



# City of Richmond

## Report to Committee

**To:** Public Works and Transportation Committee      **Date:** December 11, 2019  
**From:** Milton Chan, P.Eng.  
Acting Director, Engineering      **File:** 10-6060-04-01/2019-  
Vol 01  
**Re:** **Iona Island Wastewater Treatment Plant Upgrade Project**

### Staff Recommendation

That the proposed comments on the Metro Vancouver Iona Island Wastewater Treatment Plant Upgrade project, as outlined in the staff report titled "Iona Island Wastewater Treatment Plant Upgrade Project," dated December 11, 2019 from the Acting Director, Engineering be endorsed for submission to Metro Vancouver.

Milton Chan, P.Eng.  
Acting Director, Engineering  
(604-276-4377)

Att. 1

| REPORT CONCURRENCE                                       |                                     |                                |
|--|-------------------------------------|--------------------------------|
| ROUTED TO:   | CONCURRENCE                         | CONCURRENCE OF GENERAL MANAGER |
| Development Applications                                 | <input checked="" type="checkbox"/> |                                |
| Transportation   | <input checked="" type="checkbox"/> |                                |
| Sustainability   | <input checked="" type="checkbox"/> |                                |
| Parks Services   | <input checked="" type="checkbox"/> |                                |
| REVIEWED BY STAFF REPORT /<br>AGENDA REVIEW SUBCOMMITTEE | INITIALS:<br><br>CS                 | APPROVED BY CAO<br><br>        |

## Staff Report

### Origin

At the November 20, 2019 Public Works and Transportation Committee, Metro Vancouver presented an update on the Iona Island Wastewater Treatment Plant (Iona Plant) Upgrade Project.

The treatment plant serves approximately 750,000 residents in the Vancouver Sewerage Area (VSA), which includes Vancouver, UBC Endowment Lands, and parts of Burnaby and Richmond. For Richmond, the Iona Plant only provides treatment for sewage originating from Mitchell Island and Richmond Island.

The Iona Plant Upgrade project involves construction of a new facility to replace the existing primary treatment plant located on Iona Island. This upgrade is required to comply with the updated Federal regulations of achieving a minimum of secondary level wastewater treatment by 2030. The new facility will provide a higher level of treatment and will be located on the site of the existing wastewater treatment plant on Iona Island, but with an expanded footprint.

The project is currently in the Project Definition phase and the Design and Construction phase is expected to begin in 2021. Project completion is anticipated by the end of 2030. Three preliminary concepts were provided to the Committee (Attachment 1). Metro Vancouver is currently presenting the three concepts to regional stakeholders and refining these into a preferred design. The preferred design may incorporate elements from any or all of the preliminary concepts and is scheduled to be presented to the Metro Vancouver Liquid Waste Committee in March, followed by another round of public engagement. Metro Vancouver is planning a public workshop in Richmond in early 2020; however, the date and location have not been finalized.

In December 2018, Council issued an Environmentally Sensitive Area (ESA) Development Permit (DP 18-820582) to Metro Vancouver to allow construction of temporary mechanical dewatering facilities on site in preparation for future upgrades to the treatment facility. A second associated ESA Development Permit (DP 19-850320) for a temporary concrete pad and gravel parking areas to further facilitate the dewatering activities has been endorsed by the Development Permit Panel and is anticipated to be brought forward to Council in early 2020.

In addition, at the November 20, 2019 Public Works and Transportation Committee, the Committee made the referral that “staff work with Metro Vancouver and YVR Airport Authority to improve the safety of the road out to Iona for cyclists and other users.” A joint meeting between the City, Metro Vancouver and Vancouver Airport Authority staff has been scheduled in January 2020 to initiate work on this matter.

This report supports the following strategies within Council's Strategic Plan 2018-2022:  
Strategy #1, A Safe and Resilient City:

*Enhance and protect the safety and well-being of Richmond.*

*1.2 Future-proof and maintain city infrastructure to keep the community safe.*

Strategy #2, A Sustainable and Environmentally Conscious City:

*Environmentally conscious decision-making that demonstrates leadership in implementing innovative, sustainable practices and supports the City's unique biodiversity and island ecology.*

*2.1 Continued leadership in addressing climate change and promoting circular economic principles*

*2.2 Policies and practices support Richmond's sustainability goals.*

This report outlines proposed comments on the general treatment plant upgrade concept for Council consideration.

## **Analysis**

Staff have reviewed the general concept of the project and have proposed comments, as outlined below:

1. That the City supports a tertiary level of treatment for the new wastewater treatment plant;
2. That Metro Vancouver seek opportunities to contribute to the provincial and federal efforts to revitalize Sturgeon Bank through the Steveston and Iona restoration projects that are currently under way;
3. That Metro Vancouver include discussions supporting fish and wildlife habitat enhancement in their stakeholder engagement events and further consider all wildlife receptors specific to the provincially protected Sturgeon Banks Wildlife Management Area;
4. That the effluent standards be reviewed to further reduce any environmental impacts;
5. That potential odour issues related to increased operation and expansion of the Iona Plant be investigated;
6. That public access to Iona Beach Park be maintained and enhanced, and pedestrian trails be implemented to make the beaches to the south and west of the Iona Plant more accessible;


7. That Metro Vancouver implement educational programming and interpretation amenities to promote the ecological values of the marsh and foreshore areas;
8. That Metro Vancouver work with the City and YVR to provide protected cycling facilities along Ferguson Road and Iona Island Causeway to improve safety of the road for cyclists accessing Iona Beach Park;
9. That the impacts of additional loading on the road be evaluated to ensure that ditch bank stability for both sides of the road is not compromised;
10. That Metro Vancouver consider climate change-induced sea level rise and flood risk management in the planning and implementation of this project, and explore options to raise the land elevation and/or implement flood protection infrastructure to ensure operational capability of the treatment plant over its service life;
11. That Metro Vancouver anticipate that future development associated with the Iona Plant project will continue to follow the City's Environmentally Sensitive Area Development Permit Process to secure appropriate compensation;
12. That discussions regarding the facility's waste recovery initiative, which will produce resources of value to the City, such as water for irrigation, be included as a part of the project's stakeholder engagement events; and
13. That Metro Vancouver explore opportunities to maximize energy recovery from the wastewater treatment process.

### **Financial Impact**

None.

### **Conclusion**

The Metro Vancouver Iona Island Wastewater Treatment Plant Upgrade Project will replace the existing primary treatment plant located in Richmond with a new facility that provides a higher level of treatment. The project is currently in the Project Definition phase and the construction is anticipated to be completed by the end of 2030. Staff have reviewed the information presented and have proposed comments regarding the project. The proposed comments aim to enhance the City's environmental quality and public safety, as well as encourage Metro Vancouver to explore waste and energy recovery initiatives. Staff recommend that the proposed comments outlined in this report be endorsed for submission to Metro Vancouver.

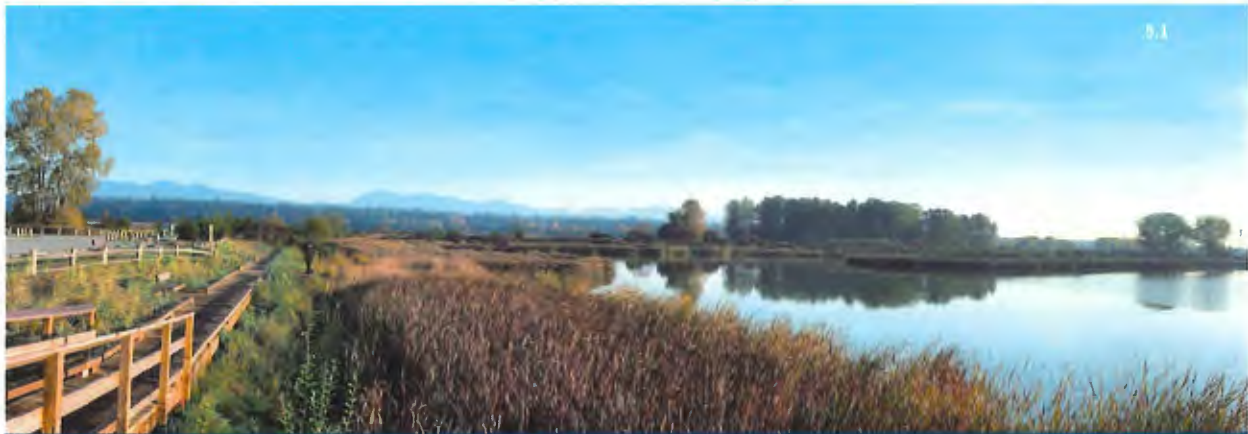


Jason Ho, P.Eng.  
Manager, Engineering Planning  
(604-244-1281)

JH:rd

Attachment 1: Metro Vancouver Iona Plant Project Definition Update Presentation

## Metro Vancouver Iona Plant Project Definition Update Presentation



# IONA ISLAND WASTEWATER TREATMENT PLANT

## PROJECT DEFINITION UPDATE

**Fred Nenninger**

DIRECTOR, POLICY, PLANNING AND ANALYSIS  
LIQUID WASTE SERVICES

VSA Councils Update

33390011



## PROJECT GOALS

Secondary  
Wastewater  
Treatment

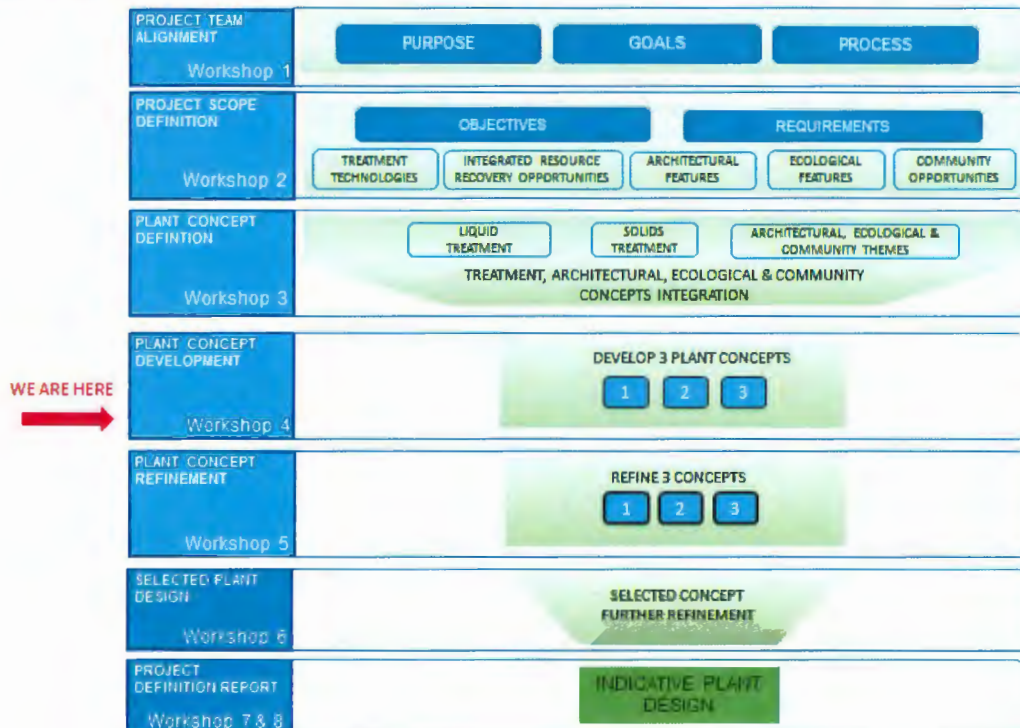
Community and  
Park Integration

Resource Recovery












## PROJECT DEFINITION PHASE

- Plan for plant to 2100
- Compare liquid treatment options
- Compare solids treatment options
- Develop an indicative design for 2030 build
- Integrate new plant with park
- Business case resource recovery opportunities

## PROJECT DEFINITION PROCESS

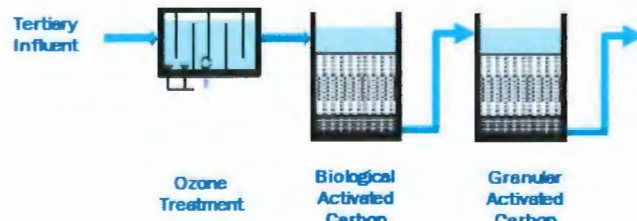


# WASTEWATER TREATMENT MATRIX

|                             | Plant Build Scenarios  |  |  |
|-----------------------------|--|--|--|
|                             | Secondary Plant  | Tertiary Plant (Filtration)  | Tertiary Plant (MBR)   |
| Primary Treatment Options   | <p>INCLINED PLATE CLARIFIERS</p>                                  | <p>BIOLOGICALLY ENHANCED CLARIFICATION</p>                          | <p>INCLINED PLATE CLARIFIERS + CHEMICALS</p>  |
| Secondary Treatment Options | <p>ACTIVATED SLUDGE</p>   | <p>ACTIVATED SLUDGE</p>   | <p>MEMBRANE BIOREACTOR</p>                    |
| Tertiary Treatment Options  |  | <p>TERTIARY FILTRATION</p>    | <p>MEMBRANE BIOREACTOR</p>                    |
| Solids Treatment Options    | <p>ANAEROBIC DIGESTION</p>  <p>→ BIOSOLIDS MANAGEMENT PROGRAM</p> | <p>THERMAL HYDROLYSIS + ANAEROBIC DIGESTION + BIOSOLIDS DRYING</p>  | <p>SLUDGE WASTE-TO-ENERGY</p>                 |

# ADVANCED TREATMENT PILOT PLANT

- Example process train for micropollutant removal



# IONA ISLAND



# SECONDARY PLANT





## TERTIARY PLANT (FILTRATION)



## TERTIARY PLANT (MBR)



## RESOURCE RECOVERY OPPORTUNITIES



## ENGAGEMENT ACTIVITIES (2019 / 2020)

| Timeline                         | Activity   |
|----------------------------------|--|
| October 17<br>November 1         | Present preliminary design concepts to Liquid Waste Committee and GVS&DD Board   |
| November 2019 -<br>February 2020 | Present preliminary design concepts to: <ul style="list-style-type: none"> <li>• VSA municipal councils / committees</li> <li>• Musqueam Chief and Council</li> <li>• Regional Parks Committee</li> <li>• Public Workshop #2 (Richmond)</li> <li>• Community associations / environmental groups</li> <li>• Musqueam Community Meeting #2</li> </ul> |
| Ongoing                          | Monthly meetings with VSA municipal staff<br>Meetings with Musqueam staff<br>Stakeholder meetings  |

## ENGAGEMENT ACTIVITIES (2020)

| Timeline           | Activity  |
|--------------------|---|
| March              | <b>Special Meeting of the Liquid Waste Committee to workshop design concepts and recommended design</b><br><b>Present design concepts and recommended design to GVS&amp;DD Board</b>  |
| April to September | Present recommended design to: <ul style="list-style-type: none"><li>• VSA municipal councils / committees</li><li>• Musqueam Chief and Council (TBC)</li><li>• Regional Parks Committee</li><li>• Public Workshop #3</li><li>• Community associations / environmental groups</li><li>• Musqueam Community Meeting #3 (TBC)</li></ul> |
| November           | <b>Project Definition Report and Indicative Design to Liquid Waste Committee and GVS&amp;DD Board</b>   |

