IIWWTP – ETAP Main Room Meeting Minutes
June 1, 2022 – 1pm-4pm
Meeting Platform: Zoom Meeting
Draft Minutes

Summary of Iona Island Wastewater Treatment Plant (IIWWTP) Ecological Technical Advisory Panel (ETAP) Meeting No. 1 - Early stage / Pre-Design Risks & Opportunities Workshop for the xʷəyeyət/Iona Island Foreshore Ecological Restoration Projects held June 1, 2022 via Zoom videoconference.

Welcome

Michelle Candido, Community Engagement Coordinator, External Relations, Metro Vancouver (MV), called the Meeting to order at 1.00 p.m., gave First Nations Lands Acknowledgement and welcomed participants.

Participants briefly introduced themselves to the group. The list of meeting staff and resources is included in **Error! Reference source not found.**.

Ms. Candido commenced the presentation entitled "Iona Island Wastewater Treatment Plant Projects - Ecological Technical Advisory Panel Meeting" and highlighted:

- Agenda:

Agenda Items
• Ecological Technical Advisory Panel (ETAP) • IIWWTP Projects: WWTP upgrade & Ecological Restoration Projects • IIWWTP Foreshore Ecological Restoration Projects • Breakout session • Next steps

- Session purpose is to provide information about the Ecological Technical Advisory Panel (ETAP), the IIWWTP ecological restoration projects, and to seek feedback on the foreshore restoration risks and opportunities to inform design.

1. Ecological Technical Advisory Panel (ETAP)

- Purpose of ETAP is to provide objective, strategic, scientific and technical input into the IIWWTP ecological restoration projects through data collection, design, restoration, monitoring, and adaptive management in order to maximize ecological priorities and the success of the restoration projects.
- MV has prepared a Terms of Reference which will be shared after the meeting.
- ETAP membership made up of qualified experts, research scientists, and environmental specialists from government, academic and non-governmental organizations with interest in the Fraser River estuary and expertise in ecosystems and species of interest found at Iona Island, conservation and ecological restoration of similar habitats.

- ETAP member role is to help guide the projects, share expertise, and amplify learnings throughout the Fraser River estuary.
- ETAP meetings span over the course of the projects, will be run by MV 2-4 times per year, and are structured to encourage free and open discussion.

2. Iona Island Wastewater Treatment Plant Upgrade & Ecological Restoration Projects

Lea Elliott, Senior Policy Analyst, Project Delivery, Metro Vancouver provided an update on the Iona Island Wastewater Treatment Plant and ecological project goals, and highlighted:

- Project definition goals to meet wastewater treatment regulatory requirements, maximize resource recovery, and integrate park and community.
- Overall project approach has shifted from primarily focusing on the new wastewater treatment plant to an integrated program, that is intended to deliver a suite of ecological projects and the new wastewater treatment plant, respecting the surrounding rich biodiverse environment. Primary driver for all of the projects is improvement of the overall health of the Salish Sea.
- The Iona Island Causeway and jetties (outfall and north arm) create a barrier to aquatic connectivity and prevent mixing of fresh/salt water and sediment transport. The first plant was built in 1963, without consideration for First Nations and their well-being. This project is an opportunity to provide higher levels of wastewater treatment, but also to enhance other key aspects of Iona Island and to continue this ongoing repair and healing of the site, the estuary, the Salish Sea and our relationships.
- The Project Definition Report (PDR) and Conceptual Design were endorsed by the GVS&DD Board in March 2022.
- Current plant has primary treatment and is required by the Province and Government of Canada to be updated to secondary treatment. The Conceptual Design includes tertiary treatment at the plant.
- Ecological restoration opportunities for xʷəyeyət/Iona Island and its foreshore were developed through background research and discussions with people and organizations working on issues related to xʷəyeyət /Iona Island and the health of the Fraser River Estuary as a whole, six ecological priorities arose:
    1. Fostering resilience to sea-level rise
    2. Connecting people to nature
    3. Integration of Musqueam cultural values
    4. Restoring estuary health, biodiversity and ecological processes
    5. Enhancing terrestrial and freshwater habitats
    6. Improving water quality
- The project team identified a suite of ecological restoration projects around the island to foster these six ecological priorities. Project portfolios include breaches, foreshore restoration, off-channel tidal habitats, freshwater wetlands and terrestrial restoration projects.
- Breach projects are to re-establish ecological connectivity and estuary processes that have been disrupted, including sediment transport and the mixing of fresh and salt water to improve conditions for wild juvenile salmon and other aquatic species.

2.1 North Arm Jetty Breach Project

Dave Scott provided a brief overview of the North Arm Jetty Breach Project lead by Raincoast Conservation Foundation (Raincost), and highlighted:

- Raincoast started looking at Iona connectivity in 2017. In February 2022, work began on breaching the North Arm Jetty with connectivity at mid-to-high tide, and Raincoast has already observed salmon using the breach. Will continue monitoring breach during freshet and spring season. Raincoast is preparing for an additional breach in the North Arm jetty in 2023.

Lea Elliott continued with the presentation regarding the ecological priorities:

- Creation of off-channel tidal habitat projects: intent to provide protected areas for aquatic species to grow and feed. Concept includes transitioning a lagoon and pond into tidal channel.
- Foreshore restoration/nature-based climate adaptation projects: aim to help tidal habitats keep pace with sea level rise and help mitigate storm wave energy – will be piloting thin layer sediment additions and wave breaks in the intertidal areas.
- Freshwater restoration projects: intent to enhance biodiversity, transition sludge lagoons into freshwater wetlands, planting native vegetation and removing invasive species.
- Terrestrial restoration: enhancing existing riparian cotton wood and coastal sand ecosystems, and replacing invasive species with native species.
- In all projects there are opportunities to integrate Musqueam cultural values and interests as desired by Musqueam.

Project is in early days and is now moving into preliminary design and data collection.

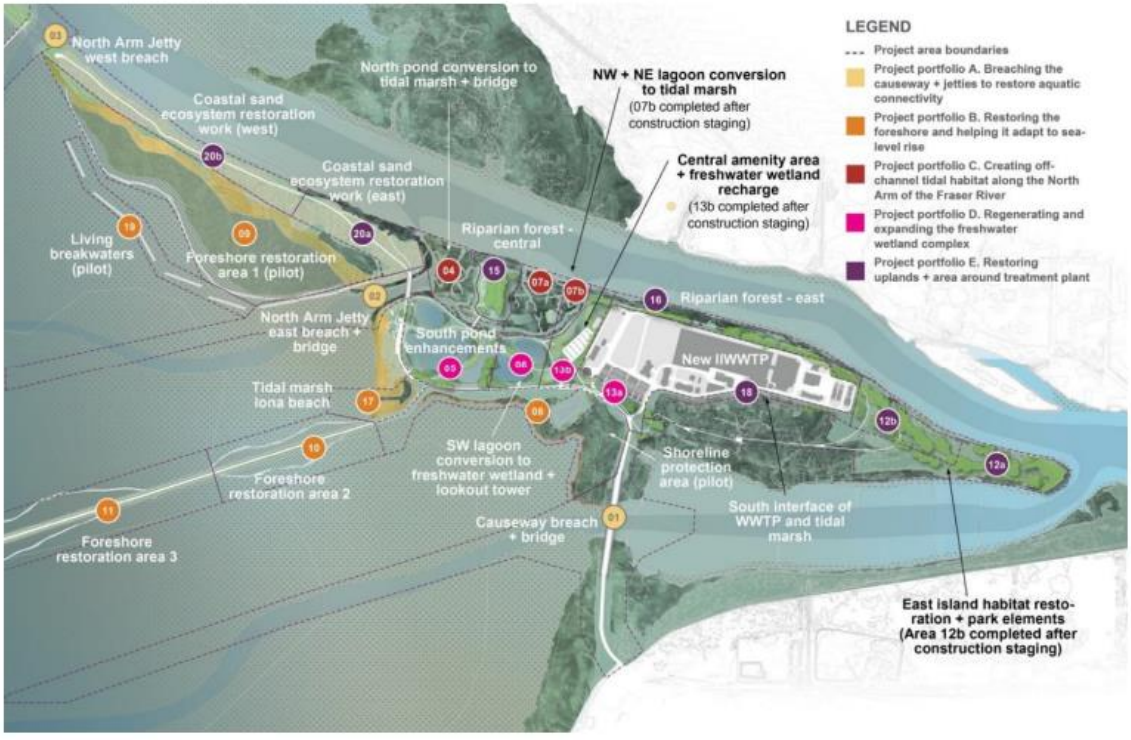

Figure 1. xʷəyeyət/Iona Island Ecological Projects

3. Xʷəyeyət /Iona Island Foreshore Restoration Projects

Margaret Scott presented Advisian's scope of work highlighting the following:

- Reviewing available data to identify data gaps and collection of required information to appropriately characterize the Project Areas (ongoing).
- Defining and ranking design criteria in order to prepare three potential design alternatives (initiating).
- Development of a hydrodynamic modelling tool to simulate the design options under a series of scenarios (planning).
- Evaluation of design options using a structured decision-making process to recommend preferred designs.
- Delivery of preliminary design drawings for the preferred options.
- Advisian has already executed some environmental data collection programs, but current focus is to characterize existing conditions to inform design.
- Advisian presented a summary of the studies between 1988 and 2021, highlighting available data (e.g. biophysical surveys, surveys in terrestrial habitat and ponds) and marking bigger data gaps in foreshore projects and associated need for data collection.
- The foreshore ecological restoration projects are complex and interconnected and require a holistic approach to preparing preliminary designs that consider longer-term habitat viability
- Through the project definition phase, the Iona Causeway Breach (Project Area 1) was noted as a highly anticipated restoration project to re-establish the ecological connectivity and natural processes that have been disrupted, including sediment transport and the mixing of fresh and salt water to improve conditions for wild salmon and other species.
- The causeway breach restoration project is hydro-dynamically connected to the shoreline protection (Area 8) and foreshore restoration projects (Areas 10 and 11 south of the Iona Jetty Outfall). For this reason, projects 1, 8, 10 and 11 (south of the outfall jetty) are being considered as part of the first aggregate of projects to be designed and are the focus of today's discussion. These projects are being referred to as the Causeway Breach Area Projects.
- Advisian shared MV's design concepts for Areas 1, 8, 10 and 11 highlighting opportunities associated with the projects:
    - Area 1 - Causeway Breach and Bridge which includes a multi-use path
    - Area 8 - Shoreline Protection Area: test different strategies to reduce shoreline erosion, while finding ways to maintain and increase the ecological values of the shoreline.
    - Areas 10 and 11 – Foreshore Restoration Areas: intended to create tidal flats, biofilm habitat and/or beach habitat for benefit of a diverse range of aquatic species and test strategies to help mudflats adapt to sea-level rise. This area also may dissipate wave energy, protecting project Area 8, reducing erosion and promoting of sediment accretion.
- Habitat restoration projects are complex and require evaluation of design options which will result in a solution that achieves the objectives. As noted in the pre-read materials, Advisian is proposing to conduct a Multi-Criteria Decision analysis (MCDA). The purpose of the MCDA is to provide a structured and documented decision-making process for reviewing three design alternatives for the Causeway Breach Area Projects. An MCDA provides an effective decision and risk analysis by defining and communicating what's relevant, material, and delivering long term value while balancing risks.
- Advisian is currently commencing definition of the design criteria for the Causeway Breach Area Projects. Input from the ETAP today on risks and opportunities with the potential to drive decisions on the design will be collated to define a robust set of design criteria that fully cover the design objectives and will include criteria related to project feasibility, biophysical/ecological

outcomes, integration of Musqueam cultural interests and values, community experience, and stewardship.

- Three design options, each likely to achieve overall design objectives, will be prepared for evaluation. This will include the development of hydrodynamic models to complete the evaluation of the design options across a series of scenarios. Following that, design options will be scored and evaluated. The design options will be discussed with the ETAP this fall.
- Before recommending a preferred design, Advisian will also assess the sensitivity of the evaluation weighting to assess the influence of critical project objectives and test for consistency in the MCDA outcomes.
- The results of the evaluation, weighting sensitivity, and recommendation of the preferred design option will be discussed with this group in the Winter of 2023.

4. Discussion

The following table summarizes responses to questions and comments expressed by participants, organized by topic, throughout the first half of the Meeting.

Issue, Comment, Question	Metro Vancouver (MV)
IIWWTP Projects	
Raincoast has constructed a breach through the North Arm Jetty and are considering adding another breach to the North Arm Jetty. Which of the breaches has been completed and where are additional breaches proposed?	Raincoast is planning for a new 30 metre breach on the North Arm as indicated by area 3 (Figure 1). The additional breach that Raincoast is proposing is a little further east on the North Arm Jetty from the breach completed earlier in the year.
Are there any breaches planned on Iona Jetty? Is there an engineering requirement for a 70 m deep outfall when there is tertiary treatment?	There are no breaches planned in the Iona jetty at this time. Requirements for the jetty may be revisited in the future.
How have the location(s) and size of the breaches/bridges been determined? Has hydrodynamic modeling been done?	Intent of today's discussion is to discuss breach design considerations. Current plan for hydrodynamic modelling is to evaluate several breach scenarios.
Are there assessments of changes to sedimentation in the marine habitats associated with breaches or other shoreline changes?	Advisian is looking at impacts of sedimentation on foreshore areas as a result of the breaches and opportunities for shoreline protection with increased sediment movement within the study area. Opportunity to consider breach and foreshore designs that promote sediment accretion in areas to protect tidal marshes and build them to be more resilient to climate change impacts. Currently, Advisian is beginning to evaluate the sediment load through the North Arm.

Issue, Comment, Question	Metro Vancouver (MV)
Which of these enhancements could trigger an environmental assessment? Has the project team applied for an exemption to this requirement?	MV has a regulatory strategy and a regulatory team looking into this; majority of foreshore projects have potential to trigger Provincial Environmental Assessment (EA), and breaches – Federal IAA; when design is further along intent is to provide further consideration of an exemption.
For any proposed project – are there any mitigation offsetting projects? Or are all these proactive stewardship restoration projects? What is the level of risk if one of the restoration projects does not respond as expected to restoration?	These projects were not developed as a requirement of offsetting or compensation but were planned to holistically restore the island and foreshore ecosystems and processes. If needed for IIWWTP activities, there is the potential for required habitat compensation. However, the WWTP footprint has limited impact on an area designated as an Environmentally Sensitive Area (ESA) by City of Richmond. Adaptive management and monitoring will be included to monitor and respond to restoration outcomes as needed.
Have there been any discussions with the Province regarding the existing log storage usages within McDonald Slough and the North Arm of the Fraser River? Will these uses affect restoration project designs?	MV initiated communication with the Province looking into log storage improvement in McDonald Slough and along the North Arm, and to consider licenses that are close to breaches and other projects, MV has started conversations with the Province, but it is in the early stages.
Is there any overlap between new water habitat, and known or potentially contaminated areas from historical island operations?	MV hired a remediation consultant that is undertaking phase 2 studies to understand contamination from historical uses to ensure compliance with Ministry of Environment.
Xʷəyeyət /Iona Island Foreshore Restoration Projects Q&A	
Main risk of the Project for YVR is attraction of more birds in the vicinity of airport. YVR wants to understand and quantify habitat types that exist in the area today and understand how it changes the overall habitat landscape on Iona Island. Breaches will also potentially impact a larger portion of foreshore than just Iona Island. How is this being addressed?	Part of studies coming in the summer includes aerial survey of the island and mapping of the habitat to better understand existing conditions, and potential impacts (along with hydrodynamic modelling). Robustness of these will not suffice for baseline, but will give an approximate idea about different types of habitat in the area.

Issue, Comment, Question	Metro Vancouver (MV)
How much information on the historical conditions on Iona Island is there? What did it look like prior to alteration that led to what it looks like today? Sharing aerials would be helpful with the group to understand historical natural processes.	MV has quite a few aerial images, but not a lot of data from before Iona Jetty was constructed. MV does have good imagery of McDonald Slough area. Most images with better aerial imagery are post 1920's and 30's (see PDR summary report).
Where is archaeology playing a role? In design of coastal wetland restoration projects on the east coast, archaeology is the first thing to do in terms of site data collection	Archaeological importance is given because of the site proximity to MIB. MV completed a preliminary assessment with a heritage conservation inspection permit and encountered archaeological sites. Data suggests that the island was built up from dredged material and overlays historic deposits. Currently, MV is evaluating archaeology across the site, and MV recognizes this is very important.
Given that in-house resources and experts are likely limited to cover the diversity of ecological topics, do MV and Advisian have plans to outsource some of the baseline data collection and future monitoring work to other organizations? In particular does MV plan to outsource some of this work with local organizations with existing knowledge about Iona and connections to the community?	Yes, MV is preparing for island-wide baseline studies and development of a long-term monitoring plan and is open to working with local organizations with existing knowledge about Iona and connections to the community
Regarding McDonald Slough, what effects do logs have on the bridge and breach? Is it part of restoration to get rid of some of these log booms? What about them having an effect on sediment accretion, tidal marshes? Is it a part of project at all?	MV is engaging with the Province in discussions regarding storage log licenses; a lot of them are held by Howe Sound Pulp and Paper (HSPP). MV is at the beginning of these discussions with both the Province and HSPP.
Have there been any discussions with Musqueam around reinitiating or facilitating Canada goose hunting? Any creation of tidal marsh has been undermined by Canada geese. This would have to be incorporated if want to recreate marsh estuary habitat.	Musqueam hunt geese and other waterfowl in Musqueam Marsh.
[Post Meeting Comment]: Birds Canada is working with UBC Sustainability Scholar program to develop shorebird monitoring protocol for this site and in	MV met with Birds Canada in June to discuss the shorebird monitoring protocol for this site.

Issue, Comment, Question	Metro Vancouver (MV)
other parts of Delta and offered to meet with MV to discuss how MV can contribute to the proposed shorebird monitoring protocol.	
[Post-Meeting Comment]: Noted that freshwater ponds on Iona contain the largest outbreak of invasive cattails in Fraser Estuary. Connection of these ponds to other waterbodies could be vulnerable to invasive cattail expansion. Daniel Stewart (Aasarum Ecological Consulting) has expertise in the management of invasive cattails.	Comment noted and MV will follow-up.

Following the Q&A session, there was a 10-minute break after which breakout rooms opened for discussion. The Design team asked that each panel member consider the key risks and opportunities with the potential to drive decisions on the restoration designs for the Causeway Breach Area Projects and contribute those during facilitated discussions.

Five categories for criteria have been proposed and include community experience, integration of xʷməθkʷəy̓əm/Musqueam cultural interests & values, project feasibility, stewardship, and biophysical / ecological. There may be other categories for opportunities and risks that we haven't considered and we welcome the feedback.

5. Breakout rooms summary

A summary of the meeting minutes from all three break out room session discussions are included below.

- Iona Island and McDonald Slough areas are important areas for Musqueam cultural and educational practices.
- Need to consider breach width needed to restore estuary process as well as loss of existing tidal marsh from breach excavation.
- Sediment transport is a key issue that will likely drive the size of the breach.
- Width of causeway breach may not need to be as wide as shown on diagram but too narrow could lead to predation of fish from birds (potentially a positive for bird community).
- Comment that historically, channel would have been self-scouring, and that a deeper channel may be more difficult to maintain. Sediment evaluation is key to reduce maintenance costs.
- Comment that breach would restore naturally flowing estuary, support aquatic habitat, and likely improve water quality.
- Noted that navigation through the breach could be unsafe.
- Comment that log storage (log booms and loose logs) impacts habitat design. Requested more information on log booms (historical context, duration of licenses, ownership, etc.).
- Identified need to have Province involved in discussions with MV particularly relating to permitting and log storage.

- Comment that shorebird community consideration include sediment size and triggers for fatty acid production. Sediment size is a consideration for shorebird communities and foraging for benthic invertebrates.
- Raised concern about the potential for foreshore projects to attract snow geese.
- Requested a quantification of the habitat (habitat balance).
- Expressed interest in opportunities to design bird habitat not attractive to geese.
- Concern raised about loss of tidal marsh along Sturgeon Bank.
- Flagged contaminants west of the breach of the project #08 could potentially affect Southern Resident Killer Whales and their critical habitat (contaminants within sediments could be mobilized by the breach, directly or indirectly).
- Shared skepticism around viability of area 10 and 11. There is high wave energy and would need to soften it, in order for habitat to be viable in that area.
- Inquiry about whether or not tertiary treatment negates need for outfall, and if so could projects 10 and 11 influence future decisions about the outfall jetty.
- Inquiry about the design premise for project 08 and the desired habitat design outcome.
- Proposed that woody debris accumulated near project area 8 could be a restoration project itself.
- Requested distinction between restoration vs some habitat creation as there is a bit of both.
- Highlighted importance of understanding hydrodynamics and consequences for upstream and downstream of the breach.
- Noted that habitat near McDonald Slough was degraded and that Musqueam were cut off from some traditional hunting grounds.
- Comment that when initial causeway breach was proposed in 1995 by consultants, it was noted that sediment can be remediated by flushing out over time. Ecologically this area has already been highly impacted, and climate change is continuing. In a context of restoration, two changes are happening simultaneously. Key questions to ask include: what species we would want to see in the future?
- Long-term monitoring to understand how species respond before/after restoration will be vital to assess success.
- Noted that eelgrass may establish around Iona in the future but changes to sedimentation may make it less feasible.
- Noted that navigation safety aspects are high up in the hierarchy of priorities.
- Highlighted importance of areas for migratory birds, and maintaining and enhancing insect abundance.
- Discussed Federal versus Provincial regulations

6. Panel reconvened: Post-breakout room comments

- Suggestion to review the new Pacific Birds Habitat Joint Venture 2020-2030 Implementation Plan, in particular for non-waterfowl species for informing decision making objectives. It is important to think beyond stopover birds and consider breeding and overwintering birds and their habitat.
- Pacific Birds Habitat Joint Venture which is a regional partnership between regional government and non-governmental organizations. They Identified priority bird species (waterfowl and non-waterfowl) and could be useful for MV when choosing birds to prioritize and have positive response for restoration effort.

- Advisian is looking at sea level rise and storm surge effects inclusion into the modelling. Coastal team is considering high and low flow, seasonal changes to Fraser River flow and collecting data during freshet which will be one of the key scenarios as well.
- Some ETAP participants are a part of discussion in lower flood management discussion, noted that the Lower Fraser Flood Model led by Fraser River Basin Council is a good resource.
- Advisian is keeping aware of other modelling groups and utilizing similar parameters for the models and conditions to inform design.

7. Close of the meeting

Metro Vancouver will:

- Share Terms of Reference with ETAP Panelists
- Share meeting summary with ETAP Panelists
- Continue data collection
- Draft design criteria for evaluation
- Carry out hydrodynamic model development and calibration

Image from 1930s of historic Fraser River Estuary conditions for reference. Image provided by Ducks Unlimited Canada

APPENDIX A – PROJECT STAFF AND ETAP CONTRIBUTORS

Metro Vancouver:

- Michelle Candido
- Nelson Szeto
- Lea Elliott
- Emily Bickel
- Sylvia Pendl

Advisian:

- Margaret Scott
- Ben Wheeler
- Helen Ambrose
- Claudette Cloutier-Baigent
- Evgeniya (Jane) Yangel

ETAP contributors:

- Dave Scott – Raincoast Conservation Foundation
- James Casey – Birds Canada
- Gadwyn Gan – Musqueam Environmental Division
- Tara Martin – UBC
- Scott Fleming - ECCC-CWS
- Simon Robinson – YVR
- Matthew Discusso – City of Richmond
- Murray Manson - DFO
- Yeganeh Asadian – Musqueam Indian Band
- Eric Balke - Ducks Unlimited Canada
- David Bradbeer – YVR
- Tony Bowron – CBWES and TransCoastal Solutions
- Sean Boyd Biologist Emeritus
- Ken Ashley – BCIT Rivers institute
- Andrew Huang – ECCC-CWS
- Trevor Andrews – Port of Vancouver
- Warren Mills – City of Richmond
- Mary O'Connor - UBC
- Rene McKibbin - ECCC-CWS