

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

**ANNUAL WORK SCHEDULE  
2010 - 2011**



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

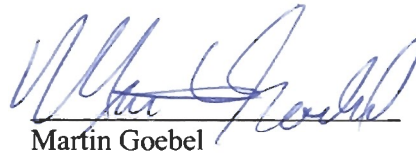


**Canada-Newfoundland and Labrador  
Water Quality Monitoring Agreement  
Annual Work Schedule 2010-2011**

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.



Jean-François Bibeault  
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. Jean Francois Bibeault                      Environment Canada Atlantic Region, 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. Joe Pomeroy                                 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 2010-2011**

**Schedule B – Work Shared Activities 2010-2011**

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

**Table B.1: Index Station Location, Designation and Sampling Frequency 2010-2011 for Newfoundland Stations**

Station #	Description	Latitude	Longitude	Samples/year	Sampled By	Classification
<b><u>EASTERN REGION</u></b>						
NF02ZK0005	Northeast River	47 16 23	53 50 25	8	P	CABIN site 09-10 / 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	Chemical Management Plan / RTWQ / Hydrometric / Local CESI Station
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	Local CESI Station
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
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	Former CESI Station
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	
NF02ZM0178	Learys Brook at Clinch Cres.	47 34 21	52 44 21	5	P	RTWQ / Hydrometric / Core CESI Station
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
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
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	



<b><u>CENTRAL REGION</u></b>						
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	Former CESI Station
NF02YO0142	Corduroy Brook	48 56 21	55 39 47	4	P	Local CESI Station
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	Local CESI Station
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
<b><u>WESTERN REGION</u></b>						
NF02YE0005	Western Brook	49 49 49	57 51 23	5	P	CABIN site 08-09 / Core CESI Station
NF02YE0004	Portland Creek	50 10 54	57 36 13	4	P	
NF02YG0001	Main River at Bridge	49 46 10	56 54 15	5	P	Canadian Heritage River / CABIN site 10-11 / Core CESI Station
NF02YG0009	Main River at Paradise Pool	49 48 46	57 09 24	4	P	RTWQ / Hydrometric / Canadian Heritage River
NF02YG0020	Eagle Mountain Brook	49 49 53	57 17 15	4	P	Local CESI Station
NF02YH0018	Lomond River	49 24 07	57 43 49	4	P	CABIN site 08-09
NF02YJ0004	Pinchgut Brook	48 47 51	58 03 43	8	P	CABIN site 08-09 / Core CESI Station
NF02YK0022	Humber Canal	49 09 58	57 24 56	4	P	
NF02YL0011	Humber River at Little Falls	49 20 54	57 14 07	4	P	Former CESI Station
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

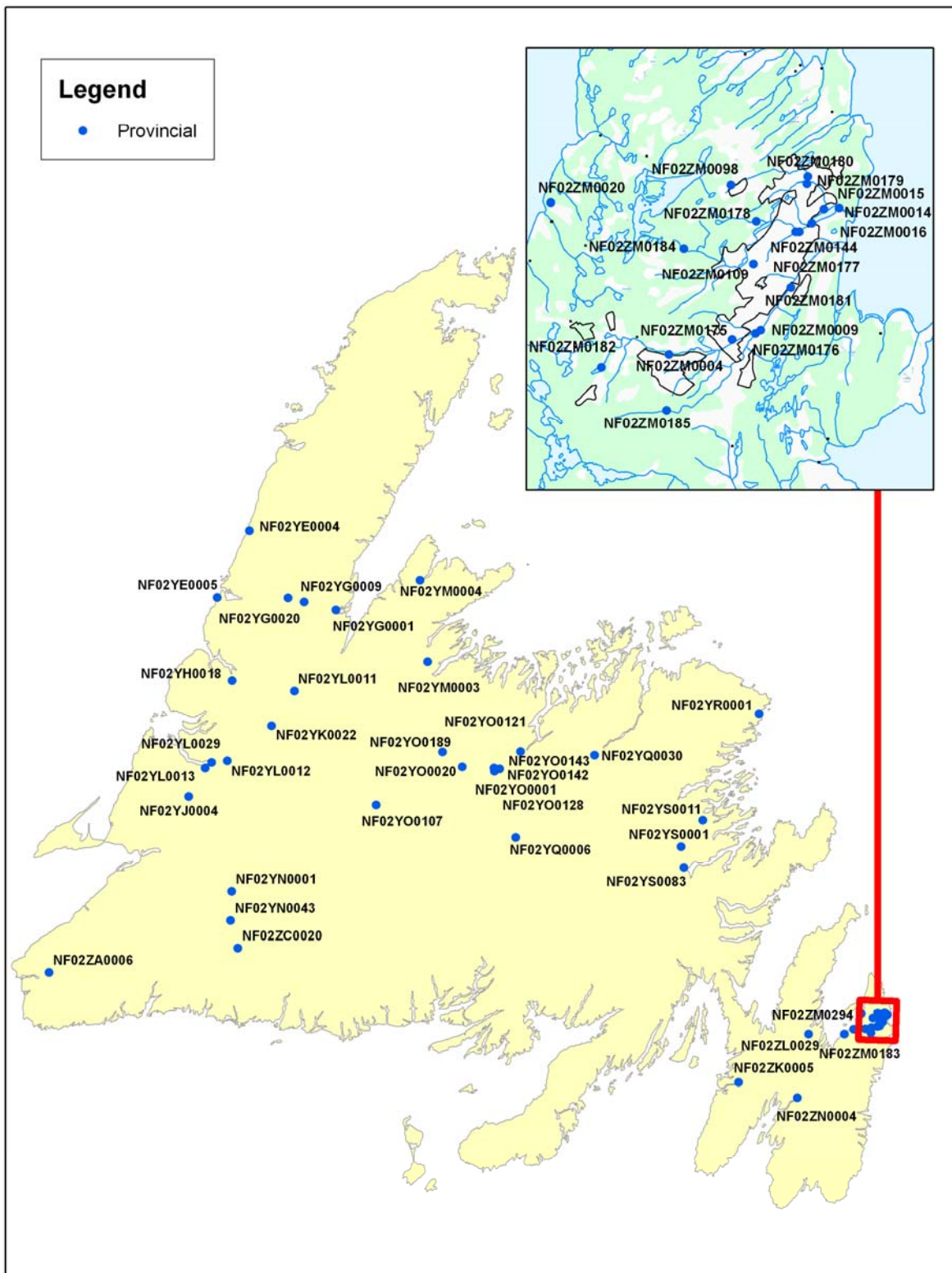
NF02YL0029	Wild Cove Brook	48 58 28	57 53 02	4	P	Local CESI Station
NF02YN0001	Lloyds River	48 18 16	57 43 07	5	P	CABIN site 09-10 / Core CESI Station
NF02YN0043	Peter Strides Lake	48 09 13	57 43 24	4	P	
NF02ZC0020	Buck Lake	48 00 48	57 39 59	4	P	
NF02ZA0006	Grand Codroy River	47 52 08	59 07 05	4	P	

**P-Provincial**

Notes:

1. A total of 57 stations will be sampled during 2010-2011 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 2010-2011 – Newfoundland



**Table B.2: Northern Index Station Location, Designation and Sampling Frequency 2010-2011 for Labrador Stations**

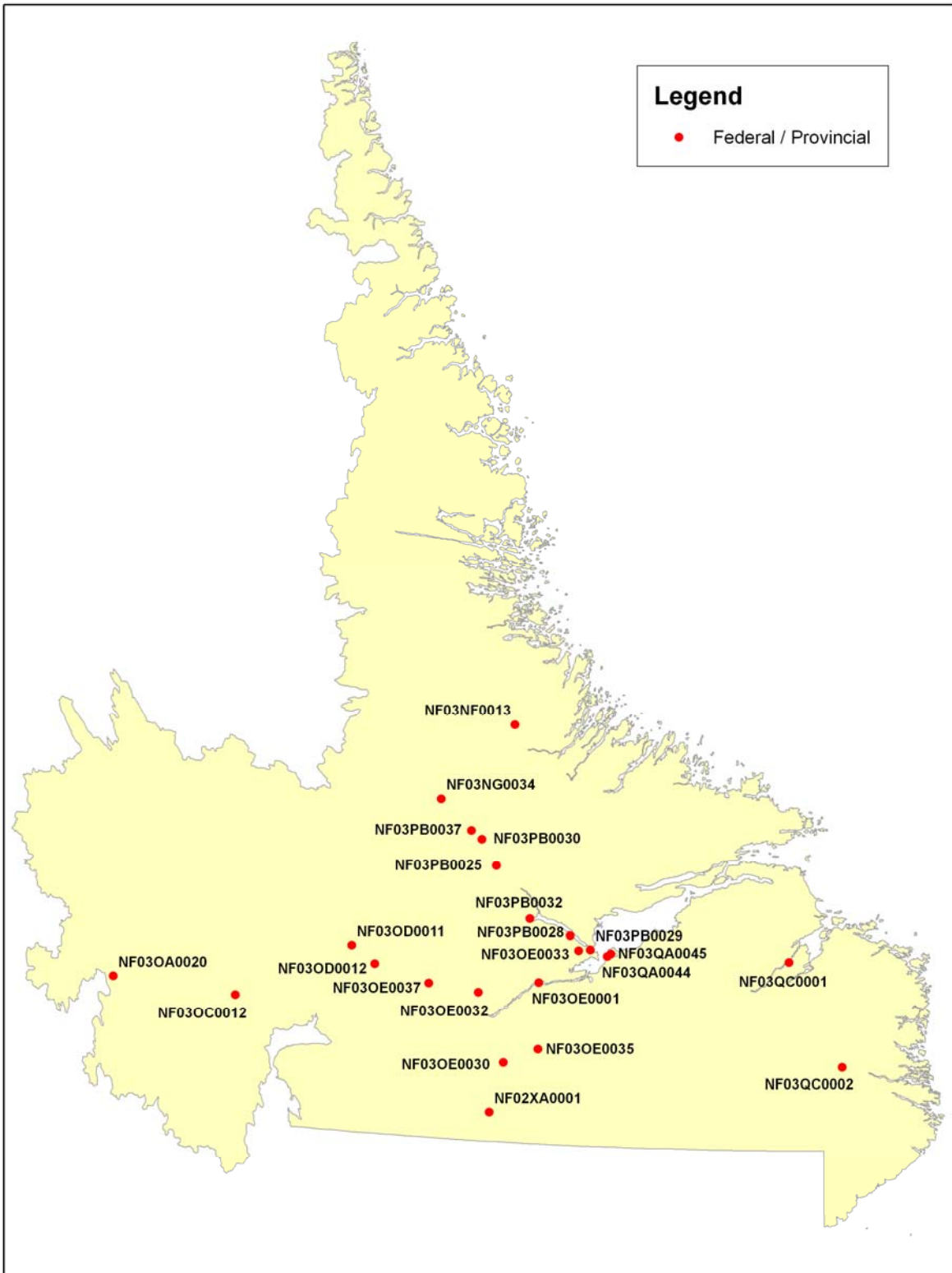
Station #	Description	Latitude	Longitude	Samples/year	Sampled By	Classification
<b>LABRADOR REGION</b>						
NF02XA0001	Little Mecatina River	52 13 42	61 19 32	4	F/P	Hydrometric / Local CESI Station
NF03NF0013	Ugjoktok River	55 13 60	61 17 57	5	F/P	Hydrometric / Core CESI Station
NF03OC0012	Atikonak 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
NF03NG0034	Shipiskan Lake East	54 37 24	62 12 58	3	F/P	Ashkui / 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 / Local CESI Station
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 / Local CESI Station
NF03QA0044	Carter Basin	53 29 52	59 52 25	4	F/P	Ashkui / Local CESI Station
NF03QA0045	Kenamu River	53 28 34	59 55 01	4	F/P	Ashkui / Comp Guidelines Site / Local CESI Station
NF03OA0020	Ashuanipi River	53 0 06	66 14 30	4	P	

**P**-Provincial  
**F**-Federal

Notes:

1. A total of 23 stations will be sampled during 2010-2011 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 96 (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 2010-2011 – Labrador



**Table B.3: Analytical Parameters, Holding Times and Schemas for 2010-2011**

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

\* 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. The report will be made available on the ENVC Departmental web page at a later date.

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

Schema Number	Schema Name	Parameter/ Grouping
1	ALKPHCOND	alkalinity, pH, conductivity
2	MI4-U	Ca, Mg, Na, and K
5	NO3ATL-U	NO3 by IC
6	CLSO4-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	

**Table B.4: ENVIRODAT – Data Management**

Management Activities		Lead Agency	Remarks
<b>Current/Ongoing Special Projects</b>	Data Verification and Validation of Sample/Masurement Data	Environment Canada – ALET/CIOB  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 us 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 our 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.
	Variable Grouping	Environment Canada – ALET/CIOB  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 will initiate a contract over two years (2010-11 and 2011-12) that will secure a chemist that can review existing variables and methods with the aim to facilitate variable grouping and comparability. 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).



	<p>ALET Client Package:</p> <ul style="list-style-type: none"> <li>- Distribution of standardized forms to clients for review</li> <li>- Review of standardized forms and provision of feedback/comments</li> <li>- Revisions/Changes to standardized forms</li> <li>- Adoption of new standardized forms by NL WRMD</li> </ul>	<p>Environment Canada – ALET/CIOB</p> <p>Newfoundland and Labrador Department of Environment and Conservation - staff</p>	<p>ALET will distribute a standardized client package (pending approval) that will include: 1) a multi-sample submission sheet, 2) a project/ parameter submission sheet, and 3) a station submission sheet.</p> <p>These will be the recommended standards for submission of sample, project, and station information.</p> <p>NL staff will review new forms and provide feedback/comments to CIOB/ALET.</p> <p>CIOB/ALET will compile the feedback from clients and make the appropriate improvements to the forms.</p> <p>NL staff will begin to utilize the standardized forms as indicated by ALET.</p>
<b>Sample Submission</b>	Laboratory Procedures and Quality Control Processes	Environment Canada – ALET	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	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.

<b>Management of National Water Quality Database (ENVIRODAT)</b>	Processing and Loading of NLET Data	Environment Canada – CIOB	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 – CIOB	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 (Cathy Cormier) to ensure consistency.
	Establishment of a formal data sharing agreement	Environment Canada – ALET/CIOB  Newfoundland and Labrador Department of Environment and Conservation – Renee Paterson	EC and NL ENVC must develop a data sharing process that will be maintained as part of the agreement and reviewed periodically as to relevance. This data sharing process will essentially provide sign-off for permissions to distribute NL WQMA dataset to other partners and/or users by both EC and NL ENVC.
	Historical Data Issues and Problem Resolution	Environment Canada – CIOB  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 the CIOB contact. EC must ensure that problem resolution is timely and collaborative.
<b>Data Extraction Tool/Web Services</b>	Accessibility/Availability of NL WQMA Dataset	Environment Canada – CIOB/WQMS	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 – CIOB/WQMS  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 – CIOB/WQMS	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). This project is currently in a discovery phase for fiscal year 2010-2011 with a national tool slated for development in fiscal year 2011-2012.
	Regular request of archived NL WQMA data from ENVIRODAT	Newfoundland and Labrador Department of Environment and Conservation – Renee Paterson	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 replace the former dataset.

**CIOB** – Chief Information Officer Branch (Cathy Cormier);

**ALET** – Atlantic Laboratory for Environmental Testing (Art Cook);

**WQMS** – Water Quality Monitoring and Surveillance (Jean-Francois Bibeault)

**Table B.5: Technical Documents and Reporting**

<b>Project</b>	<b>Activity</b>	<b>Responsible Agency</b>	<b>Remarks</b>
<b>CANAL / Site Documentation Database / Bacteriological Database</b>	Structural changes/modifications to CANAL webpage	Environment Canada – WQMS  Newfoundland and Labrador Department of Environment and Conservation – Paul Neary/Leona Hyde/Kyla Brake	In an effort to update the CANAL webpage, there are a number of structural modifications that will need to be made. The basic modifications will be done by NL ENVC staff (ie: incorporating the new WQI scores and new fact sheets; etc.). EC staff will provide technical support and/or advice for making significant modifications (ie: incorporating new tabs/sheets for CABIN data display; structural changes on WQI score page; etc.). This project will take into consideration the context of the Atlantic MOU Water Annex. This is a multiyear project that will commence in fiscal year 2010-2011 and will carry over into 2011-2012.
	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 be reviewing and updating all information in the Site Documentation Database throughout 2010-2011; 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 is to be finalized by the end of fiscal year 2010-2011.
	On-going <u>maintenance</u> 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 <u>populating</u> 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 <u>maintenance</u> 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 will commence 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 will commence 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 will be completed to determine which watersheds under the Agreement have been delineated to date; a priority list of outstanding watersheds that need to be delineated will be compiled; watersheds will be delineated for all routine grab sample stations, real-time stations, hydrometric stations and CABIN stations. This is a multiyear project that will commence in fiscal year 2010-2011 and will carry over into 2011-2012.
<b>Automatic Data Retrieval System (ADRS)</b>	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.
	Testing/Review of ADRS Search Engine	Newfoundland and Labrador Department of Environment and Conservation – staff	All staff will utilize the ADRS Search Engine and provide feedback/suggestions to Leona on potential improvements.
	Improvements to ADRS Search Engine	Newfoundland and Labrador Department of Environment and Conservation – Paul Neary/Leona Hyde	Feedback from staff will be compiled and incorporated into the ADRS Search Engine. This review will be completed by the end of fiscal year 2010-2011.
	Implementation of Automated Deployment Spreadsheet into ADRS	Newfoundland and Labrador Department of Environment and Conservation – Paul Neary/Leona Hyde	After the pilot testing of the automated deployment spreadsheet is completed by real-time staff (Dec. 2010), this automated system will be provided to Paul/Leona for incorporation into the ADRS during fiscal year 2011-2012.
	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 – WQMS  Newfoundland and Labrador Department of Environment and Conservation – Paul Neary/Leona Hyde/Ryan Pugh	In order to ensure this web camera is providing useful information, 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 develop an application to archive photographs and produce movie capabilities EC will provide limited support in context of new technologies/development tool, exploring possibility of using such technology as part of web reporting.
<b>WQMA Search Engine</b>	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 in fiscal year 2010-2011 and will carry over into 2011-2012.
<b>Technical Documents - WQMA</b>	Completion of Stability Study Report	Newfoundland and Labrador Department of Environment and Conservation – Joanne Sweeney	The results of the Stability Study conducted in 2009-2010 will be evaluated, analysed and compiled into a report by NL ENVC staff; the report will be reviewed and approved by EC staff (WQMS; NLET). The report will be made available on the Divisional webpage. This report is to be finalized by the end of fiscal year 2010-2011.
	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 early 2011. This is an on-going task.
	Completion of Intensive Survey 2008-09 Report (Churchill River)	Environment Canada – WQMS  Newfoundland and Labrador Department of Environment and Conservation – Renee Paterson	A draft version of the Churchill River Intensive Survey Report has been completed by EC staff (with input from NL ENVC staff). It is currently undergoing final review by Agreement administrators. This report is to be finalized by the end of fiscal year 2010-2011.

	Completion of Intensive Survey 2009-10 Report (Bonne Bay Ponds)	Environment Canada – WQMS  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 is to be finalized by the end of fiscal year 2010-2011.
	Updating of the Trend Analysis Report	Newfoundland and Labrador Department of Environment and Conservation – staff (TBD)	As assessment of the existing Trend Analysis Report needs to be completed to determine if updates are required. This is a multiyear project that will commence 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.
<b>Technical Documents - RTWQ</b>	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 is to be finalized by the end of fiscal year 2010-2011.
	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 is to be finalized by the end of fiscal year 2010-2011.



	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.
<b>Education / Outreach</b>	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 (2 <sup>nd</sup> 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 will commence in fiscal year 2010-2011 and will carry over into 2011-2012.

- **WQMS** – Water Quality Monitoring and Surveillance (Jean-Francois Bibeault)

**Table B.6 – Special Projects for Fiscal Year 2010-2011 (work shared activities)**

<b>Project</b>	<b>Activity</b>	<b>Responsible Agency</b>	<b>Remarks</b>
<b>Automated Uploading of Field Data</b>	Testing of equipment that is capable of automatically uploading field data into correct forms as required by the laboratory	Environment Canada – WQMS  Newfoundland and Labrador Department of Environment and Conservation – staff	EC has recently 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 2010-2011 and will carry over into 2011-2012.
<b>Site-specific Guidelines Project</b>	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 <i>CCME Protection of Aquatic Life Guidelines</i> in the majority of case., 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 will commence in fiscal year 2010-2011 and will carry over into 2011-2012.
<b>Mobile Environmental Monitoring Platform (MEMP)</b>	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 – WQMS	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 will be fully equipped, functional and utilized at select sites on a need basis as appropriate in fiscal year 2010-2011. The MEMP will be continuously utilized, upgraded and improved in upcoming years. EC is providing capital costs for the MEMP as part of the Atlantic Monitoring Capital Plan (see cost-shared Schedule C).

<b>Blue-green Algae Monitoring</b>	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 2010-2011, 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. This report is to be finalized by the end of fiscal year 2010-2011.
<b>Real-Time related projects</b>	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.
	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.

	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 and data correction under the real-time program need to be assessed and revised if appropriate. In fiscal year 2010-2011, a complete review of all protocols (including field, lab and office) will be reviewed and revised if necessary. EC will share its own procedures to improve common standardization. This is a multiyear project that will commence in fiscal year 2010-2011 and will carry over into 2011-2012.
	Establishment of Quality Control Laboratory	Newfoundland and Labrador Department of Environment and Conservation – Renee Paterson/staff to be determined	A laboratory will be established and NL ENVC staff will be trained in servicing/ repairing of automated equipment. As assessment of the current workspace with recommended improvements will be the first step in the process of redesigning, retrofitting and optimizing the workspace. When complete, this service will also be available for EC Atlantic automated instrumentation. This is a multiyear project that will commence in fiscal year 2010-2011 and will carry over into 2011-2012.
	Development/Testing of new Automated Deployment Spreadsheet	Newfoundland and Labrador Department of Environment and Conservation – staff	A pilot-project is being initiated to develop an automated deployment spreadsheet. This spreadsheet will be created in Microsoft Excel and will provide automatic data correction and graphing. The spreadsheet will be utilized by all real-time staff throughout 2010. The automated deployment spreadsheet will be reassessed after it has been in use for a period of time (January 2011). The spreadsheet will then be passed along to programming staff for integration into the existing ADRS. This is a multiyear project that will commence in fiscal year 2010-2011 and will carry over into 2011-2012.

	<p>Preparation for 3<sup>rd</sup> national Real-Time Water Quality Monitoring Workshop 2011 (June 2011)</p>	<p>Newfoundland and Labrador Department of Environment and Conservation – Renee Paterson/Tara Clinton</p> <p>Environment Canada – WQMS</p>	<p>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. Preparation for this workshop will begin in fiscal year 2010-2011 (ie: booking meeting space; inviting speakers; identifying themes; etc.). EC will provide support to the workshop through in-kind dedicated time. Preparation will begin in fiscal year 2010-2011 and continue into fiscal year 2011-2012.</p>
	<p>Comparison Study between various water quality monitoring equipment (Hydrolab; YSI; S::CAN)</p>	<p>Newfoundland and Labrador Department of Environment and Conservation – Ryan Pugh</p> <p>Environment Canada – WQMS</p>	<p>There is a variety of water quality sondes from several manufacturers utilized in the NL real-time program. It is important to be assured that the data gathered through a myriad of makes and models is representative of the actual conditions exhibited by the water body of interest. NL ENVC staff will follow up on a study that was initiated in 2009 to compare results from various instruments. EC will support review of the study. This is a multiyear project that will commence in fiscal year 2010-2011 and will carry over into 2011-2012.</p>
	<p>Organization of Hydrolab Training Course for all real-time staff</p>	<p>Newfoundland and Labrador Department of Environment and Conservation – Renee Paterson</p>	<p>A Hydrolab Training Course will be arranged for all real-time staff to ensure maintenance/calibration methods are being performed correctly by all staff. This course will be completed in fiscal year 2010-2011.</p>

	<p>Establishment of Standalone Station on Paddy's Pond (testing of communication equipment; testing of instrumentation)</p>	<p>Newfoundland and Labrador Department of Environment and Conservation – Ryan Pugh/Joanne Sweeney</p>	<p>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 will commence in fiscal year 2010-2011 and will carry over into 2011-2012.</p>
	<p>Statistical project to determine extrapolation of non-measured data at select real-time stations</p>	<p>Newfoundland and Labrador Department of Environment and Conservation – Shibly Rahman  Environment Canada – WQMS</p>	<p>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 will be investigated in depth in relation to some of the mega-projects currently underway. EC will provide support on reviewing the approach, considering its national applicability. This is a multiyear project that will commence in fiscal year 2010-2011 and will carry over into 2011-2012.</p>

	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 2010-2011 and will carry over into 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 2010-2011.
	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	There are a number of 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 in-depth analysis of well data and changes overtime investigation of the effects of well purging on real-time values integration of weather station data This is a multiyear project that will commence 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	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. This is a multiyear project that will commence 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 will commence 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 will commence 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 – WQMS 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 will commence 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 – WQMS 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 will commence 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.
<b>Application of Earth Observation for Water Quality Monitoring</b>	Assessing if Earth Observation can be used to monitor the impact of development projects on water resources	Newfoundland and Labrador Department of Environment and Conservation – Keith	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



	Building knowledge in using high resolution data/imagery to extract water resources related information such as land cover, wetlands and water bodies	Abbott	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 will commence in fiscal year 2010-2011 and will carry over into 2011-2012.
<b>Automated Weather Stations</b>	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.
<b>Partnering on technical projects</b>	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

- **WQMS** – Water Quality Monitoring and Surveillance (Jean-Francois Bibeault)

**Schedule C**

**Cost Shared Activities for Fiscal Year 2010-2011**

**Schedule C – Cost Shared Activities 2010-2011**

<b>Project</b>	<b>Activity</b>	<b>Amount Payable</b>	<b>Remarks</b>
<b>Real-time Water Quality Monitoring</b>	<p>Operation of NL Real-Time Water Quality Monitoring Network.</p> <p>(See Table C.1 and Figures 3 &amp; 4 for station details)</p>	<p><b>\$20,000</b></p> <p>(+ \$800 for cond/temp probe; \$15,000 for Datasonde – with no transfer *)</p>	<ul style="list-style-type: none"> <li>- NL is the lead jurisdiction and responsible for the completion of work</li> <li>- EC will support financially one key real-time monitoring site on Miawpukek reservation (Southwest Brook )</li> <li>- EC will pay its share by March 31<sup>st</sup>, 2011 to NL Exchequer</li> <li>- NL equivalent financial contribution is part of the Water Quality Monitoring Agreement budget</li> </ul>
<b>Mobile Environmental Monitoring Platform (MEMP)</b>	<p>Operation of Mobile Environmental Monitoring Platform designated for NL region.</p>	<p><b>\$85,000 - with no transfer *</b></p>	<ul style="list-style-type: none"> <li>- NL is the lead jurisdiction and responsible for the completion of work as described in Table B.6.</li> <li>- EC will provide capital support (one MEMP dedicated to NL region) at the initial value of \$70,000.</li> <li>- EC will support RT repair/upgrade of probes equipments up to a value of \$5,000.</li> <li>- NL equivalent financial contribution is part of the Water Quality Monitoring Agreement budget</li> </ul>
<b>Chemical Management Plan</b>	<p><b>Priority substances</b></p> <p>National priority substances are targeted for water quality monitoring. This year’s work will show a slight increase of monitoring work form</p>	<p><b>\$4,000</b></p>	<ul style="list-style-type: none"> <li>- Co-lead between NL and EC</li> <li>- EC will pay its share by March 31<sup>st</sup>, 2011 to NL Exchequer</li> <li>- NL equivalent financial</li> </ul>

	previous year.		contribution is part of the Water Quality Monitoring Agreement budget
<b>Canadian Aquatic Biomonitoring Network (CABIN)</b>	<p>Monitoring of benthic invertebrates of selected water bodies to better assess the aquatic ecosystem health in complement to physical-chemical work.</p> <p>Investigation into new research and development in the field of aquatic biomonitoring, notably in context of new decision tools.</p> <p>Completion of Baseline Report on Reference Invertebrate Assemblages in NL, as part of initial investment for long term effect based monitoring.</p>	<b>\$10,000</b>	<p>- Co-lead between NL and EC</p> <p>- EC will pay its share by March 31<sup>st</sup>, 2011 to NL Exchequer</p> <p>- NL equivalent financial contribution is part of the Water Quality Monitoring Agreement budget</p>
<b>Canadian Environmental Sustainability Indicators (CESI)</b>	<p><b>Provincial Input to National CESI Reporting</b></p> <p>Site selection, water quality data extraction, and manipulation.</p> <p>Decision on WQI inputs and calculation of ratings for each station.</p> <p>Overview interpretation of results (short document on parameters &amp; issues driving the ratings and spatial trends; issues encountered; etc.).</p> <p>Data analysis and report preparation. NL will validate/contribute to CESI core sites review for longer term WQI national reporting.</p> <p>Sensitivity analysis of</p>	<p><b>\$20,000</b></p> <p>(+ in-kind contribution for lab analysis for sensitivity analysis project)</p>	<p>- NL is the lead jurisdiction and responsible for the completion of work – Kyla Brake</p> <p>- EC will pay its share by March 31<sup>st</sup>, 2011 to NL Exchequer</p> <p>- CESI 2010 Report</p>

	sampling frequency on WQI score study using selected core CESI stations.		
	<p><b>Modifications / Improvements to CESI WQI Calculator</b></p> <p>Provision of fixes/solutions to issues encountered</p> <p>Documentation of issues/fixes</p> <p>Improvements to the Help Manual</p> <p>Investigation of utilizing “R” Software for determination of confidence intervals</p> <p>Implementation of utilizing “R” Software for determination of confidence intervals</p> <p>Testing of calculator (with added statistical functionality)</p>	<b>\$30,000</b>	<p>- NL is the lead jurisdiction and responsible for the completion of work – Shibly Rahman</p> <p>- EC will pay its share by March 31<sup>st</sup>, 2011 to NL Exchequer</p>
	<p><b>Northern Sampling and Analysis (Labrador)</b></p> <p>Labrador water samples are collected by both federal and provincial staff in support of CESI reporting (for more remote core sites).</p>	<b>\$30,000</b>	<p>- NL is the lead jurisdiction and responsible for the completion of work</p> <p>- EC will pay its share by March 31<sup>st</sup>, 2011 to NL Exchequer</p> <p>- Refer to Table B.2 and Figure 2 for sampling details</p>
	<b>TOTAL:</b>	<b>\$114,000</b>	

\* Note the amounts of \$800 (temp/cond probe), \$15,000 (Datasonde) and \$85,000 (Mobile Environmental Monitoring Platform) with no transfer is not included in the total amount.

**Table C.1 Real-time Water Quality Monitoring Stations for 2010-2011 fiscal year**

Station #	Description	Latitude	Longitude	Accessibility	Remarks	Classification
<b><u>VOISEY'S BAY PROJECT (VALE)</u></b>						
NF03NE0009	Reid Brook	56 22 22	62 09 43	HS	- These stations are fully industry funded	RTWQ / Hydrometric / former CESI / EA
NF03NE0010	Camp Pond Brook	56 20 32	62 06 24	HS		RTWQ / Hydrometric / former CESI / EA
NF03NE0011	Lower Reid Brook	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
<b><u>DUCK POND OPERATIONS – TECK</u></b>						
NF02YO0190	Gill's Pond Brook	48 38 26	56 31 44	VA	- These stations are fully industry funded	RTWQ / Hydrometric / EA
NF02YO0192	East Pond Brook	48 40 55	56 30 39	VA		RTWQ / Hydrometric / EA
NF02YO0193	Well after Tailings Dam	48 39 18	56 28 55	VA	- This station is funded by NL ENVC	RTWQ
<b><u>IRON ORE COMPANY OF CANADA (IOCC)</u></b>						
NF03OA0019	Wabush Lake @ Dolomite Road	52 58 00	66 51 33	VA	- These stations are fully industry funded	RTWQ / Hydrometric / EA
NF03OA0017	Wabush Lake @ Julianne Narrows	53 09 05	66 47 08	BS/HS		RTWQ / Hydrometric / EA
<b><u>LONG HARBOUR PROJECT (VALE)</u></b>						
NF02ZK0023	Rattling Brook below Bridge	47 24 51	53 48 26	VA	- These stations are fully industry	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	funded	RTWQ / Hydrometric / EA
<b><u>NALCOR ENERGY (FORMERLY NL HYDRO)</u></b>						
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 6.15km 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
<b><u>LABRADOR IRON MINES</u></b>						
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
<b><u>CANADA-NEWFOUNDLAND AND LABRADOR WATER QUALITY MONITORING AGREEMENT</u></b>						
NF02YG0009	Main River**	49 46 48	57 09 24	HS	- These stations are fully funded by the Canada /Newfoundland and Labrador Water Quality Monitoring Agreement	RTWQ / Hydrometric / Canadian Heritage River
NF03OE0030	Minipi River **	52 36 53	61 11 11	HS		RTWQ / Hydrometric / core CESI station
NF02ZE0033	Water Supply Intake (Miawpukek watershed)	47 50 56	55 46 04	VA		RTWQ / Hydrometric / First Nations
NF02ZM0178	Learys Brook**	47 34 21	52 44 21	VA		RTWQ / Hydrometric / core CESI station
NF02ZM0009	Waterford River**	47 31 46	52 44 34	VA		RTWQ / Hydrometric / local CESI station / Chemical Management Plan
NF02YL0012	Humber River**	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 / Hydrometric
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
<b><u>STATIONS UNDER DISCUSSION/NEGOTIATIONS</u></b>						
<b>Nalcor Energy</b> will be establishing one station in the Rigolet area in 2011 as stated in a letter of intent.						
<b>Vale (Long Harbour)</b> will be establishing a network of groundwater real-time stations in the vicinity of the proposed tailings pond (three in 2011; two in 2012) as stated in a letter of intent.						
<b>City of St. John's</b> will be establishing two stations in the Torbay Road North Commercial Development Area in 2011 as stated in a letter of intent.						
<b>Central Waste Management Authority</b> may establish two stations in Norris Arm at the new waste management facility.						
<b>Teck (Duck Pond Operations)</b> may establish additional stations in the vicinity of the with the new boundary deposit.						
<b>Environment Canada/Department of Environment and Conservation</b> may establish one station in Gros Morne National Park.						
<b>Environment Canada/Department of Environment and Conservation</b> may establish one station in the Mealy Mountain National Park.						
<b>Environment Canada/Department of Environment and Conservation</b> may establish one station in Terra Nova National Park.						

- \* The well at Voisey's Bay is not in operation and will be 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 2010-2011 – Newfoundland

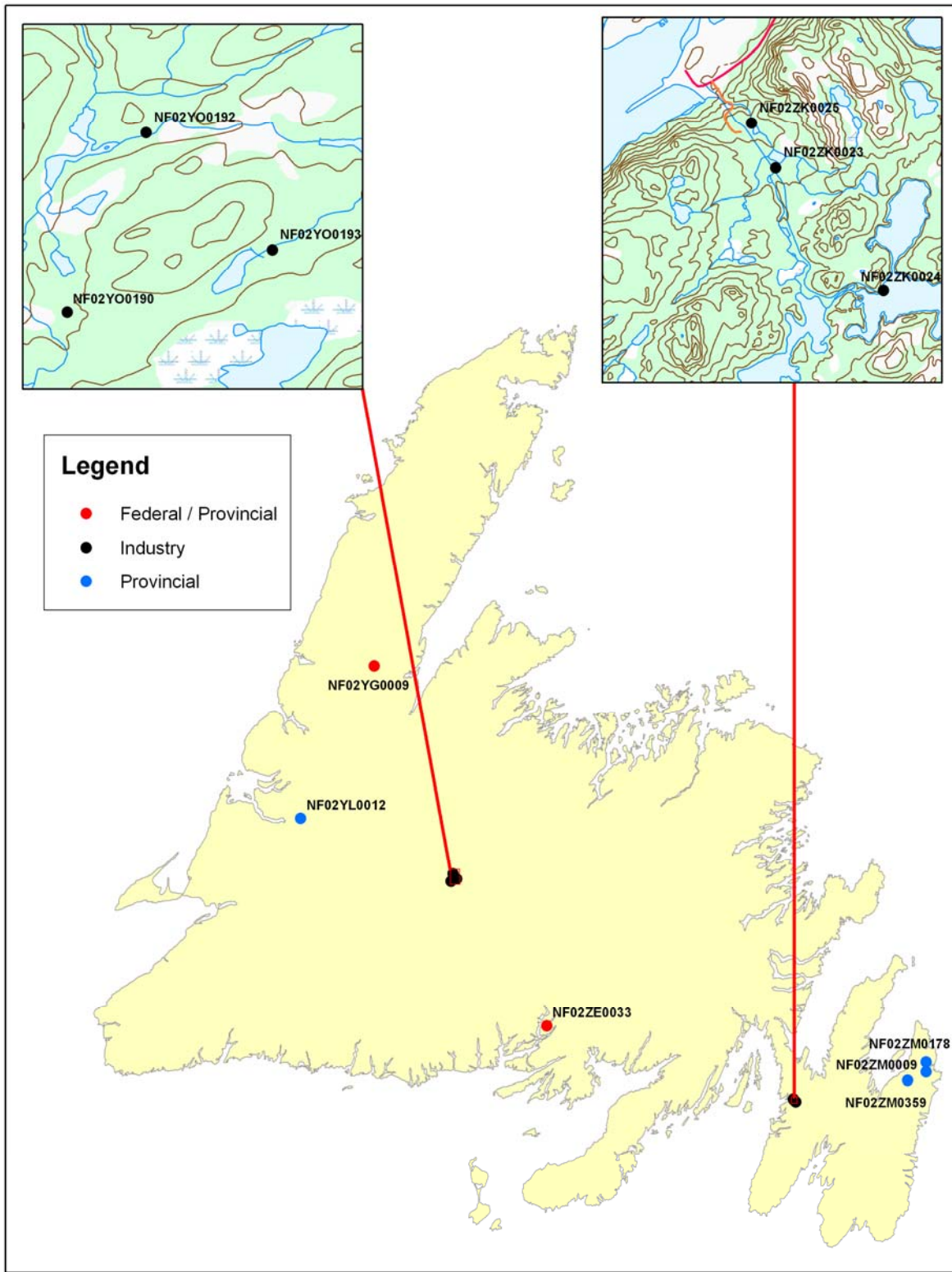
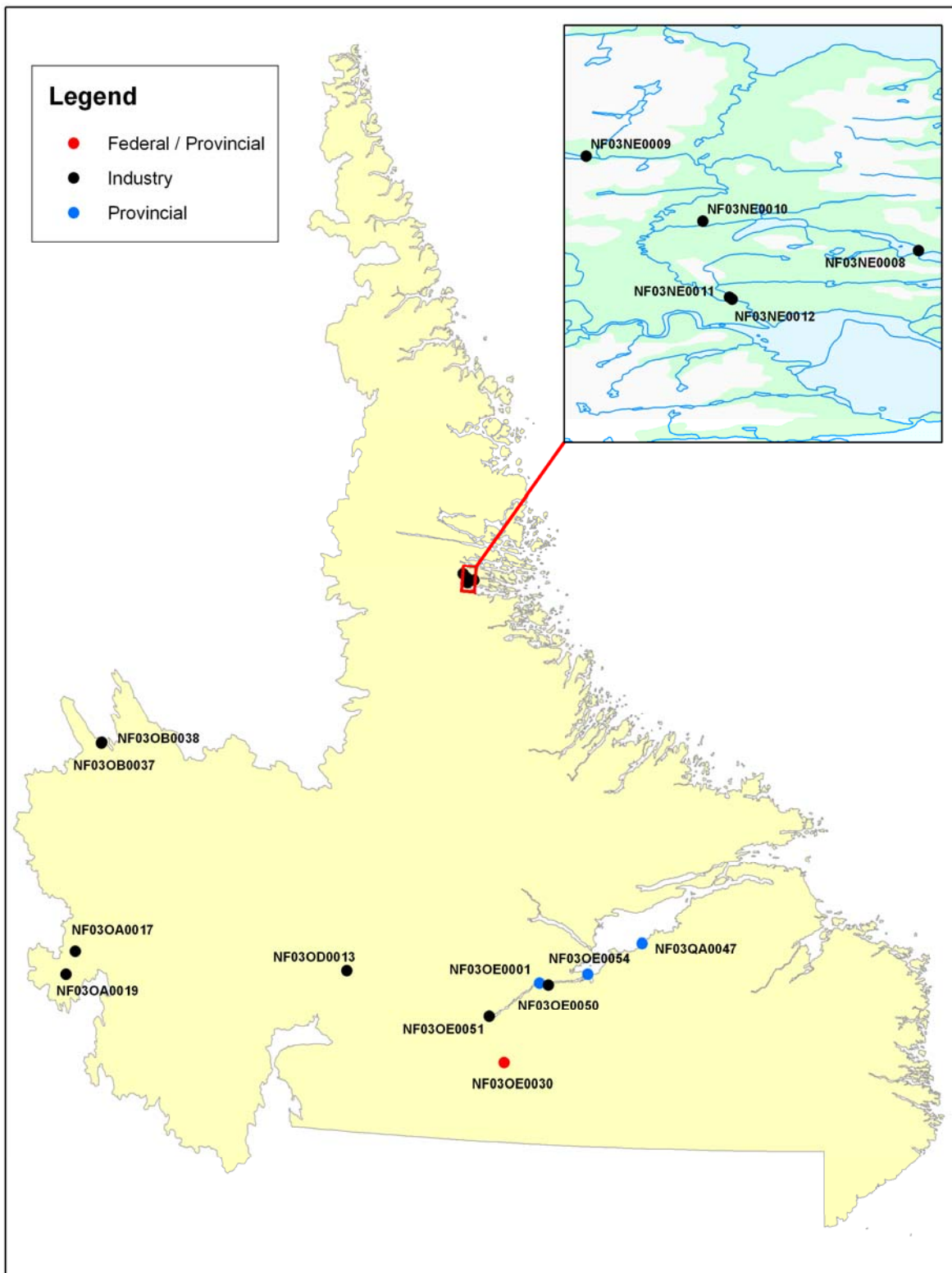


Figure 4 – Real-Time Water Quality Stations 2010-2011 – Labrador



**Schedule D**  
**Meeting Minutes**

**Canada-Newfoundland and Labrador Water Quality Monitoring Agreement Planning Meeting**  
**Environment Canada Bldg**  
**Dartmouth, NS**  
**Date: April 8<sup>th</sup>, 2010**

**Meeting Minutes**

**Participants**

**Jean-Francois Bibeault**  
**Haseen Khan**  
**Denis Parent**

**Vincent Mercier**  
**Art Cook**  
**Renee Paterson**

**Cathy Cormier (by phone)**

**Welcome**

Jean-Francois welcomed everyone to Dartmouth and expressed his pleasure in having representatives from EC and NL “at the table” to discuss high-level priorities of both the federal government (EC) and the provincial government (NL ENVC) and how they can be integrated and prioritized under the *Canada-NL Water Quality Monitoring Agreement*.

**Jurisdictional and Recent Priorities Overview**

- Environment Canada (Jean-Francois Bibeault)

EC has been focusing on the “Clean Water Plan” and still delivering on federal mandates:

- 1) **CESI** has been renewed officially for two years and is recognized as a government priority (CESI discussed in more detail below)
- 2) The ADM in WS&T Section is working towards improving the **CABIN** program (CABIN discussed in detail below)
- 3) The concept of **Integrated Monitoring** has been introduced and is being pursued (ie: CABIN; grab sampling; real-time; hydrometric; etc.)
- 4) Significant emphasis is being placed on **Reporting**; this refers to all forms of reporting including real-time; CESI; CABIN; etc.

There has been significant reorganization throughout EC whereby national initiatives are distributed across Canada; no longer a national office; regions are being reinforced with staff specializing in various subject areas (ie; Real-time; CABIN; CESI; Reporting; etc.)

The Atlantic Region is taking the lead on the following projects:

- 1) Real-Time Monitoring
- 2) CABIN Program
- 3) Web Development

It was discussed that under all programs we need to ensure we have information and products available to clients (ie: academia; industry partners; policy makers; various stakeholders; NGOs; general public; etc.)

The development of the Water MOU and Annex are important initiatives for the Atlantic region; with CCME goals and strategies being recognized as important as well.

It was discussed that EC has been involved heavily in a recent audit; this has been a time-consuming task in preparing all the necessary information, however, it also highlights areas where improvements are needed to be addressed in all program areas.

Jean-Francois indicated that there was a new “Federal Sustainable Development” initiative.

**Action Item: Jean-Francois will email Haseen the information regarding the Federal Sustainable Development initiative.**

- Dept of Environment and Conservation - Water Resources Management Division (Haseen Khan)

Haseen indicated that Jean-Francois provided a great overview of the existing federal government priorities; Haseen stated that many of the NL provincial government priorities are similar to federal priorities; certainly can integrate and work together under the *Agreement* in many areas.

NL is currently in a good economic state therefore no programs have been cut.

There has been significant reorganization in the NL Water Resources Management Division (WRMD) throughout the past year.

- Martin Goebel (former Director of WRMD) has now been assigned the ADM of NL Dept of Environment and Conservation
- Haseen Khan (former Manager of Surface Water Section) has now been assigned the Director of WRMD
- Robert Picco (formerly with MAPA) has been awarded the position of Surface Water Section Manager
- Currently in a restructuring process to assign Program Leads for all major program areas under the Surface Water Section; the assigned individuals as are follows:
  - o Water Quality – Renee Paterson
  - o Drinking Water – Annette Tobin
  - o Community Water and Wastewater – Paula Dawe
  - o Operator Education, Training and Certification – Deneen Spracklin

The ADM (Martin Goebel) is remaining involved as Administrator to the *Canada-NL Water Quality Monitoring Agreement*.

The Director (Haseen Khan) will remain involved with all Federal-Provincial Agreements.

Haseen indicated that the main NL priorities will be touched on throughout the agenda (ie: real-time; ENVIRODAT; CANAL; CABIN: Integrated Monitoring; CESI; etc.)

Haseen indicated that the Annual Work Schedule has been a very important document in clearly setting a “path forward” for the fiscal year; this document is also beneficial during both the federal and provincial auditing process. It was noted that a “Progress Report” should be written at the end of each fiscal year to determine if projects (in the

AWS) are being completed or carried over to the next fiscal year. This too would be beneficial during the auditing process.

**Action Item: Tara will produce a short progress report for fiscal year 2009-2010 evaluating performance.**

The CCME Water Action Plan, Water Annex exercise and Atlantic Water Workshop are all priorities for NL as well.

**Action Item: Haseen will email Jean-Francois with a summary of the McGill Conference.**

Haseen made the suggestion that EC should consider hosting a meeting with all Water Quality Managers across Canada.

### **Overview of Canada-NL Water Quality Monitoring Agreement 2009-2010**

- Main challenges and issues

2009-2010 was a very difficult year for work under the *Agreement*; work continued on the federal and provincial sides but lack of communication led to a misunderstanding about program objectives which resulted in a lack of products/information being made available.

- Main accomplishments

There was significant restructuring and reappointments within EC early in 2010 whereby a new manager (Jean-Francois Bibeault) was assigned to Atlantic Region; this change has been a “boost” to Atlantic Canada and has led to open communication lines and reinforced the partnership between EC and NL.

Additionally, decision-making in the Atlantic region is easier than in other parts of Canada simply due to the fact that there are four key individuals involved in the area of “water” from all four Atlantic Canada provinces. The Atlantic Region is a perfect area to establish “pilot-projects” or “demos” (such as CANAL; ENVIRODAT; CESI Calculator); this has certainly been a strength in the past and should continue in the future.

### **Reviewing Monitoring Networks**

- EC monitoring network review (National, Regional, Provincial)

Denis provided a presentation on the “Monitoring Network Review” project that was undertaken by EC during the past fiscal year; the overall aim of the project was to ensure that the national grab sampling network was in-line and representative of the federal government priorities and mandates (ie: CMP; CARA; transboundary issues; etc.); this project was based on existing stations only and helped identify gaps or areas that could potentially be included in the monitoring network.

- Integrated monitoring

This is an initiative that both the federal and provincial governments are interested in pursuing; both parties will be cognizant about “integrating” the various forms of monitoring and reporting; with the overall aim of providing value-added products to

Canadians. Various initiatives that may be integrated include CABIN; WQI work; chemical sampling; real-time sampling; hydrometric; etc.

### **Key Shared Activities**

- **Canadian Environmental Sustainability Indicators (CESI)**

Jean-Francois indicated that the 2009 CESI Report is now due to be released on April 23<sup>rd</sup>, 2010.

- **Discussion of how core stations vs. local stations were selected; how NL is affected by this change in reporting style**

A brief explanation of the CESI Internal Review project was provided by Vincent, Denis and Jean-Francois. There was a need for better spatial representativity of sites. This was a more “science-based” assessment of existing stations (looked at hydrology; drivers & pressures, etc.) to develop a more reliable indicator with better comparability nation-wide.

The concept of “core stations” vs “local stations” is being used in the 2009 CESI Report that is due to be released towards the end of April. However, the NL WRMD staff has not yet had the opportunity to sit with EC staff and go through each station classification. This is an in-depth technical task that needs to take place in a separate meeting (with appropriate technical individuals involved).

**Action Item: Renee will organize a technical meeting to discuss/finalize the designation of CESI stations (core vs local); EC will provide an in-depth presentation on the results of the CESI Internal Review project with respect to NL specifically.**

From looking at a map that was presented, it was obvious that there were gaps in the following areas of NL:

- South Coast
- Gander and area loop
- Northern Peninsula

As a result of the CESI internal review there is a significant amount of useful information now available from Stats Canada for all the stations. It was decided that this information should be used by NL staff while updating the Site Documentation database. Keith Abbott (NL WRMD) will be a “good fit” for this work.

**Action Item: Jean-Francois will send products to Renee for use in updating the Site Documentation database; Renee will coordinate with NL staff.**

- **Preparation/Analysis of NL CESI scores**

The preparation/analysis of the CESI scores will occur a little later this year (as opposed to previous years) due to the later release of the 2009 CESI report. Kyla has begun the process of downloading and evaluating the data



for the upcoming request; NL has assigned three staff (one staff to lead the process; two staff to check the results) to minimize the room for error.

o Calculator improvement

NL WRMD has produced the final CESI WQI Calculator as required by fiscal year end (2009-2010). EC is in the process of reviewing the calculator and determining if there are areas that may be improved in fiscal year 2010-2011. Shibly is in the process of compiling a “help” document to go along with the calculator. Other than a few minor modifications, the calculator is ready to be used by all jurisdictions in the preparation of CESI scores for 2010. It was agreed that a technical meeting to discuss further work on the calculator should be scheduled when all technical individuals are available to meet.

**Action Item: Renee will organize a technical meeting to discuss any additional work for the CESI WQI Calculator (fiscal year 2010-2011).**

It was noted that “down the road” it is important to try to move forward by introducing additional indicators such as climate change (with respect to water); land-use and biological indicators.

### Shared Activities

• Ambient Water Quality Sampling

o Review of stations to be sampled in 2010-2011 + northern areas

Grab water quality sampling remains a core activity under the *Agreement*. There was no specific discussion on the exact number of stations that will be sampled during the 2010-2011 fiscal year; however, the number of stations will remain similar to that of the past fiscal year (due to the available lab credits).

The stations listed in the 2009-2010 AWS will be reviewed shortly and the new list of stations will be included in the 2010-2011 AWS that will be prepared early in the summer months and available for review towards the end of the summer.

**Action Item: Renee will produce a draft version of the AWS 2010-2011 for review during the summer months.**

Art discussed the following points:

- the lab credits are with the Water Monitoring group (on a national level) and will be distributed by Caroline;
- the lab could possibly be moving but this would only be on a consensus-basis with a significant amount of QA/QC involved in the process;
- there will be an RFP for a new data management system for the nation that would reduce the number of steps in the data input process;
- there will be a project in this fiscal year whereby a chemist (possibly Tom Pollock) will look at the NL agreement data specifically and determine which parameters can be “lumped”.



**Action Item: Renee will add this “lumping” project to the AWS.**

- Discussion of any changes needing to be made to existing analysis schema at NLET

All protocols/procedures remain status quo though DL justification has to be revised in context of all ATL provinces as ALET may be able to provide the needed support.

- Site specific guidelines development – Eco-regions approach and key contaminants: **dissolved** aluminum measurement

The development of Site Specific Guidelines is a project that will be included in the 2010-2011 AWS. NL WRMD staff have already begun developing a path forward to determine which parameters should be included (some of this work will overlap with the CESI score preparations). This will be a multi-year project.

Aluminum is a parameter that exceeds national guidelines consistently in NL. There was Water Effects Ratio testing performed over the past two fiscal years (on particular water bodies) that resulted in the development of an aluminum site specific guideline for certain water bodies. This project has raised concerns about the fact that NL is comparing total aluminum values to a dissolved aluminum guideline. This question can be addressed by carrying out a small sampling study comparing dissolved, total and monomeric aluminum values.

**Action Item: Joanne Sweeney will coordinate a small study (with Art – Moncton lab) to determine if there is a significant difference between dissolved, total and monomeric aluminum values in NL waters.**

- Aquatic Bio-monitoring (CABIN)

Both parties (federal and provincial) agree and support the CABIN program; it was discussed that the goals and objectives of this program need to be outlined more clearly and more thought needs to be put into how the CABIN program will benefit Canadians with value added products.

There will be a national CABIN program meeting in the upcoming weeks where many of the above-mentioned issues can be discussed in detail.

**Action Item: Vincent will send Renee an overview of the discussions resulting from the national CABIN meetings.**

In NL, Kyla Brake is now coordinating the CABIN work. The results from the 2009 field sampling season arrived just before fiscal year end. This information will be shared between NL and EC.

**Action Item: Kyla will send an email to EC with the new CABIN results from the QC laboratory.**

It was decided that CABIN is a priority for both parties and there will be continued and improved communication to ensure this program is implemented successfully. A

variety of in-depth details (ie: training; communication; products; labs; etc.) will need to be discussed during a separate meeting (with the appropriate technical individuals).

**Action Item: Renee will organize a technical meeting to discuss all details under the CABIN program.**

### **Key Shared Activities**

- Real-Time Water Quality Monitoring Network

- Approach/review of existing real-time stations in NL network / joint stations

The NL Real-time network is expanding rapidly. It continues to successfully generate revenue due to industry partnership.

More in-depth discussion (on a station-by-station basis) will take place in a separate technical meeting.

**Action Item: Renee will organize a technical meeting to discuss all details under the Real-Time program.**

It is now time to reassess and evaluate the pilot-project (joint federal-provincial) in Conne River; there are significant areas where improvements are needed. A meeting is planned in Conne River to discuss all aspects of the project in more detail and define a clear path forward.

**Action Item: Renee will finalize the agenda for this meeting and circulate to participants.**

- Update on new real-time stations to be established in 2010-2011

There are a number of new real-time stations that are planned to be installed during this fiscal year (including 2 stations for Labrador Iron Mines; 2 additional stations on Churchill River; 1 stand-alone station on Paddy's Pond).

There are additional stations that are being negotiated (including 3 stations in Town of Logy Bay-Middle Cove-Outer Cove; 2 stations with Central Waste Management Authority; 1 station with Elross Lake Area mine; 1 station with Nalcor Energy in Rigolet).

- Reporting approach for RT (web page; monthly; annual)

Continue to report to the public departmental web page in near real-time; data is interpreted in the form of a monthly deployment report for all stations; data is interpreted further in an annual report for all industry stations.

Reporting is labour intensive but necessary to ensure the data is being utilized.

- Preparation for RTWQ Workshop 2011

NL WRMD aims to host a 3<sup>rd</sup> Real-Time Water Quality Workshop in June 2011; preparation will begin in winter 2010; Renee will network with potential presenters/participants at the conference in Denver (April 2010).

- Modeling - Report on the Relationship of Turbidity to TSS

There will be time spent on determining the relationship between TSS and turbidity using the values obtained from our real-time stations at Long Harbour; this will add a new dimension for use as a regulatory tool.

- Protocols Adjustments (account for biofouling error and calibration drift)

In 2009-2010, there were significant changes made to the current protocols/procedures under the Real-time program; the changes are in accordance with the USGS and reflect similarities to the procedures used by EC Atlantic region. These protocols will be re-evaluated in January 2011.

- Technical improvements (e.g. Automated Grab Sampling Triggered by Alert system; Implementation of Email Alert System)

The email alert system is being utilized for the real-time stations at Long Harbour (construction zone); the aim is to introduce email alerts for any other stations in the network that may warrant alerts. The next step is to set up automated grab sampling in conjunction with the alert system.

- Additional Points of Discussion

It will be necessary to reassess/audit the stations from time to time; Renee plans to audit at least one station in each region during this upcoming fiscal year to ensure consistency throughout the network.

The issue of “variability of measurements” and “guidelines for real-time data” was discussed briefly. This issue has been brought up in the past by Amir Ali Khan and Les Swain.

**Action Item: Renee will investigate this issue further through discussions with USGS staff, Ali and Les.**

The concept of using regression analysis to extrapolate to other non-measured parameters is something of interest to EC and NL for many years; there is extensive work in this field through the USGS (Kansas and Maryland); this is a multi-year project that will be included in the AWS.

NL WRMD will be hosting a refresher Hydrolab course sometime in late spring; staff from NL and EC will be invited to attend.

**Action Item: Renee will organize a Hydrolab Training Course.**

- National Surveillance Studies

- Chemical Management Plan (CMP)

The sampling at Waterford River under CMP will continue in 2010-2011; no changes.

### **Shared Activities**

- **Data management**

Data management is a significant component to the process; EC has made substantial progress in improving ENVIRODAT over the past few years; these improvements need to continue.

The current form of communication from NL staff direct to Cathy with any obvious ENVIRODAT issues is working; NL staff will continue to report any issues with ENVIRODAT to Cathy.

There are no new projects planned for ENVIRODAT during this upcoming fiscal year.

EC has developed an internal tool that allows for further data validation (ie: flagging on samples with issues); it would be beneficial to make this tool available to NL staff to allow data validation and flagging; a meeting will be held to “brainstorm” and determine a workaround for bringing this tool to NL.

**Action Item: Renee will organize a technical meeting to discuss ENVIRODAT projects to be included in AWS.**

EC will continue to simplify the ENVIRODAT Extraction Tool; NL staff will be more than willing to test out this tool when available

**Action Item: EC staff will inform NL staff when they are ready to have the Extraction Tool tested.**

As a result of the EC audit, it was mentioned that NL should begin logging the data requests that are received; this can be used as a performance benchmark in progress reporting.

**Action Item: Renee will determine a method to log all data requests under the Agreement.**

There is an issue with the mapping interface on the CANAL web page; EC has changed it's application being used and no longer supports this type of map; Todd Smith was in conversation with Ali Khan on this matter in the past; unsure of the final outcome.

**Action Item: Renee will arrange a meeting with Ali and Paul to discuss the CANAL mapping interface and open communication lines with Todd and Dave.**

- **Data Reporting**

- Technical Documents WQMA (I.S. Report 2008-09; I.S. Report 2009-2010; etc.)

The Intensive Survey 2008-09 Report is nearing completion; Denis is getting comments back from reviewers; NL has the capabilities for printing this report if need be; report should be posted in NL departmental web site.

The Intensive Survey 2009-2010 Report will be completed in this fiscal year by Ian Bell with review from EC.

- o Technical Documents RTWQ (Standard Protocols Manual)

The RTWQ Manual is nearing completion; currently undergoing review internally; Renee will send the document to EC staff for review and input prior to release.

### **New Technologies and Development**

- Mobile Environmental Monitoring Platform

The Mobile Environmental Monitoring Platform (MEMP) will be a useful tool when completed; to be used for short-term deployments; communication will continue between NL staff and EC staff to ensure the MEMP is properly equipped and ready to operate by early summer.

- Real-Time Related Projects

- o Research and Development of New Technologies (s::can; iridium; GHG emission monitoring system; etc)

There are a number of new technologies being tested for incorporation into NL real-time program:

- s::can testing will resume at the Paddy's Pond station throughout the summer months; encountered corrosion issues with the instrument in Fall 2009
- currently reviewing GHG automated monitoring technology to determine if it can be logistically incorporated at real-time station on Churchill River
- successfully using iridium communication with web camera on Churchill River; will continue to test and investigate further
- Renee/Denis will be networking and learning about any new technologies at the conference in Denver
- Tara/Genvieve will look into various new technologies being implemented in Europe (ie: Australia; France; UK; etc.)

- Application of Earth Observation for Water Quality Monitoring

- o Testing of Buoy System in Paddy's Pond (real-time data used with satellite imagery)

NL has been involved in international projects that utilize earth observation technology with real-time instrumentation; during this fiscal year, NL staff would like to test/utilize this technology in NL; the first step is to implement the use of a buoy system to collect the real-time data (large pond setting) and then incorporate the earth observation aspect.

- Continued work in building knowledge using high-resolution imagery; possibility of EC contributing by allowing use of imagery

NL staff has a significant amount of expertise in utilizing earth observation (satellite imagery) and remote sensing; there are a number of water quality projects that can be initiated if imagery becomes easily available.

**Action Item: Jean-Francois will contact someone in the Canadian Space Agency to establish a contact for earth observation and water quality work.**

**Action Item: Joe will look into accessing available satellite imagery when he returns in May.**

### **Miscellaneous Items**

- Project WET

Kyla Brake is trained as a Project WET instructor; there are a number of books available to be used (left from last year); Kyla will arrange at least one seminar for educators; she will organize more if funds are available; Education initiatives are coordinated through a different section of EC therefore somewhat difficult to coordinate.

- Stability Study with NLET

Joanne Sweeney is analyzing the results of this study completed during the past fiscal year; report will be shared with EC and made available on the departmental web page.

- Water Quality Impacts of Cranberry Farming

This is an area of concern in NL; many cranberry farms are being established with little knowledge concerning the impacts to water quality; these operations use specialized pesticides; the areas where these farms are established are not being captured by CESI stations; consideration needs to be given as to where this type of project falls with respect to federal priorities/initiatives.

**Action Item: Jean-Francois will look into this further and report back to group.**

- Blue-Green Algae Data Summary for 2009 Season

Blue-green algae did not become a major issue during the past fiscal year; sampling was on a need-basis; Joanne Sweeney will be compiling the report for the 2009 season in the coming months.

- Letter of Support from EC (Sept. 2010 for new position in Labrador)

Due to the abundant resource development in Labrador, the number of northern real-time stations are increasing annually; some CESI sites need to be supported and CABIN is also expanding in this area; it is a high priority of NL WRMD to create a new position in Labrador to distribute the excessive workload.

**Action Item: Jean-Francois will write a letter of support in Sept 2010 (for inclusion in 2011-2012 budget request for NL WRMD) to get a position in Labrador; Haseen will provide all necessary background information.**

### **Closing Remarks and Next Steps/Meeting**

There will be a number of in-depth technical meetings organized to discuss a variety of subject areas (ie: CESI project; CESI Calculator; CABIN program: Real-Time program; ENVIRODAT; etc.)

The next joint federal-provincial planning meeting will be held in Labrador at some point during the summer months (July or August) to finalize details of the Annual Work Schedule.

**Action Item: Renee will be responsible for arranging all upcoming meetings.**

From: Paterson, Renee  
To: Parent, Denis [Dartmouth]  
Cc: Brake, Kyla; Picco, Robert; Gillis, Grace  
Subject: Re: Action Items from CESI Technical Meeting - May 26th, 2010

Sent: Fri 5/28/2010 2:33 PM

Hello Denis,

Thank you so much for traveling down here to meet with us on Wednesday. I think it was a very successful meeting in trying to nail down the "core" CESI sites. I know that myself and Kyla have a much better understanding of the CESI program and the many projects happening behind the scene at a national level. Kyla and I have summarized some of the action items from the meeting....please see below.

- 1) Renee will discuss the transboundary water issue with Haseen; will inform group with this information
- 2) Renee will discuss the possibility of using industry data for a "core station" with Haseen
- 3) Renee will discuss with Joe the reasoning behind the fed-prov real-time partnership for Minipi River station
- 4) Grace will verify the station ID for Little Mecatina River
- 5) Renee/Kyla will discuss which stations we would like to monitor more frequently (perform a small comparison study to determine the "best" frequency of sampling)
- 6) Denis will look into the possibility of additional funding to perform this small comparison study
- 7) Denis will finalize the list that was decided up at meeting; any stations in question will be decided upon through email discussion
- 8) Denis will inform Kyla when CESI report 2009 is released
- 9) Kyla will "reduce" the statistics database to a "more user friendly manner"; distribute to WQMA staff for use in updating the Site Documentation Database

I think we have covered most items....but please feel free to write back with any additions.

We'll be in touch shortly to finalize the list of "core" stations.

Thanks,  
Renee

From: Paterson, Renee  
To: Mercier, Vincent [Moncton]; Carter, Lesley [Dartmouth]  
Cc: Brake, Kyla; Picco, Robert  
Subject: Re: Action Items from CABIN Technical Meeting - May 27th, 2010

Sent: Fri 5/28/2010 2:38 PM

Hello Vincent and Lesley,

Thank you so much for traveling down here yesterday to meet and discuss the CABIN program. Myself and Kyla now have a much better understanding of the program itself and the many on-going projects on a national level. We have summarized the action items from the meeting... please see below:

- 1) Vincent and Lesley will continue to provide Kyla with information on new research and development (ie: DNA bar-coding; Atlantic model development; etc.)
- 2) Kyla will provide Lesley with maps (or additional information as needed) to help in the planning of the sites that will be sampled by EC staff
- 3) Kyla will begin the process of site selection (to be done by provincial staff) using the gap analysis information provided... will inform Lesley/Vincent when this task is complete so they can provide input
- 4) Lesley will inform Kyla when the field practicum will be taking place so that WRMD can plan to have some staff in attendance
- 5) Renee will discuss the potential of training two contract staff in CABIN field procedures with Bob
- 6) Kyla will inform the contract staff of training dates (when Renee provides the go ahead)
- 7) Renee/Kyla will have a meeting with Paul Neary to discuss the potential of linking CABIN info to CANAL
- 8) Vincent/Lesley will begin to compile thoughts on how the CABIN data could be displayed (potential pilot products that could be developed by NL WRMD in partnership with EC)
- 9) Vincent/Lesley will put together a basic outline of a "baseline assemblage report" and then circulate for input
- 10) Vincent will talk to contact regarding opportunities for funding/partnership under IPY (Labrador)
- 11) Lesley will provide Kyla with TOR for taxonomic lab tendering
- 12) Vince/Lesley will make contact with Parks Canada (Terra Nova, Gros Morne, Torngat Mountains, Mealy Mountains) to discuss a partnership with NL (if possible or necessary)
- 13) Kyla will review Pacific/Yukon CABIN database for possible improvements/development of a similar database for NL or Atlantic Canada
- 14) Kyla will contact Lesley as soon as the first sampling site and date for the season is determined for possible audit of field sampling techniques
- 15) Kyla will inform Lesley if EC assistance is required for any sampling regions

I think we have covered most items....but please feel free to write back with any additions.

Thanks,  
Renee



CESI WQI Calculator Technical Meeting  
Confederation Building, St. John's, NL  
June 3, 2010

*In attendance:*

Julie Boyer (EC)	Renee Paterson (ENVC)	Amir Ali Khan (ENVC)
Serge L'Italien (EC)	Shibly Rahman (ENVC)	Cathy Cormier (phone) (EC)
Paul Klawunn (EC)	Paul Neary (ENVC)	
Abdel El-Shaarrawi (EC)	Kyla Brake (ENVC)	

**Meeting Objective: To determine potential projects that may be undertaken in partnership between EC and NL ENVC for improvements to CESI WQI Calculator and Help Manual in fiscal year 2010-2011.**

- Introductions were made including the various roles each attendee plays in the CESI program.

**Testing of the CESI WQI Calculator**

- Serge presented his results on 'Testing The New Calculator'. Testing included using datasets and guidelines from different regions across Canada.
- Paul K. explained that often the Ontario dataset is missing temperature data. To fill in the data gaps, he has developed monthly average charts based on historical data which are used to fill in the gaps.
- Paul K. mentioned that Ontario data receives calculated hardness values from the analyzing lab.
- Renee pointed out that NL hardness values must first be calculated for each sample before they can be used in the calculator.
- Hardness\_Used = the hardness values used in the calculation of guidelines.
- Julie pointed out that hardness equations differ between provinces.
- Serge pointed out that when the Ontario dataset was run in the new calculator, pH was included as a variable (total of 8 variables) whereas it was not included as a variable in the old calculator (7 variables).
- Shibly suggested that the 'type of guideline' selected may have made a difference in the calculation, and they would look at this later.
- Shibly explained that to make selecting guidelines easier, one should export a guideline file from the calculator, add their own guidelines, then import the user guidelines into the calculator.
- **Action Item: Julie will be sending out a user guidelines template file to make this process easier for the partners.**
- Serge continued with the presentation: Quinsam B.C. data may have been unsuccessful due to the fact that data were missing.
- Renee suggested that we need to better explain how to use the user guidelines option in the help manual.

- There was some discussion on the use of SSG's by some regions. Julie responded that SSG's are usually fixed over time with partners using the same SSG guideline values each year. They do not change from year to year.
- Julie mentioned that it is not unusual for datasets from partners to be missing pH and/or temperature values. In previous years, she has 'created' missing data to fill in the gaps from the previous year's pH and temperature data by taking averages. These variables are only modifying factors in the calculations.
- Renee commented that Serge's testing of the calculator was an excellent step toward pinpointing whether issues with the calculator are to do with coding, or are related to a need for more explanation in the Help Manual.
- Serge commented that there seemed to be an error as two exports from the calculator produced the same result. Shibly/Paul pointed out that 'export' in the calculator exports all data in separate tabs into the excel file, not just the visible tab. This point should be more clearly explained in the Help Manual.
- **Action Item: Shibly will alter the calculator so the export button is more explanatory eg. 'Export all tabs'.**

#### **Hands-on Display of CESI WQI Calculator (by developer)**

- Shibly and Serge loaded the Ontario dataset used by Serge into the calculator to investigate the issues Serge found with the calculator.
- Shibly commented that column headers have to say 'temp', 'pH', 'Hardness'. They must not include the word 'USED'.
- Paul N. provided background on the calculator project. The project was begun just over a year ago. The overall goal was to simplify the process for the CESI users. Paul N. asked for copies of the 'old calculator' and files used in Serge's calculator testing to run some in-house comparisons.
- Serge commented that the old calculator results were the results from last years CESI reporting.
- **Action Item: Serge will send all associated files to Shibly.**
- Paul asked Serge and Julie if the calculator was an improvement or easier to use than previous CESI versions.
- Julie commented that for her the new version is a definite improvement.
- Serge suggested that ideally, partners should provide quality assured data to EC, so it could all be run together by one person.
- Paul K. commented that he likes the new version of the calculator.
- Paul N. provided background on web services etc. supplied by EC in Atlantic Canada. He noted that improvements need to be made to the Help Manual by both parties (NL and EC).
- Julie(?) mentioned that Ontario uses pH, temperature and hardness strictly as modifiers. If it is to be used as a modifier, this must be indicated in the guideline table (eg. PH\_CALC).
- Serge suggested that the hardness column read 'Hardness\_Used'.
- Paul suggested 'Hardness\_Calc' would be more appropriate to stay in line with the other calculated and used variables.
- Renee suggested it may be easier to save a guideline file and import it each time for usage rather than alter all the guidelines in the calculator each time.
- Renee asked Julie when the 'request for data' will be sent out to the CESI partners. Julie will hopefully send the request next week.

- Action Item: If any issues arise with the calculator, Julie will email Paul N. with cc to Shibly and Renee for quick resolution and to track problems and issues.
- Action Item: Shibly will have to include Julie's English and French Help Manuals in the installation file package to be sent to partners. Change the English install to French. There will now be two help manuals to be installed in the start menu as separate links.
- Action Item: Julie will supply Shibly with the two new Help Manuals (English and French).
- Action Item: Julie will make one banner graphic for English and French and email it to Shibly.
- Action Item: Shibly will get the exact pixel size for the banner currently in the calculator and email this to Julie for her to make the bilingual banner graphic.
- Serge asked if there would be a place to store the guidelines used. Julie suggested placing them in appendices next year.
- Julie mentioned that (5. Method Notes) in the calculator and Methodological Notes in the tab should be the same.
- Action Item: Shibly will change Method Notes to match the tab.
- Serge suggested that 'Alerts' should be changed in the French version of the calculator as this is 'Alertes' in French.
- Action Item: Shibly will make this change to the calculator.
- Paul N. commented that the discrepancies between results from the new and old calculators used in Serge's report must be addressed.
- Action Item: Julie and Serge will supply all the data and guidelines used in Serge's report to Shibly and Paul N. for testing.

### **Introduction of the concept of Confidence Intervals to the WQI Scores**

- Dr. Abdel El-Shaarawi began his presentation on Confidence Intervals.
- Abdel mentioned that to get some form of uncertainty measurement is very important when dealing with data. He looked at using data driven confidence intervals. One must verify distributions are met for every dataset. This procedure takes correlation into account, but assumes independence between rows. The 'bootstrapping method' is applied to the data.
- R-excel links excel with the R software.
- Paul K. pointed out in the sample data that when sample size is 11-13, the spread of the data is more extensive. However when there are more samples (eg. 36), the spread of the data is tighter.
- Ali asked if a user would need to download R software to use the calculator with the confidence interval function. Abdel responded that "R-excel" and "R" are free software obtained from the internet.
- Ali proposed the question 'how do we link R to the new calculator?'
- Serge asked Abdel if the option to use bootstrapping is already built into the R software or if code was written for this function.
- Abdel answered that the index is computed in R, and then a few lines of code were written to perform the function.
- Ali said that NL has to look into R excel and how to link it into our calculator.
- Abdel mentioned that he can offer a course on using R, or there are free manuals on how to use the software online.

- Ali said Shibly will first need to understand R. Then he will try to determine how to link it into the new calculator. There may already be tools for outputting from visual basic to R.
- **Action Item: Shibly will learn more about 'R' and 'R-excel', as well as the potential to link 'R' with Visual Basic.**
- Ali mentioned that if a user needs R, this must be included and implemented in the CESI user package.
- **Action Item: Abdel will send to Shibly/Ali/Paul N. material on workshops or conferences to assist in training Shibly in R. Abdel will also send any information available on R packages which are available.**
- Julie stated that it is the intention of CESI to include confidence intervals in next years calculator.
- Abdel mentioned that it would be useful if the calculator had the ability to show or predict the next year's trend. Predictions can be made in R. This would be very useful from a water manager's perspective.
- Abdel stated that graphics would be important for the public and managers as this makes it easier to see and understand the results.
- Ali mentioned that SSG's may be a complication.
- **Action Item: Abdel will send Ali and Shibly the Confidence Interval version of the calculator to see how it works, what is involved, etc. Abdel will also send some useful books to Ali/Shibly.**

#### **Flow Chart Describing the Potential of 'hiding' the Calculations of Modifying Factors**

- Cathy Cormier joined the meeting via conference call.
- Cathy walked through the flow chart which was distributed to all participants. The flow chart illustrated the desired improvements for next year.
- The flow chart basically discussed the desired improvements had already been discussed in depth earlier in the meeting.
- The main topic of discussion was using parameters such as temperature and pH as variables with guidelines only, variables for computation purpose only, and both as variables with guideline and computational purpose.
- Shibly stated that it is essential that any changes such as suggested by the 'flow chart' need to be agreed upon and finalized before 'programming changes' are implemented.
- Renee concluded by stating that she will arrange an 'in-house' technical meeting to discuss proposed projects for fiscal year 2010-2011.
- **Action Item: Renee will arrange an 'in-house' technical meeting and will inform Julie of the decisions reached after this meeting in late June.**
- Meeting adjourned.

From: Paterson, Renee  
To: 'Boyer, Julie [Montreal]'  
Cc: Bibeault, Jean-Francois [Montreal]; Khan, Haseem; Neary, Paul; Picco, Robert; Khan, Ali; Rahman, Shibly; Brake, Kyla  
Subject: CESI WQI Calculator Tasks/Projects for 2010-2011

Sent: Tue 6/15/2010 12:27 PM

Hello Julie,

We have finally had a chance to get all our "technical" people together (in-house) to discuss potential projects/tasks that can be undertaken by NL ENVC in fiscal year 2010-2011 to integrate improvements to the national CESI WQI Calculator that was developed during the last fiscal year (2009-2010). The proposed projects/tasks that NL ENVC will be able to undertake are as follows:

- 1) **NL ENVC will provide solutions/fixes** to issues encountered in the upcoming months as the calculator is deployed for use nationally. As discussed in the technical meeting, EC will document any issues by email and send to Paul, Shibly and me; these emails will be batched and addressed in a timely manner.
- 2) **NL ENVC will provide feedback/comments on the Help Manual** after EC has revised the document to address any "explanation issues" that were encountered after the national deployment of the calculator (Ex: "pH" vs. "pH\_Calc"). This will be a joint effort, however, we feel it is important for EC to identify the areas needing improvement in the Help Manual and then attempt a more thorough explanation. NL ENVC will then provide comments/feedback. EC will be responsible for incorporating any comments from NL ENVC and then translating the document into French; NL ENVC will ensure the finalized Help Manuals (French and English) are incorporated into the installation package.
- 3) **Investigation of utilizing "R" software to achieve desired outcome for determination of confidence intervals:**
  - a. Dr. Abdel El-Shaarawi will provide Shibly and Paul the exact web site where the "R" software should be downloaded (to ensure the "most appropriate" version is being used by NL ENVC and EC)
  - b. Dr. Abdel El-Shaarawi will provide Shibly and Paul with the programming code used; input test files as well as results files (so that work can be duplicated and tested)
  - c. Dr. Abdel El-Shaarawi will provide Shibly and Paul a copy of the modified WQI calculator (with programming password) used in the presentation so that NL ENVC can ascertain exactly what data is being sent to R from the Excel calculator and in what particular format
  - d. Shibly and another technical person (TBD) from NL ENVC will travel to meet with Dr. Abdel El-Shaarawi to learn and understand the basics related to the use of "R" but also the intricacies of the programming/calculation of the confidence intervals; an agenda outlining desired objectives will need to be agreed upon by both parties prior to travel; this initial transfer of knowledge/training session needs to take place sometime throughout the summer months to ensure there is enough time to complete the project prior to March 31<sup>st</sup>, 2011.
- 4) **Implementation of utilizing "R" software for determination of confidence intervals:** Shibly will link the national CESI WQI Calculator with the use of the "R" software to determine confidence intervals if logistically possible.
- 5) **Testing the calculator (with added statistical functionality):** NL ENVC will ensure the calculator (with added statistical functionality) is tested in-house prior to submission to EC at end of fiscal year.

Please note that the above-mentioned projects have been put forth as discussion points. The finalized list will be incorporated into the Annual Work Schedule under the *Canada-NL Water Quality Monitoring Agreement* where the transfer of funds (from EC to NL ENVC) will take place. There will be subsequent discussions on the exact amount of funding that will be required to perform the tasks listed above between Julie and Renee in the upcoming month. Depending on the funding allocated for this project list in 2010-2011, the list may change slightly.

Please feel free to discuss our proposed list of projects/tasks within your working group and provide feedback by early July. The sooner we are able to agree on a finalized list of tasks, the sooner we will be able to get started working on these projects to ensure the work is completed in the specified time-frame (end of fiscal year 2010-2011).

Please let me know if you have any questions or need clarification.

Thanks,  
Renee

**Federal / Provincial Hydrometric & WQMA Agreement  
Meeting Minutes  
August 24<sup>th</sup>-26<sup>th</sup>, 2010  
Happy Valley-Goose Bay, Labrador**

**DAY ONE – Meeting began at approximately 2:00pm at the Birch Brook Ski Lodge outside Happy Valley-Goose Bay**

**In Attendance:**

- |                        |                         |                        |
|------------------------|-------------------------|------------------------|
| - Jean-Guy Deveau (EC) | - Howie Wills (EC)      | - Vincent Mercier (EC) |
| - Denis Parent (EC)    | - Cathy Cormier (EC)    | - Haseen Khan (WRMD)   |
| - Robert Picco (WRMD)  | - Renée Paterson (WRMD) | - Grace Gillis (WRMD)  |

**Unable to Attend:**

- |                               |                    |                 |
|-------------------------------|--------------------|-----------------|
| - Jean-Francois Bibeault (EC) | - Joe Pomeroy (EC) | - Art Cook (EC) |
|-------------------------------|--------------------|-----------------|

**Welcome & Introductions (All)**

**Meeting Objective**

- Work towards finalizing Schedule D (under the Hydrometric Agreement) and finalizing the Annual Work Schedule (under the Canada-NL Water Quality Monitoring Agreement).

---

---

**CANADA-NL HYDROMETRIC AGREEMENT**

---

---

**1. Welcome and Overview**

**2. Chairing of Meeting & Note Taking**

- It was agreed that Bob Picco would chair the Hydrometric portion of the meeting while Renée and Grace took notes.

**3. Review of Agenda**

- The agenda was reviewed and agreed upon by all parties. Two additional points were added for discussion:
  - o Succession Planning
  - o National Hydrometric Program

**4. Review/Approval of Previous Meeting Minutes**

- There were two Hydrometric Planning meetings that were held previously (May 14 2009 - Gros Morne National Park and June 24, 2010 - St. John's). The meeting minutes for both previous meetings were reviewed in detail and changes were made as necessary. Both sets of meeting minutes were approved by the group.

**Action Item: Jean-Guy will email the two sets of meeting minutes to meeting attendees.**

## **5. 2010-11 Budget – EC, NL**

- Jean-Guy explained that he had received the operational budget and that it was slightly less than last year but certainly still a “workable” budget.
- Haseen explained that there is significant pressure on WRMD to expand the hydrometric network due to regulatory constrictions and industrial demands (by both new and old industries). The newer industries have been contributing at an adequate level to recover costs; however, WRMD is not recovering costs from the older industries.
- Measures need to be taken to ensure the contribution improves via a number of initiatives:
  - o A case will be made to the Treasury Board (internally)
  - o Make contact/meetings with industries that have old Agreements established (ie: Deer Lake Power; Nalcor Energy; etc.) to discuss increasing contribution.
    - Bob/Howie plan to meet with Deer Lake Power in early Sept.
    - Renee has produced a letter for Nalcor Energy detailing the historical and current stations over the years; Bob will organize a meeting with Nalcor Energy staff in the fall.
    - Howie added that the industry partners need to be advised that all dataloggers within the network will need to be upgraded to HDR by 2013.
  - o **Action Item: Bob will arrange meeting with Deer Lake Power.**
  - o **Action Item: Bob will arrange meeting with Nalcor Energy.**
  - o The federal government supplied additional funds last year under the Agreement and plan to provide additional funds again this year (ie: letter drafted by Jean-Guy). Therefore, since this is a cost-shared program the provincial contribution needs to reflect these additional funds.
    - **Action Item: Jean-Guy will forward the letter to Haseen in the near future.**
  - o In the past, there were funds contributed by Abitibi (for Exploits stations); with the changes that have taken place in the past year with respect to ownership/operation, an option is to approach the provincial government to cover the amount that was once brought in through Abitibi.

## **6. LCM**

- Jean Guy discussed how the federal government can maintain their commitment to life cycle management as long as the provincial government also contributes.

**Action Item: Renée will set up a meeting with Bob and Howie to specifically discuss life cycle management by the end of October.**

## **7. Hydrometric Workstation deployment**

- Jean-Guy/Howie updated that the new Hydrometric Workstation is being deployed nationally; the aim is to have the roll-out complete by Feb 2011.



- The Atlantic region is the last region where the workstation will be deployed.
- Staff will be trained thoroughly.
- Moving towards using the new system will require a substantial commitment from staff and therefore it is possible that delays will be felt elsewhere during the learning phase.
- The new workstation will definitely lead to improved services/products at select high-profile stations.
- This project is certainly moving ahead but there has been a substantial mobilization of staff/resources that would normally have been used elsewhere.

## 8. New Stations - 2010

- **Labrador Iron Mines (Schefferville):** Howie/Renée/Grace explained that the recon survey has been completed and locations for the stations are determined. The installation of these stations has been delayed due to the blockade that is currently at the project site; no work is proceeding. The main contact with LIM indicated that as soon as the blockade is lifted they will be ready to deploy the instrumentation. There is still a small window of opportunity to get the stations established before the colder months (ie: September/October) but the window is closing quickly.
- **Lower Churchill:** Howie/ Renée/Grace explained that the two sites (a. English Point near Mud Lake and b. Lake Melville) have been prepped (ie: chopper pads built; huts built; trees cleared). The current plan is for Water Survey staff to travel to Labrador during the week of Sept. 20<sup>th</sup>; Grace and Water Survey staff will work to install the two stations. Ideally the water quality instrumentation will be in and collecting data for at least one month prior to having to be removed for the winter months.
- **City of St. John's:** Renée explained that the MOA was prepared mid-July and sent to the City staff for review. Upon follow-up, the City indicated that they will need additional time to perform a more in-depth review of the exact nature of their obligations. It does not look as though this Agreement will be signed in the near future; likely the stations will not be installed in this fiscal year.
- **New stations requested by Hydrological Modeling Section:** Prior to the meeting, the Hydrologic Modeling Section provided Haseen with a list of five new hydrometric stations that they would like to see established for use in flood forecasting. Haseen will respond to this request when the amount received from the budget submission (for flood forecasting) is determined.

## 9. Major Construction & Maintenance

- Howie explained that Middle Brook will be upgraded with a new shelter and equipment this fiscal year; additional minor equipment upgrades will be completed.
- Howie raised the issue that both Atikonak and Naskaupi need new shelters (possibly the smaller look-in shelters); this issue needs to be raised at the meeting with Nalcor Energy in the fall.

**Action Item: Bob will add this item (ie: replacement of shelters) to the agenda for the Nalcor Energy meeting.**



- Howie explained that there are plans underway for the cableway at Noel Paul's station to be taken down and a Hornet unit will be deployed on the Humber River.

#### **10. Water Quality Field Work**

- Howie/Grace explained that the water quality sampling performed by EC is working out very well and should continue in the future at status quo. By EC assisting with the sampling in Labrador, WRMD is now getting the required number of samples to participate in the CESI national reporting protocol for Labrador rivers.

#### **11. 2010-11 Work Plan**

- Jean-Guy is working on a five-year roll up of the work plan.

##### **a. Finalize bilateral agreement**

It was explained that the bilateral agreement is a template that is common amongst all provinces and incorporates a new costing component. NL is on-board with adopting the bilateral agreement but cannot proceed until other Atlantic provinces are ok with moving ahead.

##### **b. Provincial cost off-sets**

Province needs to start determining what products /services can be provided as an off-set (ie: delineation/digitization of all hydrometric stations; climate stations; snow stations; fact sheets; posters; etc.).

**Action Item: Renee will set up a meeting with Haseen and Bob to discuss potential areas where products/services can be provided by provincial staff.**

**Action Item: Renee will inform Jean-Guy of the outcome of this meeting by the end of October.**

##### **c. Staffing**

Need to be planning ahead; should be aiming for a staff complement of six individuals (all able to work in the field). We will wait for the response of the 2011-2012 budget submission and then make a decision in the March/April 2011 planning meeting. Staffing will be determined based on budget funding.

##### **d. Annual Reports (Week in St. John's) and Cumulative Payment adjustment**

Jean-Guy is working on the Annual Reports; he proposed that he should visit St. John's for a short period (ie: one week) to work with Howie and Haseen (potentially before the NAT meeting at the end of September) on the annual reports.

**Action Item: Jean-Guy will arrange a meeting in St. John's.**

Jean-Guy will come up with a number of options on how to incorporate the water quality component; Jean-Guy will propose options to Haseen and he will decide what works best.

There is an excess amount owed to the province (~\$60,000); Haseen and Jean-Guy will discuss how to best arrange this pay-out (ie: use it for LCM; pay-out over time; etc.).

**e. Network Review – classification validation**

National Hydrometric Program Coordinating Committee has ownership of this on a national level to bring together stakeholders for meetings; stakeholders are widely varied (ie: industry; researchers; public; consultants; etc.).

**Action Item: Haseen will raise this issue in Halifax at the NAT meeting.**

**f. Transition to bilateral costing**

We should aim to be in the new regime by next fiscal year.

**12. Estimated Costs 2010-11 & Schedule D & Invoicing**

- Jean-Guy made some changes to Schedule D as agreed upon by the group:
  - o 15% of Bill's salary will be cost-shared
  - o Deleted the three City of St. John's stations (ie: entered 0.0)
  - o The total of Schedule D = \$692,540

**Action Item: Jean-Guy will email Schedule D shortly after returning to NS; invoicing will be initiated (¾ amount in Dec; ¼ amount in Mar).**

**Action Item: Bob will ensure the final cheque generated in March is held and sent to Jean-Guy in April.**

**13. Other**

**a. Climate Stations**

- There was some discussion amongst the meeting participants regarding the existing climate stations across the province (ie: Are the stations being maintained?; Who is utilizing the data?; etc.).

**Action Item: Renee will set up a meeting with Haseen and Bob to discuss the path forward with respect to the climate network (ie: climate agreement; various EC stations; provincial weather stations; provincial GMON stations; etc.).**

**Action Item: Bob will start to look into the climate network in more detail and determine the various types of stations in existence; incorporate this information into the hydrometric work plan if applicable.**

**Action Item: Renée will send the replacement wind speed sensor to Howie; Howie will ask the “met guys” to install.**

**Action Item: Jean-Guy and Howie will make a note of the “Related Monitoring” as an additional table in Schedule C (ie: place-holder).**

**b. Water Temperature Probes**

- There was some discussion amongst the meeting participants regarding the water temperature probes that were deployed last fiscal year on many of the hydrometric stations (ie: Is the water temperature data being reported/used?; What QA/QC program can be established to check accuracy?; How many units remain undeployed?; etc.)

**Action Item: Renée will ask one of her staff (Joanne Sweeney) to look into the water temperature probe issue and provide an update; Renee will request list of stations (with temperature probes) from Howie; Renee will update the meeting participants when review is completed.**

**c. Permitting**

- There was some discussion amongst the meeting participants regarding whether both EC and WRMD have the permission to build huts for both water quantity and quality monitoring purposes (without obtaining numerous permits from various agencies). There are some letters in existence (through WRMD) that may address this issue.

**Action Item: Renée will look into the permitting issue in more depth; Grace has provided Renée with a list of permits that she obtained for the stations on the Lr. Churchill River; Renée will track down the letters and determine what permission is provided.**

**d. Maps**

- Jean-Guy indicated that it would be beneficial to have a map of Labrador showing the Innu and Inuit land claims areas in relation to the existing hydrometric stations.

**Action Item: Grace will produce the map of Labrador with Innu and Inuit Land Claim Areas and hydrometric stations and provide to Howie and Jean-Guy.**

**e. Succession Planning**

- There are several regional managers that are anticipating retirement in the next couple of years.  
- There is a national contest open internally; results of the pool will be released shortly; there will be a pool of approximately 12 individuals.  
- Jean-Guy is planning on retiring next year.

**f. Miscellaneous**

- Potential cross-training for hydrometric staff

**Action Item: Vincent will send an email to Jean-Guy about upcoming meeting in September for cross-training of hydrometric staff in Dartmouth.**

- Possibly look at formally arranging to use the OHS Field Coordinator.
- Familiarization of equipment used by Water Survey of Canada

**Action Item: Howie will arrange a time when Bob can go on a field visit to view the new equipment that is currently being used by Water Survey of Canada staff.**

**14. Adjournment – 5:30pm**

**DAY TWO – Meeting began at approximately 9:00am at the Birch Brook Ski Lodge outside Happy Valley-Goose Bay**

---

---

**CANADA-NL WATER QUALITY MONITORING AGREEMENT**

---

---

**Distribution of finalized “Progress Report 2009-2010”**

Renee passed around a printed version of the “Progress Report 2009-2010” so that meeting participants could have a look at it; this document was put together quickly by NL staff this year (2009-2010) at the request of Jean-Francois Bibeault; the production of a progress report is essential to document progress and evaluate the various projects under the *Canada-NL Water Quality Monitoring Agreement*; a progress report will be prepared at the end of each fiscal year.

**Action Item: Renee (or her staff) will mail the printed progress reports to EC staff when they are available.**

**Annual Work Schedule 2010-11 Review and Discussion**

Renee went through each section of the draft Annual Work Schedule in detail.

**a. Schedule A – Agreement Committees**

**Action Item: Renee will add the names of additional EC staff to the committee list.**

**b. Schedule B – Work Shared Activities**

- i. Ambient Water Quality Sampling**
  - a. Network Assessment and Review**

- The list of grab sampling locations remains the same as last year (with minor exceptions).

**Action Item: Renee will provide more details for each station under the “Classification” column (ie: urban station; hydrometric; CABIN; CESI; ...).**

**Action Item: Denis will forward the list from the internal Network Review to assist with the above-mentioned task.**

**b. Sampling Frequency Review**

- The sampling frequency was discussed in detail during earlier technical meetings; all grab sample stations will be sampled at least four times per year (each season); core CESI stations will be sampled five times per year to ensure enough samples are collected for inclusion in the national reporting each year; an additional 3 sites will be sampled eight times per year as part of a small project to perform sensitivity analysis on frequency of sampling impact on CESI scores.
- The timing of the sampling was also discussed; it was suggested by Denis that the aim should be to capture the hydrograph (ie: peaks and valleys) and to spread out the sampling (ie: eight times per year would be approximately every six weeks).

**ii. Ambient Water Quality Analysis**

**a. Discussion of available lab credits**

- The Canada-NL Water Quality Monitoring Agreement is a core project that falls under the A base budget; lab credits remain status quo to cover the listed grab sample analysis.
- It was explained that all national labs fall under the same structure and are working towards standardization in the upcoming years (ie: standardization of equipment and database importation practices; etc.).
- There is potential that the NL grab samples may be analyzed at ALET (as opposed to NLET) in the future; samples will continue to be sent to NLET until told otherwise.

**Action Item: Renee will arrange to have a separate meeting with Art Cook to figure out the impact of switching labs (ie: processes; data compatibility; etc.).**

- Renee informed the group that for this fiscal year we have asked NLET to add “hardness” to the schema list; this was a request that was made by Kyla to make producing the CESI scores a little easier.

**Action Item: Joanne will inform EC (ALET) that the above-mentioned change in schema has been made.**

- It was decided that in future versions of the Annual Work Schedule it would be beneficial to have the VMV code information and detection limits listed in association with the schema numbers being used; this will be a good placeholder for this information as it changes throughout the years.

**Action Item: Joanne will compile this information from NLET/ALET for inclusion in this year's Annual Work Schedule (if time permits).**

### iii. ENVIRODAT / Data Management and Reporting

- Haseen raised the question of “**Who has ownership of ENVIRODAT?**”; It was agreed that it is not well coordinated nationally; there needs to be a more formalized system in place nationally when dealing with the database management systems; Cathy explained that she is currently working with the “Information Management Group” and that the management of ENVIRODAT is part of her job but she continues to be pulled away from this work onto other projects that take priority; Joe Pomeroy is the regional coordinator for data management issues.

**Action Item: Haseen will talk to Jean-Francois and suggest for him to bring together data management people to assess the issue and define a clear path forward; there will need to be a commitment in order to move forward nationally.**

### a. Current On-going Special Projects

#### i. Quality Flagging of Sample/Measurement Data

- The group discussed this project and decided to change the title to “Data Verification and Validation of Sample/Measurement Data”; this project parallels a project on a national scale; a full description is available in the Annual Work Schedule.

#### ii. Variable Grouping

- Detailed description of this project available in the Annual Work Schedule; Cathy and Art have worked together and have determined an approach for this project; waiting for the contract to go through to hire a chemist to do the grouping work.
- Cathy has been asked to work on a “Data Migration Strategy”; it is proposed that it should be done at the lab level for implementation into LIMS.

#### iii. ALET Client Package Review

- Detailed description of this project available in the Annual Work Schedule.

**Action Item: Renee will ask Joanne to coordinate this project; Joanne will send out the new forms to Water Quality staff for review and comments.**

**b. Sample Submission**

- No major changes to be made to this section.

**c. Management of ENVIRODAT**

- No major changes to be made to this section.
- There was discussion of “formal data sharing agreement”; it was agreed that this would better fit under the MOU Water Annex as an appendix.

**d. Data Extraction Tool/Web Services**

- No major changes to be made to this section.

**Action Item: Kyla will continue to share any thoughts/ideas about improvements to Extraction Tool as necessary with Dave Benoit.**

- There was some discussion about the fact that NL would like to have an archive of the Agreement data; a protocol needs to be established to retrieve and manage this data.

**Action Item: Renee will set up a meeting with appropriate individuals to discuss requesting an archive dataset of Agreement data from EC.**

**e. CANAL/Site Doc Database**

- No major changes to be made to this section.
- It was noted that the mapping application as the opening page for CANAL needs to be updated/changed.

**Action Item: Renee will set up a conference call for all appropriate individuals to determine a path forward for CANAL mapping application.**

**f. ADRS**

- No major changes to be made to this section.

**g. WQMA Search Engine**

- No major changes to be made to this section.

**h. Technical Documents – WQMA**

- No major changes to be made to this section.

**Action Item: Renee will review the Churchill River Intensive Survey Report and respond to Denis.**

**Action Item: Denis/Vincent will check with Jean-Francois about protocol on sign off for the Churchill River Intensive Survey Report.**

**i. Technical Documents – RTWQ**

- No major changes to be made to this section.

**j. Education/Outreach**

- No major changes to be made to this section.

**Action Item: Renee will inform Kyla that a poster needs to be made for the hydrometric network; add to existing poster list to be updated.**

**iv. Special Projects (work-shared)**

**a. Automated Uploading of Field Data**

- No major changes to be made to this section.

**b. Site-specific Guidelines Project**

- No major changes to be made to this section.

**Action Item: Vincent will send a copy of a document produced by CESI that will assist in this project.**

**c. Mobile Environmental Monitoring Platform**

- No major changes to be made to this section.
- Need to put some thought into the potential applications of the MEMP and any additional instrumentation that needs to be added to it to expand its services/applications.

**d. Blue-green Algae Monitoring**

- No major changes to be made to this section.

**e. Real-time Related Projects (see list in draft AWS)**

- No major changes to be made to this section.

**Action Item: Renee will add “brain-storming” for topics for the 3<sup>rd</sup> Real-time Water Quality Monitoring Workshop as an agenda item at the next section meeting.**

**Action Item: Renee will discuss the work involved in getting an LCD screen display with Dan from EC.**

**Monitoring**

**f. Application of Earth Observation for Water Quality**

- No major changes to be made to this section.



**c. Schedule C – Cost Shared Activities**

**Action Item: All EC leads (Joe; Vincent; Denis) will go back and talk to Jean-Francois about the dollar amounts that are included in the draft version of Schedule C; communicate with Renee if dollar amounts need to be changed.**

**d. Miscellaneous Items**

**Transboundary Waters**

- There was some discussion regarding the transboundary waters along the coast of southern Labrador.
- Haseen is in the process of having staff from the Hydrologic Modeling Section prepare a report on the Hydrology of Transboundary Waters in Labrador.
- Work in this area can be justified since it is a federal initiative as well.

**Action Item: Denis will email Haseen a copy of a report that may provide useful background information on the above-mentioned issue.**

**IOC**

- During a meeting with IOC earlier this summer, it was decided that the water quantity data would be halted and not reported through HYDAT; this does not follow national protocol.

**Action Item: Renee will contact IOC and ask about publishing the information to HYDAT on a delayed basis.**

**Action Item: Renee will add much more detail to the Annual Work Schedule (each project description; etc.) and distribute for final review by EC and ENVC staff by mid-October.**

---

---

**FIELD VISIT TO CHURCHILL RIVER VIA HELICOPTER - FANTASTIC!!!!**

---

---

**Annex I**  
**Detailed Schema Listings from NLET**

4-Oct-2011 09:50 AM LANE

### Detailed Schema Listing

Schema: HARDNESS1

Report Label	Ecclims Code	Qualifiers	Method Abbreviation	Envirodat Code	Star Code	Integrated Star	Detection Limit	Reporting Unit
HRDCAC03	0E15	T-	CALCULATED	010303	00300	01374	.5	MG/L

**Schema Description:** HARDNESS  
**Schema Time Unit:** 0.050 hours  
**Holding Time:** 50 days  
**Turnaround Time:** 0 weeks  
**Substrate:** Water  
**Lab Group:** (15) AA & ICP  
**Number of Methods:** 1  
**Batch Size:**  
**Old Schema Name(s):**  
**Active Schema2:** Yes

Created by LANE on 5-Feb-2004 2:35 PM

4-Oct-2010 9:46 AM LANE

### Detailed Schema Listing

Schema: MI4-U

Report Label	Esolims Code	Qualifiers	Method Abbreviation	Envirodat Code	Star Code	Integrated Star	Detection Limit	Reporting Unit
CA-UF	0019	UNF-	DA-UNF	920198	00324	01373	.05	MG/L
MG-UF	0023	UNF-	DA-UNF	312106	00354	01375	.01	MG/L
NA-UF	2888	UNFLI-	DA-UNF	101947	00543	01372	.01	MG/L
K-UF	2886	UNFLT-	DA-UNF	101946	00841	01375	.01	MG/L

Schema Description: CA, MG NA, K-UNFLI, ATOM, ABSORPTION

Schema Time Unit: 3.170 Hours Substrate: Water

Holding Time: 50 days Lab Group: (1.5) AA & CP

Turnaround Time: 9 weeks Number of Methods: 4

Created by LANE on 8-Feb-2004 2:48 PM

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

Batch Size:  
Old Schema Name(s):  
Active Schema?: Yes

4-Oct-2010 9:46 AM LANE

### Detailed Schema Listing

Schema: NO3ATL-U

Report Label	Ecolims Code	Qualifiers	Method Abbreviation	Envirodat Code	Star Code	Integrated Star	Detection Limit	Reporting Unit
NO3-N-UJ	4203	NO3-UNE	ION:HROM-DNX	074473			.01	MC/L

**Schema Description:** NO3-IC(only valid w CISO4 schema for Atlantic Reg)  
**Substrate:** Water  
**Schema Time Unit:** 0.020 hours  
**Lab Group:** (1.8) IC  
**Holding Time:** 2 days  
**Number of Methods:** 1  
**Turnaround Time:** 0 weeks  
**Batch Size:**  
**Old Schema Name(s):**  
**Active Schema(s):** Yes

Created by LANE on 30-Mar-2004 9:45 AM  
 Modified by LANE on 30-Mar-2004 9:59 AM

7-Oct-2010 9:48 AM LANE

### Detailed Schema Listing

Schema: TM2004/T27W

Report Label	Ecolims Code	Qualifiers	Method Abbreviation	Envirodat Code	Star Code	Integrated Star	Detection Limit	Reporting Unit
AGT-MS	3646	TOT-UNF	IN-BOTTLE-DIGN	107904	01566		.001	UG/L
ALT-MS	3646	TOT-UNF	IN-BOTTLE-DIGN	107906	01568		5	UG/L
AST-MS	3647	TOT-UNF	IN-BOTTLE-DIGN	107906	01567		.01	UG/L
BAT-MS	3648	TOT-UNF	IN-BOTTLE-DIGN	107907	01568		.5	UG/L
BAT-MS	3649	TOT-UNF	IN-BOTTLE-DIGN	107908	01569		.05	UG/L
BEF-MS	3650	TOT-UNF	IN-BOTTLE-DIGN	107909	01570		.001	UG/L
BUT-MS	3651	TOT-UNF	IN-BOTTLE-DIGN	107910	01571		.001	UG/L
CDT-MS	3652	TOT-UNF	IN-BOTTLE-DIGN	107911	01572		.01	UG/L
COF-MS	3654	TOT-UNF	IN-BOTTLE-DIGN	107913	01574		.002	UG/L
CRU-MS	3655	TOT-UNF	IN-BOTTLE-DIGN	107914	01575		.01	UG/L
CUL-MS	3657	TOT-UNF	IN-BOTTLE-DIGN	107916	01577		.02	UG/L
FET-MS	3658	TOT-UNF	IN-BOTTLE-DIGN	107917	01578		.5	UG/L
GAT-MS	3658	TOT-UNF	IN-BOTTLE-DIGN	107918	01579		.001	UG/L
IAT-MS	3659	TOT-UNF	IN-BOTTLE-DIGN	107919	01580		.01	UG/L
LIT-MS	3661	TOT-UNF	IN-BOTTLE-DIGN	07920	01581		.01	UG/L
MMT-MS	3662	TOT-UNF	IN-BOTTLE-DIGN	07921	01582		.05	UG/L
MOT-MS	3663	TOT-UNF	IN-BOTTLE-DIGN	07922	01583		.005	UG/L
NIT-MS	3665	TOT-UNF	IN-BOTTLE-DIGN	07924	01585		.02	UG/L
PBT-MS	3668	TOT-UNF	IN-BOTTLE-DIGN	107925	01586		.005	UG/L
RAT-MS	3668	TOT-UNF	IN-BOTTLE-DIGN	107928	01589		.001	UG/L
SBT-MS	3670	TOT-UNF	IN-BOTTLE-DIGN	107928	01590		.001	UG/L
SET-MS	3671	TOT-UNF	IN-BOTTLE-DIGN	107930	01591		.01	UG/L
SRT-MS	3673	TOT-UNF	IN-BOTTLE-DIGN	107932	01593		.05	UG/L
TLT-MS	3675	TOT-UNF	IN-BOTTLE-DIGN	107934	01595		.001	UG/L
UT-MS	3676	TOT-UNF	IN-BOTTLE-DIGN	107936	01598		.0005	UG/L
VIT-MS	3677	TOT-UNF	IN-BOTTLE-DIGN	107936	01607		.005	UG/L
ZNT-MS	3680	TOT-UNF	IN-BOTTLE-DIGN	107939	01600		.2	UG/L

Schema Description: 27 Total Metals by In-Bottle Digestion ICP-MS

Substrate: Water  
 Lab Group: (2.0) Trace Metals  
 Number of Methods: 27

Schema Time Unit: 183 days  
 Holding Time: 183 days  
 Turnaround Time: 0 weeks

Batch Size:  
 Old Schema Name(s):  
 Active Schema(s): Yes

Created by SARDELLA on 23-Dec-2010 1:33 PM

4-Oct-2010 9:46 AM LANE

### Detailed Schema Listing

Schema: TN1-U

Report Label	Ecolims Code	Qualifiers	Method Abbreviation	Envirodat Code	Star Code	Integrated Star	Detection Limit	Reporting Unit
TN1-U	554	T-UNF-	COLAUT_V	000077	00292	00440	.014	MG/L

**Schema Description:** UNFILTERED TOTAL NITROGEN  
**Schema Time Unit:** 0.210 hours  
**Holding Time:** 7 days  
**Turnaround Time:** 0 weeks  
**Substrate:** Water  
**Lab Group:** (.2) Nutrients  
**Number of Methods:** 1  
 Batch Size:  
 Old Schema Name(s):  
 Active Schema?: Yes

Created by LANE on 6-Oct-2004 2:58 PM

4-Oct-2010 9:47 AM LANE

### Detailed Schema Listing

Schema: TP1-U

Report Label	Ecolins Code	Qualifiers	Method Abbreviation	Envirodat Code	Star Code	Integrated Star	Detection Limit	Reporting Unit
TP-P-UF	0073	T-UNF-	UNF	015-112	00260	00259	0005	MGL
<b>Schema Description:</b> UNFILTERED TOTAL PHOSPHORUS <b>Schema Time Unit:</b> 0.150 Hours <b>Substrate:</b> Water <b>Holding Time:</b> 365 days <b>Lab Group:</b> (1,2) NUTRIS <b>Turnaround Time:</b> 0 weeks <b>Number of Methods:</b> 1 <b>Batch Size:</b> <b>Old Schema Name(s):</b> <b>Active Schema ?:</b> Yes								
Created by LANE on 6-Feb-2004 2:55 PM Modified by DUFFIELD on 14-Dec-2007 11:04 AM								



4-Oct-2010 9:49 AM LANE

### Detailed Schema Listing

Schema: TURBIDITY3

Report Label	Code	Qualifiers	Method Abbreviation	Envirodat Code	Star Code	Integrated Star	Detection Limit	Reporting Unit
TURB	3644		NFPHELOMETRY	104768	01131	C1436	.01	NTU

Schema Description: TURBIDITY

Schema Time Unit: 0.080 hours

Holding Time: < days

Turnaround Time: 0 weeks

Created by SARJELLA on 26-Apr-2007 11:05 AM.

Substrate: Water

Lab Group: (1.3) Physicals

Number of Methods: 1

Batch Size:

Old Schema Name(s):

Active Schema?: Yes

4 Oct 2010 9:45 AM LANE

### Detailed Schema Listing

Schema: ALKPHCOND

Report Label	Ecoline Code	Qualifiers	Method Abbreviation	Envirodat Code	Star Code	Integrated Star	Detection Limit	Reporting Unit
SPCOND	0005	25-		002041	00780		.9	US/CM
PH	0003	25-	FLECTRO	010301	00275		.00	PH/UMFS
ALKAC03	4198	AUTO.INF.PT.	POT.TITN	1011	01498	C1501	.1	MG/L
ALKAC03	4194	AUTO.INF.GRAN	POT.TITN	10110	01459	C1502	589.00	MG/L
ALKAC03	4196	PHN-	PHEN.TITN	1015	01500	C1503	.1	MG/L

Schema Description: PH, Sp. Conductance and Alkalinity

Schema Time Unit: 0.280 hours Substrate: Water

Holding Time: 1 days Lab Groups: (1,3) Physicals

Turnaround Time: 8 weeks Number of Methods: 5

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

Batch Size:  
 Old Schema Name(s):  
 Active Schema?: Yes

4-Oct-2010 9:47 AM LANE

### Detailed Schema Listing

Schema: CLS04-U

Report Label	Ecolins Code	Qualifiers	Method Abbreviation	Envirodat Code	Star Code	Integrated Star	Detection Limit	Reporting Unit
CL-LF	4135	UNF	IONCHROM-DNX	087856	01198	01197	.02	MG/L
SO4-LF	4136	UNF	IONCHROM-DNX	097960	01198	01199	.02	MG/L

**Schema Description:** CL&SO4UNFILT, ION CHROMATOGRAPHY  
**Schema Time Unit:** 0.300 hours  
**Substrate:** Water  
**Holding Time:** 28 days  
**Lab Group:** (1.6) IC  
**Turnaround Time:** 0 weeks  
**Number of Methods:** 2  
**Batch Size:**  
**Old Schema Name(s):**  
**Active Schema?:** Yes

Created by LANE on 6-Feb-2004 2:45 PM  
 Modified by DUFFIELD on 14-Apr-2004 1:15 PM

4-Oct-2010 9:48 AM LANE

### Detailed Schema Listing

Schema: COL-APP

Report Label	Ecolins Code	Qualifiers	Method Abbreviation	Envirodat Code	Star Code	Integrated Star	Detection Limit	Reporting Unit
COLOR-AP	2951	UNF-	COLOURIMETRIC	102558	00005		.5	PT-CO UK

**Schema Description:** COLOR-APP  
**Schema Time Unit:** 0.150 hours  
**Holding Time:** 2 days  
**Turnaround Time:** 0 weeks  
**Substrate:** Water  
**Lab Group:** (1-3) Physicals  
**Number of Methods:** 1  
**Batch Size:**  
**Old Schema Name(s):**  
**Active Schema?:** Yes

Created by LANE on 6 Feb 2004 3:26 PM

4-Oct-2010 8:48 AM LANE

### Detailed Schema Listing

Schema: DIC/DDOC1

Report Label	Ecolims Code	Qualifiers	Method Abbreviation	Envirodat Code	Star Code	Integrated Star	Detection Limit	Reporting Unit
DOC	0048	ORG-FLT-	DIC-FLT	006104	00236	00236	.1	MG/L
DIC	2220	IND FIT	DIC-PLI	103300	00236	00237	.2	MG/L

**Schema Description:** DISSOLVED INORGANIC & ORGANIC CARBON-PHOENIX 8000

**Schema Time Unit:** 3,300 hours **Substrate:** Water

**Holding Time:** 1 days **Lab Group:** (1.2) Nutrients

**Turnaround Time:** 3 weeks **Number of Methods:** ?

Created by LANE on 6-Feb-2004 3:08 PM  
 Mod'ified by DUFFIELD on 7-Nov-2005 3:42 PM

**Batch Size:**  
 Old Schema Name(s):  
 Active Schema?: Yes





