spring and summer (MNRF 2017).	**Suitable Habitat Potentially Present.** Buildings and bridge structures have potential to provide roosting habitat. Suitable bat roost trees have the potential to occur in trees > 10 cm in diameter, but they are more likely to occur in trees > 25 cm in diameter. Suitable bat trees have the potential to occur throughout the Study Area.
Little Brown Myotis	Trees, buildings and bridges for roosting; trees for nesting; caves and mines for hibernation (COSEWIC 2013).	**Suitable Habitat Potentially Present.** Suitable bat roost trees have the potential to occur in trees > 10 cm in diameter, but they are more likely to occur in trees > 25 cm in diameter. Suitable bat trees have the potential to occur throughout the Study Area.
Tri-colored Bat	Found in a variety of habitats; caves provide overwintering habitat (COSEWIC 2013).	**Suitable Habitat Potentially Present.** Suitable bat roost trees have the potential to occur in trees > 10 cm in diameter, but they are more likely to occur in trees > 25 cm in diameter. Suitable bat trees have the potential to occur throughout the Study Area.

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Attachment B-2: Species of Conservation Concern Habitat Assessment in the Project Study Areas

Species	Habitat Preference	Habitat Potential in the Project Study Areas
PLANTS		
Green Dragon	Flowering late spring; mesic to wet deciduous woods, thickets, and bottomlands (Thompson 2000)	**Suitable Habitat Potentially Present.** In lowland deciduous forest and moist vegetation communities in the Study Areas.
AMPHIBIANS		
Western Chorus Frog	The Western Chorus Frog prefers small, ephemeral wetlands disconnected from other water sources for breeding (Environment Canada 2015; COSEWIC 2008). The temporary nature of these wetlands leads to a reduction in predation pressure, but also makes entire populations susceptible to seasonal events such as premature drying due to climate conditions. The vegetation composition in breeding ponds is typically herbaceous with the presence of occasional shrubs or partially submerged trees forming a discontinuous or open canopy. Some populations may breed at the edges of closed-canopy habitats (Environment Canada 2015).	**Suitable Habitat Potentially Present.** In wetlands and seasonal pond areas in the Study Areas.
MOLLUSCS		
Rainbow Mussel	Mainly small streams to small rivers in coarse sand or gravel substrates in or near riffles along the edges of emergent vegetation in moderate to strong current (MECP 2021a).	**Habitat Present.** Current DFO SAR data (DFO 2022) includes this species in the Nith River and its tributaries in the northern part of the Servicing Review Study Area. Habitat is present in the Nith River in the Baden-New Hamburg Wastewater Servicing Study Area.
REPTILES		
Eastern Milksnake	Generally occur in rural areas, where it is most frequently reported in and around buildings, especially old structures. It is also found in a wide variety of habitats, from prairies, pastures, and hayfields, to rocky hillsides and a wide variety of forest types. They must also be in proximity of water, and suitable locations for basking and egg-laying.	**Suitable Habitat Potentially Present.** Habitat has the potential to occur in the Study Areas. Rock piles and old foundations have the potential to provide suitable hibernacula.
Midland Painted Turtle	Generally occur in ponds, lakes, marshes and slow-moving creeks (Ontario Nature 2022). Often observed basking on logs or rocks along shorelines (Ontario Nature 2022).	**Habitat Present.** Ponds in the Foxboro Green Water and Wastewater Servicing Study Area and the Baden-New Hamburg Wastewater Servicing Study Area provide habitat.

Attachment B-2: Species of Conservation Concern Habitat Assessment in the Project Study Areas

Species	Habitat Preference	Habitat Potential in the Project Study Areas
Snapping Turtle	Generally inhabit shallow waters where they can hide under the soft mud and leaf litter. Nesting sites usually occur on gravely or sandy areas along streams. Snapping Turtles often take advantage of man-made structures for nest sites, including roads (especially gravel shoulders), dams and aggregate pits.	**Habitat Present.** Slow-moving watercourses with soft, muddy substrates and wetlands with permanent water deep enough not to freeze have the potential to provide overwintering habitat. Exposed loose soils adjacent to wetlands/watercourses have the potential to provide nesting habitat. Species present within Study Areas during time of field investigations on June 9, 2022.
BIRDS		
Caspian Tern	The Caspian Tern generally nests in colonies and prefers sparsely vegetated flat rocky islands, beaches, and sandy shores of James Bay and the Great Lakes in Ontario (Cuthbert and Wires, 1999). It usually nests on the more elevated areas of islands and it often found nesting with Ring-billed Gulls (Cadman et al., 2007)	**Habitat Absent.** No islands for colonial nesting present in the Study Areas.
Common Nighthawk	Generally prefer open, vegetation- free habitats, including dunes, beaches, recently harvested forests, burnt-over areas, logged areas, rocky outcrops, rocky barrens, grasslands, pastures, peat bogs, marshes, lakeshores, and river banks. This species also inhabits mixed and coniferous forests. Can also be found in urban areas (nest on flat roof-tops).	**Suitable Habitat Potentially Present.** Potential habitat for Common Nighthawk occurs in open areas in the Study Areas, including meadows and pastures.
Eastern Wood-Pewee	Associated with deciduous and mixed forests. Within mature and intermediate age stands it prefers areas with little understory vegetation as well as forest clearings and edges.	**Habitat Present.** Habitat for Eastern Wood-Pewee occurs in deciduous and mixed forest communities in the Study Areas. Species present within Study Areas at time of field investigations on June 9, 2022.
Peregrine Falcon	Generally nest on tall, steep cliff ledges adjacent to large waterbodies; some birds adapt to urban environments and nest on ledges of tall buildings, even in densely populated downtown areas.	**Habitat Absent.**
Wood Thrush	Nests mainly in second-growth and mature deciduous and mixed forests, with saplings and well-developed understory layers. Prefers large forest mosaics, but may also nest in small forest fragments.	**Suitable Habitat Potentially Present.** Potential habitat for Wood Thrush occurs in deciduous and mixed forest communities in the Study Areas.
FISH		
Northern Sunfish (Great Lakes - Upper St. Lawrence pop.)	Shallow, vegetated areas of slow-flowing streams and rivers (MECP 2021b).	**Suitable Habitat Present.** Potential habitat within the New Hamburg Oxbow Wetland Complex.

Attachment B-2: Species of Conservation Concern Habitat Assessment in the Project Study Areas

Species	Habitat Preference	Habitat Potential in the Project Study Areas
INSECTS		
Monarch	Exist primarily wherever milkweed and wildflowers exist; abandoned farmland, along roadsides, and other open spaces.	**Suitable Habitat Present.** Habitat for Monarch occurs in open meadow areas in the Study Areas; especially areas with an abundance of common milkweed.

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Appendix H
Stage 1 Archaeological Assessment
P390-0364-2022

Stage 1 Archaeological Assessment for the Baden – New Hamburg Water and Wastewater System Servicing Review

Various Lots and Concessions, Geographic Township of Wilmot, former Waterloo County, now Township of Wilmot, Regional Municipality of Waterloo, Ontario

March 27, 2023

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Project Information Form Number:
P390-0364-2022

Limitations and Sign-off

The conclusions in the Report titled Stage 1 Archaeological Assessment for the Baden – New Hamburg Water and Wastewater System Servicing Review are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

Stantec has assumed all information received from Regional Municipality of Waterloo (the "Client") and third parties in the preparation of the Report to be correct. While Stantec has exercised a customary level of judgment or due diligence in the use of such information, Stantec assumes no responsibility for the consequences of any error or omission contained therein.

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Executive Summary

The Regional Municipality of Waterloo (Region) retained Stantec Consulting Ltd. (Stantec) and C3 Water Inc. (C3W) to complete a System Servicing Review for the New Hamburg Water and Wastewater Systems. Future planned growth and development have been identified within the current Urban Area Boundaries for Baden, New Hamburg and Foxboro Green, as defined in the 2019 *Township of Wilmot Official Plan*. Before any development of planned growth, the water and wastewater servicing needs for these areas needs to be addressed.

This Servicing Review aims to evaluate the status of existing water and wastewater servicing systems in Baden – New Hamburg, provide recommendations to address existing servicing constraints, and provide the framework to meet the water/wastewater servicing needs for the planned growth within the Region. Following an evaluation of alternatives, the Preliminary Preferred Alternative is: increasing water storage capacity at the New Hamburg Water Treatment Plant (WTP); upgrading the Baden Pump Station (PS) and constructing a new forcemain and connecting directly to the New Hamburg Wastewater Treatment Plant (WWTP); and, connecting Foxboro Green to the Baden sewer and water supply system.

To facilitate this study, the Region retained Stantec to undertake a Stage 1 archaeological assessment for the Preliminary Preferred Alternatives. The study area for this archaeological assessment is in part of Lots 17-19, German Block North of Bleems Road; part of Lots 18-21 and 23, German Block South of Bleems Road; part of Lot 16, German Block North of Snyders Road; part of Lot 15-17, German Block South of Synders Road; and, part of Lot 16, German Block South of Erbs Road, in the former Geographic Township of Wilmot, Waterloo County, now the Township of Wilmot, Regional Municipality of Waterloo.

Based on the background research and property inspection results, parts of the study area are determined to be extensively disturbed from previous road construction, utility installations, infrastructure development, and building footprints, which have removed any archaeological potential that may have been present. Also, parts of the study area were determined to have no or low archaeological potential based on identifying permanently wet areas and steeply sloping terrain. Other parts of the study area have been subject to previous archaeological assessments and were determined to have no further cultural value or interest. Collectively, these areas are considered to have no to low archaeological potential.

The remainder of the study area was determined to retain its archaeological potential.

Based on the findings, the following recommendations are provided:

1. Parts of the study area identified as having archaeological potential are recommended to be subject to a Stage 2 archaeological assessment before any impacts.
2. Parts of the study area identified as having been previously assessed and of no further cultural heritage value or interest; no further archaeological assessment is recommended.
3. Parts of the study area identified as having no to low archaeological potential; no further archaeological assessment is recommended.

The Ministry of Tourism, Culture and Sport (MTCS) is asked to review the results presented and accept this report into the *Ontario Public Register of Archaeological Reports*. Additional archaeological assessment is still required, so the archaeological sites recommended for further archaeological fieldwork remain subject to Section 48(1) of the *Ontario Heritage Act* (Government of Ontario 1990b) and may not be altered or have artifacts removed except by a person holding an archaeological license.

The Executive Summary highlights key points from the report only; for complete information and findings, the reader should examine the complete report.

Project Personnel

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Acknowledgements

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Ministry of Citizenship and Multiculturalism	Robert von Bitter, Archaeological Data Coordinator

1 Project Context

1.1 Development Context

The Regional Municipality of Waterloo (Region) retained Stantec Consulting Ltd. (Stantec) and C3 Water Inc. (C3W) to complete a System Servicing Review for the New Hamburg Water and Wastewater Systems. Future planned growth and development have been identified within the current Urban Area Boundaries for Baden, New Hamburg, and Foxboro Green, as defined in the *Township of Wilmot Official Plan* (2019). Before any development of planned growth, the water and wastewater servicing needs for these areas needs to be addressed.

This System Servicing Review aims to evaluate the status of existing water and wastewater servicing systems in Baden – New Hamburg, provide recommendations to address existing servicing constraints, and provide the framework to meet the water/wastewater servicing needs for the planned growth within the Region. Following an evaluation of alternatives, the Preliminary Preferred Alternative is:

- Increasing water storage capacity at the New Hamburg Water Treatment Plant (WTP);
- Upgrading the Baden Pump Station (PS) and construction of a new forcemain connecting directly to the New Hamburg Wastewater Treatment Plant (WWTP); and,
- Connecting Foxboro Green to the Baden sewer and water supply system.

To facilitate this study, the Region retained Stantec to undertake a Stage 1 archaeological assessment for the Preliminary Preferred Alternatives. The study area for this archaeological assessment is in part of Lots 17 to 19, German Block North of Bleems Road; part of Lots 18 to 21 and 23, German Block South of Bleems Road; part of Lot 16, German Block North of Snyders Road; part of Lots 15 to 17, German Block South of Synders Road; and, part of Lot 16, German Block South of Erbs Road, in the Geographic Township of Wilmot, former Waterloo County, now the Township of Wilmot, Regional Municipality of Waterloo, Ontario (Figure 1).

This study is being undertaken in accordance with the Municipal Class Environmental Assessment (Government of Ontario 2021). The Stage 1 archaeological assessment was completed from public rights-of-way (ROW).

1.1.1 Objectives

In compliance with the provincial standards and guidelines set out in the 2011 Standards and Guidelines for Consultant Archaeologists (Government of Ontario 2011), governed by the Ministry of Citizenship and Multiculturalism (MCM), the objectives of Stage 1 archaeological assessment are to:

- Provide information about the study area's geography, history, previous archaeological fieldwork, and current land conditions
- Evaluate the study area's archaeological potential, which will support recommendations for Stage 2 survey for all or parts of the property

- Recommend appropriate strategies for Stage 2 survey

To meet these objectives, Stantec archaeologists:

- Reviewed relevant archaeological, historical, and environmental literature about the study area.
- Reviewed the land-use history, including pertinent historical maps
- Examined of the *Ontario Archaeological Sites Database* to determine the presence of registered archaeological sites in and around the study area
- Query of the *Ontario Public Register of Archaeological Reports* database to identify previous archeological assessments within 50 metres of the study area
- Undertook a property inspection of the study area by a licensed archaeologist

1.2 Historical Context

"Contact" is typically used as a chronological benchmark when discussing Indigenous archaeology in Canada and describes the contact between Indigenous and European cultures. The precise moment of contact is a constant matter of discussion. Contact in what is now the province of Ontario is broadly assigned to the 16th century (Loewen and Chapdelaine 2016).

1.2.1 Pre-Contact Indigenous Resources

Indigenous peoples have occupied this portion of southwestern Ontario since the retreat of the Wisconsin glacier approximately 11,000 years ago. Much of what is understood about the lifeways of these Indigenous peoples is derived from archaeological evidence and ethnographic analogy. In Ontario, Indigenous culture before the period of contact with European peoples has been distinguished into cultural periods based on observed changes in material culture. These cultural periods are primarily based on observed changes in formal lithic tools and separated into the Early Paleo, Late Paleo, Early Archaic, Middle Archaic, and Late Archaic periods. Following the advent of pottery technology in the Indigenous archaeological record, cultural periods are separated into the Early Woodland, Middle Woodland, and Late Woodland periods, based primarily on observed changes in formal pottery decoration.

It should be noted that these cultural periods do not necessarily represent specific cultural identities but are a helpful paradigm for understanding differences in Indigenous culture through time. Table 1.1 provides a general outline of the study area's cultural chronology, summarized by Ellis and Ferris (1990). The provided periods are based on the "Before Present" (BP) calendar notation system, wherein BP stands for the years before the present. The "Present Year" is set in the calendar year 1950.

Table 1.1 Generalized Cultural Chronology Related to the Study Area

Period	Characteristics	Time Period	Comments
Early Paleo	Fluted Projectiles	10,950 – 10,350 BP	Spruce parkland, caribou hunters
Late Paleo	Hi-Lo Projectiles	10,350 – 9,950 BP	Smaller but more numerous sites
Early Archaic	Kirk and Bifurcate Base Points	9,950 – 7,950 BP	Slow population growth
Middle Archaic	Brewerton-like points	7,950 – 4,450 BP	Environment similar to present
Late Archaic	Narrow Points	4,450 – 3,750 BP	Increasing site size
	Broad Points	3,750 – 3,450 BP	Large chipped lithic tools
	Small Points	3,450 – 3,050 BP	Introduction of bow hunting
Terminal Archaic	Hind Points	3,050 – 2,900 BP	Emergence of true cemeteries
Early Woodland	Meadowood Points	2,900 – 2,350 BP	Introduction of pottery
Middle Woodland	Dentate/Pseudo-Scallop Pottery	2,350 – 1,540 BP	Increased sedentism
	Princess Point	1,450 – 1,150 BP	Introduction of corn
Late Woodland	Early Ontario Iroquoian	1,150 – 750 BP	Emergence of agricultural villages
	Middle Ontario Iroquoian	750 – 550 BP	Long longhouses (100m +)
	Late Ontario Iroquoian	550 – 350 BP	Tribal warfare and displacement
Contact Indigenous	Various Algonkian and Iroquoian Groups	350 – 75 BP	Early written records and treaties
Historic	French/Euro-Canadian	200 BP – present	European settlement

Local environmental conditions during the Paleo period significantly differed from today. Ontario's first peoples would have crossed the landscape in small groups searching for food, mainly migratory game species. Caribou may have been a Paleo diet staple in this area, supplemented by wild plants, small game, birds, and fish. Given the low density of populations on the landscape at this time and their mobile nature, Paleo sites are small and ephemeral. The presence of fluted points sometimes identifies them. Sites are frequently located adjacent to the shorelines of large glacial lakes. Between 10,950 and 9950 BP, Indigenous populations were sustained by hunting, fishing, and foraging and lived a relatively nomadic existence across an extensive geographic territory. Despite these vast territories, social ties were maintained between groups. One way to strengthen social relations between distant groups was through gift exchange, evident through exotic lithic material documented on many sites (Ellis 2013:35-40).

Archaeological records indicate subsistence changes around 9,950 BP at southwestern Ontario's start of the Archaic Period. Since the large mammal species that formed the basis of the Paleo diet became extinct or moved north with the warming of the climate, Archaic populations had a more varied diet, exploiting a range of plants and birds, mammals, and fish species. Reliance on specific food resources like fish, deer, and several nut species became more noticeable through the Archaic Period. The presence of warmer, more hospitable environs led to expanding group and family sizes. In the archaeological record, this is evident in the presence of larger sites.

By approximately 9,950 BP, evidence exists and becomes more common for producing ground-stone tools such as axes, chisels, and adzes. These tools themselves are believed to be indicative specifically of woodworking. This evidence can be extended to indicate an increased craft production and arguably craft specialization. This latter statement is also supported by evidence, dating to approximately 8,950 BP of ornately carved stone objects which would be laborious to produce and have explicit aesthetic qualities (Ellis 2013:41). This indirectly indicates changes in the social organization, which permitted individuals to devote time and effort to craft specialization. Since 9,950 BP, the Great Lakes basin has experienced a low-water phase, with shorelines significantly below current lake levels (Stewart 2013: Figure 1.1.C). It is presumed that most human settlements would have been focused along these former shorelines. At approximately 8,450 BP, the climate had warmed considerably since the recession of the glaciers, and the environment had grown more like the present day. By about 6450 BP, evidence exists from southern Ontario for using native copper, i.e., naturally occurring pure copper metal (Ellis 2013:42). The recorded origin of this material along Lake Superior's north shore indicates extensive exchange networks across the Great Lakes basin.

The coniferous forests of earlier times were replaced by stands of mixed coniferous and deciduous trees by about 5,950 BP. The transition to more productive environmental circumstances led to a rise in population density. As a result, Archaic sites become more abundant over time. Artifacts typical of these occupations include a variety of stemmed and notched projectile points; chipped stone scrapers; ground stone tools (i.e., celts, adzes) and ornaments (i.e., bannerstones and gorgets); bifaces or tool blanks; animal bone; and chert waste flakes, a by-product of the tool making process (Ellis *et al*. 1990).

At approximately 5,450 BP, the isostatic rebound of the North American plate following the melt of the Laurentide glacier had reached a point that significantly affected the Great Lakes basin watershed. Before this, the Upper Great Lakes had drained down the Ottawa Valley via the French River and Mattawa River valleys. Following this shift in the watershed, the drainage course of the Great Lakes basin had changed to its present course. This also prompted a significant increase in water level to approximately current levels (with a brief high-water period); this change in water levels is believed to have occurred catastrophically (Stewart 2013:28-30). This change in geography coincides with the earliest evidence for cemeteries (Ellis 2013:46). By 4,920 BP, the earliest evidence exists for the construction of fishing weirs (Stevens 2004). Construction of these weirs would have required a large amount of communal labour and are indicative of the continued development of the social organization and communal identity. The large-scale procurement of food at a single location also has significant implications for the permanence of settlement within the landscape. This period is also marked by further population increase; by 3,450 BP, evidence exists for substantial permanent structures (Ellis 2013:45-46).

By approximately 2,900 BP, the earliest evidence exists for populations using pottery. People are understood to have continued to exploit natural resources seasonally. However, this advent of pottery technology correlated with the intensive exploitation of seed foods such as goosefoot and knotweed and mast such as nuts (Williamson 2013:48). The use of pottery implies changes in the social organization of food storage, food cooking, and diet changes. Fish also continued to be an important facet of the economy. Evidence continues to exist for the expansion of social organization (including the hierarchy), group identity, ceremonialism (particularly in burial), interregional exchange throughout the Great Lakes basin and beyond, and craft production (Williamson 2013:48-54).

By approximately 1,400 BP, evidence emerges for the introduction of maize into southern Ontario. This crop would have initially only supplemented Indigenous peoples' diet and economy (Birch and Williamson 2013:13-14). Maize-based agriculture gradually became more important to societies. By approximately 1050 BP, permanent communities emerged primarily focused on agriculture and the storage of crops, with satellite locations oriented toward procuring other resources via hunting, fishing, and foraging. By approximately 700 BP, evidence exists for the common cultivation of historic Indigenous cultigens, including maize, beans, squash, sunflower, and tobacco. The archaeological record demonstrates many cultural traits similar to historical Indigenous nations (Williamson 2013:55).

1.2.2 Post-Contact Indigenous Resources

The dispersal of various Iroquoian-speaking communities heavily influenced the post-Contact Indigenous occupation of southern Ontario by the New York State Iroquois and the subsequent arrival of Algonkian-speaking groups from northern Ontario at the end of the 17th century and beginning of the 18th century (Konrad 1981; Schmalz 1991). Broadly, numerous Indigenous groups and communities are associated with the post-contact occupation of southern Ontario and the general area of the study area.

At the turn of the 17th century, the region of the study area was occupied by Iroquoian populations who are historically described as the *Neutre* (by the French), *Neutral* (by the English), or the *Atawandaron* (by the Huron-Wendat); their autonym is not conclusively known (Birch 2015). In 1626, French Recollet Father Daillon reportedly travelled the length of the Grand River and counted 28 Neutral villages in the area (Harper 1950:10-11; White 1978:410). This initial survey of the Grand River and the adjacent lands demonstrated the significance of the area and its resources to Indigenous peoples and their communities. To the north was the territory occupied by the Wendat-Tionontati (also known as the Huron-Wendat and Petun, respectively) (Heidenreich 1978). The Five Nations Iroquois, located in present-day upstate New York, failed to convince the Wendat-Tionontati to join them in an alliance (Warrick 2013). In 1649, the Seneca and the Mohawk led a campaign into southern Ontario, dispersed the Atawandaron and the Wendat-Tionontati, and established dominance over the region (Heidenreich 1978; Konrad 1981). Claude Bernou's 1680 map indicates that the then dispersed *Attiragenga* (near present-day Hamilton) and *Antouaronon* (west of the Grand River along the Lake Erie north shore) nations occupied the region of the study area (White 1978: Figure 2).

The fur trade expansion led to increased interaction between European and Indigenous people and ultimately intermarriage between European men and Indigenous women. During the 18th century, the progeny of these marriages began to identify as Métis, and no longer identified directly with either their paternal or maternal cultures. The ethnogenesis of the Métis progressed with the establishment of distinct Métis communities along the major waterways in the Great Lakes of Ontario. Métis communities were primarily focused around the upper Great Lakes and along Georgian Bay; however, Métis people have historically lived throughout Ontario (Métis Nation of Ontario 2021; Stone and Chaput 1978:607-608).

The nature of Indigenous settlement size, population distribution, and material culture shifted as Europeans encroached upon their territory. Despite this shift, "written accounts of material life and livelihood, the correlation of historically recorded villages to their archaeological manifestations, and the similarities of those sites to more ancient sites have revealed an antiquity to documented cultural

expressions that confirms a deep historical continuity to…systems of ideology and thought" (Ferris 2009:114). As a result, Indigenous peoples have left behind archaeological resources throughout southern Ontario, which show continuity with past peoples, even if they have not been recorded in Euro-Canadian documentation.

Since contact with European explorers and immigrants, and, later, with the establishment of provincial and federal governments (the Crown), the lands within Ontario and the Geographic Township of Wilmot have been included in various treaties, land claims, and land cessions. Though not an exhaustive list, Morris (1943) provides a general outline of some treaties within the Province of Ontario from 1783 to 1923. Based on Morris (1943), the study area is situated within Treaty Number 3 (Between the Lakes Purchase), signed on December 7, 1792. Treaty Number 3 was:

> ...made with the Mississa[ug]a Indians 7th December 1792, though purchased as early as 1784. This purchase in 1784 was to procure a permanent abode for that part of the Six Nation Indians coming into Canada.
>
> The area included in this Treaty is, Lincoln County excepting Niagara Township; Saltfleet, Binbrook, Barton, Glanford and Ancaster Townships, in Wentworth County; Brantford, Onondaga, Tusc[a]r[o]ra, Oakland and Burford Townships in Brant County; East and West Oxford, North and South Norwich, and Dereham Townships in Oxford County; North Dorchester Township in Middlesex County; South Dorchester, Malahide and Bayham Township in Elgin County; all Norfolk and Haldimand Counties; Pelham, Wainfleet, Thorold, Cumberland and Humberstone Townships in Welland County.
>
> (Morris 1943:17-18)

While it is challenging to delineate treaty boundaries today exactly, Figure 2 provides the approximate boundaries of Treaty Number 3 (identified by the letter "D"), based on Morris (1943).

1.2.3 Euro-Canadian Resources

1.2.3.1 Waterloo County and Wilmot Township

In 1791, the Provinces of Upper Canada and Lower Canada were created from the former Province of Quebec by British Parliament (Craig 1963:17). At this time, Colonel John Graves Simcoe was appointed Lieutenant Governor of Upper Canada. He was tasked with governing the new province, directing its settlement, and establishing a constitutional government modelled after Britain (Coyne 1895). In 1792, Simcoe divided Upper Canada into 19 counties consisting of previously settled lands, new lands opened for settlement and lands not yet acquired by the Crown. These new counties stretched from Essex in the west to Glengarry in the east.

Waterloo County is located east of Perth County, north of Brant and Oxford Counties, and south and west of Wellington County. It contains several major waterways, including the Speed, Conestoga, and Grand rivers. In addition, the quality of lumber and agricultural land was excellent and attracted many farmers to settle in the area in the late 18th and early 19th centuries, mainly German Mennonites (Sutherland 1864). The population of Waterloo County continued to grow into the latter half of the 19th century with the

introduction of multiple railways (Breithaupt 1917). The presence of the railways accelerated industrial development throughout Waterloo County. By 1861 the population had reached 13,782 (Sutherland 1864).

Wilmot Township was first settled by Christian Naffziger, a German Menonnite, in 1822. Following a survey of the township in 1824, he emigrated with his family and other German settlers in 1826, who each received a front quarter of each lot north and south of Erbs Road, Snyder's Road and Bleams Road (Sutherland 1864; Heritage Wilmot 2022). Consequently, the survey of the Township of Wilmot divided the township into three horizontal blocks of land: the German Blocks North and South of Erbs Road, Snyder's Road and Bleams Road; and Block A and Block B, which were purchased by the Canada Company (Sutherland, 1864:51). In 1825, the township contained 720 individuals; by 1841, there were 2,220 individuals (who were primarily German, with few Canadians). By 1854, the population was 4,863 and by 1861, there were 6,173 individuals living in the Township of Wilmot (Smith, 1846:220; Smith 1851:122; Sutherland 1864:51). As the township continued to develop, small villages began to form that serviced the surrounding rural community.

1.2.3.2 Baden

Baden, located northwest of the study area, was founded and established in 1855. The community was initially named Weissenburg after an elderly bachelor living in the area but was renamed Baden after the Grand Duchy of Baden-Baden in Germany (Heritage Wilmot 2022). By 1873, Baden was described as "a thriving post village in Waterloo Co., Ont., on the G.T.R. [Grand Trunk Railway], 72 miles W. of Toronto. It contain[ed] a large iron foundry, woollen, flax and stave factories, a brewery, a telegraph office, and several stores" (Lovell 1873:25).

1.2.3.3 New Hamburg

In 1830, the village of Cassel was established by William Scott (Heritage Wilmot 2022). An epidemic of Asiatic cholera in 1834 nearly decimated the village (Heritage Wilmot 2022). German settlers renamed the village New Hamburg in 1851 after the German city (Rayburn 1997). Incorporated as a village in 1858 and as a town in 1966, it was annexed by the municipal township of Wilmot in 1973 (Rayburn 1997).

1.2.3.4 Study Area

The study area is located within part of Lots 17 to 19, German Block North of Bleems Road; part of Lots 18 to 21 and 23, German Block South of Bleems Road; part of Lot 16, German Block North of Snyders Road; part of Lost 15 to 17, German Block South of Synders Road; and, part of Lot 16, German Block South of Erbs Road, in the Geographic Township of Wilmot, former Waterloo County, now the Township of Wilmot, Regional Municipality of Waterloo, Ontario.

To understand the past land-use history of the study area and determine the presence of features that may indicate archaeological potential, the 1861 *Tremaine's Map of the County of Waterloo, Canada West* (Tremaine 1861) and 1881-1877 *Historical Atlas of Waterloo & Wellington Counties, Ontario* (Parsell, H. & Co. 1881) were reviewed (Figure 3). Both resources identify the lots associated with the study area to

have been owned by numerous individuals by 1861. According to these resources, numerous historical homesteads, transportation routes, and water courses are located near the study area.

A review of the study area through 20th century topographic maps shows a predominantly agricultural landscape. The urban regions of Baden and New Hamburg are seen near the study area (Figure 4). By the middle of the 20th century, the historical field division and sparse nature of development in terms of housing had mainly remained the same as in the latter half of the 19th century (Figure 5). Reviewing imagery from the 21st century reveals that the project area and surrounding landscape have not experienced significant urban/suburban expansion aside from the minimal growth of Baden and New Hamburg and some infrastructure development.

1.3 Archaeological Context

1.3.1 Natural Environment

The study area is situated within southern Ontario's Stratford Till Plain and Waterloo Hills physiographic regions (Chapman and Putnam 1984). The Stratford Till Plain region is described as:

> …broad clay plain of 1,370 square miles, extending from London in the south to Blyth and Listowel in the north with a projection toward Arthur and Grand Valley. It is an area of ground moraine interrupted by several terminal moraines. The moraines are more closely spaced in the southwestern portion of the region; consequently, that part resembles the Mount Elgin Ridges…. Throughout this area, the till is relatively uniform, a brown calcareous silty clay on the ridges or the more level ground moraine. It is a product of the Huron ice lobe. Some of the silt and clay is calcareous rock flour, probably a good deal of it coming from previously deposited varved clays of the Lake Huron Basin.
>
> (Chapman and Putnam 1984:133)

The Waterloo Hills region is described as:

> …occupies about 300 square miles or 192,000 acres, lying chiefly in the Regional Municipality of Waterloo…The surface is composed of sandy hills, some of them being ridges of sandy till while others are kames or kame moraines, with outwash sands occupying the intervening hollows….Adjoining the hilly region is an extensive area of alluvial terraces of the Grand River spillway system, which, although more nearly horizontal, contains similar but more uniform sandy and gravelly materials….The original forest consisted of splendid pines and hardwoods such as sugar maple, beech, wild cherry, and red oak.
>
> (Chapman and Putnam 1984:136)

The study area is in Ecoregion 6E (Lake Simcoe-Rideau Ecoregion) and, more specifically, the Ecodistrict of 6E-1 (Stratford) (Henson and Brodribb 2005). Ecodistrict 6E-1 consists of smooth clay areas and gently rolling till moraines. The land use in this Ecodistrict is predominately agricultural, with cropland constituting a large portion of the land cover (44%) (Henson and Brodribb 2005:312). Other land uses include gravel pits, quarries, and settlement areas. Sixteen percent (16%) of the Ecodistrict remains as natural cover and has forests and wetland pockets (Henson and Brodribb 2005:312).

The study area is within the Niagara section of the Deciduous Forest Region (Rowe 1972). This section covers the Ontario peninsula, enclosed by lakes Ontario, Erie, and Huron. Forest communities are dominated by broadleaved trees that are common to the Great Lakes-St. Lawrence and Deciduous Forest Regions. They consist of beech, Sugar maple, basswood, Red maple, Red oak, White oak, and Bur oak.

Potable water is an essential resource for any extended human occupation or settlement. Since water sources in southwestern Ontario have remained relatively stable over time, proximity to potable water is a helpful index for evaluating archaeological potential. Distance to water is one of Ontario's most used variables for predictive modelling of archaeological site locations. The study area is within the Grand River watershed and is in proximity to and crossed by several named and unnamed watercourses, including Baden Creek, Nith River, and Silver Springs Creek.

1.3.2 Registered Archaeological Sites and Surveys

In Canada, archaeological sites are registered within the Borden system, a national grid system designed by Charles Borden in 1952 (Borden 1952). The grid covers the entire surface area of Canada and is divided into major units containing an area that is two degrees in latitude by four degrees in longitude. Major units are designated by upper case letters. Each major unit is subdivided into 288 basic unit areas, each containing an area of 10 minutes in latitude by 10 minutes in longitude. The width of basic units reduces due to the earth’s curvature as one moves north. In southern Ontario, each basic unit measures approximately 13.5 kilometres east-west by 18.5 kilometres north-south. In northern Ontario, adjacent to Hudson Bay, each basic unit measures approximately 10.2 kilometres east-west by 18.5 kilometres north-south. Basic units are designated by lower case letters. Individual sites are assigned a unique, sequential number as they are registered. These sequential numbers are issued by the MCM, which maintains the *Ontario Archaeological Sites Database*. The study area under review is in Borden Blocks AiHd and AiHe.

Information concerning specific site locations is protected by provincial policy and is not fully subject to the *Freedom of Information and Protection of Privacy Act* (Government of Ontario 1990a). The release of such information in the past has led to looting or various forms of illegally conducted site destruction. Confidentiality extends to media capable of conveying location, including maps, drawings, or textual descriptions of a site location. The MCM will provide information concerning site location to the party or an agent of the party holding title to a property, or a licensed archaeologist with relevant cultural resource management interests. An examination of the *Ontario Archaeological Sites Database* has shown that 38 registered archaeological sites are located within a one-kilometre radius of the study area (Table 1.2) (Government Ontario 2022a); no registered sites are within 50 metres of the study area.

Table 1.2 Registered Sites within One Kilometre of the Study Area

Borden Number	Site Name	Cultural Affiliation	Site Type
Registered Sites within 300 metres of the Study Area			
AiHd-91	Baden Brewery	Euro-Canadian	Brewery; creamery
AiHd-162	-	Euro-Canadian	Dump
AiHd-177	-	Indigenous	Scatter
AiHd-178	Skiwa	Indigenous, Late Archaic	Findspot
AiHe-467	Kwaya-si	Indigenous, Late Paleo	Findspot
AiHe-468	-	Indigenous, Middle Archaic	Hunting loss
AiHe-470	-	Indigenous	Scatter
Registered Sites greater than 300 metres and within One Kilometre of the Study Area			
AiHd-2	Baden	-	-
AiHe-14	Bergey 1 and 2	Indigenous, Archaic	Camp/ campsite
AiHe-20	Boehler Pottery	Euro-Canadian	-
AiHe-29	Nader	Euro-Canadian	House
AiHe-30	Nevill	Euro-Canadian	Midden
AiHe-31	Good Enough	Indigenous	Lithic scatter
AiHe-34	Morningside	Indigenous, Middle Archaic	Camp/ campsite
AiHe-35	Helmuth	Indigenous	Lithic scatter
AiHe-36	Nuhrgang	Indigenous	Unknown
AiHe-38	Castle Kilbride	Euro-Canadian	Farmstead
AiHe-45	-	Indigenous	Scatter
AiHd-69	Schout	Indigenous	Lithic scatter
AiHd-110	Michel	Indigenous, Early Archaic	Findspot
AiHe-7	New Hamburg 1	Indigenous	Village
AiHe-14	Bergey 1 and 2	Indigenous, Archaic	Camp/ campsite
AiHe-20	Boehler Pottery	Euro-Canadian	-
AiHe-29	Nader	Euro-Canadian	House
AiHe-30	Nevill	Euro-Canadian	Midden
AiHe-31	Good Enough	Indigenous	Lithic scatter
AiHe-34	Morningside	Indigenous, Middle Archaic	Camp/ campsite
AiHe-35	Helmuth	Indigenous	Lithic scatter
AiHe-36	Nuhrgang	Indigenous	Unknown
AiHe-38	Castle Kilbride	Euro-Canadian	Farmstead
AiHe-45	-	Indigenous	Scatter
AiHe-46	-	Euro-Canadian	Homestead; midden
AiHe-463	-	Indigenous Archaic	Findspot
AiHe-464	-	Indigenous, Middle Archaic; Early Woodland	Camp/ campsite

Borden Number	Site Name	Cultural Affiliation	Site Type
AiHe-465	-	Indigenous, Middle Archaic; Late Archaic	Camp/ campsite
AiHe-466	-	Indigenous, Early Woodland	Camp/ campsite; scatter
AiHe-469	Asyeh	Indigenous, Late Archaic; Late Woodland	Short term
AiHe-477	-	Euro-Canadian	Residential

'-' denotes MCM Ontario Archaeological Sites Database data is unavailable.

A query of the *Ontario Public Register of Archaeological Reports* database was completed to identify previous archeological assessments within 50 metres of the study area (Government Ontario 2022b). The results of the query are presented in Table 1.3.

Table 1.3 Archaeological Assessments within 50 metres of the Study Area

Consultant	Report	Project Information Form (PIF) Number	Year
The Archaeologists Inc.	*Stage 1 & 2 Archaeological Assessment of Part of Lot 15 – South of Snyder's Road Concession, Township of Wilmot (Part 9 and 10, Plan 58R-15186), Regional Municipality of Waterloo*	P052-0592-2014	2015
Amick Consultants Ltd.	*Stage 1-2 Archaeological Assessment, 1012 Snyder's Road West, Part of Lots 15 & 16, German Block South of Erbs Road and Part of Lot 16, German Block North of Snyder's Road, (Geographic Township of Wilmot, County of Waterloo), Township of Wilmot, Regional Municipality of Waterloo*	P038-0989-2019	2019
Detritus Consulting Ltd.	*Stage 1-2 Archaeological Assessment Foundry and Gingerich Lands Part of Lots 15 and 16, German Block South of Snyder Road, Geographic Township of Wilmot, now the Region of Waterloo, Ontario*	P017-0806-2020	n.d.

The Archaeologists Inc. (2015) undertook a Stage 1-2 archaeological assessment of part of Lot 15, South of Snyder's Road for a parcel at the northeast corner of Gingerich Road and Foundry Street (Part 9 and 10, Plan 58R-15186). This assessment included a part of the current Baden PS and the forcemain portion of the study area for the Project. No archaeological resources were recovered, and no further assessment was recommended (The Archaeologists Inc. 2015).

In 2019, a Stage 1-2 archaeological assessment of 1012 Snyder's Road West was completed by Amick Consultants Ltd (2019). This assessment included a part of the current Foxboro water and a sanitary portion of the study area for the Project. No archaeological resources were recovered, and no further assessment was recommended (Amick Consultants Ltd. 2019).

Detritus Consulting Ltd. undertook a Stage 1-2 archaeological assessment of part of Lots 15 and 16, German Block South of Snyder Road (n.d.). This assessment included a part of the current Baden PS and the forcemain portion of the study area for the Project. Although archaeological resources were recovered, no archaeological sites retaining further cultural heritage value or interest were identified within 150 metres of the current study area (Detritus Consulting Ltd. n.d).

1.3.3 Archaeological Master Plan

The Regional Municipality of Waterloo developed an Archaeological Facilities Master Plan (Regional Municipality of Waterloo 1989). The purpose of the plan "is to identify and evaluate the archaeological resources in the Region and to study the feasibility of developing an archaeological facility" (Regional Municipality of Waterloo 1989:2). Distance to water, and distance to multiple different water sources, provided the basis for the most efficient model for Indigenous site potential modelling. Euro-Canadian site potential modelling focused on areas which would provide evidence for some of the area's earliest settlements, including historical roads, early historical communities, and structures illustrated on historical mapping. Based on the archaeological potential modelling criteria included in the *Archaeological Facilities Master Plan* (Regional Municipality of Waterloo 1989), portions of the study area are situated within areas retaining archaeological potential.

1.3.4 Existing Conditions

The study area is in southwestern Ontario within the Township of Wilmot in the Regional Municipality of Waterloo. It can be characterized as countryside agricultural, rural settlement, and urban industrial and residential. Several roads and adjacent rural and urban properties are within the study area, including agricultural, residential, industrial, wood, park, and scrublands. Also, several named and unnamed watercourses, including Baden Creek, Nith River, and Silver Springs Creek, are in proximity to and cross the study area.

2 Field Methods

The Stage 1 property inspection of the study area was conducted in compliance with Section 1.2 of the MCM's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011) on June 9, 2022. Stage 1 property inspection was conducted by Heather Kerr, MA (P1148). The weather during the Stage 1 property inspection was sunny and clear. The lighting conditions during the inspection permitted good visibility of all parts of the study area and were conducive to identifying features and assessing archaeological potential.

The property inspection was carried out systematically every 20 to 30 metres, reviewing the entire extent of the study area to identify the presence or absence of archaeological potential. Photographic images of the study area are presented within Section 7. Location and orientation information associated with representative photographs taken in the field is provided in Figure 6.

Features of archaeological potential were confirmed to be present, including watercourses, physiography conducive to past land use, historical transportation routes, and historical settlements.

Per Section 1.3.2 of the MCM's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), the study area was evaluated for extensive disturbances that would have removed archaeological potential. According to the MCM's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), disturbances may include but are not limited to: grading below topsoil, quarrying, building footprints, or sewage and infrastructure development. Disturbances consisting of existing infrastructure (i.e., roadways and ROWs, PS, WTP, etc.), urban development (i.e., residential and industrial), utilities, gravel laneways, and building footprint were encountered (Photo 1 to Photo 21).

The study area was also evaluated for physical features of no or low archaeological potential. These usually include but are not limited to permanently wet areas, exposed bedrock, and steep slopes (greater than 20°), except in locations likely to contain pictographs or petroglyphs, per Section 2.1, Standard 2.a of the MCM's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). Physical features with low archaeological potential consisting of low-lying terrain, permanently wet areas (i.e., Baden Creek, Nith River, and Silver Springs Creek), and steeply sloping terrain were encountered (Photo 22 to Photo 24).

The remainder of the study area, excluding areas previously assessed to have no further archaeological potential (Section 1.3.2), can be considered to retain archaeological potential (Photo 25 to Photo 32).

3 Analysis and Conclusions

3.1 Evaluating Archaeological Potential

3.1.1 Features Indicating Archaeological Potential

Archaeological potential is established by determining whether features or characteristics indicating potential are located on or in the vicinity of a project area. Features and characteristics that indicate archaeological resources are defined within Section 1.3.1 of the MCM's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011:17-18) and include:

- Previously identified archaeological sites.
- Water sources:
  - Primary water sources (i.e., lakes, rivers, streams, and creeks).
  - Secondary water sources (i.e., intermittent streams and creeks, springs, marshes, and swamps).
  - Features indicating past water sources (i.e., glacial lake shorelines indicated by the presence of raised sand or gravel beach ridges, relic river or stream channels, shorelines of drained lakes or marshes, and cobble beaches).
- Accessible or inaccessible shoreline (i.e., high bluffs, swamps or marsh fields by the edge of a lake, and sandbars stretching into marsh).
- Elevated topography (i.e., eskers, drumlins, large knolls, plateaux).
- Pockets of well-drained sandy soil, especially near areas of heavy soil or rocky ground.
- Distinctive land formations that might have been special or spiritual places, such as waterfalls, rock outcrops, caverns, mounds, and promontories and their bases.
- Resource areas including:
  - Food or medicinal plants.
  - Scarce raw minerals (i.e., quartz, copper, ochre, and/or outcrops of chert).
  - Early Euro-Canadian industry (i.e., fur trade, logging, prospecting, mining).
- Areas of early Euro-Canadian settlement including:
  - Early military or pioneer settlement (i.e., pioneer homesteads, isolated cabins, and farmstead complexes).
  - Early wharf or dock complexes, pioneer churches and early cemeteries.
- Early historical transportation routes (i.e., trails, passes, roads, railways, and portage routes).
- Property listed on a municipal register or designated under the *Ontario Heritage Act* (Government of Ontario 2022) or that is a federal, provincial, or municipal historical landmark or site.

- Property that local histories or informants have identified with possible archaeological sites, historical events, activities, or occupations.

Many of the above features of archaeological potential have a buffer assigned to them, extending the zone of archaeological potential beyond the feature. The following buffers are commonly accepted by the MCM and are specifically indicated in Section 1.4 of the 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011:20-21).

- 300 metre buffer: registered archaeological sites; water sources; areas of early Euro-Canadian settlement; or locations identified through local knowledge or informants.
- 100 metre buffer: early historical transportation route.

If no buffer is inherently present, the potential is restricted to the physical limits or the feature: elevated topography, pockets of well-drained sandy soil, distinctive land formations, resources areas, listed or designated properties and landmark properties.

Distance to water sources is an important determinant of past human settlement patterns and may determine archaeological potential. However, any combination of two or more other criteria, such as well-drained soils, or topographic variability, may also indicate archaeological potential.

The closest hydrological features include several named and unnamed watercourses, including Baden Creek, Nith River, and Silver Springs Creek. These watercourses are in proximity to and cross parts of the study area. Soil texture can be an important determinant of past settlement, usually combined with other factors, such as topography. The study area consists of soils which are characterized as having been suitable for past human settlement.

Furthermore, the MCM stipulates those areas within 300 metres of registered archaeological sites have archaeological potential. A review of the *Ontario Archaeological Sites Database* maintained by the MCM identifies registered archaeological sites within 300 metres of the study area (Table 1.2).

Areas of early Euro-Canadian settlements (i.e., pioneer homesteads, isolated cabins, farmstead complexes, early wharf or dock complexes, pioneer churches, and early cemeteries), early historical transportation routes (i.e., trails, passes, roads, railways, and portage routes), and properties that local histories or informants have identified with possible archaeological sites, historical events, activities, or occupations, are considered features of archaeological potential. A review of 19th century mapping illustrates that the study area is close to several historical settlements (i.e., homesteads and farmsteads) and historical transportation routes (Figure 3).

In addition to the above, based on the archaeological potential modelling criteria included in the *Archaeological Facilities Master Plan* (Regional Municipality of Waterloo 1989), portions of the study area are situated within areas that retain archaeological potential.

3.1.2 Archaeological Integrity

Archaeological potential can be determined not to be present for either the study area or part(s) of it when the area under consideration has been subject to extensive and deep land alterations that have severely damaged the integrity of any archaeological resources. This is commonly referred to as 'disturbed' or 'disturbance' and may include: grading below topsoil, quarrying, building footprints, or sewage and infrastructure development. Activities such as agricultural cultivation, gardening, minor grading and landscaping do not necessarily affect archaeological potential. Through the background research and property inspection, disturbances consisting of existing infrastructure (i.e., roadways and ROWs, PS, WTP, etc.), urban development (i.e., residential and industrial), utilities, gravel laneways, and building footprint were encountered in the study area (Photo 1 to Photo 21).

The study area was also evaluated for physical features of no or low archaeological potential. These usually include but are not limited to permanently wet areas, exposed bedrock, and steep slopes (greater than 20°) except in locations likely to contain pictographs or petroglyphs, per Section 2.1, Standard 2.a of the MCM's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). Physical features of no or low archaeological potential were encountered within the study area in the form of permanently low and wet conditions associated with several watercourses and steeply sloping terrain (Photo 22 to Photo 24; Figure 6).

3.1.3 Previous Archaeological Assessments

Section 1.3.3 of this report noted that several archaeological assessments had been completed adjacent to and within the study area. These assessments have resulted in their respective areas having no further cultural heritage value or interest (Figure 6).

3.2 Conclusions

Based on the background research and property inspection results, the following conclusions regarding the archaeological potential of the study area are provided below.

Parts of the study area were extensively disturbed from previous road construction, utility installations, infrastructure development, and building footprints, which have removed any archaeological potential that may have been present. Also, parts of the study area were determined to have no or low archaeological potential based on identifying permanently wet areas and steeply sloping terrain. Other parts of the study area have been subject to previous archaeological assessments and were determined to have no further cultural value or interest. These areas have no to low archaeological potential (Figure 6).

The remainder of the study area was determined to retain archaeological potential based on its proximity to water sources, registered archaeological sites, historical settlements and routes, and physiographic features (Photo 25 to Photo 32; Figure 6).

4 Recommendations

Based on the findings presented in the preceding sections of this report, the following recommendations are provided:

1. Parts of the study area identified as having archaeological potential are recommended to be subject to a Stage 2 archaeological assessment before any impacts. These areas are recommended to be subject to pedestrian or test pit survey at 5 m intervals per Sections 2.1.1 and 2.1.2 of the MCM's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011).

   The pedestrian survey involves systematic walking of open ploughed fields at 5 m intervals as outlined in Section 2.1.1 of the MCM's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). The MCM standards further require that agricultural land, both active and inactive, be recently ploughed and sufficiently weathered to improve the visibility of archaeological resources. Ploughing must be deep enough to provide total topsoil exposure but not deeper than the previous ploughing and must provide at least 80% ground surface visibility.

   For areas inaccessible for ploughing, Stage 2 archaeological assessment will include a test pit survey at 5 m intervals as outlined in Section 2.1.2 of the MCM's *2011 Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). The MCM standards require that each test pit be at least 30 centimetres in diameter, excavated to at least five centimetres into the subsoil, and have excavated soil screened through six-millimetre mesh to facilitate the recovery of any cultural material that may be present. Before backfilling, each test pit will be examined for stratigraphy, cultural features, or evidence of fill.

2. Parts of the study area identified as having been previously assessed and of no further cultural heritage value or interest. For these areas, no further archaeological assessment is recommended.

3. Parts of the study area identified as having no to low archaeological potential. For these areas, no further archaeological assessment is recommended.

The MCM is asked to review the presented results and accept this report into the *Ontario Public Register of Archaeological Reports*.

5 Advice on Compliance with Legislation

In accordance with Section 7.5.9 of the MCM's 2011 Standards and Guidelines for Consultant Archaeologists *(Government of Ontario 2011), the following standard statements are a required component of archaeological reporting and are provided verbatim from the MCM's 2011* Standards and Guidelines for Consultant Archaeologists *(Government of Ontario 2011).*

This report is submitted to the Ministry of Citizenship and Multiculturism as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c O.18 (Government of Ontario 1990b). The report is reviewed to ensure that it complies with the standards and guidelines that the Minister issues, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the study area of a development proposal have been addressed to the satisfaction of the Ministry of Citizenship and Multiculturism, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* (Government of Ontario 1990b) for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the *Ontario Public Register of Archaeological Reports* referred to in Section 65.1 of the *Ontario Heritage Act* (Government of Ontario 1990b)

Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the *Ontario Heritage Act* (Government of Ontario 1990b) The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48(1) of the *Ontario Heritage Act* (Government of Ontario 1990b)

The *Funeral, Burial and Cremation Services Act,* 2002, S.O. 2002, c.33 (Government of Ontario 2002), requires that any person discovering or having knowledge of a burial site shall immediately notify the police or coroner. It is recommended that the Registrar of Cemeteries at the Ministry of Government and Consumer Services is also immediately notified.

Archaeological sites recommended for further archaeological fieldwork remain subject to Section 48(1) of the *Ontario Heritage Act* (Government of Ontario 1990b) and may not be altered, or have artifacts removed, except by a person holding an archaeological license.

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7 Images



Photo 1 **Existing Foxboro Green PS, facing southwest**



Photo 2 **Existing road (Golf Link Drive) and utilities, facing southwest**



Photo 3 **Existing road (Golf Link Drive), facing north**



Photo 4 **Existing water infrastructure, facing north**



Photo 5 **Existing late-20th to early 21st century residential development, facing northeast**



Photo 6 **Existing late-20th to early 21st century residential development, facing north**



Photo 7 **Existing New Hamburg WTP, facing south**



Photo 8 **Existing New Hamburg WWTP, facing north**



Photo 9 **Existing New Hamburg WWTP, facing east**



Photo 10 **Existing road (Holland Mills Road), facing north**



Photo 11 **Existing road (Holland Mills Road), facing east**



Photo 12 **Existing road (Holland Mills Road), facing south**



Photo 13 Existing road (Bleams Road East) and ditching, facing west



Photo 14 Existing road (Nafziger Road) and ditching, facing southeast



Photo 15 Existing road (Nafziger Road) and ditching, facing northwest



Photo 16 Existing road (Gingerich Road) and ROW, facing southeast



Photo 17 Existing road (Gingerich Road) and ditching, facing east



Photo 18 Existing road (Gingerich Road) and ditching, facing northeast



Photo 19 Existing road (Gingerich Road) and ditching, facing northeast



Photo 20 Existing road (Foundry Street) and ditching, facing northeast



Photo 21 Existing Baden WPS, facing southwest



Photo 22 Area of low-lying permanently wet terrain, facing south



Photo 23 Area of low-lying permanently wet terrain (Baden Creek), facing southwest



Photo 24 Permanently wet area (Baden Creek), facing south



Photo 25 **Area of archaeological potential (left), facing south**



Photo 26 **Area of archaeological potential (right), facing southwest**



Photo 27 **Area of archaeological potential beyond the road, facing south**



Photo 28 **Area of archaeological potential (right), facing north**



Photo 29 **Area of archaeological potential (right), facing west**



Photo 30 **Area of archaeological potential, facing northwest**



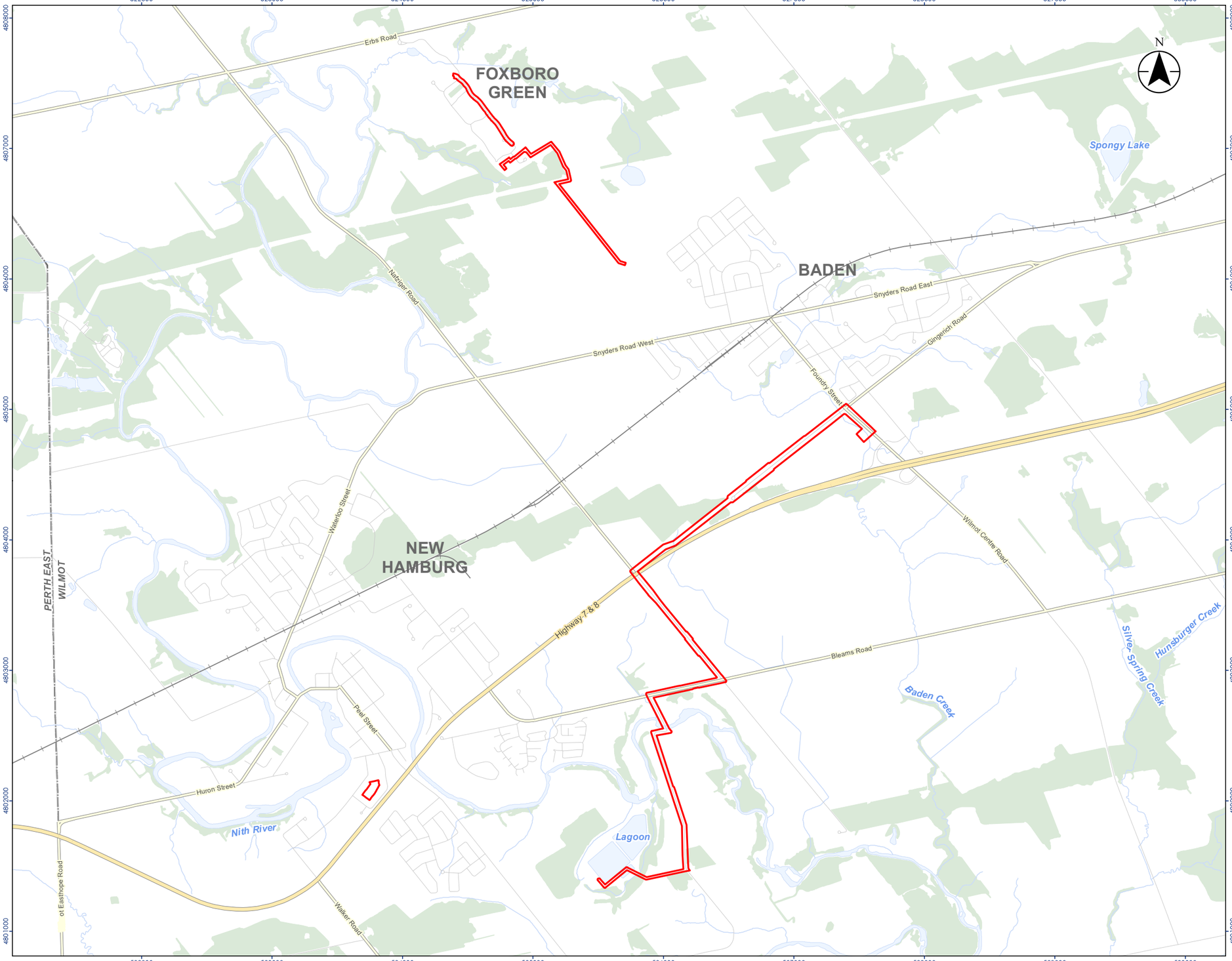
Photo 31 Area of archaeological potential, facing southwest



Photo 32 Area of archaeological potential, facing northeast

8 Maps

General maps of the study area for the Project follow on succeeding pages.



Stantec

Legend

Study Area

0 500 1,000 m

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Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
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Project Location
Wilmot Township

165640324 REVA
Prepared by KDB on 2022-06-24

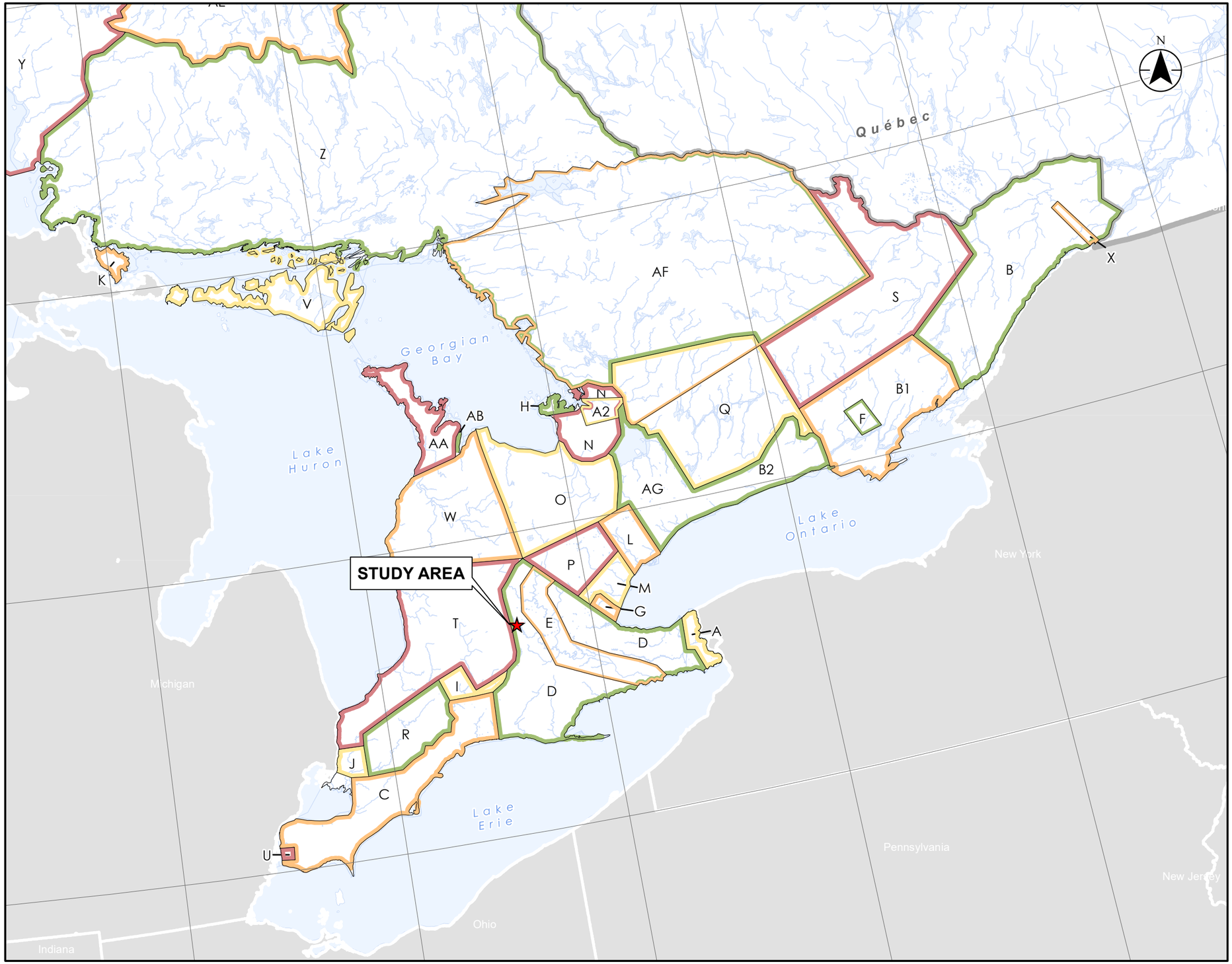
Client/Project
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Figure No.
1

Title
Project Location

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Legend

★ Approximate Location of Study Area

A	Treaty No. 381, May 9th, 1781 (Mississauga and Chippewa)
AA	Treaty No. 72, October 30th, 1854 (Chippewa)
AB	Treaty No. 82, February 9th, 1857 (Chippewa)
AE	Treaty No. 9, James Bay 1905, 1906 (Ojibway and Cree)
AG	Williams Treaty, October 31st, 1923 (Chippewa)
A2	John Collins' Purchase, 1785 (Chippewa)
B	Crawford's Purchase, October 9th, 1783 (Algonquin and Iroquois)
B1	Crawford's Purchase, October 9th, 1783 (Mississauga)
B2	Crawford's Purchase, 1783, 1787, 1788 (Mississauga)
C	Treaty No. 2, May 19th, 1790 (Odawa, Chippewa, Pottawatomi, and Huron)
D	Treaty No. 3, December 2nd, 1792 (Mississauga)
E	Haldimand Tract: from the Crown to the Mohawk, 1793
F	Tyendinaga: from the Crown to the Mohawk, 1793
G	Treaty No. 3 3/4: from the Crown to Joseph Brant, October 24th, 1795
H	Treaty No. 5, May 22nd, 1798 (Chippewa)
I	Treaty No. 6, September 7th, 1796 (Chippewa)
J	Treaty No. 7, September 7th, 1796 (Chippewa)
K	Treaty No. 11, June 30th, 1798 (Chippewa)
L	Treaty No. 13, August 1st, 1805
M	Treaty No. 13A, August 2nd, 1805
N	Treaty No. 16, November 18th, 1815 (Chippewa)
O	Treaty No. 18, October 17th, 1818 (Chippewa)
P	Treaty No. 19, October 28th 1818 (Chippewa)
Q	Treaty No. 20, November 5th, 1818 (Chippewa)
R	Treaty No. 21, March 9th, 1819 (Chippewa)
S	Treaty No. 27, May 31st, 1819 (Mississauga)
T	Treaty No. 27½, April 25th, 1825 (Ojibwa and
U	Treaty No. 35, August 13th, 1833 (Wyandot or
W	Treaty No. 45½, August 9th, 1836
X	Treaty No. 57, June 1st, 1847 (Iroquois of St. Regis)
Y	Treaty No. 60, Robinson, Superior, September 7th, 1850 (Ojibwa)
Z	Treaty No. 61, Robinson, Huron, September 9th, 1850 (Ojibwa)

0 50 100 Km

1:3,000,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 Statistics Canada Lambert
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2018.
3. Treaty boundaries adapted from Morris 1943 (1964 reprint). For cartographic representation only.

Project Location
Township of Wilmot

165640324 REVA
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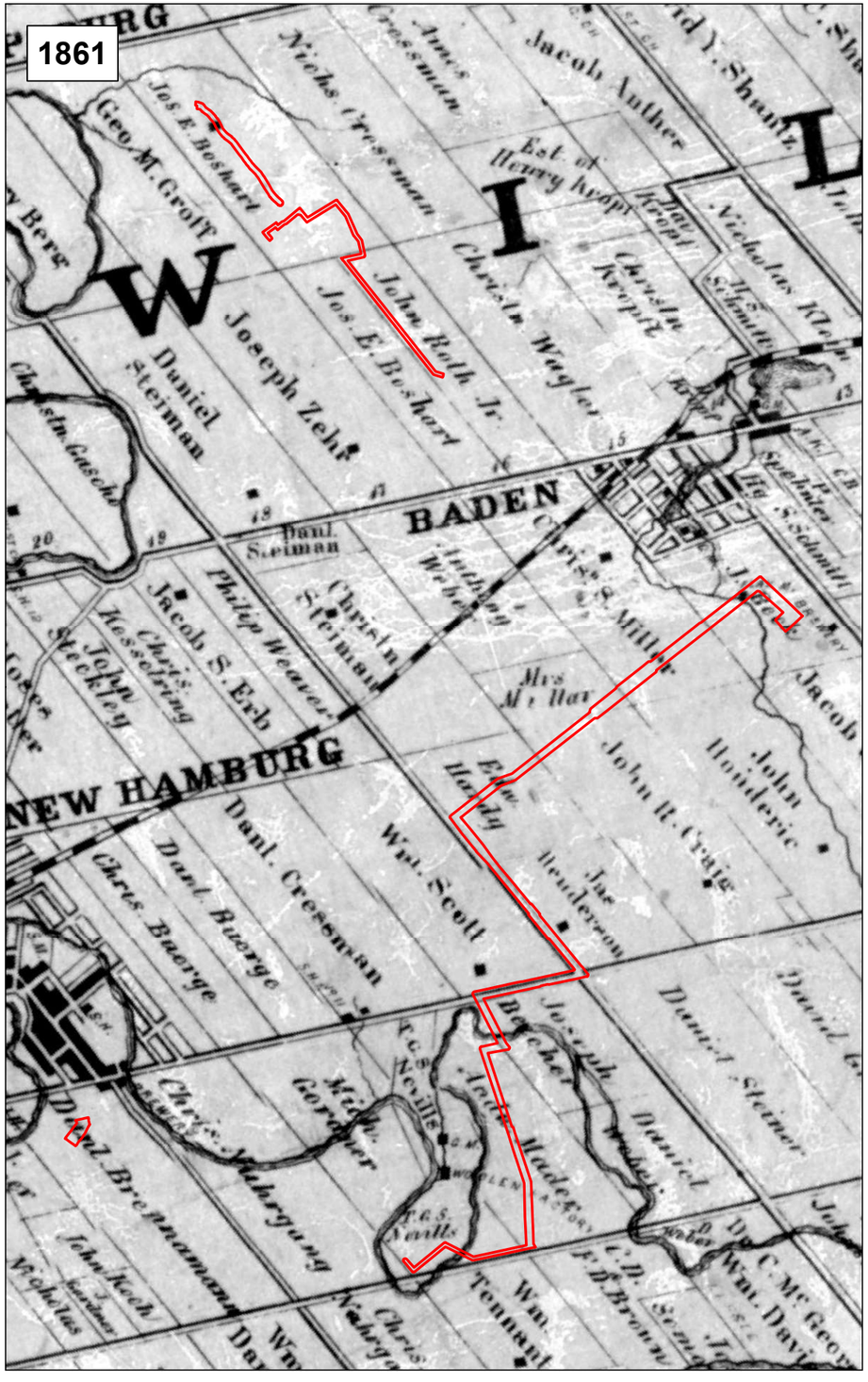
Client/Project
REGION OF WATERLOO | BADEN - NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

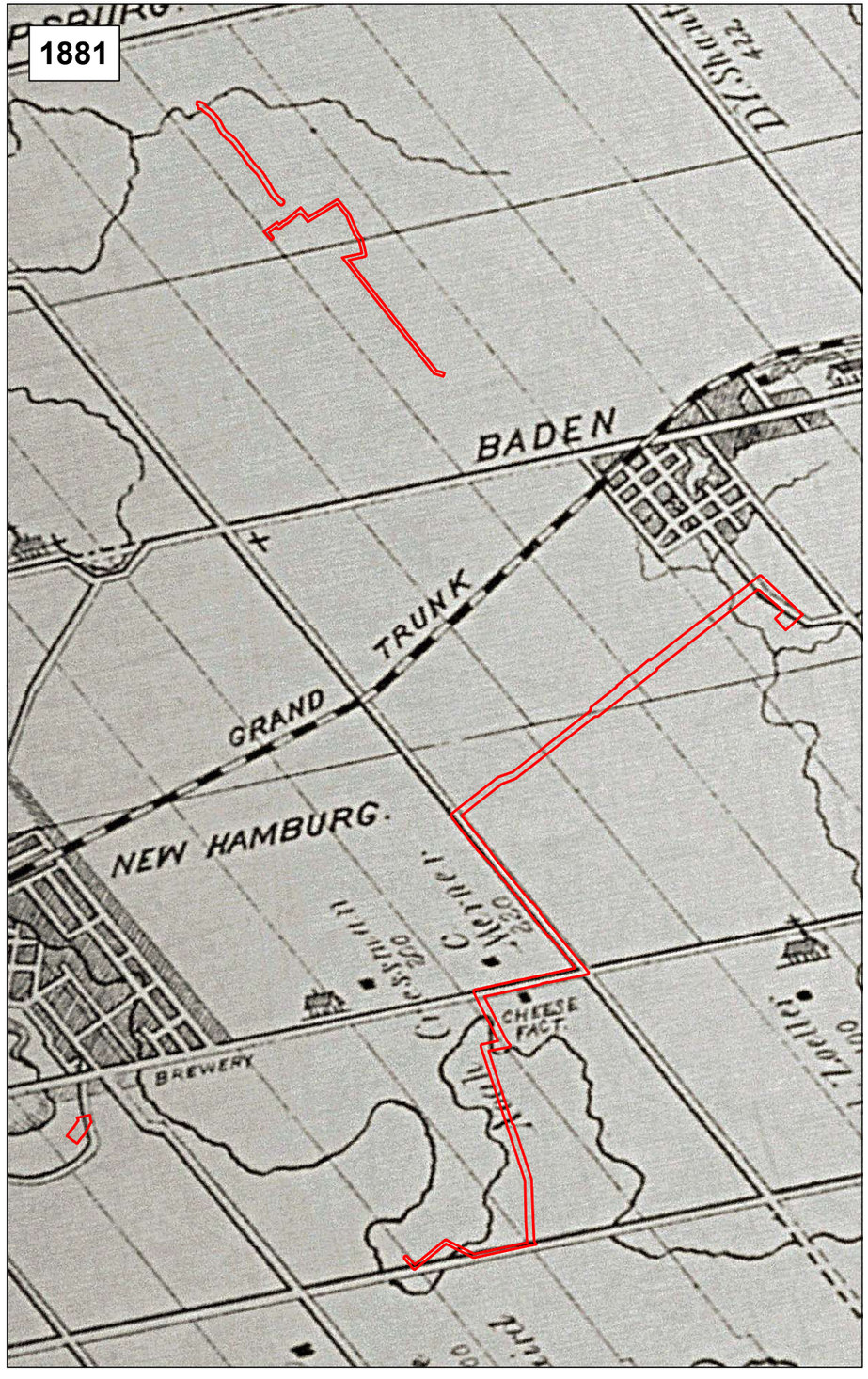
Figure No.
2

Title
Treaties and Purchases (Adapted from Morris 1943)

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Stantec

Legend

Approximate Location of Study Area

Notes

1. Historical mapping not to scale.
2. Sources: 1861 Tremaine's Map of the County of Waterloo, Canada West Historical County Map of Ontario County (Geo. R. & G.M. Tremaine); 1877-1881 Historical Atlas of Waterloo & Wellington Counties, Ontario (H. Parsell & Co and Walker & Miles)

Project Location
Wilmot Township

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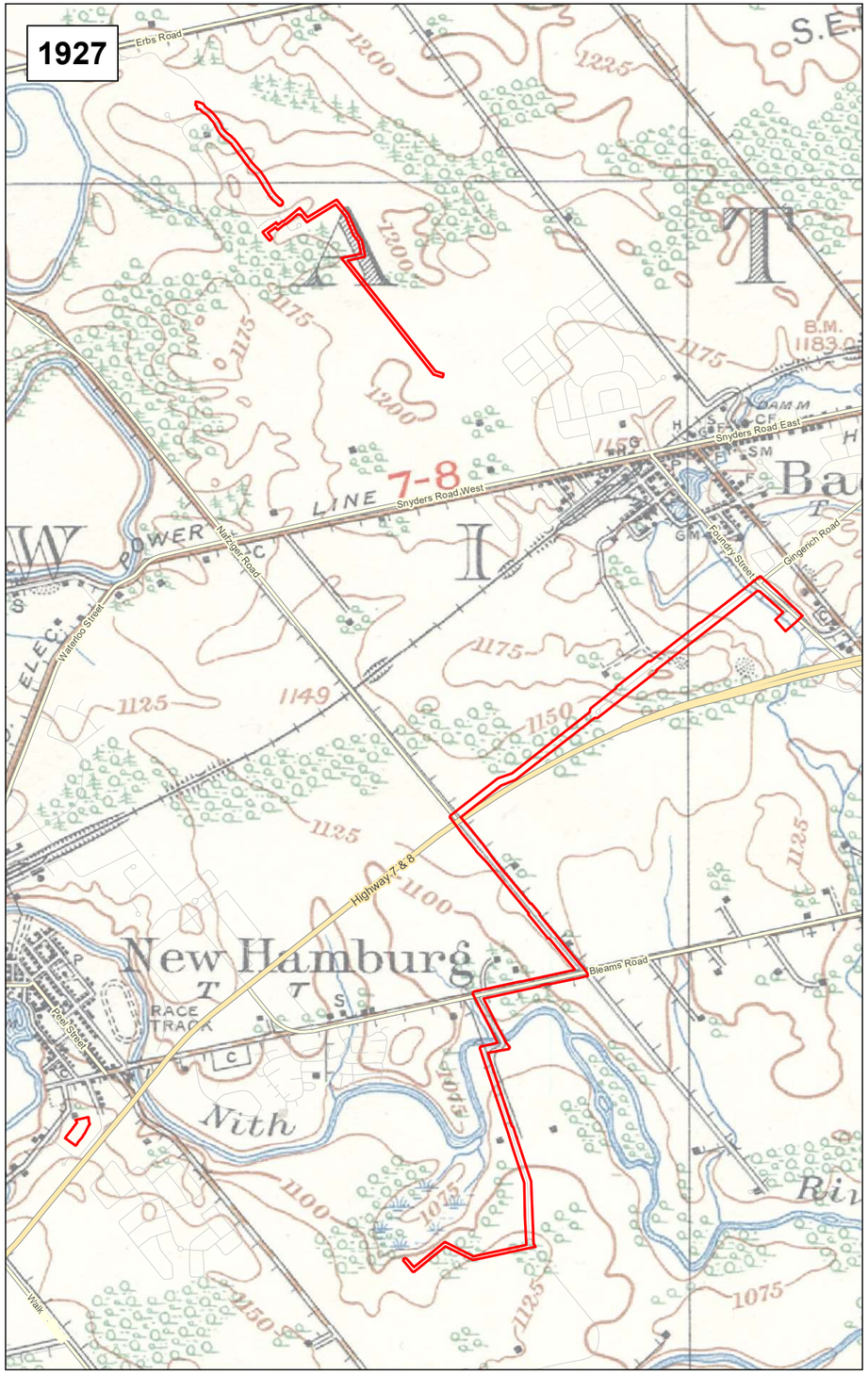
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REGION OF WATERLOO | BADEN - NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

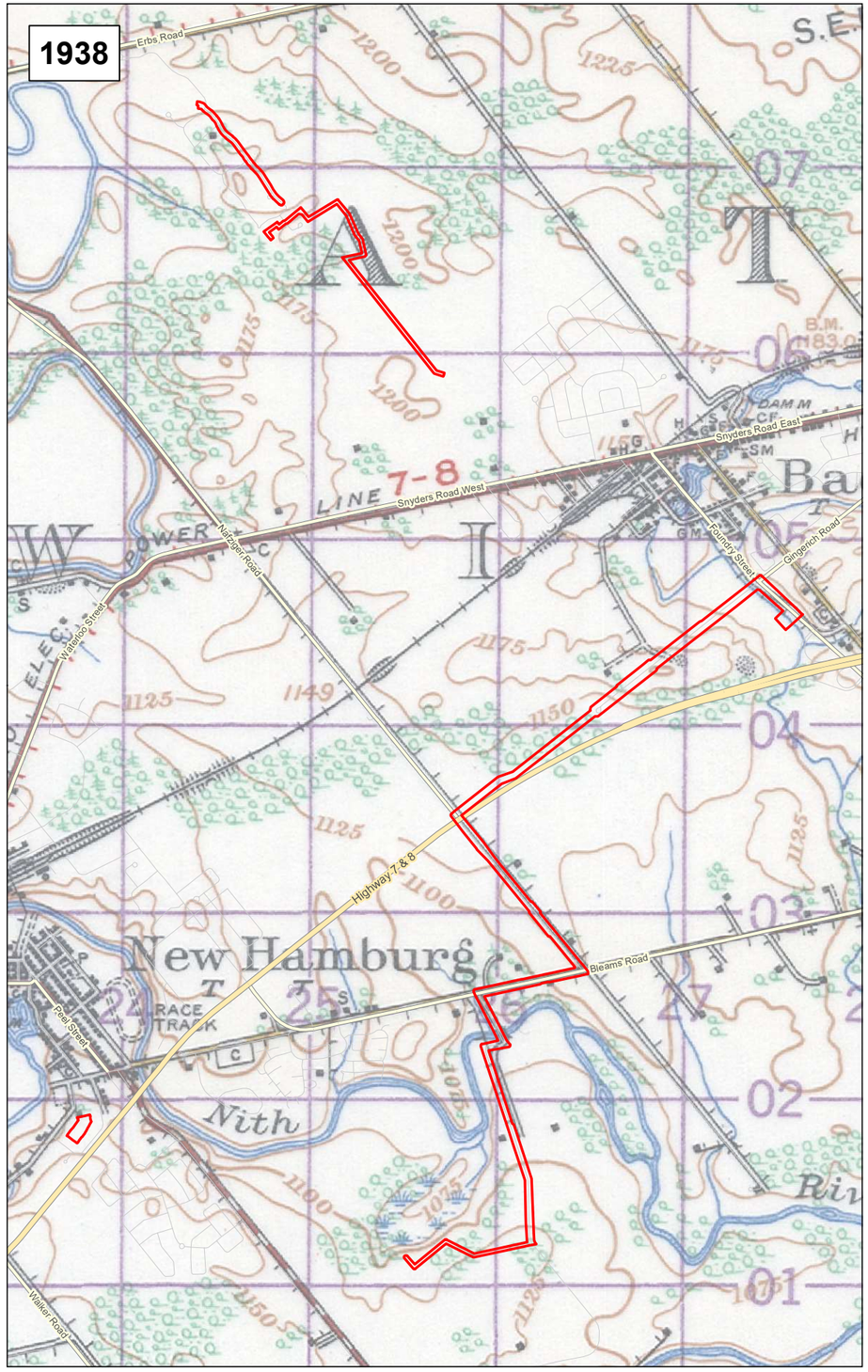
Figure No.
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Title
19th Century Historical Maps

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Legend

Approximate Location of Study Area

Notes

1. Historical mapping not to scale.
2. Sources: 1927 Stratford, Ontario. 1:63,360. Map Sheet 040P07, [ed. 1]. Geographical Section, General Staff, Department of National Defence;
1938 Stratford, Ontario. 1:63,360. Map Sheet 040P07, [ed. 3], gridded. Geographical Section, General Staff, Department of National Defence

Project Location
Wilmot Township

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Client/Project
REGION OF WATERLOO | BADEN - NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
4

Title
20th Century Topographic Maps

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Stantec

Legend

Approximate Location of Study Area

Notes

1. Non-orthorectified imagery not to scale.
2. Source: 1954 Air Photos of Southern Ontario. University of Toronto Libraries, Map and Data Library. Available at https://mdl.library.utoronto.ca/collections/air-photos/1954-air-photos-southern-ontario/index (Accessed 21 June 2022)

Project Location
Wilmot Township

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Prepared by KDB on 2022-06-27

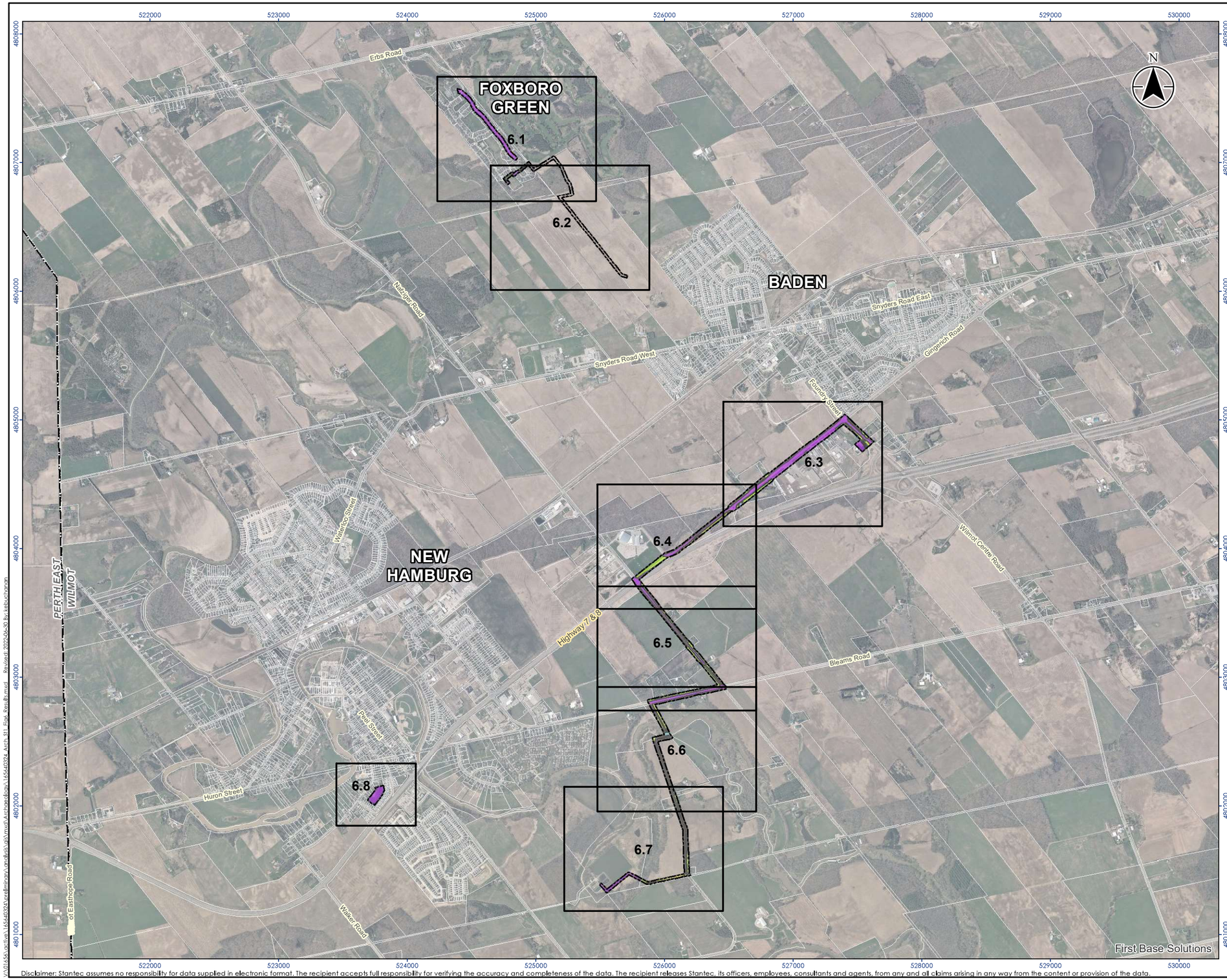
Client/Project
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Figure No.
5

Title
1954 Aerial Photograph

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Stantec

Legend

Study Area

Recommendations

- Area of Archaeological Potential, Stage 2 Pedestrian Survey at 5 m Intervals Recommended
- Area of Archaeological Potential, Stage 2 Test Pit Survey at 5 m Intervals Recommended
- Low Archaeological Potential, Steep Slope
- No Archaeological Potential, Permanently Wet
- No Archaeological Potential, Previously Disturbed
- No Archaeological Potential, Previously Assessed (Amick Consultants Ltd. 2019, P038-0989-2019)
- No Archaeological Potential, Previously Assessed (Detritus Consulting Ltd. 2020, P017-0806-2020)
- No Archaeological Potential, Previously Assessed (The Archaeologists Inc. 2015, P052-0592-2014)

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Notes

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Project Location
Wilmot Township

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Prepared by KDB on 2022-06-30

Client/Project
REGION OF WATERLOO | BADEN - NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
6.0

Title
Stage 1 Archaeological Assessment Results and Recommendations

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Stantec

Legend

- Study Area
- Parcel Fabric
- Photo Location and Direction

Recommendations

- Area of Archaeological Potential, Stage 2 Pedestrian Survey at 5 m Intervals Recommended
- Area of Archaeological Potential, Stage 2 Test Pit Survey at 5 m Intervals Recommended
- Low Archaeological Potential, Steep Slope
- No Archaeological Potential, Permanently Wet
- No Archaeological Potential, Previously Disturbed
- No Archaeological Potential, Previously Assessed (Amick Consultants Ltd. 2019, P038-0989-2019)
- No Archaeological Potential, Previously Assessed (Detritus Consulting Ltd. 2020, P017-0806-2020)
- No Archaeological Potential, Previously Assessed (The Archaeologists Inc. 2015, P052-0592-2014)

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Notes

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Project Location
Wilmot Township

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Prepared by KDB on 2022-06-30

Client/Project
REGION OF WATERLOO | BADEN - NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
6.1

Title
Stage 1 Archaeological Assessment Results and Recommendations (Sheet 1 of 8)

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Stantec

Legend

- Study Area
- Parcel Fabric
- Photo Location and Direction

Recommendations

- Area of Archaeological Potential, Stage 2 Pedestrian Survey at 5 m Intervals Recommended
- Area of Archaeological Potential, Stage 2 Test Pit Survey at 5 m Intervals Recommended
- Low Archaeological Potential, Steep Slope
- No Archaeological Potential, Permanently Wet
- No Archaeological Potential, Previously Disturbed
- No Archaeological Potential, Previously Assessed (Amick Consultants Ltd. 2019, P038-0989-2019)
- No Archaeological Potential, Previously Assessed (Detritus Consulting Ltd. 2020, P017-0806-2020)
- No Archaeological Potential, Previously Assessed (The Archaeologists Inc. 2015, P052-0592-2014)

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Project Location
Wilmot Township

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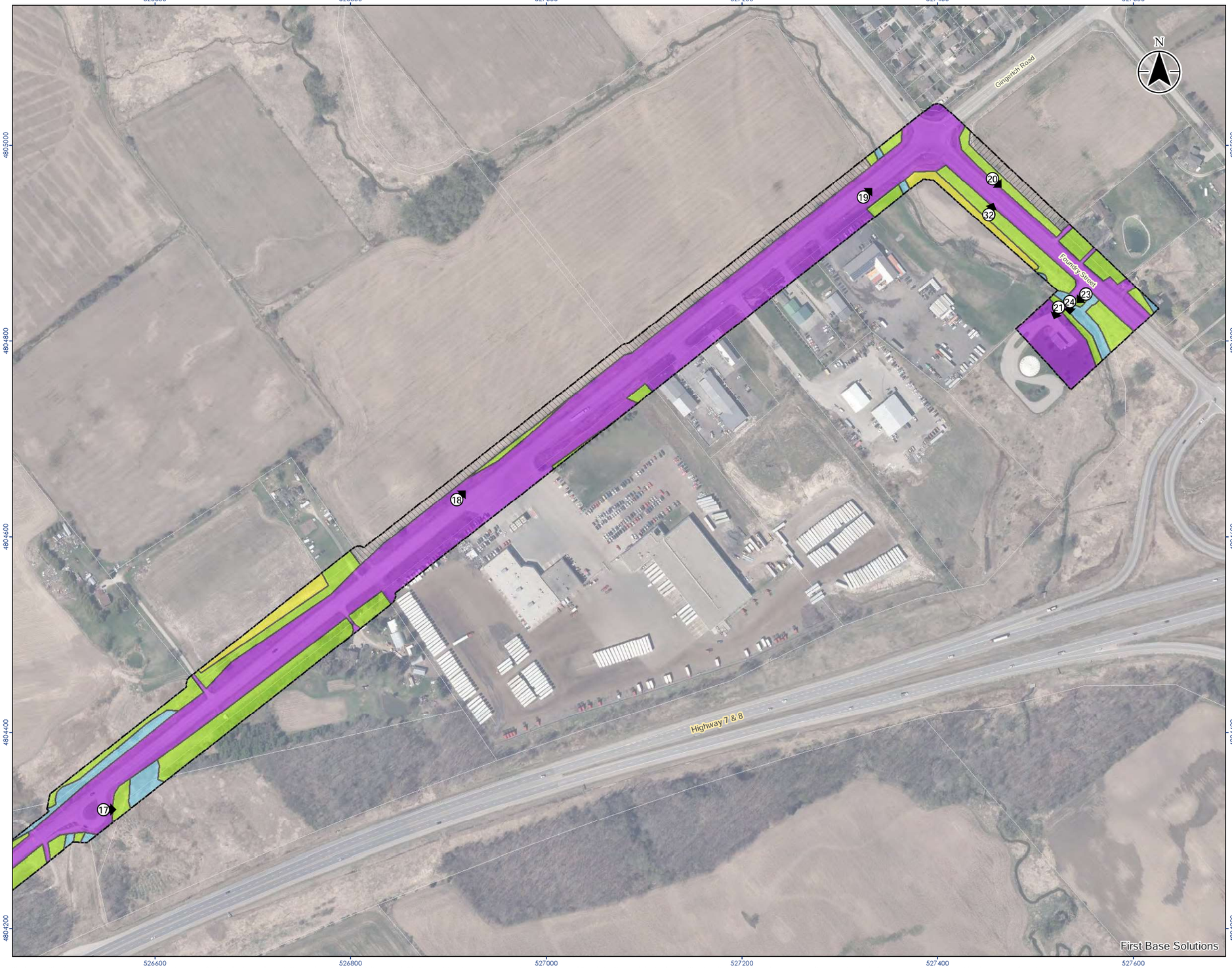
Client/Project
REGION OF WATERLOO | BADEN - NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
6.2

Title
Stage 1 Archaeological Assessment Results and Recommendations (Sheet 2 of 8)

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Stantec

Legend

- Study Area
- Parcel Fabric
- Photo Location and Direction

Recommendations

- Area of Archaeological Potential, Stage 2 Pedestrian Survey at 5 m Intervals Recommended
- Area of Archaeological Potential, Stage 2 Test Pit Survey at 5 m Intervals Recommended
- Low Archaeological Potential, Steep Slope
- No Archaeological Potential, Permanently Wet
- No Archaeological Potential, Previously Disturbed
- No Archaeological Potential, Previously Assessed (Amick Consultants Ltd. 2019, P038-0989-2019)
- No Archaeological Potential, Previously Assessed (Detritus Consulting Ltd. 2020, P017-0806-2020)
- No Archaeological Potential, Previously Assessed (The Archaeologists Inc. 2015, P052-0592-2014)

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Notes

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Project Location
Wilmot Township

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Prepared by KDB on 2022-06-30

Client/Project
REGION OF WATERLOO | BADEN - NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
6.3

Title
Stage 1 Archaeological Assessment Results and Recommendations (Sheet 3 of 8)

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Stantec

Legend

- Study Area
- Parcel Fabric
- Photo Location and Direction

Recommendations

- Area of Archaeological Potential, Stage 2 Pedestrian Survey at 5 m Intervals Recommended
- Area of Archaeological Potential, Stage 2 Test Pit Survey at 5 m Intervals Recommended
- Low Archaeological Potential, Steep Slope
- No Archaeological Potential, Permanently Wet
- No Archaeological Potential, Previously Disturbed
- No Archaeological Potential, Previously Assessed (Amick Consultants Ltd. 2019, P038-0989-2019)
- No Archaeological Potential, Previously Assessed (Detritus Consulting Ltd. 2020, P017-0806-2020)
- No Archaeological Potential, Previously Assessed (The Archaeologists Inc. 2015, P052-0592-2014)

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3. Spring 2018 orthoimagery from Region of Waterloo web map service.

Project Location
Wilmot Township

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Client/Project
REGION OF WATERLOO | BADEN - NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
6.4

Title
Stage 1 Archaeological Assessment Results and Recommendations (Sheet 4 of 8)

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Legend

- Study Area
- Parcel Fabric
- Photo Location and Direction

Recommendations

- Area of Archaeological Potential, Stage 2 Pedestrian Survey at 5 m Intervals Recommended
- Area of Archaeological Potential, Stage 2 Test Pit Survey at 5 m Intervals Recommended
- Low Archaeological Potential, Steep Slope
- No Archaeological Potential, Permanently Wet
- No Archaeological Potential, Previously Disturbed
- No Archaeological Potential, Previously Assessed (Amick Consultants Ltd. 2019, P038-0989-2019)
- No Archaeological Potential, Previously Assessed (Detritus Consulting Ltd. 2020, P017-0806-2020)
- No Archaeological Potential, Previously Assessed (The Archaeologists Inc. 2015, P052-0592-2014)

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Notes

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Project Location
Wilmot Township

165640324 REVA
Prepared by KDB on 2022-06-30

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Figure No.
6.5

Title
Stage 1 Archaeological Assessment Results and Recommendations (Sheet 5 of 8)

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Stantec

Legend

- Study Area
- Parcel Fabric
- Photo Location and Direction

Recommendations

- Area of Archaeological Potential, Stage 2 Pedestrian Survey at 5 m Intervals Recommended
- Area of Archaeological Potential, Stage 2 Test Pit Survey at 5 m Intervals Recommended
- Low Archaeological Potential, Steep Slope
- No Archaeological Potential, Permanently Wet
- No Archaeological Potential, Previously Disturbed
- No Archaeological Potential, Previously Assessed (Amick Consultants Ltd. 2019, P038-0989-2019)
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Project Location
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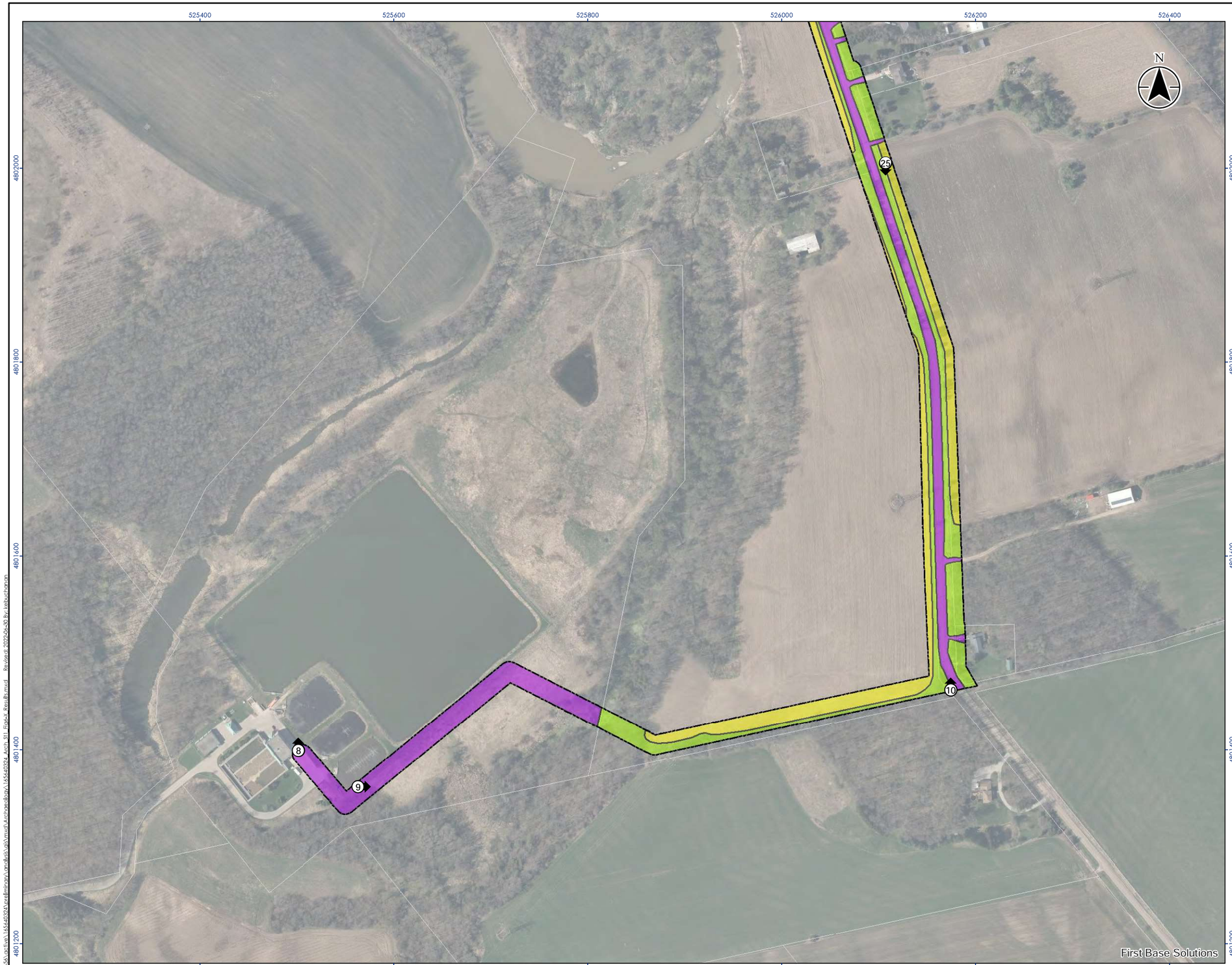
Client/Project
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Figure No.
6.6

Title
Stage 1 Archaeological Assessment Results and Recommendations (Sheet 6 of 8)

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Stantec

Legend

- Study Area
- Parcel Fabric
- Photo Location and Direction

Recommendations

- Area of Archaeological Potential, Stage 2 Pedestrian Survey at 5 m Intervals Recommended
- Area of Archaeological Potential, Stage 2 Test Pit Survey at 5 m Intervals Recommended
- Low Archaeological Potential, Steep Slope
- No Archaeological Potential, Permanently Wet
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Project Location
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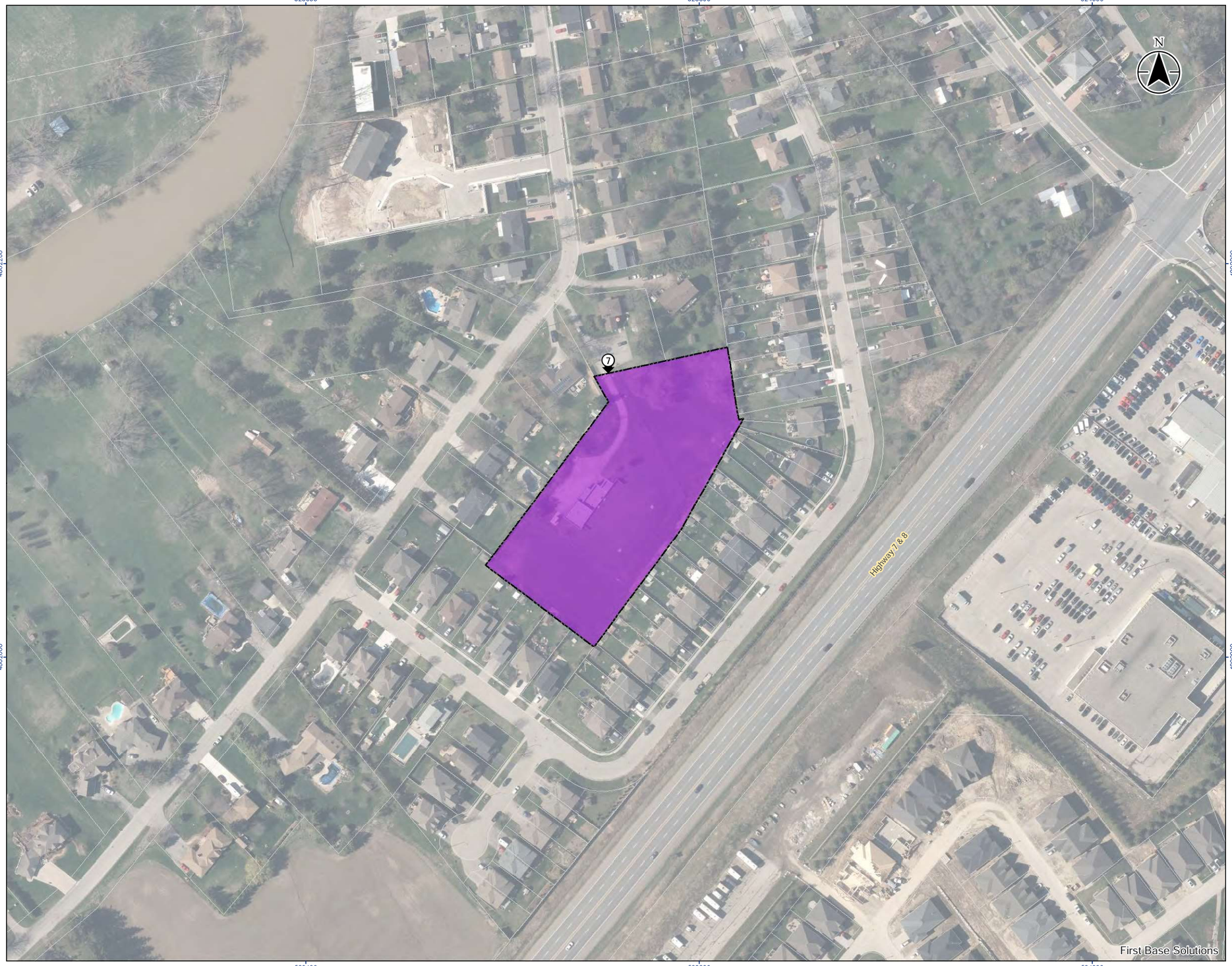
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Figure No.
6.7

Title
Stage 1 Archaeological Assessment Results and Recommendations (Sheet 7 of 8)

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Stantec

Legend

- Study Area
- Parcel Fabric
- Photo Location and Direction

Recommendations

- Area of Archaeological Potential, Stage 2 Pedestrian Survey at 5 m Intervals Recommended
- Area of Archaeological Potential, Stage 2 Test Pit Survey at 5 m Intervals Recommended
- Low Archaeological Potential, Steep Slope
- No Archaeological Potential, Permanently Wet
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- No Archaeological Potential, Previously Assessed (Detritus Consulting Ltd. 2020, P017-0806-2020)
- No Archaeological Potential, Previously Assessed (The Archaeologists Inc. 2015, P052-0592-2014)

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Project Location
Wilmot Township

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Prepared by KDB on 2022-06-30

Client/Project
REGION OF WATERLOO | BADEN - NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
6.8

Title
Stage 1 Archaeological Assessment Results and Recommendations (Sheet 8 of 8)

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9 Closure

This report documents work that was performed in accordance with generally accepted professional standards at the time and location in which the services were provided. No other representations, warranties or guarantees are made concerning the accuracy or completeness of the data or conclusions contained within this report, including no assurance that this work has uncovered all potential archaeological resources associated with the identified property.

All information received from the client or third parties in the preparation of this report has been assumed by Stantec to be correct. Stantec assumes no responsibility for any deficiency or inaccuracy in information received from others.

Conclusions made within this report consist of Stantec's professional opinion as of the time of the writing of this report and are based solely on the scope of work described in the report, the limited data available and the results of the work. The conclusions are based on the conditions encountered by Stantec at the time the work was performed. Due to the nature of archaeological assessment, which consists of systematic sampling, Stantec does not warrant against undiscovered environmental liabilities nor that the sampling results are indicative of the condition of the entire property.

This report has been prepared for the exclusive use of the client identified herein and any use by any third party is prohibited. Stantec assumes no responsibility for losses, damages, liabilities, or claims, howsoever arising, from third party use of this report. We trust this report meets your current requirements. Please do not hesitate to contact us should you require further information or have additional questions about any facet of this report.

Appendix I
Cultural Heritage Report

CULTURAL HERITAGE REPORT: EXISTING CONDITIONS AND PRELIMINARY IMPACT ASSESSMENT— BADEN AND NEW HAMBURG WATER AND WASTEWATER SYSTEM REVIEW

Final Report

March 10, 2023

Prepared for:
Regional Municipality of Waterloo
150 Frederick Street
Kitchener, Ontario N2G 4J3

Prepared by:
Stantec Consulting Ltd.
600-171 Queens Avenue
London, Ontario N6A 5J7

Project Number:
165640324

The conclusions in the Report titled Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment—Baden and New Hamburg Water and Wastewater System Review are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

Stantec has assumed all information received from Regional Municipality of Waterloo (the "Client") and third parties in the preparation of the Report to be correct. While Stantec has exercised a customary level of judgment or due diligence in the use of such information, Stantec assumes no responsibility for the consequences of any error or omission contained therein.

This Report is intended solely for use by the Client in accordance with Stantec's contract with the Client. While the Report may be provided to applicable authorities having jurisdiction and others for whom the Client is responsible, Stantec does not warrant the services to any third party. The report may not be relied upon by any other party without the express written consent of Stantec, which may be withheld at Stantec's discretion.

Prepared by: Digitally signed by Smith, Frank Date: 2023.03.10 14:20:49 -05'00'

Signature

Frank Smith, MA, CAHP

Printed Name

Reviewed by: Waverman, David Digitally signed by Waverman, David Date: 2023.03.10 14:13:22 -05'00'

Signature

David Waverman, OALA, CSLA, CAHP

Printed Name

Approved by: Digitally signed by Colin Varley Date: 2023.03.10 13:45:01 -05'00'

Signature

Colin Varley, MA, RPA

Printed Name

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Executive Summary

The Regional Municipality of Waterloo (the client) retained Stantec Consulting Ltd. (Stantec) to complete a Municipal Class EA (MCEA) to evaluate the status of existing water and wastewater servicing systems in Baden – New Hamburg and Foxboro Green, provide recommendations to address existing servicing constraints, and to provide the framework to meet the current and future water / wastewater servicing needs. Following an evaluation of alternatives, the preliminary preferred alternative is increased storage at New Hamburg Water Treat Plant and upgrades to the Baden Wastewater Pumping Station and a new force main from the Baden Pumping Station to the New Hamburg Wastewater Treatment Plant. The Project will involve the construction of the preferred Baden wastewater servicing alternative WW4 to the New Hamburg Wastewater Treatment Plant, and the Foxboro Green preferred alternative F3.

The requirement to consider cultural heritage in Municipal Class EAs (MCEA) is discussed in the *Municipal Class Environmental Assessment Manual* (MCEA Manual) (Municipal Engineers Association 2015) and the revised 2020 *Provincial Policy Statement* (PPS). The MCEA Manual considers cultural heritage, including built heritage resources and cultural heritage landscapes, as well as archaeological resources, as one in a series of environmental factors to be considered when undertaking an MCEA, particularly when describing existing and future conditions, development alternatives, and determination of the preferred alternative.

In order to identify the presence of built heritage resources and cultural heritage landscapes within the Study Area, understand the potential impacts of the Project on these resources, and prepare mitigation strategies to minimize these impacts, it was determined that a *Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment* would be prepared. The Study Area includes a 50-metre boundary around the Project Location, which is the preferred alternative.

Where a potential heritage resource was identified within the Study Area, an evaluation of the potential cultural heritage value or interest of the property, or properties, was undertaken. Where cultural heritage value or interest was identified, the property was determined to contain a built heritage resource or cultural heritage landscape. Following evaluation, 3277 Bleams Road (BHR-2) was determined to be situated within 50 metres of planned construction activities and at risk for potential indirect vibration related impacts.

The Preferred Option is to avoid 3277 Bleams Road East (BHR-2) by establishing a buffer zone around the built heritage resource to avoid construction activity within 50 metres. This should use appropriate preventative measures such as mapping on construction maps and temporary fencing. Staging and laydown areas should also be selected so that they are non-invasive and avoid the previously identified or potential built heritage resource or cultural heritage landscape. Where avoidance is not feasible, the alternative option should be applied.

If 3277 Bleams Road East (BHR-2) cannot be avoided, the alternative option to mitigate this risk is for a qualified building condition specialist or engineer to develop a strategy to carry out condition surveys and vibration monitoring, where required. The pre-condition survey may consist of screening activities to identify critical properties and determine appropriate vibration levels based on building type, age, and condition. Vibration monitoring may consist of random confirmatory vibration monitoring during pipeline installation at the most critical properties. A post-condition survey should be carried out on an as-needed basis to be determined by the qualified building condition specialist or engineer

The executive summary highlights key points from the report only; for complete information and findings the reader should examine the complete report.

Project Personnel

Project Manager:	Jeff Paul, P.Eng.
Heritage Consultant:	Laura Walter, MA, CAHP
Report Writers:	Jenn Como, BA
	Frank Smith, MA, CAHP
GIS Specialist:	Kent Buchanan
Administrative Assistant:	Carol Naylor
Quality Reviewer:	David Waverman, BLA OALA CSLA CAHP
Independent Reviewer:	Colin Varley, MA, RPA

Abbreviations

BHR	Built Heritage Resource
CAHP	Canadian Association of Heritage Professionals
CHR	Cultural Heritage Report
CHL	Cultural Heritage Landscape
CHR	Cultural Heritage Resource
CHVI	Cultural Heritage Value or Interest
EA	Environmental Assessment
MA	Master of Arts
MCEA	Municipal Class Environmental Assessment
MCM	Ministry of Citizenship and Multiculturalism
O. Reg.	Ontario Regulation
OHA	*Ontario Heritage Act*
OHT	Ontario Heritage Trust
PPS	Provincial Policy Statement
RoW	Right-of-Way
WW	Wastewater

1 Introduction

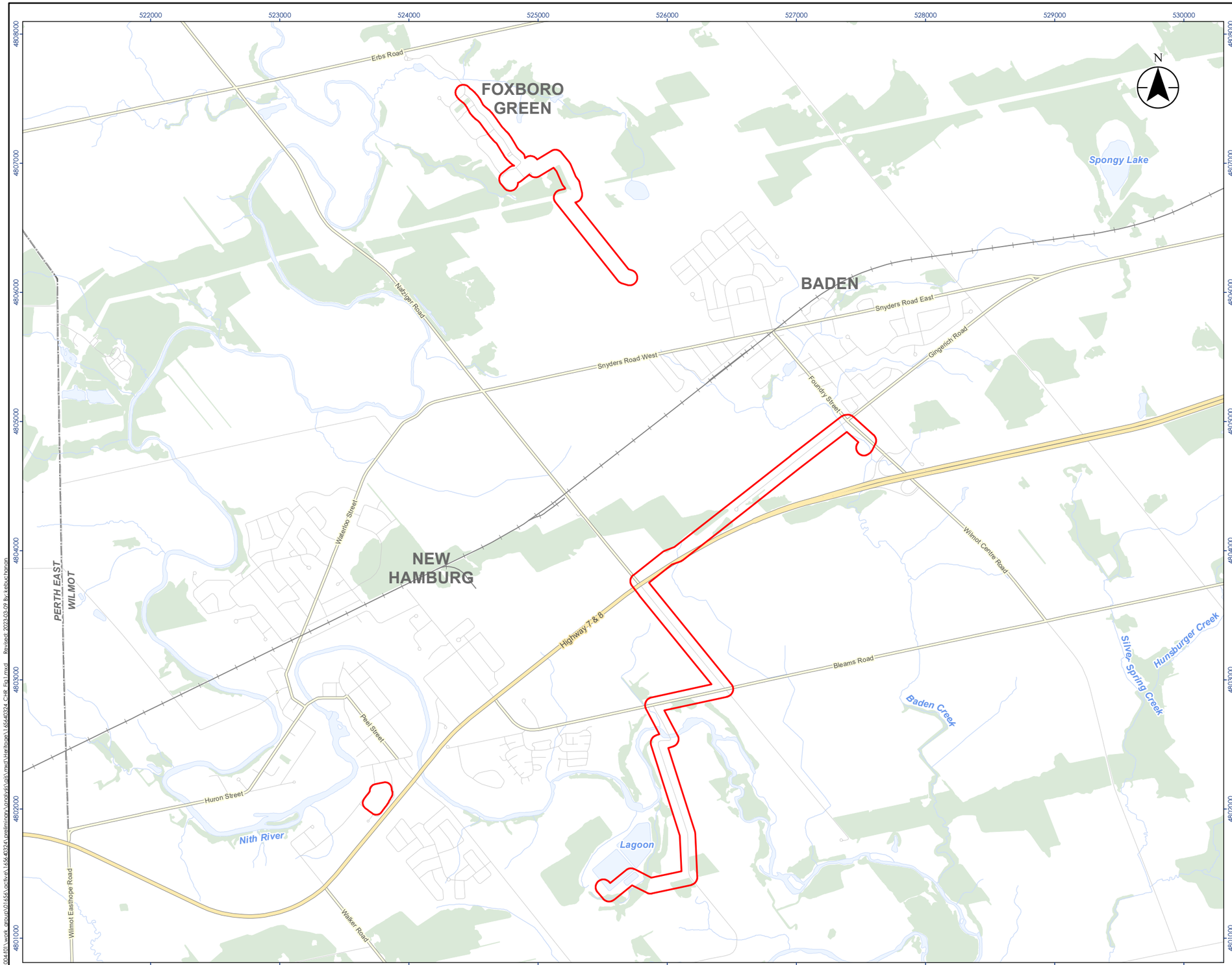
1.1 Study Purpose and Objectives

As part of a Municipal Class Environmental Assessment (MCEA), the Region of Waterloo (the Client) retained Stantec Consulting Ltd. (Stantec) to evaluate the status of existing water and wastewater servicing systems in Baden – New Hamburg and Foxboro Green, provide recommendations to address existing servicing constraints, and to provide the framework to meet the current and future water / wastewater servicing needs. Following an evaluation of alternatives, the preliminary preferred alternative is increased storage at New Hamburg Water Treat Plant and upgrades to the Baden Wastewater Pumping Station and a new force main from the Baden Pumping Station to the New Hamburg Wastewater Treatment Plant. The Project will involve the construction of the preferred Baden wastewater servicing alternative WW4 to the New Hamburg Wastewater Treatment Plant, and the Foxboro Green preferred alternative F3 (Figure 1 and Figure 2).

In order to identify the presence of built heritage resources and cultural heritage landscapes within the Study Area, understand the potential impacts of the Project on these resources, and prepare mitigation strategies to minimize these impacts, it was determined that a *Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment* would be prepared. The Study Area includes a 50-metre boundary around the Project Location, which is the preferred alternative. The 50-metre Study Area boundary is used as a sufficient distance to encompass a buffer zone for potential vibration effects resulting from the Project. Although structures on a specific property may be situated outside the 50-metre buffer, in some instances the property boundary is within the buffer, and therefore built heritage resources or cultural heritage landscapes on the property are required to be examined as they are within the Study Area.

As part of the Cultural Heritage Report, potential built heritage resources and cultural heritage landscapes were identified, inventoried, and screened according to *Ontario Regulation* (O. Reg.) *9/06 (amended by O. Reg. 569/22)*, the criteria for determining cultural heritage value or interest (CHVI) (Government of Ontario 2023). A land use history was completed to provide a cultural context for the Study Area and historical background upon which to base evaluations. Where CHVI was identified, the resource was mapped, and recommendations were made for further study. The objectives of the Cultural Heritage Report are summarized below:

- Prepare a land use history of the Study Area for use in the identification and evaluation of built heritage resources and cultural heritage landscapes.
- Identify potential built heritage resources and cultural heritage landscapes within the Study Area through a windshield survey from the public RoW;
- Screen the CHVI of the potential built heritage resources and cultural heritage landscapes to determine the number of heritage resources present; and
- Prepare recommendations for future work where built heritage resources and cultural heritage landscapes were identified.



Stantec

Legend

Study Area

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Notes

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Wilmot Township

165640324 REVA
Prepared by KDB on 2023-03-09

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Figure No.
1

Title
Location of Study Area

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- Study Area
- Parcel Fabric

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Figure No.

2

Title

Study Area

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2 Methodology

2.1 Requirements

The Ontario Heritage Act (OHA) provides the primary statutory framework for the conservation of cultural heritage resources in Ontario. Conservation of cultural heritage resources is a matter of provincial interest, as reflected in the OHA and Ministry of Citizenship and Multiculturalism (MCM) policies.

The requirement to consider cultural heritage in Municipal Class EAs (MCEA) is discussed in the *Municipal Class Environmental Assessment Manual* (MCEA Manual) (Municipal Engineers Association 2015) and the revised 2020 *Provincial Policy Statement* (PPS) (Government of Ontario 2020). The MCEA Manual considers cultural heritage, including built heritage resources and cultural heritage landscapes, as well as archaeological resources, as one in a series of environmental factors to be considered when undertaking an MCEA, particularly when describing existing and future conditions, development alternatives, and determination of the preferred alternative.

The MCEA Manual further suggests that cultural heritage resources that retain heritage attributes should be identified early in the EA process and avoided where possible. Where avoidance is not possible, potential effects to these attributes should be identified and minimized. Adverse impacts should be mitigated according to provincial and municipal guidelines. It is suggested that this happen early in the process so that potential impacts to significant features can be included in an understanding of project impacts and plans established to mitigate these impacts.

In addition to requirements outlined in the MCEA Manual, provisions made under the PPS were also considered in the preparation of the study. Section 2.6 of the PPS addresses cultural heritage in the land use planning process and was considered. The applicable provisions include:

> *2.6.1 - Significant built heritage resources and significant cultural heritage landscapes shall be conserved.*
>
> *2.6.3 - Planning authorities shall not permit development and site alteration on adjacent lands to protected heritage property except where the proposed development and site alteration has been evaluated and it has been demonstrated that the heritage attributes of the protected heritage property will be conserved.*
>
> (Government of Ontario 2020)

2.2 Background History

To familiarize the study team with the Study Area, local historical resources were consulted, archival documents were reviewed, and a summary of the historical background of the local area was prepared. Specifically, historical mapping from 1830, 1861, 1881, and 1938 and aerial photography from 1954 were reviewed to identify the presence of structures, settlements, and other potential built heritage resources and cultural heritage landscapes in advance of the field program.

2.3 Municipal and Agency Consultation

Listings of provincially and locally designated properties, districts, and easements for the municipality were collected from the Ontario Heritage Trust (OHT), the MCM, and the Township of Wilmot. Consultation with these interested agencies and municipalities within which the Project is proposed was undertaken to determine the presence of designated, listed, or registered heritage properties within the Study Area.

2.4 Field Program

A vehicular windshield survey was conducted by Frank Smith, Cultural Heritage Specialist, and Jenn Como, Material Culture Analyst, on June 16, 2022, from publicly accessible roadways, unless specified otherwise. During the survey, the preferred route of the Study Area was surveyed for previously identified or potential built heritage resources or cultural heritage landscapes. Where identified, these were photographed, their characteristics noted while in the field, and their locations digitally recorded.

In general, buildings and structures of more than 40 years of age were screened during the survey for their potential to satisfy O. Reg. 9/06 criteria and the MCM *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes* (MCM 2016). Only properties containing buildings or structures determined to have potential to satisfy O. Reg. 9/06 were inventoried. The use of the 40-year threshold is generally accepted by both the federal and provincial authorities as a preliminary screening measure for cultural heritage interest or value. This practice does not imply that all buildings and structures more than 40 years of age are inherently of significant heritage value, nor does it exclude exceptional examples constructed within the past 40 years of being of significant cultural heritage value.

2.5 Evaluation of Cultural Heritage Value or Interest

The criteria for determining CHVI is defined by O. Reg. 9/06, which was amended by O. Reg. 569/22 in 2023 (see Section 2.5.1). Each potential heritage resource was considered both as an individual structure and as cultural landscape. Where CHVI was identified, a structure or landscape was assigned a cultural heritage resource (CHR) number and the property was determined to contain a heritage resource.

2.5.1 Ontario Regulation 9/06

1. The property has design value or physical value because it is a rare, unique, representative or early example of a style, type, expression, material or construction method.

2. The property has design value or physical value because it displays a high degree of craftsmanship or artistic merit.

3. The property has design value or physical value because it demonstrates a high degree of technical or scientific achievement.

4. The property has historical value or associative value because it has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community.

5. The property has historical value or associative value because it yields, or has the potential to yield, information that contributes to an understanding of a community or culture.

6. The property has historical value or associative value because it demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.

7. The property has contextual value because it is important in defining, maintaining or supporting the character of an area.

8. The property has contextual value because it is physically, functionally, visually or historically linked to its surroundings.

9. The property has contextual value because it is a landmark

(Government of Ontario 2023)

2.6 Assessment of Impacts

Where a component of a previously identified or potential built heritage resource or cultural heritage landscape was situated within the Study Area, the impacts of the proposed undertaking were evaluated. The impacts, both direct and indirect, are evaluated according to InfoSheet #5.

Seven potential negative effects have been identified (Government of Ontario 2006), including:

1. **Destruction** of any, or part of any, significant heritage attributes or features
2. **Alteration** that is not sympathetic, or is incompatible, with the historic fabric and appearance
3. **Shadows** created that alter the appearance of a heritage attribute or change the viability of a natural feature or plantings, such as a garden
4. **Isolation** of a heritage attribute from its surrounding environment, context, or a significant relationship
5. **Direct or indirect obstruction** of significant views or vistas within, from, or of built and natural features
6. **A change in land use** such as rezoning a battlefield from open space to residential use, allowing new development or site alteration to fill in the formerly open spaces
7. **Land disturbances** such as a change in grade that alters soils and drainage patterns that adversely affect an archaeological resource

In addition to direct effects related to destruction, the potential for indirect effects resulting from vibration due to construction and operation activities and the transportation of Project components and personnel were also evaluated. Although the existing effect of traffic and construction vibrations on historic period structures is not fully known, negative effects have been demonstrated on buildings with a setback of less than 40 metres from the curbside (Crispino and D'Apuzzo 2001; Ellis 1987; Rainer 1982; Wiss 1981). The proximity of Project components to built heritage resources and cultural heritage landscapes was considered in this assessment, particularly those within 50 metres, in order to encompass a wide enough buffer zone to account for built resources less than 40 metres from curbside or potential Project activities. The 50-metre buffer represents a conservative approach to effects identification.

Indirect impacts resulting from land disturbances apply to archaeological resources, which are beyond the scope of this assessment. An Archaeological Assessment has been prepared under separate cover which addresses the archaeological potential of the Study Area and includes recommendations for further work (Stantec 2022). No further consideration to archaeological resources is provided in this report.

3 Existing Conditions

3.1 Background and Historical Research

3.1.1 Introduction

The Study Area is located in southwestern Ontario within the Township of Wilmot in the Regional Municipality of Waterloo (former County of Waterloo). The Study Area consists of two portions, one located in Foxboro Green to the north of Baden and one that travels from the southwest corner of Baden west to south of New Hamburg.

The Study Area spans the following historical lots and concessions in the Township of Wilmot:

- Lot 16, German Block, South of Erbs Road
- Lot 16, German Block, North of Snyders Road
- Lots 15-17, German Block, South of Snyders Road
- Lots 17-19, German Block, North of Bleems Road
- Lots 18-21, German Block, South of Bleems Road
- Lot 21, Concession 1, Block A

The Township of Wilmot is situated on the traditional territory of the Neutral (Attawandaron), Anishnaabeg, Haudenosaunee (Iroquois), and Mississauga peoples.

Since contact with European explorers and immigrants and, later, with the establishment of provincial and federal governments (the Crown), the lands within Ontario have been included in various treaties, land claims, and land cessions. Though not an exhaustive list, Morris (1943) provides a general outline of some of the treaties within the Province of Ontario from 1783 to 1923. According to Morris, the study area is situated within the described limits of the 1792 indenture of the 1784 Between the Lakes Purchase between the English government (referred to as “the Crown”) and the Mississaugas. This treaty:

> *...was made with the Mississa[ug]a Indians 7th December, 1792, though purchased as early as 1784. This purchase in 1784 was to procure for that part of the Six Nation Indians coming into Canada a permanent abode.*
>
> *The area included in this Treaty is, Lincoln County excepting Niagara Township; Saltfleet, Binbrook, Barton, Glanford and Ancaster Townships, in Wentworth County; Brantford, Onondaga, Tusc[a]r[o]ra, Oakland and Burford Townships in Brant County; East and West Oxford, North and South Norwich, and Dereham Townships in Oxford County; North Dorchester Township in Middlesex County; South Dorchester, Malahide and Bayham Township in Elgin County; all Norfolk and Haldimand Counties; Pelham, Wainfleet, Thorold, Cumberland and Humberstone Townships in Welland County ... .*
>
> (Morris 1943:17-18)

3.1.2 Physiography

The Study Area is situated within two physiographic regions. The northern portion of the Study Area falls within the Waterloo Hills region while the southwestern portion of the Study Area falls within the Stratford Till Plain region.

The Waterloo Hills region, which covers approximately 300 square miles, or 192,000 acres, is located chiefly within the Regional Municipality of Waterloo, with smaller portions extending into the townships of Blandford-Blenheim and North Easthope in Perth County (Chapman and Putnam 1984: 136). The region is characterized by hills of sandy till and kames and the predominant soil type is fine sand. Kames are a type of landform consisting of mounded hills of sand and gravel that were deposited in the delta of a glacial meltwater stream or formed by accumulations of debris trapped in a depression on a glacier and left behind as it melted (Encyclopedia Britannica 2022). The Baden Hills, clearly visible from Highway 7, are one of the region's most extreme examples of kames. They consist of domes of gravel and sand that are approximately 200 feet or 60 metres high with an apron of outwash sand around the bases and a nearby kettle lake (Chapman and Putnam 1984: 136). The Conestogo River and the Nith River divide the area and have large, swampy valleys associated with them. Other distinguishing features of the region include numerous kettle lakes and an abundance of small swamps (Chapman and Putnam 1984: 136).

The original forest in the Waterloo Hills region, of which approximately 10% remains, consisted of pines and a variety or hardwoods including Sugar maple, beech, wild cherry, and oak. Historically the region has been used under the mixed field crop and livestock agriculture tradition favoured by the people of German descent who relocated from Pennsylvania to Upper Canada in the early 1800s with approximately 70% of farmland dedicated to growing crops (Chapman and Putnam 1984: 137).

In contrast to the Waterloo Hills region, the Stratford Till Plain region is a broad clay plain of 1,370 square miles or 876,800 acres that stretches from London in the south to Blyth and Listowel in the north, covering a large portion of the County of Perth (Chapman and Putnam 1984: 133). The Stratford Till Plain is shaped by moraines and the till is a fairly uniform brown, calcareous, and silty clay. The areas of the region with the highest elevations drain into the Conestogo and Nith River, while the remainder of the area is part of the Thames watershed. The region's location on the slope to the east of Lake Huron means that it receives more snow and rain than other areas in Southern Ontario (Chapman and Putnam 1984: 134). This leads to muddy springs that pose a challenge for seeding crops and difficult travel in winter snows but is balanced by the relatively low frequency of droughts.

Some of the Stratford Till Plain's soils require the installation of artificial drains to successfully support crops and municipal drains are a prominent feature of the landscape (Chapman and Putnam 1984: 134). Despite the need for additional drainage, the soil's natural fertility makes the Stratford Till Plain one of the most productive agricultural areas in Ontario. By the 1920s, all of the vacant land in the region had been incorporated into farm operations and by the early 1980s approximately 91% of the region's land was classified as improved, leaving only 9% in woodlots, marsh, and rough pasture, with 81% of farmland used for crops (Chapman and Putnam 1984: 135). The area covered by the Stratford Till Plain does not include any major cities and encroachment into the rural landscape has remained limited. The land in the

region yields a 50% greater gross return than average farmland in Ontario (Chapman and Putnam 1984: 135).

3.1.3 Township of Wilmot

3.1.3.1 Survey and Settlement

The *Constitutional Act* of 1791 identified the Township of Wilmot as a Crown Reserve (Heritage Wilmot n.d.). In addition to the Crown Reserve, Wilmot also included Clergy Reserves before the township was divided horizontally into three tracts of land: Block B in the north which was controlled by the Canada Land Company, the German Block in the centre which was controlled by the Crown, and Block A in the south which was also controlled by the Canada Land Company (Region of Waterloo Museums 2021). The township's block divisions are illustrated on Plate 1. The earliest settlement in what would become the Township of Wilmot occurred within the German Block. The name "German Block" was likely chosen for the central portion of the township because of the early settlement and road development that had occurred there prior to an official survey. When the Canada Land Company acquired Blocks A and B in 1825 they were incorporated along with the German Block into Wilmot Township (Region of Waterloo Museums 2021). The most likely namesake for the township was Sir Robert John-Wilmot-Horton, who was Under Secretary of State for War and the Colonies and who was also involved with the Canada Land Company (Region of Waterloo Museums 2021). The German block was settled primarily by German immigrants from Pennsylvania, Europe and other areas of Waterloo Township. In addition to immigrants of German descent, the settlers of Blocks A and B included greater variety in country of origin, including people who had arrived from Scotland, England, and Ireland (Region of Waterloo Museums 2021).

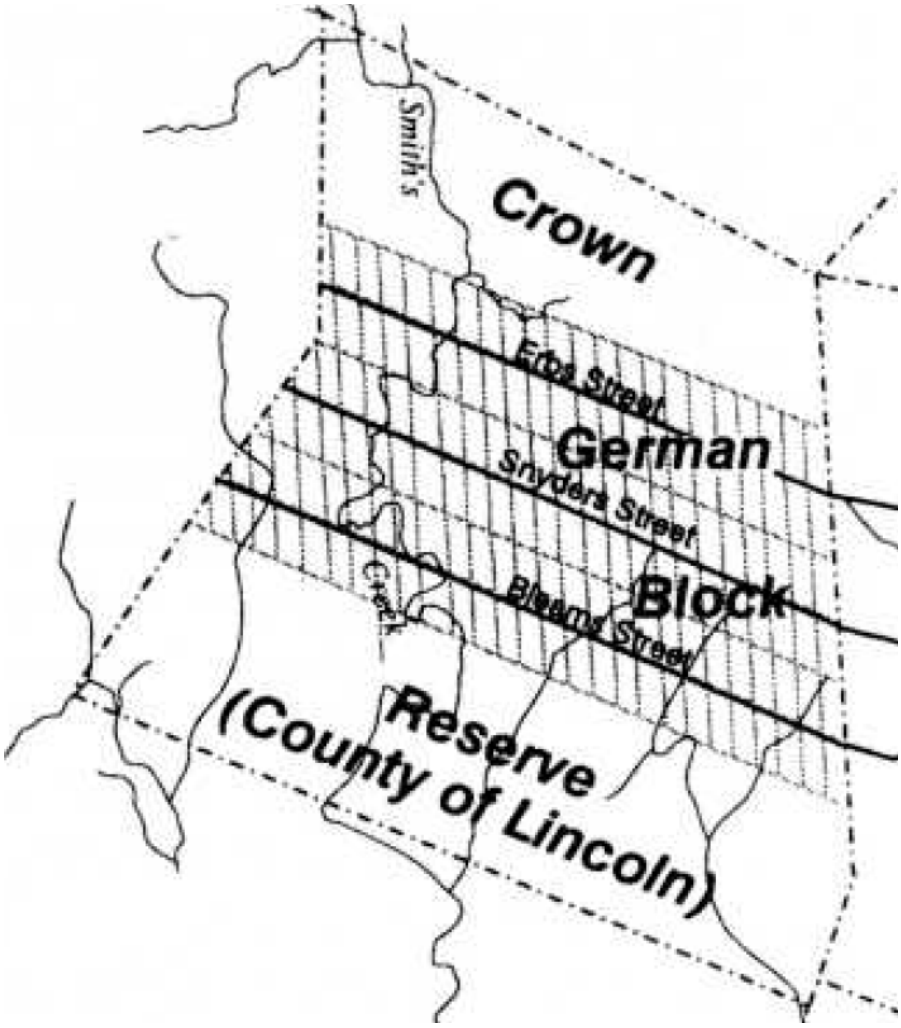


Plate 1: Block Divisions of Wilmot Township, with "Crown" corresponding to Block B and "Reserve" corresponding to Block A (Hilty and Roth 1996: 17)

The German Block of Wilmot Township was prepared for settlement by Christian Nafziger who was an Amish Mennonite from Bavaria, Germany (Region of Waterloo Museums 2021). According to the traditional story, Nafziger departed Amsterdam on Christmas Day 1821 and sailed to New Orleans before making his way to Pennsylvania with the intention of acquiring a large piece of land where fellow Amish Mennonites could settle (Hilty and Roth 1996: 18). When he arrived in Pennsylvania, he was advised that land was much less expensive in Upper Canada. He reached the Waterloo area in the summer of 1822, where he found a Mennonite community inhabited by immigrants who had made the same Pennsylvania to Upper Canada journey over the previous 21 years and that was willing to offer aid to Nafziger and any additional settlers he could bring to the area (Hilty and Roth 1996: 18). After a petition failed to secure the provision of specific lands, Nafziger returned to London to obtain a promise of land from the Colonial Office and to encourage more settlers to join him (Hilty and Roth 1996:18). Multiple petition requests were made for permission to settle the land west of Waterloo throughout the early 1820s, until finally a request

made in February 1824 was approved and a survey was undertaken by Deputy Surveyor John Goesman (Hilty and Roth 1996: 19; Region of Waterloo Museums 2021).

The survey of the township was completed in 1828 and used a combination of the single and double-front systems (Association of Ontario Land Surveyors 1997). The German Block was surveyed using the single-front system (Plate 2) while Blocks A and B were surveyed using the double-front system (**Plate 3**). Lots in a single-front system were typically deep and narrow though towards the end of the period in which this system was popular, lots 30 chains (approximately 600 metres) wide by 66.67 chains (approximately 1,340 metres) deep containing an area of 200 acres were often used (Weaver 1968). The single-front system was likely chosen for the German Block in deference to the existing development that had been undertaken by the German Mennonite community that settled in the area before the official survey was undertaken. The double-front system used to survey Blocks A and B was the preferred system in use by the 1820s and the 200 acre lots have the same proportions as those in the German Block but with different allocations for road allowances. Since Crown Patents were generally granted in one-half lots equaling 100 acres, the double-front system was implemented to make it easier for settlers to locate and access the back 100 acres of a lot (Weaver 1968).



Plate 2: Single-Front System (Dean 1996)

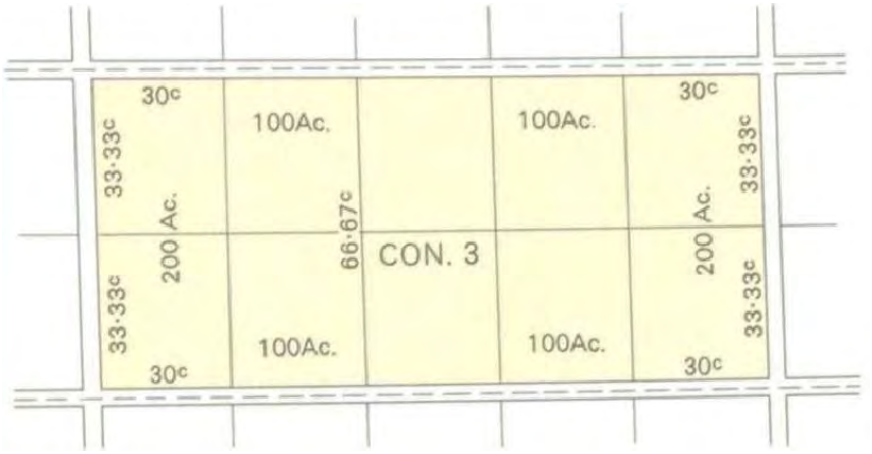


Plate 3: Double-Front System (Dean 1969)

Within the German Block, full-sized lots were 200 acres and terms were settled, granting those who were able to complete the duties of opening the road at the front of the lot, clearing 10 acres of land, and constructing a house of sufficient size, 50 acres for free with the option to purchase the remaining 150 acres of the lot at a “reasonable” price (Hilty and Roth 1996: 19). Three main roads were cleared allowing passage between early settlements. These roads were named Oberstrasse (Upper Street), Mittlestrasse (Middle Street) and Unterstrasse (Lower Street), which are known as Erb's Road, Snyder's Road and Bleams Road respectively within the present-day Study Area (Heritage Wilmot n.d.). Wilmot was also connected to a wider, well-established roadway system that provided access to supplies and goods from other townships in Waterloo County and enabled rapid settlement in the township (Region of Waterloo Museums 2021). The area’s plentiful agricultural potential and major roadways that provided opportunities to transport produce to markets made Wilmot appealing to Amish Mennonite settlers and those of other religious persuasions who wished to establish farmsteads and maintain their traditional ways of life (Region of Waterloo Museums 2021). Although Nafziger did not return to Wilmot until 1826, settlement of the township began with immigrants from Pennsylvania arriving in 1824 and those from Europe arriving in 1826 (Region of Waterloo Museums 2021).

The settlement of Wilmot Township met with difficulties when King’s College, which would later become the University of Toronto, was granted an endowment of 226,00 acres of leased Crown Lands that included the German Block in Wilmot in 1828 (Hilty and Roth 1996: 19). The college attempted to raise the agreed upon purchase price from twelve shillings six pence per acre to twenty shillings and to change the terms so that if settlers did not purchase the remaining 150 acres of the lot at the new price they would forfeit their right to the 50 acres of patent land granted for completion of settlement duties (Hilty and Roth 1996: 19-20). This new price was beyond the means of many of the settlers and even higher than land prices in other parts of the country. After an appeal, intercession from Lieutenant-Governor Colborne, and an inspection commissioned by King’s College and carried out by Deputy-Surveyor Samuel Street Wilmot, King’s College agreed to revert to the original terms of purchase, though many settlers who had not cleared the area for the road by 1830 endured additional disputes about the lack of stipulated timelines for the completion of settlement duties before deeds were successfully obtained (Hilty and Roth 1996: 20-21). Figure 3 shows a map compiled from the results of Deputy-Surveyor Samuel

Street Wilmot's inspection of the township and illustrates the degree to which the German Block was settled by 1830. The population in of the entire Township of Wilmot was 1,272 people in 1830 (Region of Waterloo Museums 2021).

Development of the community of New Hamburg, centred around Bleams Road and originally named Cassel, was initiated by a man named William Scott in 1830 (Heritage Wilmot n.d.). An epidemic of Asiatic cholera that swept through the area in 1834 nearly wiped out the village but it persisted and was renamed Hamburg in the late 1830s before eventually becoming known as New Hamburg (Heritage Wilmot n.d.).

3.1.3.2 19th Century Development

The 1830s and 1840s saw the development of several small villages and towns along Wilmot Township's major roadways. These included the village of Baden, originally named Weissenburg, which developed along Snyder's Road (Region of Waterloo Museums 2021).

While development of the German Block was occurring, the Canada Land Company helped to construct Huron Road in Block A (Region of Waterloo Museums 2021). The road, which ran from Guelph to Goderich, connected to other existing roads and provided the first link between Lake Ontario and Lake Huron, creating a network that became the dominant route for travel through Waterloo County and Upper Canada until the railway was built in the mid-1850s (Region of Waterloo Museums 2021). The waterways present in Wilmot provided potential power sources for mills including the sawmills built by Joseph Goldschmidt and David Kropf by 1831 (Region of Waterloo Museums 2021). In 1840, Wilmot Township became part of the District of Wellington and on January 21, 1850, the township's first elected council met in Wilmot Centre (Heritage Wilmot n.d.).

By 1850, Wilmot's population was approximately 4,863 and most of the available land in the township had been claimed (Region of Waterloo Museums 2021). Population growth continued into 1851 when the census recorded the township as having a population of 5,297 and containing 53,757 acres of occupied land with 29,613 acres under cultivation and 24,144 acres in wood and wild land (Census of Canada 1851a and 1851b). The area under cultivation included 21,034 acres of crops, 8,041 acres of pasture, and 538 acres of gardens. Wilmot Township's largest crop in 1851 was wheat, which occupied 7,607 acres. Other crops included 3,455 acres of oats, 1,176 acres of peas, 1,089 acres of Indian corn, 641 acres of rye, 551 acres of potatoes, 158 acres of barley, and 195 acres of turnips (Census of Canada 1851b). Livestock holdings for the township included 5,761 cattle, 1,528 horses, 7,309 sheep, and 5,079 pigs. Wilmot Township's agricultural outputs for that year also included 3,588 tons of hay, 19,162 lbs. of wool, 28,176 lbs. of maple sugar, 6,012 yards of fulled cloth, 1,395 yards of linen, 4,628 yards of flannel, 63,842 lbs. of butter, and 3,405 lbs. of cheese (Census of Canada 1851b).

The Census of 1851 recorded four water powered grist mills, 13 sawmills, including one steam powered mill and twelve water powered mills, and two carding and fulling mills in Wilmot[1] (Census of Canada 1851b). Other industries in the township included one tannery, one foundry, and one brewery. New Hamburg was a primarily industrial community in the 1850s and it experienced a boom following the arrival of the Grand Trunk Railway in 1856 (Region of Waterloo Museums 2021). The settlement, which was home to a substantial number of mills and factories, several general stores, eight taverns and two German newspapers, had reached a population of 1,000 and become an incorporated village by 1858 (Region of Waterloo Museums 2021). Baden also received a stop on the railway in 1856. Railway building provided ample employment opportunities to the township's settlers and encouraged workers from other townships to move to the area (Region of Waterloo Museums 2021). In anticipation of the railway boom, Jacob Beck purchased 200 acres of land in Weissenburg which he had surveyed (Region of Waterloo Museums 2021). Beck renamed the community Baden after his hometown the Grand Dutchy of Baden-Baden in Germany in 1854 and by 1855 he had built several mills in the area (Heritage Wilmot n.d. and Region of Waterloo Museums 2021). Similar to New Hamburg, Baden also developed into a centre of industry and boasted an iron foundry, several flourmills, a flax mill, two sawmills, a distillery, a factory that produced pails, tub staves[2] and headings, and multiple general stores by 1864 (Region of Waterloo Museums 2021).

By 1871, the population of Wilmot Township had risen to 5,811 people and continued to experience minor fluctuations over the later half of the 19th century, with a population of 5,358 in 1881 and 5,487 in 1891 (Dominion Bureau of Statistics 1953a). After the boom associated with the Grand Trunk Railway's construction subsided, other townships in Waterloo County continued to grow but Wilmot Township experienced only limited industrial growth for the remainder of the 19th century (Region of Waterloo Museums 2021). The railway did however support agriculture in Wilmot Township, providing a new means for both local sales and larger exports of agricultural products.

[1] Carding and fulling mills were used in the production of woolen cloth prior to the industrial revolution. Once a wool fleece has been sheared from a sheep, it must be carded to prepare it for batting or spinning. Carding could be completed by hand, but in the 1800s carding mills offered a much quicker, less labor-intensive option where wool would be washed then carded to remove dirt and debris and align the fibers to prepare them for use as quilt batting or for spinning into threads or yarns (Kilbride History Group n.d.). Carding mills used large rollers covered with heavy cloth that was embedded with wire pins to comb the wool fibres. 'Fulling' was a process applied to finished woven cloth, often made of wool, again using machines with large rollers to beat and work wet cloth to lock the fibres together which shrunk, thickened, and strengthened fabric that would then be used to make blankets, clothing or other items (Kilbride History Group n.d.).

[2] 'Staves' in this context refers to narrow strips of wood or iron placed edge to edge to create a vessel like a bucket or barrel (Merriam-Webster 2022).

3.1.3.3 20th Century Development

Throughout the first half of the 20th century, the Township of Wilmot's population remained relatively stable, with minor fluctuations keeping it above 4,000 but below 5,000 people during that time. The population in 1901 was 4,944, which decreased over the next two censuses falling to 4,569 in 1911 and 4,263 in 1921 (Dominion Bureau of Statistics 1953a). The population rose to 4,439 in 1931 before decreasing to 4,215 in 1941 and increasing to 4,865 in 1951 (Dominion Bureau of Statistics 1953a).

The Village of Baden was the birthplace of Sir Adam Beck, who shaped Ontario's electric system in the early 20th century. In 1903, he joined the committee that formed and operated Ontario Hydro, in 1905 he became the unofficial minister of power, and in 1906 a bill introduced by Beck officially formed the Hydro Electric Power Commission of Ontario which was the first publicly owned utility in the world (Canadian Business Hall of Fame n.d.)



Plate 4: Looking east along Snyder's Road, Baden, circa 1910 (Heritage Wilmot n.d.)

By 1951, the area of farmland within the Township of Wilmot had increased slightly to 60,303 acres including 50,486 acres of improved land and 9,817 acres of unimproved land (Dominion Bureau of Statistics 1953b). The township's improved acreage included 40,268 acres under crops, 587 acres of summer fallow land, 8,183 acres of pasture, and 1,448 acres used for other farming purposes. In 1951, Wilmot's largest crop was cultivated hay which covered 12,135 acres. Other crops included 9,969 acres of mixed grains, 8,183 acres of oats, 5,955 acres of wheat, 2, 233 acres of other fodder crops, 606 acres

of root crops, 520 acres of barley, and 270 acres of rye (Dominion Bureau of Statistics 1953b). Livestock holdings for the township included 11,134 cattle, 1,048 horses, 424 sheep, and 16,237 pigs. The amount of land under cultivation had nearly doubled since the 1851 census. The crops grown in the 20th century had shifted from wheat and other staple food crops for humans to a focus on hay and other grains commonly used for animal feed. This shift was in keeping with the changes in livestock holdings between 1851 and 1951. The 1951 records show that while there was a moderate decrease in the number of horses, the number of cattle had nearly doubled and the number of pigs had more than tripled. In addition, the township's farms had just over 17 times the number of sheep compared to 1851. This shows that the Township of Wilmot's agricultural industry continued to grow throughout the late 19th and early 20th centuries with the 20th century seeing a greater emphasis on livestock rearing.

On January 1, 1973, the Regional Municipality of Waterloo was established, replacing the former county of Waterloo that had been established by the Provincial government in 1853 (Region of Waterloo n.d.). The new Regional government created an elected Council which includes a Regional Chair, eight Regional Councillors, and the mayors of the seven local municipalities included in the Region. The regional government was tasked with planning, eliminating duplicate services, providing fair and equal standards of physical and human services and protecting the Region's citizens (Region of Waterloo n.d.). The Township of Wilmot was not subject to the amalgamations and annexations that many of Ontario's historical townships experienced in the 1990s and retains the same boundaries as the historical township. Wilmot remains largely rural and agricultural in character on present-day aerial imagery.

3.1.4 Site History

Most of the Study Area is located within the German Block of the Township of Wilmot. Like the rest of the township, these areas were settled quickly and early in the township's history. Table 3.1 contains a list of settlers for the portion of the Study Area within the German Block based on the results of Deputy-Surveyor Samuel Street Wilmot's 1830 inspection.

Table 3.1 Early German Block Settlers within the Study Area (Hilty and Roth 1996)

Lot, Concession	Settler	Settling Duties Complete in 1830?
Lot 16, German Block, South of Erbs Road	David Eby	No, but the road allowance had been chopped
Lot 16, German Block, North of Snyders Road	Michael Roth	Yes
Lot 15, German Block, South of Snyders Road	Abraham Hunsberger	Yes
Lot 16, German Block, South of Snyders Road	Jacob Miller	Yes
Lot 17, German Block, South of Snyders Road	Christian Bassecker	No
Lot 17, German Block, North of Bleams Road	Ulrick Besicker	No, but the road allowance had been cleared and a log cabin had been built
Lot 18, German Block, North of Bleams Road	John Brennaman Jr.	No, but the road allowance had been cleared and a log cabin had been built
Lot 19, German Block, North of Bleams Road	Peter Miller	Yes
Lot 18, German Block, South of Bleams Road	Ulrick Steiner	Yes

Lot, Concession	Settler	Settling Duties Complete in 1830?
Lot 19, German Block, South of Bleams Road	Daniel Unzicker	No, but the road allowance had been cleared and a log cabin had been built
Lot 20, German Block, South of Bleams Road	Solomon Beringer	No, but the road allowance had been cleared and a log cabin had been built
Lot 21, German Block, South of Bleams Road	Vacant	N/A

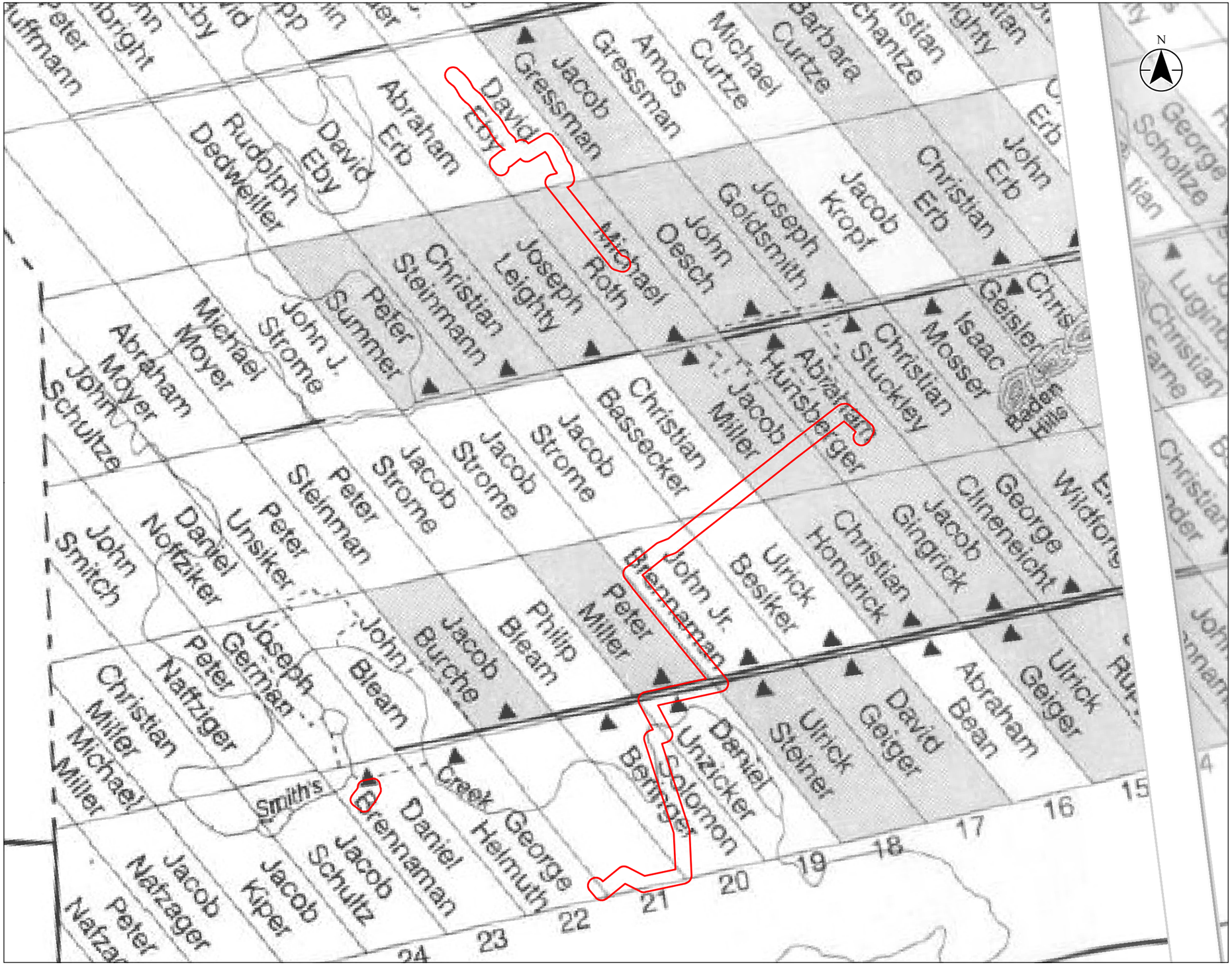
The remaining portion of the Study Area is within Block A. The Crown Patent for Lot 21, Concession 1, Block A was granted with the Canada Company in 1829 (ONLand 2022). The Canada Company retained control of at least half of the lot until 1851.

Historic mapping from 1861 reflects the early 19th century settlement of Wilmot Township and indicates that many of the lots had structures by this time (Figure 4). Properties in the northern most part of the Study Area are farmsteads in 1861 and the road networks in the villages of Baden and New Hamburg are well developed. The Grand Trunk Railway is also depicted connecting Baden and New Hamburg on its path traveling west-east across the Township.

Historic mapping from 1881 depicts the village of Baden on the north and south sides of Snyder's Road with a church to the east of the village but does not depict any other property owners or industries in the northern portion of the Study Area (Figure 5). The mapping does depict a cheese factory and a brewery outside of New Hamburg but does not provide any additional details for within the village itself. The Grand Trunk Railway is depicted traveling west-east across the township and linking New Hamburg to Baden, but very few property owners are marked in between. Based on other sources available, the 1881 mapping does not depict the full extent of the township's settlement and development. Mapping from this period often only included structures and landowners who subscribed to the Dominion Atlas in which these illustrated historical township maps were added as a supplement (Caston 1997; Gentilcore and Head 1984).

Topographic mapping from 1938 depicts the rural and agricultural character of the northernmost portion of the Study Area and in the area between the villages of Baden and New Hamburg (Figure 6). The road networks depicted in the villages are similar to those seen on the historical mapping, with a smaller number of streets in the southwestern corner of Baden. On the topographic mapping from 1938 the railway is operated by the Canadian National Railway Company.

Aerial photography from 1954 confirms that the character of the Study Area was still largely rural and agricultural (Figure 7). A review of additional topographic maps showed that the land to the east of the northern most part of the Study Area had become a campsite by 1968 and a golf course by 1976. The areas of suburban development present in the villages of Baden and New Hamburg today do not appear in 1976 which is the last available topographic map. Based on this topographic mapping and aerial imagery available on google earth, the present-day community of Foxboro Green in the northern portion of the Study Area was likely built sometime between 1976 and 2006.



Stantec

Legend

Approximate Location of Study Area

Notes

1. Historical mapping not to scale.
2. Source: Hilty, Ann and Lorraine Roth. 1996. "The Settlement of the German Block in Wilmot Township, Upper Canada." In *Ontario Mennonite History: The Newsletter of the Mennonite Historical Society of Ontario*, Volume XIV, Number 2, September 1996.

Project Location
Wilmot Township

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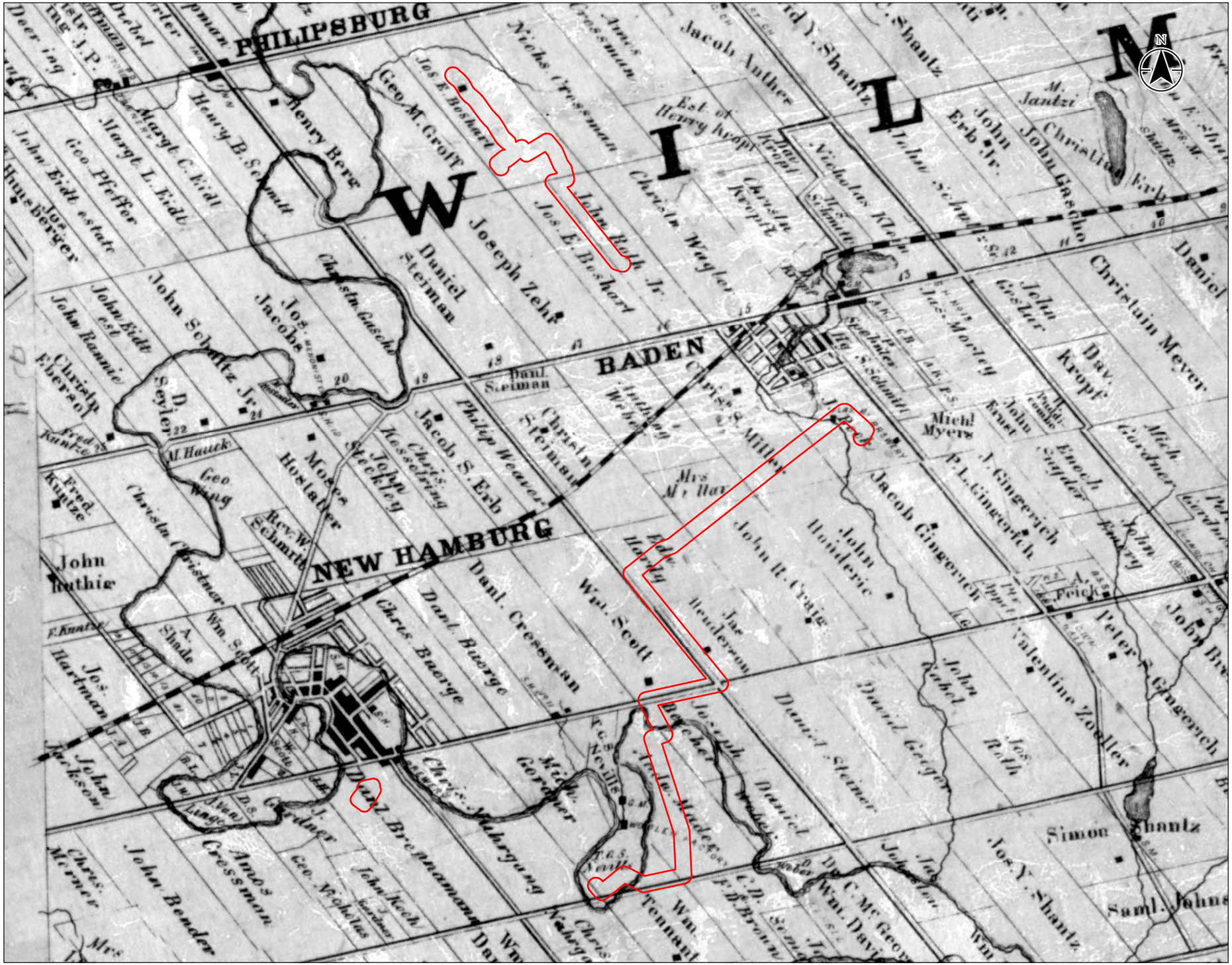
Client/Project
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Figure No.
3

Title
1830 German Block Settler Records

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Approximate Location of Study Area

Notes

1. Historical mapping not to scale.
2. Source: Geo. R. and G.M. Tremaine. 1861. *Tremaine's map of the County of Waterloo, Canada West: compiled and drawn from actual and original surveys by the publishers.* Toronto: Geo. R. and G.M. Tremaine.

Project Location
Wilmot
Township

165640324 REVA
Prepared by KDB on 2023-03-09

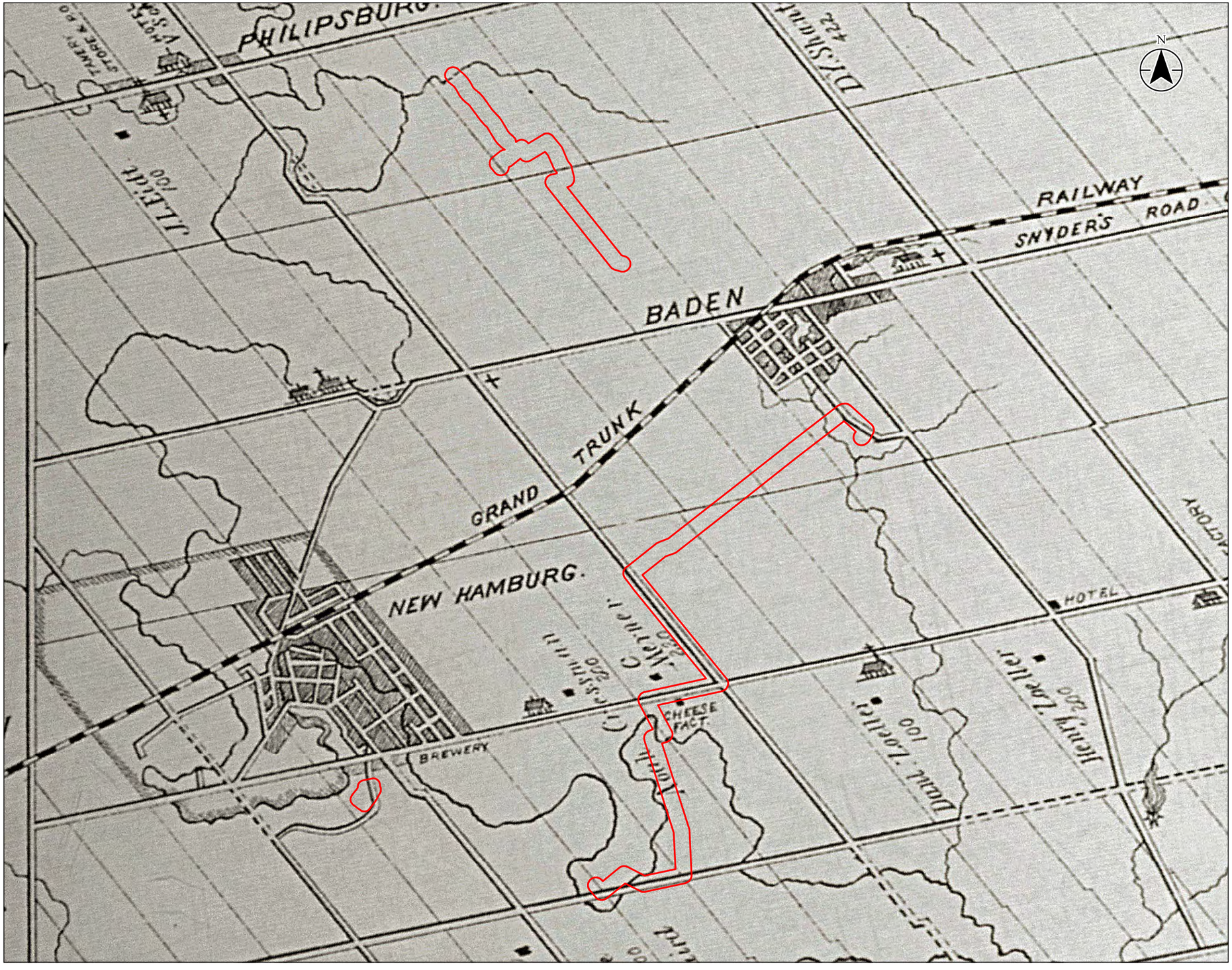
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Figure No.
4

Title
Historical Mapping, 1861

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Legend

Approximate Location of Study Area

Notes

1. Historical mapping not to scale.
2. Source: H. Parsell and Co and Walker and Miles. 1881. *Illustrated Historical Atlas of Waterloo and Wellington Counties Ontario 1881 and 1877.* Owen Sound: Richardson, Bond and Wright Ltd.

Project Location
Wilmot Township

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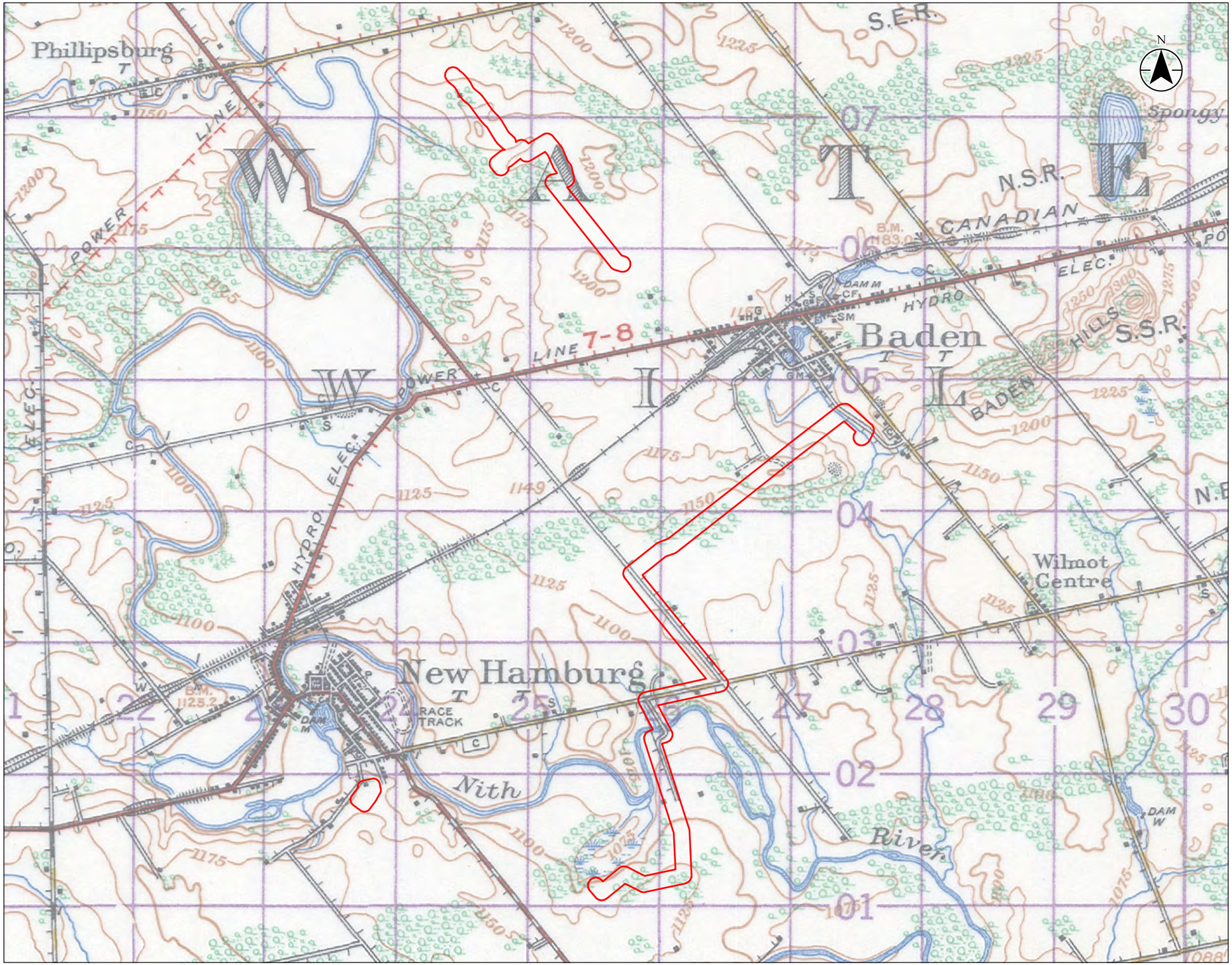
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Figure No.
5

Title
Historical Mapping, 1881

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Legend

Approximate Location of Study Area

Notes

1. Historical mapping not to scale.
2. Source: Department of Militia and Defense. 1938. *Topographic Map, Ontario, Stratford Sheet.*

Project Location Wilmot Township	165640324 REVA Prepared by KDB on 2023-03-09

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REGION OF WATERLOO | BADEN - NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.

6

Title

Topographic Mapping, 1938

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Stantec

Legend

Approximate Location of Study Area

Notes

1. Historical mapping not to scale.
2. Source: Hunting Survey Corporation. 1954. *Air Photos of Southern Ontario, Photoa 433803 and 434803.*

Project Location
Wilmot Township

165640324 REVA
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Client/Project
REGION OF WATERLOO | BADEN - NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
7

Title
Aerial Photography, 1954

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\\cd1004-f01.ww.group\01656\active\165640324\preliminary\analysis\gis\mxd\Heritage\165640324 CHR Fig7 1954.mxd Revised: 2023-03-09 By: kebuchanan

3.2 Municipal and Agency Requests

In order to identify previously identified built heritage resources or cultural heritage landscapes, the MCM, OHT, Wilmot Township, and the Wilmot Historical Society were contacted, and the municipal heritage register was reviewed. As a result of the data request and review of the heritage register, one property was identified within the Study Area. This property is 3332 Bleams Road East, which has a Part IV designation (Township of Wilmot By-Law 86-17). Consultation with Indigenous peoples and the public was undertaken as part of the broader EA process.

Table 3.2 Information Request Results

Organization	Contact	Results
MCM	Karla Barboza, Team Lead, Heritage	No properties designated by the Minister and no provincial heritage were identified within the Study Area.
OHT	Krystal Power, Co-ordinator, Real Property Portfolio	As of June 28, 2022, no response had been received from the OHT.
Wilmot Township	Tracy Loch, Director/Curator of Heritage Wilmot Advisory Committee	As of June 28, 2022, no response had been received from Wilmot Township, however, Wilmot's heritage register is available on the township's website and was consulted. One property with a Part IV Designation was identified within the study area.
Wilmot Historical Society	Liz Kirby, President	As of June 28, 2022, no response had been received from the Wilmot Historical Society.

3.3 Identification of Previously Identified and Potential Built Heritage Resources and Cultural Heritage Landscapes

As described in Section 2.4, a windshield survey of the Study Area was undertaken to identify potential built heritage resources and cultural heritage landscapes situated within the Study Area and confirm the presence of previously identified protected properties. Where identified, the site was photographically documented from publicly accessible roadways and its location was digitally recorded.

The Study Area is set in a predominantly rural and suburban landscape within the Township of Wilmot, Region of Waterloo. The south section of the Study Area is located within and near the community of New Hamburg and community of Wilmot. It consists mostly of agricultural properties and some examples of mid-20th century to contemporary residences which have been subdivided from agricultural properties. The southern part of the Study Area also contains some industrial properties on Gingerich Road. The north section of the Study Area contains a rural south section and a contemporary suburban development along Golf Links Drive.



Photo 1: View of the rural landscape within the Study Area, taken on Holland Mills Road facing north

The potential for CHVI was identified through professional judgement, historical research, and screening following the MCM *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes* (MCM 2016) and O. Reg 9/06. If found to have potential for CHVI, a structure or landscape was assigned a built heritage resource (referred to as BHR) or cultural heritage landscape (referred to as CHL) number and deemed to contain a potential built heritage resource or cultural heritage landscape. A total of six newly identified potential built heritage resources and one previously identified cultural heritage landscape were identified following the application of the screening criteria (Figure 8). Each property was considered both as an individual built heritage resource and as part of a larger potential cultural heritage landscape. Table 3.3 provides an overview of the identified built heritage resources and cultural heritage landscapes.

Table 3.3 Previously Identified or Potential Built Heritage Resources or Cultural Heritage Landscapes

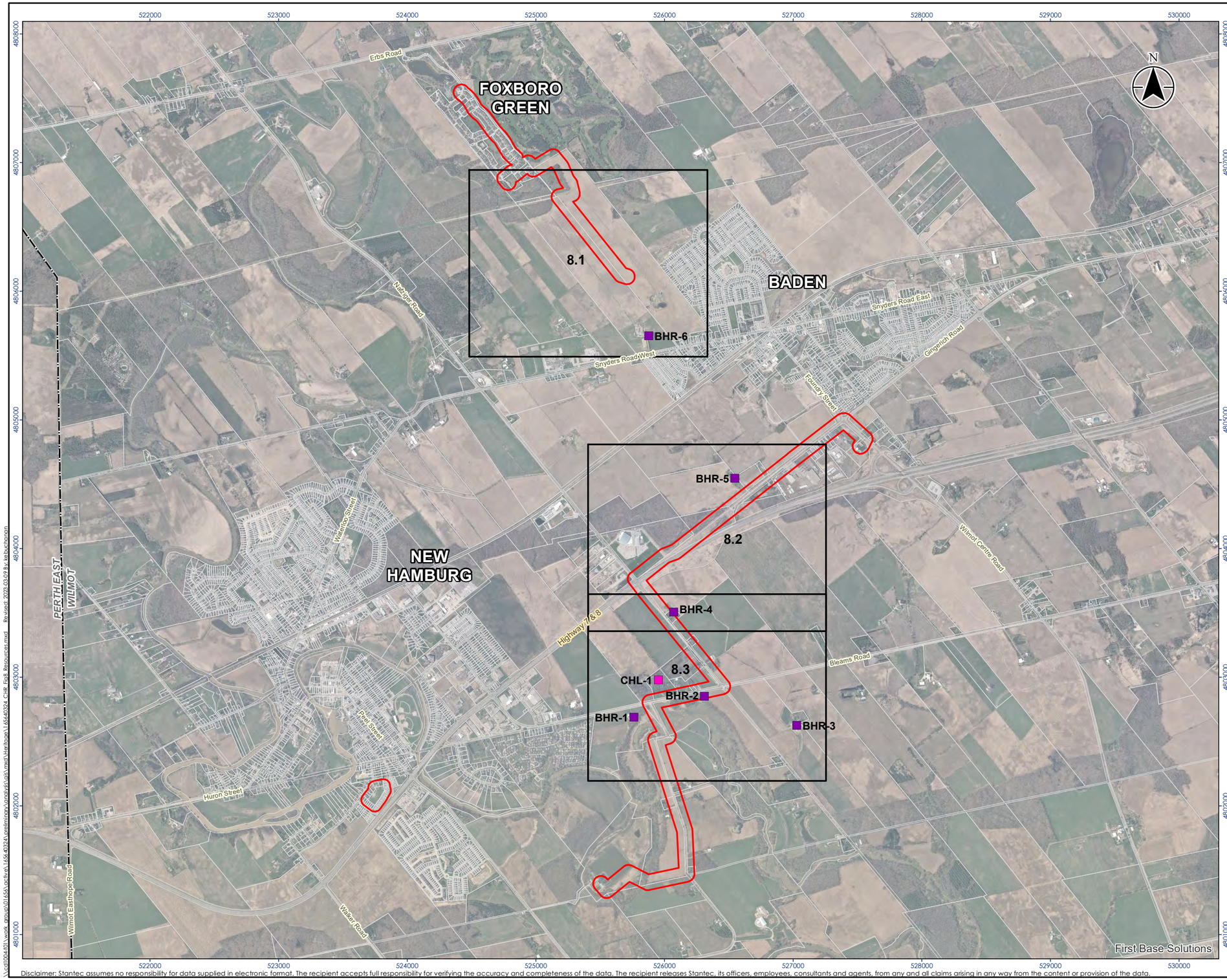
CHR Reference Number	Type of Property	Location	Previous Heritage Recognition	Description of Known or Potential CHVI	Photograph
BHR-1	Farmstead	3385 Bleams Road East	Identified during field review	This property contains a farmstead consisting of a residence, barn, outbuilding, and silo. The residence is a one and one half storey structure with a steeply pitched front facing gable roof with bargeboard and a finial. The exterior of the residence is buff brick and contains arched window openings. The residence contains a full width front porch, and the foundation is obscured. The barn is a gable and gambrel roof structure. The gambrel roof section is oriented in an east-west direction and the gable roof section is oriented in a north-south direction. The barn contains metal roof cladding, a timber exterior which has been painted red, and a concrete block foundation. The barn has a sign for “W Gingerich and Sons.” The outbuilding is a gambrel roof structure with modern garage doors. The silo is concrete. The residence was likely built between 1862 and 1880 based on historical mapping and architectural style. The barn was likely built or heavily modified to its present configuration between 1900 and 1930 based on materials and architectural style. The residence contains potential design value as a representative example of mid to late 19th century Ontario vernacular structure with Gothic Revival design elements. The barn contains potential design value as a representative early 20th century gable and gambrel roof barn.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition	Description of Known or Potential CHVI	Photograph
CHL-1	Farmstead	3332 Bleams Road East	Part IV designation (Township of Wilmot By-Law 86-17)	This property contains the William J. Scott House and is designated under Part IV of the OHA. The property contains a residence, servants house, smokehouse, landscaped grounds, and a pond. The residence is a one and one half storey structure with a steeply pitched intersecting gable roof with bargeboard. The exterior is stone and contains lancet window openings and a partial-width porch. Additional details of the residence are obscured by vegetation and distance from roadway. The servant's house is a gable roof structure with gable dormers and is located northwest of the main residence. The smoke house is not visible from the public realm. The property is landscaped with mature deciduous trees, coniferous trees, and a pond. The residence was built in 1858. Based on the designating bylaw, the property contains design value as a representative example of a mid-19th century Gothic Revival structure and displays a high degree of craftsmanship. The property is historically associated with William J. Scott, an important early settler in Wilmot Township. The property has a contextual relationship with the landscape and is situated on a hill (Township of Wilmot 1986).	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition	Description of Known or Potential CHVI	Photograph
BHR-2	Barn	3277 Bleams Road East	Identified during field review	This property contains a modern residence, outbuilding, silo, and barn. The residence is a one and one half storey structure with a steeply pitched side gable roof. The residence has a red brick and faux half timbering exterior. The barn is a gable roof structure with metal roof cladding and an earth bank. The exterior of the barn is timber, and the barn contains a stone foundation. The silo is a cast-in-place concrete silo, and the outbuilding is a modern gable rood structure. The barn was likely built between 1850 and 1900 based on materials, architectural style, and historic settlement patterns. The barn has potential design value as a representative mid-19th to late 19th century gable roof bank barn.	
BHR-3	Farmstead	3171 Bleams Road East	Identified during field review	This property contains a farmstead consisting of a residence, barn, outbuilding and silo. The residence is a one and one half storey structure with a side gable roof. Additional details of the residence are obscured by vegetation and distance from roadway. The barn is a gable roof structure with an earth bank. The barn contains a metal clad roof, timber exterior, and stone foundation. The outbuilding is a modern gable roof structure clad in metal and the silo is a cast-in-place concrete structure. The residence was likely built between 1862 and 1927 based on historical and topographic mapping. The barn was likely built between 1850 and 1900 based on materials, architectural style, and historic settlement patterns. The residence has potential design value as a mid-19th to early 20th century Ontario vernacular structure and the barn has potential design value as a mid to late 19th century gable roof bank barn.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition	Description of Known or Potential CHVI	Photograph
BHR-4	Residence	1135 Nafziger Road	Identified during field review	This property contains a residence. The residence is a one and one half storey structure with a medium pitched side gable roof with a stucco chimney and return eaves. The exterior is stucco, and the residence contains modern windows. The front (south) façade is symmetrical. The foundation is obscured. The residence was likely prior to 1870 based on settlement patterns and architectural style. The residence has potential design value as a rare example of an Ontario vernacular structure with Classic Revival or Neo-Classical residence.	
BHR-5	Residence	1578 Gingerich Road	Identified during field review	This property contains a residence. The residence is deeply setback on the lot and partially obscured by vegetation. The residence is a one or one and one half storey structure with a medium pitch side gable roof. The exterior of the residence is stucco or pebbledash. The front (south) façade is symmetrical and contains a full-width porch. The residence was likely prior to 1870 based on settlement patterns and architectural style. The residence has potential design value as a rare example of an Ontario vernacular residence with Georgian design influence.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition	Description of Known or Potential CHVI	Photograph
BHR-6	Residence	1056 Snyder's Road West	Identified during field review	This property contains a residence, heavily modified barn, outbuilding, and bins. The residence is a one and one half storey structure with a medium pitched cross gable roof and brick chimney. The exterior of the residence is painted brick. The east, west, and south elevations contain gable dormers with pointed arch window openings. The east elevation contains a partial width front porch, and the north elevation contains a modern addition. Additional details are obscured by distance from roadway and vegetation. The barn is a cross gable structure with a metal clad roof. The barn is clad in modern siding, contains modern windows, and a stone foundation. The outbuilding is a modern Quonset hut structure, and the bins are metal. The residence and barn were likely built between 1862 and 1880 based on historical mapping, materials, and architectural style. The residence has potential design value as a representative example of an Ontario vernacular structure with Gothic Revival design influence.	



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Legend

- Study
- Parcel Fabric

Built Heritage Resource or Cultural Heritage Landscape

- Designated Part IV
- Other Potentail or Identified

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Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
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Project Location
Wilmot Township

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Figure No.
8.0

Title
Previously Identified or Potential Built Heritage Resources or Cultural Heritage Landscapes

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Stantec

Legend

- Study
- Parcel Fabric

Built Heritage Resource or Cultural Heritage Landscape

- Designated Part IV
- Other Potentail or Identified

0 150 300 m

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Project Location
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Figure No.
8.1

Title
Previously Identified or Potential Built Heritage Resources or Cultural Heritage Landscapes (Sheet 1 of 3)

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Stantec

Legend

- Study
- Parcel Fabric

Built Heritage Resource or Cultural Heritage Landscape

- Designated Part IV
- Other Potentail or Identified

0 150 300 m

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Notes

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Project Location
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REGION OF WATERLOO | BADEN - NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Figure No.
8.2

Title
Previously Identified or Potential Built Heritage Resources or Cultural Heritage Landscapes (Sheet 2 of 3)

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Legend

- Study
- Parcel Fabric

Built Heritage Resource or Cultural Heritage Landscape

- Designated Part IV
- Other Potentail or Identified

0 150 300 m

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Project Location
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Figure No.
8.3

Title
Previously Identified or Potential Built Heritage Resources or Cultural Heritage Landscapes (Sheet 3 of 3)

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4 Preliminary Impact Assessment

4.1 Description of Proposed Undertaking

The purpose of the Servicing Review is to evaluate the status of existing water and wastewater servicing systems in Baden – New Hamburg and Foxboro Green, provide recommendations to address existing servicing constraints, and to provide the framework to meet the current and future water / wastewater servicing needs. Following an evaluation of alternatives, the preliminary preferred alternative is increased storage at New Hamburg Water Treat Plant and upgrades to the Baden Wastewater Pumping Station and a new force main from the Baden Pumping Station to the New Hamburg Wastewater Treatment Plant. The Project will involve the construction of the preferred Baden wastewater servicing alternative WW4 to the New Hamburg Wastewater Treatment Plant, and the Foxboro Green preferred alternative F3.

4.2 Identification of Preliminary Potential Project Specific Impacts and Proposed Mitigation Measures

The results of the preliminary impact assessment and preparation of mitigation measures are presented in Table 4.1. No direct impacts to any previously identified or potential built heritage resources or cultural heritage landscapes are anticipated at this stage of the Project. Indirect impacts were identified for one property (3277 Bleams Road East).

Table 4.1 Preliminary Impact Assessment and Mitigation Measures

CHR Reference Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation
BHR-1	3385 Bleams Road East	Identified during field review	**No Impacts Anticipated:** The property is located adjacent to the Project Location. Construction activities are proposed more than 151 metres east of the barn. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	Continued avoidance is recommended.

CHR Reference Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation
CHL-1	3332 Bleams Road East	Part IV designation (Township of Wilmot)	**No Impacts Anticipated:** The property is located adjacent to the Project Location. Construction activities are proposed more than 133 metres south of any buildings on the property. Landscaping elements such as the pond, lawn, and trees are located within 50 metres of proposed construction. These elements of the property will not be negatively impacted as construction is limited to the municipal right of way and no driplines of mature trees are near or within the municipal right of way. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	Continued avoidance is recommended.
BHR-2	3277 Bleams Road East	Identified during field review	**Indirect:** The barn is situated adjacent to the Project Location. Construction activities are proposed within 35 metres of the identified BHR. The position of the barn within 35 metres has the potential for indirect impacts resulting from vibration damage during construction activities.	**Preferred Option:** Avoid the BHR by establishing a buffer zone around the barn to limit construction activity to more than 50 metres away. This should use appropriate preventative measures such as mapping of the BHR on construction maps and temporary fencing. Staging and laydown areas should also be selected so that they are non-invasive and avoid the BHR. Where avoidance is not feasible, the alternative option should be applied. **Alternative Option:** Where construction activities are anticipated within the 50-metre buffer zone a pre-construction vibration assessment by a qualified engineer is recommended in order to determine if vibration monitoring or site plan controls are required.

CHR Reference Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation
BHR-3	3171 Bleams Road East	Identified during field review	**No Impacts Anticipated:** The property is located adjacent to the Project Location. Construction activities are proposed more than 588 metres northwest of the residence and barn. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	Continued avoidance is recommended.
BHR-4	1135 Nafziger Road	Identified during field review	**No Impacts Anticipated:** The property is located adjacent to the Project Location. Construction activities are proposed more than 65 metres east of the residence. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	Continued avoidance is recommended.
BHR-5	1578 Gingerich Road	Identified during field review	**No Impacts Anticipated:** The property is located adjacent to the Project Location. Construction activities are proposed more than 146 metres south of the residence. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	Continued avoidance is recommended.
BHR-6	1056 Snyder's Road West	Identified during field review	**No Impacts Anticipated:** The property is located adjacent to the Project Location. Construction activities are proposed more than 489 metres north of the residence. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	Continued avoidance is recommended.

4.2.1 Summary of Impacts

Direct Impacts: Following the assessment of impacts presented in Table 4.1, no previously identified or potential built heritage resources or cultural heritage landscapes were identified to be situated within the Project Location and at risk for direct impacts.

Indirect Impacts: Following the assessment of impacts presented in Table 4.1, the barn at 3277 Bleams Road East (BHR-2) was identified to be situated within 50 metres of planned construction activity and at risk for potential indirect vibration related impacts:

Where potential for impacts has been identified, measures to mitigate them have been prepared. Precautions are required to conserve previously identified or potential built heritage resources or cultural heritage landscapes through avoidance and mitigation where the potential for the Project to cause an impact has been identified. Vibration velocity, or PPV, should be limited to three millimetres per second. Therefore, the below mitigation options have been developed to provide for the conservation of previously identified or potential built heritage resources or cultural heritage landscapes identified.

The potential for indirect impacts resulting from vibration effects is related to the construction phase of the Project. Where potential impacts have been identified, components of the previously identified or potential built heritage resource or cultural heritage landscape are positioned within the 50-metre buffer but outside the direct Project Location. As a result, a preventive approach to mitigation measures will contribute to a reduction in risk of indirect impacts. The following is the preferred and alternative mitigation options:

Preferred Option: Avoid 3277 Bleams Road East (BHR-2) by establishing a buffer zone around the resource to avoid construction activity within 50 metres of the built heritage resource. This should use appropriate preventative measures such as mapping on construction maps or plans and temporary fencing. Staging and laydown areas should also be selected so that they are non-invasive and avoid the built heritage resource. Where avoidance is not feasible, the alternative option should be applied.

Alternative Option: If the 50-metre buffer at 3277 Bleams Road East (BHR-2) cannot be avoided, the alternative option to mitigate this risk is for a qualified building condition specialist or engineer to develop a strategy to carry out condition surveys and vibration monitoring, where required. The pre-condition survey may consist of screening activities to identify critical properties and determine appropriate vibration levels based on building type, age, and condition. Vibration monitoring may consist of random confirmatory vibration monitoring during pipeline installation at the most critical properties. A post-condition survey should be carried out on an as-needed basis to be determined by the qualified building condition specialist or engineer.



5 Recommendations

The built heritage resource consisting of the barn at 3277 Bleams Road East (BHR-2) was determined to be situated within 50 metres of planned construction activities and at risk for potential indirect vibration related impacts. The Preferred Option is to avoid 3277 Bleams Road East (BHR-2) by establishing a buffer zone around the built heritage resource to avoid construction activity within 50 metres. This should use appropriate preventative measures such as mapping on construction maps or plans and temporary fencing. Staging and laydown areas should also be selected so that they are non-invasive and avoid the previously identified or potential built heritage resource or cultural heritage landscape. Where avoidance is not feasible, the alternative option should be applied.

If the 50-metre buffer at 3277 Bleams Road East (BHR-2) cannot be avoided, the alternative option to mitigate this risk is for a qualified building condition specialist or engineer to develop a strategy to carry out condition surveys and vibration monitoring, where required. The pre-condition survey may consist of screening activities to identify critical properties and determine appropriate vibration levels based on building type, age, and condition. Vibration monitoring may consist of random confirmatory vibration monitoring during pipeline installation at the most critical properties. A post-condition survey should be carried out on an as-needed basis to be determined by the qualified building condition specialist or engineer.

To assist in the retention of historic information, a copy of this report should be deposited with a local repository of historic material. Therefore, it is recommended that this report be deposited at the following location:

Region of Waterloo Archives
190 Frederick Street
Kitchener, Ontario N2H 2M6

6 Closure

This report has been prepared for the sole benefit of the Regional Municipality of Waterloo, and may not be used by any third party without the express written consent of Stantec Consulting Ltd. Any use which a third party makes of this report is the responsibility of such third party.

We trust this report meets your current requirements. Please do not hesitate to contact us should you require further information or have additional questions about any facet of this report.

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