

City of Yellowknife

Submarine Pipeline Replacement

Open House

November 2, 2022

Land Acknowledgement



Agenda



Welcome + Introductions

- Objectives
- Team



Introducing the Project

- Project History
- Project Drivers
- Project Schedule



Project Elements

- Submarine Pipeline Replacement
- Pumphouse 1 + 2 Upgrades
- Intake Screen Design
- Land Use
- Regulatory + Engagement

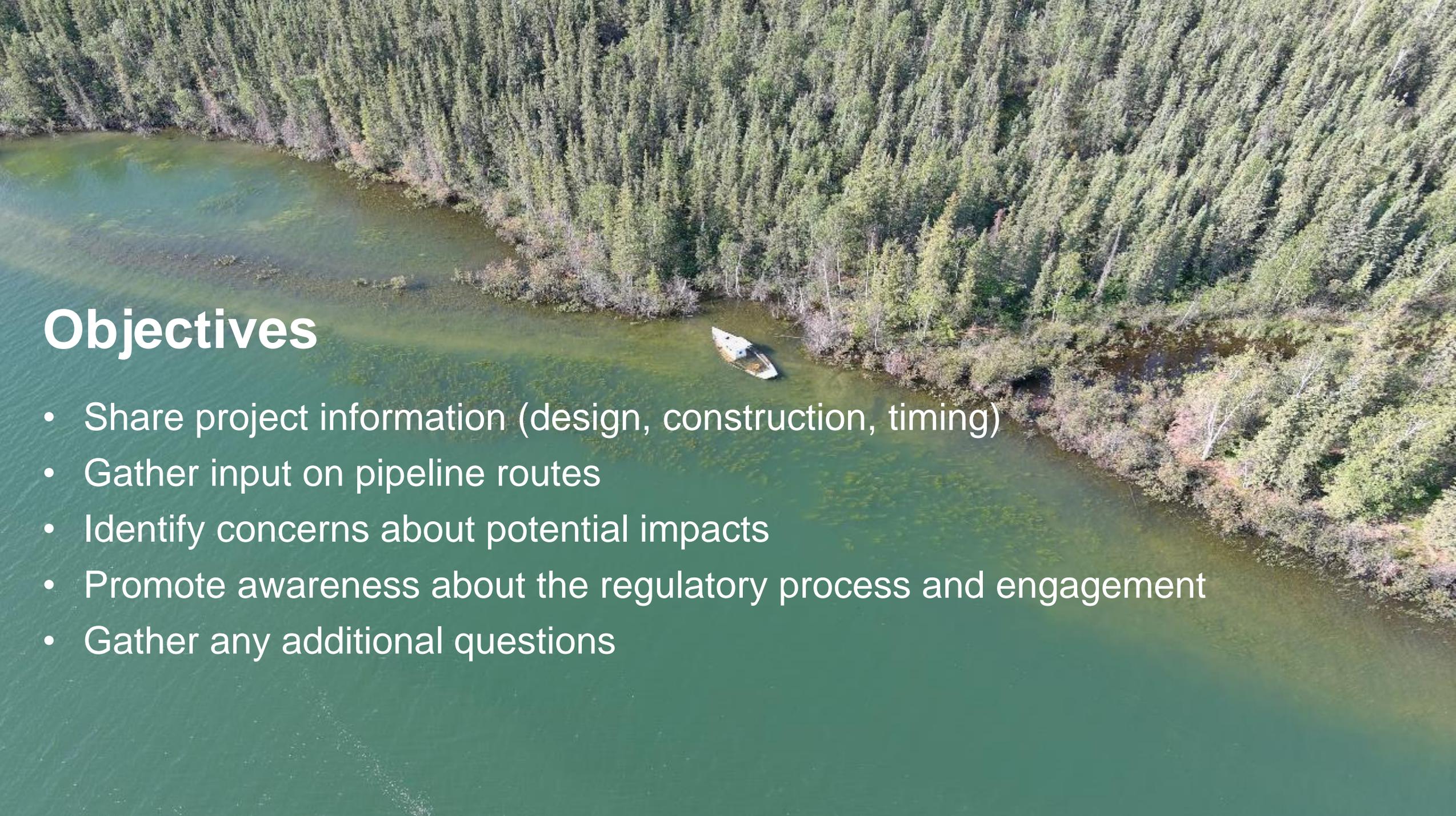


Key Considerations

- Water Quality + Monitoring
- Construction Sequencing
- Construction Timing



Discussion & Questions

An aerial photograph of a large, greenish-brown lake surrounded by a dense forest of evergreen trees. A small, light-colored boat is visible on the water near the shoreline. The text 'Objectives' is overlaid on the left side of the image in a large, white, sans-serif font.

Objectives

- Share project information (design, construction, timing)
- Gather input on pipeline routes
- Identify concerns about potential impacts
- Promote awareness about the regulatory process and engagement
- Gather any additional questions

The Team



CITY OF YELLOWKNIFE



Chris Greencorn
Director, Public Works



Wendy Newton
Manager, Sustainability + Solid Waste



Caroline Pollock
Outgoing Project Manager



Alex Rodriguez
Project Manager

AECOM



Ryan King
Project Engineer



Lance Fradette
Design Engineer



Jay Allen
Civil Engineer



Cortney McCracken
Process Engineer



Morag McPherson
Regulatory Lead



Erin Huck
Engagement Specialist

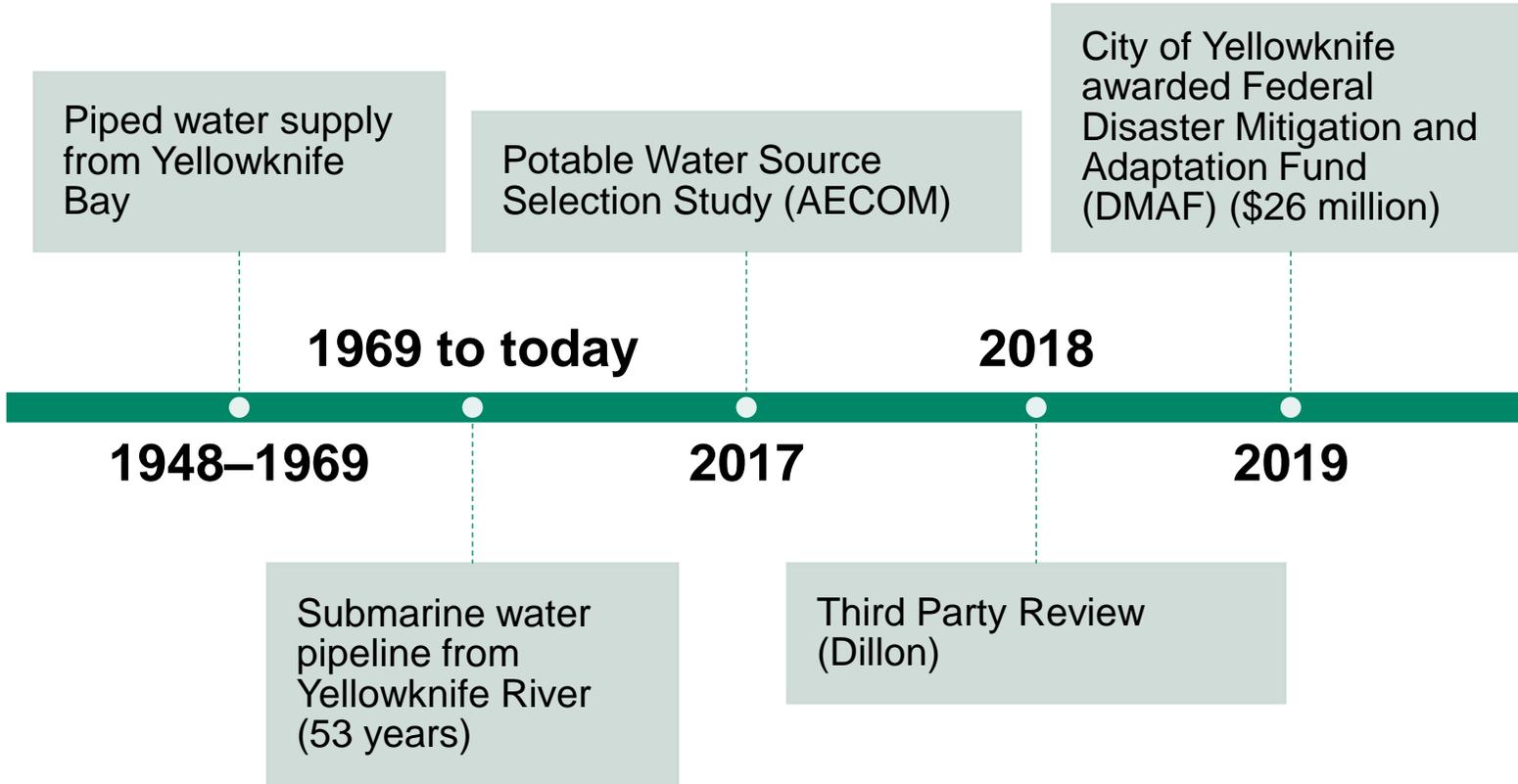


Alisa Blake
Senior Project Coordinator

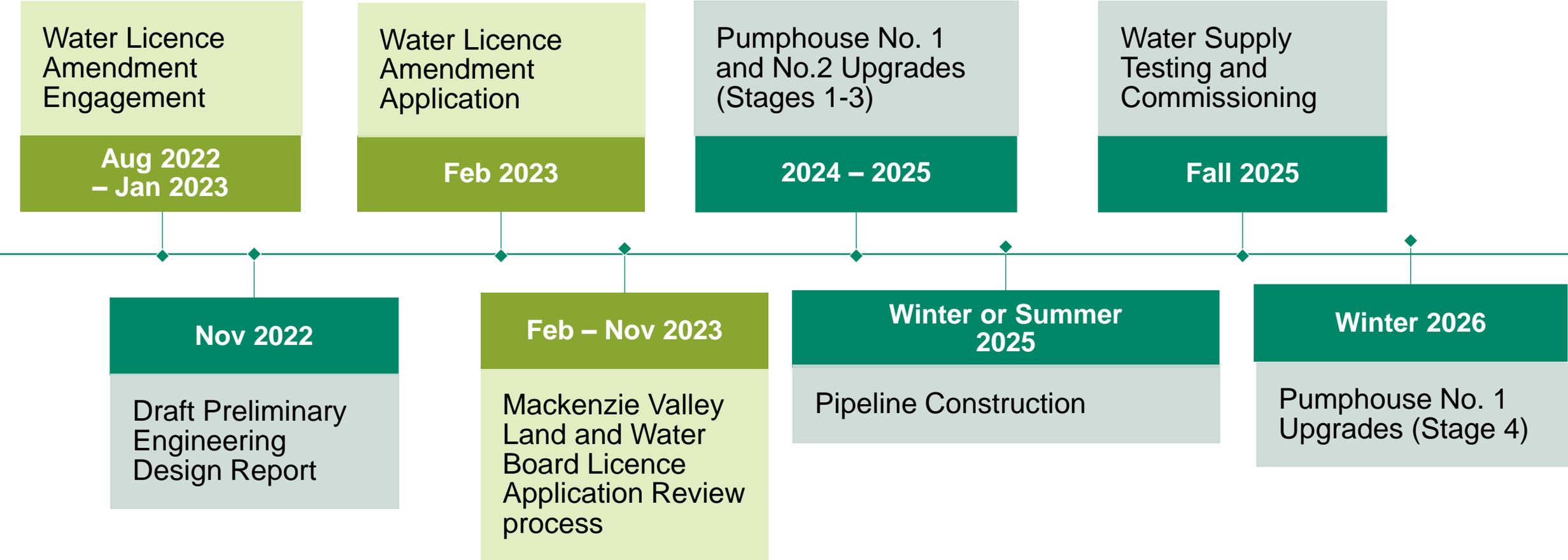
Introducing the Project

- Project History + Drivers
- Project Schedule

History + Drivers



Project Timeline



* Estimated schedule - to be revised as planning progresses

Project Elements

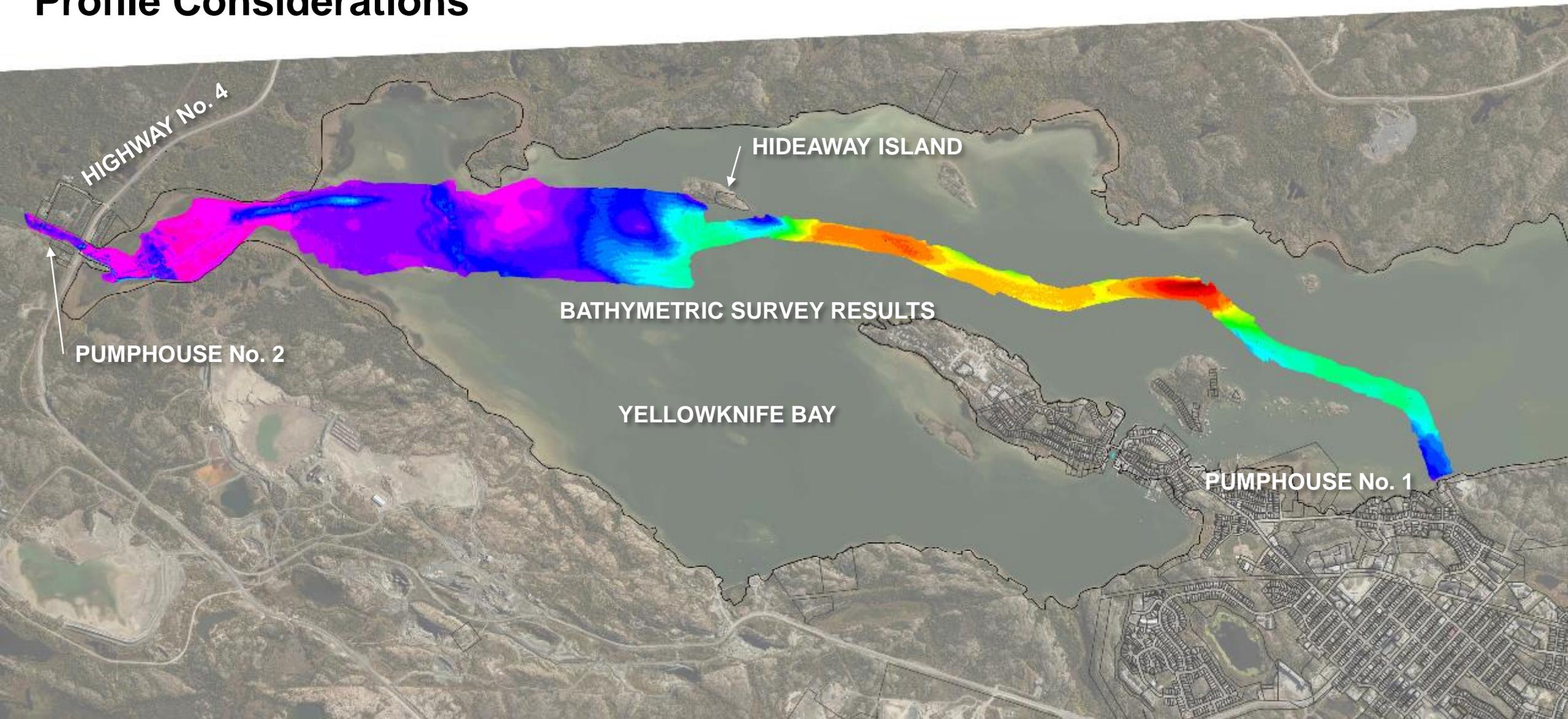
- Submarine Pipeline Design + Replacement
- Pumphouses
- Intake Screen Design
- Land Use
- Regulatory + Engagement

Submarine Pipeline Design + Replacement

- Profile Considerations
- Proposed Pipeline Routes
- Pipeline Material & Features



Profile Considerations



Proposed Alignment – Overall

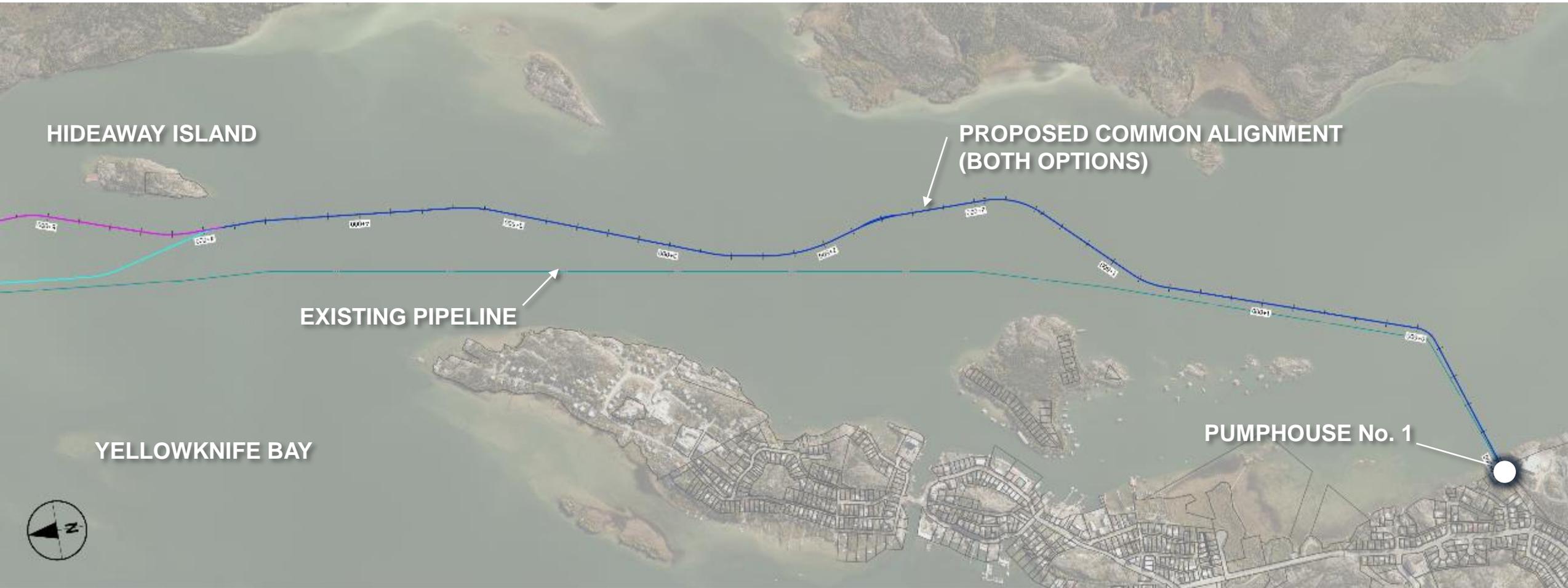


LEGEND

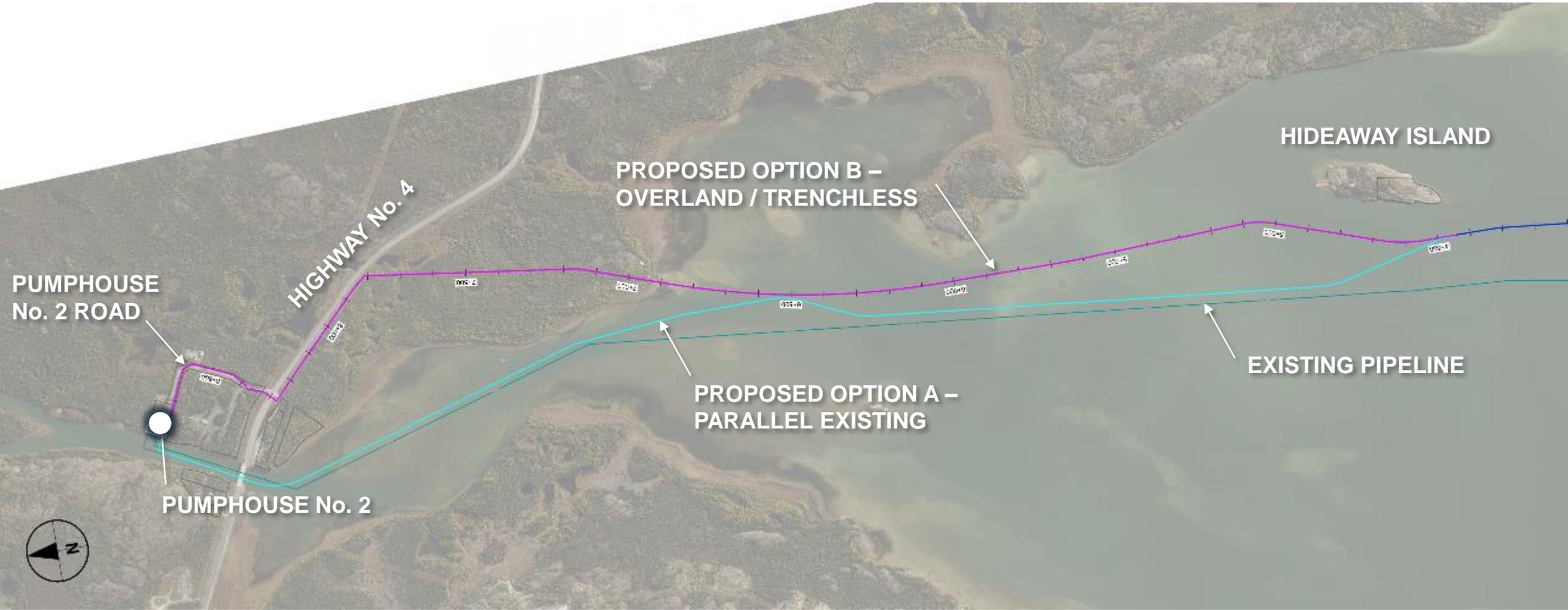
	EXISTING	PROPOSED
WATER MAIN		
WATER MAIN - ROUTE OPTION A		
WATER MAIN - ROUTE OPTION B		



Proposed Pipeline – Common Alignment



Proposed Pipeline – Option A & B Alignments





**OPTION B
PROPOSED TRENCHLESS
SHORELINE CROSSING**

HIDEAWAY ISLAND

HIGHWAY No. 4

PUMPHOUSE No.2 ROAD

**YELLOWKNIFE RIVER
TERRITORIAL DAY
USE PARK**

WELEDEH GATHERING AREA

Pipeline Material + Features

High Density Polyethylene (HDPE)

- Proven submarine pipeline construction
- Does not corrode
- Relatively light material
- Concrete weights required for submersion



Steel

- Existing pipeline material
- Susceptible to corrosion

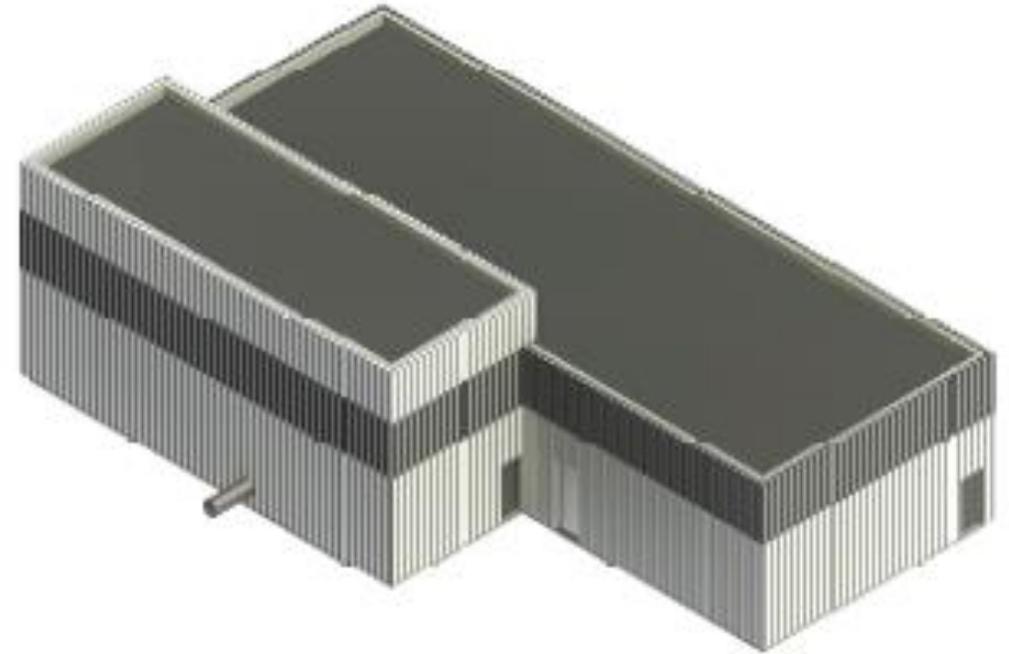


Pumphouses



Pumphouse No. 2

- 75 year design life for structure
- Replace pumps and piping
- New ventilation, cooling
- New generator
- Air compressor for intake screens
- Electrical and heating upgrades
- Building and road expansion



Conceptual Rendering – Pumphouse No. 2

Pumphouse No. 1

- 75 year design life for new structure
- Replace oldest part of structure
- Piping
- Heat, ventilation, cooling
- Generator
- New office space on second floor
- Site grading, parking, water/wastewater



Conceptual Rendering – Pumphouse No. 1

Intake Design

Regulations
Full Intake Screen
Low Profile Half Intake Screen

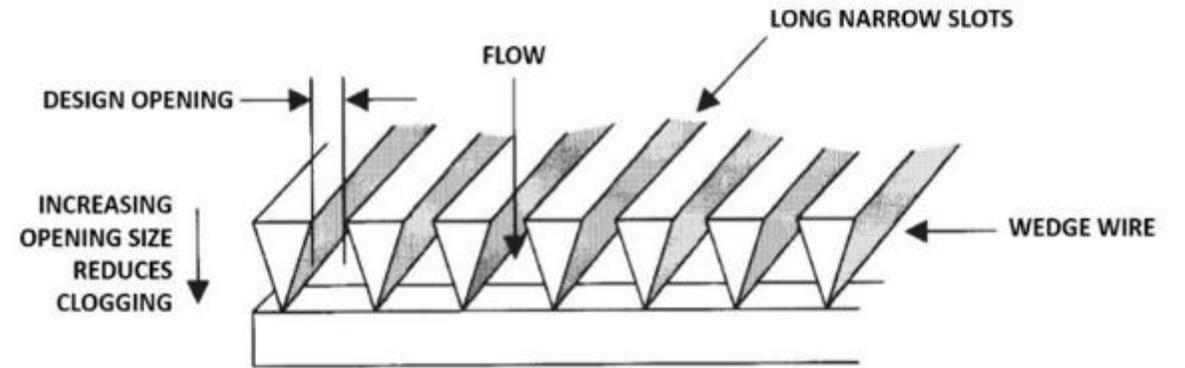


Department of Fisheries and Oceans Code of Practice: End-of-Pipe Fish Protection Screens

Key Fish Species in Yellowknife Bay				
Species Group	Species	Wiilideh Name	DFO required approach Velocity	Photos
Salmon and Walleye	Inconnu	wiilii	0.098 m/s	
	Lake Trout	łiwezq		
	Lake Whitefish	łi		
	Cisco	wiilitsòà		
	Arctic Grayling	ts'èt'ìq		
	Longnose Sucker	dohdori		
	Ninespine Stickleback	-		
	Slimy Sculpin	-		
Pike	Northern Pike	łhdaà	0.055 m/s	
Eel	Burbot	Nqkwè	0.035 m/s	

Department of Fisheries and Oceans Code of Practice: Key Design Requirements

- Effective screen area
- Screen material
- Screen shape



Intake Replacement Locations

1) River Intake at Pumphouse No. 2
(Primary)



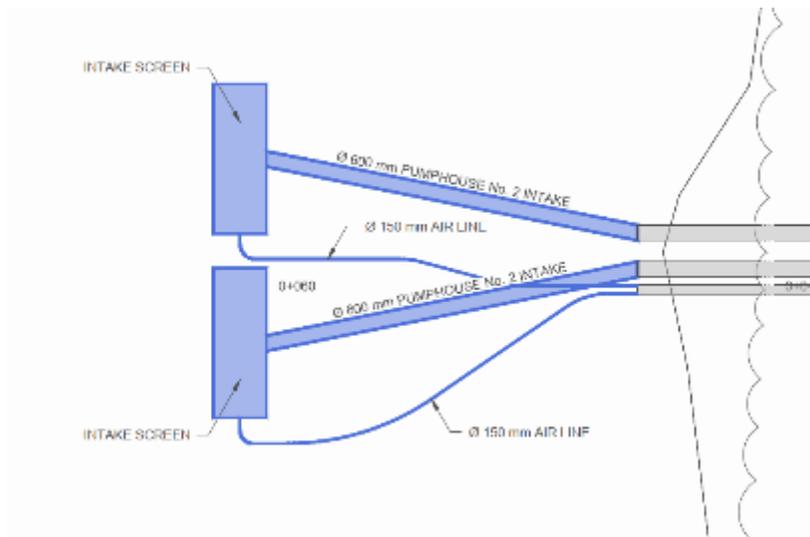
2) Bay Intake at Pumphouse No. 1
(Emergency / Secondary)



Yellowknife River - Low Profile Half Intake Screens



- Two screens each installed on existing 600mm intake pipe
- Mounted to a concrete base
- Ideal for rivers and locations with shallow depth
- Able to operate at half the water depth of standard / traditional intake screens.
- Designed to counteract the forces of the River
- 0.035 m/s maximum approach velocity at design flow of submarine pipeline
- Compressed air cleaning system



Yellowknife Bay – Cylindrical Tee Style Screen



- New Tee screen will replace existing 600mm intake pipe
- Ideal for lakes and other locations with abundant depth
- Space efficient and easy to install relative to the half intake style screen
- 0.035 m/s maximum approach velocity at 20-year maximum instantaneous Water Treatment Plant flowrate

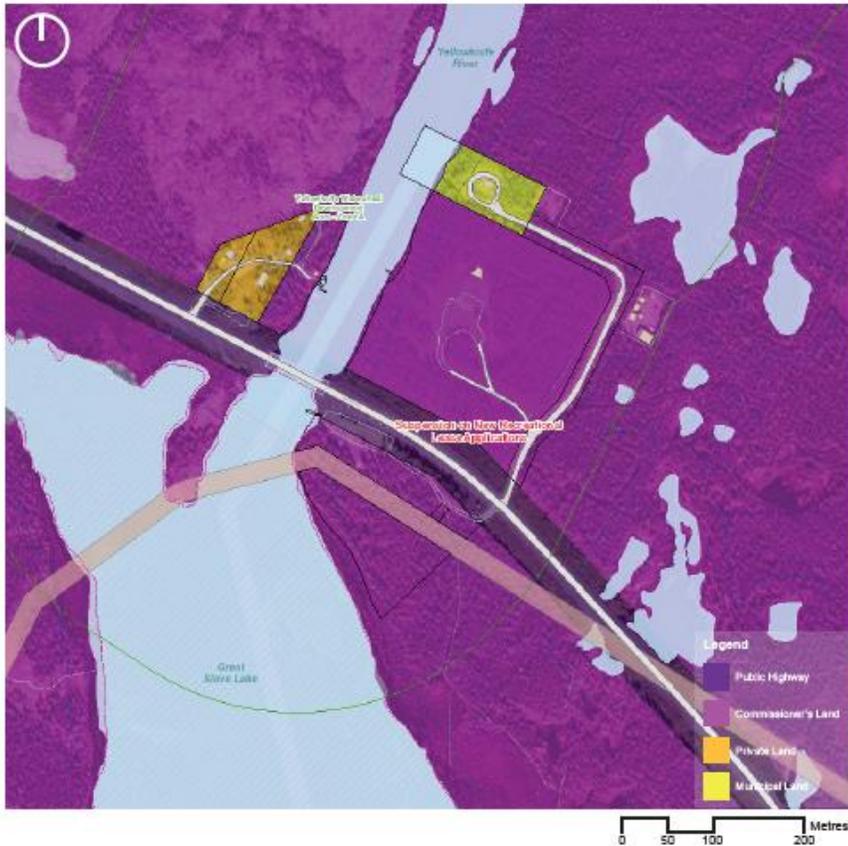
Land Use

- Pumphouse No. 2
- Pumphouse No. 1
- Submarine Pipeline Lease Easement



Pumphouse No. 2: Option B

- Overlapping land interests south of Highway No. 4 (Ingraham Trail)
- Proposed pipeline route will require construction and permanent easement

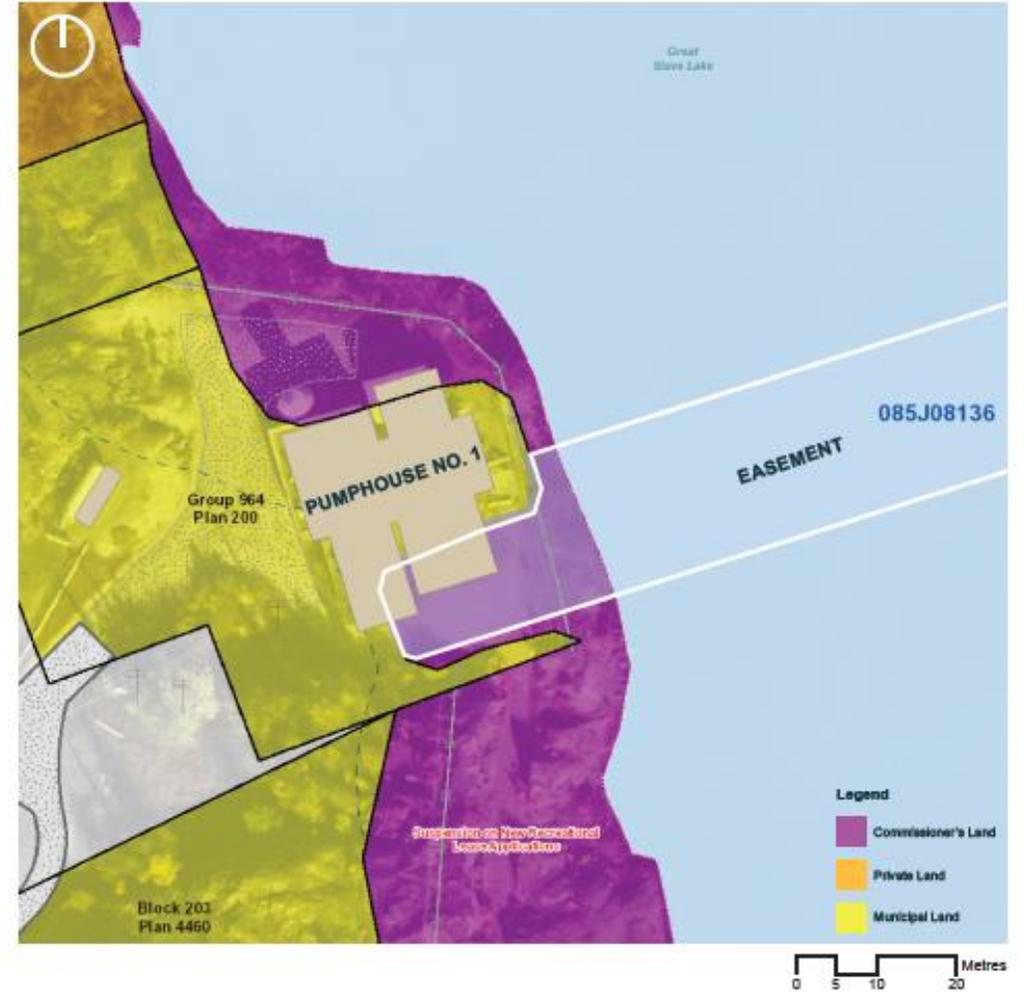


Credit: <https://www.maps.geomatics.gov.nt.ca/ATLAS>



Pumphouse No. 1

- Commissioner's land between Pumphouse No 1 property and Yellowknife Bay
- Proposed Pumphouse No 1 expansion will further encroach on this property
- Connects to existing pipeline easement

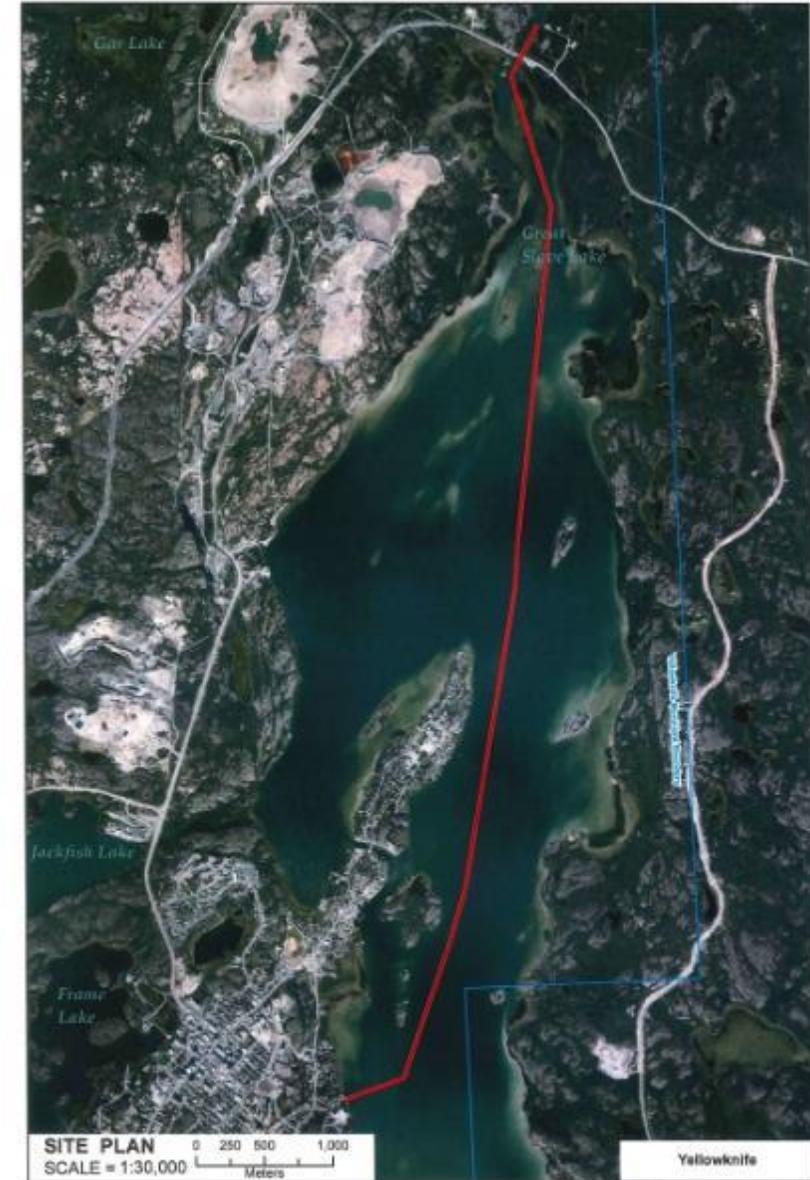


Credit: <https://www.maps.geomatics.gov.nt.ca/ATLAS>



Submarine Pipeline Lease

- Lease agreement between City and Northwest Territories
- Existing pipeline lease easement 20 m width along existing alignment (16.78 ha)
- Revised alignment will require revised lease agreement



		Government of Northwest Territories / Territoires du Nord-Ouest	
ANNEXED HERETO AND FORMING PART OF N.W.T. LICENSE No. 85J/8-136-4			
License Width: 20 m License Area: 16.78 ha	Drawn By: Ipeck Date: Thursday, September 17, 2020 Date of Image: September 10, 2015	MANAGER, TERRITORIAL LAND ADMINISTRATION 	
Coordinate System: NAD 1983 UTM Zone 11N Projection: Transverse Mercator Datum: North American 1983	*Location of pipeline and associated infrastructure provided by the City of Yellowknife	DATE September 21, 2020	

DUPPLICATE

Regulatory Context



Regulatory Requirements and Reviews

MVLWB

- Preliminary Screening *Mackenzie Valley Resource Management Act*
- Amendment Application to Type A Water Licence MV2021L3-0003 + plan updates
 - Engagement
 - Spill Contingency
 - Waste Management
- Type A Land Use Permit
 - Geotechnical investigations
 - Pumphouse expansions and upgrades
 - Pipeline alignment overland route and Horizontal Directional Drilling



Source: www.cklradio.com

Regulatory Requirements and Reviews

Department of Fisheries and Oceans *Fisheries Act*

- Codes of Practice
- Measures to protect fish and fish habitat
- Request for Review

Transport Canada *Canadian Navigable Waters Act*

Government of the Northwest Territories

- Lands

Others

- Explosives permit
- City permits



Cisco run at Tartan Rapids, Yellowknife River. Photo: Paul Vecsei

Considerations

- Drinking Water Quality + Monitoring
- Decommissioning the Existing pipeline
- Construction Timing

Drinking Water + Quality

- Water is drawn from Yellowknife Bay for maintenance and emergencies
- The City will seek permission to draw water from the Bay for a period of construction.
- Water is tested monthly, annually, and each time water is drawn from the Bay.

Decommissioning the Existing Submarine Pipeline

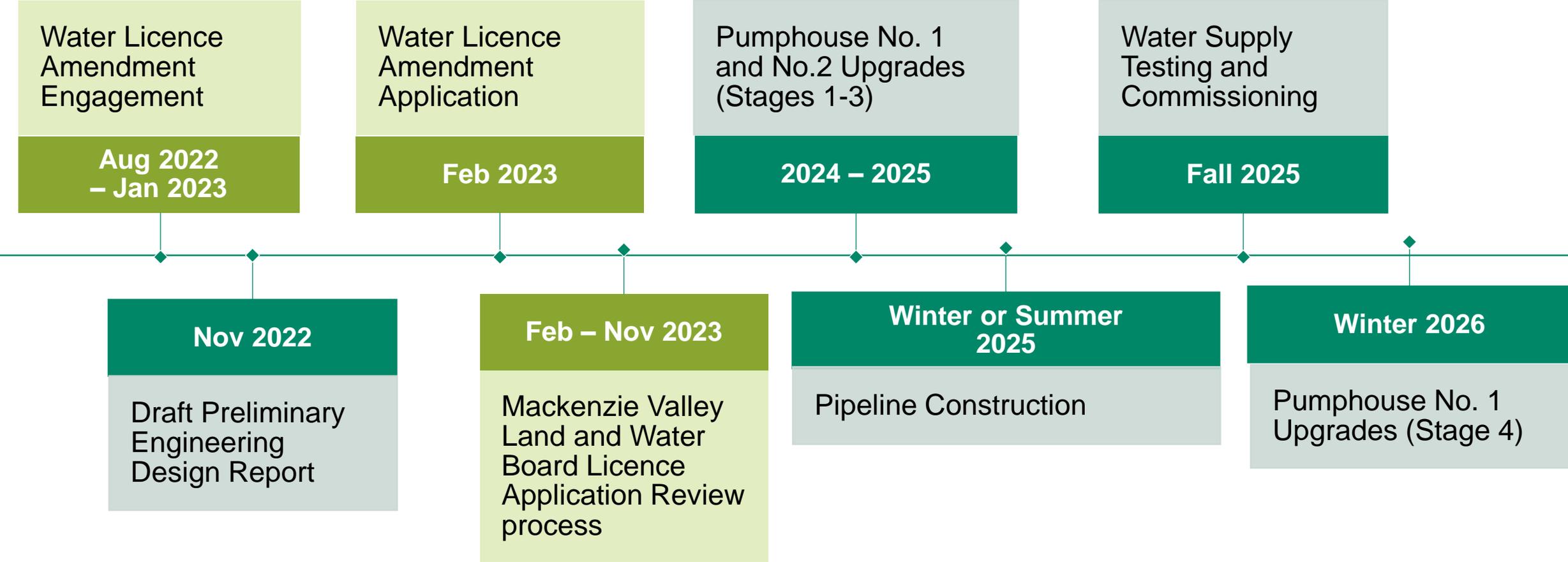
- Existing pipeline will be left in place.
- Limit sediment disturbance to Yellowknife Bay lake bed
- Localized, short term disturbance as pipeline settles.
- Seeking stakeholders' input to understand concerns
- Ongoing sediment sampling and water quality monitoring during construction



Construction Timing



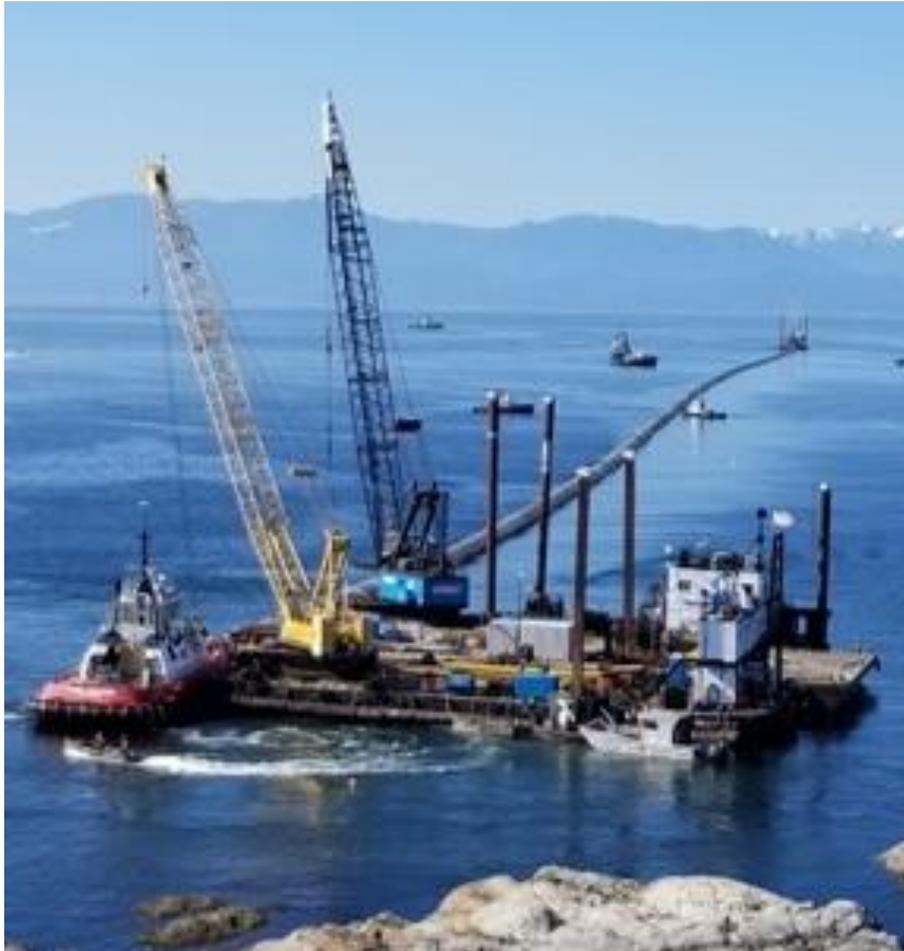
Construction Sequencing



* Estimated schedule - to be revised as planning progresses

Submarine Pipeline Construction

Summer Installation



vs

Winter Installation



Discussion & Questions

Stay in Touch!



CITY OF YELLOWKNIFE

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The screenshot shows the City of Yellowknife website. At the top left is the City of Yellowknife logo and name. Navigation links include 'Living Here', 'Getting Active', and 'Exploring Yellowknife'. A search bar contains the text 'What are you looking for?'. The main heading is 'Submarine Water Pipeline Replacement Project'. Below the heading is a breadcrumb trail: 'Home / Living Here / Water and Sewer / Submarine Water Pipeline Replacement Project'. A settings bar includes options for 'Hide Sidebar', 'Hide Sub Nav', 'Hide Banner Image' (checked), 'Hide Contact', and 'Hide Emergency Alert'. The main content area has a 'Project Overview' section with three paragraphs of text. A 'Public Open House' section follows, detailing an event on November 2, 2022. A 'Frequently Asked Questions' section is partially visible with the question 'Where does our water come from today?'. On the right side, there is a 'Water and Sewer' menu with links for 'Sewage System', 'Stormwater', 'Submarine Water Pipeline Replacement Project', 'Water Treatment Plant', 'Water Licence', and 'Water'. Below this is a 'View Full Living Here Menu' link. At the bottom of the right sidebar is a 'Contact Us' section with the address: 'City of Yellowknife, General Inquiries, City Hall, 4807 - 52 Street'.



<https://www.yellowknife.ca/en/living-here/water.aspx>

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