

Appendix A

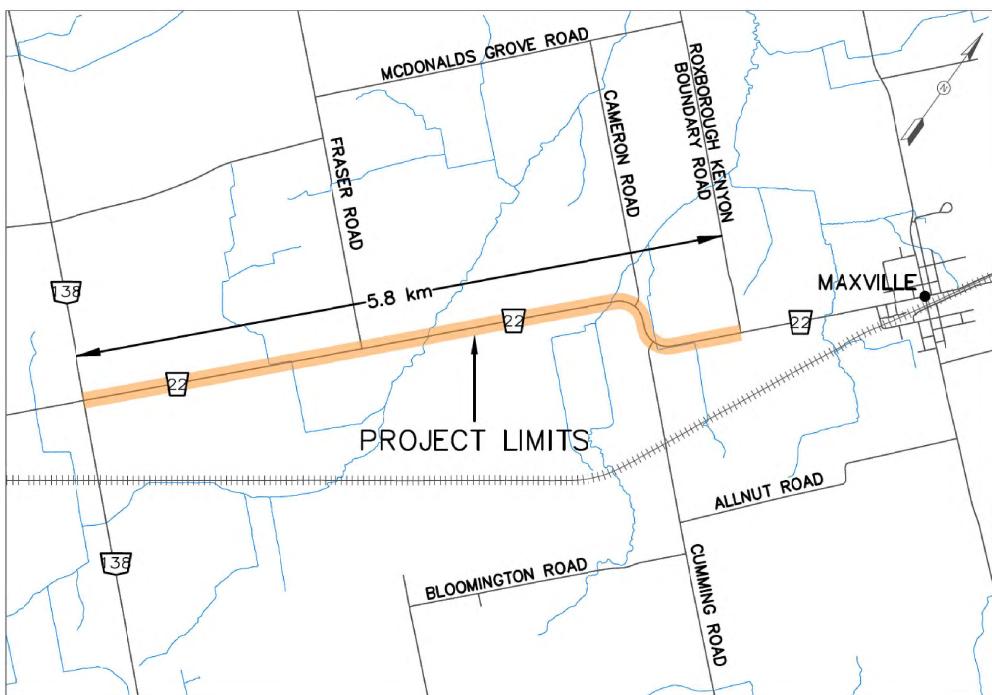
Record of Consultation



Notice of Study Commencement United Counties of Stormont, Dundas and Glengarry County Road 22 Reconstruction and Drainage Improvements

INTRODUCTION

The United Counties of Stormont, Dundas and Glengarry has retained BT Engineering Inc. to undertake Engineering Services for the reconstruction and drainage improvements for County Road 22. The project will complete the design for the reconstruction including relocation of utilities (if required) and municipal drains to accommodate potential road widening. The project limits extend from Roxborough Kenyon Boundary Road westerly to Highway 138. **At this time, property impacts are unknown and dependent on the design.**



STUDY PROCESS

The project is being conducted as a Schedule A+ Municipal Class Environmental Assessment (MCEA) (2015). The project is pre-approved for construction with this mandatory public notice. If property acquisition or adverse environmental impacts are identified during the design, the project may be elevated to a Schedule B MCEA project. If the project is elevated to a Schedule B, a public notice will be provided at that time. The Study will proactively consult with the public, stakeholders and Indigenous Peoples.

PUBLIC CONSULTATION

Public Information Centre: A Public Information Centre (PIC) will be held to present the Preliminary Design drawings and potential property impacts. The goal of the PIC event is to engage the public/stakeholders on their perspectives and interests in the project and present the reconstruction recommendations. **Notice of the PIC will be advertised prior to the event. It is tentatively scheduled for fall 2022. Members of the public wishing to**

be included on the contact list and be given notice of the event can contact either of the Project Managers below.

Comments: There is an opportunity at any time during the Class EA process for interested persons to provide comments. Early identification of individual and group concerns greatly aids in addressing these concerns. All information will be collected in accordance with the *Municipal Freedom of Information and Protection of Privacy Act* (2009). With the exception of personal information, all comments will become part of the public record.

For more information or if you wish to be placed on the study's mailing or emailing contact list, contact either:

Steve Taylor, P.Eng., M.Eng.
EA Project Manager
BT Engineering Inc.
100 Craig Henry Drive, Suite 201
Ottawa, ON K2G 5W3
Phone: 613-228-4813
Email: steven.taylor@bteng.ca

Michael Jans, P.Eng.
Manager of Infrastructure
United Counties of Stormont, Dundas and Glengarry
26 Pitt Street
Cornwall, ON K6J 3P2
Phone: 613-932-1515 ext. 219
Email: mjans@sdgcounties.ca



Notice of Public Information Centre (PIC)
United Counties of Stormont, Dundas, and Glengarry
County Road 22 Reconstruction and Drainage Improvements
November 29, 2022, from 5:00 pm to 7:00 pm

Introduction

The United Counties of Stormont, Dundas and Glengarry has retained BT Engineering Inc. to complete the design and undertake engineering services for the reconstruction and drainage improvements for County Road 22.

Project Process

The project will complete the design for the reconstruction including the relocation of utilities and municipal drains to accommodate potential road widening. The project limits extend from the urban boundary of Maxville westerly to Highway 138. **The study is being elevated to a Schedule B Municipal Class EA (MCEA).**

Preliminary recommendations will be provided on the scope of roadway improvements, property requirements and associated realignment of Municipal Drains.

Public Consultation

The PIC is being held in-person as follows:

Date: Tuesday, November 29, 2022

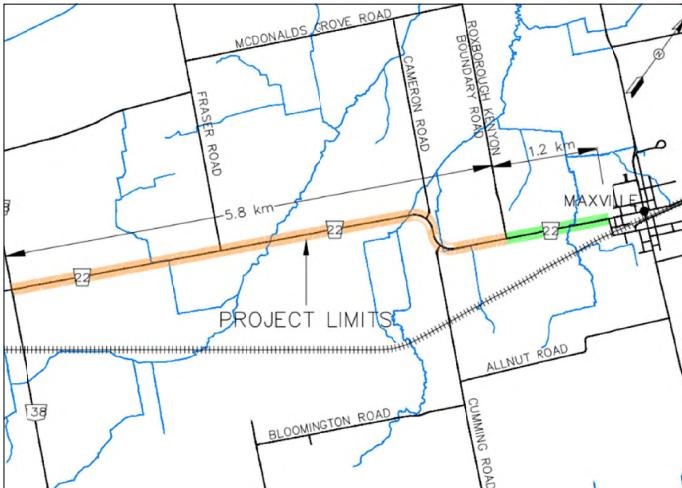
Time: 5:00 pm to 7:00 pm

Location: Maxville & District Sports Complex Banquet Hall

25 Fair Street, Maxville, ON K0C 1T0

There is an opportunity at any time during the Class EA process for interested persons to provide comments. Early identification of individual and group concerns greatly aids in addressing these concerns. All information will be collected in accordance with the *Municipal Freedom of Information and Protection of Privacy Act (2009)*. With the exception of personal information, all comments will become part of the public record.

For more information, to be placed on the project's email/postal mailing list, or if you wish to be removed from the contact list, please contact either:



Steve Taylor, P.Eng.
Consultant Project Manager
BT Engineering Inc.
100 Craig Henry Drive, Suite 201
Ottawa, Ontario K2G 5W3
Phone: 613-228-4813
Email: steven.taylor@bteng.ca

Michael Jans, P.Eng.
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26 Pitt Street
Cornwall, Ontario K6J 3P2
Phone: 613-932-1515 ext. 219
Email: mjans@sdgcountries.ca

This notice issued on November 16, 2022.



Public Information Centre Summary Report

The United Counties of Stormont, Dundas and Glengarry
County Road 22 Reconstruction and Drainage Improvements

January 2023

The United Counties of Stormont, Dundas and Glengarry
County Road 22 Reconstruction and Drainage Improvements
PIC No. 1 Summary Report



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Submitted by:
BT Engineering Inc.
100 Craig Henry Drive, Suite 201
Ottawa, ON K2G 5W3
613-228-4813



1.0 INTRODUCTION

The United Counties of Stormont, Dundas and Glengarry has retained BT Engineering Inc. to undertake engineering services for the reconstruction and drainage improvements for County Road 22. The project will complete the design for the reconstruction including relocation of utilities (if required) and municipal drains to accommodate the road widening.

The recommended reconstruction and drainage improvements require the acquisition of property and therefore the project has been elevated to a Schedule B Municipal Class Environmental Assessment project. Phases 1 and 2 are being completed to present the recommendations to the public. Following completion of the EA process, a Project File will be prepared to document key components of the study: need and justification; natural and socio-economic inventories; evaluation of alternatives; selection of the recommended alternative; and public and Indigenous Peoples consultation. The Project File Report will be made available for a 30-day public review.

The purpose of Public Information Centre (PIC) No. 1 was to present the project limits, drainage map, preliminary design alternatives, pavement rehabilitation and reconstruction alternatives.

The project limits are shown in **Figure 1**.

PIC No. 1 for this project was held on:

Tuesday, November 29, 2022
5:00 pm to 7:00 pm (drop-in format)
Maxville & District Sports Complex Banquet Hall
25 Fair Street, Maxville, ON K0C 1T0

The PIC included presenting the following:

- Preliminary design drawings for the County Road 22 reconstruction
- Relocation of the Municipal Drains
- Property impacts
- Timeline of upcoming steps
- Opportunity to ask questions and provide comments

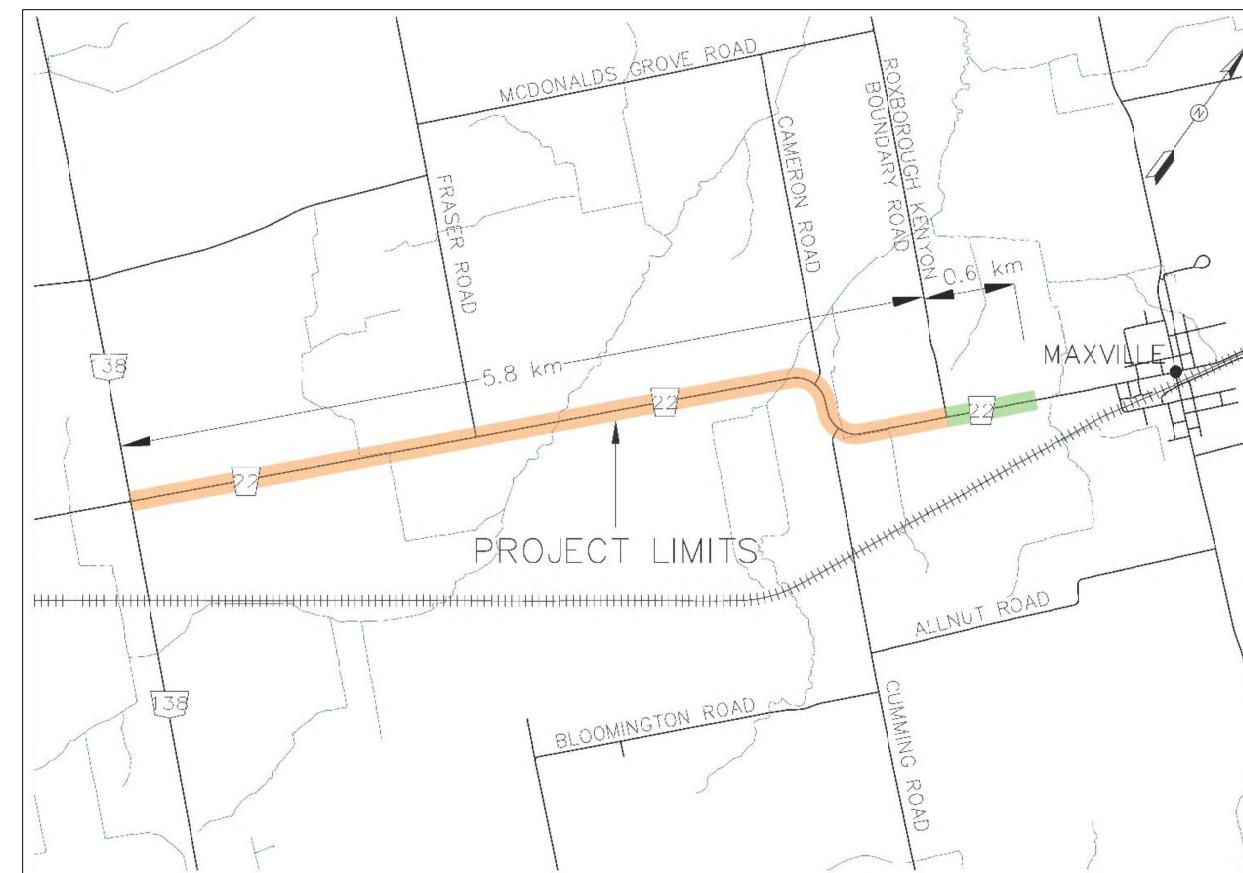


Figure 1: Project Limits

United Counties and consultant representatives were available to respond to any inquiries.

All members of the public and interest groups were invited to the PIC to view the presentation material and to discuss the project with the United Counties and consultant representatives. The exhibits are included in **Appendix A**.

2.0 PUBLIC AND AGENCY CONSULTATION

One of the key aspects of the project is to provide the public, interested parties and affected agencies with the opportunity for input. In order to ensure this objective is met, a public and agency notification program was undertaken. The program includes a number of communication mechanisms, discussed in the following sections.

2.1 PIC Notice

Notice of PIC No. 1 was issued on Wednesday, November 16, 2022 by social media and hard copy letters to members of the public.

The notice is provided in **Appendix B**.

3.0 PIC COMMENTS

Seven (7) comment sheets were received during the PIC comment period. Copies of the comments, excluding personal information, are provided in **Appendix C**. The results of the comments and discussions are summarized in the following sections.

3.1 Summary of Comments

The results of the comments received and discussions held at PIC No. 1 are summarized below in **Table 1**. The comments have been summarized by general subject matter.

Table 1: Summary of Written Comments Public Information Centre No. 1 November 29, 2022		
Comment	Comments Received	Comment Sheet ID
Concern over improvements for raising the road	2	5, 7
Drain ditch along the road in front of Villeneuve.	1	6
Concern with water running from the road to house/basement if road is raised a foot (17480 County Road 22).	1	7
Request the installation of a pipe under County Road 22 connecting Lot 10, Concession 6 and Lot 11 Concession 7.	2	1, 2
Recommend the municipal drain cross County Road 22 at the Kenyon-Roxborough Boundary Road which is the east end of the drain. Then proceed west on the north side of County Road 22 on vacant property owned by North Glengarry. Presently, the area is not being used and is scrub brush.	1	3
Recommend a passing/turn lane at Kenyon/Roxborough Boundary Road.	1	3
Lot A – well located between barn and the county road. Well is 15' deep into an existing spring. Expansion of North side would limit effect of water source. Existing hydro + Bell Canada lines would not need to be moved.	1	4



4.0 NEXT STEPS

Following the PIC, all comments will be reviewed and refinements may be made to the County Road 22 Reconstruction and Drainage Improvements, based on these comments.

Appendix A

Exhibits



Welcome!



United Counties of Stormont, Dundas and Glengarry

County Road 22 Reconstruction and Drainage Improvements

Welcome to the Public Information Centre event for the County Road 22 Reconstruction and Drainage Improvements project.

Should you have any questions regarding the materials or any other aspect of the study, or if you would like to review any of the background reports, contact either of the following by **December 16, 2022**:

Steve Taylor, P.Eng.
BT Engineering Inc., Project Manager
Email: steven.taylor@bteng.ca
Phone: 613-228-4813

Michael Jans, P.Eng.
Manager of Infrastructure, United Counties
Email: mjans@sdgcounties.ca
Phone: 613-932-1515 ext. 219

There is an opportunity at any time during the process for interested persons to provide written input. Any comments received will be collected under the *Environmental Assessment Act* and, with the exception of personal information, will become part of the public record.

Introduction

The United Counties of Stormont, Dundas and Glengarry has retained BT Engineering Inc. to undertake engineering services for the reconstruction and drainage improvements for County Road 22. The project will complete the design for the reconstruction including relocation of utilities (if required) and municipal drains to accommodate potential road widening.

Property acquisition is recommended for the reconstruction and drainage improvements and therefore the project has been elevated to a Schedule B Municipal Class Environmental Assessment project. Phases 1 and 2 are being completed to present the recommendations to the public. After completion of the EA process, a Project File will be produced. The Report will document key components of the study: need and justification; natural and socio-economic inventories; evaluation of alternatives; selection of the recommended alternative; and public and Indigenous Peoples consultation. The Project File will be made available for a 30-day public review of the Report.



1

3

Purpose of Public Information Centre

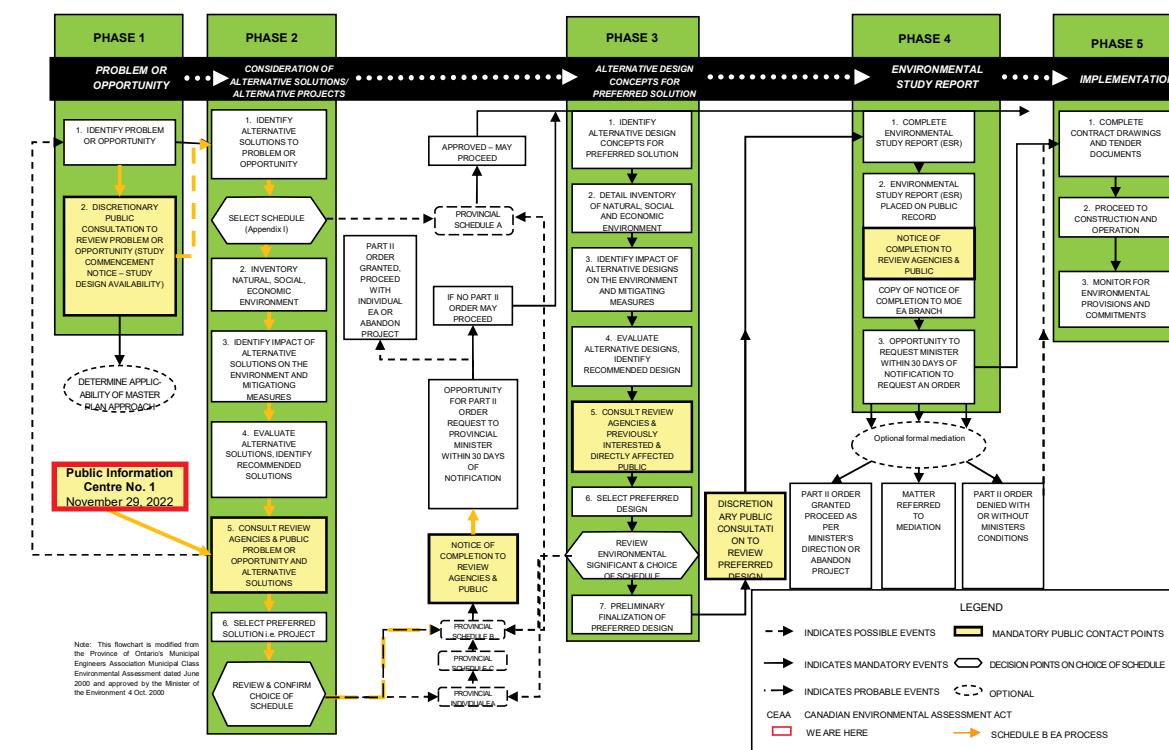
The purpose of this meeting is to:

- Present the preliminary design drawings for the County Road 22 reconstruction
- Present the relocation of the Municipal Drains
- Present property impacts
- Provide a timeline of upcoming steps
- Provide the public with an opportunity to ask questions and provide comments

The works are tentatively scheduled to be constructed within the 5-year property program (subject to Council approval). The following exhibits present background information, existing conditions and the detail design of the projects.

2

Municipal Class EA Process



4

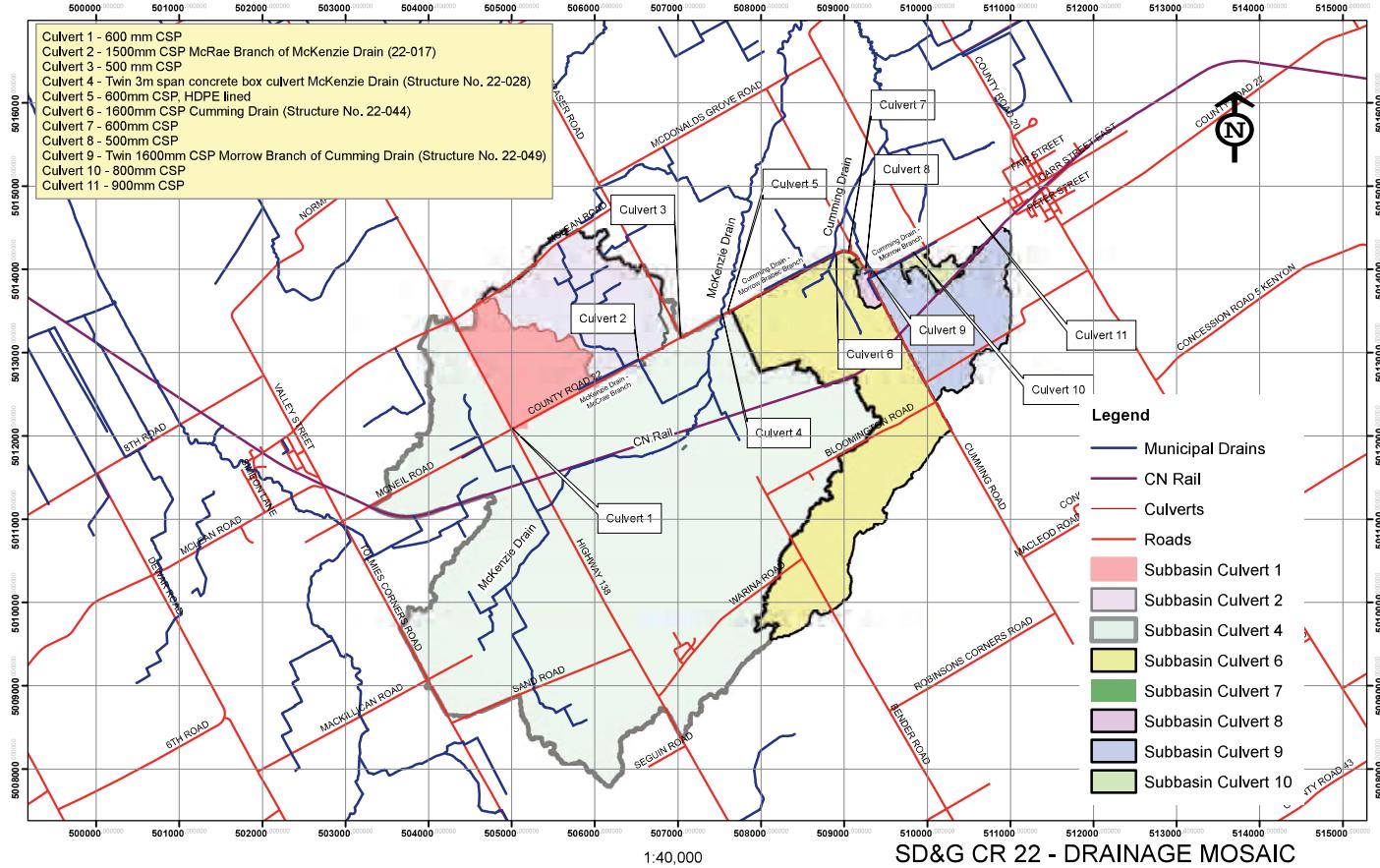
Project Limits



Legend:

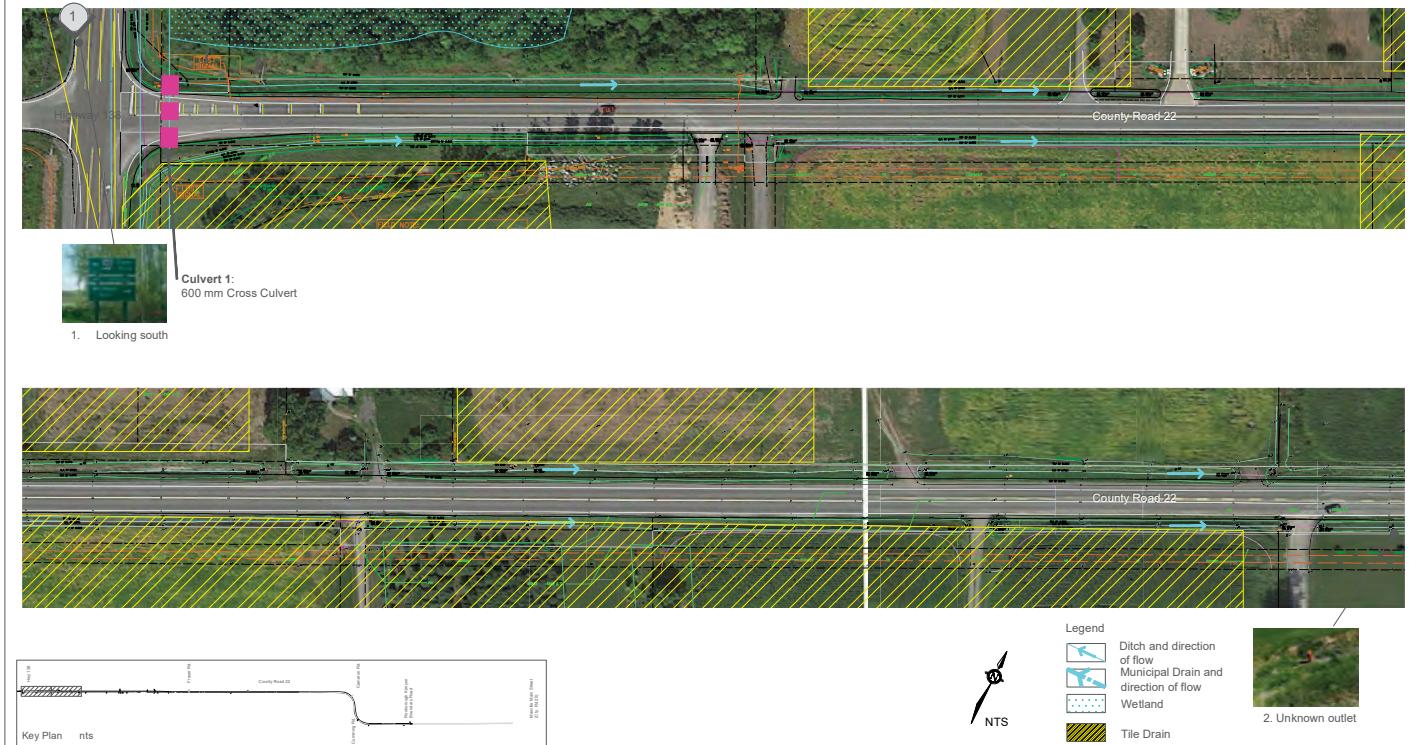
— Original Project Limits

— Project Limit Extension based on Geotechnical Investigations



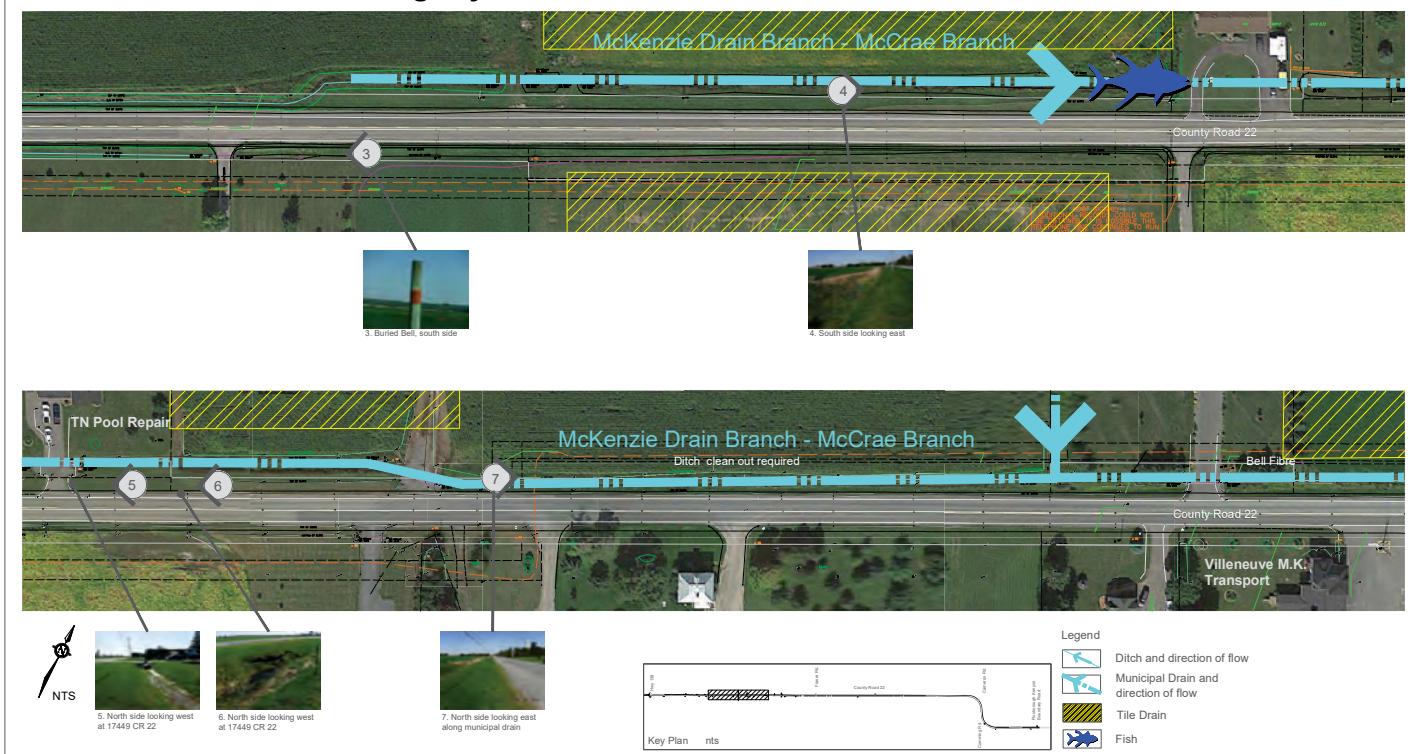
Drainage Map 1

County Road 22
Stormont Dundas and Glengarry



Drainage Map 2

County Road 22
Stormont Dundas and Glengarry



Drainage Map 3

County Road 22

Stormont Dundas and Glengarry

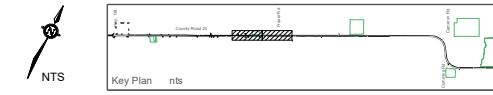


8. Fish
Culvert 2: CSP 1500 mm Ø



10. Culvert 3:
CSP 500 mm Ø

Legend
Ditch and direction of flow
Municipal Drain and direction of flow
Tile Drain
Fish

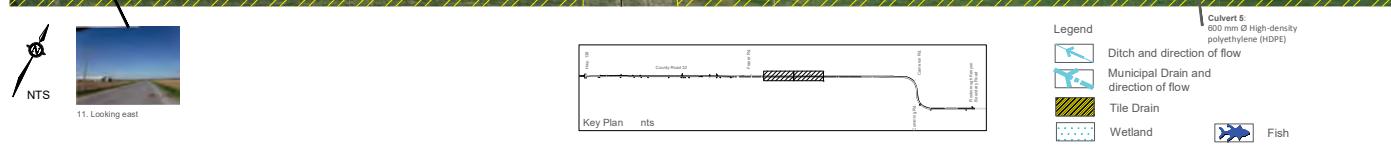


Key Plan nts

Drainage Map 4

County Road 22

Stormont Dundas and Glengarry



Key Plan nts

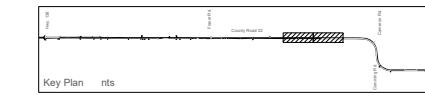
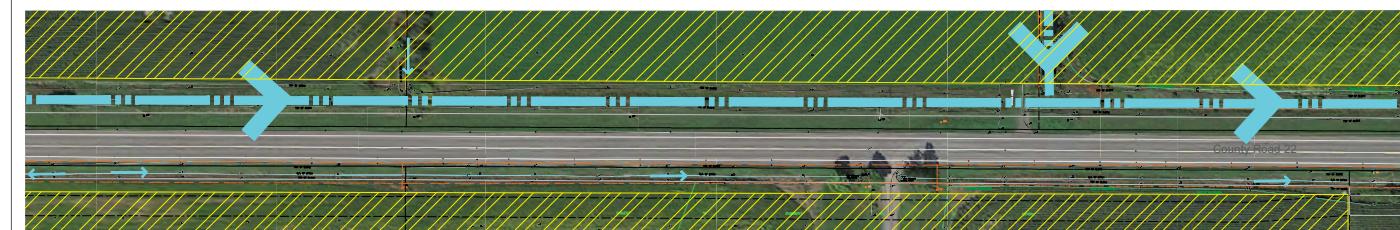
Legend
Ditch and direction of flow
Municipal Drain and direction of flow
Tile Drain
Wetland
Fish

Legend
Ditch and direction of flow
Municipal Drain and direction of flow
Tile Drain
Fish

Drainage Map 5

County Road 22

Stormont Dundas and Glengarry

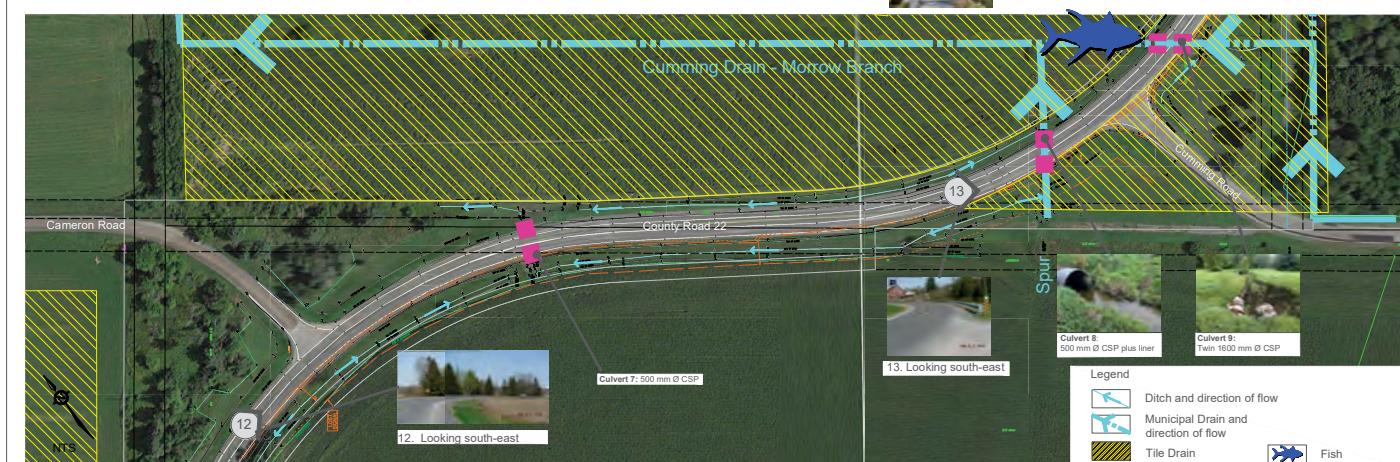


Legend
Ditch and direction of flow
Municipal Drain and direction of flow
Wetland
Tile Drain

Drainage Map 6

County Road 22

Stormont Dundas and Glengarry



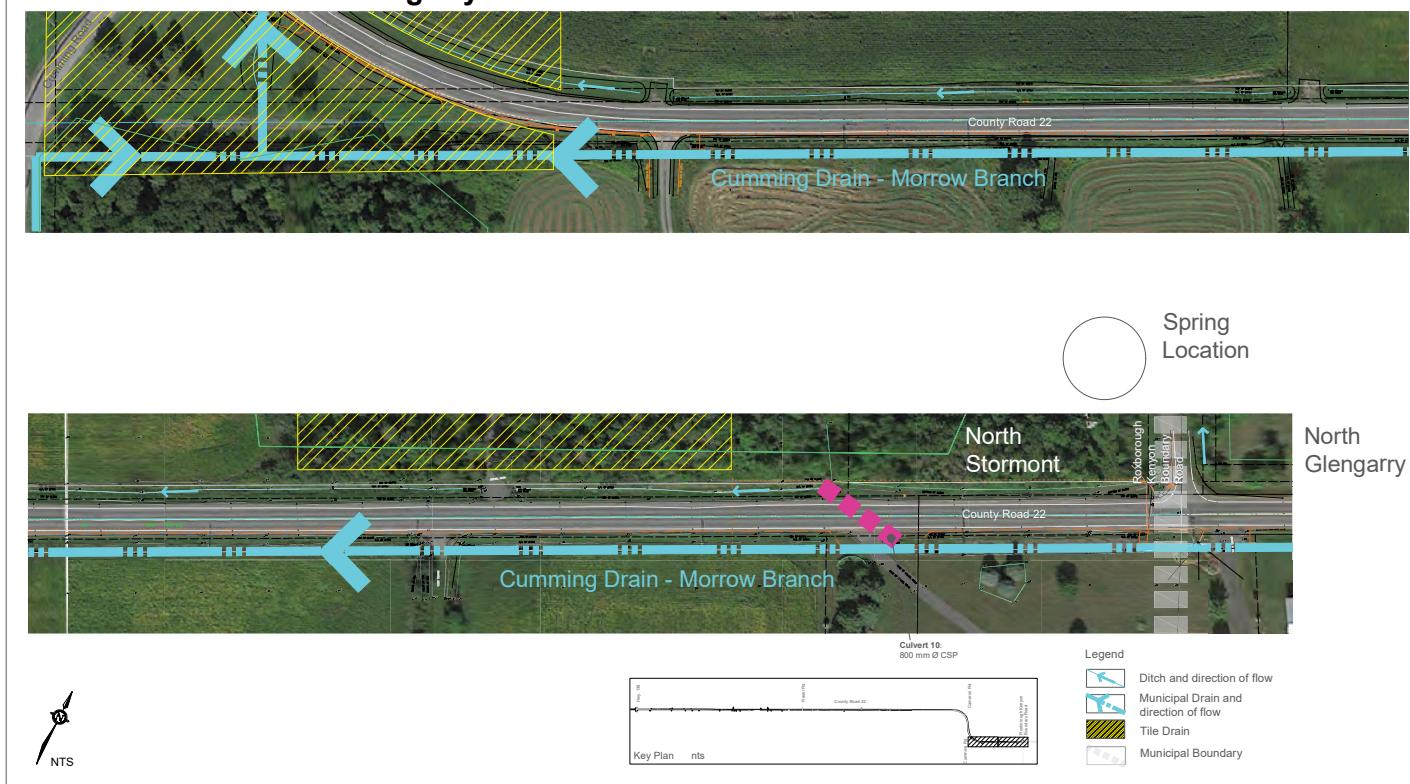
Key Plan nts

Legend
Ditch and direction of flow
Municipal Drain and direction of flow
Tile Drain
Fish

Drainage Map 7

County Road 22

Stormont Dundas and Glengarry



Drainage Map 8

County Road 22

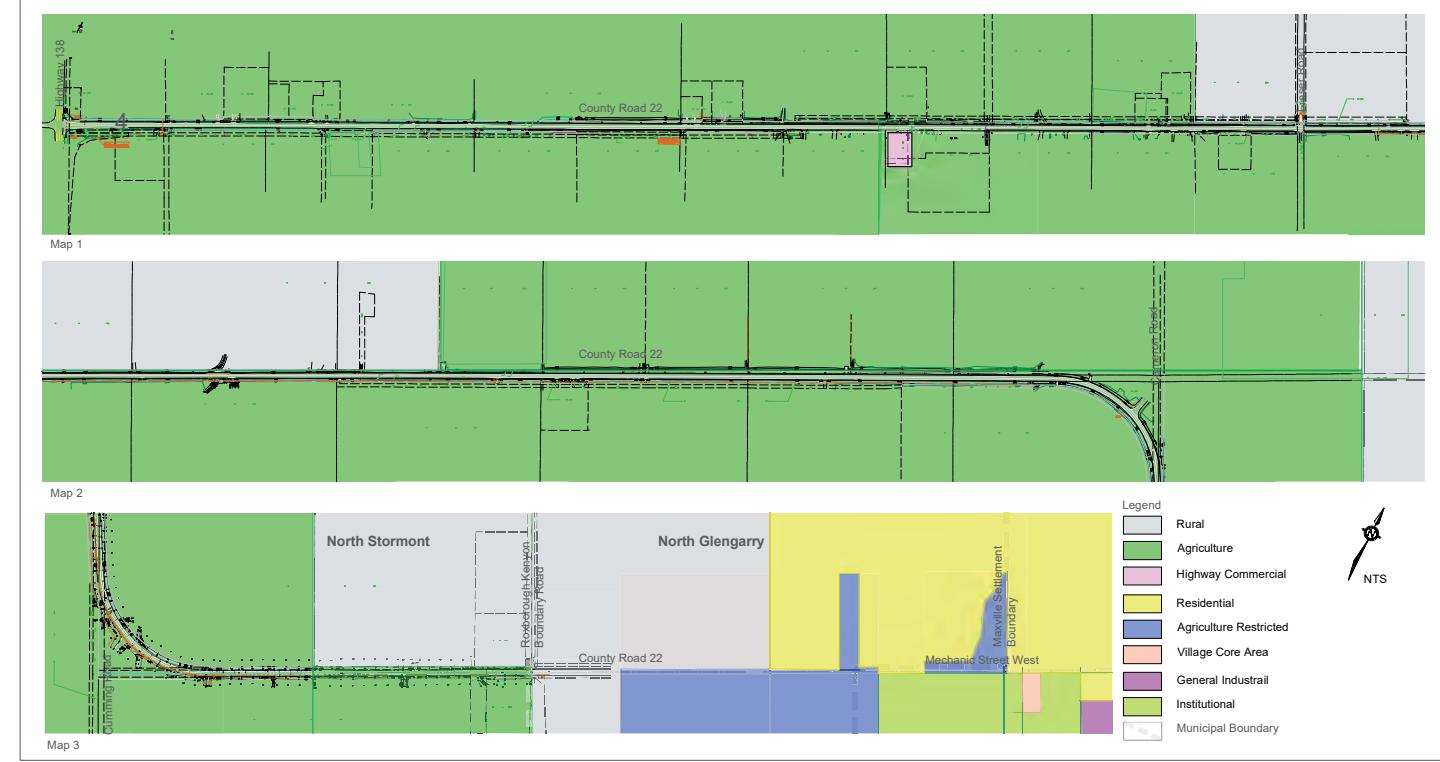
Stormont Dundas and Glengarry



Existing Land Use

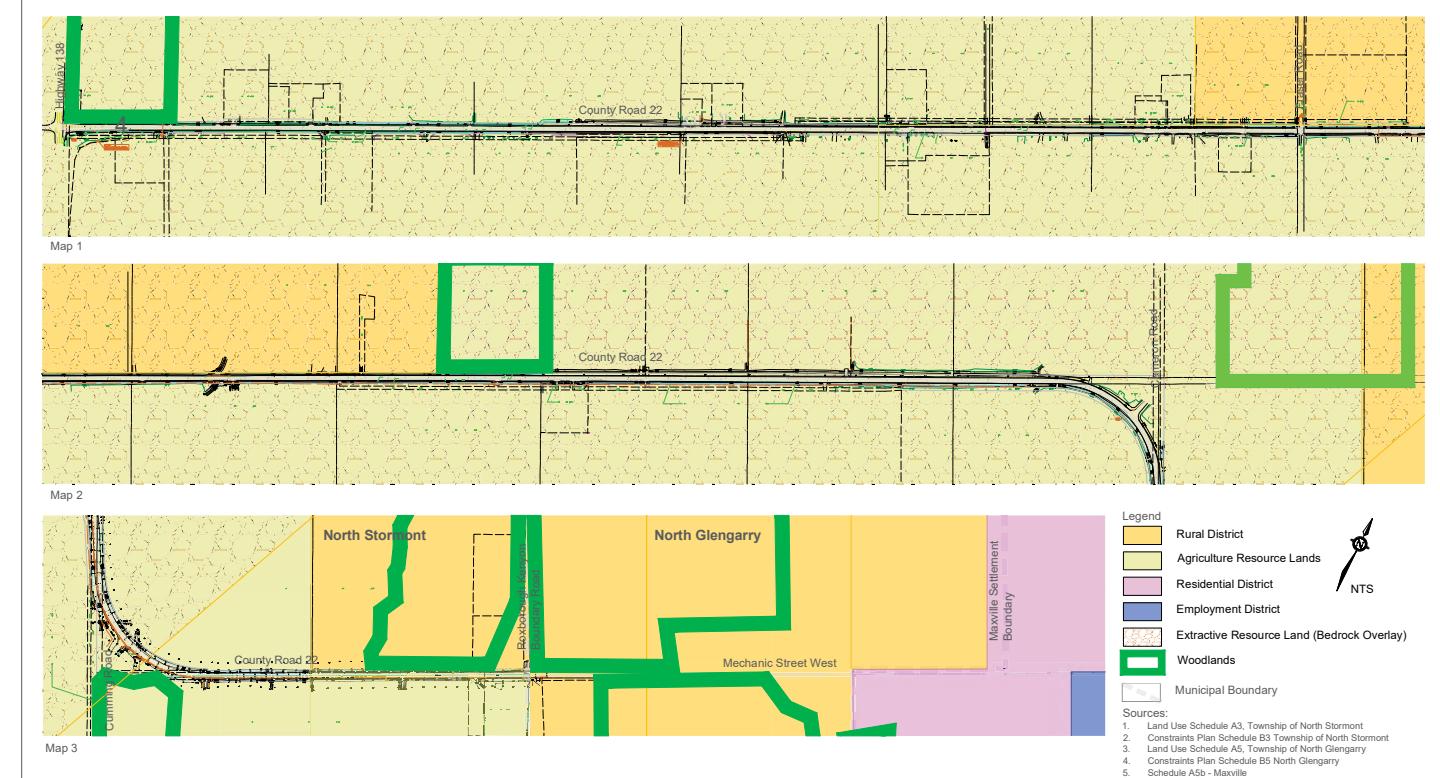
County Road 22

Stormont Dundas and Glengarry



Official Plan County Road 22

Stormont Dundas and Glengarry



Soils

County Road 22

Stormont Dundas and Glengarry

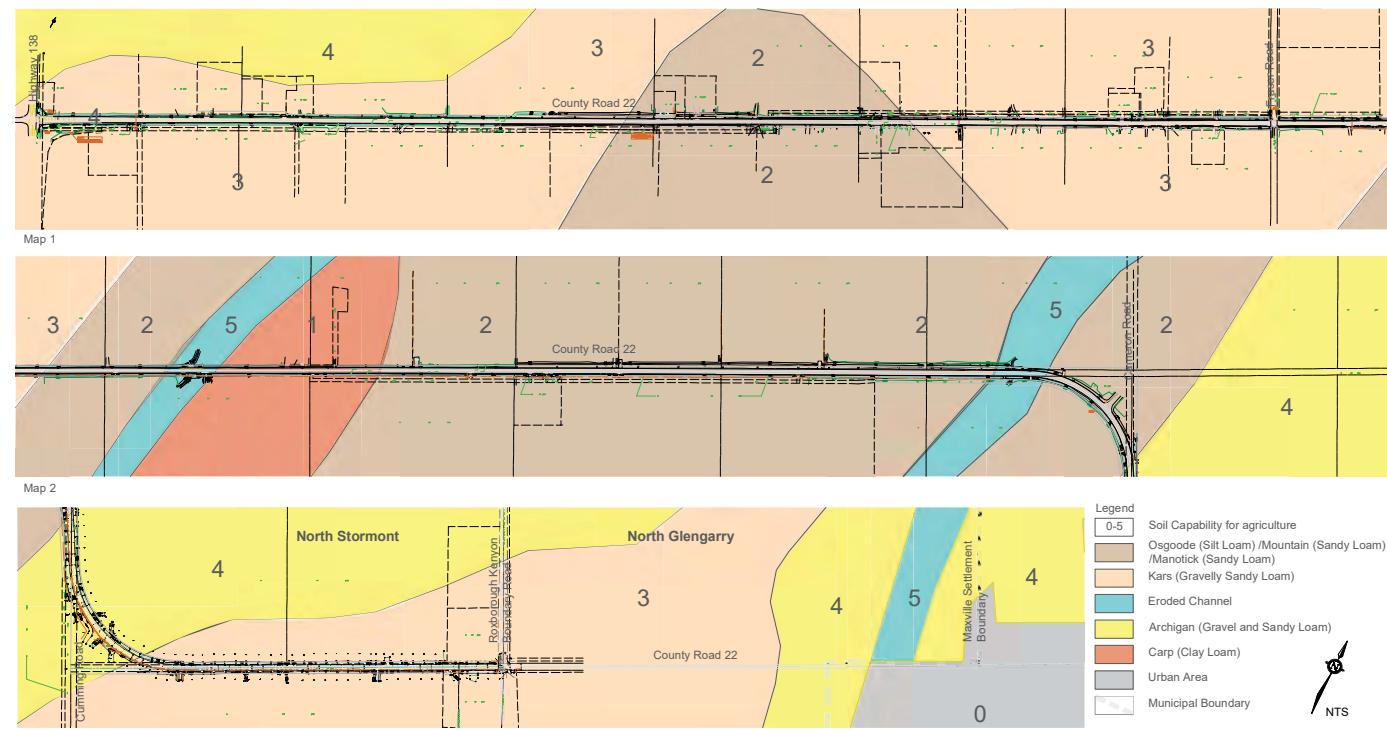


Photo Log of Cross Culverts



Culvert #1: Damaged, 600 mm CSP immediately east of Highway 138. Proposed to be replaced.



Culvert #2: Corroded, 1500 mm CSP west of 17515 CR 22. Proposed to be replaced.



Culvert #3: Lined and perched 500 mm CSP, west of Fraser Road. Proposed to be replaced.



Culvert #4: Twin box culverts conveying the MacKenzie Municipal Drain. Not proposed for replacement.



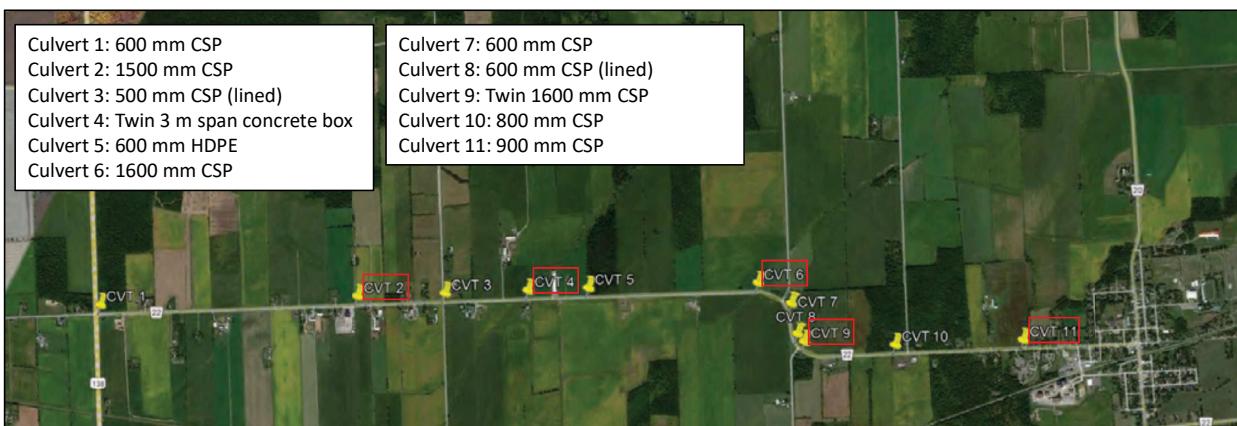
Culvert #5: 600 mm HDPE pipe. Not proposed for replacement.



Culvert #6: Damaged, 1600 mm CSP with erosion issues conveying Cumming Drain. Proposed to be replaced.

Natural Environment and Cross Culverts

- Fish habitat in roadside ditches (not shown), unnamed tributaries, MacKenzie Drain and the Cumming Drain.
- Perched and damaged culverts inhibiting fish passage.
- Erosion leading to sedimentation of fish habitat.
- Unevaluated wetland pockets throughout the Project Area.
- Woodlands (not significant) identified by the Official Plan.



■ Direct / Indirect Fish Habitat

Photo Log of Cross Culverts



Culvert #7: Lined, 600 mm CSP. Proposed to be replaced.



Culvert #8: Lined 600 mm CSP, 40 m west of Cumming Road. Proposed to be replaced.



Culvert #9: Corroded, twin 1600 mm CSPs conveying the Morrow Branch of the Cumming Drain. Proposed to be replaced.



Culvert #10: 800 mm CSP. Proposed to be replaced.



Culvert #11: Perched 900 mm CSP, east of the Maxville Manor. Not proposed for replacement. Recommend river run rock outlet.

Preliminary Design Alternatives

Three alternatives are being reviewed for the back-to-back curve improvements, as shown on the following exhibits:

- Alternative 1: Existing alignment with widened shoulders
- Alternative 2: Existing alignment with fully paved shoulder widening through curves and guiderail (recommended)
- Alternative 3: Curve realignment to flatten curves

Three cross section alternatives are being reviewed for improvements:

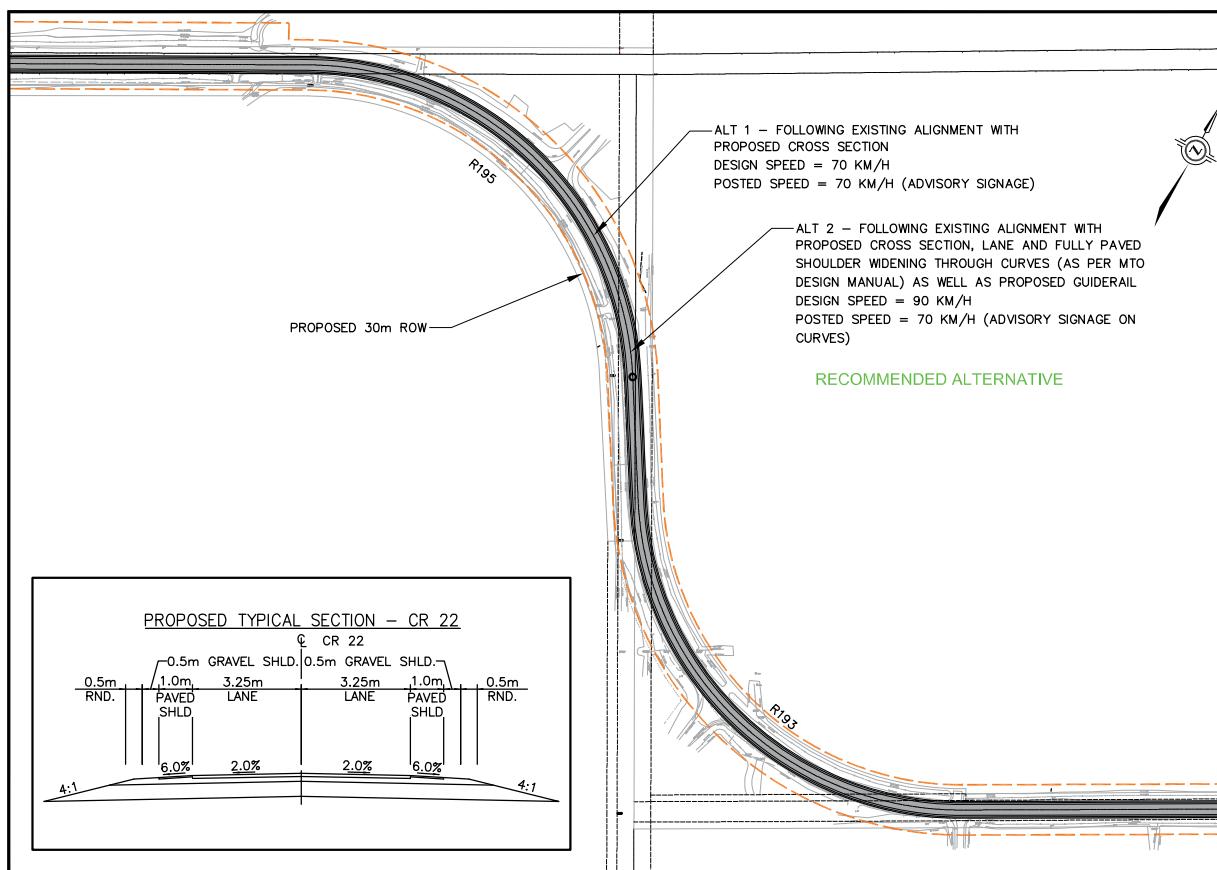
- Alternative A: Widen to the north
- Alternative B: Widen to the south
- Alternative C: Widen on centre (recommended to widen to a 30 m right-of-way with equal property acquisition)

Intersection operational improvements are being considered at Cummings Road:

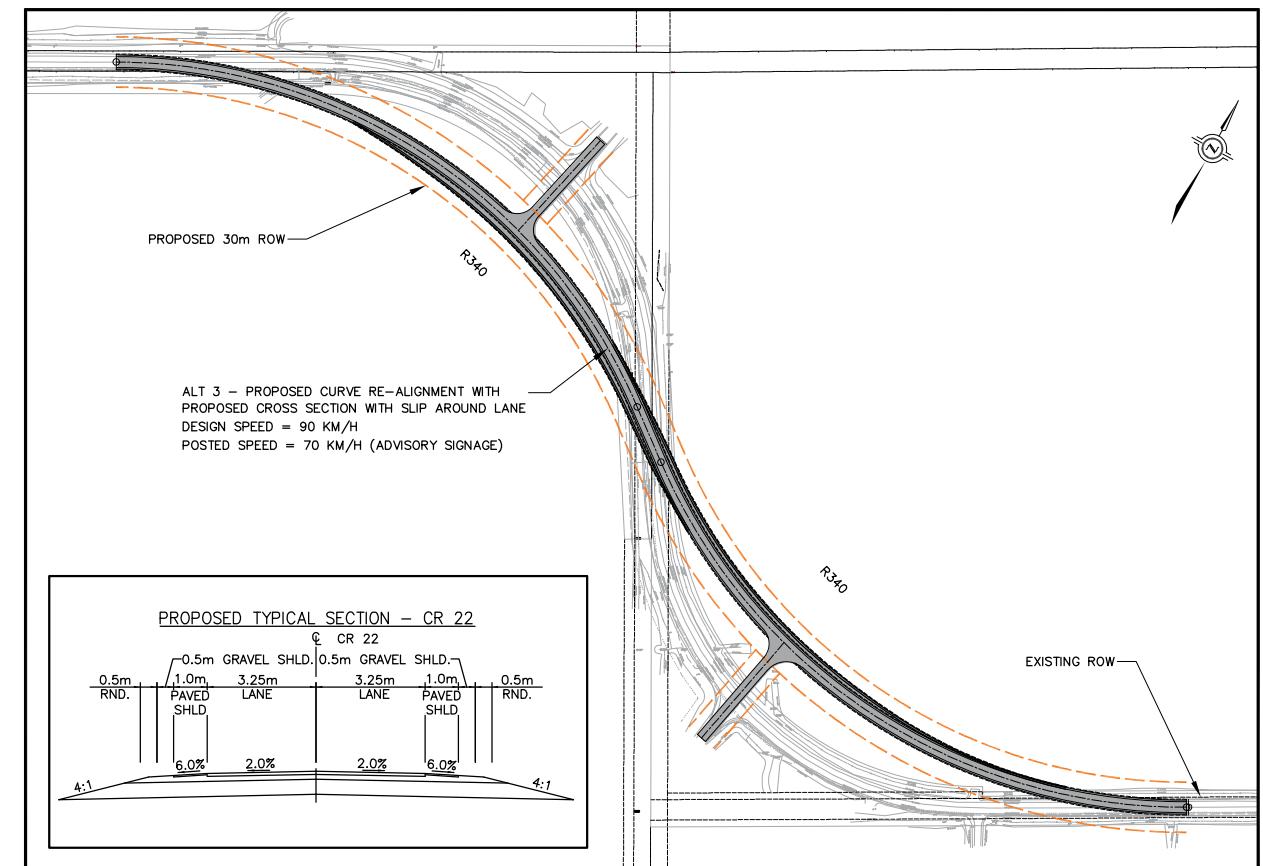
- Left-turn lane (not warranted)
- Slip-around lane (recommended)

21

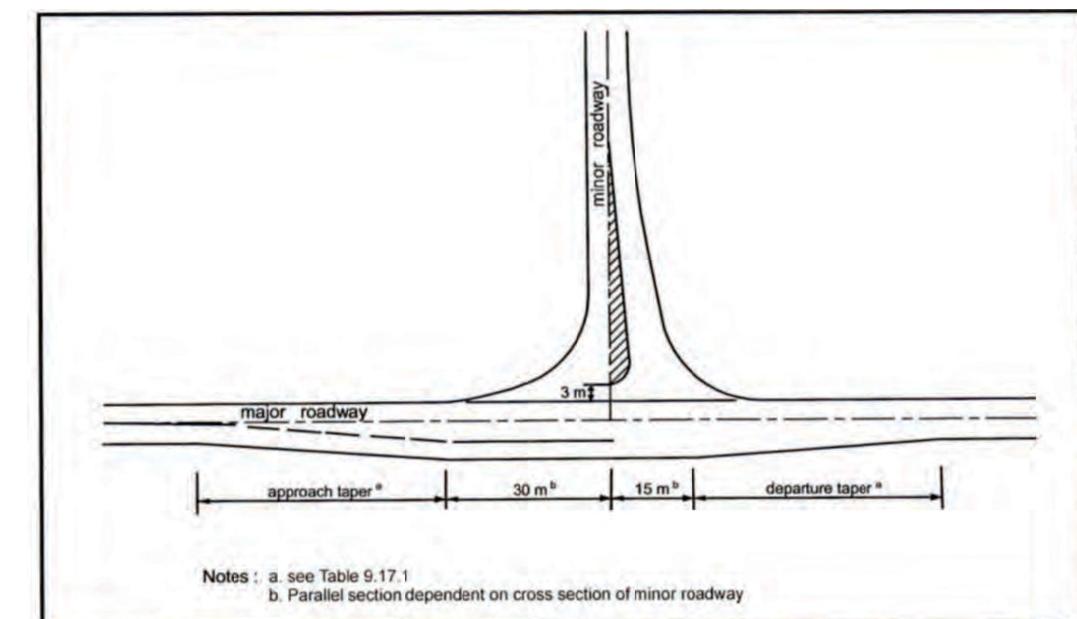
CR 22 BACK-TO-BACK CURVE FOLLOWING EXISTING ALIGNMENT - ALTERNATIVES 1 & 2



CR 22 BACK-TO-BACK CURVE REALIGNMENT - ALTERNATIVE 3



Slip-around Lane at Cummings Road and Cameron Road



Pavement Rehabilitation and Reconstruction Alternatives

The following pavement alternatives are being considered:

- Pavement removal and resurfacing
- Pulverizing with minor grade raise and resurfacing
- Full reconstruction with larger grade raise

Pulverizing with a minor grade raise and resurfacing is recommended from Highway 138 to the Kenyon Roxborough Boundary Road. See the following exhibit.

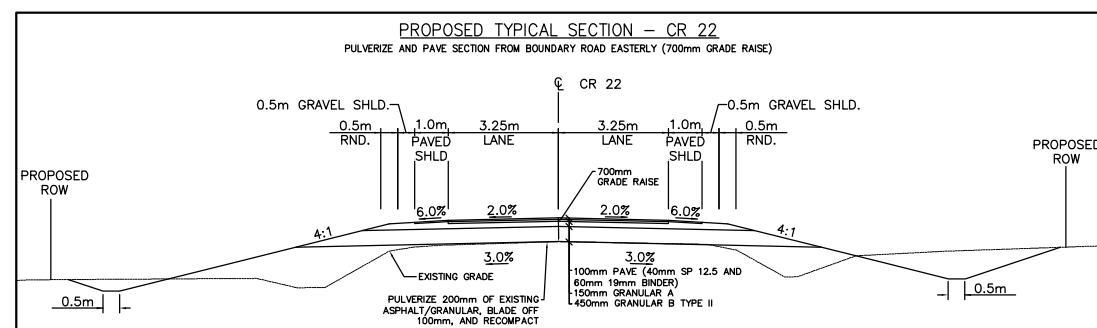
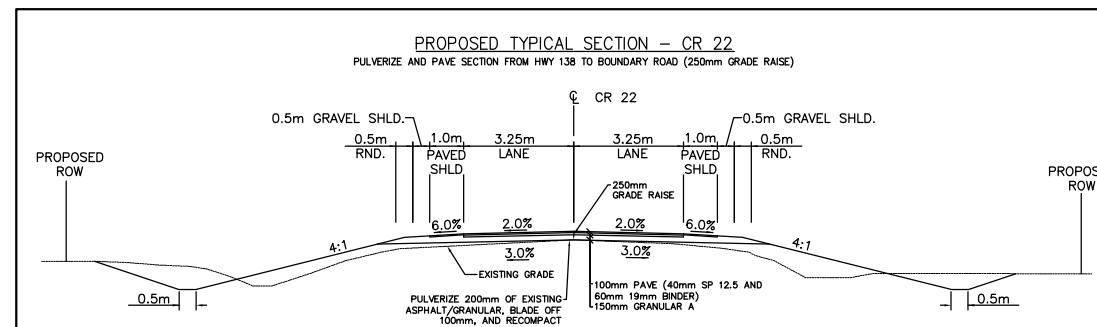
Reconstruction with grade raise is recommended from the Kenyon Roxborough Boundary Road to the urban area of Maxville. See the following exhibit.

Recommended Improvements

The following improvements are recommended:

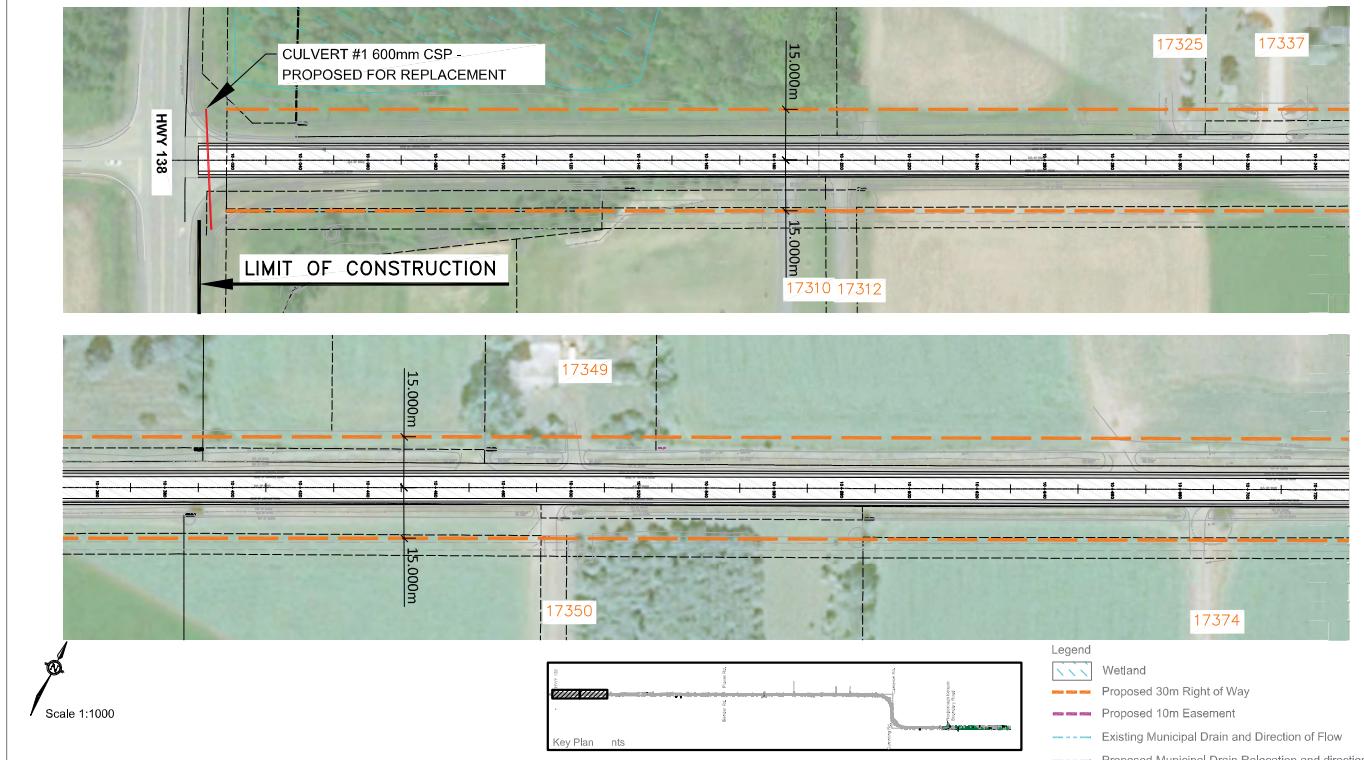
- Pavement rehabilitation and standard County cross section
- In the area of the back-to-back curves, improvements include fully paved shoulders, lane widening and guiderail
- Relocation of the municipal drains
- Slip-around lane at Cummings Road and Cameron Road

Reconstruction and Drainage Improvement Plan No.10 County Road 22 Stormont, Dundas and Glengarry



Scale 1:100

Reconstruction and Drainage Improvement Plan No.1 County Road 22 Stormont, Dundas and Glengarry



Scale 1:1000

Key Plan

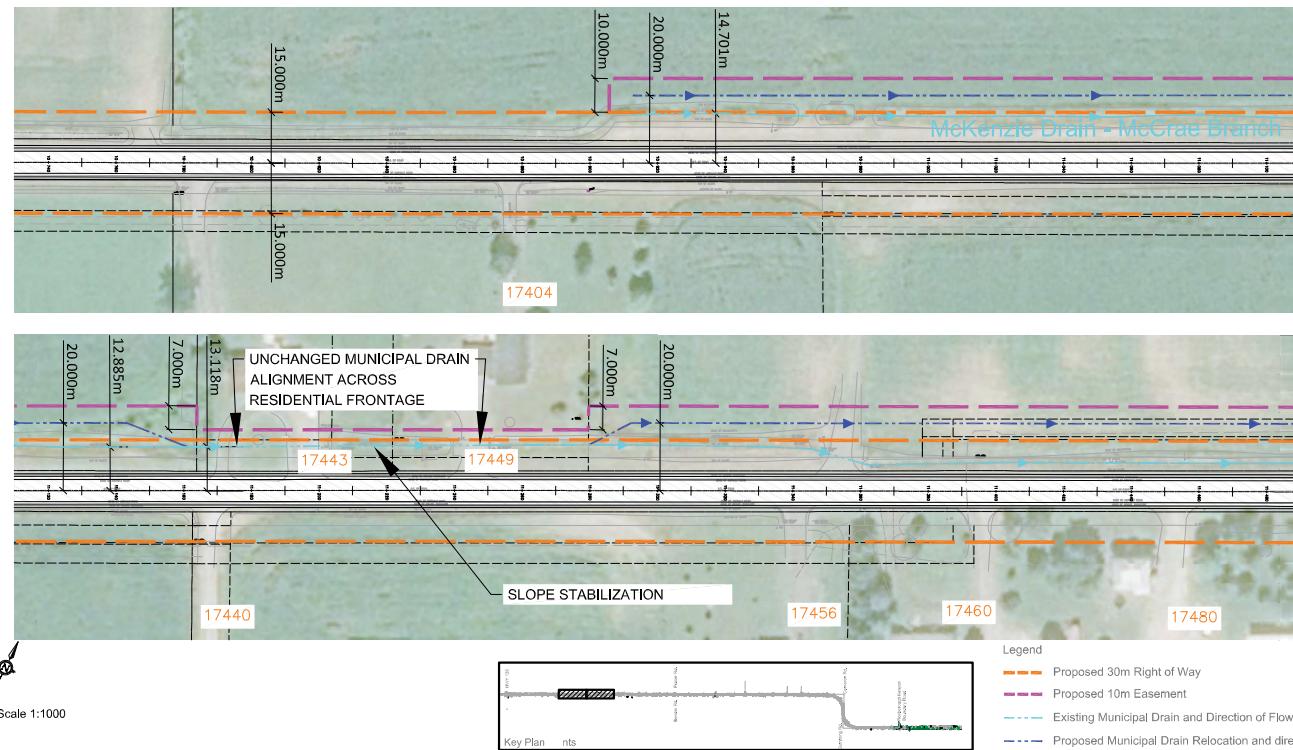
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Reconstruction and Drainage Improvement Plan No.2

County Road 22

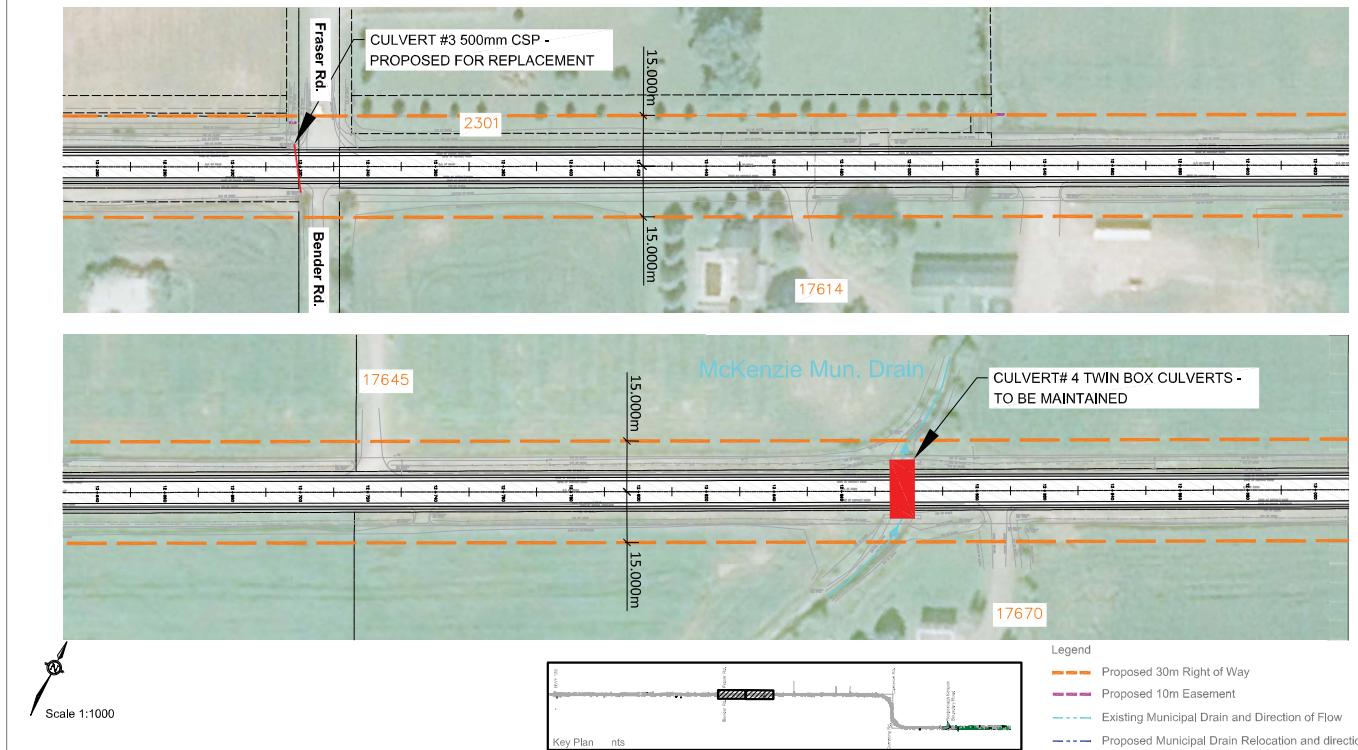
Stormont, Dundas and Glengarry



Reconstruction and Drainage Improvement Plan No.4

County Road 22

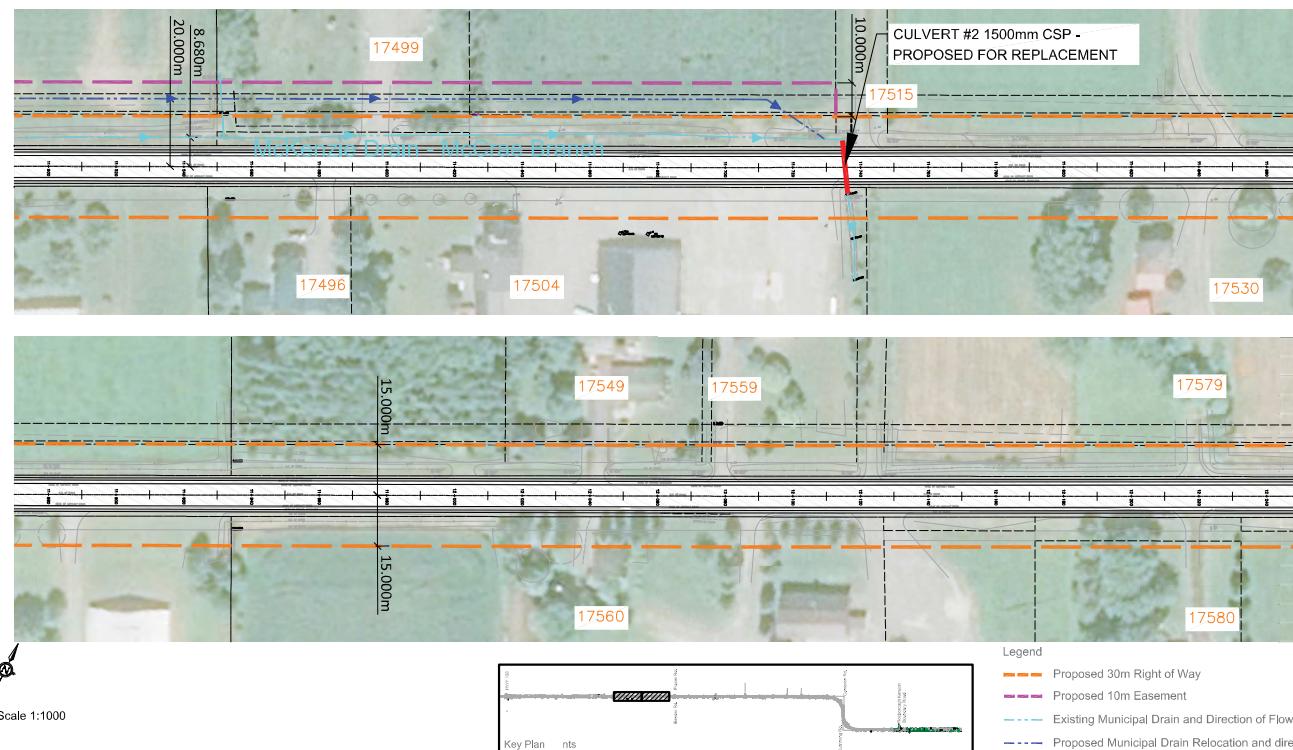
Stormont, Dundas and Glengarry



Reconstruction and Drainage Improvement Plan No.3

County Road 22

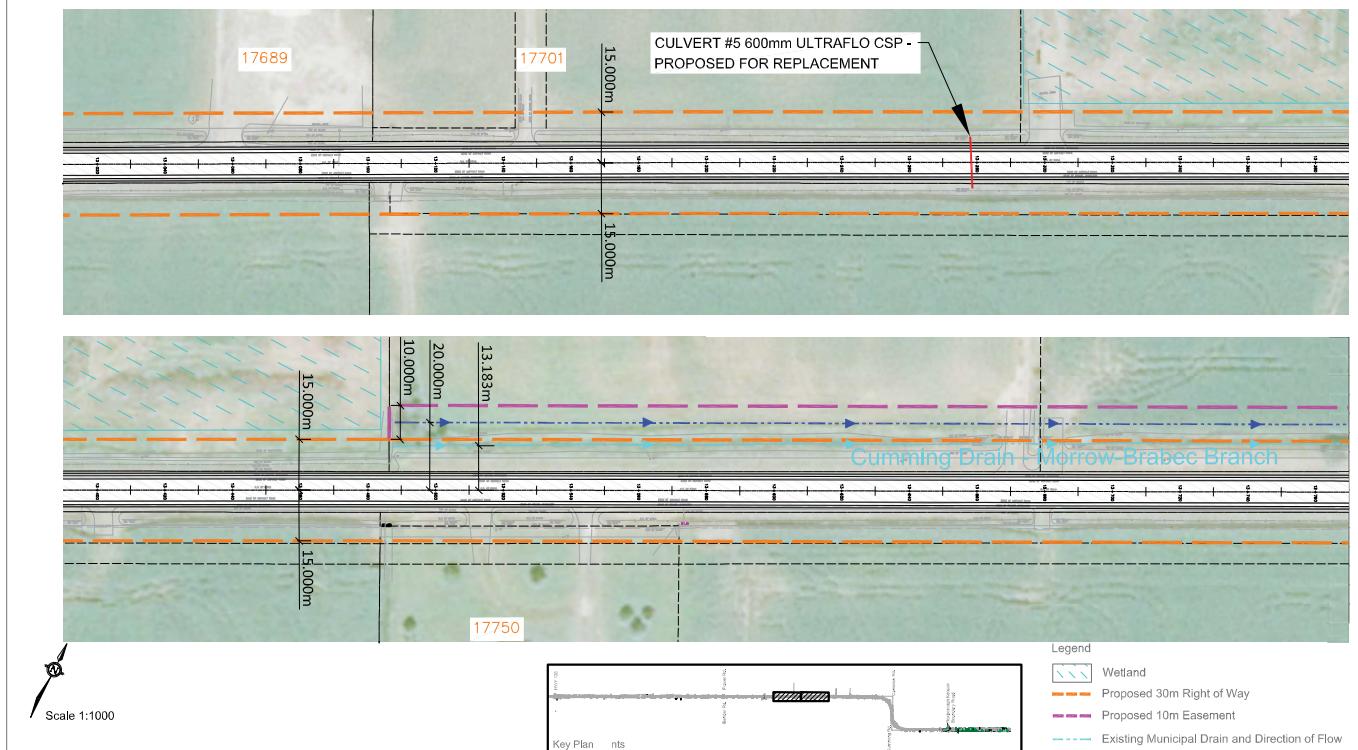
Stormont, Dundas and Glengarry



Reconstruction and Drainage Improvement Plan No.5

County Road 22

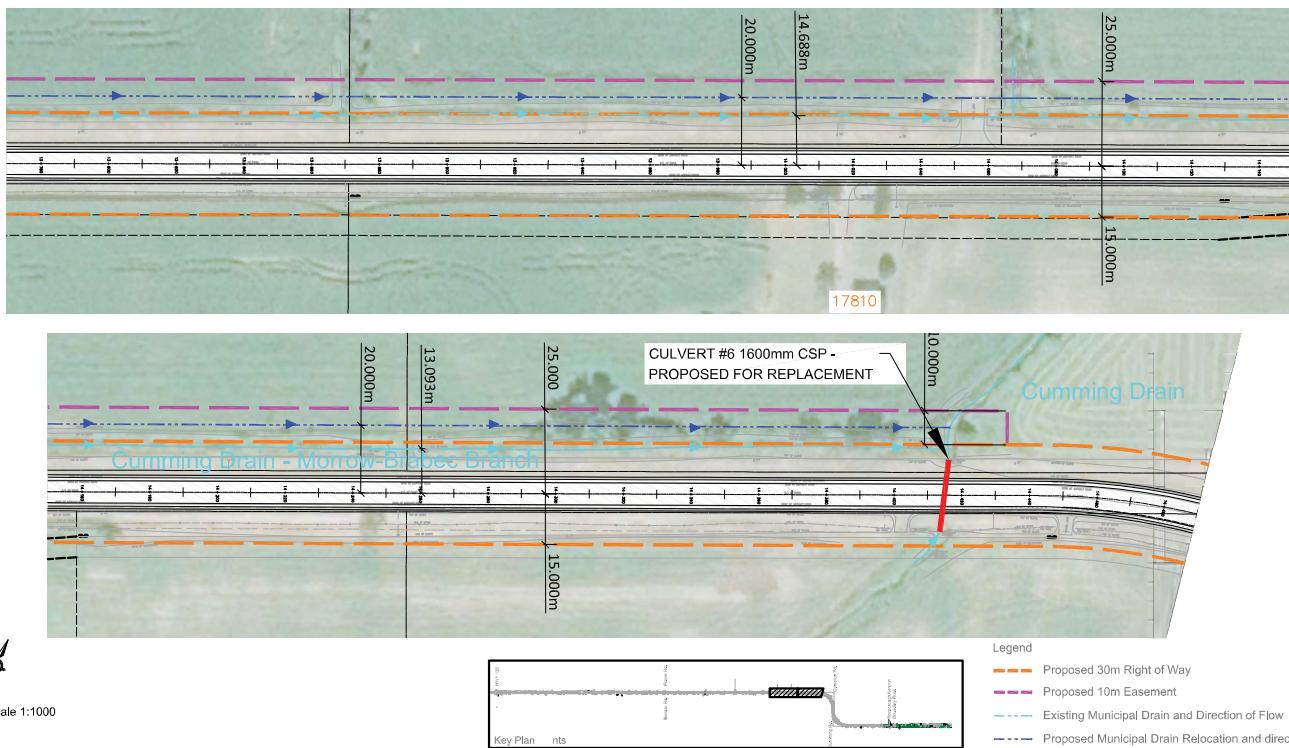
Stormont, Dundas and Glengarry



Reconstruction and Drainage Improvement Plan No.6

County Road 22

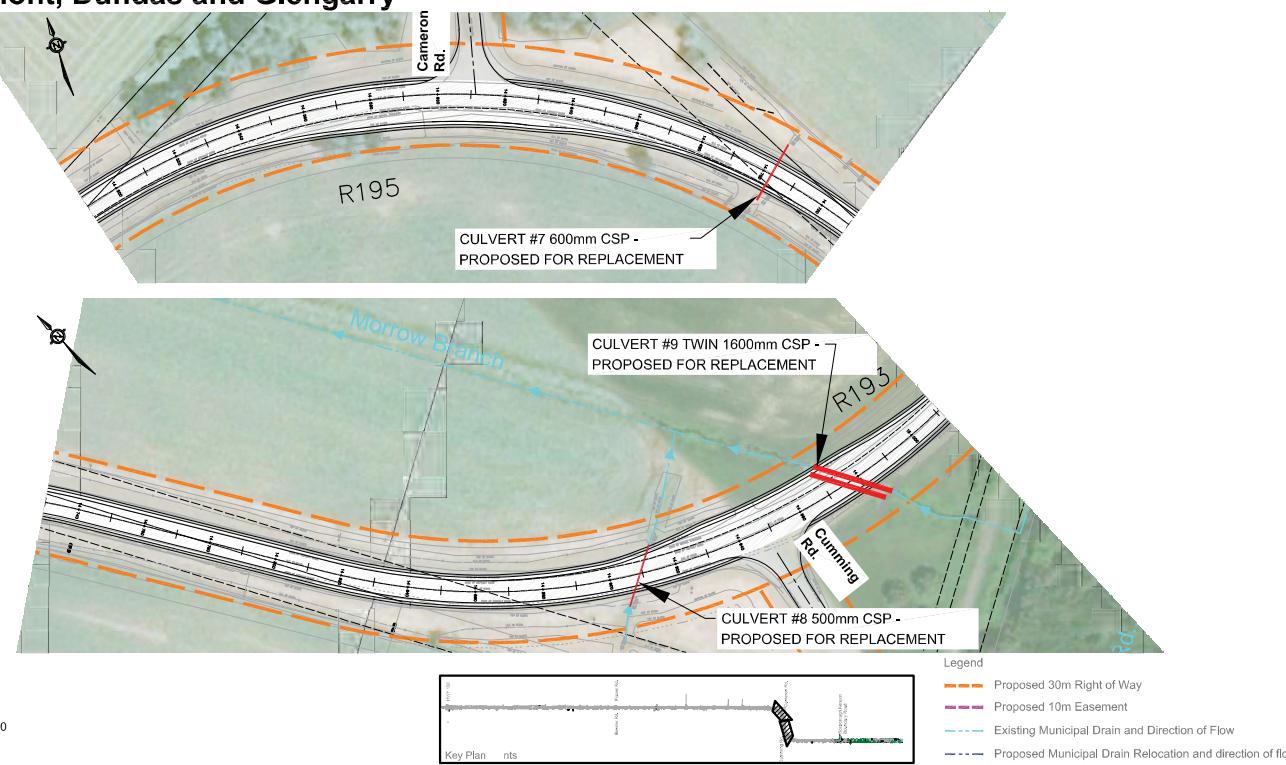
Stormont, Dundas and Glengarry



Reconstruction and Drainage Improvement Plan No.7

County Road 22

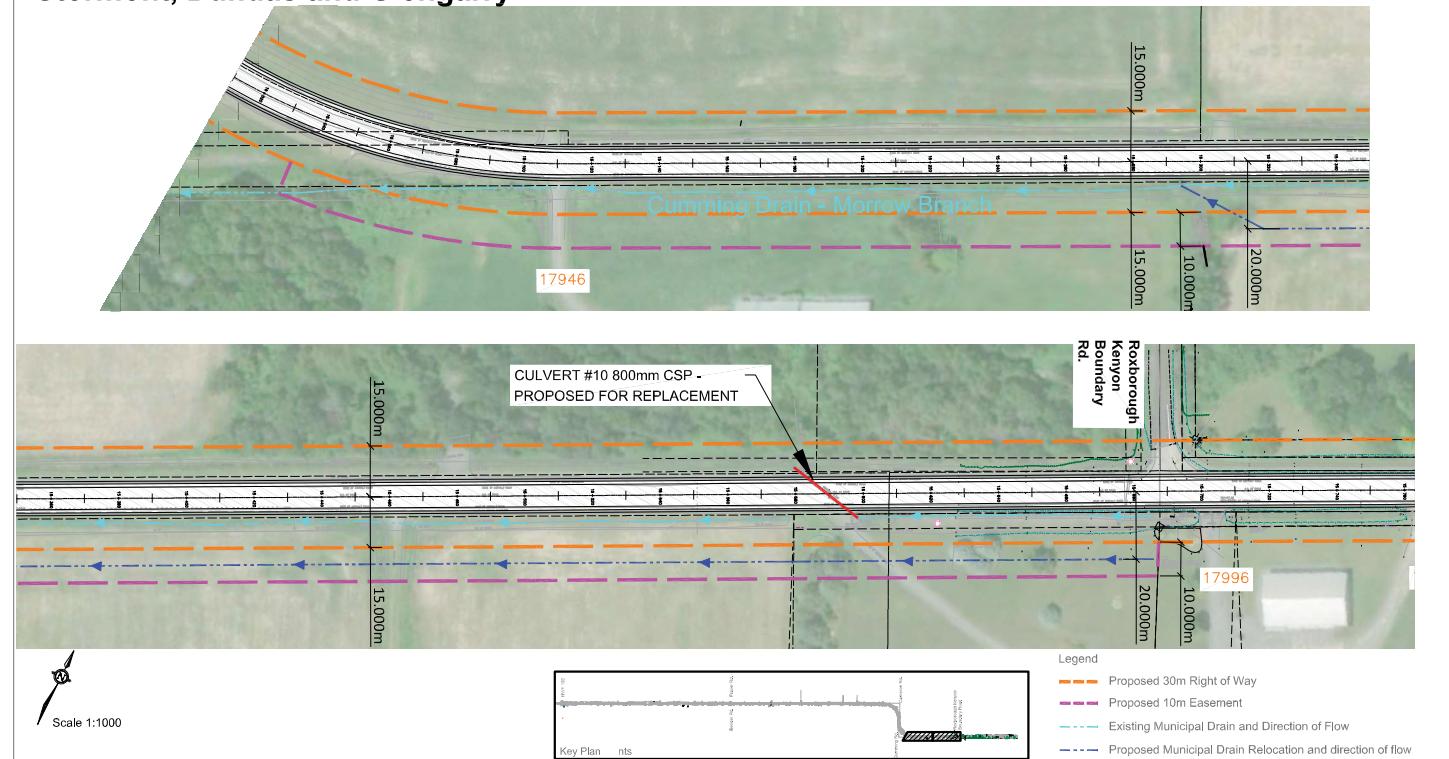
Stormont, Dundas and Glengarry



Reconstruction and Drainage Improvement Plan No.8

County Road 22

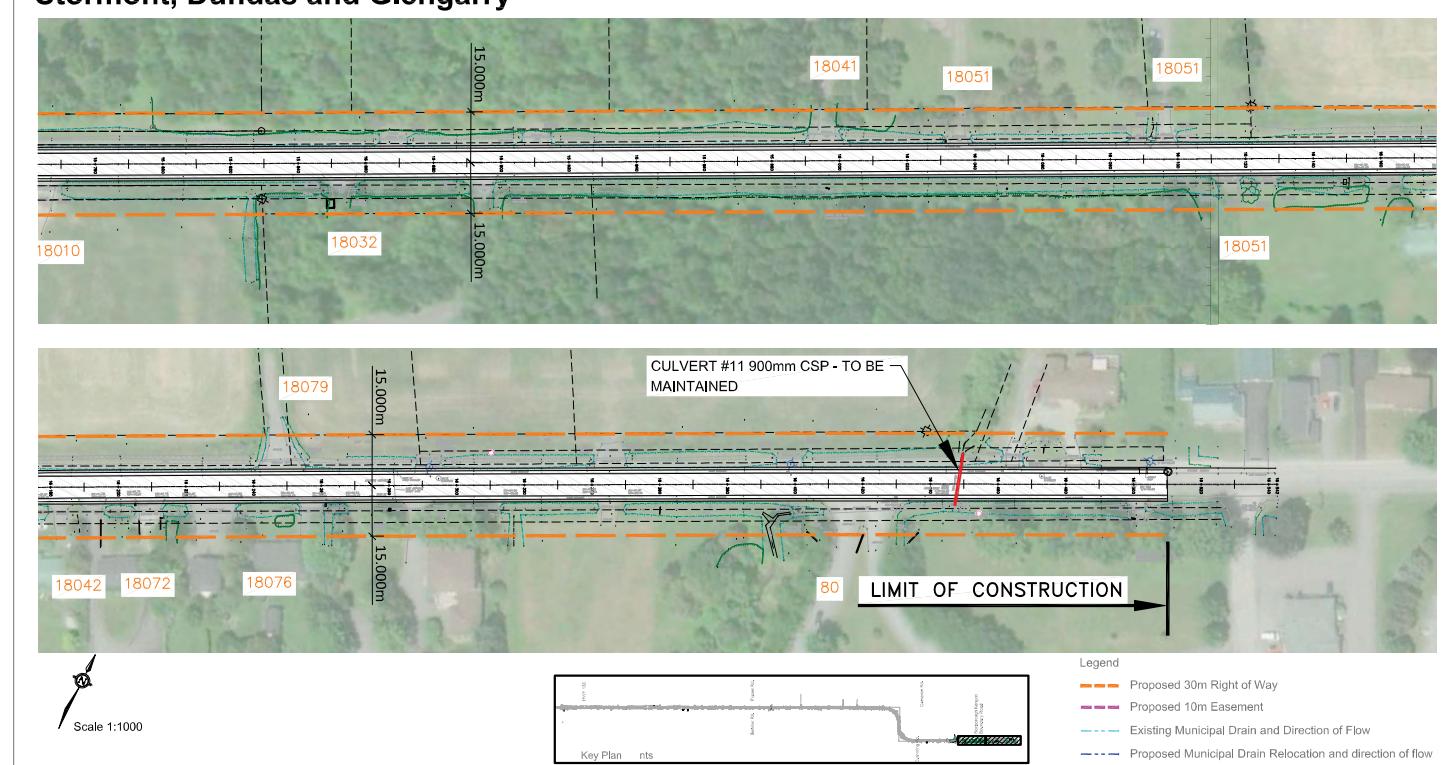
Stormont, Dundas and Glengarry



Reconstruction and Drainage Improvement Plan No.9

County Road 22

Stormont, Dundas and Glengarry



Sample Municipal Drain Relocation Outside Right-of-way County Road 5, Inkerman Ontario



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Next Steps

Following this Public Information Centre we will:

- Review all Public Information Centre comments and prepare a Summary Report
- Review transition of high to low grade raise
- Project File and 30-day Public Review
- Municipal Drain planning process under the *Drainage Act*
- Engineer's Report for the Municipal Drain improvements and relocation

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Your Involvement

How can you remain involved in the Study?

- Request that your name/e-mail be added to the Project Mailing List
- Provide an online comment
- Contact the County's representative or the Consultant at any time. Contact information is provided on the next exhibit.

Thank you for your participation in this Public Information Centre.

Your input into this project is valuable and appreciated.

All information is collected in accordance with the *Freedom of Information and Protection of Privacy Act*.

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For More Information Please Contact:

Steve Taylor, P.Eng.
BT Engineering Inc., Project Manager
Email: steven.taylor@bteng.ca
Phone: 613-228-4813

Michael Jans, P.Eng.
Manager of Infrastructure, United Counties
Email: mjans@sdgcounties.ca
Phone: 613-932-1515 ext. 219

Please submit any questions or comments to the contacts listed above by
December 16, 2022.

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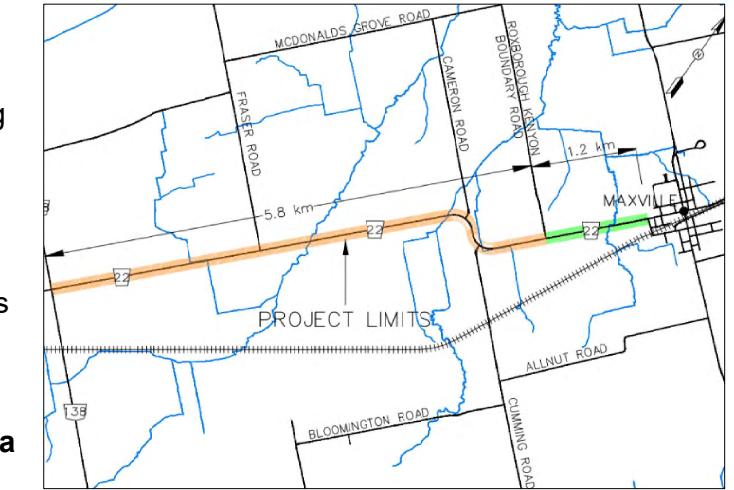
Notice of Public Information Centre (PIC)
United Counties of Stormont, Dundas, and Glengarry
County Road 22 Reconstruction and Drainage Improvements
November 29, 2022, from 5:00 pm to 7:00 pm

Appendix B

PIC Notice

Introduction

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Preliminary recommendations will be provided on the scope of roadway improvements, property requirements and associated realignment of Municipal Drains.

Public Consultation

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Date: Tuesday, November 29, 2022

Time: 5:00 pm to 7:00 pm

Location: Maxville & District Sports Complex Banquet Hall
25 Fair Street, Maxville, ON K0C 1T0

There is an opportunity at any time during the Class EA process for interested persons to provide comments. Early identification of individual and group concerns greatly aids in addressing these concerns. All information will be collected in accordance with the *Municipal Freedom of Information and Protection of Privacy Act* (2009). With the exception of personal information, all comments will become part of the public record.

For more information, to be placed on the project's email/postal mailing list, or if you wish to be removed from the contact list, please contact either:

Steve Taylor, P.Eng.
Consultant Project Manager
BT Engineering Inc.
100 Craig Henry Drive, Suite 201
Ottawa, Ontario K2G 5W3
Phone: 613-228-4813
Email: steven.taylor@bteng.ca

Michael Jans, P.Eng.
Manager of Infrastructure
United Counties of Stormont, Dundas, and Glengarry
26 Pitt Street
Cornwall, Ontario K6J 3P2
Phone: 613-932-1515 ext. 219
Email: mjans@sdgcountries.ca

This notice issued on November 16, 2022.

Appendix C

PIC Comment Sheets

12/19/22, 11:24 AM

Sure, no problem.

[REDACTED]

Hi [REDACTED]

Can I share your contact information with our design engineer? They have further questions about where exactly the Hickenbottom outlets to. They would also like to mail you a set of drawings that will be used at the public meeting.

[REDACTED]

Sent from my [REDACTED]

[REDACTED]

CAUTION This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good day [REDACTED]

As discussed via telephone today, I would like to request the installation of a pipe under County Road 22 when it gets reconstructed.

The pipe would connect our two properties flanking county road 22.

Lot 10, Conc 6 and Lot 11 Concession 7.

Regards,

[REDACTED]

Comment Sheet 1

12/19/22, 11:26 AM

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
Hi [REDACTED],

I received a phone call from [REDACTED], who's farm is at [REDACTED]. It seems they got the flyer in the mail but will be out of Country by next week

He wanted to provide some initial input, which is summarized below

- property at lot 11, concession 7
- drain across front of property complete with hickenbottom drain
- each field has tile drainage, some of which outlets to the roadside ditch
- rents a property from [REDACTED] west of lot 11
- tile drain at rented land outlets to a sump which is 2ft lower than roadside ditch

There were a couple of action items that sprang from the conversation:

1. Obtaining copies of each field's tile drainage design drawings
2. Need to determine if their rented land's outlet drains to a municipal drain or regular ditch. If it's the latter, I want to explore options to deepen the roadside ditch and provide positive drainage
3. SDG will look into past applications of manure pipelines and determine what might be needed to come to an agreement to install one across the road at [REDACTED] farm

Overall the exchange was very positive and I think if we can provide items 2 and 3 from the list above, we will have cooperation when it comes to the widening. I also particularly wanted to draw your attention to action item #1, which I think we need to make a point of discussing at next week's PIC

Regards,



Michael Jan , P Eng ,
Manager of Infrastructure
Transportation Service

United Counties of Stormont, Dundas and Glengarry
26 Pitt Street, Cornwall, ON K6J 3P2
P: (613) 932 1515 x 219
F: (613) 936-2913
E: mjans@dgcountie.ca
W: www.dgcountie.ca



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12/4/22, 6:03 PM



Comment Sheet 3

12/4/22, 6:03 PM



Comment Sheet 3

There is limited vision in all directions at this corner.

On the west entrance driveway , it appears that the majority of our flower bed will be affected.

Our east entrance driveway it appears the reconstruction and widen will affect most of our landscaping and flower bed .

Please consider these recommendations in your final assessment.

Thanks



Sent from my iPad

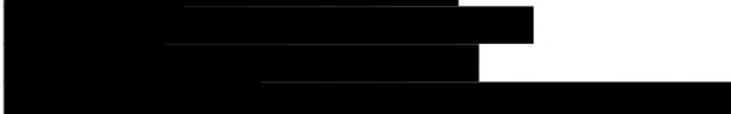
Thank you [REDACTED] for taking the time to provide comments These will be considered for the next phase of the design development

They will be included in the Record of Consultation

Steve



Steve Taylor P.Eng., M.Eng., CVS-LIFE, P.E.
President
100 Craig Henry Drive, Suite 201
Ottawa, Ont. K2G 5W3
E-Mail: steven.taylor@bteng.ca
Phone: 613-228-4813
FAX: 1-613-280-1305
Toll Free: 1-866-218-1001
[www.bteng.ca]www.bteng.ca



Hi [REDACTED]
We attended the information session last night.

We would recommend the municipal drain cross County rd 22 at the Kenyon - Roxborough Boundary Road which is the east end of the drain.

Then proceed west on the north side of County rd 22 on vacant property owned by North Glengarry .
Presently, the area is not being used and is scrub brush .
Instead of destroying 3 blue spruce on our land which is 30 years old and is a central point of landscaping on our property.

I also recommend a passing/turn lane at Kenyon/Roxborough Boundary road .
Many transports are using this side road to by pass the village as poor/ limited turning at end of County Road 22 and County Road 20 on Main Street in the village of Maxville.



Comment Sheet 4

United Counties of Stormont, Dundas and Glengarry
County Road 22 Reconstruction and Drainage Improvements
Public Information Centre No. 1
Tuesday, November 29, 2022

Thank you for attending tonight's community meeting. Please provide your comments on any of the material presented.

My concerns with the widening of County Rd 22 specifically concerning Lot A, there is a well located between the barn and the county road that would be affected. The well is only 15' deep into an existing spring. Expansion on the North side would limit the effect of our water source. As well, the existing hydro + Bell Canada lines would not need to be moved.

(Please turn over if additional space is required.)

Please complete your comment sheet this evening and place in the comment box provided OR send your completed comment sheet by Friday, December 16, 2022 to:

Michael Jans, P.Eng.
Manager of Infrastructure
United Counties of Stormont, Dundas, and Glengarry
Phone: 613-932-1515 ext. 219
Email: mjans@sdgcountries.ca

Steve Taylor, P.Eng.
Consultant Project Manager
BT Engineering Inc.
Phone: (613) 228-4813
Email: steven.taylor@bteng.ca

Personal Information contained on this form is being collected pursuant to the Municipal Freedom of Information and Protection of Privacy Act and will be used for the purpose of responding to your request. Questions about this collection should be directed to the County Project Manager.

Name / Organization: [REDACTED]

Address: [REDACTED]

City / Town: [REDACTED]

Postal Code: [REDACTED]

Email address: [REDACTED]

Please check a box if you would like to be added to our mailing list to be informed of the publication of the EA. mailing address email



Comment Sheet 5

United Counties of Stormont, Dundas and Glengarry
County Road 22 Reconstruction and Drainage Improvements
Public Information Centre No. 1
Tuesday, November 29, 2022

Thank you for attending tonight's community meeting. Please provide your comments on any of the material presented.

- VERY INFORMATIVE, WELL SETUP

- PLEASE SEND ME A HARD COPY OF THE FULL PRESENTATION TO THE MAILING ADDRESS BELOW ABOUT THE

- ONE CONCERN ABOUT IMPROVEMENT IS THE RAISING OF THE ROAD

(Please turn over if additional space is required.)

Please complete your comment sheet this evening and place in the comment box provided OR send your completed comment sheet by Friday, December 16, 2022 to:

Michael Jans, P.Eng.
Manager of Infrastructure
United Counties of Stormont, Dundas, and Glengarry
Phone: 613-932-1515 ext. 219
Email: mjans@sdgcountries.ca

Steve Taylor, P.Eng.
Consultant Project Manager
BT Engineering Inc.
Phone: (613) 228-4813
Email: steven.taylor@bteng.ca

Personal Information contained on this form is being collected pursuant to the Municipal Freedom of Information and Protection of Privacy Act and will be used for the purpose of responding to your request. Questions about this collection should be directed to the County Project Manager.

Name / Organization: [REDACTED]

Address: [REDACTED]

City / Town: [REDACTED]

Postal Code: [REDACTED]

Email address: [REDACTED]

Please check a box if you would like to be added to our mailing list to be informed of the publication of the EA. mailing address email



Comment Sheet 6

United Counties of Stormont, Dundas and Glengarry
County Road 22 Reconstruction and Drainage Improvements
Public Information Centre No. 1
Tuesday, November 29, 2022

Thank you for attending tonight's community meeting. Please provide your comments on any of the material presented.

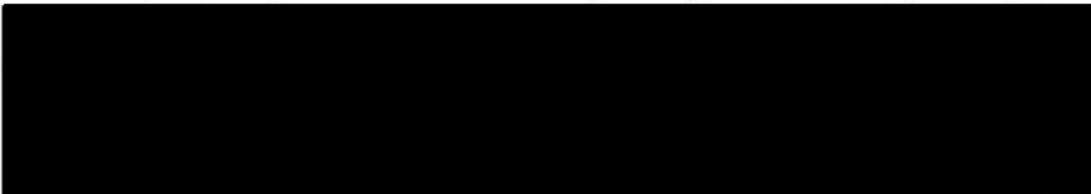
Lots of my questions been answered.

*I would like a hand copy of the proposals
of the project.*

*My concern is the # Drain Ditch along the road
in front of villnewe.*

(Please turn over if additional space is required.)

Please complete your comment sheet this evening and place in the comment box provided OR send your completed comment sheet by **Friday, December 16, 2022** to:



Personal Information contained on this form is being collected pursuant to the Municipal Freedom of Information and Protection of Privacy Act and will be used for the purpose of responding to your request. Questions about this collection should be directed to the County Project Manager.

Name / Organization:

Address:

City / Town:

Postal Code:

Email address:

Please check a box if you would like to be added to our mailing list to be informed of the publication of the EA. mailing address email



Comment Sheet 7

United Counties of Stormont, Dundas and Glengarry
County Road 22 Reconstruction and Drainage Improvements
Public Information Centre No. 1
Tuesday, November 29, 2022

Thank you for attending tonight's community meeting. Please provide your comments on any of the material presented.

*Piggest concern would
be water running from the road
to my house / basement especially.
if raising the road a foot.*

(Please turn over if additional space is required.)

Please complete your comment sheet this evening and place in the comment box provided OR send your completed comment sheet by **Friday, December 16, 2022** to:

Michael Jans, P.Eng.
Manager of Infrastructure
United Counties of Stormont, Dundas, and Glengarry
Phone: 613-932-1515 ext. 219
Email: mjans@sdgcountries.ca

Steve Taylor, P.Eng.
Consultant Project Manager
BT Engineering Inc.
Phone: (613) 228-4813
Email: steven.taylor@bteng.ca

Personal Information contained on this form is being collected pursuant to the Municipal Freedom of Information and Protection of Privacy Act and will be used for the purpose of responding to your request. Questions about this collection should be directed to the County Project Manager.

Name / Organization:

Address:

City / Town:

Postal Code:

Email address:

Please check a box if you would like to be added to our mailing list to be informed of the publication of the EA. mailing address email

Appendix B

Select Correspondence

**Ministry of the Environment,
Conservation and Parks**

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

Environmental Assessment
Branch

Direction des évaluations
environnementales

1st Floor
135 St. Clair Avenue W
Toronto ON M4V 1P5
Tel.: 416 314-8001
Fax.: 416 314-8452

Rez-de-chaussée
135, avenue St. Clair Ouest
Toronto ON M4V 1P5
Tél.: 416 314-8001
Téléc. : 416 314-8452

By email only

December 1, 2022

United Counties of Stormont, Dundas and Glengarry

Attention: Michael Jans, P. Eng., Manager of Infrastructure
mjans@sdgcounties.ca

Dear Michael Jans,

Re: **United Counties of Stormont, Dundas, and Glengarry
County Road 22 Reconstruction and Drainage Improvements - Notice of
Public Information Centre (PIC)**

Thank you for providing the Notice of Public Information Centre issued November 16th.

Introduction

The United Counties of Stormont, Dundas and Glengarry has retained BT Engineering Inc. to complete the design and undertake engineering services for the reconstruction and drainage improvements for County Road 22.

Project Process

The project will complete the design for the reconstruction including the relocation of utilities and municipal drains to accommodate potential road widening. The project limits extend from the urban boundary of Maxville westerly to Highway 138.

This project originally commenced as a pre-approved exempt project (Schedule A/A+) and we now understand that this notice advises that this project is being elevated to

Schedule B undertaking under the Municipal Class Environmental Assessment process. This is being made necessary in order to accommodate the acquisition of additional property needed for project completion.

The **updated (February 2021)** attached “Areas of Interest” document provides guidance regarding the ministry’s interests with respect to the Class EA process. Please address all areas of interest in the EA documentation at an appropriate level for the EA study. Proponents who address all the applicable areas of interest can minimize potential delays to the project schedule. **Further information is provided at the end of the Areas of Interest document relating to recent changes to the Environmental Assessment Act through Bill 197, Covid-19 Economic Recovery Act 2020.**

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.

The 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 the proposed project, **the MECP is delegating the procedural aspects of rights-based consultation to the proponent 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 provided MECP staff have confirmed that the list of indigenous communities provided has not changed with one exception:

- **Mohawks of Akwesasne**
- **Algonquins of Ontario (AOO)**
- **Algonquins of Pikwakanagan First Nation – engagement/consultation should be separate from AOO**

If the proponent has undertaken archeological studies and are required to undertake any work related to archeological resources, they should also include:

- **Huron-Wendat**

Steps that the proponent may need to take in relation to Aboriginal consultation for the proposed project are outlined in the [“Code of Practice for Consultation in Ontario’s Environmental Assessment Process”](#). Additional information related to Ontario’s Environmental Assessment Act is available online at: www.ontario.ca/environmentalassessments.

Please also refer to the attached document “A Proponent’s Introduction to the Delegation of Procedural Aspects of consultation with Aboriginal Communities” for further information, including the MECP’s expectations for EA report documentation related to consultation with communities.

The proponent must contact the Director of Environmental Assessment Branch (EABDirector@ontario.ca) under the following circumstances subsequent to initial discussions with the communities identified by the 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 with Indigenous communities or other stakeholders has reached an impasse; or
- A Section 16 Order request is expected on the basis of impacts to Aboriginal or treaty rights

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

A draft copy of the report should be sent directly to me prior to the filing of the final report, allowing a minimum of 30 days for the ministry’s technical reviewers to provide comments.

Please also ensure a copy of the final notice is sent to the ministry’s Eastern Region EA notification email account (eanotification.eregion@ontario.ca) after the draft report is reviewed and finalized.

Should you or any members of your project team have any questions regarding the material above, please contact me at jon.orpana@ontario.ca.

Sincerely,



Jon K. Orpana
Regional Environmental Planner – Eastern Region

Cc:
Charlie Primeau, (A) Supervisor, Cornwall Area Office, MECP
Charlie.primeau@ontario.ca

Steve Taylor, P.Eng
Consultant Project Manager, BT Engineering Inc.
Ottawa, Ontario
Stephen.taylor@bteng.ca

Encl. Areas of Interest

AREAS OF INTEREST (v. February 2021)

It is suggested that you check off each section after you have considered / addressed it.

Planning and Policy

- Parts of the study area located in Eastern Region may also be subject to the [Oak Ridges Moraine Conservation Plan](#) (2017), [Greenbelt Plan](#) (2017) or [Lake Simcoe Protection Plan](#) (2014). Applicable plans and the applicable policies should be identified in the report, and the proponent should describe how the proposed project adheres to the relevant policies in these plans.
- The [Provincial Policy Statement \(2020\)](#) contains policies that protect Ontario's natural heritage and water resources. Applicable policies should be referenced in the report, and the proponent should describe how the proposed project is consistent with these policies.
- In addition to the provincial planning and policy level, the report should also discuss the planning context at the municipal and federal levels, as appropriate.

Source Water Protection

The *Clean Water Act*, 2006 (CWA) aims to protect existing and future sources of drinking water. To achieve this, several types of vulnerable areas have been delineated around surface water intakes and wellheads for every municipal residential drinking water system that is located in a source protection area. These vulnerable areas are known as a Wellhead Protection Areas (WHPAs) and surface water Intake Protection Zones (IPZs). Other vulnerable areas that have been delineated under the CWA include Highly Vulnerable Aquifers (HVAs), Significant Groundwater Recharge Areas (SGRAs), Event-based modelling areas (EBAs), and Issues Contributing Areas (ICAs). Source protection plans have been developed that include policies to address existing and future risks to sources of municipal drinking water within these vulnerable areas.

Projects that are subject to the Environmental Assessment Act that fall under a Class EA, or one of the Regulations, have the potential to impact sources of drinking water if they occur in designated vulnerable areas or in the vicinity of other at-risk drinking water systems (i.e. systems that are not municipal residential systems). MEA Class EA projects may include activities that, if located in a vulnerable area, could be a threat to sources of drinking water (i.e. have the potential to adversely affect the quality or quantity of drinking water sources) and the activity could therefore be subject to policies in a source protection plan. Where an activity poses a risk to drinking water, policies in the local source protection plan may impact how or where that activity is undertaken. Policies may prohibit certain activities, or they may require risk management measures for these activities. Municipal Official Plans, planning decisions, Class EA projects (where the project includes an activity that is a threat to drinking water) and prescribed instruments must conform with policies that address significant risks to drinking water

and must have regard for policies that address moderate or low risks.

- In October 2015, the MEA Parent Class EA document was amended to include reference to the Clean Water Act (Section A.2.10.6) and indicates that proponents undertaking a Municipal Class EA project must identify early in their process whether a project is or could potentially be occurring with a vulnerable area. **Given this requirement, please include a section in the report on source water protection.**
 - The proponent should identify the source protection area and should clearly document how the proximity of the project to sources of drinking water (municipal or other) and any delineated vulnerable areas was considered and assessed. Specifically, the report should discuss whether or not the project is located in a vulnerable area and provide applicable details about the area.
 - If located in a vulnerable area, proponents should document whether any project activities are prescribed drinking water threats and thus pose a risk to drinking water (this should be consulted on with the appropriate Source Protection Authority). Where an activity poses a risk to drinking water, the proponent must document and discuss in the report how the project adheres to or has regard to applicable policies in the local source protection plan. This section should then be used to inform and be reflected in other sections of the report, such as the identification of net positive/negative effects of alternatives, mitigation measures, evaluation of alternatives etc.
- While most source protection plans focused on including policies for significant drinking water threats in the WHPAs and IPZs it should be noted that even though source protection plan policies may not apply in HVAs, these are areas where aquifers are sensitive and at risk to impacts and within these areas, activities may impact the quality of sources of drinking water for systems other than municipal residential systems.
- In order to determine if this project is occurring within a vulnerable area, proponents can use this mapping tool: <http://www.applications.ene.gov.on.ca/swp/en/index.php>. Note that various layers (including WHPAs, WHPA-Q1 and WHPA-Q2, IPZs, HVAs, SGRAs, EBAs, ICAs) can be turned on through the "Map Legend" bar on the left. The mapping tool will also provide a link to the appropriate source protection plan in order to identify what policies may be applicable in the vulnerable area.
- For further information on the maps or source protection plan policies which may relate to their project, proponents must contact the appropriate source protection authority. **Please consult with the local source protection authority to discuss potential impacts on drinking water. Please document the results**

of that consultation within the report and include all communication documents/correspondence.

More Information

For more information on the *Clean Water Act*, source protection areas and plans, including specific information on the vulnerable areas and drinking water threats, please refer to [Conservation Ontario's website](#) where you will also find links to the local source protection plan/assessment report.

A list of the prescribed drinking water threats can be found in [section 1.1 of Ontario Regulation 287/07](#) made under the *Clean Water Act*. In addition to prescribed drinking water threats, some source protection plans may include policies to address additional "local" threat activities, as approved by the MECP.

□ Climate Change

The document "[Considering Climate Change in the Environmental Assessment Process](#)" (Guide) is now a part of the Environmental Assessment program's Guides and Codes of Practice. The Guide sets out the MECP's expectation for considering climate change in the preparation, execution and documentation of environmental assessment studies and processes. The guide provides examples, approaches, resources, and references to assist proponents with consideration of climate change in EA. Proponents should review this Guide in detail.

- **The MECP expects proponents of Class EA projects to:**

1. Consider during the assessment of alternative solutions and alternative designs, the following:
 - a. the project's expected production of greenhouse gas emissions and impacts on carbon sinks (climate change mitigation); and
 - b. resilience or vulnerability of the undertaking to changing climatic conditions (climate change adaptation).
2. Include a discrete section in the report detailing how climate change was considered in the EA.

How climate change is considered can be qualitative or quantitative in nature and should be scaled to the project's level of environmental effect. In all instances, both a project's impacts on climate change (mitigation) and impacts of climate change on a project (adaptation) should be considered.

- The MECP has also prepared another guide to support provincial land use planning direction related to the completion of energy and emission plans. The "[Community Emissions Reduction Planning: A Guide for Municipalities](#)" document is designed to educate stakeholders on the municipal opportunities to reduce energy and greenhouse gas emissions, and to provide guidance on

methods and techniques to incorporate consideration of energy and greenhouse gas emissions into municipal activities of all types. We encourage you to review the Guide for information.

□ Air Quality, Dust and Noise

- If there are sensitive receptors in the surrounding area of this project, a quantitative air quality/odour impact assessment will be useful to evaluate alternatives, determine impacts and identify appropriate mitigation measures. The scope of the assessment can be determined based on the potential effects of the proposed alternatives, and typically includes source and receptor characterization and a quantification of local air quality impacts on the sensitive receptors and the environment in the study area. The assessment will compare to all applicable standards or guidelines for all contaminants of concern. **Please contact this office for further consultation on the level of Air Quality Impact Assessment required for this project if not already advised.**
- If a quantitative Air Quality Impact Assessment is not required for the project, the MECP expects that the report contain a qualitative assessment which includes:
 - A discussion of local air quality including existing activities/sources that significantly impact local air quality and how the project may impact existing conditions;
 - A discussion of the nearby sensitive receptors and the project's potential air quality impacts on present and future sensitive receptors;
 - A discussion of local air quality impacts that could arise from this project during both construction and operation; and
 - A discussion of potential mitigation measures.
- As a common practice, "air quality" should be used an evaluation criterion for all road projects.
- Dust and noise control measures should be addressed and included in the construction plans to ensure that nearby residential and other sensitive land uses within the study area are not adversely affected during construction activities.
- The MECP recommends that non-chloride dust-suppressants be applied. For a comprehensive list of fugitive dust prevention and control measures that could be applied, refer to [Chemininfo Services Inc. Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities](#) report prepared for Environment Canada. March 2005.
- The report should consider the potential impacts of increased noise levels during the operation of the completed project. The proponent should explore all potential measures to mitigate significant noise impacts during the assessment of alternatives.

Ecosystem Protection and Restoration

- Any impacts to ecosystem form and function must be avoided where possible. The report should describe any proposed mitigation measures and how project planning will protect and enhance the local ecosystem.
- Natural heritage and hydrologic features should be identified and described in detail to assess potential impacts and to develop appropriate mitigation measures. The following sensitive environmental features may be located within or adjacent to the study area:
 - Key Natural Heritage Features: Habitat of endangered species and threatened species, fish habitat, wetlands, areas of natural and scientific interest (ANSIs), significant valleylands, significant woodlands; significant wildlife habitat (including habitat of special concern species); sand barrens, savannahs, and tallgrass prairies; and alvars.
 - Key Hydrologic Features: Permanent streams, intermittent streams, inland lakes and their littoral zones, seepage areas and springs, and wetlands.
 - Other natural heritage features and areas such as: vegetation communities, rare species of flora or fauna, Environmentally Sensitive Areas, Environmentally Sensitive Policy Areas, federal and provincial parks and conservation reserves, Greenland systems etc.

We recommend consulting with the Ministry of Natural Resources and Forestry (MNRF), Fisheries and Oceans Canada (DFO) and your local conservation authority to determine if special measures or additional studies will be necessary to preserve and protect these sensitive features. In addition, you may consider the provisions of the Rouge Park Management Plan if applicable.

Species at Risk

- The Ministry of the Environment, Conservation and Parks has now assumed responsibility of Ontario's Species at Risk program. Information, standards, guidelines, reference materials and technical resources to assist you are found at <https://www.ontario.ca/page/species-risk>.
- The Client's Guide to Preliminary Screening for Species at Risk (Draft May 2019) has been attached to the covering email for your reference and use. Please review this document for next steps.
- For any questions related to consideration of SAR and subsequent permit requirements, please contact SAROntario@ontario.ca.

Surface Water

- The report must include enough information to demonstrate that there will be no negative impacts on the natural features or ecological functions of any watercourses within the study area. Measures should be included in the planning and design process to ensure that any impacts to watercourses from construction or operational activities (e.g. spills, erosion, pollution) are mitigated as part of the proposed undertaking.
- Additional stormwater runoff from new pavement can impact receiving watercourses and flood conditions. Quality and quantity control measures to treat stormwater runoff should be considered for all new impervious areas and, where possible, existing surfaces. The ministry's [Stormwater Management Planning and Design Manual \(2003\)](#) should be referenced in the report and utilized when designing stormwater control methods. **A Stormwater Management Plan should be prepared as part of the Class EA process** that includes:
 - Strategies to address potential water quantity and erosion impacts related to stormwater draining into streams or other sensitive environmental features, and to ensure that adequate (enhanced) water quality is maintained
 - Watershed information, drainage conditions, and other relevant background information
 - Future drainage conditions, stormwater management options, information on erosion and sediment control during construction, and other details of the proposed works
 - Information on maintenance and monitoring commitments.
- Ontario Regulation 60/08 under the *Ontario Water Resources Act (OWRA)* applies to the Lake Simcoe Basin, which encompasses Lake Simcoe and the lands from which surface water drains into Lake Simcoe. If the proposed sewage treatment plant is listed in Table 1 of the regulation, the report should describe how the proposed project and its mitigation measures are consistent with the requirements of this regulation and the OWRA.
- Any potential approval requirements for surface water taking or discharge should be identified in the report. A Permit to Take Water (PTTW) under the OWRA will be required for any water takings that exceed 50,000 L/day, except for certain water taking activities that have been prescribed by the Water Taking EASR Regulation – O. Reg. 63/16. These prescribed water-taking activities require registration in the EASR instead of a PTTW. Please review the [Water Taking User Guide for EASR](#) for more information. Additionally, an Environmental Compliance Approval under the OWRA is required for municipal stormwater management works.

Groundwater

- The status of, and potential impacts to any well water supplies should be addressed. If the project involves groundwater takings or changes to drainage patterns, the quantity and quality of groundwater may be affected due to drawdown effects or the redirection of existing contamination flows. In addition, project activities may infringe on existing wells such that they must be reconstructed or sealed and abandoned. Appropriate information to define existing groundwater conditions should be included in the report.
- If the potential construction or decommissioning of water wells is identified as an issue, the report should refer to Ontario Regulation 903, Wells, under the OWRA.
- Potential impacts to groundwater-dependent natural features should be addressed. Any changes to groundwater flow or quality from groundwater taking may interfere with the ecological processes of streams, wetlands or other surficial features. In addition, discharging contaminated or high volumes of groundwater to these features may have direct impacts on their function. Any potential effects should be identified, and appropriate mitigation measures should be recommended. The level of detail required will be dependent on the significance of the potential impacts.
- Any potential approval requirements for groundwater taking or discharge should be identified in the report. A Permit to Take Water (PTTW) under the OWRA will be required for any water takings that exceed 50,000 L/day, with the exception of certain water taking activities that have been prescribed by the Water Taking EASR Regulation – O. Reg. 63/16. These prescribed water-taking activities require registration in the EASR instead of a PTTW. Please review the [Water Taking User Guide for EASR](#) for more information.
- Consultation with the railroad authorities is necessary wherever there is a plan to use construction dewatering in the vicinity of railroad lines or where the zone of influence of the construction dewatering potentially intercepts railroad lines.

Excess Materials Management

- In December 2019, MECP released a new regulation under the Environmental Protection Act, titled "[On-Site and Excess Soil Management](#)" (O. Reg. 406/19) to support improved management of excess construction soil. This regulation is a key step to support proper management of excess soils, ensuring valuable resources don't go to waste and to provide clear rules on managing and reusing excess soil. New risk-based standards referenced by this regulation help to facilitate local beneficial reuse which in turn will reduce greenhouse gas emissions from soil transportation, while ensuring strong protection of human health and the environment. The new regulation is being phased in over time,

with the first phase in effect on January 1, 2021. For more information, please visit <https://www.ontario.ca/page/handling-excess-soil>.

- The report should reference that activities involving the management of excess soil should be completed in accordance with O. Reg. 406/19 and the MECP's current guidance document titled "[Management of Excess Soil – A Guide for Best Management Practices](#)" (2014).

- All waste generated during construction must be disposed of in accordance with ministry requirements

Contaminated Sites

- Any current or historical waste disposal sites should be identified in the report. The status of these sites should be determined to confirm whether approval pursuant to Section 46 of the EPA may be required for land uses on former disposal sites. We recommend referring to the [MECP's D-4 guideline](#) for land use considerations near landfills and dumps.
- Resources available may include regional/local municipal official plans and data; provincial data on [large landfill sites](#) and [small landfill sites](#); Environmental Compliance Approval information for waste disposal sites on [Access Environment](#).
- Other known contaminated sites (local, provincial, federal) in the study area should also be identified in the report (Note – information on federal contaminated sites is found on the Government of Canada's [website](#)).
- The location of any underground storage tanks should be investigated in the report. Measures should be identified to ensure the integrity of these tanks and to ensure an appropriate response in the event of a spill. The ministry's Spills Action Centre must be contacted in such an event.
- Since the removal or movement of soils may be required, appropriate tests to determine contaminant levels from previous land uses or dumping should be undertaken. If the soils are contaminated, you must determine how and where they are to be disposed of, consistent with *Part XV.1 of the Environmental Protection Act* (EPA) and Ontario Regulation 153/04, Records of Site Condition, which details the new requirements related to site assessment and clean up. Please contact the appropriate MECP District Office for further consultation if contaminated sites are present.

Servicing, Utilities and Facilities

- The report should identify any above or underground utilities in the study area such as transmission lines, telephone/internet, oil/gas etc. The owners should be consulted to discuss impacts to this infrastructure, including potential spills.
- The report should identify any servicing infrastructure in the study area such as wastewater, water, stormwater that may potentially be impacted by the project.
- Any facility that releases emissions to the atmosphere, discharges contaminants to ground or surface water, provides potable water supplies, or stores, transports or disposes of waste must have an Environmental Compliance Approval (ECA) before it can operate lawfully. Please consult with MECP's Environmental Permissions Branch to determine whether a new or amended ECA will be required for any proposed infrastructure.
- We recommend referring to the ministry's [environmental land use planning guides](#) to ensure that any potential land use conflicts are considered when planning for any infrastructure or facilities related to wastewater, pipelines, landfills or industrial uses.

Mitigation and Monitoring

- Contractors must be made aware of all environmental considerations so that all environmental standards and commitments for both construction and operation are met. Mitigation measures should be clearly referenced in the report and regularly monitored during the construction stage of the project. In addition, we encourage proponents to conduct post-construction monitoring to ensure all mitigation measures have been effective and are functioning properly.
- Design and construction reports and plans should be based on a best management approach that centres on the prevention of impacts, protection of the existing environment, and opportunities for rehabilitation and enhancement of any impacted areas.
- The proponent's construction and post-construction monitoring plans must be documented in the report, as outlined in Section A.2.5 and A.4.1 of the MEA Class EA parent document.

Consultation

- The report must demonstrate how the consultation provisions of the Class EA have been fulfilled, including documentation of all stakeholder consultation efforts undertaken during the planning process. This includes a discussion in the report that identifies concerns that were raised and **describes how they have been addressed by the proponent** throughout the planning process. The report

should also include copies of comments submitted on the project by interested stakeholders, and the proponent's responses to these comments (as directed by the Class EA to include full documentation).

- Please include the full stakeholder distribution/consultation list in the documentation.

Class EA Process

- If this project is a Master Plan: there are several different approaches that can be used to conduct a Master Plan, examples of which are outlined in Appendix 4 of the Class EA. **The Master Plan should clearly indicate the selected approach for conducting the plan**, by identifying whether the levels of assessment, consultation and documentation are sufficient to fulfill the requirements for Schedule B or C projects. Please note that any Schedule B or C projects identified in the plan would be subject to Part II Order Requests under the Environmental Assessment Act, although the plan itself would not be. **Please include a description of the approach being undertaken (use Appendix 4 as a reference)**.
- If this project is a Master Plan: Any identified projects should also include information on the MCEA schedule associated with the project.
- The report should provide clear and complete documentation of the planning process in order to allow for transparency in decision-making.
- The Class EA requires the consideration of the effects of each alternative on all aspects of the environment (including planning, natural, social, cultural, economic, technical). The report should include a level of detail (e.g. hydrogeological investigations, terrestrial and aquatic assessments, cultural heritage assessments) such that all potential impacts can be identified, and appropriate mitigation measures can be developed. Any supporting studies conducted during the Class EA process should be referenced and included as part of the report.
- Please include in the report a list of all subsequent permits or approvals that may be required for the implementation of the preferred alternative, including but not limited to, MECP's PTTW, EASR Registrations and ECAs, conservation authority permits, species at risk permits, MTO permits and approvals under the *Impact Assessment Act, 2019*.
- Ministry guidelines and other information related to the issues above are available at <http://www.ontario.ca/environment-and-energy/environment-and-energy>. We encourage you to review all the available guides and to reference any relevant information in the report.

Amendments to the EAA through the Covid-19 Economic Recovery Act, 2020

Once the EA Report is finalized, the proponent must issue 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. The Notice of Completion must be sent to the appropriate MECP Regional Office email address (for projects in MECP Eastern Region, the email is eanotification.eregion@ontario.ca).

The public has the ability to request a higher level of assessment on a project if they are concerned about potential adverse impacts to constitutionally protected Aboriginal and treaty rights. In addition, the Minister may issue an order on his or her own initiative within a specified time period. The Director (of the Environmental Assessment Branch) will issue a Notice of Proposed Order to the proponent if the Minister is considering an order for the project within 30 days after the conclusion of the comment period on the Notice of Completion. At this time, the Director may request additional information from the proponent. 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.

Therefore, the proponent cannot proceed with the project until at least 30 days after the end of the comment period provided for in the Notice of Completion. Further, the proponent may not proceed after this time if:

- a Section 16 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 the project.

Please ensure that the Notice of Completion advises 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, Section 16 Order requests on those matters should be addressed in writing to:

Minister

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
EABDirector@ontario.ca

Appendix C

Culvert Assessment and Fish Habitat Memorandum



100 Craig Henry Drive, Suite 201
Ottawa, ON K2G 5W3
613-228-4813

MEMORANDUM

TO: File
FROM: Zachery Wells, BTE
PROJECT: County Road 22 Reconstruction and Drainage Improvement
SUBJECT: Inspection of County Road 22 Culverts and Associated Fish Habitat

DATE: November 14, 2022, REV 2
PROJECT #: 22-019

A survey was conducted on May 17, 2022, to document existing cross culverts which may require replacement within the limits of the County Road 22 (CR 22) Project Area. Additionally, cross culverts and subsamples of driveway culverts and drainage ditches (mostly components of municipal drains) were cursorily assessed to determine if any have the potential to provide fish habitat. An additional survey was completed on September 28, 2022, to both identify additional culverts in the expanded Project Area (eastward) and to complete fish community surveys at select locations where potential fish habitat was identified. This was a non-exhaustive assessment of fisheries potential in the Project Area from which a submission package to environmental regulatory agencies could be developed.

A total of 11 centreline culverts were observed. Numerous driveway culverts and ditches were also observed, 2 of which are identified in the attached photographic diary. All culverts and ditching associated with Municipal Drains in the Project Area were found to either provide direct fish habitat or found likely to function as contributing fish habitat. Any work within Municipal Drain ditches or culverts, or within culverts not associated with a Municipal Drain but instead conveying a watercourse where fish are present, will require a submission to the Department of Fisheries and Oceans (DFO) under the Request for Review process. Field Data Sheets completed for a subset of culvert crossings are attached to this memorandum and will function as supporting documentation in the future DFO review process.

Table 1 summarizes the culverts including their coordinates, type, size, condition and recommendation for replacement based on condition. **Attachment 1** shows the location of all culverts assessed during the two site surveys, **Attachment 2** is a photographic diary of the culverts and **Attachment 3** provides a biological overview (Field Data Sheets) of culverts selected based on a higher likelihood of providing fish habitat.

Subject: Reconstruction and Drainage Improvements, County Road 22
Project: 22-019, County Road 22 Reconstruction and Drainage Improvement
Date: November 14, 2022

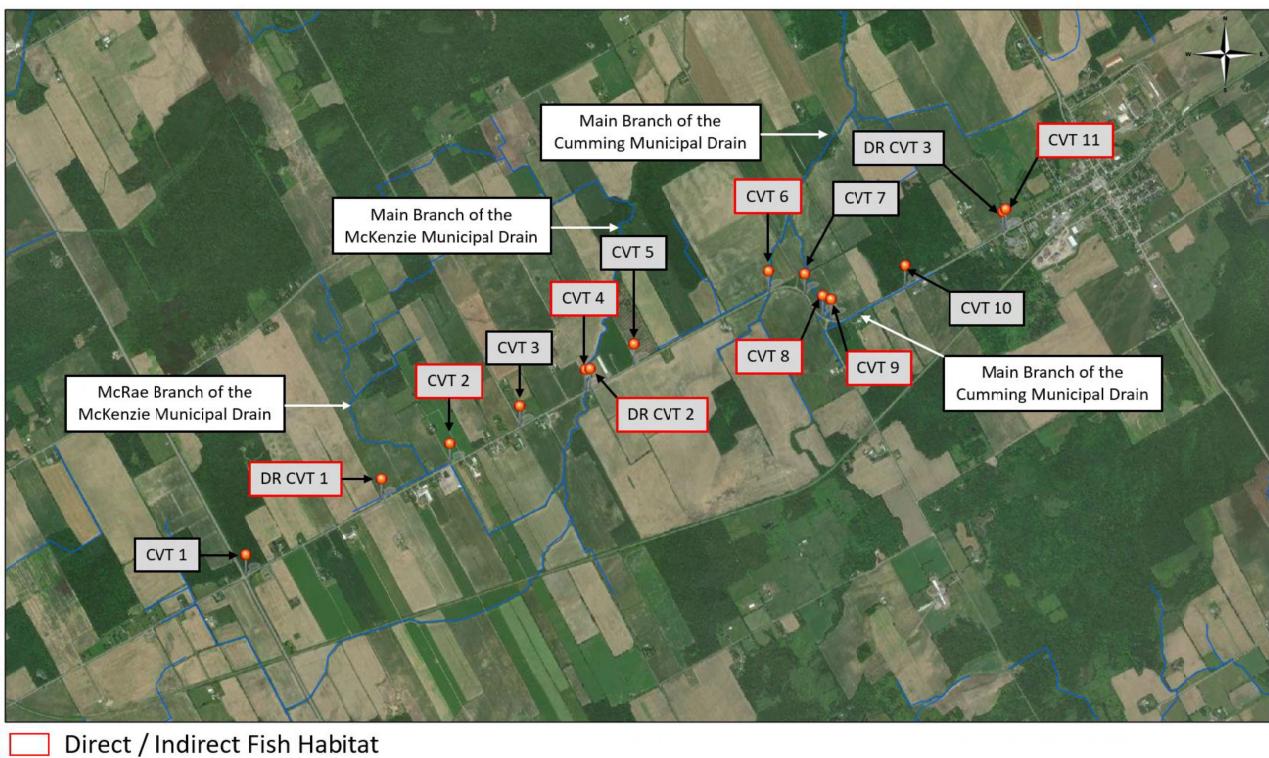


Table 1: Summary of Existing Culverts (driveway/ditchline not exhaustive)

Culvert I.D.	Coordinates (UTM)	Type (Observed In-Field)	Existing Size (mm) (Observed In-Field)	Condition	Recommended for Replacement	Fish Habitat
CVT 1	18T 505010 m E 5012088 m N	CSP (centreline)	600	Poor	Yes	No
DR CVT 1	18T 506019 m E 5012646 m N	CSP (driveway)	1000	Poor	NA	Yes
CVT 2	18T 506527 m E 5012908 m N	CSP (centreline)	1500	Fair/Poor	Yes	Yes
CVT 3	18T 507040 m E 5013185 m N	CSP (lined) (centreline)	500	Poor	Yes	No
CVT 4	18T 507532 m E 5013452 m N	Twin Concrete Box	3300 (span)	Good	No	Yes
DR CVT 2	18T 507560 m E 5013458 m N	CSP (driveway)	700	Poor	NA	Yes
CVT 5	18T 507881 m E 5013645 m N	HDPE or PVC (centreline)	600	Good	Yes	No
CVT 6	18T 508883 m E 5014182 m N	CSP (centreline)	1600	Poor	Yes	Yes
CVT 7	18T 509144 m E 5014160 m N	CSP (lined) (centreline)	600	Poor	Yes	No
CVT 8	18T 509272 m E 5013997 m N	CSP (lined) (centreline)	600	Poor	Yes	Yes
CVT 9	18T 509336 m E 5013971 m N	Twin CSP (centreline)	1600	Poor	Yes	Yes
CVT 10	18T 509885 m E 5014222 m N	CSP (centreline)	800	Good	Yes	No
DR CVT 3	18T 510617 m E 5014614 m N	CSP (driveway)	800	Fair	NA	No
CVT 11	18T 510638 m E 5014635 m N	CSP (centreline)	900	Fair	No	Yes

- Attachments:**
1. Culvert Location Map
 2. Culvert Photos
 3. Field Data Sheets

ATTACHMENT 1 – Culvert Location Map



ATTACHMENT 2 – Photographic Diary

CVT 1



View of the culvert inlet looking north (above) and south (below). The 600 mm CSP is damaged at the inlet, and erosion/washout is evident along the Highway 138 embankment.



View of the culvert outlet (above) and the interior of the pipe (below). The culvert is over 50% corroded in addition to being damaged at the inlet.



ATTACHMENT 2 – Photographic Diary

DR CVT 1 (and ditching)



View of ditch flows moving east into a 1000 mm CSP driveway culvert under 17443 CR 22 (above and below). Fish were observed. The culvert is approximately 40% corroded



Outlet of the CSP under 17443 CR 22 (above). View of the continued ditching and associated driveway culverts further east (below).



ATTACHMENT 2 – Photographic Diary

CVT 2



The outlet of the CSP under 17443 CR 22 contained significantly more vegetation and cattail growth during the fall visit (above). Blacknose Dace (some spawning colouration) and Fathead Minnow were captured during a presence/absence survey (below).



View of the 1500 mm CSP immediately west of 17515 CR 22, looking north (above). View of the culvert inlet looking south (below). Note the driveway culvert immediately to the east.



ATTACHMENT 2 – Photographic Diary



View of the culvert outlet looking south (above). View of the interior of the culvert, looking north (below). The culvert is approximately 25% corroded. Connectivity to Culvert #3 means this feature may provide fish habitat.



CVT 3



View of the inlet of the 500 mm, lined CSP looking northwest to capture drainage coming from the west (above). The same inlet was nearly dry in September (below).



ATTACHMENT 2 – Photographic Diary



View of the culvert inlet looking south (below). Note erosion around the culvert/road shoulder. View of the perched culvert outlet and closeup of the culvert liner (below). The liner appears to be partially deteriorated.



View of the culvert outlet, looking south (above). Note ditch drainage confluencing with this main channel, from the west. This culvert is immediately west of Fraser Road.

ATTACHMENT 2 – Photographic Diary

CVT 4



View of the box culverts outletting to the north (above). View of the culvert outlets, looking southwest (below). This feature is the McKenzie Municipal Drain.



DR CVT 2



View of drainage flowing north (above) to a 700 mm CSP (below) under a field access/driveway at 17670 CR 22. Water was backed up in May and September.



ATTACHMENT 2 – Photographic Diary

CVT 5



View of the culvert crossing (outlet) under 17670 CR 22 looking southeast. Closeup of the culvert outlet (below) which is nearing maximum capacity. Outletting water is discoloured and enters McKenzie Municipal Drain 20 m to the west.



View of the 600 mm PVC cross culvert approximately 390 m east of the McKenzie Municipal Drain crossing under CR 22. This feature does not support fish habitat (directly or indirectly).



ATTACHMENT 2 – Photographic Diary

CVT 6



View of the 1600 mm CSP culvert inlet, looking south (above). Note bank erosion on either side of the inlet. Photo of remnant concrete (below), east of the culvert inlet.



View of the interior of the CSP at the culvert inlet (above). View of eroding banks further to the south (below). It appears that this channel has recently had a cleanout.



ATTACHMENT 2 – Photographic Diary

CVT 7



View of the culvert outlet, looking south (below). The CSP appears to be approximately 40% corroded. This is the Cumming Drain. Darters were captured (below) and may be either Johnny, Tessellated or a hybrid species.



View of the lined, 600 mm CSP crossing under CR 22. This culvert conveys runoff from nearby agricultural fields and does not provide fish habitat.



ATTACHMENT 2 – Photographic Diary

CVT 8



View of a lined, 600 mm CSP conveying drainage from a nearby agricultural drain under CR 22, eastward (above). The liner appears to be in fair condition (below).



CVT 9



View of the east pipe inlet (above) and west pipe inlet (below). Note that there is significant damage to the integrity of the end of the east pipe, and both pipes are approximately 60% corroded. The west pipe is dry and appears to convey only major flows.



ATTACHMENT 2 – Photographic Diary

CVT 10



View of the twin 1500 mm culvert inlets (above), and the old road alignment further south. View of the CSPs outletting to the north (below). No fish were captured; however, this is a branch of the Cumming Drain within which fish were previously captured.



View of the 800 mm CSP crossing under CR 22 looking east on the south side of the road (above) and looking at the inlet, looking north (below).



ATTACHMENT 2 – Photographic Diary

DR CVT 3



Drainage from agricultural fields to the south flow north through a swale (above) and into an 800 mm CSP (below). Flow is conveyed east under the entrance to the Maxville Manor to a catchbasin. One catchbasin connection from the north can be seen, below.



Flow enters the above catchbasin at the east limit of the Manor driveway before it continues east to a confluence point of east and west drainage (below) which is ultimately directed to the north.



CVT 11



Top-down view of the confluence point (above). The 800 mm CSP enters from the west (right pipe) and a storm inlet enters from the east (left pipe). Flow then moves north through a 900 mm CSP (above and below).



ATTACHMENT 2 – Photographic Diary



The culvert outlet is perched and approximately 25% corroded. A scour pool (0.65 m deep) has developed due to the 0.3 m perch from the culvert invert to the surface of the water.



WATERCOURSE FIELD COLLECTION FORM

GENERAL INFORMATION

Project #	Project Description:	Date:
22-019	CR 22 Improvement	Sep 28-22

Is Stream Realignment required for this section:

Yes No Unknown

Collectors:	Time Started:	Time Finished:
ZW, SF	0810h	

Weather Conditions:

75% OC, showers, 12°C

Air Temp (°C):	Water Temp (°C):	Conductivity (µS/cm):	Velocity (m/s):
12°	/	/	/

Photos Numbers And Descriptions:

See culvert memo

LOCATION

Name of Waterbody:	Drainage System:	Crossing #:	Station #:
Unnamed ditch drainage	West Branch Scotch River	CVT 1	1 (only)

Location Of Crossing:

Dyer Rd (CR 22) immediately east of Hwy 136

GPS Coordinates:	MTO Chainage:
18T 505011mE 5012091mN	/
Township:	MNRF District:
Moose Creek / Marville	Kemptonville

ATTACHMENT 2 – Photographic Diary



Water was observed below the pipe (above), although it is unclear if the barrel has a leak or if water is running along the exterior of the culvert.



One Brook Stickleback (above) was captured during a presence/absence survey.

LAND USE AND POLLUTION										
Surrounding Land Use: Agriculture & residential			Sources of Pollution: Road & field runoff							
EXISTING STRUCTURE TYPE										
Bridge <input type="radio"/>	Box Culvert <input type="radio"/>	Open Foot Culvert <input type="radio"/>	CSP <input checked="" type="checkbox"/>	N/A <input type="radio"/>						
Other <input type="radio"/> (Describe)			Size: (w x h) m ² 600mm CSP							
SECTION TYPE AND MORPHOLOGY										
Section (Reach) Identifier: CVT 1			Section Location: (Include On Habitat Map)							
Associated Wetland None										
Stream / River <input type="radio"/>	Channelized <input type="radio"/>	Permanent <input type="radio"/>	Intermittent <input type="radio"/>	Ephemeral <input type="radio"/>						
Total Section (Reach) Length (m):										
Sub-Sections:		Run <input type="radio"/>	Pool <input type="radio"/>	Riffle <input type="radio"/>	Flats <input type="radio"/>	Culvert <input checked="" type="checkbox"/>	Other <input checked="" type="checkbox"/>			
Percentage of Area:						80	20 grassy ditch			
Mean wetted depth (m)										
Mean wetted width (m)										
Mean bankfull depth (m)										
Mean bankfull width (m)										
Substrate (type & %)										
Bedrock (Br) <input type="radio"/>	Boulder (Bo) <input type="radio"/>	Cobble (Co) <input type="radio"/>	Gravel (Gr) <input type="radio"/>	Sand (Sa) <input type="radio"/>	Silt (Si) <input type="radio"/>	Clay (Cl) <input type="radio"/>	Muck (Mu) <input type="radio"/>	Detritus (D) <input type="radio"/>		
40	30	30	40	40	40	40	20			

BANK STABILITY				
	Stable <input type="radio"/>	Slightly Unstable <input type="radio"/>	Moderately Unstable <input type="radio"/>	Unstable <input type="radio"/>
Left Bank	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Right Bank	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Deposition Zone <input type="radio"/>	Protected Bank <input type="radio"/>	Vulnerable Bank <input type="radio"/>	Eroding Bank <input type="radio"/>
Left Bank	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Right Bank	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
HABITAT				
In-Stream Cover (% surface area):				
Undercut banks: Eroded 4/5 left bank (west)	Boulders: <input type="radio"/>	Cobbles: <input type="radio"/>	Organic Debris: <input type="radio"/>	None <input type="radio"/>
Vascular Macrophytes:			Woody Debris:	
Instream: Overhanging:			Instream: Overhanging:	
Shore Cover (% stream shaded):				
100-90% <input type="radio"/>	89-60% <input type="radio"/>	59-30% <input type="radio"/>	29-1% <input type="radio"/>	None <input type="radio"/>
Canyon geps, plugged channel				
Vegetation Type:				
Vegetation Type (%)	Submergent: <input type="radio"/>	Floating: <input type="radio"/>	Emergent: <input type="radio"/>	None <input type="radio"/>
Predominant Species: Canyon Grass 100%				

MIGRATORY OBSTRUCTIONS

Permanent	Seasonal	None
	Dense in-stream veg	

POTENTIAL CRITICAL HABITAT

Spawning	Groundwater	Other
No	No	

POTENTIAL ENHANCEMENT OPPORTUNITIES

ADDITIONAL COMMENTS

Not fish habitat - grass ditch.
Additional Notes Appended? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Number of Pages _____

WATERCOURSE FIELD COLLECTION FORM**GENERAL INFORMATION**

Project #	Project Description:	Date:
22-019	CR22 Improvements	Sep. 28-22

Is Stream Realignment required for this section:

 Yes No Unknown

Collectors:	Time Started:	Time Finished:
ZW, SF	0840	

Weather Conditions:

75% OC, shower

Air Temp (°C):	Water Temp (°C):	Conductivity (µS/cm):	Velocity (m/s):
12°C	15.4°C	641	Minimal

Photos Numbers And Descriptions:

LOCATION

Name of Waterbody: Draining / tributary to Mackenzie Drain	Drainage System: Mackenzie/ West Branch Scotch River	Crossing #: DR CVT 1	Station #: XXXXXX 1 (only)

Location Of Crossing:

CR 22, ~1.2 km east of HWY 138 (@ 17443 CR 22)

GPS Coordinates: 18T 506025 mE 5012649 mN	MTO Chainage: _____
Township: Moose Creek / Marville	MNRF District: Kemptville

LAND USE AND POLLUTION									
Surrounding Land Use: Agriculture & residential			Sources of Pollution: Road & field runoff						
EXISTING STRUCTURE TYPE									
Bridge <input type="radio"/>	Box Culvert <input type="radio"/>	Open Foot Culvert <input type="radio"/>	CSP <input checked="" type="checkbox"/>	N/A <input type="radio"/>					
Other <input type="radio"/> (Describe)			Size: (w x h) m ² 1000mm CSP leading to a 1460mm CSP						
SECTION TYPE AND MORPHOLOGY									
Section (Reach) Identifier: XXXXXX DR CVT 1			Section Location: (Include On Habitat Map)						
Associated Wetland <input checked="" type="checkbox"/>			DR CVT 1 XXXXXX						
Stream / River <input type="radio"/>	Channelized <input type="radio"/>	Permanent <input checked="" type="checkbox"/>	Intermittent <input type="radio"/>	Ephemeral <input type="radio"/>					
Total Section (Reach) Length (m):									
Sub-Sections:	Run <input type="radio"/>	Pool <input type="radio"/>	Riffle <input type="radio"/>	Flats <input checked="" type="checkbox"/>	Culvert <input checked="" type="checkbox"/>	Other <input type="radio"/>			
Percentage of Area:			50%		50%				
Mean wetted depth (m)									
Mean wetted width (m)									
Mean bankfull depth (m)			2.5m		1m				
Mean bankfull width (m)			10m		1m				
Substrate (type & %)			HO Gravel 40% 40% 20% 20%						
Bedrock (Br)	Boulder (Bo)	Cobble (Co)	Gravel (Gr)	Sand (Sa)	Silt (Si)	Clay (Cl)	Muck (Mu)	Detritus (D)	
			40	40	20				

See
prev.
visit

BANK STABILITY				
	Stable <input checked="" type="checkbox"/>	Slightly Unstable <input type="radio"/>	Moderately Unstable <input type="radio"/>	Unstable <input type="radio"/>
Left Bank	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Right Bank	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Deposition Zone <input type="radio"/>	Protected Bank <input checked="" type="checkbox"/>	Vulnerable Bank <input type="radio"/>	Eroding Bank <input type="radio"/>
Left Bank	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>
Right Bank	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>
HABITAT				
In-Stream Cover (% surface area):				
Undercut banks: <input checked="" type="checkbox"/>	Boulders: <input checked="" type="checkbox"/>	Cobbles: <input type="checkbox"/>	Organic Debris: <i>Archaeogives</i>	None <input type="radio"/>
Vascular Macrophytes: Instream: <i>Cattails</i> Overhanging: <i>40% Canopy Grass</i>			Woody Debris: Instream: Overhanging: <i>Spruce tree limbs</i>	
Shore Cover (% stream shaded):				
100-90% <input type="radio"/>	89-60% <input type="radio"/>	59-30% <input type="radio"/>	29-1% <input checked="" type="checkbox"/>	None <input type="radio"/>
Vegetation Type:				
Vegetation Type (%)	Submergent:	Floating:	Emergent:	None <input type="radio"/>
Predominant Species:		<i>Minor duckweed</i>	<i>RCG</i> <i>Cattails</i> <i>Purple loosestrife</i>	

MIGRATORY OBSTRUCTIONS

Permanent	Seasonal <i>Potential dense veg growth w/s tree canopy barrier</i>	None
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POTENTIAL CRITICAL HABITAT

Spawning	Male spawn- coloured Blacknose Dace observed.	Groundwater	Other
		No	

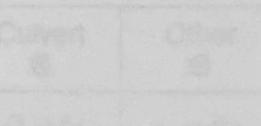
POTENTIAL ENHANCEMENT OPPORTUNITIES

- Maratown embedded culvert.

ADDITIONAL COMMENTS

TDS: 464 ppm	Fish <i>Settings: 350V, 100Hz</i>
Sal: 0.15 ppt	- School of 50+ Blacknose Dace observed. Spawning male coloration.
pH: 8.0	- 1 Fathead Minnow captured
Additional Notes Appended? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	Number of Pages _____

WATERCOURSE FIELD COLLECTION FORM

GENERAL INFORMATION			
Project #	Project Description:		Date:
22-019	CR 22 Improvements		Sp. 28-22
Is Stream Realignment required for this section:			
<input type="radio"/> Yes	<input checked="" type="radio"/> No	<input type="radio"/> Unknown	<i>CR 22</i>
Collectors:		Time Started:	Time Finished:
Zw, SF		0925h	
Weather Conditions:			
50% OC, 12°C, light wind			
Air Temp (°C):	Water Temp (°C):	Conductivity (µS/cm):	Velocity (m/s):
12°C	15.2°C	703	Min
Photos Numbers And Descriptions:			
			
LOCATION			
Name of Waterbody:	Drainage System:	Crossing #:	Station #:
Ditch drainage outletting to Mackenzie Drain	Mackenzie Drain / West Branch Scotch	CVT 3	XXXXXX 1 (only)
Location Of Crossing:			
CR 22, immediately west of Froter Road			
GPS Coordinates:	MTO Chainage:		
18T 507040mE 5013460mN	<i>-----</i>		
Township:	MNRF District:		
Moose Creek / Maaville	Kemptville		

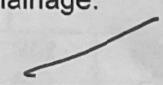
LAND USE AND POLLUTION									
Surrounding Land Use:			Sources of Pollution:						
Agriculture & residential			Field & road runoff						
EXISTING STRUCTURE TYPE									
Bridge <input type="radio"/>	Box Culvert <input type="radio"/>	Open Foot Culvert <input type="radio"/>	CSP <input checked="" type="checkbox"/>	N/A <input type="radio"/>					
Other <input type="radio"/> (Describe)			Size: (w x h) m ² 500mm CSP (lined)						
SECTION TYPE AND MORPHOLOGY									
Section (Reach) Identifier: XXXXXX CVT 3			Section Location: (Include On Habitat Map)						
Associated Wetland None			None						
Stream / River <input type="radio"/>	Channelized <input type="radio"/>	Permanent <input type="radio"/>	Intermittent <input checked="" type="checkbox"/>	Ephemeral <input type="radio"/>					
Total Section (Reach) Length (m):									
Sub-Sections:	Run <input type="radio"/>	Pool <input type="radio"/>	Riffle <input type="radio"/>	Flats <input type="radio"/>	Culvert <input checked="" type="checkbox"/>	Other <input checked="" type="checkbox"/>			
Percentage of Area:					90%	10%			
Mean wetted depth (m)									
Mean wetted width (m)									
Mean bankfull depth (m)									
Mean bankfull width (m)									
Substrate (type & %)					Gravel Sand	50/50			
Bedrock (Br)	Boulder (Bo)	Cobble (Co)	Gravel (Gr)	Sand (Sa)	Silt (Si)	Clay (Cl)	Muck (Mu)	Detritus (D)	

BANK STABILITY				
	Stable <input type="radio"/>	Slightly Unstable <input type="radio"/>	Moderately Unstable <input type="radio"/>	Unstable <input type="radio"/>
Left Bank	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Right Bank	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Deposition Zone <input type="radio"/>	Protected Bank <input type="radio"/>	Vulnerable Bank <input type="radio"/>	Eroding Bank <input type="radio"/>
Left Bank	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Right Bank	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
HABITAT				
In-Stream Cover (% surface area):				
Undercut banks:	Boulders:	Cobbles:	Organic Debris:	None <input type="radio"/>
Vascular Macrophytes:			Woody Debris:	
Instream:	Instream:			
Overhanging:	Overhanging:			
Shore Cover (% stream shaded):				
100-90% <input type="radio"/>	89-60% <input type="radio"/>	59-30% <input type="radio"/>	29-1% <input type="radio"/>	None <input type="radio"/>
Vegetation Type:				
Vegetation Type (%)	Submergent:	Floating:	Emergent:	None <input type="radio"/>
Predominant Species:				

MIGRATORY OBSTRUCTIONS		
Permanent Perched culvert 10 ^t cm	Seasonal	None
POTENTIAL CRITICAL HABITAT		
Spawning	Groundwater	Other
POTENTIAL ENHANCEMENT OPPORTUNITIES		
- Embled culvert		
ADDITIONAL COMMENTS		
pH: 7.73 TDS: 502 ppm Sal: 0.35 ppt	Firh None	
Additional Notes Appended? <input type="radio"/> No <input checked="" type="radio"/> Yes Number of Pages _____		

NOT FISH HAB

WATERCOURSE FIELD COLLECTION FORM

GENERAL INFORMATION			
Project #	Project Description:		Date:
22-019	CR 22 Improvements		Sep 28-22
Is Stream Realignment required for this section: <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Unknown			
Collectors:	Time Started:	Time Finished:	
ZW, SF	0943h		
Weather Conditions: 50° OC, 11° C			
Air Temp (°C): 11°	Water Temp (°C): 15.2°	Conductivity (µS/cm): 630	Velocity (m/s): min
Photos Numbers And Descriptions:			
LOCATION			
Name of Waterbody: Drainage (ditch under driveway) to Mackenzie Drain	Drainage System: Mac Drain/ West Branch Scotch River	Crossing #: DR CVT 2 XXXXXX	Station #: 1 (on J)
Location Of Crossing: CR 22 @ 17670 (culvert under driveway, connected to Mac Drain).			
GPS Coordinates: 18T 507560 mE 5013460 mN	MTO Chainage: 		
Township: Moose Creek / Maxville	MNRF District: Kempville		

LAND USE AND POLLUTION									
Surrounding Land Use: Agriculture & residential			Sources of Pollution: Field & road runoff (apparent)						
EXISTING STRUCTURE TYPE									
Bridge <input type="radio"/>	Box Culvert <input type="radio"/>	Open Foot Culvert <input type="radio"/>	CSP <input checked="" type="checkbox"/>	N/A <input type="radio"/>					
Other <input type="radio"/> (Describe)			Size: (w x h) m ² 700mm CSP						
SECTION TYPE AND MORPHOLOGY									
Section (Reach) Identifier: XXXXXX DR CVT 2			Section Location: (Include On Habitat Map)						
Associated Wetland None									
Stream / River <input type="radio"/>	Channelized <input type="radio"/>	Permanent <input checked="" type="checkbox"/>	Intermittent <input type="radio"/>	Ephemeral <input type="radio"/>					
Total Section (Reach) Length (m):									
Sub-Sections:		Run <input type="radio"/>	Pool <input type="radio"/>	Riffle <input type="radio"/>	Flats <input type="radio"/>	Culvert <input checked="" type="checkbox"/>	Other <input type="checkbox"/>		
Percentage of Area:							Gross ditch		
Mean wetted depth (m)									
Mean wetted width (m)									
Mean bankfull depth (m)									
Mean bankfull width (m)									
Substrate (type & %)							Mu <i>Si</i>	Gr	
Bedrock (Br)	Boulder (Bo)	Cobble (Co)	Gravel (Gr)	Sand (Sa)	Silt (Si)	Clay (Cl)	Muck (Mu)	Detritus (D)	

BANK STABILITY				
	Stable <input type="radio"/>	Slightly Unstable <input type="radio"/>	Moderately Unstable <input type="radio"/>	Unstable <input type="checkbox"/>
Left Bank	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Right Bank	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Deposition Zone	Protected Bank	Vulnerable Bank	Eroding Bank
Left Bank	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Right Bank	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
HABITAT				
In-Stream Cover (% surface area):				
Undercut banks:	Boulders:	Cobbles:	Organic Debris:	None <input type="radio"/>
Vascular Macrophytes:			Woody Debris:	
Instream:			Instream:	
Overhanging:			Overhanging:	
Shore Cover (% stream shaded):				
100-90% <input type="radio"/>	89-60% <input type="radio"/>	59-30% <input type="radio"/>	29-1% <input type="radio"/>	None <input type="radio"/>
Vegetation Type:				
Vegetation Type (%)	Submergent:	Floating:	Emergent:	None <input type="radio"/>
Predominant Species:				

Gross ditch in area of culvert.

MIGRATORY OBSTRUCTIONS

Permanent	Seasonal Higher grade than the Mackenzie Drain	None
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POTENTIAL CRITICAL HABITAT

Spawning	Groundwater	Other
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POTENTIAL ENHANCEMENT OPPORTUNITIES

- Larger culvert

ADDITIONAL COMMENTS

- Flows north, then west under the driveway into Mackenzie Drain
 pH: 7.62 - Not direct fish hab (no captured or obs)
 TDS: 447 ppm but indirect/contributing D/S.
 Sal: 0.32 ppt - As such, appropriate mitigation needed

- Tile drain 300 HDPE outlets into the channel east of the driveway, from further east field.

Additional Notes Appended? No Yes

Number of Pages _____

- Gross ditch in area of culvert, though a ~1m wide drainage
 scarp in flow observed in two seasons, flows north Page 4 of 4
 & enters the CSP from the east.

WATERCOURSE FIELD COLLECTION FORM**GENERAL INFORMATION**

Project #	Project Description:	Date:
22-019	CR 22 Improvements	Sep. 28 - 22

Is Stream Realignment required for this section:

Yes No Unknown

Collectors: Time Started: Time Finished:

ZW, SF 1013h

Weather Conditions:

50% oc, 14°C

Air Temp (°C):	Water Temp (°C):	Conductivity (µS/cm):	Velocity (m/s):
14°C	17°	605	Mod

Photos Numbers And Descriptions:

LOCATION

Name of Waterbody: West Branch of the Scotch River - Munroe Branch	Drainage System: See left	Crossing #: CVT 6 XXXXXX	Station #: 1 (only)
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Location Of Crossing:

CR 22, ~ 195m west of Cameron Road

GPS Coordinates: MTO Chainage:

19T 509884 mE 5014185mN

Township: MNRF District:

Moore Creek / Manville

Kemptville

LAND USE AND POLLUTION										
Surrounding Land Use: Agriculture & residential			Sources of Pollution: Field & road runoff							
EXISTING STRUCTURE TYPE										
Bridge <input type="radio"/>	Box Culvert <input type="radio"/>	Open Foot Culvert <input type="radio"/>	CSP <input checked="" type="checkbox"/>	N/A <input type="radio"/>						
Other <input type="radio"/> (Describe)			Size: (w x h) m ² XXXXXX 1600 mm CSP							
SECTION TYPE AND MORPHOLOGY										
Section (Reach) Identifier: XXXXXX CVT 6			Section Location: (Include On Habitat Map)							
Associated Wetland <input type="radio"/>										
Stream / River <input type="radio"/>	Channelized <input type="radio"/>	Permanent <input checked="" type="checkbox"/>	Intermittent <input type="radio"/>	Ephemeral <input type="radio"/>						
Total Section (Reach) Length (m):										
Sub-Sections:		Run <input checked="" type="checkbox"/>	Pool <input type="radio"/>	Riffle <input type="radio"/>	Flats <input type="radio"/>	Culvert <input checked="" type="checkbox"/>	Other <input type="radio"/>			
Percentage of Area:		50%				50%				
Mean wetted depth (m)										
Mean wetted width (m)										
Mean bankfull depth (m)		1.5								
Mean bankfull width (m)		2m								
Substrate (type & %)		Si <input type="radio"/>	50/50	Sa <input type="radio"/>	Silt <input type="radio"/>	Clay <input type="radio"/>	Muck <input type="radio"/>	Detritus <input type="radio"/>		
Bedrock (Br)	Boulder (Bo)	Cobble (Co)	Gravel (Gr)	Sand (Sa)	Silt (Si)	Clay (Cl)	Muck (Mu)	Detritus (D)		

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4

BANK STABILITY				
	Stable <input type="radio"/>	Slightly Unstable <input type="radio"/>	Moderately Unstable <input checked="" type="checkbox"/>	Unstable <input type="radio"/>
Left Bank	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
Right Bank	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	Deposition Zone	Protected Bank	Vulnerable Bank	Eroding Bank
Left Bank	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>
Right Bank	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>
HABITAT				
In-Stream Cover (% surface area):				
Undercut banks: 50%	Boulders: 5%	Cobbles:	Organic Debris:	None <input checked="" type="checkbox"/>
Vascular Macrophytes:			Woody Debris:	
Instream:			Instream:	
Overhanging: RCG → Queen Ann's lace			Overhanging:	
Shore Cover (% stream shaded):				
100-90% <input type="radio"/>	89-60% <input type="radio"/>	59-30% <input type="radio"/>	29-1% <input checked="" type="checkbox"/>	None <input type="radio"/>
Vegetation Type:				
Vegetation Type (%)	Submergent:	Floating:	Emergent:	None <input type="radio"/>
Predominant Species:	0%	0%	0%	

MIGRATORY OBSTRUCTIONS		
Permanent	Seasonal	None
POTENTIAL CRITICAL HABITAT		
Spawning	Groundwater	Other
POTENTIAL ENHANCEMENT OPPORTUNITIES		
<ul style="list-style-type: none"> - Increased riparian plantings - Bank stabilization - Stabilization around CVT inlet &/or larger pipe. 		
ADDITIONAL COMMENTS		
<p>pH: 7.85 TDS: 436 ppm Sal: 0.31 ppt</p>	<p><u>Firh</u> 2x Unknown Darters ↳ Johnny, Tessellated, Channel or JXT hybrid.</p>	
<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Number of Pages _____		

WATERCOURSE FIELD COLLECTION FORM

GENERAL INFORMATION			
Project #	Project Description:	Date:	
22-019	CR 22 Improvements	Sep 28-22	
Is Stream Realignment required for this section: <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Unknown			
Collectors:	Time Started:	Time Finished:	
ZW,	1108h		
Weather Conditions: 75% OC, no rain			
Air Temp (°C): 14°C	Water Temp (°C): 17.1°	Conductivity (µS/cm): 676	Velocity (m/s): Mod
Photos Numbers And Descriptions:			
LOCATION Name of Waterbody: West Scotch Branch Scotch River - Munroe Branch			
Drainage System: See left	Crossing #: CVT 9 XXXXXX	Station #: 1 (only)	
Location Of Crossing: CR 22, ~30m east of Cumming Road			
GPS Coordinates: 18T 509334mE 5013975mN	MTO Chainage:		
Township: Moore Creek / Manville	MNRF District: Kemptville		

LAND USE AND POLLUTION									
Surrounding Land Use: <i>Agriculture & residential</i>			Sources of Pollution: <i>Field → road runoff</i>						
EXISTING STRUCTURE TYPE									
Bridge ○	Box Culvert ○	Open Foot Culvert ○	CSP ✗	N/A ○					
Other ○ (Describe)			Size: (w x h) m ² <i>Twin 1500mm CSPs.</i>						
SECTION TYPE AND MORPHOLOGY									
Section (Reach) Identifier: XXXXXXXXXX CVT 9			Section Location: (Include On Habitat Map)						
Associated Wetland <i>None</i>									
Stream / River ○	Channelized ○	Permanent ○	Intermittent ○	Ephemeral ○					
Total Section (Reach) Length (m):									
Sub-Sections:	Run ✗	Pool ○	Riffle ○	Flats ○	Culvert ✗	Other ○			
Percentage of Area:	<i>50%</i>				<i>50%</i>				
Mean wetted depth (m)									
Mean wetted width (m)									
Mean bankfull depth (m)	<i>3m</i>				<i>1.9m</i>				
Mean bankfull width (m)	<i>15m</i>				<i>1.8m</i>				
Substrate (type & %)	Cl 80% So 20%								
Bedrock (Br)	Boulder (Bo)	Cobble (Co)	Gravel (Gr)	Sand (Sa)	Silt (Si)	Clay (Cl)	Muck (Mu)	Detritus (D)	

See
prev
visit

BANK STABILITY				
	Stable ✗	Slightly Unstable ○	Moderately Unstable ✗ Ds only at cut outlet	Unstable ○
Left Bank	✗	○	○	○
Right Bank	✗	○	○	○
	Deposition Zone	Protected Bank	Vulnerable Bank	Eroding Bank
Left Bank	○	○	○	○
Right Bank	○	○	○	○
HABITAT				
In-Stream Cover (% surface area):				
Undercut banks:	Boulders:	Cobbles:	Organic Debris:	None ✗
Vascular Macrophytes:			Woody Debris:	
Instream:			Instream:	
Overhanging: Queen Ann's Lace, Goldenrod, Purple Loosestrife, RCG, Phragmites (mainly e cut outlet)			Overhanging:	
Shore Cover (% stream shaded):				
100-90% ○	89-60% ○	59-30% ✗	29-1% ○	None ○
Vegetation Type:				
Vegetation Type (%)	Submergent:	Floating:	Emergent:	None ○
Predominant Species:				

MIGRATORY OBSTRUCTIONS

Permanent	Seasonal	None
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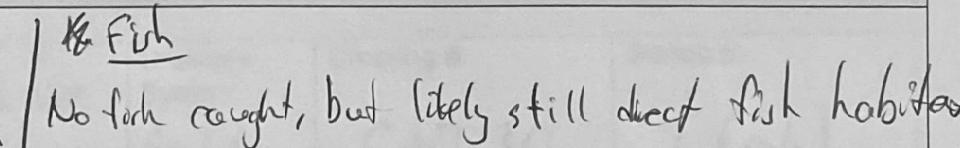
POTENTIAL CRITICAL HABITAT

Spawning	Groundwater	Other
None	Non	

POTENTIAL ENHANCEMENT OPPORTUNITIES

- Embed culvert 300mm
↳ not currently perched, but could be when flows are very low.
- Bank stabilization @ outlet.

ADDITIONAL COMMENTS

pH: 8.16	 <u>No fish</u>
TDS: 482 ppm	
Sal: 0.34	

Additional Notes Appended? No Yes

Number of Pages _____

WATERCOURSE FIELD COLLECTION FORM**GENERAL INFORMATION**

Project #	Project Description:	Date:
22-019	CR 22 Improvements	Sep. 28-22

Is Stream Realignment required for this section:

 Yes No Unknown

Collectors:	Time Started:	Time Finished:
ZW, SF	1139	

Weather Conditions:

75% OC, 15°C

Air Temp (°C):	Water Temp (°C):	Conductivity (µS/cm):	Velocity (m/s):
15°C	15.8°C	887	Mod

Photos Numbers And Descriptions:

LOCATION

Name of Waterbody: West Branch Scotch River - Monroe Branch	Drainage System: See left	Crossing #: CVT 11 XXXXXX	Station #: 1 (only)
---	------------------------------	---------------------------------	------------------------

Location Of Crossing: east

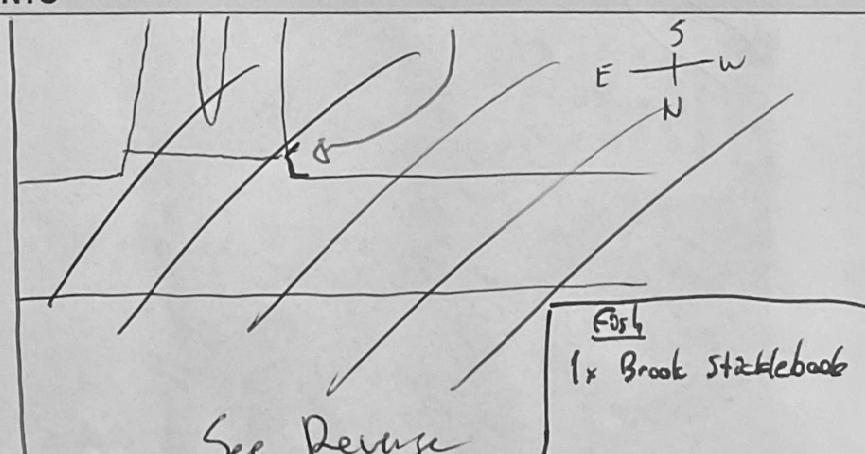
CR 22, immediately ~~XXX~~ of Maxville Manor

GPS Coordinates:	MTO Chainage:
------------------	---------------

Township: Moon Cycles / Maxville	MNRF District: Kemptville
-------------------------------------	------------------------------

LAND USE AND POLLUTION									
Surrounding Land Use: <i>Agriculture & residential</i>			Sources of Pollution: <i>Field & road runoff</i>						
EXISTING STRUCTURE TYPE									
Bridge <input type="radio"/>	Box Culvert <input type="radio"/>	Open Foot Culvert <input type="radio"/>	CSP <input checked="" type="radio"/>	N/A <input type="radio"/>					
Other <input type="radio"/> (Describe)			Size: (w x h) m ² <i>900 mm CSP</i> XXXXXX						
SECTION TYPE AND MORPHOLOGY									
Section (Reach) Identifier: <i>CVT 11</i>			Section Location: (Include On Habitat Map)						
Associated Wetland <i>Non</i>									
Stream / River <input checked="" type="radio"/> D/S	Channelized <input type="radio"/>	Permanent <input checked="" type="radio"/>	Intermittent <input type="radio"/>	Ephemeral <input type="radio"/>					
Total Section (Reach) Length (m): <i>40m</i>									
Sub-Sections:		Run <input type="radio"/>	Pool <input type="radio"/>	Riffle <input type="radio"/>	Flats <input type="radio"/>	Culvert <input type="radio"/>	Other <input type="radio"/>		
Percentage of Area:			<i>25%</i>	<i>25%</i>		<i>50%</i>			
Mean wetted depth (m)		<i>0.60</i>	<i>0.270.1</i>		<i>0.1</i>				
Mean wetted width (m)		<i>4m</i>	<i>3m</i>		<i>0.95</i>				
Mean bankfull depth (m)		<i>2.5</i>	<i>2.5</i>		<i>0.95</i>				
Mean bankfull width (m)		<i>7m</i>	<i>6m</i>		<i>0.95</i>				
Substrate (type & %)		<i>B 60% C 20% Gr 20%</i>	<i>B 20% C 60% Gr 60%</i>						
Bedrock (Br)	Boulder (Bo)	Cobble (Co)	Gravel (Gr)	Sand (Sa)	Silt (Si)	Clay (Cl)	Muck (Mu)	Detritus (D)	

BANK STABILITY				
	Stable <input type="radio"/>	Slightly Unstable <input checked="" type="radio"/>	Moderately Unstable <input type="radio"/>	Unstable <input type="radio"/>
Left Bank	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Right Bank	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Deposition Zone	Protected Bank	Vulnerable Bank	Eroding Bank
Left Bank	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Right Bank	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
HABITAT				
In-Stream Cover (% surface area):				
Undercut banks: <i>25%</i>	Boulders: <i>25%</i>	Cobbles: <i>25%</i>	Organic Debris: <i>25%</i>	None <input type="radio"/>
Vascular Macrophytes:			Woody Debris:	
Instream:			Instream: <i>Dead logs</i>	
Overhanging: <i>RGG, ferns, alders</i>			Overhanging:	
Shore Cover (% stream shaded):				
100-90% <input type="radio"/>	89-60% <input checked="" type="radio"/>	59-30% <input type="radio"/>	29-1% <input type="radio"/>	None <input type="radio"/>
Vegetation Type:				
Vegetation Type (%)	Submergent:	Floating:	Emergent:	None <input checked="" type="radio"/>
Predominant Species:	<i>0%</i>	<i>0%</i>	<i>0%</i>	<input checked="" type="checkbox"/>

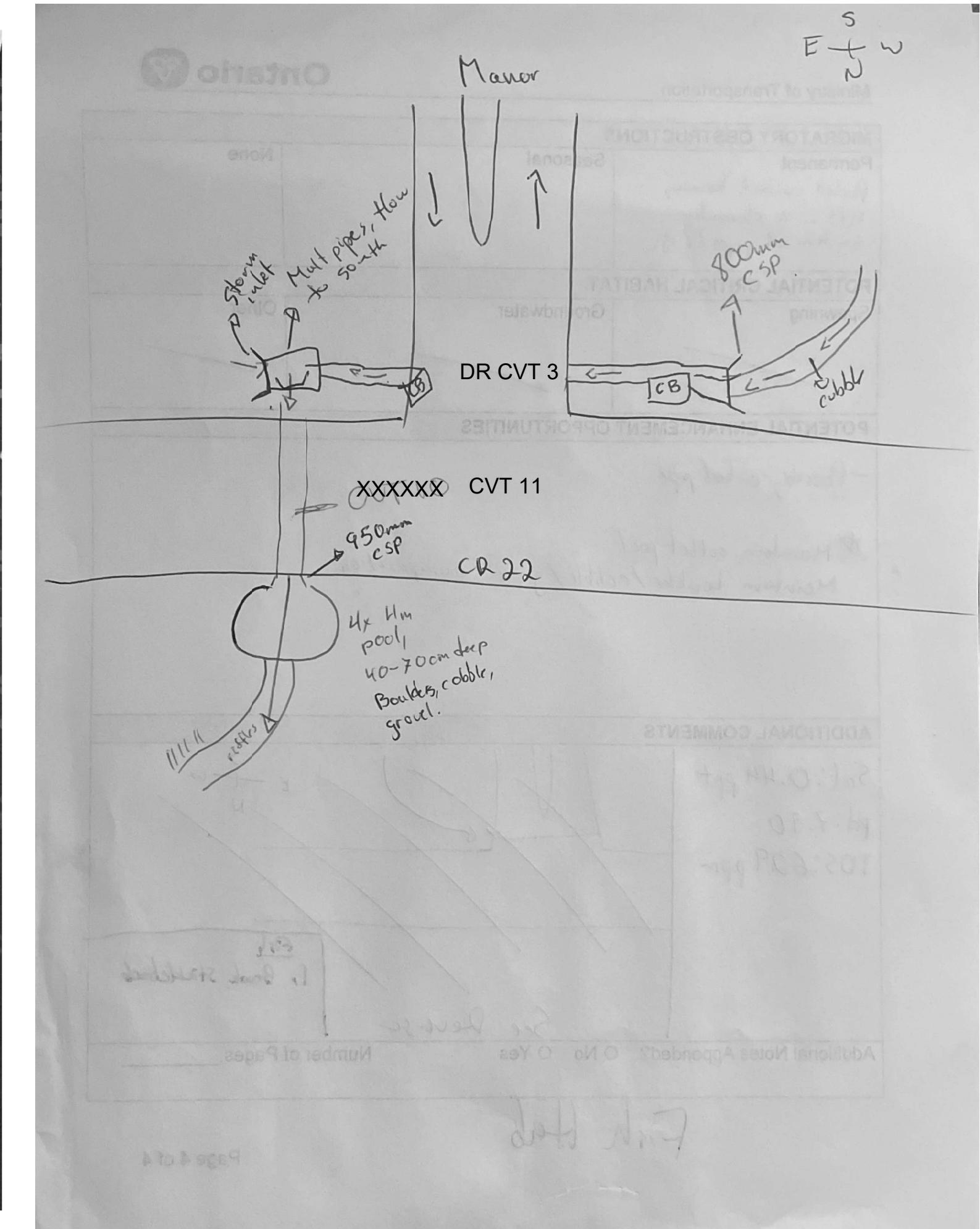
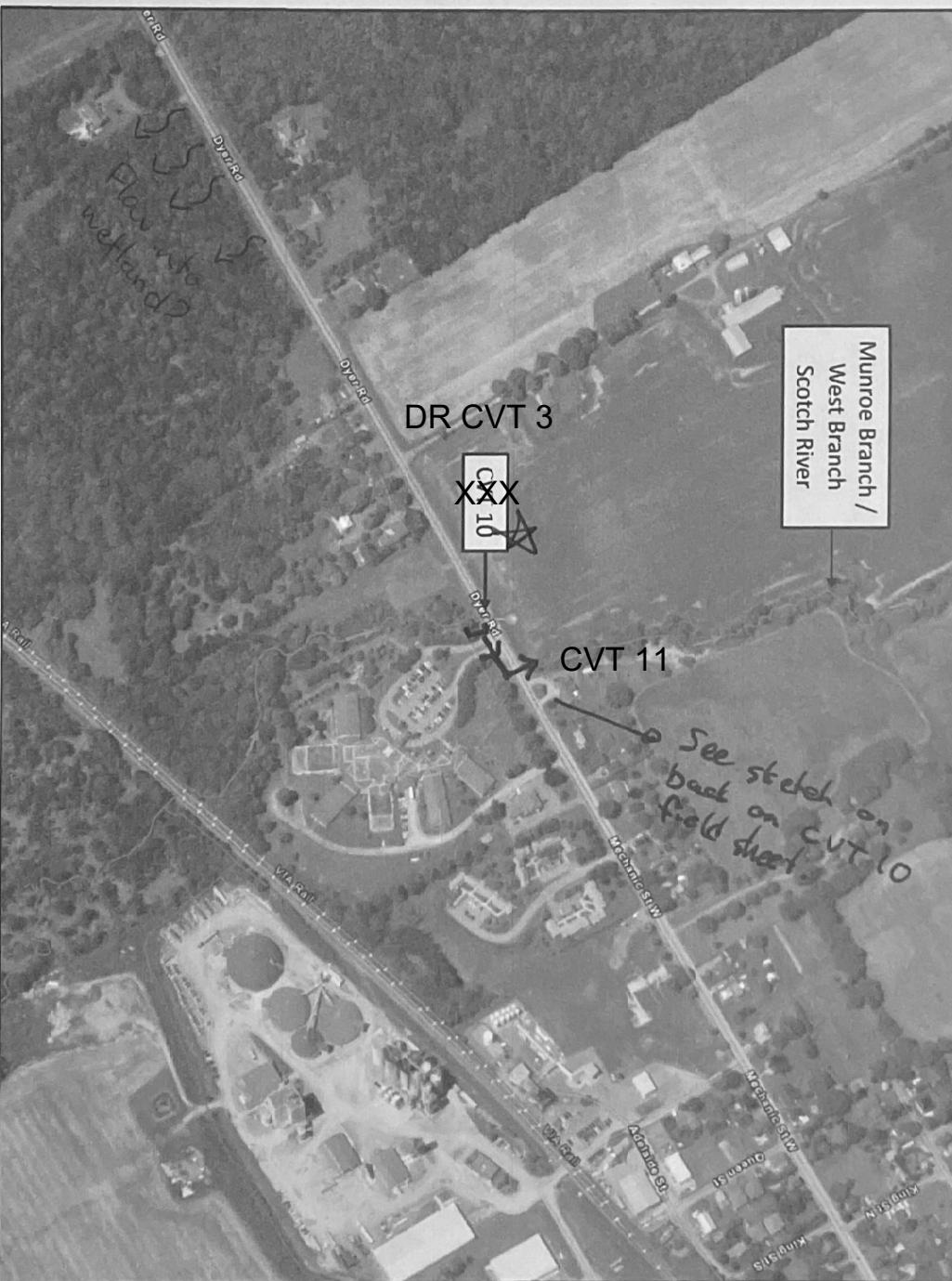
MIGRATORY OBSTRUCTIONS		
Permanent	Seasonal	None
Perched culvert, however, MIS is a stormwater system of pipes / CBs		
POTENTIAL CRITICAL HABITAT		
Spawning	Groundwater	Other
POTENTIAL ENHANCEMENT OPPORTUNITIES		
<ul style="list-style-type: none"> - Possibly embed pipe ★ Maintain outlet pool Maintain boulder/cobble/gravel composition 		
ADDITIONAL COMMENTS		
Sol: 0.44 ppt		
pH: 7.90		
TDS: 629 ppm		
Additional Notes Appended? <input type="radio"/> No <input checked="" type="radio"/> Yes		Number of Pages _____

Fish Hab

OLD MAP. See Culvert Inspection and Fish Habitat Assessment Report



Gal 89a2 =
Indicator/contributing
fish habitats.



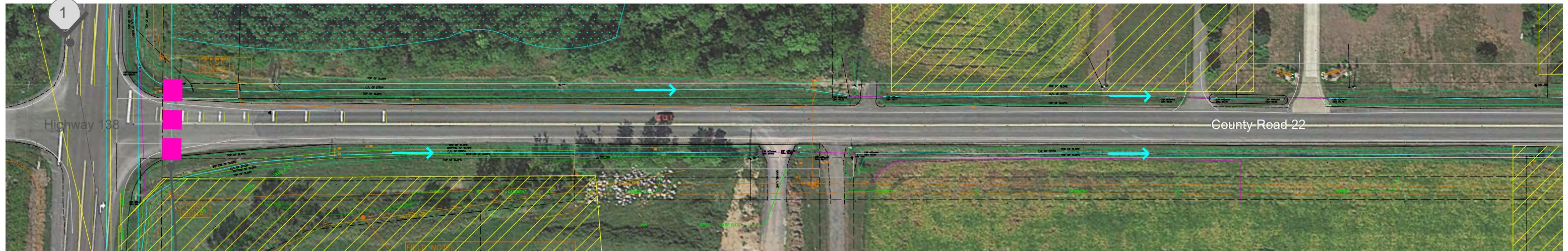
Appendix D

Drainage

Drainage Map 1

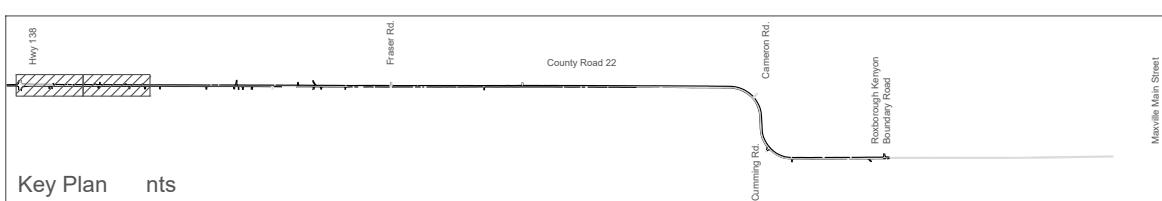
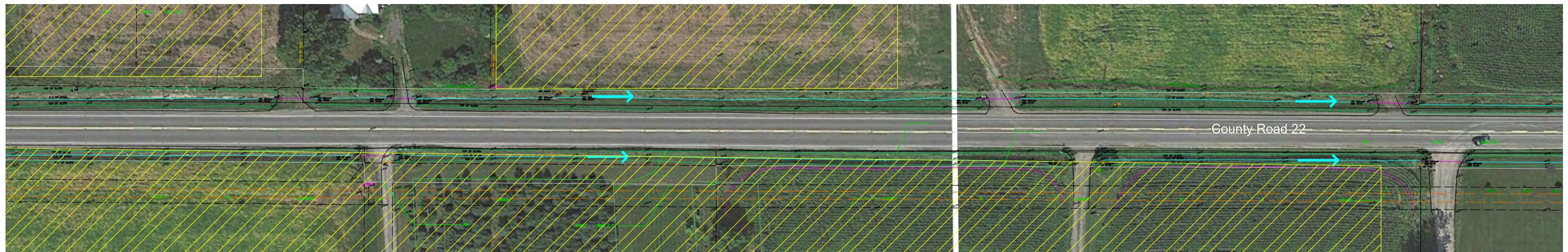
County Road 22

Stormont Dundas and Glengarry



Culvert 1:
600 mm Cross Culvert

1. Looking south



Key Plan nts



Legend



Ditch and direction
of flow
Municipal Drain and
direction of flow
Wetland



Tile Drain

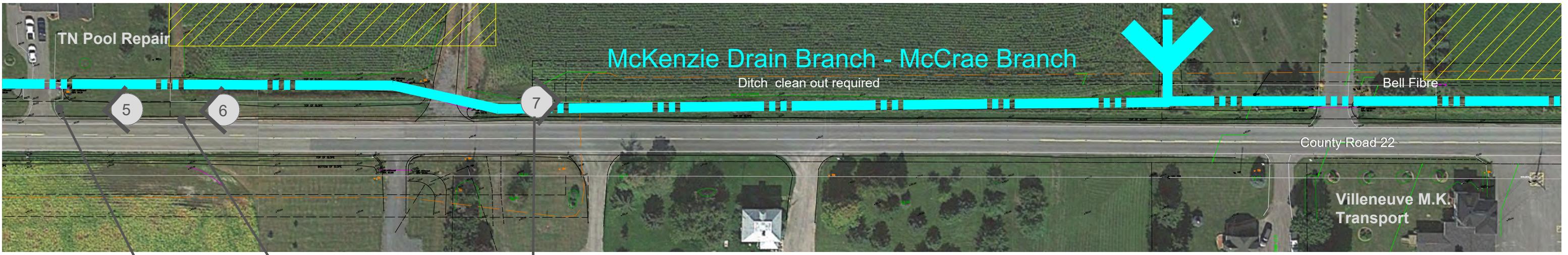


2. Unknown outlet

Drainage Map 2

County Road 22

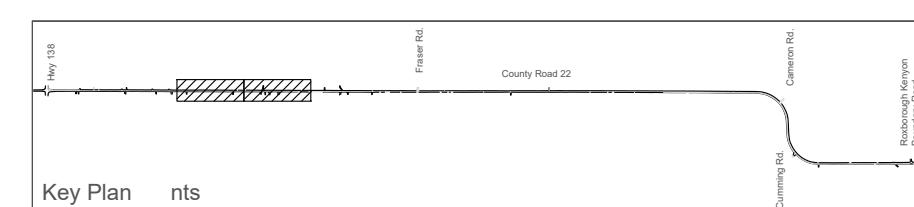
Stormont Dundas and Glengarry



5. North side looking west at 17449 CR 22

A photograph showing a large, dark, irregularly shaped hole or excavation site in a grassy field, likely a sinkhole or a dugout.

A paved road leads through a rural landscape. To the left is a green field, and to the right is a line of trees. Utility poles and wires are visible along the left side of the road.



Legend

- Ditch and direction of flow
 - Municipal Drain and direction of flow
 - Tile Drain
 - Fish

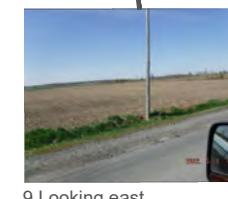
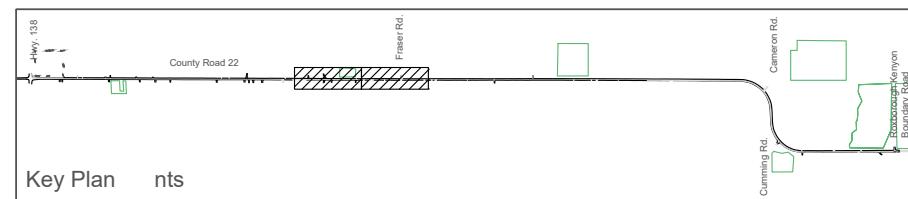
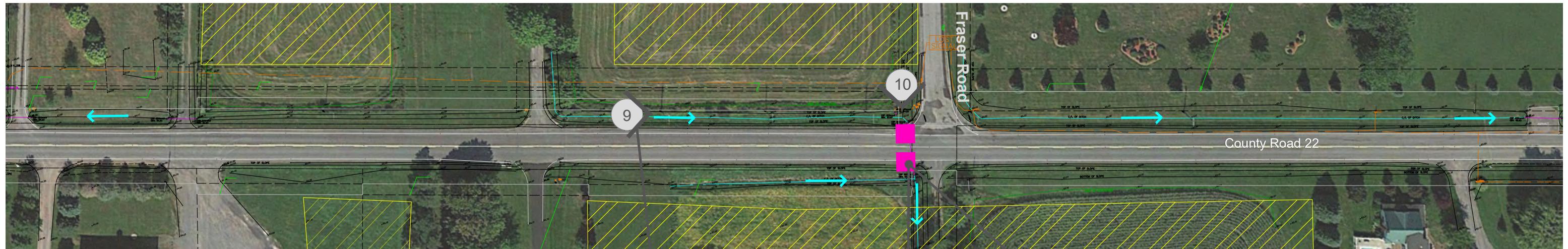
Drainage Map 3

County Road 22

Stormont Dundas and Glengarry



8. Fish
Culvert 2: CSP 1500 mm Ø



9 Looking east
Top of the crest curve



10. Culvert 3:
CSP 500 mm Ø

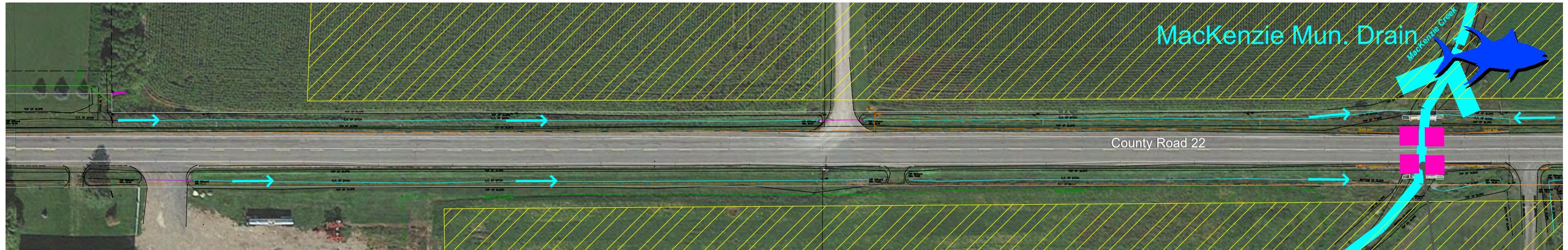
Legend

- Ditch and direction of flow
- Municipal Drain and direction of flow
- Tile Drain
- Fish

Drainage Map 4

County Road 22

Stormont Dundas and Glengarry



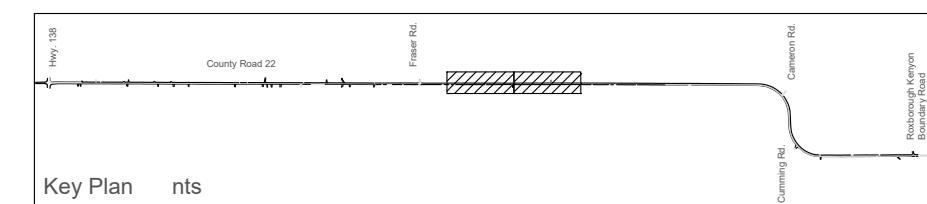
Culvert 4:
Twin box culverts
38 m Steel Beam
3.3 m wide x 2.4 m ht.



Culvert 5:
600 mm Ø High-density
polyethylene (HDPE)



11. Looking east



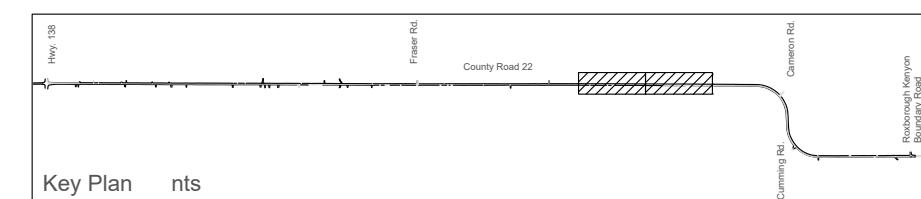
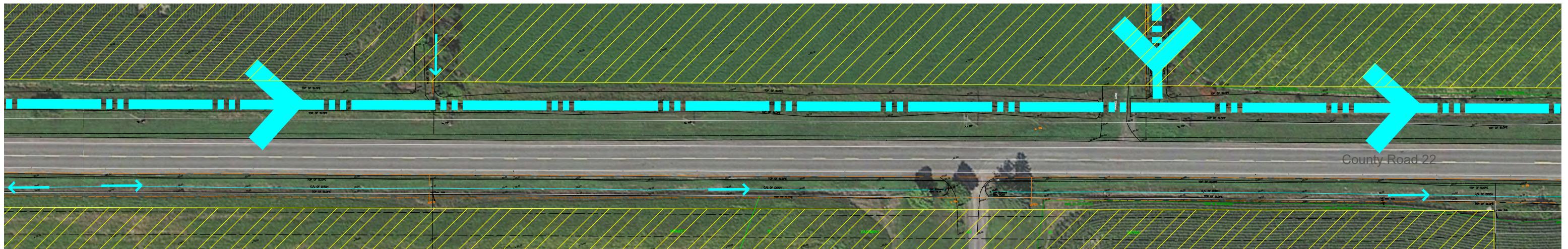
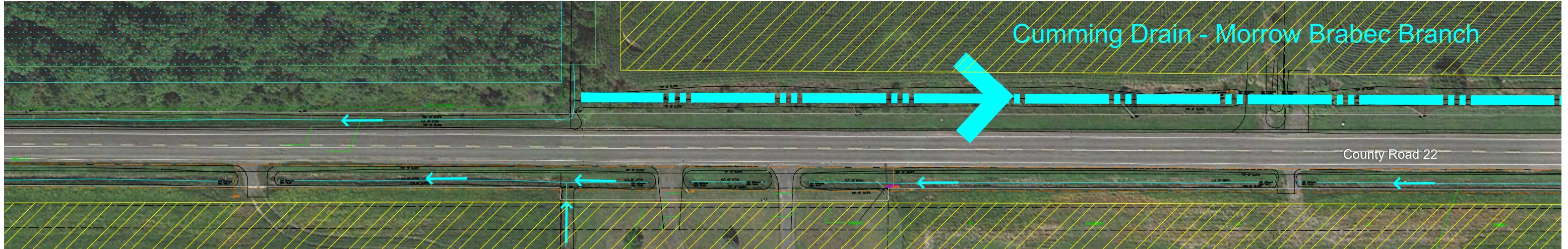
Legend

- Ditch and direction of flow
- Municipal Drain and direction of flow
- Tile Drain
- Wetland
- Fish

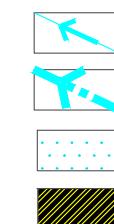
Drainage Map 5

County Road 22

Stormont Dundas and Glengarry



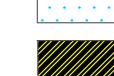
Legend



Ditch and direction of flow



Municipal Drain and direction of flow



Wetland

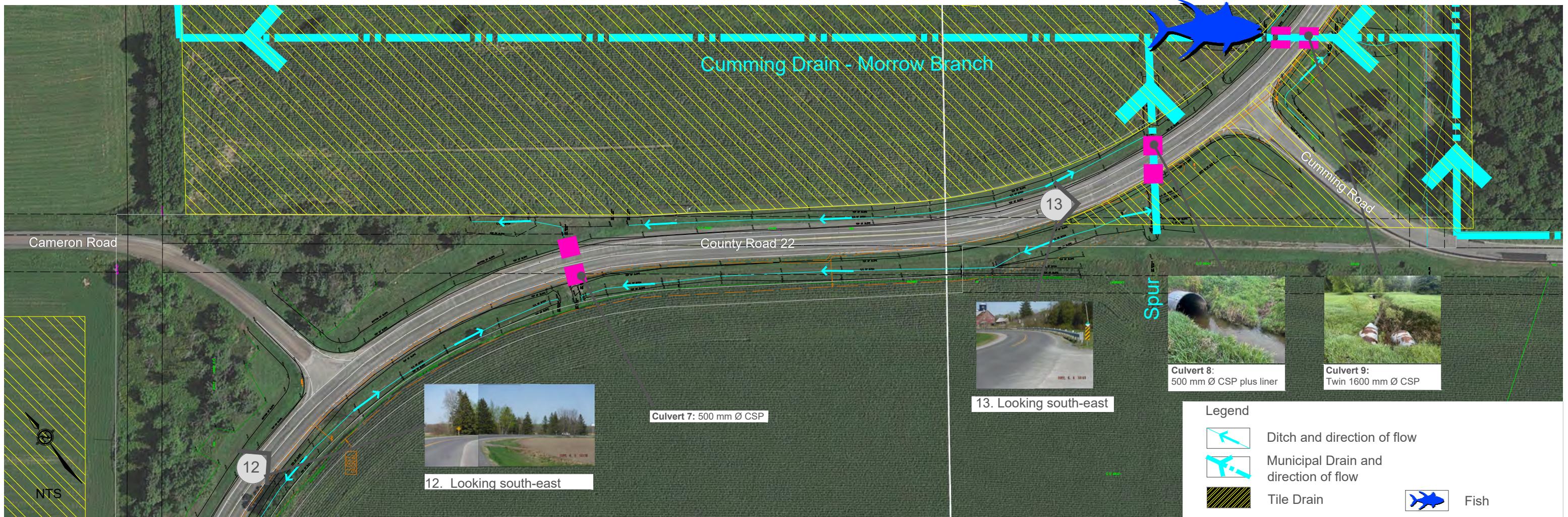
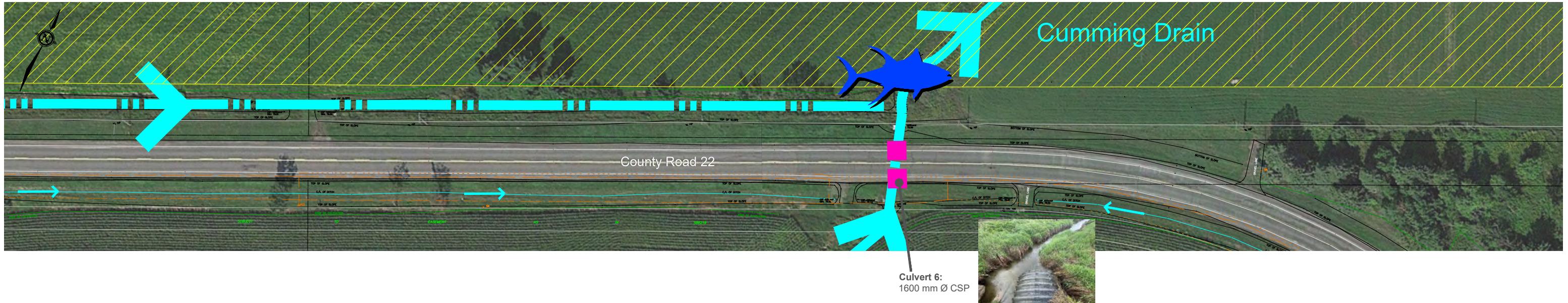
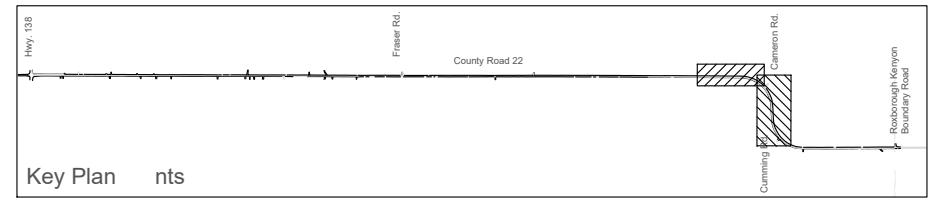


Tile Drain

Drainage Map 6

County Road 22

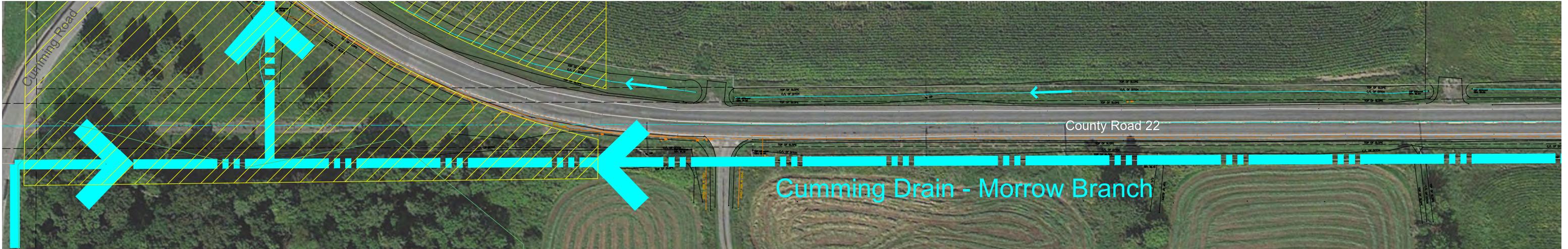
Stormont Dundas and Glengarry



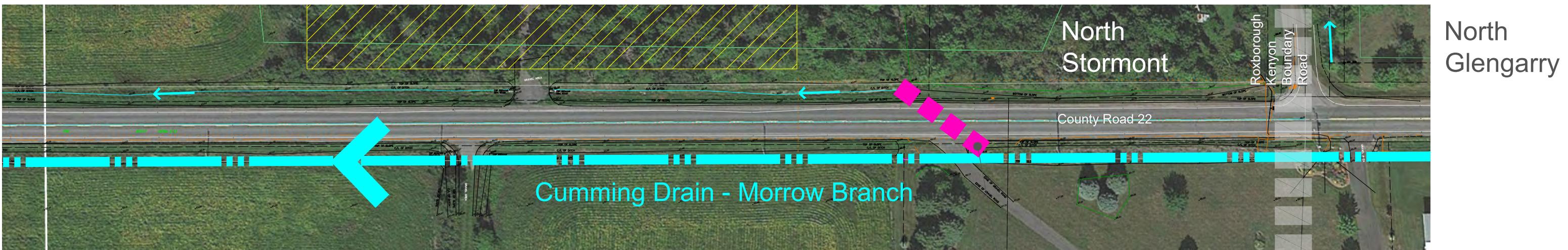
Drainage Map 7

County Road 22

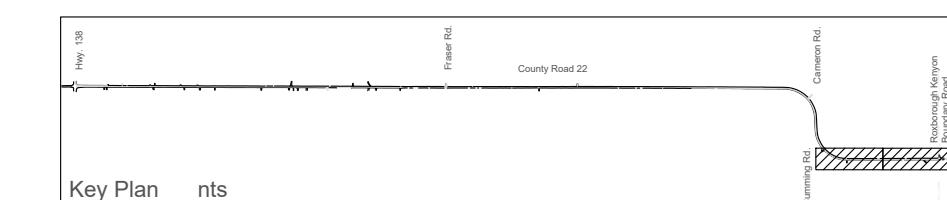
Stormont Dundas and Glengarry



Spring Location



North
Glengarry



Legend

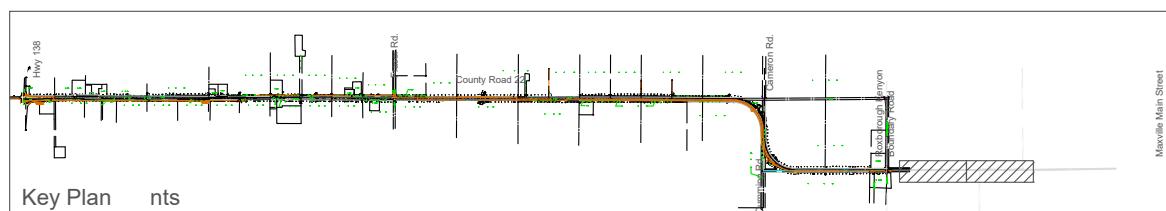
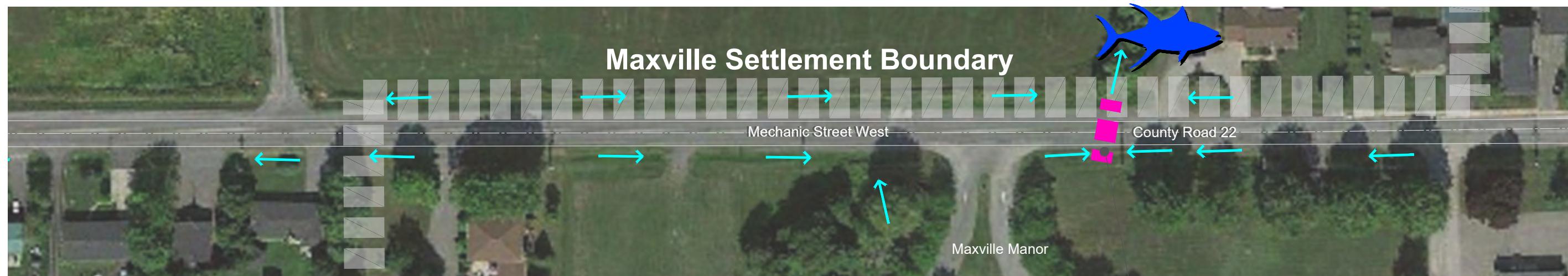
- Ditch and direction of flow
- Municipal Drain and direction of flow
- Tile Drain
- Municipal Boundary



Drainage Map 8

County Road 22

Stormont Dundas and Glengarry



Legend

- Ditch and direction of flow
- Municipal Drain and direction of flow
- Tile Drain
- Municipal Boundary



TECHNICAL MEMORANDUM

TO: Steve Taylor, P.Eng. **OUR REF.:** SN0461
FROM: Leonardo Sanchez, P.Eng. **DATE:** November 14, 2022
COPY: Darcie Dillon, P.Eng., Zachary Wells
RE: **Stormont, Dundas & Glengarry Counties Road 22 Rehabilitation,
Municipal Drain Relocation and Culvert Replacement Size for Hydraulics**

1 Introduction

BT Engineering was retained by the United Counties of Stormont, Dundas and Glengarry (SDG) to complete the design for the reconstruction of County Road 22 (CR 22) from Highway 138 to Roxborough Kenyon Boundary Road. The design includes the relocation of the municipal drains in the segments where CR 22 will be widened.

CR 22 is considered a minor arterial link between Highway 138 and the Village of Maxville. The annual average daily traffic ranges from 1223 at the west end to 1267 at the east end.

2 Design Criteria

2.1 Municipal Drains

The municipal drains will be relocated without improvements to their section or grade. Therefore their hydraulic capacity will be maintained as designed in their respective Drainage Reports.

2.2 Culvert Design Criteria

Culverts will be replaced based on their condition, as described in the BTE memorandum *Inspection of County Road 22 Culverts and Associated Fish Habitat*. The replacement culverts will be HDPE culverts, except that culverts greater than 2.4 m diameter will be replaced with precast box culverts.

3 Replacement Culverts

The location of the culverts is shown on the attached Drainage Mosaic. Table 1 summarizes the existing culverts to be replaced and the recommended culvert types and sizes. The culverts can be placed at the same invert elevations as the existing, except for culverts 3 and 5, which should be set with invert elevations matching the approach and leaving channels, to avoid scour at the outlet due to the perched outlets. In addition, Culvert 3 should be upsized to reduce the barrel velocities.

Appropriate scour and erosion protections must be provided at the inlet and outlet of each culvert.

Table 1 Replacement Culverts				
Culvert Number	Existing Culvert		Proposed Culvert	
	Type	Diameter (mm)	Type	Diameter [Span x Rise(mm)]
1	CSP	600	HDPE	900 ^(a)
2	CSP	1500	Aluminized Type 2 Steel CSP	1600
3	CSP	500	HDPE	600
5	UltraFlo™ CSP	600	HDPE	600
6	CSP	1600	Aluminized Type 2 Steel CSP	1600
7	CSP	600	HDPE	600
8	CSP	600	HDPE	600
9	Twin CSP	1600	CBC	2700 x 1500 ^(b)
10	CSP	800	HDPE	2-900 ^(a)

CSP = Corrugated Steel Pipe; HDPE = High Density Polyethylene; CBC = Concrete Box Culvert
^(a) Culvert must be upsized to accommodate the 25-year design storm flow.
^(b) Culvert 9 could be replaced with Twin Aluminized Type 2 Steel 1600 mm diameter CSP pipes, equal to the existing culvert.

4 Conclusions

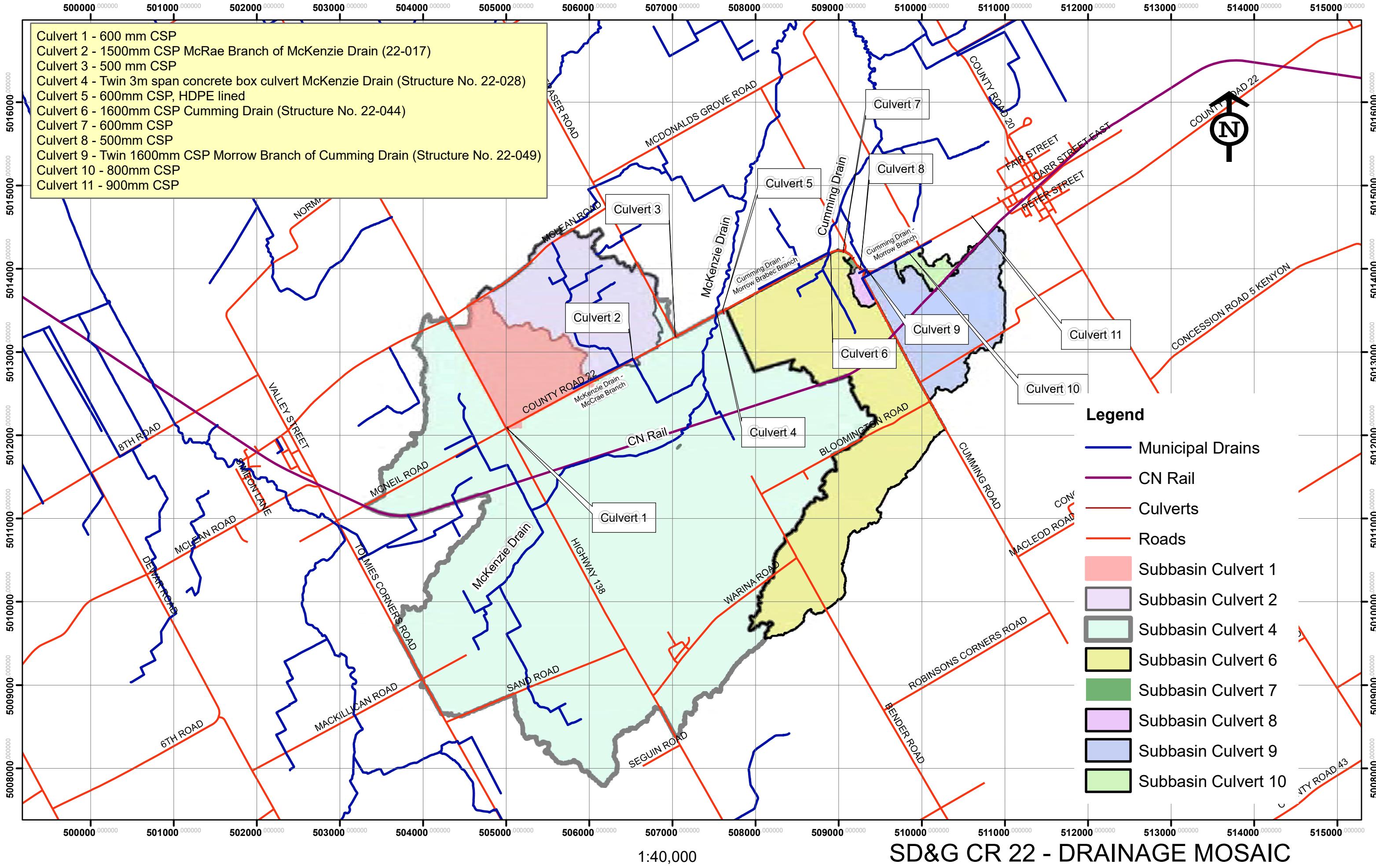
Based on their condition, a total of eight culverts will be replaced. CSP culverts with diameters up to 900 mm will be replaced with HDPE pipe.

Culverts with diameter greater than 900 mm can be replaced with aluminized Type 2 steel CSP culverts.

Culvert 9 can be replaced with a concrete box culvert with equal or greater hydraulic capacity than the existing or with aluminized Type 2 steel CSP culverts of the same diameter as existing.

5 Recommendations

It is recommended that the culverts be replaced in accordance with the sizes given in Table 1. The culvert inverts should match the existing inverts, except at culverts 3 and 5, where they should be modified to match the inverts of the approach and leaving channels.



TECHNICAL MEMORANDUM

TO: Steve Taylor, P.Eng. **OUR REF.:** SN0461
FROM: Leonardo Sanchez, P.Eng. **DATE:** April 5, 2023
COPY: Darcie Dillon, P.Eng., Zachary Wells
RE: **Stormont, Dundas & Glengarry Counties Road 22 Rehabilitation, Culvert Replacement Recommendations**

1 Introduction

BT Engineering was retained by the United Counties of Stormont, Dundas and Glengarry (SDG) to complete the design for the reconstruction of County Road 22 (CR 22) from Highway 138 to Roxborough Kenyon Boundary Road. The design includes the relocation of the municipal drains in the segments where CR 22 will be widened.

A Technical Memorandum was provided on November 14, 2022 providing the recommended sizes for the proposed replacement transverse culverts. This memorandum supersedes and expands on the previous one by providing the design flows for the culverts and confirmation of the culvert replacement recommendations.

2 Design Criteria

CR 22 is considered a minor arterial link between Highway 138 and the Village of Maxville. The annual average daily traffic ranges from 1,223 at the west end to 1,267 at the east end.

2.1 Municipal Drains

The municipal drains will be relocated without improvements to their section or grade. Therefore their hydraulic capacity will be maintained as designed in their respective Drainage Reports.

2.2 Culvert Design Criteria

Culverts will be replaced based on their condition, as described in the BTE memorandum *Inspection of County Road 22 Culverts and Associated Fish Habitat*. The replacement culverts will be HDPE culverts, except that culverts greater than 2.4 m diameter will be replaced with precast box culverts.

The MTO *Highway Drainage Design Standards* provides the design criteria for culvert hydraulic design and for watercourses along a road.

Standard WC-1 – Design Flows (Bridges and Culverts) provides that culverts with span less than 6.0 m shall be designed to convey the 25-year flood.

Standard WC-7 – Culvert Crossings on a Watercourse states that the Freeboard design standard for arterial roads is a minimum of 1.0 m. The standard recognizes that it may not be possible to achieve the required Freeboard and/or Clearance in some retrofit applications.

3 Design Flows

The drainage areas to the culverts are shown on the attached Drainage Area Plan, included at the back of this memorandum.

Design flows were estimated using three alternative methods:

- a. UOFM - MTO Unified Ontario Flood Method, per Highway Standards Branch, Provincial Engineering Memorandum, Design and Contracts Standards Office #2016-03, March 31, 2016.
- b. Index Method - Regional Flood Frequency Analysis for Ontario Streams, Volume 1, Single Station Analysis and Index Method, Canada/Ontario Flood Damage Reduction Program, S. Moin & M. Shaw, 1985.
- c. HEC-HMS model of the watersheds.

A comparison of the resulting flood estimates is presented in Table 1. As can be observed, the largest peak flows were estimated using the MTO Unified Ontario Flood Method. The flows calculated using the Index Flood Method are significantly lower, and the flows calculated using the HEC-HMS models are very low.

Culvert No.	Drainage Area (ha)	Estimated Design Flood flow Q ₂₅ (m ³ /s)		
		UOFM	Index Flood Method	HEC-HMS
1	68.5	1.79	0.65	0.13
2	282.9	5.41	2.33	0.24
3	8.0	0.34	0.10	0.05
5	2.0	0.11	0.03	0.10
6	401.6	7.11	3.19	0.75
7	2.0	0.11	0.03	0.01
8	7.6	0.32	0.09	0.13
9	195.4	4.06	1.67	1.10
10	16.3	0.59	0.18	0.26

In selecting the design flood for each crossing, it is necessary to consider that the three methods provide estimates of the flood flow associated with each return period (the inverse of the annual probability that the flood will be equaled or exceeded in any one year). The UOFM and the Index Method are based on statistical analysis of recorded flows, undertaken on a regional basis, which means that the methods are applicable within the range of watershed drainage areas and flows

used to estimate the probability distributions and the regression equations. In the case of the small watersheds in the study area, it was found that they are outside of the ranges for both UOFM and the Index Method. The HEC-HMS method may introduce more uncertainty into the results, since it is based on models of the unit hydrographs, the rainfall-runoff relations, and the rainfall distributions, all of which are based on approximations.

To help determine which flood estimates are most appropriate for this project, the Unit Flow for each watershed was calculated, defined as the ratio of the total flood estimated divided by the drainage area. The units for the Unit Flows are $\text{m}^3/\text{s}/\text{km}^2$. The results of the calculation of the unit flow per square kilometer produced by each watershed for each method is shown on Table 2.

Table 2 - Unit Flows (Design Flood/Drainage Area)			
Culvert No.	Unit Flow (Design Flood/Drainage Area) ($\text{m}^3/\text{s}/\text{km}^2$)		
	UOFM	Index Flood Method	HEC-HMS
1	3.13	0.95	0.19
2	2.13	0.82	0.08
3	5.61	1.19	0.63
5	8.18	1.38	5.00
6	1.93	0.79	0.19
7	8.17	1.38	0.50
8	5.69	1.20	1.72
9	2.35	0.86	0.56
10	4.62	1.11	1.60

It can be observed that the values produced by the UOFM in this case are very high. Generally it is expected that the unit flow for the 25 year flood will be around $1.0 \text{ m}^3/\text{s}/\text{km}^2$. Review of the average unit flows and their standard deviation, as shown on Table 3, indicates that in this case the Index Flood Method results are the more stable of the three estimates. This is reflected in the standard deviation of the unit flow.

Table 3 - Unit Flow Average and Standard Deviation			
Parameter	UOFM	Index Flood Method	HEC-HMS
Average Unit Flow ($\text{m}^3/\text{s}/\text{km}^2$)	4.30	1.03	2.91
Standard Deviation ($\text{m}^3/\text{s}/\text{km}^2$)	2.56	0.25	5.72

Based on these results, it can be concluded that the Index Flood Method provides the best estimates of the design floods for this project.

To further confirm the results, the relation between drainage area and the Mean Annual Flood (2.33 year return period) published in *Flood Flow Statistics for the Great Lakes Watershed System, Ontario, 2014* was used to calculate the Mean Annual Flood for the watersheds.

$$MAF = Q_{2.33} = 0.8753(Drainage Area)^{0.7072}$$

The results are presented in Table 4. The Mean Annual Flood was converted to the Design Flood (25 year return period) using the ratio between the 2 year flood and the 25 year flood contained in the Moin and Shaw 1985 publication. The resulting estimates of the 25 year flood for each watershed are also presented in Table 4.

Table 4 - Mean Annual Flood and Design Flood Estimate based on Ontario Flood Statistics

Culvert No.	Mean Annual Flood (m^3/s)	$Q_{25}/Q_{2.33}$	Q_{25} (m^3/s)
1	0.67	1.8	1.21
2	1.83	1.8	3.29
3	0.15	1.8	0.26
5	0.06	1.8	0.10
6	2.34	1.8	4.21
7	0.06	1.8	0.10
8	0.14	1.8	0.25
9	1.41	1.8	2.53
10	0.24	1.8	0.44

Comparison of the flood estimates in Tables 2 and 4 confirms that in most cases the Index Flood Method provides a realistic estimate of the design floods for the study watersheds. Accordingly, the Design Flood values used to design the culverts are presented in Table 5. It is noted that Culvert 4 was not part of this analysis, as it will not be replaced or enlarged.

Table 5 - Design Flood Flows

Culvert No.	Drainage Area (ha)	Design Flood (m^3/s)
1	68.5	0.65
2	282.9	2.33
3	8.0	0.10
5	2.0	0.03
6	401.6	3.19
7	2.0	0.03
8	7.6	0.09
9	195.4	1.67
10	16.3	0.18

4 Replacement Culverts

Table 6 summarizes the existing culverts to be replaced and the recommended culvert types and sizes. The culverts can be placed at the same invert elevations as the existing, except for culverts 3 and 5, which should be set with inverts matching the approach and leaving channels, to avoid scour at the outlet due to the perched outlets. In addition, Culvert 3 should be upsized to reduce the barrel velocities.

Appropriate scour and erosion protections must be provided at the inlet and outlet of each culvert.

Table 6 - Replacement Culverts				
Culvert Number	Existing Culvert		Proposed Culvert	
	Type	Diameter (mm)	Type	Diameter [Span x Rise(mm)]
1	CSP	600	HDPE	900 ^(a)
2	CSP	1500	Aluminized Type 2 Steel CSP	1600
3	CSP	500	HDPE	600
5	UltraFlo™ CSP	600	HDPE	600
6	CSP	1600	Aluminized Type 2 Steel CSP	1600
7	CSP	600	HDPE	600
8	CSP	600	HDPE	600
9	Twin CSP	1600	CBC	2000 x 1500 ^(b)
10	CSP	800	HDPE	900 ^(a)

CSP = Corrugated Steel Pipe; HDPE = High Density Polyethylene; CBC = Concrete Box Culvert

^(a) Culvert must be upsized to accommodate the 25-year design storm flow.

^(b) Culvert 9 could be replaced with Twin Aluminized Type 2 Steel 1600 mm diameter CSP pipes, equal to the existing culvert.

With the exception of Culverts 1 and 10, the proposed culverts will provide freeboard greater than 1 m. At Culverts 1 and 10 the calculated freeboard is 0.8 m. Table 7 presents the headwater level, ratio of headwater depth to rise of the culvert (HW/D), and freeboard for each culvert.

Table 7 - Headwater Level, Freeboard & HW/D				
Culvert No.	Station	Headwater Level (m)	Freeboard (m)	HW/D
1	10+015	89.19	0.80	0.80
2	11+730	82.71	1.61	0.68
3	12+320	83.84	1.36	0.48
5	13+278	78.24	2.56	0.48

Table 7 - Headwater Level, Freeboard & HW/D				
Culvert No.	Station	Headwater Level (m)	Freeboard (m)	HW/D
6	14+415	78.37	1.91	0.97
7	14+703	78.40	1.90	0.26
8	14+909	78.76	2.04	0.53
9	14+976	79.04	1.96	0.33
10	15+590	84.67	0.83	0.41

5 Conclusions

Based on their condition, a total of eight culverts will be replaced. CSP culverts with diameters up to 900 mm will be replaced with HDPE pipe.

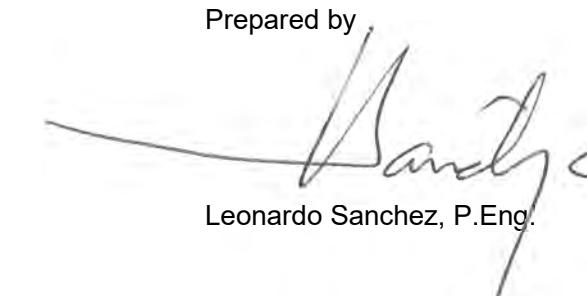
Culverts with diameter greater than 900 mm can be replaced with aluminized Type 2 steel CSP culverts.

Culvert 9 can be replaced with a concrete box culvert with equal or greater hydraulic capacity than the existing or with aluminized Type 2 steel CSP culverts of the same diameter as existing.

6 Recommendations

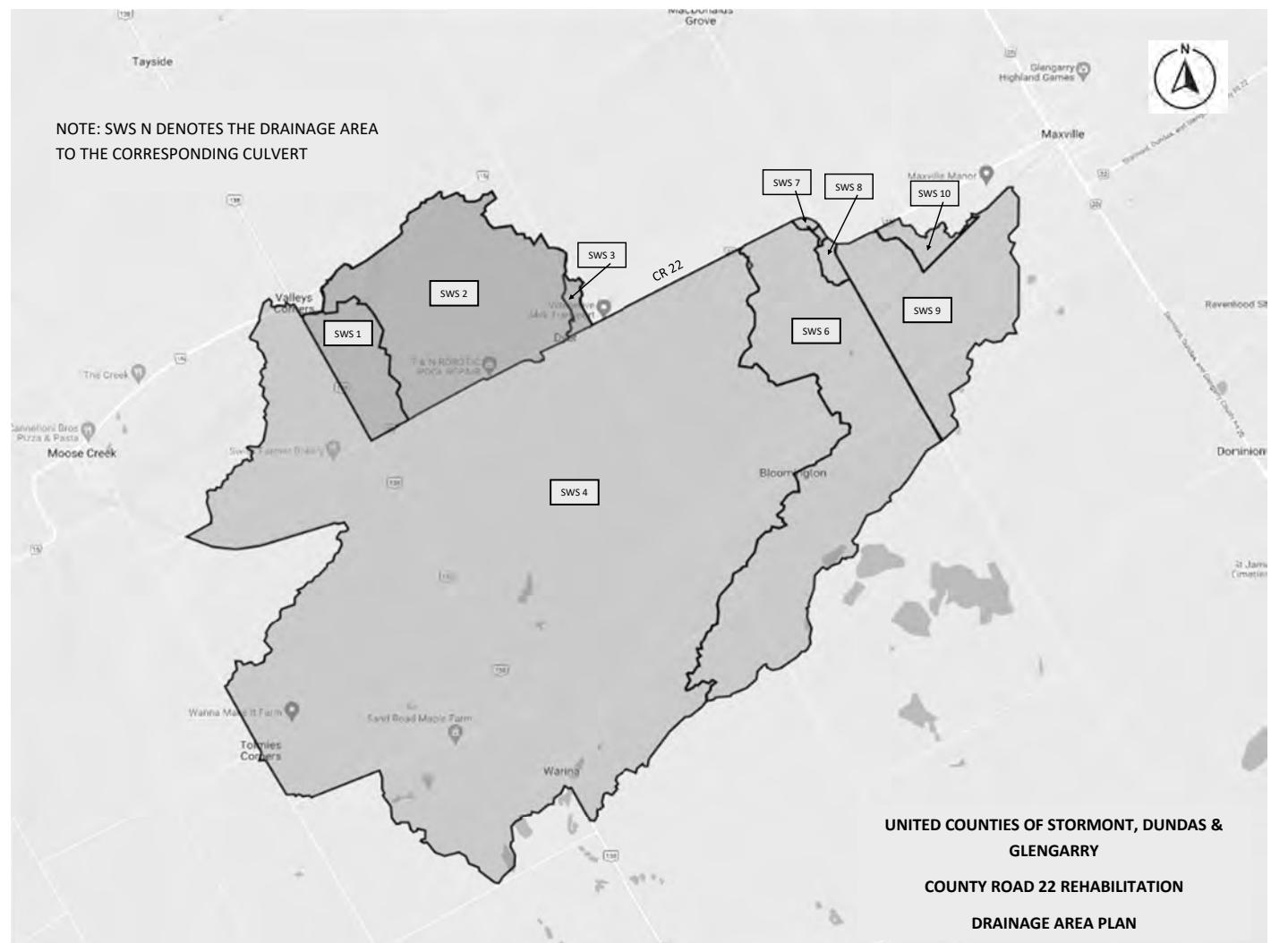
It is recommended that the culverts be replaced in accordance with the sizes given in Table 6. The culvert inverts should match the existing inverts, except at culverts 3 and 5, where they should be modified to match the inverts of the approach and leaving channels.

Prepared by



Leonardo Sanchez, P.Eng.





Appendix E

Geotechnical Report

November 9, 2022

File No. 22604-1

VIA email only

The United Counties of Stormont, Dundas & Glengarry
26 Pitt Street
Cornwall, Ontario
K6J 3P2

Att'n: Michael Jans, P.Eng.
Manager of Infrastructure

Ref: **Final Pavement Investigation Report
County Road 22, The United Counties of Stormont, Dundas & Glengarry**

Dear Mr. Jans:

Further to your request and our recent discussions we have completed our geotechnical assessment of County Road 22, between Hwy 138 and the western end of the Village of Maxville, and are pleased to present a report of our findings.

GENERAL DATA

The purpose of the assignment was to complete a geotechnical investigation of County Road 22 and provide recommendations for the preferred rehabilitation method to support the Reconstruction of County Road 22. The assignment included field investigations consisting of the advancement of boreholes to log the existing subsoil conditions, securing of selective subsoil samples for laboratory analysis and a visual assessment of the existing roadway surface condition.

The overall study area along with the borehole locations is shown within **Figure 1 – Site and Borehole Location Plan**, attached to this report.

SOILS INVESTIGATION AND FIELD REVIEW

Prior to completing the intrusive soil investigation program, the section of roadway under study was reviewed and a visual condition assessment completed to identify the main surface deficiencies and elements contributing to poor performance.

A soils investigation was conducted in July 2022 under the constant supervision of a member of the Ainley Group's geotechnical team. A total of fourteen (14) boreholes were advanced during the field program. All boreholes were advanced by means of a CME-55 truck mounted drill rig equipped for soil sampling with the exception of borehole 13B which was completed with manual sampling methods as this location was not truck accessible. Representative grab samples were collected from the solid stem augers and submitted to a laboratory for moisture content and grain size distribution analysis. Upon completion, each borehole was backfilled using native material

and compacted to reduce settlement within the drilled areas. The boreholes in paved or hard surface locations were filled and compacted with cold-mix asphalt. The borehole locations Borehole logs and laboratory test results are attached as **Enclosure Nos. 1 and 2**, respectively.

EXISTING CONDITIONS

The following summarizes our findings with respect to the existing pavement structure and condition:

Typical Pavement Structure

90 mm asphalt
180 mm gravelly sand
550 gravelly sand trace cobbles
Over clayey sandy silt subgrade

The subgrade soil is considered to have a low to high frost susceptibility to frost heave. Grain size distribution testing on a sample of the granular base (gravelly sand) indicate 87.1% of the material passing the 4.75 mm sieve and 27.9% passing the 75 µm sieve. Based on the result, the material does not meet the requirements of OPSS 1010 for Granular 'A' (35% to 55% passing 4.75mm, 2% to 8% passing 75 µm).

Grain size distribution testing on samples of the granular subbase (gravelly sand trace cobbles) indicated 69.0% of the material passing the 4.75 mm sieve and 19.4 passing the 75 µm sieve. Based on the result, the material does not meet the requirements of OPSS 1010 for Granular 'B', Type I (20% to 100% passing 4.75mm, 0% to 8% passing 75 µm). The material does meet OPSS specification for SSM (Select Subgrade Material).

The existing pavement is in very poor condition exhibiting severe, extensive transverse and mid-lane cracking with severe, extensive alligator cracking. Moderate to severe pavement edge cracking was also noted. The ride is poor with exception of a hot mix patch at the east end of the project.

Fibrous organic material was encountered in BH4 and BH6 at a depth of 750 mm below the existing pavement surface. The organic layer was 150 mm in thickness.

A 50 mm thick buried asphalt layer was encountered in BH13A in the WB lane 4.59 km east of the intersection of Highway 138. The asphalt layer was encountered at a depth of 250 mm below the existing pavement surface.

In BH12, the pavement structure lacked any granular subbase layer and consisted of 50 mm of asphalt over 200 mm of sand with silt, some gravel over silty sandy clay subgrade.

GRANULAR BASE EQUIVALENCY

The following factors were utilized to calculate the existing and proposed design Granular Base Equivalency (GBE):

Existing Pavement Component	GBE Factor
Old Hot Mix	1.0
Old Granular Base (in specification)	0.75
Old Granular Base/Subbase (out of specification)	0.50
New Pavement Component	GBE Factor
New Hot Mix	2.0
In-Place Processing	1.0

To determine a suitable pavement structure, the traffic volume indicated in the Design Criteria prepared for the project is 1250 AADT with a percentage of commercial traffic assumed to be less than 10%. It is noted that during the field program, a higher percentage of truck traffic was observed. The target GBE has been established based on the Ministry of Transportation Ontario's Pavement Design and Rehabilitation Manual for secondary highways. Based on the subgrade soil and the traffic volume, a design GBE of 550 is chosen. The existing GBE has been calculated as 405.

DESIGN CONSIDERATIONS

Based on the findings of our field program, laboratory testing results and our observations in the field, we have identified the main contributing factors affecting the overall performance of the roadway section.

In general, our findings indicated that the roadway is adequate from a structural standpoint. However, the base and subbase material were found to be out of specification with respect to the requirements of OPSS 1010. In addition, roadside drainage (ditching) was generally found to be adequate, however ditch cleanout is recommended for review.

It is common practice to utilize recycling rehabilitation techniques when the existing roadway structure is considered adequate. However, in consideration of the poor pavement condition, the out of specification granular material and the proposed widening of the paved platform, these alternatives have not been considered suitable for rehabilitation of this section.

Based on the above, the following rehabilitation considerations are offered:

Option 1

- In place process to 200 mm depth
- Pad and fine grade with 100 mm Granular 'A'
- Pave with 100 mm asphalt (40 mm SP 12.5 Surface over 60 mm 19.0 mm Binder)

GBE: 720

Initial Cost: \$ 2,070,000

November 9, 2022

Life Cycle Cost: \$2,385,000

Option 2

- Full Depth Removal
- Excavate full width and place 150 mm Granular 'A'
- Pave with 100 mm asphalt (40 mm SP 12.5 Surface over 60 mm 19.0 mm Binder)

GBE: 635

Initial Cost: \$ 2,660,000

Life Cycle Cost: \$2,984,000

Life Cycle Cost analysis was completed on each of the options using a 30-year horizon and a 6% discount rate. The initial construction costing and the life cycle cost analysis is attached as **Enclosure No. 3**.

RECOMMENDATIONS

Full Depth Pavement Removal

Remove the existing asphalt pavement full depth throughout the project.

Excavation

Upon completion of the full depth pavement removal operation, excavate full width to provide for 150 mm of Granular 'A' throughout.

Between the east project limit and 100 m west of Roxborough Kenyon Boundary Road, deepen the excavation to allow placement of 550 mm of Granular 'B', Type II subbase.

Widening

Platform widening should be completed as follows:

Beginning at the existing edge of paved shoulder, excavate to provide for:

- 150 mm Granular 'A'
- 550 mm Granular 'B', Type II
- Over acceptable earth fill

All base and subbase material shall meet the requirements of OPSS 1010 and should be compacted to 100% SPMDD.

November 9, 2022

Page | 4

Paving

Place 40 mm SP 12.5 Surface Course over 60 mm SP 19.0 Binder Course throughout the main lanes including commercial entrances. Paved driveway entrances should be paved with 50 mm SP 12.5 Surface Course.

It is recommended that the asphalt cement specified for this project be PG58-34 using a minimum 5.2% for the surface course and 5.0 % for the binder course.

Commercial Entrances should be paved.

Culvert Replacements

Based on our observations, the existing centreline culverts are relatively shallow (less than 1.2 m depth to invert). It is recommended that embedment and bedding materials consist of Granular 'A', as per OPSD 800 series. For flexible and rigid circular pipes, a minimum bedding depth of 200 mm should be provided (Class C bedding for rigid pipes).

Backfill shall consist of the existing native subsoil material excavated at the culvert locations. Bedding and backfill should be placed in accordance with OPSD 800 series for the applicable culvert type.

In general, the base, subbase, and subsoil materials encountered may be considered as Type 3 soil for excavation purposes. Site conditions at the time of construction may deviate from what was encountered at the time of the field investigation and the contractor should support the excavations based on the condition of the materials encountered at the time of construction.

Frost Penetration Depth

The frost penetration depth for this project is 1.8 m.

CLOSURE

We trust this report provides sufficient information for your present requirements in accordance with our Statement of Work. Should you have any questions concerning the above, please feel free to contact our office.

Sincerely,

AINLEY GRAHAM & ASSOCIATES LIMITED

Lois-Ann Hayes

Lois-Ann L. Hayes P. Eng.
Vice President & Branch Manager



FIGURE NOS. 1

SITE AND BOREHOLE LOCATION PLAN



KEY MAP
N.T.S.



LEGEND
● = BOREHOLE LOCATION
NE = FEATURE NOT ENCOUNTERED

Ainley
CONSULTING
ENGINEERS
PLANNERS
GROUP

FIGURE NO. 1
SITE AND BOREHOLE LOCATION PLAN



AG File No. 22604-1
Geotechnical Services Report
County Road 22
The Counties SDG



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Geotechnical Services Report
County Road 22
The Counties SDG

BOREHOLE LOGS

Roxborough TWP

BH1, 2.1 m Lt CL, WBL, 105 m east of the intersection of Hwy 138 and Co Rd 22

0	-	150	Asphalt
150	-	400	Br Sa w Si so Gr, compact
400	-	1.00	Br Gr Sa & Cobs so Si, compact
1.00	-	1.50	Grey Si Sa, moist, loose
-		220	End of BH

BH2, 2.4 m Rt CL, EBL, 610 m east of the intersection of Hwy 138 and Co Rd 22

0	-	150	Asphalt
150	-	900	Br Gr Sa so Si tr Cobs, LAH590, LAH591 % Passing LAH591 4.75 mm = 69.0 75 µm = 19.4 Moisture Content = 5.7%
900	-	1.50	Dk Grey Si Sa Cl, soft, moist, LAH592
-		1.50	End of BH

BH3, 1.5 m Lt CL, WBL, 1.11 km east of the intersection of Hwy 138 and Co Rd 22

0	-	100	Asphalt
100	-	250	Br Sa w Si so Gr tr Cobs
250	-	900	Br Gr Sa & Cobs so Si
900	-	1.50	Br Sa
-		1.50	End of BH

BH4, 2.0 m Rt CL, EBL, 1.62 km east of the intersection of Hwy 138 and Co Rd 22

0	-	100	Asphalt
100	-	750	Br Sa w Si so Gr & Cobs
750	-	900	Fine Fibrous Org
900	-	1.50	Grey Si Sa, moist, LAH593 % Passing LAH593 4.75 mm = 100 75 µm = 37.0 5 µm = 2.0 LSFH 2 µm = 0.00 Moisture Content = 18.1%
-		1.50	End of BH

BH5, 1.8 m Lt CL, WBL, 2.10 km east of the intersection of Hwy 138 and Co Rd 22

0	-	100	Asphalt
100	-	325	Br Sa w Si so Gr
325	-	750	Br Gr Sa so Si tr Cobs
750	-	1.20	Grey Si Sa, moist
1.20	-	1.50	Br Si Sa Cl, moist, LAH594
-		1.50	End of BH

BH6, 2.4 m Rt CL, EBL, 2.61 km east of the intersection of Hwy 138 and Co Rd 22

0	-	150	Asphalt (New)
150	-	750	Br Sa w Si so Gr tr Cobs
750	-	1.50	Br Sa w Si tr Gr
-		1.50	End of BH

BH7, 1.8 m Lt CL, WBL, 3.10 km east of the intersection of Hwy 138 and Co Rd 22

0	-	75	Asphalt
75	-	225	Br Sa w Si so Gr
225	-	900	Br Sa w Si so Gr tr Cobs
900	-	1.50	Br Cl Sa Si, LAH596 % Passing LAH596 4.75 mm = 99.0 75 µm = 71.0 5 µm = 36.0 LSFH 2 µm = 27.0 Moisture Content = 23.7%
-		1.50	End of BH



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BH8, 2.4 m Rt CL, EBL, 3.60 km east of the intersection of Hwy 138 and Co Rd 22

0 - 75 Asphalt
75 - 250 Br Sa w Si so Gr
250 - 750 Br Sa w Si so Gr & Cobs
750 - 1.50 Grey Si Sa Cl, moist
- 1.50 End of BH

BH9, 2.0 m Lt CL, WBL, 4.10 km east of the intersection of Hwy 138 and Co Rd 22

0 - 100 Asphalt
100 - 200 Br Sa w Si so Gr, LAH597
% Passing LAH597
4.75 mm = 87.1
75 µm = 27.9
Moisture Content = 3.00%
200 - 750 Br Gr Sa w Cobs so Si
750 - 1.20 Blk Si Sa Cl, tr Orgs
1.20 - 1.50 Dk Br Si Sa Cl, soft, moist
- 1.50 End of BH

BH10, 1.8 m Rt CL, EBL, 4.40 m east of the intersection of Hwy 138 and Co Rd 22

0 - 75 Asphalt
75 - 750 Br Sa w Si so Gr tr Cobs
750 - 1.50 Grey Si Sa Cl, moist
- 1.50 End of BH

BH13A, 2.0 m Lt CL, WBL, 4.59 km east of the intersection of Hwy 138 and Co Rd 22

0 - 50 Asphalt
50 - 250 Br Sa w Si so Gr
250 - 325 Buried asphalt
325 - 1.15 Br Sa w Si so Gr tr Cobs
1.15 - 1.50 Grey Si Sa Cl, moist
- 1.50 End of BH



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BH13B, 6.0 m Lt CL, WB Ditch, 4.6 km east of the inters. of Hwy 138 and Co Rd 22 (D-0.3)

0 - 75 Topsoil
75 - 1.50 Br/Grey Si Sa, tr Cl, moist
% Passing LAH599
4.75 mm = 100
75 µm = 45.0
5 µm = 5.00 MSFH
2 µm = 3.00
Moisture Content = 24.1%
- 1.50 End of BH

BH14, 9.9 m Rt CL, EB Ditch, 4.93 km east of the inters. of Hwy 138 and Co Rd 22 (D-0.3)

0 - 50 Topsoil
50 - 900 Br Si Sa Cl, tr Gr, fill
900 - 1.10 Blk Si Sa Cl, tr Orgs
1.10 - 2.10 Grey Si Sa Cl, native
2.10 - 3.00 Grey Sa Si so Cl, moist, LAH600
% Passing LAH600
4.75 mm = 100
75 µm = 68.0
5 µm = 13.0 HSFH
2 µm = 12.0

Moisture Content = 38.3%
- 3.00 End of BH, groundwater infiltration was encountered at 3.0 m.

BH11, 1.5 m Lt CL, WBL, 5.30 km east of the intersection of Hwy 138 and Co Rd 22

0 - 50 Asphalt
50 - 250 Br Sa w Si so Gr
250 - 750 Br Sa w Si so Gr tr Cobs
750 - 1.00 Blk Si Sa, Fine Fibrous Orgs
1.00 - 1.50 Grey Si Sa Cl, wet
- 1.50 End of BH, groundwater infiltration was encountered at 0.9 m.



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The Counties SDG

Kenyon TWP

BH12, 2.0 m Rt CL, EBL, 5.86 km east of the intersection of Hwy 138 and Co Rd 22

0	-	50	Asphalt
50	-	250	Br Sa w Si so Gr
250	-	1.10	Dk Br/Blk Si Sa Cl
1.10	-	1.50	Grey Si Sa Cl, moist
-		1.50	End of BH

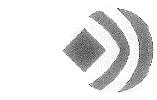
ENCLOSURE NO. 2 – LABORATORY TEST RESULTS



SNC • Lavalin

Lab # 22211 Client: Ainley
Project Name: 22604-1 Geotechnical Services Date: July 21, 2022

SAMPLE INFORMATION	SAMPLE	MASS OF SAMPLE WET & TARE (g)	MASS OF DRY & TARE (g)	MASS OF WATER (g)	MASS OF DRY SOIL (g)	MASS OF TARE (g)	MOISTURE CONTENT (%)
LAH591	A	875	835	40	696.1	138.9	5.7
LAH597	B	883	861.1	21.9	724.7	136.4	3.0
LAH593	C	696.3	609.9	86.4	476.8	133.1	18.1
LAH596	D	805.5	677.5	128	541.2	136.3	23.7
LAH599	E	758.8	637.2	121.6	504	133.2	24.1
LAH600	F	1044.7	793.9	250.8	655.5	138.4	38.3



SNC • Lavalin

SNC-Lavalin GEM Ontario Inc.

1164 Clyde Court

Kingston, Ontario K7P 2E4

(613) 389-178 (613) 389-4204

Grain Size Analysis Test Report

Project No.: 22-1690-01 Project Description: Ainley 2022 Lab Testing Date: Aug 02, 2022

Project Location:

SAMPLE DATA

Material: Granular

Date Sampled: Jul 21, 2022

Time Sampled:

Sample Type: Borehole

Sample Location: 22604-1 Geotechnical Services, LAH591,BH#2 0.15-0.90M

Lot: Sublot:

Source: Ainley

Sampled By: Client

LAB DATA

Lab No.: 22211-A

Date Tested: Aug 02, 2022

Specification: OPSS1010, Granular B Type I

PARTICLE ANALYSIS

TEST	Sample	Specification
Percent Crushed:		
% Asphalt Coated:		30
% Flat and Elongated		

WASH PASS 0.075mm

TEST	Sample	Specs
Wash Pass 0.075 mm:		
FINENESS MODULUS		1.40

Comments: Moisture Content is 5.7%

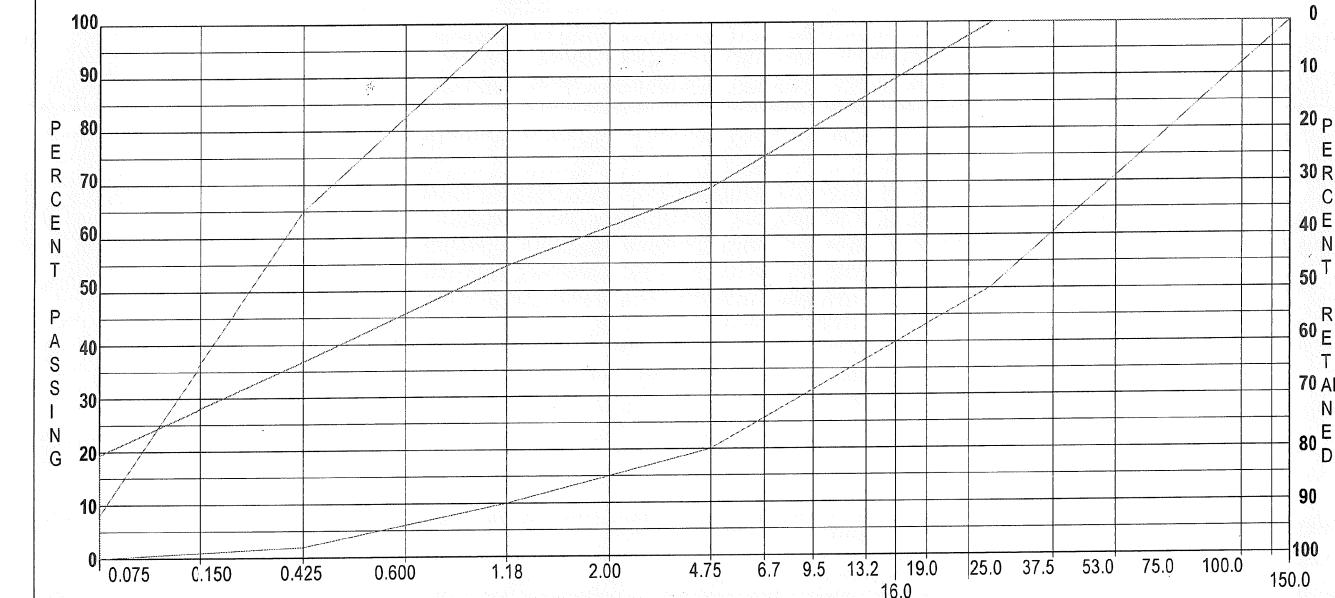
Contract No.:

Grain Size Analysis

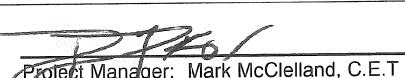
Sieve Sizes (mm)	Percent Passing	
	Sample	Specification
150.0	100	100 - 100
100.0		-
75.0		-
53.0		-
50.0		-
37.5		-
26.5	100	50 - 100
25.0		-
19.0		-
16.0		-
13.2		-
9.5		-
6.7		-
4.75	69	20 - 100
2.36		-
2.00		-
1.18	54.6	10 - 100
0.600		-
0.425		-
0.300	36.8	2 - 65
0.150		-
0.075	19.4*	0 - 8

* Indicates Out of Specification

Sample: _____ Specs: _____



Data presented herein is for the sole use of the stipulated client. SNCL is not responsible, nor can be held liable, for use made of this report by any other party, with or without the knowledge of SNCL. The testing services reported herein have been performed by a SNCL technician to recognized industry standards, unless otherwise noted. No other warranty is made. This data does not include or represent any interpretation or opinion of specification compliance or material suitability. Should engineering interpretation be required, SNCL will provide it upon written request.


Project Manager: Mark McClelland, C.E.T.

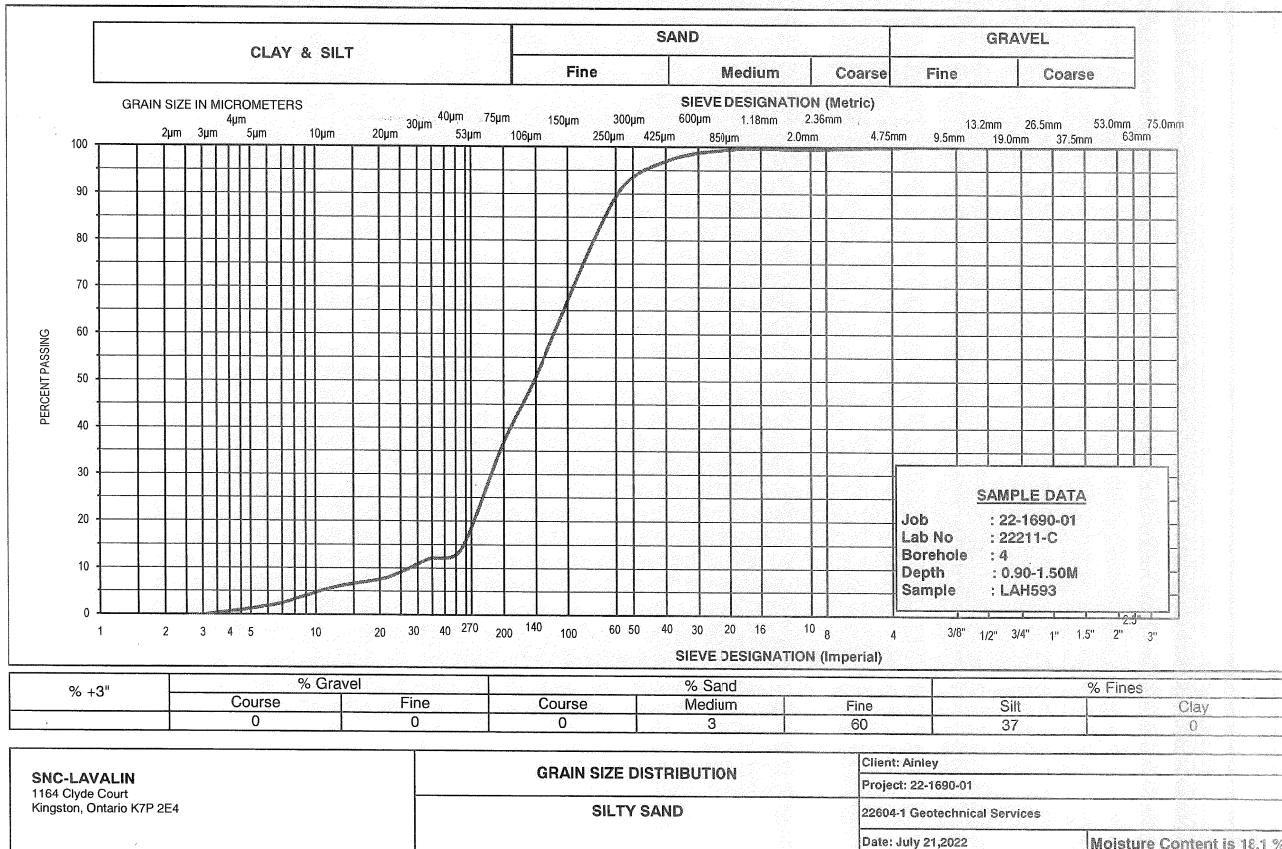
Infrastructure





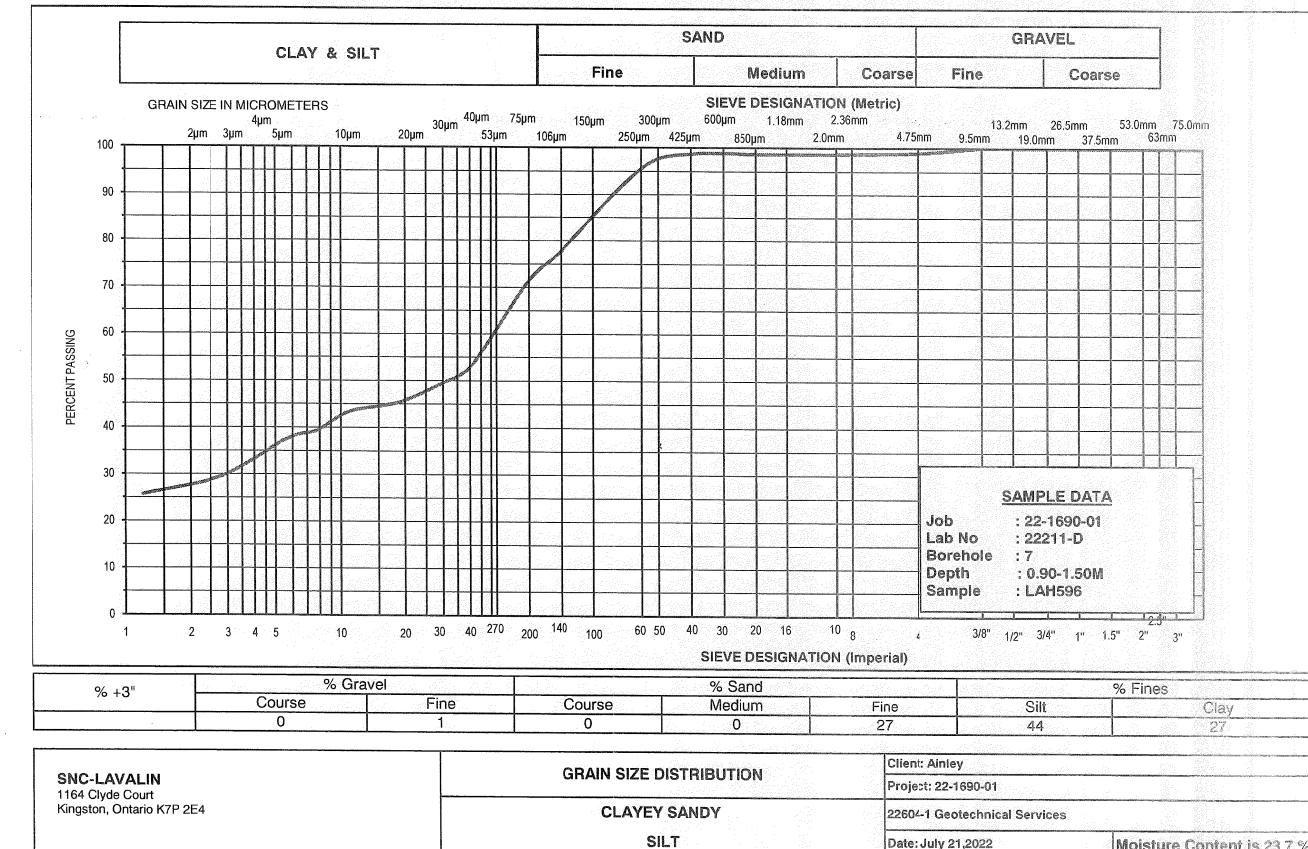
SNC-LAVALIN

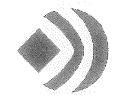
UNIFIED SOIL CLASSIFICATION SYSTEM



SNC-LAVALIN

UNIFIED SOIL CLASSIFICATION SYSTEM





SNC-LAVALIN

SNC-Lavalin GEM Ontario Inc.

1164 Clyde Court

Kingston, Ontario K7P 2E4

(613) 389-178 (613) 389-4204

Grain Size Analysis Test Report

Project No.: 22-1690-01 Project Description: Ainley 2022 Lab Testing

Date: Aug 02, 2022

Project Location:

SAMPLE DATA

Material: Granular
Date Sampled: Jul 21, 2022
Time Sampled:
Sample Type: Borehole
Sample Location: 22604-1 Geotechnical Services, LAH597, BH#9, 0.10-0.20M
Lot: Sublot:
Source: Ainley
Sampled By: Client

LAB DATA

Lab No.: 22211-B

Date Tested: Aug 02, 2022

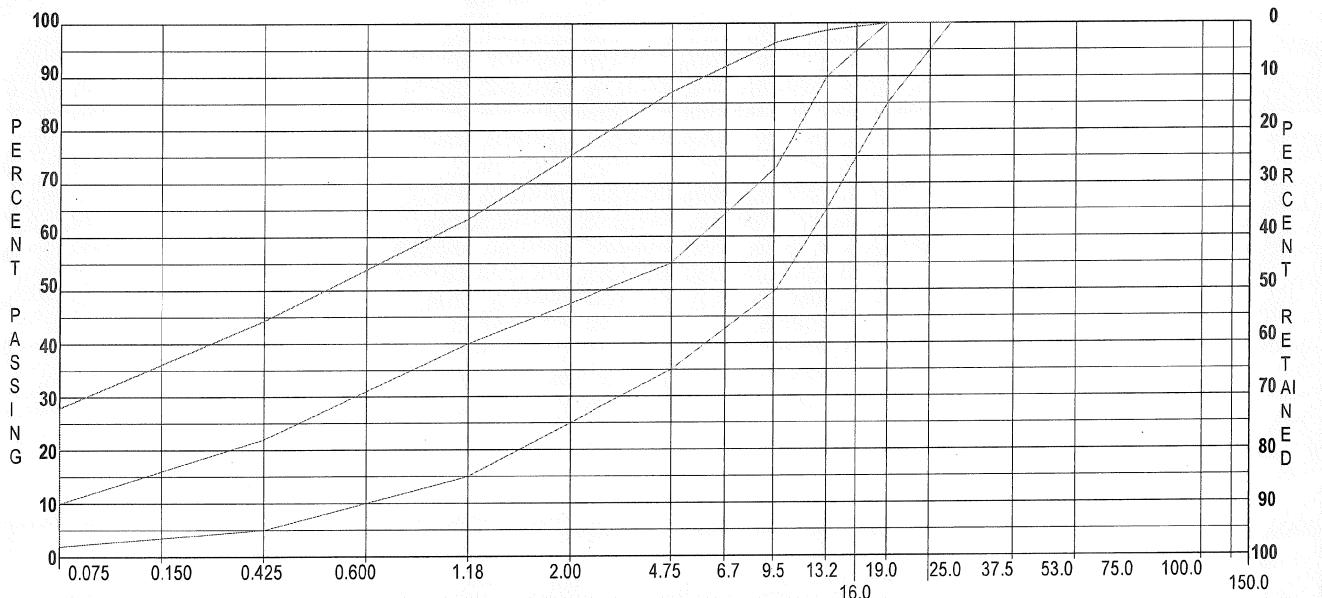
Specification: OPSS, Granular A

PARTICLE ANALYSIS

TEST	Sample	Specification
Percent Crushed:		60
% Asphalt Coated:		30
% Flat and Elongated		

Comments: Moisture Content is 3.0%

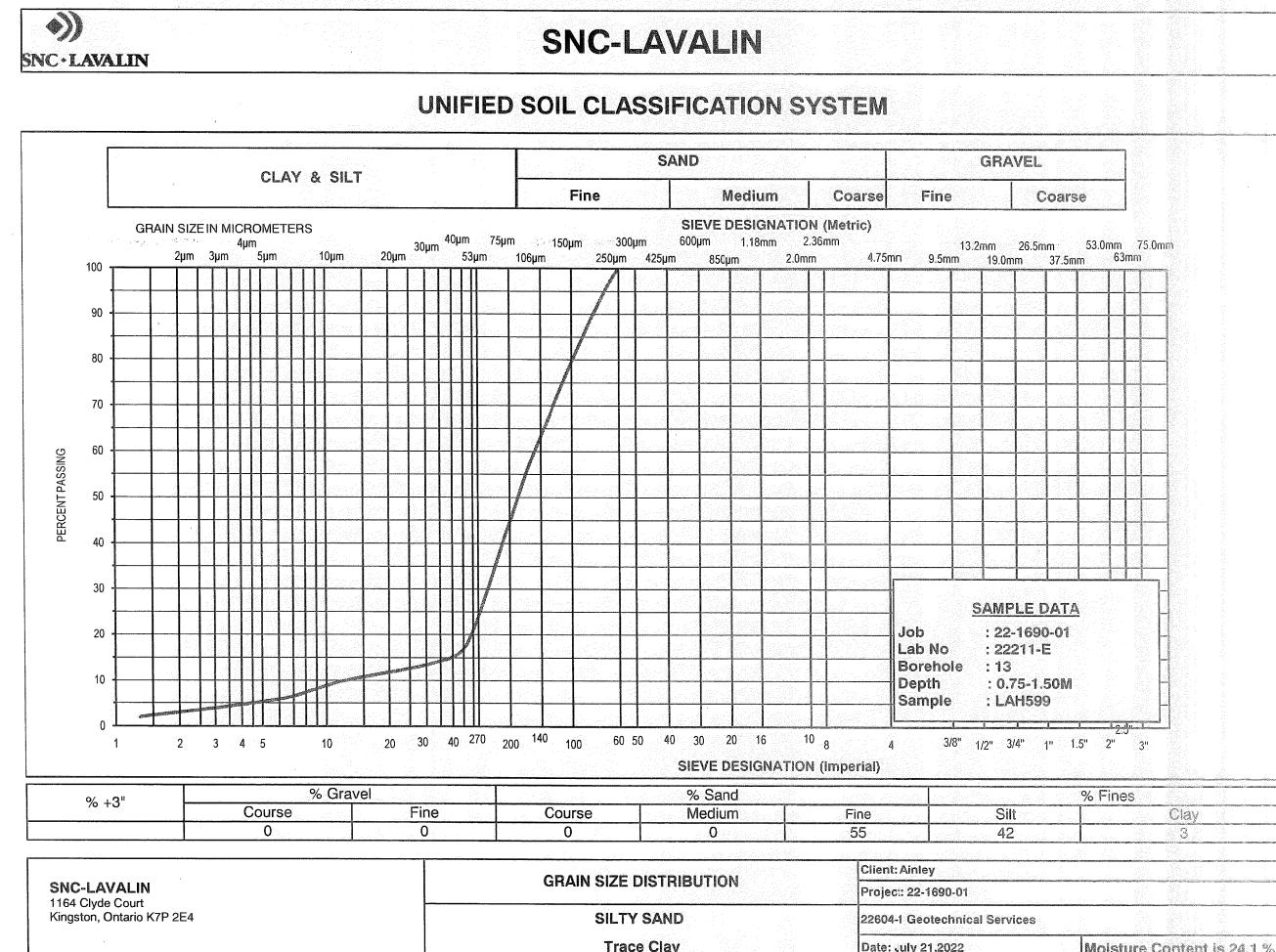
Sample: _____ Specs: _____



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Project Manager: Mark McClelland, C.E.T.

Infrastructure



SNC-LAVALIN



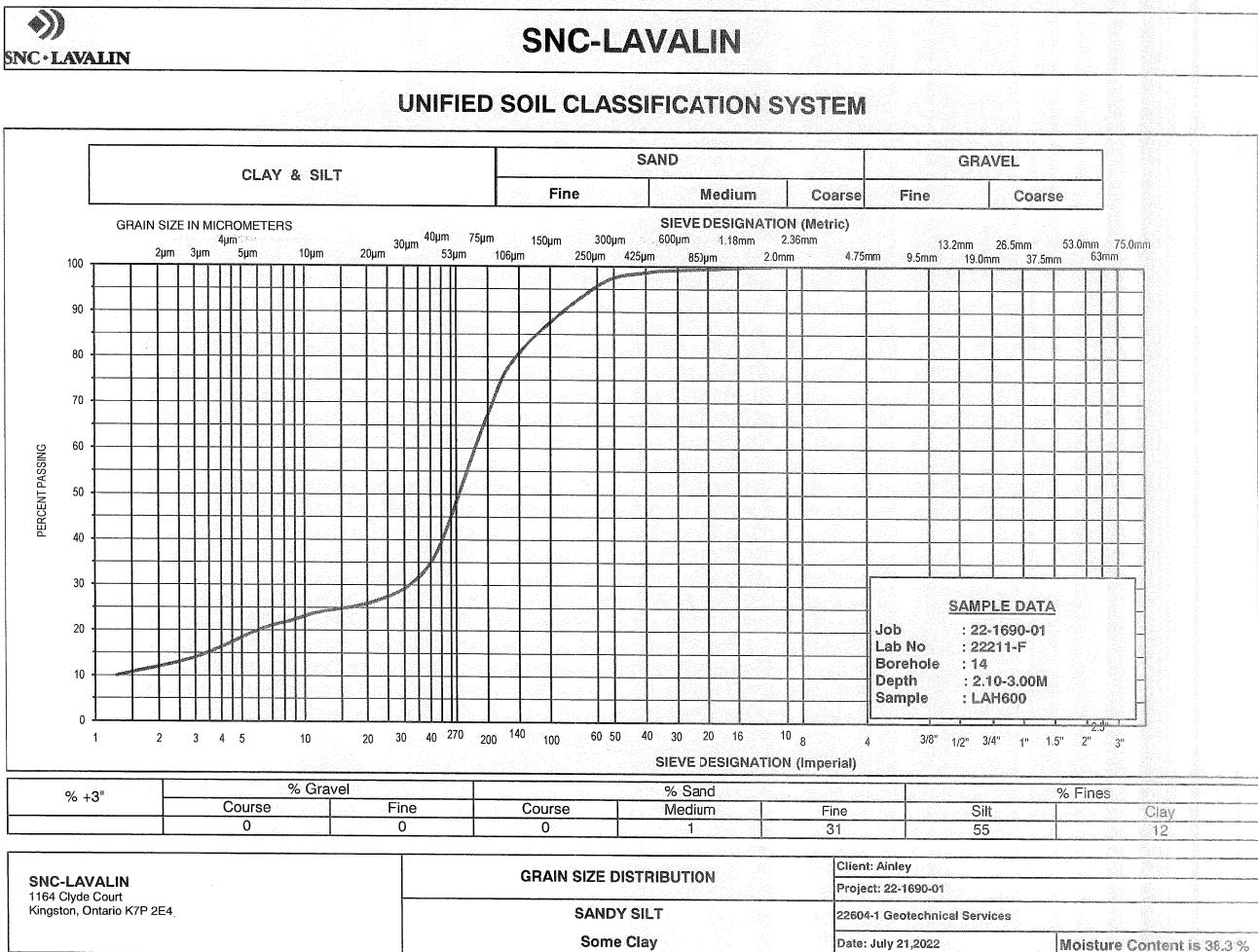
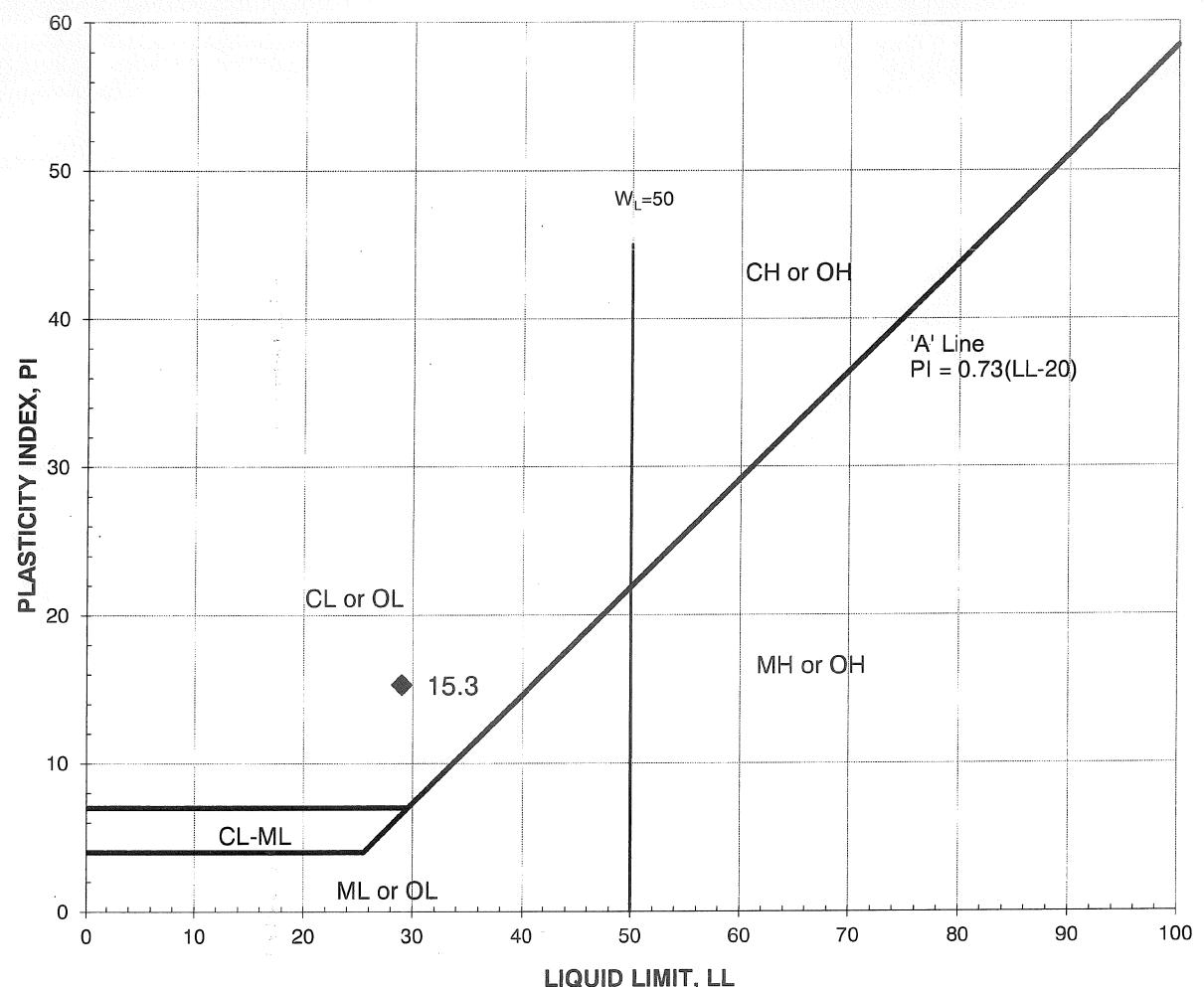
SNC-LAVALIN

PLASTICITY CHART

Job # :	22-1690-01	Lab # :	22211
Project Client:	Ainley	Technician :	KH
Project :	22604-1 Geotechnical Services	Manager	JU
Location :		Date	: 07-21-22

TEST RESULTS									
Specimen #	Sample #	Depth	LL%	PL%	PI	Fines	W%	Classification	Remarks
22211-D	LAH 596	0.90-1.50M	29.0	13.7	15.3			CL	Moisture 23.7%

◆ 22211-D LAH 596





AG File No. 22604-1
Geotechnical Services Report
County Road 22
The Counties of SDG

PRESENT WORTH LIFE CYCLE COST ANALYSIS - SDG CR 22

Option 1
In Place Process, place 100 mm granular A, pave with 40 mm SP12.5 over 50 mm SP 19.0

Discount Rate = 6%

Year	Treatment	GBE	Unit Cost	Tot. Cost	PW Cost	Tot. PWC
0	INITIAL CONSTRUCTION IPP 200 Place 100 mm Granular A SP 12.5 Surface (40 mm) SP 19.0 binder (60 mm) Granular shoulderering		1.50 36.00 103.00 193.00 38.00	78,000 378,000 497,490 1,069,992 43,700	78,000 378,000 497,490 1,069,992 43,700	2,067,182
10	Maintenance		20672	20,672	11,543	11,543
20	FIRST REHABILITATION Mill 50 mm Tack Coat SP 12.5 surface (50 mm)		4.50 2.00 103.00	234,000 104,000 622,120	72,962 32,428 193,980	299,370
25	Maintenance		29937	29,937	6,975	6,975
30	Residual Value				0	0
Total Life Cycle Cost						\$2,385,070

ENCLOSURE NO. 3 – LIFE CYCLE COSTING



AG File No. 22604-1
Geotechnical Services Report
County Road 22
The Counties of SDG

PRESENT WORTH LIFE CYCLE COST ANALYSIS - SDG CR 22

Option 2

Full Depth Pavement removal, excavate 150 mm, place 150 mm granular A, pave with 40 mm SP 12.5 surface over 50 mm SP 19.0 binder

Discount Rate = 6%

Year	Treatment	GBE	Unit Cost	Tot. Cost	PW Cost	Tot. PWC
0	INITIAL CONSTRUCTION full depth removal Earth Excavation 150 mm 150 Granular A SP 12.5 surface (40 mm) SP 19.0 binder (60 mm) GA shoulderings		8.90 19.00 27.00 103.00 193.00 38.00	462,800 148,200 440,100 497,490 1,069,992 43,700	462,800 148,200 440,100 497,490 1,069,992 43,700	2,662,282
10	Maintenance	26623		26,623	14,866	14,866
20	FIRST REHABILITATION Mill 50 mm Tack Coat SP 12.5 surface (50 mm)		4.50 2.00 103.00	234,000 104,000 622,120	72,962 32,428 193,980	299,370
25	Maintenance	29937		29,937	6,975	6,975
30	Residual Value				0	0
Total Life Cycle Cost						\$2,983,493