CANADA-NEWFOUNDLAND and LABRADOR
WATER QUALITY MONITORING AGREEMENT

ANNUAL WORK SCHEDULE
2011 - 2012

Water Resources Management Division
Department of Environment & Conservation
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 2011-2012

The attached Schedules A, B, C, and D outline work activities to be carried out during the current fiscal year under the Canada-Newfoundland and Labrador Water Quality Monitoring Agreement. All four Schedules have been reviewed and approved by the Administrators of the Agreement.

Darren Goetze
Administrator, on behalf of
Environment Canada
Government of Canada

Martin Goebel
Administrator, on behalf of
Department of Environment & Conservation
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. Darren Goetze	Environment Canada, on behalf of Canada
Mr. Martin Goebel	Department of Environment & Conservation, on behalf of Newfoundland & Labrador

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

Mr. Jean Francois Bibeault	Environment Canada Atlantic Region (Water Quality Monitoring & Surveillance)
Mr. Joe Pomeroy	Environment Canada Atlantic Region (Water Quality Monitoring & Surveillance)
Mr. Vincent Mercier	Environment Canada Atlantic Region (Water Quality Monitoring & Surveillance)
Mr. Denis Parent	Environment Canada Atlantic Region (Water Quality Monitoring & Surveillance)
Mr. Art Cook	Environment Canada Atlantic Region (Atlantic Laboratory for Environmental Testing)
Mr. Haseen Khan	Water Resources Management Division, Newfoundland & Labrador Department of Environment & Conservation
Mr. Robert Picco	Water Resources Management Division, Newfoundland & Labrador Department of Environment & Conservation
Ms. Renée Paterson	Water Resources Management Division, Newfoundland & Labrador Department of Environment & Conservation

Schedule B

Work Shared Activities for Fiscal Year 2011-2012

Schedule B – Work Shared Activities 2011-2012

Activity	Responsible Agency	Remarks
Ambient Water Quality Sampling	Newfoundland and Labrador Department of Environment and Conservation	Refer to **Table B.1** & **Figure 1** for sampling details in Newfoundland Refer to **Table B.2** & **Figure 2** for sampling details in Labrador
Ambient Water Quality Analysis	Environment Canada – National Laboratory for Environmental Testing (NLET)	Refer to **Table B.3a & B.3b** for laboratory analysis details
ENVIRODAT and Data Management/Reporting	Newfoundland and Labrador Department of Environment and Conservation and Environment Canada	Refer to **Table B.4** for ENVIRODAT projects/tasks Refer to **Table B.5** for Data Management/Reporting tasks
Real-Time Water Quality Monitoring	Newfoundland and Labrador Department of Environment and Conservation and Environment Canada	Refer to **Table B.6** & **Figures 3 & 4** for sampling details in Newfoundland and Labrador
Special Projects	Newfoundland and Labrador Department of Environment and Conservation and Environment Canada	Refer to **Table B.7** for Special Projects (work shared activities)

Table B.1: Index Station Location, Designation and Sampling Frequency 2011-2012 for Newfoundland Stations

Station #	Description	Latitude	Longitude	Samples/year	Sampled By	Classification
EASTERN REGION						
NF02ZK0005	Northeast River	47 16 23	-53 50 25	8	P	CABIN site 09-10 & 11-12 / Hydrometric / Core CESI Station
NF02ZL0029	Goulds Brook	47 30 18	-53 17 28	5	P	CABIN site 09-10 / Core CESI Station
NF02ZM0004	Waterford River at Commonwealth Ave.	47 31 19	-52 48 29	4	P	Local CESI Station
NF02ZM0009	Waterford River at Kilbride	47 31 46	-52 44 34	4	P	RTWQ / Hydrometric / Local CESI Station / Chemical Management Plan
NF02ZM0014	Virginia River at The Boulevard	47 35 02	-52 41 29	4	P	Local CESI Station / CABIN site 10-11
NF02ZM0015	Quidi Vidi Lake at Outlet	47 35 02	-52 40 51	4	P	
NF02ZM0016	Rennies River at Carnell Drive	47 34 40	-52 42 03	4	P	Local CESI Station
NF02ZM0020	Broad Cove Brook	47 35 53	-52 52 53	4	P	CABIN site 08-09 / Local CESI Station
NF02ZM0098	Virginia River at headwaters	47 35 56	-52 45 17	4	P	CABIN site 08-09 / Comp Guidelines Site / Local CESI Station
NF02ZM0109	Mundy Pond at Outlet	47 33 40	-52 44 38	4	P	
NF02ZM0144	Kelly's Brook at Portugal Cove Rd.	47 34 28	-52 42 45	4	P	Local CESI Station
NF02ZM0175	Waterford River at Brookfield Rd.	47 31 34	-52 45 48	4	P	Local CESI Station
NF02ZM0176	South Brook at Mouth	47 31 41	-52 44 48	4	P	Local CESI Station
NF02ZM0177	Rennies River at Portugal Cove Rd.	47 34 28	-52 42 36	4	P	Local CESI Station
NF02ZM0178	Learys Brook at Clinch Cres.	47 34 21	-52 44 21	5	P	RTWQ / Hydrometric / Core CESI Station / CABIN site 11-12
NF02ZM0179	Virginia River at Guzzwell Drive	47 35 47	-52 42 06	4	P	Local CESI Station
NF02ZM0180	Virginia River at Newfoundland Dr.	47 35 59	-52 42 02	4	P	Local CESI Station
NF02ZM0181	Waterford River at Blackhead Road	47 32 53	-52 43 09	5	P	Core CESI Station
NF02ZM0182	Waterford River at Bremigans Pond	47 31 07	-52 51 21	4	P	Local CESI Station
NF02ZM0183	Kelligrews River at Kelliview Cres.	47 29 45	-53 01 03	4	P	Local CESI Station / CABIN site 11-12
NF02ZM0184	Learys Brook at Outer Ring Road	47 34 16	-52 47 29	4	P	Local CESI Station
NF02ZM0185	South Brook at Headwaters	47 29 37	-52 51 02	4	P	CABIN site 08-09 / Comp Guidelines Site / Local CESI Station
NF02ZM0294	Manuels River	47 31 11	-52 56 41	4	P	Archaeologically significant / Local

						CESI Station
NF02ZM0359	Paddy's Pond at Outlet	47 29 17	-53 47 36	4	P	RTWQ stand-alone station
NF02ZN0004	Salmonier River	47 10 54	-53 23 56	4	P	Local CESI Station
CENTRAL REGION						
NF02YM0003	Indian Brook	49 29 53	-56 10 35	4	P	CABIN site 08-09 / Hydrometric / Local CESI Station
NF02YM0004	South West Brook at Baie Verte	49 55 15	-56 13 45	4	P	Hydrometric / Local CESI Station
NF02YO0001	Exploits River at Grand Falls	48 55 27	-55 39 21	4	P	Local CESI Station
NF02YO0121	Peter's River	49 06 21	-55 24 38	4	P	Hydrometric /Former RTWQ / Local CESI Station
NF02YO0020	Exploits River at Aspen Brook	48 56 55	-55 54 56	4	P	Local CESI Station
NF02YO0107	Exploits River at Millertown Dam	48 45 34	-56 35 32	5	P	Hydrometric / Core CESI Station
NF02YR0001	Pound Cove Brook	49 11 11	-55 55 24	4	P	Comp Guidelines Site
NF02YO0128	Exploits River below Grand Falls	48 56 12	-55 37 03	4	P	Local CESI Station
NF02YO0142	Corduroy Brook	48 56 21	-55 39 47	4	P	Local CESI Station / CABIN site 11-12
NF02YO0143	Exploits River at Bond Bridge	49 01 15	-55 27 15	4	P	Local CESI Station
NF02YO0189	Joe's Lake	49 01 43	-56 04 01	4	P	
NF02YQ0006	North West Gander River	48 34 54	-55 30 20	4	P	CABIN site 08-09 / Comp Guidelines Site / Local CESI Station
NF02YQ0030	Gander River at Appleton	48 59 41	-54 52 04	8	P	Hydrometric / Core CESI Station
NF02YS0001	Terra Nova River at Terra Nova	48 30 27	-54 12 43	4	P	Local CESI Station
NF02YS0011	Terra Nova River at ES Spencer Bridge	48 38 27	-54 02 11	5	P	Hydrometric / Core CESI Station
NF02YS0083	Northwest River at Terra Nova	48 23 44	-54 11 53	4	P	Hydrometric / National Park / Local CESI Station
WESTERN REGION						
NF02YE0004	Portland Creek	50 10 54	-57 36 13	4	P	Local CESI Station
NF02YE0005	Western Brook @ Bridge	49 49 49	-57 51 23	5	P	CABIN site 08-09 / Core CESI Station
NF02YG0001	Main River at Bridge	49 46 10	-56 54 15	5	P	Canadian Heritage River /Core CESI Station
NF02YG0009	Main River at Paradise Pool	49 48 46	-57 09 24	4	P	Former RTWQ / Hydrometric / Canadian Heritage River
NF02YG0020	Eagle Mountain Brook	49 49 53	-57 17 15	4	P	Local CESI Station
NF02YH0018	Lomond River @ Bridge	49 24 07	-57 43 49	4	P	CABIN site 08-09 / Local CESI Station
NF02YJ0004	Pinchgut Brook	48 47 51	-58 03 43	8	P	CABIN site 08-09 & 11-12 / Core CESI Station

NF02YK0022	Humber Canal	49 09 58	-57 24 56	4	P	Local CESI Station
NF02YL0011	Humber River at Little Falls	49 20 54	-57 14 07	4	P	
NF02YL0012	Humber River at Humber Village Bridge	48 59 01	-57 45 40	5	P	RTWQ / Hydrometric / Core CESI Station
NF02YL0013	Corner Brook at Margaret Bowater Park	48 56 40	-57 56 12	4	P	Local CESI Station
NF02YL0029	Wild Cove Brook	48 58 28	-57 53 02	4	P	Local CESI Station
NF02YN0001	Lloyds River @ Bridge	48 18 16	-57 43 07	5	P	CABIN site 09-10 / Core CESI Station
NF02YN0043	Peter Strides Lake	48 09 13	-57 43 24	4	P	
NF02ZC0020	Buck Lake	48 00 48	-57 39 59	4	P	
NF02ZA0006	Grand Codroy River	47 52 08	-59 07 05	4	P	

P-Provincial

Notes:

1. A total of 57 stations will be sampled during 2011-2012 on the island portion of the province.

2. For statistical analysis it is important that at least four samples are collected from each station representing four seasons in a fiscal year.

3. Total number of samples to be collected is 249 (this number does not include triplicate or blank samples).

4. All Core CESI stations being sampled 5 times per year.

5. Selected Core CESI stations being sampled 8 times per year to perform sensitivity analysis on frequency of sampling impact on CESI scores.

Figure 1 – Water Quality Stations 2011-2012 – Newfoundland

Table B.2: Northern Index Station Location, Designation and Sampling Frequency 2011-2012 for Labrador Stations

Station #	Description	Latitude	Longitude	Samples/year	Sampled By	Classification
LABRADOR REGION						
NF02XA0001	Little Mecatina River	52 13 42	61 19 32	4	F/P	Hydrometric / Local CESI Station
NF03NF0013	Ugjoktok River	55 13 60	61 17 57	5	F/P	Hydrometric / Core CESI Station
NF03OC0012	Atikonak River	52 58 03	64 39 40	5	F/P	Hydrometric / Core CESI Station
NF03OD0011	East Metchin River	53 26 07	63 14 03	4	F/P	Hydrometric / Local CESI Station
NF03OE0001	Churchill River Above Upper Muskrat	53 14 52	60 47 21	4	F/P	RTWQ / Hydrometric / Local CESI Station
NF03OE0030	Minipi River	52 36 53	61 11 11	5	F/P	RTWQ / Hydrometric / Core CESI Station
NF03OE0032	Pinus River	53 08 52	61 33 31	4	F/P	Hydrometric / Comp Guidelines Site / Local CESI Station
NF03OE0033	Big Pond Brook	53 30 43	60 17 31	4	F/P	Hydrometric / Local CESI Station
NF03PB0025	Naskaupi River	54 07 54	61 25 45	5	F/P	Hydrometric / Core CESI Station
NF03QC0001	Eagle River	53 27 54	57 33 29	5	F/P	Hydrometric / Core CESI Station / Eagle River Plateau Management Zone
NF03QC0002	Alexis River	52 38 57	56 52 17	4	F/P	Hydrometric / Local CESI Station
NF03OD0012	Wilson River E. Branch	53 18 33	62 55 11	4	F/P	Ashkui / CABIN site 10-11 / Local CESI Station
NF03OE0035	Dominion Lake	52 43 45	61 45 17	4	F/P	Ashkui / Local CESI Station
NF03OE0037	Cache River	53 11 33	62 12 11	4	F/P	Ashkui / Local CESI Station
NF03PB0028	Cape Caribou River	53 37 16	60 24 52	4	F/P	Ashkui / Local CESI Station
NF03PB0029	Northwest River	53 31 18	60 08 31	4	P	Ashkui
NF03PB0030	Seal Lake Narrows	54 19 55	61 38 27	4	F/P	Ashkui / Local CESI Station
NF03PB0032	Susan River	53 44 17	60 56 48	4	F/P	Ashkui / Local CESI Station
NF03PB0037	Wuchusk Lake	54 23 43	61 47 09	4	F/P	Ashkui
NF03QA0044	Carter Basin	53 29 52	59 52 25	4	F/P	Ashkui
NF03QA0045	Kenamu River	53 28 34	59 55 01	4	F/P	Ashkui / Comp Guidelines Site
NF03OA0020	Ashuanipi River	53 0 06	66 14 30	4	P	

P-Provincial
F-Federal

Notes:

1. A total of 22 stations will be sampled during 2011-2012 in Labrador.

2. The Labrador stations are listed as being sampled four times per year; this refers to the number of samples taken; **there must be a minimum of three samples taken each fiscal year** at the Labrador sites. Generally, five trips are made to each station.

3. All Labrador stations are accessible only by helicopter with the exception of Northwest River (NF03PB0029); Ashuanipi River (NF03OA0020); Big Pond Brook (NF03OE0033); East Metchin (NF03OD0011); Wilson River East Branch (NF03OD0012) and Cache River (NF03OE0037) which are accessible by vehicle.

4. Total number of samples to be collected is 93 (this number does not include triplicate or blank samples).

5. All Core CESI stations being sampled 5 times per year if possible.

Figure 2 – Water Quality Stations 2011-2012 – Labrador

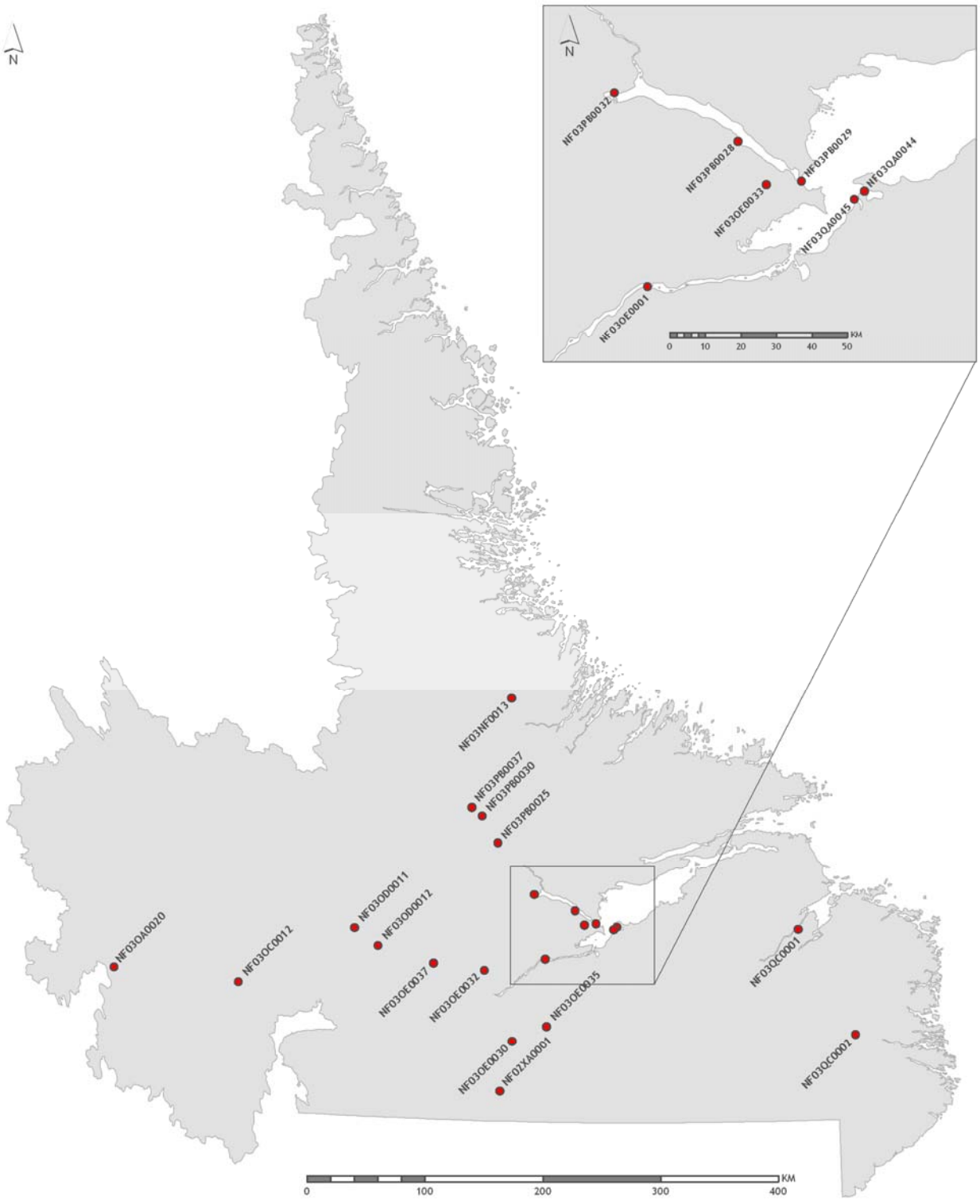


Table B.3a: Analytical Parameters, Holding Times and Schemas for 2011-2012

Parameter	Holding Times (recommended by NLET)
MAJOR IONS	
Alkalinity	24 hours*
Chloride	28 days
Sulphate	28 days
Calcium	8 weeks
Magnesium	8 weeks
Sodium	8 weeks
Potassium	8 weeks
PHYSICAL	
pH	24 hours*
Conductivity	28 days
Colour	48 hours*
Turbidity	24 hours*
NUTRIENTS	
Nitrate	24 hours*
Total Nitrogen	24 hours*
Total Phosphorus	1 year
DIC/DOC	24 hours*
METALS	
Total Metals-27 elements	6 months

Schema Number	Schema Name	Parameter/ Grouping
1	ALKPHCOND	alkalinity, pH, conductivity
2	MI4-U	Ca, Mg, Na, and K
5	ANION1-U	NO3 by IC
6	ANION2-U	Cl and SO4 by IC
11	TP1-U	total phosphorus
12	TN1-U	total nitrogen
13	DIC/DOC1	dissolved inorganic and organic carbon
22	HARDNESS1	Calculation derived from Ca and Mg
23	COL-APP	Colour-apparent (unfiltered sample)
24	TURBIDITY3	turbidity
31	TM2004/T27W	Total metals-27 elements

***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	

A detailed schema listing for each measured parameter is located in Annex I at the end of the document.

* Due to the logistics involved in sample shipment from NL to NLET in ON, the shorter holding times of 24 and 48 hours are continuously exceeded; a "Stability Study" report prepared by NL ENVC and reviewed/approved by EC addresses this issue. This report is available on the ENVC Departmental web page.

Table B.3b – Work-Shared Activities – Analytical Credits

Water Quality Sampling and Water Quality Analysis	Water samples from WQMA network are collected primarily by provincial staff. Analysis is completed by federal lab to ensure consistency. Additional lab credits 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.)	**996.31 TMUs (Lab Credits)**	- Co-lead between NL and EC -EC will provide the analytical services (according to Tables B.1, B.2, and B.3a) by March 31, 2012.

Table B.4: ENVIRODAT – Data Management

Management Activities		Lead Agency	Remarks
Current/Ongoing Special Projects	Data Verification and Validation of Sample/Measurement Data	Environment Canada Newfoundland and Labrador Department of Environment and Conservation - staff	EC must provide a mechanism that will enable project leaders and data reviewers to flag both sample and measurement data as to quality. A national WQMS quality-flagging system has been chosen and a prototype application has been designed that is currently part of the Atlantic EcoLIMS. To further develop this project, the application must be moved to a stand-alone version that will have the capability to connect to either the ENVIRODAT database or an Access database. This will allow EC to distribute the application and a client's dataset for review and flagging. Once this has been done, a user training session will be developed. NL ENVC will act as the development user for this project, providing feedback/ comments/ suggestions as the project unfolds. This application will also contain the functionality to compare an analytical value to historical data for the station and perform an ion balance on the sample. Should the roll-out of this application be delayed, EC will provide a guidance document that outlines the quality flagging system so that NL ENVC can flag their data using an approach consistent with that used by other projects within ENVIRODAT.

	Variable Grouping	Environment Canada Newfoundland and Labrador Department of Environment and Conservation - staff	The current design of EC's variable and method tables makes it difficult to group variables for data extraction and interpretation purposes. Also, for lab purposes, additional information must now be retained on variable methods and variable comparability so that data can be merged together from all national water quality labs. EC staff (Julie Boyer) has begun the initial phase of the variable grouping process. In addition to this work, EC plans to initiate a contract that will secure a chemist that can review existing variables and methods with the aim to facilitate variable grouping and comparability and at the same time build on the work already completed by EC. Redesign of the variable and method tables will be part of this process. These changes should greatly expedite the development of associated applications. Additionally, EC will provide an assessment of the implications of a switchover in labs (from NLET to ALET).
Sample Submission	Laboratory Procedures and Quality Control Processes	Environment Canada	Laboratory analyses are completed according to ISO 17025. Detection limits for all required parameters are mutually agreed upon between EC and NL ENVC. Analyses of all parameters for NL WQMA samples are currently being done at NLET. EC will provide an ongoing update on options for laboratory services at ALET given the current ability of new instruments to analyze at lower detection limits, reduce analysis delay time and provide options for data comparability.
	Entering field data onto field sheets and subsequent submission to laboratory	Newfoundland and Labrador Department of Environment and Conservation – staff	NL field staff is responsible for entering all field data onto specified field sheets and submitting them to ALET regularly.
	Sample/Project/Station Initialization and Modifications	Environment Canada	ALET will receive components of the client package (sample submission, project/parameter submission or modification, and new station submission) and input/update EcoLIMS as required. All original copies will be retained for future reference. Even though sample analyses are performed at NLET, ALET will initialize the samples to facilitate sample processing and validation.

Management of National Water Quality Database (ENVIRODAT)	Processing and Loading of NLET Data	Environment Canada	Samples are analyzed by NLET, transferred to a holding file in Burlington, and retrieved for loading to Atlantic ENVIRODAT. Samples are validated for date, time, station, and number of parameters. Any errors are identified and corrected. Sample and measurement information is transferred to ENVIRODAT in bulk every 2-3 months. A summary (data audit) report is generated once all samples for a fiscal year are validated and finalized.
	ENVIRODAT Ongoing Management	Environment Canada	Management of ENVIRODAT is recognized as an on-going function. Data is backed up daily and off-site backups are kept for disaster-recovery purposes. All modifications/ upgrades/additions to the NL ENVC dataset are communicated through one contact (Alexandra Audet) to ensure consistency.
	Historical Data Issues and Problem Resolution	Environment Canada Newfoundland and Labrador Department of Environment and Conservation - staff	The majority of missing data issues has been resolved for previous years of data. Periodically issues do still arise and these are managed and resolved through email to Alexandra Audet & Vincent Mercier. EC must ensure that problem resolution is timely and collaborative.
Data Extraction Tool/Web Services	Accessibility/Availability of NL WQMA Dataset	Environment Canada	EC must ensure that the NL WQMA dataset is accessible on an external server for download. To facilitate this, a data transformation package has been designed and will be maintained that will provide a filtered copy of ENVIRODAT outside the EC firewall. The NL WQMA dataset is part of this filtered copy. This information can be requested from external clients (e.g. through access of information legislation from either EC or NL).
	ENVIRODAT Web Services	Environment Canada Newfoundland and Labrador Department of Environment and Conservation – Paul Neary/Leona Hyde	EC has provided several web services that NL ENVC and others can use for extracting ENVIRODAT data and water quality indicators data. EC will be required to provide additional services and update existing services from time to time.

	ENVIRODAT Data Extraction Tools	Environment Canada	EC must ensure that modifications to ENVIRODAT data extraction tools will not adversely affect NL ENVC's ability to extract data. Where possible, any modifications will be presented to NL ENVC for review and feedback. Out of necessity EC WQMS will need to move to a national tool (from its current three regional tools). EC has proposed a temporary extraction tool, GENIE, which will replace the three regional extraction tools until a new national extraction tool has been developed. This will affect the extraction of NL ENVC data and therefore all efforts will be made by EC in consultation with NL ENVC to maintain the same level of extraction ability as the old extraction tool. GENIE is expected to be launched in 2012-2013.
	Regular request of archived NL WQMA data from ENVIRODAT	Environment Canada Newfoundland and Labrador Department of Environment and Conservation – Shibly Rahman	NL will regularly request the archived NL WQMA dataset from EC (on DVD) to ensure there is an updated back-up with the province; each new requested archive dataset will be reviewed, QA/QCed and will replace the former dataset.

Table B.5: Technical Documents and Reporting

Project	Activity	Responsible Agency	Remarks
CANAL / Site Documentation Database / Bacteriological Database	Structural changes/modifications to CANAL webpage	Environment Canada Newfoundland and Labrador Department of Environment and Conservation – Paul Neary/Leona Hyde/Kyla Brake	Structural changes to the CANAL web page are necessary; however, this task will not be initiated until the updating of the Site Documentation Database is complete. At this point, the CANAL update project will be assigned to NL ENVC staff sometime within the next two years. Assistance from EC may be needed to better understand the code utilized to create CANAL. This is a multiyear project that will carry over into the next two years.
	Intense ground-truthing and updating of the Site Documentation Database (ie: review of all stations)	Newfoundland and Labrador Department of Environment and Conservation - staff	NL ENVC staff will continue to review and update all information in the Site Documentation Database throughout 2011-2012; up-to-date metadata for all routine grab sample stations, real-time stations and CABIN stations will be included. This project will ensure that the information made public on the CANAL webpage is up-to-date. This project was slated to be finalized by the end of fiscal year 2010-2011 however it is being carried over into 2011-2012 due to the time needed to adequately update the voluminous information.
	On-going maintenance of the Site Documentation Database	Newfoundland and Labrador Department of Environment and Conservation - staff	NL ENVC staff will continue to maintain the Site Documentation Database with up-to-date metadata after the above-mentioned project is completed. This is an on-going task.
	On-going populating of the Site Documentation Database	Newfoundland and Labrador Department of Environment and Conservation – Paul Neary/Rob Holloway	NL ENVC staff responsible for populating fields of the Site Documentation Database utilizing GIS components from various sources. This is an on-going task.
	On-going maintenance of the Bacteriological Database	Newfoundland and Labrador Department of Environment and Conservation - staff	If bacteriological data is collected at any stations, the data will be entered into the database by NL ENVC staff. This is an on-going task.

	On-going updating of the Water Quality Index scores	Newfoundland and Labrador Department of Environment and Conservation – Kyla Brake/Paul Neary	In the past, water quality index scores available on CANAL have been calculated in-house using the most recent data available through ENVIRODAT. An assessment will be done to determine if this same method will be used to incorporate the scores into CANAL after the structural changes to the web page have been made. Another potential option may be to develop web services to access the scores from the existing water quality index database. NL ENVC and EC will work together to determine the most appropriate approach. This is a multiyear project that commenced in fiscal year 2010-2011 and will carry over into 2011-2012.
	Development of Fact Sheets for selected WQMA stations	Newfoundland and Labrador Department of Environment and Conservation – Kyla Brake	When the Site Documentation Database is updated by staff, fact sheets for selected WQMA stations will be produced (using up-to-date metadata) and incorporated into the CANAL web page. The fact sheets will include such information as: watershed characteristics, water quality, WQI scores, trend analysis and other relevant information for each station on the CANAL web page. This is a multiyear project that commenced in fiscal year 2010-2011 and will carry over into 2011-2012.
	Delineation and digitization of all WQMA stations (Newfoundland and Labrador); including any new stations added (ie: CABIN: real-time)	Newfoundland and Labrador Department of Environment and Conservation - Keith Abbott	An assessment has been completed to determine which watersheds under the Agreement have been delineated to date; a priority list of outstanding watersheds that need to be delineated is compiled; watersheds will continue to be delineated for all routine grab sample stations, real-time stations, hydrometric stations and CABIN stations. This is a multiyear project that commenced in fiscal year 2010-2011 and will carry over into 2011-2012.
Automatic Data Retrieval System (ADRS)	On-going Real-time Service Delivery (ADRS – reporting)	Newfoundland and Labrador Department of Environment and Conservation – Paul Neary/Leona Hyde	The day-to-day operation and maintenance of the ADRS will be performed. This is an on-going task.

	Upgrades to ADRS as needed	Newfoundland and Labrador Department of Environment and Conservation – Paul Neary/Leona Hyde	Upgrades and development of new applications for the ADRS software will be made as necessary. This is an on-going task.
	Continued Testing/Review of ADRS Search Engine	Newfoundland and Labrador Department of Environment and Conservation – staff	All staff will continue to utilize the ADRS Search Engine and provide feedback/suggestions to Leona on potential improvements. This is an on-going task.
	Improvements to ADRS Search Engine	Newfoundland and Labrador Department of Environment and Conservation – Paul Neary/Leona Hyde	Feedback from staff will continue to be compiled and incorporated into the ADRS Search Engine. This is an on-going task.
	Implementation of Automated Deployment Spreadsheet into ADRS	Newfoundland and Labrador Department of Environment and Conservation – Paul Neary/Leona Hyde	The pilot testing of the automated deployment spreadsheet has been completed by real-time staff, this automated system will be provided to Paul/Leona for incorporation into the ADRS beginning in fiscal year 2011-2012 and carrying over into 2012-2013.
	Maintenance of Inventory / Servicing Spreadsheet	Newfoundland and Labrador Department of Environment and Conservation – Tara Clinton	The Inventory/Servicing spreadsheet will be updated and maintained continually to: - alert when instrumentation requires servicing - assist in the establishment of a life cycle management plan - assess the costs being spent in servicing/repairing instrumentation This is an on-going task.

	Maintenance of camera technology at Leary's Brook Real-Time Station	Environment Canada Newfoundland and Labrador Department of Environment and Conservation – Paul Neary/Leona Hyde/Ryan Pugh	In fiscal year 2010-2011, an application was developed to archive photographs and produce movie capabilities. In fiscal year 2011-2012, NL ENVC staff will undertake the following work: - adjust the camera position - improve image resolution - establish a staff gauge measurement tool as a visual reference point EC will continue to provide in-kind support ($1,200) in context of new technologies/development tool, exploring possibility of using such technology as part of web reporting.
WQMA Search Engine	Development and Testing of WQMA Search Engine (utilizing EC web services)	Newfoundland and Labrador Department of Environment and Conservation – Paul Neary/Leona Hyde	NL ENVC staff to develop an internal web application that is an ENVIRODAT search engine that consumes web services provided by EC. This is a multiyear project that will commence when the "variable grouping" project being led by EC moves forward.
Technical Documents - WQMA	Maintenance of NL-WQMA Sampling Manual	Newfoundland and Labrador Department of Environment and Conservation – Joanne Sweeney	NL ENVC has decided to adopt a national water sampling manual developed through CCME; additions pertinent to water sampling technique in NL will continue to be included in the existing manual; an on-line version of the CCME manual is planned to be released in Fall 2011. This is an on-going task.
	Completion of Intensive Survey 2009-10 Report (Bonne Bay Ponds)	Environment Canada Newfoundland and Labrador Department of Environment and Conservation – Ian Bell	NL ENVC staff is responsible for obtaining the data collected during the 2009-2010 intensive survey of the Bonne Bay ponds from EC, analyzing the data and compiling the results in a comprehensive report. EC will support report review. The report is to be made available on the Divisional web page. This report was to be finalized by the end of fiscal year 2010-2011, however it is being carried over to 2011-2012.
	Updating of the Trend Analysis Report	Newfoundland and Labrador Department of Environment and Conservation – Shibly Rahman	As assessment of the existing Trend Analysis Report needs to be completed to determine if updates are required. This is a multiyear project that commenced in fiscal year 2010-2011 and will carry over into 2011-2012.

	On-going updating of WQMA website	Newfoundland and Labrador Department of Environment and Conservation – Joanne Sweeney/Paul Neary	Due to organizational changes made to the Departmental webpage throughout the past year, NL ENVC staff will review the current organization, links and gaps of the WQMA section of the web page and provide suggestions for improvements to Paul Neary (for forwarding to OCIO). This is an on-going task.
Technical Documents - RTWQ	Real-Time Water Quality Deployment and Annual Reports	Newfoundland and Labrador Department of Environment and Conservation – staff	NL ENVC staff is responsible for the completion of deployment reports after each deployment period for all stations. Annual report to be completed at the end of each calendar year for all stations that are industry funded. EC will be involved as reviewer and in context of data sharing. This is an on-going task.
	Completion of Real-Time Water Quality Manual	Newfoundland and Labrador Department of Environment and Conservation – Renee Paterson/Grace Gillis/Tara Clinton/Ryan Pugh	NL ENVC staff is responsible for the review and revision of the Real-Time Water Quality Manual that was initiated during last fiscal year; this manual will incorporate all new procedures and protocols used in the NL real-time program. The report will be available on the web page and distributed to all field staff for implementation. This manual was to be finalized by the end of fiscal year 2010-2011, however it is being carried over to 2011-2012.
	Completion of Bio-fouling Report	Newfoundland and Labrador Department of Environment and Conservation – Tara Clinton	NL ENVC staff will compile the "bio-fouling" results gathered during the summer of 2009 into a comprehensive report. The report is to be made available on the Divisional web page. This report was to be finalized by the end of fiscal year 2010-2011, however it is being carried over to 2011-2012.
	On-going updating of Real-Time Water Quality Website	Newfoundland and Labrador Department of Environment and Conservation – Renee Paterson/Paul Neary	Due to organizational changes made to the Departmental webpage throughout the past year, NL ENVC staff will review the current organization, links and gaps of the real-time section of the web page and provide suggestions for improvements to Paul Neary (for forwarding to OCIO). This is an on-going task.
Education / Outreach	Educational Displays	Newfoundland and Labrador Department of Environment and Conservation – Kyla Brake	NL ENVC staff will be involved in setting-up displays on water quality/quantity at various educational institutions as requested. This is an on-going task.

	Maintenance/Trouble-shooting the real-time water monitoring display at the Fluvarium	Newfoundland and Labrador Department of Environment and Conservation – Kyla Brake	The Suncore Energy Fluvarium in St. John's went through a revitalization project (2nd floor) in 2009 whereby an interactive display featuring real-time water monitoring was incorporated into the new design. NL ENVC staff will maintain communication with this group to ensure the display is functioning as planned. This is an on-going task.
	Updating of all posters	Newfoundland and Labrador Department of Environment and Conservation – Kyla Brake	NL ENVC staff will be responsible for updating posters for education and awareness opportunities. A list of existing and desired posters will be compiled and ranked on a priority basis for completion. This is a multiyear project that commenced in fiscal year 2010-2011 and will carry over into 2011-2012.
	Updating of contour maps	Newfoundland and Labrador Department of Environment and Conservation – Kyla Brake/Keith Abbott	NL ENVC staff will be responsible for updating contour maps for education and awareness opportunities as well as inclusion in the Water Resources Portal. This is a multiyear project that will commence in fiscal year 2011-2012 and will carry over into 2012-2013.

Table B.6 Real-time Water Quality Monitoring Stations for 2011-2012 fiscal year

Station #	Description	Latitude	Longitude	Accessibility	Remarks	Classification
VOISEY'S BAY PROJECT (VALE)						
NF03NE0009	Reid Brook @ Outlet of Reid Pond	56 22 22	-62 09 43	HS	- These stations are fully industry funded	RTWQ / Hydrometric / former CESI / EA
NF03NE0010	Camp Pond Brook below Camp Pond	56 20 32	-62 06 24	HS		RTWQ / Hydrometric / former CESI / EA
NF03NE0011	Reid Brook below Tribuatry	56 18 18	-62 05 34	HS		RTWQ / Hydrometric / EA
NF03NE0012	Tributary to Reid Brook	56 18 21	-62 05 39	HS		RTWQ / Hydrometric / EA
NF03NE0008	Well after Tailings Dam*	56 19 42	-62 00 17	VA	- This station is funded by NL ENVC	RTWQ
DUCK POND OPERATIONS – TECK						
NF02YO0190	Tribuatry to Gill's Pond Brook	48 38 26	-56 31 44	VA	- These stations are fully industry funded	RTWQ / Hydrometric / EA / CABIN 11-12
NF02YO0192	East Pond Brook below East Pond	48 40 55	-56 30 39	VA		RTWQ / Hydrometric / EA / CABIN 11-12
NF02YO0193	Well after Tailings Dam	48 39 18	-56 28 55	VA	- This station is funded by NL ENVC	RTWQ
IRON ORE COMPANY OF CANADA (IOCC)						
NF03OA0019	Wabush Lake @ Dolomite Road	52 58 00	-66 51 33	VA	- These stations are fully industry funded	RTWQ / Hydrometric / EA
NF03OA0017	Wabush Lake @ Lake Outlet	53 09 05	-66 47 08	BS/HS		RTWQ / Hydrometric / EA

LONG HARBOUR PROJECT (VALE)						
NF02ZK0023	Rattling Brook below Bridge	47 24 51	-53 48 26	VA	- These stations are fully industry funded	RTWQ / Hydrometric / EA
NF02ZK0024	Rattling Brook Big Pond	47 24 07	-53 47 37	VA		RTWQ / Hydrometric / EA
NF02ZK0025	Rattling Brook below Plant Discharge	47 25 07	-53 48 36	VA		RTWQ / Hydrometric / EA
TBD	Well #1					RTWQ
TBD	Well #2					RTWQ
TBD	Well #3					RTWQ
TBD	Well #4					RTWQ
NALCOR ENERGY (FORMERLY NL HYDRO)						
NF03OD0013	Churchill River below Metchin River	53 14 22	-63 17 06	HS	- These stations are fully industry funded	RTWQ / Hydrometric / EA
NF03OE0051	Churchill River below Grizzle Rapids	52 57 50	-61 24 30	HS		RTWQ / Hydrometric / EA
NF03OE0050	Churchill River 6.15kms below Lower Muskrat Falls	53 14 16	-60 40 31	HS		RTWQ / Hydrometric / EA
NF03OE0001	Churchill River Above Upper Muskrat Falls**	53 14 52	-60 47 21	HS	- This station is funded by NL ENVC	RTWQ / Hydrometric / local CESI station/ EA
LABRADOR IRON MINES						
NF03OB0037	Unnamed Tributary below Settling Pond	54 46 8	-66 49 11	HS/VA	- These stations are fully industry funded	RTWQ / Hydrometric / EA
NF03OB0038	James Creek above Bridge	54 46 31	-66 49 12	HS/VA		RTWQ / Hydrometric / EA

ELROSS LAKE AREA IRON ORE MINE						
NF03OB0039	Elross Creek below Pinette Lake Inflow	54 52 40	-67 05 59	HS	- These stations are fully industry funded	RTWQ / Hydrometric / EA
NF03OB0040	Goodream Creek 2km Northwest of Timmins 6	54 55 03	-67 07 26	HS/VA		RTWQ / Hydrometric / EA
CITY OF ST. JOHNS – TORBAY ROAD NORTH COMMERCIAL DEVELOPMENT AREA						
TBD	TBD				- These stations are fully funded by the City of St. John's	
TBD	TBD					
CANADA-NEWFOUNDLAND AND LABRADOR WATER QUALITY MONITORING AGREEMENT						
NF03OE0030	Minipi River below Minipi Lake **	52 36 53	-61 11 11	HS	- These stations are fully funded by the Canada /Newfoundland and Labrador Water Quality Monitoring Agreement	RTWQ / Hydrometric / core CESI station
NF02ZE0033	Southwest Brook below Southwest Pond	47 50 56	-55 46 04	VA		RTWQ / Hydrometric / First Nations
NF02ZM0178	Learys Brook at Prince Philip Drive**	47 34 21	-52 44 21	VA		RTWQ / Hydrometric / core CESI station / CABIN 11-12
NF02ZM0009	Waterford River at Kilbride**	47 31 46	-52 44 34	VA		RTWQ / Hydrometric / local CESI station / Chemical Management Plan
NF02YL0012	Humber River at Humber Village Bridge**	48 59 01	-57 45 40	VA		RTWQ / Hydrometric / core CESI station
NF02ZM0359	Paddy's Pond @ Outlet	47 25 07	-53 48 36	VA		RTWQ
NF03OE0054	Churchill River English Point	53 20 13	-60 10 19	BS/HS		RTWQ / Hydrometric
NF03QA0047	Lake Melville East of Little River	53 35 22	-59 28 44	HS		RTWQ / Hydrometric

STATIONS UNDER DISCUSSION/NEGOTIATIONS
Nalcor Energy will be establishing one station in the Rigolet area in 2012; it was initially due to be installed in 2011 but was delayed so that a more suitable location can be chosen.
Central Waste Management Authority may establish two stations in Norris Arm at the new waste management facility.
Teck (Duck Pond Operations) may establish an additional groundwater station in the vicinity of the new boundary deposit.

***** The well at Voisey's Bay is being relocated to a better location during 2011-12.

* * These stations are also part of the ambient water quality index network where grab samples are collected 4 or 5 times per year depending on the classification of the station.

VA – Vehicle Access Site
HS – Helicopter Access Site
BS – Boat Access Site

Notes:

1. All real-time water quality stations have grab samples collected on a monthly basis for QA/QC purposes; all analysis is completed at the same lab as that used for the analysis of the samples under the drinking water program and the cost is covered by NL ENVC.

2. There will be approximately 200 grab samples taken for RTWQ stations as part of the QA/QC procedures. The samples will be sent to a private laboratory due to required turnaround times. Laboratory costs will be covered by NL ENVC.

Figure 3 – Real-Time Water Quality Stations 2011-2012 – Newfoundland

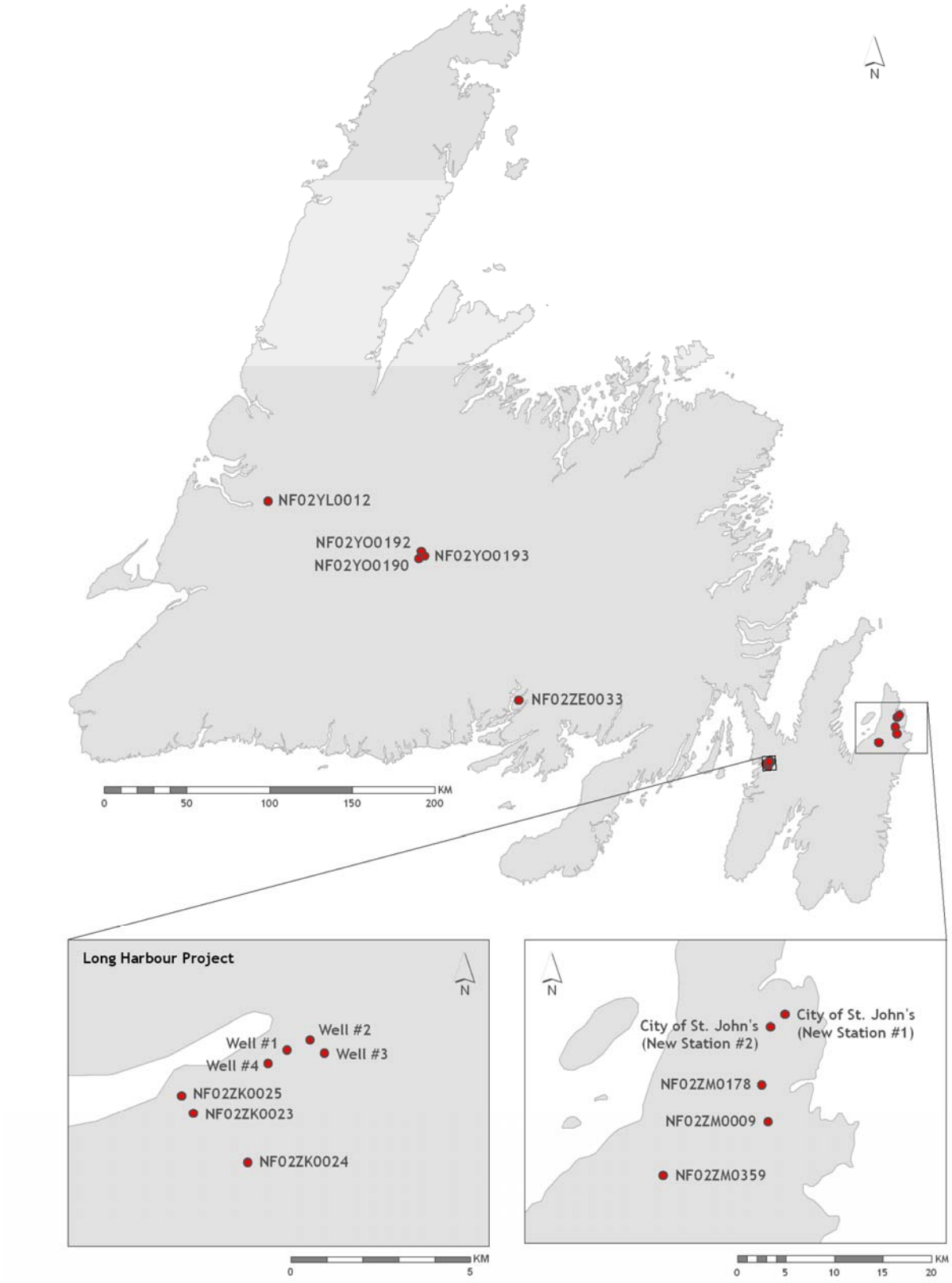


Figure 4 – Real-Time Water Quality Stations 2011-2012 – Labrador

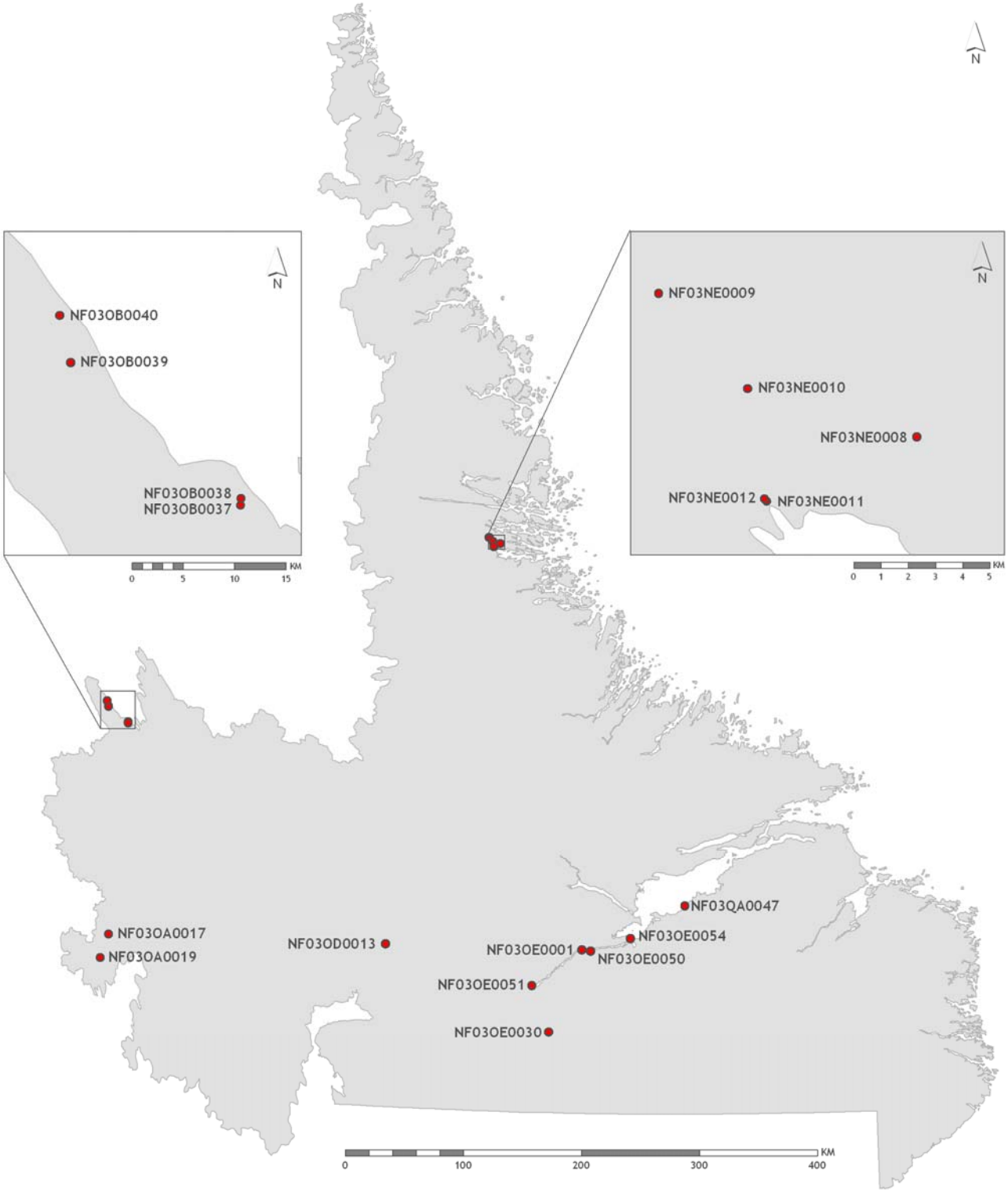


Table B.7 – Special Projects for Fiscal Year 2011-2012 (work shared activities)

Project	Activity	Responsible Agency	Remarks
Automated Uploading of Field Data	Testing of equipment that is capable of automatically uploading field data into correct forms as required by the laboratory	Environment Canada Newfoundland and Labrador Department of Environment and Conservation – staff	EC has purchased equipment and developed software to enable automated uploading of field data from water quality sondes. NL ENVC field staff will be testing this equipment to determine if it will be beneficial to the sampling program in reducing data entry errors. This is a multiyear project that will commence in fiscal year 2011-2012.
Site-specific Guidelines Project	Development of site-specific guidelines for select NL water bodies	Newfoundland and Labrador Department of Environment and Conservation – Kyla Brake/Joanne Sweeney	NL utilizes the national *CCME Protection of Aquatic Life Guidelines* in the majority of cases. However, in some instances the national guidelines are not applicable due to high background concentrations of select parameters. This project will aim to develop site-specific guidelines for select parameters at select NL water bodies which better reflect the actual characteristics of the water body. This is a multiyear project that commenced in fiscal year 2010-2011 and will carry over into 2011-2012.
Mobile Environmental Monitoring Platform (MEMP)	In-situ water quality/quantity monitoring using a mobile environmental monitoring platform on a need-basis across the province	Newfoundland and Labrador Department of Environment and Conservation – Ryan Pugh Environment Canada	The MEMP is a rapidly-deployable, trailer-mounted, water quantity, quality and weather station combined. The MEMP is also equipped with a refrigeration system to ensure grab samples collected by the autosamplers remain cool and resistant to degradation throughout the holding time. This platform has been fully equipped, functional and utilized at a station on Outer Cove Brook during fiscal year 2010-2011. EC provided capital costs for the MEMP as part of the Atlantic Monitoring Capital Plan during fiscal year 2010-2011. ENVC contributed the truck as well as some additional equipment during fiscal year 2010-2011. The MEMP will be continuously utilized, upgraded and improved in upcoming years. EC and ENVC will continue to work together to share expertise in this area. ENVC will continue to dedicate one staff (Ryan Pugh) as the custodian of this unit.

Blue-green Algae Monitoring	Monitoring of blue-green algae on a need basis (Paddy's Pond and surrounding water bodies)	Newfoundland and Labrador Department of Environment and Conservation – Joanne Sweeney	In recent years there have been blue-green algae blooms detected in Paddy's Pond and some of the surrounding water bodies. In 2011-2012, there will be visual observations of these particular water bodies throughout the most sensitive summer/fall months when blooms most commonly occur. If a bloom is detected visually, subsequent samples will be collected and analysed on a need basis. A report will be prepared at the end of the season (if any blooms are detected). This report is to be finalized by the end of fiscal year 2011-2012 (if warranted).
Automated Weather Stations	Operation of four automated weather stations to provide valuable climate information to support water quantity and quality analysis	Newfoundland and Labrador Department of Environment and Conservation – staff	There are currently four automated weather stations established across the province (one in each region). The staff responsible for each station is as follows: Eastern: Joanne Sweeney Central: Robert Wight Western: Ian Bell Labrador: Grace Gillis NL ENVC staff is responsible for the day-to-day operation and maintenance of the automated weather stations. The data management and reporting is the responsibility of the Hydrologic Modeling Section within WRMD. This is an on-going task.
Application of Earth Observation for Water Quality Monitoring	Assessing if Earth Observation can be used to monitor the impact of development projects on water resources Building knowledge in using high resolution data/imagery to extract water resources related information such as land cover, wetlands and water bodies	Newfoundland and Labrador Department of Environment and Conservation – Keith Abbott	NL ENVC staff is working to assess if Earth Observation can be used to monitor the impact of development projects on water resources. Additionally, NL ENVC staff is continuing to build knowledge in using high resolution data/imagery to extract water resources related information such as land cover, wetlands and water bodies. More specific project details will be determined. NL ENVC staff will share testing results with EC since this technology may be used more broadly throughout the Atlantic region. This is a multiyear project that commenced in fiscal year 2010-2011 and will carry over into 2011-2012.

Monitoring Network Evaluation and Optimization	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.	Environment Canada Newfoundland and Labrador Department of Environment and Conservation – staff	EC is developing a science-based methodology for characterizing WQA related monitoring stations and assessing risk at the station level and this has been presented to NL ENVC for their review and feedback. Initial RB scores will be presented by EC and there will be opportunity for NL ENVC to provide expert opinion and scientific data to refine the RB station scores. This work will be done in conjunction with reviewing CESI core vs local site designation in context of national and provincial reporting. In addition to the sensitivity analysis work identified under the CESI reporting project, it is proposed to develop a plan to evaluate sampling frequencies for trend detection. This will complement the trend analysis work being completed by NL ENVC. In parallel, there will be discussion on federal, federal-provincial and provincial sites designation based on respective and joint roles and responsibilities. Similar discussion will occur with other federal and provincial partners. This is a multi-year project that will commence in 2011-2012 with a start-up meeting in January 2012 to discuss potential projects and to develop a plan for upcoming fiscal years.
Real-Time related projects	Trouble-shooting with issues at real-time stations	Newfoundland and Labrador Department of Environment and Conservation – Renee Paterson	Problems/issues that arise from all real-time stations will be identified by staff responsible for each station and brought to the attention of the Program Lead to be addressed as appropriate. This is an on-going task.

	Audit real-time stations visits/meet with clients	Newfoundland and Labrador Department of Environment and Conservation – Renee Paterson	The Program Lead will identify a select number of real-time stations to audit each year to provide quality assurance and consistency to the real-time monitoring program. The Program Lead will aim to meet with industry clients at least once a year to discuss and address any issues that may arise. This is an on-going task.
	Planning for Real-Time Water Quality Monitoring for Mega-projects	Newfoundland and Labrador Department of Environment and Conservation – Renee Paterson	Review all projects that enter the provincial environmental assessment process to assess the project's impact on water quality. Provide input and recommendations for real-time water quality monitoring where deemed appropriate. EC will consider support in context of inter-provincial waters, when applicable. This is an on-going task.
	Negotiation/renewals of Memorandum of Agreements with industry	Newfoundland and Labrador Department of Environment and Conservation – Renee Paterson	NL ENVC uses a collaborative process to engage potential stakeholders and encourage partnership through the Real-time Water Quality Monitoring Program. This engagement is generally in the form of an introductory presentation given by the Coordinator followed by correspondence to determine the more detailed logistics involved. When agreement in principle is made between NL ENVC and the industry partner, a formal Memorandum of Agreement is negotiated and signed by both parties. This is an on-going task.
	Provide training on procedures to clients	Newfoundland and Labrador Department of Environment and Conservation – Renee Paterson/Grace Gillis/Robert Wight/Tara Clinton/Ryan Pugh	In fiscal year 2011-2012, it will be necessary for select NL ENVC staff to provide training sessions to select clients to ensure they are up-to-date on the techniques that need to be used under the real-time program. The planned training sessions are as follows: Grace Gillis – Vale (Vosiey's Bay)/Labrador Iron Mines Robert Wight – Conne River Ryan Pugh/Tara Clinton – Vale (Long Harbour)

	Regular graph reviews and alerting appropriate staff	Newfoundland and Labrador Department of Environment and Conservation – Tara Clinton	In order to address the main objective of the real-time monitoring program (to catch emerging water quality issues in order to initiate a proactive response), one NL ENVC staff has been tasked with performing daily reviews of the real-time water quality graphs on-line to identify issues and alert the staff responsible for that particular station so action can be initiated as appropriate. This is an on-going task.
	Advanced specialized training on servicing/repair of HACH equipment	Newfoundland and Labrador Department of Environment and Conservation – Tara Clinton/Ryan Pugh	Two NL ENVC staff (Tara Clinton and Ryan Pugh) will receive specialized training on servicing/repair of HACH equipment from the manufacturer in Loveland, Colorado. This training will provide these staff with the necessary skills to perform in house servicing/repairs to the real-time instrumentation. The move towards in house servicing/repairs will cut down on operational costs incurred by the program.
	Establishment of Quality Control Laboratory	Newfoundland and Labrador Department of Environment and Conservation – Renee Paterson/Tara Clinton/Ryan Pugh	The existing laboratory will be completely renovated by September 2011 as per specifications outlined by NL ENVC. All servicing/repairs to automated equipment will take place in this laboratory. As discussed in more detail in Schedule C, this service will also be available for shared automated instrumentation from EC Atlantic. This is a multiyear project that commenced in fiscal year 2010-2011 and will carry over into 2011-2012.

	Instrumentation to monitor water quality at key joint monitoring sites	Environment Canada Newfoundland and Labrador Department of Environment and Conservation – Renee Paterson/Tara Clinton/Ryan Pugh	See Annex II - EC-shared Instrumentation Inventory EC in-kind contribution based on annual value of $3,000 per instrument for a life cycle of 5 years (each instrument totals $15,000 over 5 years); 3 instruments are outdated and in need of replacement. ENVC will provide in-kind contribution for regular servicing and performance checks (performed by ENVC) on shared instruments at the newly renovated lab (see page 34). EC and ENVC will cost share the amount required for sensor replacement to the shared instruments (with EC paying a maximum of $5,000 per year).
	Review/Revision of QA/QC protocols for Real-Time Water Quality data	Newfoundland and Labrador Department of Environment and Conservation – Renee Paterson/Tara Clinton/Ryan Pugh/Grace Gillis	The current protocols being used for QA/QC under the real-time program are being assessed and revised where appropriate. In fiscal year 2010-2011, a complete review of all protocols (including field, lab and office) took place. Additionally, statistical analysis was done to compare QA/QC lab samples to real-time field data. In fiscal year 2011-2012, the protocols will be analysed further and documented in the Real-time manual currently being developed. This is a multiyear project that commenced in fiscal year 2010-2011 and will carry over into 2011-2012.
	Continued Testing and Implementation of new Automated Deployment Spreadsheet	Newfoundland and Labrador Department of Environment and Conservation – Ryan Pugh/Leona Hyde	An automated deployment spreadsheet has been developed and in use by NL ENVC staff since January 2010. This spreadsheet will continue to be utilized and tested by all NL ENVC staff throughout fiscal year 2011-2012. Discussions/meetings will be initiated with the programming staff for integration of the spreadsheet capabilities into the existing ADRS. This is a multiyear project that commenced in fiscal year 2010-2011 and will carry over into 2011-2012.

	Host 3rd Real-Time Water Quality Monitoring Workshop 2011 (June 2011)	Newfoundland and Labrador Department of Environment and Conservation – Renee Paterson/Tara Clinton	WRMD will be hosting its third national Real-Time Water Quality Monitoring Workshop in June 2011. The objective of this workshop is to bring together various jurisdictions, institutions, organizations, suppliers and industry that are using or interested in applying real-time technology in their respective water quality monitoring programs. The workshop will be a vehicle for the exchange of information, ideas and expertise and to discuss a path forward for real-time water quality monitoring.
	Comparison Study between Various Turbidity Monitoring Instrumentation	Newfoundland and Labrador Department of Environment and Conservation – Ryan Pugh Environment Canada	There is a variety of instrumentation that is capable of monitoring turbidity available from several manufacturers. It is important to do an in-depth study to look at how each instrument functions in relation to NL waters since turbidity is one of the main parameters of concern from an industrial monitoring viewpoint. Initially, a background document will be prepared to demonstrate the variety of equipment available and the advantages and disadvantages of each instrument. This report will then be followed up by an in-field testing scenario (comparison study) to determine if the existing equipment is providing valuable turbidity information or if improvements need to be made. EC will support review of the study. This is a multiyear project that will commence in fiscal year 2011-2012 and will carry over into 2012-2013.
	Categorization of Turbidity Alerts	Newfoundland and Labrador Department of Environment and Conservation – Tara Clinton/Shibly Rahman/Leona Hyde	A project is being initiated in fiscal year 2011-2012 by NL ENVC staff to categorize the turbidity alerts received from the industrial station operating in Long Harbour (VALE) to be able to assign various levels of importance. This is a multiyear project that will commence in fiscal year 2011-2012 and will carry over into 2012-2013.

	Organization of Datalogger Programming Course for all real-time staff	Newfoundland and Labrador Department of Environment and Conservation – Renee Paterson	A Datalogger Programming Course (offered by Campbell Scientific Canada) will be arranged for all real-time staff .This course will be completed in fiscal year 2011-2012.
	Coordination of Temperature Probe Installations	Newfoundland and Labrador Department of Environment and Conservation – Joanne Sweeney	Throughout the past couple of years a number of temperature probes were purchased by NL ENVC to be installed at numerous hydrometric stations across the province on a priority basis. This task is coordinated by Joanne Sweeney in conjunction with EC counterparts from Water Survey of Canada. This is an on-going task.
	Establishment of Standalone Station on Paddy's Pond (testing of communication equipment; testing of instrumentation)	Newfoundland and Labrador Department of Environment and Conservation – Ryan Pugh/Joanne Sweeney/Leona Hyde	The NL real-time network has been successful due in large part to the expertise and cooperation of the WRMD and EC – Water Survey of Canada. As a result of such close partnership, WMRD has never endeavored to establish a station without the aid of another party. In an attempt to become familiar with the process, WRMD is constructing a standalone station on Paddy's Pond near St. John's. The construction of the hut is completed. There will be a variety of water quality instrumentation, datalogging equipment and telemetry options installed for testing purposes. A location close to St. John's allows for this station to function as a test bed for new techniques and technologies, in addition to providing valuable information on the Paddy's Pond watershed. This is a multiyear project that commenced in fiscal year 2010-2011 and will carry over into 2011-2012.

	Statistical project to determine extrapolation of non-measured data at select real-time stations	Newfoundland and Labrador Department of Environment and Conservation – Shibly Rahman Environment Canada	This is an area of research that is moving forward through work being completed by the USGS in select states. It is time to apply this work to the NL real-time program. WRMD staff will look at the potential of utilizing statistical procedures (using existing real-time data and grab sample data) to extrapolate non-measured water quality parameters. This project is very technical in nature and will be multi-phased. Some preliminary work has been done in this field using NL real-time water quality data by a master's student at MUN. In particular, the area of turbidity vs. TSS as well as specific conductivity vs. various ion concentrations will be investigated in depth. EC will provide support on reviewing the approach, considering its national applicability. This is a multiyear project that commenced in fiscal year 2010-2011 and will carry over into 2011-2012.
	LCD Screen Display	Newfoundland and Labrador Department of Environment and Conservation – Renee Paterson/Paul Neary/Leona Hyde	Development of a LCD screen that will be placed in a public location with all real-time graphs being displayed to bring recognition to the real-time water quality monitoring program. This is a multiyear project that will commence in fiscal year 2011-2012.
	Preparation of "Application Note" for HACH web page detailing case study – Vale (Long Harbour Project)	Newfoundland and Labrador Department of Environment and Conservation – Tara Clinton	There is a section on the HACH web page which displays short case studies for clients where HACH instrumentation is being applied. NL ENVC staff will prepare an "Application Note" detailing the Vale (Long Harbour Project) upon approval from Vale. This case study is to be finalized by the end of fiscal year 2011-2012.

	In-depth data analysis for real-time stations in partnership with Teck (Duck Pond Operations)	Newfoundland and Labrador Department of Environment and Conservation – Robert Wight	During fiscal year 2010-2011, there was significant work completed in investigating and implementing well purging protocols to improve the well data collection and analysis. There remain a number of additional areas where the real-time data from the stations at Duck Pond need to be assessed in more detail. The list is as follows: - investigation of false/positive turbidity readings - integration of weather station data This is a multiyear project that commenced in fiscal year 2010-2011 and will carry over into 2011-2012.
	Definition of parameter limits for email alert system; implementation of email alert system	Newfoundland and Labrador Department of Environment and Conservation – Tara Clinton/Kyla Brake	On a site-by-site basis, NL ENVC staff is working on defining the parameter limits that need to be implemented to trigger the email alert system. The primary parameter that will be looked at in-detail during this fiscal year will be pH. This is a multiyear project that commenced in fiscal year 2010-2011 and will carry over into 2011-2012.
	Testing and implementation of autosampler technology at select real-time stations	Newfoundland and Labrador Department of Environment and Conservation – Tara Clinton/Ryan Pugh	NL ENVC staff will revisit the autosampler technology that was established at Leary's Brook a number of years ago. It will be determined if this technology can be implemented at select stations throughout the network. This is a multiyear project that commenced in fiscal year 2010-2011 and will carry over into 2011-2012.
	Testing, implementation and integration of S::CAN technology into real-time program	Newfoundland and Labrador Department of Environment and Conservation – Ryan Pugh	NL ENVC staff is continuing to test the s::can equipment and determine how to integrate the equipment into our existing infrastructure; s::can equipment will be in use at the Paddy's Pond stand alone station.This is a multiyear project that commenced in fiscal year 2010-2011 and will carry over into 2011-2012.
	Collaboration / transfer of knowledge on set up and deployment of UV sensor owned by EC	Environment Canada Newfoundland and Labrador Department of Environment and Conservation – Ryan Pugh	NL ENVC staff will share testing results with EC since this technology may be used more broadly throughout the Atlantic region. This is a multiyear project that commenced in fiscal year 2010-2011 and will carry over into 2011-2012.

	Collaboration / transfer of knowledge on set up and deployment of buoys owned by EC	Environment Canada Newfoundland and Labrador Department of Environment and Conservation – Ryan Pugh	NL ENVC staff will share testing results with EC since this deployment option may be used more broadly throughout the Atlantic region. This is a multiyear project that commenced in fiscal year 2010-2011 and will carry over into 2011-2012.
	Research and development of new technologies	Newfoundland and Labrador Department of Environment and Conservation – Ryan Pugh/Tara Clinton/Renee Paterson	NL ENVC staff is continuing to research new technologies that may be able to be incorporated into the real-time program (ie: fibre-sensor system; wireless technology; GHG technology; etc.).This is an on-going task.
Partnering on technical projects	Partnering with various organizations in a collaborative effort to investigate new and innovative techniques and technologies	Newfoundland and Labrador Department of Environment and Conservation – staff	The following partnerships are currently being pursued: Working with Wireless Communications and Mobile Computing Research Centre (at MUN) to integrate wireless communication into the real-time program Working with Masters students from the Engineering Department (at MUN) looking into the relationship between TSS and turbidity Working with research group (at MUN) looking at building a surface vehicle capable of supporting water quality sondes Working with research group (at MUN) to provide water quality information to support research initiatives on the west coast of the province and into Labrador

Schedule C

Cost Shared Activities for Fiscal Year 2011-2012

Schedule C – Cost Shared Activities 2011-2012

Project	Activity	Amount Payable	Remarks
Canadian Aquatic Biomonitoring Network (CABIN)	Monitoring of benthic invertebrates of selected water bodies to better assess the aquatic ecosystem health in complement to physical-chemical work. Investigation into new research and development in the field of aquatic biomonitoring, notably in context of new decision tools. Completion of Baseline Report on Reference Invertebrate Assemblages in NL, as part of initial investment for long term effect based monitoring. Poster presentation at the Canadian Water Resources Association Workshop in June 2011 and the Science and Technology Forum (Atlantic Canada) in November 2011.	**$10,000**	- Co-lead between NL and EC - EC will pay its share by March 31st, 2012 to NL Exchequer - NL equivalent financial contribution is part of the Water Quality Monitoring Agreement budget - In-kind contribution in CABIN reference model development and associated assessment tools
Canadian Environmental Sustainability Indicators (CESI)	**Provincial Input to National CESI Reporting** Site selection, water quality data extraction, and manipulation. Decision on WQI inputs and calculation of ratings for core CESI stations. Overview interpretation of results (short document on parameters & issues driving the ratings and spatial trends; issues encountered;	**$20,000**	- NL is the lead jurisdiction and responsible for the completion of work – Kyla Brake - EC will pay its share by March 31st, 2012 to NL Exchequer - EC in-kind contribution for lab analysis for sensitivity analysis project as well as travel to workshop in Toronto - CESI 2011 Report

	etc.). Data analysis and report preparation. NL will validate/contribute to CESI core stations review for longer term WQI national reporting. Sensitivity analysis of sampling frequency on WQI score study using selected core CESI stations. (**Note:** This study requires three years of data which will be completed in 2012-2013)		
	Modifications / Improvements to CESI WQI Calculator Provision of fixes/solutions to issues encountered with calculator Documentation of issues/fixes Improvements to the Help Manual Modifications regarding storing of information in Access (ie: storing of metal variables using hardness based guidelines; storing confidence intervals and related results; etc.) Addressing issues as identified by EC (ie: less than detects; commas; index periods; invalid units; null values; etc.) Initiate investigation into how to make the product accessible to CCME	**$20,000**	- NL is the lead jurisdiction and responsible for the completion of work – Shibly Rahman - EC will pay its share by March 31st, 2012 to NL Exchequer

	Northern Sampling and Analysis (Labrador) Labrador water samples are collected by both federal and provincial staff in support of CESI reporting (for more remote core sites).	**$15,000**	- NL is the lead jurisdiction and responsible for the completion of work - EC will pay its share by March 31st, 2012 to NL Exchequer - Refer to Table B.2 and Figure 2 for sampling details
	TOTAL:	**$65,000**	

Schedule D

Meeting Minutes
April 2011- November 2011

WQMA and Hydrometric Agreement Meeting Minutes
Wednesday, June 29th, 2011
1:30pm – Main Boardroom
Dept of Environment and Conservation

Attendees:

Jean-Francois Bibeault (EC)	Robert Picco (ENVC)
Jean-Guy Deveau (EC)	Howie Wills (EC)
Haseen Khan (ENVC)	Renee Paterson (ENVC)

1) Welcome and Introduction – Haseen

- Haseen welcomed the group and thanked all for making the effort to attend the meeting.
- This planning meeting was delayed this fiscal year for appropriate reasons.
- This meeting is intended to allow high-level discussion of items of strategic importance.
- Haseen conveyed two key messages:
    - These agreements/programs operate through partnerships; challenges will occur from both sides, thus it is important to work together to minimize the impacts but still respond to the directions provided; NL ENVC will continue to support EC in whatever form is needed.
    - The priorities of the various levels of government continuously change so we need to work together to determine ways of "repackaging" our work to meet the needs of the shifting priorities while at the same time ensure we are producing useful outcomes.

2) Federal Priorities and Strategic Direction

- **Water Quality – Jean-Francois**

- The federal government just went through a "warrant" situation.
- There has been some reorganization/reallocation of EC staff to ensure the Shellfish Monitoring Program continues; in turn there are less resources to carry out the work relating to water quality.
- There are numerous initiatives that are taking priority within the federal government mandate. They are as follows:
    - Canadian Shellfish Sanitation Program (CSSP)
    - Oil sands
    - Chemical Management Plan (CMP)
    - Clean Air Regulatory Agenda (CARA)
    - Climate Change initiatives
    - Canadian Environmental Sustainability Indicators (CESI)
    - Canadian Aquatic Biomonitoring Network (CABIN)
    - Integrated Monitoring (science plan)

- There are numerous examples of “integration”. Integrated monitoring remains a priority but should be initiated at the front-line level (ie: integration of programs).

Action Item: Renee will arrange a “brainstorming session” to determine the key elements involved in integrated monitoring within NL. The various gaps and overlaps can be discussed in this session.

- Jean-Francois explained that there are three levels of integration that should be considered including: 1) operational; 2) assessment; 3) reporting.
- There also have been some recent examples of horizontal integration. They are as follows:
    - Water Survey and Water Quality Programs – both programs have been through an audit recently and there is an external push for some form of integration in some areas.
    - CESI and CCME WQM Subgroup – both groups are interested in looking at network optimization and climate change initiatives; a coordinated workshop is being planned to follow in early December 2011.
    - Atlantic MOU – looking at some of the commonalities throughout the Atlantic provinces
    - Connection with other federal departments

- There are some potential areas of upcoming interest in NL (from a federal perspective) including:
    - Development of the Lower Churchill River for hydroelectric power generation as this may involve QC, NL and NS
    - New mining activities
    - Trans-boundary waters with QC in Labrador

- The following initiatives are still a priority under the Canada-NL WQMA:
    - CESI
    - CABIN
    - Testing of s::can in the Mobile Environmental Monitoring Platform (MEMP)
    - Potential for work under CMP (ie: testing of various media through an intensive survey – example could be the cranberry farming operations) – though this may be limited as funding will come late this fiscal year
    - Potential for projects looking at climate change due to the pristine nature of some of the water bodies in NL; this would be an aspect of network optimization/gap
    - Real-time water quality program – very stable and sustainable with little input from federal counterparts; EC is more closely looking at other federal departmental leading roles
    - Maintaining the current grab sample index network

- EC has to become more strategic with the stations that they support and provide significant rationale for their involvement; they will no longer be involved with the operation or maintenance of the real-time station in conjunction with the Miawapukek First Nations; INAC should be approached and leading on behalf of the federal government.

Action Item: Haseen will follow up with Jean-Francois on items discussed in a previous meeting.

- Haseen raised the issue that data management and reporting has been a drawback in the past and remains an area of concern since Cathy Cormier will no longer be working with ENVIRODAT; Jean-Francois will now become the main contact for items relating to ENVIRODAT; it is essential to make the data available in a timely manner and convert data to information; the importance of this issue needs to be communicated to senior managers. Jean-Francois agreed to look into options for addressing this concern (Plan B).

o **Water Quantity – Jean-Guy**

- Jean-Guy reiterated that there have definitely been changes within the federal government; the full scale of the changes are not yet fully understood.
- Currently operating with less funding (salary budget is impacted more than the operation and maintenance budget); however this agreement is starting from a stronger base.
- There is a freeze currently on hiring and the salary inventory is restricted, however, Jean-Guy is working towards making a case for the fact that an additional staff person is needed in NL due to the increasing number of stations annually (ie: reaching the critical level).

Action Item: Bob and Howie will discuss the need of an additional staff person in more detail.

- There is a current review underway of all stations; need to provide better rationale for “why” and “when” stations were established (ie: industry; link to federal priorities; etc.) as well as changes in classification; this information needs to be better documented.

Action Item: Haseen will locate the document that provides the rationale for many of the existing sites and provide to Howie.

Action Item: Jean-Guy will send the spreadsheet.

- There is some discussion as to whether it is more beneficial to have stations funded from within vs by other departments.
- An important note is that NL had a very significant event (Hurricane Igor) in the fall of 2010; this provides important justification for the program.
- There was some discussion around the outcomes of the “bilateral agreements”.

- Jean-Guy provided a short presentation on the options that have been presented to PEI for consideration; it was felt that these options should also be presented to NL even though the current structure is satisfactory to both parties.

Action Item: Jean-Guy will forward the presentation to Haseen and Bob.

Action Item: Haseen and Bob will review the presentation and get back to Jean-Guy if necessary.

- The Hydrometric Workstation is being implemented throughout the country; it will be available in the Atlantic region sometime in November or December.
- Jean-Guy is planning on retiring in December 2011; the scenario for replacement is unknown.
- Bill Appleby is also getting close to retirement.

Action Item: Jean-Guy will discuss the Annual Report with Haseen.

Action Item: Bob will provide provincial hydrology to Jean-Guy.

- The second version of the cost model is almost completed; it is comparable from one province to another; it was presented to AB and they thought it was a good resource.

Action Item: Jean-Guy will provide a cost estimate; it will include indirect costing.

- There was some brief discussion on some of the upgrades completed since Hurricane Igor.
- Jean-Guy and Howie have recently spent a significant amount of time going over the Igor measurements; it would be very beneficial to have it peer reviewed by the province (ie: modeling).

Action Item: Bob will ask Ali to run the data through a model.

- Jean-Guy confirmed with Renee/Bob that WSC will continue to collect the grab samples in Labrador as in previous years; this will be reassessed annually.
- There was brief discussion on some of the new stations that will be installed this fiscal year. Howie and Renee will meet next week to discuss in more detail.

3) Provincial Priorities and Mandate:

- **Water Quality – Haseen/Renee**
- **Water Quantity – Haseen/Howie/Bob**

- There was insufficient time to go into detail regarding the provincial priorities/mandates; however the provincial perspective was interspersed in discussion throughout the afternoon.

4) Path Forward and Next Meeting

- It was agreed that the next high-level planning meeting will be scheduled for late August (potentially in Gros Morne National Park) if the majority of participants are available.

Action Item: Renee will arrange the next high-level planning meeting.

- It will be necessary to have a number of more in-depth technical meetings/conference calls to decide upon all information that will be included in the Annual Work Schedule.

Action Item: Renee will arrange the necessary technical meetings/conference calls.

CABIN Technical Meeting Conference Call
August 4, 2011, 1:30pm NL Time

Attendance: Renee Paterson, Kyla Brake, Vincent Mercier, Lesley Carter

1. Renee enquired if there were any updates from EC regarding cost sharing contributions which could be added to the new annual work schedule. Vince stated that no definite decisions have made and it is still too early to confirm contributions.

Action Item: Renee will include EC contributions for CABIN in the annual work schedule in red, to identify them as tentative amounts.

2. It was agreed that we should continue to try to move CABIN in NL forward, despite the program's uncertain future at the moment. Vince stated that CABIN is a priority right now, as its methods are economical and thus there is a good argument for its continuation. EC's contribution this year may be the use of probes for sampling (and the assistance of Lesley for field work!)

3. Kyla mentioned that while the methods are economical, there is a monopoly on kicknets as only 1 supplier in Canada provides the recommended kicknets at a cost of $400+. Kyla has brought this issue to the attention of Michelle Grey at Canadian Rivers Institute, NB, who has agreed to look into the possibility of manufacturing the nets at a cheaper cost.

4. Update from EC: Don and Wendy (modelers from UNB) met with EC. The current state of the model is complete and useable with a completed manuscript awaiting publication through Canadian Journal of Fisheries and Aquatic Sciences.
The model does not use the BEAST assessment approach as do the other models in the CABIN database, but instead uses the RIVPACS approach. EC feels this is more reliable then BEAST, and more powerful to determine level of divergence.
Dan Bastarache and Tim Pascoe will investigate how to integrate the Atlantic model into the website.
The next step for UNB will be further validation of test sites. Then they will redevelop the model using the data collected in 2010 which was omitted from the first edition of the model.

Action Item: NL to move to 'test site' phase of sampling for 2011.
EC has entered as much of the Gros Morne data as possible.

5. Don suggested redoing one site every year, maybe in each region, in order to track changes over time for climate change studies. 10% or so of the sites should be repeats.

6. Roughness Coefficient, WSC, NL: Water Survey conducting research at sites across Atlantic Canada. Derrick Elliott will know if this project is going ahead or not by Sept 6. This project has to do with Roughness Coefficient, and calculating drag on the bottom of the river. May be useful to co-locate CABIN sites with sites for this project.

Sites considered in NL:
LEARY'S BROOK AT PRINCE PHILLIP DRIVE 47°33'51.3" N 52°44'54.5" W
SALMONIER RIVER NEAR LAMALINE 46°52'40" N 55°46'34" W
SALMON RIVER NEAR GLENWOOD 49°00'40.6" N 54°55'00.8" W
ISLE AUX MORTS RIVER BELOW HIGHWAY BRIDGE 47°36'48.0" N 59°00'35.2" W
SOUTHERN BAY RIVER 48°22'50" N 53°40'26" W

Action Item: EC to update NL on status of this project for possible inclusion of sites from this project with CABIN.

7. UNB modellers agree there are no current gaps in data. 2010 sampling covered their areas of concern regarding temperature, precipitation, etc. Now it is time to move to test sites for model validation.

Action Item: Kyla to determine which CESI Core sites are currently CABIN sites, and if more can be co-located.

Action Item: EC to contact Parks Canada about possibility of PC sampling Mealy Mountains National Park Reserve, the largest national park in Atlantic Canada. (http://en.wikipedia.org/wiki/Mealy_Mountains_National_Park_Reserve)

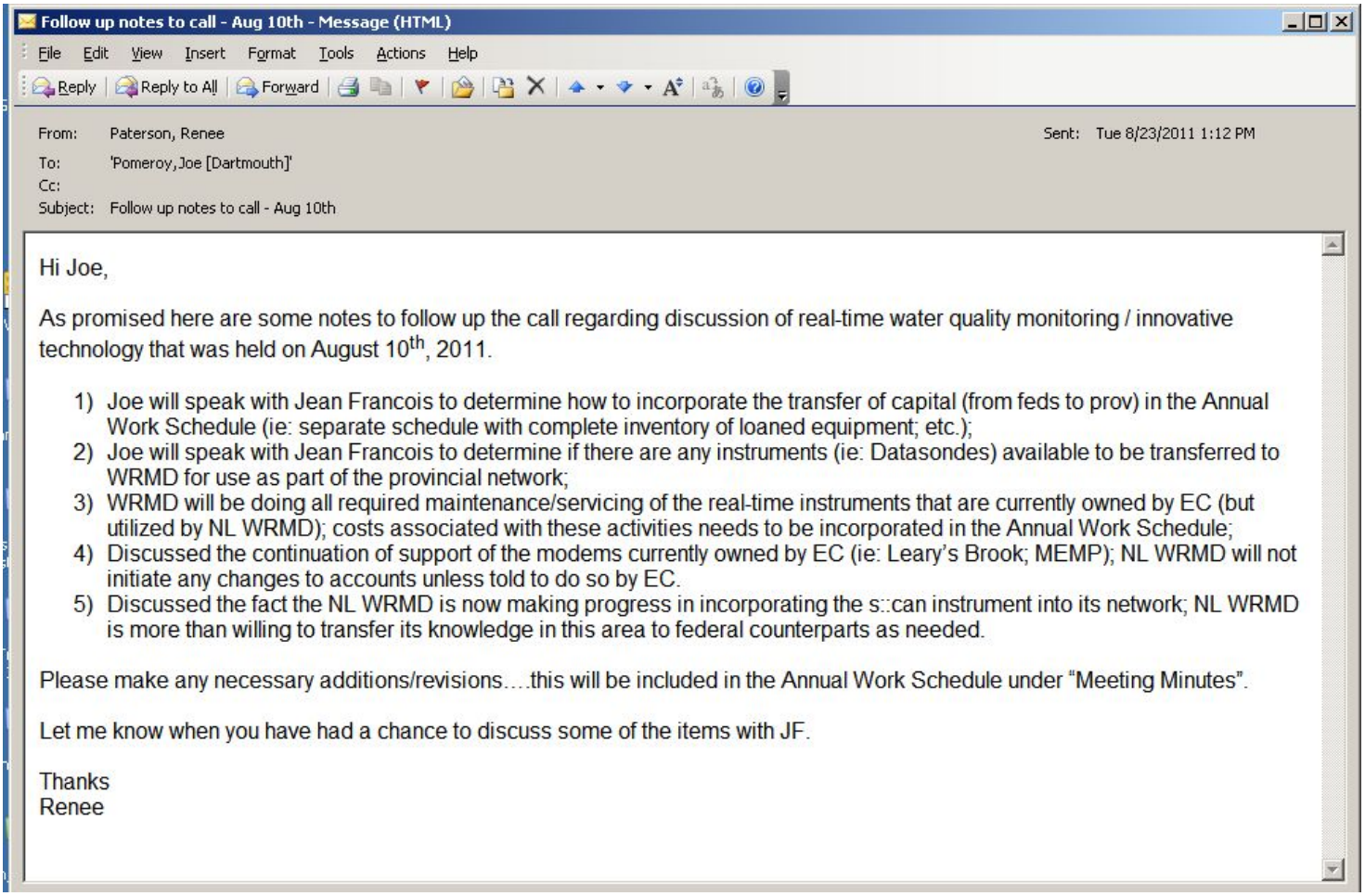
Action Item: Kyla to coordinate NL sampling to begin ~ Sept 6. Kyla to inform staff and Lesley of scheduling options.

8. Baseline Report: Vince has volunteered to start compiling the report together and continuing analysis.

Action Item: Vince will forward report sections for review as available. Kyla will work with Vince to move report forward

~~Meeting adjourned~~

Follow up Notes to Innovative Technology Technical Conference Call
August 10th, 2011



Follow up notes to call - Aug 10th - Message (HTML)

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From: Paterson, Renee
Sent: Tue 8/23/2011 1:12 PM
To: 'Pomeroy,Joe [Dartmouth]'
Cc:
Subject: Follow up notes to call - Aug 10th

Hi Joe,

As promised here are some notes to follow up the call regarding discussion of real-time water quality monitoring / innovative technology that was held on August 10th, 2011.

1) Joe will speak with Jean Francois to determine how to incorporate the transfer of capital (from feds to prov) in the Annual Work Schedule (ie: separate schedule with complete inventory of loaned equipment; etc.);
2) Joe will speak with Jean Francois to determine if there are any instruments (ie: Datasondes) available to be transferred to WRMD for use as part of the provincial network;
3) WRMD will be doing all required maintenance/servicing of the real-time instruments that are currently owned by EC (but utilized by NL WRMD); costs associated with these activities needs to be incorporated in the Annual Work Schedule;
4) Discussed the continuation of support of the modems currently owned by EC (ie: Leary's Brook; MEMP); NL WRMD will not initiate any changes to accounts unless told to do so by EC.
5) Discussed the fact the NL WRMD is now making progress in incorporating the s::can instrument into its network; NL WRMD is more than willing to transfer its knowledge in this area to federal counterparts as needed.

Please make any necessary additions/revisions….this will be included in the Annual Work Schedule under "Meeting Minutes".

Let me know when you have had a chance to discuss some of the items with JF.

Thanks
Renee

CESI Technical Meeting Conference Call
August 11, 2011, 10:30am NL Time

Attendance: Renee Paterson, Kyla Brake, Denis Parent

1. Denis provided an update from EC. They are still in the process of determining budget allocations; the final decision will be made when Jean-Francois returns from annual leave.
2. CESI Submission from NL: Some issues with submitted lake sites. Phosphorus guideline for lake sites changed to 0.02mg/L, instead of the 0.03mg/L used for most sites which are rivers. Estuaries were removed from submission (Carter Basin, Northwest River, Kenamu River). Sites with no dissolved oxygen values were discussed. This is due to sampling procedures from Water Survey of Canada and Parks Canada, who do not measure DO in-situ.
3. For sites with less than the minimum number of samples required, justification must be provided. Action Item: Kyla/Denis will check for justification for sites with <12 samples.
4. CESI Report Timeline: Sept 1-29 – Technical review of report and scores by provinces and regional leads. Expected release date of Dec 23, with updates to website to be released quarterly for other indicators.
5. Some provinces only report their core network stations. NL has decided to continue including as many stations as possible as this adds justification to our sampling sites.
6. Denis stated that it is likely that the annual CESI workshop will not proceed this year.
7. Regarding the annual work schedule, Denis is hopeful the 20k/year for reporting will remain unchanged, and that CESI Calculator work may receive 20-30k; the dollar amount will be decided when Jean-Francois returns from annual leave. Action Item: Renee to adjust the annual work schedule under CESI to indicate the funding is for "Core Federal/Provincial sites".
8. Denis stated that the classification of sites is being done at the national level using a risk-based approach, but he is not sure when it will be shared with provinces but their input will be required soon. Action Item: Denis will follow-up and determine if further input is needed from NL.
9. Sampling Frequency Project: The 3 sites identified last year for increased sampling (8/year) will continue this sampling frequency until informed otherwise. Must have several years of data for it to be meaningful. Action Item: NL staff will continue with special sampling (8/year).
10. Envirodat Issues: Renee and Kyla informed Denis that NL has some issues with Envirodat, as no samples for project 215 have been entered/uploaded since August 2010, with a lag time of 12 months. Action Item: Denis will look into this issue.
11. NS Report: Denis has been working with NS on producing a report of CESI scores. This is still in draft version. Includes samples from 2006 to 2010 at 24 sites, with each site having a page of data/metadata (picture, basin, WQI scores, annual scores and 3 year scores). Also includes stressor information, parameter exceedances, etc. Action Item: Denis will share this product with NL when appropriate.

CESI WQI Calculator Technical Conference Call
Meeting Minutes
August 22nd, 2011

1. Index Period

Issue: In some instances "Date" field cannot capture the three years Index Period using the "Three years" option. In these cases the end user needs to select all data from outside the specified index period range by selecting "All year" option. However at the database level the specified index period in the "All year" option is considered invalid as the date in the "Date" field falls outside the Index Period range.
Action Item EC: Need to quantify the problem to determine whether the issue should be addressed by modification to the calculator code or at the database level. Need to review whether there are additional methods that can be implemented from the user end without changing the existing Index Period selection method.
Action Item DOEC: Need to review if adding the Index Period from the Index_Period column would add more time to project deadline and testing.

2. Comma

Issue: When guidelines are exported to the French version of Access, the commas are transported to the Access database for upper and lower guidelines. This causes problem for Cathy to export the guideline file into the database.
Action Item EC: Serge needs to identify a problem file and send the Export to Access results to DOEC.
Action Item DOEC: DOEC will check whether the comma is carried over in the Access file and figure out appropriate solution to remove the commas.

3. Less than Detect

Issue: In earlier years it was decided that both "<" and "L" were acceptable signs to indicate less than detects. However the database cannot accept "<".
Modification: EC has decided to replace all less than signs ("<") with "L" in order to accept the less than detect value at the database end.
Action Item: DOEC to incorporate the changes in the code to replace all "<" with "L".

4. Maximum Field size for CESI Access Database

Issue: The exported CESI Access Database consists of six data tables consisting data fields of varying lengths. The length of these fields has been set by Cathy as a QA/QC measure in order that no error arises when Cathy export these results into her own database. Hence the user cannot change the field size for the CESI Access Database and any item that is exported to the CESI Access Database with a field size exceeding the size set by Cathy would result to an error message.
Action Item: EC needs to notify Cathy of any changes whenever the default maximum field size of any of the fields in the Access data table needs to be increased.

5. Units

Issue: When valid variable_id (from Web Service) is selected by the user, the corresponding unit would automatically be selected from the available units given into the Web Service. The automatic selection of units would take place internally within the code. However the user needs to ensure that proper units has been retained for the data values of the selected valid variable_ids and any modification from the original unit would require the user to convert the valid variable_id values to correct unit.

Action item EC: EC needs to inform User to properly convert the unit for data values when valid variable_id is selected.

Action item DOEC: Update the help manual and mention regrarding unit conversion once code modification on valid variable_ids is performed. A check needs to be performed on any change in unit_id field after User guidelines are compared to the Web Service guidelines.

6. NULL values

Issue: Clarification is required in what constitutes a NULL and how it will be stored in the CESI WQI calculator Access database.

Solution: Cathy has identified that textual NULL values (CHAR(0)) are not converted in proper format when results are exported to Access.

Action Item DOEC: All textual NULL values needs to be converted to CHAR(0) before it is exported to Access.

7. Duplicates/Triplicates

Solution: EC has developed an internal application that can flag duplicates/triplicates.

8. Database fields

a. ***Wqi_calculated_guidelines:*** guideline_unit_id is not present in the USER guideline option. This needs to be added by the user in order for it to be exported.

Action Item EC: guideline_unit_id is currently present in the CESI Access Database but not in the Web Services. This needs to be added in the Web Services.

Action Item DOEC: Once guideline_unit_id is added to the Web Service, it needs to be exported to Access.

b. ***Wqi_station:*** resp_organization, monitoring_program fields is not present in the Web Service nor the CESI Access Database.

Action Item EC: EC needs to ensure that resp_organization are added in the Web Service as well as in the CESI Access database.

c. ***Wqi_calculated_guidelines:*** Does all items in compliance_id needs to be capitalized?

Action Item DOEC: Changes need to be made in the application for capitalizing all items in the compliance_id.

CESI WQI Calculator Technical Conference Call
Meeting Minutes
November 3rd, 2011

Help Manual

- The users will have the option to see the contents of the Web Service for valid variable id, valid variable names and the valid unit id listed out in the Help Manual in table format.

Action Item: ENVC will incorporate the change in the Help Manual.

- Message needs to be added for the unit conversion when invalid units are changed to valid units in the User Guideline where the user needs to be warned to ensure that the correct conversion has been made manually in the actual input file.

Action Item: ENVC will incorporate the change in the Help Manual.

Test Application for Comma Check

- ENVC has sent a test application to EC. Serge ensured that the test application is working on his end and notified that no comma is appearing in the exported Access Database.

Action Item: ENVC will incorporate the logic used in the test application to exclude comma in the exported Access file.

Calculator Code

Index Period

- There must be a column named "IndexPeriod" in the input file if the reporting year is based on IndexPeriod Column.
- The word "IndexPeriod" should not have any space in between.
- The text "Use IndexPeriod Column" next to the radio button will be more appropriate than "Index Period" in order to clarify the user when IndexPeriod option is selected.
  Action Item: ENVC needs to identify whether making change in text will affect the code behind and modify the text appropriately.

UserGuideline: Variable_id and Unit_id Validation

- EC agrees with the idea of the modified changes to the Calculator that would correct invalid variable_id/unit_id.
- A pop up/warning message will be displayed when incorrect variable_id/unit_id exists in the UserGuideline. An example of the message can be "You have changed units! Please ensure that all corresponding input data has been manually converted."
  Action Item: ENVC will make the required modification to add the warning message.

Detection Limit Keyword

- Different types of keywords for detection limits will be used to store into the exported CESI Access database after computation of confidence interval. This modification will highlight the type of detection limit used by the user when the confidence interval is computed. Since the Access database structure created by Cathy allows two letters for the detection limit method, the following values will be used:
  « DL » if the method of replacement uses the value of the Detection Limit
  « HF » if the method of replacement uses the value of Half the Detection Limit
  « ZR » if the method of replacement uses the value Zero

Action Item: ENVC will incorporate the changes in the VB code to store all the different types of detection limits when confidence interval is stored.

Database

Person responsible for the CESI Database

- Cathy has been appointed to other projects and is no long working on the Atlantic ENVIRODAT and updating the CESI Calculator data (data exported to Access Database) into the EC Database (Enterprise database for EC).
- The new person responsible for the CESI Calculator database (Access and Enterprise) will be Alexandra Audet who is an IM/IT person for EC. Cathy has briefed Alexandra on the CESI Calculator database (Access and Enterprise). There is a possibility of Alexandra visiting NL sometime in the future in order to have face-to-face meeting with NL staff related to Atlantic ENVIRODAT and CESI Access Database.

Action Item: ENVC will send an email to EC identifying the changes in the database structure that needs to be incorporated in the exported Access Database and also to ensure that the exported Access Database fields reflects the Enterprise database for EC. Alexandra will be cc'd in the email. A follow up teleconference will be arranged to further explain to Alexandra about the changes that need to be made in the Access Database.

Action Item: EC will incorporate the change within the next three week to facilitate the completion of the project within the proposed time frame (end of December).

Journal Paper on the CESI WQI Calculator

- EC agreed about the possibility of publishing a journal paper which would detail all the concepts used in the CESI WQI Calculator (Export to Access Database, Web Services, and Confidence Interval).

Action Item: ENVC pull thoughts for publishing a journal paper for the fiscal year 2012-2013.

Action Item: Reneé will discuss the concept of a journal article with Jean Francois.

Meeting Minutes
Federal/Provincial Technical Meeting – Data Management
November 22-23, 2011
EA Boardroom (Dept of Environment & Conservation)
St. John's, NL

Attendance:

Renee Paterson	Jean-Francois Bibeault
Kyla Brake	Julie Boyer
Shibly Rahman	Alexandra Audet
Haseen Khan	Vincent Mercier

Welcome and Introductions
Renee welcomed everyone to the meeting and led introductions.

Federal Provincial Updates & Meeting Objectives
Haseen stressed the linkage between data and products. Now is the time to connect the two by ensuring the data is converted to information and knowledge. NL used ENVIRODAT as a template for the in-house drinking water quality database. ENVIRODAT continues to be essential for the success of the NL WQMA program.

Jean-Francois mentioned that EC has been in a state of transition the past few years and will hopefully now stabilize. What the public sees is what the politicians will see, and there is a push to make data more accessible to the public.

Renee pointed out that all WQMA tasks are listed in the Annual Work Schedule (**AWS**). Suggested changes to txt or tasks should be sent to her ASAP for modification in the AWS.

ENVIRODAT

Data validation
On the EC side, this data flagging task still falls to Denis, who is working on a validation process. Renee stated that the guidance document prepared by Denis will be implemented in NL for WQMA sample validation. Julie mentioned that the aim is to have a national standardized data validation process in the next few years.

Alex provided a history of ENVIRODAT since its conception.

Action Item: Alex to send ENVIRODAT history document to Renee.

Action Item: Renee will change all mention of CSB in AWS to EC.

Alex mentioned that EC is working toward a national water quality data QA/QC protocol in the next two years. The data extraction tool for water quality data will be redeveloped first, then a new database will be created.

Cathy Cormier has approx. 5-7 days of work left to complete a data 'flagging' program. This could be an intermediary step before the national protocol a few years down the road.

Action Item: Alex to send Renee updated text for AWS items previously assigned to Cathy Cormier by Dec 2.

Variable Grouping

Julie has been working on grouping VMV codes as she is a chemist. This item has been in the AWS for several years, so this is welcome progress.

Action Item: Julie will extract the VMV dictionary and send to NL.

Data Archiving

Shibly will be responsible for this on NL's end. This task has been assigned to Dave Benoit with EC. Dave is also responsible for the transfer of data from NLET to ENVIRODAT.

Historical Issues

Alex is now the EC contact for data IM/IT (information management / information technology) issues. Issues with ENVIRODAT should be emailed to Alex and Vince.

Action Item: Kyla to continue documenting ENVIRODAT issues and resolutions.

Data Access- GENIE

The ENVIRODAT extraction tool will be offline by 2012. It will be temporarily replaced by GENIE while awaiting a national data extraction tool.

Alex provided an overview of GENIE via video clip presentations.

Action Item: Alex to provide text for GENIE/ENVIRODAT connection in AWS to Renee.

CANAL

Kyla demonstrated the functions of the CANAL website which is due for structural and content changes. The issue remains unclear as to the future of where CANAL will be hosted (depending on the changes taking place on the federal end). In any event, it is likely that the CANAL URLs will change in the future and we will have to be cognizant of what links will be affected.

Action Item: Renee will discuss this topic in more detail with Paul Neary.

Action Item: Julie to send Kyla a list of CESI 2011 stations which do not have metadata or a link to the CANAL station profile page.

Julie suggested that the WQI tab for the station profiles would be beneficial if they contained all the CESI scores throughout the years the station was reported (eg. bar graphs).

Action Item: NL/EC to investigate whether or not the WQI data tab information can be populated by pulling info from Web services/GENIE.

Vince suggested that the new trend analysis to be done by Shibly should possibly include a flow weighted component.

It was discussed that the addition of CABIN sites to the portal will be different from WQMA, and RT as this data is not readily available to the public (password protected). There will need to be a way of linking to the available benthic NL data.

Action Item: Kyla to investigate if the 'Know Your Watershed' feature of the CABIN database is functioning for NL, and investigate if this feature can be added to NL's Portal.

Action Item: EC to keep NL informed as things move forward and changes are required.

CESI

Shibly provided an updated CESI Calculator demonstration.

Alex commented that the 'web services' which the calculator uses will only be available until the server is removed.

Action Item: Alex to investigate if there are alternative solutions that can handle the gap left by discontinuation of web services in the CESI calculator.

Action Item: Shibly to forward a list of fields the calculator uses from the web services and send it to Alex.

Action Item: Shibly to send warning text to Julie. Julie will translate the 'warning note' which Shibly is implementing in the calculator, warning users that data has not been converted.

Action Item: Shibly will check the latest CESI Calculator Help manual to see if it includes text on how to fully view the Monitoring Agreement list (hold mouse over selection).

Action Item: Shibly will send CESI Calculator meeting minutes to Alex for her review.

Action Item: NL will thoroughly test the latest calculator edition in December before sending it to EC. EC agrees to test the latest calculator and provide all feedback to Shibly before end of February 2012, so it can be finalized for end of fiscal year (March 31st, 2012).

Renee suggested that it would be beneficial to document the CESI calculator work in a peer-reviewed journal article.

Action Item: Shibly will research potential journals for publication; Shibly will begin writing this paper in the upcoming fiscal year.

There was discussion on the use of the CESI calculator by the CCME, and how it could be used for other purposes by outside agencies or internationally. A couple of options were suggested: a) Julie suggested that there be two separate versions of the calculator so that anyone could use it for whatever they want; b) Alex suggested that the code could be modified inside the calculator to better meet the needs. NL's preferred approach would be to treat these as two separate products (ie: CESI calculator and CCME calculator). NL would provide calculator modifications in the form of in-kind support if necessary to achieve a calculator product that would be posted to the CCME website.

Action Item: EC to investigate what would need to change in the calculator for it to be posted to the CCME website.

Action Item: Shibly will begin to investigate what would need to change in the calculator for it to be posted to the CCME website.

Haseen mentioned how there is now a Water Levels Indicator being calculated through CESI and how this work is attempting to tie-in with the CESI water quality work. A presentation on the water levels indicator work might be a good idea for a presentation at the CESI workshop as work is currently underway (led by Martha Guy) to combine the two indicators.

CABIN

Shibly is working on a way to easily convert CABIN database exports into the proper format for use in the Atlantic model. Dalhousie may be building a web interface to support and run the Atlantic Model.

Action Item: Kyla will send Keith a list of CABIN test sites in NL that need to be delineated (to take priority over other CABIN sites), which will allow NL to run NL CABIN data in the model.

EC & NL would like to see the CABIN Baseline Report completed by the end of fiscal year. The focus of the report should be on basic metrics (EPT, Bray Curtis, etc.). Vince said he would need a few weeks at the report to finish a first draft.

Action Item: Kyla & Vince to work on completing first draft of Baseline Report. Kyla can travel to Moncton to work on this with Vince if deemed necessary.

Action Item: Vince to look at the wording of Schedule C, p. 41 in the AWS and advise Renee on changes.

Action Item: Renee will add the presentation of two CABIN posters to the AWS.

Action Item: It was decided that a meeting or call would be appropriate to discuss the future of the Labrador CABIN sampling. This will be arranged by EC.

Miscellaneous

Action Item: Renee will send Jean-Francois the latest version of the AWS for review and changing of text.

Action Item: Jean Francois will let Renee know at what level the AWS will need to be signed (ie: Director; ADM; etc.); Renee will include the appropriate name as directed by Jean-Francois.

Action Item: Jean-Francois will send any final changes for text to Renee by Dec. 2nd.

Action Item: Renee to remove mention of the various EC divisions from AWS and replace with EC for simplicity.

Annex I
Detailed Schema Listings from NLET
Fiscal Year 2011-2012

Detailed Schema Listing

23-Aug-2011 3:17 PM LANE

Schema: ALKPHCOND

Report Label	Ecolims Code	Qualifiers	Method Abbreviation	Envirodat Code	Star Code	Integrated Star	Detection Limit	Reporting Unit
SPCOND	0005	25-		002041	00160		.9	US/CM
PH	0003	25-	ELECTRO	010301	00215		.00	PHUNITS
ALKCACO3	4193	AUTO.INF.PT.	POT.TITN	10111	01498	01501	.1	MG/L
ALKCACO3	4194	AUTO.INF.GRAN	POT.TITN	10110	01499	01502	-999.00	MG/L
ALKCACO3	4195	PHN-	PHEN.TITN	10151	01500	01503	.1	MG/L

Schema Description: pH/Cond/Alk by PC Titrate

Schema Time Unit: 0.280 hours **Substrate:** Water

Holding Time: 1 days **Lab Group:** (1,3) Physicals

Turnaround Time: 8 weeks **Number of Methods:** 5

Batch Size:

Old Schema Name(s):

Active Schema?: Yes

Created by LANE on 6-Feb-2004 3:16 PM

Modified by ANNA on 25-May-2011 7:56 AM

Detailed Schema Listing

23-Aug-2011 3:17 PM LANE

Schema: ANION1-U

Report Label	Ecolims Code	Qualifiers	Method Abbreviation	Envirodat Code	Star Code	Integrated Star	Detection Limit	Reporting Unit
NO3-N-UF	3903	NO3-UNF	IONCHROM-DNX	108317	01650	01654	.005	MG/L

Schema Description: NO3 UNF., DECANTED, ION CHROMATOGRAPHY
Schema Time Unit: 0.020 hours **Substrate:** Water **Batch Size:**
Holding Time: 2 days **Lab Group:** (1,8) IC **Old Schema Name(s):**
Turnaround Time: 0 weeks **Number of Methods:** 1 **Active Schema?:** Yes

Created by SARDELLA on 24-Nov-2010 4:39 PM
Modified by SARDELLA on 24-Nov-2010 4:54 PM

Detailed Schema Listing

23-Aug-2011 3:17 PM LANE

Schema: ANION2-U

Report Label	Ecolims Code	Qualifiers	Method Abbreviation	Envirodat Code	Star Code	Integrated Star	Detection Limit	Reporting Unit
CL-UF	3899	UNF	IONCHROM-DNX	108315	01648	01652	.01	MG/L
SO4-UF	3901	UNF	IONCHROM-DNX	108316	01649	01653	.01	MG/L

Schema Description: CL&SO4_UNF,DECANTED,ION CHROMATOGRAPHY
Schema Time Unit: 0.250 hours **Substrate:** Water **Batch Size:**
Holding Time: 28 days **Lab Group:** (1.8) IC **Old Schema Name(s):**
Turnaround Time: 0 weeks **Number of Methods:** 2 **Active Schema?:** Yes

Created by SARDELLA on 24-Nov-2010 4:43 PM

Detailed Schema Listing

23-Aug-2011 3:17 PM LANE

Schema: COL-APP

Report Label	Ecolims Code	Qualifiers	Method Abbreviation	Envirodat Code	Star Code	Integrated Star	Detection Limit	Reporting Unit
COLOR-AP	2951	UNF-	COLOURIMETRIC	102558	00035		.5	PT-CO UN

Schema Description: COLOR-APP by Spectrophotometry
Schema Time Unit: 0.150 hours **Substrate:** Water **Batch Size:**
Holding Time: 2 days **Lab Group:** (1.3) Physicals **Old Schema Name(s):**
Turnaround Time: 0 weeks **Number of Methods:** 1 **Active Schema?:** Yes

Created by LANE on 6-Feb-2004 3:26 PM
Modified by ANNA on 24-May-2011 11:32 AM

Detailed Schema Listing

23-Aug-2011 3:17 PM LANE

Schema: DIC/DOC1

Report Label	Ecolims Code	Qualifiers	Method Abbreviation	Envirodat Code	Star Code	Integrated Star	Detection Limit	Reporting Unit
DOC	0049	ORG-FLT-	DOC-FLT	006104	00226	00238	.1	MG/L
DIC	2220	INO-FLT-	DIC-FLT	100300	00236	00237	.2	MG/L

Schema Description: DISSOLVED INORGANIC & ORGANIC CARBON-PHOENIX 8000

Schema Time Unit: 0.300 hours **Substrate:** Water **Batch Size:**

Holding Time: 1 days **Lab Group:** (1.2) Nutrients **Old Schema Name(s):**

Turnaround Time: 0 weeks **Number of Methods:** 2 **Active Schema?:** Yes

Created by LANE on 6-Feb-2004 3:08 PM

Modified by DUFFIELD on 7-Nov-2005 3:42 PM

Detailed Schema Listing

23-Aug-2011 3:17 PM LANE

Schema: HARDNESS1

Report Label	Ecolims Code	Qualifiers	Method Abbreviation	Envirodat Code	Star Code	Integrated Star	Detection Limit	Reporting Unit
HRDCACO3	0016	T-	CALCULATED	010606	00300	01374	.5	MG/L

Schema Description: HARDNESS by calculation from AA data

Schema Time Unit: 0.050 hours **Substrate:** Water **Batch Size:**

Holding Time: 56 days **Lab Group:** (1.5) AA & ICP **Old Schema Name(s):**

Turnaround Time: 0 weeks **Number of Methods:** 1 **Active Schema?:** Yes

Created by LANE on 6-Feb-2004 2:35 PM

Modified by ANNA on 24-May-2011 11:29 AM

Detailed Schema Listing

23-Aug-2011 3:17 PM LANE

Schema: MI4-U

Report Label	Ecolims Code	Qualifiers	Method Abbreviation	Envirodat Code	Star Code	Integrated Star	Detection Limit	Reporting Unit
CA-UF	0019	UNF-	DA-UNF	020108	00324	01373	.05	MG/L
MG-UF	0023	UNF-	DA-UNF	012106	00354	01376	.01	MG/L
NA-UF	2888	UNFLT-	DA-UNF	101947	00943	01372	.01	MG/L
K-UF	2886	UNFLT-	DA-UNF	101946	00941	01375	.01	MG/L

Schema Description: CA,MG,NA,K-UNFILT, ATOM. ABSORPTION

Schema Time Unit: 0.170 hours **Substrate:** Water **Batch Size:**

Holding Time: 56 days **Lab Group:** (1.5) AA & ICP **Old Schema Name(s):**

Turnaround Time: 0 weeks **Number of Methods:** 4 **Active Schema?:** Yes

Created by LANE on 6-Feb-2004 2:49 PM

Modified by DUFFIELD on 14-Dec-2007 11:03 AM

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Detailed Schema Listing

23-Aug-2011 3:17 PM LANE

Schema: TM2004/T27W

Report Label	Ecolims Code	Qualifiers	Method Abbreviation	Envirodat Code	Star Code	Integrated Star	Detection Limit	Reporting Unit
AG/T-MS	3645	TOT-UNF	IN-BOTTLE-DIGN	107904	01565	01749	.001	UG/L
AL/T-MS	3646	TOT-UNF	IN-BOTTLE-DIGN	107905	01566	01750	.5	UG/L
AS/T-MS	3647	TOT-UNF	IN-BOTTLE-DIGN	107906	01567	01751	.01	UG/L
B/T-MS	3648	TOT-UNF	IN-BOTTLE-DIGN	107907	01568	01752	.5	UG/L
BA/T-MS	3649	TOT-UNF	IN-BOTTLE-DIGN	107908	01569	01753	.05	UG/L
BE/T-MS	3650	TOT-UNF	IN-BOTTLE-DIGN	107909	01570	01754	.001	UG/L
BI/T-MS	3651	TOT-UNF	IN-BOTTLE-DIGN	107910	01571	01755	.001	UG/L
CD/T-MS	3652	TOT-UNF	IN-BOTTLE-DIGN	107911	01572	01756	.001	UG/L
CO/T-MS	3654	TOT-UNF	IN-BOTTLE-DIGN	107913	01574	01758	.002	UG/L
CR/T-MS	3655	TOT-UNF	IN-BOTTLE-DIGN	107914	01575	01759	.01	UG/L
CU/T-MS	3657	TOT-UNF	IN-BOTTLE-DIGN	107916	01577	01761	.02	UG/L
FE/T-MS	3658	TOT-UNF	IN-BOTTLE-DIGN	107917	01578	01762	.5	UG/L
GA/T-MS	3659	TOT-UNF	IN-BOTTLE-DIGN	107918	01579	01763	.001	UG/L
LA/T-MS	3660	TOT-UNF	IN-BOTTLE-DIGN	107919	01580	01764	.001	UG/L
LI/T-MS	3661	TOT-UNF	IN-BOTTLE-DIGN	107920	01581	01765	.01	UG/L
MN/T-MS	3662	TOT-UNF	IN-BOTTLE-DIGN	107921	01582	01766	.05	UG/L
MO/T-MS	3663	TOT-UNF	IN-BOTTLE-DIGN	107922	01583	01767	.005	UG/L
NI/T-MS	3665	TOT-UNF	IN-BOTTLE-DIGN	107924	01585	01769	.02	UG/L
PB/T-MS	3666	TOT-UNF	IN-BOTTLE-DIGN	107925	01586	01770	.005	UG/L
RB/T-MS	3669	TOT-UNF	IN-BOTTLE-DIGN	107928	01589	01773	.001	UG/L
SB/T-MS	3670	TOT-UNF	IN-BOTTLE-DIGN	107929	01590	01774	.001	UG/L
SE/T-MS	3671	TOT-UNF	IN-BOTTLE-DIGN	107930	01591	01775	.01	UG/L
SR/T-MS	3673	TOT-UNF	IN-BOTTLE-DIGN	107932	01593	01777	.05	UG/L
TL/T-MS	3675	TOT-UNF	IN-BOTTLE-DIGN	107934	01595	01779	.001	UG/L
U/T-MS	3676	TOT-UNF	IN-BOTTLE-DIGN	107935	01596	01780	.0005	UG/L
V/T-MS	3677	TOT-UNF	IN-BOTTLE-DIGN	107936	01597	01781	.005	UG/L
ZN/T-MS	3680	TOT-UNF	IN-BOTTLE-DIGN	107939	01600	01784	.2	UG/L

Schema Description: 27 Total Metals by In-Bottle Digestion ICP-MS
Schema Time Unit: 0.600 hours
Holding Time: 183 days
Turnaround Time: 0 weeks
Substrate: Water
Lab Group: (2.0) Trace Metals
Number of Methods: 27
Batch Size:
Old Schema Name(s):
Active Schema?: Yes

Created by SARDELLA on 23-Dec-2009 1:33 PM

Detailed Schema Listing

23-Aug-2011 3:17 PM LANE

Schema: TN1-U

Report Label	Ecolims Code	Qualifiers	Method Abbreviation	Envirodat Code	Star Code	Integrated Star	Detection Limit	Reporting Unit
TN-N-UF	1554	T-UNF-	COLAUTLV	000077	00292	00440	.014	MG/L

Schema Description: UNFILTERED TOTAL NITROGEN by Colorimetry

Schema Time Unit: 0.210 hours
Substrate: Water
Batch Size:

Holding Time: 7 days
Lab Group: (1.2) Nutrients
Old Schema Name(s):

Turnaround Time: 0 weeks
Number of Methods: 1
Active Schema?: Yes

Created by LANE on 6-Feb-2004 2:58 PM
Modified by ANNA on 24-May-2011 12:50 PM

Detailed Schema Listing

23-Aug-2011 3:17 PM LANE

Schema: TP1-U

Report Label	Ecolims Code	Qualifiers	Method Abbreviation	Envirodat Code	Star Code	Integrated Star	Detection Limit	Reporting Unit
TP-P-UF	0073	T-UNF-	UNF	015413	00260	00259	.0005	MG/L

Schema Description: UNFILTERED TOTAL PHOSPHORUS by CFA
Schema Time Unit: 0.150 hours **Substrate:** Water **Batch Size:**
Holding Time: 365 days **Lab Group:** (1.2) Nutrients **Old Schema Name(s):**
Turnaround Time: 0 weeks **Number of Methods:** 1 **Active Schema?:** Yes

Created by LANE on 6-Feb-2004 2:55 PM
Modified by ANNA on 25-May-2011 7:58 AM

Detailed Schema Listing

23-Aug-2011 3:17 PM LANE

Schema: TURBIDITY3

Report Label	Ecolims Code	Qualifiers	Method Abbreviation	Envirodat Code	Star Code	Integrated Star	Detection Limit	Reporting Unit
TURB	3644		NEPHELOMETRY	104788	01434	01435	.01	NTU

Schema Description: TURBIDITY by Nephelometric Method
Schema Time Unit: 0.080 hours **Substrate:** Water **Batch Size:**
Holding Time: 1 days **Lab Group:** (1.3) Physicals **Old Schema Name(s):**
Turnaround Time: 0 weeks **Number of Methods:** 1 **Active Schema?:** Yes

Created by SARDELLA on 26-Apr-2007 11:05 AM
Modified by ANNA on 24-May-2011 12:53 PM

Annex II
EC-shared Instrumentation Inventory

Serial No.	Model	ID No.	Customer	Station Name	Date of Manufacture	Year of Life Cycle (2011=Year 1)
	Datasonde 5X		**EC (Dartmouth NS)**		**2011**	**(Year 1 of 5)**
	Datasonde 5X		**EC (Dartmouth NS)**		**2011**	**(Year 1 of 5)**
60394	**Datasonde 5**	**60394**		**MEMP**	**January 2011**	**(Year 1 of 5)**
81200047384	**Datasonde 5X**	**H47384**	**EC (Dartmouth NS)**	**Environment Canada #3 (Minipi #2)**	**December 2008**	**(Year 4 of 5)**
44998	**Minisonde 5**		**EC (in Gatineau QC) - First Nations Project**	**Conne River Minisonde**	**February 2007**	**(Year 5 of 5)**
44422	**Datasonde 5X**	**H44422**	**EC (in Gatineau QC) - First Nations Project**	**Southwest Brook below Southwest Pond**	**March 2006**	**(Year 6 of 5) Overdue for replacement**
60300043806	**Datasonde 5X**	**H43806**	**EC (Dartmouth NS)**	**Environment Canada #1 (Main River)**	**March 2006**	**(Year 6 of 5) Overdue for replacement**
60300043820	**Datasonde 5X**	**H43820**	**EC (Dartmouth NS)**	**Environment Canada #2 (Minipi #1)**	**March 2006**	**(Year 6 of 5) Overdue for replacement**