Rambo Creek Erosion Control Project

Industrial Street to Mountain View Drive

City of Burlington Public Information Centre

February 15, 2023

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First Nations Land Acknowledgement

Burlington as we know it today is rich in history and modern traditions of many First Nations and the Métis. From the Anishinaabeg to the Haudenosaunee, and the Métis– our lands spanning from Lake Ontario to the Niagara Escarpment are steeped in Indigenous history.

The territory is mutually covered by the “Dish with One Spoon Wampum Belt Covenant,” an agreement between the Iroquois Confederacy, the Ojibway, and other allied Nations to peaceably share and care for the resources around the Great Lakes.

We would like to acknowledge that the land on which we gather is part of the Treaty Lands and Territory of the “Mississaugas of the Credit.”

Virtual Public Information Center Agenda

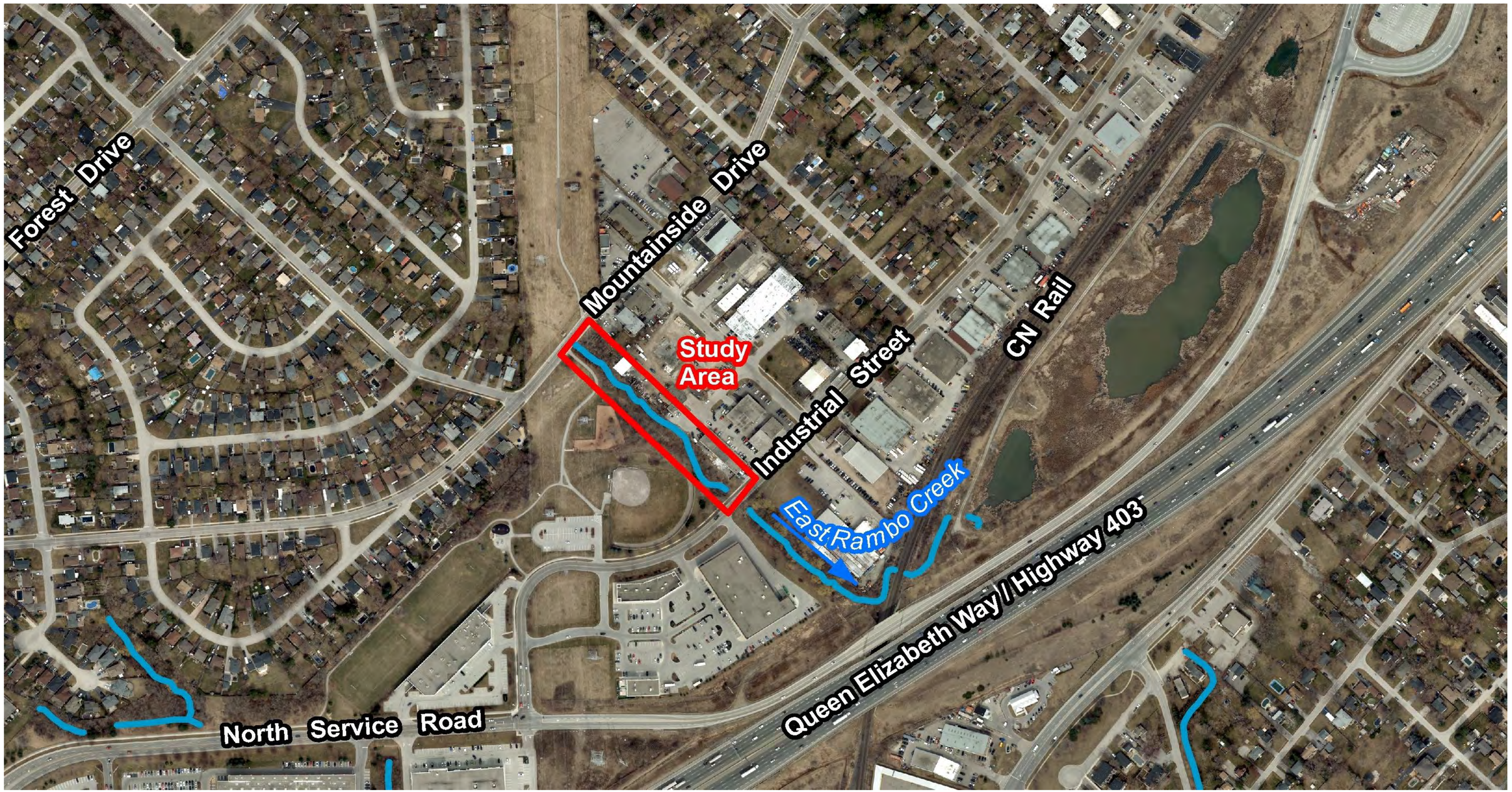


- Study Objectives
- Existing Conditions
- Alternative Solutions Development
- Alternative Solutions
- Evaluation Criteria
- Next Steps

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Study Area

The study area is located along East Rambo Creek, extending from Mountainside Drive to Industrial Street



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Problem Identification & Study Objectives

Through its ongoing erosion monitoring program, the City of Burlington identified areas of erosion concern along a reach of East Rambo Creek (from Industrial Road to Mountainview Drive), including:

- Bank erosion and instability
- Failure of existing erosion control measures
- Threats to private property, municipal park land and usage, and human safety
- Threats to utilities (hydro/gas) and municipal infrastructure (sanitary sewer)
- Impacts and risk to ecological features and habitat

The purpose of this study is to characterize and evaluate erosion issues and provide recommendations to reduce excessive erosion and associated risks to property, utilities, and human safety, while enhancing ecological features and habitat.



Municipal Class Environmental Assessment Process

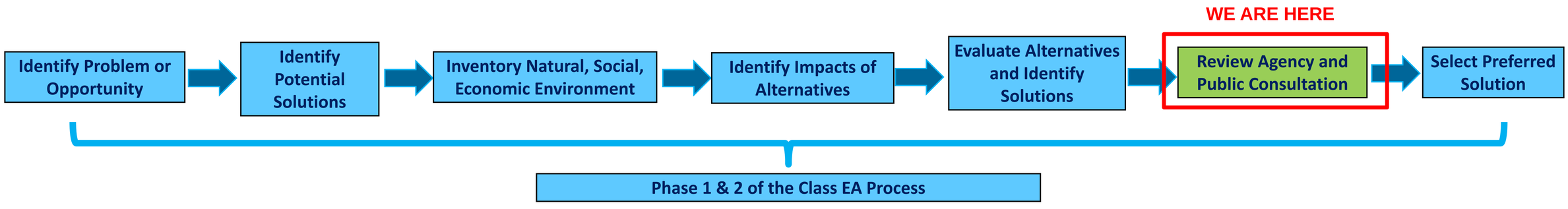
- The City of Burlington is undertaking a **Municipal Class Environmental Assessment** (MCEA) to assess erosion concerns for East Rambo Creek from Mountainside Drive to Industrial Street.

- The MCEA process provides opportunities for **public and stakeholder involvement** throughout the study.

- This process ensures that all **reasonable alternatives** are considered and that a selected alternative would have minimal impact on the surrounding environment.

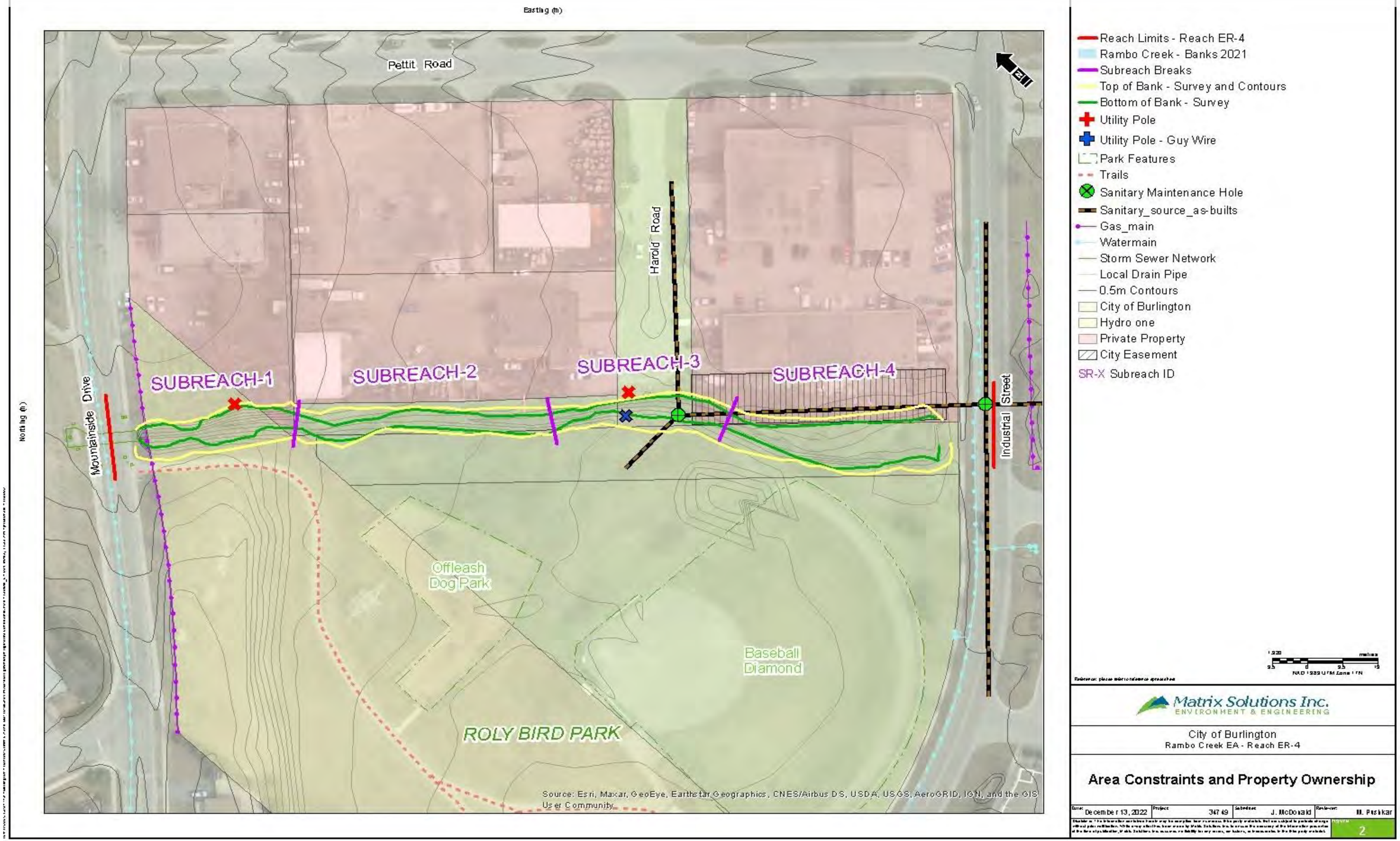
- This MCEA study is being undertaken as a **Schedule 'B'** Class EA project.

- We are currently at the stage of Agency and Public Consultation for: Problem Identification or Opportunities, and Alternative Solutions



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Study Area Constraints



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Channel Condition and Geomorphology

- Rambo Creek is relatively straight and situated in a 15 - 20 m wide vegetated corridor
- Several erosion sites were noted throughout the study area
- Urban storm flows are the primary driver of channel instability and erosion
- Middle reaches are relatively stable, though private property is at risk due to erosion
- Driving forces of flows are greater than resisting forces of channel under all flow conditions (i.e., this results in erosion)
- Sediment within the study area is derived locally through bed and bank erosion
- Channel has cut down into bedrock throughout the study area
- Bank treatments are generally unstable or failing
- Local floodplain is limited or absent, except for a short distance upstream of Industrial Street
- Industrial Street culvert is filling with sediment
- Four “Subreaches” have been delineated for the characterization and development of alternative solutions



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Natural Environment

- Field investigations completed during the spring and summer of 2022 included
  - Aquatic habitat assessment
  - Ecological Land Classification (ELC)
  - Vegetation Inventory
  - Fauna Inventory
  - Species at Risk Screening
  - Significant Wildlife Habitat Screening
  - Breeding Bird Surveys
  - Incidental Wildlife Observations
- Field Observations did not identify any Species at Risk (SAR) Flora Species.
- Aquatic habitat was considered to be degraded.
- Potential for four Species at Risk (SAR) bat species and one species of concern (monarch butterfly); as a result, the study reach is Candidate Significant Wildlife Habitat, and should be considered in the design and design implementation. NOTE: none were identified though 2022 field investigations
- Tree Inventory is to be completed Spring 2023



Social Environment & Considerations

- West side of Creek is adjacent to Roly Bird Park which contains a baseball field, an off-leash dog walking park, and multi-purpose trail that is at risk to erosion
- East side of Creek is adjacent to private property (commercial, residential, industrial) and Harold Road.
- Sanitary sewer is at risk (manhole, pipe)
- Other utilities that provide services at risk: gas lines and Burlington Hydro poles
- Erosion and sedimentation issues require frequent maintenance





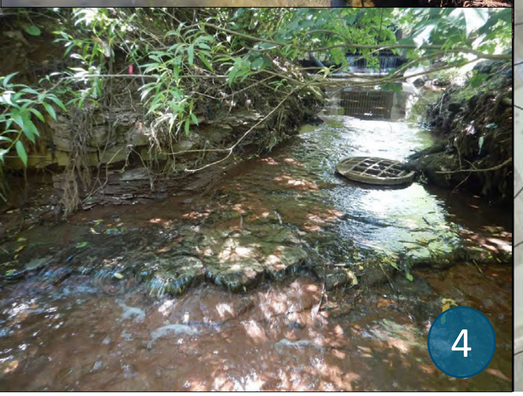
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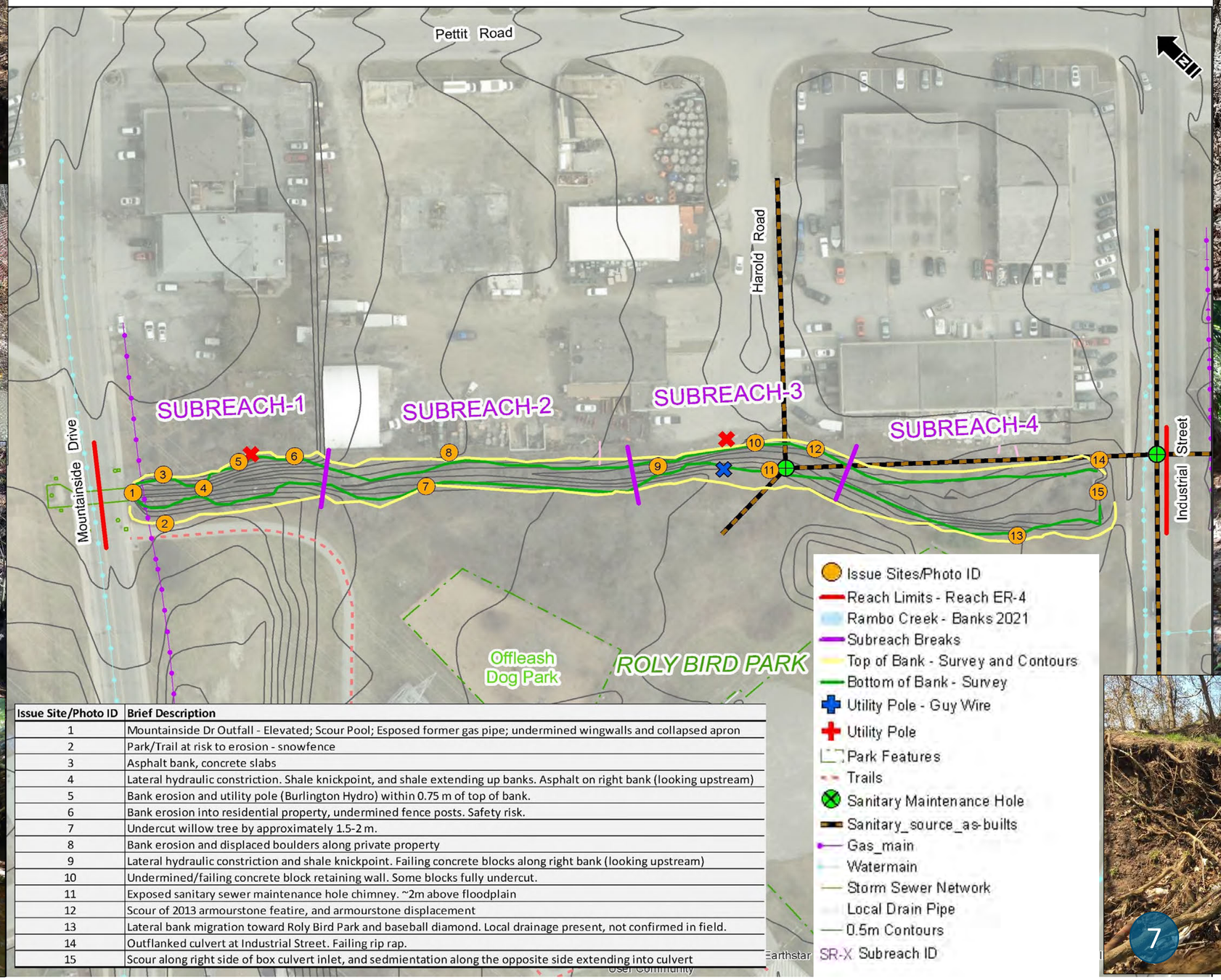
Summary of Identified Issues



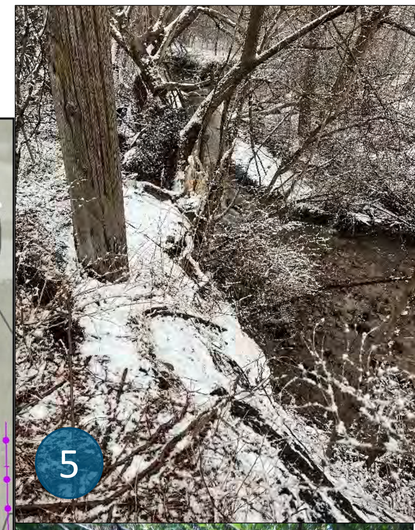


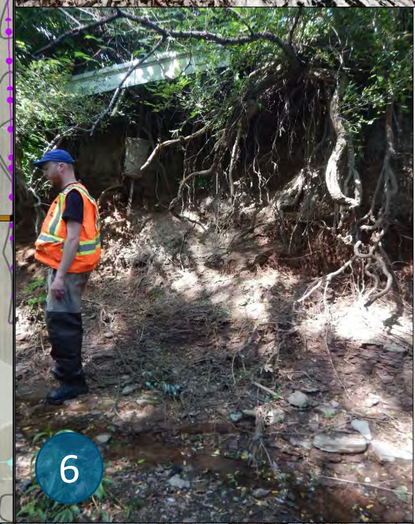


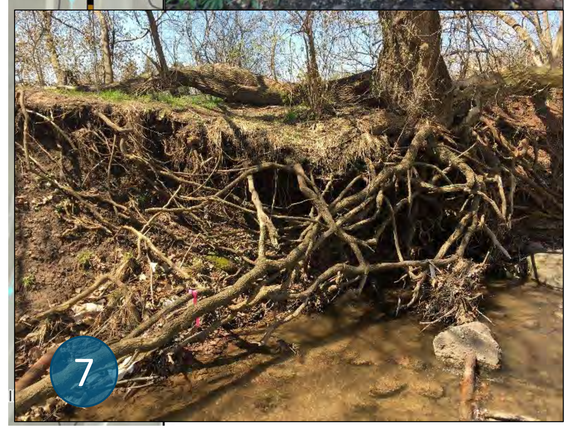




Issue Site/Photo ID	Brief Description
1	Mountainside Dr Outfall - Elevated; Scour Pool; Esposed former gas pipe; undermined wingwalls and collapsed apron
2	Park/Trail at risk to erosion - snowfence
3	Asphalt bank, concrete slabs
4	Lateral hydraulic constriction. Shale knickpoint, and shale extending up banks. Asphalt on right bank (looking upstream)
5	Bank erosion and utility pole (Burlington Hydro) within 0.75 m of top of bank.
6	Bank erosion into residential property, undermined fence posts. Safety risk.
7	Undercut willow tree by approximately 1.5-2 m.
8	Bank erosion and displaced boulders along private property
9	Lateral hydraulic constriction and shale knickpoint. Failing concrete blocks along right bank (looking upstream)
10	Undermined/failing concrete block retaining wall. Some blocks fully undercut.
11	Exposed sanitary sewer maintenance hole chimney. ~2m above floodplain
12	Scour of 2013 armourstone featire, and armourstone displacement
13	Lateral bank migration toward Roly Bird Park and baseball diamond. Local drainage present, not confirmed in field.
14	Outflanked culvert at Industrial Street. Failing rip rap.
15	Scour along right side of box culvert inlet, and sedmientation along the opposite side extending into culvert



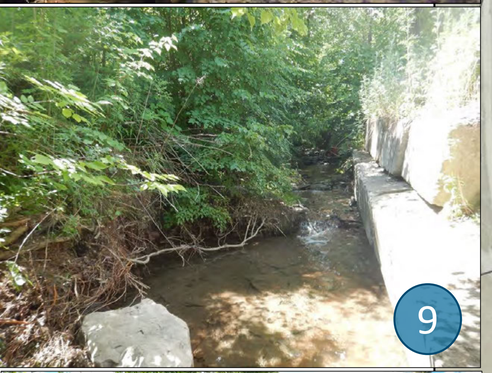




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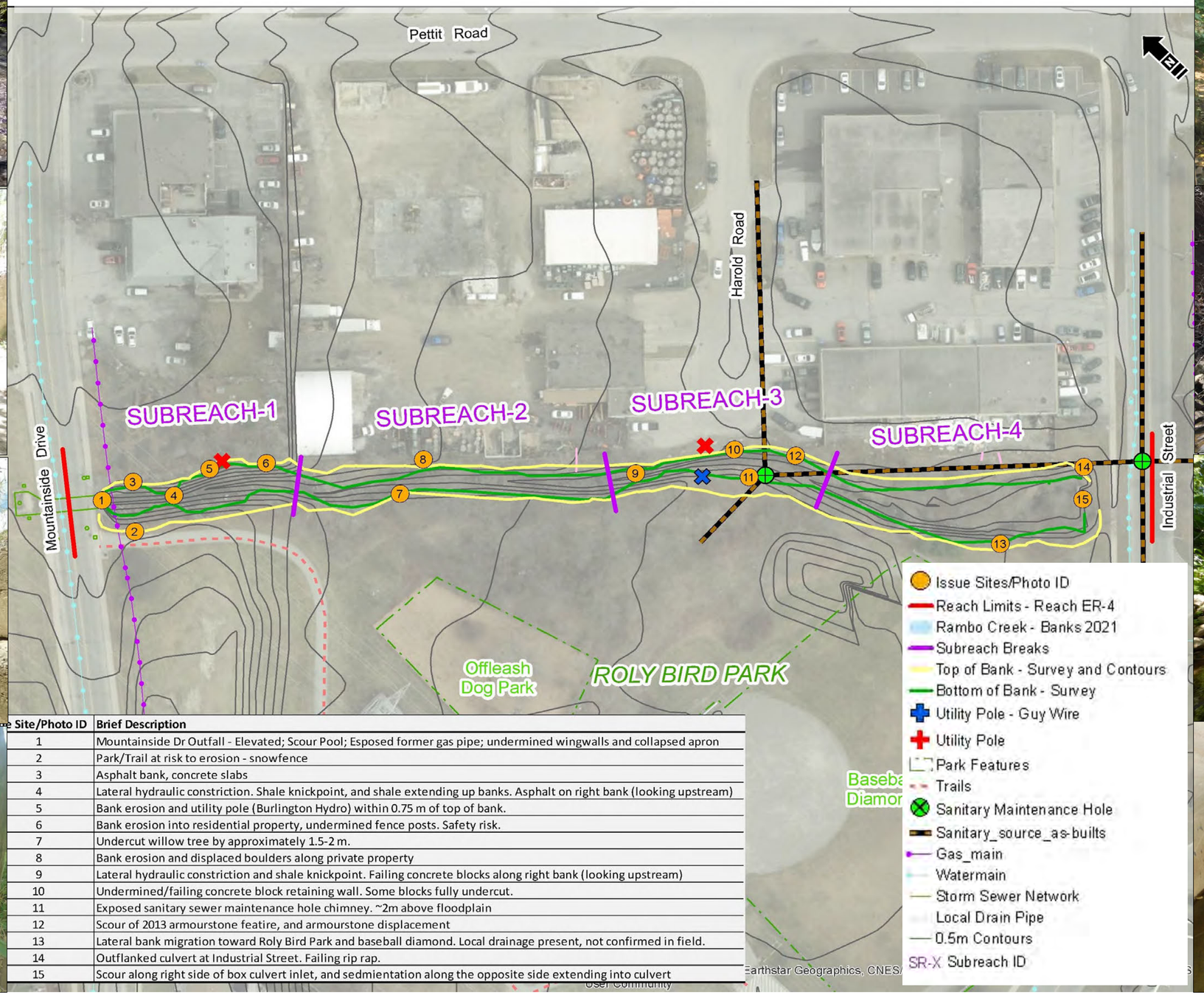
Summary of Identified Issues





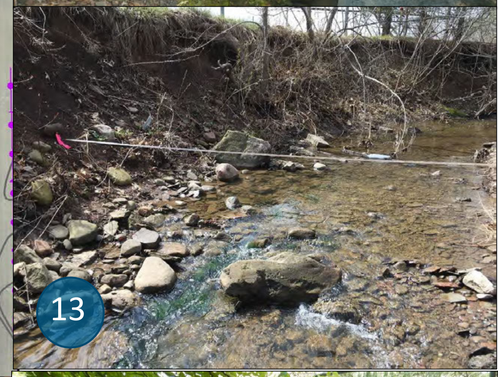






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Alternative Solutions Development

Alternative 1: Do Nothing

- No action taken to address identified erosion issues.
- Channel downcutting and enlargement will continue; this will further increase erosion risk.
- Bank erosion near Industrial Street will continue and sediment accumulation upstream of this culvert will continue.
- Risk to property, infrastructure, and safety likely to increase.
- No impacts to natural environment due to construction. But impacts due to channel degradation will continue.
- Always considered in an EA for comparative purposes.

Alternative 2: Repair and Replace/Enhance

- Channel generally remains in same position with minor/local shifts in planform.
- Repair or replace existing failing treatments: concrete slabs, asphalt, angular boulders, concrete blocks, armourstone blocks, rip-rap.
- Stabilize new erosion sites/concerns throughout the study area – bed and banks.
- “Softer” bank treatments to be considered where risks are lower, including channel training and incorporating vegetation.
- Local bed treatments are limited to grade control (armourstone ribs) for stabilization
- Provide cross-section modifications locally to reduce in-channel erosion potential.
- Protect the maintenance hole.

Alternative 3: Channel Realignment

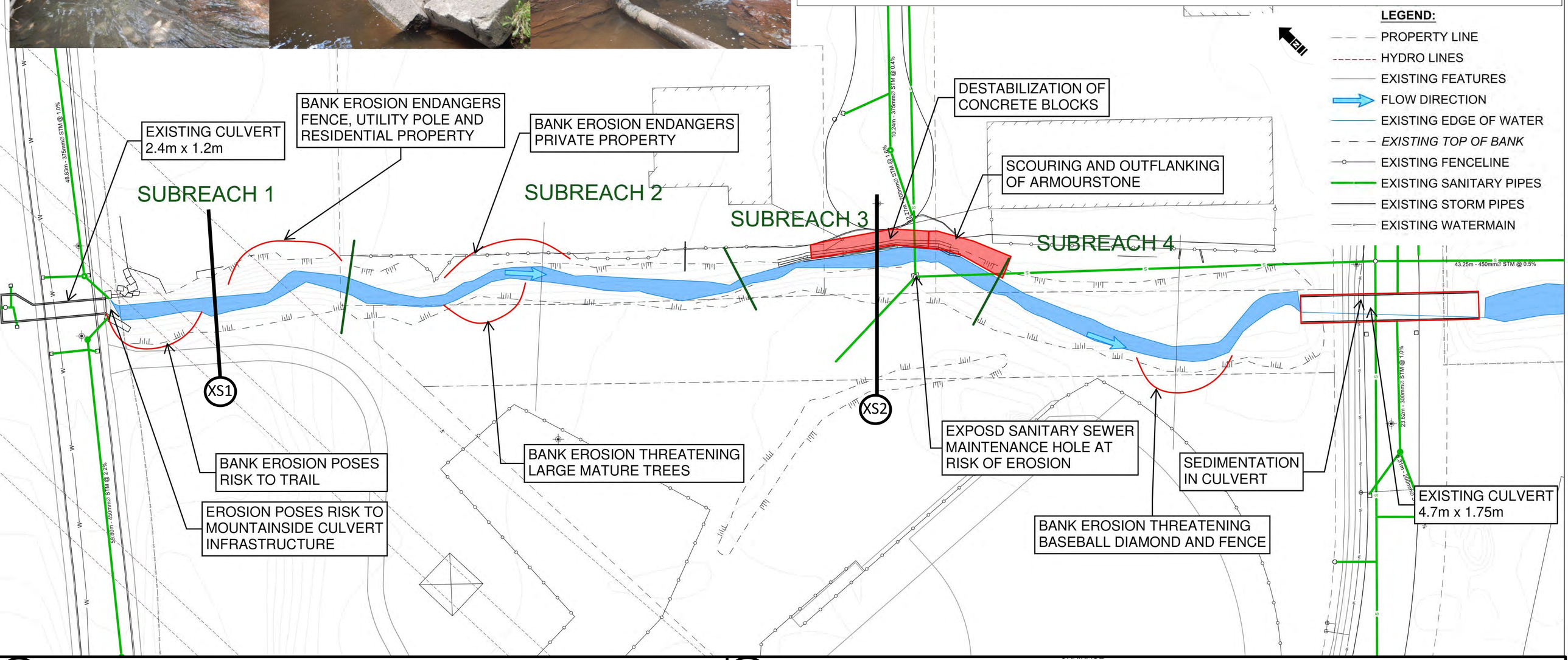
- Channel realigned into central position within corridor between private property and Park land, away from high risk areas; this would lengthen channel and include a meandering pattern.
- Bankfull channel set within design floodplain and corridor, attenuates in-stream stresses that contribute to erosion.
- Promote natural channel form and functions.
- Address all identified erosion issues including repair/replacement of erosion control, bank stability and drops in channel shale bed (knickpoint) stabilization.
- Softer bioengineering treatments possible due to reduced energy.
- Channel bed profile would be modified to provide grade control, with geomorphically referenced natural channel design.

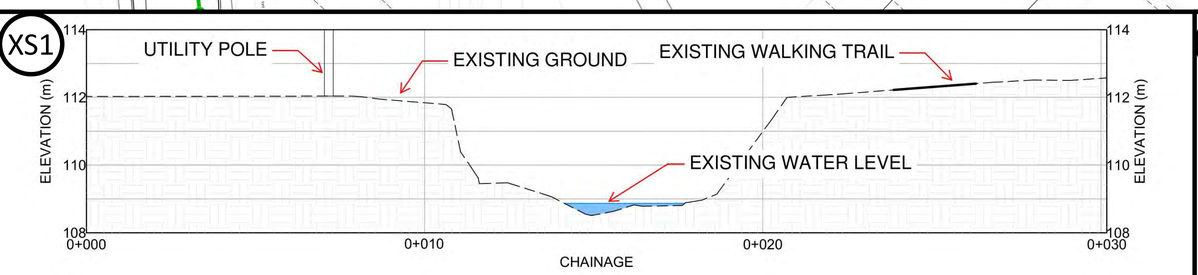
Alternative 1 – Do Nothing

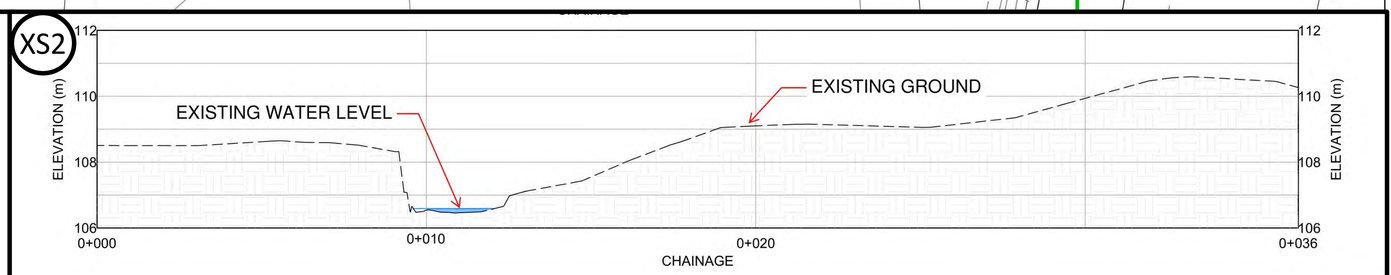


Description

- Existing channel processes will continue (i.e., widening, incision, deposition, planform development)
- Failure of concrete block, armourstone, and riprap bank treatments will continue to occur
- Risk to culvert, utilities (poles and pipes) and private property will remain, and worsen
- Ecological degradation to continue





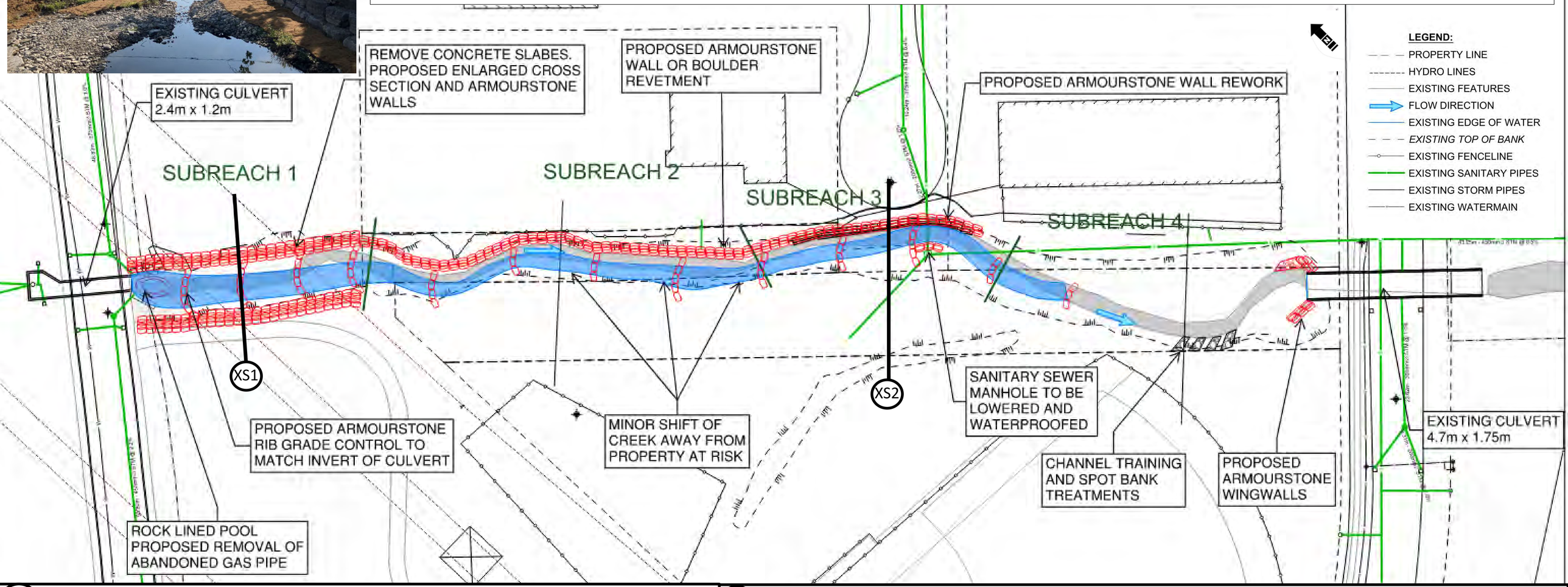


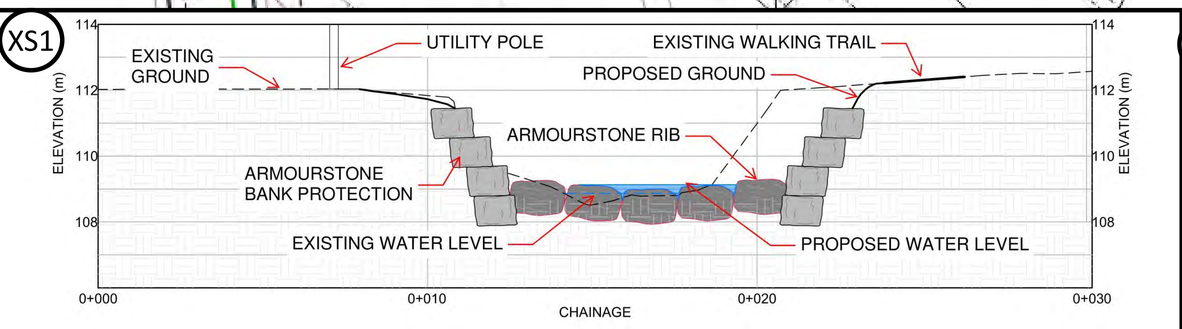
Alternative 2 - Repair and Replace/Enhance

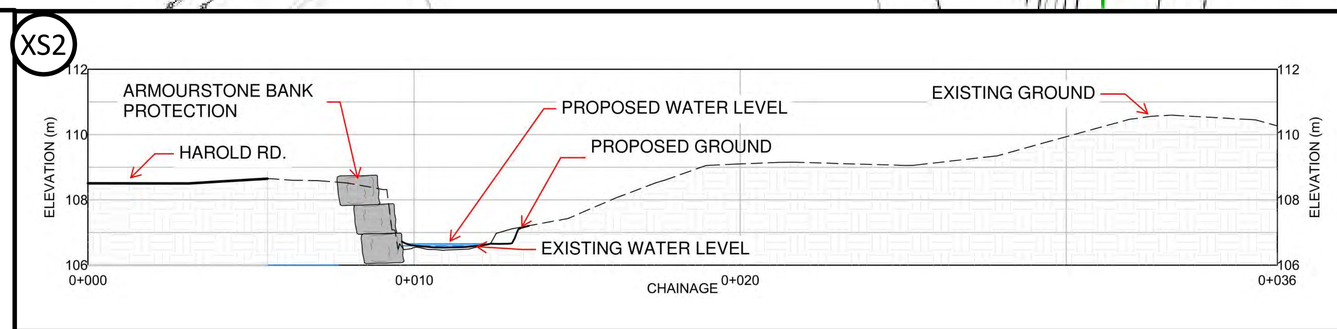


Description:

- Address failing bank treatments, manage hydraulic flow conditions and enhance geomorphic characteristics and stability
- Increase capacity to reduce hydraulic stresses and stream power on bed and bank materials
- Reduce erosion risk to property and/or infrastructure by using river training techniques (e.g., deflectors)
- Provide future protection for potential risks to infrastructure, and minor/localized realignment away from risk
- Provide subaqueous protection of bedrock would be provided, where possible, to protect the bedrock from wetting/drying processes







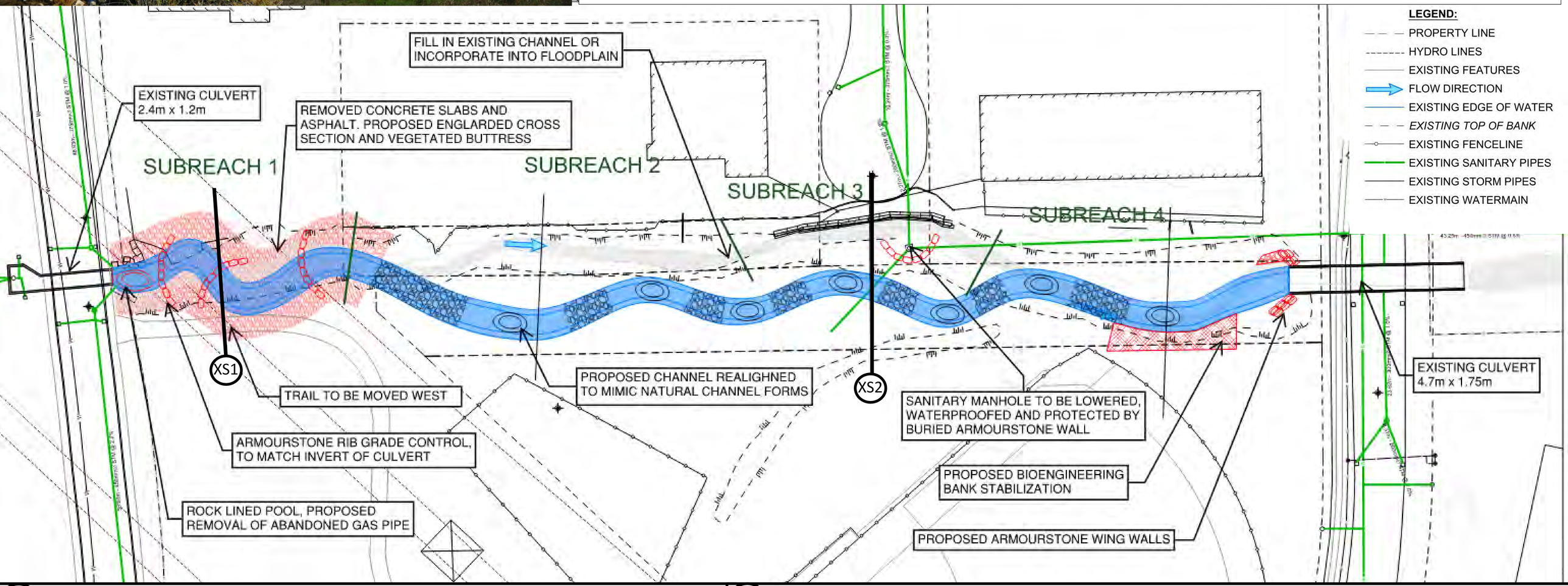
Alternative 3 - Channel Realignment

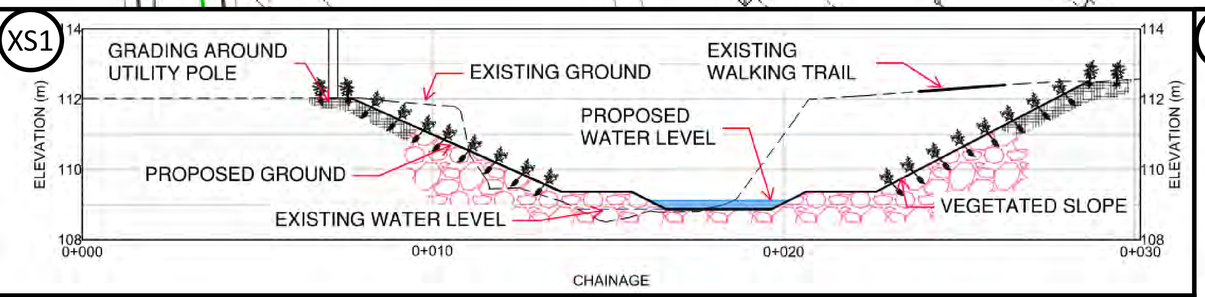


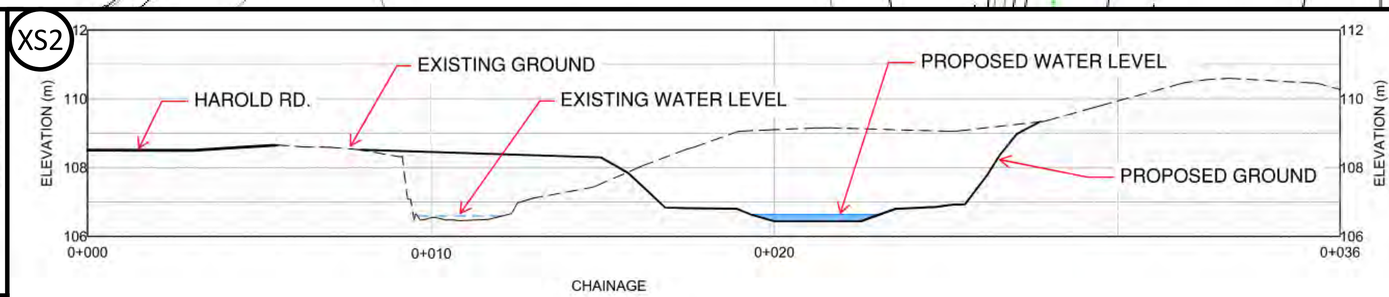


Description

- All identified erosion issues including repair/replacement of erosion control measures, bank stability, and knickpoint stabilization would be addressed
- Cross-section would include a nested bankfull channel to enhance geomorphic and ecological processes, while a wider corridor and floodplain would reduce flow energy
- Channel bed profile would be modified to conform with naturally occurring patterns of riffles and pools
- The position of the creek would be altered, where feasible, to reduce overall erosion risk
- Could reduce risk to the sanitary sewer and features







Evaluation Criteria

Category	Criteria
Environment	• Impact on aquatic habitat and species • Impact on terrestrial habitat and communities • Impact on Species at Risk (SAR) and associated habitat • Potential for enhancement
Technical	• Erosion protection • Impacts to stream processes • Flood risk • Constructability • Construction impacts (temporary) – site access, noise, vibration, impacts to residents and businesses • Operation and maintenance
Social	• Public health and safety • Protection of residents, buildings, and property • Aesthetics (vegetation removal, material placement, restoration) • Impact on use of Roly Bird Park and amenities • Archaeological value • Indigenous communities
Economic	• Flood damages • Construction cost (short term & long term) • Implementation costs • Operation and maintenance • Cost comparison

Next Steps



- Compile and review feedback from Public Information Centre and Review Agencies
- Confirm preferred solution(s) and implementation plan
- Finalize Study Report for agency and public review (30-day comment period)
  - Early March 2023
- Undertake design of preferred alternative
  - To be completed by August 2023
- Construction Anticipated for Fall 2023

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