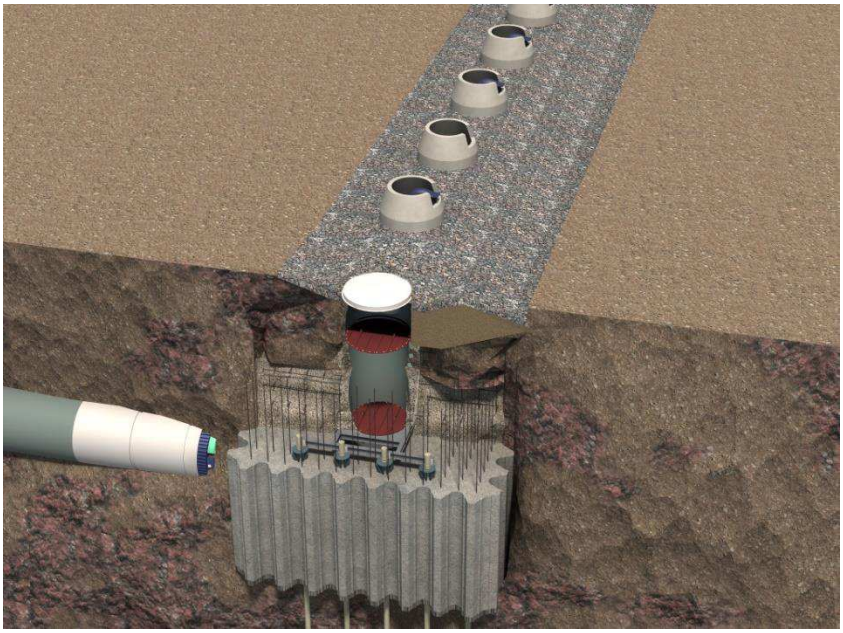
APPENDIX F
NAVIGATION STUDIES

F.1: Marine User Information Session

Annacis Island WWTP New Outfall System

Vancouver Fraser Port Authority
Project and Environmental Review Application



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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

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Summary of Marine User Information Session

Annacis Island Wastewater Treatment Plant (AIWWTP) Outfall Project

Information session and workshop with marine users on May 11, 2017

June 7, 2017

For Metro Vancouver, Port of Vancouver and the Corporation of Delta

Contents

1. Purpose

The purpose of this document is to provide a summary of the activities and stakeholder input obtained from the information session with marine users held on May 11, 2017 at the Annacis Research Centre.

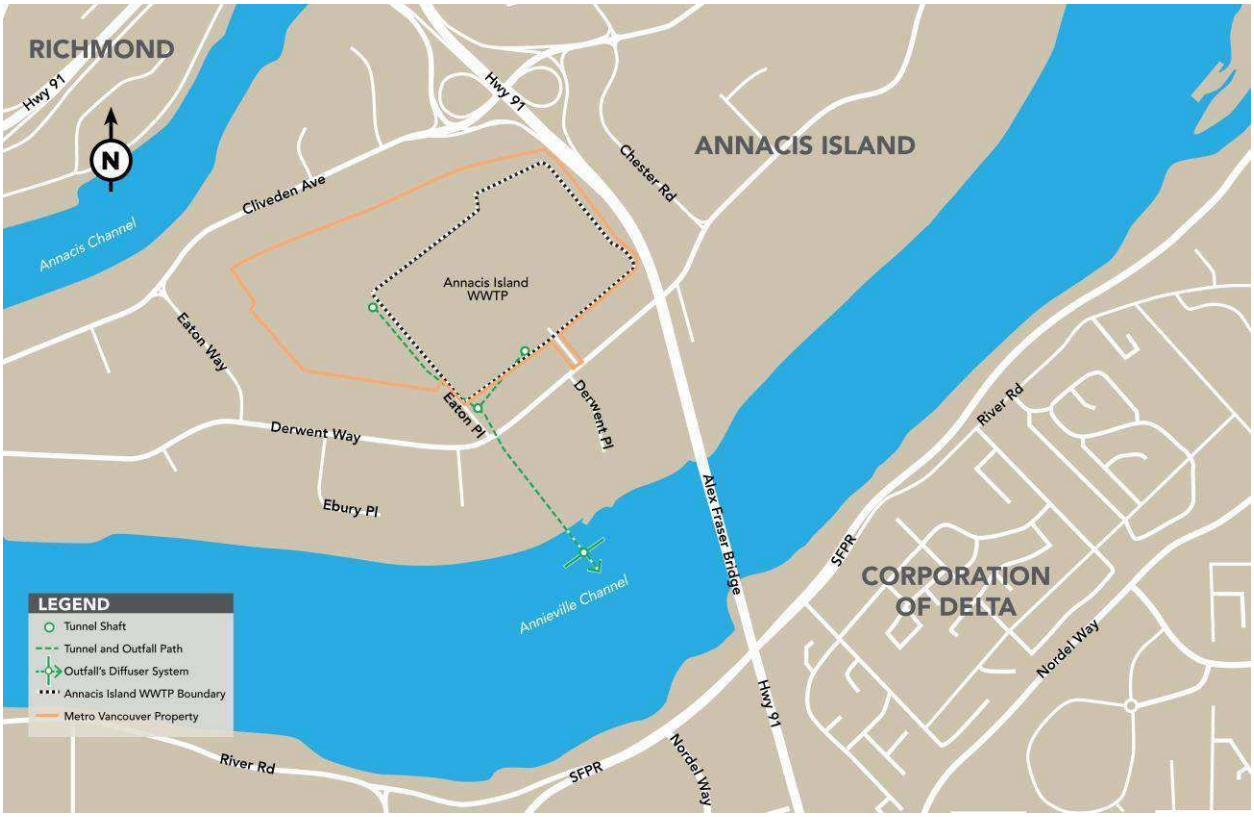
2. Project description

Annacis is one of the region's largest wastewater treatment plants. Starting in the summer of 2017, the plant will be undergoing a series of upgrades including:

- Building a new outfall pipe to carry treated wastewater from the plant to the Fraser River
- Increasing the size of the plant and its ability to treat more wastewater
- Repairing or replacing older parts of the existing plant
- Strengthening the plant to reduce the impacts of an earthquake
- Improving existing odour controls
- Building a more reliable back-up power source

This summary report is for the outfall pipe construction work that will take place from 2019 to 2022 (see Figure 1).

Figure 1 – Annacis Island Waste Water Treatment Plant Outfall Project



3. Stakeholders and impacts

The outfall pipe construction work will take place over three seasons. "Marine users"—businesses and organizations who use this area of the Fraser River—are expected to be the most impacted by the construction work. There are also several other groups who are interested in the project, for both the construction work as well as the ongoing operations of the pipe, in terms of water quality for agriculture, fish and wildlife, and recreation. These groups include First Nations, environmental organizations, recreational groups, and the Delta Farmers Institute. This report focuses on the information session held specifically for marine users on May 11, 2017.

4. Communications and engagement objectives

The primary objective for the marine user information session was to:

- Gather information about their operations that would be used in:
    - completing the detailed designed of the outfall pipe construction
    - defining the construction work plan in the construction tender document

The secondary objectives for the meetings were to:

- Provide an overview on the project
- Introduce the project team and the Community Liaison Officer as the Metro Vancouver point of contact for questions and information
- Answer questions and listen to concerns
- Describe next steps

5. Participants

Metro Vancouver worked with the Council of Marine Carriers and their president Captain Phillip Nelson to send invitations to 44 marine user organizations, based on a contact list initially provided to Metro Vancouver by the Port of Vancouver and then updated and added to by the Council. A total of 16 people attended the event, with the following organizations represented:

Catherwood Towing (Ron Dunsire)
Council of Marine Carriers (Capt Phillip Nelson)
Delta Cedar Specialties (Brian Dyck)
Forrest Marine (Mike Forrest)
Fraser River Pile and Dredge (Mike Bevan-Pritchard)
Fraser River Pilots (Mike Armstrong and Randy Smigel)
Harken Towing (Ian Shandler)
Ledcor (Tom Fontana)
Port of Vancouver (Sean Baxter and Dave Hart)
Seaspan (Chris Jensen)
SRY Rail Link (Richard Foth)
Transport Canada – NWP (Roberta Dight and John Mackie)
Typlan (Russ Tyson)

6. Session format

The session took place from 9:00am to 10:30am with refreshments from 8:30am to 9:00am. Key activities included:

Welcome and introductions

Metro Vancouver Communication and Education Coordinator Tanya Melanson welcomed everyone to the event, confirmed the purpose and objectives for the session, and facilitated introductions around the room, including the project team and participants. Tanya also provided an overview of Metro Vancouver's liquid waste work in the region.

Presentation on the project

Metro Vancouver Project Manager Ken Massé and consultant John Newby from CDM Smith provided an overview of the project, including the construction rationale and methodology, the timeline, and the planned construction areas in the river, particularly which areas were "fixed" based on the construction rationale, and which areas were somewhat "flexible" and could be potentially adjusted in location and/or timing based on the information marine users provided on their operations. A copy of the full presentation is provided in Appendix 1.

Question and answer

Following the presentation, participants were invited to ask questions about any of the information provided and about the project in general. The questions and answers included:

Q: What volume of effluent will the new outfall discharge?
A: Up to 1600 mld/day

Q: What is the timeline for the cofferdam?
A: Only Season 1, 2019/2020

Q: Will it be a single contract for the project, or will it be broken up into individual segments?
A: Single contract, with the contractor expected to demonstrate their team's capability to do all the work.

Q: How do you expect to transport materials to the construction areas? Where will be your access points? Could CanRon [down river] be an access point?
A: That will be up to the contractor. We will look into CanRon.

Q: What dredging methodology are you planning on using?
A: Clamshell primarily.

Small group working session

Community Liaison Officer Jeni Vlahovic facilitated the next part of the session, which was a working exercise for participants to provide information about their operations in the river. Using large printed-out version of the maps from the presentation (Figure 2), Jeni asked participants:

1. Are there any areas we should stay away from? Why? Are there certain times that are okay?
2. What considerations should Metro Vancouver be aware of as we develop our construction plan?

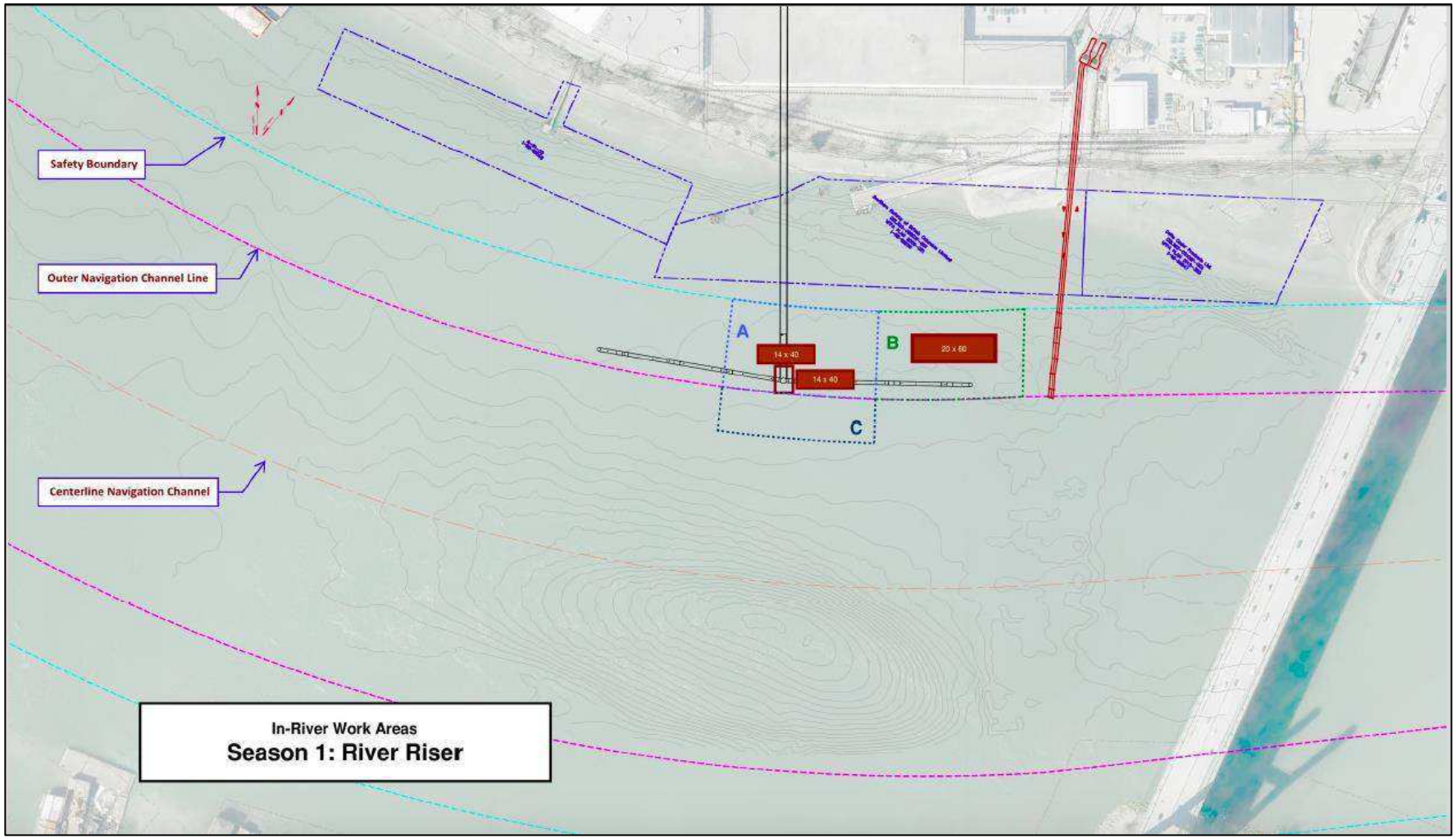
The participants were placed into three groups of approximately five people each, with a table facilitator (Tanya Melanson, Jeni Vlahovic and Metro Vancouver Communications Officer Kevin Chan), and a member of the technical project team (Ken Massé, John Newby and Metro Vancouver Lead Senior Engineer Nancy Bonham). A summary of the information obtained from this exercise is provided in the next section, Key Findings.

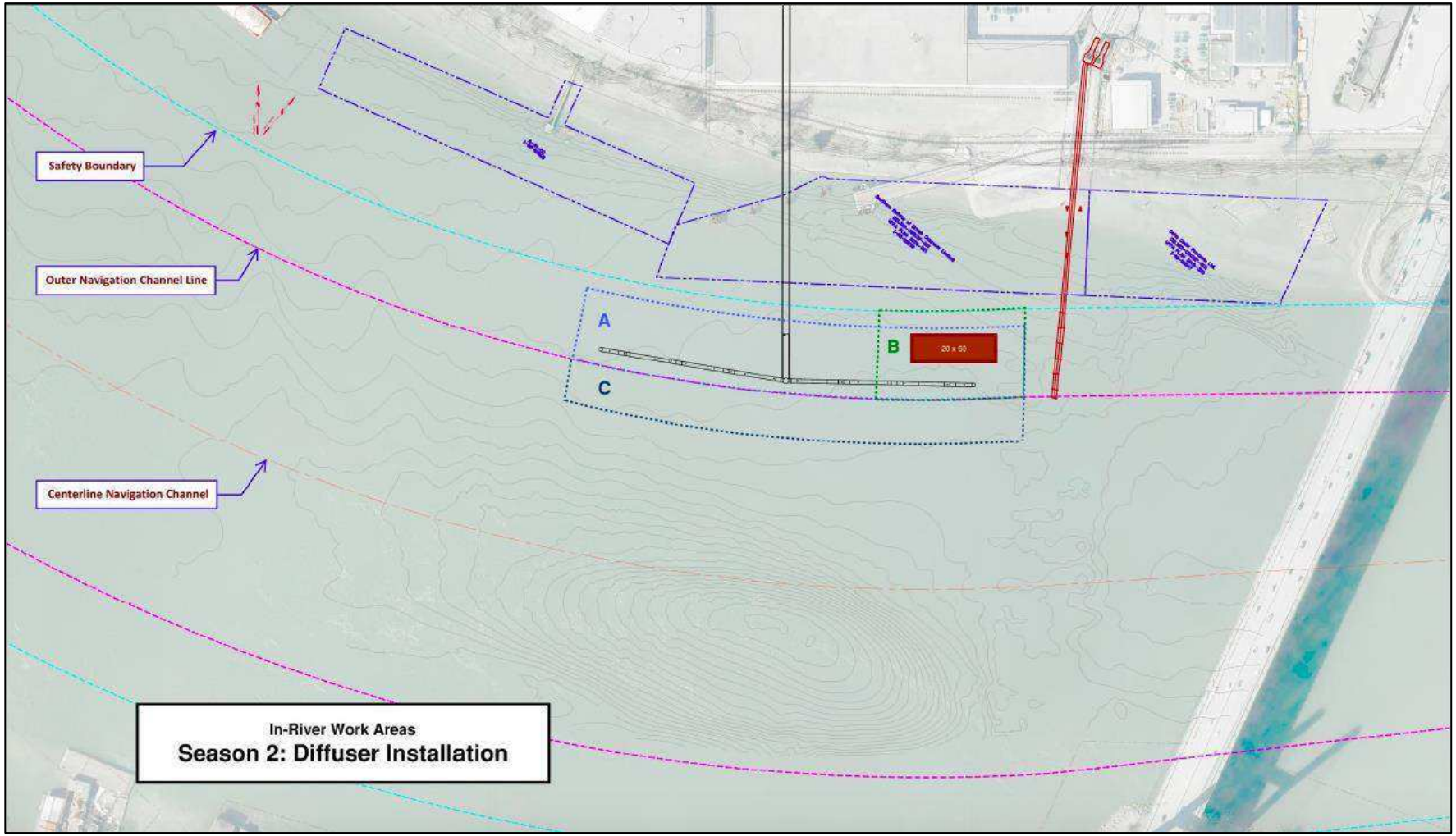
Thank you and next steps

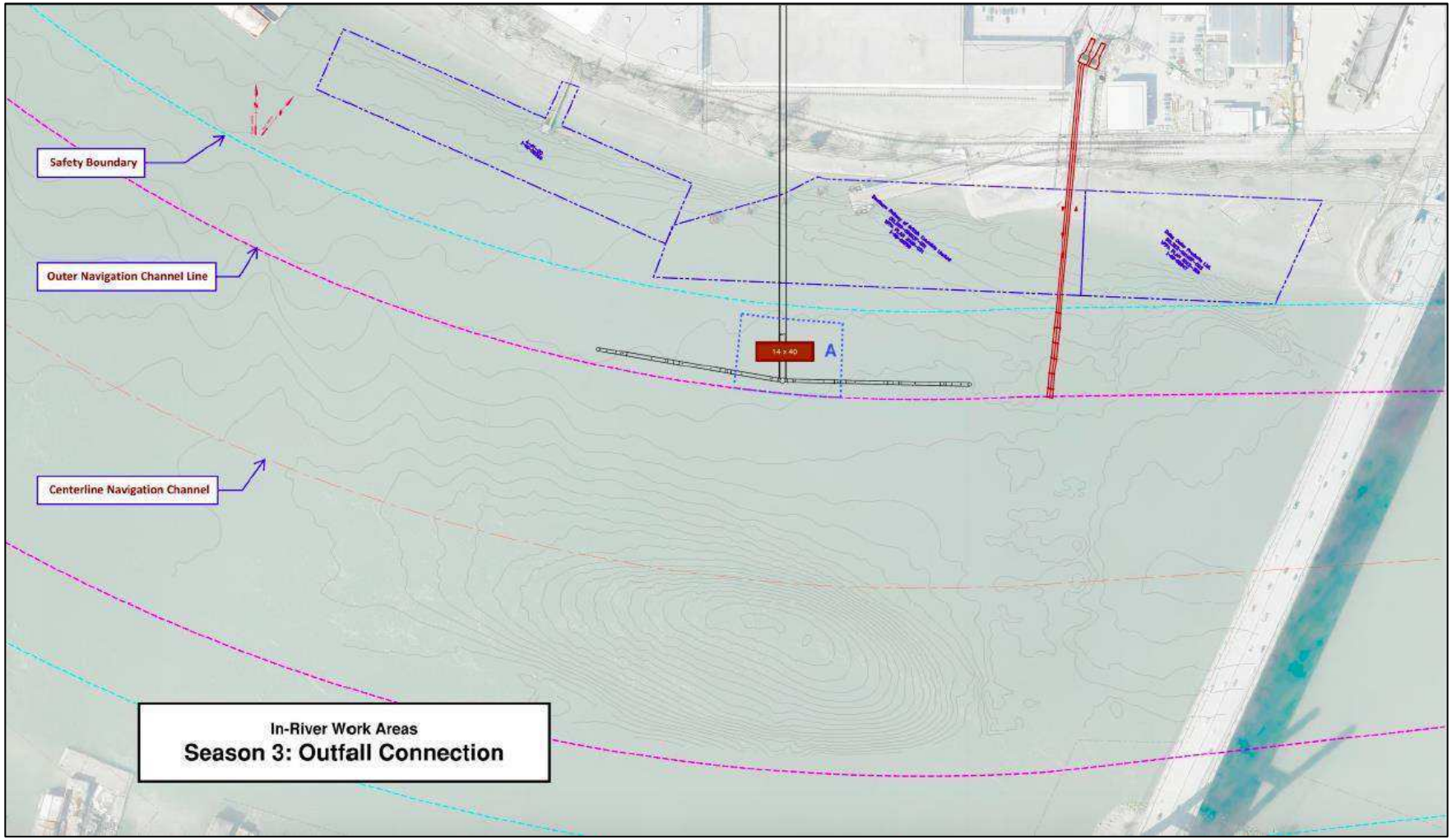
Tanya Melanson concluded the session, saying thank-you to everyone for participating. Tanya informed the group that the project team will keep them informed as work progresses, and will look to bring this group back together for a similar session. Captain Nelson from the Council of Marine Carriers spoke on behalf of the group saying they would be very interested in forming a type of Marine Communications Committee to provide ongoing advice and input into the project.

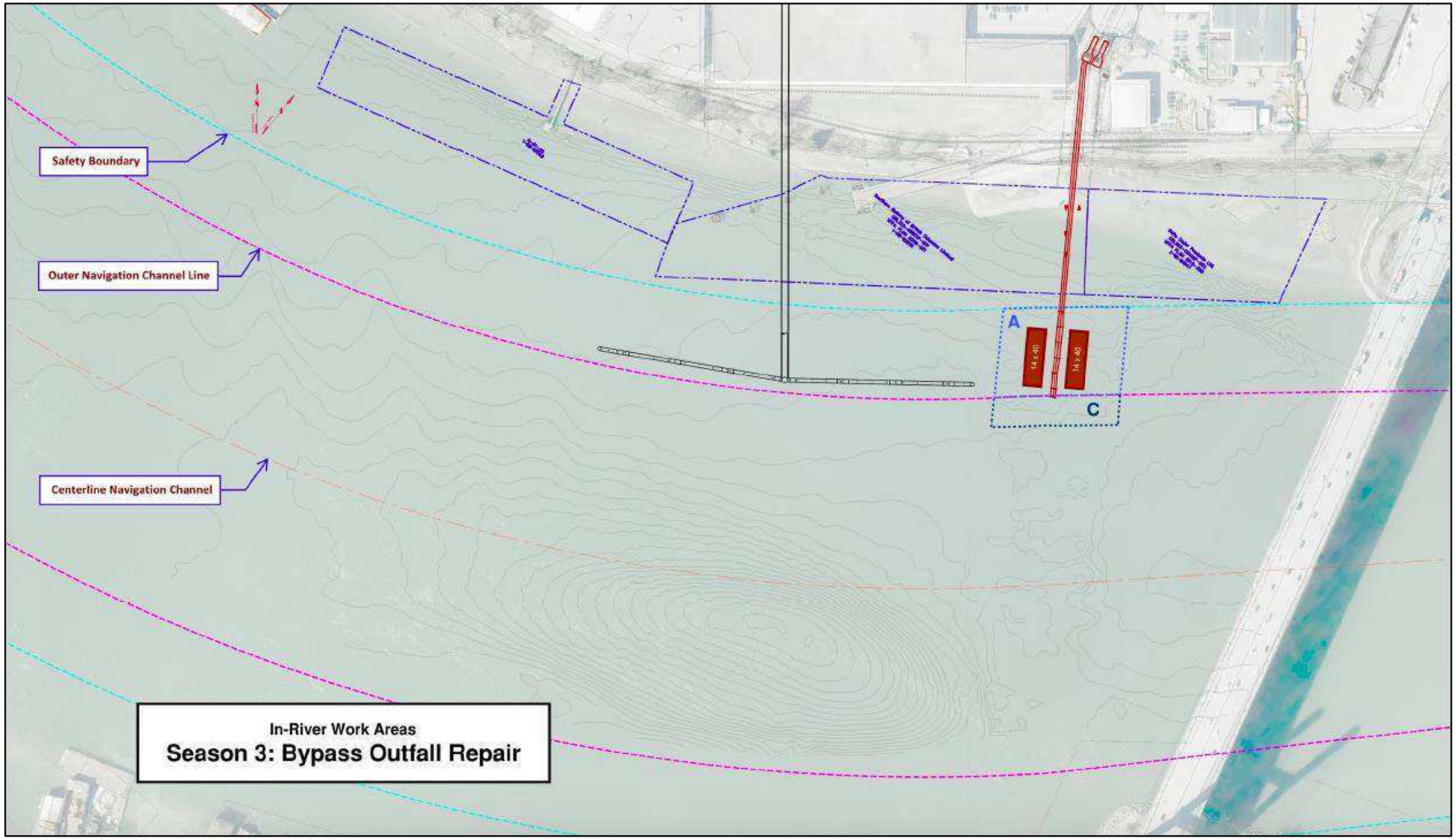
Figure 2 – Maps used for the small group working session

A = Exclusive for contractor's operations (fixed)
B = Contractor's staging area (somewhat flexible in location)
C = Temporary work area within the navigation channel (somewhat flexible in timing)




Safety Boundary
Outer Navigation Channel Line
Centerline Navigation Channel
A
B
C
20 x 60
In-River Work Areas
Season 2: Diffuser Installation


Safety Boundary
Outer Navigation Channel Line
Centerline Navigation Channel
14 x 40
A
In-River Work Areas
Season 3: Outfall Connection


Safety Boundary
Outer Navigation Channel Line
Centerline Navigation Channel
A
C
In-River Work Areas
Season 3: Bypass Outfall Repair

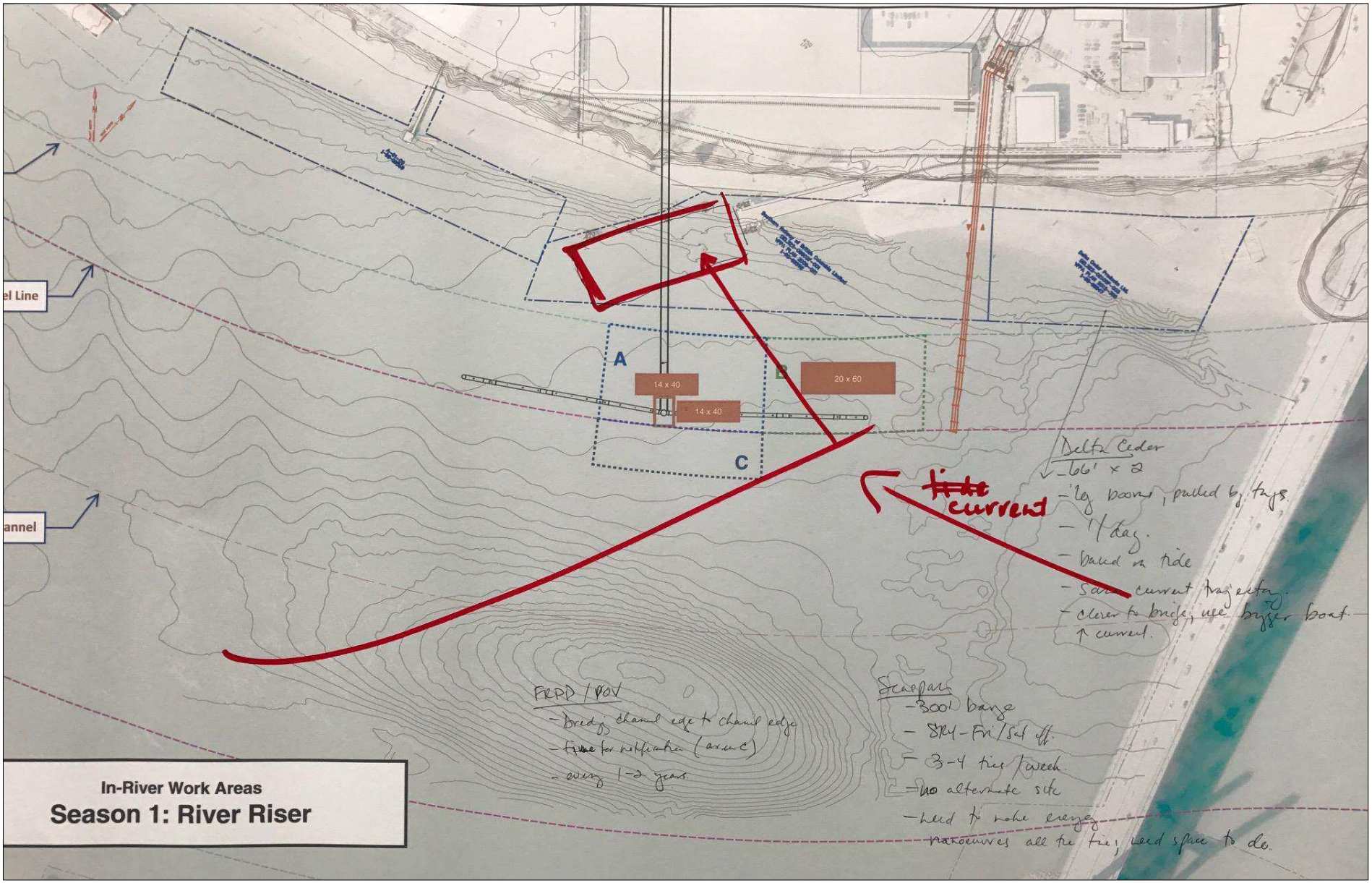
7. Key findings

Following is a summary of the operational information that was collected from the small group working session. The most detailed information came from Seaspan, Southern Rail and Delta Cedar Products whose operations are currently in the exact location and/or very near to the planned outfall construction work. Transport Canada also provided information and suggestions on feasible ways to do the work, particularly with respect to transporting materials to and from the construction areas in the river, based on their experience with the Port Mann Bridge construction. The other organizations in the session provided general information on their operations, which would only be affected either when the outfall construction work extended temporarily into the navigation channel, or when transporting materials down or across the river to the construction barges.

Seaspan & Southern Rail

- Their current operations require full use of the area where the outfall pipe construction will take place (see Figure 3).
- They tow in and park very large, 300-foot barges three to four times per week, that they need to bring in past their dock (northeast side, almost directly over where the outfall pipe construction will take place) in order to compensate for the westward current of the river. They need to follow the same path to disembark from the dock.
- It is a very tricky manoeuvre. There are often emergency procedures—quick changes done on the fly using radio communications—each time they dock.
- If Seaspan were able to manoeuvre their barges in a different way, it would still be a significant size vessel very close to the outfall construction work, posing a potential safety hazard for the construction crew.
- Assist tugs were suggested to help with the manoeuvring, however Seaspan believes that additional boats would be more likely to add to the confusion and already tight space, more than actually helping with the manoeuvring.
- A trestle would not be an option on this project because the construction zone is too close to their dock/operations.
- Metro Vancouver will continue direct discussions with Seaspan and will look into setting up a “simulator” with BCIT with all the correct coordinates to review and analyze feasible options.

Figure 3 – Seaspan, Southern Rail and Delta Cedar Products' operations near the construction are



Delta Cedar Products

- Their current operations require a similar manoeuvre to Seaspan's, though further east from the planned construction work area for Season 1 (see Figure 3).
- They usually tow in two 66' barges (one behind the other) once per day, with the timing based on tide levels.
- They would be most affected by the work on the existing outfall in Season 3.
- For the work on the new outfall pipe, they may have to do their manoeuvre further up current, which means closer to the bridge, which would require a stronger, bigger tug (potentially paid for by Metro)

Transport Canada

- Metro Vancouver should consider that the methodology for construction (i.e. delivery of materials by barge) may change once the contractor is hired. The contractor may have an innovative approach to doing the work that may be beneficial.
- However, Transport Canada and other marine users should have an opportunity to provide input on any changes to the design to ensure it does not increase the impact on them.
- Transport Canada's experience with the construction of the Port Mann bridge was used as an example:
    - The bridge contractor proposed a trestle to move construction materials in and out.
    - There were delays to the project as Transport Canada worked with the contractor to figure out ways to let vessels pass through the trestle.
    - The result was positive in the end because fewer bridge pillars were required.
- Transport Canada is willing to work with Metro Vancouver by providing comments on the construction methodology proposed by the potential contractor before the contract is awarded.

Other Key Findings

- Concerns from other organizations at the session were primarily about Area C in all three season, and how far it will extend into the navigation channel (see Figure 4)
    - The closer Metro Vancouver extends into the channel, the more the construction crews may be affected by the wake and/or interference of commercial users
    - Will a "shear boom" (logs laid out around corners of the cofferdam to avoid snagging of fishing nets, lines, etc.) be necessary?
    - Any anchors dropped (for barges, etc.) must be well inside the marked work areas (A, B, C, etc.) and communication given out
    - Clearly marked and lighted buoys would be necessary for any areas near the river channel
- Communication methods
    - River signage is not necessary for commercial users who receive communications in other mediums. It might be necessary for recreational users who do not access and/or check the other communication methods
    - It was suggested that a depth map is created upon project completion and sent to marine users to depict the depth between the top of the riser and the river level, for use in navigating around the outfall
    - They would like to attend another info session once the contractor has been awarded and before work begins to acknowledge exactly where boundaries for work areas will be

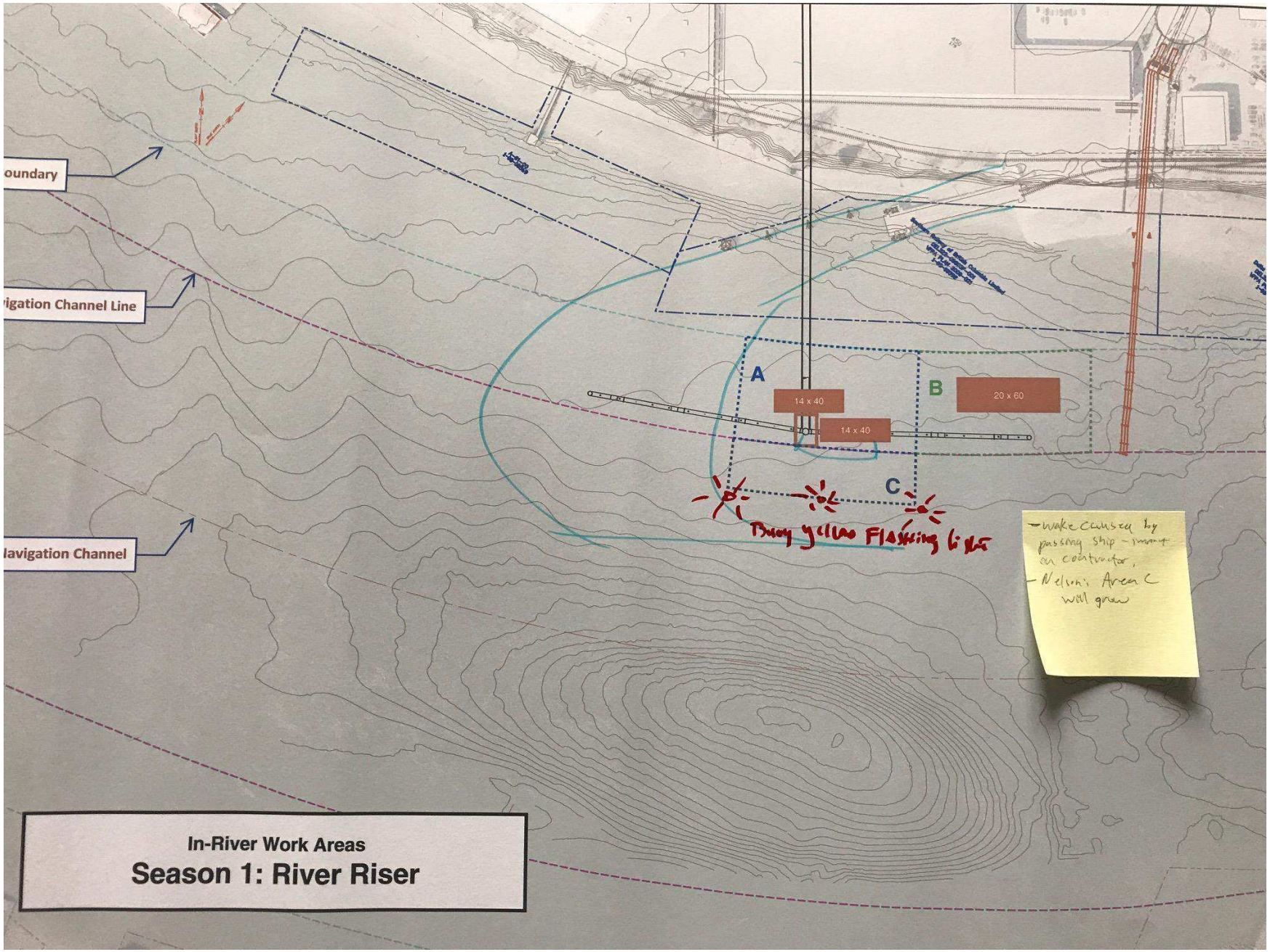
- It was suggested to engage Richmond, New West, and Delta RCMP regarding pleasure boaters. There have been issues in the past with these boaters acting recklessly and being close to work areas.
- For Metro Vancouver supply boats, it's always best to cross the river at a 90-degree angle
- Ships don't usually pass on the bend but prefer to cross in straight sections.
- Passing ships will have a huge pull on the water that may induce a significant force on the cofferdam. Metro Vancouver's design should account for this force. It was referred to as an underwater tornado. This wake/surface water effect is from big ships displacing water. Waves will be created by the ships.

8. Next steps

This table illustrates the key next steps for this project leading up to posting the construction tender document in January 2018. All projected timeframes are subject to change.

Task	Timeframe	People
Meet directly with Seaspan, SRY Rail, Port of Vancouver and Transport Canada and set up BCIT simulation to review detailed design options.	June	Project team
Revise/finalize design plans	July/August	Project team
Re-engage with marine users to review revised/finalized detailed design plans	September	Public Involvement team Project team
Present detailed design and stakeholder engagement summary to the Port of Vancouver	September	Public Involvement team Project team
Provide stakeholder requirements for tender documents	October-December	Public Involvement team Project team
Post tender documents	January 2018	Project team

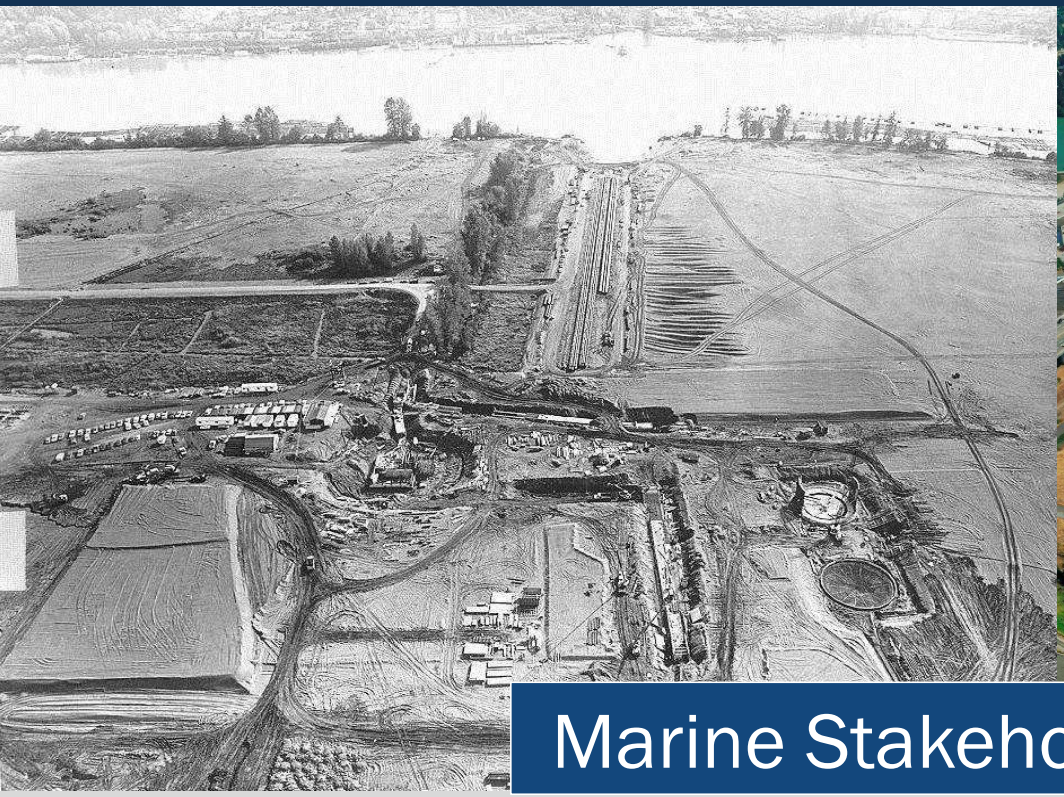
Figure 4 – Other organizations' concerns about Area C



Appendix 1 – Presentation


METRO VANCOUVER REGIONAL DISTRICT
LIONS BAY
BOWEN ISLAND
WEST VANCOUVER
NORTH VANCOUVER DISTRICT
NORTH VANCOUVER CITY
ANMORE
BELCARRA
PORT MOODY
ELECTORAL AREA A
VANCOUVER
BURNABY
COQUITLAM
PORT COQUITLAM
PITT MEADOWS
MAPLE RIDGE
NEW WESTMINSTER
RICHMOND
Annacis Outfall Project
DELTA
SURREY
LANGLEY CITY
LANGLEY TOWNSHIP
TSAWWASSEN FIRST NATION
WHITE ROCK

Annacis Island Wastewater Treatment Plant Outfall Project



Marine Stakeholder Workshop

Ken Massé, P.Eng.
METRO VANCOUVER

John Newby, P.E.
CDM SMITH

May 11, 2017

metrovancouver
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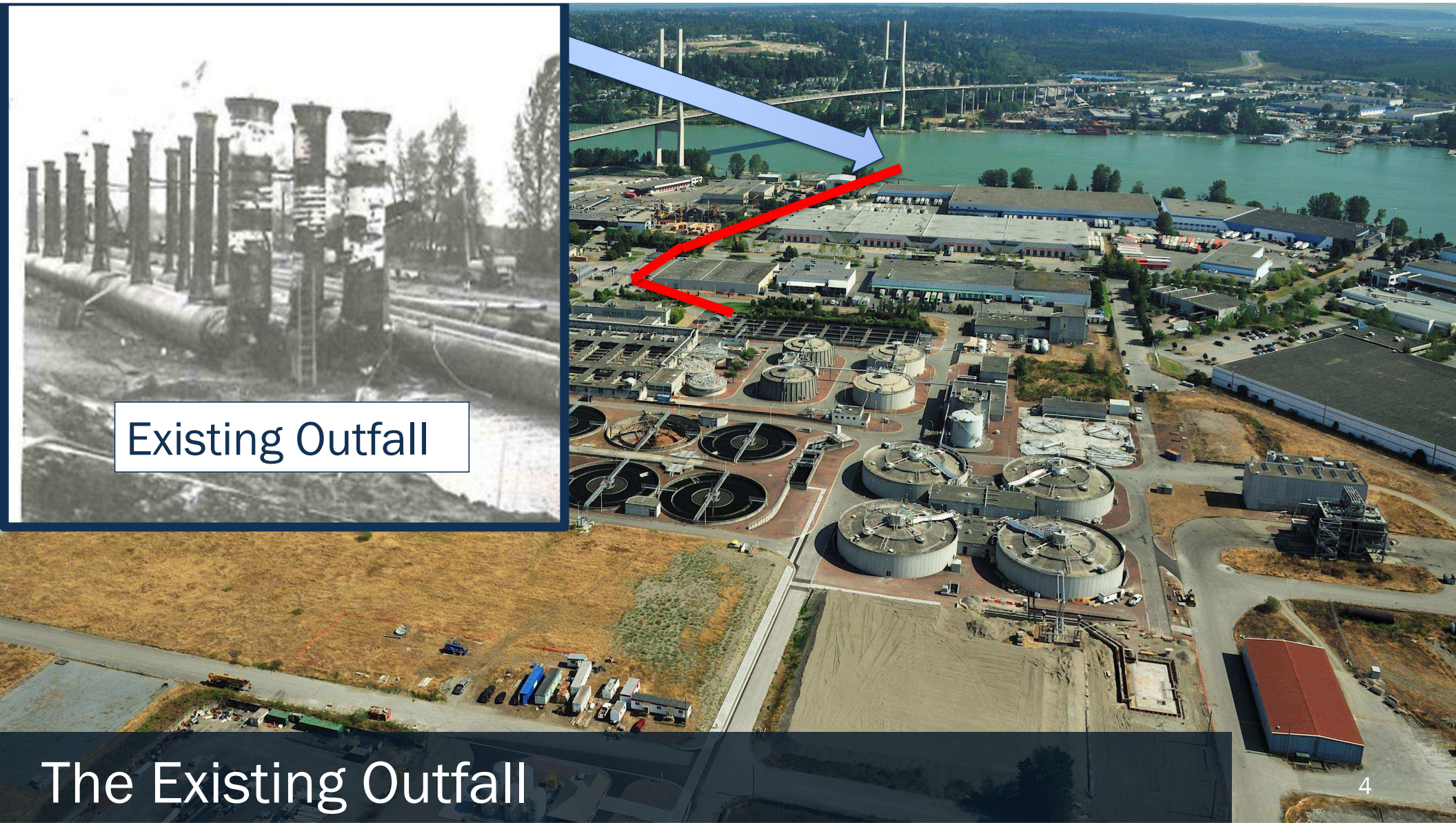
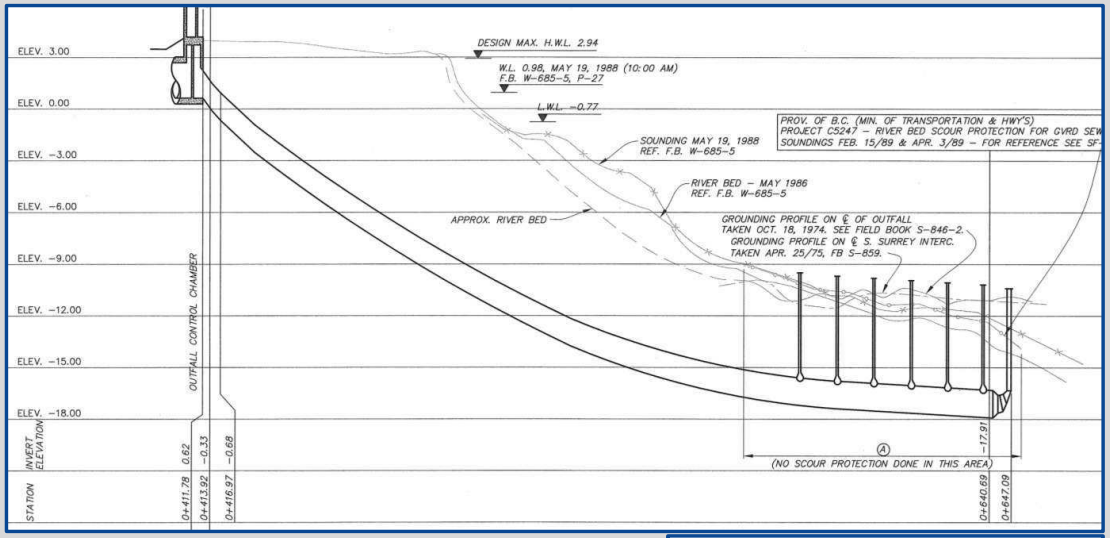
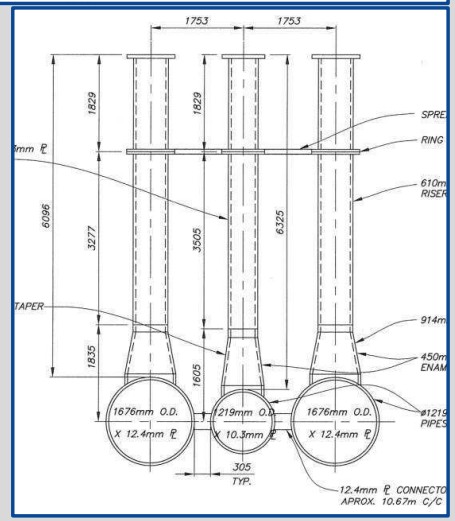
Annacis Island Wastewater Treatment Plant



The Existing Outfall

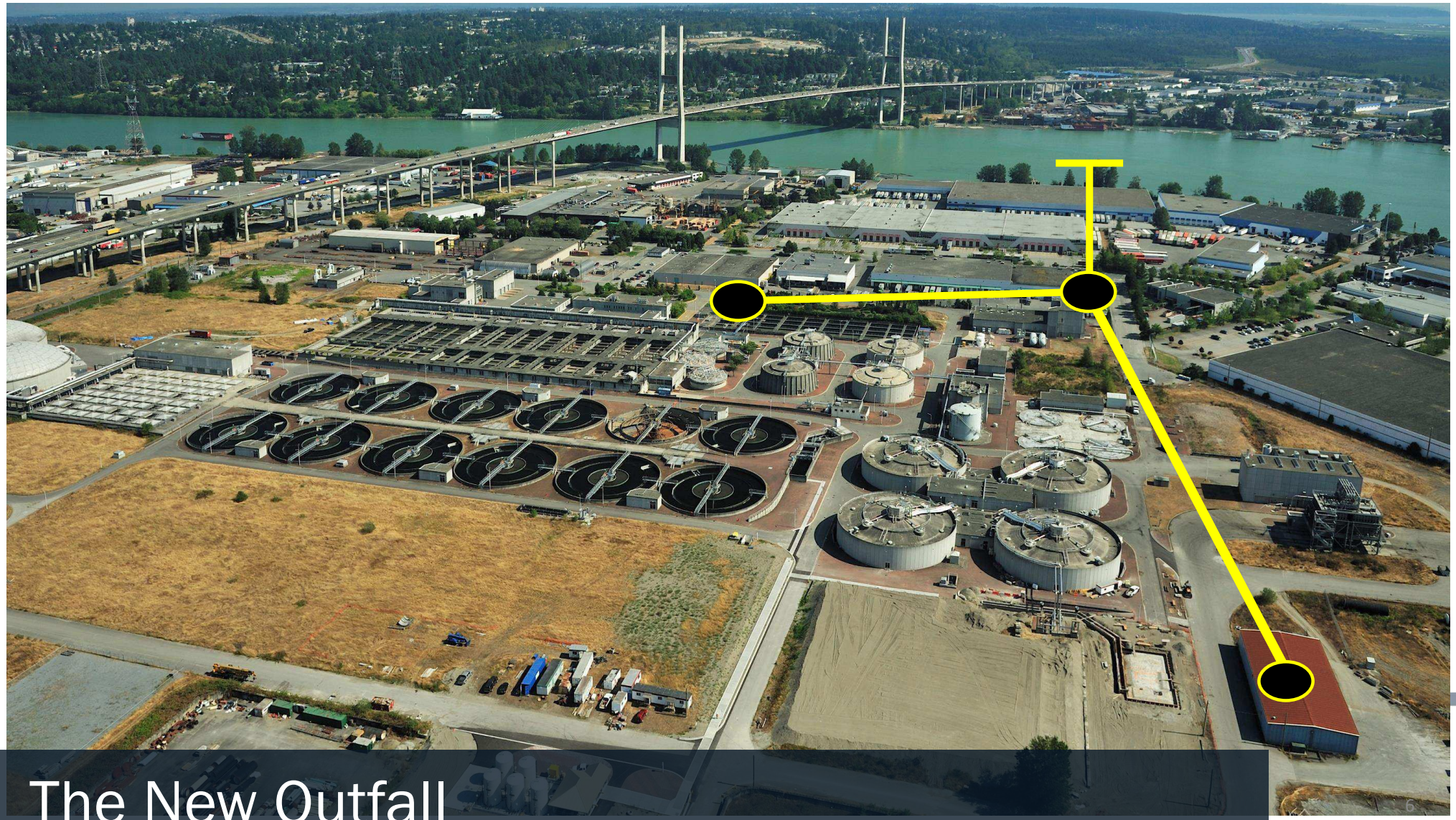
Existing Outfall



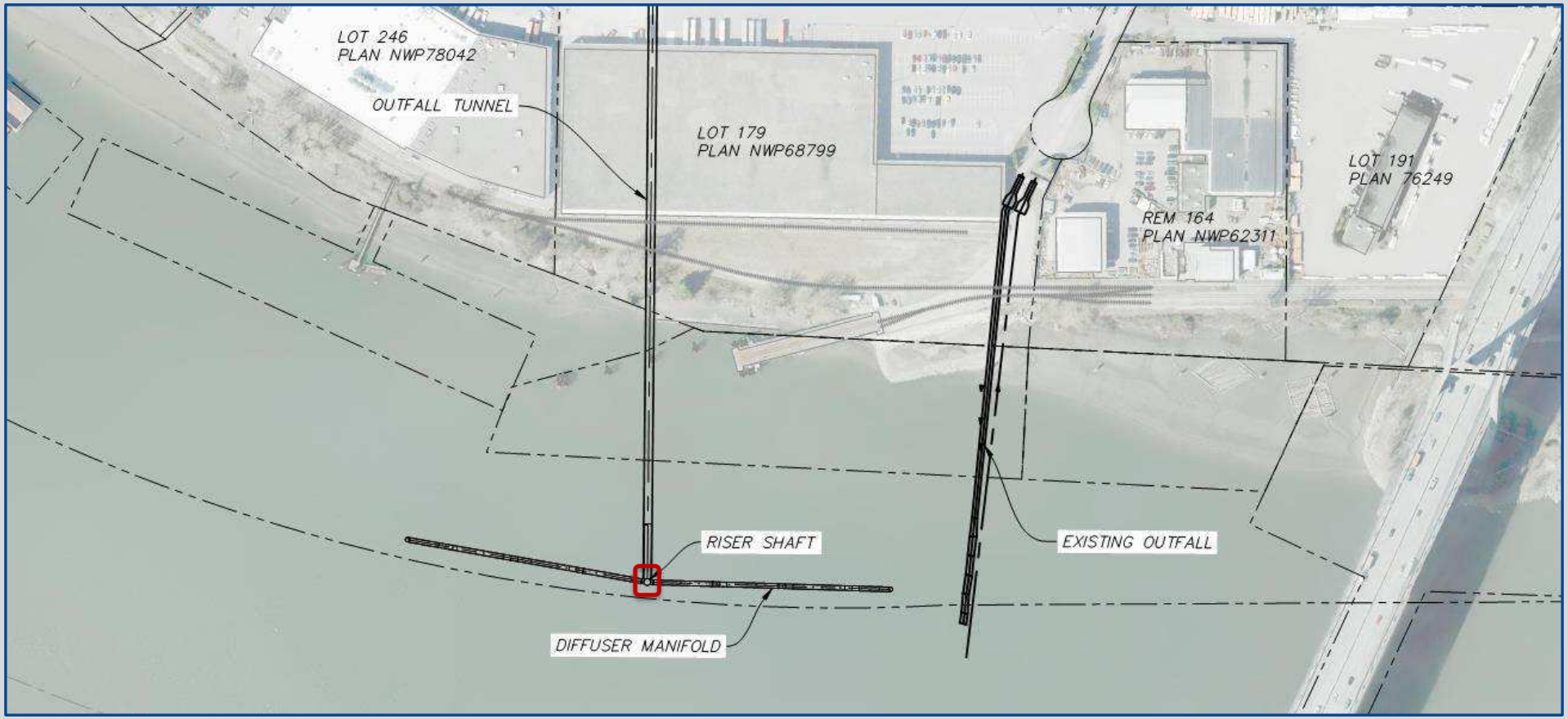


Will continue to serve as influent emergency bypass

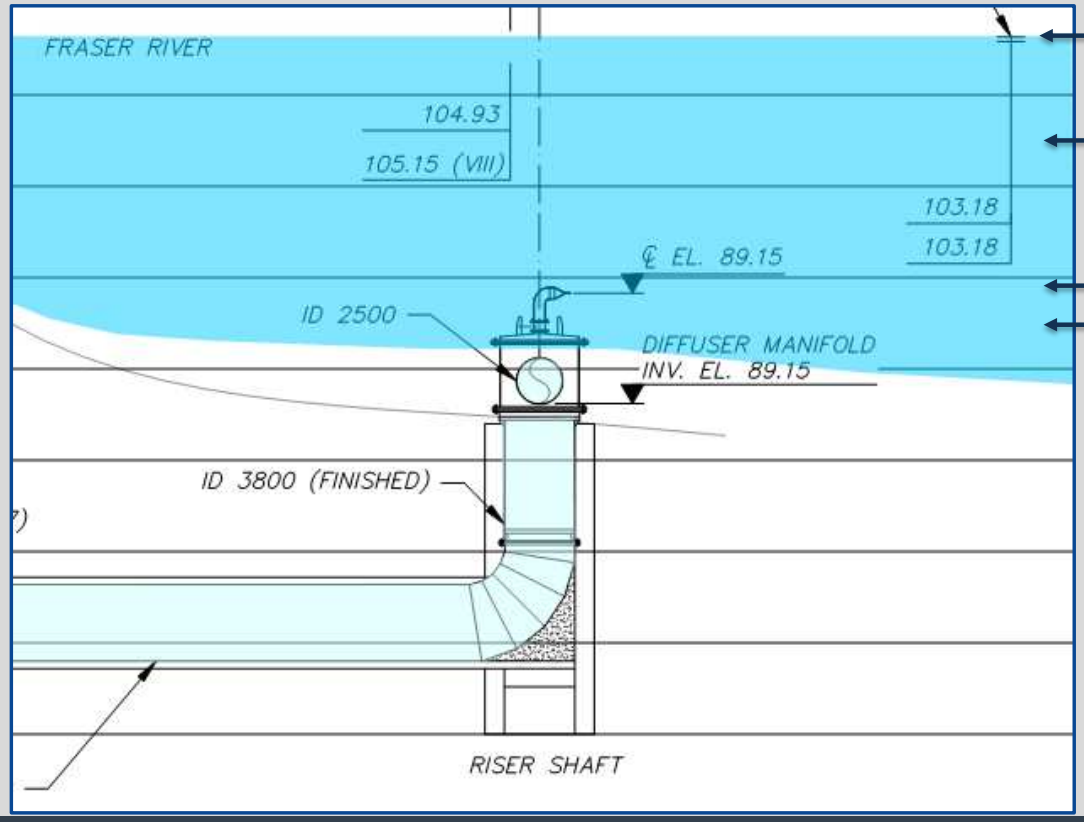
- Cleaning and repair
- Installation of ‘duckbill’ ports



The New Outfall



New Outfall: Riser Shaft and Diffuser Manifold



7.3 m – Design river level, 200-yr peak winter flood

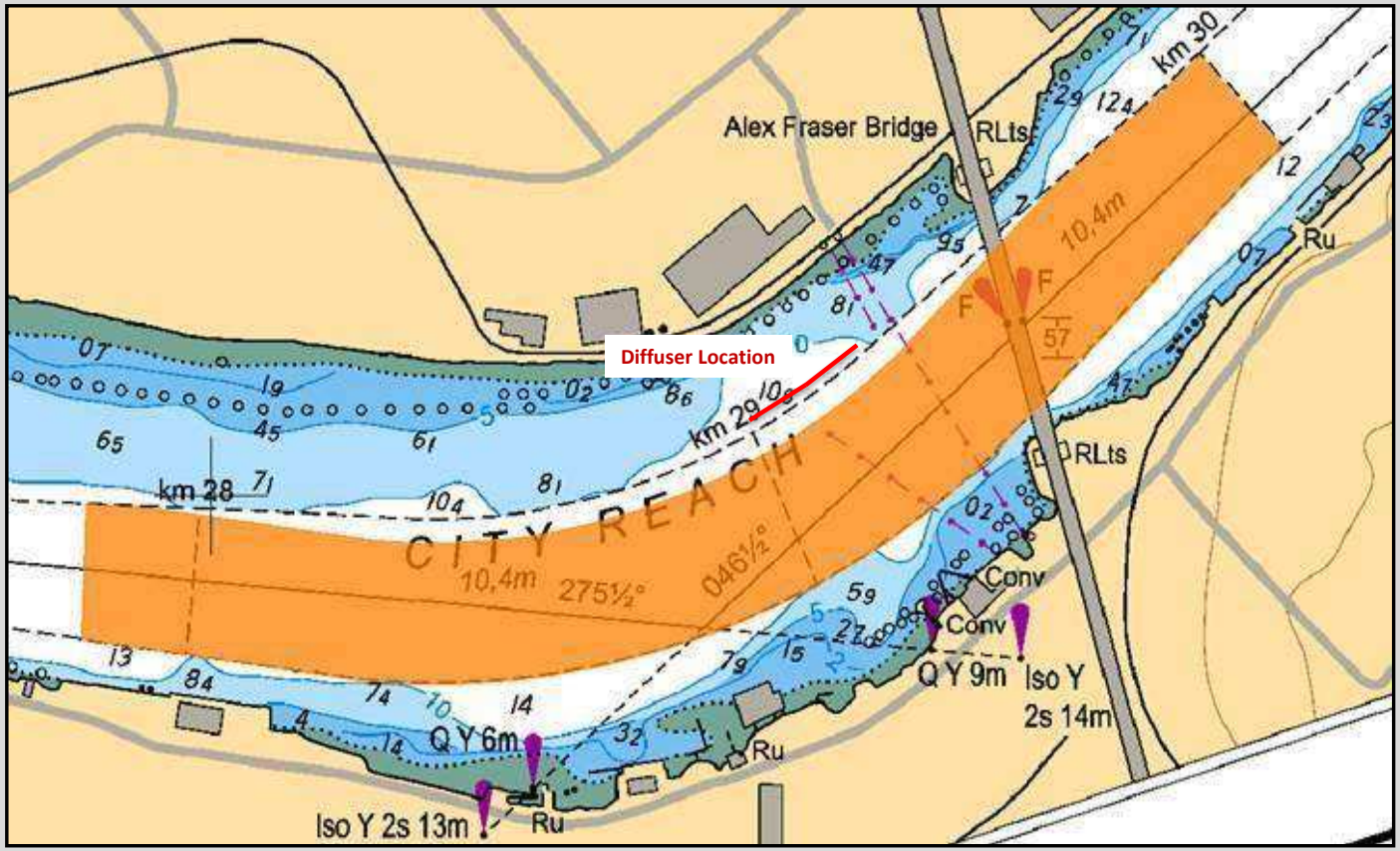
0.0 m – Chart Datum

-9.1 m – Top of Diffuser

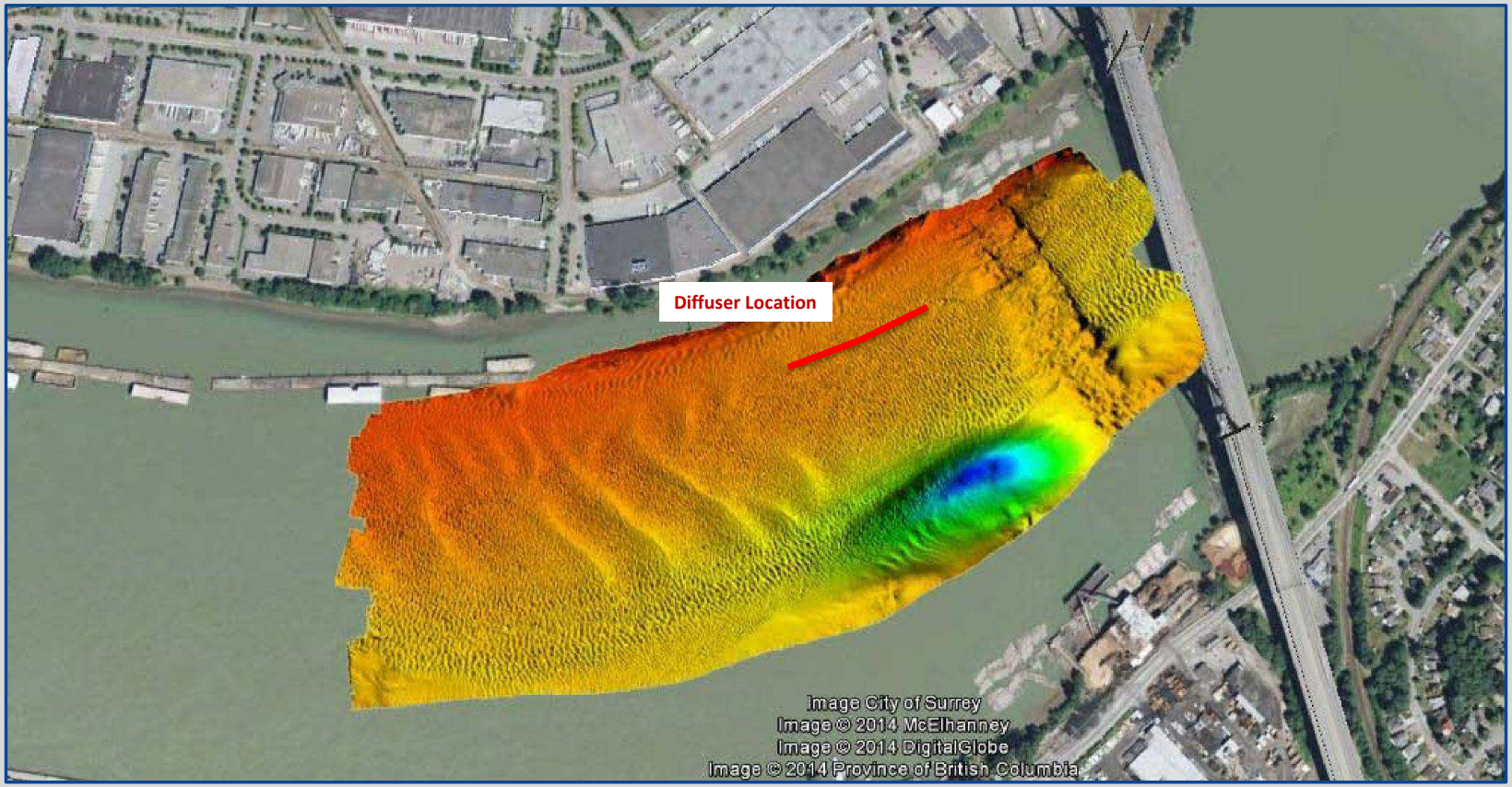
-10.9 m – Navigation channel minimum depth

Elevations / Water Depth

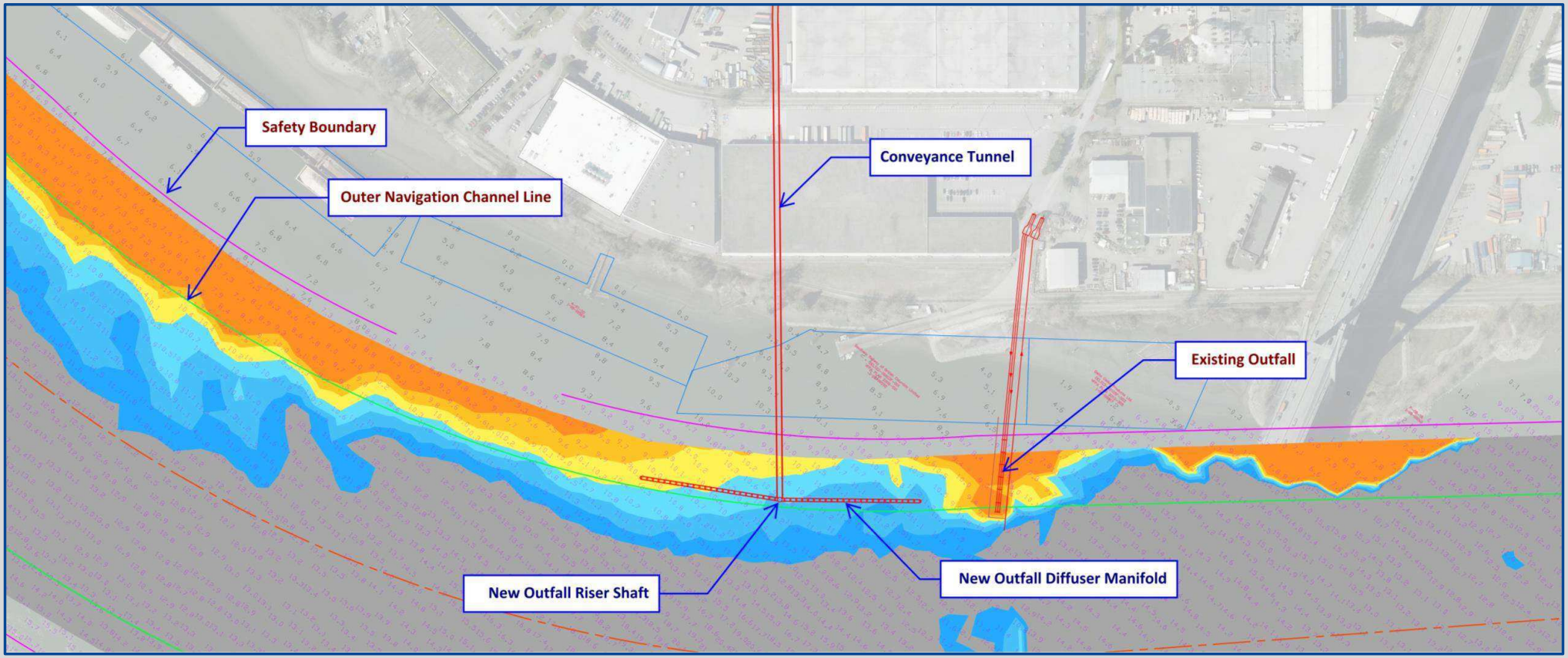
Outfall Location



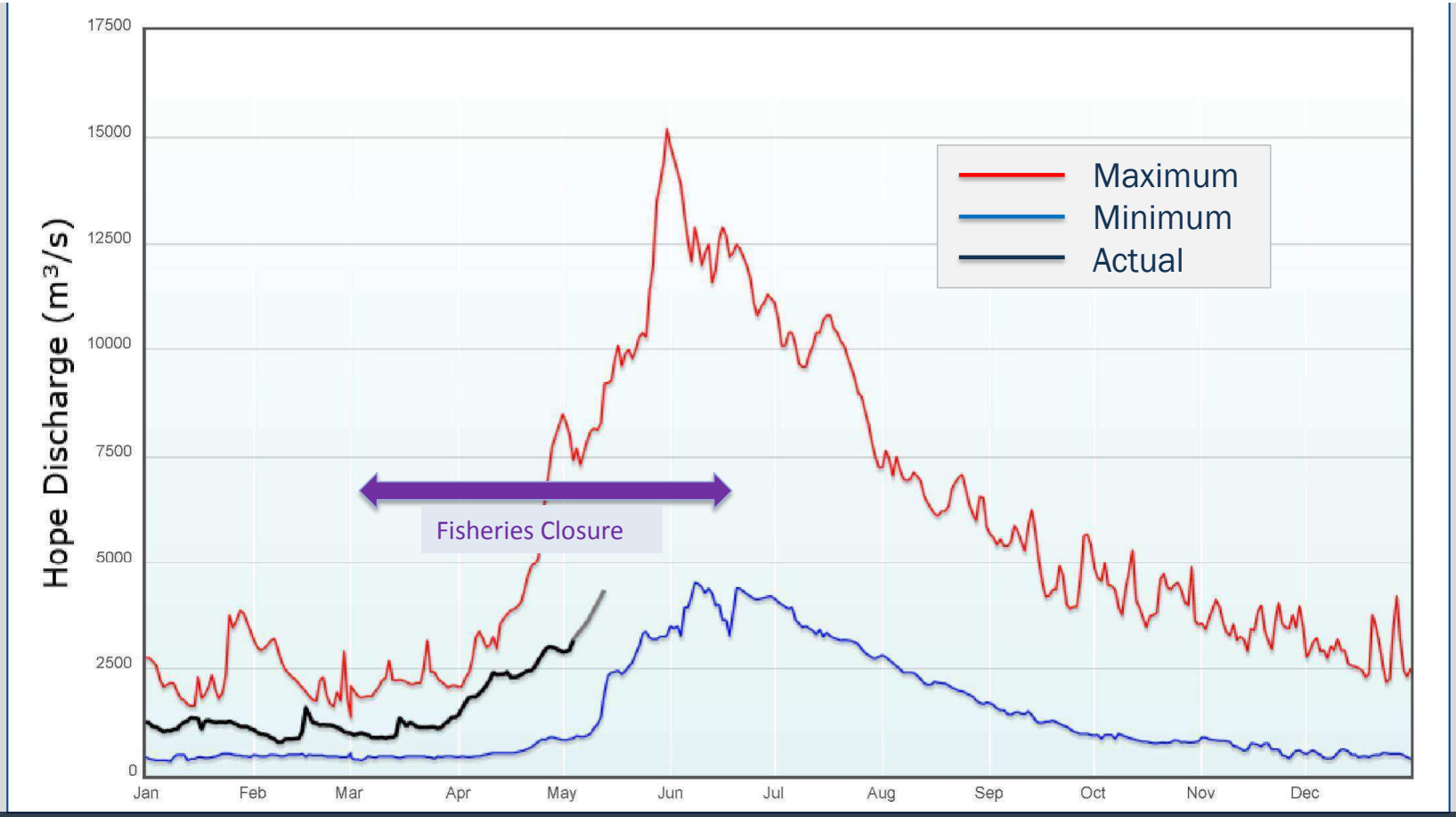
Fraser River Setting – Navigation Channel



River Bathymetry and Geomorphology



Diffuser Location



Fraser River Flow

Schedule

Schedule

- 90% Design complete: August 2017
- Submit Stage 2 EIS to MoE: September 2017
- Submit applications to FLRNO & Port: September 2017
- Obtain approvals & permits: March 2018
- Issue construction tender: April 2018
- Contractor mobilization: January 2019
- First work in river: June 2019

In-River Construction Seasons

Season 1

- River Riser Construction (June 2019)

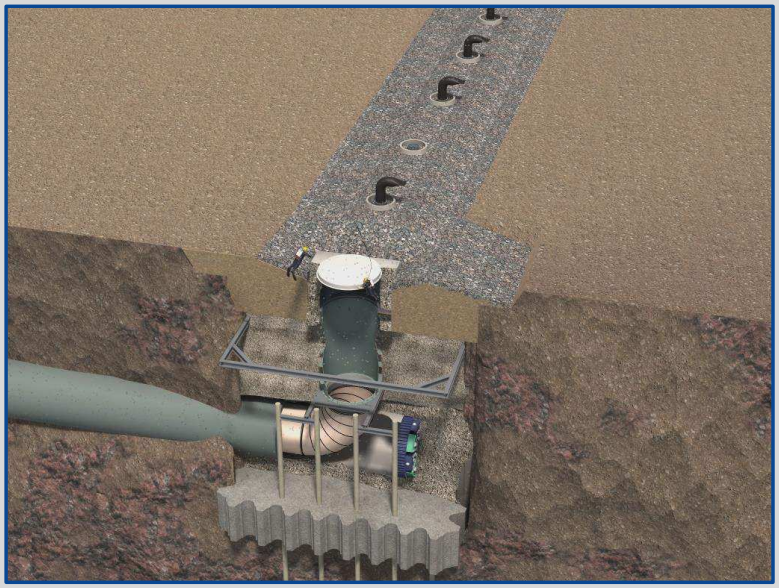
Season 2

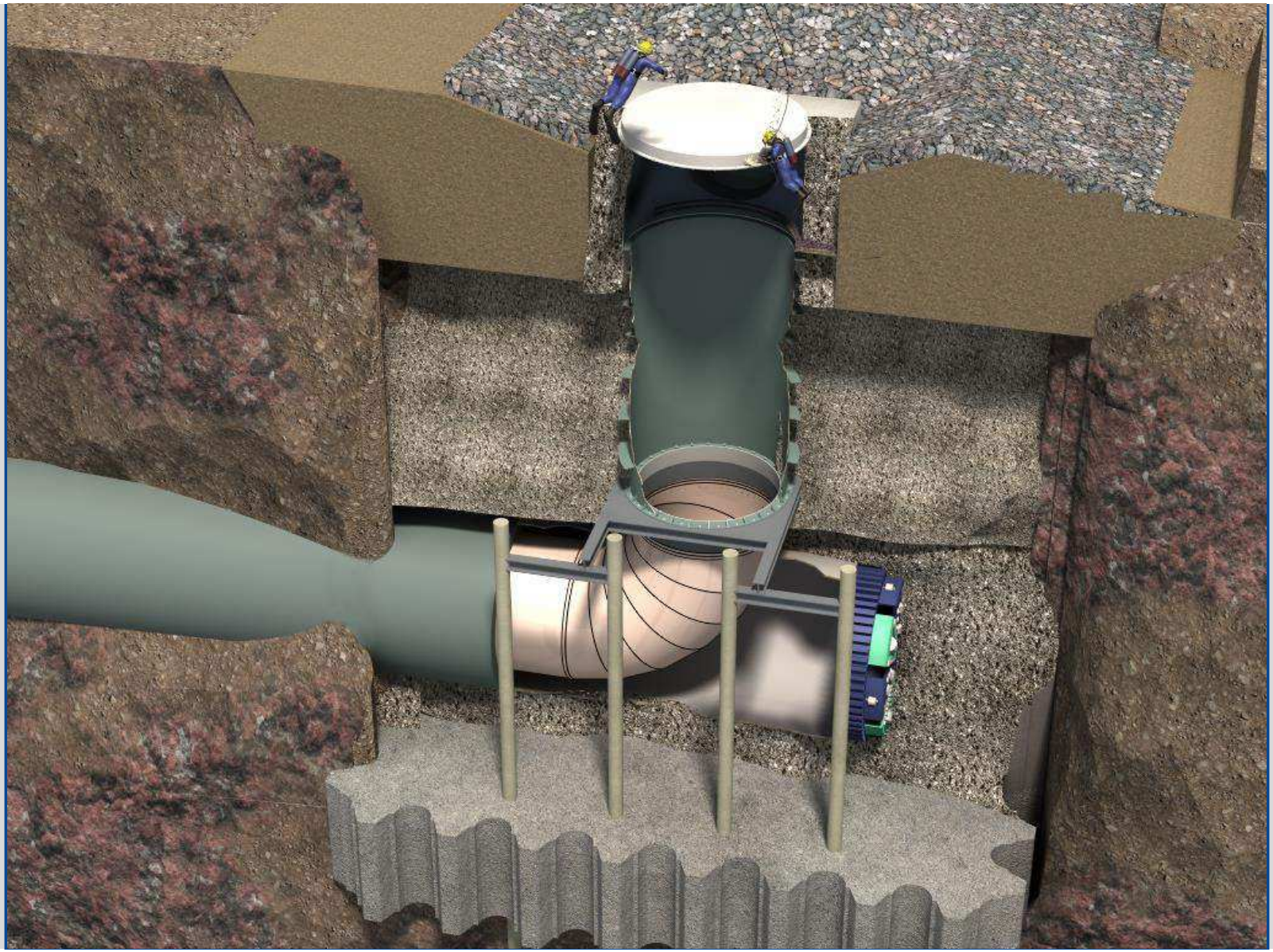
- Diffuser Construction (June 2020)

Season 3

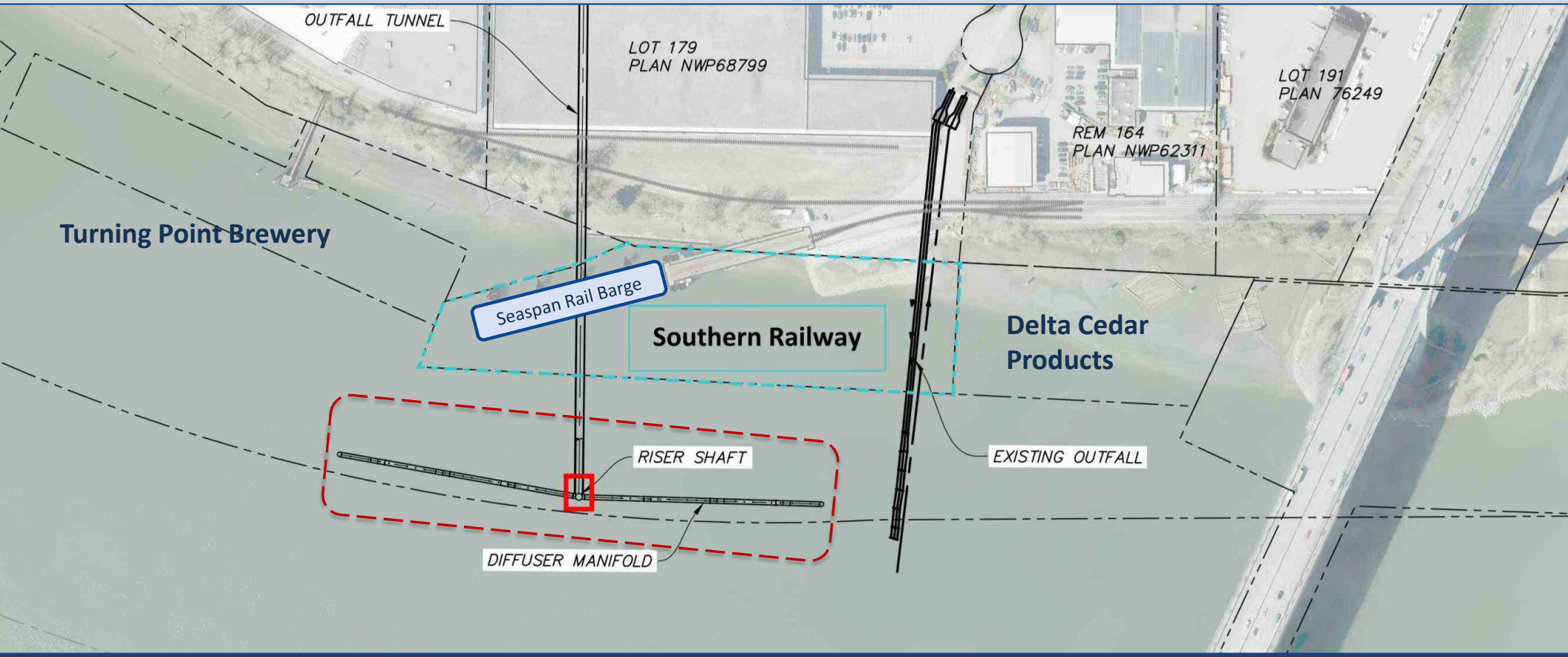
- Diffuser Connection (Summer 2021)
- Repair/Retrofit Existing Outfall (Winter 2021)

River Riser and Diffuser





In-River Work Areas



Riser and Diffuser Construction Site Limits

In-River Work Areas

Type A

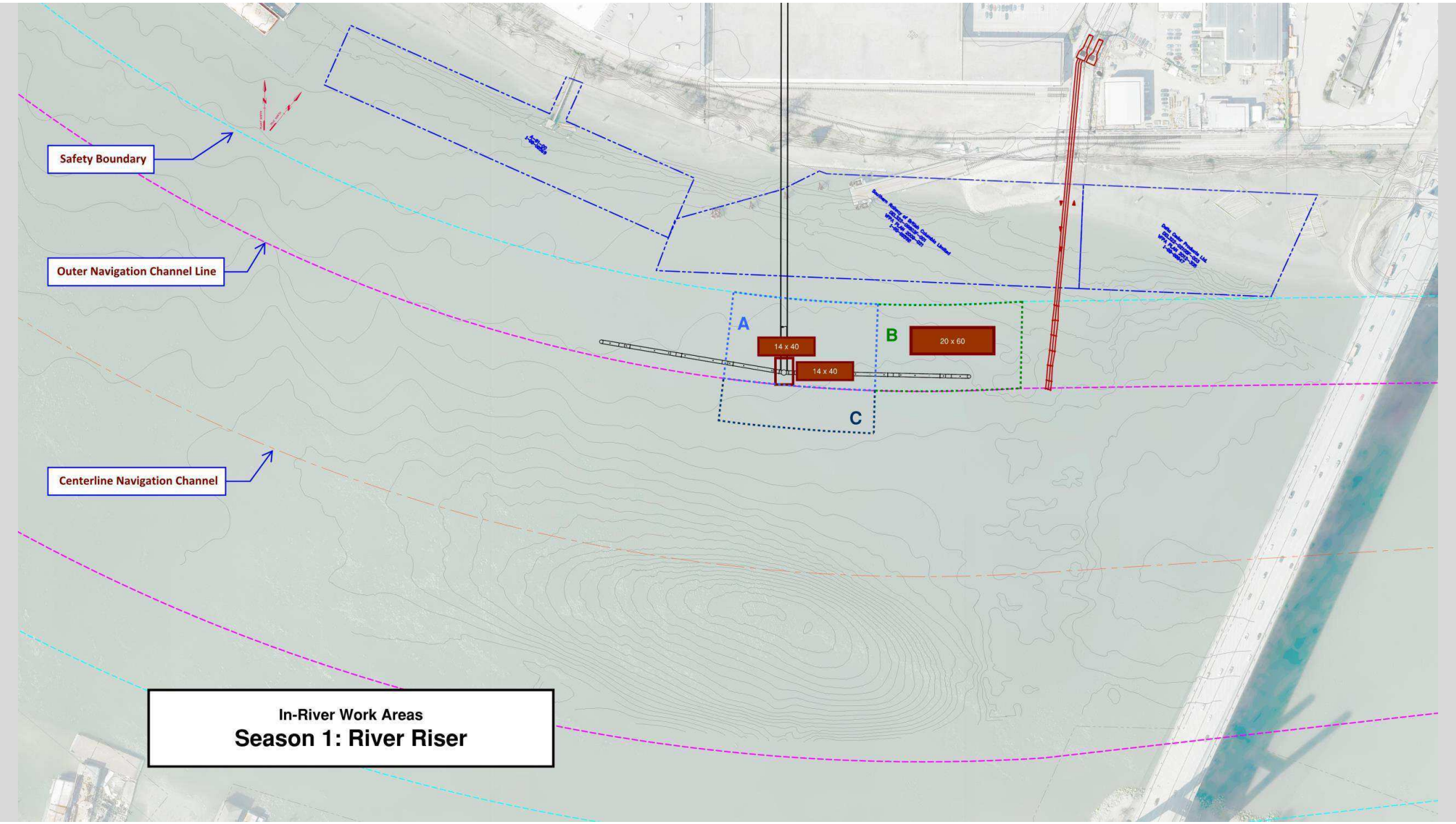
- Exclusive for Contractor's Operations

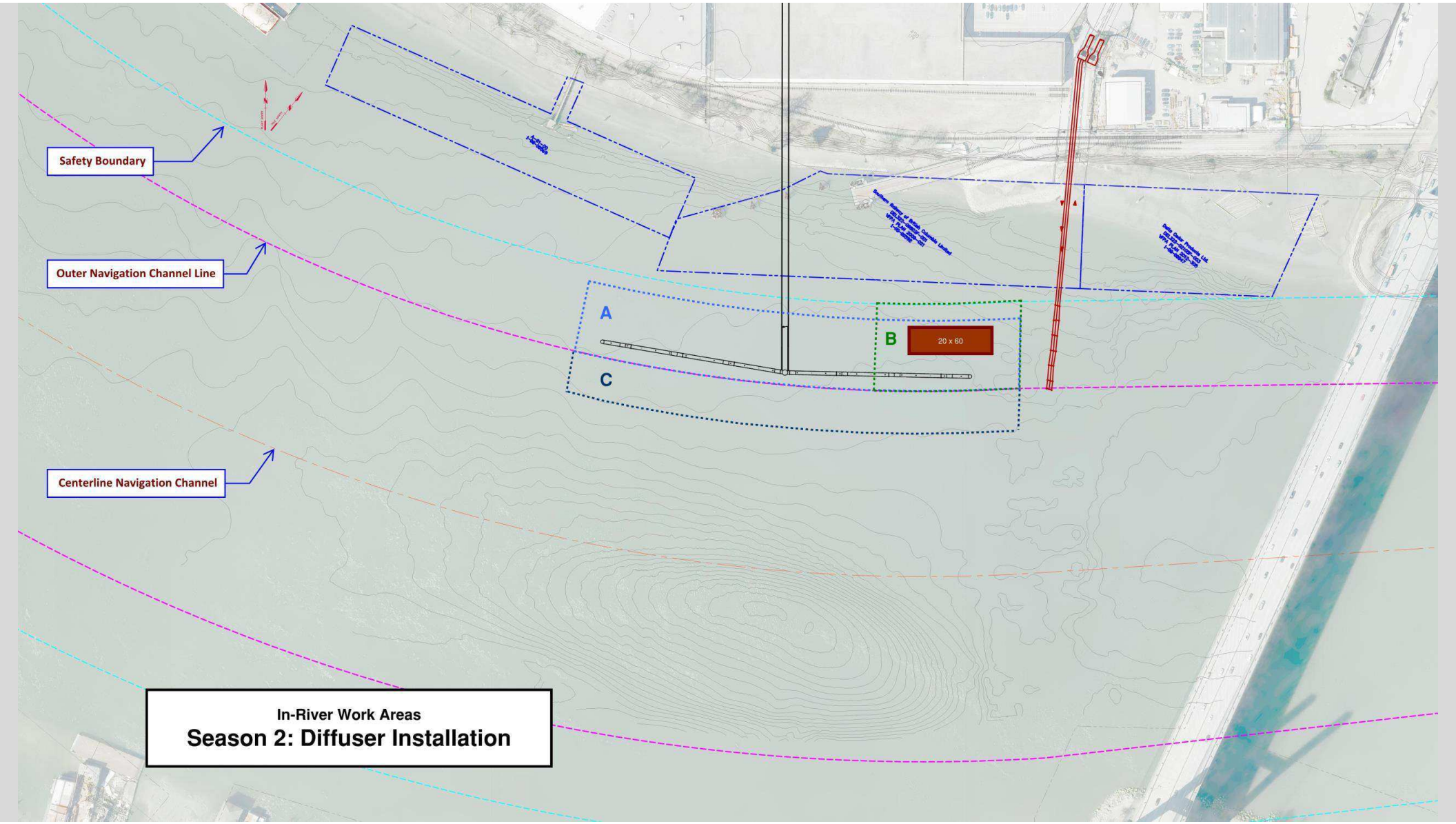
Type B

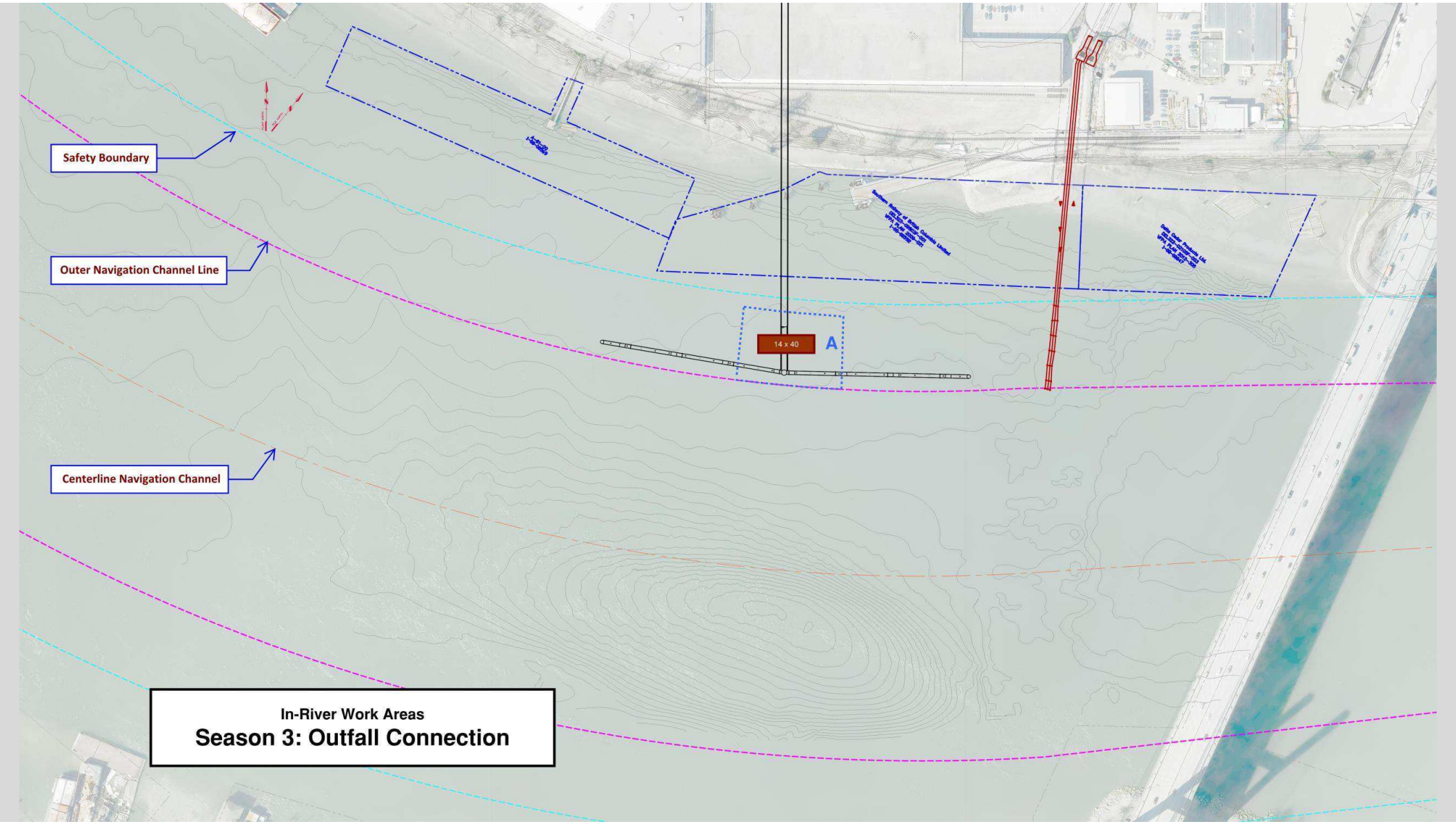
- Contractor's Staging Areas

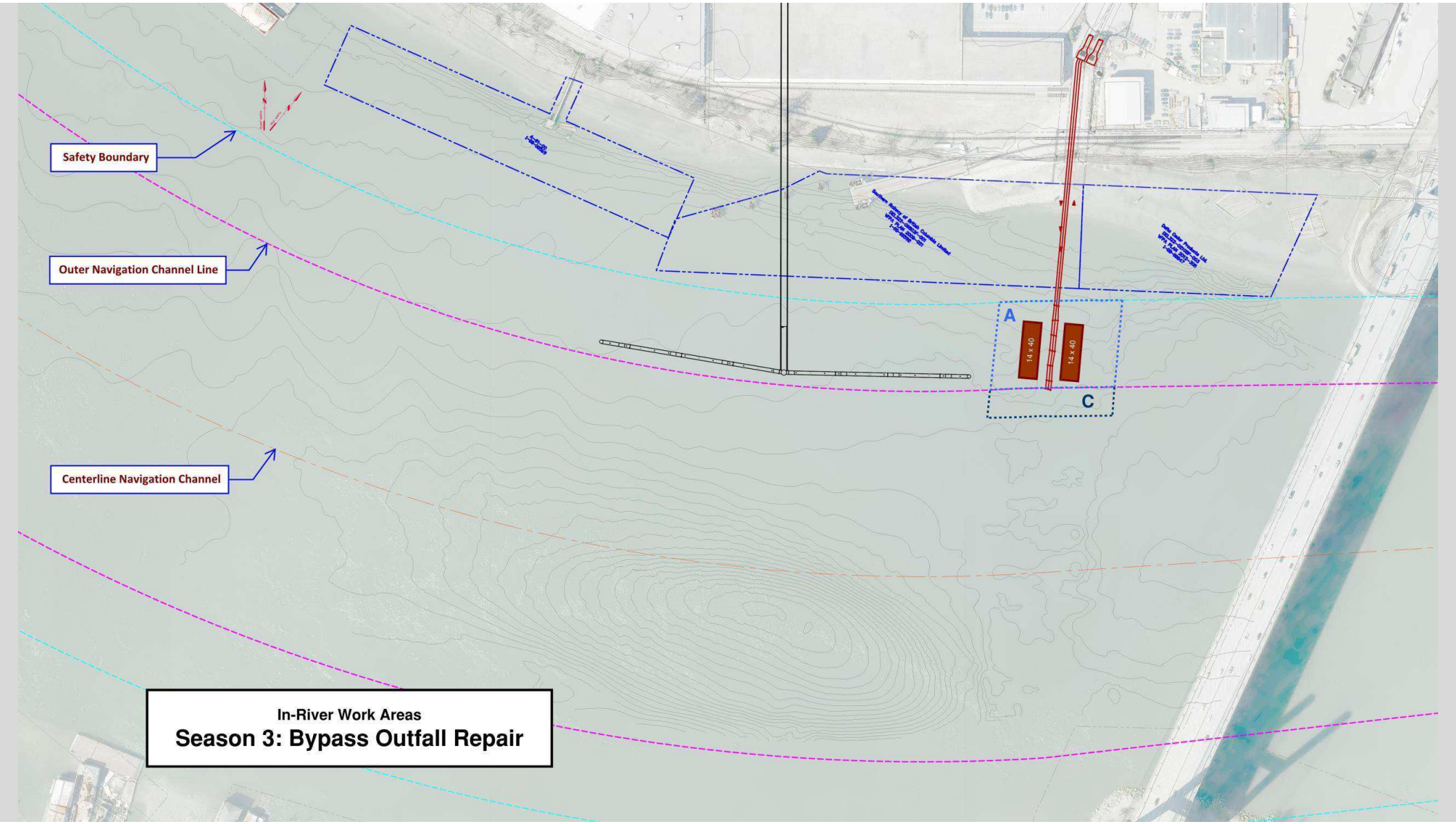
Type C

- Temporary Work Area within Navigation Channel.


Safety Boundary
Outer Navigation Channel Line
Centerline Navigation Channel
A
B
C
14 x 40
14 x 40
20 x 60
In-River Work Areas
Season 1: River Riser


Safety Boundary
Outer Navigation Channel Line
Centerline Navigation Channel
A
B
C
20 x 60
In-River Work Areas
Season 2: Diffuser Installation


Safety Boundary
Outer Navigation Channel Line
Centerline Navigation Channel
14 x 40
A
In-River Work Areas
Season 3: Outfall Connection


Safety Boundary
Outer Navigation Channel Line
Centerline Navigation Channel
A
C
14 x 40
14 x 40
In-River Work Areas
Season 3: Bypass Outfall Repair

Marine Contractor Requirements

Marine Contractor

- Hold Regular Meetings with Marine Users
- Submit a Marine Communications Plan
- Issue a Temporary Notice to Mariners
- Issue Weekly Notice to Shipping Advisories
- Post Public Notice
- Provide Assist Tug
- Hydrographic Survey
- Permanent Notice with Chart Correction

REGULATORY & PERMITTING ISSUES

- Port of Vancouver
  - Navigation Impact Assessment
  - Dredging Information
- Transport Canada
- Department of Fisheries & Oceans (DFO)
- Ministry of Environment (MoE)
- Ministry of Forest, Lands &
- Natural Resources Operations (FLNRO)
- Corporation of Delta
- Environment and Climate Change Canada

We want to learn about how and when you use this area of the river.

Please indicate on the maps how your operations take place around the outfall construction site:

1. *Are there any areas we should stay away from? Why? Are there certain times that are okay?*
2. *What considerations should Metro Vancouver be aware of as we develop our construction plan?*

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