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*Presentation by Golder Associates, for
Public Services and Procurement Canada,
Transport Canada & Parks Canada*

Kingston Inner Harbour – Conceptual Sediment Management Plan

Presentation to City of Kingston -
Environment, Infrastructure and Transportation Policies Committee

September 28, 2021

Introductions

PURPOSE AND OBJECTIVES

- Share information with the City of Kingston regarding Transport Canada and Parks Canada's conceptual plans for managing contaminated sediment within Kingston Inner Harbour
- Invite questions from the City of Kingston regarding the conceptual plan and its supporting scientific studies
- Facilitate feedback from the City of Kingston regarding their interest in partnering on the sediment management project



Introductions

PROJECT TEAM

Site Custodians

Transport Canada / Parks Canada

Technical Expert, Contracting Authority

Public Services and Procurement Canada

Conceptual Plan, Engagement
Consultant

Golder Associates

Ecological Inventory, Impact
Assessment Consultant

SNC-Lavalin

Design Consultant

TBD

Introductions

GOLDER PROJECT TEAM

Gary Lawrence, R.P. Bio, Associate / Senior Environmental Scientist

- **Project Director**
- **25 years experience in assessment/management of aquatic contaminated sites, specific focus on sediment quality and persistent substances**
- **Instructor - Framework for Addressing and Managing Aquatic Contaminated Sites under the Federal Contaminates Sites Action Plan**



Shawn Seguin, R.P. Bio, Senior Environmental Scientist

- **Project Manager**
- **18 years experience in ecological risk assessments, environmental effects monitoring and assessments, environmental permitting, and sediment remediation**
- **Manages remedial design, dredging, and marine construction projects, with emphasis on environmental assessments and management**



AGENDA

Site Background

- Federal Contaminated Sites Policy and Prioritization
- History of Contamination
- Management Area and Jurisdiction

Studies and Results

- Assessment and Management Frameworks
- Sediment Chemistry and Ecological Impairment
- Risk Assessment - Approach and Outcomes

Recommended Management Strategy

- Risk Management Approach and Considerations
- Source Control and Potential for Recontamination
- Management Options and Conceptual Plan
- Residual Risk and Uncertainties

Current Status

- Preliminary Planning
- Impact Assessment and Supporting Studies
- Engagement

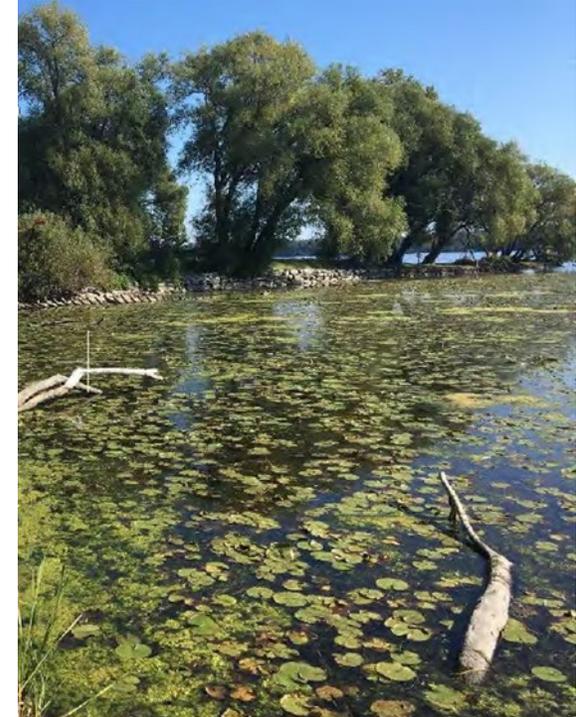
Next Steps

- Key Steps and Schedule

Site Background

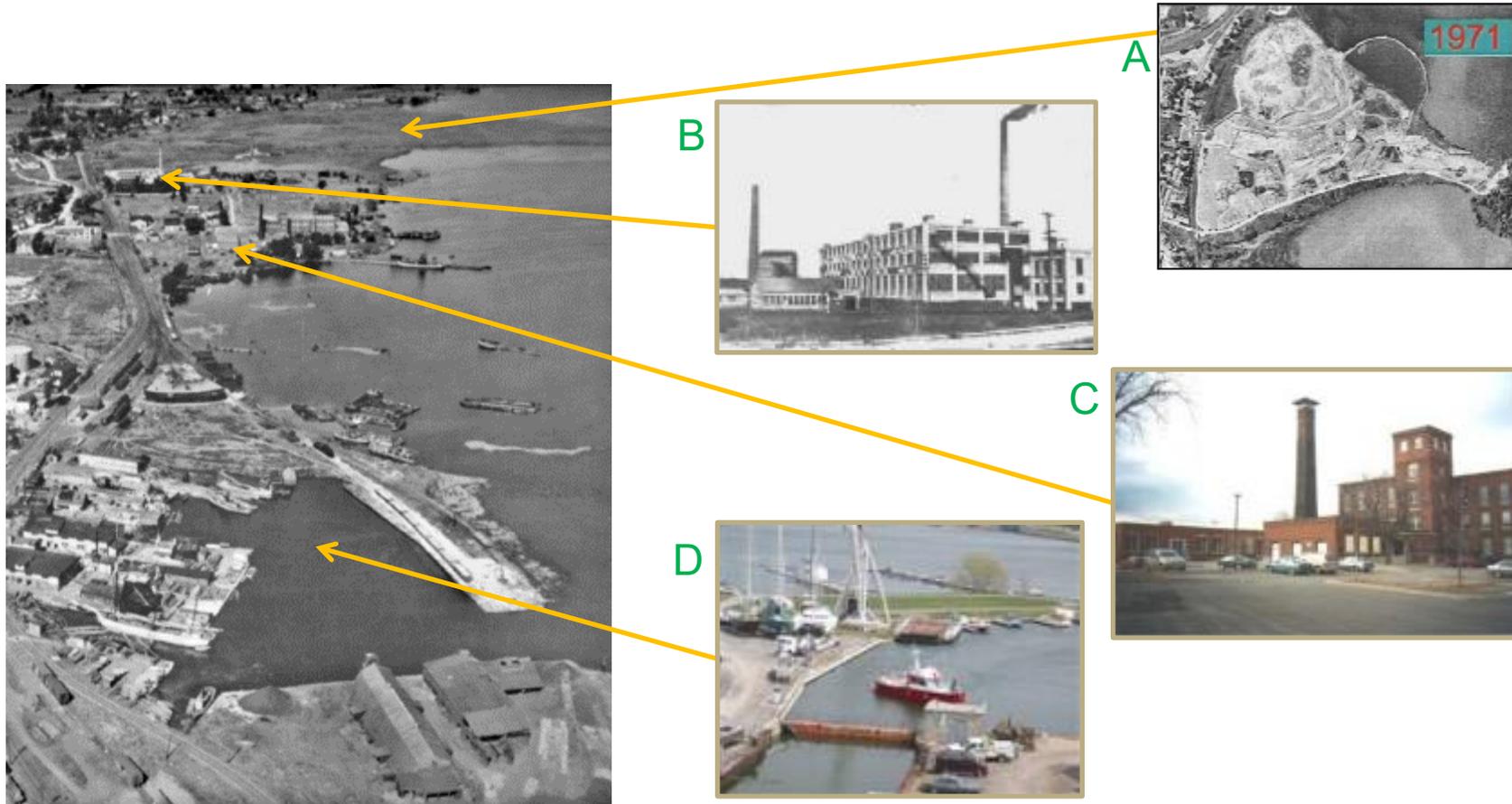
FEDERAL CONTAMINATED SITES POLICY AND PRIORITIZATION

- **Federal *Policy on Management of Real Property* requires federal property to be managed protective of people and the environment**
- **Federal Contaminated Sites Action Plan (FCSAP) aims to reduce environmental and human health risks and associated liabilities from known federal contaminated sites**
- **Federal aquatic sites are classified based on the Aquatic Sites Classification System, which evaluates sites in a systematic manner, according to potential for adverse impacts**
- **Kingston Inner Harbour has been classified as a Class 1 site, meaning it is a high priority for action**



Site Background

HISTORY OF CONTAMINATION



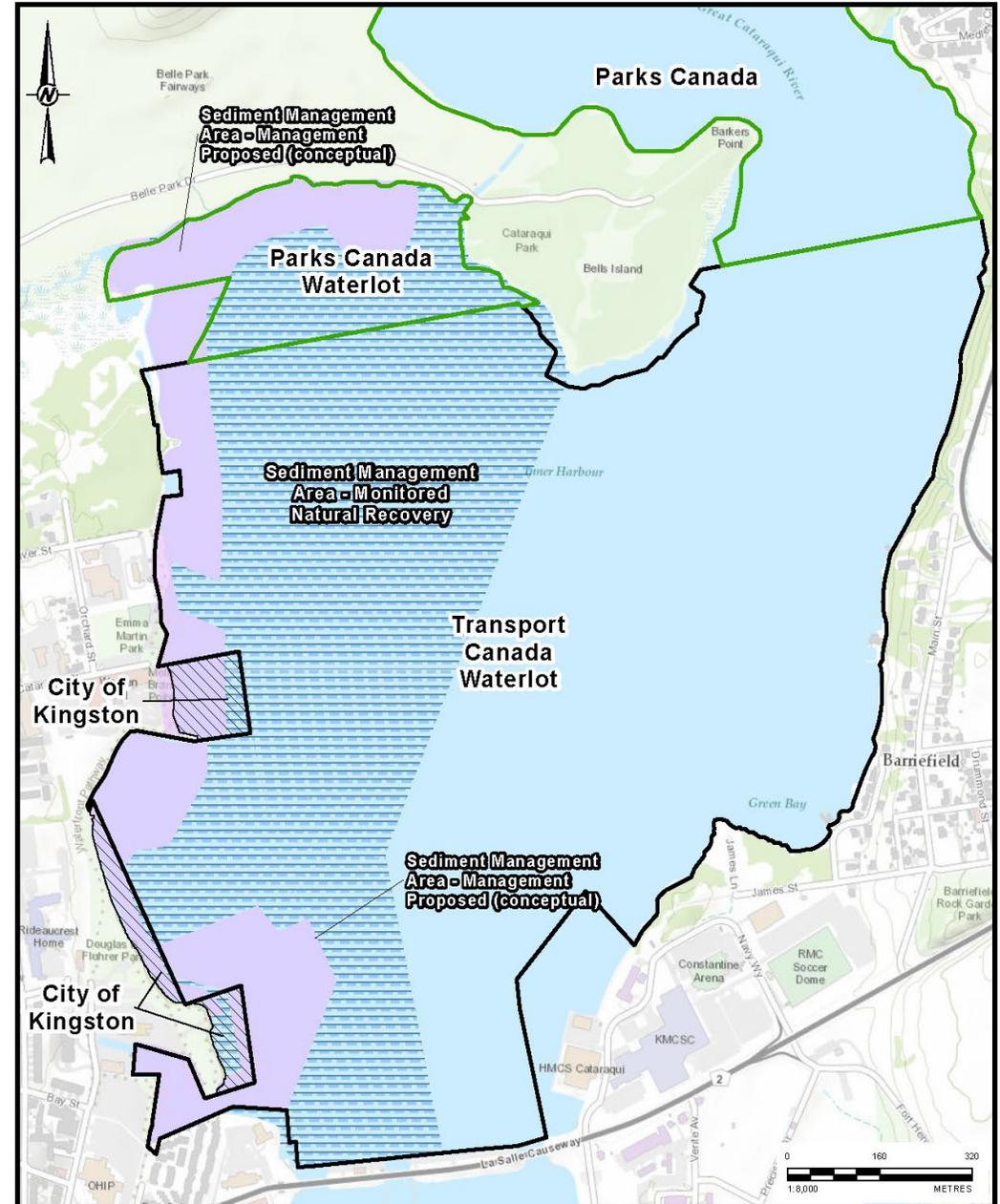
- Historical contaminating industries: coal gasification, tannery, lead smelter (B), manufacturing/fabrication, landfill (A), mills (C), shipyards (D), fuel depot, railway

Site Background

MANAGEMENT AREA AND JURISDICTION

- Management area includes approx. 1.7 km of Great Cataraqui River, bound by Hwy 2 (LaSalle Causeway) to the south and Belle Island to the north, on the west side of the harbour

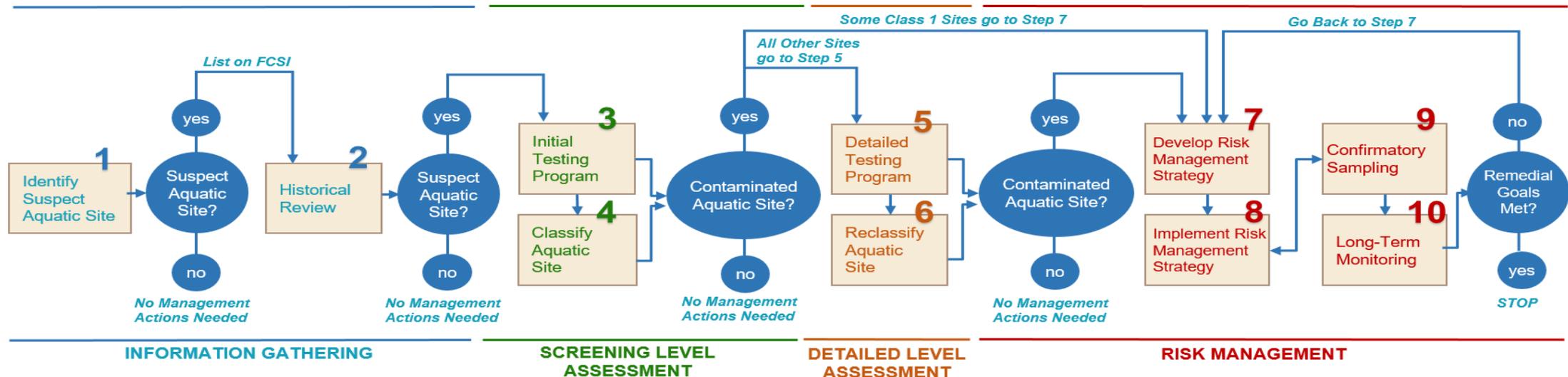
- | | | |
|-----------|---|--------------------|
| Federal | } | • Parks Canada |
| | | • Transport Canada |
| | | • National Defence |
| Municipal | } | • City of Kingston |



Environmental Studies and Results

ASSESSMENT AND MANAGEMENT FRAMEWORKS

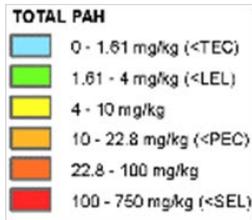
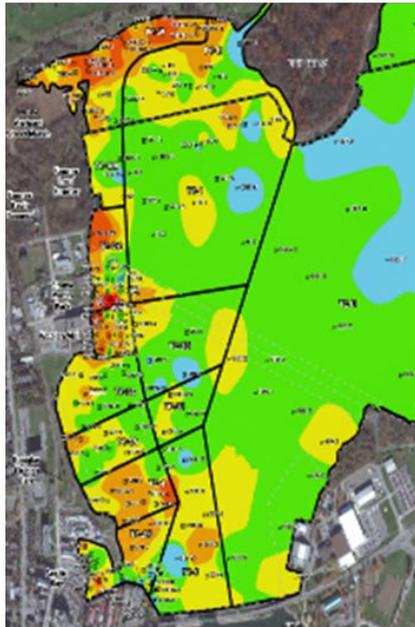
- Numerous studies building on work by RMC, including studies on sediment quality, risk evaluation, sediment transport and stability, and other targeted research (e.g., fish deformities)
- Investigations and analysis based on federal guidance, peer-reviewed by scientists at Fisheries and Oceans Canada, Environment and Climate Change Canada and Health Canada:
 - Canada-Ontario Decision-Making Framework for Assessment of Great Lakes Contaminated Sediment
 - Framework for Addressing and Managing Aquatic Contaminated Sites under FCSAP
 - Guidance for Assessing and Managing Aquatic Contaminated Sites in Working Harbours
- Three pre-requisites to planning: determine cause of contamination; control on-going sources; ensure management actions do not cause more environmental damage than they remedy



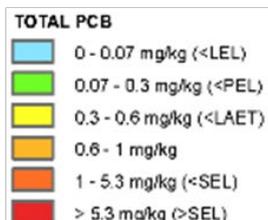
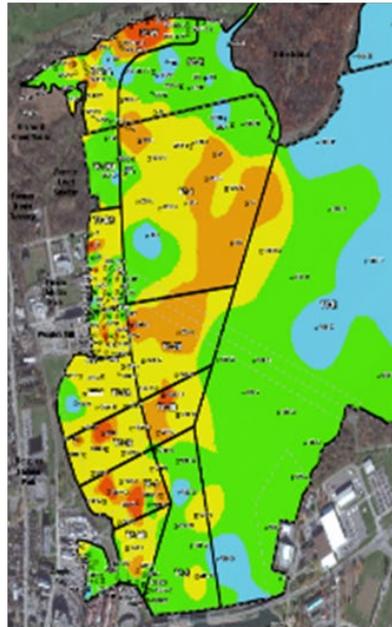
Environmental Studies and Results

SEDIMENT CHEMISTRY AND ECOLOGICAL IMPAIRMENT

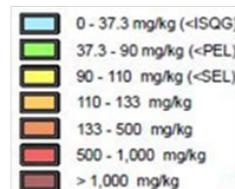
Polycyclic aromatic hydrocarbon (PAH)



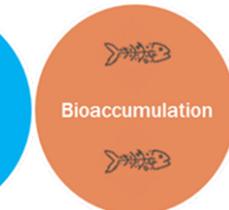
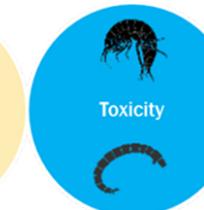
Polychlorinated biphenyl (PCB)



Chromium



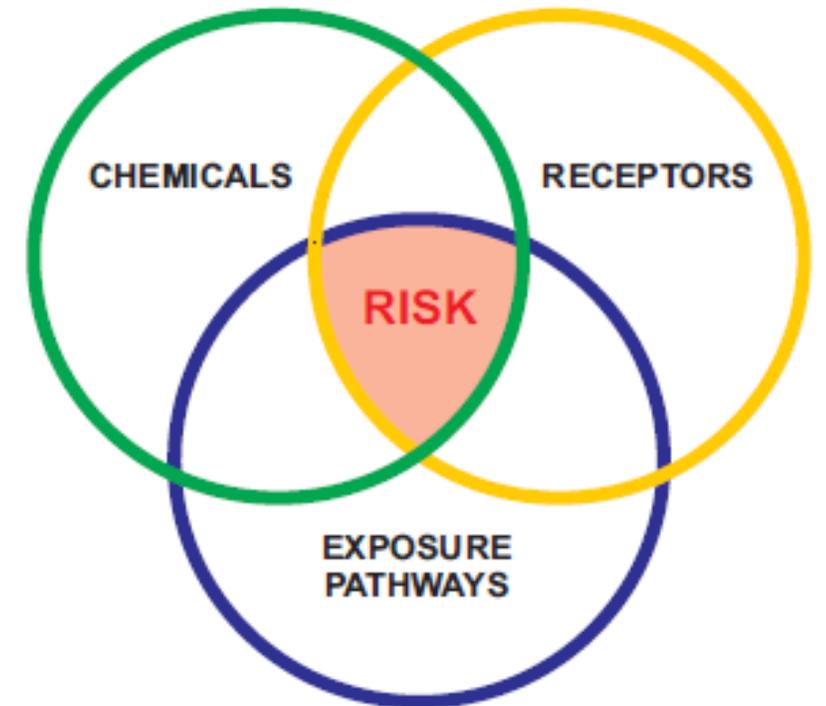
- Eastern KIH exhibited sediment quality similar to reference conditions, with no consistent indications of ecological impairment – no management action recommended
- Western KIH exhibited evidence of impairment - sediment chemistry, biological and toxicological effects, and other factors (bioaccumulation) assessed to determine need for management action



Environmental Studies and Results

RISK ASSESSMENT APPROACH

- **Environmental risk assessment is a scientific approach to estimating the likelihood and severity of potential adverse health effects (potential risks) resulting from exposure to contaminants**
- **Three components must be present for potential risks to exist:**
 - 1. the amount of the chemical in the environment is high enough to potentially harm organisms (people, fish, wildlife, etc.)**
 - 2. a receptor (e.g., people, fish, wildlife) that can eat or be exposed to the chemical must be at the site at least some of the time**
 - 3. there must be a way for the organism to contact the chemicals**

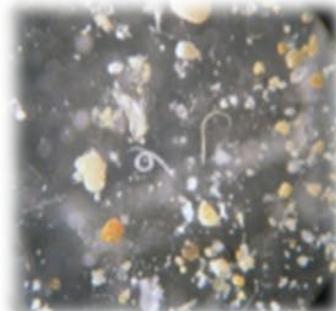


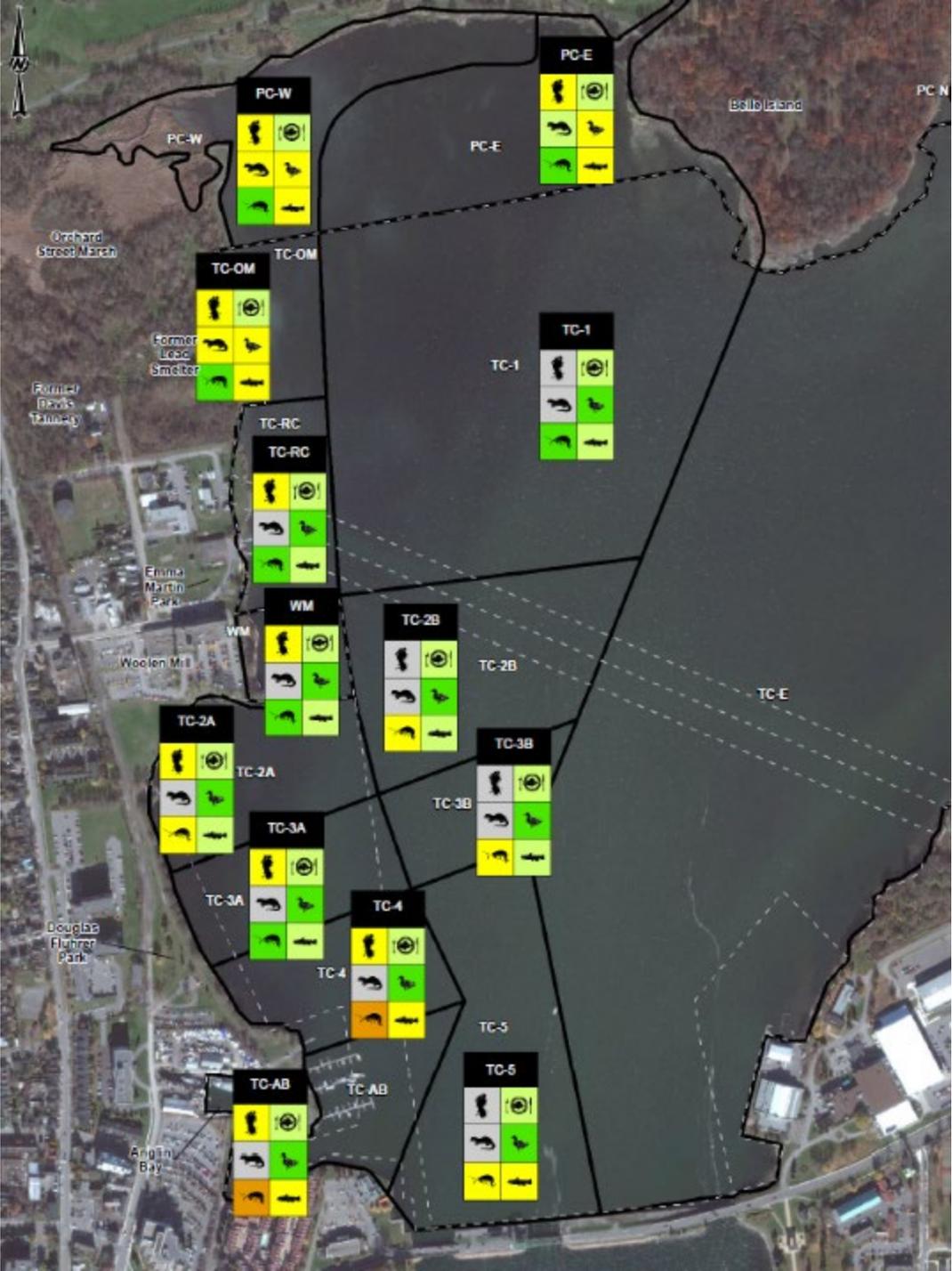
Environmental Studies and Results

RISK ASSESSMENT APPROACH

- **Multiple lines of evidence, including comparison to reference (background) conditions**
- **Risk of adverse effects considered in five categories:**

	NOT APPLICABLE	Receptors not present / contact unlikely
	NEGLIGIBLE RISK	Contaminants below guidelines considered to be safe
	LOW RISK	Contaminants exceed guidelines, concentrations tolerated by most receptors
	MODERATE RISK	Contaminants likely affect sensitive receptors, eco communities may be altered
	HIGH RISK	Potential for larger alterations to communities or health





Studies and Results

RISK ASSESSMENT OUTCOMES

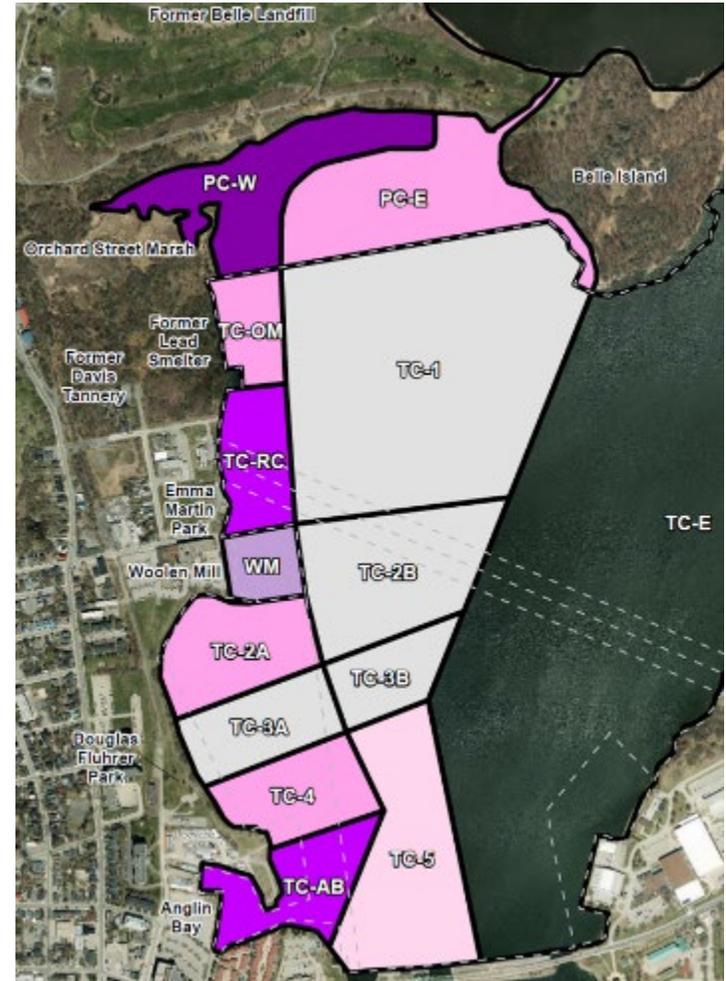
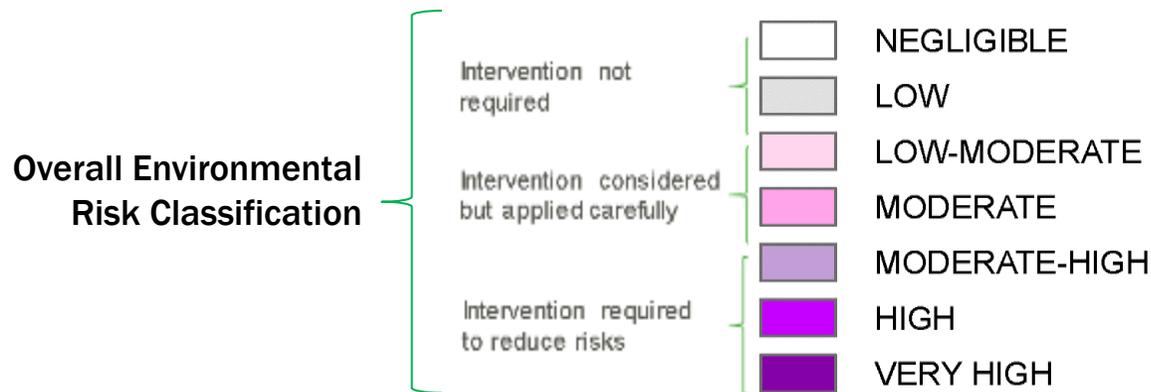
-  NOT APPLICABLE
-  NEGLIGIBLE RISK
-  LOW RISK
-  MODERATE RISK
-  HIGH RISK

	
Human health— dermal contact	Human health—fish ingestion
	
Ecological health— mammalian wildlife	Ecological health— avian wildlife
	
Ecological health— benthic community	Ecological health— fish

Recommended Management Strategy

RISK MANAGEMENT APPROACH

- Create Management Units to allow a customized approach based on localized conditions, habitat values, and other considerations
- Focus physical intervention on areas of higher risk (intervention for “moderate” risk magnitude or higher)
- Accept low risk conditions that can be managed through natural recovery or administrative controls
- Allow for adjustments based on input from Indigenous communities and stakeholders



Recommended Management Strategy

CONSIDERATIONS

Risk
Reduction

Environmental

Social

Economic



- **Reduction of contaminant levels and exposure to contamination**
- **Indigenous rights and interests**
- **Protection of sensitive habitats, utilities/infrastructure**
- **Archaeological, recreational, aesthetic values**
- **Practical and feasible management methods**
- **Fiscal responsibility**
- **City of Kingston waterfront master plan**

Recommended Management Strategy

SOURCE CONTROL AND POTENTIAL FOR RECONTAMINATION

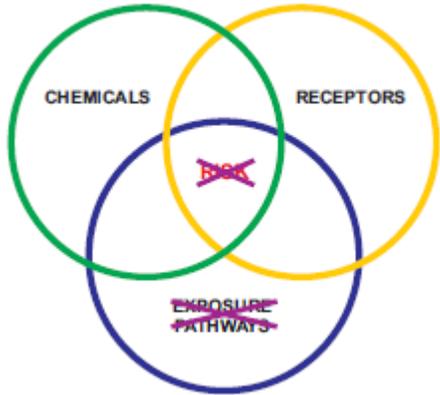
- **Most contamination from historical activities in surrounding areas is being managed, or planned for management, which will help prevent future contamination of the harbour**
- **Brownfield area that includes Orchard Street Marsh requires containment of contaminated soil – capping planned as part of property development, additional measures likely required by City of Kingston (municipal land north of private property)**
- **KIH may continue to receive inputs from active uses (e.g., stormwater, boat traffic) - ongoing sources not expected to worsen conditions beyond the managed level**
- **City and other harbour users encouraged to comply with all current environmental regulations and to apply best practices that will reduce likelihood of recontamination**



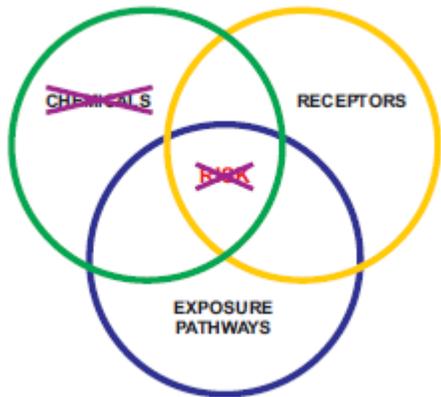
Recommended Management Strategy

MANAGEMENT OPTIONS

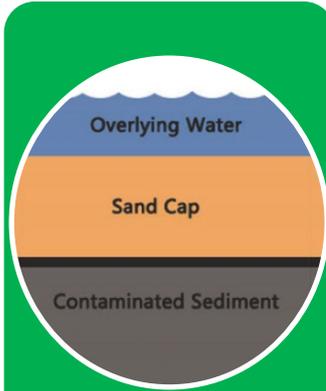
Risk Management



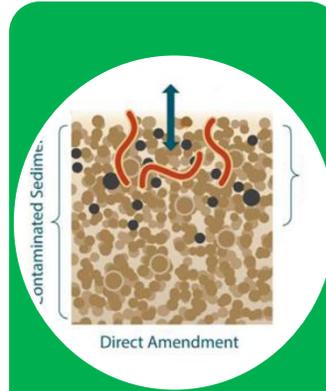
Remediation



Dredging



Conventional capping



Thin-layer activated carbon capping



Engineered shoreline features



Monitored natural recovery

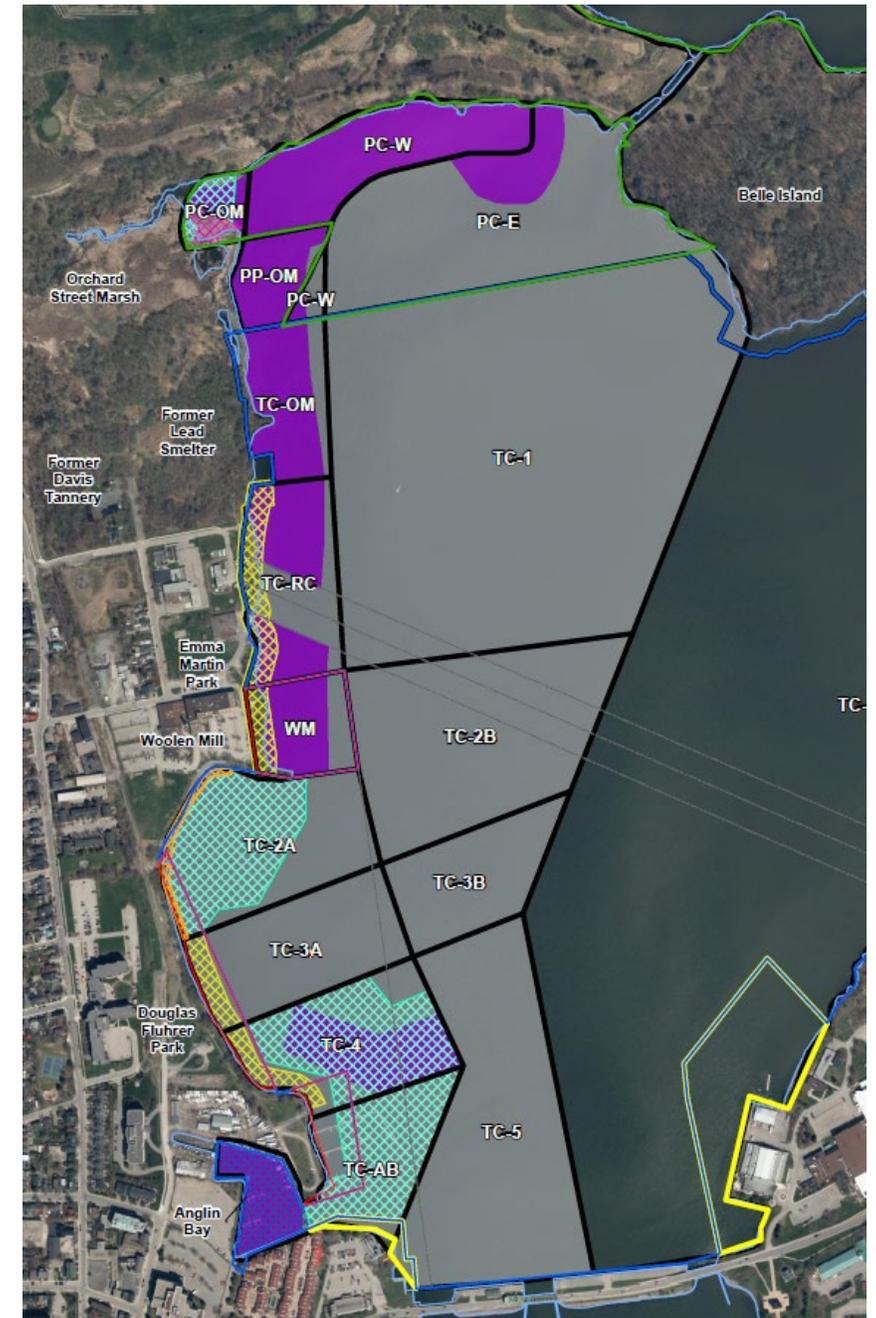
Strategy includes combinations of above for each management unit

Recommended Management Strategy

CONCEPTUAL SEDIMENT MANAGEMENT PLAN

- Balance least amount of disturbance with greatest degree of risk removal
- Natural recovery is significant component - physical intervention only recommended for higher risk areas where natural recovery not effective
- Approaches for each area carefully chosen to balance reducing amount of chemicals against disturbance of habitat
- Intervention techniques proven to be safe and effective:
 - **Dredging:** remove contamination where it cannot be effectively managed in place, limit to highest risk areas
 - **Capping:** isolate contamination where it is effective to manage in place, carbon to absorb contaminants, thin cap in shallow areas
 - **Shoreline Engineering:** isolate and/or limit access to near-shore contaminants, integrate habitat enhancement features and recreational uses

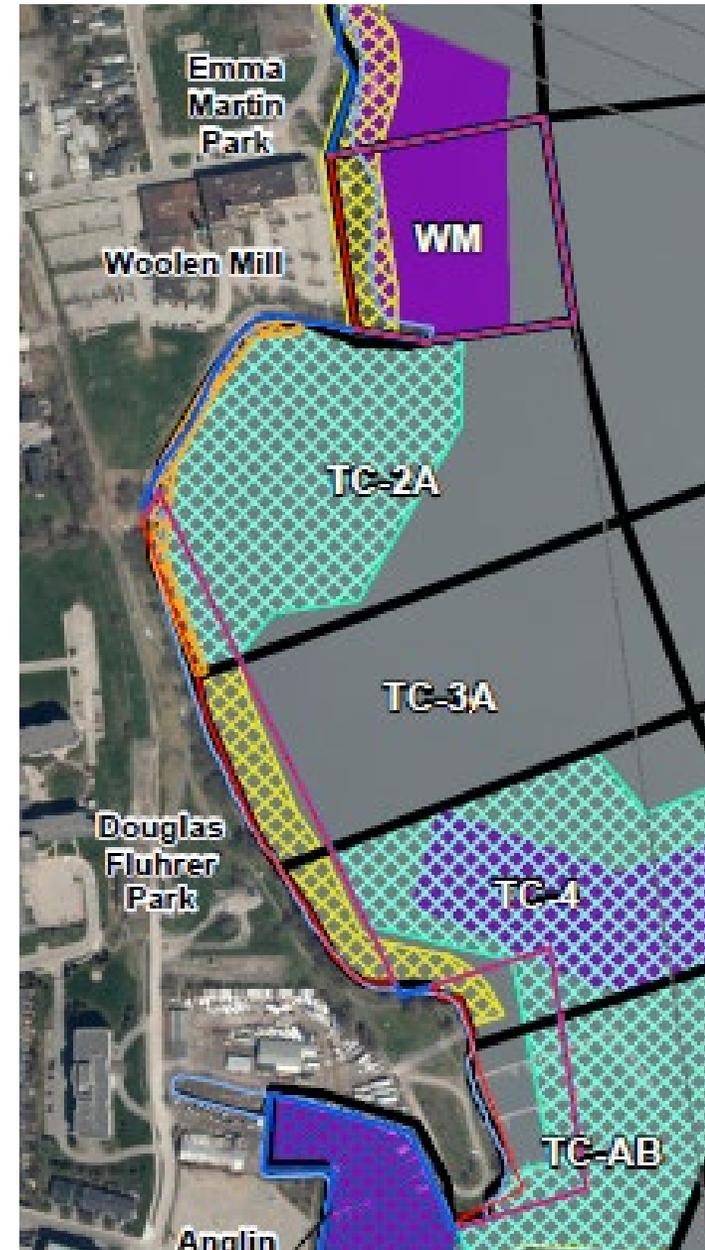
	CAP (CONVENTIONAL WITH ACTIVATED CARBON)
	THIN CAP WITH ACTIVATED CARBON
	ENGINEERING CONTROL (SHORELINE REVETMENT)
	ENGINEERING CONTROL (BOARDWALK)
	HABITAT MOSAIC (WETLAND REMEDIATION)
	DREDGED SURFACE SEDIMENT
	MONITORED NATURAL RECOVERY



Recommended Management Strategy

CONCEPTUAL PLAN - CITY OF KINGSTON PROPERTY

- **Woolen Mill (WM)** – dredging, shoreline controls and natural recovery recommended
- **Douglas Fluhrer Park (shoreline of 2A, 3A, 4, AB)** – capping, shoreline controls and natural recovery recommended (dredging not recommended in City-owned area due to high habitat and archaeological values, and lower contamination)
- **Could incorporate shoreline measures that will mitigate risk of exposure and may be desirable to the City for other reasons (i.e., aesthetic, recreational value)**
- **Alternative options can be considered - strategy developed to allow flexibility in application of shoreline measures**



Recommended Management Strategy

RESIDUAL RISK AND UNCERTAINTY

- **Dredging will remove some but not all contamination**
- **Some residual risk will remain:**
 - **No population-level risks to fish; low risk to individual bottom-feeding fish (potential for lesions)**
 - **Negligible risk to most wildlife species; low risk to wildlife species with small home ranges that reside in the marsh**
 - **Negligible risk to humans (fish consumption advisories remain in place)**
- **Potential for partnership between TC, PC and the City – higher residual risks will remain if partnership not pursued**
- **May need to implemented in phases, depending on various factors**



Current Status

PRELIMINARY PLANNING



- **Engaging and consulting with Indigenous communities**
- **Seeking internal approvals and partnerships**
- **Determining regulatory requirements (e.g., *Impact Assessment Act, Fisheries Act, Canadian Navigable Waters Act*, other permitting)**
- **Completing inventory/assessment work**
- **Refining conceptual plans**
- **Early engagement with key stakeholders**
- **Businesses operating in KIH will be consulted to ensure potential impacts to operations can be identified and mitigated**

Current Status

IMPACT ASSESSMENT AND SUPPORTING STUDIES

- Detailed Impact Assessment (DIA) underway (preliminary stage) to determine if project may cause significant adverse environmental effects (*PC Impact Assessment Directive*)
- Changes to design will be made if there is potential for significant adverse effects that can't be mitigated
- Mitigation measures to prevent or minimize adverse effects will be implemented – an environmental protection plan will be developed, and the project will be monitored to ensure compliance with environmental protection requirements
- Baseline studies being completed to facilitate evaluation of potential effects, including archaeological assessments, aquatic vegetation, aquatic wildlife, bat, breeding bird and waterfowl stopover surveys, fish/fish habitat characterization



Current Status

ENGAGEMENT

- Preliminary stage of engagement, exploring potential partnership opportunities
- Ongoing discussions with Indigenous communities
- Seeking initial feedback and information sharing from key stakeholders (City of Kingston, regulators, adjacent landowners/tenants, businesses that operate in KIH, community groups with a specific interest in KIH, etc.)
- Opportunities for general public engagement will be provided as planning progresses



Next Steps

KEY STEPS AND SCHEDULE



- Schedule is approximate and could change
- Preliminary project details are currently available - specific details will be established / refined as planning and detailed design progress
- Conceptual SMP will be refined following initial engagement and confirmation of partnership interest
- Detailed design based on revised conceptual SMP – refinements continue as detailed design progresses, based on additional data, engagement feedback and impacts identified through DIA