

Appendix 2-A

2023 Fish and Fish Habitat Technical Data Report

Project Nuji'o'qonik: Amendment to the Environmental Impact Statement



**Project Nujio'qonik - 2023 Fish
and Fish Habitat Field Data
Report**

Final Report

January 23, 2024

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World Energy GH2

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File: 121417575

Limitations and Sign-off

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Executive Summary

The 2023 Fish and Fish Habitat Study is the first aquatic technical data report completed by Stantec Consulting Ltd. (Stantec) on behalf World Energy GH2 (WEGH2) for Project Nujio'qonik (the Project), a commercial-scale, "green hydrogen" and ammonia production facility powered by renewable wind energy western Newfoundland. The results of the baseline surveys are being used to support the desktop assessment conducted for the environmental assessment (EA) and the data will be incorporated into fisheries related permitting for the Project.

The 2023 aquatic surveys characterized freshwater fish habitat at potential road, transmission line, collector line stream crossings and in the vicinity of turbine and substation footprints for the Port au Port Wind Farm and hydrogen / ammonia facility. Fish sampling was also conducted using a variety of methods to determine fish presence within a representative number of streams, proposed road crossings, turbine footprints and potential waterbodies in the Study Area. Surveys of the Codroy Wind Farm and supporting infrastructure are planned for 2024.

Fish habitat was classified at a total of 330 proposed watercourse crossings associated with the Port au Port Wind Farm and related infrastructure, and the hydrogen / ammonia facility. This includes 116 potential road crossings, 194 crossings associated with transmission and collector lines, and 20 locations associated with the hydrogen / ammonia facility, substation, and turbine footprints.

Of the 116 potential road crossings surveyed, 73 watercourses / waterbodies were considered fish-bearing based on confirmed presence or connectivity with downstream watercourses or waterbodies. Of those, 68 were classified as small watercourses (stream order of 2 or smaller) while 4 were moderately sized (stream order of 3-5) and 1 was a pond. Of the 43 stream crossings that were not fish habitat, 21 had were observed to have no visible channel (i.e., no watercourse was present), 18 were considered overland drainage channels which had no connectivity to fish bearing waters and 4 were bog holes which were isolated from fish bearing waters.

Of the 194 potential watercourse crossings surveyed for the Port au Port collector and transmission lines, 128 watercourses / waterbodies were considered fish-bearing. Of those, 95 of were classified as small watercourses (stream order of 2 or smaller) while 24 were moderately sized (stream order of 3-5) and 9 were ponds. Of the 66 stream crossings that were not fish habitat, 39 were observed to have no visible channel, 18 were considered overland drainage channels which had no connectivity to fish bearing waters and 9 were bog holes which were isolated from fish bearing waters.

In general, small watercourses (stream order of 2 or smaller) were typically less than 5 m in width, with run and riffle habitats and had a variety of substrates from muck (fine sediments mixed with organic material) to cobble and riparian vegetation dominated by grasses and shrubs. Medium watercourses were 5 to 20 m in width, and were dominated by run and riffle habitats, coarser substrates (such as rubble) and had riparian vegetation dominated by trees and shrubs.



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Twenty watercourses within 15 m from substation and turbine locations were assessed to determine if they were fish bearing. One of the 2 streams within or adjacent to the substation footprints was classified as fish habitat and 4 of the 14 watercourses within or adjacent to the turbine footprints were classified as fish habitat. 8 of the remaining watercourses were considered overland drainage channels or no visible channel (i.e., not fish habitat).

Two of the three streams on the hydrogen / ammonia facility site were identified as fish habitat and small first order streams, while the third was a stagnant pool with no connectivity and was not considered fish-bearing. Adjacent to the Hydrogen / Ammonia facility site, Warm Creek is a mapped stream that drains Noels Pond and flows into the Atlantic Ocean. The 4, km surveyed portion consists primarily of riffle/run habitat, with coarse substrates and riparian vegetation that was predominantly shrubs and grass.

Water temperatures at the time of the survey were typically acceptable (94% of sites) for coldwater fish species such as brook trout and Atlantic salmon. Dissolved oxygen concentrations were above the Canadian Water Quality Guidelines for the Protection of Aquatic Life (CWQG PAL) recommended value for all life stages of fish at 42% of locations, and above the recommended value for early life stages at 8% of locations. The pH was below the CWQG PAL recommended value of 6.5 at 21% of sites.

A combination of backpack electrofishing, minnow traps, and the collection of environmental deoxyribonucleic (eDNA) were used to confirm presence or absence of fish at several representative streams. Fish species diversity was low, with only American eel, Atlantic salmon, brook trout, and threespine stickleback were captured by backpack electrofisher. Similarly, eDNA analysis indicated brook trout, American eel, stickleback, and Atlantic salmon were the most common fish species in the RAA. Banded killifish, rainbow smelt, and brown trout were also detected by eDNA, though infrequently.

Two SAR/SOCC were identified from the fish community sampling. American eel is considered a SAR/SOCC and is listed as "Threatened" under COSEWIC and "Vulnerable" under the NLESA and banded killifish is considered a SAR/SOCC in Newfoundland and Labrador and is considered Special Concern under the Canadian *Species at Risk Act* and "Vulnerable" under the NLESA.

Overall, the desktop assessment conducted for the EIS was accurate in predicting watercourse type for waterbodies and watercourses predicted to be fish bearing. It was difficult to assess using desktop methods whether potential watercourses would be drainage channels or have no visible channel in the field. Therefore, as a conservative approach, no visible channels and drainage channels (not fish habitat) should be considered watercourses until confirmed absent in the field. The desktop assessment did identify five additional unmapped watercourses and one unmapped pond that are assumed to be fish-bearing.

As part of the desktop assessment, the proposed watercourse crossings were assessed for dominant riparian vegetation surrounding watercourses and waterbodies within the Project Right of Way (RoW) using satellite imagery. The desktop assessment was successful in predicting if shrubs or wetlands / grasses / bare would be the dominant riparian vegetation. However, trees were predicted more frequently during the desktop assessment than was observed in the field. In some cases, the satellite imagery was of insufficient quality to differentiate between tall alders and smaller deciduous trees or the understory (shrubs and grasses) were obscured by trees, resulting in an underestimation of shrubs and grasses.



PROJECT NUJIO'QONIK - 2023 FISH AND FISH HABITAT FIELD DATA REPORT

The desktop assessment was typically accurate in predicting whether watercourses or waterbodies would have coarse or fine substrates, however accuracy was low when the desktop assessment predicted mixed substrates associated with shrubs. These differences are likely due to localized reach level variations in substrates (e.g., pools or other slower flowing habitats) within each watercourse that are not easily visible on imagery. Going forward the mixed substrate category will be removed and future desktop work will be completed using coarse and fine categories.

Regarding the fish community, the desktop assessment was accurate in predicting that brook trout, Atlantic salmon, American eel, and stickleback were likely to be the most common and abundant fish species to be encountered within the Project Area.

Similar field surveys are planned for the Codroy Wind Farm.



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1.0 Introduction

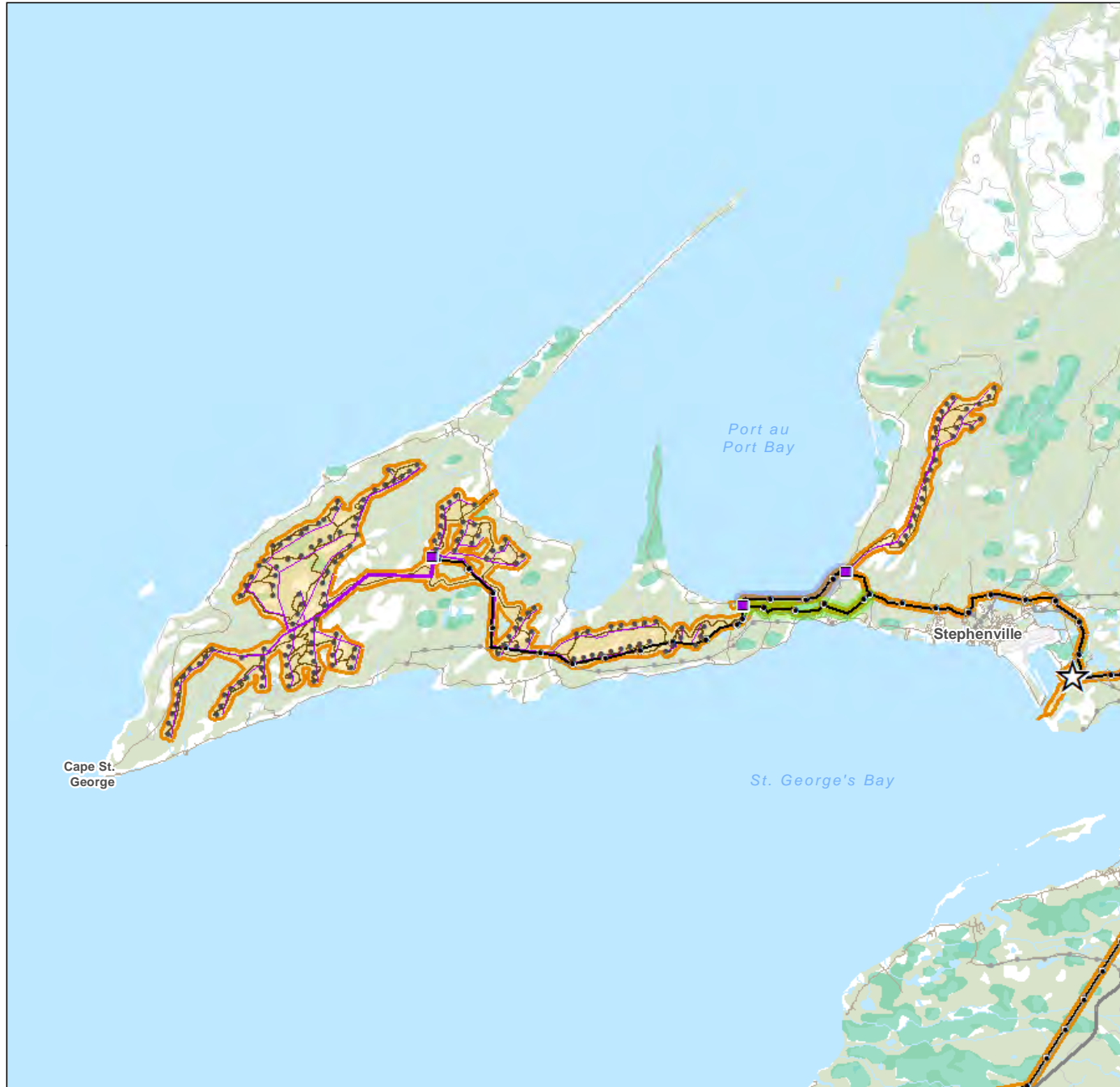
Project Nujio'qonik (the Project) involves the development, construction, operation and maintenance, and eventual decommissioning and rehabilitation of one of the first Canadian, commercial-scale, “green hydrogen” and ammonia production plants powered by renewable wind energy. Located on the western coast of the island of Newfoundland, Newfoundland and Labrador (NL), the Project will have a maximum production of up to approximately 206,000 t of green hydrogen per year. The hydrogen produced by the Project will be converted into ammonia and the resulting 1.17 Mt of ammonia exported to international markets by ship. The hydrogen / ammonia facility and associated storage and export facilities will be located at the Port of Stephenville (in the Town of Stephenville, NL) on a privately-owned brownfield site and at an adjacent existing marine terminal, both of which are zoned for industrial purposes.

Renewable energy from two approximately 1,000 megawatt (MW) / 1 gigawatt (GW) onshore wind farms on the western coast of Newfoundland will be used to power the hydrogen and ammonia production processes. These wind farms (referred to herein as the “Port au Port Wind Farm” and the “Codroy Wind Farm”) will collectively include up to 328 turbines and produce approximately 2,000 MW / 2 GW of renewable electricity. The Port au Port Wind Farm (Figure 1.1) will include up to 164 wind turbines, with up to 171 sites that are being studied for the EIS, on the Port au Port Peninsula, NL and adjacently on the Newfoundland “mainland” (i.e., northeast of the isthmus at Port au Port). The Codroy Wind Farm will also consist of up to 164 wind turbines located on Crown land in the Anguilles Mountains near the Codroy Valley, NL. Final wind farm layouts will be dependent on results of the wind campaign and more detailed field investigations. Once the layout and number of turbines are finalized, the results of models will be reviewed and updated as required.

Stantec Consulting Ltd. (Stantec) was retained by World Energy GH2 (WEGH2) to conduct a number of environmental surveys for this Project, including Aquatic Baseline Surveys. The Environmental Impact Statement (EIS) was submitted to the provincial Minister of Environment, Climate Change and Municipalities for regulatory review in August 2023 pursuant to the Newfoundland and Labrador *Environmental Protection Act* (NL EPA) and associated *Environmental Assessment Regulations*. The EIS includes an effects assessment for Project components which have the potential to interact with fish and fish habitat. These include, but are not limited to, the wind farms, the associated infrastructure (roads, collector systems, transmission lines and substations), and the hydrogen / ammonia production and storage facilities.

The 2023 Fish and Fish Habitat Study is the first aquatic environment technical data report for the Project and provides information on watercourses and waterbodies potentially affected by the Port au Port Wind Farm, associated electrical infrastructure, and the hydrogen / ammonia production and storage facilities known herein as “the hydrogen / ammonia facility”. It should be noted that the conceptual layout of the Project continues to evolve, and field work was completed in advance of a finalized conceptual layout.





Proposed Project Features

- Turbine Location
- Substation
- ★ Hydrogen / Ammonia Plant Location
- Transmission Line 230 kV
- Port au Port Interconnection
- Proposed Route
- Alternate Route
- Collector Line
- Access Road
- Project Area

Other Features

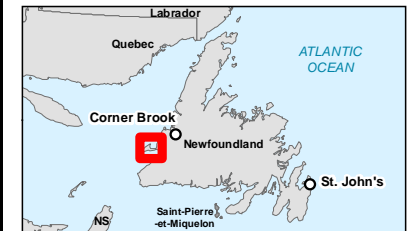
- Substation, Existing
- ⚡ Electrical Generation, Existing
- Transmission Line, Existing
- Trans-Canada Highway
- Road
- Contour (100 m)
- Watercourse
- Waterbody
- Wetland
- Forested Area



0 8 Kilometres
(At original document size of 8.5x11)
1:350,000

Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
2. Data Sources: World Energy GH2, NRCan CanVec, OpenStreetMap
3. Background: NRCan CanVec



Project Location: Stephenville, NL
Prepared by NW on 2023-07-20
QR by AW on 2023-07-20

Client/Project: World Energy GH2, Project Nujio'qonik
121417233_038d

Figure No.
1.1

WEGH2 Project Site Plan

2.0 Objectives and Regulatory Context

2.1 Objectives

The following are the objectives of the 2023 Baseline Fish and Fish Habitat study:

- Conduct fish sampling to determine fish presence and fish community at up to half of the proposed access road stream crossings.
- Collect environmental deoxyribonucleic (eDNA) and water chemistry samples at locations along the proposed transmission line and access road (Right-of-Ways) RoWs for the Port au Port Wind Farm.
- Characterize fish habitat at watercourses and waterbodies crossed by the proposed access roads, collection lines and transmission line associated with the Port au Port Wind Farm and streams associated with the hydrogen / ammonia facility.
- Confirm presence of watercourses located within the footprint of the substations and turbine footprints for the Port au Port Wind Farm and characterize habitat if confirmed.

2.2 Regulatory Context

The Project is subject to an EA under the *Newfoundland and Labrador Environmental Protection Act* (NL EPA) and associated *Environmental Assessment Regulations*.

The 2023 aquatic surveys were designed to:

- ground truth the desktop habitat assessment that was completed ahead of the EA submission
- support the assessment of potential project interactions and environmental effects of the Project on the aquatic environment
- identify fish bearing waters to support site planning activities related to locating Project infrastructure to avoid waters frequented by fish, where feasible
- form part of the supporting documentation for the Project's EA process
- support the determination of harmful alteration, disruption or destruction (HADD) of fish habitat and the requirement for offsetting under the *Fisheries Act*



3.0 Methods

The 2023 field studies included an assessment of fish habitat, fish presence/absence, and fish community surveys. Habitat classification of stream crossings were conducted along the proposed access roads, transmission, and collector lines, and within the proposed substation and turbine footprints at the Port au Port Wind Farm and hydrogen / ammonia facility site (Figure 3.1) Habitat classification was also completed within streams associated with the hydrogen / ammonia facility site (Figure 3.2). Habitat assessments of the watercourse crossings within the Codroy Wind Farm (Figure 3.3) and associated transmission line (Figure 3.2 and Figure 3.3) are planned for summer 2024.

Fish community surveys were completed using standard methods (i.e., electrofishing and minnow trapping) and through eDNA collections at the Port au Port Wind Farm, the hydrogen / ammonia facility site, and the transmission line linking Codroy Wind Farm.

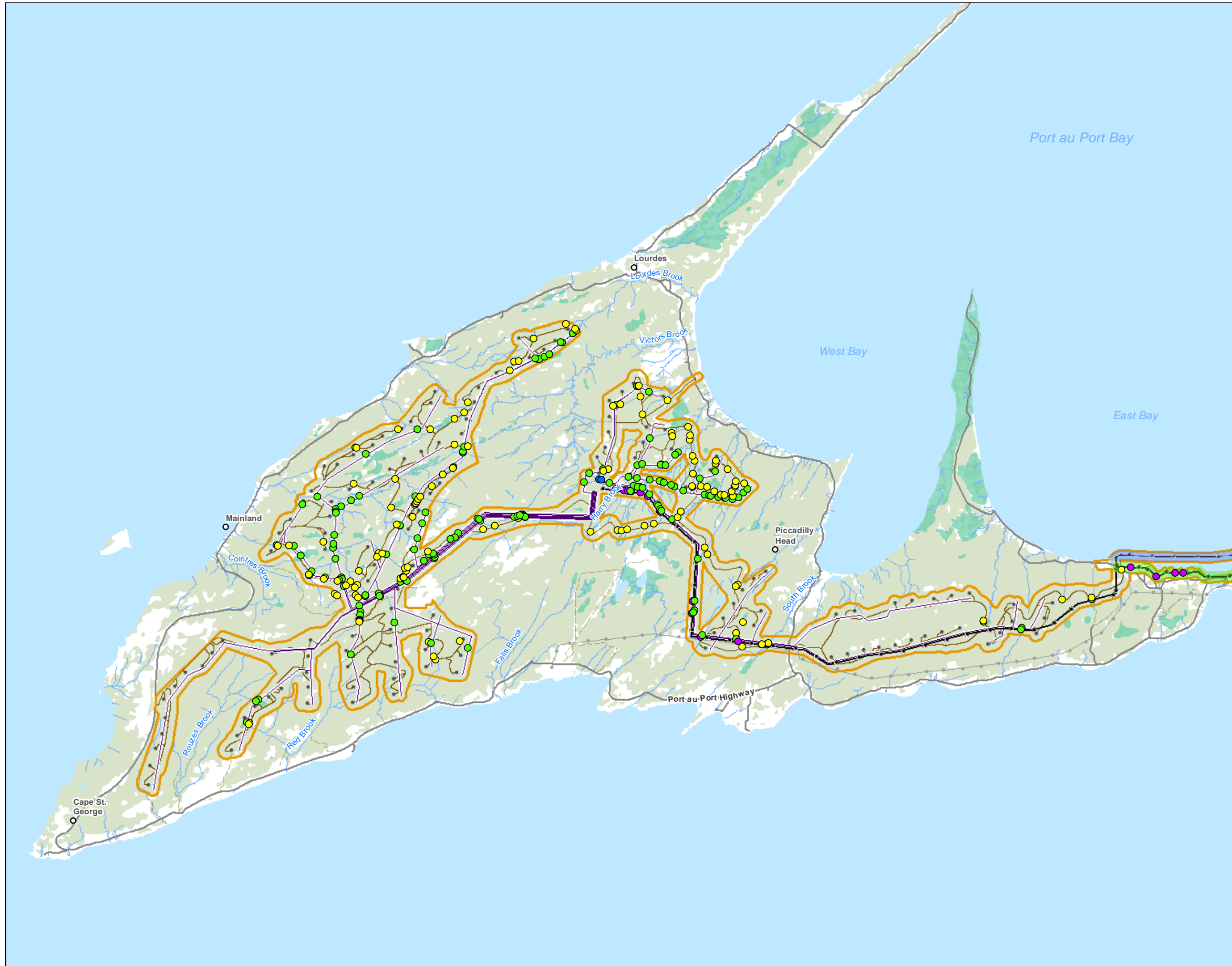
The field surveys were conducted between May 24th and October 15th, 2023.

3.1 Study Area

The Study Area for the 2023 field study focused on data collection within waterbodies and watercourses potentially affected by development of the Port au Port Wind Farm, the associated infrastructure, and the hydrogen / ammonia facility (Figures 3.1 and 3.2). eDNA was also collected along the transmission line linking the Codroy Wind Farm and the hydrogen / ammonia facility to inform regional fish presence (Figures 3.2 and 3.3). It should be noted that the conceptual layout of the Project continues to evolve based on the results of the field programs and detailed engineering design, and field work was completed in advance of a finalized conceptual layout.



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Watercourse Crossings

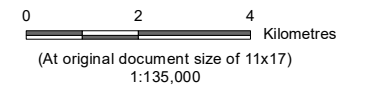
- Road Crossing
- Collector Line Crossing
- Substation Crossing
- Transmission Line Crossing

Proposed Project Features

- Turbine Location
- Collector Line
- Access Road
- Transmission Line 230 kV
- Proposed Route
- Alternate Route
- Project Area

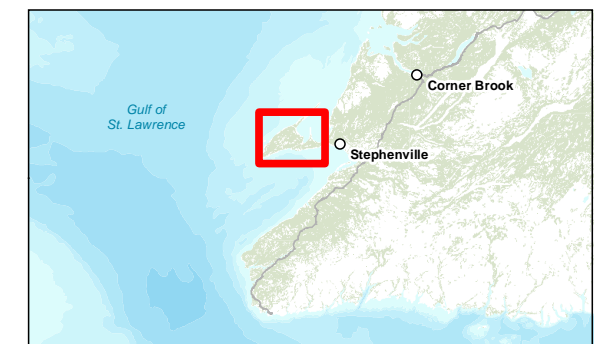
Other Features

- Transmission Line, Existing
- Road / Highway
- Watercourse
- Waterbody
- Wetland
- Forested Area



Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
2. Data Sources: World Energy GH2; NL ECC Water Resources Management Division; NL Fisheries, Forestry and Agriculture; NRCan CanVec; OpenStreetMap
3. Background: NRCan CanVec



<i>Project Location</i>	Prepared by NW on 2023-05-19
Stephenville	QR by AW on 2023-07-14
NL	
<i>Client/Project</i>	121417233_66a REVA

World Energy GH2
Project Nujio'qonik

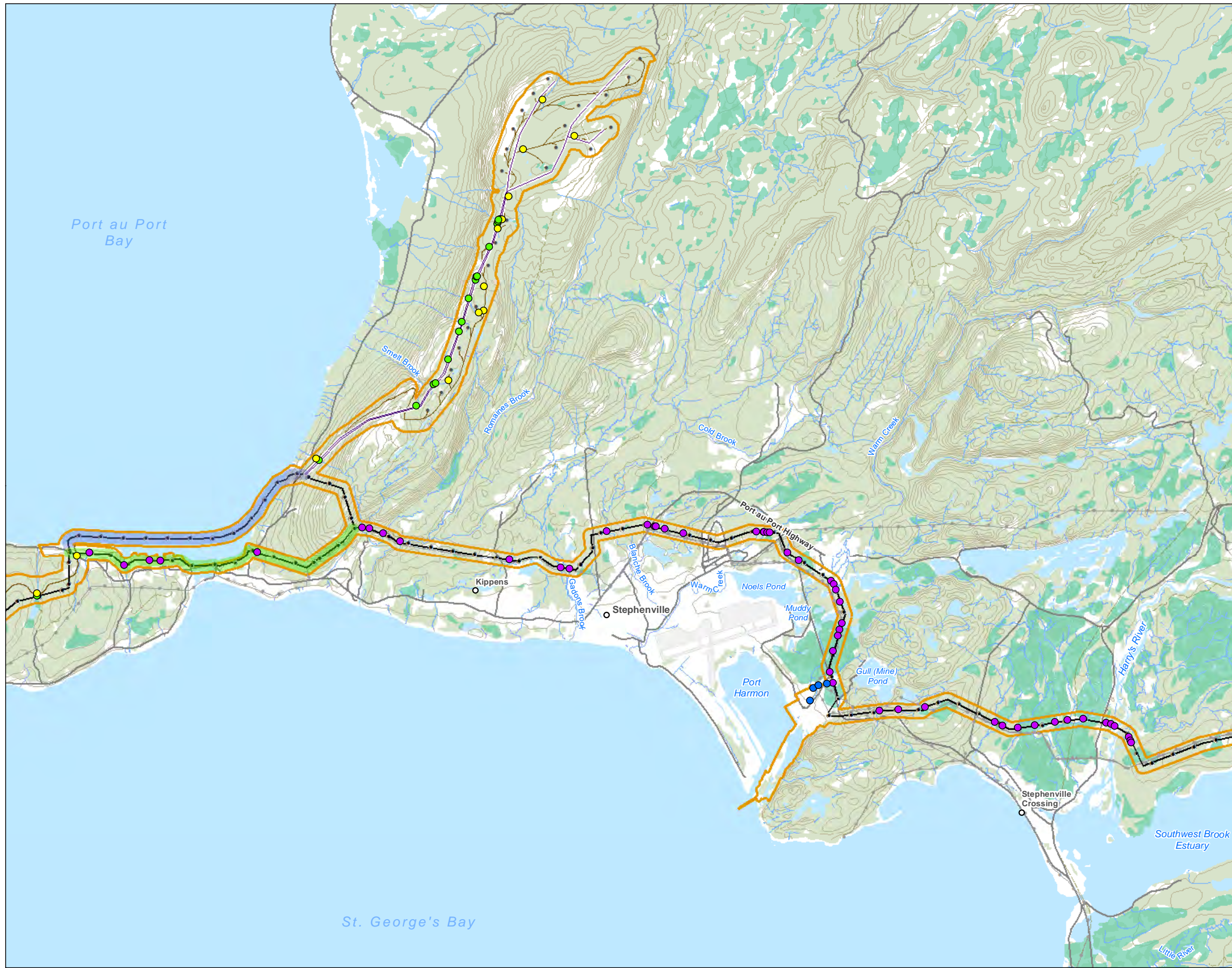
Figure No.

3.1

Title

2023 Stream Crossing Survey Locations on Port au Port Peninsula, NL

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Watercourse Crossings

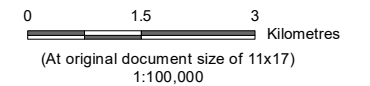
- Road Crossing
- Collector Line Crossing
- Within Plant Site
- Transmission Line Crossing

Proposed Project Features

- Turbine Location
- Collector Line
- Access Road
- Transmission Line 230 kV
- Proposed Route
- Alternate Route
- Project Area

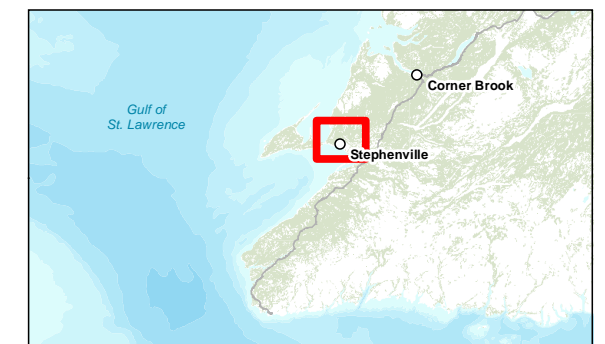
Other Features

- Transmission Line, Existing
- Road / Highway
- Watercourse
- Waterbody
- Wetland
- Forested Area



Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
2. Data Sources: World Energy GH2; NL ECC Water Resources Management Division; NL Fisheries, Forestry and Agriculture; NRCan CanVec; OpenStreetMap
3. Background: NRCan CanVec



Project Location: Stephenville, NL
 Prepared by NW on 2023-05-19, QR by AW on 2023-07-24

Client/Project: 121417233_66c REVA

World Energy GH2
 Project Nujio'qonik

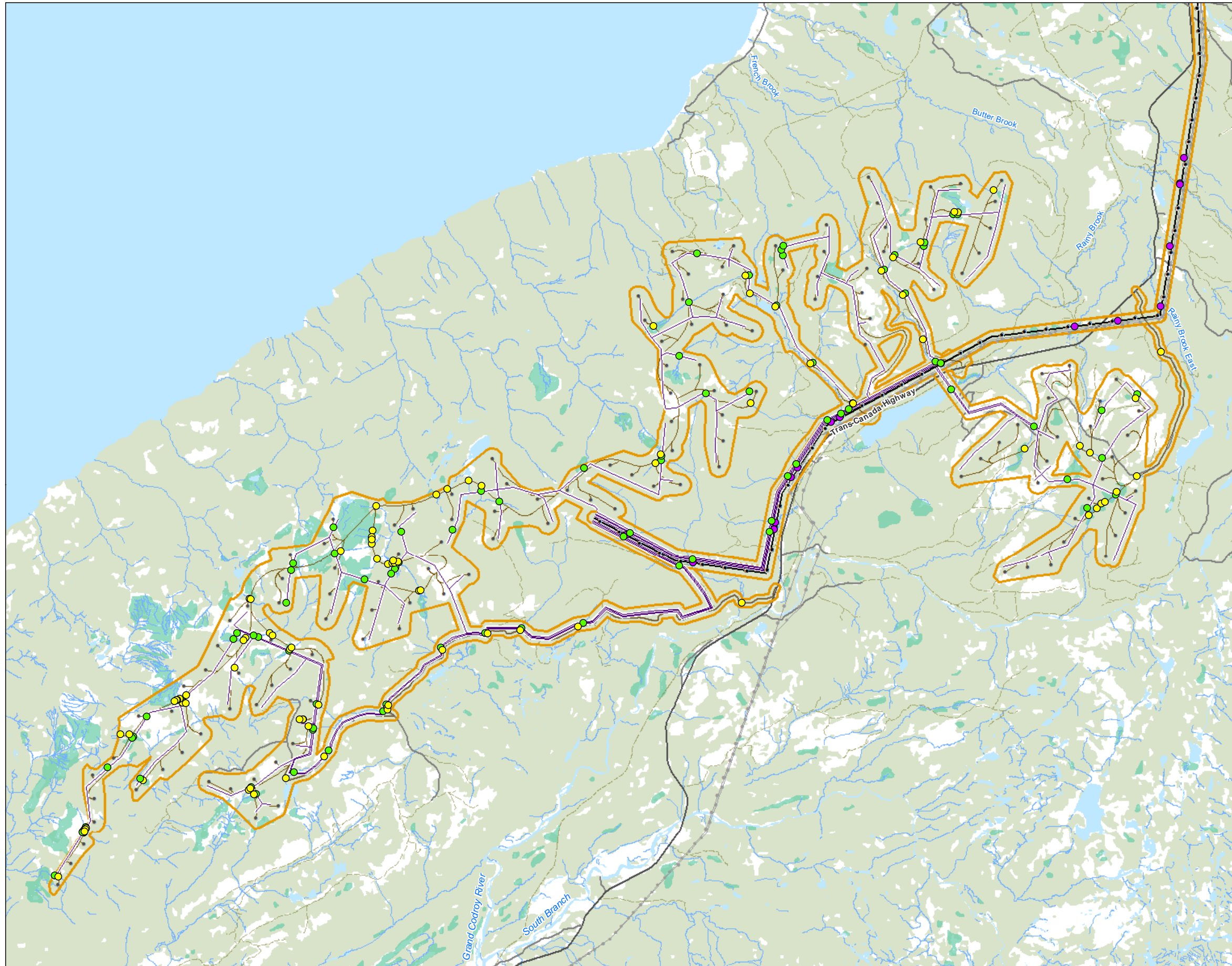
Figure No.

3.2

Title

**2023 Stream Crossing Survey
 Locations in Stephenville Area, NL**

\\ca0151-ppfss0\work_group\1214\active\121417233\03_data\gis_cad\gis_data\mapping\mxd\general\aquatics\121417233_066b_Watercourse_Crossings_Codroy_REV.D.mxd Revised: 2023-06-03 By: NWWhite



Watercourse Crossings

- Road Crossing
- Collector Line Crossing
- Transmission Line Crossing

Proposed Project Features

- Collector Line
- Access Road
- Transmission Line 230 kV
- Project Area

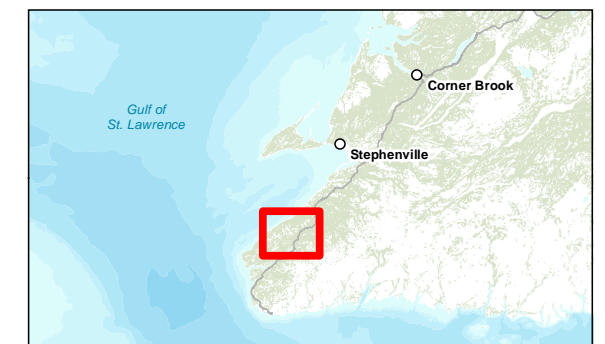
Other Features

- Transmission Line, Existing
- Trans-Canada Highway
- Road / Highway
- Watercourse
- Waterbody
- Wetland
- Forested Area



0 1.5 3 Kilometres
 (At original document size of 11x17)
 1:115,000

- Notes**
1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
 2. Data Sources: World Energy GH2; NL ECC Water Resources Management Division; NL Fisheries, Forestry and Agriculture; NRCan CanVec; OpenStreetMap
 3. Background: NRCan CanVec



Project Location: Stephenville, NL
 Prepared by NW on 2023-05-19, QR by AW on 2023-07-14
 Client/Project: 121417233_66b REVA

World Energy GH2
 Project Nujio'qonik

Figure No.

3.3

Title

**2023 Stream Crossing Survey
 Locations, Codroy NL**

3.2 Fish Habitat Classification

Fish habitat survey locations were accessed either by foot or helicopter. The fish habitat survey methods were based on the Standard Methods for Classifying Fish Habitat in NL (Bradbury et al. 2001; McCarthy et al. 2007). Streams were classified from the ground. Habitat surveys consisted of a fish habitat characterization, including a description of wetted and bankfull width, water depth, water velocity, substrate, riparian vegetation, and cover.

To support habitat characterization, *in situ* water quality measurements of pH, dissolved oxygen, temperature, conductivity, and turbidity were collected at select locations using either a YSI PRO2030 or a YSI 556 water quality meter and a Hanna pH pen (HI98127). Turbidity was analysed from a water sample within one day of collection using a Hach 2100Q Portable Turbidity Meter.

Incidental observations of fish were also noted.

3.2.1 Access Road Crossings

Fish habitat surveys were conducted at each watercourse or waterbody that crossed the proposed access road within the Port au Port Wind Farm. Surveys were conducted within a 100 m reach of each watercourse, centering on the crossing, 50 m upstream to 50 m downstream of the proposed watercourse crossings. A total of 116 access road crossings were surveyed within the Port au Port Wind Farm. There were 20 access road crossings that are shown on the map book and were not assessed in 2023 because of additional constraints associated with potential changes in the Project layout. These locations included WCA-015, WCA-018, WCA-019, WCA-020, WCA-027, WCA-037, WCA-080, WCA-096, WCA-097, WCA-101, WCA-114 and WCA-156 to WCA-162.

3.2.2 Collector Lines and Transmission Line RoWs

Fish habitat surveys were also conducted at each watercourse or waterbody that crossed the proposed collector lines and transmission lines within the Port au Port Wind Farm. Surveys were conducted at each watercourse crossing only, approximately 10 m upstream to 10 m downstream of the proposed crossings. A total of 194 collector line and transmission line crossings were surveyed. There were 11 collector line or transmission line crossings that are shown on the map book and were not assessed in 2023 because of additional constraints associated with potential changes in the Project layout. These included WCL-768a,b,d, WCL-741a, WCL-783, WCL-770, WCL-725, WCL-854, WCT-544, WCT-545 and WCT-546.



3.2.3 Hydrogen / Ammonia Facility, Substations, and Turbine Footprints

Fish habitat surveys were also conducted within sections of each watercourse which were potentially overprinted or within setbacks of proposed substation or turbine footprint. In total, two watercourses associated with the substations were surveyed, and 14 watercourses associated with turbine footprints were surveyed.

Surveys were also conducted within the portion of the four watercourses that potentially interacted with the hydrogen / ammonia facility and included Warm Creek and portions of the outlet of Gull Pond. A portion of the outlet of Gull Pond could not be surveyed as a result of land access.

3.3 Fish Communities

Fishing activity was conducted in accordance with Experimental License NL-7675-23 obtained from Fisheries and Oceans Canada (DFO).

3.3.1 Fish Sampling

3.3.1.1 Streams

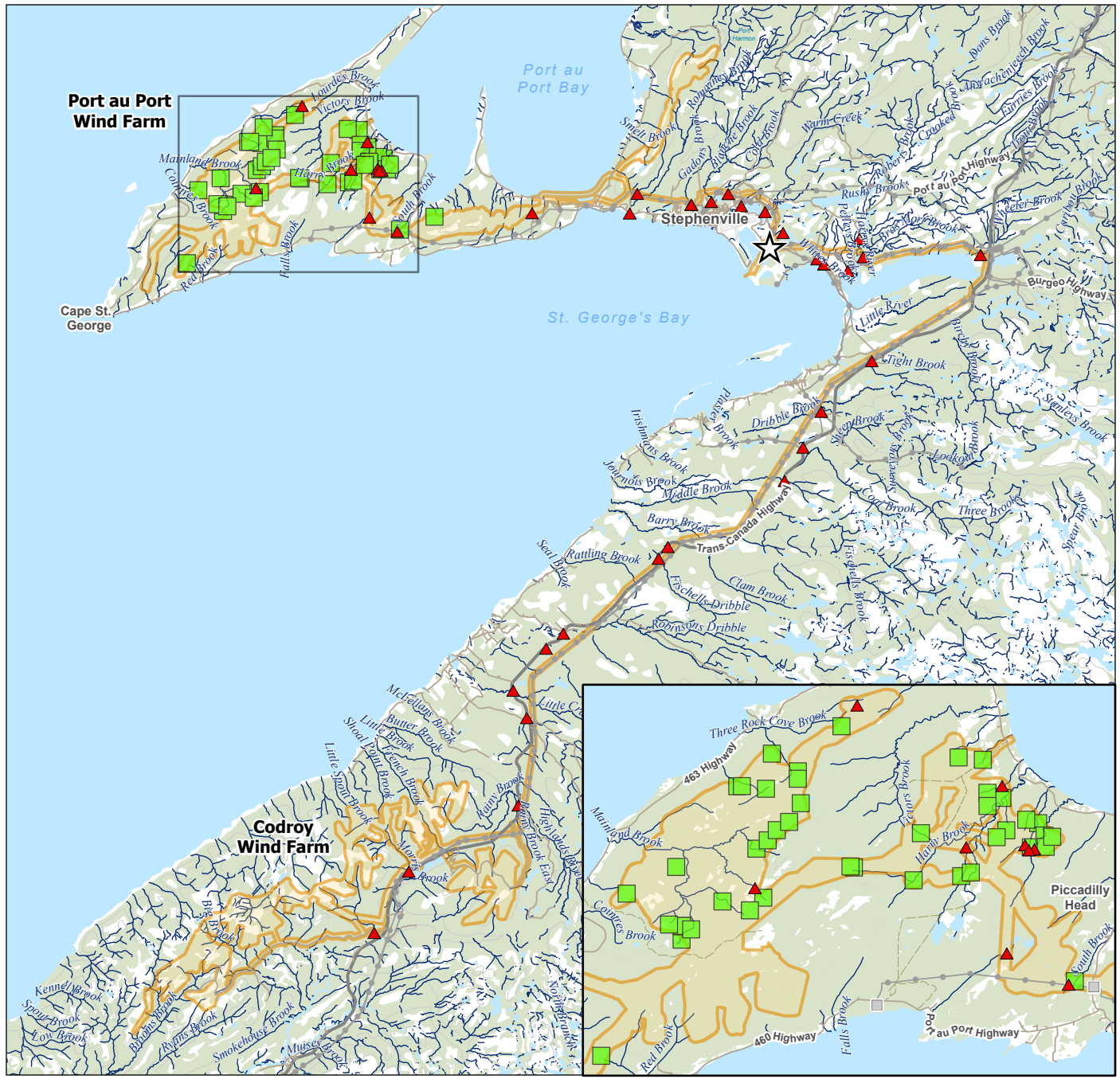
Fish sampling in streams was conducted by index (qualitative) electrofishing using a backpack electrofishing unit (Smith Root LR-24). A total of 34 stream crossings were sampled between June 22nd and September 8th, 2023 (Figure 3.4). Fish habitat characterization was completed at each stream crossing where fish sampling occurred. Fishing methods used in this study are described in Sooley et al. (1997). Stream crossings were fished up to a distance of 50 m upstream and downstream of the crossing, with a minimum targeted fishing effort of 500 seconds. The time fished for each site was recorded, captured fish were identified to species, measured by length and weight, and released alive.

3.3.1.2 Waterbodies

Where unsuitable conditions were present for electrofishing minnow traps were set from shore around waterbodies to assess the the presence or absence of fish habitat and inform the fish species within the fish community, if present. Minnow traps were baited with dry cat food and set for a minimum of 9 hours.



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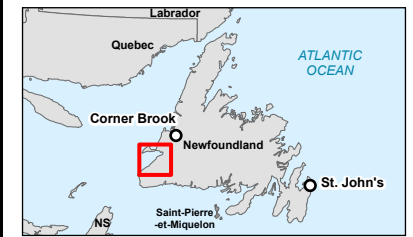


Legend

- ▲ Environmental DNA Sampling Locations
- Fish Sampling Locations
- ☆ Hydrogen / Ammonia Plant Location
- ▭ Project Area
- Substation, Existing
- ⚡ Electrical Generation, Existing
- Transmission Line, Existing
- Trans-Canada Highway
- Road
- Resource Road / Trail
- Watercourse
- Waterbody
- Forested Area

N
0 4 8 12 16 km
(At original document size of 8.5x11)
1:500,000

Notes
1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
2. Data Sources: World Energy GH2, NRCan CanVec, GovNL, Stantec Field
3. Background: NRCan CanVec



Project Location: Stephenville, NL
Prepared by AC on 2024-01-10, QR by AW on 2024-01-10

Client/Project: World Energy GH2, Project Nujio'qonik
121417575

Figure No.: **3.4**

2023 Locations of Fish and Environmental DNA Sampling

Disclaimer: This document has been prepared based on information provided by others as cited in the Notes section. Stantec has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result. Stantec assumes no responsibility for data supplied in electronic format, and the recipient accepts full responsibility for verifying the accuracy and completeness of the data.

3.3.2 Environmental DNA

3.3.2.1 Environmental DNA Sampling

eDNA water samples were collected at watercourses associated with the Port au Port Wind Farm, hydrogen / ammonia facility, and Codroy Wind Farm transmission line. Sampling locations were selected to represent a variety of freshwater flowing habitats found in the Project Area (i.e., larger and smaller watercourses) over the region. In total, 40 watercourses were sampled for eDNA analysis between July 21st and 26th, 2023 (Figure 3.4). eDNA was not collected from watercourses that were already sampled by electrofishing in order to maximize the number of fish community surveys completed.

The eDNA sampling study design was developed based on guidance from Abbott et al. (2021). One composite water sample was collected per site along a transect that crossed bank-to-bank for wadable water or progressed across the watercourse until conditions became unsuitable for wading. Water was collected facing upstream in the watercourse. If the watercourse was too deep to wade, water was collected along the bank at five discrete locations from slower and faster moving areas of the watercourse. Using a bucket (pail) sanitized with 10% bleach solution, a 5L representative water sample was collected from each site by collecting a 1L sample from five consecutive points along the transect. A 1L sample bottle was dipped just below surface (facing upstream to fill) and decanted into a 5L pail. The water was then mixed in the pail and a 1L subsample was taken by submerging a 1L sample bottle below surface to fill. After collection at each site, the 1L water sample bottle was sealed, labelled, and placed into a cooler with ice.

The 1L water samples were filtered to collect eDNA at the end of day at base camp using a peristaltic pump and Smith-Root Self-Preserving Filters (PES 1.2 µM mesh size). Clean tubing connected to the filter casing at the intake end and a peristaltic pump was used to draw the water through the filter. After filtration was complete, the intake tubing was removed and discarded into a waste container and the filter casing was placed into a labeled bag, sealed, and placed into a cooler with ice.

Filters were shipped on ice for analysis to the Centre for Environmental Genomics Applications (CEGA), operated by eDNAtec Inc. in St. John's, NL. At the laboratory, eDNA metabarcoding analysis of the water samples was performed by extracting DNA from the filters and sequencing two DNA markers that recover bony fish biodiversity. The eDNA sequences from the two DNA markers were bioinformatically processed to resolve the unique sequences recovered from each sample and annotated with taxonomic information using CEGA's purpose-built metabarcoding pipeline. The fish biodiversity inventory and site detections, with number of sequence reads per species were summarized in a report.

3.3.2.2 Environmental DNA Water Quality Sampling

A separate water sample was collected per site to analyze water chemistry parameters, which may indicate the presence of potential inhibitors, including pH, total suspended solids (TSS), tannins and lignins, and total organic carbon (TOC; Lance and Guan, 2020; Stoekle et al., 2017). Water samples were stored on ice during storage and for shipment to BV Laboratories in Dartmouth, NS for analysis. Water samples were analyzed within the holding time limits specified by the laboratory.



3.3.2.3 Quality Assurance and Quality Control

Sampling for eDNA was conducted by a biologist with experience in collecting eDNA samples following a sampling plan developed by an experienced practitioner based on published guidance. To avoid contamination and cross-contamination of samples, fresh gloves were worn at each site to collect water samples and work surfaces were wiped with 10% bleach solution between samples. Containers used to hold water prior to filtration were cleaned between samples by spraying with 10% bleach solution then rinsing twice with site water. To evaluate for potential of DNA contamination within sampling equipment and movement DNA sampling sites, one negative field control was collected per day of sampling. This negative field control was collected using distilled water and the same filtration technique as used for the watercourse samples. Filters were stored on ice during storage and for shipment to the eDNA laboratory.

Quality assurance and quality control (QC) practices were also followed by the eDNA laboratory. QC procedures were implemented throughout the workflow to monitor samples and laboratory protocols were designed to reduce the risk of sample contamination. Negative controls were carried through sequencing for inclusion in the final analysis.

3.4 Fish Species Distribution and Habitat Usage

The results of the fish sampling and eDNA sampling was used to predict potential fish communities for watercourses and waterbodies that were not physically sampled in 2023. The results of the fish sampling and eDNA sampling were used to determine the species present in each watershed. The fish species distribution was further refined for each watershed based on stream order. This considered specific habitat preference of species which were more likely to occur in small headwater streams versus larger rivers or waterbodies closer to the ocean. For smaller watersheds (i.e., unnamed tributaries to the Atlantic Ocean) it was assumed the fish communities were representative of adjacent similar sized watersheds. The prediction of fish communities was only completed for proposed watercourse crossings considered to be fish habitat (i.e., fish-bearing).

Habitat Suitability Index (HSI) values for each proposed stream crossing deemed to be fish habitat were derived from McCarthy et al. (2007), Grant and Lee (2004), Bradbury et al. (1999), Bradbury et al. (2001), and Stanley and Trial (1995). The habitat rankings were used to determine habitat quality brook trout, Atlantic salmon, and American eel. If species was not predicted to be present in a given watershed (i.e., Atlantic salmon) the associated life stages were not determined. Where species were predicted to be present, the HSI values for each life stage (e.g., spawning, young of year, juvenile or adult, as applicable) were then used to predict whether a life stage was likely to occur at the proposed crossing location. Watercourse crossings with HSI rankings of greater than 0.5 for a life stage were considered suitable and assumed the life stage was likely to occur.

Given the abundance of young of the year, juvenile and adult habitats for brook trout and Atlantic salmon and juvenile habitats for American eel in Newfoundland it was assumed these habitats were not limiting to populations and therefore not considered sensitive. As spawning habitats for brook trout and Atlantic salmon are often considered limiting to populations, the HSI values for the spawning life stage were used



to assess the potential for sensitive habitats. Watercourse crossings with HSI rankings greater than 0.75 (preferable) for spawning habitats were considered sensitive.

3.5 Comparison of Desktop Analysis and Ground-Truthing

To support the EIS, a baseline freshwater fish and fish habitat study was conducted using available desktop information (Stantec 2023). The objective of the desktop analysis was to identify potential watercourse crossings, characterize the fish habitat and describe the fish communities (including the potential for species at risk (SAR) or of conservation concern (SOCC)) potentially present at these crossings. The field program was conducted to support the EIS and subsequent fisheries related permitting and to verify the results of the desktop assessment (i.e., compare the habitat types identified as well as the fish habitat status).

3.5.1 Fish Habitat

For the desktop assessment, potential watercourse and waterbody crossings were identified within the proposed access road crossings, transmission line RoWs, collector line RoWs, and substation and turbine footprints using the 1:50,000 topographic mapping (Government of Canada n.d.) and existing satellite imagery. Fish habitat parameters including channel status (visible or not visible), habitat type, estimated width, and riparian vegetation, were assessed by digital satellite imagery, with slope estimated from the topographic mapping. The dominant substrate type was predicted based on the type of riparian vegetation present and/or channel slope. A detailed description of the methods are provided in Stantec (2023).

The fish habitat parameters identified for the desktop analysis were then compared to the in-field parameters collected for crossings surveyed in Port au Port in 2023. It should be noted that not all crossings identified as part of the Port au Port Wind Farm were surveyed in 2023, as a result of changes in Project layout.

In total, the fish habitat results for the desktop and in-field assessment were compared for 294 crossings.

3.5.2 Fish Communities

For the desktop assessment, satellite imagery, publicly available information, watercourse connectivity, and professional knowledge was used to inform the presence of fish and species potentially present in watercourses and waterbodies within the Project Area. Publicly available literature, aquatic SAR mapping and data from Atlantic Canada Conservation Data Centre (AC CDC) were used to assess the potential for aquatic SAR.

The fish communities from the desktop assessment were compared to the fish species observed during the fish and eDNA completed in 2023 to support the EIS and subsequent fisheries related permitting.



4.0 Results

4.1 Fish Habitat Classification

Fish habitat classification for a total of 330 access road crossings, collector and transmission line RoWs and watercourses / waterbodies within the hydrogen / ammonia facility, Substation and Turbine footprints are discussed in the following sections. This includes water quality information that was collected at crossings.

Representative photos of each site surveyed are provided in Appendix B. The complete habitat classification data set by habitat type is included in Appendix C, Tables C.1 to C.4.

4.1.1 Access Road Crossings

Of the 116 potential watercourse crossings surveyed for the proposed Port au Port Wind Farm access roads, 73 watercourses / waterbodies were considered fish-bearing as fish were confirmed present or there appeared to be connectivity with downstream watercourses or waterbodies. Of those, 68 of were classified as small watercourses (stream order of 2 or smaller) while four were moderately sized (stream order of 3-5) and one was a pond. Of the 43 stream crossings that were not fish habitat, 21 had no visible channel (i.e., no watercourse was present), 18 were considered overland drainage channels, and 4 were bog holes with no connectivity to fish bearing waters.

Small watercourses identified as fish habitat were generally narrow (less than 5 m) runs or riffles and had average wetted and channel widths of 2.9 and 3.6 m, respectively. Average water depth was 0.46 m and the banks were generally stable. Substrates were dominated by muck (24%) and gravel (19%), with riparian vegetation dominated by shrubs (65%; Table 4.1). Instream cover was 15% and consisted of mostly emergent vegetation. Overhead cover was 13% and consisted of mostly tree shrubs.



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Medium sized watercourses larger (2 to 13 m) runs or riffles and had average wetted and channel widths of 10.9 and 14.3 m, respectively. Average water depth was 0.42 m and depths ranged from 0.1 to 1.0 m. The banks were generally stable. Substrates were dominated by gravel (75%) with riparian vegetation dominated by trees (75%; Table 4.1). Instream cover averaged 4% and consisted of mostly emergent vegetation. Overhead cover averaged 7% and consisted of large woody debris.

The pond was dominated by muck substrate (30%) with some gravel (23%) and had riparian vegetation consisting of grass (50%) and shrubs (30%). Cover was 10% and was divided between boulders and emergent grasses.

A summary of habitat attributes for watercourse crossings associated with the access road is provided in Table 4.1.

Fish were observed during the fish habitat surveys at WCA-074a, WCA-075, WCA-076, WCA-100, WCA-125 and WCA-133.



Table 4.1 Summary of Fish Habitat Characteristics for Watercourses Crossings Associated with Access Roads for the Port au Port Wind Farm

HABITAT PROFILE DATA																																					
Site ID	Latitude	Longitude	Survey Date	Stream Order	Watercourse Size	Dominant Habitat Type	Fish Habitat Classification	Fish Habitat Profile Length (m)	HABITAT TYPE (%/100)					BANK STABILITY (%/100)			RIPARIAN VEGETATION (%/100)					SUBSTRATE (%/100)								OVERHEAD COVER (%/ survey area)							
									Rapid, Cascade, Step Pool	Riffle/Run	Flat/Glide	Pool/Impoundment	Pond	Unstable	Moderately Stable	Stable	Bare	Grass	Shrub	Tree	Wetland	Muck	Silt	Sand	Gravel	Cobble	Rubble	Boulder	Bedrock	Embedded-ness Rank*	Total Cover	Undercut Bank	Grass	Tree Shrubs	Large Woody Debris		
WCA-002a	48.56294	-59.13701	2023-09-26	1	Small	Riffle/Run	Fish habitat - based on connectivity	198	0%	49%	51%	0%	0%	0%	0%	100%	0%	20%	45%	35%	0%	35%	25%	0%	19%	16%	5%	0%	0%	3	20%	5%	0%	15%	0%		
WCA-002b	48.56233	-59.13759	2023-09-26	1	Small	Riffle/Run	Fish habitat - based on connectivity	100	0%	100%	0%	0%	0%	0%	100%	0%	20%	45%	35%	0%	35%	25%	0%	19%	16%	5%	0%	0%	3	20%	5%	0%	15%	0%			
WCA-009	48.54692	-59.13193	2023-06-22	0	Small	Riffle/Run	Fish habitat - based on connectivity	111	0%	48%	52%	0%	0%	2%	98%	0%	21%	42%	37%	0%	86%	0%	0%	1%	2%	3%	7%	0%	4	48%	0%	21%	25%	1%			
WCA-010	48.54630	-59.13076	2023-06-22	1	Small	Riffle/Run	Fish habitat - confirmed fish present	162	0%	91%	0%	9%	0%	0%	100%	0%	24%	44%	32%	0%	0%	4%	0%	12%	17%	16%	29%	20%	2	20%	6%	4%	9%	1%			
WCA-011a	48.54734	-59.12172	2023-06-22	0	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCA-011b	48.54629	-59.12179	2023-06-22	0	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCA-013	48.55514	-59.09970	2023-05-25	na	Waterbody	Pond	Fish habitat - based on connectivity	106	0%	0%	0%	0%	100%	0%	0%	100%	0%	50%	30%	20%	0%	30%	5%	5%	23%	10%	7%	20%	0%	0	0%	0%	0%	0%	0%		
WCA-014a	48.55986	-59.11257	2023-05-25	1	Small	Riffle/Run	Fish habitat - based on connectivity	200	0%	100%	0%	0%	0%	0%	100%	0%	15%	65%	20%	0%	0%	5%	5%	17%	26%	26%	15%	5%	1	10%	5%	0%	0%	5%			
WCA-014b	48.55559	-59.10046	2023-05-25	1	Small	Riffle/Run	Fish habitat - based on connectivity	300	0%	100%	0%	0%	0%	0%	100%	5%	25%	50%	20%	0%	0%	0%	3%	13%	13%	70%	0%	0	60%	0%	0%	60%	0%				
WCA-016	48.55909	-59.11309	2023-05-25	0	Small	Riffle/Run	Fish habitat - based on connectivity	100	0%	0%	100%	0%	0%	20%	80%	0%	50%	40%	10%	0%	100%	0%	0%	0%	0%	0%	0%	0%	4	0%	0%	0%	0%	0%			
WCA-021	48.59823	-59.08919	2023-08-18	1	Small	Riffle/Run	Fish habitat - based on connectivity	140	0%	0%	100%	0%	0%	0%	6%	94%	0%	50%	50%	0%	0%	100%	0%	0%	0%	0%	0%	0%	4	64%	10%	25%	29%	0%			
WCA-022	48.61684	-59.05410	2023-09-22	0	Small	No visible channel	No	0	Not Fish Habitat																												
WCA-023	48.50681	-59.16945	2023-06-27	na	Waterbody	No visible channel	No	0	Not Fish Habitat																												
WCA-024a	48.50648	-59.16968	2023-06-27	na	Waterbody	Boghole	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCA-024b	48.50659	-59.16964	2023-06-27	0	Small	Boghole	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCA-025	48.60944	-58.98073	2023-05-26	1	Small	Riffle/Run	Fish habitat - confirmed fish present	100	0%	100%	0%	0%	0%	0%	100%	10%	15%	55%	20%	0%	15%	25%	25%	22%	5%	3%	5%	0%	1	45%	10%	0%	30%	5%			
WCA-026	48.60472	-58.99191	2023-05-26	0	Small	Riffle/Run	Fish habitat - based on connectivity	60	0%	100%	0%	0%	0%	0%	100%	10%	15%	40%	35%	0%	5%	5%	20%	20%	21%	23%	5%	0%	1	15%	5%	0%	10%	0%			
WCA-028c	48.59897	-58.97784	2023-05-27	0	Small	Riffle/Run	Fish habitat - based on connectivity	100	0%	100%	0%	0%	0%	0%	100%	15%	15%	50%	20%	0%	0%	0%	20%	27%	17%	7%	10%	0%	1	20%	10%	0%	5%	5%			
WCA-030a	48.58144	-58.95828	2023-09-25	3	Medium	Riffle/Run	Fish habitat - based on connectivity	123	0%	95%	0%	5%	0%	0%	100%	0%	43%	2%	55%	0%	0%	10%	10%	28%	27%	20%	5%	0%	0	20%	8%	0%	5%	7%			
WCA-030b	48.58837	-58.95215	2023-09-05	3	Medium	Riffle/Run	Fish habitat - confirmed fish present	128	0%	84%	0%	16%	0%	0%	100%	4%	20%	53%	23%	1%	2%	3%	8%	28%	25%	17%	2%	14%	0	7%	1%	0%	2%	4%			
WCA-031	48.58029	-58.95546	2023-07-24	0	Small	Riffle/Run	Fish habitat - confirmed fish present	113	0%	94%	0%	6%	0%	0%	8%	92%	0%	30%	30%	40%	0%	0%	0%	7%	14%	20%	25%	17%	17%	2	15%	5%	5%	0%	5%		
WCA-032	48.58032	-58.95334	2023-07-24	1	Small	Riffle/Run	Fish habitat - based on connectivity	105	0%	80%	0%	20%	0%	0%	100%	5%	20%	45%	30%	0%	0%	0%	15%	25%	29%	21%	10%	0%	0	15%	5%	5%	5%	0%			
WCA-051a	48.56131	-59.15925	2023-06-23	1	Small	Riffle/Run	Fish habitat - confirmed fish present	124	0%	82%	0%	18%	0%	0%	100%	5%	12%	50%	33%	0%	0%	10%	6%	15%	16%	10%	31%	11%	2	35%	5%	10%	20%	0%			
WCA-051b	48.56135	-59.15351	2023-06-25	1	Small	Riffle/Run	Fish habitat - based on connectivity	156	0%	100%	0%	0%	0%	0%	100%	0%	37%	42%	22%	0%	0%	0%	87%	7%	7%	0%	0%	0%	0	23%	0%	5%	3%	15%			
WCA-053	48.55235	-59.10185	2023-05-25	1	Small	No visible channel	No	0	Not Fish Habitat																												
WCA-055	48.57077	-59.09639	2023-07-22	1	Small	Riffle/Run	Fish habitat - based on connectivity	220	0%	100%	0%	0%	0%	10%	40%	50%	0%	15%	45%	30%	10%	70%	0%	0%	2%	3%	0%	0%	25%	0	80%	0%	25%	30%	25%		
WCA-057a	48.57446	-59.09603	2023-06-22	1	Small	Riffle/Run	Fish habitat - based on connectivity	100	0%	100%	0%	0%	0%	10%	10%	80%	0%	55%	28%	18%	0%	40%	25%	5%	15%	2%	3%	10%	0%	2	25%	0%	20%	5%	0%		
WCA-057b	48.57490	-59.09601	2023-06-22	1	Small	Riffle/Run	Fish habitat - based on connectivity	42	0%	100%	0%	0%	0%	0%	100%	0%	50%	15%	35%	0%	10%	10%	10%	28%	25%	17%	0%	0%	1	25%	5%	5%	15%	0%			
WCA-057c	48.57524	-59.09575	2023-06-22	1	Small	Riffle/Run	Fish habitat - based on connectivity	20	0%	100%	0%	0%	0%	0%	100%	0%	45%	40%	15%	0%	10%	20%	0%	17%	25%	23%	5%	0%	1	15%	5%	0%	5%	5%			
WCA-057d	48.57540	-59.09565	2023-06-22	1	Small	Riffle/Run	Fish habitat - based on connectivity	20	0%	100%	0%	0%	0%	0%	100%	0%	20%	35%	45%	0%	10%	10%	10%	17%	25%	23%	5%	0%	1	10%	0%	0%	10%	0%			
WCA-057e	48.57587	-59.09517	2023-06-22	1	Small	Riffle/Run	Fish habitat - based on connectivity	50	0%	100%	0%	0%	0%	0%	100%	0%	20%	45%	35%	0%	5%	5%	0%	7%	7%	10%	60%	0	25%	0%	0%	25%	0%				
WCA-058	48.57765	-59.09437	2023-06-22	1	Small	Riffle/Run	Fish habitat - confirmed fish present	100	0%	100%	0%	0%	0%	0%	100%	0%	15%	50%	35%	0%	0%	0%	0%	8%	18%	23%	0%	50%	0	5%	0%	0%	5%	0%			
WCA-059a	48.58100	-59.08781	2023-08-16	1	Small	Pool	Fish habitat - based on connectivity	101	0%	50%	0%	50%	0%	0%	100%	0%	27%	55%	17%	0%	0%	5%	18%	42%	26%	7%	2%	0%	0	15%	3%	0%	12%	0%			
WCA-059b	48.58469	-59.08300	2023-08-16	1	Small	Riffle/Run	Fish habitat - confirmed fish present	108	0%	75%	0%	25%	0%	0%	100%	5%	29%	39%	27%	0%	0%	0%	0%	7%	7%	5%	3%	78%	0	14%	2%	2%	7%	2%			
WCA-059c	48.58679	-59.07875	2023-06-26	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCA-060	48.58649	-59.07903	2023-06-26	1	Small	No visible channel	No	0	Not Fish Habitat																												
WCA-061	48.59363	-59.07845	2023-06-26	1	Small	Riffle/Run	Fish habitat - based on connectivity	145	0%	28%	36%	36%	0%	0%	0%	100%	0%	31%	40%	29%	0%	7%	32%	31%	22%	6%	1%	0%	0%	3	50%	3%	24%	13%	9%		
WCA-062	48.59341	-59.07211	2023-06-26	1	Small	Riffle/Run	Fish habitat - confirmed fish present	94	0%	100%	0%	0%	0%	18%	82%	0%	39%	39%	22%	0%	52%	14%	15%	10%	6%	3%	0%	0%	3	47%	5%	19%	23%	0%			
WCA-063	48.59090	-59.12453	2023-09-19	1	Small	Riffle/Run	Fish habitat - based on connectivity	152	0%	100%	0%	0%	0%	0%	100%	0%	30%	30%	40%	0%	20%	20%	25%	28%	7%	0%	0%	2	38%	17%	5%	17%	0%				
WCA-064	48.59777	-59.10491	2023-06-23	1	Small	Riffle/Run	Fish habitat - based on connectivity	150	0%	100%	0%	0%	0%	0%	100%	0%	20%	63%	17%	0%	65%	18%	2%	7%	5%	3%	0%	0%	2	55%	5%	17%	32%	2%			
WCA-066	48.60165	-59.07883	2023-06-23	1	Small	Riffle/Run	Fish habitat - based on connectivity	70	0%	71%	29%	0%	0%	21%	79%	0%	20%	60%	20%	0%	25%	60%	0%	7%	5%	3%	0%	0%	1	32%	14%	4%	14%	0%			
WCA-067	48.60352	-59.07482	2023-06-23	1	Small	Riffle/Run	Fish habitat - based on connectivity	106	0%	100%	0%	0%	0%	0%	100%	0%	15%	35%	50%	0%	10%	10%	33%	29%	11%	7%	0%	0%	1	45%	10%	5%	30%	0%			
WCA-069a	48.61958	-59.05278	2023-09-06	1	Small	Riffle/Run	Fish habitat - based on connectivity	96	0%	100%	0%	0%	0%	0%	100%	0%	27%	45%	28%	0%	10%	10%	0%	12%	18%	10%	5%	35%	0	25%	5%	10%	10%	0%			
WCA-069b	48.61944	-59.04953	2023-09-22	1	Small	Riffle/Run	Fish habitat - based on connectivity	93	0%	28%	0%	72%	0%	0%	100%	3%	43%	16%	38%	0%	44%	31%	3%	1%	4%	4%	0%	14%	3	12%	0%	8%	4%	0%			
WCA-070	48.62686	-59.04354	2023-06-24	1	Small	Riffle/Run	Fish habitat - based on connectivity	33	0%	100%	0%	0%	0%	50%	50%	0%	25%	50%	25%	0%	50%	50%	0%	0%	0%	0%	0%	3	65%	0%	0%	65%	0%				
WCA-071b	48.60960	-58.99406	2023-05-26	1	Small	Riffle/Run	Fish habitat - confirmed fish present	100	0%	100%	0%	0%	0%	0%	100%	10%	10%	45%	35%	0%	5%	20%	20%	33%	8%	3%	5%	5%	0	10%	5%	0%	0%	5%			
WCA-071c	48.60646	-59.00637	2023-05-26	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCA-071d	48.60730	-59.00326	2023-05-26	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCA-072a	48.58336	-58.96454	2023-06-28	1	Small	Pool	Fish habitat - based on connectivity	52	0%	0%	0%	100%	0%	50%	50%	0%	0%	30%	55%	15%	0%	100%	0%	0%	0%	0%	0%	0%	4	75%	0%	25%	50%	0%			
WCA-072b	48.59076	-58.96756	2023-06-26	1	Small	Riffle/Run	Fish habitat - based on connectivity	153	0%	100%	0%	0%	0%	0%	100%	0%	30%	55%	15%	0%	25%	30%	5%	20%	13%	7%	0%	0%	2	20%	10%	5%	5%	0%			
WCA-073a	48.58280	-58.96852	2023-06-28	1	Small	Riffle/Run	Fish habitat - based on connectivity	90	0%	100%	0%	0%	0%	0%	100%	0%	40%	40%	20%	0%	3%	5%	5%	55%	16%	15%	0%	0%	1	19%	0%	13%	7%	0%			
WCA-073b	48.58665	-58.96786	2023-06-28	1	Small	Riffle/Run	Fish habitat - based on connectivity	146	0%	100%	0%	0%	0%	0%	100%																						

Table 4.1 Summary of Fish Habitat Characteristics for Watercourses Crossings Associated with Access Roads for the Port au Port Wind Farm

HABITAT PROFILE DATA																																					
Site ID	Latitude	Longitude	Survey Date	Stream Order	Watercourse Size	Dominant Habitat Type	Fish Habitat Classification	Fish Habitat Profile Length (m)	HABITAT TYPE (%/100)					BANK STABILITY (%/100)			RIPARIAN VEGETATION (%/100)					SUBSTRATE (%/100)								OVERHEAD COVER (%/ survey area)							
									Rapid, Cascade, Step Pool	Riffle/Run	Flat/Glide	Pool/Impoundment	Pond	Unstable	Moderately Stable	Stable	Bare	Grass	Shrub	Tree	Wetland	Muck	Silt	Sand	Gravel	Cobble	Rubble	Boulder	Bedrock	Embeddedness Rank*	Total Cover	Undercut Bank	Grass	Tree Shrubs	Large Woody Debris		
WCA-117	48.58715	-59.00959	2023-05-30	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCA-121	48.62931	-59.02423	2023-06-24	2	Small	Riffle/Run	Fish habitat - based on connectivity	100	0%	100%	0%	0%	0%	0%	0%	0%	100%	0%	15%	45%	40%	0%	0%	0%	0%	5%	31%	43%	10%	10%	2	5%	0%	0%	5%	0%	
WCA-122	48.63005	-59.02431	2023-06-24	0	Small	No visible channel	No	0	Not Fish Habitat																												
WCA-123	48.63188	-59.02836	2023-06-24	0	Small	Riffle/Run	Fish habitat - based on connectivity	32	0%	100%	0%	0%	0%	0%	0%	100%	0%	25%	30%	45%	0%	0%	0%	0%	12%	41%	36%	0%	10%	2	15%	0%	0%	15%	0%		
WCA-124	48.55092	-59.13075	2023-06-23	na	Waterbody	Boghole	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCA-125	48.55240	-59.14369	2023-06-23	1	Small	Riffle/Run	Fish habitat - based on connectivity	107	0%	50%	50%	0%	0%	0%	100%	0%	30%	37%	33%	0%	10%	0%	20%	63%	7%	0%	0%	0%	1	40%	5%	15%	20%	0%			
WCA-126	48.55280	-59.14376	2023-06-23	1	Small	Riffle/Run	Fish habitat - based on connectivity	35	0%	0%	100%	0%	0%	0%	100%	0%	45%	45%	10%	0%	31%	0%	15%	49%	5%	0%	0%	0%	2	15%	0%	15%	0%	0%			
WCA-127	48.55147	-59.13710	2023-06-23	1	Small	Riffle/Run	Fish habitat - confirmed fish present	100	0%	0%	100%	0%	0%	0%	100%	0%	35%	30%	35%	0%	100%	0%	0%	0%	0%	0%	0%	4	50%	0%	45%	0%	5%				
WCA-128	48.56133	-59.15361	2023-06-25	1	Small	Riffle/Run	Fish habitat - based on connectivity	52	0%	100%	0%	0%	0%	0%	100%	0%	65%	10%	25%	0%	0%	80%	10%	10%	0%	0%	0%	3	20%	0%	10%	10%	0%				
WCA-129a	48.59173	-59.12374	2023-09-19	0	Small	No visible channel	No	0	Not Fish Habitat																												
WCA-129b	48.59173	-59.12374	2023-09-19	0	Small	No visible channel	No	0	Not Fish Habitat																												
WCA-130	48.55965	-59.11107	2023-09-25	2	Small	Riffle/Run	Fish habitat - confirmed fish present	218	0%	100%	0%	0%	0%	0%	100%	0%	27%	52%	21%	0%	2%	12%	17%	31%	23%	9%	0%	7%	2	25%	15%	5%	5%	0%			
WCA-131	48.54979	-59.12087	2023-09-09	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCA-132	48.54906	-59.12269	2023-09-22	0	Small	Riffle/Run	Fish habitat - based on connectivity	156	0%	100%	0%	0%	0%	0%	100%	0%	17%	5%	78%	0%	0%	0%	0%	2%	8%	7%	54%	28%	0	2%	0%	0%	2%	0%			
WCA-133	48.54986	-59.12612	2023-09-09	1	Small	Pool	Fish habitat - confirmed fish present	86	0%	0%	0%	100%	0%	0%	100%	0%	20%	45%	35%	0%	0%	17%	22%	21%	13%	10%	9%	0%	2	31%	10%	0%	13%	8%			
WCA-134	48.54650	-59.11767	2023-09-22	0	Small	No visible channel	No	0	Not Fish Habitat																												
WCA-135a	48.54748	-59.11146	2023-07-20	0	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCA-135b	48.54674	-59.11069	2023-07-20	0	Small	No visible channel	No	0	Not Fish Habitat																												
WCA-136a	48.53840	-59.12064	2023-07-20	0	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCA-136b	48.53844	-59.12066	2023-07-20	0	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCA-137a	48.52768	-59.08538	2023-07-24	0	Small	No visible channel	No	0	Not Fish Habitat																												
WCA-137b	48.52908	-59.08508	2023-07-24	0	Small	No visible channel	No	0	Not Fish Habitat																												
WCA-138a	48.53283	-59.08755	2023-07-24	0	Small	No visible channel	No	0	Not Fish Habitat																												
WCA-138b	48.53283	-59.08755	2023-07-24	0	Small	No visible channel	No	0	Not Fish Habitat																												
WCA-139	48.53365	-59.07364	2023-10-11	0	Small	No visible channel	No	0	Not Fish Habitat																												
WCA-140a	48.55272	-59.10038	2023-09-18	0	Small	No visible channel	No	0	Not Fish Habitat																												
WCA-140b	48.55272	-59.10038	2023-09-18	0	Small	No visible channel	No	0	Not Fish Habitat																												
WCA-140c	48.55272	-59.10038	2023-09-18	0	Small	No visible channel	No	0	Not Fish Habitat																												
WCA-141	48.55568	-59.09847	2023-09-18	1	Small	No visible channel	No	0	Not Fish Habitat																												
WCA-142	48.56115	-59.09000	2023-09-08	1	Small	Riffle/Run	Fish habitat - based on connectivity	104	0%	51%	49%	0%	0%	0%	100%	0%	30%	38%	33%	0%	0%	0%	0%	14%	28%	2%	56%	0	5%	0%	0%	5%	0%				
WCA-143	48.56757	-59.06470	2023-07-26	1	Small	Pool	Fish habitat - based on connectivity	110	0%	0%	0%	100%	0%	0%	100%	0%	25%	40%	35%	0%	5%	0%	0%	8%	20%	26%	0%	40%	0	40%	5%	5%	25%	5%			
WCA-144	48.56968	-59.05952	2023-07-26	na	Waterbody	Boghole	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCA-145	48.57197	-59.04749	2023-07-25	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCA-146	48.57221	-59.04545	2023-07-25	2	Small	Riffle/Run	Fish habitat - based on connectivity	105	0%	100%	0%	0%	0%	0%	10%	90%	0%	25%	35%	35%	5%	10%	70%	0%	2%	7%	7%	0%	5%	3	20%	5%	5%	5%	5%		
WCA-147	48.56835	-59.01425	2023-09-07	3	Medium	Riffle/Run	Fish habitat - based on connectivity	93	0%	100%	0%	0%	0%	0%	100%	0%	15%	20%	65%	0%	0%	0%	2%	2%	11%	20%	10%	55%	0	2%	0%	0%	0%	2%			
WCA-148a	48.56917	-59.00190	2023-09-20	1	Small	Riffle/Run	Fish habitat - based on connectivity	23	0%	100%	0%	0%	0%	0%	100%	0%	30%	15%	55%	0%	0%	5%	10%	35%	26%	13%	10%	0%	0	15%	10%	0%	5%	0%			
WCA-148b	48.56914	-59.00051	2023-09-20	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCA-149	48.56908	-58.99803	2023-09-07	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCA-150	48.57041	-58.98994	2023-09-20	1	Small	Riffle/Run	Fish habitat - confirmed fish present	108	0%	100%	0%	0%	0%	0%	100%	0%	25%	20%	55%	0%	0%	0%	0%	0%	12%	24%	30%	34%	0	5%	0%	0%	5%	0%			
WCA-151	48.57109	-58.98568	2023-09-07	2	Small	Riffle/Run	Fish habitat - based on connectivity	110	0%	63%	30%	7%	0%	0%	100%	0%	30%	20%	50%	0%	0%	0%	0%	9%	22%	28%	13%	28%	0	12%	0%	0%	12%	0%			
WCA-152	48.61333	-58.99358	2023-07-27	0	Small	Riffle/Run	Fish habitat - based on connectivity	85	0%	100%	0%	0%	0%	0%	100%	0%	20%	55%	25%	0%	10%	50%	20%	7%	7%	7%	0%	0%	3	70%	0%	0%	60%	10%			
WCA-153	48.58283	-58.96097	2023-09-25	0	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCA-154a	48.53872	-58.94618	2023-08-18	0	Small	No visible channel	No	0	Not Fish Habitat																												
WCA-155	48.53413	-58.94344	2023-10-13	0	Small	No visible channel	No	0	Not Fish Habitat																												

NOTE:

* Embeddedness is ranked as follows:

- 0 Non-embedded
- 1 Low <25% embedded
- 2 Medium 25-50% embedded
- 3 High 50-75% embedded
- 4 Very High >75% embedded

Table 4.1 Summary of Fish Habitat Characteristics for Watercourses Crossings Associated with Access Roads for the Port au Port Wind Farm

HABITAT PROFILE DATA																		TRANSECT DATA													
Site ID	Latitude	Longitude	Survey Date	Stream Order	Watercourse Size	Dominant Habitat Type	Fish Habitat Classification	Fish Habitat Profile Length (m)	INSTREAM COVER (%/ survey area)							AQUATIC VEGETATION (%/100)					Width (m)		Wet Depth (m)					Bank Height (m)			
									Total Instream Cover	Large Woody Debris	Small Woody Debris	Boulders	Water Visibility	Aquatic Vegetation	Emergent	Floating Leafed	Free Floating	Sub-merged	Filamentous Algae	Macrophytic Algae	Wet Width	Channel Width	Average Wet Depth	25% from LB	50% from LB	75% from LB	Bankfull Max Depth (m)	Gradient (%)	Left Bank	Right Bank	
WCA-117	48.58715	-59.00959	2023-05-30	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	No Fish Habitat																						
WCA-121	48.62931	-59.02423	2023-06-24	2	Small	Riffle/Run	Fish habitat - based on connectivity	100	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.82	2.00	0.16	0.09	0.09	0.00	0.63	3	0.50	0.57
WCA-122	48.63005	-59.02431	2023-06-24	0	Small	No visible channel	No	0	No Fish Habitat																						
WCA-123	48.63188	-59.02836	2023-06-24	0	Small	Riffle/Run	Fish habitat - based on connectivity	32	10%	0%	0%	5%	0%	5%	0%	0%	0%	0%	100%	0%	0.21	0.68	0.05	0.02	0.04	0.00	0.30	0	0.26	0.37	
WCA-124	48.55092	-59.13075	2023-06-23	na	Waterbody	Boghole	Unlikely - based on no connectivity	0	No Fish Habitat																						
WCA-125	48.55240	-59.14369	2023-06-23	1	Small	Riffle/Run	Fish habitat - based on connectivity	107	15%	5%	5%	0%	0%	5%	100%	0%	0%	0%	0%	0.86	0.75	0.27	0.19	0.18	0.00	0.32	1	0.17	0.15		
WCA-126	48.55280	-59.14376	2023-06-23	1	Small	Riffle/Run	Fish habitat - based on connectivity	35	40%	0%	0%	0%	0%	40%	100%	0%	0%	0%	0%	0.68	0.81	0.10	0.05	0.04	0.00	0.14	1	0.07	0.06		
WCA-127	48.55147	-59.13710	2023-06-23	1	Small	Riffle/Run	Fish habitat - confirmed fish present	100	45%	0%	0%	0%	0%	45%	100%	0%	0%	0%	0%	0.75	0.93	0.36	0.23	0.14	0.00	0.34	2	0.12	0.07		
WCA-128	48.56133	-59.15361	2023-06-25	1	Small	Riffle/Run	Fish habitat - based on connectivity	52	10%	0%	0%	0%	0%	10%	0%	0%	0%	0%	100%	2.00	2.60	0.25	0.17	0.11	0.00	0.23	1	0.06	0.09		
WCA-129a	48.59173	-59.12374	2023-09-19	0	Small	No visible channel	No	0	No Fish Habitat																						
WCA-129b	48.59173	-59.12374	2023-09-19	0	Small	No visible channel	No	0	No Fish Habitat																						
WCA-130	48.55965	-59.11107	2023-09-25	2	Small	Riffle/Run	Fish habitat - confirmed fish present	218	22%	5%	5%	0%	0%	12%	0%	0%	0%	0%	11%	89%	1.85	2.18	0.19	0.11	0.09	0.07	0.58	2	0.45	0.45	
WCA-131	48.54979	-59.12087	2023-09-09	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	No Fish Habitat																						
WCA-132	48.54906	-59.12269	2023-09-22	0	Small	Riffle/Run	Fish habitat - based on connectivity	156	7%	0%	0%	7%	0%	0%	0%	0%	0%	0%	0%	0.77	2.94	0.06	0.03	0.06	0.06	0.28	6	0.23	0.22		
WCA-133	48.54986	-59.12612	2023-09-09	1	Small	Pool	Fish habitat - confirmed fish present	86	14%	0%	11%	0%	0%	3%	0%	0%	0%	0%	0%	1.90	3.00	0.22	0.12	0.11	0.00	0.49	0	0.38	0.32		
WCA-134	48.54650	-59.11767	2023-09-22	0	Small	No visible channel	No	0	No Fish Habitat																						
WCA-135a	48.54748	-59.11146	2023-07-20	0	Small	Drainage Channel	Unlikely - based on no connectivity	0	No Fish Habitat																						
WCA-135b	48.54674	-59.11069	2023-07-20	0	Small	No visible channel	No	0	No Fish Habitat																						
WCA-136a	48.53840	-59.12064	2023-07-20	0	Small	Drainage Channel	Unlikely - based on no connectivity	0	No Fish Habitat																						
WCA-136b	48.53844	-59.12066	2023-07-20	0	Small	Drainage Channel	Unlikely - based on no connectivity	0	No Fish Habitat																						
WCA-137a	48.52768	-59.08538	2023-07-24	0	Small	No visible channel	No	0	No Fish Habitat																						
WCA-137b	48.52908	-59.08508	2023-07-24	0	Small	No visible channel	No	0	No Fish Habitat																						
WCA-138a	48.53283	-59.08755	2023-07-24	0	Small	No visible channel	No	0	No Fish Habitat																						
WCA-138b	48.53283	-59.08755	2023-07-24	0	Small	No visible channel	No	0	No Fish Habitat																						
WCA-139	48.53365	-59.07364	2023-10-11	0	Small	No visible channel	No	0	No Fish Habitat																						
WCA-140a	48.55272	-59.10038	2023-09-18	0	Small	No visible channel	No	0	No Fish Habitat																						
WCA-140b	48.55272	-59.10038	2023-09-18	0	Small	No visible channel	No	0	No Fish Habitat																						
WCA-140c	48.55272	-59.10038	2023-09-18	0	Small	No visible channel	No	0	No Fish Habitat																						
WCA-141	48.55568	-59.09847	2023-09-18	1	Small	No visible channel	No	0	No Fish Habitat																						
WCA-142	48.56115	-59.09000	2023-09-08	1	Small	Riffle/Run	Fish habitat - based on connectivity	104	15%	0%	0%	0%	0%	15%	10%	0%	0%	0%	50%	40%	4.41	5.05	0.06	0.02	0.05	0.00	0.13	4	0.07	0.13	
WCA-143	48.56757	-59.06470	2023-07-26	1	Small	Pool	Fish habitat - based on connectivity	110	30%	10%	0%	0%	0%	20%	100%	0%	0%	0%	0%	0.98	1.62	0.10	0.06	0.05	0.00	0.35	1	0.29	0.67		
WCA-144	48.56968	-59.05952	2023-07-26	na	Waterbody	Boghole	Unlikely - based on no connectivity	0	No Fish Habitat																						
WCA-145	48.57197	-59.04749	2023-07-25	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	No Fish Habitat																						
WCA-146	48.57221	-59.04545	2023-07-25	2	Small	Riffle/Run	Fish habitat - based on connectivity	105	15%	5%	0%	0%	0%	10%	50%	0%	0%	0%	50%	0%	7.50	7.00	0.69	0.32	0.60	0.00	0.90	0	0.40	0.30	
WCA-147	48.56835	-59.01425	2023-09-07	3	Medium	Riffle/Run	Fish habitat - based on connectivity	93	8%	0%	0%	0%	0%	8%	0%	0%	0%	0%	0%	4.19	5.92	0.34	0.20	0.19	0.11	0.44	3	0.38	0.19		
WCA-148a	48.56917	-59.00190	2023-09-20	1	Small	Riffle/Run	Fish habitat - based on connectivity	23	10%	0%	5%	0%	0%	5%	100%	0%	0%	0%	0%	0.69	0.88	0.11	0.06	0.05	0.00	0.30	2	0.31	0.21		
WCA-148b	48.56914	-59.00051	2023-09-20	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	No Fish Habitat																						
WCA-149	48.56908	-58.99803	2023-09-07	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	No Fish Habitat																						
WCA-150	48.57041	-58.98994	2023-09-20	1	Small	Riffle/Run	Fish habitat - confirmed fish present	108	15%	0%	5%	5%	0%	5%	0%	0%	0%	100%	0%	3.68	4.02	0.19	0.10	0.13	0.38	0.44	3	0.35	0.41		
WCA-151	48.57109	-58.98568	2023-09-07	2	Small	Riffle/Run	Fish habitat - based on connectivity	110	29%	0%	0%	4%	0%	25%	1%	0%	0%	0%	0%	2.11	2.75	0.16	0.09	0.11	0.13	0.24	1	0.13	0.14		
WCA-152	48.61333	-58.99358	2023-07-27	0	Small	Riffle/Run	Fish habitat - based on connectivity	85	10%	5%	0%	0%	0%	5%	100%	0%	0%	0%	0%	0.58	2.43	0.06	0.03	0.03	0.00	0.42	1	0.41	0.37		
WCA-153	48.58283	-58.96097	2023-09-25	0	Small	Drainage Channel	Unlikely - based on no connectivity	0	No Fish Habitat																						
WCA-154a	48.53872	-58.94618	2023-08-18	0	Small	No visible channel	No	0	No Fish Habitat																						
WCA-155	48.53413	-58.94344	2023-10-13	0	Small	No visible channel	No	0	No Fish Habitat																						

NOTE:

- * Embeddedness is ranked as follows:
- 0 Non-embedded
- 1 Low <25% embedded
- 2 Medium 25-50% embedded
- 3 High 50-75% embedded
- 4 Very High >75% embedded



4.1.2 Collector Lines and Transmission Line RoWs

Of the 194 potential watercourse crossings surveyed for the proposed Port au Port Wind Farm collector and transmission lines, 128 watercourses / waterbodies were considered fish-bearing as fish were confirmed present or there appeared to be connectivity with downstream watercourses or waterbodies. Of those, 95 of were classified as small watercourses (stream order of 2 or smaller) while 24 were moderately sized (stream order of 3-5) and 9 were ponds. Of the 66 stream crossings that were not fish habitat, 39 had no visible channel (i.e., no watercourse was present), 18 were considered overland drainage channels and 9 were bog holes with no connectivity to fish bearing waters.

Small watercourses identified as fish habitat were generally narrow (less than 5 m) runs or riffles and had average wetted and channel widths of 3.6 and 4.4 m, respectively. Average water depth was 0.92 and ranged from 0.01 to 1.5 m. The banks were generally stable. Substrates were varied, dominated by rubble (18%), muck (17%) and gravel (16%), with riparian vegetation dominated by shrubs (52%; Table 4.1). Instream cover averaged 3% and consisted of mostly emergent vegetation. Overhead cover averaged 21% and consisted of tree shrubs.

Medium sized watercourses were larger (5 to 20 m) runs or riffles and had average wetted and channel widths of 13.7 and 16.7 m, respectively. Average water depth was 0.69 m and depths ranged from 0.1 to 1.5 m. The banks were generally stable. Substrates were dominated by rubble (33%) and bedrock (25%) with riparian vegetation dominated by shrubs (58%; Table 4.4). Instream cover was 3% and consisted of mostly large woody debris and vegetation. Overhead cover was 24% and consisted of shrubs.

The ponds had mostly muck substrate (89%) and riparian vegetation consisting of grass (67%). Cover was 21% and was divided between small woody debris, shrubs and undercut banks.

A summary of habitat attributes for watercourse crossings associated with the collector lines and transmission lines is provided in Tables 4.2 and 4.3.

Fish were observed during the fish habitat surveys at WCT-519.



Table 4.2 Summary of Fish Habitat Characteristics for Watercourses Crossings Associated with Collector Lines for the Port au Port Wind Farm

HABITAT PROFILE DATA																																				
Site ID	Latitude	Longitude	Survey Date	Stream Order	Watercourse Size	Dominant Habitat Type	Fish Habitat Classification	Fish Habitat Profile Length (m)	HABITAT TYPE (%/100)					BANK STABILITY (%/100)			RIPARIAN VEGETATION (%/100)					SUBSTRATE (%/100)										OVERHEAD COVER (%/ survey area)				
									Rapid, Cascade, Step Pool	Riffle/Run	Flat/Glide	Pool/Impoundment	Pond	Unstable	Moderately Stable	Stable	Bare	Grass	Shrub	Tree	Wetland	Muck	Silt	Sand	Gravel	Cobble	Rubble	Boulder	Bedrock	Embedded-ness Rank	Total Cover	Under-cut Bank	Grass	Tree Shrubs	Large Woody Debris	
WCL-704a	48.5584	-59.1479	2023-06-25	1	Small	No visible channel	No	0	Not Fish Habitat																											
WCL-704b	48.5611	-59.1514	2023-06-25	1	Small	Riffle/Run	Fish habitat - based on connectivity	24	0%	100%	0%	0%	0%	0%	0%	100%	0%	30%	60%	10%	0%	80%	20%	0%	0%	0%	0%	2	15%	0%	5%	10%	0%			
WCL-704c	48.5613	-59.1593	2023-06-23	1	Small	Pool	Fish habitat - based on connectivity	22	0%	0%	0%	100%	0%	0%	0%	100%	5%	10%	40%	45%	0%	0%	10%	0%	13%	13%	13%	10%	40%	2	25%	5%	10%	10%	0%	
WCL-706	48.5494	-59.1274	2023-06-23	1	Small	Riffle/Run	Fish habitat - based on connectivity	20	0%	100%	0%	0%	0%	0%	0%	100%	0%	15%	40%	45%	0%	0%	0%	0%	15%	28%	36%	20%	0%	0	10%	5%	0%	5%	0%	
WCL-707a	48.5522	-59.1289	2023-06-23	na	Waterbody	Boghole	Unlikely - based on no connectivity	0	Not Fish Habitat																											
WCL-707b	48.5515	-59.1287	2023-06-23	na	Waterbody	No visible channel	No	0	Not Fish Habitat																											
WCL-707c	48.5513	-59.1300	2023-06-23	na	Waterbody	No visible channel	No	0	Not Fish Habitat																											
WCL-708	48.5577	-59.1319	2023-09-26	2	Small	Pool	Fish habitat - based on connectivity	23	0%	0%	0%	100%	0%	0%	0%	100%	0%	30%	65%	5%	0%	15%	15%	20%	35%	12%	3%	0%	0%	2	50%	20%	5%	20%	5%	
WCL-709	48.5610	-59.1332	2023-09-26	1	Small	Pool	Fish habitat - based on connectivity	23	0%	0%	0%	100%	0%	0%	0%	100%	0%	10%	40%	50%	0%	5%	5%	20%	25%	21%	23%	0%	0%	2	20%	15%	0%	5%	0%	
WCL-710	48.5771	-59.1218	2023-10-12	3	Medium	Riffle/Run	Fish habitat - based on connectivity	20	0%	100%	0%	0%	0%	0%	100%	0%	45%	10%	45%	0%	0%	0%	0%	22%	25%	23%	20%	10%	0	5%	0%	0%	5%	0%		
WCL-711a	48.5623	-59.1333	2023-09-26	3	Medium	Riffle/Run	Fish habitat - based on connectivity	24	0%	100%	0%	0%	0%	0%	100%	0%	10%	45%	45%	0%	0%	0%	0%	13%	15%	17%	35%	20%	0	0%	0%	0%	0%	0%		
WCL-711b	48.5649	-59.1329	2023-10-12	3	Medium	Riffle/Run	Fish habitat - based on connectivity	21	0%	100%	0%	0%	0%	0%	100%	0%	20%	70%	10%	0%	0%	5%	10%	12%	30%	33%	5%	5%	0	20%	5%	0%	10%	5%		
WCL-711c	48.5737	-59.1296	2023-10-12	3	Medium	Riffle/Run	Fish habitat - based on connectivity	30	0%	100%	0%	0%	0%	0%	100%	0%	15%	15%	70%	0%	0%	0%	5%	8%	10%	7%	20%	50%	3	15%	5%	0%	5%	5%		
WCL-712a	48.5731	-59.1325	2023-10-12	1	Small	Riffle/Run	Fish habitat - based on connectivity	22	0%	100%	0%	0%	0%	0%	20%	80%	10%	45%	20%	25%	0%	0%	5%	10%	37%	30%	13%	5%	0%	0	15%	0%	5%	5%	5%	
WCL-712b	48.5724	-59.1324	2023-10-12	1	Small	Riffle/Run	Fish habitat - based on connectivity	29	0%	100%	0%	0%	0%	0%	100%	10%	15%	20%	55%	0%	0%	0%	30%	33%	30%	7%	0%	0%	3	15%	5%	0%	0%	10%		
WCL-712c	48.5717	-59.1324	2023-10-12	1	Small	Riffle/Run	Fish habitat - based on connectivity	23	0%	100%	0%	0%	0%	5%	95%	10%	30%	15%	45%	0%	0%	0%	10%	30%	33%	26%	0%	0%	3	10%	5%	0%	0%	5%		
WCL-713	48.5766	-59.1409	2023-10-12	4	Medium	Riffle/Run	Fish habitat - based on connectivity	23	0%	100%	0%	0%	0%	0%	100%	5%	20%	20%	55%	0%	0%	0%	0%	0%	0%	20%	80%	0	5%	0%	0%	0%	5%			
WCL-714	48.5979	-59.0957	2023-10-12	2	Small	Riffle/Run	Fish habitat - based on connectivity	21	0%	100%	0%	0%	0%	0%	100%	5%	25%	45%	25%	0%	0%	0%	10%	57%	33%	0%	0%	0	20%	5%	0%	10%	5%			
WCL-715a	48.5435	-59.1204	2023-06-22	0	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																											
WCL-715b	48.5417	-59.1197	2023-06-22	0	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																											
WCL-715c	48.5408	-59.1199	2023-06-22	0	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																											
WCL-716	48.5595	-59.1087	2023-05-25	1	Small	Riffle/Run	Fish habitat - based on connectivity	20	0%	100%	0%	0%	0%	0%	100%	5%	20%	50%	25%	0%	0%	0%	0%	12%	30%	33%	25%	0%	0	10%	0%	10%	0%	0%		
WCL-717	48.5683	-59.1026	2023-10-10	2	Small	Riffle/Run	Fish habitat - based on connectivity	22	0%	100%	0%	0%	0%	0%	100%	5%	30%	10%	55%	0%	0%	0%	0%	17%	36%	46%	0%	0%	2	10%	0%	5%	0%	5%		
WCL-718	48.5774	-59.0960	2023-06-22	1	Small	Riffle/Run	Fish habitat - based on connectivity	20	0%	100%	0%	0%	0%	0%	100%	5%	15%	40%	40%	0%	0%	0%	0%	8%	13%	13%	40%	25%	0	0%	0%	0%	0%	0%		
WCL-719	48.5912	-59.0744	2023-06-26	1	Small	Riffle/Run	Fish habitat - based on connectivity	27	0%	100%	0%	0%	0%	0%	100%	0%	25%	40%	35%	0%	0%	0%	10%	30%	31%	23%	5%	0%	3	30%	0%	5%	20%	5%		
WCL-720	48.5915	-59.0744	2023-06-26	1	Small	Riffle/Run	Fish habitat - based on connectivity	17	0%	100%	0%	0%	0%	0%	100%	0%	25%	40%	35%	0%	0%	0%	30%	30%	25%	10%	5%	0%	3	40%	0%	10%	20%	10%		
WCL-721	48.5931	-59.0738	2023-06-26	2	Small	Riffle/Run	Fish habitat - based on connectivity	26	0%	100%	0%	0%	0%	0%	100%	0%	20%	40%	40%	0%	10%	10%	30%	27%	17%	7%	0%	0%	2	60%	5%	20%	20%	15%		
WCL-722	48.6205	-59.0413	2023-09-22	2	Small	No visible channel	No	0	Not Fish Habitat																											
WCL-725	48.6254	-59.0299	2023-06-24	0	Small	Riffle/Run	Fish habitat - based on connectivity	20	0%	100%	0%	0%	0%	0%	100%	0%	40%	35%	25%	0%	15%	15%	10%	23%	23%	13%	0%	0%	1	25%	10%	5%	10%	0%		
WCL-726	48.5509	-59.1017	2023-05-25	na	Waterbody	Boghole	Unlikely - based on no connectivity	0	Not Fish Habitat																											
WCL-727	48.5612	-59.0958	2023-09-25	1	Small	No visible channel	No	0	Not Fish Habitat																											
WCL-728	48.5646	-59.0944	2023-07-22	2	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																											
WCL-729	48.5694	-59.0926	2023-10-10	0	Small	No visible channel	No	0	Not Fish Habitat																											
WCL-730	48.5725	-59.0910	2023-10-10	1	Small	No visible channel	No	0	Not Fish Habitat																											
WCL-739	48.5862	-59.0161	2023-05-30	1	Small	Riffle/Run	Fish habitat - based on connectivity	20	0%	0%	0%	100%	0%	0%	0%	100%	15%	15%	40%	30%	0%	40%	20%	20%	5%	5%	10%	0%	0%	1	25%	5%	0%	15%	5%	
WCL-740a	48.6117	-58.9906	2023-05-26	1	Small	Riffle/Run	Fish habitat - based on connectivity	20	0%	100%	0%	0%	0%	0%	100%	10%	10%	60%	20%	0%	5%	70%	13%	7%	0%	0%	0%	1	10%	5%	0%	0%	5%			
WCL-740b	48.6071	-59.0044	2023-05-26	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																											
WCL-741a	48.5830	-59.0065	2023-05-29	3	Medium	Riffle/Run	Fish habitat - based on connectivity	60	33%	67%	0%	0%	0%	0%	100%	10%	12%	32%	47%	0%	3%	2%	5%	7%	6%	12%	60%	0	8%	0%	0%	5%	3%			
WCL-741b	48.5812	-59.0037	2023-05-29	3	Medium	Riffle/Run	Fish habitat - based on connectivity	20	0%	100%	0%	0%	0%	0%	100%	20%	10%	35%	35%	0%	0%	10%	20%	42%	25%	3%	0%	0	5%	0%	0%	5%	0%			
WCL-742	48.5851	-58.9980	2023-05-28	1	Small	Riffle/Run	Fish habitat - based on connectivity	20	0%	100%	0%	0%	0%	0%	100%	5%	15%	35%	45%	0%	10%	5%	10%	7%	8%	10%	0%	50%	0	10%	0%	0%	10%	0%		
WCL-743	48.5848	-58.9941	2023-05-28	1	Small	Pool	Fish habitat - based on connectivity	20	0%	0%	0%	100%	0%	0%	100%	15%	20%	30%	35%	0%	0%	10%	35%	45%	3%	7%	0%	0	10%	5%	0%	5%	0%			
WCL-744	48.5874	-59.0099	2023-05-30	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																											
WCL-745a	48.5841	-58.9836	2023-10-10	3	Medium	Riffle/Run	Fish habitat - based on connectivity	19	0%	100%	0%	0%	0%	0%	100%	5%	20%	30%	45%	0%	0%	0%	0%	8%	10%	7%	5%	70%	2	10%	5%	0%	5%	0%		
WCL-745b	48.5841	-58.9828	2023-10-10	3	Medium	Riffle/Run	Fish habitat - based on connectivity	23	0%	100%	0%	0%	0%	0%	100%	3%	30%	33%	35%	0%	0%	0%	0%	8%	12%	10%	10%	60%	0	15%	5%	0%	5%	5%		
WCL-746	48.5838	-58.9816	2023-10-10	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																											
WCL-747	48.5826	-58.9768	2023-10-10	0	Small	Riffle/Run	Fish habitat - based on connectivity	21	0%	100%	0%	0%	0%	20%	80%	14%	24%	14%	48%	0%	0%	10%	5%	37%	23%	20%	5%	0%	0	15%	5%	5%	0%	5%		
WCL-748	48.5814	-58.9725	2023-06-28	1	Small	Riffle/Run	Fish habitat - based on connectivity	20	0%	100%	0%	0%	0%	0%	100%	0%	30%	30%	40%	0%	0%	5%	5%	17%	40%	33%	0%	0%	0	10%	0%	0%	10%	0%		
WCL-749	48.5824	-58.9682	2023-06-28	1	Small	No visible channel	No	5	Not Fish Habitat																											
WCL-750	48.5851	-58.9651	2023-06-28	1	Small	Riffle/Run	Fish habitat - based on connectivity	22	100%	0%	0%	0%	0%	0%	100%	0%	25%	55%	20%	0%	100%	0%	0%	0%	0%	0%	0%	0%	3	60%	0%	20%	40%	0%		
WCL-751	48.5877	-58.9581	2023-06-26	1	Small	Riffle/Run	Fish habitat - based on connectivity	24	0%	100%	0%	0%	0%	0%	100%	0%	20%	65%	15%	0%	40%	45%	5%	7%	3%	0%	0%	2	15%	5%	0%	10%	0%			
WCL-752	48.5803	-58.9629	2023-09-25	1	Small	Riffle/Run	Fish habitat - based on connectivity	25	0%	100%	0%	0%	0%	0%	100%	0%	55%	10%	35%	0%	0%	0%	0%	23%	30%	26%	10%	10%	0	5%	5%	0%	0%	0%		
WCL-753	48.5801	-58.9606	2023-09-25	1	Small	Riffle/Run	Fish habitat - based on connectivity	21	0%	100%	0%	0%	0%	0%	100%	0%	40%	20%	40%	0%	5%	0%	10%	28%	30%	26%	0%	0%	0	20%	10%	0%	10%	0%		
WCL-754	48.5800	-58.9598	2023-09-25	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																											
WCL-755	48.5796	-58.9563	2023-07-22	1	Small	Riffle/Run	Fish habitat - based on connectivity	28	0%	100%	0%	0%	0%	0%	100%	0%	25%	45%	30%	0%	0%	5%	40%	32%	8%	10%	5%	0%	0	35%	0%	10%	5%	20%		
WCL-756	48.5797	-58.9535	2023-07-24	1	Small	Riffle/Run	Fish habitat - based on connectivity	20	0%	100%	0%	0%	0%	0%	100%	0%	30%	35%	35%	0%	0%	0%	0%	0%	26%	53%	20%	0%	2	0%	0%	0%	0%	0%		
WCL-757	48.5795	-58.9528	2023-07-24	1	Small	Riffle/Run	Fish habitat - based on connectivity	21	0%	100%	0%	0%	0%	0%	100%	0%	30%	35%	35%	0%	0%	0%	40%	27%	20%	13%	0%	0	20%	5%	10%	0%	5%			
WCL-758	48.																																			

Table 4.2 Summary of Fish Habitat Characteristics for Watercourses Crossings Associated with Collector Lines for the Port au Port Wind Farm

HABITAT PROFILE DATA																																					
Site ID	Latitude	Longitude	Survey Date	Stream Order	Watercourse Size	Dominant Habitat Type	Fish Habitat Classification	Fish Habitat Profile Length (m)	HABITAT TYPE (%/100)					BANK STABILITY (%/100)			RIPARIAN VEGETATION (%/100)						SUBSTRATE (%/100)										OVERHEAD COVER (%/ survey area)				
									Rapid, Cascade, Step Pool	Riffle/Run	Flat/Glide	Pool/Impoundment	Pond	Unstable	Moderately Stable	Stable	Bare	Grass	Shrub	Tree	Wetland	Muck	Silt	Sand	Gravel	Cobble	Rubble	Boulder	Bedrock	Embeddedness Rank	Total Cover	Under-cut Bank	Grass	Tree Shrubs	Large Woody Debris		
WCL-768f	48.5845	-58.9880	2023-05-28	4	Medium	Riffle/Run	Fish habitat - based on connectivity	20	0%	100%	0%	0%	0%	0%	0%	100%	5%	10%	65%	20%	0%	0%	5%	10%	15%	21%	23%	10%	15%	0	5%	0%	0%	5%	0%		
WCL-769	48.5823	-58.9936	2023-06-27	1	Small	Riffle/Run	Fish habitat - based on connectivity	19	0%	100%	0%	0%	0%	0%	100%	0%	20%	30%	50%	0%	0%	0%	0%	33%	66%	0%	0%	0	65%	0%	0%	65%	0%	0%			
WCL-770	48.5808	-58.9966	2023-05-29	2	Small	Riffle/Run	Fish habitat - based on connectivity	20	0%	100%	0%	0%	0%	0%	100%	20%	10%	35%	35%	0%	0%	5%	5%	15%	23%	26%	15%	10%	0	10%	0%	0%	10%	0%			
WCL-771b	48.5817	-58.9913	2023-06-27	2	Small	Riffle/Run	Fish habitat - based on connectivity	47	51%	49%	0%	0%	0%	0%	100%	0%	22%	50%	28%	0%	0%	0%	0%	11%	26%	26%	36%	0%	0	10%	0%	3%	5%	3%			
WCL-772	48.5802	-58.9879	2023-06-27	2	Small	Riffle/Run	Fish habitat - based on connectivity	40	0%	100%	0%	0%	0%	0%	100%	0%	50%	33%	18%	0%	0%	0%	0%	26%	32%	21%	10%	10%	0	5%	0%	3%	3%	0%			
WCL-773	48.5772	-58.9840	2023-10-11	2	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCL-774a	48.5768	-58.9839	2023-10-11	2	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCL-774b	48.5755	-58.9827	2023-10-11	2	Small	No visible channel	No	0	Not Fish Habitat																												
WCL-776	48.5726	-58.9774	2023-06-27	1	Small	Riffle/Run	Fish habitat - based on connectivity	20	100%	0%	0%	0%	0%	0%	50%	50%	0%	40%	40%	20%	0%	0%	0%	60%	30%	3%	7%	0%	0%	1	45%	15%	15%	15%	0%		
WCL-778	48.5476	-58.9652	2023-10-13	na	Waterbody	Pond	Fish habitat - based on connectivity	122	0%	0%	0%	0%	100%	0%	0%	100%	0%	40%	10%	50%	0%	70%	0%	0%	3%	13%	13%	0%	0%	0	0%	0%	0%	0%	0%		
WCL-779	48.5451	-58.9660	2023-07-21	na	Waterbody	Pond	Fish habitat - based on connectivity	31	0%	0%	0%	0%	100%	0%	0%	100%	0%	70%	20%	10%	0%	95%	0%	0%	0%	0%	0%	5%	4	20%	0%	0%	20%	0%			
WCL-780	48.5376	-58.9620	2023-10-13	1	Small	No visible channel	No	0	Not Fish Habitat																												
WCL-781	48.5359	-58.9313	2023-05-31	1	Small	Riffle/Run	Fish habitat - based on connectivity	10	0%	0%	100%	0%	0%	0%	0%	100%	0%	30%	50%	20%	0%	5%	5%	5%	18%	31%	30%	5%	0%	0	15%	5%	5%	5%	0%		
WCL-783	48.5835	-58.8881	2023-05-24	2	Small	Riffle/Run	Fish habitat - based on connectivity	60	0%	100%	0%	0%	0%	0%	0%	100%	0%	10%	65%	25%	0%	0%	0%	3%	20%	26%	45%	5%	0	0%	0%	0%	0%	0%			
WCL-851	48.5514	-58.7831	2023-10-16	1	Small	Riffle/Run	Fish habitat - based on connectivity	22	0%	100%	0%	0%	0%	0%	0%	100%	0%	20%	80%	0%	0%	100%	0%	0%	0%	0%	0%	4	20%	0%	10%	0%	10%				
WCL-852	48.5751	-58.9824	2023-10-11	1	Small	No visible channel	No	0	Not Fish Habitat																												
WCL-854	48.5751	-58.9834	2023-10-11	0	Small	No visible channel	No	0	Not Fish Habitat																												
WCL-855	48.5830	-58.9782	2023-10-10	0	Small	No visible channel	No	0	Not Fish Habitat																												
WCL-856	48.5665	-59.0764	2023-10-11	na	Waterbody	Boghole	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCL-857	48.5653	-59.0773	2023-10-11	na	Waterbody	Boghole	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCL-858	48.5649	-59.0793	2023-10-11	na	Waterbody	Boghole	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCL-861	48.5518	-59.1366	2023-06-23	1	Small	Riffle/Run	Fish habitat - based on connectivity	20	0%	0%	100%	0%	0%	0%	0%	100%	0%	25%	30%	45%	0%	100%	0%	0%	0%	0%	0%	4	50%	0%	45%	0%	5%				
WCL-862	48.5536	-59.1428	2023-06-23	2	Small	Riffle/Run	Fish habitat - based on connectivity	23	0%	0%	100%	0%	0%	0%	0%	100%	0%	25%	45%	30%	0%	20%	10%	30%	27%	13%	0%	0%	3	30%	5%	15%	10%	0%			
WCL-863	48.5139	-59.1658	2023-10-12	na	Waterbody	Boghole	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCL-864	48.5134	-59.1667	2023-10-12	1	Small	Riffle/Run	Fish habitat - based on connectivity	19	0%	100%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	4	0%	0%	0%	0%	0%				
WCL-865	48.5070	-59.1707	2023-06-27	na	Waterbody	Boghole	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCL-866	48.5685	-59.1025	2023-10-10	2	Small	Riffle/Run	Fish habitat - based on connectivity	18	0%	100%	0%	0%	0%	0%	15%	85%	0%	20%	10%	70%	0%	0%	5%	5%	48%	30%	7%	5%	0%	0	10%	5%	0%	0%	5%		
WCL-867	48.6290	-59.0247	2023-06-24	2	Small	Riffle/Run	Fish habitat - based on connectivity	20	0%	100%	0%	0%	0%	0%	0%	100%	0%	10%	35%	55%	0%	0%	0%	5%	31%	43%	0%	20%	2	5%	0%	0%	5%	0%			
WCL-868	48.6286	-59.0255	2023-06-24	1	Small	Riffle/Run	Fish habitat - based on connectivity	20	0%	0%	100%	0%	0%	33%	33%	33%	0%	25%	40%	35%	0%	50%	50%	0%	0%	0%	0%	0	0%	0%	0%	0%	0%	0%			
WCL-869	48.5756	-59.1252	2023-10-12	1	Small	Riffle/Run	Fish habitat - based on connectivity	21	0%	100%	0%	0%	0%	0%	0%	100%	0%	70%	0%	30%	0%	0%	0%	5%	18%	33%	13%	5%	25%	0	10%	5%	0%	0%	5%		
WCL-870	48.5741	-59.1480	2023-10-15	1	Small	Riffle/Run	Fish habitat - based on connectivity	26	0%	100%	0%	0%	0%	0%	0%	100%	10%	10%	5%	75%	0%	10%	20%	40%	13%	10%	7%	0%	0%	0	0%	0%	0%	0%	5%		
WCL-894	48.6206	-59.0424	2023-09-22	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCL-895	48.5900	-59.1193	2023-09-22	0	Small	Riffle/Run	Fish habitat - based on connectivity	22	0%	100%	0%	0%	0%	0%	0%	100%	5%	20%	35%	40%	0%	5%	10%	20%	25%	20%	20%	0%	0%	1	25%	15%	5%	5%	0%		
WCL-896b	48.5476	-59.1116	2023-07-20	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCL-896c	48.5478	-59.1119	2023-07-20	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCL-896d	48.5470	-59.1108	2023-07-20	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCL-897a	48.5399	-59.1205	2023-07-20	0	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCL-897b	48.5394	-59.1200	2023-07-20	0	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCL-898	48.5334	-59.0875	2023-07-24	0	Small	No visible channel	No	0	Not Fish Habitat																												
WCL-899	48.5315	-59.0699	2023-10-11	0	Small	No visible channel	No	0	Not Fish Habitat																												
WCL-900	48.5387	-59.1040	45195	0	Small	No visible channel	No	0	Not Fish Habitat																												
WCL-901	48.5286	-59.1237	2023-10-12	0	Small	No visible channel	No	0	Not Fish Habitat																												
WCL-902a	48.5521	-59.0997	2023-09-18	0	Small	No visible channel	No	0	Not Fish Habitat																												
WCL-902b	48.5516	-59.0992	2023-09-18	0	Small	No visible channel	No	0	Not Fish Habitat																												
WCL-902c	48.5515	-59.0988	2023-09-18	0	Small	No visible channel	No	0	Not Fish Habitat																												
WCL-903a	48.5587	-59.0864	2023-09-25	0	Small	No visible channel	No	0	Not Fish Habitat																												
WCL-903b	48.5591	-59.0863	2023-09-25	1	Small	No visible channel	No	0	Not Fish Habitat																												
WCL-903c	48.5598	-59.0864	2023-09-25	1	Small	No visible channel	No	0	Not Fish Habitat																												
WCL-903d	48.5600	-59.0870	2023-09-25	0	Small	No visible channel	No	0	Not Fish Habitat																												
WCL-904a	48.5706	-59.0656	2023-10-11	0	Small	No visible channel	No	0	Not Fish Habitat																												
WCL-904b	48.5709	-59.0663	2023-10-11	0	Small	No visible channel	No	0	Not Fish Habitat																												
WCL-904c	48.5713	-59.0670	2023-10-11	0	Small	No visible channel	No	0	Not Fish Habitat																												
WCL-905a	48.5719	-59.0501	2023-07-25	1	Small	No visible channel	No	0	Not Fish Habitat																												
WCL-905b	48.5724	-59.0486	2023-07-25	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCL-905c	48.5729	-59.0465	2023-07-25	1	Small	No visible channel	No	0	Not Fish Habitat																												
WCL-905d	48.5728	-59.0462	2023-07-25	1	Small	Riffle/Run	Fish habitat - based on connectivity	28	0%	100%	0%	0%	0%	0%	0%	100%	0%	20%	45%	35%	0%	0%	30%	5%	7%	20%	33%	5%	0%	2	10%	0%	5%	5%	0%		
WCL-905e	48.5726	-59.0462	2023-07-25	1	Small	Riffle/Run	Fish habitat - based on connectivity	22	0%	100%	0%	0%	0%	0%	0%	100%	0%	50%	35%	15%	0%	10%	35%	0%	2%	20%	33%	0%	0%	0	20%	5%	0%	0%	15%		
WCL-905f	48.5724	-59.0462	2023-07-25	1	Small	Riffle/Run	Fish habitat - based on connectivity	20	0%	100%	0%	0%	0%	0%	10%	90%	0%	40%	40%	20%	0%	90%	0%	0%	3%	7%	0%	0%	4	5%	5%	0%	0%	0%			
WCL-905g	48.5724	-59.0456	2023-07-25	2	Small	Riffle/Run	Fish habitat - based on connectivity	24	0%	100%	0%	0%	0%	0%	0%	100%	0%	35%	35%	20%	10%	20%	80%	0%	0%	0%	0	15%	0%	0%	0%	15%	0%				
WCL-905h	48.5722	-59.0454	2023-07-25	2	Small	Riffle/Run	Fish habitat - based on connectivity	10	0%	100%	0%	0%	0%	0%	10%	90%	0%	25%	35%	35%	5%	10%	70%	0%	2%	7%	7%	0%	5%	3	20%	5%	5%	5%	5%		
WCL-905i	48.5727	-59.0476	2023-07-25	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																												
WCL-906	48.5831	-59.0185	2023-10-15	2	Small	Riffle/Run	Fish habitat - based on connectivity	20	0%	100%	0%	0%	0%	0%	0%	100%	0%	10%	60%	30%	0%	0%	0%	0%	8%	8%	3%	0%	80%	0	10%	5%	0%	5%	0%		
WCL-907a	48.6131	-58.9949	2023-07-27	0	Small	Riffle/Run	Fish habitat - based on connectivity	30	0%	100%	0%	0%	0%	0%	5%	95%	5%	15%	40%	40%	0%	5%	40%	30%	7%	8%	10%	0%	0%	3	70%	5%	5%	55%	5%		
WCL-907b	48.6130	-58.9945	2023-07-27	0	Small	Riffle/Run	Fish habitat - based on connectivity	22	0%	100%	0%	0%	0%	0%	0%	100%	5%	20%	55%	20%	0%	0%	10%	40%	20%	17%	13%	0%	0%	3	75%	5%	20%	45%	5%		
WCL-908	48.5364	-58.9465	2023-10-13	0	Small	No visible channel	No	0	Not Fish Habitat																												
WCL-909	48.5442	-58.9663	2023-10-13	0	Small	No visible channel	No	0	Not Fish Habitat																												

NOTE:

* Embeddedness is ranked as follows:

- 0 Non-embedded
- 1 Low <25% embedded
- 2 Medium 25-50% embedded
- 3 High 50-75% embedded
- 4 Very High >75% embedded

Table 4.3 Summary of Fish Habitat Characteristics for Watercourses Crossings Associated with Transmission Lines for the Port au Port Wind Farm

HABITAT PROFILE DATA																																				
Site ID	Latitude	Longitude	Survey Date	Stream Order	Watercourse Size	Dominant Habitat Type	Fish Habitat Classification	Fish Habitat Profile Length (m)	HABITAT TYPE (%/100)					BANK STABILITY (%/100)			RIPARIAN VEGETATION (%/100)					SUBSTRATE (%/100)							OVERHEAD COVER (%/ survey area)							
									Rapid, Cascade, Step Pool	Riffle/Run	Flat/Glide	Pool/Impoundment	Pond	Unstable	Moderately Stable	Stable	Bare	Grass	Shrub	Tree	Wetland	Muck	Silt	Sand	Gravel	Cobble	Rubble	Boulder	Bedrock	Embeddedness Rank	Total Cover	Undercut Bank	Grass	Tree Shrubs	Large Woody Debris	
WCT-500	48.58123	-59.00370	2023-05-29	3	Medium	Riffle/Run	Fish habitat - based on connectivity	20	0%	100%	0%	0%	0%	0%	0%	0%	100%	20%	10%	35%	35%	0%	0%	10%	20%	42%	25%	3%	0%	0%	0	5%	0%	0%	5%	0%
WCT-501a	48.58078	-58.99734	2023-05-29	4	Medium	Riffle/Run	Fish habitat - based on connectivity	20	0%	100%	0%	0%	0%	0%	0%	100%	10%	15%	40%	35%	0%	0%	0%	5%	27%	31%	36%	0%	0%	0	5%	0%	0%	5%	0%	
WCT-501b	48.58091	-58.99802	2023-05-29	4	Medium	Riffle/Run	Fish habitat - based on connectivity	20	100%	0%	0%	0%	0%	0%	0%	100%	15%	10%	45%	30%	0%	0%	0%	7%	7%	7%	75%	5%	0	0%	0%	0%	0%	0%	0%	
WCT-501c	48.58092	-58.99987	2023-05-29	4	Medium	Riffle/Run	Fish habitat - based on connectivity	20	0%	100%	0%	0%	0%	0%	0%	100%	5%	10%	35%	50%	0%	0%	0%	5%	7%	18%	30%	35%	5%	0	0%	0%	0%	0%	0%	
WCT-502	48.58083	-58.99662	2023-05-29	2	Small	Riffle/Run	Fish habitat - based on connectivity	20	0%	100%	0%	0%	0%	0%	0%	100%	20%	10%	35%	35%	0%	0%	5%	5%	15%	23%	26%	15%	10%	0	10%	0%	0%	10%	0%	
WCT-503	48.58052	-58.99205	2023-06-27	2	Small	Riffle/Run	Fish habitat - based on connectivity	22	0%	100%	0%	0%	0%	0%	0%	100%	0%	40%	40%	20%	0%	0%	0%	23%	40%	26%	10%	0%	0	20%	5%	5%	10%	0%		
WCT-504	48.57950	-58.98873	2023-06-27	2	Small	Riffle/Run	Fish habitat - based on connectivity	22	0%	100%	0%	0%	0%	0%	0%	100%	0%	40%	30%	30%	0%	0%	0%	17%	36%	26%	15%	5%	0	5%	5%	0%	0%	0%		
WCT-505	48.57509	-58.98340	2023-10-11	1	Small	No visible channel	No	0	Not Fish Habitat																											
WCT-506	48.57476	-58.98295	2023-10-11	1	Small	No visible channel	No	0	Not Fish Habitat																											
WCT-507	48.57599	-58.98350	2023-10-11	2	Small	No visible channel	No	0	Not Fish Habitat																											
WCT-508	48.54770	-58.96694	2023-10-13	na	Waterbody	Riffle/Run	Fish habitat - based on connectivity	17	0%	0%	100%	0%	0%	0%	0%	100%	0%	100%	0%	0%	0%	0%	10%	15%	43%	28%	3%	0%	0%	2	5%	0%	5%	0%	0%	
WCT-509	48.53719	-58.96233	2023-10-13	1	Small	No visible channel	No	0	Not Fish Habitat																											
WCT-510	48.53479	-58.93405	2023-05-31	1	Small	Riffle/Run	Fish habitat - based on connectivity	10	0%	100%	0%	0%	0%	0%	0%	100%	5%	20%	40%	35%	0%	35%	30%	5%	22%	5%	3%	0%	0%	2	30%	5%	5%	20%	0%	
WCT-511	48.53502	-58.93229	2023-05-31	1	Small	Riffle/Run	Fish habitat - based on connectivity	20	0%	100%	0%	0%	0%	0%	0%	100%	5%	30%	45%	20%	0%	0%	20%	5%	17%	28%	30%	0%	0%	1	20%	0%	5%	15%	0%	
WCT-513	48.55144	-58.78307	2023-10-16	1	Small	Riffle/Run	Fish habitat - based on connectivity	22	0%	100%	0%	0%	0%	0%	0%	100%	0%	20%	80%	0%	0%	100%	0%	0%	0%	0%	0%	4	20%	0%	10%	0%	10%	0%		
WCT-514	48.56829	-58.67272	2023-06-01	2	Small	Riffle/Run	Fish habitat - based on connectivity	20	100%	0%	0%	0%	0%	0%	0%	100%	5%	15%	35%	45%	0%	0%	0%	8%	15%	17%	25%	35%	0	10%	0%	0%	0%	10%		
WCT-515	48.56819	-58.67060	2023-06-01	2	Small	Riffle/Run	Fish habitat - based on connectivity	20	100%	0%	0%	0%	0%	0%	0%	100%	5%	10%	40%	45%	0%	0%	0%	8%	21%	30%	40%	0%	0	5%	0%	0%	5%	0%		
WCT-516	48.56720	-58.66551	2023-06-01	3	Medium	Riffle/Run	Fish habitat - based on connectivity	20	0%	100%	0%	0%	0%	0%	0%	100%	5%	10%	35%	50%	0%	5%	5%	15%	25%	30%	15%	0%	0	10%	0%	0%	10%	0%		
WCT-518	48.56179	-58.62229	2023-06-01	1	Small	Riffle/Run	Fish habitat - based on connectivity	20	0%	100%	0%	0%	0%	0%	0%	100%	5%	25%	60%	10%	0%	5%	5%	5%	25%	50%	5%	0%	0	65%	0%	5%	60%	0%		
WCT-519	48.56019	-58.60456	2023-06-01	3	Medium	Riffle/Run	Fish habitat - based on connectivity	20	0%	100%	0%	0%	0%	0%	0%	100%	0%	20%	70%	10%	0%	5%	5%	5%	43%	38%	3%	0%	0	5%	0%	0%	5%	0%		
WCT-520	48.56004	-58.60184	2023-06-01	2	Small	Riffle/Run	Fish habitat - based on connectivity	20	0%	100%	0%	0%	0%	0%	0%	100%	0%	20%	55%	25%	0%	15%	5%	5%	7%	25%	43%	0%	0%	1	35%	5%	10%	20%	0%	
WCT-521	48.56886	-58.58900	2023-09-21	4	Medium	Riffle/Run	Fish habitat - based on connectivity	50	0%	100%	0%	0%	0%	0%	0%	100%	0%	3%	85%	13%	0%	0%	0%	5%	23%	30%	26%	10%	5%	0	5%	0%	0%	5%	0%	
WCT-522	48.57037	-58.57539	2023-09-21	2	Small	Riffle/Run	Fish habitat - based on connectivity	24	0%	100%	0%	0%	0%	0%	0%	100%	0%	10%	10%	80%	0%	0%	0%	0%	22%	48%	30%	0%	0%	0	5%	0%	0%	5%	0%	
WCT-523	48.57030	-58.57292	2023-10-15	2	Small	Pond	Fish habitat - based on connectivity	16	0%	0%	0%	0%	100%	0%	0%	100%	0%	60%	20%	20%	0%	100%	0%	0%	0%	0%	0%	0%	4	10%	0%	0%	5%	5%		
WCT-524	48.57011	-58.57231	2023-10-15	2	Small	Riffle/Run	Fish habitat - based on connectivity	58	0%	100%	0%	0%	0%	0%	0%	100%	0%	50%	50%	0%	0%	0%	60%	0%	10%	23%	7%	0%	0	10%	0%	10%	0%	0%		
WCT-525	48.56962	-58.56948	2023-09-21	1	Small	No visible channel	No	0	Not Fish Habitat																											
WCT-526	48.56849	-58.56320	2023-07-22	3	Medium	Riffle/Run	Fish habitat - based on connectivity	23	0%	100%	0%	0%	0%	10%	35%	55%	0%	20%	60%	20%	0%	0%	0%	5%	8%	30%	46%	10%	0%	0	40%	10%	0%	25%	5%	
WCT-527	48.56927	-58.53816	2023-09-21	1	Small	Riffle/Run	Fish habitat - based on connectivity	34	0%	100%	0%	0%	0%	0%	0%	100%	0%	15%	40%	45%	0%	0%	5%	0%	5%	30%	59%	0%	0%	0	10%	0%	5%	5%	0%	
WCT-528a	48.56928	-58.53576	2023-09-21	2	Small	Riffle/Run	Fish habitat - based on connectivity	63	0%	100%	0%	0%	0%	0%	0%	100%	0%	50%	35%	15%	0%	30%	30%	0%	0%	13%	26%	0%	0%	3	50%	0%	25%	25%	0%	
WCT-528b	48.56928	-58.53576	2023-09-21	2	Small	Riffle/Run	Fish habitat - based on connectivity	63	0%	100%	0%	0%	0%	0%	0%	100%	0%	50%	35%	15%	0%	30%	30%	0%	0%	13%	26%	0%	0%	3	50%	0%	25%	25%	0%	
WCT-528c	48.56919	-58.53436	2023-09-21	2	Small	Riffle/Run	Fish habitat - based on connectivity	21	0%	100%	0%	0%	0%	0%	0%	100%	0%	60%	35%	5%	0%	0%	0%	33%	40%	26%	0%	0%	1	90%	0%	45%	45%	0%		
WCT-528d	48.56914	-58.53369	2023-09-21	2	Small	Riffle/Run	Fish habitat - based on connectivity	22	0%	100%	0%	0%	0%	0%	0%	100%	0%	45%	50%	5%	0%	5%	10%	15%	22%	23%	20%	5%	0%	1	25%	0%	10%	15%	0%	
WCT-529	48.56482	-58.52741	2023-10-15	1	Small	Riffle/Run	Fish habitat - based on connectivity	24	0%	100%	0%	0%	0%	0%	0%	100%	15%	10%	10%	65%	0%	10%	0%	10%	20%	0%	2%	3%	65%	0%	2	5%	0%	0%	0%	5%
WCT-530	48.56310	-58.52349	2023-10-15	1	Small	No visible channel	No	0	Not Fish Habitat																											
WCT-531	48.55868	-58.51250	2023-10-14	4	Medium	Riffle/Run	Fish habitat - based on connectivity	23	0%	100%	0%	0%	0%	0%	0%	100%	0%	50%	50%	0%	0%	0%	80%	20%	0%	0%	0%	0%	0%	0	10%	0%	5%	5%	0%	
WCT-532	48.55783	-58.51139	2023-10-14	2	Small	No visible channel	No	0	Not Fish Habitat																											
WCT-533	48.55648	-58.51069	2023-10-14	2	Small	No visible channel	No	0	Not Fish Habitat																											
WCT-534	48.55331	-58.50740	2023-10-14	na	Waterbody	Pond	Fish habitat - based on connectivity	224	0%	0%	0%	0%	100%	0%	0%	100%	0%	15%	30%	55%	0%	100%	0%	0%	0%	0%	0%	0%	4	0%	0%	0%	0%	0%		
WCT-535	48.54798	-58.50712	2023-10-14	na	Waterbody	Pond	Fish habitat - based on connectivity	103	0%	0%	0%	0%	100%	0%	0%	100%	0%	40%	40%	20%	0%	80%	0%	0%	7%	13%	0%	0%	0%	0	5%	0%	0%	5%	0%	
WCT-536	48.54755	-58.50908	2023-10-14	1	Small	Riffle/Run	Fish habitat - based on connectivity	18	0%	100%	0%	0%	0%	0%	0%	100%	0%	35%	55%	10%	0%	80%	0%	0%	3%	10%	7%	0%	0%	0	15%	0%	5%	10%	0%	
WCT-537	48.54701	-58.50993	2023-10-14	na	Waterbody	Pond	Fish habitat - based on connectivity	255	0%	0%	0%	0%	100%	0%	0%	100%	0%	50%	50%	0%	0%	90%	0%	0%	7%	3%	0%	0%	0%	4	0%	0%	0%	0%	0%	
WCT-538	48.54270	-58.51095	2023-10-14	na	Waterbody	Pond	Fish habitat - based on connectivity	19	0%	0%	0%	0%	100%	0%	0%	100%	0%	70%	20%	10%	0%	100%	0%	0%	0%	0%	0%	0%	4	0%	0%	0%	0%	0%		
WCT-539	48.53786	-58.51202	2023-10-13	2	Small	Riffle/Run	Fish habitat - based on connectivity	21	0%	100%	0%	0%	0%	0%	0%	100%	0%	45%	45%	10%	0%	60%	0%	0%	33%	7%	0%	0%	0	5%	0%	0%	5%	0%		
WCT-540	48.53600	-58.51035	2023-10-13	na	Waterbody	Pond	Fish habitat - based on connectivity	95	0%	0%	0%	0%	100%	0%	0%	100%	0%	30%	60%	10%	0%	100%	0%	0%	0%	0%	0%	0%	4	5%	0%	0%	5%	0%		
WCT-544	48.52720	-58.45582	2023-07-22	3	Medium	Riffle/Run	Fish habitat - based on connectivity	24	0%	100%	0%	0%	0%	15%	30%	55%	0%	25%	50%	25%	0%	0%	0%	20%	25%	20%	15%	0%	0	25%	5%	0%	15%	5%		
WCT-545	48.52640	-58.45310	2023-07-22	1	Small	Riffle/Run	Fish habitat - based on connectivity	27	0%	0%	100%	0%	0%	60%	20%	20%	0%	20%	40%	20%	20%	100%	0%	0%	0%	0%	0%	4	80%	15%	65%	0%	0%			
WCT-546	48.52600	-58.44773	2023-07-22	3	Medium	Riffle/Run	Fish habitat - based on connectivity	40	0%	100%	0%	0%	0%	5%	35%	60%	0%	15%	50%	35%	0%	20%	0%	0%	8%	17%	20%	0%	35%	0	50%	10%	10%	30%	0%	
WCT-627	48.54396	-58.96722	2023-10-13	0	Small	No visible channel	No	0	Not Fish Habitat																											
WCT-628	48.53573	-58.94544	2023-10-13	0	Small	No visible channel	No	0	Not Fish Habitat																											
WCT-629	48.56122	-58.76571	2023-10-16	1	Small	Riffle/Run	Fish habitat - based on connectivity	26	0%	100%	0%	0%	0%	0%	0%	100%	10%	30%	40%	20%	0%	0%	0%	5%	28%	25%	13%	29%	0%	3	5%	0%	0%	0%	0%	
WCT-630	48.55897	-58.75397	2023-10-16	1	Small	Riffle/Run	Fish habitat - based on connectivity	23	0%	100%	0%	0%	0%	0%	0%	100%	0%																			

Table 4.3 Summary of Fish Habitat Characteristics for Watercourses Crossings Associated with Transmission Lines for the Port au Port Wind Farm

HABITAT PROFILE DATA								TRANSECT DATA																							
Site ID	Latitude	Longitude	Survey Date	Stream Order	Watercourse Size	Dominant Habitat Type	Fish Habitat Classification	Fish Habitat Profile Length (m)	INSTREAM COVER (%/ survey area)					AQUATIC VEGETATION (%/100)						Width (m)		Wet Depth (m)					Bank Height (m)				
									Total Instream Cover	Large Woody Debris	Small Woody Debris	Boulders	Water Visibility	Aquatic Vegetation	Emergent	Floating Leafed	Free Floating	Sub-merged	Fila-mentous Algae	Macrophytic Algae	Wet Width	Channel Width	Average Wet Depth	25% from LB	50% from LB	75% from LB	Bankfull Max Depth (m)	Gradient (%)	Left Bank	Right Bank	
WCT-500	48.58123	-59.00370	2023-05-29	3	Medium	Riffle/Run	Fish habitat - based on connectivity	20	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1.54	5.81	0.15	0.09	0.08	0.54	0.78	0	0.68	20.00
WCT-501a	48.58078	-58.99734	2023-05-29	4	Medium	Riffle/Run	Fish habitat - based on connectivity	20	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12.20	13.30	0.20	0.10	0.18	0.30	0.78	1	0.77	0.60
WCT-501b	48.58091	-58.99802	2023-05-29	4	Medium	Riffle/Run	Fish habitat - based on connectivity	20	15%	0%	0%	0%	15%	0%	0%	0%	0%	0%	0%	0%	3.00	8.00	0.67	0.46	0.23	0.48	10.46	0	0.00	10.00	
WCT-501c	48.58092	-58.99987	2023-05-29	4	Medium	Riffle/Run	Fish habitat - based on connectivity	20	25%	0%	0%	20%	5%	0%	0%	0%	0%	0%	0%	0%	7.93	10.54	0.47	0.19	0.40	0.39	1.35	2	3.00	0.91	
WCT-502	48.58083	-58.99662	2023-05-29	2	Small	Riffle/Run	Fish habitat - based on connectivity	20	20%	5%	5%	5%	5%	0%	0%	0%	0%	0%	0%	0%	1.13	4.11	0.23	0.16	0.10	0.00	0.65	0	0.49	3.00	
WCT-503	48.58052	-58.99205	2023-06-27	2	Small	Riffle/Run	Fish habitat - based on connectivity	22	10%	5%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%	3.17	3.00	0.10	0.04	0.10	0.36	0.33	2	0.23	0.52	
WCT-504	48.57950	-58.98873	2023-06-27	2	Small	Riffle/Run	Fish habitat - based on connectivity	22	20%	5%	0%	0%	15%	0%	0%	0%	0%	0%	0%	0%	3.67	3.74	0.27	0.12	0.21	0.29	0.56	2	0.35	0.33	
WCT-505	48.57509	-58.98340	2023-10-11	1	Small	No visible channel	No	0	No Fish Habitat																						
WCT-506	48.57476	-58.98295	2023-10-11	1	Small	No visible channel	No	0	No Fish Habitat																						
WCT-507	48.57599	-58.98350	2023-10-11	2	Small	No visible channel	No	0	No Fish Habitat																						
WCT-508	48.54770	-58.96694	2023-10-13	na	Waterbody	Riffle/Run	Fish habitat - based on connectivity	17	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.87	0.72	0.23	0.14	0.12	0.00	0.30	1	0.16	0.15
WCT-509	48.53719	-58.96233	2023-10-13	1	Small	No visible channel	No	0	No Fish Habitat																						
WCT-510	48.53479	-58.93405	2023-05-31	1	Small	Riffle/Run	Fish habitat - based on connectivity	10	35%	0%	20%	0%	0%	15%	0%	0%	0%	10%	70%	20%	1.27	1.07	0.32	0.19	0.18	0.15	0.35	2	0.14	0.21	
WCT-511	48.53502	-58.93229	2023-05-31	1	Small	Riffle/Run	Fish habitat - based on connectivity	20	10%	0%	5%	0%	0%	5%	0%	0%	0%	0%	95%	5%	2.37	2.46	0.29	0.16	0.14	0.24	0.50	1	1.01	0.26	
WCT-513	48.55144	-58.78307	2023-10-16	1	Small	Riffle/Run	Fish habitat - based on connectivity	22	30%	0%	0%	0%	0%	30%	50%	0%	0%	50%	0%	0%	1.37	1.41	0.31	0.20	0.06	0.00	0.32	1	0.06	0.11	
WCT-514	48.56829	-58.67272	2023-06-01	2	Small	Riffle/Run	Fish habitat - based on connectivity	20	30%	5%	5%	10%	5%	5%	0%	0%	0%	0%	100%	0%	1.64	3.46	0.15	0.10	0.07	0.00	0.50	5	0.70	0.40	
WCT-515	48.56819	-58.67060	2023-06-01	2	Small	Riffle/Run	Fish habitat - based on connectivity	20	15%	0%	5%	0%	5%	5%	0%	0%	0%	0%	100%	0%	1.21	3.89	0.18	0.12	0.08	0.00	1.61	3	1.49	1.51	
WCT-516	48.56720	-58.66551	2023-06-01	3	Medium	Riffle/Run	Fish habitat - based on connectivity	20	35%	5%	10%	0%	10%	10%	0%	0%	0%	90%	0%	10%	2.83	6.48	0.38	0.21	0.14	0.51	0.64	2	0.28	0.50	
WCT-518	48.56179	-58.62229	2023-06-01	1	Small	Riffle/Run	Fish habitat - based on connectivity	20	5%	0%	0%	0%	0%	5%	100%	0%	0%	0%	0%	0%	1.05	1.09	0.16	0.08	0.10	0.00	0.26	1	0.12	0.14	
WCT-519	48.56019	-58.60456	2023-06-01	3	Medium	Riffle/Run	Fish habitat - based on connectivity	20	10%	0%	5%	0%	5%	0%	0%	0%	0%	0%	0%	4.46	4.92	0.21	0.15	0.12	0.42	0.69	1	0.54	39.00		
WCT-520	48.56004	-58.60184	2023-06-01	2	Small	Riffle/Run	Fish habitat - based on connectivity	20	25%	5%	5%	0%	5%	10%	25%	0%	0%	25%	25%	25%	1.15	1.01	0.40	0.24	0.22	0.13	0.47	1	0.22	0.50	
WCT-521	48.56886	-58.58900	2023-09-21	4	Medium	Riffle/Run	Fish habitat - based on connectivity	50	50%	0%	0%	5%	45%	0%	0%	0%	0%	0%	0%	10.41	16.98	0.58	0.39	0.24	0.55	0.94	3	0.83	0.55		
WCT-522	48.57037	-58.57539	2023-09-21	2	Small	Riffle/Run	Fish habitat - based on connectivity	24	5%	0%	5%	0%	0%	0%	0%	0%	0%	0%	0%	3.31	3.54	0.12	0.07	0.06	0.34	0.44	1	0.37	0.35		
WCT-523	48.57030	-58.57292	2023-10-15	2	Small	Pond	Fish habitat - based on connectivity	16	23%	0%	18%	0%	0%	5%	100%	0%	0%	0%	0%	0%	16.00	15.00	1.00	1.00	0.00	0.00	1.15	1	0.15	0.15	
WCT-524	48.57011	-58.57231	2023-10-15	2	Small	Riffle/Run	Fish habitat - based on connectivity	58	30%	0%	0%	0%	0%	30%	100%	0%	0%	0%	0%	0%	2.00	1.00	0.34	0.21	0.12	0.14	0.36	1	0.08	0.11	
WCT-525	48.56962	-58.56948	2023-09-21	1	Small	No visible channel	No	0	No Fish Habitat																						
WCT-526	48.56849	-58.56320	2023-07-22	3	Medium	Riffle/Run	Fish habitat - based on connectivity	23	15%	0%	0%	5%	0%	10%	50%	0%	0%	0%	50%	0%	3.76	4.13	0.39	0.20	0.24	0.00	0.82	2	0.64	0.50	
WCT-527	48.56927	-58.53816	2023-09-21	1	Small	Riffle/Run	Fish habitat - based on connectivity	34	10%	0%	0%	0%	0%	10%	54%	0%	0%	0%	0%	46%	0.64	0.65	0.21	0.13	0.10	0.08	0.19	1	0.16	0.05	
WCT-528a	48.56928	-58.53576	2023-09-21	2	Small	Riffle/Run	Fish habitat - based on connectivity	63	25%	0%	0%	0%	0%	25%	70%	0%	0%	30%	0%	0%	1.62	1.39	0.72	0.41	0.38	0.18	0.73	1	0.25	0.17	
WCT-528b	48.56928	-58.53576	2023-09-21	2	Small	Riffle/Run	Fish habitat - based on connectivity	63	25%	0%	0%	0%	0%	25%	70%	0%	0%	30%	0%	0%	1.62	1.39	0.72	0.41	0.38	0.18	0.73	1	0.25	0.17	
WCT-528c	48.56919	-58.53436	2023-09-21	2	Small	Riffle/Run	Fish habitat - based on connectivity	21	25%	0%	0%	0%	0%	25%	100%	0%	0%	0%	0%	0%	0.97	1.01	0.83	0.49	0.48	0.00	0.64	1	0.18	0.09	
WCT-528d	48.56914	-58.53369	2023-09-21	2	Small	Riffle/Run	Fish habitat - based on connectivity	22	20%	0%	10%	0%	0%	10%	0%	0%	0%	0%	50%	50%	1.90	2.01	0.38	0.24	0.14	0.21	0.60	1	0.32	0.33	
WCT-529	48.56482	-58.52741	2023-10-15	1	Small	Riffle/Run	Fish habitat - based on connectivity	24	35%	0%	5%	10%	0%	20%	0%	0%	0%	0%	0%	1.62	1.55	0.29	0.17	0.18	0.00	0.39	4	0.21	0.39		
WCT-530	48.56310	-58.52349	2023-10-15	1	Small	No visible channel	No	0	No Fish Habitat																						
WCT-531	48.55868	-58.51250	2023-10-14	4	Medium	Riffle/Run	Fish habitat - based on connectivity	23	10%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8.00	8.50	0.00	0.00	0.00	0.00	0.00	1	0.45	0.45		
WCT-532	48.55783	-58.51139	2023-10-14	2	Small	No visible channel	No	0	No Fish Habitat																						
WCT-533	48.55648	-58.51069	2023-10-14	2	Small	No visible channel	No	0	No Fish Habitat																						
WCT-534	48.55331	-58.50740	2023-10-14	na	Waterbody	Pond	Fish habitat - based on connectivity	224	25%	0%	20%	0%	0%	5%	100%	0%	0%	0%	0%	0%	224.00	130.00	0.00	0.00	0.00	0.00	0.00	1	0.15	0.15	
WCT-535	48.54798	-58.50712	2023-10-14	na	Waterbody	Pond	Fish habitat - based on connectivity	103	26%	0%	21%	0%	0%	5%	100%	0%	0%	0%	0%	0%	103.00	65.00	0.00	0.00	0.00	0.00	0.00	1	0.10	0.00	
WCT-536	48.54755	-58.50908	2023-10-14	1	Small	Riffle/Run	Fish habitat - based on connectivity	18	30%	0%	0%	0%	0%	30%	100%	0%	0%	0%	0%	0%	2.50	3.50	0.84	0.49	0.49	0.00	0.77	1	0.21	0.31	
WCT-537	48.54701	-58.50993	2023-10-14	na	Waterbody	Pond	Fish habitat - based on connectivity	255	37%	10%	22%	0%	0%	5%	100%	0%	0%	0%	0%	0%	255.00	85.00	1.33	1.00	1.00	0.00	1.50	1	0.50	0.50	
WCT-538	48.54270	-58.51095	2023-10-14	na	Waterbody	Pond	Fish habitat - based on connectivity	19	23%	0%	23%	0%	0%	0%	0%	0%	0%	0%	0%	0%	19.00	30.00	0.00	0.00	0.00	0.00	0.00	1	0.20	0.20	
WCT-539	48.53786	-58.51202	2023-10-13	2	Small	Riffle/Run	Fish habitat - based on connectivity	21	40%	0%	0%	0%	0%	40%	0%	0%	0%	100%	0%	0%	2.25	2.60	0.49	0.20	0.39	0.25	1.00	1	0.67	0.52	
WCT-540	48.53600	-58.51035	2023-10-13	na	Waterbody	Pond	Fish habitat - based on connectivity	95	10%	0%	0%	0%	0%	10%	100%	0%	0%	0%	0%	0%	60.00	70.00	1.33	1.00	1.00	0.00	2.00	1	1.00	1.00	
WCT-544	48.52720	-58.45582	2023-07-22	3	Medium	Riffle/Run	Fish habitat - based on connectivity	24	15%	5%	0%	5%	5%	0%	0%	0%	0%	0%	0%	3.82	3.81	0.43	0.25	0.26	0.00	0.50	1	0.30	0.23		
WCT-545	48.52640	-58.45310	2023-07-22	1	Small	Riffle/Run	Fish habitat - based on connectivity	27	50%	0%	0%	0%	0%	50%	100%	0%	0%	0%	0%	0%	0.68	0.75	0.64	0.45	0.18	0.00	0.45	0	0.00	0.00	
WCT-546	48.52600	-58.44773	2023-07-22	3	Medium	Riffle/Run	Fish habitat - based on connectivity	40	10%	0%	0%	0%	0%	10%	100%	0%	0%	0%	0%	0%	1.86	1.90	0.62	0.34	0.35	0.00	0.56	0	0.06	0.14	
WCT-627	48.54396	-58.96722	2023-10-13	0	Small	No visible channel	No	0	No Fish Habitat																						
WCT-628	48.53573	-58.94544	2023-10-13	0	Small	No visible channel	No	0	No Fish Habitat																						
WCT-629	48.56122	-58.76571	2023-10-16	1	Small	Riffle/Run	Fish habitat - based on connectivity	26	15%	0%	0%	5%	0%	10%	0%	0%	0%	0%	100%	0%	0.95	1.58	0.13	0.07	0.12	0.00	0.56	4	0.44	0.47	
WCT-630	48.55897	-58.75397	2023-10-16	1	Small	Riffle/Run	Fish habitat - based on connectivity	23	35%	5%	0%	0%	0%	30%	0%	0%	0%	0%	100%	2.10	2.32	0.16	0.13	0.05	0.80	0.25	2	0.14	0.12		
WCT-631	48.55986	-58.74514	2023-10-16	1	Small	Riffle/Run	Fish habitat - based on connectivity	21	10%	5%	5%	0%	0%	0%	0%	0%	0%	0%	0%	1.25	1.30	0.28	0.17	0.09	0.00	0.47	3	0.23	0.37		
WCT-632	48.																														

4.1.3 Hydrogen / Ammonia Facility, Substations, and Turbine Footprints

Two of the three watercourses (WCS-407 and WCS-409) at the hydrogen / ammonia facility site were identified as fish habitat and small first order streams, while the third (WCS-408) was a stagnant pool with no connectivity and was not considered a watercourse. The surveyed portions of WCS-407 and WCS-409 had average wetted widths ranging from 1.5 to 3.2 m and channel widths from 4.0 -9.0 m. Depths ranged from 0.07 to 0.26 m. The banks were mostly stable with riparian vegetation predominately consisting of grass (42%) and shrubs (32%). The dominant substrate was muck (38%).

Two of the three watercourses within the substation site were classified as fish habitat, both of which were classified as small watercourses. Small watercourses identified as fish habitat were generally narrow (less than 5 m) runs or riffles and had average wetted and channel widths of 2.4 and 4.9 m, respectively. Average water depth was 0.21 m. Substrates were dominated by bedrock (33%) and boulders (23%) with bare banks (40%) and riparian vegetation dominated by trees (33%) and shrubs (26%; Table 4.4). The remaining stream crossing was an overland drainage channel.

Four of the 14 watercourses within the turbine footprints were classified as fish habitat. Eight of the remaining watercourses were considered overland drainage channels and two were considered no visible channel (i.e., no watercourse was present).

Warm Creek (WCS-410) is a mapped fourth order stream that is located to the west of the hydrogen / ammonia facility and flows southwest into the Atlantic Ocean. While it is not within the Project footprint, Warm Creek may be affected by water taking from Noels Pond to supply the hydrogen / ammonia facility. The surveyed portion of Warm Creek is the downstream 4,333 m, which is the reach between Noel's Pond and the outlet to the ocean. The downstream portion of the stream is tidally influenced while the other surveyed sections are freshwater and dominated by riffles and runs. Warm Creek had average wetted and channel widths of 12.1 and 15.6 m, respectively. The average depth was 0.41 m and depths ranged from 0.1 to 1.4 m. The banks were mostly stable with riparian vegetation predominately consisting of shrubs (44%) and grasses (29%). Dominant substrate consisted of rubble (24%) and boulder (24%). The surveyed portion of WCS-410 includes four bridge crossings and a beaver impoundment approximately 3,300 m upstream from the outlet. There is a remnant concrete dam at the outlet of Noel's Pond (Photo 40, Appendix B.3).

A summary of habitat attributes for watercourse crossings associated with the proposed turbines and substations for the Port au Port Wind Farm and hydrogen / ammonia facility is provided in Table 4.4.



Table 4.4 Summary of Fish Habitat Characteristics for Watercourses Associated with Turbines and Substations for the Port au Port Wind Farm and the Hydrogen / Ammonia Plant

HABITAT PROFILE DATA																																										
Site ID	Latitude	Longitude	Survey Date	Stream Order	Watercourse Size	Dominant Habitat Type	Fish Habitat Classification	Fish Habitat Profile Length (m)	HABITAT TYPE (%/100)					BANK STABILITY (%/100)			RIPARIAN VEGETATION (%/100)					SUBSTRATE (%/100)							OVERHEAD COVER (%/ survey area)					INSTREAM COVER (%/ survey area)								
									Rapid, Cascade, Step Pool	Riffle/Run	Flat/Glide	Pool/Impoundment	Pond	Unstable	Moderately Stable	Stable	Bare	Grass	Shrub	Tree	Wetland	Muck	Silt	Sand	Gravel	Cobble	Rubble	Boulder	Bedrock	Embeddedness Rank	Total Cover	Undercut Bank	Grass	Tree Shrubs	Large Woody Debris	Total Instream Cover	Large Woody Debris	Small Woody Debris	Boulders	Water Visibility	Aquatic Vegetation	
WCS-400	48.58418	-59.01146	2023-05-30	2	Small	Riffle/Run	Fish habitat - based on connectivity	20	0%	100%	0%	0%	0%	0%	0%	0%	100%	5%	15%	40%	40%	0%	0%	0%	0%	0%	7%	5%	3%	20%	65%	0	5%	0%	0%	5%	0%	15%	5%	0%	5%	5%
WCS-401	48.58404	-59.01054	2023-05-30	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																																	
WCS-407	48.52791	-58.52243	2023-09-23	3	Medium	Riffle/Run	Fish habitat - based on connectivity	90	0%	100%	0%	0%	0%	0%	50%	50%	40%	35%	25%	0%	0%	0%	10%	20%	37%	26%	7%	0%	0%	0	5%	5%	0%	0%	0%	25%	0%	0%	0%	0%	25%	
WCS-408	48.52442	-58.52127	2023-09-23	1	Small	Pool	Fish habitat - based on connectivity	44	0%	0%	0%	100%	0%	0%	0%	100%	5%	75%	20%	0%	0%	60%	20%	0%	0%	0%	2	10%	0%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
WCS-409	48.52799	-58.51124	2023-09-23	1	Small	Riffle/Run	Fish habitat - based on connectivity	1253	0%	84%	0%	16%	0%	12%	21%	67%	9%	19%	56%	11%	4%	17%	9%	10%	22%	21%	14%	3%	4%	2	59%	1%	10%	35%	13%	14%	1%	0%	2%	0%	11%	
WCS-410	48.54963	-58.56805	2023-07-18	4	Medium	Riffle/Run	Fish habitat - based on connectivity	4333	0%	100%	0%	0%	0%	11%	19%	70%	15%	29%	44%	12%	1%	13%	1%	4%	12%	21%	24%	24%	0%	1	8%	0%	4%	3%	0%	7%	0%	1%	0%	6%		
WCF-1000	48.59403	-58.97797	2023-06-29	1	Small	Drainage Channel	Unlikely - based on no connectivity	120	0%	100%	0%	0%	0%	0%	0%	100%	4%	17%	37%	43%	0%	6%	6%	21%	30%	24%	13%	0%	0%	1	7%	6%	1%	0%	0%	10%	0%	4%	0%	6%		
WCF-1001	48.58634	-58.96788	2023-06-28	1	Small	Drainage Channel	Unlikely - based on no connectivity	157	0%	100%	0%	0%	0%	0%	0%	100%	0%	46%	42%	12%	0%	100%	0%	0%	0%	0%	4	39%	0%	17%	22%	0%	29%	0%	0%	0%	0%	0%	29%			
WCF-1002	48.58301	-58.97262	2023-06-28	1	Small	Riffle/Run	Fish habitat - confirmed fish present	205	0%	100%	0%	0%	0%	0%	0%	100%	6%	30%	48%	16%	0%	0%	5%	5%	27%	36%	26%	0%	0%	1	12%	4%	0%	8%	0%	16%	0%	8%	0%	8%		
WCF-1003	48.58078	-58.94772	2023-07-24	2	Small	Riffle/Run	Fish habitat - based on connectivity	200	0%	100%	0%	0%	0%	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		
WCF-1004	48.58447	-58.94497	2023-09-19	1	Small	Riffle/Run	Fish habitat - confirmed fish present	104	0%	51%	0%	49%	0%	0%	0%	100%	0%	15%	42%	43%	0%	7%	12%	20%	21%	19%	15%	5%	0%	1	25%	7%	0%	12%	5%	10%	0%	10%	0%			
WCF-1005	48.54616	-58.89293	2023-06-28	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																																	
WCF-1006	48.60146	-59.07421	2023-06-23	1	Small	No visible channel	No	0	Not Fish Habitat																																	
WCF-1007	48.59354	-59.07167	2023-06-26	1	Small	Riffle/Run	Fish habitat - based on connectivity	107	0%	100%	0%	0%	0%	0%	16%	84%	0%	43%	35%	21%	0%	58%	13%	13%	8%	5%	3%	0%	0%	3	46%	5%	21%	20%	0%	16%	0%	0%	0%	16%		
WCF-1008	48.58688	-59.07800	2023-06-26	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																																	
WCF-1009	48.60966	-59.08767	2023-06-29	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																																	
WCF-1010	48.59848	-59.10243	2023-07-26	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																																	
WCF-1011	48.57055	-59.13521	2023-06-29	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																																	
WCF-1031	48.55680	-59.09663	2023-06-29	0	Small	No visible channel	No	0	Not Fish Habitat																																	
WCF-1032	48.53872	-58.94618	2023-08-18	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	Not Fish Habitat																																	

NOTE:
 * Embeddedness is ranked as follows:
 0 Non-embedded
 1 Low <25% embedded
 2 Medium 25-50% embedded
 3 High 50-75% embedded
 4 Very High >75% embedded

Table 4.4 Summary of Fish Habitat Characteristics for Watercourses Associated with Turbines and Substations for the Port au Port Wind Farm and the Hydrogen / Ammonia Plant

HABITAT PROFILE DATA								TRANSECT DATA																
Site ID	Latitude	Longitude	Survey Date	Stream Order	Watercourse Size	Dominant Habitat Type	Fish Habitat Classification	Fish Habitat Profile Length (m)	AQUATIC VEGETATION (%/100)						Width (m)		Wet Depth (m)					Gradient (%)	Bank Height (m)	
									Emergent	Floating Leafed	Free Floating	Sub-merged	Fila-mentous Algae	Macrophytic Algae	Wet Width	Channel Width	Average Wet Depth	25% from LB	50% from LB	75% from LB	Bankfull Max Depth (m)		Left Bank	Right Bank
WCS-400	48.58418	-59.01146	2023-05-30	2	Small	Riffle/Run	Fish habitat - based on connectivity	20	0%	0%	0%	50%	0%	50%	1.77	2.83	0.21	0.12	0.12	0.27	0.51	3	0.38	0.37
WCS-401	48.58404	-59.01054	2023-05-30	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	No Fish Habitat															
WCS-407	48.52791	-58.52243	2023-09-23	3	Medium	Riffle/Run	Fish habitat - based on connectivity	90	0%	0%	0%	0%	100%	0%	2.61	7.37	0.16	0.06	0.15	0.07	0.57	2	0.42	0.43
WCS-408	48.52442	-58.52127	2023-09-23	1	Small	Pool	Fish habitat - based on connectivity	44	0%	0%	0%	0%	0%	0%	3.58	4.00	0.36	0.22	0.17	0.00	0.33	1	0.07	0.08
WCS-409	48.52799	-58.51124	2023-09-23	1	Small	Riffle/Run	Fish habitat - based on connectivity	1253	38%	0%	0%	0%	0%	62%	1.55	5.43	0.13	0.08	0.05	0.00	1.11	0	1.05	1.57
WCS-410	48.54963	-58.56805	2023-07-18	4	Medium	Riffle/Run	Fish habitat - based on connectivity	4333	74%	0%	0%	5%	10%	11%	12.07	15.06	0.57	0.31	0.38	0.57	1.60	0	1.59	1.50
WCF-1000	48.59403	-58.97797	2023-06-29	1	Small	Drainage Channel	Unlikely - based on no connectivity	120	8%	0%	0%	0%	92%	0%	0.65	0.69	0.11	0.07	0.06	0.00	0.27	1	0.20	0.55
WCF-1001	48.58634	-58.96788	2023-06-28	1	Small	Drainage Channel	Unlikely - based on no connectivity	157	68%	0%	0%	16%	16%	0%	0.57	0.65	0.40	0.25	0.22	0.00	0.45	1	0.27	0.19
WCF-1002	48.58301	-58.97262	2023-06-28	1	Small	Riffle/Run	Fish habitat - confirmed fish present	205	0%	0%	0%	0%	100%	0%	1.05	1.01	0.15	0.09	0.09	0.00	0.31	2	0.30	0.21
WCF-1003	48.58078	-58.94772	2023-07-24	2	Small	Not assessed	Fish habitat - based on connectivity	200	0%	0%	0%	0%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00
WCF-1004	48.58447	-58.94497	2023-09-19	1	Small	Riffle/Run	Fish habitat - confirmed fish present	104	0%	0%	0%	0%	0%	0%	1.43	2.07	0.20	0.11	0.10	0.00	0.64	3	0.52	0.55
WCF-1005	48.54616	-58.89293	2023-06-28	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	No Fish Habitat															
WCF-1006	48.60146	-59.07421	2023-06-23	1	Small	No visible channel	No	0	No Fish Habitat															
WCF-1007	48.59354	-59.07167	2023-06-26	1	Small	Riffle/Run	Fish habitat - based on connectivity	107	100%	0%	0%	0%	0%	0%	1.08	1.45	0.35	0.21	0.19	0.02	0.34	2	0.10	0.24
WCF-1008	48.58688	-59.07800	2023-06-26	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	No Fish Habitat															
WCF-1009	48.60966	-59.08767	2023-06-29	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	No Fish Habitat															
WCF-1010	48.59848	-59.10243	2023-07-26	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	No Fish Habitat															
WCF-1011	48.57055	-59.13521	2023-06-29	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	No Fish Habitat															
WCF-1031	48.55680	-59.09663	2023-06-29	0	Small	No visible channel	No	0	No Fish Habitat															
WCF-1032	48.53872	-58.94618	2023-08-18	1	Small	Drainage Channel	Unlikely - based on no connectivity	0	No Fish Habitat															

NOTE:

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- 0 Non-embedded
- 1 Low <25% embedded
- 2 Medium 25-50% embedded
- 3 High 50-75% embedded
- 4 Very High >75% embedded

4.1.4 In Situ Water Quality

Water temperatures at the time of the surveys ranged between 6.1°C and 24.1°C, with a mean temperature of 12.7°C. The majority of sites (221 out of 235) were acceptable for the 19°C threshold required for coldwater fish species such as brook trout and Atlantic salmon. Conductivity ranged from 10.3 µS/cm to 356.6 µS/cm (Appendix C, Table C.2). Dissolved oxygen concentrations ranged from 1.6 mg/L to 9.9 mg/L (15.1 to 99.6% saturation), with 42% of locations sampled above the Canadian Water Quality Guidelines for the Protection of Aquatic Life (CWQG PAL) minimum recommended value of 6.5 mg/L. A higher dissolved oxygen concentration is recommended for early aquatic life stages (i.e. eggs, larvae fry) and 8% of the locations sampled were above the recommended minimum dissolved oxygen concentration of 9.5 mg/L for early life stages (CCME 1999). The pH ranged from 4.4 to 8.5 and was within the CWQG PAL recommended value of 6.5 to 9.5 at 79% of sites.

In situ water quality measurements are included in Appendix C, Table C.2.

4.2 Fish Communities

Seventy-one proposed access road crossings, collector and transmission line crossings were sampled to confirm the presence or absence of fish (i.e., determine fish habitat) and determine the fish species present within the fish community within representative watersheds. The results of these surveys are provided below.

4.2.1 Fish Sampling

Fish sampling using an electrofisher or minnow traps was completed at 35 proposed access road crossings and substation and turbine footprints to confirm the presence or absence of fish (i.e., determine if these areas represent fish habitat) and to determine the species present within the fish community.

4.2.1.1 Streams

Fish were caught at 19 of 34 stream crossings that were electrofished. A total of 230 fish consisting of four different species were collected from the 19 streams (Table 4.2). Overall, fish species diversity was low as a result species richness was also low ranging from one to three. Brook trout (*Salvelinus fontinalis*; Photo 1) were the most abundant fish species representing 98% of the total catch and were caught at 17 of 19 sites. American eels (*Anguilla rostrata*; Photo 2) were captured at three streams, and Atlantic salmon (*Salmo salar*; Photo 3) were captured at two streams. One threespine stickleback (*Gasterosteus aculeatus*; Photo 4) was caught.



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The distribution of fish species in the watersheds associated with the Port au Port Wind Farm is provided in Figure 4.1. Brook trout were captured within all of the watersheds sampled (where fish were successfully captured). American eel were only observed in Mainland Brook and an unnamed tributary to the Atlantic Ocean near Harry Brook. American eel is considered a SAR/SOCC and is listed as “Threatened” under COSEWIC and Vulnerable under the NL ESA (COSEWIC 2012). Atlantic salmon were observed in Harry Brook and South Brook. Fishing effort and biological information is provided in Appendix D.

Table 4.5 Total Number of Fish Captured by Watercourse Crossing for Fish Surveys, 2023

Sites	American eel	Atlantic salmon	Brook trout	Threespine Stickleback	Total
WCA-010	0	0	28	0	28
WCA-021	0	0	0	0	0
WCA-025	0	0	21	0	21
WCA-030b	0	0	5	0	5
WCA-031	0	0	10	0	10
WCA-051a	0	0	14	0	14
WCA-058	5	0	0	0	5
WCA-059a	0	0	0	0	0
WCA-059b	4	0	0	0	4
WCA-062 / WCF- 1007	1	0	2	0	3
WCA-064	0	0	0	0	0
WCA-067	0	0	0	0	0
WCA-069a	0	0	0	0	0
WCA-071b	0	0	40	0	40
WCA-073b / WCF-1001	Electrofishing not possible due to low flow conditions.				
WCA-099	0	3	29	0	32
WCA-110	0	0	0	0	0
WCA-111a	0	0	4	0	4
WCA-113	0	2	1	1	4
WCA-115	0	0	2	0	2
WCA-127	0	0	1	0	1
WCA-130	0	0	29	0	29
WCA-133	0	0	13	0	13
WCA-142	0	0	0	0	0
WCA-146 / WCL-905	0	0	0	0	0
WCA-147	0	0	0	0	0
WCA-150	0	0	2	0	2
WCA-151	0	0	0	0	0



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Table 4.5 Total Number of Fish Captured by Watercourse Crossing for Fish Surveys, 2023

Sites	American eel	Atlantic salmon	Brook trout	Threespine Stickleback	Total
WCF-1000	0	0	0	0	0
WCF-1002	0	0	12	0	12
WCF-1003	Electrofishing not possible due to low flow conditions.				
WCF-1004	0	0	1	0	1
WCF-1005	Electrofishing not possible due to low flow conditions.				
WCF-1006	Electrofishing not possible due to low flow conditions.				
WCF-1008	Electrofishing not possible due to low flow conditions.				
WCF-1009	Electrofishing not possible due to low flow conditions.				
WCF-1010	Electrofishing not possible due to low flow conditions.				
WCF-1011	0	0	0	0	0
WCF-1031	Electrofishing not possible due to low flow conditions.				
WCS-400	0	0	0	0	0
Total	10	5	214	1	230



Photo 1 Representative Photo of Brook Trout



Photo 2 Representative Photo of American eel



Photo 3 Representative Photo of Atlantic salmon



Photo 4 Representative Photo of Threespine stickleback



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The catch per unit effort (CPUE) at sites where fish were caught ranged from 1 to 8 fish per 100 seconds (Table 4.6). The number of each species caught, the minimum, maximum, and average fork length are presented in Table 4.6. The size range of brook trout captured (4.2 - 20.4 cm) indicated that young of the year (YOY), juvenile and adult life stages were present within watercourses crossed by the Project. The size range of Atlantic salmon captured (9.2 - 11.5 cm) were considered parr (juvenile life stage). The size range of American eel captured (11.0 - 34.0 cm) infers that juvenile eels are also present in watercourses crossed by the Project. The threespine stickleback captured was likely the adult life stage.

4.2.1.2 Bogholes

Two waterbodies (i.e., WCA-024, WCA-124) were sampled using minnow traps, which were left in-place for a minimum of 20 hours (survey effort 20 to 93 hours). No fish were caught at either location. These waterbodies had no connectivity with adjacent watercourses and were determined to be fishless therefore these waterbodies are not considered fish habitat (i.e., bog holes).



Table 4.6

Summary of Fish Sampling for Stream Crossings 2023, WEGH2 Aquatic Baseline

Location	Effort	American Eel				Atlantic salmon				Brook Trout				Threespine Stickleback				All Species Count	All Species CPUE (#fish/100 seconds)
		Fork Length (mm)				Fork Length (mm)				Fork Length (mm)				Fork Length (mm)					
		Count	Minimum	Average	Maximum	Count	Minimum	Average	Maximum	Count	Minimum	Average	Maximum	Count	Minimum	Average	Maximum		
WCA-010	506	0	-	-	-	0	-	-	-	28	73	100	179	0	-	-	-	28	6
WCA-021	503	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0	0
WCA-025	532	0	-	-	-	0	-	-	-	21	62	81	155	0	-	-	-	21	4
WCA-030b	508	0	-	-	-	0	-	-	-	5	72	94	138	0	-	-	-	5	1
WCA-031	536	0	-	-	-	0	-	-	-	10	67	87	118	0	-	-	-	10	2
WCA-051a	521	0	-	-	-	0	-	-	-	14	47	107	134	0	-	-	-	14	3
WCA-058	653	5	110	236	330	0	-	-	-	0	-	-	-	0	-	-	-	5	1
WCA-059a	524	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0	0
WCA-059b	528	4	171	181	340	0	-	-	-	0	-	-	-	0	-	-	-	4	1
WCA-062 /WCF-1007	525	1	185	185	185	0	-	-	-	2	82	86	89	0	-	-	-	3	1
WCA-064	513	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0	0
WCA-067	503	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0	0
WCA-069a	508	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0	0
WCA-071b	508	0	-	-	-	0	-	-	-	40	42	79	170	0	-	-	-	40	8
WCA-073b/WCF-1001	505	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0	0
WCA-077/WCF-1004	503	0	-	-	-	0	-	-	-	1	168	168	168	0	-	-	-	1	0
WCA-099	na	0	-	-	-	3	92	103	112	29	44	65	143	0	-	-	-	32	-
WCA-110	500	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0	0
WCA-111a	508	0	-	-	-	0	-	-	-	4	77	95	123	0	-	-	-	4	1
WCA-113	524	0	-	-	-	2	109	112	115	1	164	164	164	1	63	63	63	4	1
WCA-115	515	0	-	-	-	0	-	-	-	2	83	98	113	0	-	-	-	2	0
WCA-127	511	0	-	-	-	0	-	-	-	1	141	141	141	0	-	-	-	1	0
WCA-130	507	0	-	-	-	0	-	-	-	29	57	98	148	0	-	-	-	29	6
WCA-133	509	0	-	-	-	0	-	-	-	13	47	97	158	0	-	-	-	13	3
WCA-142	501	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0	0
WCA-146/WCL-905	503	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0	0
WCA-147	510	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0	0
WCA-150	518	0	-	-	-	0	-	-	-	2	52	90	127	0	-	-	-	2	0
WCA-151	532	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0	0
WCF-1000	534	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0	0
WCF-1002	513	0	-	-	-	0	-	-	-	12	45	103	204	0	-	-	-	12	2
WCF-1003		No fish sampling conducted.																	
WCF-1004	na	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0	-
WCF-1005		No fish sampling conducted as intermittent ephemeral channel with no connectivity. Not fish habitat																	
WCF-1006		No fish sampling conducted as no visible channel. Not fish habitat.																	
WCF-1008		No fish sampling conducted as intermittent ephemeral channel with no connectivity. Not fish habitat																	
WCF-1009		No fish sampling conducted as intermittent ephemeral channel with no connectivity. Not fish habitat																	
WCF-1010		No fish sampling conducted as pools of wetland seepage with no connectivity. Not fish habitat																	
WCF-1011	502	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0	0
WCF-1031		No fish sampling conducted as no visible channel. Not fish habitat.																	
WCF-1032		No fish sampling conducted as no visible channel. Not fish habitat.																	
WCS-400	504	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0	0
WCS-401		No fish sampling conducted as intermittent ephemeral channel with no connectivity. Not fish habitat																	



4.2.2 Environmental DNA

4.2.2.1 Environmental DNA

eDNA water samples were collected at watercourses associated with the Port au Port Wind Farm, hydrogen / ammonia facility, and Codroy Wind Farm transmission line. eDNA of fish taxa (sequences identified to species level) was positively detected within 27 of the 40 sampling sites (Table 4.4). A total of eight species of fish from five families were detected. The results of the eDNA analysis indicated brook trout (detected at 55% of sampling sites), American eel (23%), threespine and ninespine stickleback (23%) and Atlantic salmon (15%) are the most common fish species in the sampled watersheds. Banded killifish (one location), rainbow smelt (two locations) and brown trout (one location) were also detected.

The eDNA sampling indicated that brook trout were present within the majority of watersheds sampled; Figure 4.1 to 4.3). American eel were detected in Warm Creek watershed, White's Brook watershed, Pellys Brook watershed, Wheeler Brook watershed, Dribble Brook watershed, Fischells Brook watershed and Middle Barachois River. Atlantic salmon eDNA was detected in Southwest Brook, Barachois Brook, Dribble Brook, Fischells Brook, Little Crabbe's River and Highlands River watersheds. Threespine stickleback eDNA was detected in Romaine's Brook, Gadon's Brook, Warm Creek, Flat Bay Brook, Fischells Brook and Little Crabbe's River watersheds.

Banded killifish eDNA was detected in Gull (Mine) Pond. Banded killifish is considered a SAR/SOCC in NL and is considered Special Concern on Schedule 1 of SARA.

Further details including the laboratory results of the eDNA analysis are provided in Appendix E.

4.2.2.2 Environmental DNA Water Quality

Water chemistry was analyzed for one sample taken at each of the 40 sites to check for the presence of inhibitors, in the event that qPCR inhibition was noted. A summary of results for potential inhibitory substances is provide in Appendix E.2. Several parameters which could signal potential inhibition were substantially higher at 11 sites compared to the other sites. Eight of these watercourses crossed the transmission line between Stephenville and the Codroy Wind Farm, and were thus much more turbid, which likely contributed to having elevated TSS, tannins and lignins, and TOC.

4.2.2.3 Quality Assurance and Quality Control

Negative field and laboratory controls resulted in no fish detection, indicating no signs of contamination during the field collection or laboratory processing.



PROJECT NUJIO'QONIK - 2023 FISH AND FISH HABITAT FIELD DATA REPORT

Table 4.7 Summary of eDNA Fish Sampling for Streams and Stream Crossings 2023

Watercourse / Species	American eel (<i>Anguilla rostrata</i>) ¹	Banded killifish (<i>Fundulus diaphanus</i>) ^{1,2}	Rainbow smelt (<i>Osmerus mordax</i>)	Threespine stickleback (<i>Gasterosteus aculeatus</i>)	Ninespine stickleback (<i>Pungitius pungitius</i>)	Atlantic salmon (<i>Salmo salar</i>)	Brown trout (<i>Salmo trutta</i>)	Brook trout (<i>Salvelinus fontinalis</i>)	Number of Fish Taxa Detected
WCA-027	1	0	0	0	0	0	0	1	2
WCA-030a	0	0	0	0	0	0	0	1	1
WCA-032	0	0	0	0	0	0	0	0	0
WCA-070	0	0	0	0	0	0	0	0	0
WCA-100	0	0	0	0	0	0	0	0	0
WCL-519	0	0	0	0	0	0	0	1	1
WCL-714	0	0	0	0	0	0	0	1	1
WCL-728	0	0	0	0	0	0	0	0	0
WCL-755	0	0	0	0	0	0	0	1	1
WCL-772	0	0	0	0	0	0	0	0	0
WCL-779	0	0	0	0	0	0	0	0	0
WCS-407	1	0	0	0	0	0	0	0	1
WCS-408	0	1	0	0	0	0	0	0	1
WCT-513	0	0	0	0	0	0	0	0	0
WCT-516	0	0	0	0	0	0	0	0	0
WCT-517	0	0	0	1	0	0	0	1	2
WCT-519	0	0	1	1	0	0	0	0	2
WCT-521	0	0	0	0	0	0	0	0	0
WCT-526	0	0	0	0	0	0	0	1	1
WCT-531	1	0	0	1	1	0	0	1	4
WCT-544	0	0	0	0	0	0	0	1	1
WCT-546	1	0	0	0	1	0	0	1	3
WCT-549	1	0	0	0	1	0	0	1	3
WCT-553	0	0	0	0	0	0	0	0	0



PROJECT NUJIO'QONIK - 2023 FISH AND FISH HABITAT FIELD DATA REPORT

Table 4.7 Summary of eDNA Fish Sampling for Streams and Stream Crossings 2023

Watercourse / Species	American eel (<i>Anguilla rostrata</i>) ¹	Banded killifish (<i>Fundulus diaphanus</i>) ^{1,2}	Rainbow smelt (<i>Osmerus mordax</i>)	Threespine stickleback (<i>Gasterosteus aculeatus</i>)	Ninespine stickleback (<i>Pungitius pungitius</i>)	Atlantic salmon (<i>Salmo salar</i>)	Brown trout (<i>Salmo trutta</i>)	Brook trout (<i>Salvelinus fontinalis</i>)	Number of Fish Taxa Detected
WCT-555	0	0	0	1	1	1	0	1	4
WCT-563b	1	0	0	0	0	0	1	1	3
WCT-564	0	0	0	0	0	1	0	0	1
WCT-574	0	0	0	0	0	1	0	0	1
WCT-581	1	0	0	0	1	1	0	1	4
WCT-583	0	0	1	1	0	0	0	1	3
WCT-585	0	0	0	0	0	0	0	1	1
WCT-592	1	0	0	1	0	1	0	1	4
WCT-596	0	0	0	0	0	0	0	1	1
WCT-600	0	0	0	0	0	0	0	0	0
WCT-602	1	0	0	0	0	0	0	1	2
WCT-609	0	0	0	0	0	0	0	0	0
WCT-610	0	0	0	0	0	0	0	0	0
WCT-614	0	0	0	0	0	1	0	1	2
WCT-619	0	0	0	0	0	0	0	1	1
WCT-625	0	0	0	0	0	0	0	1	1
Number of Watercourses Species were Detected	9	1	2	6	5	6	1	22	0
<p>Notes:</p> <p>¹ listed as Vulnerable under NL ESA</p> <p>² listed as Special Concern under SARA</p> <p>0 = not detected</p> <p>1 = detected</p>									



4.3 Fish Species Distribution and Habitat Usage

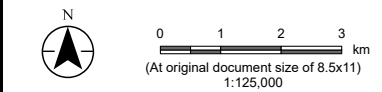
The distribution of fish species from eDNA and electrofishing surveys associated with the Port au Port Wind Farm, the hydrogen / ammonia facility, and transmission line associated with the Codroy Wind Farm are presented in Figure 4.1, Figure 4.2 and Figure 4.3, respectively.





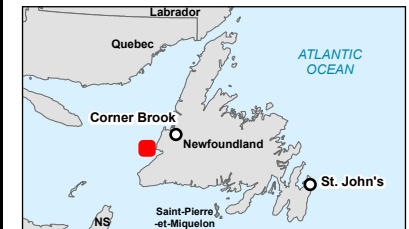
Legend

- Project Area
- Substation, Existing
- Transmission Line, Existing
- Road
- Resource Road / Trail
- Watercourse
- Waterbody
- Forested Area



Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
2. Data Sources: World Energy GH2, NRCan CanVec, GovNL, Stantec Field
3. Background: NRCan CanVec



Project Location: Stephenville, NL
 Prepared by XX on 1/9/2024
 QR by XX on 20XX-XX-XX

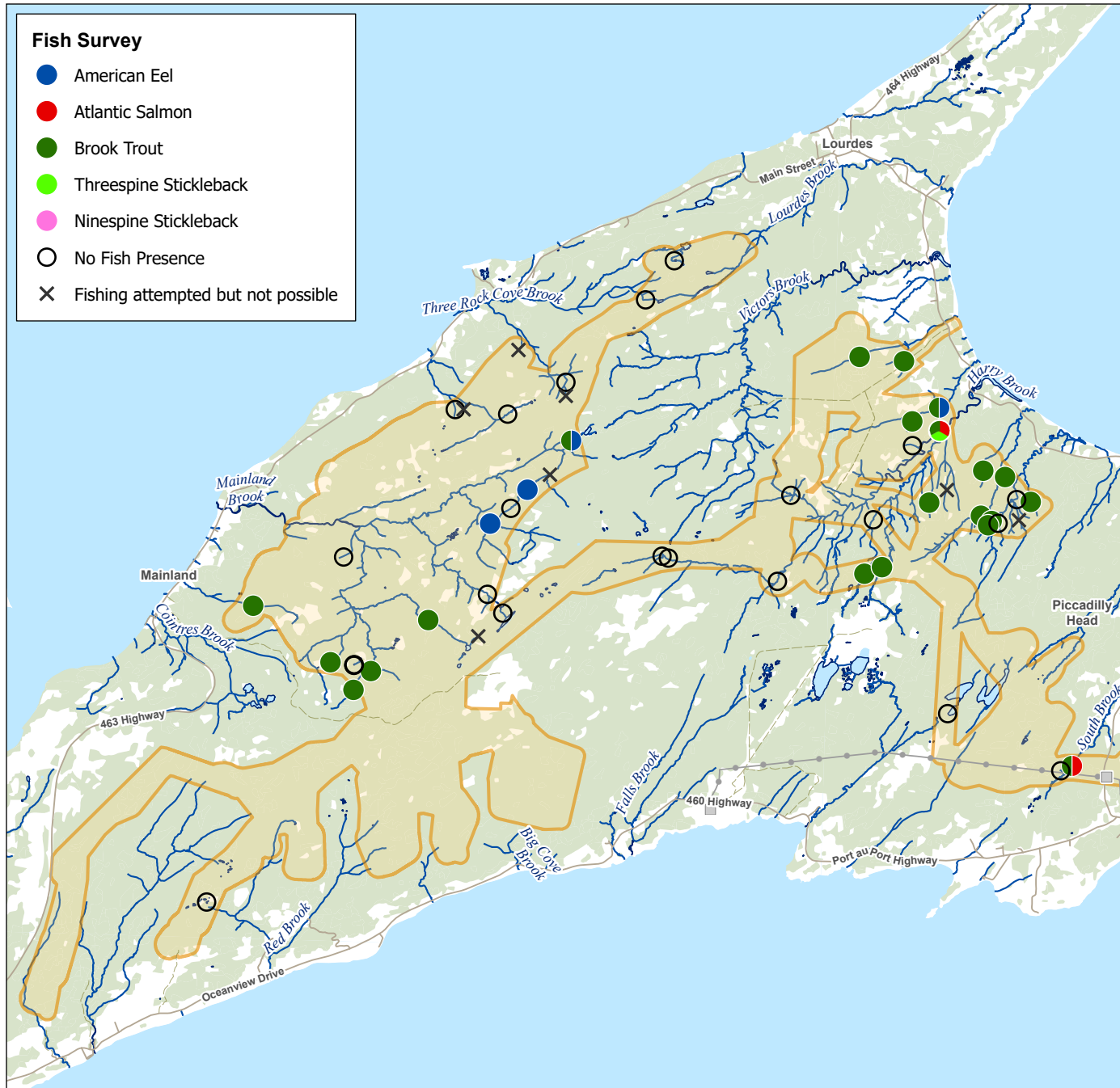
Client/Project: World Energy GH2
 Project Nujio'qonik

Figure No. **4.1**

Occurrence of Fish Species - Port au Port Wind Farm

Fish Survey

- American Eel
- Atlantic Salmon
- Brook Trout
- Threespine Stickleback
- Ninespine Stickleback
- No Fish Presence
- Fishing attempted but not possible



I:\a0151-pp\ss01\work_group\121417233003_data\gis_cad\gis_data\map\pp\arcx\Marine\121417233003_Fish_Community_Surveys_V2.aprx Revised: 2024-01-09 By: acuff

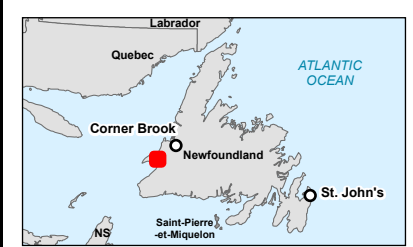


Legend

- ☆ Hydrogen / Ammonia Plant Location
- Port au Port Interconnection**
- Proposed Route
- Alternate Route
- Project Area
- Substation, Existing
- ⚡ Electrical Generation, Existing
- Transmission Line, Existing
- Road
- Resource Road / Trail
- Watercourse
- Waterbody
- Forested Area



- Notes**
1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
 2. Data Sources: World Energy GH2, NRCan CanVec, GovNL, Stantec Field
 3. Background: NRCan CanVec



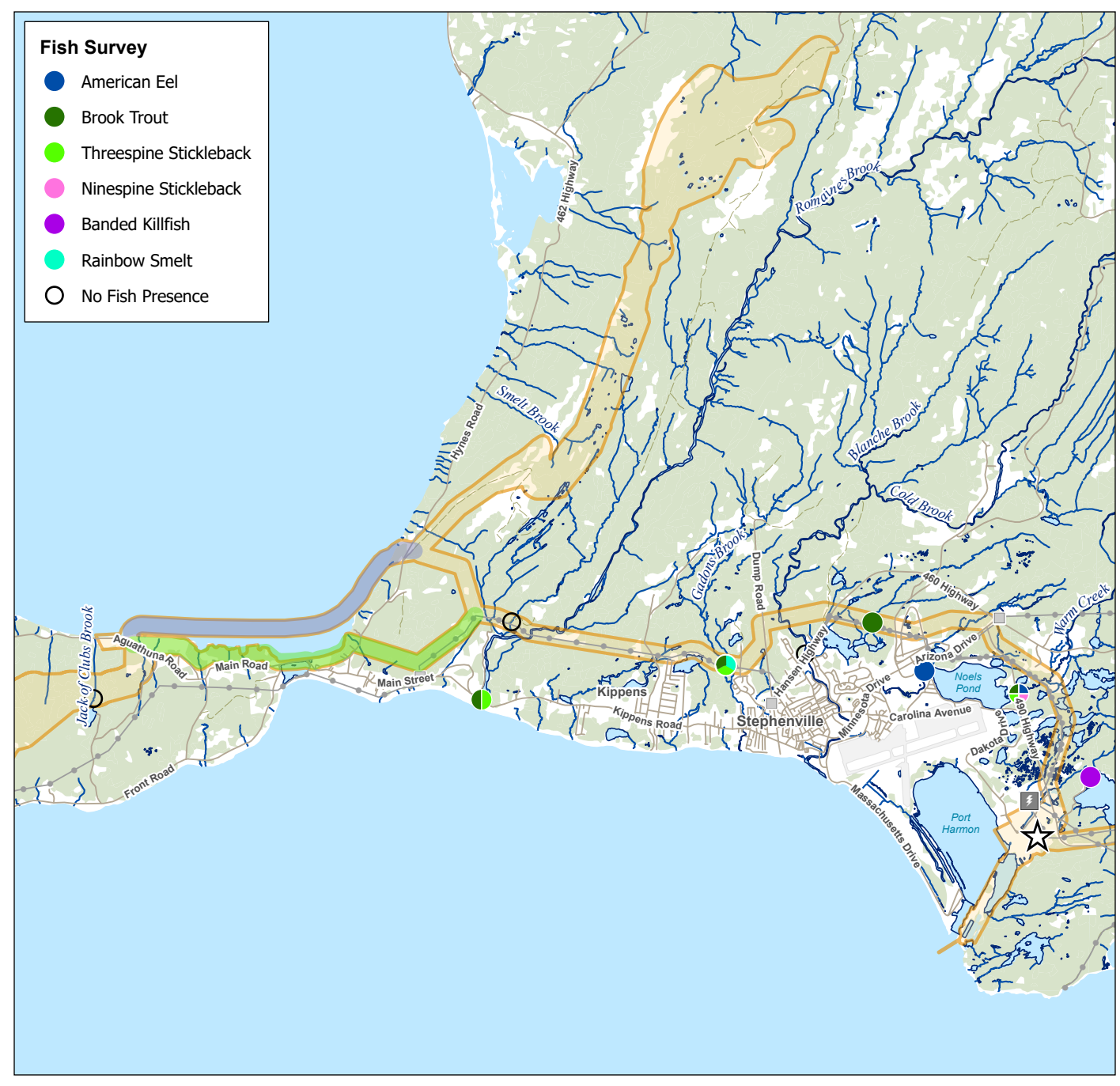
Project Location: Stephenville, NL
 Prepared by XX on 1/9/2024
 QR by XX on 20XX-XX-XX

Client/Project: World Energy GH2, Project Nujio'qonik
 121417575

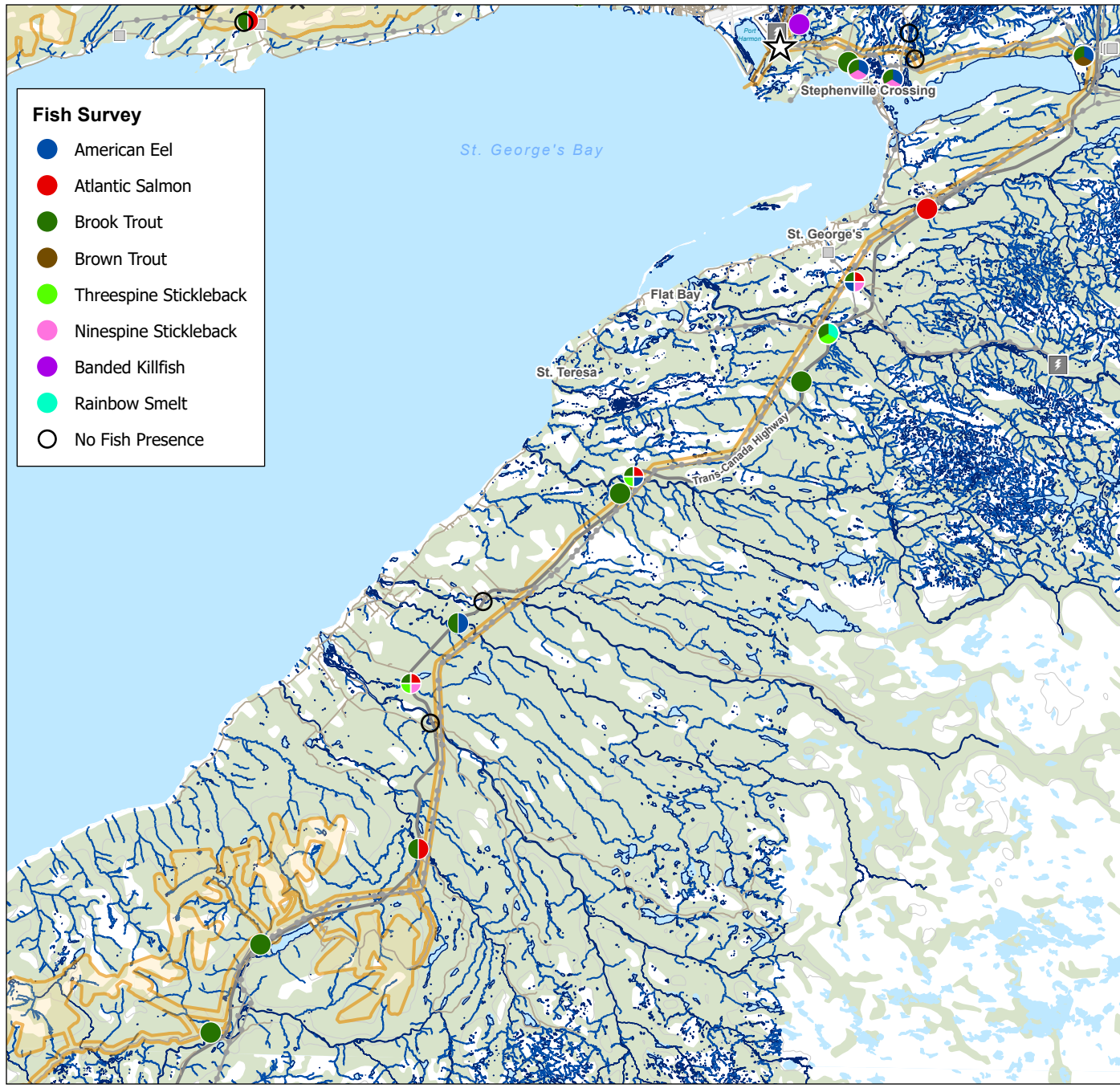
Figure No. **4.2**

Occurrence of Fish Species - Hydrogen / Ammonia Plant and Port au Port Transmission Line

- Fish Survey**
- American Eel
 - Brook Trout
 - Threespine Stickleback
 - Ninespine Stickleback
 - Banded Killfish
 - Rainbow Smelt
 - No Fish Presence



\\ca0151-pps\ss01\work_group\1214active\121417233003_data\gis_data\mapping\lpx\Marine\121417575_Fish_Community_Surveys_V2.aprx Revised: 2024-01-09 By: acrif



Fish Survey

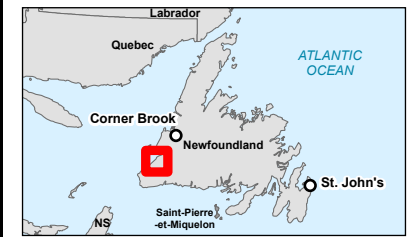
- American Eel
- Atlantic Salmon
- Brook Trout
- Brown Trout
- Threespine Stickleback
- Ninespine Stickleback
- Banded Killfish
- Rainbow Smelt
- No Fish Presence



Legend

- Hydrogen / Ammonia Plant Location
 - Project Area
 - Substation, Existing
 - Electrical Generation, Existing
 - Transmission Line, Existing
 - Trans-Canada Highway
 - Road
 - Resource Road / Trail
 - Watercourse
 - Waterbody
 - Forested Area
- N
- 0 2.5 5 7.5 10 km
(At original document size of 8.5x11)
1:350,000

- Notes**
1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
 2. Data Sources: World Energy GH2, NRCan CanVec, GovNL, Stantec Field
 3. Background: NRCan CanVec



Project Location: Stephenville, NL
Prepared by XX on 1/9/2024
QR by XX on 20XX-XX-XX

Client/Project: World Energy GH2, Project Nujio'gonik
121417575

Figure No. **4.3**

Occurrence of Fish Species - Codroy Wind Farm and Transmission Line

PROJECT NUJIO'QONIK - 2023 FISH AND FISH HABITAT FIELD DATA REPORT

These occurrences informed the predicted fish species distribution for each watercourse crossing and the predicted distribution is provided in Table 4.8 to 4.11. Species diversity varied by watershed (Figure 4.1 to 4.3). The lowest diversity of fish species was typically observed in smaller order stream (i.e., headwaters), with diversity generally increasing with distance downstream or in proximity to the marine environment.

Brook trout were predicted to occur in all of the proposed crossing locations deemed to be fish habitat (210). Atlantic salmon were predicted to occur at 33 proposed crossing locations. American eel were predicted to occur at 98 proposed crossing locations. Threespine or ninespine stickleback were predicted to occur at 34 proposed crossing locations, rainbow smelt at one proposed crossing location and banded killifish at two watercourses associated with the hydrogen / ammonia facility.

The predicted life stages for brook trout, Atlantic salmon and American eel are provided in Table 4.4 for each proposed watercourse crossing. 131 out of 210 proposed crossings were predicted to contain habitat suitable for all life stages of brook trout. Eleven proposed crossings were considered to contain potentially sensitive spawning habitats from brook trout. Where Atlantic salmon were predicted to occur, YOY (fry) and juvenile (parr) habitats were predicted to occur at the majority of crossings. Spawning habitats were predicted at nine proposed crossing locations and of those four were considered potentially sensitive. Where American eel were predicted to occur, juvenile and adult life stages were anticipated to occur as they are habitat generalists.



Table 4.8 Fish Species Distribution and Habitat Usage for Watercourses Crossings Associated with Access Roads for the Port au Port Wind Farm

FISH HABITAT SUITABILITY								
Site ID	Watercourse/Waterbody Type	Fish Habitat	Fish Species Potentially Present	Brook Trout Life Stages Potentially Present	Brook Trout Potentially Sensitive Habitats	Atlantic Salmon Life Stages Potentially Present	Atlantic Salmon Potentially Sensitive Habitats	American Eel Life Stages Potentially Present
WCA-002a	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	S, J, A	-	NA	NA	J, A
WCA-002b	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	Poor quality for all life stages	-	NA	NA	J, A
WCA-009	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	J	-	NA	NA	J, A
WCA-010	Watercourse Visible	Fish habitat - confirmed fish present	Brook trout, American eel	A	-	NA	NA	J, A
WCA-011a	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCA-011b	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCA-013	Waterbody Visible	Fish habitat - based on connectivity	Brook trout, American eel	Poor quality for all life stages	-	NA	NA	J, A
WCA-014a	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	S, Y, J, A	-	NA	NA	J, A
WCA-014b	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	S, Y, J, A	-	NA	NA	J, A
WCA-016	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	J	-	NA	NA	J, A
WCA-021	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	J	-	NA	NA	NA
WCA-022	No visible channel	No	NA	NA	NA	NA	NA	NA
WCA-023	No visible channel	No	NA	NA	NA	NA	NA	NA
WCA-024a	Bog Hole	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCA-024b	Bog Hole	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCA-025	Watercourse Visible	Fish habitat - confirmed fish present	Brook trout	S, Y, J, A	-	NA	NA	NA
WCA-026	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCA-028c	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCA-030a	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	Sensitive	NA	NA	NA
WCA-030b	Watercourse Visible	Fish habitat - confirmed fish present	Brook trout	S, Y, J, A	-	NA	NA	NA
WCA-031	Watercourse Visible	Fish habitat - confirmed fish present	Brook trout	S, Y, J, A	-	NA	NA	NA
WCA-032	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCA-051a	Watercourse Visible	Fish habitat - confirmed fish present	Brook trout	S, Y, J, A	-	NA	NA	NA
WCA-051b	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	J	-	NA	NA	NA
WCA-053	No visible channel	No	NA	NA	NA	NA	NA	NA
WCA-055	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	J	-	NA	NA	J, A
WCA-057a	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	J, A	-	NA	NA	J, A
WCA-057b	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	S, Y, J, A	Sensitive	NA	NA	J, A
WCA-057c	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	S, Y, J, A	-	NA	NA	J, A
WCA-057d	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	S, Y, J, A	-	NA	NA	J, A
WCA-057e	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	S, Y, J, A	-	NA	NA	J, A
WCA-058	Watercourse Visible	Fish habitat - confirmed fish present	Brook trout, American eel	S, Y, J, A	-	NA	NA	J, A
WCA-059a	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	S, Y, J, A	-	NA	NA	J, A
WCA-059b	Watercourse Visible	Fish habitat - confirmed fish present	Brook trout, American eel	Y, J, A	-	NA	NA	J, A
WCA-059c	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCA-060	No visible channel	No	NA	NA	NA	NA	NA	NA
WCA-061	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	S, Y, J, A	-	NA	NA	J, A
WCA-062	Watercourse Visible	Fish habitat - confirmed fish present	Brook trout, American eel	S, Y, J, A	-	NA	NA	J, A
WCA-063	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	S, Y, J, A	-	NA	NA	J, A
WCA-064	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	J	-	NA	NA	NA
WCA-066	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	Poor quality for all life stages	-	NA	NA	NA
WCA-067	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, J	-	NA	NA	NA
WCA-069a	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCA-069b	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	J	-	NA	NA	NA
WCA-070	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	J	-	NA	NA	NA
WCA-071b	Watercourse Visible	Fish habitat - confirmed fish present	Brook trout	S, Y, J, A	-	NA	NA	NA
WCA-071c	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCA-071d	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCA-072a	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	J	-	NA	NA	NA
WCA-072b	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCA-073a	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCA-073b	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	J	-	NA	NA	NA
WCA-074a	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCA-074b	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCA-075	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCA-076	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	J, A	-	NA	NA	NA
WCA-077	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCA-082	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	A	-	NA	NA	J, A
WCA-099	Watercourse Visible	Fish habitat - confirmed fish present	Brook trout, Atlantic salmon	S, Y, J, A	-	Y, J, A	-	NA
WCA-100	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	Y, J, A	-	NA	NA	NA
WCA-102	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA



Table 4.8 Fish Species Distribution and Habitat Usage for Watercourses Crossings Associated with Access Roads for the Port au Port Wind Farm

FISH HABITAT SUITABILITY								
Site ID	Watercourse/Waterbody Type	Fish Habitat	Fish Species Potentially Present	Brook Trout Life Stages Potentially Present	Brook Trout Potentially Sensitive Habitats	Atlantic Salmon Life Stages Potentially Present	Atlantic Salmon Potentially Sensitive Habitats	American Eel Life Stages Potentially Present
WCA-103	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCA-105	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	J, A	-	NA	NA	NA
WCA-106	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCA-107	No visible channel	No	NA	NA	NA	NA	NA	NA
WCA-110	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCA-111a	Watercourse Visible	Fish habitat - confirmed fish present	Brook trout	Y, J, A	-	NA	NA	NA
WCA-111b	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	Y, J, A	-	NA	NA	NA
WCA-112	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, Atlantic salmon, American eel	S, Y, J, A	-	Y, J	-	J, A
WCA-113	Watercourse Visible	Fish habitat - confirmed fish present	American eel, brook trout, Atlantic salmon, threespine stickleback	S, Y, J, A	-	S, Y, J, A	-	J, A
WCA-115	Watercourse Visible	Fish habitat - confirmed fish present	Brook trout, American eel	S, Y, J, A	-	NA	NA	J, A
WCA-116	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCA-117	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCA-121	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCA-122	No visible channel	No	NA	NA	NA	NA	NA	NA
WCA-123	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCA-124	Bog Hole	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCA-125	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	Poor quality for all life stages	-	NA	NA	J, A
WCA-126	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	S, Y, J, A	-	NA	NA	J, A
WCA-127	Watercourse Visible	Fish habitat - confirmed fish present	Brook trout, American eel	J	-	NA	NA	J, A
WCA-128	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	J	-	NA	NA	NA
WCA-129a	No visible channel	No	NA	NA	NA	NA	NA	NA
WCA-129b	No visible channel	No	NA	NA	NA	NA	NA	NA
WCA-130	Watercourse Visible	Fish habitat - confirmed fish present	Brook trout, American eel	S, Y, J, A	-	NA	NA	J, A
WCA-131	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCA-132	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	A	-	NA	NA	NA
WCA-133	Watercourse Visible	Fish habitat - confirmed fish present	Brook trout, American eel	S, Y, J, A	-	NA	NA	J, A
WCA-134	No visible channel	No	NA	NA	NA	NA	NA	NA
WCA-135a	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCA-135b	No visible channel	No	NA	NA	NA	NA	NA	NA
WCA-136a	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCA-136b	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCA-137a	No visible channel	No	NA	NA	NA	NA	NA	NA
WCA-137b	No visible channel	No	NA	NA	NA	NA	NA	NA
WCA-138a	No visible channel	No	NA	NA	NA	NA	NA	NA
WCA-138b	No visible channel	No	NA	NA	NA	NA	NA	NA
WCA-139	No visible channel	No	NA	NA	NA	NA	NA	NA
WCA-140a	No visible channel	No	NA	NA	NA	NA	NA	NA
WCA-140b	No visible channel	No	NA	NA	NA	NA	NA	NA
WCA-140c	No visible channel	No	NA	NA	NA	NA	NA	NA
WCA-141	No visible channel	No	NA	NA	NA	NA	NA	NA
WCA-142	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	Y, J, A	-	NA	NA	J, A
WCA-143	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCA-144	Bog Hole	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCA-145	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCA-146	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, Atlantic salmon, American eel	J	-	Y, J	-	J, A
WCA-147	Watercourse Visible	Fish habitat - based on connectivity	American eel, brook trout, Atlantic salmon, threespine stickleback	S, Y, J, A	-	Y, J	-	J, A
WCA-148a	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCA-148b	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCA-149	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCA-150	Watercourse Visible	Fish habitat - confirmed fish present	Brook trout	Y, J, A	-	NA	NA	NA
WCA-151	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, Atlantic salmon, American eel	S, Y, J, A	-	Y, J, A	-	J, A
WCA-152	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, J	-	NA	NA	NA
WCA-153	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCA-154a	No visible channel	No	NA	NA	NA	NA	NA	NA
WCA-155	No visible channel	No	NA	NA	NA	NA	NA	NA



Table 4.9 Fish Species Distribution and Habitat Usage for Watercourses Crossings Associated with Collector Lines for the Port au Port Wind Farm

FISH HABITAT SUITABILITY								
Site ID	Watercourse/Waterbody Type	Fish Habitat	Fish Species Potentially Present	Brook Trout Life Stages Potentially Present	Brook Trout Potentially Sensitive Habitats	Atlantic Salmon Life Stages Potentially Present	Atlantic Salmon Potentially Sensitive Habitats	American Eel Life Stages Potentially Present
WCL-704a	No visible channel	No	NA	NA	NA	NA	NA	NA
WCL-704b	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	J	-	NA	NA	NA
WCL-704c	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	Y, J, A	-	NA	NA	NA
WCL-706	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	S, Y, J, A	-	NA	NA	J, A
WCL-707a	Bog Hole	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCL-707b	No visible channel	No	NA	NA	NA	NA	NA	NA
WCL-707c	No visible channel	No	NA	NA	NA	NA	NA	NA
WCL-708	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	S, Y, J, A	-	NA	NA	J, A
WCL-709	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	S, Y, J, A	Sensitive	NA	NA	J, A
WCL-710	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	S, Y, J, A	-	NA	NA	J, A
WCL-711a	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	Y, J, A	-	NA	NA	J, A
WCL-711b	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	S, Y, J, A	-	NA	NA	J, A
WCL-711c	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	J, A	-	NA	NA	J, A
WCL-712a	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	S, Y, J, A	-	NA	NA	J, A
WCL-712b	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	S, Y, J, A	-	NA	NA	J, A
WCL-712c	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	S, Y, J, A	Sensitive	NA	NA	J, A
WCL-713	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	Y, J, A	-	NA	NA	J, A
WCL-714	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	Sensitive	NA	NA	NA
WCL-715a	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCL-715b	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCL-715c	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCL-716	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	S, Y, J, A	-	NA	NA	J, A
WCL-717	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	S, Y, J, A	Sensitive	NA	NA	J, A
WCL-718	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	Y, J, A	-	NA	NA	J, A
WCL-719	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	S, Y, J, A	-	NA	NA	J, A
WCL-720	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	S, Y, J, A	-	NA	NA	J, A
WCL-721	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	S, J, A	-	NA	NA	J, A
WCL-722	No visible channel	No	NA	NA	NA	NA	NA	NA
WCL-725	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCL-726	Bog Hole	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCL-727	No visible channel	No	NA	NA	NA	NA	NA	NA
WCL-728	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCL-729	No visible channel	No	NA	NA	NA	NA	NA	NA
WCL-730	No visible channel	No	NA	NA	NA	NA	NA	NA
WCL-739	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, J, A	-	NA	NA	NA
WCL-740a	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCL-740b	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCL-741a	Watercourse Visible	Fish habitat - based on connectivity	American eel, brook trout, Atlantic salmon, threespine stickleback	S, Y, J, A	-	Y, J	-	J, A
WCL-741b	Watercourse Visible	Fish habitat - based on connectivity	American eel, brook trout, Atlantic salmon, threespine stickleback	S, Y, J, A	-	Y, J, A	-	J, A
WCL-742	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	Y, J, A	-	NA	NA	NA
WCL-743	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCL-744	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCL-745a	Watercourse Visible	Fish habitat - based on connectivity	American eel, brook trout, Atlantic salmon, threespine stickleback	S, Y, J, A	-	Y, J	-	J, A
WCL-745b	Watercourse Visible	Fish habitat - based on connectivity	American eel, brook trout, Atlantic salmon, threespine stickleback	S, Y, J, A	-	Y, J	-	J, A
WCL-746	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCL-747	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCL-748	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	Poor quality for all life stages	-	NA	NA	NA
WCL-749	No visible channel	No	NA	NA	NA	NA	NA	NA
WCL-750	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	J	-	NA	NA	NA
WCL-751	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	J, A	-	NA	NA	NA
WCL-752	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	Sensitive	NA	NA	NA
WCL-753	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	Sensitive	NA	NA	NA
WCL-754	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCL-755	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCL-756	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCL-757	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCL-758	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCL-759	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCL-760	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCL-761	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCL-762	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	Poor quality for all life stages	-	NA	NA	NA



Table 4.9 Fish Species Distribution and Habitat Usage for Watercourses Crossings Associated with Collector Lines for the Port au Port Wind Farm

FISH HABITAT SUITABILITY								
Site ID	Watercourse/Waterbody Type	Fish Habitat	Fish Species Potentially Present	Brook Trout Life Stages Potentially Present	Brook Trout Potentially Sensitive Habitats	Atlantic Salmon Life Stages Potentially Present	Atlantic Salmon Potentially Sensitive Habitats	American Eel Life Stages Potentially Present
WCL-763	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCL-764a	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	J	-	NA	NA	NA
WCL-764b	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCL-765b	Watercourse Visible	Fish habitat - based on connectivity	American eel, brook trout, Atlantic salmon, threespine stickleback	S, Y, J, A	-	S, Y, J, A	Sensitive	J, A
WCL-765c	Watercourse Visible	Fish habitat - based on connectivity	American eel, brook trout, Atlantic salmon, threespine stickleback	S, Y, J, A	-	S, Y, J, A	Sensitive	J, A
WCL-765d	Watercourse Visible	Fish habitat - based on connectivity	American eel, brook trout, Atlantic salmon, threespine stickleback	S, Y, J, A	-	S, Y, J, A	Sensitive	J, A
WCL-766	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	S, Y, J, A	-	NA	NA	J, A
WCL-767	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, Atlantic salmon, American eel	S, Y, J, A	-	S, Y, J, A	Sensitive	J, A
WCL-768a	Watercourse Visible	Fish habitat - based on connectivity	American eel, brook trout, Atlantic salmon, threespine stickleback	S, Y, J, A	-	S, Y, J, A	-	J, A
WCL-768b	Watercourse Visible	Fish habitat - based on connectivity	American eel, brook trout, Atlantic salmon, threespine stickleback	Y, J, A	-	A	-	J, A
WCL-768c	Watercourse Visible	Fish habitat - based on connectivity	American eel, brook trout, Atlantic salmon, threespine stickleback	S, Y, J, A	-	Y, J, A	-	J, A
WCL-768d	Watercourse Visible	Fish habitat - based on connectivity	American eel, brook trout, Atlantic salmon, threespine stickleback	S, Y, J, A	-	S, Y, J, A	-	J, A
WCL-768e	Watercourse Visible	Fish habitat - based on connectivity	American eel, brook trout, Atlantic salmon, threespine stickleback	S, Y, J, A	-	Y, J, A	-	J, A
WCL-768f	Watercourse Visible	Fish habitat - based on connectivity	American eel, brook trout, Atlantic salmon, threespine stickleback	S, Y, J, A	-	Y, J, A	-	J, A
WCL-769	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCL-770	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, Atlantic salmon, American eel	S, Y, J, A	-	Y, J, A	-	J, A
WCL-771b	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, Atlantic salmon, American eel	S, Y, J, A	-	Y, J, A	-	J, A
WCL-772	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, Atlantic salmon, American eel	S, Y, J, A	-	Y, J, A	-	J, A
WCL-773	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCL-774a	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCL-774b	No visible channel	No	NA	NA	NA	NA	NA	NA
WCL-776	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, J, A	-	NA	NA	NA
WCL-778	Waterbody Visible	Fish habitat - based on connectivity	Brook trout	S, J, A	-	NA	NA	NA
WCL-779	Waterbody Visible	Fish habitat - based on connectivity	Brook trout	Poor quality for all life stages	-	NA	NA	NA
WCL-780	No visible channel	No	NA	NA	NA	NA	NA	NA
WCL-781	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCL-783	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	Y, J, A	-	NA	NA	J, A
WCL-851	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	J, A	-	NA	NA	NA
WCL-852	No visible channel	No	NA	NA	NA	NA	NA	NA
WCL-854	No visible channel	No	NA	NA	NA	NA	NA	NA
WCL-855	No visible channel	No	NA	NA	NA	NA	NA	NA
WCL-856	Bog Hole	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCL-857	Bog Hole	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCL-858	Bog Hole	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCL-861	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	J	-	NA	NA	J, A
WCL-862	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	S, J, A	-	NA	NA	J, A
WCL-863	Bog Hole	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCL-864	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	J	-	NA	NA	NA
WCL-865	Bog Hole	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCL-866	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	S, Y, J, A	-	NA	NA	J, A
WCL-867	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	Poor quality for all life stages	-	NA	NA	NA
WCL-868	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	Poor quality for all life stages	-	NA	NA	NA
WCL-869	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	S, Y, J, A	-	NA	NA	J, A
WCL-870	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	S, Y, J, A	Sensitive	NA	NA	J, A
WCL-894	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCL-895	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	S, Y, J, A	-	NA	NA	J, A
WCL-896b	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCL-896c	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCL-896d	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCL-897a	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCL-897b	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCL-898	No visible channel	No	NA	NA	NA	NA	NA	NA
WCL-899	No visible channel	No	NA	NA	NA	NA	NA	NA
WCL-900	No visible channel	No	NA	NA	NA	NA	NA	NA
WCL-901	No visible channel	No	NA	NA	NA	NA	NA	NA
WCL-902a	No visible channel	No	NA	NA	NA	NA	NA	NA
WCL-902b	No visible channel	No	NA	NA	NA	NA	NA	NA
WCL-902c	No visible channel	No	NA	NA	NA	NA	NA	NA
WCL-903a	No visible channel	No	NA	NA	NA	NA	NA	NA
WCL-903b	No visible channel	No	NA	NA	NA	NA	NA	NA
WCL-903c	No visible channel	No	NA	NA	NA	NA	NA	NA



Table 4.9 Fish Species Distribution and Habitat Usage for Watercourses Crossings Associated with Collector Lines for the Port au Port Wind Farm

FISH HABITAT SUITABILITY								
Site ID	Watercourse/Waterbody Type	Fish Habitat	Fish Species Potentially Present	Brook Trout Life Stages Potentially Present	Brook Trout Potentially Sensitive Habitats	Atlantic Salmon Life Stages Potentially Present	Atlantic Salmon Potentially Sensitive Habitats	American Eel Life Stages Potentially Present
WCL-903d	No visible channel	No	NA	NA	NA	NA	NA	NA
WCL-904a	No visible channel	No	NA	NA	NA	NA	NA	NA
WCL-904b	No visible channel	No	NA	NA	NA	NA	NA	NA
WCL-904c	No visible channel	No	NA	NA	NA	NA	NA	NA
WCL-905a	No visible channel	No	NA	NA	NA	NA	NA	NA
WCL-905b	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCL-905c	No visible channel	No	NA	NA	NA	NA	NA	NA
WCL-905d	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCL-905e	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCL-905f	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	J	-	NA	NA	NA
WCL-905g	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, Atlantic salmon, American eel	J	-	Y, J	-	J, A
WCL-905h	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, Atlantic salmon, American eel	S, Y, J, A	Sensitive	Y, J	-	J, A
WCL-905i	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCL-906	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, Atlantic salmon, American eel	Y, J, A	-	Y, J, A	-	J, A
WCL-907a	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCL-907b	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	Sensitive	NA	NA	NA
WCL-908	No visible channel	No	NA	NA	NA	NA	NA	NA
WCL-909	No visible channel	No	NA	NA	NA	NA	NA	NA



Table 4.10 Fish Species Distribution and Habitat Usage for Watercourses Crossings Associated with Transmission Lines for the Port au Port Wind Farm

FISH HABITAT SUITABILITY								
Site ID	Watercourse/Waterbody Type	Fish Habitat	Fish Species Potentially Present	Brook Trout Life Stages Potentially Present	Brook Trout Potentially Sensitive Habitats	Atlantic Salmon Life Stages Potentially Present	Atlantic Salmon Potentially Sensitive Habitats	American Eel Life Stages Potentially Present
WCT-500	Watercourse Visible	Fish habitat - based on connectivity	American eel, brook trout, Atlantic salmon, threespine stickleback	S, Y, J, A	-	Y, J, A	-	J, A
WCT-501a	Watercourse Visible	Fish habitat - based on connectivity	American eel, brook trout, Atlantic salmon, threespine stickleback	S, Y, J, A	-	Y, J, A	-	J, A
WCT-501b	Watercourse Visible	Fish habitat - based on connectivity	American eel, brook trout, Atlantic salmon, threespine stickleback	Y, J, A	-	A	-	J, A
WCT-501c	Watercourse Visible	Fish habitat - based on connectivity	American eel, brook trout, Atlantic salmon, threespine stickleback	S, Y, J, A	-	S, Y, J, A	-	J, A
WCT-502	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, Atlantic salmon, American eel	S, Y, J, A	-	Y, J, A	-	J, A
WCT-503	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, Atlantic salmon, American eel	S, Y, J, A	-	Y, J, A	-	J, A
WCT-504	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, Atlantic salmon, American eel	S, Y, J, A	-	S, Y, J, A	-	J, A
WCT-505	No visible channel	No	NA	NA	NA	NA	NA	NA
WCT-506	No visible channel	No	NA	NA	NA	NA	NA	NA
WCT-507	No visible channel	No	NA	NA	NA	NA	NA	NA
WCT-508	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCT-509	No visible channel	No	NA	NA	NA	NA	NA	NA
WCT-510	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCT-511	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCT-513	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	J, A	-	NA	NA	NA
WCT-514	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, threespine stickleback	Y, J, A	-	NA	NA	NA
WCT-515	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, threespine stickleback	S, Y, J, A	-	NA	NA	NA
WCT-516	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, threespine stickleback	S, Y, J, A	-	NA	NA	NA
WCT-518	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCT-519	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, threespine stickleback, rainbow smelt	S, Y, J, A	-	NA	NA	NA
WCT-520	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel, threespine stickleback	S, Y, J, A	-	NA	NA	J, A
WCT-521	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCT-522	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCT-523	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	J	-	NA	NA	NA
WCT-524	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCT-525	No visible channel	No	NA	NA	NA	NA	NA	NA
WCT-526	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCT-527	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCT-528a	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCT-528b	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCT-528c	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCT-528d	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCT-529	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, threespine stickleback, American eel	Y, J, A	-	NA	NA	J, A
WCT-530	No visible channel	No	NA	NA	NA	NA	NA	NA
WCT-531	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, threespine and ninespine stickleback, American eel	Poor quality for all life stages	-	NA	NA	J, A
WCT-532	No visible channel	No	NA	NA	NA	NA	NA	NA
WCT-533	No visible channel	No	NA	NA	NA	NA	NA	NA
WCT-534	Waterbody Visible	Fish habitat - based on connectivity	Brook trout, threespine stickleback, American eel	Poor quality for all life stages	-	NA	NA	J, A
WCT-535	Waterbody Visible	Fish habitat - based on connectivity	Brook trout	Poor quality for all life stages	-	NA	NA	NA
WCT-536	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	Y, J, A	-	NA	NA	J, A
WCT-537	Waterbody Visible	Fish habitat - based on connectivity	Brook trout	J	-	NA	NA	NA
WCT-538	Waterbody Visible	Fish habitat - based on connectivity	Brook trout	Poor quality for all life stages	-	NA	NA	NA
WCT-539	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel, threespine stickleback	S, Y, J, A	-	NA	NA	J, A
WCT-540	Waterbody Visible	Fish habitat - based on connectivity	Brook trout	J	-	NA	NA	NA
WCT-544	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel, ninespine stickleback	S, Y, J, A	-	NA	NA	J, A
WCT-545	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel, ninespine stickleback	J	-	NA	NA	J, A
WCT-546	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel, ninespine stickleback	S, J, A	-	NA	NA	J, A
WCT-627	No visible channel	No	NA	NA	NA	NA	NA	NA
WCT-628	No visible channel	No	NA	NA	NA	NA	NA	NA
WCT-629	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCT-630	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCT-631	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCT-632	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	A	-	NA	NA	NA
WCT-633	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA



Table 4.11 Fish Species Distribution and Habitat Usage for Watercourses Associated with Turbines and Substations for the Port au Port Wind Farm and the Hydrogen / Ammonia Plant

FISH HABITAT SUITABILITY								
Site ID	Watercourse/Waterbody Type	Fish Habitat	Fish Species Potentially Present	Brook Trout Life Stages Potentially Present	Brook Trout Potentially Sensitive Habitats	Atlantic Salmon Life Stages Potentially Present	Atlantic Salmon Potentially Sensitive Habitats	American Eel Life Stages Potentially Present
WCS-400	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, Atlantic salmon, American eel	Y, J, A	-	Y, J	-	J, A
WCS-401	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCS-407	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel, threespine and ninespine stickleback, banded killifish	S, Y, J, A	-	NA	NA	J, A
WCS-408	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	J	-	NA	NA	NA
WCS-409	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	S, Y, J, A	-	NA	NA	NA
WCS-410	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel, threespine and ninespine stickleback, banded killifish	S, Y, J, A	-	NA	NA	J, A
WCF-1000	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCF-1001	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCF-1002	Watercourse Visible	Fish habitat - confirmed fish present	Brook trout	Poor quality for all life stages	-	NA	NA	NA
WCF-1003	Watercourse Visible	Fish habitat - based on connectivity	Brook trout	Poor quality for all life stages	-	NA	NA	NA
WCF-1004	Watercourse Visible	Fish habitat - confirmed fish present	Brook trout	S, Y, J, A	-	NA	NA	NA
WCF-1005	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCF-1006	No visible channel	No	NA	NA	NA	NA	NA	NA
WCF-1007	Watercourse Visible	Fish habitat - based on connectivity	Brook trout, American eel	S, Y, J, A	-	NA	NA	J, A
WCF-1008	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCF-1009	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCF-1010	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCF-1011	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA
WCF-1031	No visible channel	No	NA	NA	NA	NA	NA	NA
WCF-1032	Drainage Channel	Unlikely - based on no connectivity	NA	NA	NA	NA	NA	NA



4.4 Comparison of Desktop Analysis and Ground-Truthing

The desktop analysis identified potential watercourse crossings, characterized the fish habitat and described the fish potentially present at the proposed crossing locations. A field program was then conducted to verify the results of the desktop assessment.

4.4.1 Characterization of Fish Habitat

The fish habitat parameters identified for the desktop analysis including channel status, habitat type, riparian vegetation and substrate were compared to the in-field parameters collected for crossings surveyed in Port au Port in 2023.

4.4.1.1 Watercourse Type

A desktop and in-field assessment was completed at 294 potential crossings associated with the roads, collector lines and transmission line for the Port au Port Wind Farm. The desktop assessment predicted that of the 294 potential crossings, the habitat at these crossings would consist of: 123 watercourses, 18 waterbodies, 55 drainage channels and 98 of the watercourses present on topographic mapping would not be present on the ground.

The field assessment confirmed that 103 of 123 (84%) of the watercourse crossings identified by the desktop assessment were confirmed to be watercourses in the field. Of the 20 that were not, two were considered no visible channel (WCL-905a and WCL-905c) and seventeen were considered a drainage channel (the channel was visible but not fish habitat). Many drainage channels had large areas of dry rocky stream bed visible is likely why they were considered watercourses as part of the desktop assessment.

For waterbodies, the field assessment confirmed that 17 of the 18 waterbodies were actually present. The one location that was not predicted correctly was WCT-508. WCT-508 was categorized as a pond but in the field it was considered a watercourse. This was in part a result of the proposed crossing location being located immediately downstream of the pond (approximately 10 m).

The field assessment confirmed that 5 out of 55 drainage channels identified by the desktop assessment were confirmed to be drainage channels in the field. Of those remaining, 16 were considered no visible channel and 34 were considered watercourses. The combined results of the desktop and in-field assessment indicated it is difficult to differentiate between a drainage channel and watercourse based on existing aerial imagery. As a conservative approach, drainage channels should be considered watercourses until confirmed otherwise in the field.

The desktop assessment correctly identified 34 out of 98 (35%) mapped watercourses that were considered no visible channel. Of those incorrectly identified, 17 were considered drainage channels and 47 were considered watercourses. The combined results of the desktop and in-field assessment indicated it is difficult to differentiate between a no visible channel and watercourse based on existing aerial imagery. As a conservative approach, no visible channels should be considered watercourses until confirmed in the field.



Table 4.12 Desktop Versus Field Comparison for Watercourse Type

Desktop Assessment	Confirmed In-Field				Total
	No Visible Channel	Drainage Channel	Waterbody Present	Watercourse Present	
No Visible Channel	34	17	0	47	98
Drainage Channel	16	5	0	34	55
Waterbody Visible	1	0	16	1	18
Watercourse Visible	3	17	0	103	123
Total	54	39	16	185	294

4.4.1.2 Unmapped Watercourses

As part of the desktop assessment, existing aerial imagery was assessed for the presence of unmapped watercourses or waterbodies within the Project RoW. The desktop assessment identified 63 potential unmapped watercourse crossings, of which 54 were field assessed in 2023. Five of the unmapped watercourses were determined to be fish-bearing and one was considered a pond and assumed to be fish bearing. Of the remaining locations, no visible channel was observed at 32 locations, and a further 16 were drainage channels and seven were bog holes and did not constitute fish habitat.

4.4.1.3 Riparian Vegetation

As part of the desktop assessment, the proposed watercourse crossings were assessed for dominant riparian vegetation surrounding watercourses and waterbodies within the Project RoW. The desktop assessment predicted the riparian vegetation at 150 proposed crossing locations. Riparian vegetation was not assessed for crossings deemed by the desktop analysis to have no visible channel.

There were 90 watercourse crossings from the desktop assessment where trees was determined to be the dominant riparian vegetation and there was field data available. Of those crossings, field surveys confirmed that trees were the dominant riparian vegetation or a high percentage of the overall riparian vegetation at 50 proposed crossings (56% accuracy; Table 4.6). Shrubs was the dominant riparian vegetation or a high percentage of the overage riparian vegetation at thirty-six of the crossings. In some cases, the satellite imagery was of insufficient quality to differentiate between tall alders and smaller deciduous trees or the understory (shrubs and grasses) were obscured by trees, resulting in an underestimation of shrubs and grasses. Four locations predicted to have trees as the dominant riparian vegetation from the desktop assessment had grass as the dominant habitat type from the field surveys. In two of the cases (WCL-712a and WCL-767), grass was the understory beneath alders and the alders likely were more visible from the aerial imagery. At two separate cases, the desktop assessment could have considered shrubs or wetland vegetation (WCL-779) and the vegetation appear mixed and the more conservative option (trees) was selected (i.e., assuming that clearing would be required; WCA-057a).



There were 49 watercourse crossings from the desktop assessment where shrub was determined to be the dominant riparian vegetation and there was field data available for comparison. Of those crossings, field surveys confirmed that shrubs were the dominant riparian vegetation or a high percentage of the overall riparian vegetation at 40 proposed crossings (82% accuracy; Table 4.6). The field surveys determined that the dominant riparian vegetation or a high percentage of the overage riparian vegetation was trees at only eight of the crossings and grass at five crossings and grass, wetland or bare at five of the eight crossings. The assessment of shrubs as riparian vegetation was relatively accurate between the desktop assessment using imagery and the in-field surveys.

There were 11 watercourse crossings from the desktop assessment where wetland or bare was determined to be the dominant riparian vegetation category. Of those crossings, field surveys confirmed that wetland, grass or bare were the dominant riparian vegetation or a high percentage of the overall riparian vegetation at eight of the 11 crossings (73% accuracy; Table 4.6). The dominant vegetation at the other three crossings were trees and/or shrubs. For all three incorrect predictions (WCL-905h and WCA-146 and WCA-069a) the field data indicated the three categories of riparian vegetation was fairly equally distributed which resulted in difficulties in defining the dominant vegetation from satellite imagery.

Table 4.13 Desktop Versus Field Comparison for Riparian Vegetation

Desktop Assessment	Confirmed In-Field			
	Tree	Shrubs	Grass, Wetland, Bare	Total
Tree	50	36	4	90
Shrubs	8	36	5	49
Grass, wetland, bare	2	1	8	11
Total	60	73	17	150

4.4.1.4 Substrate Type

As part of the desktop assessment, predicted riparian vegetation and slope was used to predict the substrate in watercourses or waterbodies at stream crossings. The desktop assessment predicted the substrate type at 150 proposed crossing locations. A comparison was not completed for crossings deemed by the desktop analysis to be no visible channel or in the field as no visible habitat or drainage channels (i.e., not fish habitats).

There were 81 watercourse crossings from the desktop assessment where coarse substrates were predicted to be the dominant substrate and there was field data available. Of those crossings, field surveys confirmed that coarse was the dominant substrate or a high percentage of the overall substrates at 70 proposed crossings (86% accuracy; Table 4.7). Mixed was the dominant substrate category at two of the crossings and fines were the dominant substrate category at nine of the stream crossings predicted to have coarse substrates. These differences can be attributed to localized variations in substrates which are observed at the field survey level (e.g., mesohabitats such as pools, glides or other low gradient habitat types) within each watercourse that are not easily visible on imagery.



There were 21 watercourse crossings from the desktop assessment where fine substrates were predicted to be the dominant substrates and there was field data available to confirm. Of those crossings, field surveys confirmed that fine substrates were the dominant substrate or a high percentage of the overall substrates at 17 proposed crossings (81% accuracy; Table 4.7). Coarse substrates were the dominant substrate category at only 4 of the crossings and none of the crossings were found to have mixed substrates. These differences can be attributed to localized variations in substrates which are observed at the field survey level (e.g., mesohabitats such as pools, glides or other low gradient habitat types) within each watercourse that are not easily visible on imagery.

There were 48 watercourse crossings from the desktop assessment where mixed substrates (i.e., similar proportions of fine and coarse substrates) were predicted to be the dominant substrates and there was field data available. Of those crossings, field surveys confirmed that mixed substrates were the dominant substrate or a high percentage of the overall substrates at only one proposed crossing (2% accuracy; Table 4.7). Coarse substrates were the dominant substrate category at 29 of the crossings and fines were the dominant substrate category at 18 of the stream crossings predicted to have mixed substrates. The result of this comparison indicates that predicting dominant substrate at crossings with low slopes and shrubs as the dominant riparian vegetation is challenging due to the range of substrates in these environments. Going forward the mixed substrate category will be removed from separate desktop assessments and future desktop work will be completed using coarse and fine categories.

Table 4.14 Desktop Versus Field Comparison for Substrate Type

Desktop Assessment	Confirmed In-Field			
	Coarse	Mixed	Fines	Total
Coarse	70	2	9	81
Mixed	29	1	18	48
Fines	4	0	17	21
Total	103	3	44	150

4.4.2 Characterization of Fish Communities

The desktop assessment determined that brook trout, Atlantic salmon, American eel, threespine and ninespine stickleback were likely to be the most common and abundant fish species to be encountered within the Project Area, based on the flowing habitat characteristics associated with the vast majority of the crossings (Stantec 2023). These species were confirmed to be the most common and abundant species encountered in the field, with the exception of ninespine stickleback which was not captured during fish sampling and infrequently observed in eDNA samples.

The desktop survey also identified the potential for banded killifish, mummichog, blackspotted stickleback (*Gasterosteus wheatlandi*), rainbow smelt and Arctic char (*Salvelinus alpinus*), which were not caught by fish sampling. Banded killifish, rainbow smelt, and ninespine stickleback were identified by eDNA methods. This is a strength of eDNA sampling methods, which have the ability to detect uncommon species or those occurring in low abundances. Mummichog, blackspotted stickleback (*Gasterosteus wheatlandi*) and Arctic char (*Salvelinus alpinus*) were not observed or detected within the Project Area using the established sampling methods.



5.0 Summary

The 2023 Fish and Fish Habitat Study is the first aquatic technical data report completed by Stantec Consulting Ltd. (Stantec) on behalf World Energy GH2 (WEGH2) for Project Nujio'qonik (the Project), a commercial-scale, "green hydrogen" and ammonia production facility powered by renewable wind energy western Newfoundland. The results of the baseline surveys are being used to support the desktop assessment conducted for the environmental assessment (EA) and the data will be incorporated into fisheries related permitting for the Project.

The 2023 aquatic surveys characterized freshwater fish habitat at potential road, transmission line, collector line stream crossings and in the vicinity of turbine and substation footprints for the Port au Port Wind Farm and hydrogen / ammonia facility. Fish sampling was also conducted using a variety of methods to determine fish presence within a representative number of streams, proposed road crossings, turbine footprints and potential waterbodies in the Study Area. Surveys of the Codroy Wind Farm and supporting infrastructure are planned for 2024.

Fish habitat was classified at a total of 330 proposed watercourse crossings associated with the Port au Port Wind Farm and related infrastructure, and the hydrogen / ammonia facility. This includes 116 potential road crossings, 194 crossings associated with transmission and collector lines, and 20 locations associated with the hydrogen / ammonia facility, substation, and turbine footprints.

Of the 116 potential road crossings surveyed, 73 watercourses / waterbodies were considered fish-bearing as fish based on confirmed presence or connectivity with downstream watercourses or waterbodies. Of those, 68 were classified as small watercourses (stream order of 2 or smaller) while 4 were moderately sized (stream order of 3-5) and 1 was a pond. Of the 43 stream crossings that were not fish habitat, 21 had were observed to have no visible channel (i.e., no watercourse was present), 18 were considered overland drainage channels which had no connectivity to fish bearing waters and 4 were bog holes which were isolated from fish bearing waters.

Of the 194 potential watercourse crossings surveyed for the Port au Port collector and transmission lines, 128 watercourses / waterbodies were considered fish-bearing. Of those, 95 of were classified as small watercourses (stream order of 2 or smaller) while 24 were moderately sized (stream order of 3-5) and 9 were ponds. Of the 66 stream crossings that were not fish habitat, 39 were observed to have no visible channel, 18 were considered overland drainage channels which had no connectivity to fish bearing waters and 9 were bog holes which were isolated from fish bearing waters.

In general, small watercourses (stream order of 2 or smaller) were typically less than 5 m in width, with run and riffle habitats and had a variety of substrates from muck (fine sediments mixed with organic material) to cobble and riparian vegetation dominated by grasses and shrubs. Medium watercourses were 5 to 20 m in width, and were dominated by run and riffle habitats, coarser substrates (such as rubble) and had riparian vegetation dominated by trees and shrubs.



PROJECT NUJIO'QONIK - 2023 FISH AND FISH HABITAT FIELD DATA REPORT

Twenty watercourses within 15 m from substation and turbine locations were assessed to determine if they were fish bearing. One of the 2 streams within or adjacent to the substation footprints was classified as fish habitat and 4 of the 14 watercourses within or adjacent to the turbine footprints were classified as fish habitat. 8 of the remaining watercourses were considered overland drainage channels or no visible channel (i.e., not fish habitat).

Two of the three streams on the hydrogen / ammonia facility site were identified as fish habitat and small first order streams, while the third was a stagnant pool with no connectivity and was not considered fish-bearing. Adjacent to the facility site, Warm Creek is a mapped stream that drains Noels Pond and flows into the Atlantic Ocean. The 4, km surveyed portion consists primarily of riffle/run habitat, with coarse substrates and riparian vegetation that was predominantly shrubs and grass.

Water temperatures at the time of the survey were typically acceptable (94% of sites) for coldwater fish species such as brook trout and Atlantic salmon. Dissolved oxygen concentrations were above the Canadian Water Quality Guidelines for the Protection of Aquatic Life (CWQG PAL) recommended value for all life stages of fish at 42% of locations, and above the recommended value for early life stages at 8% of locations. The pH was below the CWQG PAL recommended value of 6.5 at 21% of sites.

A combination of backpack electrofishing, minnow traps, and the collection of environmental deoxyribonucleic (eDNA) were used to confirm presence or absence of fish at several representative streams. Fish species diversity was low, with only American eel, Atlantic salmon, brook trout, and threespine stickleback captured by backpack electrofisher. Similarly, eDNA analysis indicated brook trout, American eel, stickleback, and Atlantic salmon were the most common fish species in the RAA. Banded killifish, rainbow smelt, and brown trout were also detected by eDNA, though infrequently.

Two SAR/SOCC were identified from the fish community sampling. American eel is considered a SAR/SOCC and is listed as "Threatened" under COSEWIC and "Vulnerable" under the NLESA and banded killifish is considered a SAR/SOCC in Newfoundland and Labrador and is considered Special Concern under the Canadian *Species at Risk Act* and "Vulnerable" under the NLESA .

Overall, the desktop assessment conducted for the EIS was accurate in predicting watercourse type for waterbodies and watercourses predicted to be fish bearing. It was difficult to assess using desktop methods whether potential watercourses would be drainage channels or have no visible channel in the field. Therefore, as a conservative approach, no visible channels and drainage channels (not fish habitat) should be considered watercourses until confirmed absent in the field. The desktop assessment did identify five additional unmapped watercourses and one unmapped pond that are assumed to be fish-bearing.



PROJECT NUJIO'QONIK - 2023 FISH AND FISH HABITAT FIELD DATA REPORT

As part of the desktop assessment, the proposed watercourse crossings were assessed for dominant riparian vegetation surrounding watercourses and waterbodies within the Project Right of Way (RoW) using satellite imagery. The desktop assessment was successful in predicting if shrubs or wetlands / grasses / bare would be the dominant riparian vegetation. However, trees were predicted more frequently during the desktop assessment than was observed in the field. In some cases, the satellite imagery was of insufficient quality to differentiate between tall alders and smaller deciduous trees or the understory (shrubs and grasses) were obscured by trees, resulting in an underestimation of shrubs and grasses.

The desktop assessment was typically accurate in predicting whether watercourses or waterbodies would have coarse or fine substrates, however accuracy was low when the desktop assessment predicted mixed substrates associated with shrubs. These differences are likely due to localized reach level variations in substrates (e.g., pools or other slower flowing habitats) within each watercourse that are not easily visible on imagery. Going forward the mixed substrate category will be removed and future desktop work will be completed using coarse and fine categories.

Regarding the fish community, the desktop assessment was accurate in predicting that brook trout, Atlantic salmon, American eel, and stickleback were likely to be the most common and abundant fish species to be encountered within the Project Area.

Similar field surveys are planned for the Codroy Wind Farm.

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APPENDIX A

Map Book

\\ca0151-ppf\SSO\work\group\1214\active\121417233\03_data\gis_data\mapping\mxd\general\aquatics\121417233_066d_Watercourse_Crossings_Mapbook_REV0.mxd Revised: 2023-07-27 By: NIWhite



Watercourse Crossings

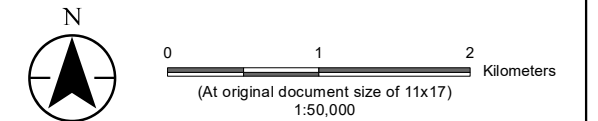
- Road Crossing
- Collector Line Crossing

Proposed Project Features

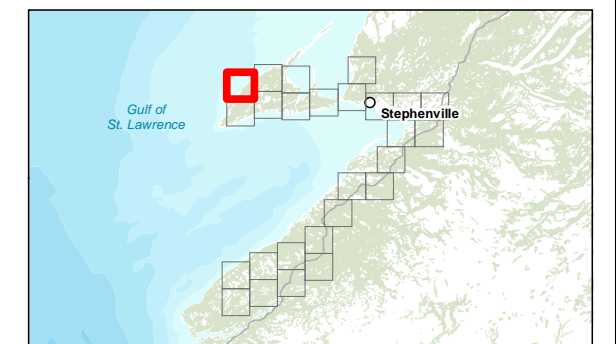
- Turbine Location
- Collector Line (Proposed)
- Access Road (Proposed)
- ▭ Project Area

Other Features

- Road / Highway
- Resource Road / Trail
- Watercourse
- Waterbody
- Wetland
- Wooded Area



- Notes**
1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
 2. Data Sources: World Energy GH2; NL ECC Water Resources Management Division; NL Fisheries, Forestry and Agriculture; NRCan CanVec
 3. Background: NRCan CanVec



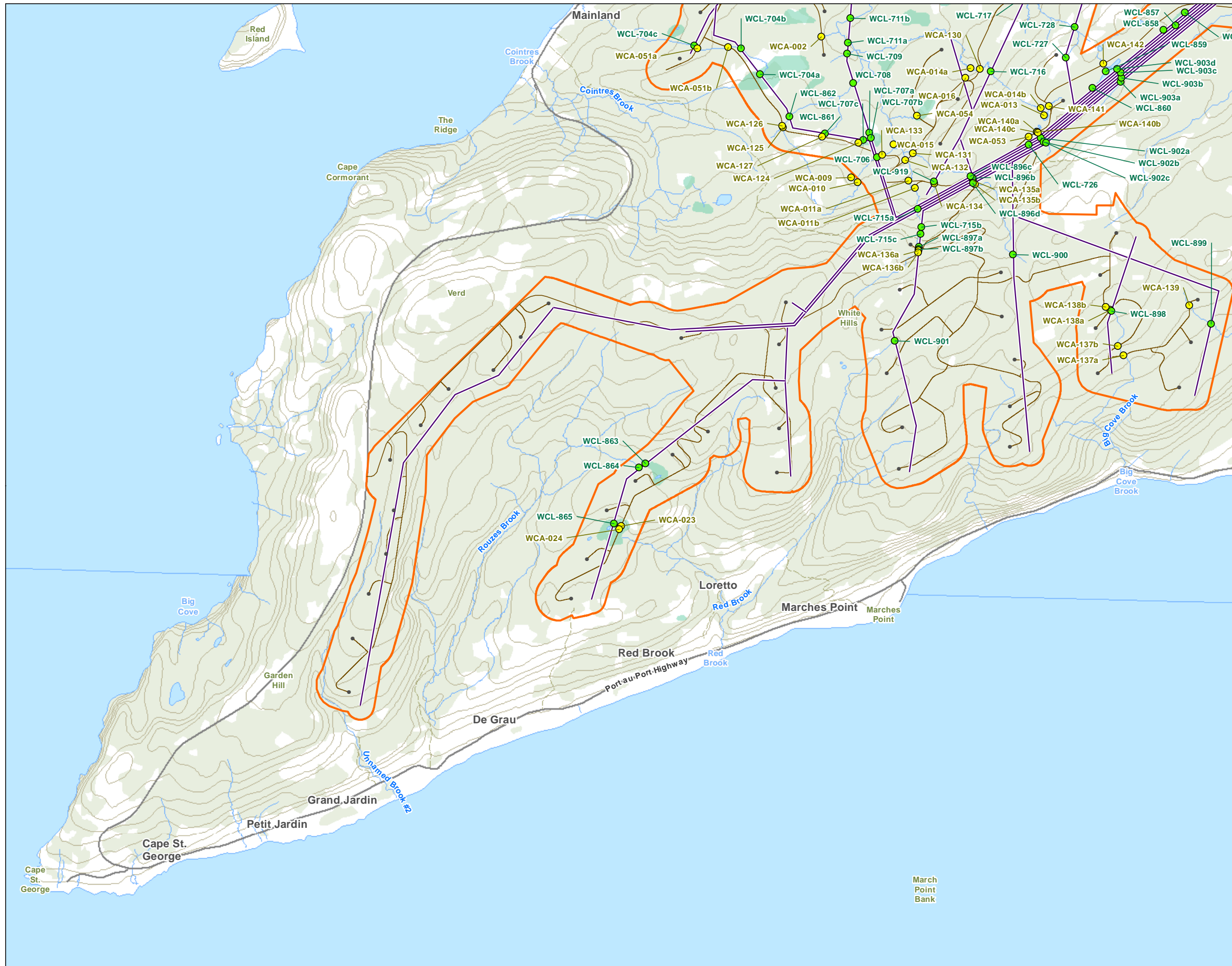
Project Location Stephenville NL	Prepared by NW on 2023-05-19 Revised by NW on 2023-07-23 QR by AW on 2023-XX-XX
Client/Project	121417233_66d REVA

World Energy GH2
Project Nujio'qonik

Appendix D

Figure No.
**Potential Watercourse Crossings for
Project Nujio'qonik GH2**

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Watercourse Crossings

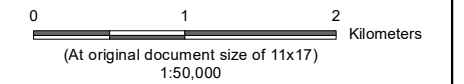
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- Collector Line Crossing

Proposed Project Features

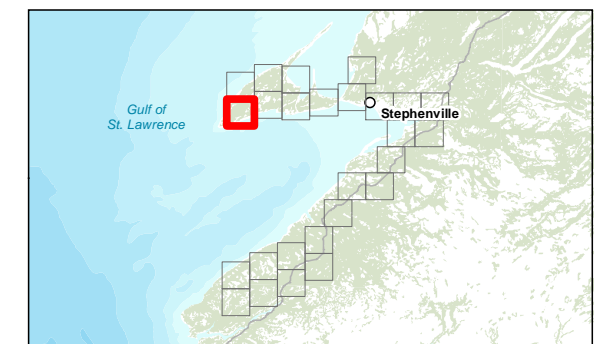
- Turbine Location
- Collector Line (Proposed)
- Access Road (Proposed)
- Project Area

Other Features

- Road / Highway
- Resource Road / Trail
- Watercourse
- Waterbody
- Wetland
- Wooded Area



- Notes**
1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
 2. Data Sources: World Energy GH2; NL ECC Water Resources Management Division; NL Fisheries, Forestry and Agriculture; NRCan CanVec
 3. Background: NRCan CanVec



Project Location Stephenville NL	Prepared by NW on 2023-05-19 Revised by NW on 2023-07-23 QR by AW on 2023-XX-XX
Client/Project	121417233_66d REVA

World Energy GH2
Project Nujio'qonik
Figure No.

Appendix D

**Potential Watercourse Crossings for
Project Nujio'qonik GH2**

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Watercourse Crossings

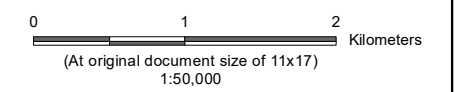
- Road Crossing
- Collector Line Crossing
- Substation Crossing
- Transmission Line Crossing

Proposed Project Features

- Turbine Location
- Substation (Proposed)
- Transmission Line 230 kV (Proposed)
- Collector Line (Proposed)
- Access Road (Proposed)
- Project Area

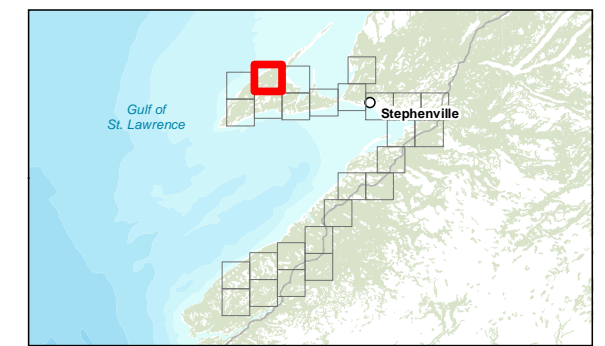
Other Features

- Road / Highway
- Resource Road / Trail
- Watercourse
- Waterbody
- Wetland
- Wooded Area



Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
2. Data Sources: World Energy GH2; NL ECC Water Resources Management Division; NL Fisheries, Forestry and Agriculture; NRCan CanVec
3. Background: NRCan CanVec



Project Location
Stephenville
NL

Prepared by NW on 2023-05-19
Revised by NW on 2023-07-23
QR by AW on 2023-XX-XX

Client/Project

121417233_66d REV A

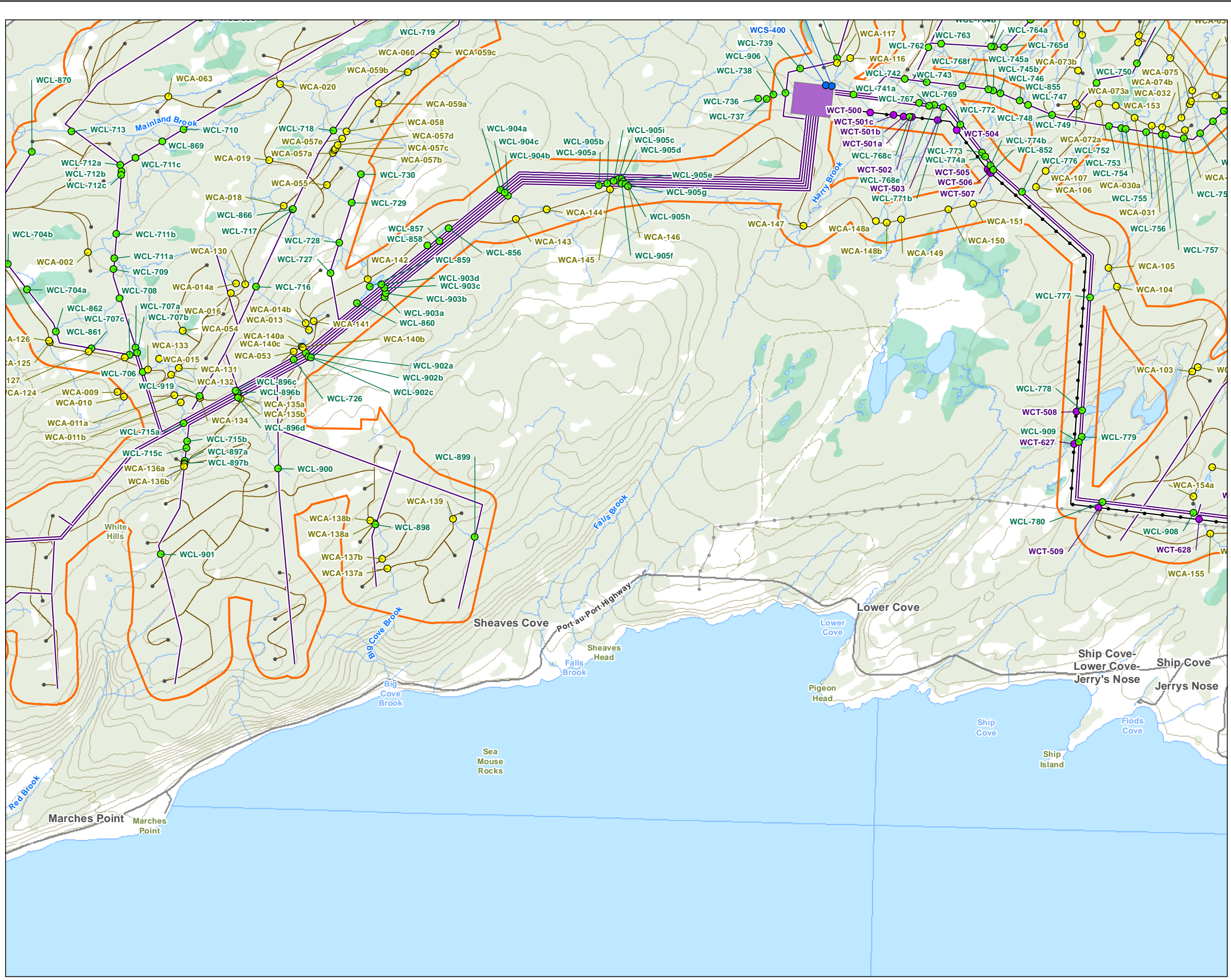
World Energy GH2
Project Nujio'qonik

Figure No.

Appendix D

**Potential Watercourse Crossings for
Project Nujio'qonik GH2**

\\ca0151-ppf\SSO\work\group1214\active\121417233\03_data\gis_card\gis_data\mapping\mxd\general\aquatics\121417233_066d_Watercourse_Crossings_Mapbook_REV.mxd Revised: 2023-07-27 By: NWhite



Watercourse Crossings

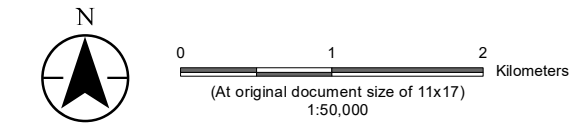
- Road Crossing
- Collector Line Crossing
- Substation Crossing
- Transmission Line Crossing

Proposed Project Features

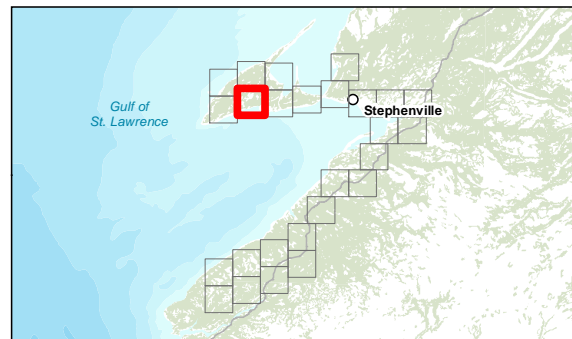
- Turbine Location
- Substation (Proposed)
- Transmission Line 230 kV (Proposed)
- Collector Line (Proposed)
- Access Road (Proposed)
- Project Area

Other Features

- Transmission Line, Existing
- Road / Highway
- Resource Road / Trail
- Watercourse
- Waterbody
- Wetland
- Wooded Area



- Notes**
1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
 2. Data Sources: World Energy GH2; NL ECC Water Resources Management Division; NL Fisheries, Forestry and Agriculture; NRCan CanVec
 3. Background: NRCan CanVec



Project Location: Stephenville, NL
 Prepared by NW on 2023-05-19
 Revised by NW on 2023-07-23
 QR by AW on 2023-XX-XX

Client/Project: 121417233_66d REVA

World Energy GH2
 Project Nujio'qonik
 Figure No.
Appendix D
 Title
Potential Watercourse Crossings for Project Nujio'qonik GH2

Watercourse Crossings

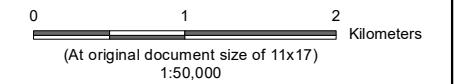
- Road Crossing
- Collector Line Crossing
- Substation Crossing
- Transmission Line Crossing

Proposed Project Features

- Turbine Location
- Substation (Proposed)
- Transmission Line 230 kV (Proposed)
- Collector Line (Proposed)
- Access Road (Proposed)
- Project Area

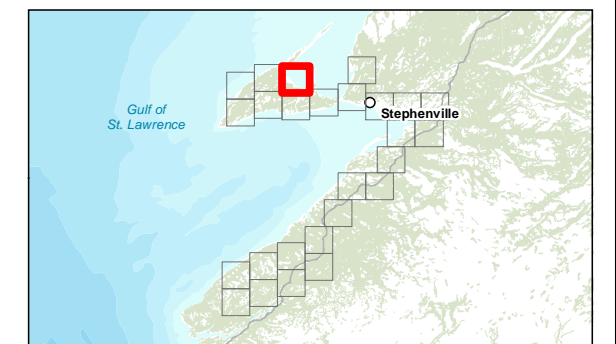
Other Features

- Road / Highway
- Resource Road / Trail
- Watercourse
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- Wooded Area



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Project Location
Stephenville
NL

Prepared by NW on 2023-05-19
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QR by AW on 2023-XX-XX

Client/Project

121417233_66d REV A

World Energy GH2
Project Nujio'qonik

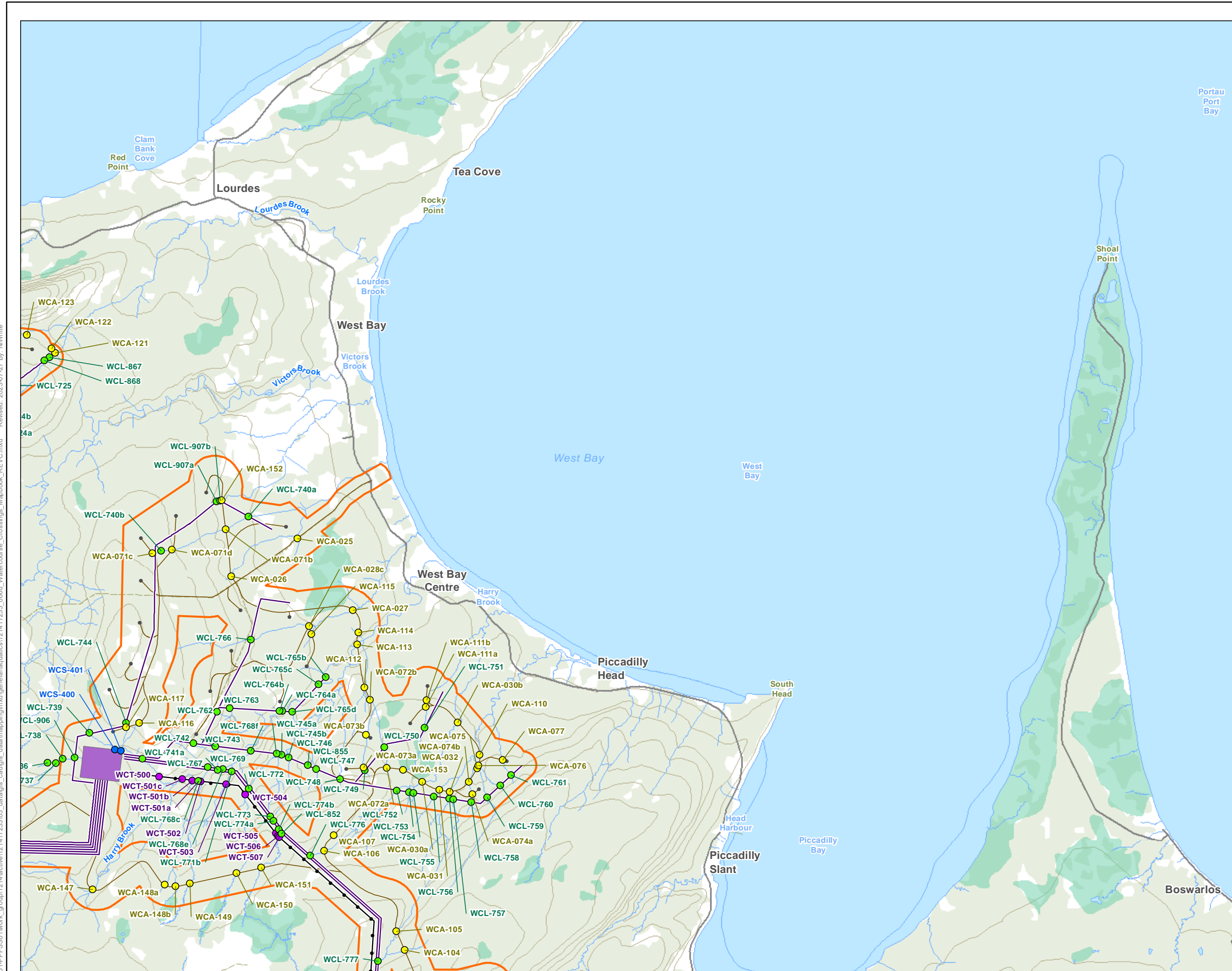
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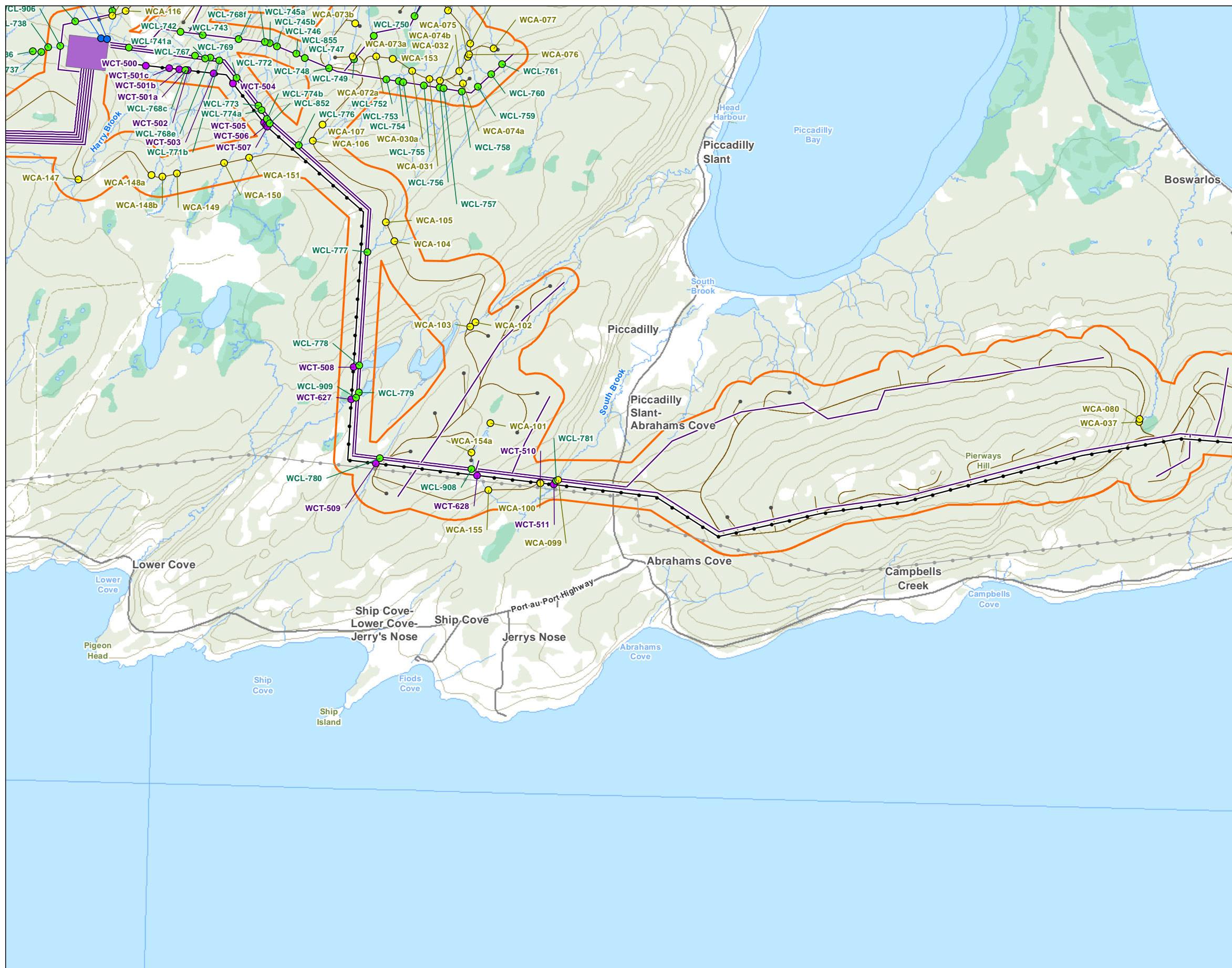
Title

**Potential Watercourse Crossings for
Project Nujio'qonik GH2**

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Watercourse Crossings

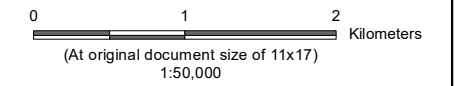
- Road Crossing
- Collector Line Crossing
- Substation Crossing
- Transmission Line Crossing

Proposed Project Features

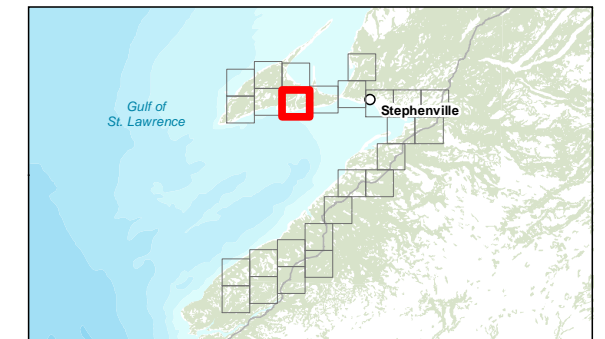
- Turbine Location
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- Collector Line (Proposed)
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- Project Area

Other Features

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Client/Project: 121417233_66d REVA

World Energy GH2
 Project Nujio'qonik

Figure No.
Appendix D
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Potential Watercourse Crossings for Project Nujio'qonik GH2

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Watercourse Crossings

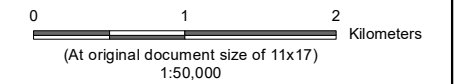
- Road Crossing
- Collector Line Crossing
- Transmission Line Crossing

Proposed Project Features

- Turbine Location
- Substation (Proposed)
- Transmission Line 230 kV (Proposed)
- Collector Line (Proposed)
- Access Road (Proposed)
- Project Area

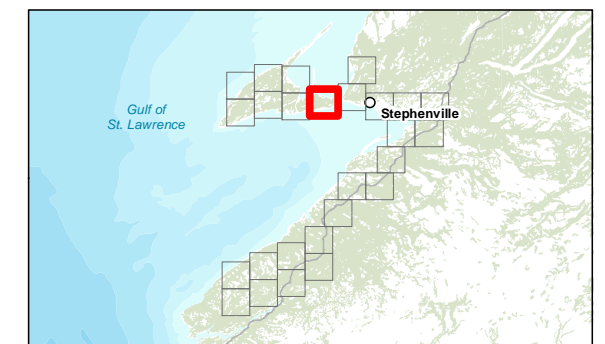
Other Features

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Project Location
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Client/Project

121417233_66d REVA

World Energy GH2
Project Nujio'qonik

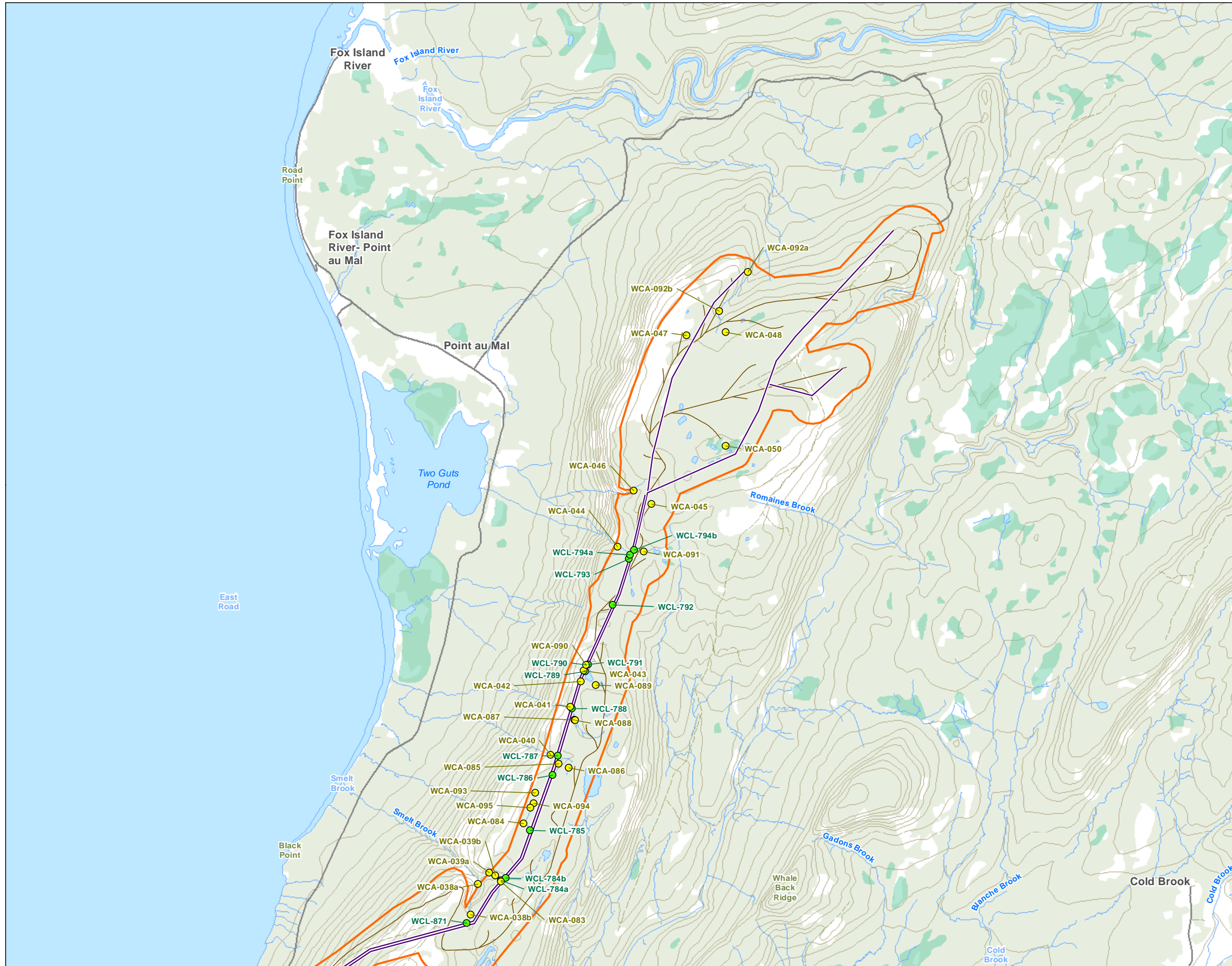
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**Potential Watercourse Crossings for
Project Nujio'qonik GH2**

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Watercourse Crossings

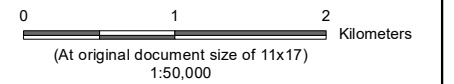
- Road Crossing
- Collector Line Crossing

Proposed Project Features

- Collector Line (Proposed)
- Access Road (Proposed)
- ▭ Project Area

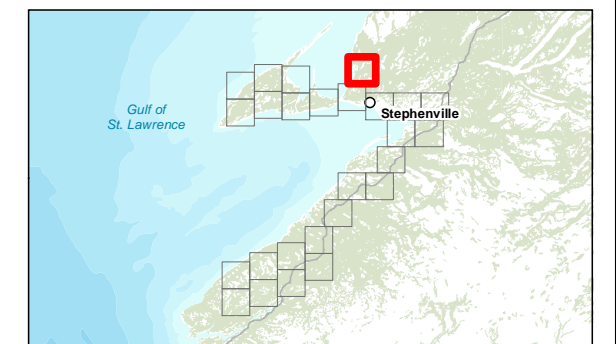
Other Features

- Road / Highway
- Resource Road / Trail
- Watercourse
- Waterbody
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- Wooded Area



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Client/Project

121417233_66d REVA

World Energy GH2
Project Nujio'qonik

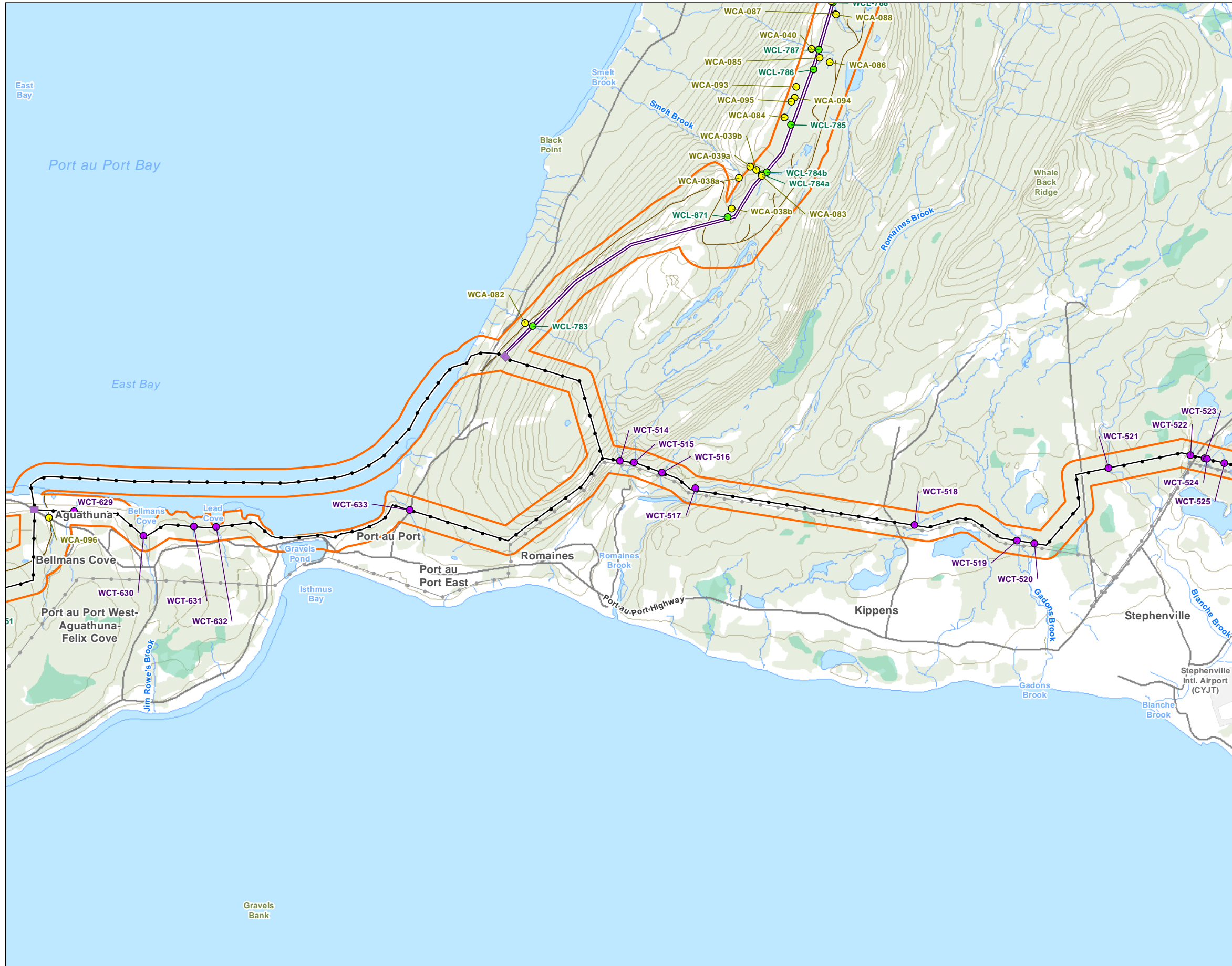
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**Potential Watercourse Crossings for
Project Nujio'qonik GH2**

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Watercourse Crossings

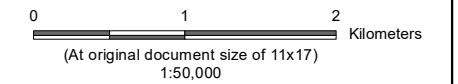
- Road Crossing
- Collector Line Crossing
- Transmission Line Crossing

Proposed Project Features

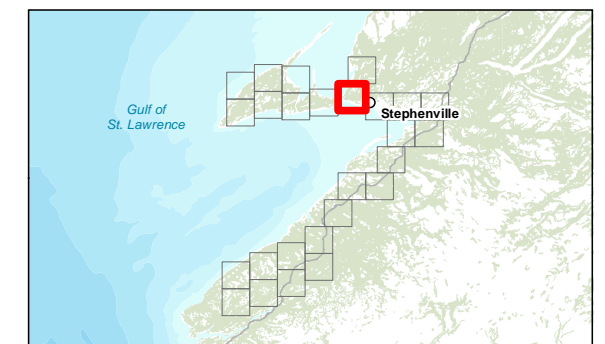
- Substation (Proposed)
- Transmission Line 230 kV (Proposed)
- Collector Line (Proposed)
- Access Road (Proposed)
- Project Area

Other Features

- Transmission Line, Existing
- Road / Highway
- Resource Road / Trail
- Watercourse
- Waterbody
- Wetland
- Wooded Area



- Notes**
1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
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 3. Background: NRCan CanVec



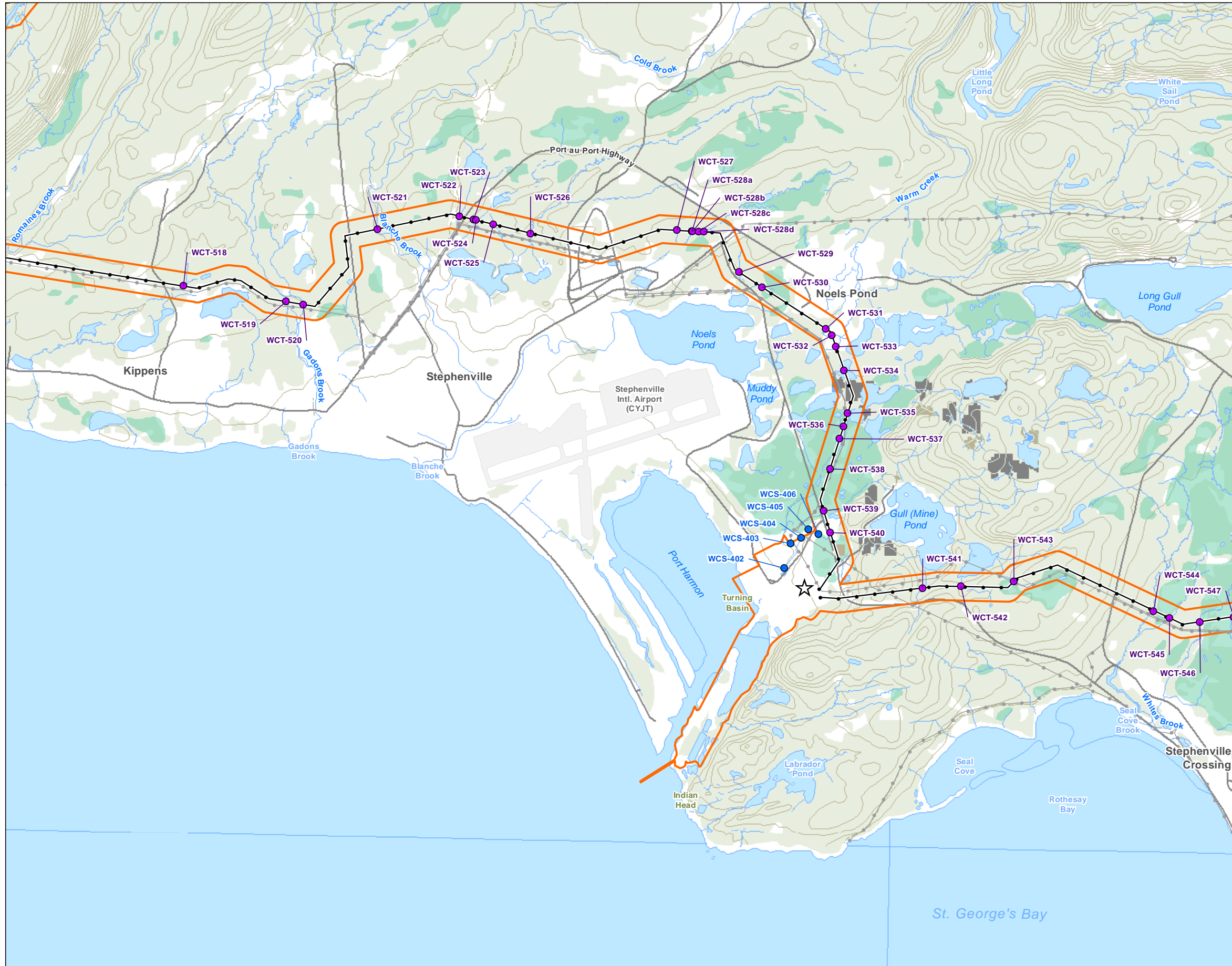
Project Location Stephenville NL	Prepared by NW on 2023-05-19 Revised by NW on 2023-07-23 QR by AW on 2023-XX-XX
Client/Project	121417233_66d REVA

World Energy GH2
Project Nujio'qonik

Appendix D

**Potential Watercourse Crossings for
Project Nujio'qonik GH2**

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Watercourse Crossings

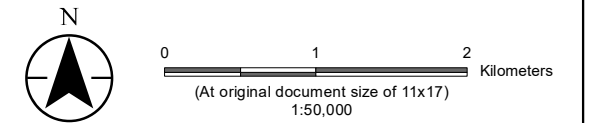
- Substation Crossing
- Transmission Line Crossing

Proposed Project Features

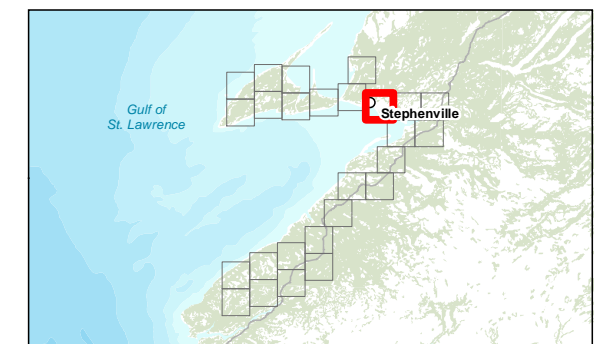
- ☆ Hydrogen / Ammonia Plant Facility
- Transmission Line 230 kV (Proposed)
- Access Road (Proposed)
- ▭ Project Area

Other Features

- Transmission Line, Existing
- Road / Highway
- Resource Road / Trail
- Watercourse
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Project Location Stephenville NL	Prepared by NW on 2023-05-19 Revised by NW on 2023-07-23 QR by AW on 2023-XX-XX
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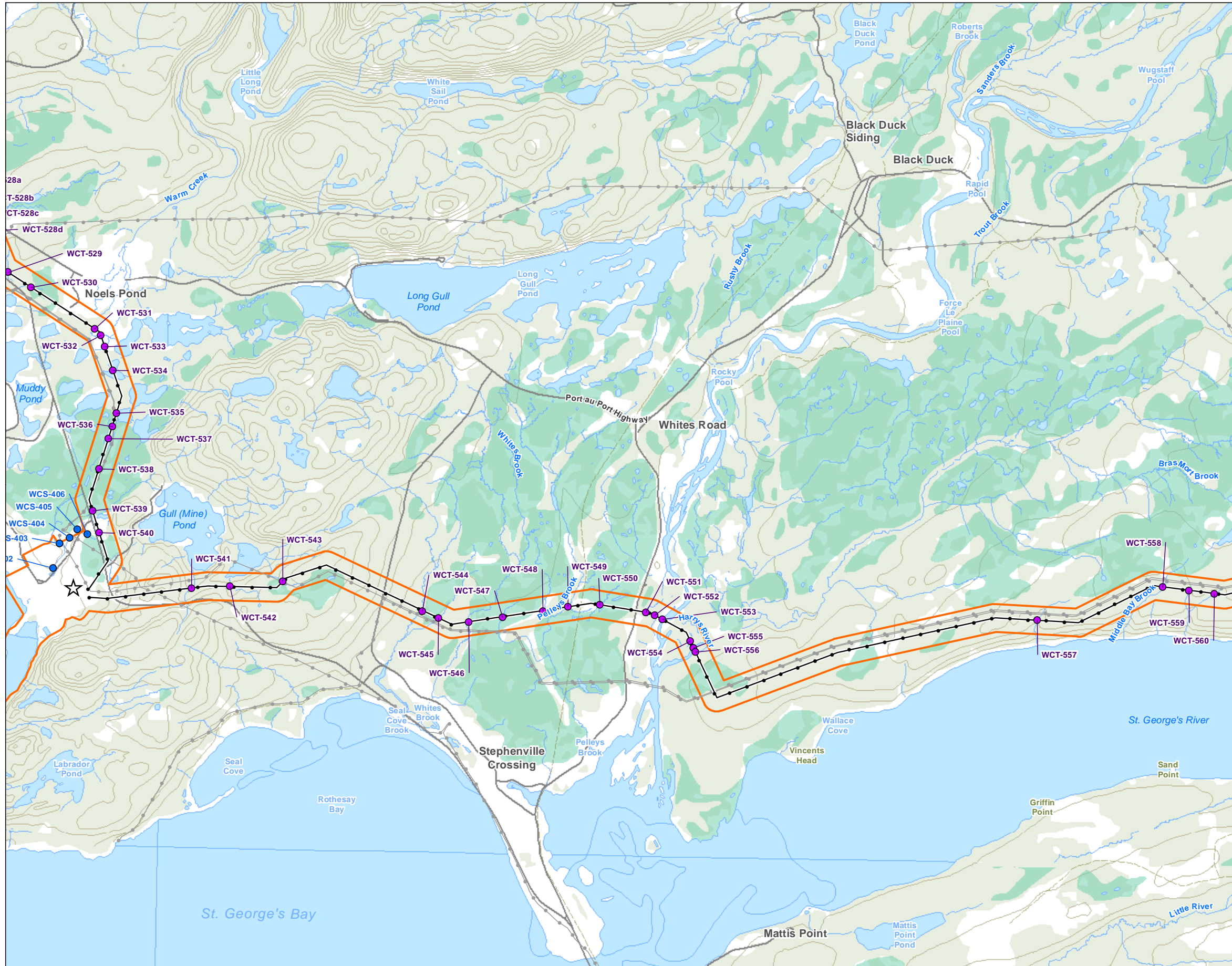
World Energy GH2
Project Nujio'qonik

Figure No.

Appendix D

Title
**Potential Watercourse Crossings for
Project Nujio'qonik GH2**

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Watercourse Crossings

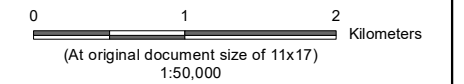
- Substation Crossing
- Transmission Line Crossing

Proposed Project Features

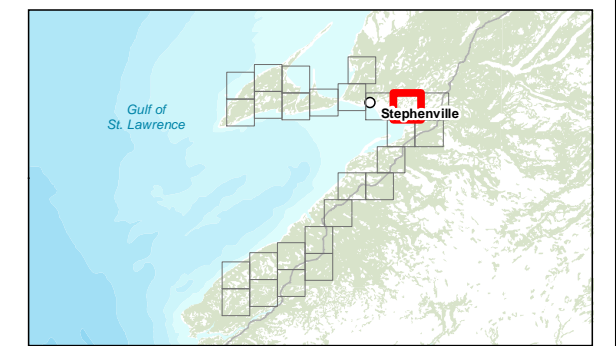
- ☆ Hydrogen / Ammonia Plant Facility
- Transmission Line 230 kV (Proposed)
- ▭ Project Area

Other Features

- Transmission Line, Existing
- Road / Highway
- - - Resource Road / Trail
- Watercourse
- Waterbody
- Wetland
- Wooded Area



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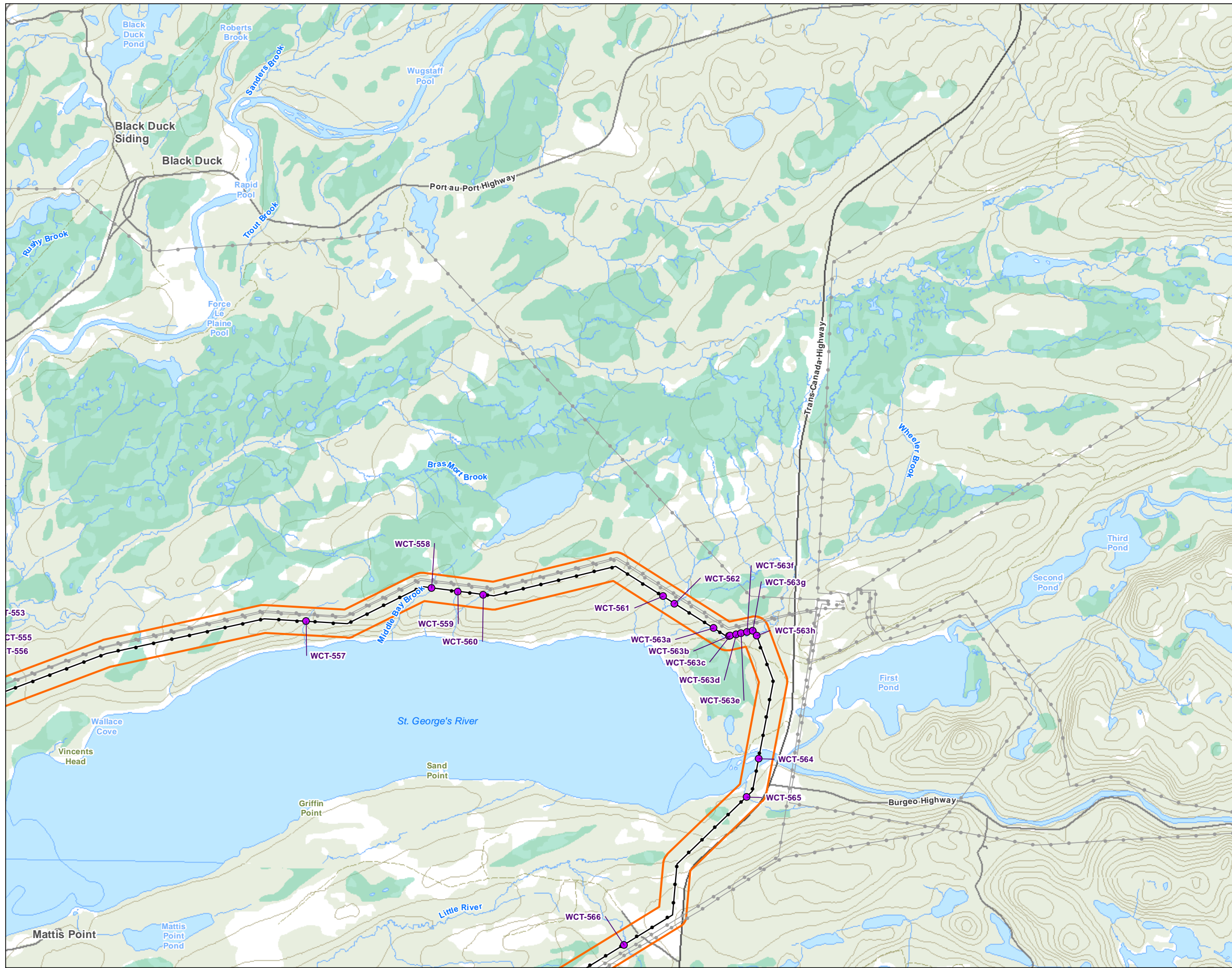
Project Location Stephenville NL	Prepared by NW on 2023-05-19 Revised by NW on 2023-07-23 QR by AW on 2023-XX-XX
Client/Project	121417233_66d REVA

World Energy GH2
Project Nujjo'qonik
Figure No.

Appendix D

Title
**Potential Watercourse Crossings for
Project Nujjo'qonik GH2**

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Watercourse Crossings

- Transmission Line Crossing

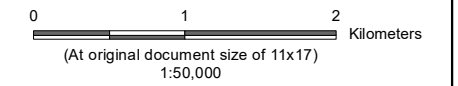
Proposed Project Features

- Transmission Line 230 kV (Proposed)

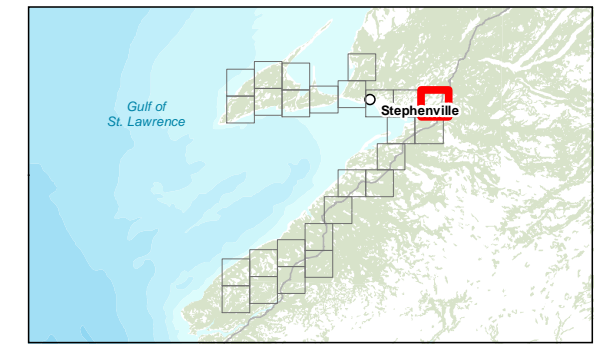
- ▭ Project Area

Other Features

- Transmission Line, Existing
- Trans Canada Highway
- Road / Highway
- Resource Road / Trail
- Watercourse
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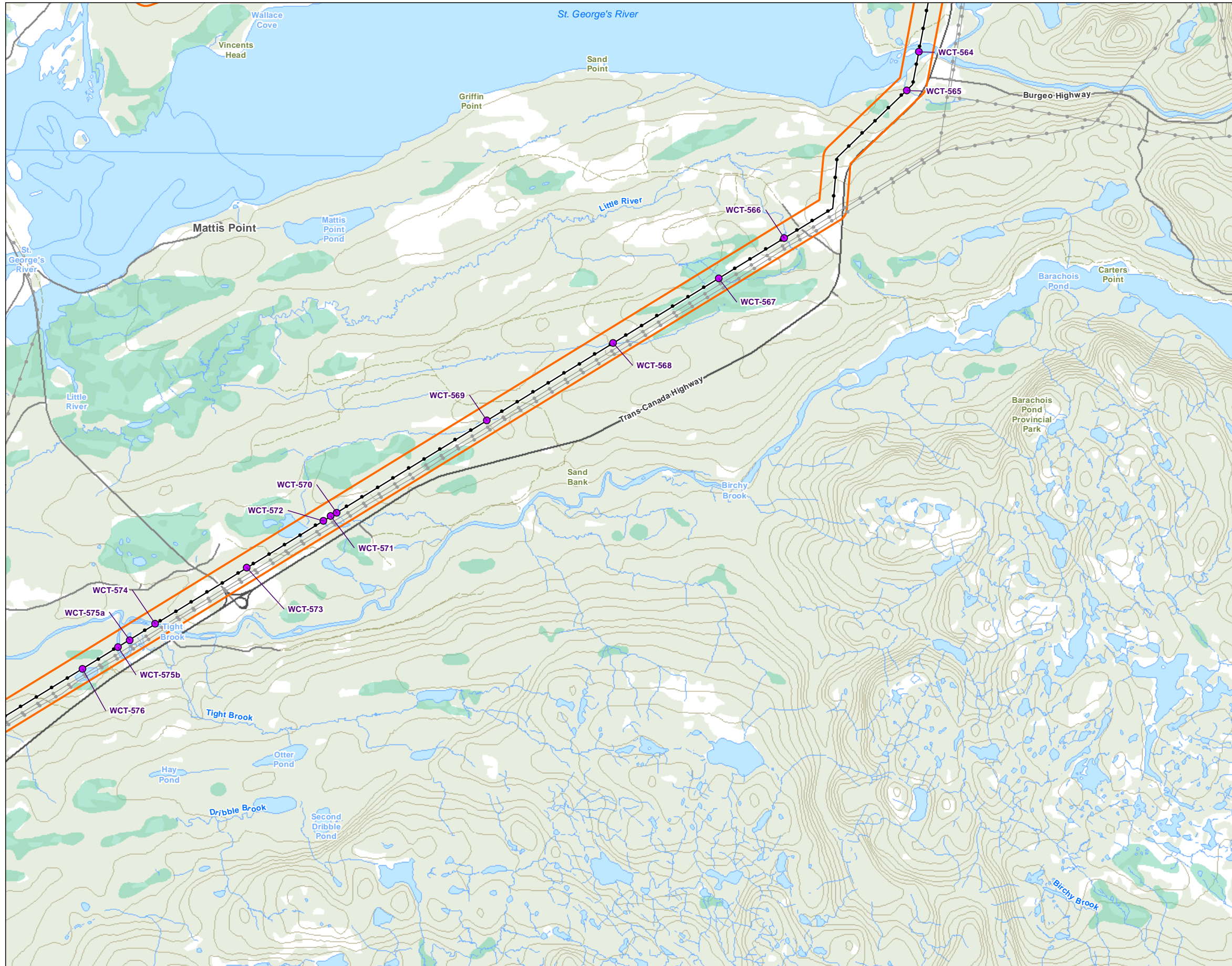


Project Location Stephenville NL	Prepared by NW on 2023-05-19 Revised by NW on 2023-07-23 QR by AW on 2023-XX-XX
Client/Project	121417233_66d REVA

World Energy GH2
Project Nujio'qonik

Figure No.
Appendix D
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Potential Watercourse Crossings for Project Nujio'qonik GH2

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Watercourse Crossings

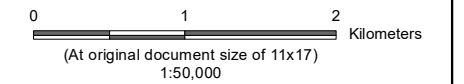
- Transmission Line Crossing

Proposed Project Features

- Transmission Line 230 kV (Proposed)
- ▭ Project Area

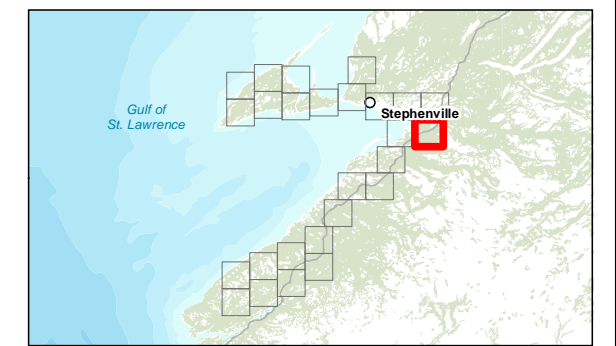
Other Features

- Transmission Line, Existing
- Trans Canada Highway
- Road / Highway
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Project Location
Stephenville
NL

Prepared by NW on 2023-05-19
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Client/Project

121417233_66d REVA

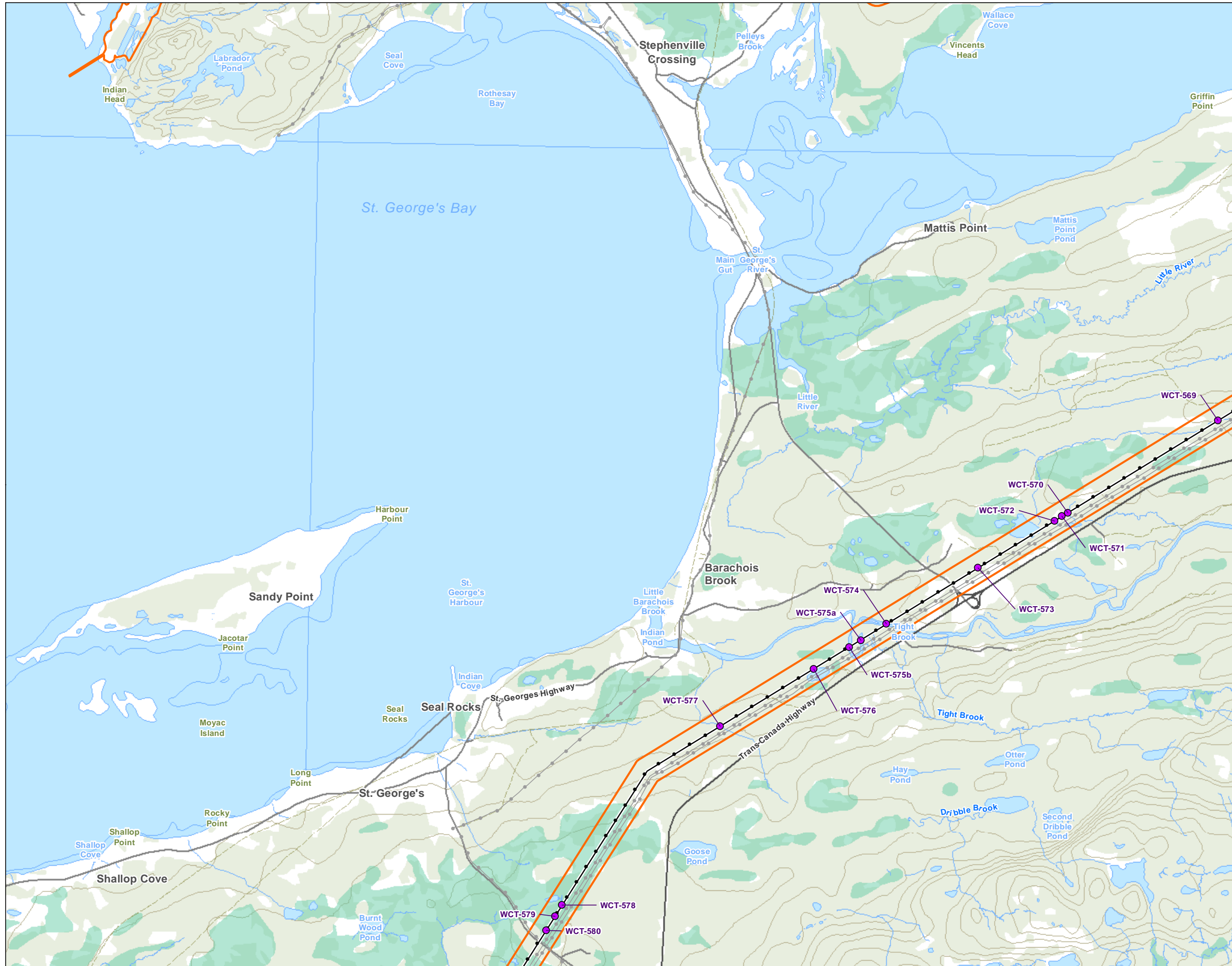
World Energy GH2
Project Nujio'qonik

Figure No.

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**Potential Watercourse Crossings for
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Watercourse Crossings

- Transmission Line Crossing

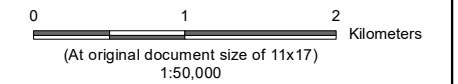
Proposed Project Features

- Transmission Line 230 kV (Proposed)

- ▭ Project Area

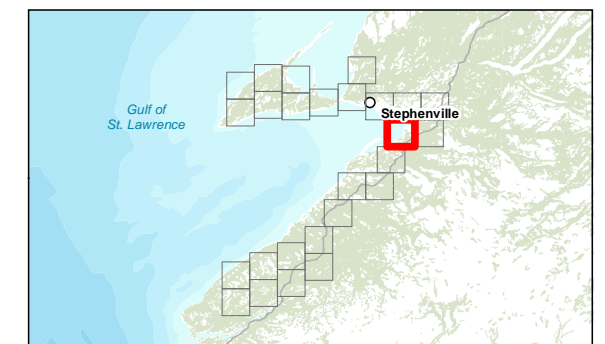
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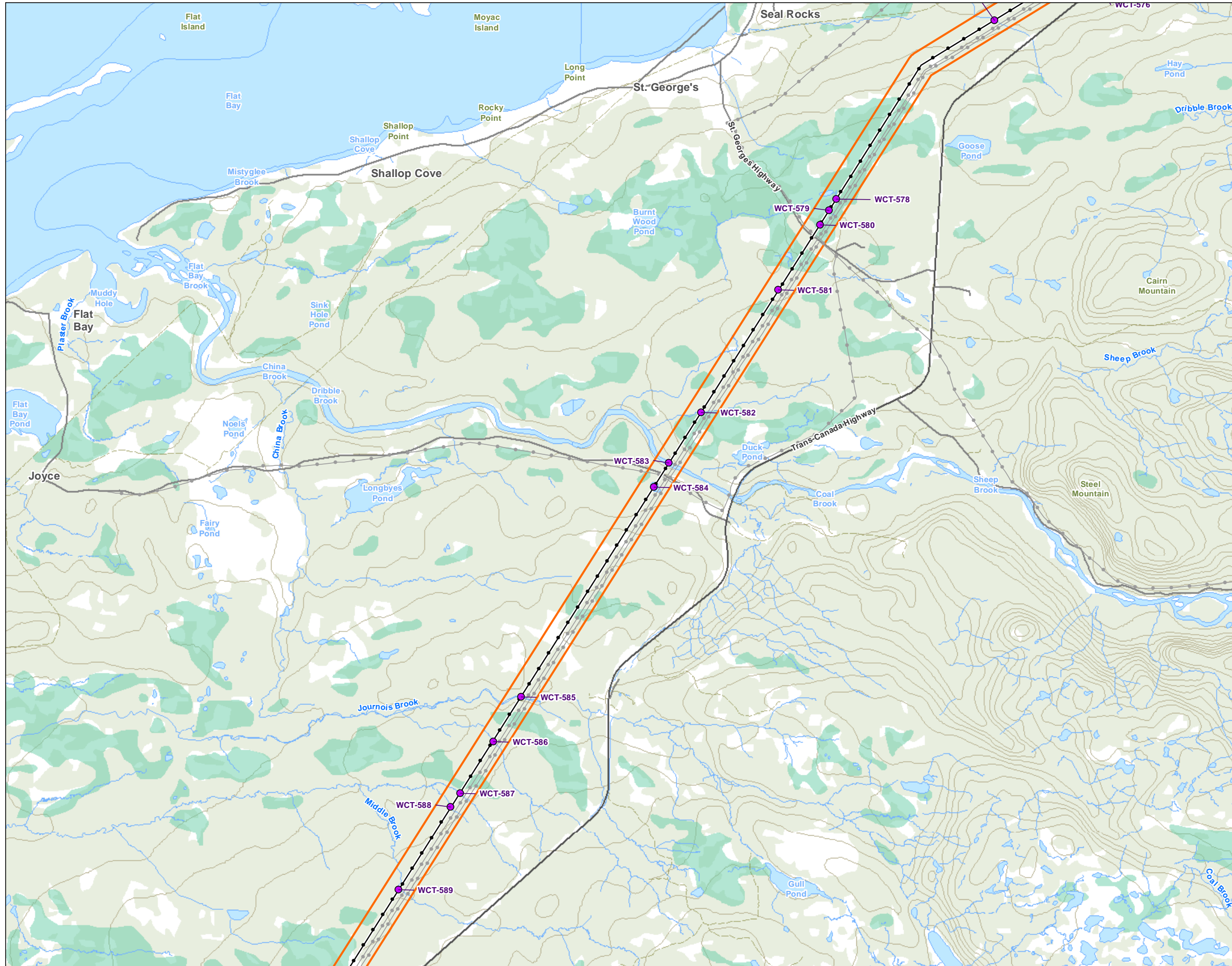
World Energy GH2
Project Nujio'qonik

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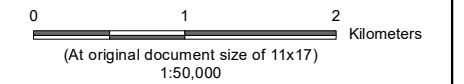
- Transmission Line Crossing

Proposed Project Features

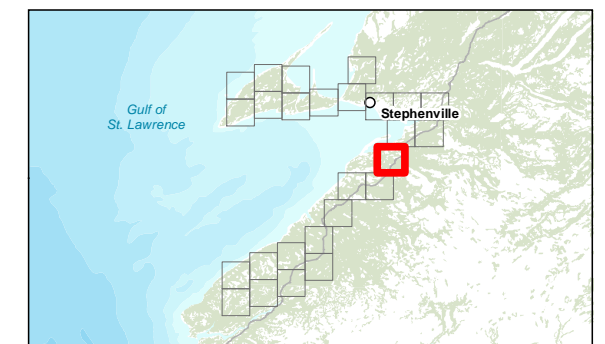
- Transmission Line 230 kV (Proposed)
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Other Features

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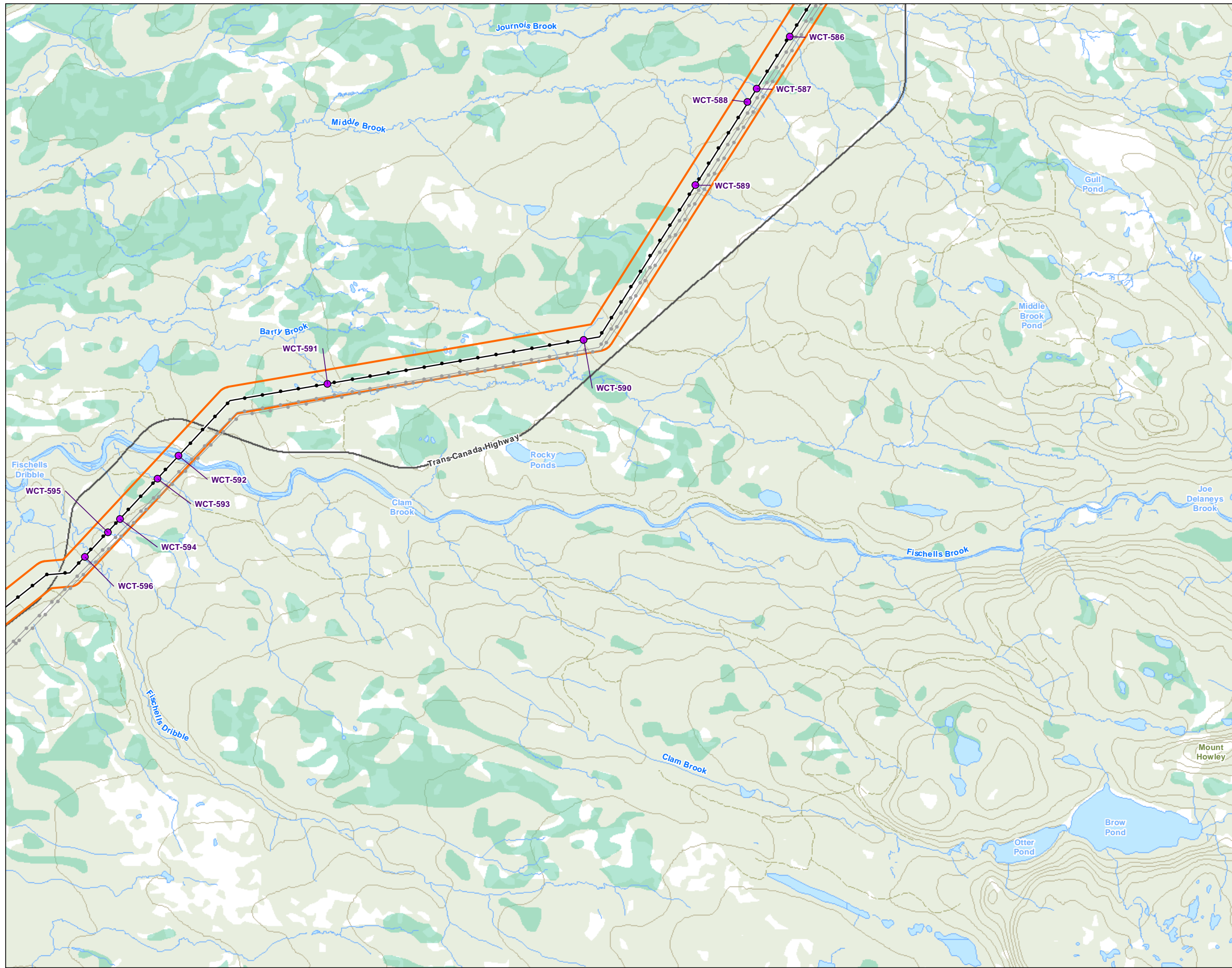


Project Location Stephenville NL	Prepared by NW on 2023-05-19 Revised by NW on 2023-07-23 QR by AW on 2023-XX-XX
Client/Project	121417233_66d REVA

World Energy GH2
Project Nujio'qonik
Figure No.

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Watercourse Crossings

- Transmission Line Crossing

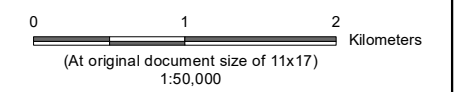
Proposed Project Features

- Transmission Line 230 kV (Proposed)

- ▭ Project Area

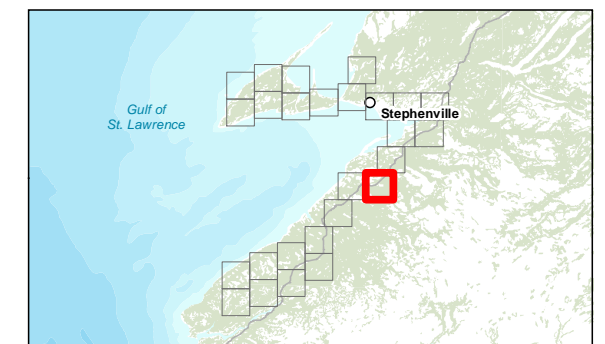
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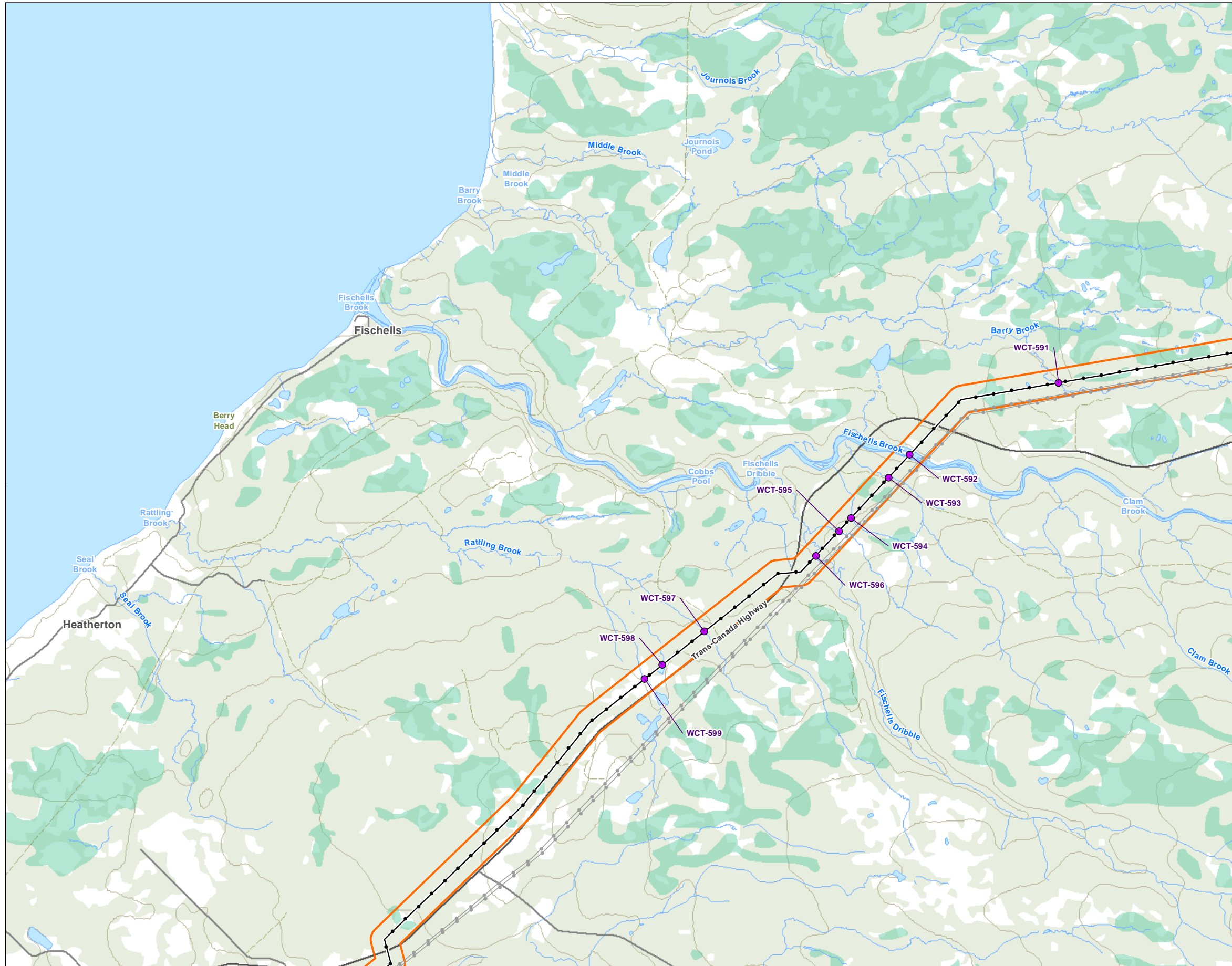
World Energy GH2
Project Nujio'qonik

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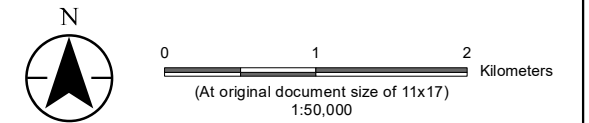
- Transmission Line Crossing

Proposed Project Features

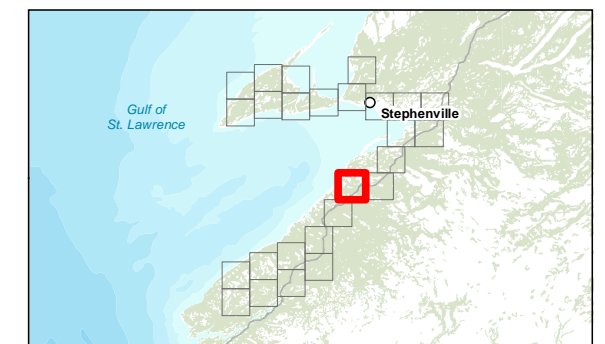
- Transmission Line 230 kV (Proposed)
- ▭ Project Area

Other Features

- Transmission Line, Existing
- Trans Canada Highway
- Road / Highway
- Resource Road / Trail
- Watercourse
- Waterbody
- Wetland
- Wooded Area



- Notes**
1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
 2. Data Sources: World Energy GH2; NL ECC Water Resources Management Division; NL Fisheries, Forestry and Agriculture; NRCan CanVec
 3. Background: NRCan CanVec



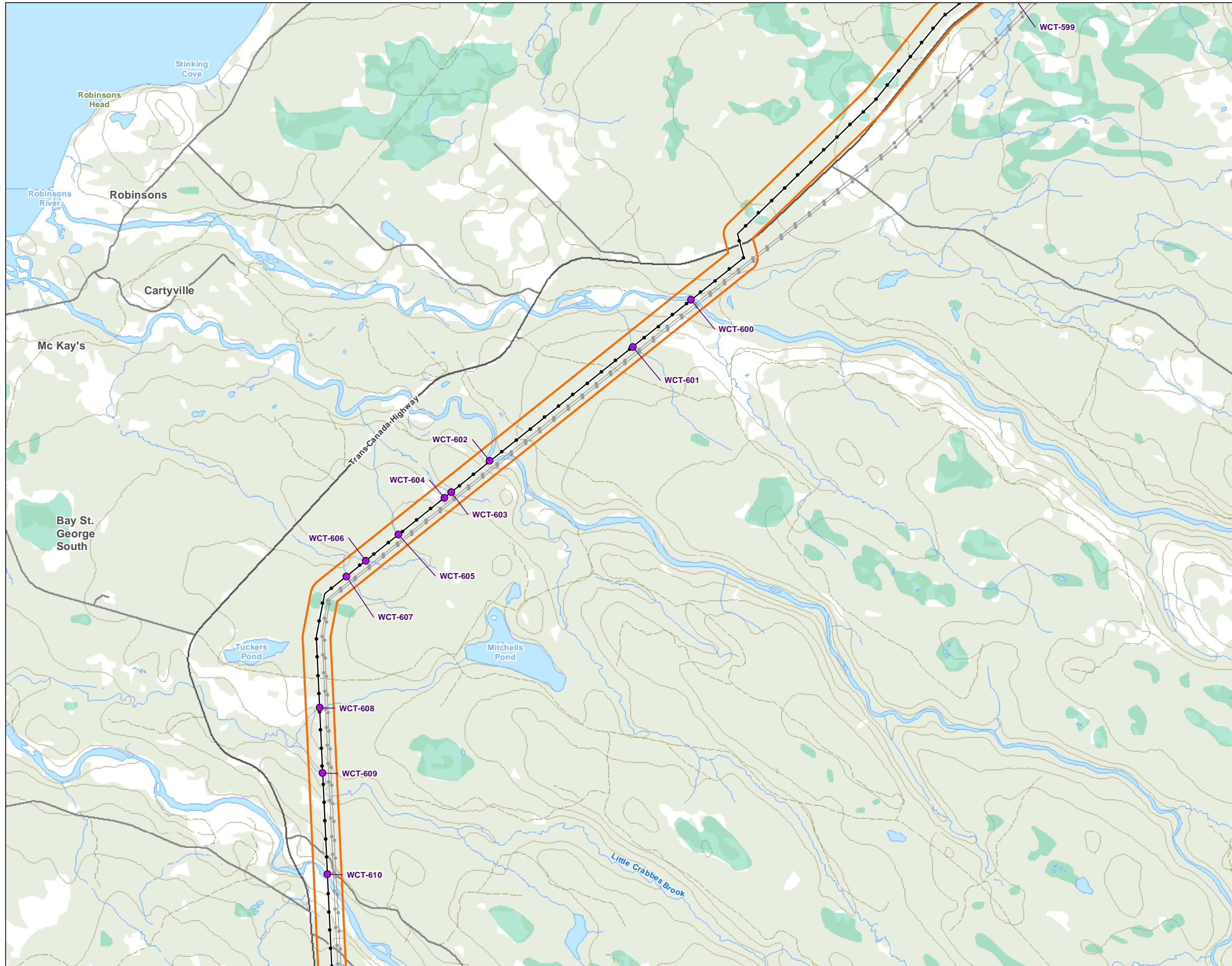
Project Location Stephenville NL	Prepared by NW on 2023-05-19 Revised by NW on 2023-07-23 QR by AW on 2023-XX-XX
Client/Project	121417233_66d REVA

World Energy GH2
Project Nujio'qonik
Figure No.

Appendix D

Title
**Potential Watercourse Crossings for
Project Nujio'qonik GH2**

\\ca0151-PPFSSO\work_group\1214\active\121417233\03_data\gis_data\mapping\mxd\general\aquatics\121417233_066d_Watercourse_Crossings_Mapbook_REV0.mxd Revised: 2023-07-27 By: NWWhite



Watercourse Crossings

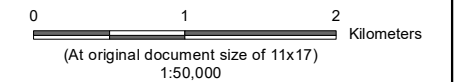
- Transmission Line Crossing

Proposed Project Features

- Transmission Line 230 kV (Proposed)
- ▭ Project Area

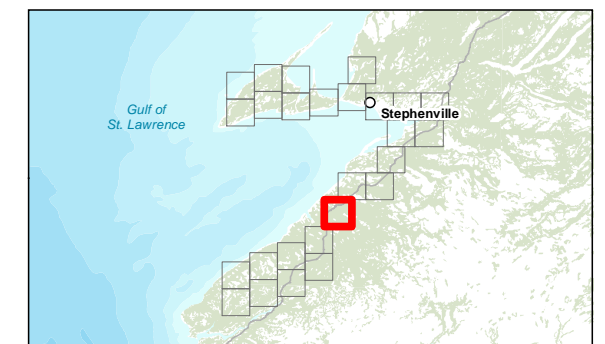
Other Features

- Transmission Line, Existing
- Trans Canada Highway
- Road / Highway
- Resource Road / Trail
- Watercourse
- Waterbody
- Wetland
- Wooded Area



Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
2. Data Sources: World Energy GH2; NL ECC Water Resources Management Division; NL Fisheries, Forestry and Agriculture; NRCan CanVec
3. Background: NRCan CanVec



Project Location
Stephenville
NL

Prepared by NW on 2023-05-19
Revised by NW on 2023-07-23
QR by AW on 2023-XX-XX

Client/Project

121417233_66d REVA

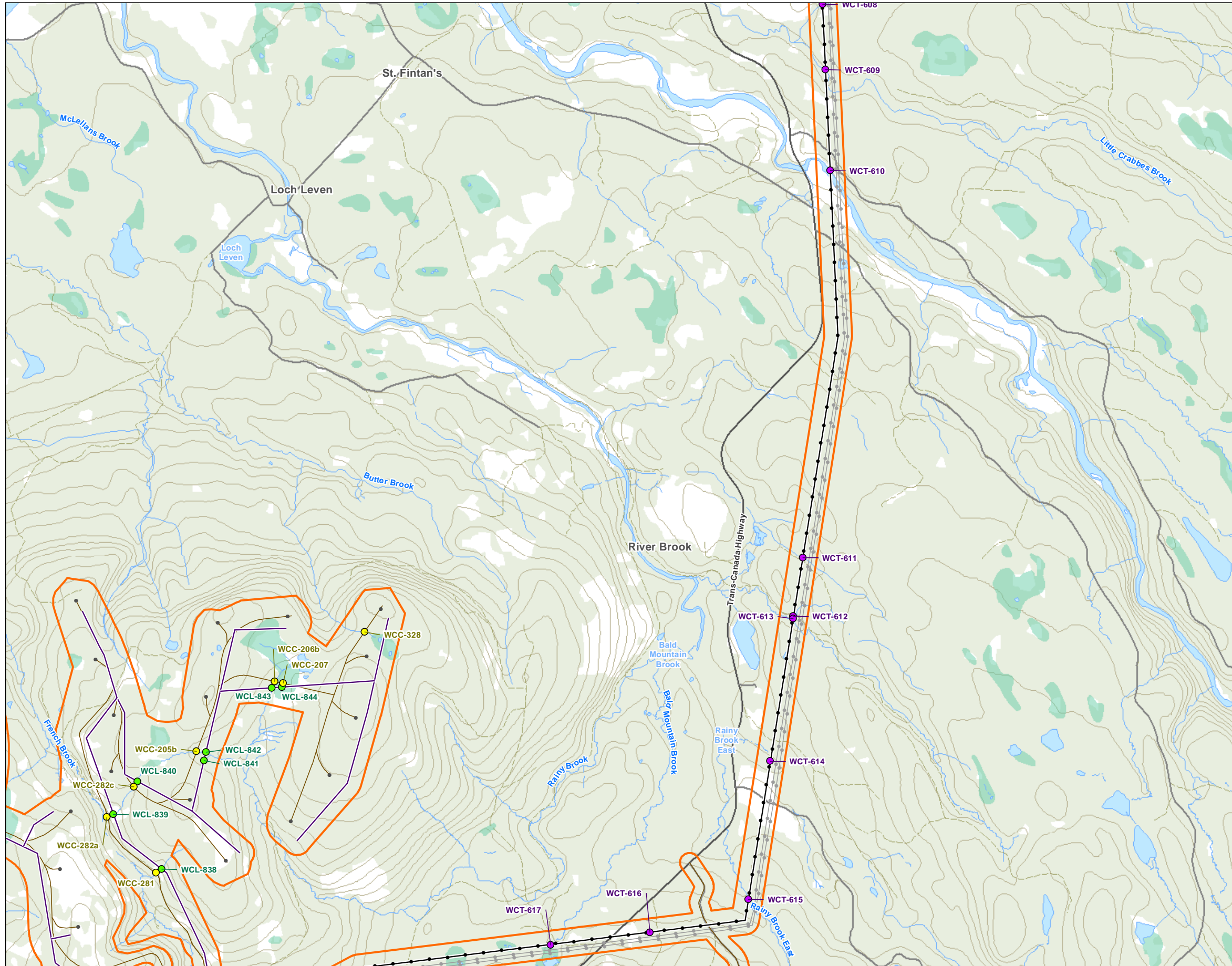
World Energy GH2
Project Nujio'qonik

Figure No.

Appendix D

**Potential Watercourse Crossings for
Project Nujio'qonik GH2**

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Watercourse Crossings

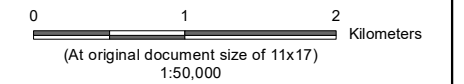
- Road Crossing
- Collector Line Crossing
- Transmission Line Crossing

Proposed Project Features

- Turbine Location
- Transmission Line 230 kV (Proposed)
- Collector Line (Proposed)
- Access Road (Proposed)
- Project Area

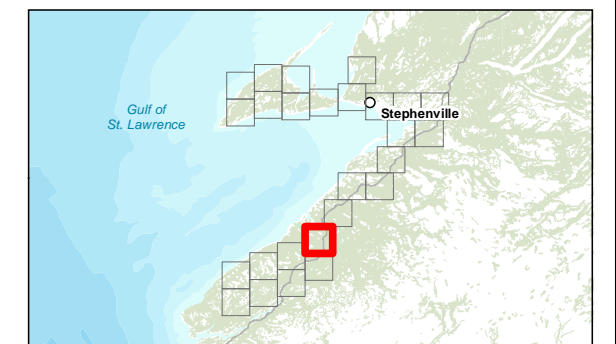
Other Features

- Transmission Line, Existing
- Trans Canada Highway
- Road / Highway
- Resource Road / Trail
- Watercourse
- Waterbody
- Wetland
- Wooded Area



Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
2. Data Sources: World Energy GH2; NL ECC Water Resources Management Division; NL Fisheries, Forestry and Agriculture; NRCan CanVec
3. Background: NRCan CanVec



Project Location
Stephenville
NL

Prepared by NW on 2023-05-19
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QR by AW on 2023-XX-XX

Client/Project

121417233_66d REVA

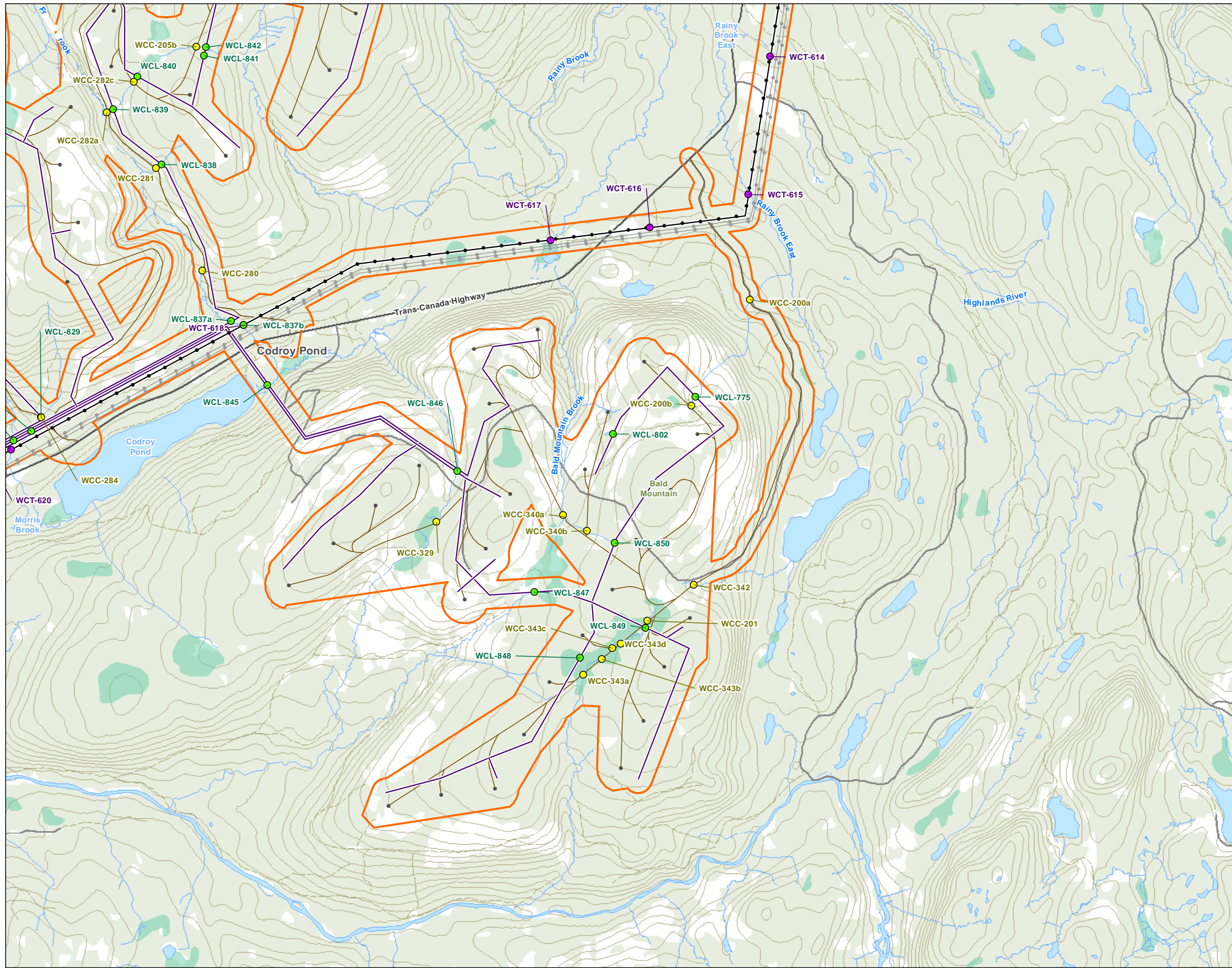
World Energy GH2
Project Nujio'qonik

Figure No.

Appendix D

Title
**Potential Watercourse Crossings for
Project Nujio'qonik GH2**

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Watercourse Crossings

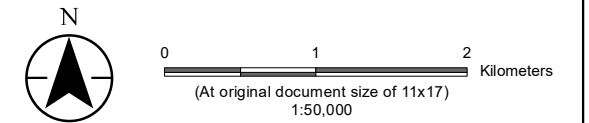
- Road Crossing
- Collector Line Crossing
- Transmission Line Crossing

Proposed Project Features

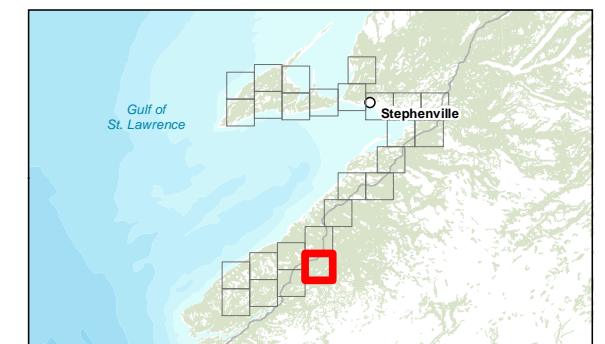
- Turbine Location
- Transmission Line 230 kV (Proposed)
- Collector Line (Proposed)
- Access Road (Proposed)
- ▭ Project Area

Other Features

- Transmission Line, Existing
- Trans Canada Highway
- Road / Highway
- Resource Road / Trail
- Watercourse
- Waterbody
- Wetland
- Wooded Area



- Notes**
1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
 2. Data Sources: World Energy GH2; NL ECC Water Resources Management Division; NL Fisheries, Forestry and Agriculture; NRCan CanVec
 3. Background: NRCan CanVec



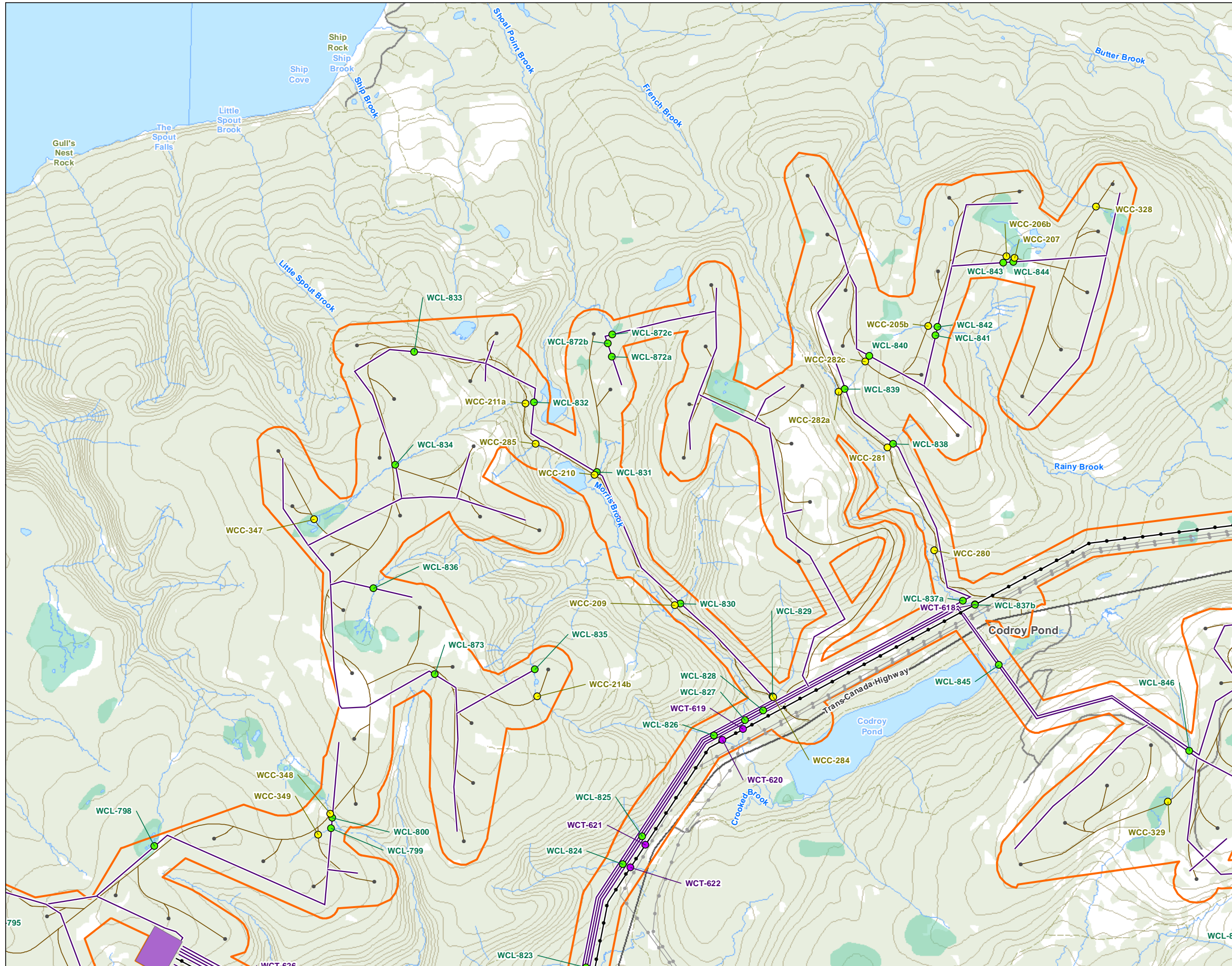
Project Location Stephenville NL	Prepared by NW on 2023-05-19 Revised by NW on 2023-07-23 QR by AW on 2023-XX-XX
Client/Project	121417233_66d REVA

World Energy GH2
Project Nujio'qonik
Figure No.

Appendix D

Title
**Potential Watercourse Crossings for
Project Nujio'qonik GH2**

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Watercourse Crossings

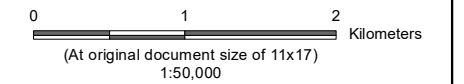
- Road Crossing
- Collector Line Crossing
- Transmission Line Crossing

Proposed Project Features

- Turbine Location
- Substation (Proposed)
- Transmission Line 230 kV (Proposed)
- Collector Line (Proposed)
- Access Road (Proposed)
- Project Area

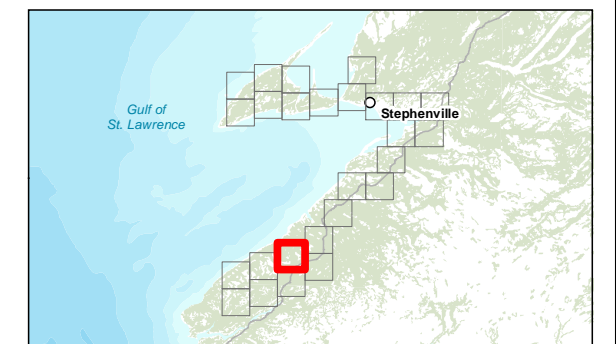
Other Features

- Transmission Line, Existing
- Trans Canada Highway
- Road / Highway
- Resource Road / Trail
- Watercourse
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3. Background: NRCan CanVec



Project Location
Stephenville
NL

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Client/Project

121417233_66d REVA

World Energy GH2
Project Nujio'qonik

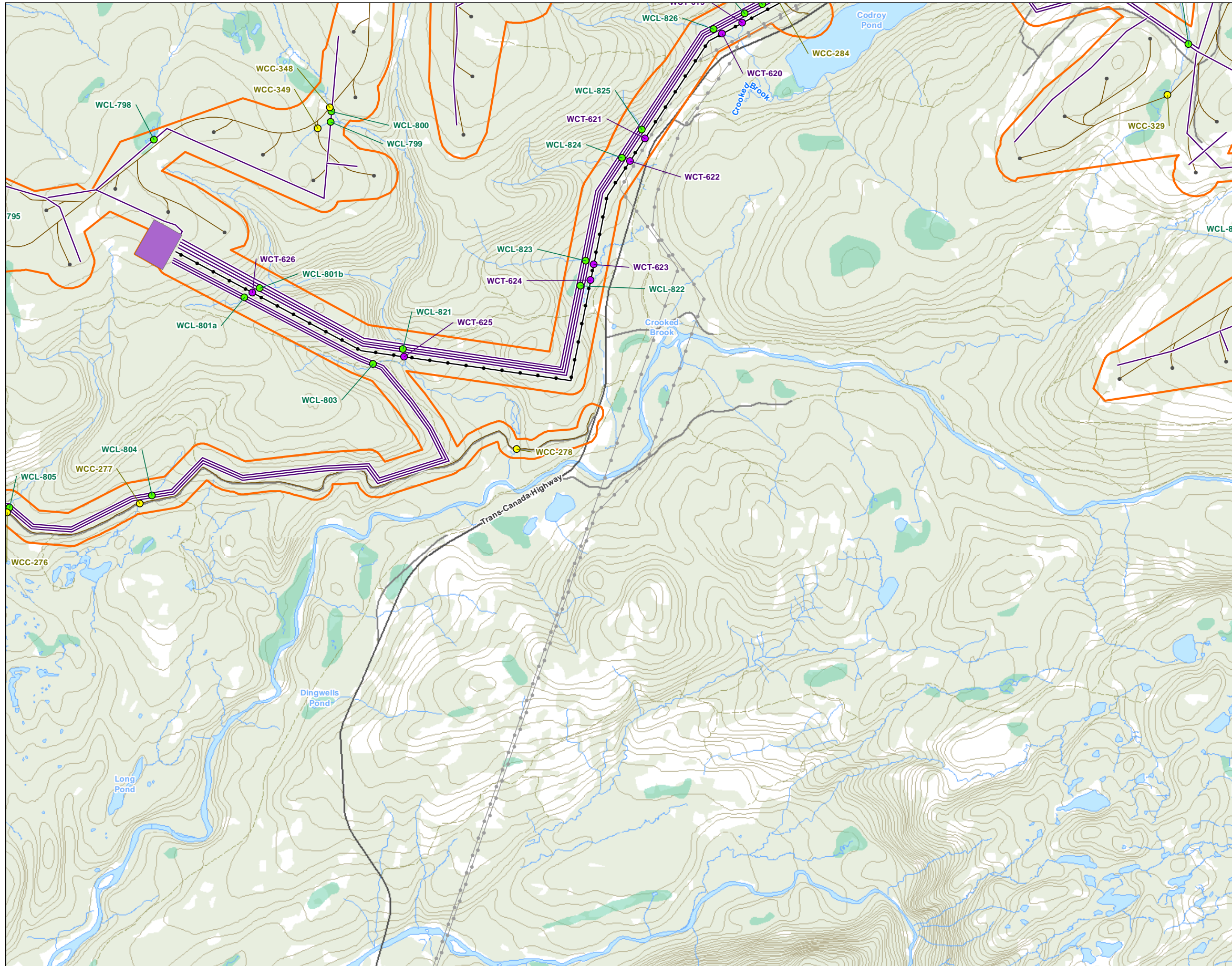
Figure No.

Appendix D

Title

**Potential Watercourse Crossings for
Project Nujio'qonik GH2**

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Watercourse Crossings

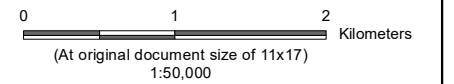
- Road Crossing
- Collector Line Crossing
- Transmission Line Crossing

Proposed Project Features

- Turbine Location
- Substation (Proposed)
- Transmission Line 230 kV (Proposed)
- Collector Line (Proposed)
- Access Road (Proposed)
- Project Area

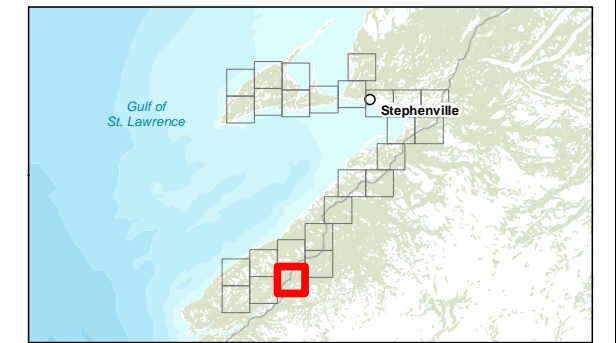
Other Features

- Transmission Line, Existing
- Trans Canada Highway
- Road / Highway
- Resource Road / Trail
- Watercourse
- Waterbody
- Wetland
- Wooded Area



Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
2. Data Sources: World Energy GH2; NL ECC Water Resources Management Division; NL Fisheries, Forestry and Agriculture; NRCan CanVec
3. Background: NRCan CanVec



Project Location
Stephenville
NL

Prepared by NW on 2023-05-19
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Client/Project

121417233_66d REVA

World Energy GH2
Project Nujio'qonik

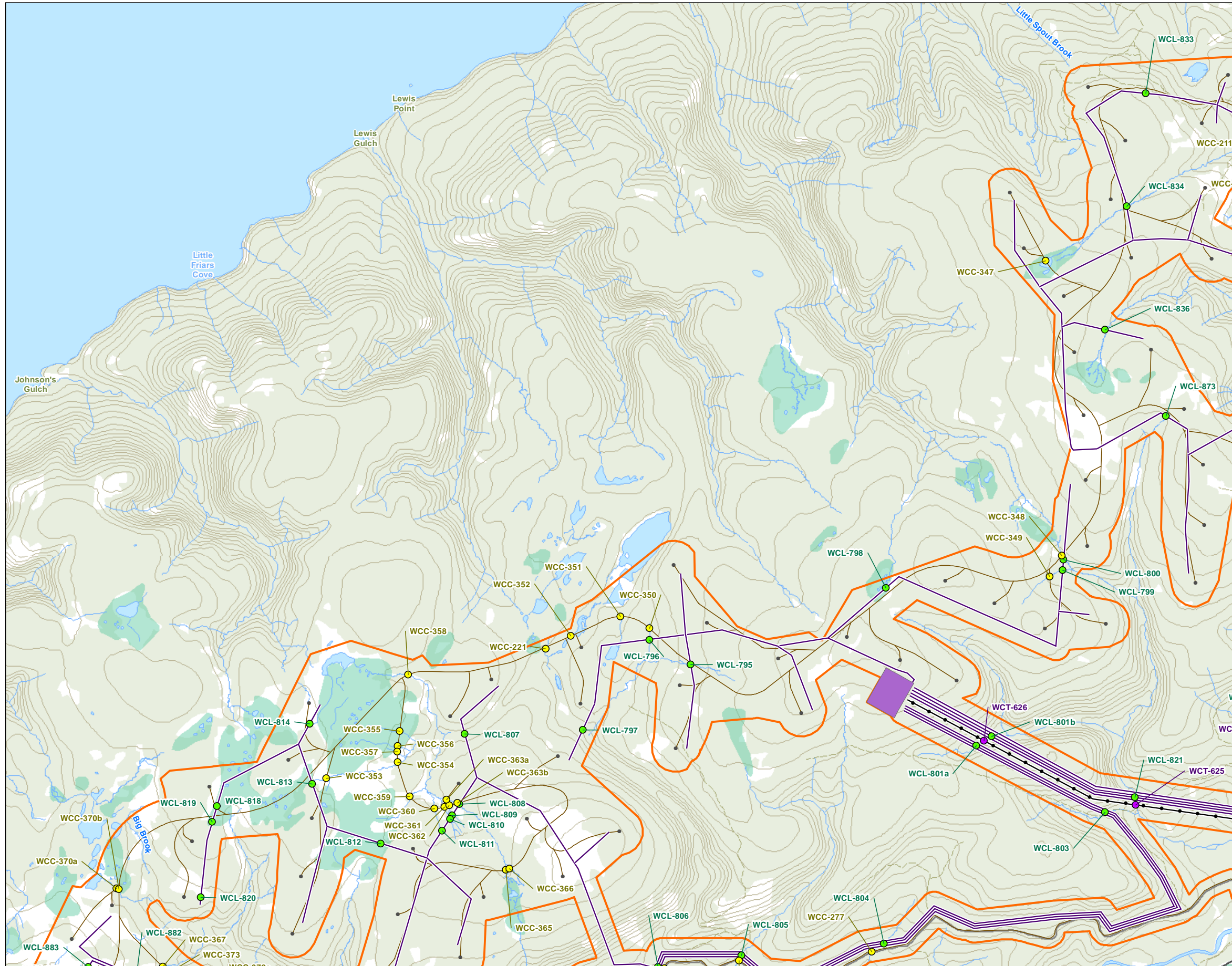
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Appendix D

Title

**Potential Watercourse Crossings for
Project Nujio'qonik GH2**

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Watercourse Crossings

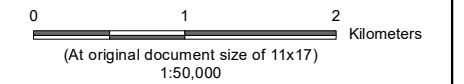
- Road Crossing
- Collector Line Crossing
- Transmission Line Crossing

Proposed Project Features

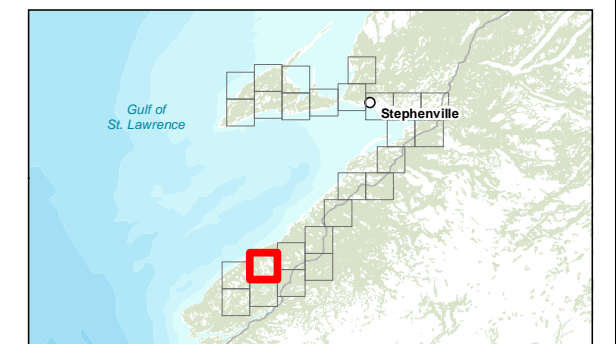
- Turbine Location
- Substation (Proposed)
- Transmission Line 230 kV (Proposed)
- Collector Line (Proposed)
- Access Road (Proposed)
- Project Area

Other Features

- Trans Canada Highway
- Road / Highway
- Resource Road / Trail
- Watercourse
- Waterbody
- Wetland
- Wooded Area



- Notes**
1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
 2. Data Sources: World Energy GH2; NL ECC Water Resources Management Division; NL Fisheries, Forestry and Agriculture; NRCan CanVec
 3. Background: NRCan CanVec



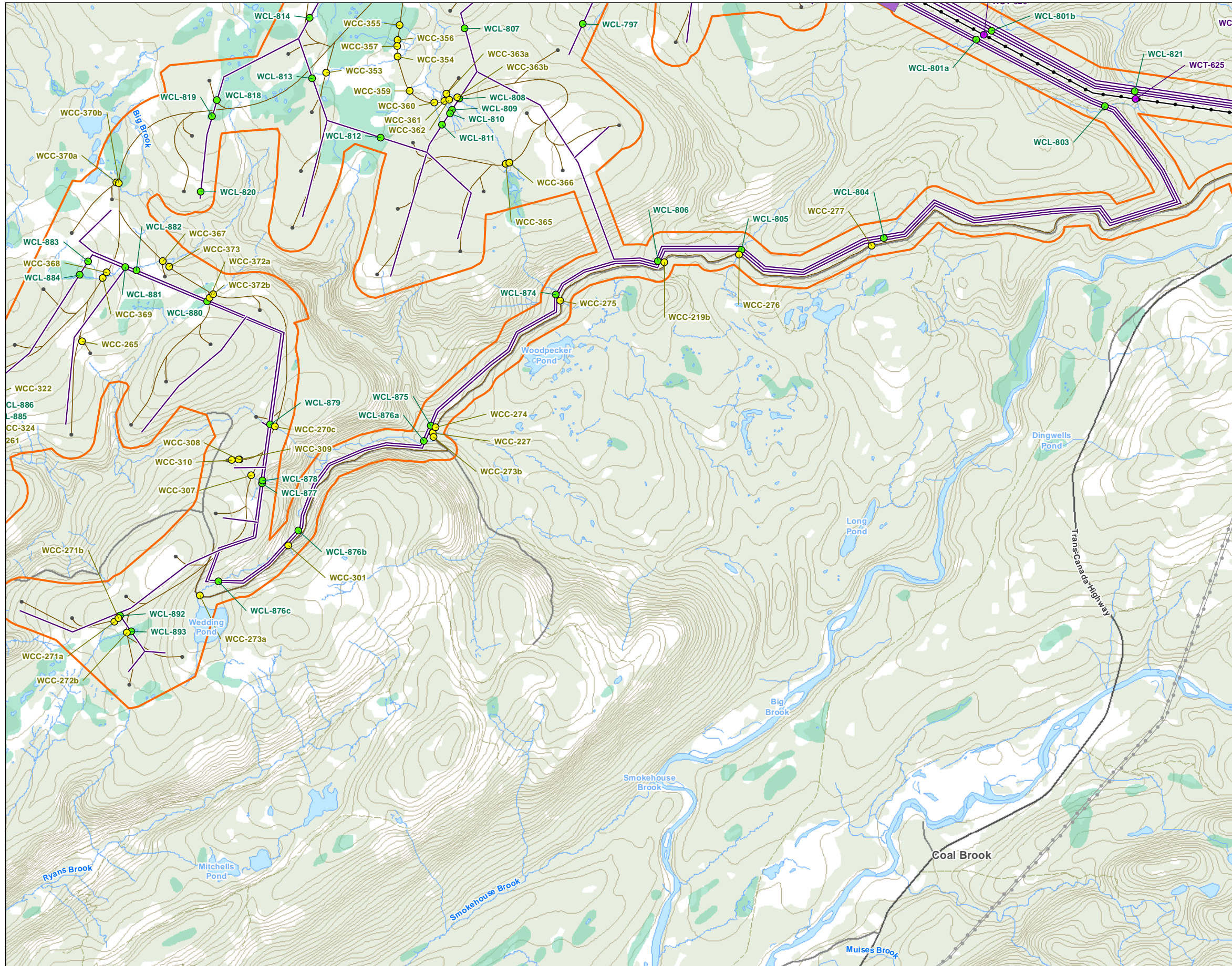
Project Location Stephenville NL	Prepared by NW on 2023-05-19 Revised by NW on 2023-07-23 QR by AW on 2023-XX-XX
Client/Project	121417233_66d REVA

World Energy GH2
Project Nujio'qonik

Appendix D

**Potential Watercourse Crossings for
Project Nujio'qonik GH2**

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Watercourse Crossings

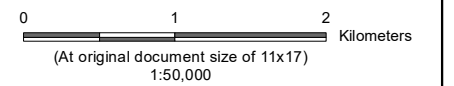
- Road Crossing
- Collector Line Crossing
- Transmission Line Crossing

Proposed Project Features

- Turbine Location
- Substation (Proposed)
- Transmission Line 230 kV (Proposed)
- Collector Line (Proposed)
- Access Road (Proposed)
- ▭ Project Area

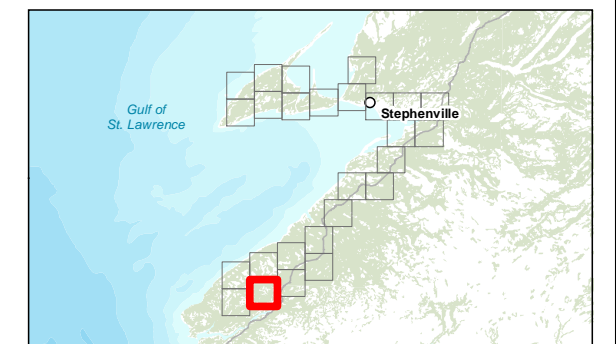
Other Features

- Transmission Line, Existing
- Trans Canada Highway
- Road / Highway
- Resource Road / Trail
- Watercourse
- Waterbody
- Wetland
- Wooded Area



Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
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3. Background: NRCan CanVec



Project Location
Stephenville
NL

Prepared by NW on 2023-05-19
Revised by NW on 2023-07-23
QR by AW on 2023-XX-XX

Client/Project

121417233_66d REV A

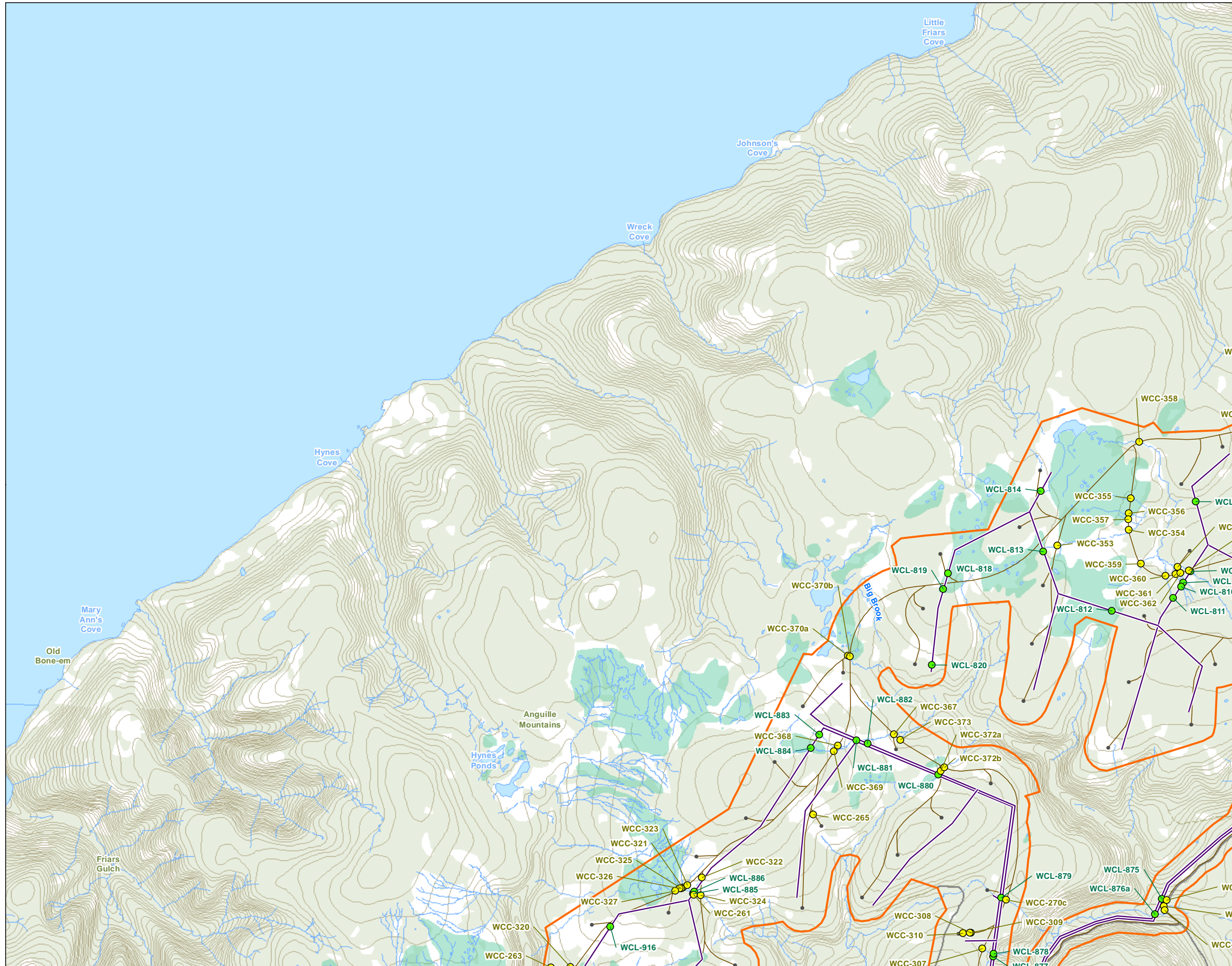
World Energy GH2
Project Nujio'qonik

Figure No.

Appendix D

**Potential Watercourse Crossings for
Project Nujio'qonik GH2**

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Watercourse Crossings

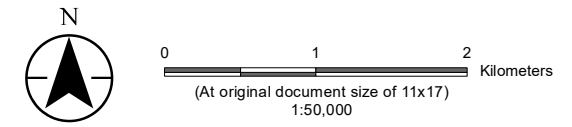
- Road Crossing
- Collector Line Crossing

Proposed Project Features

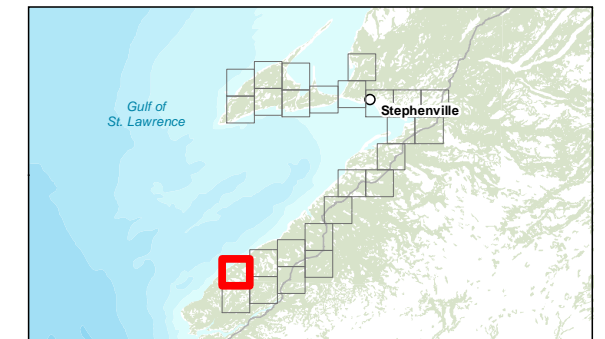
- Turbine Location
- Collector Line (Proposed)
- Access Road (Proposed)
- Project Area

Other Features

- Road / Highway
- Resource Road / Trail
- Watercourse
- Waterbody
- Wetland
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 1. Coordinate System: NAD 1983 CSRS UTM Zone 21N
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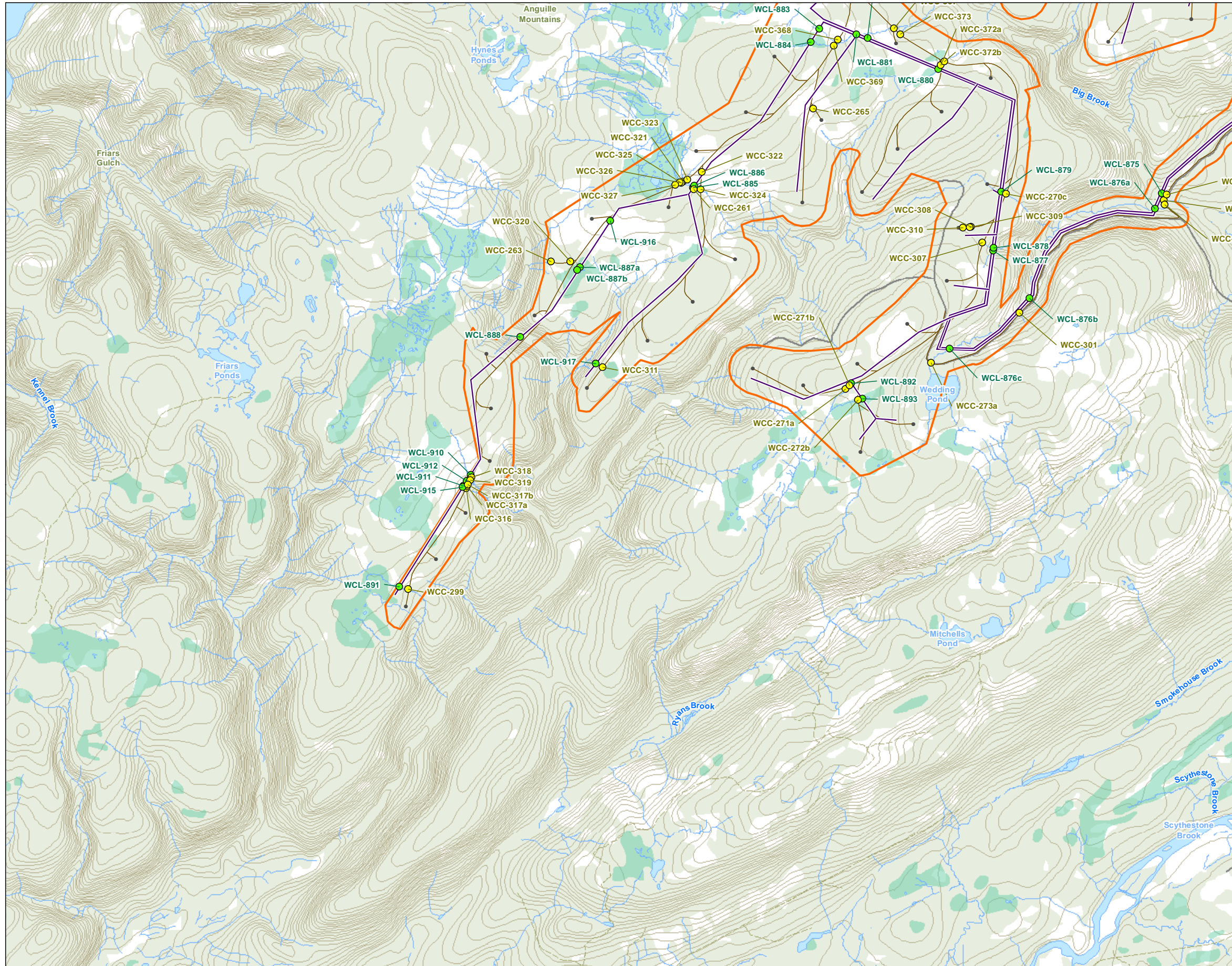


Project Location: Stephenville, NL
 Client/Project: 121417233_66d REVA
 Prepared by NW on 2023-05-19
 Revised by NW on 2023-07-23
 QR by AW on 2023-XX-XX

World Energy GH2
 Project Nujio'qonik
 Figure No.

Appendix D
Potential Watercourse Crossings for Project Nujio'qonik GH2

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Watercourse Crossings

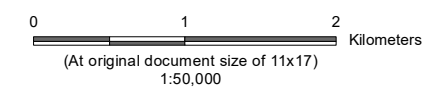
- Road Crossing
- Collector Line Crossing

Proposed Project Features

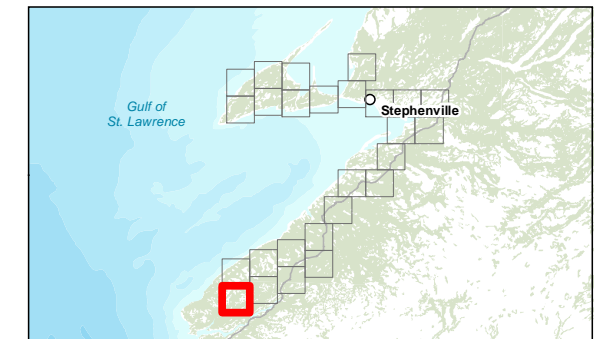
- Turbine Location
- Collector Line (Proposed)
- Access Road (Proposed)
- ▭ Project Area

Other Features

- Road / Highway
- Resource Road / Trail
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- Notes**
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Project Location: Stephenville, NL
 Client/Project: 121417233_66d REVA
 Prepared by NW on 2023-05-19
 Revised by NW on 2023-07-23
 QR by AW on 2023-XX-XX

World Energy GH2
 Project Nujio'qonik

Appendix D

Figure No.
 Title: **Potential Watercourse Crossings for Project Nujio'qonik GH2**

APPENDIX B

Photos

APPENDIX B1

Freshwater Fish and Fish Habitat Access Road Crossings

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 1 Watercourse Crossing WCA-002 Facing Upstream



Photo 2 Watercourse Crossing WCA-002 Facing Downstream



Photo 3 Watercourse Crossing WCA-009 Facing Upstream



Photo 4 Watercourse Crossing WCA-009 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 5 Watercourse Crossing WCA-010 Facing Upstream

Photo 6 Watercourse Crossing WCA-010 Facing Downstream

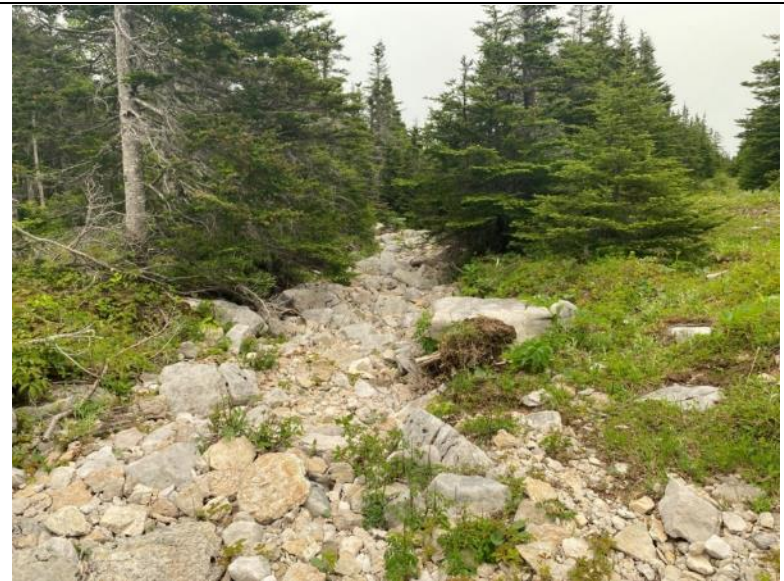
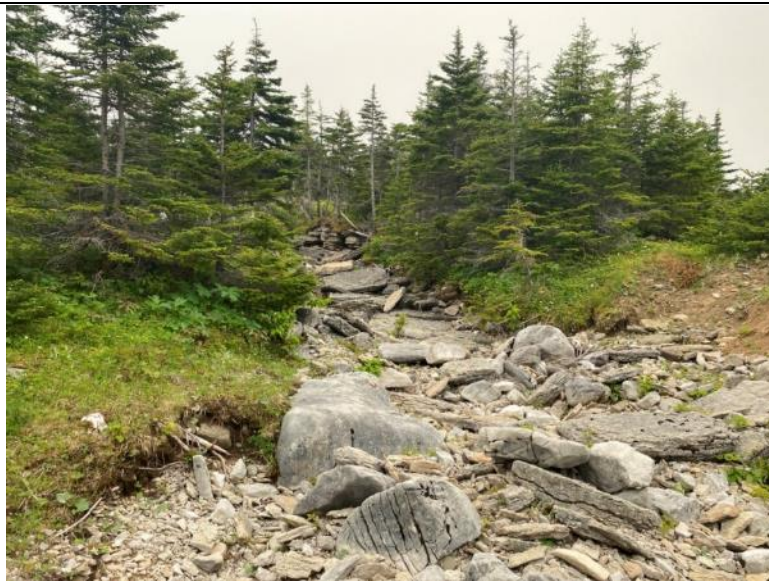


Photo 7 Watercourse Crossing WCA-011a Facing Upstream

Photo 8 Watercourse Crossing WCA-011a Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 9 Watercourse Crossing WCA-011b Facing Upstream



Photo 10 Watercourse Crossing WCA-011b Facing Downstream



Photo 11 Watercourse Crossing WCA-013 Facing Upstream



Photo 12 Watercourse Crossing WCA-013 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 13 Watercourse Crossing WCA-014a Facing Upstream



Photo 14 Watercourse Crossing WCA-014a Facing Downstream



Photo 15 Watercourse Crossing WCA-014b Facing Upstream



Photo 16 Watercourse Crossing WCA-014b Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 17 Watercourse Crossing WCA-016 Facing Upstream

Photo 18 Watercourse Crossing WCA-016 Facing Downstream

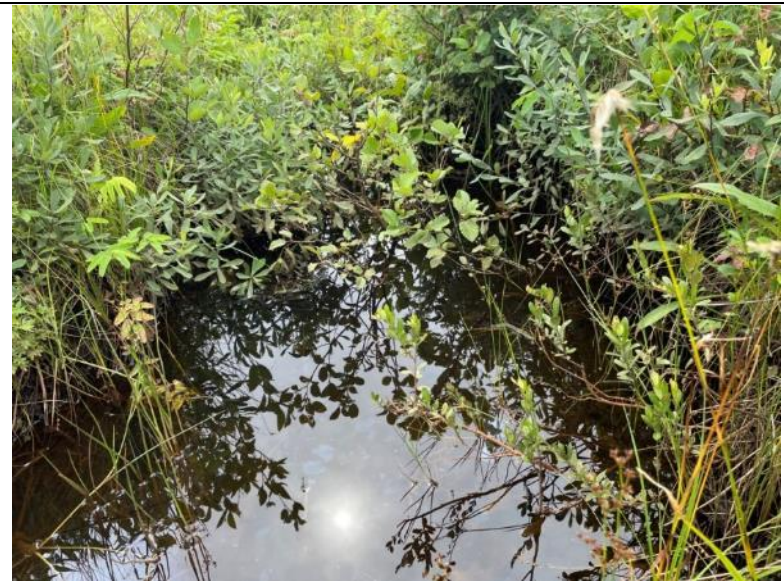
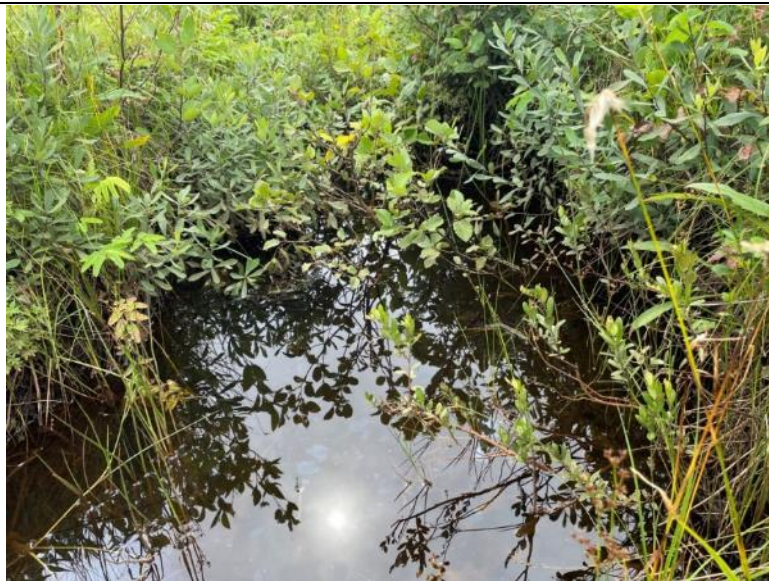


Photo 19 Watercourse Crossing WCA-021 Facing Upstream

Photo 20 Watercourse Crossing WCA-021 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 21 Watercourse Crossing WCA-022 Facing Upstream



Photo 22 Watercourse Crossing WCA-022 Facing Downstream



Photo 23 Watercourse Crossing WCA-023 Facing Upstream



Photo 24 Watercourse Crossing WCA-023 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 25 Watercourse Crossing WCA-024a Facing Upstream



Photo 26 Watercourse Crossing WCA-024a Facing Downstream



Photo 27 Watercourse Crossing WCA-024b Facing Upstream



Photo 28 Watercourse Crossing WCA-024b Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 29 Watercourse Crossing WCA-025 Facing Upstream



Photo 30 Watercourse Crossing WCA-025 Facing Downstream



Photo 31 Watercourse Crossing WCA-026 Facing Upstream



Photo 32 Watercourse Crossing WCA-026 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 33 Watercourse Crossing WCA-028c Facing Upstream



Photo 34 Watercourse Crossing WCA-028c Facing Downstream



Photo 35 Watercourse Crossing WCA-030a Facing Upstream



Photo 36 Watercourse Crossing WCA-030a Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 37 Watercourse Crossing WCA-030b Facing Upstream



Photo 38 Watercourse Crossing WCA-030b Facing Downstream



Photo 39 Watercourse Crossing WCA-031 Facing Upstream

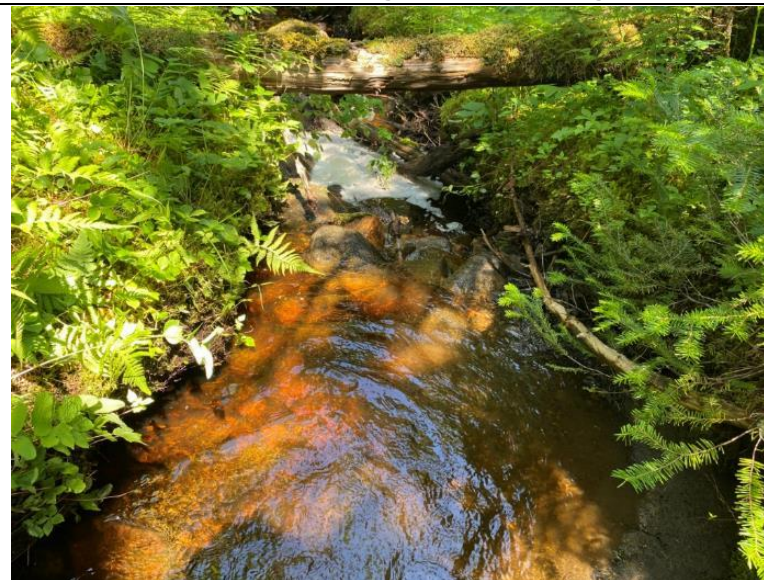


Photo 40 Watercourse Crossing WCA-031 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 41 Watercourse Crossing WCA-032 Facing Upstream



Photo 42 Watercourse Crossing WCA-032 Facing Downstream



Photo 43 Watercourse Crossing WCA-051a Facing Upstream



Photo 44 Watercourse Crossing WCA-051a Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 45 Watercourse Crossing WCA-051b Facing Upstream

Photo 46 Watercourse Crossing WCA-051b Facing Downstream



Photo 47 Watercourse Crossing WCA-053 Facing Upstream

Photo 48 Watercourse Crossing WCA-053 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 49 Watercourse Crossing WCA-054 Facing Upstream

Photo 50 Watercourse Crossing WCA-054 Facing Downstream



Photo 51 Watercourse Crossing WCA-055 Facing Upstream

Photo 52 Watercourse Crossing WCA-055 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 53 Watercourse Crossing WCA-057a Facing Upstream



Photo 54 Watercourse Crossing WCA-057a Facing Downstream



Photo 55 Watercourse Crossing WCA-057b Facing Upstream



Photo 56 Watercourse Crossing WCA-057b Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 57 Watercourse Crossing WCA-057c Facing Upstream



Photo 58 Watercourse Crossing WCA-057c Facing Downstream



Photo 59 Watercourse Crossing WCA-057d Facing Upstream



Photo 60 Watercourse Crossing WCA-057d Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 61 Watercourse Crossing WCA-057e Facing Upstream



Photo 62 Watercourse Crossing WCA-057e Facing Downstream



Photo 63 Watercourse Crossing WCA-058 Facing Upstream



Photo 64 Watercourse Crossing WCA-058 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 65 Watercourse Crossing WCA-059a Facing Upstream



Photo 66 Watercourse Crossing WCA-059a Facing Downstream



Photo 67 Watercourse Crossing WCA-059b Facing Upstream



Photo 68 Watercourse Crossing WCA-059b Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 69 Watercourse Crossing WCA-059c Facing Upstream



Photo 70 Watercourse Crossing WCA-059c Facing Downstream



Photo 71 Watercourse Crossing WCA-060 Facing Upstream



Photo 72 Watercourse Crossing WCA-060 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 73 Watercourse Crossing WCA-061 Facing Upstream



Photo 74 Watercourse Crossing WCA-061 Facing Downstream



Photo 75 Watercourse Crossing WCA-062 Facing Upstream



Photo 76 Watercourse Crossing WCA-062 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 77 Watercourse Crossing WCA-063 Facing Upstream

Photo 78 Watercourse Crossing WCA-063 Facing Downstream



Photo 79 Watercourse Crossing WCA-064 Facing Upstream

Photo 80 Watercourse Crossing WCA-064 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 81 Watercourse Crossing WCA-066 Facing Upstream



Photo 82 Watercourse Crossing WCA-066 Facing Downstream



Photo 83 Watercourse Crossing WCA-067 Facing Upstream



Photo 84 Watercourse Crossing WCA-067 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 85 Watercourse Crossing WCA-069a Facing Upstream

Photo 86 Watercourse Crossing WCA-069a Facing Downstream



Photo 87 Watercourse Crossing WCA-069b Facing Upstream

Photo 88 Watercourse Crossing WCA-069b Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 89 Watercourse Crossing WCA-070 Facing Upstream



Photo 90 Watercourse Crossing WCA-070 Facing Downstream



Photo 91 Watercourse Crossing WCA-071b Facing Upstream



Photo 92 Watercourse Crossing WCA-071b Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 93 Watercourse Crossing WCA-071c Facing Upstream



Photo 94 Watercourse Crossing WCA-071c Facing Downstream



Photo 95 Watercourse Crossing WCA-071d Facing Upstream



Photo 96 Watercourse Crossing WCA-071d Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 97 Watercourse Crossing WCA-072a Facing Upstream



Photo 98 Watercourse Crossing WCA-072a Facing Downstream



Photo 99 Watercourse Crossing WCA-072b Facing Upstream



Photo 100 Watercourse Crossing WCA-072b Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 101 Watercourse Crossing WCA-073a Facing Upstream



Photo 102 Watercourse Crossing WCA-073a Facing Downstream



Photo 103 Watercourse Crossing WCA-073b Facing Upstream



Photo 104 Watercourse Crossing WCA-073b Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 105 Watercourse Crossing WCA-074a Facing Upstream



Photo 106 Watercourse Crossing WCA-074a Facing Downstream



Photo 107 Watercourse Crossing WCA-074b Facing Upstream



Photo 108 Watercourse Crossing WCA-074b Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 109 Watercourse Crossing WCA-075 Facing Upstream



Photo 110 Watercourse Crossing WCA-075 Facing Downstream



Photo 111 Watercourse Crossing WCA-076 Facing Upstream



Photo 112 Watercourse Crossing WCA-076 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 113 Watercourse Crossing WCA-077 Facing Upstream

Photo 114 Watercourse Crossing WCA-077 Facing Downstream



Photo 115 Watercourse Crossing WCA-082 Facing Upstream

Photo 116 Watercourse Crossing WCA-082 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 117 Watercourse Crossing WCA-099 Facing Upstream



Photo 118 Watercourse Crossing WCA-099 Facing Downstream



Photo 119 Watercourse Crossing WCA-100 Facing Upstream



Photo 120 Watercourse Crossing WCA-100 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 121 Watercourse Crossing WCA-102 Facing Upstream



Photo 122 Watercourse Crossing WCA-102 Facing Downstream



Photo 123 Watercourse Crossing WCA-103 Facing Upstream



Photo 124 Watercourse Crossing WCA-103 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 125 Watercourse Crossing WCA-105 Facing Upstream

Photo 126 Watercourse Crossing WCA-105 Facing Downstream



Photo 127 Watercourse Crossing WCA-106 Facing Upstream

Photo 128 Watercourse Crossing WCA-106 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 129 Watercourse Crossing WCA-107 Facing Upstream



Photo 130 Watercourse Crossing WCA-107 Facing Downstream



Photo 131 Watercourse Crossing WCA-110 Facing Upstream



Photo 132 Watercourse Crossing WCA-110 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 133 Watercourse Crossing WCA-111a Facing Upstream



Photo 134 Watercourse Crossing WCA-111a Facing Downstream



Photo 135 Watercourse Crossing WCA-111b Facing Upstream



Photo 136 Watercourse Crossing WCA-111b Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 137 Watercourse Crossing WCA-112 Facing Upstream



Photo 138 Watercourse Crossing WCA-112 Facing Downstream



Photo 139 Watercourse Crossing WCA-113 Facing Upstream



Photo 140 Watercourse Crossing WCA-113 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 141 Watercourse Crossing WCA-115 Facing Upstream

Photo 142 Watercourse Crossing WCA-115 Facing Downstream



Photo 143 Watercourse Crossing WCA-116 Facing Upstream

Photo 144 Watercourse Crossing WCA-116 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 145 Watercourse Crossing WCA-117 Facing Upstream



Photo 146 Watercourse Crossing WCA-117 Facing Downstream



Photo 147 Watercourse Crossing WCA-121 Facing Upstream



Photo 148 Watercourse Crossing WCA-121 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 149 Watercourse Crossing WCA-122 Facing Upstream



Photo 150 Watercourse Crossing WCA-122 Facing Downstream



Photo 151 Watercourse Crossing WCA-123 Facing Upstream



Photo 152 Watercourse Crossing WCA-123 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 153 Watercourse Crossing WCA-124 Facing Upstream



Photo 154 Watercourse Crossing WCA-124 Facing Downstream



Photo 155 Watercourse Crossing WCA-125 Facing Upstream



Photo 156 Watercourse Crossing WCA-125 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 157 Watercourse Crossing WCA-126 Facing Upstream



Photo 158 Watercourse Crossing WCA-126 Facing Downstream



Photo 159 Watercourse Crossing WCA-127 Facing Upstream



Photo 160 Watercourse Crossing WCA-127 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 161 Watercourse Crossing WCA-128 Facing Upstream



Photo 162 Watercourse Crossing WCA-128 Facing Downstream



Photo 163 Watercourse Crossing WCA-129a Facing Upstream



Photo 164 Watercourse Crossing WCA-129a Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 165 Watercourse Crossing WCA-129b Facing Upstream



Photo 166 Watercourse Crossing WCA-129b Facing Downstream



Photo 167 Watercourse Crossing WCA-130 Facing Upstream



Photo 168 Watercourse Crossing WCA-130 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 169 Watercourse Crossing WCA-131 Facing Upstream



Photo 170 Watercourse Crossing WCA-131 Facing Downstream



Photo 171 Watercourse Crossing WCA-132 Facing Upstream



Photo 172 Watercourse Crossing WCA-132 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 173 Watercourse Crossing WCA-133 Facing Upstream



Photo 174 Watercourse Crossing WCA-133 Facing Downstream



Photo 175 Watercourse Crossing WCA-134 Facing Upstream

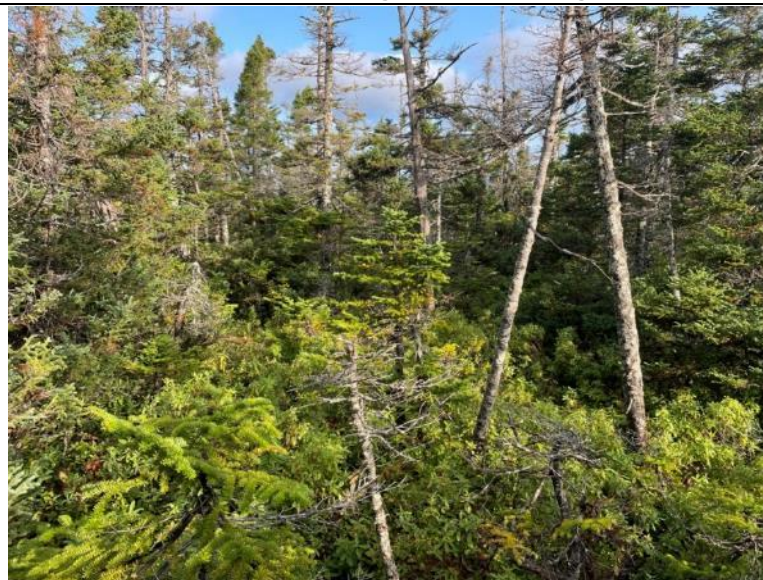


Photo 176 Watercourse Crossing WCA-134 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 177 Watercourse Crossing WCA-135a Facing Upstream



Photo 178 Watercourse Crossing WCA-135a Facing Downstream



Photo 179 Watercourse Crossing WCA-135b Facing Upstream

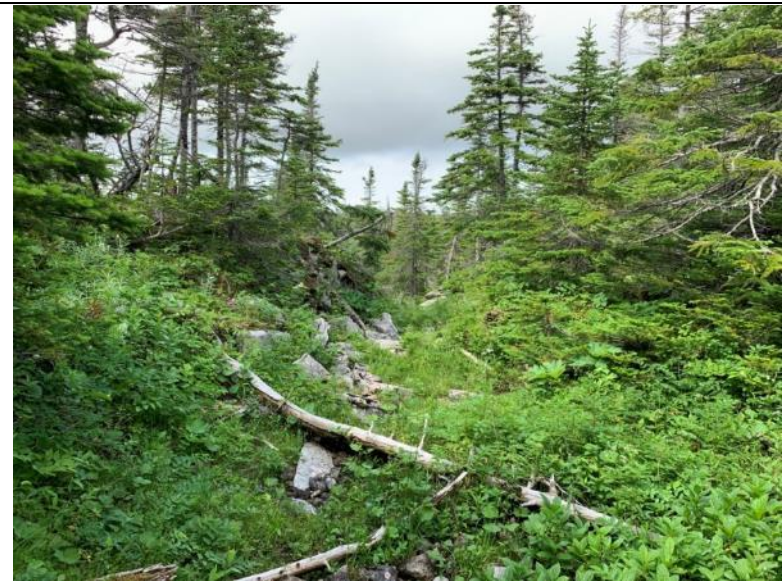


Photo 180 Watercourse Crossing WCA-135b Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik			
			
Photo 181	Watercourse Crossing WCA-136a Facing Upstream	Photo 182	Watercourse Crossing WCA-136a Facing Downstream
		No Photo Taken.	
Photo 183	Watercourse Crossing WCA-136b Facing Upstream	Photo 184	Watercourse Crossing WCA-136b Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 185 Watercourse Crossing WCA-137a Facing Upstream



Photo 186 Watercourse Crossing WCA-137a Facing Downstream



Photo 187 Watercourse Crossing WCA-137b Facing Upstream



Photo 188 Watercourse Crossing WCA-137b Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 189 Watercourse Crossing WCA-138a Facing Upstream



Photo 190 Watercourse Crossing WCA-138a Facing Downstream



Photo 191 Watercourse Crossing WCA-138b Facing Upstream



Photo 192 Watercourse Crossing WCA-138b Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 193 Watercourse Crossing WCA-140a Facing Upstream



Photo 194 Watercourse Crossing WCA-140a Facing Downstream



Photo 195 Watercourse Crossing WCA-140b Facing Upstream



Photo 196 Watercourse Crossing WCA-140b Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 197 Watercourse Crossing WCA-140c Facing Upstream



Photo 198 Watercourse Crossing WCA-140c Facing Downstream



Photo 199 Watercourse Crossing WCA-141 Facing Upstream



Photo 200 Watercourse Crossing WCA-141 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 201 Watercourse Crossing WCA-142 Facing Upstream

Photo 202 Watercourse Crossing WCA-142 Facing Downstream



Photo 203 Watercourse Crossing WCA-143 Facing Upstream

Photo 204 Watercourse Crossing WCA-143 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 205 Watercourse Crossing WCA-144 Facing Upstream



Photo 206 Watercourse Crossing WCA-144 Facing Downstream



Photo 207 Watercourse Crossing WCA-145 Facing Upstream



Photo 208 Watercourse Crossing WCA-145 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 209 Watercourse Crossing WCA-146 Facing Upstream



Photo 210 Watercourse Crossing WCA-146 Facing Downstream



Photo 211 Watercourse Crossing WCA-147 Facing Upstream



Photo 212 Watercourse Crossing WCA-147 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 213 Watercourse Crossing WCA-148a Facing Upstream

Photo 214 Watercourse Crossing WCA-148a Facing Downstream



Photo 215 Watercourse Crossing WCA-148b Facing Upstream

Photo 216 Watercourse Crossing WCA-148b Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 217 Watercourse Crossing WCA-149 Facing Upstream



Photo 218 Watercourse Crossing WCA-149 Facing Downstream



Photo 219 Watercourse Crossing WCA-150 Facing Upstream



Photo 220 Watercourse Crossing WCA-150 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 221 Watercourse Crossing WCA-151 Facing Upstream

Photo 222 Watercourse Crossing WCA-151 Facing Downstream



Photo 223 Watercourse Crossing WCA-152 Facing Upstream

Photo 224 Watercourse Crossing WCA-152 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 225 Watercourse Crossing WCA-153 Facing Upstream

Photo 226 Watercourse Crossing WCA-153 Facing Downstream



Photo 227 Watercourse Crossing WCA-154a Facing Upstream

Photo 228 Watercourse Crossing WCA-154a Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Access Road Crossings – Project Nujio'qonik



Photo 229 Watercourse Crossing WCA-155 Facing Upstream



Photo 230 Watercourse Crossing WCA-155 Facing Downstream

APPENDIX B2

Freshwater Fish and Fish Habitat Collector Line Crossings

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 1 Watercourse Crossing WCL-704a Facing Upstream

Photo 2 Watercourse Crossing WCL-704a Facing Downstream



Photo 3 Watercourse Crossing WCL-704b Facing Upstream

Photo 4 Watercourse Crossing WCL-704b Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nujio'qonik



Photo 5 Watercourse Crossing WCL-704c Facing Upstream

Photo 6 Watercourse Crossing WCL-704c Facing Downstream



Photo 7 Watercourse Crossing WCL-706 Facing Upstream

Photo 8 Watercourse Crossing WCL-706 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 9 Watercourse Crossing WCL-707a Facing Upstream



Photo 10 Watercourse Crossing WCL-707a Facing Downstream



Photo 11 Watercourse Crossing WCL-707b Facing Upstream



Photo 12 Watercourse Crossing WCL-707b Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 13 Watercourse Crossing WCL-707c Facing Upstream

Photo 14 Watercourse Crossing WCL-707c Facing Downstream



Photo 15 Watercourse Crossing WCL-708 Facing Upstream

Photo 16 Watercourse Crossing WCL-708 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 17 Watercourse Crossing WCL-709 Facing Upstream



Photo 18 Watercourse Crossing WCL-709 Facing Downstream



Photo 19 Watercourse Crossing WCL-710 Facing Upstream



Photo 20 Watercourse Crossing WCL-710 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 21 Watercourse Crossing WCL-711a Facing Upstream



Photo 22 Watercourse Crossing WCL-711a Facing Downstream



Photo 23 Watercourse Crossing WCL-711b Facing Upstream



Photo 24 Watercourse Crossing WCL-706b Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 25 Watercourse Crossing WCL-711c Facing Upstream

Photo 26 Watercourse Crossing WCL-711c Facing Downstream



Photo 27 Watercourse Crossing WCL-712a Facing Upstream

Photo 28 Watercourse Crossing WCL-712a Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 29 Watercourse Crossing WCL-712b Facing Upstream



Photo 30 Watercourse Crossing WCL-712b Facing Downstream



Photo 31 Watercourse Crossing WCL-712c Facing Upstream



Photo 32 Watercourse Crossing WCL-712c Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 33 Watercourse Crossing WCL-713 Facing Upstream



Photo 34 Watercourse Crossing WCL-713 Facing Downstream



Photo 35 Watercourse Crossing WCL-714 Facing Upstream



Photo 36 Watercourse Crossing WCL-714 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 37 Watercourse Crossing WCL-715a Facing Upstream



Photo 38 Watercourse Crossing WCL-715a Facing Downstream



Photo 39 Watercourse Crossing WCL-715b Facing Upstream



Photo 40 Watercourse Crossing WCL-715b Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik			
			
Photo 41	Watercourse Crossing WCL-715c Facing Upstream	Photo 42	Watercourse Crossing WCL-715c Facing Downstream
No photo taken.		No photo taken.	
Photo 43	Watercourse Crossing WCL-716 Facing Upstream	Photo 44	Watercourse Crossing WCL-716 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 45 Watercourse Crossing WCL-717 Facing Upstream



Photo 46 Watercourse Crossing WCL-717 Facing Downstream



Photo 47 Watercourse Crossing WCL-718 Facing Upstream



Photo 48 Watercourse Crossing WCL-718 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 49 Watercourse Crossing WCL-719 Facing Upstream



Photo 50 Watercourse Crossing WCL-719 Facing Downstream

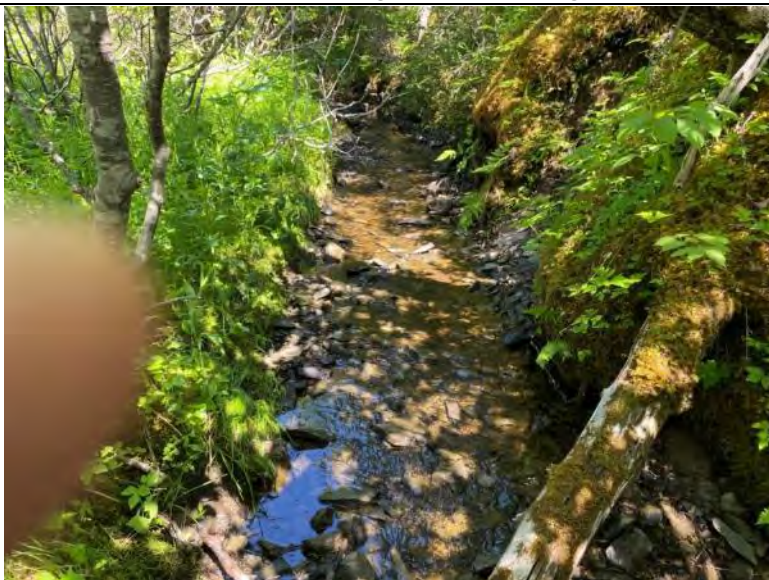


Photo 51 Watercourse Crossing WCL-720 Facing Upstream



Photo 52 Watercourse Crossing WCL-720 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 53 Watercourse Crossing WCL-721 Facing Upstream

Photo 54 Watercourse Crossing WCL-721 Facing Downstream



Photo 55 Watercourse Crossing WCL-722 Facing Upstream

Photo 56 Watercourse Crossing WCL-722 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 57 Watercourse Crossing WCL-725 Facing Upstream



Photo 58 Watercourse Crossing WCL-725 Facing Downstream



Photo 59 Watercourse Crossing WCL-726 Facing Upstream



Photo 60 Watercourse Crossing WCL-726 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 61 Watercourse Crossing WCL-727 Facing Upstream



Photo 62 Watercourse Crossing WCL-727 Facing Downstream



Photo 63 Watercourse Crossing WCL-728 Facing Upstream



Photo 64 Watercourse Crossing WCL-728 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 65 Watercourse Crossing WCL-729 Facing Upstream



Photo 66 Watercourse Crossing WCL-729 Facing Downstream



Photo 67 Watercourse Crossing WCL-730 Facing Upstream



Photo 68 Watercourse Crossing WCL-730 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nujio'qonik



Photo 69 Watercourse Crossing WCL-739 Facing Upstream



Photo 70 Watercourse Crossing WCL-739 Facing Downstream



Photo 71 Watercourse Crossing WCL-740a Facing Upstream



Photo 72 Watercourse Crossing WCL-740a Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 73 Watercourse Crossing WCL-740b Facing Upstream

Photo 74 Watercourse Crossing WCL-740b Facing Downstream



Photo 75 Watercourse Crossing WCL-741a Facing Upstream

Photo 76 Watercourse Crossing WCL-741a Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 77 Watercourse Crossing WCL-741b Facing Upstream

Photo 78 Watercourse Crossing WCL-741b Facing Downstream



Photo 79 Watercourse Crossing WCL-742 Facing Upstream

Photo 80 Watercourse Crossing WCL-742 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nujio'qonik



Photo 81 Watercourse Crossing WCL-743 Facing Upstream

Photo 82 Watercourse Crossing WCL-743 Facing Downstream



Photo 83 Watercourse Crossing WCL-744 Facing Upstream

Photo 84 Watercourse Crossing WCL-744 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 85 Watercourse Crossing WCL-745a Facing Upstream



Photo 86 Watercourse Crossing WCL-745a Facing Downstream



Photo 87 Watercourse Crossing WCL-745b Facing Upstream



Photo 88 Watercourse Crossing WCL-745b Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 89 Watercourse Crossing WCL-746 Facing Upstream



Photo 90 Watercourse Crossing WCL-746 Facing Downstream



Photo 91 Watercourse Crossing WCL-747 Facing Upstream



Photo 92 Watercourse Crossing WCL-747 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nujio'qonik



Photo 93 Watercourse Crossing WCL-748 Facing Upstream

Photo 94 Watercourse Crossing WCL-748 Facing Downstream



Photo 95 Watercourse Crossing WCL-749 Facing Upstream

Photo 96 Watercourse Crossing WCL-749 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nujio'qonik



Photo 97 Watercourse Crossing WCL-750 Facing Upstream



Photo 98 Watercourse Crossing WCL-750 Facing Downstream



Photo 99 Watercourse Crossing WCL-751 Facing Upstream



Photo 100 Watercourse Crossing WCL-751 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 101 Watercourse Crossing WCL-752 Facing Upstream



Photo 102 Watercourse Crossing WCL-752 Facing Downstream



Photo 103 Watercourse Crossing WCL-753 Facing Upstream



Photo 104 Watercourse Crossing WCL-753 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nujio'qonik



Photo 105 Watercourse Crossing WCL-754 Facing Upstream



Photo 106 Watercourse Crossing WCL-754 Facing Downstream



Photo 107 Watercourse Crossing WCL-755 Facing Upstream



Photo 108 Watercourse Crossing WCL-755 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 109 Watercourse Crossing WCL-756 Facing Upstream



Photo 110 Watercourse Crossing WCL-756 Facing Downstream



Photo 111 Watercourse Crossing WCL-757 Facing Upstream



Photo 112 Watercourse Crossing WCL-757 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nujio'qonik



Photo 113 Watercourse Crossing WCL-758 Facing Upstream



Photo 114 Watercourse Crossing WCL-758 Facing Downstream



Photo 115 Watercourse Crossing WCL-759 Facing Upstream



Photo 116 Watercourse Crossing WCL-759 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 117 Watercourse Crossing WCL-760 Facing Upstream



Photo 118 Watercourse Crossing WCL-760 Facing Downstream



Photo 119 Watercourse Crossing WCL-761 Facing Upstream



Photo 120 Watercourse Crossing WCL-761 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 121 Watercourse Crossing WCL-762 Facing Upstream



Photo 122 Watercourse Crossing WCL-762 Facing Downstream



Photo 123 Watercourse Crossing WCL-763 Facing Upstream



Photo 124 Watercourse Crossing WCL-763 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nujio'qonik



Photo 125 Watercourse Crossing WCL-764a Facing Upstream

Photo 126 Watercourse Crossing WCL-764a Facing Downstream



Photo 127 Watercourse Crossing WCL-764b Facing Upstream

Photo 128 Watercourse Crossing WCL-764b Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 129 Watercourse Crossing WCL-765b Facing Upstream



Photo 130 Watercourse Crossing WCL-765b Facing Downstream



Photo 131 Watercourse Crossing WCL-765c Facing Upstream



Photo 132 Watercourse Crossing WCL-765c Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 133 Watercourse Crossing WCL-765d Facing Upstream

Photo 134 Watercourse Crossing WCL-765d Facing Downstream



Photo 135 Watercourse Crossing WCL-766 Facing Upstream

Photo 136 Watercourse Crossing WCL-766 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 137 Watercourse Crossing WCL-767 Facing Upstream



Photo 138 Watercourse Crossing WCL-767 Facing Downstream



Photo 139 Watercourse Crossing WCL-768a Facing Upstream

Photo 140 Watercourse Crossing WCL-768a Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik			
			
Photo 141	Watercourse Crossing WCL-768b Facing Upstream	Photo 142	Watercourse Crossing WCL-768b Facing Downstream
No Photos Taken.		No Photos Taken.	
Photo 143	Watercourse Crossing WCL-768c Facing Upstream	Photo 144	Watercourse Crossing WCL-768c Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 145 Watercourse Crossing WCL-768d Facing Upstream

Photo 146 Watercourse Crossing WCL-768d Facing Downstream



Photo 147 Watercourse Crossing WCL-768e Facing Upstream

Photo 148 Watercourse Crossing WCL-768e Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 149 Watercourse Crossing WCL-768f Facing Upstream



Photo 150 Watercourse Crossing WCL-768f Facing Downstream



Photo 151 Watercourse Crossing WCL-769 Facing Upstream



Photo 152 Watercourse Crossing WCL-769 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 153 Watercourse Crossing WCL-770 Facing Upstream

Photo 154 Watercourse Crossing WCL-770 Facing Downstream



Photo 155 Watercourse Crossing WCL-771b Facing Upstream

Photo 156 Watercourse Crossing WCL-771b Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 157 Watercourse Crossing WCL-772 Facing Upstream



Photo 158 Watercourse Crossing WCL-772 Facing Downstream



Photo 159 Watercourse Crossing WCL-773 Facing Upstream



Photo 160 Watercourse Crossing WCL-773 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 161 Watercourse Crossing WCL-774a Facing Upstream

Photo 162 Watercourse Crossing WCL-774a Facing Downstream



Photo 163 Watercourse Crossing WCL-774b Facing Upstream

Photo 164 Watercourse Crossing WCL-774b Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 165 Watercourse Crossing WCL-776 Facing Upstream



Photo 166 Watercourse Crossing WCL-776 Facing Downstream



Photo 167 Watercourse Crossing WCL-778 Facing Upstream



Photo 168 Watercourse Crossing WCL-778 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 169 Watercourse Crossing WCL-779 Facing Upstream

Photo 170 Watercourse Crossing WCL-779 Facing Downstream



Photo 171 Watercourse Crossing WCL-780 Facing Upstream

Photo 172 Watercourse Crossing WCL-780 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 173 Watercourse Crossing WCL-781 Facing Upstream



Photo 174 Watercourse Crossing WCL-781 Facing Downstream



Photo 175 Watercourse Crossing WCL-783 Facing Upstream



Photo 176 Watercourse Crossing WCL-783 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 177 Watercourse Crossing WCL-851 Facing Upstream

Photo 178 Watercourse Crossing WCL-851 Facing Downstream



Photo 179 Watercourse Crossing WCL-852 Facing Upstream

Photo 180 Watercourse Crossing WCL-852 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 181 Watercourse Crossing WCL-854 Facing Upstream



Photo 182 Watercourse Crossing WCL-854 Facing Downstream



Photo 183 Watercourse Crossing WCL-855 Facing Upstream



Photo 184 Watercourse Crossing WCL-855 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 185 Watercourse Crossing WCL-856 Facing Upstream



Photo 186 Watercourse Crossing WCL-856 Facing Downstream



Photo 187 Watercourse Crossing WCL-857 Facing Upstream



Photo 188 Watercourse Crossing WCL-857 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 189 Watercourse Crossing WCL-858 Facing Upstream

Photo 190 Watercourse Crossing WCL-858 Facing Downstream



Photo 191 Watercourse Crossing WCL-861 Facing Upstream

Photo 192 Watercourse Crossing WCL-861 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nujio'qonik



Photo 193 Watercourse Crossing WCL-862 Facing Upstream



Photo 194 Watercourse Crossing WCL-862 Facing Downstream



Photo 195 Watercourse Crossing WCL-863 Facing Upstream



Photo 196 Watercourse Crossing WCL-863 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 197 Watercourse Crossing WCL-864 Facing Upstream



Photo 198 Watercourse Crossing WCL-864 Facing Downstream



Photo 199 Watercourse Crossing WCL-865 Facing Upstream



Photo 200 Watercourse Crossing WCL-865 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 201 Watercourse Crossing WCL-866 Facing Upstream



Photo 202 Watercourse Crossing WCL-866 Facing Downstream



Photo 203 Watercourse Crossing WCL-867 Facing Upstream



Photo 204 Watercourse Crossing WCL-867 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 205 Watercourse Crossing WCL-868 Facing Upstream



Photo 206 Watercourse Crossing WCL-868 Facing Downstream



Photo 207 Watercourse Crossing WCL-869 Facing Upstream



Photo 208 Watercourse Crossing WCL-869 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 209 Watercourse Crossing WCL-870 Facing Upstream

Photo 210 Watercourse Crossing WCL-870 Facing Downstream



Photo 211 Watercourse Crossing WCL-894 Facing Upstream

Photo 212 Watercourse Crossing WCL-894 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 213 Watercourse Crossing WCL-895 Facing Upstream



Photo 214 Watercourse Crossing WCL-895 Facing Downstream

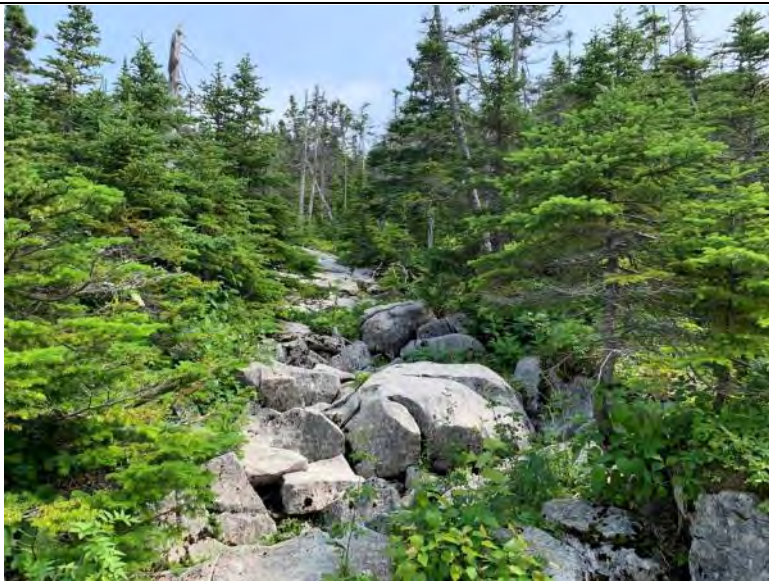


Photo 215 Watercourse Crossing WCL-896b Facing Upstream



Photo 216 Watercourse Crossing WCL-896b Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 217 Watercourse Crossing WCL-896c Facing Upstream



Photo 218 Watercourse Crossing WCL-896c Facing Downstream



Photo 219 Watercourse Crossing WCL-896d Facing Upstream



Photo 220 Watercourse Crossing WCL-896d Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 221 Watercourse Crossing WCL-897a Facing Upstream



Photo 222 Watercourse Crossing WCL-897a Facing Downstream



Photo 223 Watercourse Crossing WCL-897b Facing Upstream



Photo 224 Watercourse Crossing WCL-897b Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 225 Watercourse Crossing WCL-898 Facing Upstream


Photo 226 Watercourse Crossing WCL-898 Facing Downstream



Photo 227 Watercourse Crossing WCL-899 Facing Upstream

Photo 228 Watercourse Crossing WCL-899 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik	
	
Photo 229 Watercourse Crossing WCL-900 Facing Upstream	Photo 230 Watercourse Crossing WCL-900 Facing Downstream
	<p>No Photo Taken.</p>
Photo 231 Watercourse Crossing WCL-901 Facing Upstream	Photo 232 Watercourse Crossing WCL-901 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 233 Watercourse Crossing WCL-902a Facing Upstream



Photo 234 Watercourse Crossing WCL-902a Facing Downstream



Photo 235 Watercourse Crossing WCL-902b Facing Upstream



Photo 236 Watercourse Crossing WCL-902b Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 237 Watercourse Crossing WCL-902c Facing Upstream



Photo 238 Watercourse Crossing WCL-902c Facing Downstream



Photo 239 Watercourse Crossing WCL-903a Facing Upstream



Photo 240 Watercourse Crossing WCL-903a Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 241 Watercourse Crossing WCL-903b Facing Upstream



Photo 242 Watercourse Crossing WCL-903b Facing Downstream



Photo 243 Watercourse Crossing WCL-903c Facing Upstream



Photo 244 Watercourse Crossing WCL-903c Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 245 Watercourse Crossing WCL-903d Facing Upstream



Photo 246 Watercourse Crossing WCL-903d Facing Downstream



Photo 247 Watercourse Crossing WCL-904a Facing Upstream



Photo 248 Watercourse Crossing WCL-904a Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 249 Watercourse Crossing WCL-904b Facing Upstream



Photo 250 Watercourse Crossing WCL-904b Facing Downstream



Photo 251 Watercourse Crossing WCL-904c Facing Upstream



Photo 252 Watercourse Crossing WCL-904c Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 253 Watercourse Crossing WCL-905a Facing Upstream



Photo 254 Watercourse Crossing WCL-905a Facing Downstream



Photo 255 Watercourse Crossing WCL-905b Facing Upstream



Photo 256 Watercourse Crossing WCL-905b Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 257 Watercourse Crossing WCL-905c Facing Upstream



Photo 258 Watercourse Crossing WCL-905c Facing Downstream



Photo 259 Watercourse Crossing WCL-905d Facing Upstream



Photo 260 Watercourse Crossing WCL-905d Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 261 Watercourse Crossing WCL-905e Facing Upstream



Photo 262 Watercourse Crossing WCL-905e Facing Downstream



Photo 263 Watercourse Crossing WCL-905f Facing Upstream



Photo 264 Watercourse Crossing WCL-905f Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nujo'qonik



Photo 265 Watercourse Crossing WCL-905g Facing Upstream



Photo 266 Watercourse Crossing WCL-905g Facing Downstream



Photo 267 Watercourse Crossing WCL-905h Facing Upstream



Photo 268 Watercourse Crossing WCL-905h Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 269 Watercourse Crossing WCL-905i Facing Upstream

Photo 270 Watercourse Crossing WCL-905i Facing Downstream



Photo 271 Watercourse Crossing WCL-906 Facing Upstream

No Photo Taken.

Photo 272 Watercourse Crossing WCL-906 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 273 Watercourse Crossing WCL-907a Facing Upstream

Photo 274 Watercourse Crossing WCL-907a Facing Downstream



Photo 275 Watercourse Crossing WCL-907b Facing Upstream

Photo 276 Watercourse Crossing WCL-907b Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Collector Line Crossings – Project Nuji'o'qonik



Photo 277 Watercourse Crossing WCL-908 Facing Upstream



Photo 278 Watercourse Crossing WCL-908 Facing Downstream





Photo 279 Watercourse Crossing WCL-909 Facing Upstream



Photo 280 Watercourse Crossing WCL-909 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio’qonik			
			
Photo 281	Watercourse Crossing WCT-500 Facing Upstream	Photo 282	Watercourse Crossing WCT-500 Facing Downstream
No Photos Taken.		No Photos Taken.	
Photo 283	Watercourse Crossing WCT-501a Facing Upstream	Photo 284	Watercourse Crossing WCT-501a Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio’qonik



Photo 285 Watercourse Crossing WCT-501b Facing Upstream

Photo 286 Watercourse Crossing WCT-501b Facing Downstream



Photo 287 Watercourse Crossing WCT-501c Facing Upstream

Photo 288 Watercourse Crossing WCT-501c Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio’qonik



Photo 289 Watercourse Crossing WCT-502 Facing Upstream

Photo 290 Watercourse Crossing WCT-502 Facing Downstream



Photo 291 Watercourse Crossing WCT-503 Facing Upstream

Photo 292 Watercourse Crossing WCT-503 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio’qonik



Photo 293 Watercourse Crossing WCT-504 Facing Upstream

Photo 294 Watercourse Crossing WCT-504 Facing Downstream



Photo 295 Watercourse Crossing WCT-505 Facing Upstream

Photo 296 Watercourse Crossing WCT-505 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio'qonik



Photo 297 Watercourse Crossing WCT-506 Facing Upstream



Photo 298 Watercourse Crossing WCT-506 Facing Downstream



Photo 299 Watercourse Crossing WCT-507 Facing Upstream



Photo 300 Watercourse Crossing WCT-507 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio’qonik



Photo 301 Watercourse Crossing WCT-508 Facing Upstream

Photo 302 Watercourse Crossing WCT-508 Facing Downstream



Photo 303 Watercourse Crossing WCT-509 Facing Upstream

Photo 304 Watercourse Crossing WCT-509 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio'qonik



Photo 305 Watercourse Crossing WCT-510 Facing Upstream



Photo 306 Watercourse Crossing WCT-510 Facing Downstream



Photo 307 Watercourse Crossing WCT-511 Facing Upstream



Photo 308 Watercourse Crossing WCT-511 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio'qonik



Photo 309 Watercourse Crossing WCT-513 Facing Upstream

Photo 310 Watercourse Crossing WCT-513 Facing Downstream



Photo 311 Watercourse Crossing WCT-514 Facing Upstream

Photo 312 Watercourse Crossing WCT-514 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio’qonik



Photo 313 Watercourse Crossing WCT-515 Facing Upstream



Photo 314 Watercourse Crossing WCT-515 Facing Downstream



Photo 315 Watercourse Crossing WCT-516 Facing Upstream



Photo 316 Watercourse Crossing WCT-516 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio’qonik



Photo 317 Watercourse Crossing WCT-518 Facing Upstream



Photo 318 Watercourse Crossing WCT-518 Facing Downstream



Photo 319 Watercourse Crossing WCT-519 Facing Upstream



Photo 320 Watercourse Crossing WCT-519 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio’qonik



Photo 321 Watercourse Crossing WCT-520 Facing Upstream



Photo 322 Watercourse Crossing WCT-520 Facing Downstream



Photo 323 Watercourse Crossing WCT-521 Facing Upstream



Photo 324 Watercourse Crossing WCT-521 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio’qonik



Photo 325 Watercourse Crossing WCT-522 Facing Upstream

Photo 326 Watercourse Crossing WCT-522 Facing Downstream



Photo 327 Watercourse Crossing WCT-523 Facing Upstream

Photo 328 Watercourse Crossing WCT-523 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio’gonik



Photo 329 Watercourse Crossing WCT-524 Facing Upstream

Photo 330 Watercourse Crossing WCT-524 Facing Downstream



Photo 331 Watercourse Crossing WCT-525 Facing Upstream

Photo 332 Watercourse Crossing WCT-525 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio’qonik



Photo 333 Watercourse Crossing WCT-526 Facing Upstream

Photo 334 Watercourse Crossing WCT-526 Facing Downstream



Photo 335 Watercourse Crossing WCT-527 Facing Upstream

Photo 336 Watercourse Crossing WCT-527 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio'qonik



Photo 337 Watercourse Crossing WCT-528a Facing Upstream



Photo 338 Watercourse Crossing WCT-528a Facing Downstream



Photo 339 Watercourse Crossing WCT-528b Facing Upstream



Photo 340 Watercourse Crossing WCT-528b Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio'qonik



Photo 341 Watercourse Crossing WCT-528c Facing Upstream

Photo 342 Watercourse Crossing WCT-528c Facing Downstream



Photo 343 Watercourse Crossing WCT-528d Facing Upstream

Photo 344 Watercourse Crossing WCT-528d Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio'qonik



Photo 345 Watercourse Crossing WCT-529 Facing Upstream

Photo 346 Watercourse Crossing WCT-529 Facing Downstream



Photo 347 Watercourse Crossing WCT-530 Facing Upstream

Photo 348 Watercourse Crossing WCT-530 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio'gonik



Photo 349 Watercourse Crossing WCT-531 Facing Upstream



Photo 350 Watercourse Crossing WCT-531 Facing Downstream



Photo 351 Watercourse Crossing WCT-532 Facing Upstream



Photo 352 Watercourse Crossing WCT-532 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio’gonik



Photo 353 Watercourse Crossing WCT-533 Facing Upstream



Photo 354 Watercourse Crossing WCT-533 Facing Downstream



Photo 355 Watercourse Crossing WCT-534 Facing Upstream



Photo 356 Watercourse Crossing WCT-534 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio’qonik



Photo 357 Watercourse Crossing WCT-535 Facing Upstream



Photo 358 Watercourse Crossing WCT-535 Facing Downstream



Photo 359 Watercourse Crossing WCT-536 Facing Upstream



Photo 360 Watercourse Crossing WCT-536 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio’qonik



Photo 361 Watercourse Crossing WCT-537 Facing Upstream



Photo 362 Watercourse Crossing WCT-537 Facing Downstream



Photo 363 Watercourse Crossing WCT-538 Facing Upstream



Photo 364 Watercourse Crossing WCT-538 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio’qonik



Photo 365 Watercourse Crossing WCT-539 Facing Upstream

Photo 366 Watercourse Crossing WCT-539 Facing Downstream



Photo 367 Watercourse Crossing WCT-540 Facing Upstream

Photo 368 Watercourse Crossing WCT-540 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio’qonik



Photo 369 Watercourse Crossing WCT-544 Facing Upstream

Photo 370 Watercourse Crossing WCT-544 Facing Downstream



Photo 371 Watercourse Crossing WCT-545 Facing Upstream

Photo 372 Watercourse Crossing WCT-545 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio’qonik



Photo 373 Watercourse Crossing WCT-546 Facing Upstream



Photo 374 Watercourse Crossing WCT-546 Facing Downstream



Photo 375 Watercourse Crossing WCT-549 Facing Upstream



Photo 376 Watercourse Crossing WCT-549 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio’qonik



Photo 377 Watercourse Crossing WCT-553 Facing Upstream



Photo 378 Watercourse Crossing WCT-553 Facing Downstream



Photo 379 Watercourse Crossing WCT-555 Facing Upstream



Photo 380 Watercourse Crossing WCT-555 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio’qonik



Photo 381 Watercourse Crossing WCT-574 Facing Upstream



Photo 382 Watercourse Crossing WCT-574 Facing Downstream



Photo 383 Watercourse Crossing WCT-583 Facing Upstream



Photo 384 Watercourse Crossing WCT-583 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio’qonik



Photo 385 Watercourse Crossing WCT-585 Facing Upstream

Photo 386 Watercourse Crossing WCT-585 Facing Downstream



Photo 387 Watercourse Crossing WCT-609 Facing Upstream

Photo 388 Watercourse Crossing WCT-609 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio’gonik



Photo 389 Watercourse Crossing WCT-614 Facing Upstream

Photo 390 Watercourse Crossing WCT-614 Facing Downstream



Photo 391 Watercourse Crossing WCT-625 Facing Upstream

Photo 392 Watercourse Crossing WCT-625 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio’qonik



Photo 393 Watercourse Crossing WCT-627 Facing Upstream



Photo 394 Watercourse Crossing WCT-627 Facing Downstream



Photo 395 Watercourse Crossing WCT-627 Facing Upstream



Photo 396 Watercourse Crossing WCT-627 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio’qonik



Photo 397 Watercourse Crossing WCT-628 Facing Upstream



Photo 398 Watercourse Crossing WCT-628 Facing Downstream



Photo 399 Watercourse Crossing WCT-629 Facing Upstream



Photo 400 Watercourse Crossing WCT-629 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio'qonik



Photo 401 Watercourse Crossing WCT-630 Facing Upstream



Photo 402 Watercourse Crossing WCT-630 Facing Downstream



Photo 403 Watercourse Crossing WCT-631 Facing Upstream



Photo 404 Watercourse Crossing WCT-631 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Transmission Line Crossings – Project Nujio’qonik



Photo 405 Watercourse Crossing WCT-632 Facing Upstream



Photo 406 Watercourse Crossing WCT-632 Facing Downstream



Photo 407 Watercourse Crossing WCT-633 Facing Upstream

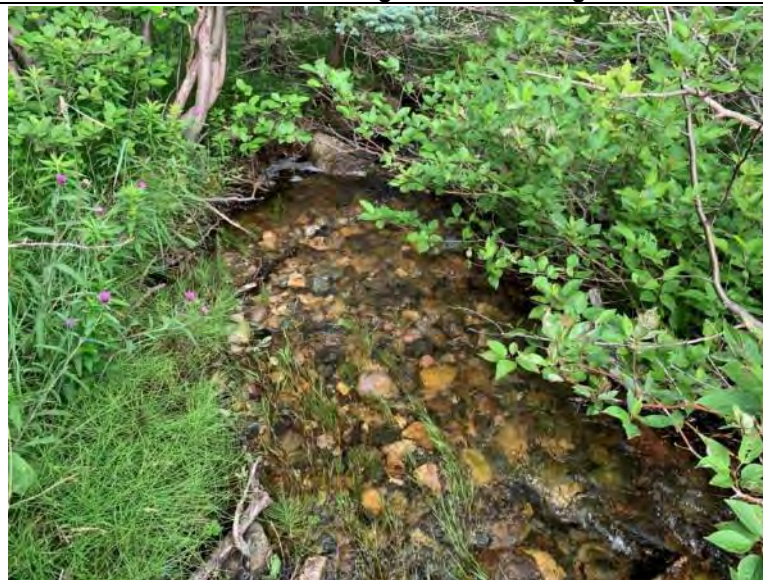


Photo 408 Watercourse Crossing WCT-633 Facing Downstream

APPENDIX B3

**Freshwater Fish and Fish Habitat
Turbine, Substations and Hydrogen /
Ammonia Plant**

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Turbine, Substations and Hydrogen / Ammonia Plant – Project Nuji'o'qonik



Photo 1 Watercourse Crossing WCF-1000 Facing Upstream

Photo 2 Watercourse Crossing WCF-1000 Facing Downstream



Photo 3 Watercourse Crossing WCF-1001 Facing Upstream

Photo 4 Watercourse Crossing WCF-1001 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Turbine, Substations and Hydrogen / Ammonia Plant – Project Nuji'o'qonik



Photo 5 Watercourse Crossing WCF-1002 Facing Upstream

Photo 6 Watercourse Crossing WCF-1002 Facing Downstream

No Photos Taken.

No Photos Taken.

Photo 7 Watercourse Crossing WCF-1003 Facing Upstream

Photo 8 Watercourse Crossing WCF-1003 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Turbine, Substations and Hydrogen / Ammonia Plant – Project Nuji'o'qonik



Photo 9 Watercourse Crossing WCF-1004 Facing Upstream

Photo 10 Watercourse Crossing WCF-1004 Facing Downstream



Photo 11 Watercourse Crossing WCF-1005 Facing Upstream

Photo 12 Watercourse Crossing WCF-1005 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Turbine, Substations and Hydrogen / Ammonia Plant – Project Nuji'o'qonik



Photo 13 Watercourse Crossing WCF-1006 Facing Upstream



Photo 14 Watercourse Crossing WCF-1006 Facing Downstream



Photo 15 Watercourse Crossing WCF-1007 Facing Upstream



Photo 16 Watercourse Crossing WCF-1007 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Turbine, Substations and Hydrogen / Ammonia Plant – Project Nuji'o'qonik



Photo 17 Watercourse Crossing WCF-1008 Facing Upstream



Photo 18 Watercourse Crossing WCF-1008 Facing Downstream



Photo 19 Watercourse Crossing WCF-1009 Facing Upstream



Photo 20 Watercourse Crossing WCF-1009 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Turbine, Substations and Hydrogen / Ammonia Plant – Project Nuji'o'qonik



Photo 21 Watercourse Crossing WCF-1010 Facing Upstream



Photo 22 Watercourse Crossing WCF-1010 Facing Downstream



Photo 23 Watercourse Crossing WCF-1011 Facing Upstream



Photo 24 Watercourse Crossing WCF-1011 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Turbine, Substations and Hydrogen / Ammonia Plant – Project Nuji'o'qonik



Photo 25 Watercourse Crossing WCF-1031 Facing Upstream



Photo 26 Watercourse Crossing WCF-1031 Facing Downstream



Photo 27 Watercourse Crossing WCF-1032 Facing Upstream



Photo 28 Watercourse Crossing WCF-1032 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Turbine, Substations and Plant – Project Nujio'qonik



Photo 29 Watercourse Crossing WCS-400 Facing Upstream



Photo 30 Watercourse Crossing WCS-400 Facing Downstream



Photo 31 Watercourse Crossing WCS-401 Facing Upstream



Photo 32 Watercourse Crossing WCS-401 Facing Downstream

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Turbine, Substations and Plant – Project Nujio'qonik



Photo 33 **Representative Run Habitat at WCS-407 (Profile 108035), Facing Upstream Towards to Access Road.**



Photo 34 **Double Culverts at WCS-407 Upstream of the Road Crossings, Facing Upstream Towards the Plant Site.**



Photo 35 **Representative Pool Habitat at WCS-408 (Profile 108038), Facing Downstream Towards the Atlantic Ocean.**



Photo 36 **Representative Riffle Habitat at WCS-409 (Profile 96348), Facing Upstream Approximately 70 m From the Confluence With Turning Basin**

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Turbine, Substations and Plant – Project Nujio'qonik



Photo 37 Steel Culvert at WCS-409 (Profile 96348) Approximately 75 m From the Confluence With Turning Basin.



Photo 38 Debris Jam at WCS-409 (Profile 96348). Approximately 140 m From the Confluence With Turning Basin.



Photo 39 Representative Run Habitat at WCS-409 (Profile 96351), Facing Downstream Approximately 240 m From the Confluence With Turning Basin.



Photo 40 Representative Riffle Habitat at WCS-409 (Profile 96353), Facing Downstream Approximately 320 m From the Confluence With Turning Basin.

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Turbine, Substations and Plant – Project Nujio’qonik



Photo 41 **Representative Run Habitat at WCS-409 (Profile 96354), Facing Upstream Approximately 600 m From the Confluence With Turning Basin.**

Photo 42 **Representative Riffle Habitat at WCS-409 (Profile 96355), Facing Upstream Approximately 660 m From the Confluence With Turning Basin.**



Photo 43 **Representative Beaver Impoundment Habitat at WCS-409 (Profile 96358), Facing Upstream Approximately 770 m From the Confluence With Turning Basin.**

Photo 44 **Representative Beaver Impoundment Habitat at WCS-409 (Profile 108036), Facing Downstream Approximately 950 m From the Confluence With Turning Basin.**

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Turbine, Substations and Plant – Project Nujio'qonik



Photo 45 Representative Riffle Habitat at WCS-409 (Profile 108037), Facing Downstream Approximately 960 m From the Confluence With Turning Basin.



Photo 46 Concrete Culvert at WCS-409 (Profile 108037). Approximately 965 m From the Confluence With Turning Basin.



Photo 47 Representative Beaver Impoundment at WCS-409 (Profile 108034), Facing Upstream Approximately 980 m From the Confluence With Turning Basin.



Photo 48 Representative Overland Drainage Channel at WCS-409 (Profile 108039), Facing Upstream Approximately 1000 m From the Confluence With Turning Basin.

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Turbine, Substations and Plant – Project Nujio'qonik



Photo 49 Double Culverts at WCS-409 (Profile 108039). Approximately 1050 m From the Confluence With Turning Basin.



Photo 50 Representative Tidal Habitat at WCS-410 (Profile 96360), Facing Downstream Approximately 50m From the Confluence with the Ocean.



Photo 51 Representative Run Habitat at WCS-410 (Profile 96361), Facing Upstream Approximately 395 m From the Confluence with the Ocean.



Photo 52 Representative Riffle Habitat at WCS-410 (Profile 96362), Facing Upstream Approximately 450 m From the Confluence with the Ocean.

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Turbine, Substations and Plant – Project Nujio'qonik



Photo 53 Representative Riffle Habitat at WCS-410 (Profile 96364), Facing Downstream Approximately 620 m From the Confluence with the Ocean.



Photo 54 Representative Riffle Habitat at WCS-410 (Profile 96365), Facing Upstream Approximately 700 m From the Confluence with the Ocean.



Photo 55 Representative Run Habitat at WCS-410 (Profile 96367), Facing Downstream Approximately 840 m From the Confluence with the Ocean.



Photo 56 Representative Riffle Habitat at WCS-410 (Profile 96368), Facing Upstream Approximately 1125 m From the Confluence with the Ocean.

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Turbine, Substations and Plant – Project Nujio'qonik



Photo 57 Representative Run Habitat at WCS-410 (Profile 96370), Facing Downstream Approximately 1300 m From the Confluence with the Ocean.



Photo 58 Representative Riffle Habitat at WCS-410 (Profile 96328), Facing Upstream Approximately 1405 m From the Confluence with the Ocean.



Photo 59 Representative Run Habitat at WCS-410 (Profile 96330), Facing Downstream Approximately 1540 m From the Confluence with the Ocean.



Photo 60 Representative Riffle Habitat at WCS-410 (Profile 96332), Facing Upstream Approximately 1970 m From the Confluence with the Ocean.

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Turbine, Substations and Plant – Project Nujo'qonik



Photo 61 Representative Run Habitat at WCS-410 (Profile 96335), Facing Downstream Approximately 2440 m From the Confluence with the Ocean.



Photo 62 Representative Riffle Habitat at WCS-410 (Profile 96337), Facing Upstream Approximately 2815 m From the Confluence with the Ocean.



Photo 63 Representative Run Habitat at WCS-410 (Profile 96330), Facing Downstream Approximately 2975 m From the Confluence with the Ocean.



Photo 64 Representative Beaver Impoundment Habitat at WCS-410 (Profile 100005), Facing Upstream Approximately 3300 m From the Confluence with the Ocean.

2023 FISH AND FISH HABITAT FIELD DATA REPORT

Freshwater Fish and Fish Habitat Turbine, Substations and Plant – Project Nujio'qonik



Photo 65 Representative Run Habitat at WCS-410 (Profile 96342), Facing Downstream Approximately 3600 m From the Confluence with the Ocean.



Photo 66 Representative Riffle Habitat at WCS-410 (Profile 96343), Facing Upstream Approximately 3900 m From the Confluence with the Ocean.



Photo 67 Representative Run Habitat at WCS-410 (Profile 96345), Facing Downstream Approximately 4000 m From the Confluence with the Ocean.



Photo 68 Remnant Concrete Dam at the Outlet of Noels Pond, WCS-410 (Profile 96345), Facing Upstream Approximately 4000 m From the Confluence with the Ocean.

APPENDIX C

Habitat Data

Table C.1 Raw Fish Habitat Survey Data by Habitat Profile
 Project Nujo'gonik
 File: 121417575

HABITAT PROFILE DATA																																							
Site ID	Survey Date (UTC)	Survey Time (UTC)	Stream Order	Latitude	Longitude	Habitat Unit Number	Dominant Habitat Unit Type	Habitat Profile Length (m)	Left Bank Stability (/50%)			Right Bank Stability (/50%)			Riparian Vegetation -Left Bank (/50%)						Riparian Vegetation -Right Bank (/50%)						Substrate Composition (%)						Total Stream Cover (%)						
									Unstable	Moderately Stable	Stable	Unstable	Moderately Stable	Stable	Bare	Grass	Shrub	Conifer	Deciduous	Wetland	Bare	Grass	Shrub	Conifer	Deciduous	Wetland	Muck/Silt	Sand	Gravel	Cobble	Rubble	Boulder		Bedrock	Substrate Embeddedness				
WCA-002a	2023-09-26	15:13:50	1	48.562936	-59.137014	111716a	Run	49	0	0	50	0	0	50	0	0	5	15	30	0	0	0	0	0	5	30	15	0	0	0	60	0	20	15	5	0	0	3	20
WCA-002a	2023-09-26	15:13:50	1	48.562936	-59.137014	111716b	Run	49	0	0	50	0	0	50	0	0	5	15	30	0	0	0	0	0	5	30	15	0	0	0	60	0	20	15	5	0	0	3	20
WCA-002a	2023-09-26	15:50:49	1	48.562816	-59.137559	111717a	Flat	50	0	0	50	0	0	50	0	0	15	20	15	0	0	0	0	15	25	10	0	0	0	60	0	15	15	5	0	0	3	20	
WCA-002a	2023-09-26	16:04:51	1	48.562328	-59.137565	111717b	Riffle	51	0	0	50	0	0	50	0	0	15	20	15	0	0	0	0	15	25	10	0	0	0	60	0	15	15	5	0	0	3	20	
WCA-002b	2023-09-26	16:01:24	1	48.562876	-59.137183	111714	Run	49	0	0	50	0	0	50	0	0	5	15	30	0	0	0	0	5	30	15	0	0	0	60	0	20	15	5	0	0	3	20	
WCA-009	2023-06-22	18:45:54	0	48.546916	-59.131934	93964	Flat	16	0	0	50	0	0	50	0	0	10	30	10	0	0	0	0	35	5	10	0	0	100	0	0	0	0	0	0	4	70		
WCA-009	2023-06-22	18:51:01	0	48.546907	-59.132128	93965	Glide	42	0	0	50	0	0	50	0	0	10	30	10	0	0	0	10	10	30	0	0	100	0	0	0	0	0	0	4	40			
WCA-009	2023-06-22	19:07:35	0	48.546916	-59.131934	93970	Run	35	0	0	50	0	0	50	0	0	10	30	10	0	0	0	5	15	35	0	0	100	0	0	0	0	0	4	40				
WCA-009	2023-06-22	19:19:13	0	48.546878	-59.131482	93972	Riffle	18	0	0	50	0	0	10	40	0	10	30	10	0	0	0	0	5	20	25	0	15	0	10	15	15	45	0	2	60			
WCA-009	2023-06-22	19:19:35	0	48.546916	-59.131934	93970b	Run	12	0	0	50	0	0	50	0	0	10	30	10	0	0	0	0	45	5	0	0	0	100	0	0	0	0	0	2	5			
WCA-010	2023-06-22	20:06:13	1	48.546295	-59.130759	93965	Pool	12	0	0	50	0	0	50	0	0	10	30	10	0	0	0	0	45	5	0	0	0	5	5	15	15	5	50	0	2	5		
WCA-010	2023-06-22	19:29:04	1	48.54683	-59.131231	93966	Riffle	15	0	0	50	0	0	50	0	0	10	30	10	0	0	0	0	10	40	0	0	0	0	0	0	0	0	100	4	20			
WCA-010	2023-06-22	19:49:13	1	48.546783	-59.131148	93967	Riffle	15	0	0	50	0	0	50	0	0	10	30	10	0	0	0	0	10	40	0	0	0	0	0	0	0	0	100	4	25			
WCA-010	2023-06-22	19:44:40	1	48.54681	-59.131158	93969	Pool	3	0	0	50	0	0	50	0	0	10	30	10	0	0	0	0	25	25	0	10	0	0	0	0	0	5	5	80	0	30		
WCA-010	2023-06-22	19:59:50	1	48.54672	-59.131052	93971	Riffle	60	0	0	50	0	0	50	0	0	10	30	10	0	0	0	15	20	15	0	0	5	5	0	20	25	45	0	2	20			
WCA-010	2023-06-22	20:15:38	1	48.546197	-59.130712	93973	Riffle	57	0	0	50	0	0	50	0	0	15	10	25	0	0	0	15	10	25	0	5	0	25	20	25	0	2	20					
WCA-011a	2023-06-22	16:02:42	0	48.547336	-59.121721	93515	Ephemeral	80	0	0	50	0	0	50	0	0	10	30	10	0	0	0	5	5	35	0	0	0	0	0	25	20	25	45	5	0	10		
WCA-011a	2023-06-22	16:14:42	1	48.547433	-59.122041	93517	Ephemeral	53	0	0	50	0	0	50	0	0	10	30	10	0	0	0	5	5	35	0	0	0	0	0	0	0	0	0	0	0	0	10	
WCA-011b	2023-06-22	16:18:17	0	48.546291	-59.121791	93508	Ephemeral	97	0	0	50	0	0	50	0	0	10	30	10	0	0	0	5	5	35	0	0	0	0	0	0	0	0	0	0	100	4	20	
WCA-011b	2023-06-22	16:18:17	0	48.546291	-59.121791	93508b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
WCA-011b	2023-06-22	16:32:09	0	48.545978	-59.120903	93510	Ephemeral	56	0	0	50	0	0	50	0	0	10	30	10	0	0	0	5	5	35	0	0	0	0	0	0	5	5	70	20	0	10		
WCA-011b	2023-06-22	16:11:47	0	48.547238	-59.121635	93519	Ephemeral	23	0	0	50	0	0	50	0	0	10	30	10	0	0	0	5	5	35	0	0	0	0	0	5	20	25	45	5	0	10		
WCA-013	2023-05-25	17:09:29	na	48.555144	-59.099704	40003	Pond	106	0	0	50	0	0	50	0	0	25	15	10	0	0	0	0	25	15	10	0	0	35	5	25	10	5	20	0	-	0		
WCA-014a	2023-05-25	14:25:42	1	48.558859	-59.112566	92094a	Riffle	100	0	0	50	0	0	50	0	0	10	30	10	0	0	0	0	5	5	35	10	0	0	5	5	15	25	15	5	1	10		
WCA-014a	2023-05-25	14:25:42	1	48.558859	-59.112566	92094b	Riffle	100	0	0	50	0	0	50	0	0	10	30	10	0	0	0	0	5	5	35	10	0	0	5	5	15	25	15	5	1	10		
WCA-014b	2023-05-25	15:54:31	1	48.555585	-59.100455	92095a	Riffle	100	0	0	50	0	0	50	0	0	10	30	10	0	0	0	5	15	20	10	0	0	0	5	15	15	70	0	0	60			
WCA-014b	2023-05-25	15:54:31	1	48.555585	-59.100455	92095b	Riffle	100	0	0	50	0	0	50	0	0	10	30	10	0	0	0	5	15	20	10	0	0	0	5	15	15	70	0	0	60			
WCA-014b	2023-05-25	15:54:31	1	48.555585	-59.100455	92095c	Riffle	100	0	0	50	0	0	50	0	0	10	30	10	0	0	0	5	15	20	10	0	0	0	5	15	15	70	0	0	60			
WCA-016	2023-05-25	22:06:09	0	48.559091	-59.113009	92096	Flat	100	0	0	50	0	0	50	0	0	10	30	10	0	0	0	40	10	0	0	0	0	0	0	0	0	0	0	0	4	0		
WCA-021	2023-06-18	14:41:34	1	48.598232	-59.089119	104702a	Run	89	0	0	50	0	0	50	0	0	25	25	0	0	0	0	25	25	0	0	0	100	0	0	0	0	0	0	4	55			
WCA-021	2023-06-18	14:41:34	1	48.598232	-59.089119	104702b	Run	89	0	0	50	0	0	50	0	0	25	25	0	0	0	0	25	25	0	0	0	100	0	0	0	0	0	0	4	55			
WCA-021	2023-08-18	15:24:32	1	48.598111	-59.089901	104704	Flat	51	0	0	50	0	0	50	0	0	25	25	0	0	0	0	25	25	0	0	0	100	0	0	0	0	0	0	4	80			
WCA-022	2023-09-22	17:48:19	0	48.616844	-59.054097	260071	No visible channel	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
WCA-023	2023-06-27	13:35:09	na	48.506808	-59.169446	227660	No visible channel	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
WCA-024a	2023-06-27	14:06:16	na	48.50648	-59.169679	40002	Boghole	21	0	0	50	0	0	50	0	0	40	10	0	0	0	0	0	40	10	0	0	0	100	0	0	0	0	0	0	4	5		
WCA-024b	2023-06-27	13:55:59	0	48.506587	-59.169635	40003	Boghole	7	0	0	50	0	0	50	0	0	32.5	10	7.5	0	0	0	0	32.5	10	7.5	0	0	100	0	0	0	0	0	0	4	10		
WCA-025	2023-05-26	18:04:07	1	48.609435	-58.980732	92098a	Run	100	0	0	50	0	0	50	0	0	10	30	10	0	0	0	10																

Table C.1 Raw Fish Habitat Survey Data by Habitat Profile
 Project: Nujo'gonik
 File: 121417575

HABITAT PROFILE DATA																																					
Site ID	Survey Date (UTC)	Survey Time (UTC)	Stream Order	Latitude	Longitude	Habitat Unit Number	Dominant Habitat Unit Type	Habitat Profile Length (m)	Left Bank Stability (/50%)			Right Bank Stability (/50%)			Riparian Vegetation -Left Bank (/50%)						Riparian Vegetation -Right Bank (/50%)						Substrate Composition (%)						Substrate Embeddedness	Total Stream Cover (%)			
									Unstable	Moderately Stable	Stable	Unstable	Moderately Stable	Stable	Bare	Grass	Shrub	Conifer	Deciduous	Wetland	Bare	Grass	Shrub	Conifer	Deciduous	Wetland	Muck/Silt	Sand	Gravel	Cobble	Rubble	Boulder			Bedrock		
WCA-063	2023-09-19	16:45:59	1	48.580799	-59.124532	107579	Run	52	0	0	50	0	0	50	0	15	15	20	0	0	0	0	15	15	20	0	0	40	25	30	5	0	0	0	2	25	
WCA-063	2023-09-19	16:18:55	1	48.580723	-59.125003	107584a	Run	50	0	0	50	0	0	50	0	15	15	20	0	0	0	0	15	15	20	0	0	40	25	30	5	0	0	0	2	45	
WCA-063	2023-09-19	16:18:55	1	48.580723	-59.125003	107584b	Run	50	0	0	50	0	0	50	0	15	15	20	0	0	0	0	15	15	20	0	0	40	25	30	5	0	0	0	2	45	
WCA-064	2023-06-23	19:19:39	1	48.597773	-59.104908	9399a	Riffle	50	0	0	50	0	0	50	0	10	30	10	0	0	0	0	10	30	10	0	0	40	5	5	5	5	0	0	2	45	
WCA-064	2023-06-23	18:36:37	1	48.597338	-59.104843	93996a	Riffle	50	0	0	50	0	0	50	0	10	30	10	0	0	0	0	10	30	10	0	0	40	5	5	5	5	0	0	2	45	
WCA-064	2023-06-23	18:36:37	1	48.597338	-59.104843	93996b	Riffle	50	0	0	50	0	0	50	0	10	30	10	0	0	0	0	10	35	5	0	0	85	0	5	5	5	5	0	0	2	60
WCA-066	2023-06-23	16:15:04	1	48.601649	-59.078831	93991	Riffle	50	0	15	35	0	15	35	0	10	30	10	0	0	0	0	10	30	10	0	0	85	0	5	5	5	5	0	0	2	45
WCA-066	2023-06-23	15:59:56	1	48.601646	-59.079166	93995	Flat	20	0	0	50	0	0	50	0	10	30	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WCA-067	2023-06-23	17:10:27	1	48.603515	-59.074817	93992a	Run	3	0	0	50	0	0	50	0	10	30	10	0	0	0	0	5	5	40	0	0	20	35	30	10	5	0	0	1	45	
WCA-067	2023-06-23	17:10:27	1	48.603515	-59.074817	93992b	Run	3	0	0	50	0	0	50	0	10	30	10	0	0	0	0	5	5	40	0	0	20	35	30	10	5	0	0	1	45	
WCA-067	2023-06-23	23:09:53	1	48.603485	-59.074821	93997	Riffle	50	0	0	50	0	0	50	0	10	30	10	0	0	0	5	5	40	0	0	20	30	30	10	5	0	0	1	45		
WCA-067	2023-06-23	16:50:33	1	48.603916	-59.07442	93998	Riffle	50	0	0	50	0	0	50	0	10	30	10	0	0	0	5	5	40	0	0	20	35	30	10	5	0	0	1	45		
WCA-069a	2023-09-06	17:14:01	1	48.619584	-59.052775	106403	Riffle	54	0	0	50	0	0	50	0	10	25	15	0	0	0	10	25	15	0	0	20	0	10	20	10	5	35	0	25	25	
WCA-069a	2023-09-06	17:41:40	1	48.619547	-59.052152	106407	Riffle	52	0	0	50	0	0	50	0	25	15	10	0	0	0	10	25	15	0	0	20	0	10	20	10	5	35	0	25	25	
WCA-069a	2023-09-06	17:41:40	1	48.619547	-59.052152	106407b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
WCA-069b	2023-09-22	16:36:20	1	48.619438	-59.049532	107574	Run	26	0	0	50	0	0	50	0	10	10	30	0	0	0	20	10	20	0	0	10	10	5	15	15	0	50	1	20	20	
WCA-069b	2023-09-22	16:46:21	1	48.619621	-59.050087	107577	Impoundment	41	0	0	50	0	0	50	0	10	10	30	0	0	0	0	50	0	0	0	0	100	0	0	0	0	0	0	4	5	
WCA-069b	2023-09-22	16:54:32	1	48.619591	-59.049811	107583	Pool	26	0	0	50	0	0	50	10	10	10	20	0	0	0	0	20	10	20	0	0	100	0	0	0	0	0	0	4	15	
WCA-070	2023-06-24	18:16:28	1	48.626855	-59.04354	94392	Run	33	0	25	25	0	25	25	0	10	30	10	0	0	0	0	15	20	15	0	0	100	0	0	0	0	0	0	3	65	
WCA-071b	2023-05-26	15:39:46	1	48.609603	-58.994056	92103a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
WCA-071b	2023-05-26	15:39:46	1	48.609603	-58.994056	92103b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
WCA-071b	2023-05-26	15:39:46	1	48.609603	-58.994056	92103c	Riffle	100	0	0	50	0	0	50	0	10	30	10	0	0	0	10	0	15	5	20	0	25	20	35	10	5	5	5	0	10	
WCA-071c	2023-05-26	12:40:50	1	48.606457	-59.006367	92100a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
WCA-071c	2023-05-26	12:40:50	1	48.606457	-59.006367	92100b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
WCA-071c	2023-05-26	12:40:50	1	48.606457	-59.006367	92100c	Intermittent-Pool	100	0	0	50	0	0	50	0	10	30	10	0	0	0	0	15	20	10	0	5	70	20	10	0	0	0	0	1	35	
WCA-071d	2023-05-26	14:04:58	1	48.6073	-59.003255	92099a	Intermittent-Pool	100	0	0	50	0	0	50	0	10	30	10	0	0	0	0	0	25	20	5	0	10	20	45	30	5	0	0	1	15	
WCA-071d	2023-05-26	14:04:58	1	48.6073	-59.003255	92099b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
WCA-071d	2023-05-26	14:04:58	1	48.6073	-59.003255	92099c	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
WCA-072a	2023-06-28	16:23:08	1	48.583359	-58.964539	94509	Pool	52	25	25	0	25	25	0	0	10	30	10	0	0	0	0	20	25	5	0	0	100	0	0	0	0	0	0	4	75	
WCA-072b	2023-06-26	20:41:36	1	48.590755	-58.967556	94473	Run	51	0	0	50	0	0	50	0	10	30	10	0	0	0	20	25	5	0	0	55	5	20	15	5	0	0	2	20		
WCA-072b	2023-06-26	19:41:01	1	48.591115	-58.968012	94478a	Run	51	0	0	50	0	0	50	0	10	30	10	0	0	0	20	25	5	0	0	55	5	20	15	5	0	0	2	20		
WCA-072b	2023-06-26	19:41:01	1	48.591115	-58.968012	94478b	Run	51	0	0	50	0	0	50	0	10	30	10	0	0	0	20	25	5	0	0	55	5	20	15	5	0	0	2	20		
WCA-073a	2023-06-28	15:19:17	1	48.582796	-58.968517	94507a	Riffle	34	0	0	50	0	0	50	0	10	30	10	0	0	0	0	30	10	5	5	0	5	5	30	35	25	0	0	0	35	
WCA-073a	2023-06-28	14:42:12	1	48.583296	-58.968636	94508a	Riffle	56	0	0	50	0	0	50	0	10	30	10	0	0	0	0	30	10	5	5	0	10	5	70	5	10	0	0	1	10	
WCA-073a	2023-06-28	14:42:12	1	48.583296	-58.968636	94508b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
WCA-073b	2023-06-28	13:21:55	1	48.586645	-58.967861	94502	Riffle	62	0	0	50	0	0	50	0	40	10	0	0	0	0	0	40	10	0	0	0	100	0	0	0	0	0	0	4	25	
WCA-073b	2023-06-28	13:12:27	1	48.586339	-58.967879	94503a	Riffle	22	0	0	50	0	0	50	0	10	30	10	0	0	0	0	40	10	0	0	0	100	0	0	0	0	0	0	4	25	
WCA-073b	2023-06-28	13:26:08	1	48.586805	-58.968066	94506a	Riffle	62	0	0	50	0	0	50	0	10	30	10	0	0	0	0	40	10	0	0	0	100	0	0	0	0	0	0	4	25	

Table C.1 Raw Fish Habitat Survey Data by Habitat Profile
 Project: Nujo'gonik
 File: 121417575

HABITAT PROFILE DATA																																					
Site ID	Survey Date (UTC)	Survey Time (UTC)	Stream Order	Latitude	Longitude	Habitat Unit Number	Dominant Habitat Unit Type	Habitat Profile Length (m)	Left Bank Stability (/50%)			Right Bank Stability (/50%)			Riparian Vegetation -Left Bank (/50%)						Riparian Vegetation -Right Bank (/50%)						Substrate Composition (%)						Total Stream Cover (%)				
									Unstable	Moderately Stable	Stable	Unstable	Moderately Stable	Stable	Bare	Grass	Shrub	Conifer	Deciduous	Wetland	Bare	Grass	Shrub	Conifer	Deciduous	Wetland	Muck/Silt	Sand	Gravel	Cobble	Rubble	Boulder		Bedrock	Substrate Embeddedness		
WCL-708	2023-09-26	12:16:02	2	48.557679	-59.13193	111712	Pool	23	0	0	50	0	0	50	0	15	30	5	0	0	0	0	15	35	0	0	0	0	30	20	35	10	5	0	0	2	50
WCL-709	2023-09-26	13:01:24	1	48.560973	-59.133222	111715	Pool	23	0	0	50	0	0	50	0	5	15	25	5	0	0	0	5	25	20	0	0	10	20	25	20	25	0	0	2	20	
WCL-710	2023-10-12	11:45:57	3	48.577125	-59.12181	109688	Riffle	20	0	0	50	0	0	50	0	25	5	15	5	0	0	0	20	5	15	10	0	0	20	25	25	20	10	0	5		
WCL-711a	2023-09-26	13:23:35	3	48.562268	-59.133210	111710	Run	24	0	0	50	0	0	50	0	5	40	5	0	0	0	0	5	5	35	5	0	0	15	15	15	35	20	0	0		
WCL-711b	2023-10-12	15:27:21	3	48.564949	-59.132867	110993	Riffle	21	0	0	50	0	0	50	0	5	35	5	0	0	0	0	5	10	35	5	0	10	30	35	5	5	0	0	20		
WCL-711c	2023-10-12	12:57:18	3	48.573695	-59.129587	109689	Riffle	30	0	0	50	0	0	50	0	10	5	20	15	0	0	0	5	10	25	10	0	5	10	10	5	20	50	3	15		
WCL-712a	2023-10-12	13:22:55	1	48.573082	-59.132484	109686	Riffle	22	0	10	40	0	10	40	5	20	10	10	5	0	0	5	25	10	5	5	0	5	10	35	30	15	5	0	0	15	
WCL-712b	2023-10-12	13:44:15	1	48.572376	-59.132386	109690	Riffle	29	0	0	50	0	0	50	5	10	10	10	20	5	0	0	5	5	10	15	15	0	0	30	35	30	5	0	0	3	15
WCL-712c	2023-10-12	14:01:44	1	48.571697	-59.133239	109691	Run	23	0	0	50	0	5	45	0	20	15	5	10	0	0	10	10	0	20	10	0	10	30	30	35	25	0	0	3	10	
WCL-713	2023-10-12	16:40:44	4	48.576599	-59.140675	110092	Riffle	23	0	0	50	0	0	50	0	10	10	20	10	0	0	5	10	15	10	0	0	0	0	0	0	20	80	0	5		
WCL-714	2023-10-12	18:25:29	2	48.597845	-59.095699	110094	Riffle	21	0	0	50	0	0	50	0	15	10	25	0	0	0	5	10	35	0	0	0	10	55	35	0	0	0	0	0	20	
WCL-715a	2023-06-22	16:54:21	0	48.543548	-59.120441	93511	Ephemeral	20	0	0	50	0	0	50	0	5	20	25	0	0	0	10	10	20	20	0	0	0	10	15	5	60	10	0	0	0	
WCL-715a	2023-06-22	16:48:48	0	48.543955	-59.120604	93514	Ephemeral	12	0	0	50	0	0	50	0	5	20	25	0	0	0	10	20	20	0	0	0	0	10	15	5	60	10	0	0	0	
WCL-715a	2023-06-22	16:48:15	0	48.543958	-59.120697	93515b	Ephemeral	10	0	0	50	0	0	50	0	10	30	30	10	0	0	0	10	20	20	0	0	0	10	15	5	60	10	0	0	0	
WCL-715b	2023-06-22	17:24:54	0	48.541694	-59.119687	93509	Intermittent-Pool	23	0	0	50	0	0	50	0	15	15	20	0	0	0	0	5	25	20	0	0	0	0	0	0	15	85	0	0	20	
WCL-715c	2023-06-22	17:32:56	0	48.540799	-59.119882	93513	Ephemeral	25	0	0	50	0	0	50	0	15	15	20	0	0	0	5	25	20	0	0	0	10	20	15	50	5	0	0	20		
WCL-716	2023-05-25	22:56:02	1	48.559455	-59.106691	92097	Riffle	20	0	0	50	0	0	50	0	10	30	10	0	0	0	5	10	20	15	0	0	0	10	30	35	25	0	0	1	10	
WCL-717	2023-10-10	15:50:02	2	48.568322	-59.10262	109278	Riffle	22	0	0	50	0	0	50	5	20	5	20	0	0	0	0	10	5	30	5	0	0	0	15	35	45	0	0	2	10	
WCL-718	2023-06-22	17:27:54	1	48.577444	-59.096047	93960	Riffle	20	0	0	50	0	0	50	0	10	30	10	0	0	0	5	5	10	25	5	0	0	10	15	40	25	0	0	0	0	
WCL-719	2023-06-26	18:19:44	1	48.59121	-59.074399	94437	Riffle	27	0	0	50	0	0	50	0	10	30	10	0	0	0	0	15	10	25	0	0	0	10	30	30	25	5	0	3	30	
WCL-720	2023-06-26	18:01:23	1	48.591541	-59.074399	94433	Riffle	17	0	0	50	0	0	50	0	10	30	10	0	0	0	0	15	10	25	0	0	0	30	30	25	10	5	0	3	40	
WCL-721	2023-06-26	16:05:49	2	48.593107	-59.073821	94436	Run	26	0	0	50	0	0	50	0	10	30	10	0	0	0	10	10	20	10	0	0	20	30	25	15	5	0	0	2	60	
WCL-722	2023-09-22	15:38:44	2	48.620532	-59.04125	83583	No visible channel	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
WCL-725	2023-06-24	12:41:29	0	48.62542	-59.029855	94393	Riffle	20	0	0	50	0	0	50	0	10	30	10	0	0	0	0	30	5	15	0	0	0	30	10	25	25	15	0	0	1	25
WCL-726	2023-05-25	18:24:28	na	48.550941	-59.101737	40007	Boghole	73	0	0	50	0	0	50	0	17.5	15	12.5	0	0	0	0	17.5	15	12.5	0	0	80	5	5	5	5	0	0	-	0	
WCL-727	2023-09-25	15:16:46	1	48.561215	-59.095822	84786	No visible channel	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
WCL-728	2023-07-22	13:29:02	2	48.564591	-59.094409	99777	Ephemeral	21	0	0	50	0	0	50	0	10	30	10	0	0	0	0	25	10	15	0	0	0	0	5	15	15	70	0	0	15	
WCL-729	2023-10-10	14:30:51	0	48.569390	-59.092591	265874	No visible channel	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
WCL-730	2023-10-10	14:19:02	0	48.572533	-59.091022	265875	No visible channel	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
WCL-739	2023-05-30	14:42:16	1	48.586172	-59.016085	92492	Pool 3 (4.5 m)	20	0	0	50	0	0	50	0	10	30	10	0	0	0	15	5	10	20	0	0	60	20	5	5	10	0	0	1	25	
WCL-740a	2023-06-26	17:02:47	1	48.611659	-58.990555	92101	Run	20	0	0	50	0	0	50	0	10	30	10	0	0	0	10	0	30	5	5	0	10	70	15	5	0	0	0	1	10	
WCL-740b	2023-06-26	13:42:04	1	48.607134	-59.004405	92102	Intermittent-Pool	20	0	0	50	0	0	50	0	10	30	10	0	0	0	0	5	35	10	0	0	60	20	20	0	0	0	0	2	25	
WCL-741a	2023-05-29	14:05:43	3	48.582951	-59.006491	92118	Step-Pool	20	0	0	50	0	0	50	0	10	30	10	0	0	0	10	0	0	0	0	0	5	5	5	5	5	20	50	0	15	
WCL-741a	2023-05-29	13:16:39	3	48.583386	-59.006914	92120	Run	20	0	0	50	0	0	50	0	10	30	10	0	0	0	10	5	5	25	5	5	5	5	5	5	5	70	0	0	5	
WCL-741a	2023-05-29	13:40:27	3	48.583267	-59.006782	92121	Run	20	0	0	50	0	0	50	0	10	30	10	0	0	0	10	0	0	0	0	0	0	5	5	5	5	10	60	0	5	
WCL-741b	2023-05-29	14:41:48	3	48.581228	-59.003696	92119b	Run	20	0	0	50	0	0	50	0	10	30	10	0	0	0	20	0	5	25	0	0	10	40	25	5	0	0	0	5		
WCL-742	2023-05-28	18:30:48	1	48.581022	-58.997993	92110	Riffle	20	0	0	50	0	0	50	0	10	30	10	0	0	0	0	15	30	25	10	0	15	10	20	0	0	50	0	0	5	
WCL-743	2023-05-28	17:38:10	1	48.584834	-58.994069	92111	Pool	20	0	0																											

Table C.1 Raw Fish Habitat Survey Data by Habitat Profile
 Project Nujo'gonik
 File: 121417575

Site ID	Survey Date (UTC)	Survey Time (UTC)	Stream Order	Latitude	Longitude	Habitat Unit Number	Dominant Habitat Unit Type	Habitat Profile Length (m)	Left Bank Stability (/50%)			Right Bank Stability (/50%)			Riparian Vegetation -Left Bank (/50%)						Riparian Vegetation -Right Bank (/50%)						Substrate Composition (%)						Substrate Embeddedness	Total Stream Cover (%)			
									Unstable	Moderately Stable	Stable	Unstable	Moderately Stable	Stable	Bare	Grass	Shrub	Conifer	Deciduous	Wetland	Bare	Grass	Shrub	Conifer	Deciduous	Wetland	Muck/Silt	Sand	Gravel	Cobble	Rubble	Boulder			Bedrock		
WCT-515	2023-06-01	14:15:37	2	48.568193	-58.670595	92496	Cascade/Rapid	20	0	0	50	0	0	50	0	0	10	30	10	0	0	0	5	0	10	20	15	0	0	0	10	20	30	40	0	0	5
WCT-516	2023-06-01	15:17:01	3	48.567204	-58.665514	92503	Riffle	20	0	0	50	0	0	50	0	0	10	30	10	0	0	0	5	0	5	25	15	0	10	5	15	25	30	15	0	0	10
WCT-518	2023-06-01	16:42:25	1	48.561791	-58.622285	92502	Riffle	20	0	0	50	0	0	50	0	0	10	30	10	0	0	0	5	15	30	0	0	0	10	5	5	25	50	5	0	0	65
WCT-519	2023-06-01	17:45:10	3	48.560189	-58.604563	92499	Riffle	20	0	0	50	0	0	50	0	0	10	30	10	0	0	0	5	10	40	0	0	0	10	5	45	40	5	0	0	5	
WCT-520	2023-06-01	18:22:05	2	48.560041	-58.601835	92500	Run	20	0	0	50	0	0	50	0	0	10	30	10	0	0	0	5	10	25	15	0	0	20	5	5	25	45	0	0	1	35
WCT-521	2023-09-21	13:42:03	4	48.568864	-58.588999	107573	Riffle	25	0	0	50	0	0	50	0	0	5	40	5	0	0	0	0	0	45	5	0	0	0	5	20	30	25	10	10	0	5
WCT-521	2023-09-21	13:13:13	4	48.568822	-58.589661	107578	Riffle	25	0	0	50	0	0	50	0	0	0	45	5	0	0	0	0	0	40	5	5	0	0	5	30	30	25	10	0	0	5
WCT-522	2023-09-21	14:35:17	2	48.570368	-58.575386	107576	Run	24	0	0	50	0	0	50	0	0	5	5	30	10	0	0	0	5	5	10	30	0	0	20	50	30	0	0	0	5	
WCT-523	2023-10-15	15:50:55	2	48.570302	-58.572923	40015	Pond	16	0	0	50	0	0	50	0	0	20	15	15	0	0	0	0	40	5	5	0	0	100	0	0	0	0	0	0	4	10
WCT-524	2023-10-15	15:54:32	2	48.570111	-58.572305	111718	Run	58	0	0	50	0	0	50	0	0	30	20	0	0	0	0	0	20	30	0	0	0	60	0	10	25	5	0	0	10	
WCT-525	2023-09-21	15:58:13	1	48.569621	-58.56948	83587	No visible channel	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WCT-526	2023-07-22	15:22:09	3	48.568493	-58.563202	99154	Riffle	23	5	25	20	5	10	35	0	10	30	10	0	0	0	10	30	10	0	0	0	5	10	30	45	10	0	0	0	40	
WCT-527	2023-09-21	17:40:57	1	48.569265	-58.538158	106861	Run	22	0	0	50	0	0	50	0	0	10	30	10	0	0	0	5	10	35	0	0	5	5	30	60	0	0	0	0	10	
WCT-527	2023-09-21	17:53:03	1	48.569334	-58.538169	106862	Run	12	0	0	50	0	0	50	0	0	10	30	10	0	0	0	5	10	35	0	0	5	5	30	60	0	0	0	0	10	
WCT-528a	2023-09-21	17:19:33	2	48.569277	-58.535762	106860	Run	63	0	0	50	0	0	50	0	0	25	20	5	0	0	0	25	15	10	0	0	60	0	0	15	25	0	0	3	50	
WCT-528b	2023-09-21	17:19:33	2	48.569277	-58.535762	106860b	Run	63	0	0	50	0	0	50	0	0	25	20	5	0	0	0	25	15	10	0	0	60	0	0	15	25	0	0	3	50	
WCT-528c	2023-09-21	17:06:26	2	48.569188	-58.534356	106863	Run	21	0	0	50	0	0	50	0	0	35	15	0	0	0	0	25	20	5	0	0	0	35	40	25	0	0	1	90		
WCT-528d	2023-09-21	16:40:34	2	48.569137	-58.533685	106859	Run	22	0	0	50	0	0	50	0	0	25	25	0	0	0	0	20	25	5	0	0	15	15	20	25	20	5	0	1	25	
WCT-529	2023-10-15	16:50:04	1	48.564818	-58.527407	112122a	Riffle	24	0	0	50	0	0	50	5	5	5	10	25	0	10	5	5	20	10	0	10	20	0	0	5	65	0	0	2	5	
WCT-530	2023-10-15	16:36:04	1	48.5631	-58.523485	268703	No visible channel	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
WCT-531	2023-10-14	16:43:07	4	48.568682	-58.512496	111306	Run	23	0	0	50	0	0	50	0	0	25	25	0	0	0	0	25	25	0	0	0	100	0	0	0	0	0	0	0	10	
WCT-532	2023-10-14	17:05:19	2	48.557829	-58.51139	268301	No visible channel	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
WCT-533	2023-10-14	17:26:51	2	48.556481	-58.510692	268302	No visible channel	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
WCT-534	2023-10-14	17:39:35	na	48.55331	-58.507396	40016	Pond	224	0	0	50	0	0	50	0	0	7.5	15	27.5	0	0	0	0	7.5	15	27.5	0	0	100	0	0	0	0	0	4	0	
WCT-535	2023-10-14	13:01:21	na	48.547977	-58.507119	40017	Pond	103	0	0	50	0	0	50	0	0	20	20	7.5	2.5	0	0	0	20	20	7.5	2.5	0	80	0	5	15	0	0	0	5	
WCT-536	2023-10-14	13:34:37	1	48.54755	-58.509075	111305	Run	18	0	0	50	0	0	50	0	0	10	35	5	0	0	0	0	25	20	5	0	0	80	0	5	10	5	0	0	0	15
WCT-537	2023-10-14	13:49:20	na	48.547007	-58.509932	40018	Pond	255	0	0	50	0	0	50	0	0	25	25	0	0	0	0	0	25	25	0	0	0	90	0	5	5	0	0	0	4	0
WCT-538	2023-10-14	14:15:57	na	48.542699	-58.510953	40019	Pond	19	0	0	50	0	0	50	0	0	35	10	5	0	0	0	0	35	10	5	0	0	95	0	0	0	0	0	0	4	0
WCT-539	2023-10-13	18:08:56	2	48.537858	-58.512018	110903	Run	21	0	0	50	0	0	50	0	0	25	20	0	0	0	0	20	25	5	0	0	60	0	35	5	0	0	0	0	5	
WCT-540	2023-10-13	17:38:31	na	48.535999	-58.510352	110902	Pond	95	0	0	50	0	0	50	0	0	15	30	5	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	4	5	
WCT-544	2023-07-22	20:22:05	3	48.5272	-58.455823	99558	Riffle	24	10	15	25	5	15	30	0	10	30	10	0	0	0	0	15	20	15	0	0	0	20	25	20	20	15	0	0	4	25
WCT-545	2023-07-22	21:04:56	1	48.526403	-58.453102	99560	Glide	27	30	10	10	30	10	10	0	10	30	10	0	0	0	0	10	10	10	0	20	100	0	0	0	0	0	0	4	80	
WCT-546	2023-07-22	21:31:05	3	48.526004	-58.447728	99561	Run	40	5	20	25	0	15	35	0	10	30	10	0	0	0	0	5	20	25	0	0	20	0	10	15	20	0	35	0	50	
WCT-627	2023-10-13	12:36:41	0	48.543959	-58.967219	266678	No visible channel	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
WCT-628	2023-10-13	14:05:32	0	48.53573	-58.945435	266679	No visible channel	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
WCT-629	2023-10-16	12:37:42	1	48.561217	-58.765705	112124	Riffle	26	0	0	50	0	0	50	10	20	20	0	0	0	0	0	10	20	20	0	0	0	5	30	25	15	30	0	0	3	5
WCT-630	2023-10-16	13:06:13	1	48.558972	-58.753966	112125	Riffle	23	0	0	50	0	0	50	0	0	10	20	30	10	0	0	0	10	35	5	0	0	0	40	25	15	5	10	0	0	20
WCT-631	2023-10-16	13:53:59	1	48.559856	-58.745137	118525	Run	21	0	0	50	0	0	50	0																						

Table C.1 Raw Fish Habitat Survey Data by Habitat Profile
 Project: Nujo'gonik
 File: 121417575

HABITAT PROFILE DATA																																										
Site ID	Survey Date (UTC)	Survey Time (UTC)	Stream Order	Latitude	Longitude	Habitat Unit Number	Dominant Habitat Unit Type	Habitat Profile Length (m)	Overhead Stream Cover (%)					Instream Cover (%)					Aquatic Vegetation Composition (%)							Width (m)		Wet Depth (m)					Bank Height (m)		Velocity (m/s)			Comment				
									Undercut Bank	Grass Forbe	Tree Shrub	Overhead Large Woody Debris	Instream Large Woody Debris	Small Woody Debris	Boulders	Water Visibility	Instream Vegetation (%)	Emergent	Floating Leafed	Free Floating	Submerge d	Filamentou s Algae	Macrophyti c Algae	Habitat Unit Type	Wet Width	Channel Width	25% from LB	50% from LB	75% from LB	Bankfull Max	Gradient (%)	Left	Right	Riparian Crown Closure (%)	25% from LB	50% from LB	75% from LB					
WCA-063	2023-09-19	16:45:59	1	48.580799	-59.124532	107579	Run	52	10	5	10	0	0	0	15	0	5	100	0	0	0	0	0	0	0	0	0	0	0.99	0.77	0.12	0.09	0.11	0.45	1	0.40	0.33	5	no data	0.05	no data	-
WCA-063	2023-09-19	16:18:55	1	48.580723	-59.125003	107584a	Run	50	20	5	20	0	0	0	15	0	5	100	0	0	0	0	0	0	0	0	0	1.35	1.70	0.14	0.12	0.09	0.59	1	0.45	0.49	0	0.001	0.03	0.03	-	
WCA-063	2023-09-19	16:18:55	1	48.580723	-59.125003	107584b	Run	50	20	5	20	0	0	0	15	0	5	100	0	0	0	0	0	0	0	0	0	0.96	0.85	0.17	0.16	0.18	0.33	1	0.15	0.38	5	no data	0.04	no data	-	
WCA-064	2023-06-23	19:19:39	1	48.597773	-59.104908	93994	Riffle	50	15	20	5	5	0	0	10	0	15	45	0	0	45	10	0	0	0	0	0	0.63	0.57	0.11	0.11	0.07	0.28	1	no data	0.17	25	no data	no data	no data	Very low flow and pooling water.	
WCA-064	2023-06-23	18:36:37	1	48.597338	-59.104843	93996a	Riffle	50	0	15	45	0	0	0	15	0	15	0	0	0	45	10	0	0	0	0	0	0.82	0.82	0.08	0.05	0.13	0.26	1	0.16	0.40	45	no data	no data	no data	Very low flow and pooling water.	
WCA-064	2023-06-23	18:36:37	1	48.597338	-59.104843	93996b	Riffle	50	0	15	45	0	0	0	15	0	15	0	0	0	45	10	0	0	0	0	0	0.80	0.59	0.17	0.19	0.20	0.50	1	0.42	0.30	60	no data	no data	no data	Very low flow and pooling water.	
WCA-066	2023-06-23	16:15:04	1	48.601649	-59.078831	93991	Riffle	50	20	5	20	0	0	0	15	0	15	75	0	0	0	0	25	0	0	0	0.35	0.55	0.02	0.03	0.04	0.34	1	0.51	0.30	15	no data	no data	no data	-		
WCA-066	2023-06-23	15:59:56	1	48.601546	-59.079166	93995	Flat	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	no data	no data	-	-	-	-	no data	no data	no data	no data	no data	no data	-			
WCA-067	2023-06-23	17:10:27	1	48.603515	-59.074817	93992a	Run	3	10	5	30	0	0	0	10	0	5	0	100	0	0	0	0	0	0	0	0	0.78	1.11	0.13	0.17	0.09	0.40	1	0.23	0.53	45	no data	0.0099	no data	-	
WCA-067	2023-06-23	17:10:27	1	48.603515	-59.074817	93992b	Run	3	10	5	30	0	0	0	10	0	5	0	100	0	0	0	0	0	0	0	0	0.82	1.06	0.11	0.16	0.05	0.49	1	0.33	0.47	35	no data	no data	no data	-	
WCA-067	2023-06-23	23:09:53	1	48.603485	-59.074821	93997	Riffle	50	10	5	30	0	0	0	10	0	0	0	0	0	0	0	0	100	0	0	no data	no data	no data	no data	0.06	no data	no data	no data	0.03	no data	no data	no data	-			
WCA-067	2023-06-23	16:50:33	1	48.603916	-59.07442	93998	Riffle	50	10	5	30	0	0	0	10	0	5	0	100	0	0	0	0	0	0	0	0	0.64	1.02	0.18	0.08	0.08	0.34	1	0.16	0.38	10	0.03	no data	no data	-	
WCA-069a	2023-09-06	17:14:01	1	48.619584	-59.052775	106403	Riffle	54	5	10	10	0	0	0	0	0	0	20	10	0	30	10	50	0	0	0	0.42	0.48	0.01	0.01	0.01	0.05	3	0.04	0.09	0	no data	no data	no data	Too shallow for flow.		
WCA-069a	2023-09-06	17:41:40	1	48.619547	-59.052152	106407	Riffle	52	5	10	10	0	0	0	0	0	20	10	0	40	10	40	0	0	0	0	0.62	0.63	0.08	0.13	0.16	0.33	2	0.17	0.18	5	no data	0.029	no data	Too shallow for flow.		
WCA-069a	2023-09-06	17:41:40	1	48.619547	-59.052152	106407b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.57	0.59	0.08	0.10	0.09	0.15	2	0.05	0.16	0	no data	no data	no data	Too shallow for flow.		
WCA-069b	2023-09-22	16:36:20	1	48.619438	-59.049532	107574	Run	26	0	10	10	0	0	0	0	0	15	10	0	0	90	0	0	0	0	0	2.46	1.65	0.06	0.13	0.17	0.18	2	0.24	0.01	0	0.47	0.77	no data	no data	-	
WCA-069b	2023-09-22	16:46:21	1	48.619621	-59.050087	107577	Impoundment	41	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	no data	no data	-	-	-	-	no data	no data	no data	no data	no data	no data	-			
WCA-069b	2023-09-22	16:54:32	1	48.619591	-59.049811	107583	Pool	26	0	10	5	0	0	0	0	0	0	0	0	0	40	25	25	0	0	0	6.47	6.55	0.23	0.38	0.35	0.44	0	0.12	0.06	0	no data	no data	no data	Very low flow and channel is filled with grasses. No velocity measurement. No connectivity to either pond, ground water inflow at southern end of watercourse.		
WCA-070	2023-06-24	18:16:28	1	48.626855	-59.04354	94392	Run	33	0	0	65	0	0	0	5	0	25	50	0	0	0	30	20	0	0	0	0.16	0.26	0.07	0.06	0.03	0.27	no data	0.20	0.25	10	no data	no data	no data	-		
WCA-071b	2023-05-26	15:39:46	1	48.609603	-58.994056	92103a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.31	1.49	0.16	0.24	0.20	0.77	1	0.61	0.53	0	0.3	0.34	0.58	-		
WCA-071b	2023-05-26	15:39:46	1	48.609603	-58.994056	92103b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.57	1.18	0.38	0.24	0.23	0.70	1	0.39	0.32	0	0.217	0.14	0.15	-		
WCA-071b	2023-05-26	15:39:46	1	48.609603	-58.994056	92103c	Riffle	100	5	0	0	5	5	0	10	0	0	0	0	0	0	0	0	0	0	0	1.71	1.72	0.15	0.09	0.05	0.62	1	0.47	0.75	0	0.47	0.327	0.71	-		
WCA-071c	2023-05-26	12:40:50	1	48.606457	-59.006367	92100a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.53	0.48	0.30	0.28	0.33	0.56	1	0.25	0.23	15	no data	0.068	no data	Overland drainage channel. Water present due to recent rain event.		
WCA-071c	2023-05-26	12:40:50	1	48.606457	-59.006367	92100b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.35	0.32	0.26	0.29	0.26	0.37	1	0.12	0.08	10	no data	0.169	no data	Overland drainage channel. Water present due to recent rain event.		
WCA-071c	2023-05-26	12:40:50	1	48.606457	-59.006367	92100c	Intermittent-Pool	100	10	25	0	0	0	0	10	0	15	100	0	0	0	0	0	0	0	0	no data	no data	no data	no data	0.00	0.00	1	no data	no data	5	no data	no data	no data	Overland drainage channel. Water present due to recent rain event.		
WCA-071d	2023-05-26	14:04:58	1	48.6073	-59.003255	92099a	Intermittent-Pool	100	5	0	10	0	10	0	10	0	5	0	0	0	100	0	0	0	0	0	1.27	1.07	0.17	0.20	0.15	0.37	2	0.70	0.17	5	0.09	0.16	0.12	-		
WCA-071d	2023-05-26	14:04:58	1	48.6073	-59.003255	92099b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.89	0.77	0.09	0.13	0.13	0.35	1	0.23	0.22	5	0.28	0.22	0.18	-		
WCA-071d	2023-05-26	14:04:58	1	48.6073	-59.003255	92099c	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.63	0.65	0.05	0.05	0.05	0.21	1	0.16	0.21	5	0.36	0.28	0.22	-		
WCA-072a	2023-06-28	16:23:08	1	48.583359	-58.964539	94509	Pool	52	0	25	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.57	0.78	0.06	0.06	0.05	0.11	1	0.05	0.10	0	no data	no data	no data	Stream terminates at crossing location. No upstream transect.		
WCA-072b	2023-06-26	20:41:36	1	48.590755	-58.967556	94473	Run	51	10	5	5	0	0	0	5	0	10	50	0	0	50	0	0	0	0	1.50	1.85	0.05	0.19	0.19	0.57	1	0.38	0.50	75	0.14	0.22	0.25	-			
WCA-072b	2023-06-26	19:41:01	1	48.591115	-58.968012	94478a	Run	51	10	5	5	0	0	0	5	0	10	50	0	0	50	0	0	0	0	0	1.87	2.00	0.09	0.29	0.21	0.74	1	0.52	0.45	60	no data	0.01	no data	-		
WCA-072b	2023-06-26	19:41:01	1	48.591115	-58.968012	94478b	Run	51	10	5	5	0	0	0	5	0	10	50	0	0	50	0	0	0	0	0	1.62	1.53	0.14	0.19	0.11	0.57	1	0.46								

Table C.2
In Situ Surface Water Data
Project Nujó qomik
File: 121417575

Station ID	Latitude	Longitude	Date	Time	Water Clarity	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (%)	Specific Conductivity (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
WCA-100	48.535064	-58.934896	2023-05-31	15:34:05	no data	6.1	*	*	334.4	7.2	0.8	234.1
WCT-510	48.535064	-58.934896	2023-05-31	15:34:05	no data	6.1	*	*	334.4	7.2	0.8	234.1
WCL-741a	48.583205	-59.006713	2023-05-29	13:49:35	no data	6.2	*	*	125.5	7.6	-	263.7
WCL-741b	48.581135	-59.108439	2023-05-29	16:06:00	no data	6.5	*	*	199.7	8.1	0.7	206.0
WCA-028c	48.589862	-58.978508	2023-05-27	14:51:05	no data	6.5	*	*	150.4	7.6	2.4	261.1
WCT-500	48.581135	-59.003717	2023-05-29	14:51:05	no data	6.5	*	*	76.0	6.0	-	227.7
WCL-768a	48.580999	-58.999741	2023-05-29	16:06:11	no data	6.6	*	*	150.4	7.6	-	261.1
WCT-501c	48.580999	-58.999741	2023-05-29	16:06:11	no data	6.6	*	*	214.4	8.0	1.2	227.7
WCS-400	48.584174	-59.011596	2023-05-30	16:02:18	no data	6.7	*	*	179.6	7.3	6.6	282.1
WCL-740b	48.607118	-59.004448	2023-05-26	13:50:07	no data	6.8	*	*	77.5	4.5	1.8	294.9
WCL-768b	48.581023	-58.988095	2023-05-29	16:50:09	no data	6.8	*	*	213.7	7.7	1.1	256.3
WCA-071d	48.607323	-59.002412	2023-05-26	14:27:28	no data	6.8	*	*	76.7	6.1	3.7	260.5
WCT-501b	48.581023	-58.988095	2023-05-29	16:50:09	no data	6.8	*	*	213.7	8.0	1.1	256.3
WCL-770	48.580708	-58.9966	2023-05-29	18:02:51	no data	6.9	*	*	146.0	8.0	2.1	238.0
WCT-502	48.580708	-58.9966	2023-05-29	18:02:51	no data	6.9	*	*	146.0	8.0	2.1	238.0
WCL-763	48.589228	-58.991873	2023-05-28	12:56:36	no data	7.0	*	*	60.2	6.1	2.8	232.2
WCL-764b	48.589067	-58.983231	2023-05-28	13:46:23	no data	7.1	*	*	96.4	6.2	6.0	245.6
WCL-768c	48.580765	-58.997153	2023-05-29	17:32:25	no data	7.1	*	*	213.3	8.2	2.1	231.8
WCT-501a	48.580765	-58.997153	2023-05-29	17:32:25	no data	7.1	*	*	213.3	8.2	2.1	231.8
WCL-765b	48.587334	-59.007438	2023-05-27	13:05:11	no data	7.2	*	*	63.0	7.4	2.0	234.1
WCA-116	48.587334	-59.007438	2023-05-27	13:05:11	no data	7.2	*	*	63.0	7.4	2.0	234.1
WCL-762	48.586846	-58.994096	2023-05-28	13:37:38	clear	7.3	6.8	56.6	64.3	7.9	-	260.6
WCA-071b	48.609701	-58.993639	2023-05-26	16:13:13	no data	7.3	*	*	76.0	6.1	7.9	217.7
WCA-071c	48.606738	-59.005798	2023-05-26	12:59:15	no data	7.3	*	*	75.3	5.6	2.4	234.4
WCA-123	48.631666	-59.028583	2023-06-24	16:54:36	no data	7.3	*	*	313.5	7.6	0.9	218.7
WCL-765c	48.592338	-58.976656	2023-05-27	17:00:21	no data	7.5	*	*	176.1	7.7	7.3	250.9
WCA-132	48.549451	-59.122832	2023-09-22	13:22:57	clear	7.5	9.9	81.3	81.3	7.7	-	110.5
WCL-764a	48.589077	-58.982711	2023-05-28	14:11:15	no data	7.6	*	*	97.2	6.2	-	228.8
WCA-074a	48.559653	-59.112057	2023-05-26	14:39:25	no data	7.7	*	*	194.9	7.8	1.2	186.3
WCL-766	48.611596	-58.990424	2023-05-27	17:21:50	no data	7.8	*	*	77.6	5.5	19.1	254.8
WCL-749	48.582509	-58.968253	2023-06-28	15:27:13	clear	7.9	91.7	255.3	190.0	7.1	1.3	223.5
WCA-026	48.604441	-58.991992	2023-05-26	20:00:16	no data	8.3	*	*	73.6	7.5	1.4	259.6
WCL-742	48.585119	-58.998157	2023-05-28	18:39:14	no data	8.5	5.2	65.0	65.0	6.7	-	107.6
WCA-082	48.583847	-58.689429	2023-05-24	21:13:08	no data	8.5	*	*	289.5	8.0	0.6	181.4
WCA-115	48.597969	-58.978161	2023-05-27	14:32:21	no data	8.6	*	*	80.7	6.5	1.4	242.9
WCA-117	48.58679	-59.009696	2023-05-30	15:01:44	clear	9.0	89.2	249.8	80.7	6.5	2.3	-
WCL-739	48.586062	-59.016065	2023-05-30	14:48:25	no data	9.2	*	*	68.4	5.8	4.1	205.9
WCL-896b	48.547766	-59.118658	2023-07-20	16:57:51	clear	9.2	*	*	108.3	7.5	-	-
WCL-896c	48.547766	-59.118658	2023-07-20	16:57:51	clear	9.2	*	*	108.3	7.5	-	-
WCA-135a	48.547766	-59.118658	2023-07-20	16:57:51	clear	9.2	*	*	108.3	7.5	-	-
WCA-135b	48.547766	-59.118658	2023-07-20	16:57:51	clear	9.2	*	*	108.3	7.5	-	-
WCL-711b	48.565018	-59.13276	2023-10-12	15:30:55	clear	9.3	5.6	49.3	20.3	7.9	-	142.2
WCL-711c	48.573727	-59.129774	2023-10-12	13:01:54	clear	9.3	49.0	51.5	19.1	8.2	2.6	124.0
WCL-514	48.568402	-58.672625	2023-06-01	13:43:12	no data	9.3	*	*	285.4	7.9	0.6	248.6
WCL-709	48.561041	-59.133112	2023-09-26	13:09:06	brown/yellow	9.5	5.8	51.0	51.0	4.5	-	238.2
WCL-726	48.550954	-59.101738	2023-05-25	18:26:04	no data	9.5	*	*	138.7	8.1	3.6	197.4
WCL-768f	48.584393	-58.997943	2023-05-28	17:05:06	no data	9.5	*	*	195.8	7.6	3.9	247.7
WCA-014b	48.556463	-59.099885	2023-05-25	16:25:14	no data	9.5	*	*	191.7	8.4	2.3	125.4
WCA-025	48.609012	-58.980768	2023-05-26	18:31:23	no data	9.5	*	*	84.3	6.2	-	214.9
WCA-073a	48.582781	-58.968534	2023-06-28	15:07:19	clear	9.5	*	*	253.2	7.4	1.5	210.3
WCT-523	48.570081	-58.572879	2023-10-15	15:52:55	clear	9.6	2.6	23.8	48.9	7.2	-	52.3
WCA-013	48.554062	-59.098801	2023-05-25	17:12:21	no data	9.8	*	*	198.8	8.4	1.2	188.9
WCA-099	48.535865	-58.931513	2023-07-27	11:52:15	clear	9.8	98.1	257.3	257.3	8.0	-	-
WCT-516	48.56729	-58.665442	2023-06-01	15:25:38	no data	9.8	*	*	247.3	7.7	1.8	255.2
WCL-713	48.576556	-59.141042	2023-10-12	16:44:10	clear	10.1	6.0	54.2	18.8	8.4	-	105.5
WCA-014a	48.571165	-59.121688	2023-10-12	11:46:53	clear	10.2	4.9	44.4	19.7	8.4	2.3	125.4
WCA-016	48.558639	-59.112848	2023-05-25	17:44:00	no data	10.2	**	**	119.6	7.5	2.8	83.9
WCL-768d	48.582143	-59.018396	2023-06-25	13:38:35	brown/yellow	10.3	1.9	97.2	108.5	7.9	-	-
WCA-070	48.628683	-59.043539	2023-10-15	13:38:35	clear	10.3	5.2	48.2	18.9	7.7	-	162.7
WCA-071	48.628683	-59.043539	2023-06-24	18:22:23	clear	10.3	6.8	62.4	238.6	7.1	1.7	238.6
WCT-513	48.551303	-58.763105	2023-10-16	12:04:30	clear	10.3	4.8	44.1	28.9	4.9	-	121.6
WCT-630	48.559908	-58.741608	2023-10-16	13:35:57	clear	10.3	3.9	35.8	36.3	8.5	-	122.9
WCT-632	48.559908	-58.741608	2023-10-16	13:35:57	clear	10.3	3.9	35.8	36.3	8.5	0.0	122.9
WCL-761	48.582419	-58.942894	2023-09-20	17:28:51	cloudy	10.5	5.9	52.9	52.9	8.3	-	107.2
WCT-629	48.576582	-58.765682	2023-10-16	12:41:32	clear	10.6	5.0	46.0	40.7	8.2	-	-
WCL-869	48.575665	-59.125323	2023-10-12	12:27:17	clear	10.6	5.1	46.8	77.5	7.0	2.0	71.0
WCT-527	48.569344	-58.538139	2023-09-21	17:53:50	clear	10.6	5.8	51.7	51.7	8.2	-	133.9
WCT-631	48.559887	-58.745282	2023-10-16	13:58:46	clear	10.6	3.2	29.2	57.2	7.7	-	160.9
WCL-762	48.580377	-58.962787	2023-09-25	12:12:42	clear	10.7	6.1	55.2	55.2	8.2	-	115.4
WCT-759	48.579767	-58.947087	2023-09-20	15:46:07	cloudy	10.7	6.4	57.3	57.3	8.3	-	111.1
WCA-002b	48.579767	-58.947087	2023-09-20	15:46:07	cloudy	10.7	6.4	57.3	57.3	8.3	-	111.1
WCA-002a	48.579767	-58.947087	2023-09-20	15:46:07	cloudy	10.7	6.4	57.3	57.3	8.3	-	111.1
WCL-748	48.581434	-58.972554	2023-06-28	19:01:01	clear	10.8	4.2	38.2	70.0	6.3	-	-8.0
WCL-747	48.582665	-59.076796	2023-10-10	13:07:26	Clear	10.9	6.9	63.0	334.9	7.2	0.4	210.9
WCL-712a	48.572948	-59.132462	2023-10-12	13:23:42	clear	11.0	5.3	48.3	63.7	6.4	-	112.6
WCL-714	48.580008	-59.095803	2023-10-12	18:29:53	clear	11.0	5.2	47.9	95.2	6.8	-	168.7
WCL-717	48.568387	-59.102705	2023-10-10	15:55:16	clear	11.0	7.6	70.2	21.9	8.2	-	168.7
WCL-712c	48.571765	-59.132274	2023-10-12	14:02:23	clear	11.1	5.2	48.0	62.7	6.1	-	115.4
WCL-870	48.574078	-59.147766	2023-10-15	11:58:46	clear	11.1	5.3	49.6	67.5	5.8	-	134.2
WCL-905f	48.572254	-59.045568	2023-07-25	17:51:21	clear	11.1	*	*	242.6	8.0	2.6	-
WCL-712b	48.572291	-59.132238	2023-10-12	13:49:25	clear	11.2	5.4	49.3	63.1	6.2	-	123.4
WCA-002a	48.562363	-58.937509	2023-09-26	16:13:04	brown/yellow	11.2	4.3	39.5	40.0	4.8	-	197.5
WCL-745a	48.584182	-58.963589	2023-10-10	11:46:09	clear	11.3	*	*	34.3	8.5	1.4	764.6
WCL-745b	48.584074	-58.962666	2023-10-10	12:08:29	clear	11.4	9.2	84.7	34.2	8.5	1.3	168.2
WCL-746	48.583732	-58.98153	2023-10-10	12:34:16	clear	11.4	7.8	72.2	21.1	7.8	2.8	161.4
WCL-725	48.625467	-59.029978	2023-06-24	12:56:59	no data	11.5	5.6	51.2	235.0	7.7	3.9	228.3
WCA-030a	48.581403	-58.958379	2023-09-25	17:39:01	no data	11.5	*	*	51.2	8.1	-	132.2
WCT-503	48.580459	-58.992161	2023-06-27	17:39:01	no data	11.5	*	*	231.9	7.9	6.3	202.3
WCT-511	48.534925	-58.93202	2023-05-31	18:05:11	no data	11.5	*	*	352.1	7.8	1.5	242.5
WCL-771b	48.581776	-58.991268	2023-06-27	16:09:51	no data	11.6	*	*	230.6	8.0	2.2	204.8
WCL-894	48.620624	-59.042497	2023-09-22	15:58:51	clear	11.6	5.3	49.1	49.1	7.5	-	118.2
WCL-774a												

Table C.2
In Situ Surface Water Data
Project Nujjo'qomik
File: 121417575

Station ID	Latitude	Longitude	Date	Time	Water Clarity	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (%)	Specific Conductivity (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
WCA-059b	48.584381	-59.08347	2023-08-16	16:10:21	no data	13.6	*	99.6	10.3	8.2	-	108.9
WCL-704b	48.561112	-59.151278	2023-06-25	17:44:12	clear	13.7	9.7	91.6	49.5	5.1	8.0	-
WCA-110	48.584587	-58.948481	2023-06-28	16:33:37	clear	13.7	9.7	93.6	283.8	8.1	24.0	-
WCS-007	48.527614	-58.522885	2023-09-23	16:40:20	brown/yellow	13.8	4.0	38.6	38.6	6.4	-	80.3
WCL-760	48.581211	-58.944891	2023-09-20	16:15:58	brown/yellow	13.8	5.5	53.0	53.0	8.1	-	110.9
WCA-059c	48.586786	-59.078734	2023-06-26	19:52:04	clear	13.8	6.3	60.5	285.8	7.5	6.0	-
WCS-009	48.527975	-58.511238	2023-09-23	15:22:35	brown/yellow	13.8	1.6	15.1	15.1	6.7	-	-64.2
WCL-528b	48.569262	-58.534397	2023-09-21	17:11:48	clear	13.8	4.7	45.7	45.7	7.6	-	103.1
WCF-1008	48.586786	-59.078734	2023-06-26	19:52:04	clear	13.8	6.3	60.5	285.8	7.5	6.0	-
WCA-074a	48.580093	-58.949611	2023-06-28	13:27:56	clear	13.9	9.3	93.0	187.3	7.7	20.0	-
WCT-528c	48.569245	-58.535888	2023-09-21	16:52:48	brown/yellow	13.9	5.5	53.4	53.4	7.9	-	46.8
WCF-1534	48.553746	-58.571212	2023-10-14	17:44:41	clear	13.9	4.2	42.2	60.5	6.5	1.6	97.4
WCF-1001	48.586336	-58.967911	2023-06-28	13:00:20	clear	13.9	8.9	85.9	221.7	7.1	1.5	152.4
WCT-528d	48.569245	-58.535888	2023-09-21	16:52:48	Brown/Yellow	13.9	5.5	53.4	18.0	7.9	0.0	46.8
WCL-868	48.628567	-59.025489	2023-06-24	13:53:07	no data	14.2	4.2	41.6	356.6	4.1	2.9	105.3
WCA-064	48.591757	-58.104892	2023-06-23	19:03:48	no data	14.2	5.8	57.5	82.4	5.4	2.3	253.2
WCT-633	48.562317	-58.70853	2023-07-26	16:20:31	clear	14.2	*	*	323.3	8.3	0.9	-
WCL-796	48.579621	-58.953055	2023-07-24	18:16:36	clear	14.4	9.5	93.2	-	8.1	2.9	-
WCA-069a	48.580729	-59.0882	2023-08-16	18:09:38	clear	14.4	*	*	128.8	8.2	-	74.2
WCL-857	48.565302	-58.07728	2023-10-11	18:01:53	clear	14.6	4.7	47.6	24.1	7.0	0.8	121.8
WCA-150	48.570356	-58.969923	2023-09-20	13:41:58	clear	14.6	4.5	44.7	44.7	8.0	-	100.8
WCA-066	48.602219	-59.07837	2023-06-23	18:20:16	no data	14.8	7.2	71.7	196.2	6.9	1.1	247.9
WCA-067	48.603478	-59.074848	2023-06-23	17:20:43	no data	14.9	*	*	299.6	7.8	1.6	213.2
WCA-009	48.546915	-59.131942	2023-09-19	18:37:24	clear	14.9	5.2	50.8	50.8	8.1	-	98.0
WCA-063	48.580802	-59.12453	2023-06-22	18:59:58	clear	15.0	3.5	34.8	105.6	6.5	-	-
WCA-073b	48.591242	-59.074542	2023-09-16	18:40:57	clear	15.1	7.9	78.5	275.9	7.4	-	98.1
WCA-055	48.571112	-59.096917	2023-07-22	13:08:30	clear	15.1	9.3	93.5	93.5	8.3	-	-
WCA-068	48.571444	-59.093703	2023-06-22	18:22:03	no data	15.1	9.2	99.3	195.5	8.1	0.6	212.1
WCA-125	48.552389	-59.143717	2023-06-23	15:26:04	clear	15.1	6.5	64.4	202.8	0.1	2.0	-
WCL-718	48.577495	-59.095927	2023-06-22	17:38:01	no data	15.2	*	*	194.0	8.2	0.7	210.9
WCL-865	48.506996	-59.17063	2023-06-27	13:20:27	clear	15.2	6.9	68.6	35.8	4.4	20.0	-
WCA-030b	48.579219	-58.94977	2023-09-20	15:02:52	clear	15.3	5.0	50.0	50.0	7.7	-	114.2
WCA-051a	48.561113	-59.158692	2023-06-23	18:17:29	clear	15.3	7.2	71.9	71.9	8.0	-	115.6
WCA-111a	48.590021	-58.958035	2023-06-26	18:17:05	no data	15.3	9.9	98.7	262.7	6.2	6.0	-
WCA-127	48.551448	-59.137101	2023-06-23	13:48:12	clear	15.3	3.1	33.2	44.9	5.8	1.0	-
WCA-073b	48.586801	-58.968067	2023-06-28	13:18:45	clear	15.4	7.2	72.0	208.0	7.1	1.4	175.9
WCA-023	48.590735	-59.169403	2023-06-27	13:40:39	clear	15.5	5.2	51.7	40.3	4.7	21.0	-
WCA-057d	48.574898	-59.096011	2023-06-22	14:38:26	no data	15.5	*	*	192.0	7.8	0.9	243.8
WCA-133	48.549635	-59.126594	2023-09-09	15:33:00	clear	15.5	5.4	53.9	53.9	8.0	0.9	99.2
WCL-765	48.579713	-58.968626	2023-07-22	12:11:40	clear	15.8	7.8	81.6	-	7.6	2.0	-
WCL-704c	48.561398	-59.159332	2023-06-23	17:46:07	clear	16.0	8.1	81.6	111.0	6.8	5.0	-
WCA-057a	48.576617	-59.094463	2023-06-22	16:40:23	no data	16.1	15.4	15.4	208.0	7.9	3.7	194.5
WCL-905h	48.572076	-59.045101	2023-06-22	14:38:26	no data	16.2	9.3	96.4	244.2	7.9	7.8	-
WCA-146	48.572076	-59.045101	2023-07-25	18:41:46	clear	16.2	9.3	96.4	196.8	7.7	3.2	229.4
WCL-707a	48.552203	-59.128933	2023-06-23	13:30:34	no data	16.3	8.0	83.6	34.8	4.2	0.8	342.7
WCF-1009	48.609611	-59.097653	2023-06-29	13:45:13	clear	16.4	3.2	32.1	156.9	6.3	25.0	-
WCL-856	48.566513	-59.076354	2023-10-11	18:20:25	clear	16.5	4.9	52.1	14.0	7.9	1.5	99.6
WCA-057b	48.575862	-59.095188	2023-06-22	16:10:23	no data	16.5	*	*	197.7	7.8	0.9	222.4
WCL-862	48.553668	-59.14276	2023-06-23	16:40:40	clear	16.6	7.7	78.5	-	7.2	4.0	-
WCA-126	48.552584	-59.143862	2023-06-23	16:03:50	clear	16.7	5.9	60.8	88.3	5.7	-	-
WCF-1000	48.59414	-58.978663	2023-06-29	13:53:44	clear	16.7	9.5	98.8	112.2	7.1	3.0	198.6
WCA-024a	48.506481	-59.116968	2023-06-27	14:01:13	clear	16.7	16.8	17.5	51.0	5.2	24.0	-
WCA-062	48.59326	-59.072362	2023-06-26	13:55:16	clear	16.9	7.7	79.6	167.7	7.3	1.0	-
WCA-072b	48.590755	-58.967556	2023-06-26	20:16:23	no data	16.9	9.6	98.0	120.6	6.8	-	190.6
WCA-124	48.550924	-59.130741	2023-06-23	14:37:48	no data	16.9	2.7	27.0	170.5	5.6	1.9	-
WCF-1007	48.58326	-59.072362	2023-06-26	13:55:16	clear	16.9	7.7	79.6	167.7	7.3	1.0	-
WCL-907a	48.612942	-58.950997	2023-07-27	15:11:30	brown/yellow	17.3	8.7	90.7	75.8	6.8	-	-
WCA-021	48.598099	-59.089893	2023-08-18	14:52:41	brown/yellow	17.3	7.1	74.2	76.1	6.8	-	-
WCA-113	48.597065	-58.970159	2023-07-27	16:04:14	clear	17.5	8.9	93.4	-	8.2	23.0	-
WCT-519	48.564573	-58.604573	2023-06-01	17:53:13	no data	17.5	*	*	293.2	8.0	1.1	219.7
WCT-526	48.568579	-58.563176	2023-07-22	15:39:38	brown/yellow	17.6	*	*	107.3	8.2	0.9	-
WCA-152	48.613129	-58.984192	2023-07-27	14:27:30	brown/yellow	17.7	8.1	85.1	76.1	6.8	-	-
WCA-031	48.580557	-58.952563	2023-07-24	17:00:00	clear	17.8	8.9	93.0	-	6.9	9.7	-
WCA-149	48.569419	-58.997803	2023-09-07	15:13:10	clear	17.9	4.5	47.5	47.5	7.8	-	102.8
WCA-024b	48.506588	-59.169625	2023-06-27	13:50:06	clear	18.0	5.9	62.5	50.8	5.0	23.0	-
WCA-143	48.585194	-58.965033	2023-06-26	16:06:51	clear	18.4	7.5	80.0	273.5	7.1	0.7	164.7
WCA-147	48.568713	-59.08431	2023-07-26	16:20:31	clear	18.4	7.1	77.4	277.4	7.8	1.2	-
WCL-757	48.594999	-58.928889	2023-09-07	16:09:11	clear	18.7	7.5	80.3	80.3	8.3	-	86.4
WCF-1011	48.570554	-59.135209	2023-06-29	17:54:11	brown/yellow	18.9	6.2	66.8	63.6	5.2	2.2	220.0
WCL-751	48.587596	-58.958124	2023-06-26	17:37:30	no data	19.2	8.2	86.2	315.2	6.2	-	165.3
WCA-151	48.571085	-58.985741	2023-09-07	13:08:41	clear	19.2	4.9	53.5	53.5	8.3	-	91.4
WCT-545	48.526526	-58.453027	2023-07-23	10:39:41	brown/yellow	19.4	4.9	53.5	53.5	4.9	2.1	-
WCT-518	48.561896	-58.622187	2023-06-01	16:52:47	no data	19.8	*	*	289.4	7.8	2.4	212.6
WCF-544	48.527313	-58.456872	2023-07-22	20:35:54	no data	19.9	*	*	109.0	7.0	1.4	-
WCL-721	48.593134	-59.073967	2023-06-26	16:06:40	clear	20.4	7.4	82.2	168.3	7.3	2.0	-
WCA-069a	48.619552	-59.052153	2023-09-06	17:31:13	clear	20.4	4.1	45.4	45.4	7.7	-	81.8
WCT-520	48.560116	-58.601808	2023-06-01	18:29:42	no data	21.4	*	*	299.6	8.1	1.9	204.7
WCT-546	48.526166	-58.447715	2023-07-24	17:00:00	brown/yellow	21.5	7.8	87.6	87.6	5.5	1.1	-
WCT-546	48.526166	-58.447715	2023-07-24	17:00:00	brown/yellow	21.5	7.8	87.6	87.6	5.5	1.1	-
WCA-144	48.569705	-59.095664	2023-07-26	12:50:56	clear	22.3	7.2	84.3	86.1	7.4	1.5	-
WCS-010	48.555967	-58.554807	2023-07-18	16:21:57	no data	22.6	8.1	93.0	14.0	8.3	-	-
WCL-779	48.545055	-59.065972	2023-07-21	19:00:22	clear	23.5	7.4	87.1	87.1	7.7	-	-
WCA-142	48.560819	-59.089499	2023-09-08	15:36:15	Green/Algae	24.1	3.6	42.8	42.8	8.2	-	91.3
WCL-707b	48.551509	-59.128713	-	-	-	-	-	-	-	-	-	-
WCL-704a	48.558408	-59.147919	-	-	-	-	-	-	-	-	-	-
WCL-768	48.564591	-59.094409	-	-	-	-	-	-	-	-	-	-
WCL-780	48.537561	-58.961958	-	-	-	-	-	-	-	-	-	-
WCL-851	48.551144	-58.78307	-	-	-	-	-	-	-	-	-	-
WCL-854	48.576094	-58.963396	-	-	-	-	-	-	-	-	-	-
WCL-861	48.551826	-59.136615	-	-	-	-	-	-	-	-	-	-
WCL-864	48.513379	-59.166694	-	-	-	-	-	-	-	-	-	-
WCL-867	48.628998	-59.024745	-	-	-	-	-	-	-	-	-	-
WCL-897a	48.539853	-59.120519	-	-	-	-						

Table C.2
In Situ Surface Water Data
Project Nujjo'qonik
File: 121417575

Station ID	Latitude	Longitude	Date	Time	Water Clarity	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (%)	Specific Conductivity (µS/cm)	pH	Turbidity (NTU)	ORP (mV)
WCL-902b	48.551648	-59.099154	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCL-903c	48.559771	-59.086446	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCL-903d	48.56004	-59.087038	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCL-905a	48.571931	-59.050142	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCL-905f	48.572704	-59.047593	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCL-909	48.536442	-58.946487	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCA-011a	48.544198	-58.966281	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCA-011b	48.547336	-59.121721	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCA-022	48.546291	-59.121791	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCA-053	48.616844	-59.054097	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCA-072a	48.552346	-59.10185	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCA-102	48.583359	-58.964539	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCA-103	48.553514	-58.945742	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCA-106	48.55291	-58.946807	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCA-107	48.57326	-58.974683	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCA-122	48.575082	-58.973155	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCA-129a	48.630048	-59.02431	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCA-129b	48.591733	-59.123741	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCA-134	48.546498	-59.117669	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCA-136a	48.538396	-59.120639	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCA-136b	48.538437	-59.120661	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCA-137a	48.527675	-59.085384	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCA-137b	48.528078	-59.085081	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCA-138a	48.532833	-59.087549	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCA-138b	48.532833	-59.097549	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCA-140a	48.55272	-59.100382	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCA-140b	48.55272	-59.100382	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCA-140c	48.56272	-59.100382	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCA-141	48.555681	-59.098472	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCT-505	48.575094	-58.963396	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCT-525	48.569848	-58.569848	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCT-530	48.5631	-58.523485	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCT-627	48.543959	-58.967219	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCF-1004	48.584469	-58.944973	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCF-1005	48.546158	-58.892926	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCF-1006	48.607464	-59.07421	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCF-1010	48.598476	-59.102429	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCF-1031	48.556798	-59.096627	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
WCF-1032	48.538718	-58.946176	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data

Note:

- no water quality measurements were taken due to lack of flow or no visible channel.
- no data
- no water quality measurements were taken during the field surveys.
- values are inaccurate due to YSI calibration issues.

APPENDIX D

Fish Community Data

Table D.1. Backpack Electrofishing Effort Data for the 2023 Port au Port Wind Farm Fish Sampling
Project Nujo'qonik: 2023 Fish and Fish Habitat Data Report
Project: 121417575

Station Number	Latitude	Longitude	Fishing Method	Survey Date	Pass/Sweep	Voltage (V)	Duty Cycle (%)	Frequency (Hz)	Pulse Width (ms)	Electrofishing Time (s)
WCA-010	48.546313	-59.130786	Backpack Electrofisher	2023-06-22	1	250	12	35	3.4	509
WCA-021	48.597811	-59.090178	Backpack Electrofisher	2023-08-18	1	200	12	35	3.4	507
WCA-025	48.609484	-58.980711	Backpack Electrofisher	2023-09-06	1	220	12	35	3.4	501
WCA-030b	48.58866	-58.951862	Backpack Electrofisher	2023-09-05	1	300	12	35	3.4	503
WCA-031	48.580503	-58.95527	Backpack Electrofisher	2023-07-24	1	300	12	35	3.4	503
WCA-051a/WCL-704c	48.561273	-59.159211	Backpack Electrofisher	2023-09-06	1	400	12	35	3.4	504
WCA-058	48.577582	-59.094215	Backpack Electrofisher	2023-08-18	1	250	12	35	3.4	510
WCA-059a	48.5805	-59.088579	Backpack Electrofisher	2023-08-16	1	360	12	35	3.4	532
WCA-059b	48.584004	-59.084139	Backpack Electrofisher	2023-08-16	1	360	12	35	3.4	508
WCA-062 /WCF-1007	48.59321	-59.072658	Backpack Electrofisher	2023-06-26	1	360	12	35	3.4	508
WCA-064	48.598381	-59.104745	Backpack Electrofisher	2023-08-18	1	300	12	35	3.4	532
WCA-067	48.603965	-59.074273	Backpack Electrofisher	2023-09-05	1	200	12	30	4.0	503
WCA-069a	48.619515	-59.052806	Backpack Electrofisher	2023-09-06	1	200	12	30	4.0	508
WCA-071b	48.610072	-58.993038	Backpack Electrofisher	2023-09-06	1	380	12	32	3.8	515
WCA-073b/ WCF-1001	48.585997	-58.967893	Backpack Electrofisher	2023-06-28	1	290	12	30	4.0	653
WCA-077 / WCF-1004	48.584205	-58.944581	Backpack Electrofisher	2023-11-21	1	240	12	30	4.0	503
WCA-099	48.53584	-58.931292	Backpack Electrofisher	2023-09-07	1	na	na	na	na	na
WCA-110	48.584567	-58.948481	Backpack Electrofisher	2023-06-28	1	340	12	30	4.0	513
WCA-111a	48.589721	-58.957953	Backpack Electrofisher	2023-06-27	1	240	12	30	4.0	524
WCA-113	48.596853	-58.970325	Backpack Electrofisher	2023-07-27	1	300	12	30	4.0	528
WCA-115	48.598457	-58.977977	Backpack Electrofisher	2023-09-05	1	280	12	30	3.8	513
WCA-127	48.551276	-59.137358	Backpack Electrofisher	2023-06-23	1	300	15	30	4.2	524
WCA-130	48.559529	-59.110613	Backpack Electrofisher	2023-09-08	1	250	15	30	4.2	518
WCA-133	48.549858	-59.126118	Backpack Electrofisher	2023-09-09	1	190	12	30	4.0	535
WCA-142	48.561179	-59.090021	Backpack Electrofisher	2023-09-08	1	350	15	30	4.0	536
WCL-905h/WCA-146	48.572127	-59.044576	Backpack Electrofisher	2023-09-08	1	320	15	35	4.3	502
WCA-147	48.568391	-59.014176	Backpack Electrofisher	2023-09-07	1	240	15	40	3.8	534
WCA-150	48.570205	-58.990147	Backpack Electrofisher	2023-07-27	1	250	15	35	4.3	na
WCA-151	48.571503	-58.985328	Backpack Electrofisher	2023-09-07	1	275	15	35	4.3	505
WCS-400	48.584272	-59.01111	Backpack Electrofisher	2023-09-08	1	220	15	35	4.3	508
WCF-1000	48.593999	-58.977739	Backpack Electrofisher	2023-06-29	1	400	12	35	4.0	511
WCF-1002	48.583591	-58.972711	Backpack Electrofisher	2023-08-16	1	270	12	35	4.0	506
WCF-1004	48.583836	-58.944373	Backpack Electrofisher	2023-08-17	1	na	na	na	na	na
WCF-1011	48.570697	-59.134544	Backpack Electrofisher	2023-06-29	1	320	15	35	4.3	502

**Table D.2. Minnow Trap Effort Data for the 2023 Port au Port Wind Farm Fish Sampling
 Project Nujio'qonik: 2023 Fish and Fish Habitat Data Report
 Project: 121417575**

Site	Minnow Trap Number	Latitude	Longitude	Fishing Method	Survey Start Date	Survey Start Time	Survey End Date	Survey End Time	Effort
WCA-024	MT-01	48.506536	-59.169771	Minnow Trap	2023-06-27	13:12:02	2023-06-28	9:55:14	20 hours 45 min
WCA-024	MT-02	48.506387	-59.169843	Minnow Trap	2023-06-27	13:11:17	2023-06-28	10:03:44	20 hours 52 min
WCA-024	MT-03	48.506342	-59.169588	Minnow Trap	2023-06-27	13:09:52	2023-06-28	10:15:30	21 hours 6 min
WCA-124	MT-01	48.550947	-59.130754	Minnow Trap	2023-06-23	14:55:04	2023-06-27	12:37:50	47 hours 42 min
WCA-124	MT-02	48.550908	-59.130904	Minnow Trap	2023-06-23	14:54:07	2023-06-27	12:37:39	47 hours 43 min
WCA-124	MT-03	48.550816	-59.130856	Minnow Trap	2023-06-23	14:53:01	2023-06-27	12:37:23	47 hours 44 min

**Table D.3. Raw Morphometric Fish Data for the 2023 Port au Port Wind Farm Fish Sampling
Project Nujio'qonik: 2023 Fish and Fish Habitat Data Report
Project: 121417575**

Site ID	Date Sampled	Method	Species	Fork length (mm)	Total Weight (g)	Condition/ Status
WCA-058	2023-08-18	Backpack Electrofisher	American eel	140	4.2	released
WCA-058	2023-08-18	Backpack Electrofisher	American eel	110	1.2	released
WCA-058	2023-08-18	Backpack Electrofisher	American eel	330	-	released
WCA-058	2023-08-18	Backpack Electrofisher	American eel	310	41.8	released
WCA-058	2023-08-18	Backpack Electrofisher	American eel	290	-	released
WCA-059b	2023-08-16	Backpack Electrofisher	American eel	171	8.1	released
WCA-059b	2023-08-16	Backpack Electrofisher	American eel	340	-	released
WCA-059b	2023-08-16	Backpack Electrofisher	American eel	328	54.9	released
WCA-059b	2023-08-16	Backpack Electrofisher	American eel	180	10.9	released
WCA-062 /WCF- 1007	2023-06-26	Backpack Electrofisher	American eel	185	10.2	released
WCA-099	2023-09-07	Backpack Electrofisher	Atlantic salmon	92	8.8	released
WCA-099	2023-09-07	Backpack Electrofisher	Atlantic salmon	104	13.4	released
WCA-099	2023-09-07	Backpack Electrofisher	Atlantic salmon	112	14.9	released
WCA-113	2023-07-27	Backpack Electrofisher	Atlantic salmon	109	-	released
WCA-113	2023-07-27	Backpack Electrofisher	Atlantic salmon	115	-	released
WCA-133	2023-09-09	Backpack Electrofisher	Brook Trout	128	20.3	released
WCA-133	2023-09-09	Backpack Electrofisher	Brook Trout	92	8.9	released
WCA-133	2023-09-09	Backpack Electrofisher	Brook Trout	48	1.2	released
WCA-133	2023-09-09	Backpack Electrofisher	Brook Trout	139	27.7	released
WCA-133	2023-09-09	Backpack Electrofisher	Brook Trout	134	27.9	released
WCA-133	2023-09-09	Backpack Electrofisher	Brook Trout	49	1.1	released
WCA-133	2023-09-09	Backpack Electrofisher	Brook Trout	124	18.9	released
WCA-133	2023-09-09	Backpack Electrofisher	Brook Trout	96	7.3	released
WCA-133	2023-09-09	Backpack Electrofisher	Brook Trout	90	7.1	released
WCA-133	2023-09-09	Backpack Electrofisher	Brook Trout	96	8.3	released
WCA-133	2023-09-09	Backpack Electrofisher	Brook Trout	62	2.5	released
WCA-133	2023-09-09	Backpack Electrofisher	Brook Trout	47	1.0	released
WCA-133	2023-09-09	Backpack Electrofisher	Brook Trout	158	42.4	released
WCA-130	2023-09-08	Backpack Electrofisher	Brook Trout	134	25.9	released
WCA-130	2023-09-08	Backpack Electrofisher	Brook Trout	100	12.4	released
WCA-130	2023-09-08	Backpack Electrofisher	Brook Trout	81	5.6	released
WCA-130	2023-09-08	Backpack Electrofisher	Brook Trout	107	13.8	released
WCA-130	2023-09-08	Backpack Electrofisher	Brook Trout	92	8.0	released
WCA-130	2023-09-08	Backpack Electrofisher	Brook Trout	90	7.4	released
WCA-130	2023-09-08	Backpack Electrofisher	Brook Trout	86	6.0	released
WCA-130	2023-09-08	Backpack Electrofisher	Brook Trout	85	6.0	released
WCA-130	2023-09-08	Backpack Electrofisher	Brook Trout	112	14.6	released
WCA-130	2023-09-08	Backpack Electrofisher	Brook Trout	148	38.9	released
WCA-130	2023-09-08	Backpack Electrofisher	Brook Trout	98	9.9	released
WCA-130	2023-09-08	Backpack Electrofisher	Brook Trout	137	24.1	released
WCA-130	2023-09-08	Backpack Electrofisher	Brook Trout	113	15.1	released
WCA-130	2023-09-08	Backpack Electrofisher	Brook Trout	81	5.2	released
WCA-130	2023-09-08	Backpack Electrofisher	Brook Trout	91	7.4	released
WCA-130	2023-09-08	Backpack Electrofisher	Brook Trout	78	5.0	released
WCA-130	2023-09-08	Backpack Electrofisher	Brook Trout	127	21.2	released
WCA-130	2023-09-08	Backpack Electrofisher	Brook Trout	85	5.9	released
WCA-130	2023-09-08	Backpack Electrofisher	Brook Trout	109	14.1	released
WCA-130	2023-09-08	Backpack Electrofisher	Brook Trout	57	2.0	released
WCA-130	2023-09-08	Backpack Electrofisher	Brook Trout	79	4.7	injured
WCA-130	2023-09-08	Backpack Electrofisher	Brook Trout	79	4.9	released
WCA-130	2023-09-08	Backpack Electrofisher	Brook Trout	82	5.8	released
WCA-130	2023-09-08	Backpack Electrofisher	Brook Trout	123	20.1	released
WCA-130	2023-09-08	Backpack Electrofisher	Brook Trout	86	5.9	released
WCA-130	2023-09-08	Backpack Electrofisher	Brook Trout	96	9.6	released
WCA-130	2023-09-08	Backpack Electrofisher	Brook Trout	84	5.5	released
WCA-130	2023-09-08	Backpack Electrofisher	Brook Trout	96	7.9	released
WCA-130	2023-09-08	Backpack Electrofisher	Brook Trout	105	1.5	released
WCA-099	2023-09-07	Backpack Electrofisher	Brook Trout	143	34.3	released
WCA-099	2023-09-07	Backpack Electrofisher	Brook Trout	54	2.1	released
WCA-099	2023-09-07	Backpack Electrofisher	Brook Trout	93	9.2	released
WCA-099	2023-09-07	Backpack Electrofisher	Brook Trout	50	1.5	released
WCA-099	2023-09-07	Backpack Electrofisher	Brook Trout	55	2.2	released
WCA-099	2023-09-07	Backpack Electrofisher	Brook Trout	51	2.7	released
WCA-099	2023-09-07	Backpack Electrofisher	Brook Trout	51	1.6	released
WCA-099	2023-09-07	Backpack Electrofisher	Brook Trout	58	2.4	released
WCA-099	2023-09-07	Backpack Electrofisher	Brook Trout	81	5.4	released
WCA-099	2023-09-07	Backpack Electrofisher	Brook Trout	51	1.4	released
WCA-099	2023-09-07	Backpack Electrofisher	Brook Trout	44	1.1	released
WCA-099	2023-09-07	Backpack Electrofisher	Brook Trout	85	6.7	released
WCA-099	2023-09-07	Backpack Electrofisher	Brook Trout	45	1.3	released
WCA-099	2023-09-07	Backpack Electrofisher	Brook Trout	50	1.9	released
WCA-099	2023-09-07	Backpack Electrofisher	Brook Trout	49	1.9	released
WCA-099	2023-09-07	Backpack Electrofisher	Brook Trout	59	2.7	released
WCA-099	2023-09-07	Backpack Electrofisher	Brook Trout	49	1.1	released
WCA-099	2023-09-07	Backpack Electrofisher	Brook Trout	51	1.7	released
WCA-099	2023-09-07	Backpack Electrofisher	Brook Trout	105	11.4	released
WCA-099	2023-09-07	Backpack Electrofisher	Brook Trout	60	2.8	released
WCA-099	2023-09-07	Backpack Electrofisher	Brook Trout	53	2.4	released
WCA-099	2023-09-07	Backpack Electrofisher	Brook Trout	51	1.2	released
WCA-099	2023-09-07	Backpack Electrofisher	Brook Trout	48	1.3	released
WCA-099	2023-09-07	Backpack Electrofisher	Brook Trout	55	2.2	released
WCA-099	2023-09-07	Backpack Electrofisher	Brook Trout	110	20.3	released
WCA-099	2023-09-07	Backpack Electrofisher	Brook Trout	100	9.4	released

**Table D.3. Raw Morphometric Fish Data for the 2023 Port au Port Wind Farm Fish Sampling
Project Nujio'qonik: 2023 Fish and Fish Habitat Data Report
Project: 121417575**

Site ID	Date Sampled	Method	Species	Fork length (mm)	Total Weight (g)	Condition/ Status
WCA-099	2023-09-07	Backpack Electrofisher	Brook Trout	64	3.3	released
WCA-099	2023-09-07	Backpack Electrofisher	Brook Trout	55	2.2	released
WCA-099	2023-09-07	Backpack Electrofisher	Brook Trout	62	2.8	released
WCA-051a	2023-09-06	Backpack Electrofisher	Brook Trout	108	12.3	released
WCA-051a	2023-09-06	Backpack Electrofisher	Brook Trout	124	20.7	released
WCA-051a	2023-09-06	Backpack Electrofisher	Brook Trout	55	1.5	released
WCA-051a	2023-09-06	Backpack Electrofisher	Brook Trout	112	13.6	released
WCA-051a	2023-09-06	Backpack Electrofisher	Brook Trout	112	13.6	released
WCA-051a	2023-09-06	Backpack Electrofisher	Brook Trout	97	12.5	released
WCA-051a	2023-09-06	Backpack Electrofisher	Brook Trout	47	0.9	released
WCA-051a	2023-09-06	Backpack Electrofisher	Brook Trout	110	13.6	released
WCA-051a	2023-09-06	Backpack Electrofisher	Brook Trout	119	17.4	released
WCA-051a	2023-09-06	Backpack Electrofisher	Brook Trout	128	25.7	released
WCA-051a	2023-09-06	Backpack Electrofisher	Brook Trout	115	17.2	released
WCA-051a	2023-09-06	Backpack Electrofisher	Brook Trout	116	17.3	released
WCA-051a	2023-09-06	Backpack Electrofisher	Brook Trout	134	28.1	released
WCA-051a	2023-09-06	Backpack Electrofisher	Brook Trout	118	18.2	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	55	1.7	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	76	5.1	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	150	35.6	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	55	1.9	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	67	3.6	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	66	4.0	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	79	5.5	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	77	5.8	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	122	27.6	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	60	2.8	injured
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	63	2.5	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	79	6.2	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	57	2.1	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	74	5.1	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	63	3.4	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	89	7.1	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	137	35.9	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	93	8.7	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	65	3.1	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	62	2.6	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	42	0.6	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	44	1.3	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	65	3.0	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	145	39.0	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	70	3.8	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	87	6.9	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	71	4.4	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	58	2.3	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	122	23.4	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	131	29.1	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	65	3.1	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	63	2.9	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	84	6.5	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	62	2.6	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	74	5.2	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	170	69.0	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	59	2.1	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	59	2.3	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	60	2.3	released
WCA-071b	2023-09-06	Backpack Electrofisher	Brook Trout	49	1.1	released
WCA-025	2023-09-06	Backpack Electrofisher	Brook Trout	64	2.8	released
WCA-025	2023-09-06	Backpack Electrofisher	Brook Trout	65	3.4	released
WCA-025	2023-09-06	Backpack Electrofisher	Brook Trout	71	3.7	released
WCA-025	2023-09-06	Backpack Electrofisher	Brook Trout	74	4.3	released
WCA-025	2023-09-06	Backpack Electrofisher	Brook Trout	76	4.9	released
WCA-025	2023-09-06	Backpack Electrofisher	Brook Trout	81	5.6	released
WCA-025	2023-09-06	Backpack Electrofisher	Brook Trout	78	5.3	released
WCA-025	2023-09-06	Backpack Electrofisher	Brook Trout	75	4.4	released
WCA-025	2023-09-06	Backpack Electrofisher	Brook Trout	78	5.6	released
WCA-025	2023-09-06	Backpack Electrofisher	Brook Trout	74	4.0	released
WCA-025	2023-09-06	Backpack Electrofisher	Brook Trout	76	5.2	released
WCA-025	2023-09-06	Backpack Electrofisher	Brook Trout	64	3.0	released
WCA-025	2023-09-06	Backpack Electrofisher	Brook Trout	84	7.0	released
WCA-025	2023-09-06	Backpack Electrofisher	Brook Trout	62	2.6	released
WCA-025	2023-09-06	Backpack Electrofisher	Brook Trout	73	4.0	released
WCA-025	2023-09-06	Backpack Electrofisher	Brook Trout	68	3.8	released
WCA-025	2023-09-06	Backpack Electrofisher	Brook Trout	64	2.7	released
WCA-025	2023-09-06	Backpack Electrofisher	Brook Trout	111	18.3	released
WCA-025	2023-09-06	Backpack Electrofisher	Brook Trout	147	35.3	released
WCA-025	2023-09-06	Backpack Electrofisher	Brook Trout	155	45.7	released
WCA-025	2023-09-06	Backpack Electrofisher	Brook Trout	62	3.1	released
WCA-030b	2023-09-05	Backpack Electrofisher	Brook Trout	89	7.7	released
WCA-030b	2023-09-05	Backpack Electrofisher	Brook Trout	79	5.2	released
WCA-030b	2023-09-05	Backpack Electrofisher	Brook Trout	91	8.2	released
WCA-030b	2023-09-05	Backpack Electrofisher	Brook Trout	72	5.8	released
WCA-030b	2023-09-05	Backpack Electrofisher	Brook Trout	138	26.7	released

**Table D.3. Raw Morphometric Fish Data for the 2023 Port au Port Wind Farm Fish Sampling
Project Nujio'qonik: 2023 Fish and Fish Habitat Data Report
Project: 121417575**

Site ID	Date Sampled	Method	Species	Fork length (mm)	Total Weight (g)	Condition/ Status
WCA-115	2023-09-05	Backpack Electrofisher	Brook Trout	113	16.5	released
WCA-115	2023-09-05	Backpack Electrofisher	Brook Trout	83	6.6	released
WCF-1002	2023-08-16	Backpack Electrofisher	Brook Trout	134	28.7	released
WCF-1002	2023-08-16	Backpack Electrofisher	Brook Trout	103	14.1	released
WCF-1002	2023-08-16	Backpack Electrofisher	Brook Trout	84	6.4	released
WCF-1002	2023-08-16	Backpack Electrofisher	Brook Trout	45	0.9	released
WCF-1002	2023-08-16	Backpack Electrofisher	Brook Trout	134	23.7	released
WCF-1002	2023-08-16	Backpack Electrofisher	Brook Trout	93	9.4	released
WCF-1002	2023-08-16	Backpack Electrofisher	Brook Trout	102	12.5	released
WCF-1002	2023-08-16	Backpack Electrofisher	Brook Trout	113	14.7	released
WCF-1002	2023-08-16	Backpack Electrofisher	Brook Trout	54	1.6	released
WCF-1002	2023-08-16	Backpack Electrofisher	Brook Trout	204	85.0	injured
WCF-1002	2023-08-16	Backpack Electrofisher	Brook Trout	96	9.5	released
WCF-1002	2023-08-16	Backpack Electrofisher	Brook Trout	74	4.2	released
WCA-113	2023-07-27	Backpack Electrofisher	Brook Trout	164	-	released
WCA-150	2023-07-27	Backpack Electrofisher	Brook Trout	127	-	released
WCA-150	2023-07-27	Backpack Electrofisher	Brook Trout	52	-	released
WCA-031	2023-07-24	Backpack Electrofisher	Brook Trout	117.5	-	released
WCA-031	2023-07-24	Backpack Electrofisher	Brook Trout	81	-	released
WCA-031	2023-07-24	Backpack Electrofisher	Brook Trout	90	-	released
WCA-031	2023-07-24	Backpack Electrofisher	Brook Trout	81	-	released
WCA-031	2023-07-24	Backpack Electrofisher	Brook Trout	89	-	released
WCA-031	2023-07-24	Backpack Electrofisher	Brook Trout	67	-	released
WCA-031	2023-07-24	Backpack Electrofisher	Brook Trout	105	-	released
WCA-031	2023-07-24	Backpack Electrofisher	Brook Trout	78	-	released
WCA-031	2023-07-24	Backpack Electrofisher	Brook Trout	86	-	released
WCA-031	2023-07-24	Backpack Electrofisher	Brook Trout	76	-	released
WCA-111a	2023-06-27	Backpack Electrofisher	Brook Trout	77	5.4	released
WCA-111a	2023-06-27	Backpack Electrofisher	Brook Trout	123	23.2	released
WCA-111a	2023-06-27	Backpack Electrofisher	Brook Trout	99	10.5	released
WCF-1004	2023-11-21	Backpack Electrofisher	Brook Trout	168	61.0	released
WCA-111a	2023-06-26	Backpack Electrofisher	Brook Trout	82	5.7	released
WCA-062 /WCF- 1007	2023-06-26	Backpack Electrofisher	Brook Trout	82	6.5	released
WCA-062 /WCF- 1007	2023-06-26	Backpack Electrofisher	Brook Trout	89	7.6	released
WCA-127	2023-06-23	Backpack Electrofisher	Brook Trout	141	31.5	released
WCA-010	2023-06-22	Backpack Electrofisher	Brook Trout	82	4.6	released
WCA-010	2023-06-22	Backpack Electrofisher	Brook Trout	79	5.1	released
WCA-010	2023-06-22	Backpack Electrofisher	Brook Trout	90	7.9	released
WCA-010	2023-06-22	Backpack Electrofisher	Brook Trout	80	4.7	released
WCA-010	2023-06-22	Backpack Electrofisher	Brook Trout	108	11.9	released
WCA-010	2023-06-22	Backpack Electrofisher	Brook Trout	101	11.4	released
WCA-010	2023-06-22	Backpack Electrofisher	Brook Trout	86	5.0	released
WCA-010	2023-06-22	Backpack Electrofisher	Brook Trout	82	4.1	released
WCA-010	2023-06-22	Backpack Electrofisher	Brook Trout	76	4.3	released
WCA-010	2023-06-22	Backpack Electrofisher	Brook Trout	146	36.2	released
WCA-010	2023-06-22	Backpack Electrofisher	Brook Trout	102	14.0	released
WCA-010	2023-06-22	Backpack Electrofisher	Brook Trout	124	14.8	released
WCA-010	2023-06-22	Backpack Electrofisher	Brook Trout	122	15.4	released
WCA-010	2023-06-22	Backpack Electrofisher	Brook Trout	73	4.9	released
WCA-010	2023-06-22	Backpack Electrofisher	Brook Trout	81	6.7	released
WCA-010	2023-06-22	Backpack Electrofisher	Brook Trout	104	10.1	released
WCA-010	2023-06-22	Backpack Electrofisher	Brook Trout	130	24.0	released
WCA-010	2023-06-22	Backpack Electrofisher	Brook Trout	106	11.8	released
WCA-010	2023-06-22	Backpack Electrofisher	Brook Trout	88	7.7	released
WCA-010	2023-06-22	Backpack Electrofisher	Brook Trout	96	10.2	released
WCA-010	2023-06-22	Backpack Electrofisher	Brook Trout	121	19.5	released
WCA-010	2023-06-22	Backpack Electrofisher	Brook Trout	84	6.2	released
WCA-010	2023-06-22	Backpack Electrofisher	Brook Trout	73	4.3	released
WCA-010	2023-06-22	Backpack Electrofisher	Brook Trout	84	6.7	released
WCA-010	2023-06-22	Backpack Electrofisher	Brook Trout	85	4.8	released
WCA-010	2023-06-22	Backpack Electrofisher	Brook Trout	179	44.1	released
WCA-010	2023-06-22	Backpack Electrofisher	Brook Trout	109	13.2	released
WCA-010	2023-06-22	Backpack Electrofisher	Brook Trout	83	6.3	released
WCA-113	2023-07-27	Backpack Electrofisher	Threespine Stickleback	63	-	injured

APPENDIX E

Environmental DNA Analysis

Non-invasive monitoring of freshwater fish biodiversity in Western Newfoundland

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1 Executive Summary

Biodiversity data was generated from an environmental genomics analysis of water samples collected in Western Newfoundland in 2023 as part of a study by Stantec for their client. The objective of this study is to monitor fish from freshwater systems in advance of potential development in the area.

DNA was successfully sequenced from all 40 of the water samples submitted. We identified 5 fish families and 8 species of fish, with *Salvelinus fontinalis* being the most frequently detected species across samples (55%). Two species of conservation concern in Newfoundland were identified: *Anguilla rostrata* in nine samples and *Fundulus diaphanus* in one sample. In addition to these three species, four other species identified as focal species were detected: Atlantic salmon (*Salmo salar*), ninespine stickleback (*Pungitius pungitius*), threespine stickleback (*Gasterosteus aculeatus*), and rainbow smelt (*Osmerus mordax*). Brown trout (*Salmo trutta*), which was not a focal species, was identified in one sample.

The eDNA-based fish biodiversity assessment presented here provides data to support fish community characterization and monitoring in Newfoundland. Detections of other animals are reported but these are incidental detections and do not represent a comprehensive inventory of all animal taxa since the DNA analysis was targeted for fish. Data have been compiled in the associated files to facilitate downstream ecological analyses.

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2 Background

Environmental genomics is a novel approach to biodiversity characterization that does not require collection of whole biological specimens but instead relies on recovery and analysis of DNA from the physical environment in which they live (e.g., water, soil, sediment, etc.). This environmental DNA (eDNA) is released from organisms through various mechanisms including cell shedding and the excretion of various bodily fluids and feces¹⁻³. DNA is isolated from samples, biodiversity informative regions of DNA are amplified through polymerase chain reaction (PCR), and then these regions are sequenced using high-throughput genomic sequencing platforms. The resulting DNA sequences are filtered through a variety of quality control and assurance steps and then compared to publicly available databases (e.g., GenBank) where the genomic information for known specimens has been deposited. When a match is found, a taxonomic identification can be assigned to a DNA sequence from an environmental sample¹⁻³.

There are several advantages to environmental genomics compared to the conventional approach to biodiversity characterization. It is non-invasive and does not require the capture of a whole biological specimen. Very small samples of water (~250 mL) or sediment (~5 g) are required for a biodiversity assessment because, unlike conventional surveys, organisms at all trophic levels from algae to large mammals can be detected from the same environmental sample. The technique is highly sensitive, which means rare or elusive species, including endangered and invasive species, can be detected through their DNA in addition to the more common species. It is cost effective with time savings during field sampling and sample analysis. Furthermore, high-throughput DNA sequencing technology allows for simultaneous analysis of a large set of samples.

Because environmental genomics is a novel approach to biodiversity characterization, it is not widely applied yet. However, in recent years, there has been a steady increase in its application to various environmental characterization efforts⁴⁻⁶. While the sensitivity of environmental genomics is one of the many appeals of this technology, it is also one of its potential limitations as contaminants of biological nature can also be detected within the environmental sample. To manage this, many precautions are taken during the acquisition, preservation, and processing of samples to limit the introduction of contaminants (e.g., collection of field blanks as a negative control). In addition, stringent quality control measures during data analysis can limit false positives.

Stantec is surveying the fish community at a client site in western Newfoundland. As part of this project, eDNA water samples were collected for DNA metabarcoding analysis with the goal of characterizing fish biodiversity to complement other survey methods.

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3 Methods

3.1 Sample Submission

In June and July 2023, 40 water samples and two blanks were collected from streams and rivers in western Newfoundland by Stantec and submitted as desiccated self-preserving 1.2µm filters to CEGA for analysis. Samples were stored at 4°C until processing. The analysis was performed on the samples without any prior knowledge of the precise sampling locations.

3.2 Sample Processing

DNA was extracted from all samples and negative controls using the Qiagen PowerWater kit following the manufacturer’s protocol. Following extraction, the DNA was quantified for all samples (**Table 1**) and field blanks (**Table 2**).


Two DNA markers from two genomic regions (cytochrome c oxidase I and 12S) were selected to detect and identify freshwater fish, with focal species including Atlantic salmon (*Salmo salar*), brook trout (*Salvelinus fontinalis*), Arctic char (*Salvelinus alpinus*), American eel (*Anguilla rostrata*), ninespine stickleback (*Pungitius pungitius*), threespine stickleback (*Gasterosteus aculeatus*), blackspotted stickleback (*Gasterosteus wheatlandi*), mummichog (*Fundulus heteroclitus*), banded killifish (*Fundulus diaphanus*) and rainbow smelt (*Osmerus mordax*). The two DNA markers were amplified from the samples using PCR following CEGA’s standardized EnviroSeq™ DNA metabarcoding workflow to create a sequencing library. Negative controls were added during extraction and PCR and were carried through to sequencing to screen for contamination. The library was sequenced using the Illumina NovaSeq™6000 instrument using a SP500 cycle kit with a target depth of 1,000,000 sequences per sample per marker.

3.3 Data Analysis

Sequence data were parsed through CEGA’s purpose-built DNA metabarcoding bioinformatic pipeline. Sequences were filtered for quality and length and then denoised to create exact sequence variants (ESVs), each of which represent a unique sequence from the sample. ESVs were assigned taxonomy by comparing the ESVs to reference sequences in the publicly available NCBI nucleotide database (downloaded August 2023). The taxonomy presented here matches the naming conventions used in NCBI’s taxonomy database and was assigned based on a sequence similarity score (the product of the % sequence similarity and the % query coverage). The minimum scores for taxonomic assignment at each level were as follows: phylum at 85%, class and order at 90%, family at 95%, genus at 98%, and species at 99%. Taxonomic identifications were verified against the Global Biodiversity Information Facility, the World Register of Marine Species, and the Encyclopedia of Life to ensure that spurious matches resulting from poor reference database coverage were not included in the list. As standard practice, ESVs assigned to humans and food (e.g., chicken, cow) were removed from the sample data. Sequences attributed to fish (classes Actinopteri, Chondrichthyes, and Hyperoartia) were retained for subsequent analysis.

3.4 Negative Controls

Sequencing results from the negative controls were screened for contamination and any ESVs detected in the negative controls were removed from associated samples. One ESV (3 sequence reads) attributed to a rotifer were detected in lab blanks. In Field Blank 2, 88 ESVs attributed to metazoans (6,570 COI sequences reads) were recovered. None of these sequences matched fish taxa following the

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taxonomic assignment criteria described above. The removal of ESVs detected in lab and field blanks from samples did not affect the fish taxa detected across samples.


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Table 1 List of water eDNA samples collected in June and July 2023, from streams and rivers in Western Newfoundland with the DNA concentration after extraction. *BQL* indicates that the DNA in that sample was below quantification limit (< 0.1 ng/μL).

Sample Name	[DNA] (ng/μl)	Sample Name	[DNA] (ng/μl)
WCA-027	4.44	WCT-544	1.1
WCA-030a	0.1	WCT-546	1.3
WCA-032	<i>BQL</i>	WCT-549	0.4
WCA-070	1.07	WCT-553	<i>BQL</i>
WCA-100	<i>BQL</i>	WCT-563b	2.22
WCL-519	0.36	WCT-564	0.49
WCL-714	1.48	WCT-574	0.82
WCL-728	0.2	WCT-581	4.45
WCL-755	1.46	WCT-583	2.93
WCL-772	<i>BQL</i>	WCT-585	6.57
WCL-779	0.22	WCT-592	5.36
WCS-407	0.34	WCT-596	1.24
WCS-408	0.84	WCT-600	0.98
WCT-513	0.28	WCT-602	2.39
WCT-516	0.14	WCT-609-A	3.77
WCT-517	0.48	WCT-609-B	1.45
WCT-519	0.64	WCT-610	2.14
WCT-521	0.26	WCT-614	4.13
WCT-526	0.64	WCT-619	7.3
WCT-531	0.79	WCT-625	2.96

Table 2 List of field negative control samples collected in June and July 2023, from streams and rivers in Western Newfoundland with the DNA concentration after extraction. *BQL* indicates that the DNA in that sample was below quantification limit (< 0.1 ng/μL).

Sample Name	[DNA] (ng/μl)
Field Blank 2	<i>BQL</i>
Field Blank 1	<i>BQL</i>

4 Results

DNA was successfully sequenced from all 40 samples analyzed for this report with a median of 272,709 (range: 23 – 1,400,017) sequences retained per sample per marker after bioinformatic filtering. For 15 samples, animal sequences were recovered from only one of two markers. Fish sequences were recovered from 27 samples.

A total of five families and eight species of fish were identified across all samples, including seven of the focal species (**Figure 1**): Atlantic salmon (*Salmo salar*), brook trout (*Salvelinus fontinalis*), American eel (*Anguilla rostrata*), ninespine stickleback (*Pungitius pungitius*), threespine stickleback (*Gasterosteus aculeatus*), banded killifish (*Fundulus diaphanus*) and rainbow smelt (*Osmerus mordax*). Three focal species (mummichog, blackspotted stickleback, and Arctic char) were not identified in the samples. In addition to the focal species, the brown trout (*Salmo trutta*) was identified in one sample. Detections included two species considered Vulnerable in Newfoundland (*F. diaphanus* and *A. rostrata*). *F. diaphanus*, detected in a single sample, is also listed as Special Concern under SARA⁷. *A. rostrata*, detected in nine samples, is not listed under SARA, but has been assessed as threatened by COSEWIC⁸. Brook trout (*Salvelinus fontinalis*) was the fish species with the highest frequency of occurrence, detected in 55% of samples (**Figure 2**).

A complete taxonomy table listing all fish taxa detected across all samples is included in supplementary files (see **Appendix A** for a list of supplementary files). While fish were the focal group for this analysis, other animal species were detected incidentally, including birds, amphibians, arthropods, and molluscs. Among these were several taxonomic groups used as indicators of freshwater quality (e.g., Ephemeroptera, Trichoptera, Psocoptera) as well as species of potential conservation concern (e.g., the freshwater pearl mussel, *Margaretifera margaretifera*, listed as endangered under IUCN⁹, but not assessed by COSEWIC in Canada). A complete taxonomy table including all animal detections is also included in the supplementary files. Please note that in taxonomy files, rows with taxa that do not have higher resolution taxonomy assigned (i.e., no species or genus level identification) represent sequences that could not be assigned any higher level of taxonomy. These rows represent unique observations from rows that were assigned lower-level taxonomy. For example, in Table 3, the observations in row 3 do not include the observations in row 1 and 2. Rows 1 and 2 represent sequences that were identified to each species respectively and Row 3 only includes sequences that were identified as *Salmo* but could not be assigned a species name.

Table 3 Example taxonomic data to illustrate how taxonomy results are presented in the supplementary data files.

	Phylum	Class	Order	Family	Genus	Species
1	Chordata	Actinopteri	Salmoniformes	Salmonidae	<i>Salmo</i>	<i>Salmo salar</i>
2	Chordata	Actinopteri	Salmoniformes	Salmonidae	<i>Salmo</i>	<i>Salmo trutta</i>
3	Chordata	Actinopteri	Salmoniformes	Salmonidae	<i>Salmo</i>	

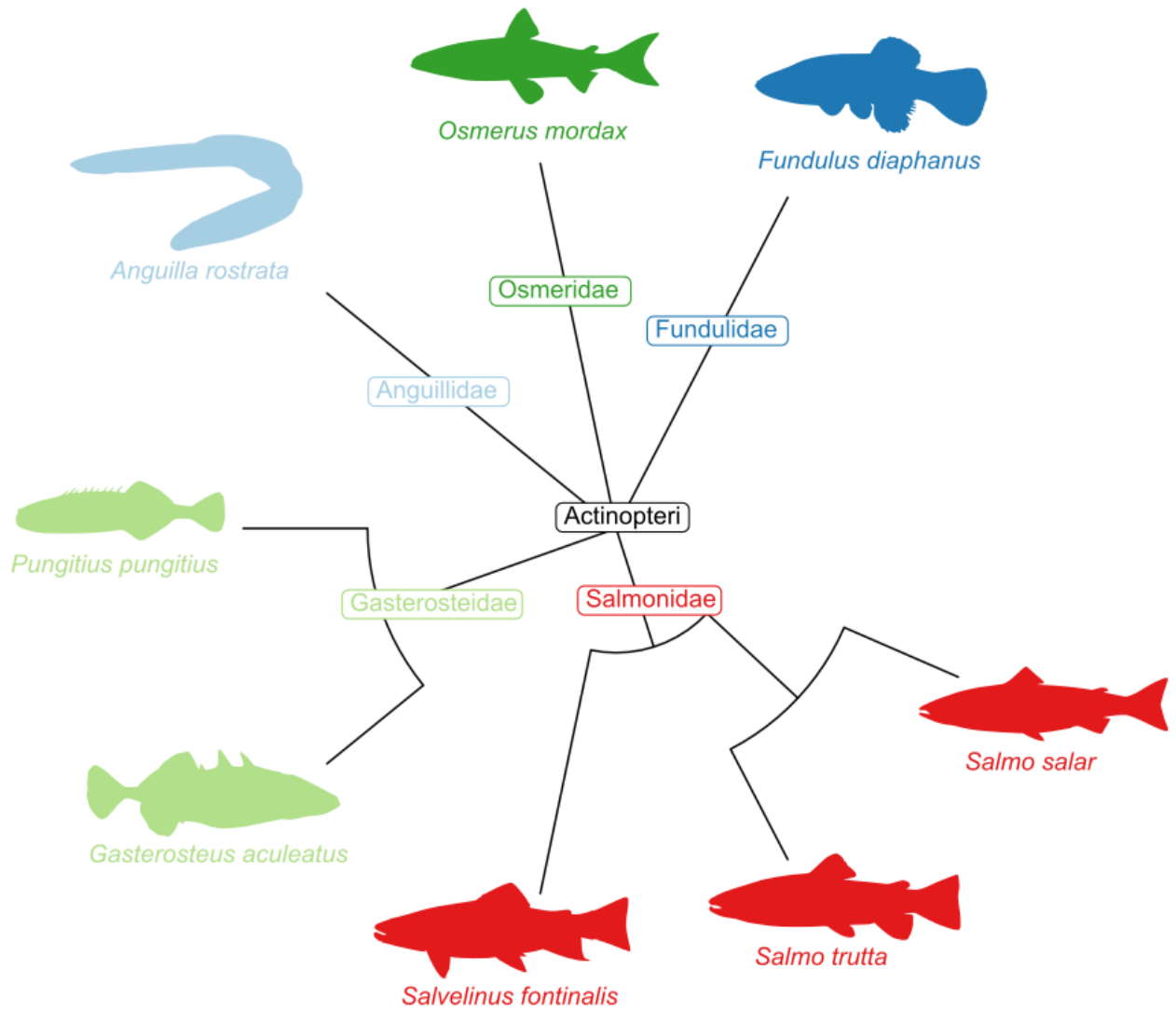


Figure 1 Dendrogram of fish species detected across all water samples collected from rivers in western Newfoundland in June and July 2023 (n = 38) where every tip represents a species and colour indicates family. The dendrogram was generated using taxonomy data from NCBI's Common Tree.

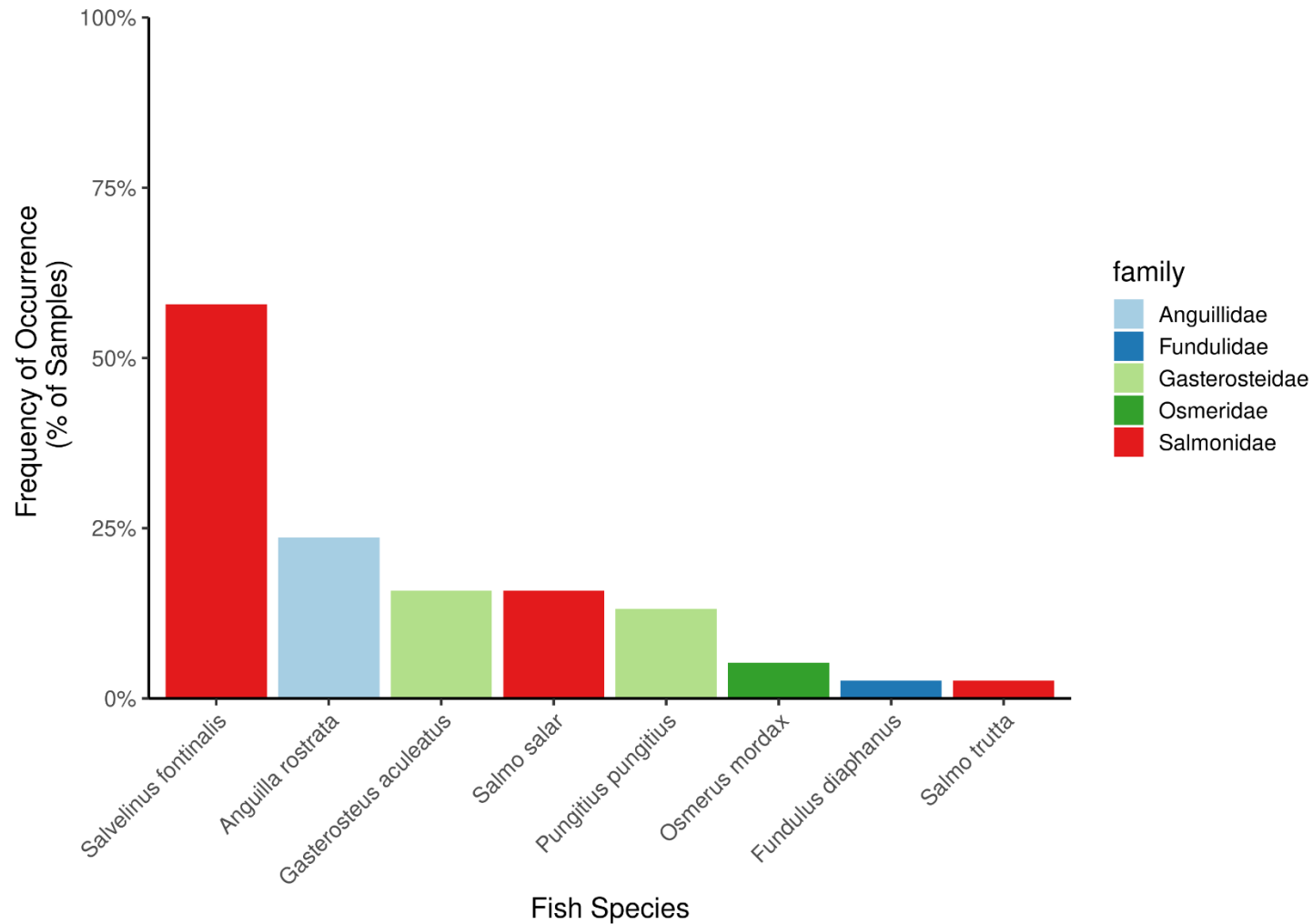



Figure 2 Frequency of occurrence of fish species (% of samples) across all water samples collected from rivers in western Newfoundland in June and July 2023 (n = 38).

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5 Conclusions


The goal of this project was to characterize fish biodiversity in rivers in western Newfoundland using environmental genomics. In total, we identified 8 fish species, which included seven fish species identified as focal species for this project, of which two are of conservation concern in Newfoundland, the American eel (*Anguilla rostrata*) and the banded killifish (*Fundulus diaphanus*). In addition to the focal species, the brown trout (*Salmo trutta*) was also identified in one sample. The brook trout (*Salvelinus fontinalis*) was the most frequently detected fish species across all samples.

The results presented here provide fish biodiversity data to support the monitoring of freshwater river systems in western Newfoundland. Detections of other animals are reported but these are incidental detections and do not represent a comprehensive inventory of all animal taxa since the DNA analysis was targeted for fish. Future eDNA samples collected in the study area as part of this project can be processed and analysed following the same protocols, enabling comparisons between sampling events and more robust comparisons between sites.

5.1 Notes on the Interpretation of eDNA Results


Taxonomic annotation of environmental DNA is heavily reliant on the quality and completeness of reference databases, which varies between genetic markers¹⁰. The ESVs with unassigned taxonomies represent organisms whose DNA may not have been sequenced yet by the general scientific community and would therefore not be represented in the publicly available reference databases. Unidentified ESVs are useful in a general analysis of biodiversity and can be informative for comparative biodiversity analyses. As databases continue to be populated and bioinformatics methods are advanced, these unidentified ESVs may be able to be assigned taxonomy in future. Additionally, errors in public reference databases exist and can potentially introduce false positives. Despite our best efforts to minimize the impact of erroneous reference sequences, there is a possibility for false assignments from these errors.

While this report includes a comprehensive list of species detected using environmental genomics, it is possible that some species present in the environment were not detected. False negatives may be due to species being absent from the reference database (as discussed above), or due to a lack of genetic resolution (i.e., high genetic similarity) between sister taxa which can lead to ambiguous or false database assignments. Alternatively, inefficiencies during the PCR stage of sample processing due to the variability in genetic markers between taxonomic groups can bias the recovery of DNA sequences in environmental genomic analyses¹⁰. A multi-marker approach is used to minimize the potential impact of these limitations by increasing the likelihood of DNA recovery, sequence resolution, and taxonomic annotation for the taxa of interest relative to any one DNA marker.

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6 References

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7 Appendix A

Table A1 List all supplementary files to be shared with the report.

Name	Filename	Description
Supplementary Table 1	RPT068-NT01 Supplementary Table 1 V1.xlsx	A complete list of animal taxa that were detected in the water samples collected from rivers in western Newfoundland in June and July 2023 (n = 38) . Detections are represented with a 1, non-detections are represented with a 0. Rows with taxa that do not have higher resolution taxonomy assigned (i.e., no species or genus level identification) represent sequences that could not be assigned any higher level of taxonomy. These rows represent unique observations from rows that were assigned lower-level taxonomy.
Supplementary Table 2	RPT068-NT01 Supplementary Table 2 V1.xlsx	A complete list of fish taxa that were detected in the water collected from rivers in western Newfoundland in June and July 2023 (n = 38). Detections are represented with a 1, non-detections are represented with a 0. Rows with taxa that do not have higher resolution taxonomy assigned (i.e., no species or genus level identification) represent sequences that could not be assigned any higher level of taxonomy. These rows represent unique observations from rows that were assigned lower-level taxonomy.
Supplementary Table 3	RPT068-NT01 Supplementary Table 3 V1.xlsx	The raw number of sequence reads after bioinformatics filtering for each fish taxon (score ≥ 0.85) in each sample with the COI marker. These files include read counts for each marker separately. For analyses using read counts, we recommend that the results for each marker be analyzed separately.
Supplementary Table 4	RPT068-NT01 Supplementary Table 4 V1.xlsx	The raw number of sequence reads after bioinformatics filtering for each fish taxon (score ≥ 0.85) in each sample with the 12S marker. For analyses using read counts, we recommend that the results for each marker be analyzed separately.
Sequence Data	Multiple files	Compressed FASTQ files (one file per sample per marker per forward and reverse read) where Illumina adapters, indexes, and primer sequences have been trimmed. No other manipulation has been performed.

Table E.2.1 Detections of fish species from World Energy environmental DNA sampling

phylum	class	order	family	genus	species	WCA-030a	WCL-755	WCT-517	WCT-519	WCT-526	WCT-531	WCT-544	WCT-546	WCT-549	WCT-563b	WCT-564	WCT-574	WCT-581	WCT-583
Chordata	Actinopteri	Anguilliformes	Anguillidae	<i>Anguilla</i>	<i>Anguilla rostrata</i>	0	0	0	0	0	1	0	1	1	1	0	0	1	0
Chordata	Actinopteri	Anguilliformes	Anguillidae			0	0	0	0	0	0	0	1	0	0	0	0	1	0
Chordata	Actinopteri	Anguilliformes				0	0	0	0	0	0	0	1	0	0	0	0	1	0
Chordata	Actinopteri	Cyprinodontiformes	Fundulidae	<i>Fundulus</i>	<i>Fundulus diaphanus</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chordata	Actinopteri	Osmeriformes	Osmeridae	<i>Osmerus</i>	<i>Osmerus mordax</i>	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Chordata	Actinopteri	Perciformes	Gasterosteidae	<i>Gasterosteus</i>	<i>Gasterosteus aculeatus</i>	0	0	1	1	0	1	0	0	0	0	0	0	0	1
Chordata	Actinopteri	Perciformes	Gasterosteidae	<i>Gasterosteus</i>		0	0	1	1	0	0	0	0	0	0	0	0	0	1
Chordata	Actinopteri	Perciformes	Gasterosteidae	<i>Pungitius</i>	<i>Pungitius pungitius</i>	0	0	0	0	0	1	0	1	1	0	0	0	1	0
Chordata	Actinopteri	Perciformes	Gasterosteidae	<i>Pungitius</i>		0	0	0	0	0	0	0	1	1	0	0	0	1	0
Chordata	Actinopteri	Perciformes	Gasterosteidae			0	0	0	0	0	0	0	1	0	0	0	0	0	0
Chordata	Actinopteri	Perciformes				0	0	0	1	0	0	0	1	1	0	0	0	1	1
Chordata	Actinopteri	Salmoniformes	Salmonidae	<i>Salmo</i>	<i>Salmo salar</i>	0	0	0	0	0	0	0	0	0	0	1	1	1	0
Chordata	Actinopteri	Salmoniformes	Salmonidae	<i>Salmo</i>	<i>Salmo trutta</i>	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Chordata	Actinopteri	Salmoniformes	Salmonidae	<i>Salvelinus</i>	<i>Salvelinus fontinalis</i>	1	1	1	0	1	1	1	1	1	1	0	0	1	1
Chordata	Actinopteri	Salmoniformes	Salmonidae	<i>Salvelinus</i>		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chordata	Actinopteri	Salmoniformes	Salmonidae			0	1	0	0	0	0	0	1	0	1	0	0	0	0
Chordata	Actinopteri	Salmoniformes				0	0	1	1	0	0	0	1	0	1	0	0	1	0

Table E.2.2 Potential Water Quality Inhibitors for Environmental EDNA

Site	Date Sampled	Potential Inhibitors			
		pH	Total Suspended Solids (mg/L)	Tannins & Lignins (mg/L)	Total Organic Carbon (mg/L)
WCA-030a	7/22/2023	8.1	<10	1.6	12
WCA-032	7/25/2023	8.3	<10	1.2	8.6
WCA-070	7/22/2023	8.01	<10	2.9	19
WCA-100	7/25/2023	8.17	<10	0.9	6.3
WCL-027	7/25/2023	7.19	<10	3.4	24
WCL-714	7/25/2023	7.31	<10	7	45
WCL-728	7/22/2023	8.28	<10	1.3	8.1
WCL-755	7/22/2023	8.03	<10	2.9	17
WCL-772	7/25/2023	8.22	<10	0.7	5
WCL-779	7/25/2023	8.1	<10	1.3	8.3
WCS-407	7/26/2023	7.82	<10	1.8	8.9
WCS-408	7/26/2023	7.32	<10	1.2	7.2
WCT-500	7/25/2023	7.94	<10	2.8	18
WCT-513	7/25/2023	8.13	<10	1.2	11
WCT-516	7/22/2023	8.26	<10	0.3	3.2
WCT-517	7/22/2023	8.27	<10	1.2	6.8
WCT-519	7/22/2023	8.14	<10	1.7	11
WCT-521	7/21/2023	8.25	<10	1.6	8.5
WCT-526	7/22/2023	8.16	<10	2.3	12
WCT-531	7/21/2023	7.75	<10	2	9.2
WCT-544	7/22/2023	7.39	<10	2.8	18
WCT-546	7/22/2023	6.31	<10	5.9	25
WCT-549	7/22/2023	5.33	<10	8.4	34
WCT-553	7/22/2023	8.05	<10	1.3	6
WCT-555	7/25/2023	8	<10	2.1	8.8
WCT-563B	7/23/2023	5.38	<10	8.7	39
WCT-564	7/22/2023	6.86	<10	2.6	11
WCT-574	7/23/2023	7.07	<10	2.6	12
WCT-581	7/23/2023	6.92	<10	5.8	28
WCT-583	7/23/2023	7.22	<10	3.7	17
WCT-585	7/23/2023	7.32	<10	5.5	27
WCT-592	7/23/2023	6.95	11	4.7	22
WCT-596	7/25/2023	7.45	<10	6.6	32
WCT-600	7/25/2023	6.79	<10	3.7	13
WCT-602	7/23/2023	7.24	<10	4.2	17
WCT-609	7/23/2023	6.97	24	4.5	27
WCT-610	7/23/2023	6.57	13	4.2	18
WCT-614	7/23/2023	7.1	13	3.8	17
WCT-619	7/23/2023	6.92	<10	4.3	22
WCT-625	7/23/2023	7.08	110	4.2	19