

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

**ANNUAL WORK SCHEDULE  
2020 - 2021**



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

Atlantic Water Quality Monitoring - Surveillance de  
la qualité de l'eau de l'Atlantique  
Environment Canada - Environnement Canada  
Dartmouth, Nova Scotia

**Canada-Newfoundland and Labrador  
Water Quality Monitoring Agreement  
Annual Work Schedule – Resource Commitment & Work Shared Activities 2020-2021**

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.

**This Annual Work Schedule supersedes any previously and signed Annual Work Schedules for the 2020-2021 fiscal year.**

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Kevin Cash  
Administrator, on behalf of  
Environment and Climate Change Canada  
Government of Canada



Haseen Khan  
Administrator, on behalf of  
Department of Environment, Climate Change and  
Municipalities  
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 Municipal Affairs and Environment, 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. Vincent Mercier  
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 Municipal Affairs and Environment

**Schedule B**

**Shared Activities for Fiscal Year 2020-2021**

**Schedule B –Shared Activities 2020-2021**

**Important note:** Self isolation and safe distancing measures have been put in place by the Federal and Provincial Governments in 2020 due to risks posed by the COVID-19 virus. This greatly affects operations of non-critical programs, such as sample collection and laboratory analyses for ambient water quality. As such, samples collected and transfer amounts, this year, will likely be lower than those identified in the work plan. This work plan is based on a potential ECCC lab opening of September 2020. If that opening is delayed further, there may be additional impacts to the commitments made in this document.

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 Municipal Affairs and Environment <u>and</u> Environment and Climate Change Canada	Refer to <b>Table B.1 and Figure A-1</b> for sampling locations in Newfoundland	<b>\$86,444 payable to NL (CESI)</b>
		Refer to <b>Table B.2 and Figure A-2</b> for sampling locations in Labrador	<b>\$7,308 payable to ECCC Laboratory Services</b>
		Refer to <b>Table B.3</b> for laboratory analysis details	
		Refer to <b>Table B.4 and Table B.5</b> for Shared Activities	
<b>Additional Cost-Shared Core Activities</b>	Newfoundland & Labrador Department of Municipal Affairs and Environment <u>and</u> Environment and Climate Change Canada	Refer to <b>Table B.5</b> for Shared Activities	<b>\$38,896 payable to NL (CESI, CABIN, CMP)</b>
	Newfoundland & Labrador Department of Municipal Affairs and Environment		N/A
<b>Work-Shared Special Projects</b>	<u>and</u> Environment and Climate Change Canada	Refer to <b>Table B.6</b> for work-shared special projects	

**Note:** Details regarding NL efforts for all additional technical projects/activities and the scope of work is documented separately within the NL Water Resources Management Division – Divisional Work Plan 2020-2021.

**Table B.1: Index Station Location, Designation and Sampling Frequency 2020-2021 for Newfoundland Stations. Core CESI stations are shaded gray.**

**EASTERN REGION**

STATION #	DESCRIPTION	LATITUDE	LONGITUDE	DESIGNATION	SAMPLES/ YEAR	CLASSIFICATION
NF02ZM0005	NORTHEAST RIVER NEAR PLACENTIA	47 16 23	-53 50 25	Fed/Prov	4	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	4	CABIN site 09-10 / Core CESI Station
NF02ZM0004	WATERFORD RIVER AT COMMONWEALTH AVENUE	47 31 19	-52 48 29	Provincial	3	Local CESI Station
NF02ZM0009	WATERFORD RIVER AT KILBRIDE	47 31 44	-52 44 40	Fed/Prov	3	RTWQ / Hydrometric / Local CESI Station / Chemical Management Plan
NF02ZM0014	VIRGINIA RIVER AT THE BOULEVARD	47 35 02	-52 41 29	Provincial	3	Local CESI Station / CABIN site 10-11
NF02ZM0015	QUIDI VIDI LAKE AT OUTLET	47 35 04	-52 40 54	Provincial	3	
NF02ZM0016	RENNIE'S RIVER AT CARNELL DRIVE	47 34 40	-52 42 03	Provincial	3	Local CESI Station
NF02ZM0020	BROAD COVE BROOK NEAR ST. PHILLIPS	47 34 16	-52 52 10	Provincial	3	CABIN site 08-09 / Local CESI Station
NF02ZM0098	VIRGINIA RIVER AT HEADWATERS	47 35 56	-52 45 17	Provincial	3	CABIN site 08-09 / Comp Guidelines Site / Local CESI Station
NF02ZM0109	MUNDY POND AT OUTLET	47 33 12	-52 44 07	Provincial	3	
NF02ZM0175	WATERFORD RIVER AT BROOKFIELD ROAD	47 31 34	-52 45 48	Provincial	3	Local CESI Station
NF02ZM0176	SOUTH BROOK AT MOUTH	47 31 41	-52 44 48	Provincial	3	Local CESI Station
NF02ZM0177	RENNIE'S RIVER AT PORTUGAL COVE ROAD	47 34 28	-52 42 36	Provincial	3	Local CESI Station
NF02ZM0178	LEARY'S BROOK AT PRINCE PHILIP DRIVE	47 33 50	-52 44 55	Fed/Prov	7	RTWQ / Hydrometric / Core CESI Station / CABIN site 11-12
NF02ZM0179	TRIBUTARY TO VIRGINIA RIVER AT GUZZWELL DRIVE	47 35 47	-52 42 06	Provincial	3	Local CESI Station

STATION #	DESCRIPTION	LATITUDE	LONGITUDE	DESIGNATION	SAMPLES/ YEAR	CLASSIFICATION
NF02ZM0180	VIRGINIA RIVER AT NEWFOUNDLAND DRIVE	47 35 59	-52 42 02	Provincial	3	Local CESI Station
NF02ZM0181	WATERFORD RIVER AT BLACKHEAD ROAD	47 32 53	-52 43 09	Fed/Prov	7	Core CESI Station
NF02ZM0182	WATERFORD RIVER AT BREMIGANS POND DAM	47 31 07	-52 51 21	Provincial	3	Local CESI Station
NF02ZM0183	KELLOGGS RIVER AT KELVIEW CRESCENT	47 29 37	-53 00 58	Provincial	3	Local CESI Station / CABIN site 11-12
NF02ZM0185	SOUTH BROOK AT HEADWATERS	47 29 44	-52 48 47	Provincial	3	CABIN site 08-09 / Comp Guidelines Site / Local CESI Station
NF02ZM0294	MANUELS RIVER ABOVE MANUELS ACCESS ROAD	47 31 11	-52 56 41	Provincial	3	Archaeologically significant / Local CESI Station
NF02ZM0359	PADDYS POND AT OUTLET	47 29 17	-52 53 39	Provincial	3	RTWQ stand-alone station
NF02ZN0004	SALMONIER RIVER AT ST. CATHERINES	47 11 29	-53 23 09	Provincial	3	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	3	Local CESI Station
NF02YO0020	EXPLOITS RIVER AT ASPEN BROOK	48 56 56	-55 54 45	Provincial	3	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	3	Local CESI Station
NF02YO0142	CORDUROY BROOK NEAR CENTENNIAL PARK	48 56 24	-55 39 43	Provincial	3	Local CESI Station / CABIN site 11-12
NF02YO0143	EXPLOITS RIVER AT BOND BRIDGE	49 01 24	-55 26 56	Provincial	3	Local CESI Station
NF02YQ0030	GANDER RIVER AT APPLETON	48 59 40	-54 52 00	Fed/Prov	4	Hydrometric / Core CESI Station



STATION #	DESCRIPTION	LATITUDE	LONGITUDE	DESIGNATION	SAMPLES/ YEAR	CLASSIFICATION
NF02YQ0072	CARELESS BROOK AT RESOURCE ROAD STEEL BRIDGE	48 54 08	-54 59 38	Fed/Prov	3	CABIN Annual site since 2010 /Local CESI Station
NF02YS0001	TERRA NOVA RIVER AT TERRA NOVA	48 30 24	-54 12 36	Provincial	3	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	3	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	3	Local CESI Station
NF02YE0005	WESTERN BROOK AT ROUTE 430	49 49 44	-57 51 18	Fed/Prov	4	CABIN site 08-09 / Core CESI Station
NF02YG0001	MAIN RIVER AT ROUTE 420	49 46 15	-56 54 33	Fed/Prov	4	Canadian Heritage River /Core CESI Station
NF02YL0106	SOUTH BROOK BELOW TCH	49 01 06	-57 37 04	Provincial	3	Hydrometric
NF02YG0020	EAGLE MOUNTAIN BROOK BELOW EAGLE MOUNTAIN POND	49 49 54	-57 17 14	Provincial	3	
NF02YH0018	LOMOND RIVER AT ROUTE 431	49 24 08	-57 43 48	Provincial	3	CABIN site 08-09 / Local CESI Station
NF02YJ0004	PINCHGUT BROOK AT TCH	48 47 49	-58 03 42	Fed/Prov	7	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	3	Local CESI Station
NF02YL0011	HUMBER RIVER AT LITTLE FALLS BRIDGE	49 20 52	-57 14 08	Provincial	3	Local CESI Station
NF02YL0012	HUMBER RIVER AT HUMBER VILLAGE BRIDGE	48 59 01	-57 45 37	Fed/Prov	7	RTWQ / Hydrometric / Core CESI Station

NF02YL0013	CORNER BROOK AT MARGARET BOWATER PARK	48 56 34	-57 55 55	Provincial	3	Local CESI Station
NF02YL0029	WILD COVE BROOK AT ROUTE 440	48 58 26	-57 52 60	Provincial	3	Local CESI Station / CABIN site 12-13
NF02YN0001	LLOYDS RIVER AT ROUTE 480	48 18 28	-57 42 10	Fed/Prov	4	CABIN site 09-10 / Core CESI Station
NF02YN0043	PETER STRIDES LAKE AT ROUTE 480	48 09 13	-57 43 23	Provincial	3	
NF02ZA0006	GRAND CODROY RIVER BELOW OVERFALL BROOK	47 52 08	-59 07 05	Provincial	3	Local CESI Station
NF02ZC0020	BUCK LAKE ON ROUTE 480	48 00 49	-57 39 59	Provincial	3	

Notes:

1. A total of 50 stations (including 12 core CESI stations) will be sampled during 2020-2021 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. Due to COVID-19 this is not possible and only 3 samples will be collected at each site. All Core CESI stations should be sampled five (5) times per year, if possible. Due to COVID-19 all five (5) samples will be not collected this year. All core CESI stations will therefore be sampled only four (4) times this year, where possible.
3. Total number of samples to be collected from all NL stations is 184 (this includes QA/QC samples); it also includes 60 samples from Core CESI stations. Total number of QA/QC samples to be collected is 10.
4. All sampling is carried out by provincial Water Resources Management Division staff.
5. Sampling frequency for select stations in eastern and western regions was 10 samples per site in 2018-2019 and in 2019-20. Due to COVID-19 sampling at those sites in 2020-21 will be likely be no more than seven (7).
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 2020-2021 for Labrador Stations. Core CESI stations are shaded gray.**

**LABRADOR REGION**

STATION #	DESCRIPTION	LATITUDE	LONGITUDE	DESIGNATION	SAMPLES/ YEAR	CLASSIFICATION
NF02XA0001	LITTLE MECATINA RIVER ABOVE LAC FOURMONT	52 13 42	-61 19 32	Fed/Prov	3	Hydrometric / Transboundary / Local CESI Station
NF03NF0013	UGJOKTOK RIVER BELOW HARP LAKE	55 13 60	-61 17 57	Fed/Prov	3	Hydrometric / Core CESI Station
NF03OA0020	ASHUANIPI RIVER AT FERGUSON BAY	53 00 06	-66 14 30	Provincial	3	Local CESI Station
NF03OC0012	ATIKONAK RIVER ABOVE PANCHIA LAKE	52 58 03	-64 39 40	Fed/Prov	3	Hydrometric / Core CESI Station
NF03OD0011	EAST METCHIN RIVER AT TLH	53 26 05	-63 14 02	Provincial	3	Former Hydrometric / Local CESI Station
NF03OD0012	WILSON RIVER EAST BRANCH	53 18 33	-62 55 11	Provincial	3	Ashkui / CABIN 10-11 / Local CESI Station
NF03OE0001	CHURCHILL RIVER ABOVE UPPER MUSKRAT FALLS	53 14 52	-60 47 21	Fed/Prov	3	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	3	RTWQ/ Hydrometric
NF03OE0029	CHURCHILL RIVER ABOVE GRIZZLE RAPIDS	52 58 12	-61 26 43	Fed/Prov	3	RTWQ/ Hydrometric
NF03OE0030	MINIPI RIVER BELOW MINIPI LAKE	52 36 54	-61 11 01	Fed/Prov	3	Former RTWQ / Former Hydrometric / Core CESI Station
NF03OE0032	PINUS RIVER ABOVE TLH	53 08 52	-61 33 31	Provincial	3	Hydrometric / Comp Guidelines Site / Local CESI Station
NF03OE0033	BIG POND BROOK BELOW BIG POND	53 30 51	-60 17 39	Provincial	3	Hydrometric / Local CESI Station
NF03OE0035	DOMINION LAKE OUTFLOW	52 43 44	-61 45 14	Provincial	3	Ashkui / Local CESI Station
NF03OE0037	CACHE RIVER AT TLH	53 11 34	-62 12 35	Provincial	3	Ashkui / Local CESI Station
NF03PB0025	NASKAUPI RIVER BELOW NASKAUPI LAKE	54 07 54	-61 25 45	Fed/Prov	3	Core CESI Station
NF03PB0028	CAPE CARIBOU RIVER AT GRAND LAKE	53 37 16	-60 24 52	Provincial	3	Ashkui / Local CESI Station

STATION #	DESCRIPTION	LATITUDE	LONGITUDE	DESIGNATION	SAMPLES/ YEAR	CLASSIFICATION
NF03PB0029	GRAND LAKE OUTFLOW AT NORTH WEST RIVER	53 31 26	-60 08 45	Provincial	3	Ashkui
NF03PB0030	SEAL LAKE AT NARROWS	54 19 55	-61 38 27	Provincial	3	Ashkui
NF03PB0032	SUSAN RIVER NORTH OF BEAVER RIVER	53 44 17	-60 56 48	Provincial	3	Ashkui / Local CESI Station
NF03PB0037	WUCHUSK LAKE AT NASKAUPI RIVER INFLOW	54 23 43	-61 47 09	Provincial	3	Ashkui
NF03QA0044	CARTER BASIN OUTFLOW	53 29 55	-59 52 11	Provincial	3	Ashkui
NF03QA0045	KENAMU RIVER NEAR MOUTH	53 28 34	-59 55 01	Provincial	3	Ashkui / Comp Guidelines Site
NF03QC0001	EAGLE RIVER ABOVE FALLS	53 32 03	-57 29 37	Fed/Prov	3	Hydrometric / Core CESI Station / Eagle River Plateau Management Zone
NF03QC0002	ALEXIS RIVER NEAR PORT HOPE SIMPSON	52 38 57	-56 52 17	Provincial	3	Hydrometric / Local CESI Station
NF02XB0018	TRIBUTARY TO ST. AUGUSTIN RIVER	52 33 06	-59 19 39	Fed/Prov	3	Transboundary/CABIN sampling in 2012

Notes:

1. A total of 25 stations (including five (5) core CESI stations) will be sampled during 2020-2021 in Labrador.
2. The Labrador stations are listed are typically 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 for CESI purposes. Generally, four trips are made to each station.
3. Total number of samples to be collected is 80 (this includes QA/QC samples); it also includes 15 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 three (3) times this year due to COVID-19, where possible.
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 2020-2021

Parameter	Holding Times (recommended by ALET Lab Services)
Major Ions	
Alkalinity	14 days
Chloride	28 days
Sulphate	28 days
Calcium	28 days
Magnesium	28 days
Sodium	28 days
Potassium	180 days
Bromide	48 hours
Fluoride	48 hours
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-53 elements	6 months (preservation required) (NLET)

Schema Name	Parameter/ Grouping
M_pH auto,	alkalinity, pH, conductivity
M_Alkalinity,	
M_Conductivity	
M_Metals_TR ICP-OES	Ca, Mg, Na, and K and Li
M_Anions_PKG	Cl, SO4, NO2, NO3, F and Bromide by IC
M_TP	total phosphorus
M_TN	total nitrogen
M_ITOC	dissolved inorganic and organic carbon
M_Hardness	Calculation derived from Ca and Mg
M_Colour	Colour-apparent (unfiltered sample)
M_Turbidity	turbidity
B_Metals_TR ICP-MS	Total Recoverable Metals by ICP-MS*

\*53 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	

Additional metals analyzed but not required by NL MAE:

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, ytterbium

**Table B.4 Core Ambient Water Quality Monitoring and Data Management Activities 2020-2021 (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>26 water samples collected by Parks Canada staff</p> <p>Analysis is completed by private lab and federal lab (metals) 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 Municipal Affairs and Environment</p> <ul style="list-style-type: none"> <li>- NL will collect 267 samples in 2020-2021, including duplicate and blank samples.</li> </ul> <p>Environment and Climate Change Canada</p> <ul style="list-style-type: none"> <li>- ECCC will provide the analytical services for 264 samples (metals only) (according to Table B.3) by March 31, 2021. The non-metal phys-chem analyses will be conducted at a private laboratory. ECCC will pay \$64,944 to NL MAE to help offset the increased cost of analyses at federal and local CESI sites, due to the continued closure of ECCC analytical laboratories.</li> <li>- This year only Parks Canada water samples will be analysed at a private laboratory and ECCC will transfer the value of those analyses (\$6,396)</li> <li>- ECCC analysis is valued at \$7,308.</li> <li>- ECCC will pay \$16,500 + a one-time support amount of \$5,000 (to support the continued collection of data at federal and local CESI sites) to NL for costs associated with sampling remote Labrador CESI stations, which are accessible only by helicopter.</li> </ul> <p><b>\$86,444 payable to NL (included in cost-shared Table B5)</b>  <b>\$7,308 payable to ECCC Laboratory Services (For Internal Purposes Only)</b></p>	

Management Activities		Leads/Commitments
<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>Environment and Climate Change Canada</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 MAE.</li> </ul> <p>NL Department of Municipal Affairs and Environment</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>Environment and Climate Change Canada</p> <ul style="list-style-type: none"> <li>- ECCC will continue to work with NL MAE to ensure all data are receiving the same verification and validation.</li> </ul> <p>NL Department of Municipal Affairs and Environment</p> <ul style="list-style-type: none"> <li>- NL MAE 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>Environment and Climate Change Canada</p> <ul style="list-style-type: none"> <li>- Due to COVID-19 ECCC has paused the updating of water chemistry agreement data to the Open Data portal on a monthly basis. Once updating to the Open Data portal is resumed, ECCC will release data within 30 days of receipt of the data from Environmental Science and Technology Laboratories.</li> </ul>	

Table B.5 Additional Core Activities 2020-2021 (Cost-Shared)

Project	Activity / In-kind Contributions	Amount Payable to NL Exchequer
<p><b>Canadian Aquatic Biomonitoring Network (CABIN)</b></p>	<p><u>NL Department of Municipal Affairs and Environment</u></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> <li>- Cover the cost of three samples for WQ analysis (this is a <u>one-time</u> increase of \$1K over the previous years' costs)</li> </ul>	<p><b>\$6,000</b></p> <p>Invoice to be provided to ECCC by <b>November 30, 2020</b></p> <p>(matched by NL from annual budget)</p>
<p><b>Canadian Environmental Sustainability Indicators (CESI)</b></p>	<p><u>NL Department of Municipal Affairs and Environment</u></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 representativity within Pearse basins.</li> <li>- Use of Risk-based Adaptive Management Framework (RBAMF) to categorize NL core sites for CESI reporting.</li> </ul>	<p><b>\$20,000</b></p> <p>Invoice to be provided to ECCC by <b>November 30, 2020</b></p> <p>(matched by NL from annual budget)</p>



Project	Activity / In-kind Contributions	Amount Payable to NL Exchequer
<b>Modifications / Improvements to CESI WQI Calculator</b>	<p>NL Department of Municipal Affairs and Environment</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>Environment and Climate Change Canada</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>\$5,000</p> <p>Invoice to be provided to ECCC by October 30, 2020</p> <p>(matched by NL from annual budget)</p>
<b>Chemical Management Plan</b>	<p>NL Department of Municipal Affairs and Environment</p> <ul style="list-style-type: none"> <li>- Two samples at Waterford River @ Kilbride for Alkylphenols and PFOS</li> </ul>	<p>\$1,500 Invoice to be provided to ECCC by November 30, 2020</p>
<b>Supplemental Laboratory Analysis (see Table B.4)</b>	<p>NL Department of Municipal Affairs and Environment</p> <ul style="list-style-type: none"> <li>- Offset the increased cost of analyses at federal and local CESI sites, due to the continued closure of ECCC analytical laboratories.</li> </ul>	<p>\$71,340 Invoice to be provided to ECCC by October 30, 2020</p>
<b>Labrador Remote Station Sampling (see Table B.4)</b>	<p>NL Department of Municipal Affairs and Environment</p> <ul style="list-style-type: none"> <li>- Remote station sampling in Labrador</li> </ul>	<p>\$21,500</p> <p>Invoice to be provided to ECCC by October 30, 2020</p>
	<b>TOTAL:</b>	<b>\$125,340</b>

Therefore Environment and Climate Change Canada will transfer to Newfoundland Exchequer the sum of \$97,840 by October 31, 2020 and \$27,500 by December 31, 2020

Table B.6. Special Projects 2020-2021 (Work-Shared)

<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>This is a multi-year project that will carry over into 2020-2021.</p>	<p><b>Risk-Based Adaptive Management Approach (station level, basin level, statistical tools):</b>  <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 MAE 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 Municipal Affairs and Environment</u></p> <ul style="list-style-type: none"> <li>- NL MAE 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 MAE will continue to finalize a report using statistical approaches to optimize the hydrometric monitoring network within the province. Hierarchal clustering (for classification) and entropy analysis (for prioritization) were the methods employed for this assessment.</li> <li>- NL MAE will finalize the Trend Analysis Report for NL stations, which compared results of older data to more recent data. This report shall be used for a detailed follow-up trend analysis report of all WQMA stations having 10 years of recent data.</li> <li>- ECCC and NL MAE will collaboratively review all results and the possible publications will be explored.</li> </ul>
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<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.  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>- ECCCC will continue to loan the Mobile Environmental Monitoring Platform (MEMP) to NL MAE until March 31, 2021.</li> <li>- ECCCC and NL MAE will continue to work together to share expertise on various new technologies associated with the MEMP.</li> <li>- ECCCC will continue to loan the camera and modem to NL MAE for Leary's Brook.</li> <li>- ECCCC will continue to loan sonde to NL MAE.</li> </ul> <p><u>NL Department of Municipal Affairs and Environment</u></p> <ul style="list-style-type: none"> <li>- NL MAE will maintain in good condition the MEMP and all loaded equipment therein.</li> <li>- NL MAE will acknowledge ECCCC in all publications arising from the collection of data using the unit.</li> <li>- NL MAE will provide in-kind contribution for regular servicing and performance checks on shared instruments at core CESI sites.</li> <li>- NL MAE continues to set up and deploy water quality equipment throughout the province.</li> <li>- NL MAE will dedicate a team of staff as the custodians of the MEMP.</li> <li>- NL MAE will continue to share testing results of new technologies with ECCCC (i.e., drone technology; buoy technology; real-time instrumentation; etc.).</li> </ul>
<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, potentially reducing sampling and analytical costs at some stations.</p>	<p><u>NL Department of Municipal Affairs and Environment</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>- Complete a technical model on the TSS-Turbidity regression models for the Churchill River sites.</li> <li>- Model a 7-day temperature forecast using real-time water temperature data (R programming - ARIMA model).</li> </ul> <p><u>Environment and Climate Change Canada</u></p> <ul style="list-style-type: none"> <li>- ECCCC will continue to provide technical advice and review on the approach considering its national applicability.</li> </ul>

<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 Municipal Affairs and Environment</u></p> <ul style="list-style-type: none"> <li>- Report on review of long-term continuous monitoring results from industry partnerships (IOC-10 years).</li> <li>- NL MAE 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 Municipal Affairs and Environment</u></p> <ul style="list-style-type: none"> <li>- Finalize 2014-2015, 2015-2016, 2016-2017, 2017-2018, &amp; 2018-2019 Progress Reports, provide to ECCC for report, and post to the NL MAE Departmental webpage.</li> <li>- Begin 2019-2020 Progress Report.</li> </ul>

**Appendix A**

Figure A-1 – Water Quality Sampling Sites 2020-2021 – Newfoundland

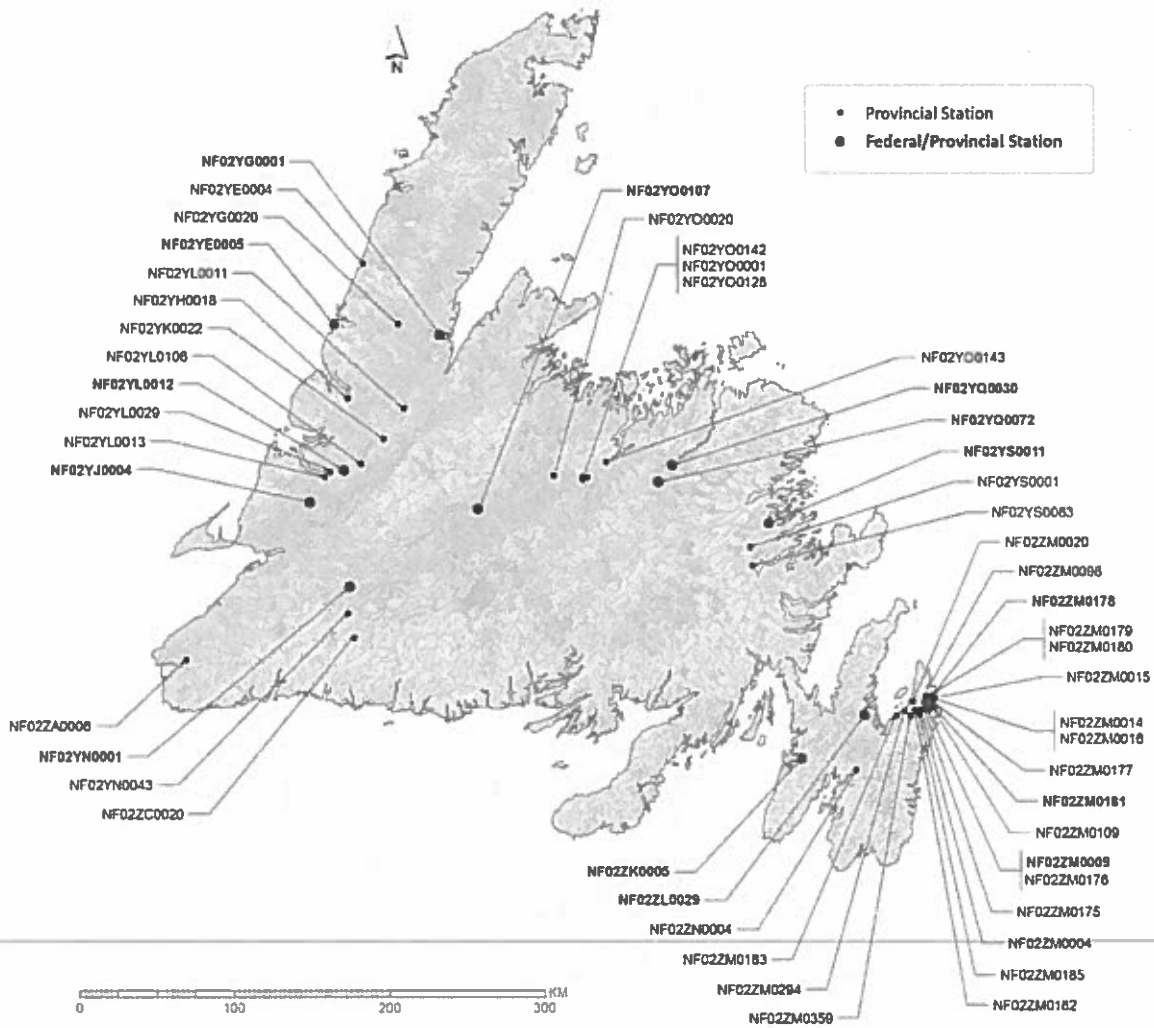


Figure A-2 – Water Quality Sampling Sites 2020-2021 – Labrador

