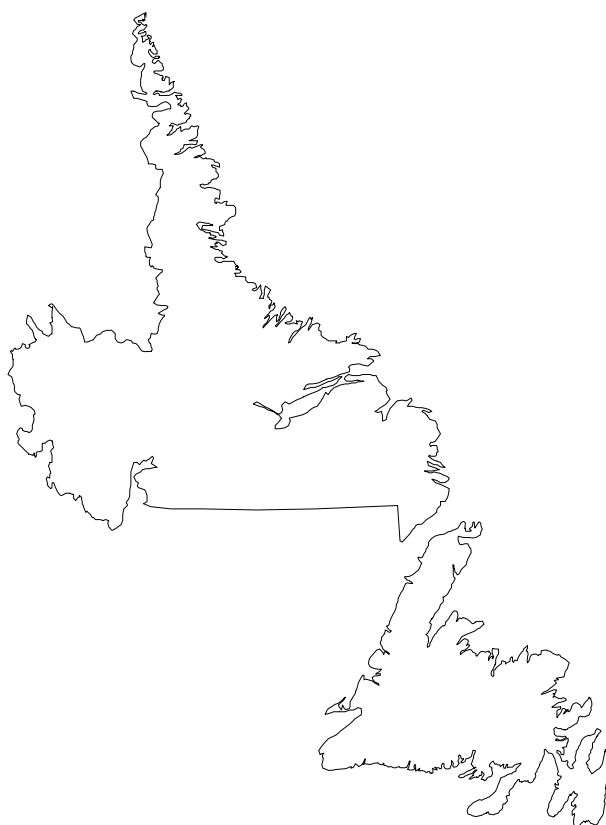


CANADA-NEWFOUNDLAND and LABRADOR WATER QUALITY MONITORING AGREEMENT

ANNUAL WORK SCHEDULE 2017 - 2018



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
2017-2018**

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.



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



Haseen Khan
Administrator, on behalf of
Department of Municipal Affairs and Environment
Government of Newfoundland and Labrador

Schedule A
Agreement Committees

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

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

Ms. Helene Harper
Environment and Climate Change Canada (Atlantic Laboratory
for Environmental Testing)

Ms. Renée Paterson Water Resources Management Division, Newfoundland &
Labrador Department of Municipal Affairs and Environment

Schedule B

Shared Activities for Fiscal Year 2017-2018

Schedule B –Shared Activities 2017-2018

Activity	Responsible Agency	Remarks
Cost-Shared and Work-Shared Core Ambient Water Quality Monitoring and Data Management Activities	Newfoundland & Labrador Department of Municipal Affairs and Environment <u>and</u> Environment and Climate Change Canada	Refer to Table B.1 and Figure A-1 for sampling locations in Newfoundland Refer to Table B.2 and Figure A-2 for sampling locations in Labrador Refer to Table B.3 for laboratory analysis details Refer to Table B.4 for Shared Activities
Additional Cost-Shared Core Activities	Newfoundland & Labrador Department of Municipal Affairs and Environment <u>and</u> Environment and Climate Change Canada	Refer to Table B.5 for Shared Activities
Work-Shared Special Projects	Newfoundland & Labrador Department of Municipal Affairs and Environment <u>and</u> Environment and Climate Change Canada	Refer to Table B.6 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 2017-2018.

Table B.1: Index Station Location, Designation and Sampling Frequency 2017-2018 for Newfoundland Stations. Core CESI stations are shaded gray.**EASTERN REGION**

STATION #	DESCRIPTION	LATITUDE	LONGITUDE	DESIGNATION	SAMPLES/ YEAR	CLASSIFICATION
NF02ZK0005	NORTHEAST RIVER NEAR PLACENTIA	47 16 23	-53 50 25	Fed/Prov	4	CABIN Annual site 09-10/11-12/12-13/13-14/ 14-15 /15-16 & 16-17/ 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	12	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	12	Core CESI Station
NF02ZM0182	WATERFORD RIVER AT BREMIGANS POND DAM	47 31 07	-52 51 21	Provincial	4	Local CESI Station
NF02ZM0183	KELLIGREWS RIVER AT KELLIVIEW 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

Canada-Newfoundland and Labrador Water Quality Monitoring Agreement

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 10-11/11-12 /12-13/13-14/ 14-15 /15-16 & 16-17
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	12	CABIN Annual site 08-09/11-12/12-13/ 13-14/ 14-15/15-16 & 16-17 / 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

Canada-Newfoundland and Labrador Water Quality Monitoring Agreement

NF02YL0012	HUMBER RIVER AT HUMBER VILLAGE BRIDGE	48 59 01	-57 45 37	Fed/Prov	12	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 2017-2018 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 (or more often where indicated). All will be sampled at least four (4) times per year.
4. Total number of samples to be collected from all NL stations is 272 (this includes QA/QC samples); it also includes 84 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 frequency for select stations in eastern and western regions were increased in 2016-17 to 12 times per year (monthly) based on results of Fresh Water Quality Monitoring and Surveillance Power Analysis, which indicated that quarterly sampling is generally not sufficient for trend analysis. That increased sampling frequency for select stations will continue in 2017-18.

Table B.2: Northern Index Station Location, Designation and Sampling Frequency 2017-2018 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	4	Hydrometric / Transboundary / Local CESI Station
NF03NF0013	UGJOKTOK RIVER BELOW HARP LAKE	55 13 60	-61 17 57	Fed/Prov	5	Hydrometric / Core CESI Station
NF03OA0020	ASHUANIPI 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	5	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
NF03OE0001	CHURCHILL RIVER ABOVE UPPER MUSKRAT FALLS	53 14 52	-60 47 21	Fed/Prov	4	RTWQ / Hydrometric / Local CESI Station
NF03OE0030	MINIPI RIVER BELOW MINIPI LAKE	52 36 54	-61 11 01	Fed/Prov	5	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	NASKAUI RIVER BELOW NASKAUI LAKE	54 07 54	-61 25 45	Fed/Prov	5	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 NASKAUI 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	5	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

Notes:

1. A total of 22 stations (including five (5) core CESI stations) will be sampled during 2017-2018 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, five trips are made to each station.
3. Total number of samples to be collected is 102 (this includes six (6) duplicates and three (3) blanks); it also includes 25 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 five (5) times per year, if possible, and **at least four (4) 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 2017-2018

Parameter	Holding Times (recommended by ALET Lab Services)
Major Ions	
Alkalinity	14 days
Chloride	28 days
Sulphate	28 days
Calcium	180 days
Magnesium	180 days
Sodium	180 days
Potassium	180 days
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/DOC	28 days
Metals	
Total Metals-27 elements	6 months (NLET)

Schema Name	Parameter/ Grouping
M_pH auto, M_Alkalinity, M_Conductivity	alkalinity, pH, conductivity
M_Metals_TR ICP-OES	Ca, Mg, Na, and K
M_Anions	NO3 by IC
included in M_Anions	Cl and SO4 by IC
M_TP	total phosphorus
M_TN	total nitrogen
M_DOC	dissolved inorganic and organic carbon
M_Hardness	Calculation derived from Ca and Mg
M_Colour	Colour-apparent (unfiltered sample)
M_Turbidity	turbidity
TM2004/T27W	Total metals-27 elements (Schema No. 31)

***27 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 analysed but not required by NL MAE:
yttrium, niobium, tin, cesium, cerium, tungsten, platinum,

Table B.4 Core Ambient Water Quality Monitoring and Data Management Activities 2017-2018 (Cost-Shared and Work-Shared)

Management Activities		Leads/Commitments
Water Quality Sampling and Analysis (Cost-shared activity)	<p>Water samples are collected by provincial staff.</p> <ul style="list-style-type: none"> - Field data submitted regularly to ECCC laboratory <p>Analysis is completed by federal lab to ensure consistency.</p> <ul style="list-style-type: none"> - ISO standards adhered to - Detection limits mutually agreed upon 	<p><u>NL Department of Municipal Affairs and Environment</u></p> <ul style="list-style-type: none"> - NL will collect 374 samples in 2017-2018, including duplicate and blank samples. <p><i>Additional lab analyses beyond what is required for core CESI stations are used to partially offset provincial sampling costs associated with sample collection at these sites (e.g. travel costs, field personnel time, etc.).</i></p> <ul style="list-style-type: none"> - Preparation of WQMA Sampling Manual (will share with ECCC). <p><u>Environment and Climate Change Canada</u></p> <ul style="list-style-type: none"> - ECCC will provide the analytical service for all samples (according to Table B.3) by March 31, 2018. - ECCC analysis is valued at \$39,741.24. The cost for ECCC to collect samples from 12 Core CESI sites in NL alone would exceed that amount. - ECCC will pay \$15,000 to NL for costs associated with sampling remote Labrador CESI stations, which are accessible only by helicopter. <p>\$15,000 payable to NL (included in cost-shared Table B5) \$39,741.24 payable to ECCC Laboratory Services (For Internal Purposes Only)</p>
Data Management (Work-shared activity)	<p>Processing and Loading of WQ analytical data</p> <ul style="list-style-type: none"> - Conducted by Environment and Climate Change Canada <p>Accessibility/Availability of NL WQMA Dataset</p> <ul style="list-style-type: none"> - Maintained by Environment and Climate Change Canada 	<p><u>Environment and Climate Change Canada</u></p> <ul style="list-style-type: none"> - Verifies and corrects data. - Transfers data to database. - Ensures NL WQMA dataset is available on external server for download. - Maintains database. - Provides a copy of NL WQMA dataset every six months to NL MAE. <p><u>NL Department of Municipal Affairs and Environment</u></p> <ul style="list-style-type: none"> - Responsible for reviewing, validating, and reporting to ECCC any corrections required of the data. - Replacing former dataset.

Data Management Special Projects (Work-shared activity)	Data Verification and Validation of Sample/Measurement Data using Developed Tools	<u>Environment and Climate Change Canada</u> <ul style="list-style-type: none"> - ECCC will continue to work with NL MAE to ensure all data are receiving the same verification and validation. - ECCC will continue to using a new tool (E-Grapher) to validate data. - ECCC will initiate a pilot to determine if access to this new tool can be given to partners and will begin with NL. <u>NL Department of Municipal Affairs and Environment</u> <ul style="list-style-type: none"> - NL MAE will continue to assess the data validation tool and adapt as necessary using 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. - NL MAE will produce a step-by-step guidance document describing the Data Verification/Data Validation process to be used by WRMD staff.
	Data extraction tools development and updates	<u>Environment and Climate Change Canada</u> <ul style="list-style-type: none"> - ECCC will continue to work toward the development of a national data extraction tool for accessing water quality data. - ECCC will provide assistance to NL in the use of the tool for data extraction. <u>NL Department of Municipal Affairs and Environment</u> <ul style="list-style-type: none"> - NL MAE will test the tool on their web site for effectiveness when available from ECCC.

Table B.5 Additional Core Activities 2017-2018(Cost-Shared)

Project	Activity / In-kind Contributions	Amount Payable to NL Exchequer
Canadian Aquatic Biomonitoring Network (CABIN)	<p><u>NL Department of Municipal Affairs and Environment</u></p> <ul style="list-style-type: none"> - 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. - Finalize a Baseline Report on Reference Invertebrate Assemblages in NL with ECCC. - Share spatial data with ECCC, for use in the reference model. - CABIN field certification and training (as needed). - Participate in sample collection for special projects as needed. <p><u>Environment and Climate Change Canada</u></p> <ul style="list-style-type: none"> - Develop CABIN reference model and associated tools. - Maintains database. 	<p>\$5,000 Invoice to be provided to ECCC by November 30, 2017 (matched by NL from annual budget)</p>
Canadian Environmental Sustainability Indicators (CESI)	<p><u>NL Department of Municipal Affairs and Environment</u></p> <ul style="list-style-type: none"> - Compile, analyse and interpret water quality data at Core and Local CESI stations according to CESI protocols. - Provide input to ECCC review of core sites - Update CANAL metadata website with current year's CESI data. - Review CESI final report from ECCC for accuracy. <p><u>Environment and Climate Change Canada</u></p> <ul style="list-style-type: none"> - QA/QC of submitted data/results and report to the public on the web. - Evaluation of core network of sites using new risk-based information to ensure representivity within Pearse basins. - Use of Risk-based Adaptive Management Framework (RBAMF) to categorize NL core sites according to Network of Network designations. 	<p>\$20,000 Invoice to be provided to ECCC by November 30, 2017 (matched by NL from annual budget)</p>

Modifications / Improvements to CESI WQI Calculator	<u>NL Department of Municipal Affairs and Environment</u> <ul style="list-style-type: none"> - Due to change in server location that hosted ECCC web services (and thus temporary unavailability of web services), the CESI WQI Calculator will be re-coded to draw the former web services data from a static Access data table (built into the calculator). - Reprogramming of the CESI WQI Calculator to avail of the web services from the new server location. - Regular troubleshooting support. - Update of CESI WQI Calculator Help Manual as required. <u>Environment and Climate Change Canada</u> <ul style="list-style-type: none"> - Investigate how Trend Analysis can be incorporated into the CESI Calculator. - Inclusion of French version of CESI Help Manual. 	<p>\$5,000 Invoice to be provided to ECCC by September 30, 2017</p> <p>(matched by NL from annual budget)</p>
Chemical Management Plan	<u>NL Department of Municipal Affairs and Environment</u> <ul style="list-style-type: none"> - Quarterly water sampling at a select location on the Waterford River. - Assist with interpretation of results, as required. <u>Environment and Climate Change Canada</u> <ul style="list-style-type: none"> - Analysis of water samples for CMP priority contaminants - Provide CMP data for NL site to NL MAE on an annual basis 	<p>\$2,500 Invoice to be provided to ECCC by February 28, 2018</p> <p>(matched by NL from annual budget)</p>
Labrador Remote Station Sampling (see Table B4)		<p>\$15,000 Invoice to be provided to ECCC by September 30, 2017</p>
	TOTAL:	<p>\$47,500</p>

Therefore Environment and Climate Change Canada will transfer to Newfoundland Exchequer the sum of \$20,000 by October 31, 2017, \$25,000 by December 31, 2017 and \$2,500 by March 31, 2018.

Table B.6. Special Projects 2017-2018 (Work Shared)

Monitoring Network Evaluation and Optimization (Work-shared activity)	<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 2018-2019.</p>	<p>Risk-Based Adaptive Management Approach (station level, basin level, statistical tools):</p> <p><u>Environment and Climate Change Canada</u></p> <ul style="list-style-type: none"> - ECCC will continue provide guidance and advice as required and work with NL MAE to optimize approach for NL waters. - ECCC will work towards providing access to the data and tools for use by external partners. - Power analysis report will be completed and provided to NL. - Sampling frequencies will be evaluated on an on-going basis. - Implementation of Network of Networks design will be scoped out, including possible addition of a federal site as part of the Large Rivers Network. <p><u>NL Department of Municipal Affairs and Environment</u></p> <ul style="list-style-type: none"> - NL MAE will add Risk-Based Assessment results to each station profile page on CANAL as well as on the Departmental webpage. - NL MAE will continue to investigate statistical approaches to optimize the monitoring network within the province. - NL MAE will publish the Trend Analysis Report for NL stations, comparing results of older data with more recent data. Additional trend analysis will be carried out and documented for other stations that have the required amount of data available. - ECCC and NL MAE will collaboratively review all results and the possible publications will be explored. - Investigate how the water quantity indicator can be combined with the water quality indicator to provide a more integrated and holistic approach to assessing waterbodies.
--	---	---

Canada-Newfoundland and Labrador Water Quality Monitoring Agreement

Climate Change impact and adaptation (Work-shared activity)	Climate change impacts and adaptation options will be included in network considerations.	<p>Environment and Climate Change Canada</p> <ul style="list-style-type: none"> - <u>ECCC will keep NL MAE updated on current science related to climate change impacts on northern rivers across Canada, in support of a Labrador Large Rivers review</u> <p><u>NL Department of Municipal Affairs and Environment</u></p> <ul style="list-style-type: none"> - In support of Network of Networks design and ECCC's priorities on climate change, NL MAE will review existing data from large rivers in Labrador to assess water quality trends related to climate change.
Real-time Instrumentation Special Projects (Work-shared activity)	<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>Environment and Climate Change Canada</p> <ul style="list-style-type: none"> - ECCC will continue to loan the Mobile Environmental Monitoring Platform (MEMP) to NL MAE until March 31, 2018. - ECCC and NL MAE will continue to work together to share expertise on various new technologies associated with the MEMP. - ECCC will continue to loan the camera and modem to NL MAE for Leary's Brook. <p><u>NL Department of Municipal Affairs and Environment</u></p> <ul style="list-style-type: none"> - NL MAE will maintain in good condition the MEMP and all loaded equipment therein. - NL MAE will acknowledge ECCC in all publications arising from the collection of data using the unit. - NL MAE will provide in-kind contribution for regular servicing and performance checks. on shared instruments at core CESI and CMP sites. - NL MAE continues to set up and deploy water quality equipment throughout the province. - NL MAE will continue to dedicate one staff (Ryan Pugh) as the custodian of the MEMP. - NL MAE will continue to share testing results of new technologies with ECCC (i.e. drone technology; buoy technology; real-time instrumentation; etc.).

Extrapolation of non-measured data at select real-time stations (Work-shared activity)	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.	<u>NL Department of Municipal Affairs and Environment</u> <ul style="list-style-type: none"> - Regression models to compare total suspended solids (TSS) concentration vs. real-time turbidity measurements. - Grab sample data is being collected to validate the models. - Publication of studies. - Graphs for extrapolated parameters will be added to NL MAE data management systems and real time web page reporting. <u>Environment and Climate Change Canada</u> <ul style="list-style-type: none"> - ECCC will continue to provide technical advice and review on the approach considering its national applicability.
Real-time water Quality Monitoring products (Work-shared activity)	Technical reports for real-time and automated water quality monitoring activities.	<u>NL Department of Municipal Affairs and Environment</u> <ul style="list-style-type: none"> - Report on review of long-term continuous monitoring results from industry partnerships (IOC-10 years). - NL MAE will finalize station audit procedures and share with Fresh Water Quality Monitoring and Surveillance. <u>Environment and Climate Change Canada</u> <ul style="list-style-type: none"> - ECCC will continue to provide technical advice and review on the technical reports considering its national applicability; may adapt manuals to reflect national program. - ECCC will continue to share products and information developed by, and associated with the Automated Fresh Water Quality Monitoring and Surveillance Task Group.
Progress Reporting	Progress reports for auditing purposes.	<u>NL Department of Municipal Affairs and Environment</u> <ul style="list-style-type: none"> - Finalize 2014-2015 & 2015-2016 Progress Reports, provide to ECCC for report, and post to the NL MAE Departmental webpage. - Begin 2016-2017 Progress Report.

Appendix A

Figure A-1 – Water Quality Sampling Sites 2017-2018 – Newfoundland

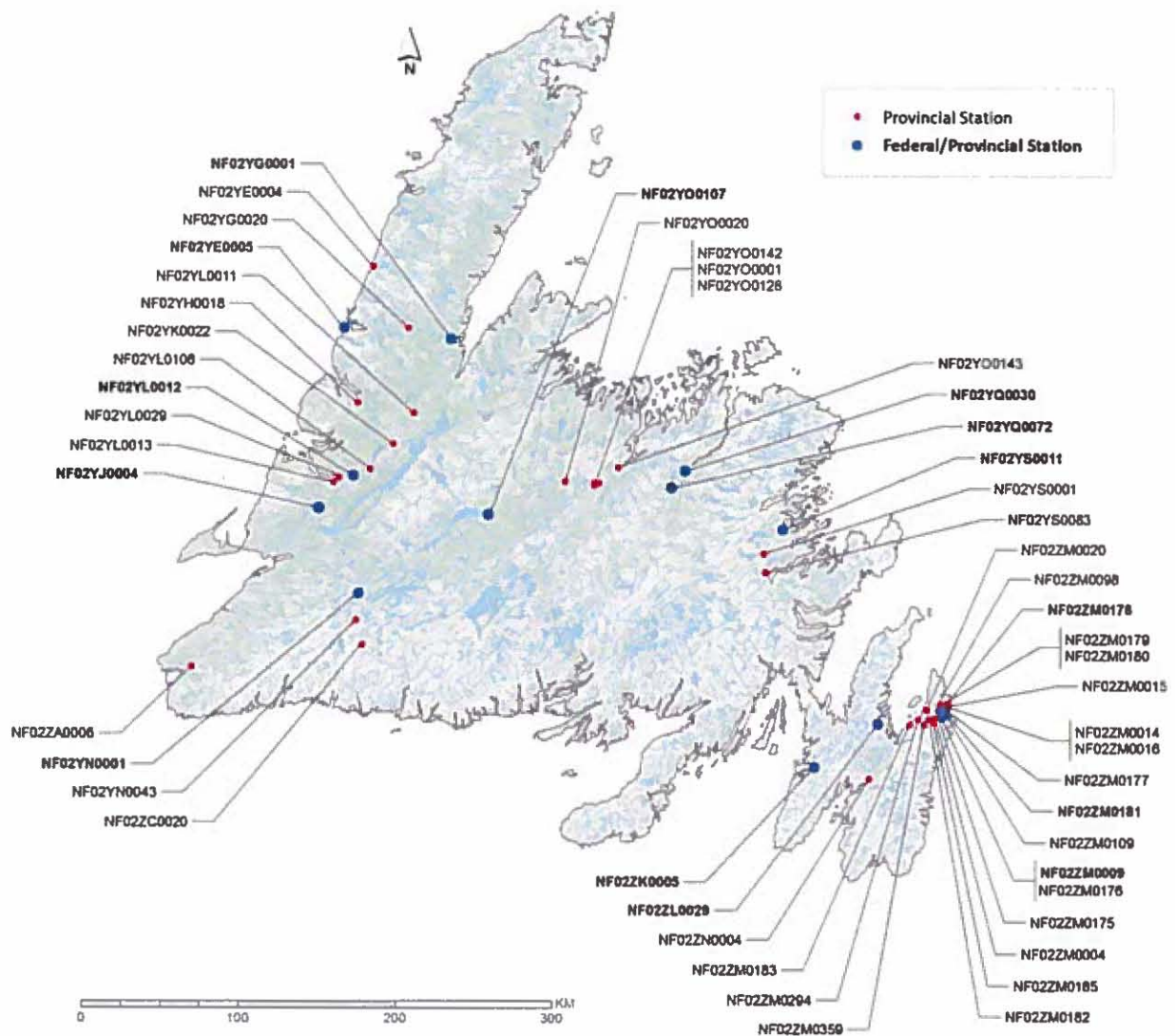


Figure A-2 – Water Quality Sampling Sites 2017-2018 – Labrador