

A photograph of a residential area with a creek. In the background, there is a two-story brick house with a white window frame. The creek flows through a wooded area with many trees, some of which are bare, suggesting early spring or late autumn. The water in the creek is shallow and clear, revealing rocks and debris on the bottom. The overall scene is a natural setting within a suburban neighborhood.

WELCOME

Harmony Creek Sites 2 & 3 Erosion Control Class Environmental Assessment

PUBLIC INFORMATION CENTRE
September 28th, 2022

Presented by:

Harshad Patel, Water Resources Engineer, City of Oshawa

Max Osburn, Water Resources Engineer, Palmer

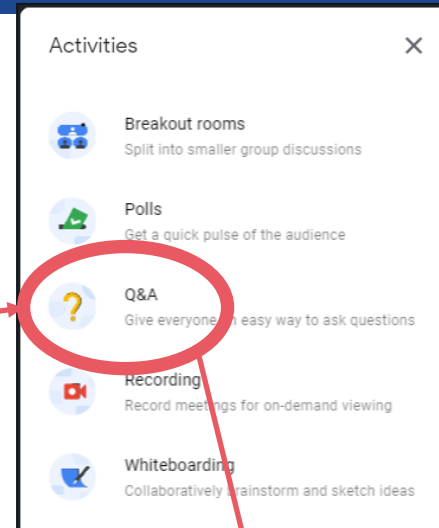
Robin McKillop, Principal Fluvial Geomorphologist, Palmer

Your comments are encouraged and appreciated,
as this will provide us an opportunity to address
project issues and concerns.

Housekeeping

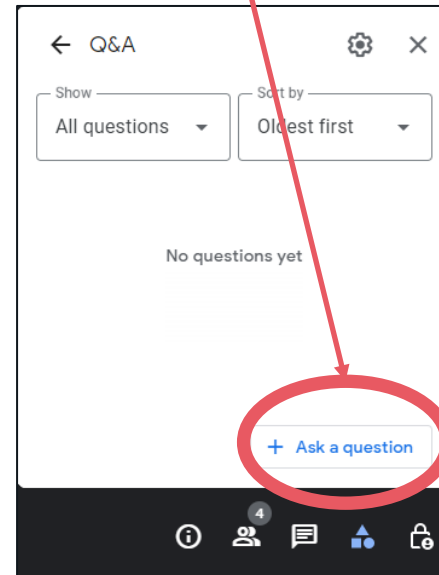
- All attendees are **muted**
- Roll call - please provide your name and address in the **Question** box at the bottom right corner of the screen

Harmony Creek Site 2 & 3 - Public Information Center



- All questions are to be submitted in writing only in the **Question** box
 - Your questions are visible to everyone
 - Questions can be submitted at any time during the presentation or Q&A session
 - Questions will be answered during the Q&A session at the end of the presentation
- This presentation, along with additional background information, studies and comment forms will be available on the City website for interested individuals. See link below:

www.Oshawa.ca/HarmonyCreek



Study Purpose / Problem Definition

To define the preferred restoration opportunity for erosion Sites 2 & 3 on Harmony Creek between Rossland Road and Hillcroft Street.

The restoration will improve the stability and health of the watercourse, protect public infrastructure and private properties along Camelot Drive and minimize the City's maintenance and operational requirements.



Project Location

Purpose of the Public Information Centre (PIC)

The PIC is meant to:

- Explain the study process and timeline
- Present background review and previous studies
- Present information on existing conditions
- Discuss potential impacts and opportunities for improvement of Harmony Creek
- Present alternative restoration opportunities and the evaluation of alternatives
- Facilitate community input



Study Process/Timeline

Municipal Class Environmental Assessment (EA)

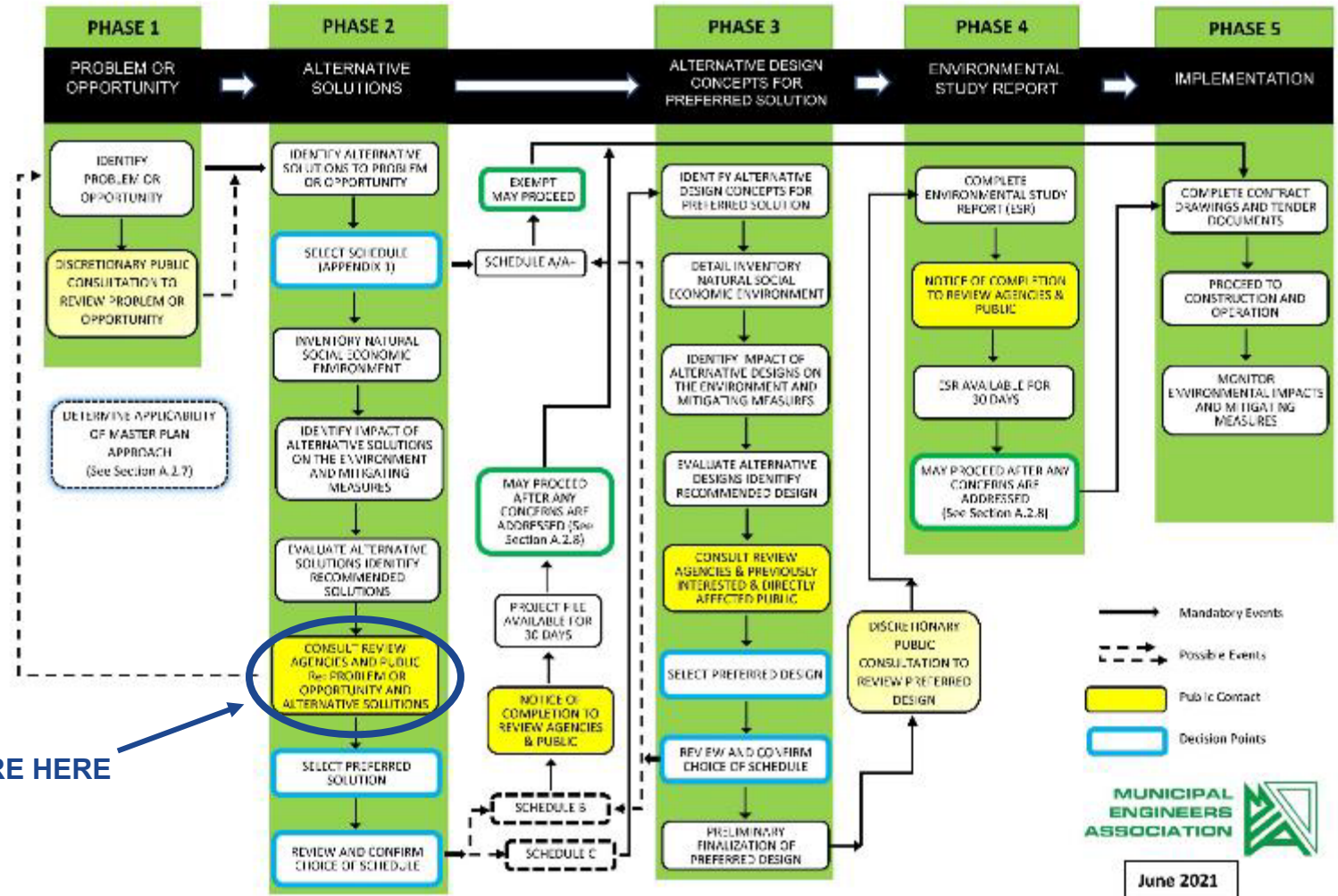
The Class EA Process – Schedule B

Many projects related to municipal systems that are similar in nature, are carried out routinely, and have predictable and mitigatable environmental effects are addressed in accordance with the Municipal Engineers Association “Municipal Class Environmental Assessment” (October 2000, as amended in 2007 & 2015).

This study is being undertaken as a “Schedule B” project under the Municipal Class Environmental Assessment process. The flow chart illustrates the key steps to be undertaken as part of the EA process.

WE ARE HERE

MUNICIPAL CLASS EA PLANNING AND DESIGN PROCESS NOTE: This flow chart is to be read in conjunction with Part A of the Municipal Class EA



Background Review / Previous Studies

Harmony Creek Branch 3 - Fluvial Geomorphological Study and Erosion Assessment

- Previous study commissioned by the City in 2021
- Identified 13 erosion sites between Rossland Road and Hillcroft Street
- 4 sites were prioritized for more detailed follow up due to potential risk to City property, private property and/or infrastructure (Sites 2, 3, 9 and 10)

The current project is focused on erosion Sites 2 & 3



Erosion sites between Rossland and Hillcroft

Existing Conditions - Site 2



Looking downstream



Looking upstream

City owned **stormwater outfall** has been outflanked and undermined, which may lead to its eventual collapse. Adjacent private property along Camelot Drive is at risk if outer bank erosion continues.



Existing Conditions - Site 3



Looking downstream



Looking upstream

30 m-long **gabion basket wall** is deteriorated along its entire length and is leaning into the channel. Infrastructure and private properties along Camelot Drive are at risk if the gabion wall continues to deteriorate and eventually fails.



Historical Channel Position and Erosion Rate

LEGEND:

Study Corridor Limit

③ Erosion Hazard Site

Flow Direction

Harmony Creek Meander Belt

Tributary Meander Belt

Migration Sites (m/year)

Harmony Creek Trail

Cross Section

Contour (1 m)

Channel Centreline (year)

2020

2018

2010

2005

1999

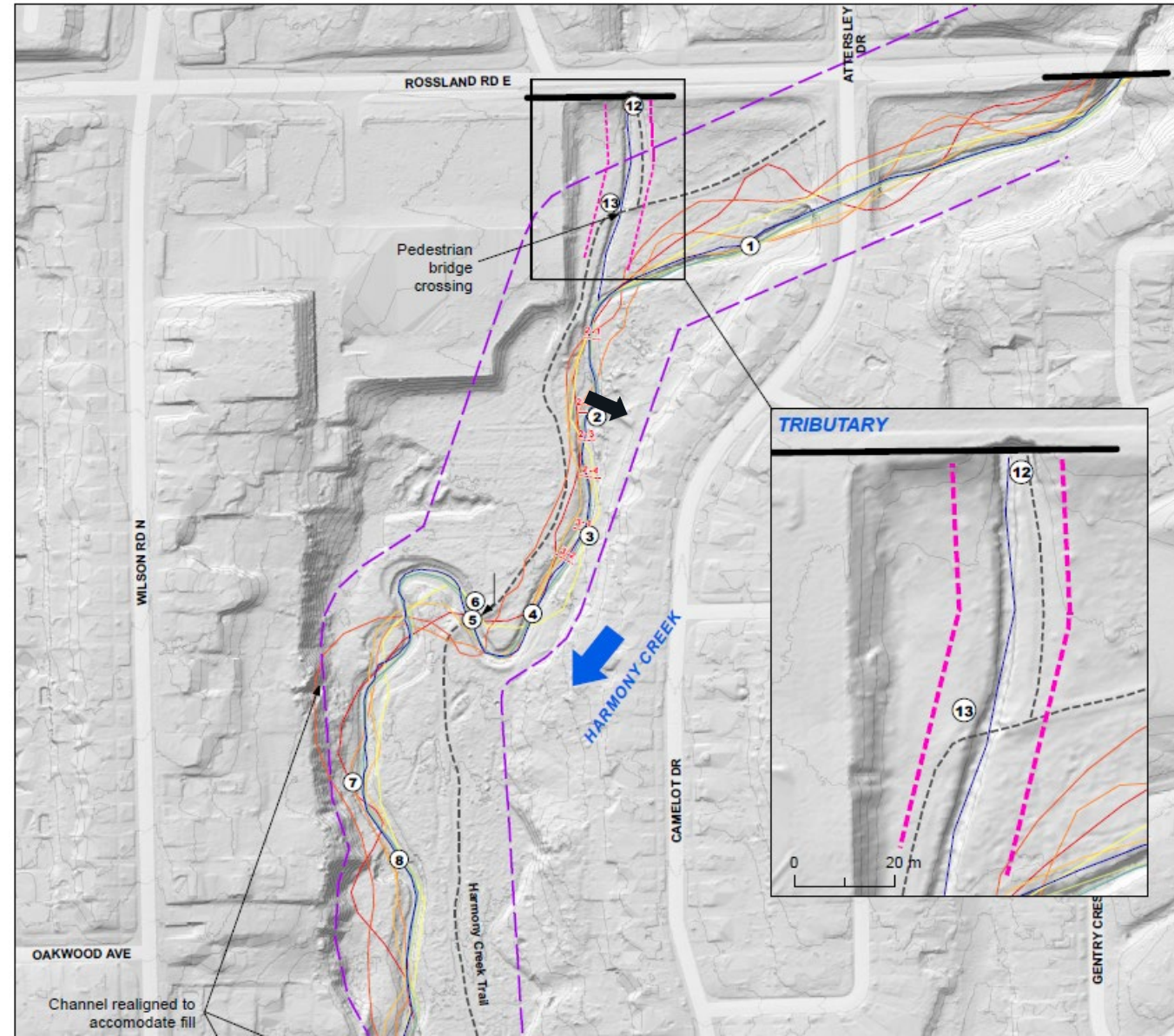
1974

1967

1954

1927

A migration rate of 0.2 meters/year was determined at Site 2 between the years of 2012 – 2020



Hydrology and Hydraulics

- Hydrology and Hydraulics of Harmony Creek were studied
- Provided information on how much water flows through the creek, the forces it exerts under normal and extreme conditions, and the extent of flooding
- This information is used to ensure proposed mitigative solutions do not worsen or impact flooding in the area
- The limits of the Regulatory floodplain are shown below as a yellow outline.



Aquatic Ecology

The study assessed aquatic habitat and fisheries within Harmony Creek

- Harmony Creek contains multiple fish species known to occur in warmwater, coolwater and coldwater systems, including Rainbow Trout (*Onchorynchus mykiss*)
- The stream reach within the study area has relatively few pools
- Normal water levels are less than 0.3 m, limiting suitability for larger bodied fish

Recommendations for habitat improvement

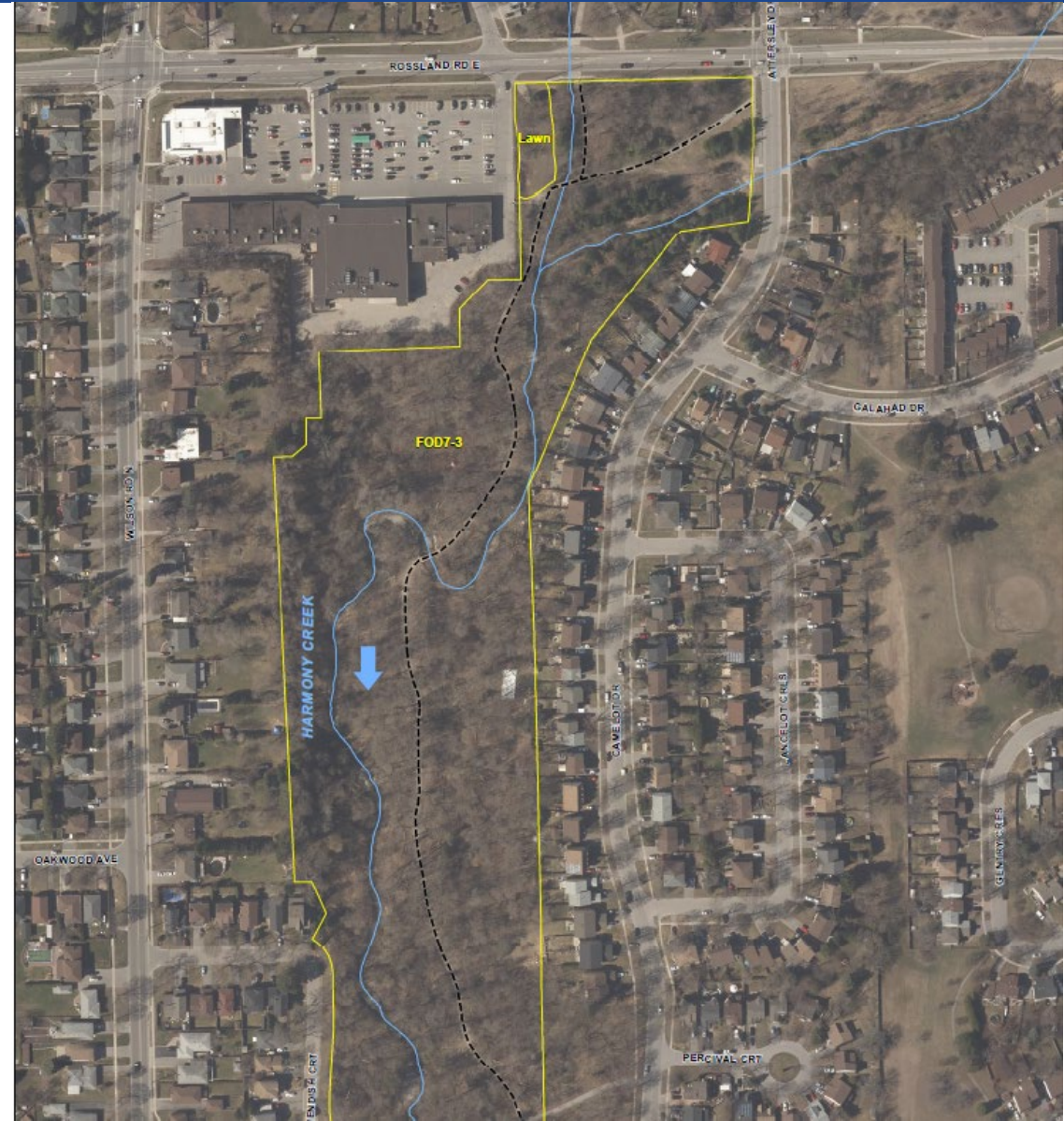
- Look for opportunities to deepen pools through proposed channel works
- Limit installation of hard structures along channel banks and use natural materials such as large wood, native vegetation, and riverstone to the extent possible
- Increase shading near anthropogenic structures (e.g. erosion control structures) to improve riparian cover and increase food sources for aquatic biota in cleared areas



Terrestrial Ecology

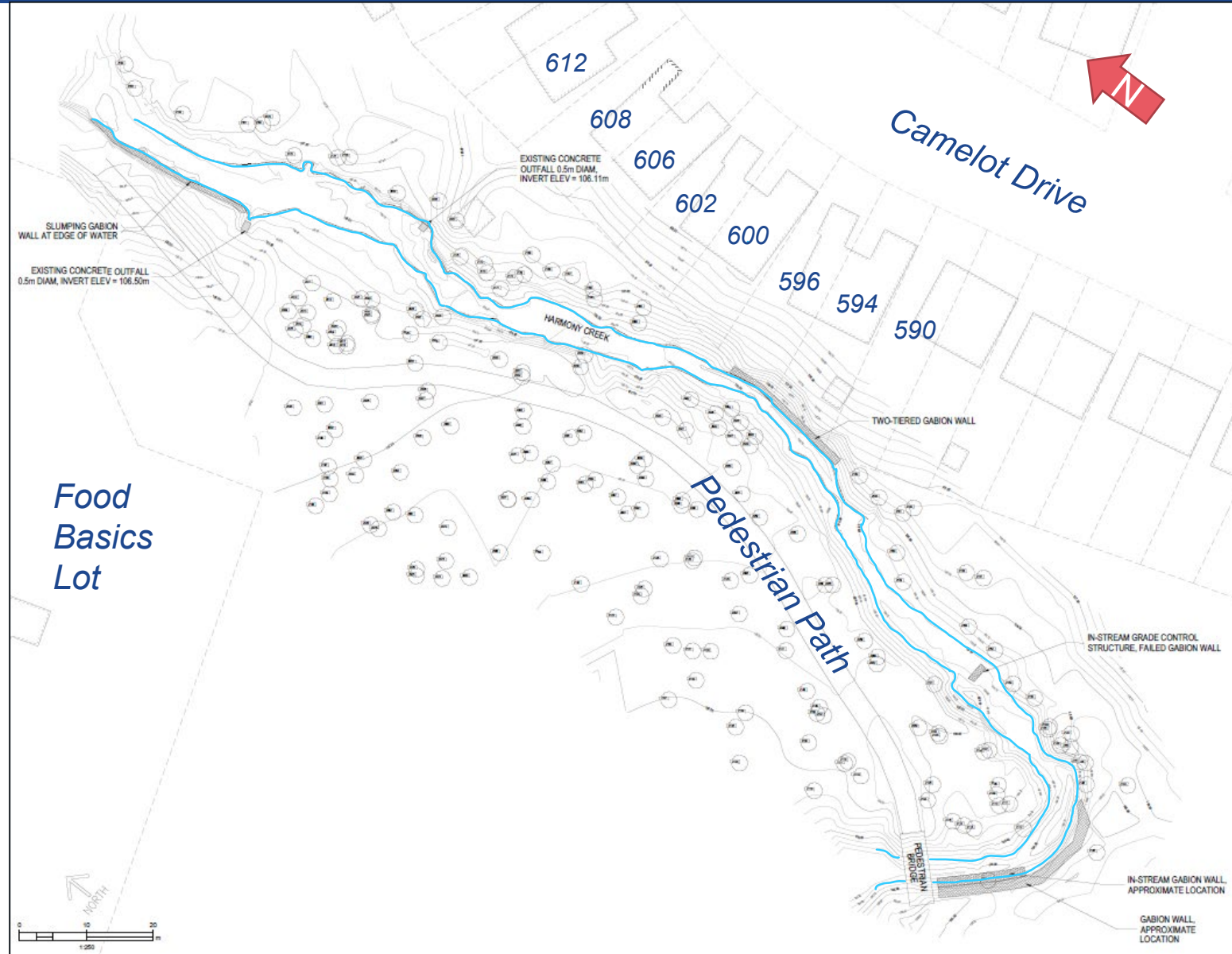
The study assessed the terrestrial ecology around Harmony Creek

- Ecological Land Classification (ELC) is a standard practice used to describe, identify, classify and map vegetation communities on the landscape
- The study corridor is primarily represented by a contiguous Moist Willow Lowland Deciduous Forest (FOD7-3)
- Canopy trees include Crack Willow, Golden Weeping Willow, Sweet Cherry, White Ash, Basswood and Manitoba Maple
- No rare vegetation species or species at risk (SAR) were observed during Palmer's field reconnaissance
- The Ministry of Environment, Conservation and Parks (MECP) will be consulted to confirm no SAR concerns in association with detailed designs.



Tree Inventory

- A comprehensive tree inventory was completed within the study area by Palmer arborists
- A total of 188 trees were inventoried, including species, diameter and tree condition
- Removal of some trees will be required to facilitate the creek restoration works.
- Compensation for the removal of trees will be provided in accordance with City of Oshawa and Central Lake Ontario Conservation Authority (CLOCA) guidelines



Conceptual Alternatives and Evaluation

There are three alternatives being considered for this project*

- 1.Do Nothing
- 2.Channel and Trail Realignment and Bank Protection
- 3.Localized Bank Protection

For each alternative concept, a range of criteria will be used to evaluate the preferred method for rehabilitation of Harmony Creek.

The following scoring can be used – 1 = unfavourable, 2 = satisfactory 3 = acceptable, 4 = positive and 5 = favourable – such that the sum of criteria can be scored for each alternative, with the highest score deemed to be preferred.

Objective	Criteria
Physical and Natural Environment	Flooding Erosion Aquatic Habitat Terrestrial Habitat
Social/Cultural Environment	Aesthetic Value Benefit to Community

Objective	Criteria
Technical Criteria	Regulatory Agency Acceptance
Financial Criteria	Capital Costs Maintenance Costs
Constructability	Complexity of Treatment
Risk	Potential Risks to Existing Infrastructure Potential Risks to Public Potential Risks to Private Property

*Note: Detailed evaluation for each site provided in design report on City’s website

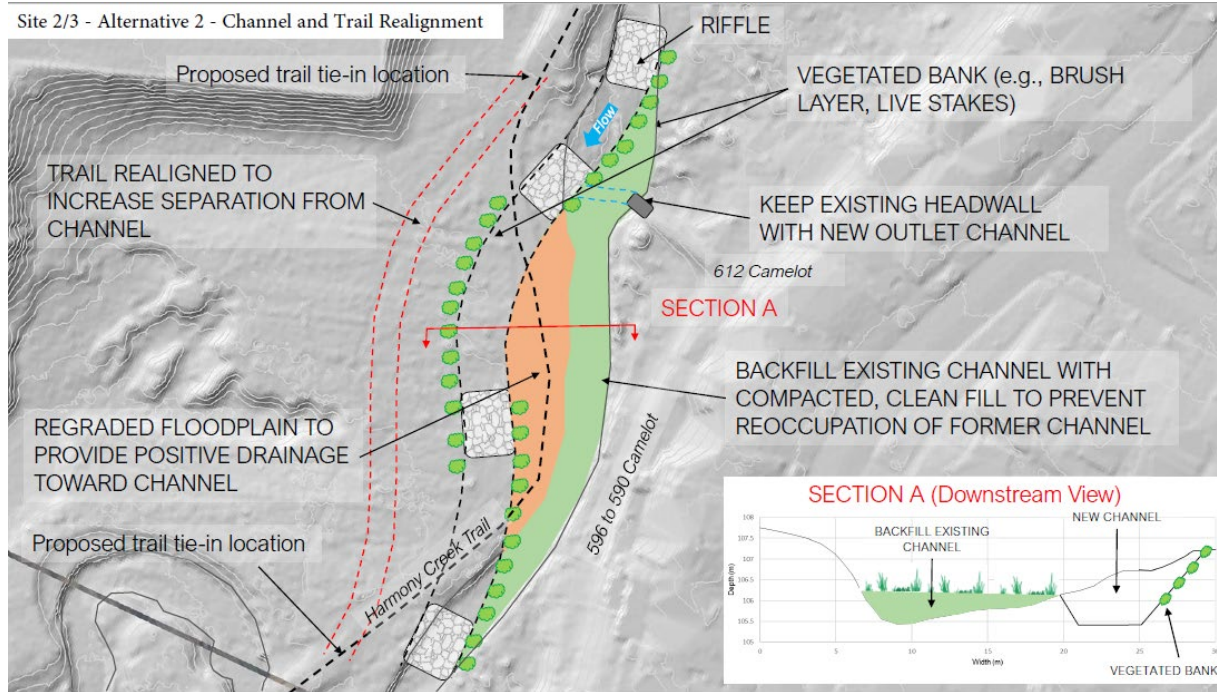
Alternative 1 – Do Nothing



Alternative 1 – Do Nothing

- No restoration measures implemented
- This alternative would involve leaving the existing creek, including the stormwater outfall and gabion basket wall, to continue failing.
- Existing risks associated with eroding streambanks, failure of the stormwater outfall, failure of the gabion wall and damage to private property remain.
- No upfront capital cost. Under emergency conditions (i.e. failure), works would occur. Ongoing monitoring would be necessary.

Alternative 2 – Channel and Trail Realignment



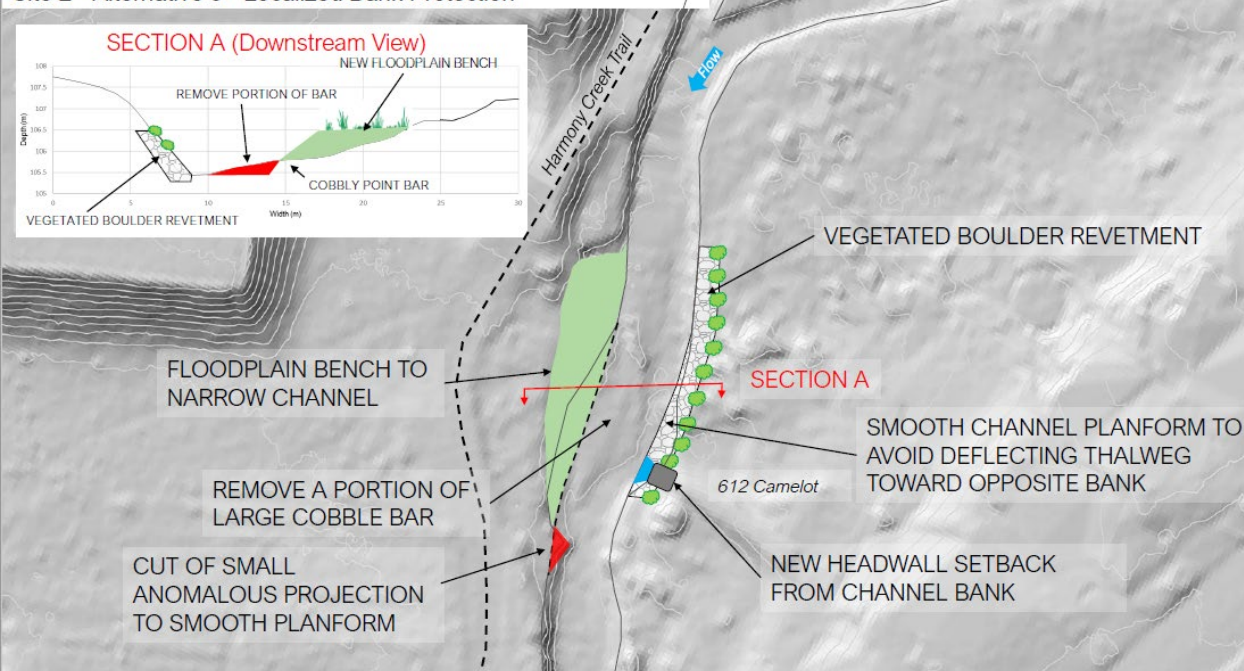
Example of Natural Channel Realignment

Alternative 2 – Channel and Trail Realignment

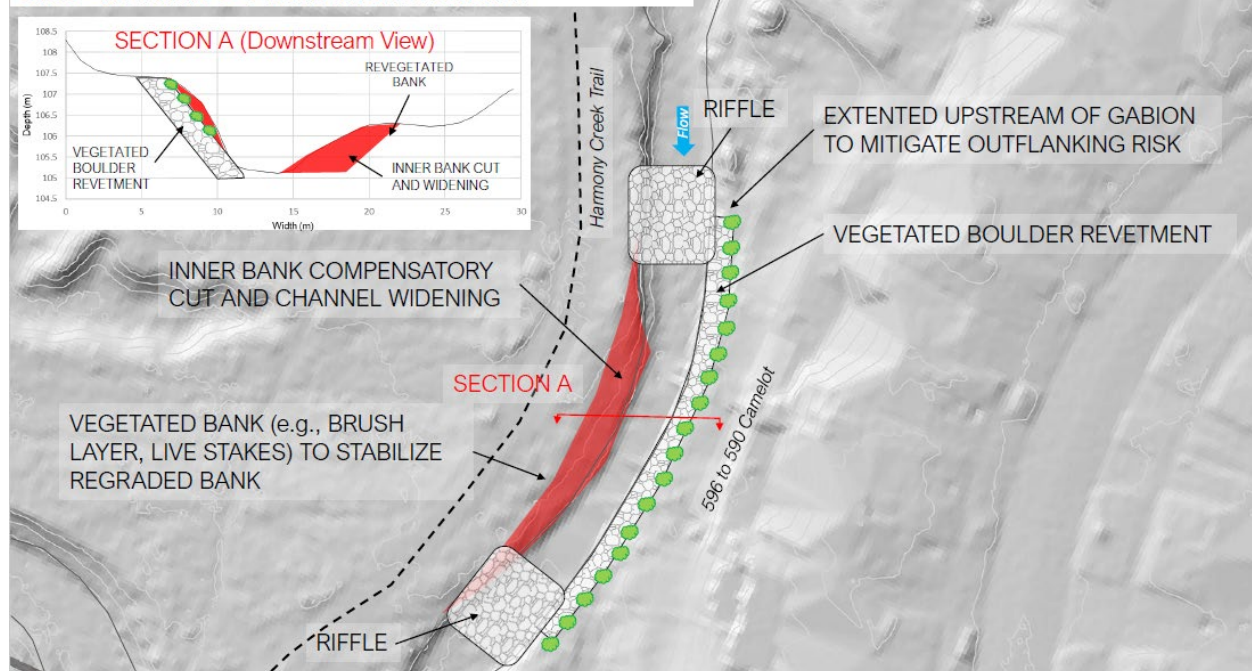
- Natural channel realignment would reposition the creek toward the center of the valley bottom, mitigating risk to the outfall and private properties.
- Combines Sites 2 and 3 into one project, maximizing efficiency and minimizing disruption to residents.
- The existing channel would be backfilled with clean fill and compacted to prevent reoccupation during flood events.
- This alternative involves the highest level of disruption to the study area and would require local realignment of the Harmony Creek Trail.
- Once completed, however, it would provide long-term erosion protection and improved conditions in terms of natural function and processes of the watercourse.

Alternative 3 – Localized Bank Protection

Site 2 - Alternative 3 - Localized Bank Protection



Site 3 - Alternative 3 - Localized Bank Protection



Alternative 3 – Localized Bank Protection

- Stream restoration along existing alignment, using localized grading and vegetated boulders to protect the outer banks and stormwater outfall.
- Erosion would be mitigated in the short-term, but the channel and erosion risk will remain close to public infrastructure and private property.
- Deteriorated gabion basket wall at Site 3 would be removed, which would have impact on adjacent private properties during construction.
- This alternative would require minor to moderate disruption to the study area. Medium term erosion protection would be provided as a result of this alternative.

Evaluation of Alternatives

The preliminary evaluation of alternatives is presented below, with Alternative 2 as the preferred alternative for restoration. Your comments on the ranking and preferred method of restoration are encouraged and appreciated. The study team will compile and review all feedback, and will then finalize the selection of the preferred alternative for the project.

Objective	Criteria	Comment	Alternative 1 Do Nothing	Alternative 2 Channel and Trail Realignment	Alternative 3 Localized Bank Protection	Notes
Physical and Natural Environment	Flooding	Impact on surface drainage, flooding; meet legislated criteria for flooding and water	3	3	3	Both concepts would alter planform and <u>cross sectional</u> geometry. Proposed changes to the cross section would restore a more natural <u>width:depth</u> ratio. A low floodplain bench associated with narrowing would avoid any adverse impacts to flood storage/conveyance. An update to the HEC-RAS model will be required in association with detailed design.
	Erosion	Impacts on soils, geology, rate of erosion	1	4	4	Both concepts would help reinstate natural channel form and function (e.g. sediment transport). The concepts would address existing erosion concerns and not impact erosional processes downstream.
	Terrestrial Habitat	Impact on connectivity, <u>diversity</u> and sustainability	2	3	4	Alternatives 3 would result in localized short-term impacts to riparian vegetation, including mature trees. Alternative 2 requires a greater area of disturbance/vegetation removal in association with channel and trail realignment. Extensive tree removal allows for the removal of non-native species.
	Aquatic Habitat	Impact on connectivity, spawning and sustainability	3	5	4	Both concepts would maintain existing bed characteristics (well sorted gravel and cobble matrix), where possible, and/or enhance bed habitat through natural channel design to maintain potential Rainbow Trout spawning areas. Alternative 2 would include a naturalized pool-riffle sequence along the realigned section.
Social/Cultural Environment	Aesthetic Value	Impact on existing and proposed development aesthetic value	1	3	4	The inclusion of a vegetated boulder revetment and local improvements would improve the aesthetic of erosion mitigation measures. Alternative 2 requires extensive mature <u>riparian</u> vegetation removal, which counteracts <u>in-stream</u> aesthetics improvements.
	Benefit to Community	Access to trails, enjoyment of valley	3	2	2	Conservatively assumes construction activities for each concept could disrupt nearby park users and necessitate temporary partial and/or full closure of the trail.
	Archaeological Features	Impacts on existing archaeological features	N/A	N/A	N/A	
Technical Criteria	Regulatory Agency Acceptance	Satisfy CLOCA, DFO, MNRF and MECP mandates	5	3	3	Both concepts would require regulatory approvals associated with in-stream work, floodplain cut and tree removals. In-stream works would trigger a need for DFO review. Consultation with MECP is required for all concepts to determine if any Species at Risk (SAR) have been reported within the study area.
Financial Criteria	Capital Costs	Rough Order Magnitude (ROM) capital costs for the detailed design, permitting and installing proposed concept	5	2	4	Do Nothing would not address erosion risk and may result in emergency works and/or additional construction costs in the long-term. Alternative 2 has the highest estimated construction cost, in association with cut of the new channel alignment. It would, however, address two high priority erosion sites, restore a larger portion <u>channel</u> and reinstate naturalized pool-riffle morphology.
	Maintenance Costs	Rough Order of Magnitude costs to maintain the proposed structure	1	5	3	Do Nothing may necessitate emergency works and/or increased maintenance frequency if not robustly designed or implemented; Alternative 2 would minimize maintenance requirements by creating additional separation between channel and at-risk properties. Alternative 3 would reduce maintenance requirements compared to those associated with the existing gabion basket wall.
Constructability	Complexity of Treatment	Requirement for specialized services to design or install unique or proprietary specifications that must be completed by a certified contractor/consultant	5	3	3	Emergency works could be completed by non-specialists in channel works. Each concept would require implementation by those experienced in natural channel works.
Risk	Potential Risks to Existing Infrastructure	Protection or potential exposure of infrastructure (fence, wall, building, etc.)	1	5	4	Alternative 2 would mitigate existing erosion risk and future impacts to private property. Alternative 3 would mitigate erosion risk but not create long-term separation between private property and fluvial scour.
	Potential Risks to Public	Impact on public safety and requirement for safety features (e.g., safety fences)	1	4	3	Alternative 2 would address erosion concerns and increase separation distance between private property and the trail. Alternative 3 would address erosion concerns <u>in close proximity</u> to the private properties, thereby improving public safety.
	Potential Risks to Private Property	Potential for loss of private property due to bank recession	1	5	4	Without intervention, erosion at Site 2 will continue to toward 608 and 612 Camelot Drive. Failure of the stormwater outfall may also negatively impact private property. At Site 3, private properties from 596 to 590 Camelot Drive are at-risk if the deteriorated gabion basket wall fails. Alternative 2 would create additional separation and protect all private properties and infrastructure from erosion-related risks. Alternative 3 would protect in place but maintain erosional forces along property limit.
Total Score:			32	47	45	
Combined Rank:			3	1	2	Alternative 2 is the preferred mitigative solution.

Next Steps

Public Consultation – Sep/Oct 2022

- Comment forms available for input
- Project team will compile and review feedback, and will confirm or adapt the preliminary preferred alternative in response.

Submit EA Report and Agency Approvals – Fall 2022

- EA project file posted on City website for 2 week review period.

Design and Implementation

- Preliminary Design by end of 2022
- Detailed Design, Permitting and Construction - 2023-2024

Comment/Feedback Form

TO PROVIDE FORMAL COMMENT, PLEASE
SUBMIT THE COMMENT FORM TO THE PROJECT
TEAM BY OCTOBER 12, 2022 (4:30pm).

Comment form available here:
www.Oshawa.ca/HarmonyCreek

Municipal Class Environmental Assessment
Harmony Creek Sites 2 & 3 Erosion Mitigation
Public Information Centre (PIC)
September 28, 2022 at 6:00PM

COMMENT FORM

The City wishes to ensure that anyone with an interest in this study has the opportunity to provide input on the Harmony Creek Sites 2 & 3 erosion mitigation alternatives. With the exception of personal information all comments will become part of the public record. To provide your comments, request additional information concerning this project or to join the study mailing list, please contact either of the Project Team members.

Contact Information (optional)

Name:

Address:

Phone Number:

Email:

Project Information

Project information including the PIC presentation, studies and mitigation options are available on the City's website (refer to the link provided below) to provide an opportunity for the public to review and comment on the study findings.

Website Link: <https://www.oshawa.ca/en/business-development/environmental-assessments.aspx>

Comments

1. Existing Conditions

Background studies and existing site conditions were presented. Please review the presentation panels and let us know if you feel anything has been missed or if you have any questions.



Palmer.

2. Evaluation of Alternatives

Three alternatives have been identified and evaluated:

- Alternative 1 – Do Nothing
- Alternative 2 – Channel and Trail Realignment
- Alternative 3 – Localized Bank Protection

The preliminary scoring of the alternatives by the project team suggests Alternative 2 – Channel and Trail Realignment as the preferred alternative. Do you support this outcome? Why or why not?

3. Additional Comments

Do you have any questions or comments about the project or the Class Environmental Assessment process?

Thank you for your comments!

Please email your completed comment forms to either contact listed below, by October 12, 2022

Mr. Harshad Patel, M.Eng., P.Eng.
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Vice President, Principal Geomorphologist
Palmer
74 Berkeley Street, Toronto, Ontario, M5A 2W7
robin.mckillop@peg.ca



Palmer.

Q&A Session

- All questions are to be submitted in writing only in the **Question** box at the bottom right corner of the screen
- Questions can also be submitted through the comment form

The image shows a Zoom mobile app interface. At the top, a dark bar contains the meeting title "Harmony Creek Site 2 & 3 - Public Information Center" and various icons for microphone, video, chat, gallery view, a plus sign, a menu, and a red phone icon. To the right of these are icons for information, participants (with a '1' badge), chat, a group of people icon, and a lock icon. Below this bar, a red arrow points from the group of people icon to a "Activities" panel. The "Activities" panel lists several options: "Breakout rooms" (Split into smaller group discussions), "Polls" (Get a quick pulse of the audience), "Q&A" (Give everyone an easy way to ask questions), "Recording" (Record meetings for on-demand viewing), and "Whiteboarding" (Collaboratively brainstorm and sketch ideas). The "Q&A" option is circled in red. A second red arrow points from the "Q&A" option to a "Q&A" panel. The "Q&A" panel has a back arrow, a title "Q&A", a settings gear, and a close "X" icon. It includes "Show" and "Sort by" dropdowns, both set to "All questions" and "Oldest first" respectively. Below these is the text "No questions yet". At the bottom, a red circle highlights a blue button labeled "+ Ask a question". The bottom of the screen shows a dark bar with icons for information, participants (with a '4' badge), chat, a group of people icon, and a lock icon.

Harmony Creek Site 2 & 3 - Public Information Center

Activities

- Breakout rooms
Split into smaller group discussions
- Polls
Get a quick pulse of the audience
- Q&A**
Give everyone an easy way to ask questions
- Recording
Record meetings for on-demand viewing
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Q&A

Show: All questions Sort by: Oldest first

No questions yet

[+ Ask a question](#)

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