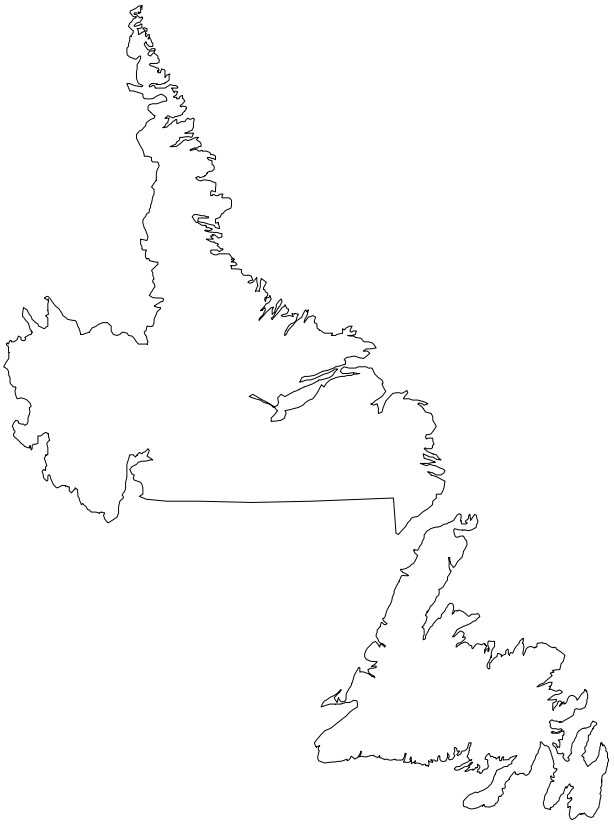
CANADA-NEWFOUNDLAND and LABRADOR
WATER QUALITY MONITORING AGREEMENT

Progress Report
2009-2010

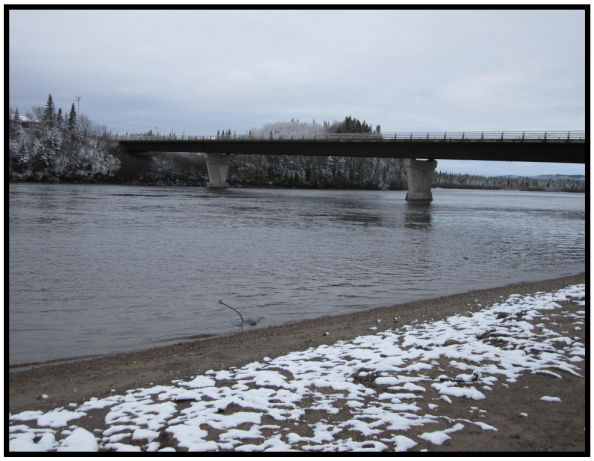


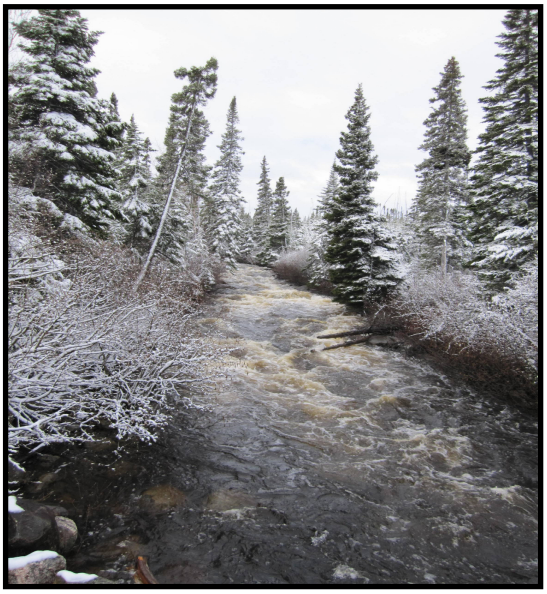
Water Resources Management Division
Department of Environment & Conservation
St. John's, Newfoundland and Labrador

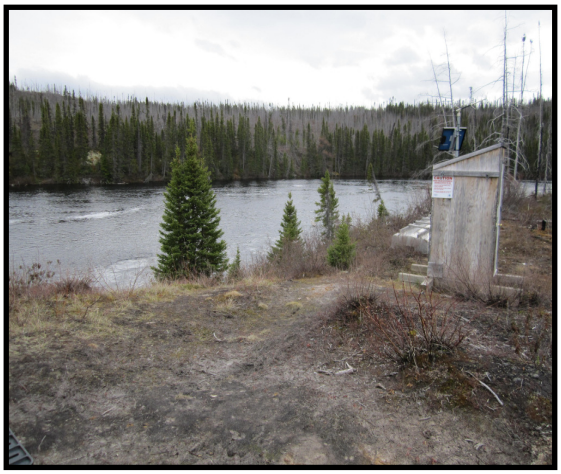
Atlantic Water Quality Monitoring - Surveillance de la qualité de l'eau de l'Atlantique
Environment Canada - Environnement Canada
Dartmouth, Nova Scotia

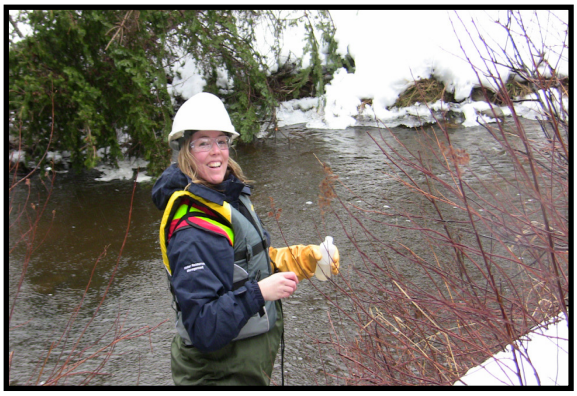
Introduction

The following progress report was prepared by NL DOEC staff to document progress made on all activities under the Canada-Newfoundland and Labrador Water Quality Monitoring Agreement during 2009-2010. This document is formatted to reflect the same layout as the 2009-2010 Annual Work Schedule.









Work Shared Activities for Fiscal Year 2009-2010

Work Shared Activities 2009-2010

Activity	Responsible Agency	Remarks
Ambient Water Quality Sampling	Newfoundland and Labrador Department of Environment and Conservation	Refer to **Table 1**.
Ambient Water Quality Analysis	Environment Canada – National Laboratory for Environmental Testing (NLET)	Refer to **Table 2**.
Recreational Water Quality Sampling and Analysis	Newfoundland and Labrador Department of Environment and Conservation	This activity has been put on-hold for this fiscal year to address office activities related to the program.
ENVIRODAT and Data Management/Reporting	Newfoundland and Labrador Department of Environment and Conservation and Environment Canada	Refer to **Table 3** for ENVIRODAT; Refer to **Table 4** for Data Management/Reporting.

Ambient Water Quality Sampling

During 2009-2010 the ambient water quality grab sampling proceeded as outlined in the Annual Work Schedule. A comparison of the number of samples scheduled vs. the number of samples collected can be seen in **Table 1**. In the majority of cases, the number of samples actually collected reflected the number of samples scheduled. In some instances due to scheduling conflicts some samples were missed.

In the upcoming fiscal year, NL DOEC staff will aim to ensure that the number of samples collected reflect the number of samples scheduled as outlined in the Annual Work Schedule 2010-2011.

Table 1: Provincial Samples Collected in 2009-2010 Fiscal Year

Station #	Description	Number of Samples Scheduled in 09-10	Number of Samples Collected in 09-10
EASTERN REGION			
NF02ZK0005	Northeast River	4	4
NF02ZL0029	Goulds Brook	4	4
NF02ZM0004	Waterford River	4	4
NF02ZM0009	Waterford River	4	4
NF02ZM0014	Virginia River	4	4
NF02ZM0015	Quidi Vidi Outlet	4	4
NF02ZM0016	Rennies River	4	4
NF02ZM0020	Broad Cove Brook	4	4
NF02ZM0098	Virginia River	4	4
NF02ZM0109	Mundy Pond	4	4
NF02ZM0144	Kelly's Brook	4	4
NF02ZM0175	Waterford River	4	4
NF02ZM0176	South Brook	4	4
NF02ZM0177	Rennies River	4	4
NF02ZM0178	Learys Brook	4	4
NF02ZM0179	Virginia River	4	4
NF02ZM0180	Virginia River	4	4
NF02ZM0181	Waterford River	4	4
NF02ZM0182	Waterford River	4	4
NF02ZM0183	Kelligrews River	4	4
NF02ZM0184	Learys Brook	4	4

Station #	Description	Number of Samples Scheduled in 09-10	Number of Samples Collected in 09-10
NF02ZM0185	South Brook	4	4
NF02ZN0004	Salmonier River	4	4
NF02ZM0294	Manuals River	4	4
CENTRAL REGION			
NF02YM0004	South West Brook	4	4
NF02YM0003	Indian Brook	4	4
NF02YO0189	Joe's Lake	4	3
NF02YO0107	Exploits River	4	3
NF02YO0020	Exploits River	4	3
NF02YO0001	Exploits River	4	3
NF02YO0128	Exploits River	4	3
NF02YO0142	Corduroy Brook	4	3
NF02YO0143	Exploits River	4	3
NF02YR0001	Pound Cove Brook	4	3
NF02YO0121	Peter's River	4	3
NF02YQ0006	North West Gander River	4	4
NF02YQ0030	Gander River	4	3
NF02YS0001	Terra Nova River	4	3
NF02YS0011	Terra Nova River	4	3
NF02YS0083	Northwest River	4	3
WESTERN REGION			
NF02YE0004	Portland Creek	4	4
NF02YE0005	Western Brook	4	4
NF02YG0001	Main River (Bridge)	4	4
NF02YG0009	Main River(Paradise Pool)	4	3
NF02YG0020	Eagle Mountain Brook	4	3
NF02YH0018	Lomond River	4	4
NF02YJ0004	Pinchgut Brook	4	4
NF02YK0022	Humber Canal	4	4
NF02YL0011	Humber River	4	4
NF02YL0012	Humber River	4	4

Station #	Description	Number of Samples Scheduled in 09-10	Number of Samples Collected in 09-10
NF02YL0013	Corner Brook	4	4
NF02YL0029	Wild Cove Brook	4	4
NF02YN0001	Lloyds River	4	4
NF02ZA0006	Grand Codroy River	4	4
NF02ZC0020	Buck Lake	4	4
NF02YN0043	Peter Stride's Lake	4	4
LABRADOR REGION			
NF02XA0001	Little Mecatina River	5	4
NF03NF0013	Ugjoktok River	5	4
NF03OC0012	Atikonak River	5	4
NF03OD0011	East Metchin River	5	5
NF03OE0001	Churchill River	5	5
NF03OE0030	Minipi River	5	6
NF03OE0032	Pinus River	5	4
NF03OE0033	Big Pond Brook	5	6
NF03PB0025	Naskaupi River	5	5
NF03QC0001	Eagle River	5	4
NF03QC0002	Alexis River	5	5
NF03NG0034	Shipiskan Lake East	5	3
NF03OD0012	Wilson River E. Branch	5	5
NF03OE0035	Dominion Lake	5	5
NF03OE0037	Cache River	5	5
NF03PB0028	Cape Caribou River	5	5
NF03PB0029	Northwest River	5	6
NF03PB0030	Seal Lake Narrows	5	5
NF03PB0032	Susan River	5	5
NF03PB0037	Wuchusk Lake	5	5
NF03QA0044	Carter Basin	5	5

Station #	Description	Number of Samples Scheduled in 09-10	Number of Samples Collected in 09-10
NF03QA0045	Kenamu River	5	5
NF03OA0020	Ashuanipi River	2	2

Notes:

1. Total number of samples collected in 2009-10 does include triplicate samples. The total does not include bottle blanks.
2. Total number of samples planned for 2009-10 for Eastern region was 96; 96 were sampled, 11 of these samples were triplicates.
3. Total number of samples planned for 2009-10 for Central region was 64; 51 were sampled, 3 of these samples were triplicates.
4. Total number of samples planned for 2009-10 for Western region was 62; 62 were sampled, 2 of these samples were triplicates.
5. Total number of samples planned for 2009-10 for Labrador region was 112; 104 were sampled, 8 of these samples were triplicates.

Ambient Water Quality Analysis

During 2009-2010 the ambient water quality samples were analyzed at NLET in Burlington, ON. There were no lab issues/delays encountered. All shipping/analysis were carried out as agreed upon in the Annual Work Schedule 2009-2010 as seen in **Table 2**.

Table 2: Analytical Parameters, Holding Times and Schemas for 2009-2010

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

Schema Number	Schema Name	Parameter/ Grouping
1	ALKPHCOND	alkalinity, pH, conductivity
2	MI4-U	Ca, Mg, Na, and K
5	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
23	COL-APP	Colour-apparent (unfiltered sample)
24	TURBIDITY3	turbidity
31	TM2003/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	

ENVIRODAT and Data Management/Reporting

During 2009-2010 significant effort from both EC and NL DOEC was put into ensuring the Agreement data was accessible in a timely manner to any potential end-users of this water quality information. Numerous products were developed to help make the water quality information more user-friendly. All data management and reporting activities were carried out as agreed upon in the Annual Work Schedule 2009-2010 as seen in **Table 3 & 4**.

Table 3: ENVIRODAT – Data Management

Management Activities		Lead Agency	Progress Evaluation
Sample Submission	Laboratory procedures and quality control practices	Environment Canada – ALET	Proceeded as per Environment Canada's protocols
	Design of field sheets and station identification sheets (administrative)	Environment Canada – CIOB Newfoundland and Labrador Department of Environment and Conservation – staff	All 2009-2010 sample submission forms have been filed in St. John's office for record keeping; all WRMD staff are utilizing consistent forms.
	Entering field data onto field sheets; entering of information on station identification sheets; submission to laboratory (field)	Newfoundland and Labrador Department of Environment and Conservation – staff	This has been completed and up to date for 2009-2010. WQMA station ID forms are now to be scanned and filed on the shared drive within WRMD.
	Data entry of station identification information and sample submission information upon receipt at laboratory (laboratory)	Environment Canada – ALET	Proceeded as per Environment Canada's protocols
Management of national water quality database (ENVIRODAT)	Processing, validating and loading of analytical results performed at NLET or ALET to ENVIRODAT	Environment Canada – CIOB	Proceeded as per Environment Canada's protocols
	Backups, modifications, upgrades and additions to ENVIRODAT	Environment Canada – CIOB	Proceeded as per Environment Canada's protocols
	Data audits, custody and transfer	Environment Canada – CIOB	Proceeded as per Environment Canada's protocols

	Quality assurance and quality control of data	Environment Canada – CIOB	Proceeded as per Environment Canada's protocols
	Activities relating to problem resolution, data modifications and additions, and requests for information	Environment Canada – CIOB	Open communication between Cathy Cormier (CIOB) and NL WRMD staff allowed the resolution of data issues and requests for information.
	Resolving historical data issues	Environment Canada – CIOB Newfoundland and Labrador Department of Environment and Conservation - staff	Response noted above.
Data Extraction Tool/Web Services	Availability of data outside the firewall for new data loaded to ENVIRODAT	Environment Canada – CIOB/WQMS	Proceeded as per Environment Canada's protocols
	Consistent planning and coordinating of modifications to data extraction tools	Environment Canada – CIOB/WQMS	In 2009-2010 the need for modifications to the existing Atlantic extraction tool were identified and Atlantic user requirements were gathered. In 2010-2011 National Water Quality Monitoring will undergo a study to identify client needs and business requirements in the area of providing water quality data to clients and partners. The intent is to launch a 2010-2011 project that will produce a national data extraction tool that will serve all of Environment Canada
	Development/Maintenance of ENVIRODAT Web Services	Environment Canada – CIOB/WQMS Newfoundland and	The development of the ENVIRODAT Web Services have been completed by Environment Canada. The testing of the Web

		Labrador Department of Environment and Conservation – Paul Neary/Leona Hyde	Services have been completed by WRMD. The actual application of the Web Services has been placed on hold and deferred for completion at a later date by WRMD.
Current/Ongoing Projects of Importance	Storing and grouping of variable and method codes that facilitate data entry, data extraction and data interpretation.	Environment Canada - CIOB	In 2009-2010 a proposal was drafted that outlined a redesign of method, variable, and method/variable data that will include grouping and method comparability. In 2010-2011 this proposal will be distributed for review and acceptance and a work contract will be put in place to identify and eliminate data redundancies and to implement the new design. This work will be organized in a phased approach that will focus on selected projects (including project AT0215 Canada-Newfoundland Water Quality Agreement) as a starting point this fiscal, with other projects to be included as work progresses through next fiscal year.
	Working towards controlled vocabulary within ENVIRODAT	Environment Canada - CIOB	In 2009-2010, as part of a redesign of the Water Quality Indicators database, CESI variables were identified using an abbreviated variable ID. The common format is the 2 or 3-character variable abbreviation followed by a dash (-) and the chemical form (i.e. CD-EXT, CD-TOT, CD-DISS) with exceptions for variables where the form does not differ (i.e. PH, MCPA, BAP). This abbreviated

			ID not only uniquely identifies the variable but can be used in column headings for spreadsheets, in drop-down lists for applications, and for variable mapping for the CESI Calculator. Work was completed in 2009-2010.
	Quality flagging of measurement data	Environment Canada - CIOB	In 2009-2010 a data validation tool was developed as an add-on to the Atlantic LIMS software and a pilot project was completed that validated data for the Ashkui project AT0393. Work will build on the pilot project in 2010-2011 to establish standard validation techniques and processes for all projects through the following: - A guidance document is in development that will include all previous data validation documentation. - The existing data validation tool will be modified to a stand-alone version that can be distributed to project leaders and partners. - A training session is planned for those users that are interested in conducting data validation.
	Downloading of NL WQMA data from ENVIRODAT	Newfoundland and Labrador Department of Environment and Conservation - staff	This is an ongoing project. Data was downloaded from ENVIRODAT as needed for projects (i.e. CESI; other data requests; analysis; etc)
	Quality assurance/quality control and data validation of NL WQMA datasets	Newfoundland and Labrador Department of Environment and	Deferred until 2010-2011when EC has a validation tool available for use as noted above.

		Conservation - staff	

- * Activities listed in this table are work-shared activities
- **CIOB** – Chief Information Officer Branch (Cathy Cormier)
- **ALET** – Atlantic Laboratory for Environmental Testing (Art Cook/Mark Thibodeau)
- **WQMS** – Water Quality Monitoring and Surveillance (Dave Benoit/Ryan Alexander/Daniel Bastrache/Dennis Parent/Todd Smith)

Table 4: Technical Documents and Reporting

Project	Activity	Responsible Agency	Progress Evaluation
CANAL / Site Documentation Database / Bacteriological Database	On-going updating of CANAL webpage	Environment Canada – WQMS --- Newfoundland and Labrador Department of Environment and Conservation – Paul Neary	The current content and design of CANAL webpage has been reviewed. There was a preliminary meeting held with the Hydrologic Modeling Section to discuss approach to updating/restructuring CANAL. This project will continue in the fiscal year 2010-2011. See note pertaining to updating of WQI scores and fact sheets.
	On-going maintenance of the Site Documentation Database	Newfoundland and Labrador Department of Environment and Conservation - staff	Planning for this project began in 2009-2010, the actual ground truthing and site documentation update on a station-by-station basis will take place in 2010-2011.
	On-going populating of the Site Documentation Database	Newfoundland and Labrador Department of Environment and Conservation – Paul Neary/Rob Holloway	Planning and procedures for utilizing the different datasets for updating the site documentation database have been completed. The overall completion of the site documentation database is scheduled for 2010-2011. See note on progress listed above.
	On-going maintenance of the Bacteriological Database	Newfoundland and Labrador Department of Environment and Conservation - staff	No bacterial monitoring took place in 2009-2010, therefore no updating of bacteriological database was necessary.
	On-going updating of the Water Quality Index scores	Newfoundland and Labrador Department of Environment and Conservation – Kyla Brake	WQI scores have been recalculated for all WQMA stations; updated WQI scores have not been incorporated into CANAL. CANAL will need to be restructured to accommodate the new WQI scores. This project will take place in 2010-2011. Please see note regarding 'On-going updating of CANAL webpage'.
	On-going updating of the summary statistics	Newfoundland and Labrador Department of Environment and Conservation – Kyla Brake	Updating of summary statistics for each station (i.e. drainage basin areas, temperatures, rainfall , etc) will be completed during the 'On-going maintenance of the site documentation database projects'. This project will take place in 2010-2011.
	Addition of CABIN sites to CANAL	Newfoundland and Labrador Department of Environment and	Many of the CABIN stations have been added to CANAL with limited supporting documentation. As the site documentation database is updated in 2010-2011, all remaining CABIN stations

		Conservation - staff	will be added to CANAL. Significant amount of time will be spent on ensuring the supporting documentation is current and complete.
	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	This project was deferred to be completed in fiscal year 2010-2011. All WQMA stations in NL (including CABIN; Real-Time; grab, etc.) will be delineated and digitized.
Automatic Data Retrieval System (ADRS)	On-going Real-time Service Delivery (ADRS – reporting)	Newfoundland and Labrador Department of Environment and Conservation – Paul Neary/Leona Hyde	This task was an on-going activity on a daily basis throughout 2009 -2010. This activity will continue in fiscal year 2010-2011.
	Development and Testing of ADRS Search Engine	Newfoundland and Labrador Department of Environment and Conservation – Paul Neary/Leona Hyde	The first draft of the ADRS search engine is finalized. It has been distributed to Real-Time staff for testing and review. This project will continue into 2010-2011.
	Development and Testing of Inventory / Servicing Database	Newfoundland and Labrador Department of Environment and Conservation – Paul Neary/Leona Hyde/Renee Paterson	This task is an ongoing activity. The inventory/servicing database has been developed in an excel spreadsheet. It is currently in the information gathering stage. The spreadsheet is currently in use to log, organize and provide information on all instruments/materials. This project will continue into 2010-2011.
	Installation/ maintenance of camera technology at Leary's Brook Real-Time Station	Environment Canada – WQMS - - - - - - - - - - - - - - - - Newfoundland and Labrador Department of Environment and Conservation – Paul Neary/Renee Paterson	This project is completed. The camera was installed and is currently working. Images are posted every 20 seconds on the government website.

WQMA Search Engine	Development and Testing of WQMA Search Engine (utilizing EC web services)	Newfoundland and Labrador Department of Environment and Conservation – Paul Neary	This project has been deferred to a later date by WRMD.
Technical Documents – WQMA	Development of Fact Sheets for selected WQMA stations	Newfoundland and Labrador Department of Environment and Conservation – Kyla Brake	Work was initiated for this project in 2009-2010. The fact sheet template was designed and finalized. Updating of each fact sheet on a station-by-station basis will take place in 2010- 2011 when up to date information has been added to the site documentation database (primary source of information for the fact sheets).
	Water Quality Index – research and development / literature review	Newfoundland and Labrador Department of Environment and Conservation – Kyla Brake	A timeline detailing the water quality index research was completed. Literature review was passed on to Hydrologic Modelling Section for information purposes.
	Completion of NL-WQMA Sampling Manual	Newfoundland and Labrador Department of Environment and Conservation – Joanne Sweeney	This project is completed. It was decided that WRMD would adopt the water quality sampling manual developed by CCME. This document was slightly revised/adjusted to meet the needs of the NL sampling program. This document will continue to be updated and used in the future.
	Completion of Intensive Survey 2008-09 Report (Churchill River)	Environment Canada – WQMS --- Newfoundland and Labrador Department of Environment and Conservation – Ian Bell	Churchill River Intensive Survey Report was completed by EC staff in 2009-2010. It was sent to WRMD staff for review/input. The document will be finalized and printed in 2010-2011.
	Completion of Intensive Survey 2009-10 Report (Bonne Bay Ponds)	Environment Canada – WQMS --- Newfoundland and Labrador Department of Environment and Conservation – Joanne Sweeney	This intensive survey was completed in Aug 2009. Many of the samples were analyzed in 2009-2010. The remaining samples will be analyzed in 2010-2011. WRMD staff will analyze the data and prepare/finalize a document in 2010-2011.

	Updating of the Trend Analysis Report	Newfoundland and Labrador Department of Environment and Conservation – staff (TBD)	This report has been deferred to a later data (when technical expertise becomes available).
	On-going updating of WQMA website	Newfoundland and Labrador Department of Environment and Conservation – Joanne Sweeney/Paul Neary	The government of NL website is currently undergoing a complete redesign. All WQMA content has been reviewed and will be incorporated into the redesigned webpage. To be completed in 2010-2011.
Technical Documents - RTWQ	Real-Time Water Quality Deployment and Annual Reports	Newfoundland and Labrador Department of Environment and Conservation – staff	Please refer to **Table 8**.
	Planning for Real-Time Water Quality Monitoring for Mega-projects	Newfoundland and Labrador Department of Environment and Conservation – Renee Paterson	During the 2009-2010 fiscal year the following progress was made with respect to real-time water quality monitoring for mega-projects: - There was a new MOA negotiated and signed with Labrador Iron Mines for the installation of two new real-time stations in Schefferville during the summer of 2010. - There was an amendment made to the MOA with Nalcor Energy. - There was an amendment (two additional stations) and an extension (three more years) made to the MOA with Vale Inco Ltd (Long Harbour Project). - There was an extension letter (three more years) signed by IOC. - There was a technical presentation and a draft MOA prepared for potential real-time stations at the proposed waste management facility in central NL through the Central Waste Management Authority. - There was a meeting held with the Town of Logy Bay/Middle Cove/Outer Cove to initiate discussion regarding the installation of real-time stations downstream of the Torbay Road North Commercial Area. - There were a number of reports (ie: EPPs; EMPs; EA registrations) reviewed to determine if real-time monitoring was necessary through the provincial Environmental Assessment process.

	Revision of QA/QC protocols for Real-Time Water Quality data	Newfoundland and Labrador Department of Environment and Conservation – Renee Paterson	During the summer of 2009, a biofouling project bought to light some adaptations that can be made in the Real-Time program in reference to QA/QC procedures. During the fiscal year 2009-2010 the new procedure were developed and implemented. Currently the following procedures have been adapted or created for the Real-Time Program: • Laboratory/Field Procedures • Data Management • Servicing and Inventory of Real-Time Instruments • Development of new forms (i.e. field sheets and data variance reports) • Site Design • Quality Assurance/Quality Control All new procedures will be tested for one year (2010-2011). Once testing completed it will be incorporated into the entire Real-Time Program as a permanent adjustment (2011-2012).
	Development of new calibration forms and deployment forms	Newfoundland and Labrador Department of Environment and Conservation – Grace Gillis	This project has been completed and corresponds with the project noted above. Forms were developed during 2009-2010. The forms have been incorporated into the Real-Time program and are currently in use during the development and testing stage (2010-2011). The forms that have been developed are: • Field Data Sheet • Laboratory Calibration Form • Grab Sample Field Sheet • Data Variance Form Once the testing stage is completed all forms will be incorporated into the entire Real-Time Program as a permanent adjustment (2011-2012).
	Completion of Real-Time Water Quality Manual	Newfoundland and Labrador Department of Environment and Conservation – Renee Paterson/Grace Gillis	This project corresponds with the previous two projects. There has been a significant amount of progress made in 2009- 2010 on the procedures and processes to be incorporated into the RTWQ Manual. The document is currently undergoing internal review and is expected to be finalized and distributed in 2010-2011.
	On-going updating	Newfoundland and	The government of NL website is currently undergoing a complete

	of Real-Time Water Quality Website	Labrador Department of Environment and Conservation – Renee Paterson/Paul Neary	redesign. All Real-Time WQ content has been reviewed and will be incorporated into the redesigned webpage. To be completed in 2010-2011.
Education / Outreach	Educational Displays	Newfoundland and Labrador Department of Environment and Conservation – Kyla Brake	The educational displays for the fiscal year 2009-2010 have been completed. DOEC participated in Earth Day on April 22, 2009 at the Burin Peninsula Area Region Celebrations, and will be partaking in Enviro-Fest 2010 on May 31st. When aware/invited DOEC will participate in any upcoming educational displays for 2010-2011.
	Fluvarium Project	Environment Canada – WQMS Newfoundland and Labrador Department of Environment and Conservation – Kyla Brake	This project is completed for 2009. This is a permanent display at the Fluvarium. The display is 100% complete, however WRMD is still providing technical assistance (i.e. technical support with computer screen; real-time graphs on-line; etc.).
	Updating of all posters	Newfoundland and Labrador Department of Environment and Conservation – Kyla Brake	This project has been deferred to 2010-2011 fiscal year.

- * Activities listed in this table are work-shared activities
- **WQMS** – Water Quality Monitoring and Surveillance (Dave Benoit/Ryan Alexander/Daniel Bastrache/Dennis Parent/Todd Smith)

Cost Shared Activities for Fiscal Year 2009-2010

Table 5: Cost Shared Activities 2009-2010

Activity	Progress Evaluation
Recurrent Survey on Bonne Bay Big Pond & Bonne Bay Little Pond **-** week of July 20th, 2009	Survey completed 2009-2010. Data analysis and reporting will take place in fiscal year 2010-2011.
Real-time Water Quality Monitoring Network	
- Operation and maintenance of two federal real-time water quality stations (Main River; Minipi River)	- Both Minipi River and Main Rain Real-Time Stations were deployed in late spring 2009 to fall 2009. There were technical issues encountered with the Main River station (cable damaged by wildlife, incorrect instrumentation settings). The Minipi River successfully transmitted data throughout the deployment period. EC arranged for payment of servicing/repairs to instruments as needed. Please see **Table 8.**
- Operation and maintenance of three provincially operated real-time water quality stations (Waterford River; Leary's Brook; Humber River)	- Successful year round deployment (Waterford River; Leary's Brook; Humber River). Please see **Table 8.** Updating monthly graphing populated on website. Full weather station installed at Humber River Station.
- Operation and maintenance of one joint pilot project real-time station with the Miawpukek reservation (Southwest Brook)	- Successful year round operation of Miawpukek reservation (Southwest Brook). Discussions began 2009-2010 on improvements that need to be implemented for this station. Further meetings will take place in 2010-2011 to initiate the improvements (field procedures, consistent data reporting & improved communication between partners).
- Establishment, operation and maintenance of real-time station at Paddy's Pond	- Hut at Paddy's Pond has been constructed and positioned. Inventory of existing materials/equipment has been taken. Actual installation/testing of instrumentation will take place in 2010-2011.
- Operation and maintenance of industry funded real-time water quality stations (5 stations at Voisey's Bay; 3 station at Long Harbour (Vale Inco); 3 stations at Duck Pond Operations; 2 stations at IOC; 4 stations at Lower Churchill River)	- Industry instruments were deployed throughout the fiscal year 2009-2010, see **Table 8.**
Northern Sampling and Analysis (Labrador)	Northern sampling and analysis proceeded as outlined in the Annual Work Schedule for 2009-2010. See **Table 1**.
Chemical Management Plan	Sample collection under the Chemical Management Plan is completed for 2009-2010. The project is on-going. There are monthly samples collected at one location.
Project WET	This project has been completed for the fiscal year 2009-2010. This project is ongoing and will continue to be implemented during the 2010-2011 fiscal year if funding permits.

Special Projects for Fiscal Year 2009-2010
(excluding CESI)

Table 6: Special Projects for Fiscal Year 2009-2010 (excluding CESI)

Project	Activity	Remarks	Progress Evaluation
1. Comparative Guidelines Project	Comparative assessment of site-specific objective methodology	- NL is the lead jurisdiction and responsible for the completion of work – Kyla Brake	Completed; this project was closed March 2010. Recommendations from this project will be implemented in 2010-2011.
2. Stability Study with NLET	Study to determine if the duration of time between water sample collection and analysis is affecting parameter concentration	- NL is the lead jurisdiction and responsible for the completion of work – Joanne Sweeney	Under peer review until the end of May 2010. This project will be finalized by July 2010.
3. Mobile Environmental Monitoring Platform	In-situ water quality monitoring using a mobile environmental monitoring platform on a need-basis across the province	- NL is the lead jurisdiction and responsible for the completion of work – Ryan Pugh	This project is still ongoing. The MEMP trailer, associated truck and equipment was purchased 2009-2010. The equipment for the trailer is to be installed end of June 2010. MEMP trailer to be utilized in summer 2010.
4. Blue-green Algae Monitoring	Monitoring of blue-green algae on a need basis (Paddy's Pond and surrounding water bodies)	- NL is the lead jurisdiction and responsible for the completion of work – Joanne Sweeney	The blue-green algae monitoring was conducted on a need-to basis, monthly observations were made but no algal bloom observed. In 2010-2011 the pond's systems will be observed monthly but no active sampling will be conducted until there is evidence of a blue-green algae bloom.
5. Real-Time related projects	Host and organize the 2nd national Real-Time Water Quality Monitoring Workshop 2009 (June '09)	- NL is the lead jurisdiction and responsible for the completion of work – Renee Paterson	Completed June 2009. Future plans include another RT workshop scheduled for Spring 2011.
	Comparison Study between various water quality monitoring equipment (Hydrolab; YSI; S::CAN)	- NL is the lead jurisdiction and responsible for the completion of work – Ryan Pugh	Initial work on this project began in 2009-2010, however, the comparison study is pending on the completion of the Paddy Pond Station. This is due to be completed summer of 2010-2011. Currently there is preliminary data being gathered.

	Bio-fouling Experiment	- NL is the lead jurisdiction and responsible for the completion of work – Tara Clinton	The biofouling project was completed summer 2009. The findings assisted in the develop and review of all QA/QC procedures for the Real-Time Program.
	Statistical project to determine extrapolation of non-measured data	- NL is the lead jurisdiction and responsible for the completion of work – Renee Paterson/Paula Dawe	This project is deferred to a later date.
	Establishment of Standalone Station on Paddy's Pond (testing of communication equipment; testing of instrumentation)	- NL is the lead jurisdiction and responsible for the completion of work – Ryan Pugh	The standalone station hut was completed November 2009. The equipment is due to be installed 2010-2011. Currently waiting on the final purchase of materials for the station. Then installation of the instrumentation will begin.
	LCD Screen Display	- NL is the lead jurisdiction and responsible for the completion of work – Renee Paterson/Paul Neary	This project is deferred to a later date.
	Definition of parameter limits for email alert system; implementation of email alert system	- NL is the lead jurisdiction and responsible for the completion of work – Tara Clinton	The email alert system was tested in 2009-2010 at Vale Inco Ltd (Long Harbour Stations). Currently working out any issues before implementing it across the board.
	Testing and implementation of autosampler technology	- NL is the lead jurisdiction and responsible for the completion of work – Tara Clinton/Ryan Pugh	This project has been deferred to 2010-2011 fiscal year. The autosampling technology will be trialed in Leary's Brook.
	Testing, implementation and integration of S::CAN technology into real-time program	- NL is the lead jurisdiction and responsible for the completion of work – Ryan Pugh	This project has been deferred to 2010-2011 fiscal year. This project is pending the purchasing of additional s::can materials which will be required for the installation at Paddy's Pond

	Research and development of new technologies	- NL is the lead jurisdiction and responsible for the completion of work – Renee Paterson	Research & development of new technologies continued in 2009-2010. Additional effort, in 2010-2011 will be put toward implementing new GHG technology; real-time cameras and buoys.
6. Application of Earth Observation for Water Quality Monitoring	Assessing if Earth Observation can be used to monitor the impact of development projects on water resources	- NL is the lead jurisdiction and responsible for the completion of work – Keith Abbott	This project has been deferred to 2010-2011; awaiting the availability of satellite imagery through EC.
	Building knowledge in using high resolution data/imagery to extract water resources related information such as land cover, wetlands and water bodies	- NL is the lead jurisdiction and responsible for the completion of work – Keith Abbott	This project is ongoing. 2009-2010 fiscal year involved the purchasing and processing of imagery. Research and work conducted with C-CORE. This project is due for completion 2010-2011.
7. Aquatic Biomonitoring (CABIN)	Monitoring of benthic invertebrate of selected water bodies to better understand the aquatic ecosystem health	- NL is the lead jurisdiction and responsible for the completion of work – Kyla Brake	This project involves annual ongoing bio-monitoring. NL completed six sites in 2009-2010, and EC completed 16 sites. Samples were analyzed and data entered into database. Planning for sampling in 2010-2011 has begun.

- *Activities listed in this table are work-shared activities

Special Projects for Fiscal Year 2009-2010
(CESI related projects)

Table 7. Special Projects for Fiscal Year 2009-2010 under CESI

Project	Activity	Progress Evaluation
1. Canadian Environmental Sustainability Indicators (CESI)	Site selection, water quality data extraction, and manipulation	Completed for 2009-2010 fiscal year
	Decision on WQI inputs and calculation of ratings for each station	Completed for 2009-2010 fiscal year
	Overview interpretation of results (2 pager on parameters & issues driving the ratings and spatial trends)	Methodological notes where provided in the submitted CESI file detailing changes from previous years (i.e. guidelines; parameters; sampling frequency; etc.)
	Data analysis and report preparation	Completed for 2009-2010 fiscal year
2.CESI WQI Calculator	Development of CESI WQI Calculator for use nationally	Completed for 2009-2010 fiscal year; improvements /changes to calculator will take place in the fiscal year 2010-2011.
3. Northern Sampling and Analysis (Labrador)	Labrador water samples are collected by both federal and provincial staff in support of CESI reporting	Northern Sampling and Analysis (Labrador) proceeded as outlined in the Annual Work schedule. See **Table 1.**

Table 8. Monthly and Annual Real-Time Water Quality Reports Completed for 2009-2010

Networks	Partners	Station Name	Monthly Deployment Reports	Annual Deployment Reports
Industry Partners Network	Vale Inco (Voisey's Bay)	Upper Reid Brook	June 19 2009–Aug 6 2009 Aug 9 2009– Sept 12 2009 Sept 15 2009– Oct 27 2009 *Removed Winter Months	June 19 2009 – Oct 27 2009
		Lower Reid Brook	June 19 2009–Aug 6 2009 Aug 9 2009– Sept 12 2009 Sept 15 2009– Oct 27 2009 *Removed Winter Months	June 19 2009 – Oct 27 2009
		Camp Pond Brook	June 19 2009– Aug 6 2009 Aug 9 2009–Sept 12 2009 Sept 15 2009– Oct 27 2009 *Removed Winter Months	June 19 2009 – Oct 27 2009
		Tributary to Lower Reid Brook	June 19 2009– Aug 6 2009 Aug 9 2009 – Sept 12 2009 Sept 15 2009– Oct 27 2009 *Removed Winter Months	June 19 2009 – Oct 27 2009
	Vale Inco (Long Harbor)	Rattling Brook below Bridge	Feb 11 2009-Mar 10 2009 Mar 11 2009-April 23 2009 April 24 2009-May 20 2009 May 20 2009- Jul 2 2009 Jul 3 2009- Aug 10 2009 Aug 11 2009-Sept 9 2009 Sept 10 2009- Oct 15 2009 Oct16 2009- Nov 17 2009 Nov 18 2009 – Jan 2 2010 Jan 3 2010 – Feb 2 2010 Feb 2 2010– March 2 2010 Mar 3 2010 – Mar 30 2010	Feb 11 2009 – Jan 1 2010
		Rattling Brook Big Pond	* Newly deployed Oct 15 2009 Oct16 2009- Nov 17 2009 Nov 18 2009 – Jan 2 2010 Jan 3 2010 – Feb 2 2010 *Removed due to Winter Conditions	Oct 15 2009 – Jan 1 2010
		Rattling Brook below Plant Discharge	* Newly deployed Oct 15 2009 Oct16 2009- Nov 17 2009 Nov 18 2009 – Jan 2 2010 Jan 3 2010 – Feb 2 2010 Feb 2 2010– March 2 2010 Mar 3 2010 – Mar 30 2010	Oct 15 2009 – Jan 1 2010

Networks	Partners	Station Name	Monthly Deployment Reports	Annual Deployment Reports
Industry Partners Network	Duck Pond Operations (TECK)	Tributary to Gills Pond Brook	Jan 15 2009-Mar 31 2009 April 1 2009-May 5 2009 May 5 2009-June 24 2009 June 24 2009-July 27 2009 July 27 2009-Sept 1 2009 Sept 1 2009- Nov 24 2009 Nov 25 2009-April 26 2010	Jan 2009 – Dec 2009
		East Pond Brook	Jan 15 2009-Mar 31 2009 April 1 2009- May 5 2009 May 5 2009- June 24 2009 June 24 2009-July 27 2009 July 27 2009-Sept 1 2009 Sept 1 2009-Nov 24 2009 Nov 25 2009-April 26 2010	Jan 2009 – Dec 2009
		Well After Tailings Dam – Duck Pond	Jan 15 2009-Mar 31 2009 April 1 2009-May 5 2009 May 5 2009-June 24 2009 June 24 2009- July 27 2009 July 27 2009-Sept 1 2009 *Removed due to Winter Conditions	Jan 2009 – Dec 2009
	IOC	Wabush Lake at Dolomite Road	May 28 2009-June 26 2009 June 26 2009-July 23 2009 July 23 2009- Sept 10 2009 Sept 10 2009-Oct 23 2009 * Removed Winter Months	May 28 2009- Oct 23 2009
		Wabush Lake at Julienne Narrows	May 28 2009-June 26 2009 June 26 2009-July 23 2009 July 23 2009- Sept 10 2009 Sept 10 2009- Oct 23 2009 * Removed Winter Months	May 28 2009- Oct 23 2009
	NL Refining Corporation (Come By Chance)	Come by Chance	Deferred until Project Commences	Deferred until Project Commences

Networks	Partners	Station Name	Monthly Deployment Reports	Annual Deployment Reports
	Nalcor	Above Muskrat Falls	June 1 2009–June 24 2009 June 24 2009–July 20 2009 July 20 2009– Sept 1 2009 Sept 1 2009– Sept 22 2009 Sept 22 2009-Nov 2 2009	June 1 2009 – Nov 2 2009
		Below Metchin River	June 1 2009–June 24 2009 June 24 2009–July 20 2009 July 20 2009– Sept 1 2009 Sept 1 2009– Sept 22 2009 Sept 22 2009-Nov 2 2009	June 1 2009 – Nov 2 2009
		6.15km below Muskrat Falls	June 1 2009–June 24 2009 June 24 2009–July 20 2009 July 20 2009– Sept 1 2009 Sept 1 2009– Sept 22 2009 Sept 22 2009-Nov 2 2009	June 1 2009 – Nov 2 2009
		Below Grizzle Rapids	*Instrument not deployed June 1 2009–June 24 2009 due to ice wall June 24 2009–July 20 2009 July 20 2009– Sept 1 2009 Sept 1 2009– Sept 22 2009 Sept 22 2009-Nov 2 2009	June 24 2009 – Nov 2 2009
Federal Partner Network	Environment Canada and NL WRMD	Minipi River	June 1 2009– June 24 2009 June 24 2009-July 21 2009 July 21 2009-Sept 1 2009 Sept 1 2009-Sept 22 2009 Sept 22 2009-Oct 27 2009 *Removed due to Winter Conditions	N/A
		Southwest Brook below Southwest Pond	June 28 2009 - Jan 16 2010 Jan 18 2010 - March 3 2010 March 3 2010 - May 8 2010	N/A
		Main River at Paradise Pool	July 14 2009 - Sept 25 2009	N/A

Networks	Partners	Station Name	Monthly Deployment Reports	Annual Deployment Reports
Provincial Network	NL WRMD	Leary's Brook at Prince Philip Drive	Dec 9 2008-Mar 25 2009 Mar 25 2009-April 22 2009 April 22 2009-May 22 2009 June 2 2009- July 17 2009 July 17 2009-Sept 16 2009 Sept 16 2009-Oct 23 2009 Oct 23 2009-Nov 20 2009 Nov 20 2009-Jan 8 2010 Jan 8 2010-Feb 23 2010 Feb 23 2010-May 11 2010	N/A
		Humber River at Humber Village Bridge	Jan 20 2009-April 27 2009 April 30 2009-June 30 2009 June 30 2009-July 31 2009 July 31 2009-Nov 15 2009 Nov 15 2009-Jan 6 2010	N/A
		Waterford River at Kilbride	April 13 2009-May 26 2009 May 26 2009-June23 2009 June 24 2009-Aug 23 2009 Aug 25 2009-Sept 28 2009 Sept 30 2009-Oct 22 2009 Oct 22 2009-Nov 26 2009 Nov 26 2009-Feb 2 2010 Feb 8 2010-Mar 1 2010 Mar 1 2010-Mar 23 2010 Mar 23 2010-April 21 2010	N/A

Notes:

- The monthly reports for the federal-provincial partnership stations were prepared by the provincial staff and reviewed by federal staff

Conclusion

A significant amount of work took place under the Canada-Newfoundland and Labrador Water Quality Monitoring Agreement for fiscal year 2009-2010. The number of available products from this program continues to grow annually. Activities for 2010-2011 will be clearly outlined in the upcoming Annual Work Schedule.

NL DOEC would like to take this opportunity to thank our federal counterparts (EC Atlantic Region) for their on-going support and commitment in ensuring the delivery of the outcomes/products under the Canada-Newfoundland and Labrador Water Quality Monitoring Agreement.