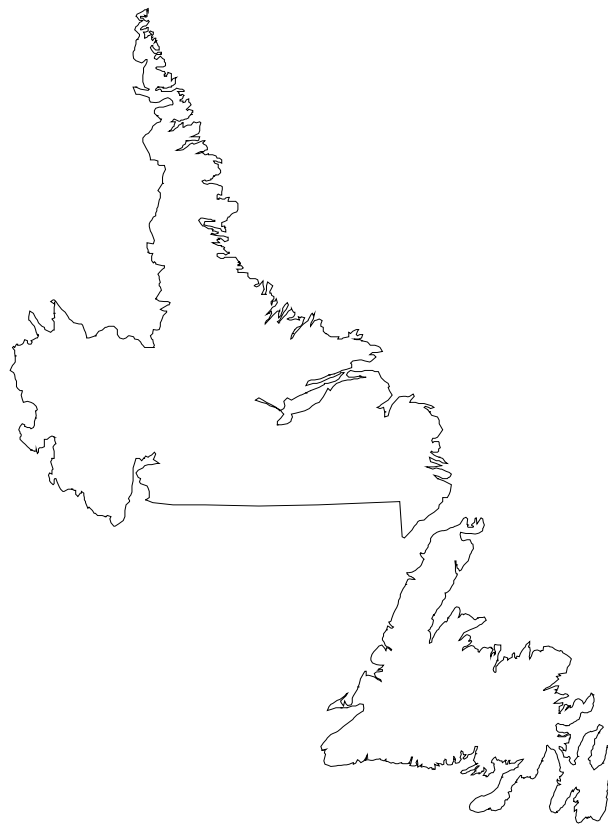


# **CANADA-NEWFOUNDLAND and LABRADOR WATER QUALITY MONITORING AGREEMENT**

## **ANNUAL WORK SCHEDULE 2021 - 2022**



Water Resources Management Division  
Department of Environment and Climate  
Change  
St. John's, Newfoundland and Labrador

Atlantic Water Quality Monitoring - Surveillance de  
la qualité de l'eau de l'Atlantique  
Environment and Climate Change Canada -  
Environnement et Changement climatique Canada  
Dartmouth, Nova Scotia

**Canada-Newfoundland and Labrador  
Water Quality Monitoring Agreement  
Annual Work Schedule –  
Resource Commitment & Work Shared Activities  
2021-2022**

This document outlines cost and work shared activities to be carried out during the current fiscal year under the Canada-Newfoundland and Labrador Water Quality Monitoring Agreement. The document has been reviewed and approved by the Administrators of the Agreement.

**Cash,  
Kevin**

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by Cash, Kevin  
Date: 2021.07.06  
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Kevin Cash  
Administrator, on behalf of  
**Environment and Climate Change Canada**  
Government of Canada



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Haseen Khan  
Administrator, on behalf of  
**Department of Environment and Climate Change**  
Government of Newfoundland and Labrador

**Schedule A**  
**Agreement Committees**

The following officials are named to administer this Agreement according to Article X under the Canada-Newfoundland and Labrador Water Quality Monitoring Agreement:

Mr. Kevin Cash  
Environment and Climate Change Canada, on behalf of Canada

Mr. Haseen Khan  
Department of Environment and Climate Change, on behalf of Newfoundland & Labrador

The Administrators will be assisted by a Coordinating Committee consisting of the following:

Mr. Arash Shahsavarani  
Environment and Climate Change Canada (Water Quality Monitoring & Surveillance)

Mr. Denis Parent  
Environment and Climate Change Canada (Water Quality Monitoring and Surveillance)

Ms. Christine Garron  
Environment and Climate Change Canada (Water Quality Monitoring & Surveillance)

Ms. Annette Tobin  
Water Resources Management Division, Newfoundland & Labrador Department of  
Environment and Climate Change

**Schedule B**

**Shared Activities for Fiscal Year 2021-2022**

**Schedule B – Shared Activities 2021-2022**

**Important note:** Self isolation and safe distancing measures have been put in place by the Federal and Provincial Governments in 2021 due to risks posed by the COVID-19 virus. This may affect operations of programs such as sample collection and laboratory analyses for ambient water quality. As such, samples collected and transfer amounts, this year, may be lower than those identified in the work plan.

| Activity  | Responsible Agency  | Remarks  | Total Cost  |
|---|---|--|---|
| <b>Cost-Shared and Work-Shared Core Ambient Water Quality Monitoring and Data Management Activities</b> | Newfoundland & Labrador Department of Environment and Climate Change<br><u>and</u><br>Environment and Climate Change Canada | Refer to <b>Table B.1</b> and <b>Figure A-1</b> for sampling locations in Newfoundland<br><br>Refer to <b>Table B.2</b> and <b>Figure A-2</b> for sampling locations in Labrador<br><br>Refer to <b>Table B.3</b> for laboratory analysis details<br><br>Refer to <b>Table B.4</b> for Shared Activities | <b>\$16,500 payable to NL</b> (Labrador sampling)<br><br><b>\$44,140 payable to ECCC</b> (Laboratory Services) This amount may be reduced due to laboratory closures from COVID-19) |
| <b>Additional Cost-Shared Core Activities</b>   | Newfoundland & Labrador Department of Environment and Climate Change<br><u>and</u><br>Environment and Climate Change Canada | Refer to <b>Table B.5</b> for Shared Activities  | <b>\$44,500 payable to NL</b> (CESI, CABIN, Data Management)  |
| <b>Work-Shared Special Projects</b>   | Newfoundland & Labrador Department of Environment and Climate Change<br><u>and</u><br>Environment and Climate Change Canada | Refer to <b>Table B.6</b> for work-shared special projects   | N/A   |

Table B.1: Index Station Location, Designation and Sampling Frequency 2021-2022 for Newfoundland Stations. Core CESI stations are shaded gray.

**E.ASTERN REGION**

| STATION #  | DESCRIPTION                            | LATITUDE | LONGITUDE | DESIGNATION | SAMPLES/<br>YEAR | CLASSIFICATION   |
|------------|--|----------|-----------|-------------|------------------|--|
| NF02ZK0005 | NORTHEAST RIVER NEAR PLACENTIA         | 47 16 23 | -53 50 25 | Fed/Prov    | 5                | CABIN Annual site since 2009 (except for 10-11)/ Hydrometric / Core CESI Station |
| NF02ZL0029 | GOULDS BROOK NEAR MAKINSONS            | 47 30 17 | -53 17 27 | Fed/Prov    | 5                | CABIN site 09-10 / Core CESI Station   |
| NF02ZM0004 | WATERFORD RIVER AT COMMONWEALTH AVENUE | 47 31 19 | -52 48 29 | Provincial  | 4                | Local CESI Station   |
| NF02ZM0009 | WATERFORD RIVER AT KILBRIDE            | 47 31 44 | -52 44 40 | Fed/Prov    | 4                | RTWQ / Hydrometric / Local CESI Station / Chemical Management Plan               |
| NF02ZM0014 | VIRGINIA RIVER AT THE BOULEVARD        | 47 35 02 | -52 41 29 | Provincial  | 4                | Local CESI Station / CABIN site 10-11  |
| NF02ZM0015 | QUIDI VIDI LAKE AT OUTLET              | 47 35 04 | -52 40 54 | Provincial  | 4                |  |
| NF02ZM0016 | RENNIE'S RIVER AT CARNELL DRIVE        | 47 34 40 | -52 42 03 | Provincial  | 4                | Local CESI Station   |
| NF02ZM0020 | BROAD COVE BROOK NEAR ST. PHILLIPS     | 47 34 16 | -52 52 10 | Provincial  | 4                | CABIN site 08-09 / Local CESI Station  |
| NF02ZM0098 | VIRGINIA RIVER AT HEADWATERS           | 47 35 56 | -52 45 17 | Provincial  | 4                | CABIN site 08-09 / Comp Guidelines Site / Local CESI Station                     |
| NF02ZM0109 | MUNDY POND AT OUTLET                   | 47 33 12 | -52 44 07 | Provincial  | 4                |  |
| NF02ZM0175 | WATERFORD RIVER AT BROOKFIELD ROAD     | 47 31 34 | -52 45 48 | Provincial  | 4                | Local CESI Station   |
| NF02ZM0176 | SOUTH BROOK AT MOUTH                   | 47 31 41 | -52 44 48 | Provincial  | 4                | Local CESI Station   |
| NF02ZM0177 | RENNIE'S RIVER AT PORTUGAL COVE ROAD   | 47 34 28 | -52 42 36 | Provincial  | 4                | Local CESI Station   |
| NF02ZM0178 | LEARYS BROOK AT PRINCE PHILIP DRIVE    | 47 33 50 | -52 44 55 | Fed/Prov    | 10               | RTWQ / Hydrometric / Core CESI Station / CABIN site 11-12                        |

|            |   |          |           |            |    |  |
|------------|---|----------|-----------|------------|----|--|
| NF02ZM0179 | TRIBUTARY TO VIRGINIA RIVER AT GUZZWELL DRIVE | 47 35 47 | -52 42 06 | Provincial | 4  | Local CESI Station   |
| NF02ZM0180 | VIRGINIA RIVER AT NEWFOUNDLAND DRIVE          | 47 35 59 | -52 42 02 | Provincial | 4  | Local CESI Station   |
| NF02ZM0181 | WATERFORD RIVER AT BLACKHEAD ROAD             | 47 32 53 | -52 43 09 | Fed/Prov   | 10 | Core CESI Station  |
| NF02ZM0182 | WATERFORD RIVER AT BREMIGANS POND DAM         | 47 31 07 | -52 51 21 | Provincial | 4  | Local CESI Station   |
| NF02ZM0183 | KELLOGGS RIVER AT KELLVIEW CRESCENT           | 47 29 37 | -53 00 58 | Provincial | 4  | Local CESI Station / CABIN site 11-12                        |
| NF02ZM0185 | SOUTH BROOK AT HEADWATERS                     | 47 29 44 | -52 48 47 | Provincial | 4  | CABIN site 08-09 / Comp Guidelines Site / Local CESI Station |
| NF02ZM0294 | MANUELS RIVER ABOVE MANUELS ACCESS ROAD       | 47 31 11 | -52 56 41 | Provincial | 4  | Archaeologically significant / Local CESI Station            |
| NF02ZM0359 | PADDYS POND AT OUTLET                         | 47 29 17 | -52 53 39 | Provincial | 4  | RTWQ stand-alone station                                     |
| NF02ZN0004 | SALMONIER RIVER AT ST. CATHERINES             | 47 11 29 | -53 23 09 | Provincial | 4  | Local CESI Station   |

**CENTRAL REGION**

| STATION #  | DESCRIPTION                         | LATITUDE | LONGITUDE | DESIGNATION | SAMPLES/ YEAR | CLASSIFICATION                        |
|------------|-------------------------------------|----------|-----------|-------------|---------------|---------------------------------------|
| NF02YO0001 | EXPLOITS RIVER AT GRAND FALLS       | 48 55 27 | -55 39 35 | Provincial  | 4             | Local CESI Station                    |
| NF02YO0020 | EXPLOITS RIVER AT ASPEN BROOK       | 48 56 56 | -55 54 45 | Provincial  | 4             | Local CESI Station                    |
| NF02YO0107 | EXPLOITS RIVER NEAR MILLERTOWN      | 48 45 38 | -56 34 56 | Fed/Prov    | 4             | Hydrometric / Core CESI Station       |
| NF02YO0128 | EXPLOITS RIVER BELOW GRAND FALLS    | 48 56 12 | -55 37 03 | Provincial  | 4             | Local CESI Station                    |
| NF02YO0142 | CORDUROY BROOK NEAR CENTENNIAL PARK | 48 56 24 | -55 39 43 | Provincial  | 4             | Local CESI Station / CABIN site 11-12 |
| NF02YO0143 | EXPLOITS RIVER AT BOND BRIDGE       | 49 01 24 | -55 26 56 | Provincial  | 4             | Local CESI Station                    |
| NF02YQ0030 | GANDER RIVER AT APPLETON            | 48 59 40 | -54 52 00 | Fed/Prov    | 4             | Hydrometric / Core CESI Station       |



|            |  |          |           |            |   |   |
|------------|--|----------|-----------|------------|---|---|
| NF02YQ0072 | CARELESS BROOK AT RESOURCE ROAD STEEL BRIDGE | 48 54 08 | -54 59 38 | Fed/Prov   | 4 | CABIN Annual site since 2010 / Local CESI Station |
| NF02YS0001 | TERRA NOVA RIVER AT TERRA NOVA               | 48 30 24 | -54 12 36 | Provincial | 4 | Local CESI Station                                |
| NF02YS0011 | TERRA NOVA RIVER AT SPENCER BRIDGE           | 48 38 26 | -54 02 11 | Fed/Prov   | 4 | Hydrometric / Core CESI Station                   |
| NF02YS0083 | NORTHWEST RIVER AT TERRA NOVA NATIONAL PARK  | 48 23 50 | -54 11 56 | Provincial | 4 | Hydrometric / National Park / Local CESI Station  |

**WESTERN REGION**

| STATION #  | DESCRIPTION                                    | LATITUDE | LONGITUDE | DESIGNATION | SAMPLES/ YEAR | CLASSIFICATION  |
|------------|--|----------|-----------|-------------|---------------|---|
| NF02YE0004 | PORTLAND CREEK AT ROUTE 430                    | 50 10 57 | -57 36 04 | Provincial  | 4             | Local CESI Station  |
| NF02YE0005 | WESTERN BROOK AT ROUTE 430                     | 49 49 44 | -57 51 18 | Fed/Prov    | 5             | CABIN site 08-09 / Core CESI Station  |
| NF02YG0001 | MAIN RIVER AT ROUTE 420                        | 49 46 15 | -56 54 33 | Fed/Prov    | 5             | Canadian Heritage River / Core CESI Station                                   |
| NF02YL0106 | SOUTH BROOK BELOW TCH                          | 49 01 06 | -57 37 04 | Provincial  | 4             | Hydrometric   |
| NF02YG0020 | EAGLE MOUNTAIN BROOK BELOW EAGLE MOUNTAIN POND | 49 49 54 | -57 17 14 | Provincial  | 4             |   |
| NF02YH0018 | LOMOND RIVER AT ROUTE 431                      | 49 24 08 | -57 43 48 | Provincial  | 4             | CABIN site 08-09 / Local CESI Station   |
| NF02YJ0004 | PINCHGUT BROOK AT TCH                          | 48 47 49 | -58 03 42 | Fed/Prov    | 10            | CABIN Annual site since 2008 (except for 09-10 and 10-11) / Core CESI Station |
| NF02YK0022 | HUMBER CANAL AT MAIN DAM ROAD                  | 49 09 59 | -57 24 53 | Provincial  | 4             | Local CESI Station  |
| NF02YL0011 | HUMBER RIVER AT LITTLE FALLS BRIDGE            | 49 20 52 | -57 14 08 | Provincial  | 4             | Local CESI Station  |
| NF02YL0012 | HUMBER RIVER AT HUMBER VILLAGE BRIDGE          | 48 59 01 | -57 45 37 | Fed/Prov    | 10            | RTWQ / Hydrometric / Core CESI Station  |

|            |   |          |           |            |   |                                       |
|------------|---|----------|-----------|------------|---|---------------------------------------|
| NF02YL0013 | CORNER BROOK AT MARGARET BOWATER PARK   | 48 56 34 | -57 55 55 | Provincial | 4 | Local CESI Station                    |
| NF02YL0029 | WILD COVE BROOK AT ROUTE 440            | 48 58 26 | -57 52 60 | Provincial | 4 | Local CESI Station / CABIN site 12-13 |
| NF02YN0001 | LLOYDS RIVER AT ROUTE 480               | 48 18 28 | -57 42 10 | Fed/Prov   | 5 | CABIN site 09-10 / Core CESI Station  |
| NF02YN0043 | PETER STRIDES LAKE AT ROUTE 480         | 48 09 13 | -57 43 23 | Provincial | 4 |                                       |
| NF02ZA0006 | GRAND CODROY RIVER BELOW OVERFALL BROOK | 47 52 08 | -59 07 05 | Provincial | 4 | Local CESI Station                    |
| NF02ZC0020 | BUCK LAKE ON ROUTE 480                  | 48 00 49 | -57 39 59 | Provincial | 4 |                                       |

Notes:

1. A total of 50 stations (including 12 core CESI stations) will be sampled during 2021-2022 on the island portion of the province.
2. For statistical analysis it is important that at least four (4) samples are collected from each station representing four seasons in a fiscal year.
3. All Core CESI stations should be sampled five (5) times per year, if possible. All local CESI stations will be sampled at least four (4) times per year. Note: Core CESI stations in central are scheduled for 4 samples per year due to staffing limitations and to avoid additional trips. However, the target for 4 samples per year has consistently been met in the past.
4. Total number of samples to be collected from all NL stations is 265 (this includes QA/QC samples); it also includes 77 samples from Core CESI stations. Total number of QA/QC samples to be collected is 36 (this is based on 12 duplicates per year in eastern region, four (4) duplicates per year in central region, eight (8) duplicates per year in western region, and 4 blanks per year in each of these regions).
5. All sampling is carried out by provincial Water Resources Management Division staff.
6. Sampling at all Core CESI sites will include field measurements for pH, conductivity, turbidity, dissolved oxygen and water temperature.

Table B.2: Northern Index Station Location, Designation and Sampling Frequency 2021-2022 for Labrador Stations. Core CESI stations are shaded gray.

| STATION #  | DESCRIPTION                                       | LATITUDE | LONGITUDE | DESIGNATION | SAMPLES/<br>YEAR | CLASSIFICATION  |
|------------|---|----------|-----------|-------------|------------------|---|
| NF02XA0001 | LITTLE MECATINA RIVER ABOVE LAC FOURMONT          | 52 13 42 | -61 19 32 | Fed/Prov    | 4                | Hydrometric / Transboundary / Local CESI Station                                      |
| NF03NF0013 | UGJOKTOK RIVER BELOW HARP LAKE                    | 55 13 60 | -61 17 57 | Fed/Prov    | 4                | Hydrometric / Core CESI Station   |
| NF03OA0020 | ASHUANUPI RIVER AT FERGUSON BAY                   | 53 00 06 | -66 14 30 | Provincial  | 4                | Local CESI Station  |
| NF03OC0012 | ATIKONAK RIVER ABOVE PANCHIA LAKE                 | 52 58 03 | -64 39 40 | Fed/Prov    | 4                | Hydrometric / Core CESI Station   |
| NF03OD0011 | EAST METCHIN RIVER AT TLH                         | 53 26 05 | -63 14 02 | Provincial  | 4                | Former Hydrometric / Local CESI Station   |
| NF03OD0012 | WILSON RIVER EAST BRANCH                          | 53 18 33 | -62 55 11 | Provincial  | 4                | Ashkui / CABIN 10-11 / Local CESI Station   |
| NF03OE0057 | MUSKRAT FALLS RESERVOIR AT LOWER BROOK            | 53 14 52 | -60 47 21 | Fed/Prov    | 4                | RTWQ / Hydrometric / Local CESI Station / River turned reservoir site (Muskrat Falls) |
| NF03OE0050 | CHURCHILL RIVER 6.15KMS BELOW LOWER MUSKRAT FALLS | 53 14 16 | -60 40 31 | Fed/Prov    | 4                | RTWQ/ Hydrometric   |
| NF03OE0029 | CHURCHILL RIVER ABOVE GRIZZLE RAPIDS              | 52 58 12 | -61 26 43 | Fed/Prov    | 4                | RTWQ/ Hydrometric   |
| NF03OE0030 | MINIPI RIVER BELOW MINIPI LAKE                    | 52 36 54 | -61 11 01 | Fed/Prov    | 4                | Former RTWQ / Former Hydrometric / Core CESI Station                                  |
| NF03OE0032 | PINUS RIVER ABOVE TLH                             | 53 08 52 | -61 33 31 | Provincial  | 4                | Hydrometric / Comp Guidelines Site / Local CESI Station                               |
| NF03OE0033 | BIG POND BROOK BELOW BIG POND                     | 53 30 51 | -60 17 39 | Provincial  | 4                | Hydrometric / Local CESI Station  |
| NF03OE0035 | DOMINION LAKE OUTFLOW                             | 52 43 44 | -61 45 14 | Provincial  | 4                | Ashkui / Local CESI Station   |
| NF03OE0037 | CACHE RIVER AT TLH                                | 53 11 34 | -62 12 35 | Provincial  | 4                | Ashkui / Local CESI Station   |

|            |  |          |           |            |   |   |
|------------|--|----------|-----------|------------|---|---|
| NF03PB0025 | NASKAUPI RIVER BELOW NASKAUPI LAKE     | 54 07 54 | -61 25 45 | Fed/Prov   | 4 | Core CESI Station   |
| NF03PB0028 | CAPE CARIBOU RIVER AT GRAND LAKE       | 53 37 16 | -60 24 52 | Provincial | 4 | Ashkui / Local CESI Station   |
| NF03PB0029 | GRAND LAKE OUTFLOW AT NORTH WEST RIVER | 53 31 26 | -60 08 45 | Provincial | 4 | Ashkui  |
| NF03PB0030 | SEAL LAKE AT NARROWS                   | 54 19 55 | -61 38 27 | Provincial | 4 | Ashkui  |
| NF03PB0032 | SUSAN RIVER NORTH OF BEAVER RIVER      | 53 44 17 | -60 56 48 | Provincial | 4 | Ashkui / Local CESI Station   |
| NF03PB0037 | WUCHUSK LAKE AT NASKAUPI RIVER INFLOW  | 54 23 43 | -61 47 09 | Provincial | 4 | Ashkui  |
| NF03QA0044 | CARTER BASIN OUTFLOW                   | 53 29 55 | -59 52 11 | Provincial | 4 | Ashkui  |
| NF03QA0045 | KENAMU RIVER NEAR MOUTH                | 53 28 34 | -59 55 01 | Provincial | 4 | Ashkui / Comp Guidelines Site   |
| NF03QC0001 | EAGLE RIVER ABOVE FALLS                | 53 32 03 | -57 29 37 | Fed/Prov   | 4 | Hydrometric / Core CESI Station / Eagle River Plateau Management Zone |
| NF03QC0002 | ALEXIS RIVER NEAR PORT HOPE SIMPSON    | 52 38 57 | -56 52 17 | Provincial | 4 | Hydrometric / Local CESI Station                                      |
| NF02XB0018 | TRIBUTARY TO ST. AUGUSTIN RIVER        | 52 33 06 | -59 19 39 | Fed/Prov   | 4 | Transboundary/CABIN sampling in 2012                                  |

Notes:

1. A total of 25 stations (including five (5) core CESI stations) will be sampled during 2021-2022 in Labrador.
2. The Labrador stations are listed as being sampled four (4) times per year; this refers to the number of samples taken; **there must be a minimum of three (3) samples taken each fiscal year** at the provincial Labrador sites. Generally, four trips are made to each station.
3. Total number of samples to be collected is 109 (this includes QA/QC samples); it also includes 20 samples from Core CESI stations. Total number of QA/QC samples to be collected is nine (9) (this is based on six (6) duplicates and three (3) blanks per year).
4. All five (5) Core CESI stations in Labrador are accessible only by helicopter.
5. All Core CESI stations should be sampled four (4) times per year, if possible, and at least (3) times per year.

6. Sampling at all Core CESI sites will include field measurements for pH, conductivity, turbidity, dissolved oxygen and water temperature.
7. Sampling is carried out by provincial and federal staff (i.e., a schedule is developed by provincial staff at beginning of sampling season and distributed to federal staff to ensure the preferred number of samples are collected at the remote sites during field visits between both agencies).

Table B.3 Analytical Parameters, Holding Times and Schemas for 2021-2022

| Parameter                | Holding Times (recommended by ALET Lab Services) | Schema Name                                   | Parameter/ Grouping                    |
|--------------------------|--|---|--|
| Major Ions               |  | M pH auto,<br>M Alkalinity,<br>M Conductivity | alkalinity, pH, conductivity           |
| Alkalinity               | 14 days  | M Metals_TR ICP-OES                           | Ca, Mg, Na, and K and Li               |
| Chloride                 | 28 days  | M Anions PKG                                  | Cl, SO4, NO2, NO3, F and Bromide by IC |
| Sulphate                 | 28 days  | M TP  | total phosphorus                       |
| Calcium                  | 28 days  | M TN  | total nitrogen                         |
| Magnesium                | 28 days  | M TOC   | dissolved inorganic and organic carbon |
| Sodium                   | 28 days  | M Hardness                                    | Calculation derived from Ca and Mg     |
| Potassium                | 180 days   | M Colour                                      | Colour-apparent (unfiltered sample)    |
| Bromide                  | 48 hours   | M Turbidity                                   | turbidity                              |
| Fluoride                 | 48 hours   | B Metals_TR ICP-MS                            | Total Recoverable Metals by ICP-MS*    |
| Physical                 |  |   |  |
| pH                       | 48 hours   |   |  |
| Conductivity             | 28 days  |   |  |
| Colour                   | 48 hours   |   |  |
| Turbidity                | 48 hours   |   |  |
| Nutrients                |  |   |  |
| Nitrate                  | 24 hours   |   |  |
| Total Nitrogen           | 28 days  |   |  |
| Total Phosphorus         | 28 days  |   |  |
| DIC/TOC                  | 28 days  |   |  |
| Metals*                  |  |   |  |
| Total Metals-27 elements | 6 months (preservation required) (NLET)          |   |  |

**\*52 Metals include:**

|           |          |            |           |          |
|-----------|----------|------------|-----------|----------|
| aluminum  | bismuth  | iron       | nickel    | uranium  |
| antimony  | cadmium  | lanthanum  | rubidium  | vanadium |
| arsenic   | cobalt   | lead       | selenium  | zinc     |
| barium    | copper   | lithium    | silver    |          |
| beryllium | chromium | manganese  | strontium |          |
| boron     | gallium  | molybdenum | thallium  |          |

Metals analyzed but not required by NL ECC: europium, gadolinium, germanium, hafnium, holmium, indium, iridium, lutetium, neodymium, niobium, palladium, yttrium, niobium, tin, cesium, cerium, tungsten, platinum, praseodymium, ruthenium, samarium, scandium, tellurium, titanium, terbium, yttrium

**Table B.4 Core Ambient Water Quality Monitoring and Data Management Activities 2021-2022 (Cost-Shared and Work-Shared)**

| Management Activities  |   | Leads/Commitments |
|--|---|-------------------|
| <p><b>Water Quality Sampling and Analysis (Cost-shared activity)</b></p> <p>Water samples are collected by provincial staff.</p> <ul style="list-style-type: none"> <li>- Field data submitted regularly to ECCC</li> </ul> <p>Analysis is completed by federal lab to ensure consistency.</p> <ul style="list-style-type: none"> <li>- ISO standards adhered to</li> <li>- Detection limits mutually agreed upon</li> </ul> | <p>NL Department of Environment and Climate Change</p> <ul style="list-style-type: none"> <li>- NL will collect 374 samples in 2021-2022, including duplicate and blank samples.</li> </ul> <p>Environment and Climate Change Canada</p> <ul style="list-style-type: none"> <li>- ECCC will provide complete analytical service for 370 samples (according to Table B.3) by March 31, 2021. The 4 samples collected on May 14, 2021 will be analysed at ECCC labs (metals, preserved) and a private laboratory (non-metal physical/chemistry). ECCC will pay \$977.80 to the private laboratory, due to the closure of ECCC analytical laboratories until May 17, 2021.</li> <li>- ECCC analysis is valued at \$44,140 (value of the samples completely analyzed at ECCC Laboratory).</li> <li>- <i>ECCC will pay an additional \$977.80 to a private laboratory to supplement analyses that were not conducted at ECC due to COVID-19. That amount is not included within this agreement, and will be paid separately.</i></li> <li>- ECCC will pay \$16,500 to NL for costs associated with sampling remote Labrador CESI stations, which are accessible only by helicopter.</li> </ul> <p><b>\$16,500 payable to NL (included in cost-shared Table B5)</b><br/> <b>\$44,140 to ECCC Laboratory Services (For Internal Purposes Only)</b></p> |                   |

|   |   |  |
|---|---|--|
| <p><b>Data Management (Work-shared activity)</b></p>                  | <p>Processing and Loading of WQ analytical data</p> <ul style="list-style-type: none"> <li>- Conducted by Environment and Climate Change Canada</li> </ul> <p>Accessibility/Availability of NL WQMA Dataset</p> <ul style="list-style-type: none"> <li>- Maintained by Environment and Climate Change Canada</li> </ul> | <p><u>Environment and Climate Change Canada</u></p> <ul style="list-style-type: none"> <li>- Verifies and corrects data.</li> <li>- Transfers data to database.</li> <li>- Ensures NL WQMA dataset is available on external server for download.</li> <li>- Maintains database.</li> <li>- Provides a copy of NL WQMA dataset every six months to NL ECC.</li> </ul> <p>NL Department of <u>Environment and Climate Change</u></p> <ul style="list-style-type: none"> <li>- Responsible for reviewing, validating, and reporting to ECCC any corrections required of the data.</li> <li>- Replacing former dataset.</li> </ul>     |
| <p><b>Data Management Special Projects (Work-shared activity)</b></p> | <p>Data Verification and Validation of Sample/Measurement Data using Developed Tools</p>  | <p><u>Environment and Climate Change Canada</u></p> <ul style="list-style-type: none"> <li>- ECCC will continue to work with NL ECC to ensure all data are receiving the same verification and validation.</li> </ul> <p>NL Department of <u>Environment and Climate Change</u></p> <ul style="list-style-type: none"> <li>- NL ECC will continue to use an in-house tool (Envirotrend) to apply to the NL WQMA dataset in an approach consistent with that used by other projects within ECCC Database. This is to be used as an interim data validation tool until ECCC's validation tool can be used and integrated.</li> </ul> |
|   | <p>Data extraction tools development and updates</p>  | <p><u>Environment and Climate Change Canada</u></p> <ul style="list-style-type: none"> <li>- Due to COVID-19 ECCC has paused the release of water chemistry agreement data to the Open Data portal</li> </ul>  |



Table B.5 Additional Core Activities 2021-2022 (Cost-Shared)

| Project   | Activity / In-kind Contributions   | Amount Payable to NL Exchequer   |
|---|--|--|
| <p><b>Canadian Aquatic Biomonitoring Network (CABIN)</b></p>          | <p>NL Department of Environment and Climate Change</p> <ul style="list-style-type: none"> <li>- Monitoring of benthic invertebrates at selected water bodies (three sites) for maintenance of the long-term reference network in support of the Atlantic Reference Approach Model and climate change research.</li> <li>- Finalize a Baseline Report on Reference Invertebrate Assemblages in NL with ECCC.</li> <li>- Share spatial data with ECCC, for use in the reference model.</li> <li>- CABIN field certification and training (as needed).</li> <li>- Participate in sample collection for special projects as needed.</li> </ul> <p><u>Environment and Climate Change Canada</u></p> <ul style="list-style-type: none"> <li>- Develop CABIN reference model and associated tools.</li> <li>- Maintains database.</li> <li>- Prepare course/presentation on how to look at data in Atlantic.</li> </ul> | <p>\$5,000</p> <p>Invoice to be provided to ECCC by November 30, 2021</p> <p>(matched by NL from annual budget)</p>  |
| <p><b>Canadian Environmental Sustainability Indicators (CESI)</b></p> | <p>NL Department of Environment and Climate Change</p> <ul style="list-style-type: none"> <li>- Compile, analyse and interpret water quality data at Core and Local CESI stations according to CESI protocols.</li> <li>- Provide input to ECCC review of core sites</li> <li>- Update CANAL metadata website with current year's CESI data.</li> <li>- Review CESI final report from ECCC for accuracy.</li> <li>- CESI WQI Fact Sheet.</li> </ul> <p><u>Environment and Climate Change Canada</u></p> <ul style="list-style-type: none"> <li>- QA/QC of submitted data/results and report to the public on the web.</li> <li>- Evaluation of core network of sites using new risk-based information to ensure representivity within Pease basins.</li> <li>- Use of Risk-based Adaptive Management Framework (RBAMF) to categorize NL core sites for CESI reporting.</li> </ul>                                | <p>\$20,000</p> <p>Invoice to be provided to ECCC by November 30, 2021</p> <p>(matched by NL from annual budget)</p> |

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| <p><b>Modifications / Improvements to CESI WQI Calculator</b></p> | <p><u>NL Department of Environment and Climate Change</u></p> <ul style="list-style-type: none"> <li>- Regular troubleshooting support and corresponding update in the CESI Calculator coding as required.</li> <li>- Update of CESI WQI Calculator Help Manual as required.</li> </ul> <p><u>Environment and Climate Change Canada</u></p> <ul style="list-style-type: none"> <li>- Investigate how Trend Analysis can be incorporated into the CESI Calculator.</li> <li>- Inclusion of French version of CESI Help Manual.</li> </ul>   | <p><b>\$5,000</b><br/>Invoice to be provided to ECCCC by September 30, 2021</p> <p>(matched by NL from annual budget)</p>                                      |
| <p><b>Chemical Management Plan</b></p>                            | <p><u>NL Department of Environment and Climate Change</u></p> <ul style="list-style-type: none"> <li>- Update the input file to have two tabs: (1) data and (2) guidelines.</li> <li>- 6-9 new columns and 3-4 renamed columns in the input data Excel file.</li> <li>- Export to Excel: Export the above added variables in "Data" and "Data Output", "Statistics" and "CI_Data" tabs.</li> <li>- Export to Access: Export the above variables to wqi_sample_value table.</li> </ul> <p><u>Environment and Climate Change Canada</u></p> <ul style="list-style-type: none"> <li>- Provide guidance on the upgrades to the Calculator.</li> <li>- Test and review the upgrades to the Calculator.</li> </ul> | <p><b>\$10,000</b><br/>Invoice to be provided to ECCCC by September 30, 2021</p> <p>(matched by NL from annual budget)</p>                                     |
| <p><b>Real Time water Quality Monitoring</b></p>                  | <p><u>NL Department of Environment and Climate Change</u></p> <ul style="list-style-type: none"> <li>- Quarterly sampling at Waterford River @ Kilbride for Alkylphenols and PFOS</li> </ul> <p><u>Environment and Climate Change Canada</u></p> <ul style="list-style-type: none"> <li>- Maintain Mobile Environmental Monitoring Platform (MEMP) in good working condition and keep safety inspections and registrations up to date. Cost of routine registrations and safety inspections to be borne by NLDECC; major repairs to be covered under this Agreement by ECCCC.</li> <li>- Cover costs for major repairs to MEMP</li> </ul>  | <p><b>\$2,500</b><br/>Invoice to be provided to ECCCC by November 30, 2021</p> <p><b>\$2,000</b><br/>Invoice to be provided to ECCCC by September 30, 2021</p> |

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| <b>Labrador Remote Station Sampling (see Table B4)</b> | NL Department of Environment and Climate Change<br>- Remote station sampling in Labrador | <b>\$16,500</b><br>Invoice to be provided to ECCC by September 30, 2021 |
| <b>TOTAL:</b>  |  | <b>\$61,000</b>   |

Therefore, Environment and Climate Change Canada will transfer to Newfoundland and Labrador Exchequer the sum of \$33,500 by October 31, 2021 and \$27,500 by December 31, 2021.

Table B.6. Special Projects 2021-2022 (Work-Shared)

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| <p><b>Monitoring Network Evaluation and Optimization (Work-shared activity)</b></p> | <p>This on-going project focuses on evaluating the network on a regular basis to ensure that the partner's monitoring objectives are being met and that the network will be sustainable in the long-term.</p> <p>Select sites in NL will be considered for inclusion in the ECCC national networks (e.g. Large Rivers, High Risk, Reference, Priority Lakes and Transboundary Networks) using the results of the RBA, RBBA, and site specific knowledge.</p> <p>These are multi-year projects that will carry over into 2021-2022.</p> | <p><b>Risk-Based Adaptive Management Approach (station level, basin level, statistical tools):</b><br/> <u>Environment and Climate Change Canada</u></p> <ul style="list-style-type: none"> <li>- ECCC will continue to provide guidance and advice as required and work with NL ECC to optimize approach for NL waters.</li> <li>- Sampling frequencies will be evaluated on an on-going basis.</li> </ul> <p><u>NL Department of Environment and Climate Change</u></p> <ul style="list-style-type: none"> <li>- NL ECC will add Risk-Based Assessment results to each station profile page on CANAL. Results have been shared on the Departmental main webpage.</li> <li>- NL ECC will finalize a report using statistical approaches to optimize the hydrometric monitoring network within the province.</li> <li>- NL ECC will continue work on the Trend Analysis Report Phase 3 (2006-2020).</li> <li>- ECCC and NL ECC will collaboratively review all results and the possible publications will be explored.</li> </ul> |
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| <p><b>Extrapolation of non-measured data at select real-time stations (Work-shared activity)</b></p> | <p>Development of regression models to extrapolate water quality parameters from real-time measurements of related parameters. Results may be applicable to the national program, reducing sampling and analytical costs at some stations.</p> <p>These are multi-year projects that will continue in 2021-22.</p> | <p><u>NL Department of Environment and Climate Change</u></p> <ul style="list-style-type: none"> <li>- Continue developing regression models to compare total suspended solids (TSS) concentration vs. real-time turbidity and major ions vs real-time conductivity. The model shall be developed at stations having sufficient grab samples (at least 30) with additional three years of samples to validate the models.</li> <li>- Continue updating TSS data and ionic concentration (sodium, calcium, chloride, and sulphate) data to develop site specific regression model.</li> <li>- Complete updating the turbidity vs TSS Lower Churchill River report using TSS grab samples from 2010-2020.</li> <li>- The 7-day temperature forecast using real-time water temperature data will be testing to identify other methods to generate reliable forecasts.</li> </ul> <p><u>Environment and Climate Change Canada</u></p> <ul style="list-style-type: none"> <li>- ECCC will continue to provide technical advice and review on the approach considering its national applicability.</li> </ul>   |
| <p><b>Real-time Instrumentation Special Projects (Work-shared activity)</b></p>                      | <p>In-situ water quality/quantity/climate monitoring using a mobile environmental monitoring platform (MEMP) on a need-basis across the province.</p> <p>Sharing of instrumentation purchase, deployment and maintenance expenses for real-time monitoring stations of joint interest.</p>                         | <p><u>Environment and Climate Change Canada</u></p> <ul style="list-style-type: none"> <li>- ECCC will continue to loan the Mobile Environmental Monitoring Platform (MEMP) to NL ECC until March 31, 2022.</li> <li>- ECCC and NL ECC will continue to work together to share expertise on various new technologies associated with the MEMP.</li> <li>- ECCC will continue to loan the camera and modem to NL ECC for Leary's Brook.</li> <li>- ECCC will continue to loan sonde to NL ECC.</li> </ul> <p><u>NL Department of Environment and Climate Change</u></p> <ul style="list-style-type: none"> <li>- NL ECC will maintain in good condition the MEMP and all loaded equipment therein.</li> <li>- NL ECC will acknowledge ECCC in all publications arising from the collection of data using the unit.</li> <li>- NL ECC will provide in-kind contribution for regular servicing and performance checks on shared instruments at core CESI sites.</li> <li>- NL ECC continues to set up and deploy water quality equipment throughout the province.</li> <li>- NL ECC will dedicate a team of staff as the custodians of the MEMP.</li> <li>- NL ECC will continue to share testing results of new technologies with ECCC (i.e., drone technology; buoy technology; real-time instrumentation; etc.).</li> </ul> |

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| <p><b>Real-time water Quality Monitoring products (Work-shared activity)</b></p> | <p>Technical reports for real-time and automated water quality monitoring activities.</p> | <p><u>NL Department of Environment and Climate Change</u></p> <ul style="list-style-type: none"> <li>- Report on review of long-term continuous monitoring results from industry partnerships.</li> <li>- NL ECC will continue to share products and information with Fresh Water Quality Monitoring and Surveillance as they become available.</li> </ul> <p><u>Environment and Climate Change Canada</u></p> <ul style="list-style-type: none"> <li>- ECCC will continue to provide technical advice and review on the technical reports considering its national applicability; may adapt manuals to reflect national program.</li> <li>- ECCC will continue to share products and information developed by, and associated with the Automated Fresh Water Quality Monitoring and Surveillance Task Group.</li> </ul> |
| <p><b>Progress Reporting</b></p>   | <p>Progress reports for auditing purposes.</p>  | <p><u>NL Department of Environment and Climate Change</u></p> <ul style="list-style-type: none"> <li>- Finalize 2016-2017, 2017-2018, 2018-2019, 2019-2020 Progress Reports, provide to ECCC for report, and post to the NL ECC Departmental webpage.</li> <li>- Complete 2010-2021 Progress Report.</li> </ul>  |

**Appendix A**

Figure A-1 – Water Quality Sampling Sites 2021-2022 – Newfoundland

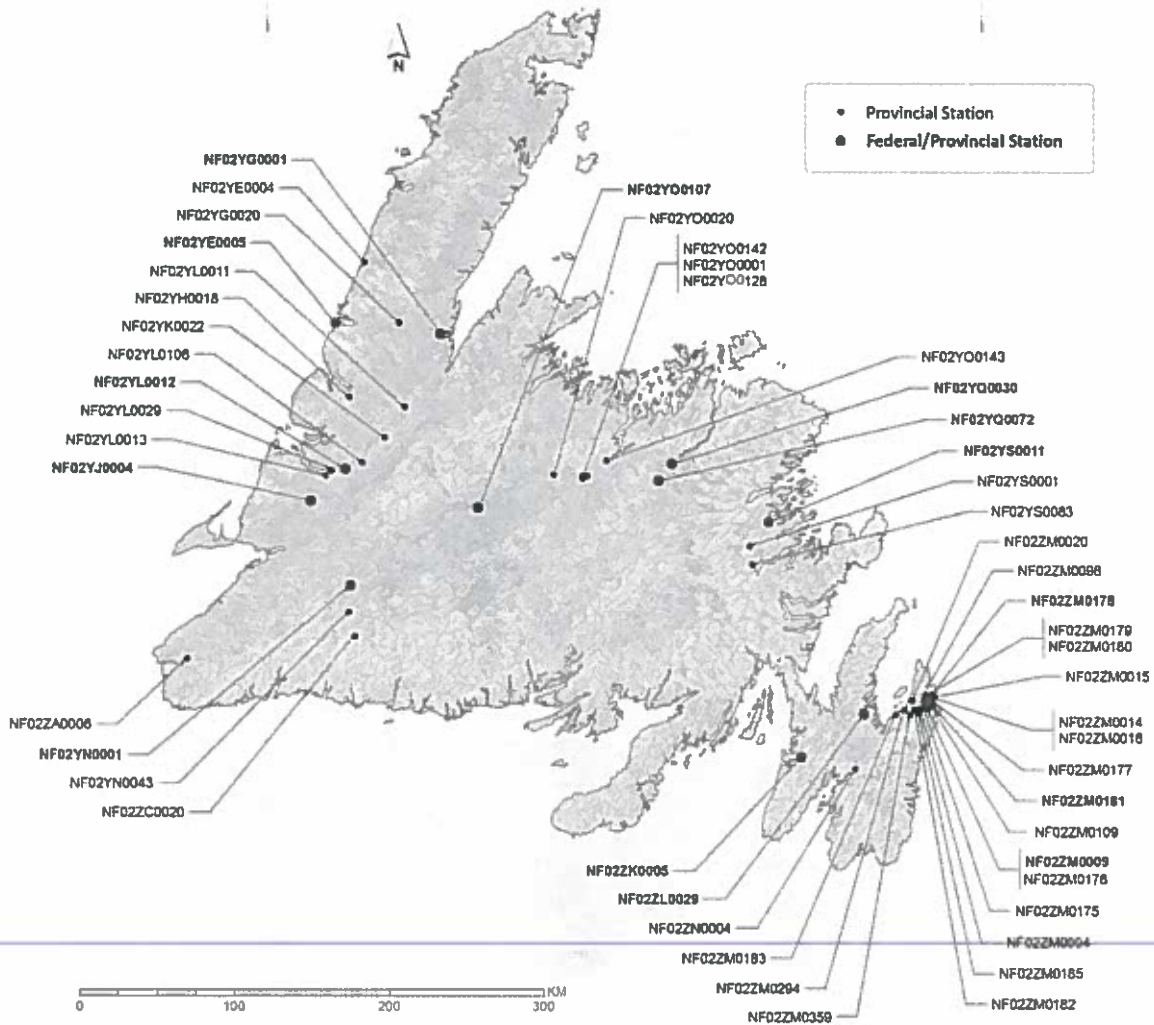




Figure A-2 – Water Quality Sampling Sites 2021-2022 – Labrador

