Environment Canada Environnement Canada

Newfoundland Labrador

CANADA – NEWFOUNDLAND AND LABRADOR

MEMORANDUM OF AGREEMENT
FOR
WATER QUANTITY SURVEYS

REPORT FOR FISCAL YEAR
2020-2021

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LETTER OF TRANSMITTAL

TO: Jean-François Cantin
Administrator for Canada

Haseen Khan
Administrator for the Department of Environment and Climate Change, Newfoundland and Labrador

We hereby submit an annual report for the fiscal year 2020-2021 covering activities under the Memorandum of Agreement for Water Quantity Surveys for Newfoundland and Labrador.

Members
Coordinating Committee

Government of Canada

Rene Savoie

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René Savoie
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EXECUTIVE SUMMARY

In 1975, Canada and its provincial partners signed Memoranda of Agreement for Water Quantity Surveys. The purpose of the Agreement is to provide a mechanism to harmonize the hydrometric data collection, processing and distribution, as well as a procedure to cost-share the activities of the program.

2020-21 was the first year of the COVID-19 pandemic, which affected various aspects of the operation of the hydrometric network including access to Labrador, fewer station visits, only one field technician per vehicle, lower actual costs, and delays in infrastructure renewal projects.

During this reporting period, one provincial station was closed. More details on stations are given in section 3 of this report.

In addition to the regular hydrometric activities, a survey of site conditions was done during fiscal year 2020-2021.

Currently 111 stations, over 99% of the network, are equipped with satellite telemetry and 1 station has modem telemetry using standard phone lines which means that 98% of the network is reporting in real-time. Only 1 station has no telemetry.

The actual share of the province ($934.8K) was 7.9% lower than the original estimate plus the provincial contribution in equipment ($1014.7K). Financial details are given in section 5 of this report.

1. INTRODUCTION

This report covers the activities under the Canada/Newfoundland and Labrador Memorandum of Agreement for Water Quantity Surveys for the fiscal year 2020-2021.

The operation of an integrated network of hydrometric stations in Newfoundland and Labrador is cost-shared between Water Survey Division, Meteorological Service of Canada, Environment Canada (DOE), and Newfoundland and Labrador, Department of Environment and Climate Change under a Memorandum of Agreement (MOA).

The core of this report has been divided in 5 main sections:

The *Hydrologic Conditions* section provides a brief description of the hydrologic conditions that were encountered during 2020-2021.

The *Coordinators Meeting* section highlights the discussions undertaken during the year.

The *Network Characteristics* section includes a brief summary of the changes from the previous year. Also available is a breakdown of the responsibility classification for each category as well as a description of the other operational activities such as sediment, real-time, etc.

The *Operations* section includes a brief description of the operational activities for the year. This section lists the details of partner shares and invoices issued, as agreed to in Schedule D Estimates (Appendix B).

The report also includes a section on *Construction and Projects* which contains a brief description of the special projects.

In addition, the following Appendices have been included:

Appendix A SCHEDULE C STATION LISTING 2020-2021
Appendix B SIGNED SCHEDULE D 2020-2021
Appendix C Summary of Cumulative Annual Costs 1975-76 to 2020-21

2.0 HYDROLOGIC CONDITIONS

Streamflow and Water Level Conditions

Below are flow tables based on Apr-Dec 2020 approved data and Jan-Mar 2021 preliminary data for five major rivers in Newfoundland and Labrador. Historical Extremes updated to 2020 data. The final information can be found online for all monitored sites in Newfoundland and Labrador at: www.wateroffice.ec.gc.ca

Rocky River 02ZK001 (Eastern NL)
(Drainage Area 301 KM2)

Year	MEAN FLOW	FOR THE		HISTORICAL EXTREMES **			
2020/2021	(M/3S)	MONTH					
		MAXIMUM	MINIMUM	MONTHLY		DAILY	
		(DAY)	(DAY)	MAXIMUM (YEAR)	MINIMUM (YEAR)	MAXIMUM (YEAR)	MINIMUM (YEAR)
April	25.3	53.2	9.97	35.8	7.89	133	1.8
2020	E	(16)	(30)	(1964)	(1979)	(2004)	(1959)
May	20.7	68.3	3.43	25.7	3.51	91.6	1.5
2020	E	(6)	(31)	(1985)	(1962)	(1985)	(1962)
June	21.9	72.6	3.52	18.5	2.04	87.1	0.65
2020	ER	(8)	(29)	(1990)	(1957)	(1988)	(1951)
July	7.54	29.8	2.07	13.8	0.81	93.9	0.42
2020		(16)	(12)	(1981)	(1949)	(1988)	(1949)
August	6.59	41.3	1.6	30.6	0.548	199	0.2
2020		(31)	(23)	(1970)	(1949)	(2007)	(1950)
September	16.4	129	3.53	19.6	0.628	216	0.24
2020	E	(19)	(18)	(2004)	(1961)	(2004)	(1961)
October	14.5	88.2	3.99	27.2	3.68	124	0.69
2020		(3)	(24)	(1970)	(1949)	(1953)	(1961)
November	13.1	28.3	6.11	25.8	3.95	125	1.9
2020		(25)	(13)	(1956)	(1948)	(1956)	(1948)
December	17.2	36.8	7.98	31.1	7.53	174	2.6
2020		(23)	(31)	(1953)	(1986)	(1953)	(1961)
January	8.61	20	3.73	28.7	4.77	146	1.8
2021		(8)	(31)	(1952)	(1988)	(1951)	(2010)
Feburary	9.2	31.4	3.56	36.9	2.26	294	1.2
2021		(4)	(2)	(1962)	(1975)	(1962)	(1961)
March	14.8	79.9	2.99	39.8	3.2	200	0.93
2021		(20)	(11)	(1994)	(1963)	(1994)	(1963)

Deficiency for the period or daily number. 25% are less than the lower quartile (below normal)

Excessive for the period or daily number. 25% are greater than the upper quartile (above normal)

Record for the period or daily number (Preliminary)

Gander River 02YQ001 (Central NL)
(Drainage Area 4450 KM2)

Year	MEAN FLOW	FOR THE		HISTORICAL EXTREMES **			
2020/2021	(M/3S)	MONTH					
		MAXIMUM	MINIMUM	MONTHLY		DAILY	
		(DAY)	(DAY)	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM
				(YEAR)	(YEAR)	(YEAR)	(YEAR)
April	267	363	121	513	44.4	925	22.8
2020		(18)	(1)	(1987)	(1967)	(1993)	(1950)
May	423	672	124	451	90.3	761	50.4
2020	E	(6)	(31)	(1967)	(1958)	(2001)	(2006)
June	135	227	62	198	37.7	336	18.1
2020	E	(7)	(27)	(2009)	(1979)	(2010)	(1979)
July	43.2	66.5	27.4	148	13.9	206	9
2020		(1)	(31)	(2010)	(1975)	(2006)	(1975)
August	23.3	55.1	14	179	6.92	378	4.8
2020	D	(31)	(25)	(1980)	(1987)	(1980)	(1987)
September	90.9	125	61.8	196	4.16	527	2.8
2020		(25)	(18)	(1984)	(1961)	(2004)	(1961)
October	83.7	99.5	70	269	9.88	597	3.3
2020		(14)	(8)	(1981)	(1950)	(2003)	(1961)
November	119	168	88.7	242	37.2	398	14.8
2020		(8)	(25)	(1962)	(1961)	(2003)	(1961)
December	170	250	110	272	36.9	549	28.4
2020		(25)	(1)	(2004)	(1985)	(1977)	(1985)
January	112	182	54.7	352	36.3	1170	25.3
2021		(1)	(31)	(1983)	(1985)	(1983)	(1985)
Feburary	69.2	95.7	49.6	288	18.6	688	14.8
2021		(10)	(4)	(1969)	(1961)	(1984)	(1961)
March	86.1	284	38.9	275	17.2	560	9.8
2021		(31)	(14)	(1988)	(1950)	(1992)	(1961)

Deficiency for the period or daily number. 25% are less than the lower quartile (below normal)

Excessive for the period or daily number. 25% are greater than the upper quartile (above normal)

Record for the period or daily number (Preliminary)

Upper Humber River 02YL001 (Western NL)
(Drainage Area 2110 KM2)

Year	MEAN FLOW	FOR THE		HISTORICAL EXTREMES **			
2020/2021	(M/3S)	MONTH					
		MAXIMUM	MINIMUM	MONTHLY		DAILY	
		(DAY)	(DAY)	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM
				(YEAR)	(YEAR)	(YEAR)	(YEAR)
April	48.3	65.5	35.4	288	19.2	749	9.2
2020	D	(17)	(13)	(1934)	(1967)	(1987)	(1955)
May	267	691	78.7	383	127	879	35.8
2020		(31)	(1)	(1993)	(1983)	(1993)	(1983)
June	209	771	53.7	354	25.8	1010	8.5
2020	E	(1)	(30)	(1933)	(1979)	(1984)	(1951)
July	22.5	60.7	7.65	140	9.3	555	3.9
2020	D	(4)	(25)	(1939)	(1987)	(1933)	(1986)
August	25.5	127	5.56	103	3.91	447	1.6
2020		(30)	(18)	(1973)	(1940)	(1973)	(1940)
September	49.1	136	23	162	15.2	504	1.6
2020		(2)	(22)	(1944)	(1946)	(1955)	(1940)
October	106	185	43.2	167	24.7	530	8
2020	E	(13)	(31)	(1977)	(1948)	(1957)	(1954)
November	73.1	196	32.2	177	42.6	813	8.8
2020		(4)	(24)	(1962)	(1986)	(1935)	(1948)
December	89.9	175	27.8	156	11.4	736	6.8
2020	E	(24)	(20)	(1954)	(1986)	(1935)	(1986)
January	37.1	94.3	7.75	129	10.2	663	4
2021		(10)	(31)	(1950)	(1971)	(1983)	(1990)
Feburary	7.11	7.52	6.74	106	5.91	348	3.7
2021	D	(1)	(28)	(1969)	(1975)	(1969)	(1993)
March	15.6	77.2	6.2	141	7.8	530	4
2021		(31)	(21)	(1979)	(1959)	(1936)	(1992)

Deficiency for the period or daily number. 25% are less than the lower quartile (below normal)

Excessive for the period or daily number. 25% are greater than the upper quartile (above normal)

Record for the period or daily number (Preliminary)

02ZB001 Isle Aux Morts River (South Western NL)
(Drainage Area 205 KM2)

Year	MEAN FLOW	FOR THE		HISTORICAL EXTREMES **			
2020/2021	(M/3S)	MONTH					
		MAXIMUM	MINIMUM	MONTHLY		DAILY	
		(DAY)	(DAY)	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM
				(YEAR)	(YEAR)	(YEAR)	(YEAR)
April	15.3	60	2.22	46.3	3.62	325	0.696
2020	D	(14)	(12)	(1994)	(1967)	(2003)	(2004)
May	17.8	157	4.39	51.1	6.16	226	2.18
2020	D	(2)	(15)	(1994)	(1986)	(1972)	(2010)
June	5.81	31.2	1.3	34.7	2.58	259	0.79
2020	D	(2)	(30)	(1972)	(1976)	(1985)	(1976)
July	4.27	25.2	0.804	22.7	1.17	102	0.35
2020		(12)	(8)	(1981)	(1989)	(1993)	(1989)
August	6.47	48.4	0.613	17.9	1.39	124	0.34
2020		(26)	(17)	(2007)	(1978)	(1990)	(1978)
September	10.6	63.7	1.51	23.7	3.53	176	0.71
2020		(4)	(22)	(1998)	(1973)	(2005)	(1969)
October	21.8	124	3.21	31	5.65	178	1.13
2020	E	(15)	(6)	(1972)	(1963)	(1977)	(2001)
November	18.6	69.6	3.68	38.3	7.7	348	1.6
2020		(24)	(15)	(1967)	(2000)	(2006)	(1970)
December	21.3	199	3.22	43	3.13	434	0.83
2020	E	(22)	(20)	(1990)	(1994)	(1990)	(2007)
January	5.86	28	1.69	24	1.22	219	0.57
2021		(8)	(31)	(1986)	(1991)	(1986)	(1991)
Feburary	5.68	36.5	1.14	31.1	0.923	243	0.41
2021		(5)	(25)	(1996)	(1975)	(1996)	(1991)
March	5.75	53.5	0.225	38.9	0.737	410	0.34
2021		(30)	(11) R	(1979)	(2004)	(1996)	(1987)

Deficiency for the period or daily number. 25% are less than the lower quartile (below normal)

Excessive for the period or daily number. 25% are greater than the upper quartile (above normal)

Record for the period or daily number (Preliminary)

03QC001 Eagle River (Labrador)
(Drainage Area 10900 KM2)

Year	MEAN FLOW	FOR THE		HISTORICAL EXTREMES **			
2020/2021	(M/3S)	MONTH					
		MAXIMUM	MINIMUM	MONTHLY		DAILY	
		(DAY)	(DAY)	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM
				(YEAR)	(YEAR)	(YEAR)	(YEAR)
April	66.8	91	59.7	311	8.33	2460	7.2
2020		(30)	(10)	(2010)	(1993)	(1983)	(1993)
May	530	1820	95.7	1400	106	2690	11.8
2020	D	(31)	(1)	(1971)	(1967)	(1971)	(1975)
June	1340	2340	675	1810	265	2990	127
2020	E	(5)	(25)	(1985)	(2005)	(1985)	(2005)
July	299	684	120	638	119	1330	71.4
2020		(1)	(31)	(1985)	(1976)	(1980)	(1976)
August	147	467	90.7	495	102	1320	64
2020	D	(31)	(20)	(1989)	(1988)	(1967)	(2008)
September	260	469	166	521	84.1	827	59
2020		(1)	(21)	(1976)	(1984)	(1976)	(1984)
October	301	380	236	515	100	705	78.4
2020	E	(23)	(31)	(1978)	(1973)	(1966)	(1973)
November	201	231	177	488	65.3	695	51
2020		(1)	(30)	(1995)	(2002)	(1980)	(1974)
December	152	175	129	218	36.3	410	27.5
2020	E	(1)	(31)	(1995)	(1974)	(2005)	(1974)
January	103	127	80.9	98.9	22.4	108	19
2021	ER	(1) R	(31)	(1969)	(1975)	(1969)	(1993)
Feburary	67.1	79.7	59.6	86.2	14.9	90.6	11.8
2021	E	(1)	(28)	(1969)	(1993)	(1969)	(1993)
March	58.5	59.5	57.5	78.7	9.64	119	8.2
2021	E	(1)	(31)	(1969)	(1993)	(1979)	(1993)

Deficiency for the period or daily number. 25% are less than the lower quartile (below normal)

Excessive for the period or daily number. 25% are greater than the upper quartile (above normal)

Record for the period or daily number (Preliminary)

3.0 COORDINATORS MEETINGS

Due to the COVID-19 pandemic, the coordinators did not meet in person in 2020-21, but were in frequent communication via e-mail correspondence and conference calls. Discussions range from operating costs, capital plan, and priority of stations.

4.0 NETWORK CHARACTERISTICS

Water Survey of Canada operates 111 hydrometric stations in Newfoundland and Labrador. The station classifications are listed in the next Table.

In 2020-21, one provincial station was decommissioned:

- Lake Melville East of Little River 03PD001

The province currently operates 4 Provincial-Contributed stations, which are listed in Appendix A.

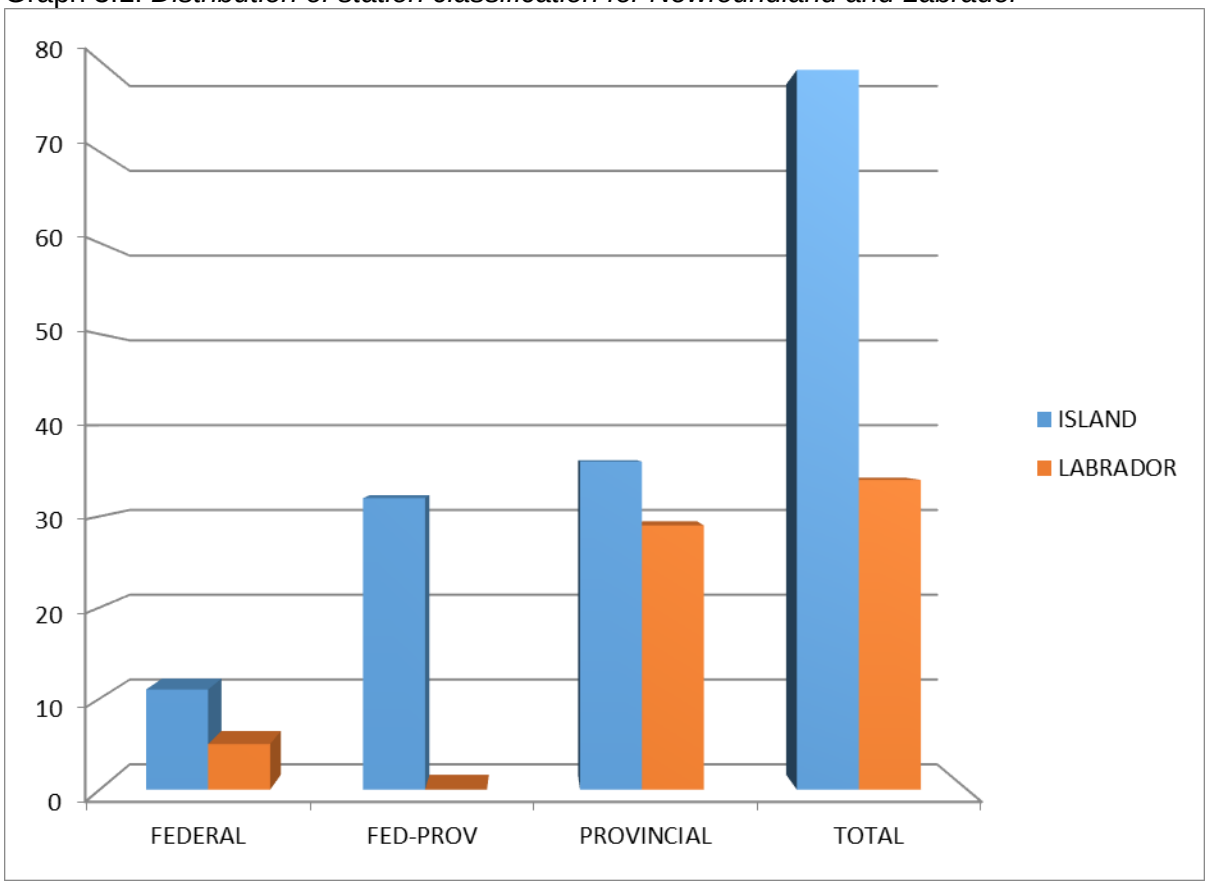
Water Survey of Canada also takes water samples at 5 different sites for water quality purposes on behalf of the Newfoundland and Labrador Department of Environment and Climate Change. These sites are converted in station units in order to have their cost calculated under this agreement.

Under the Canada–Newfoundland and Labrador Memorandum of Agreement, 111 stations were operated in 2020-2021. The complete station list is available in Appendix A. The stations classifications are as follow:

Table 3.1: *Station classification based on Newfoundland and Labrador*

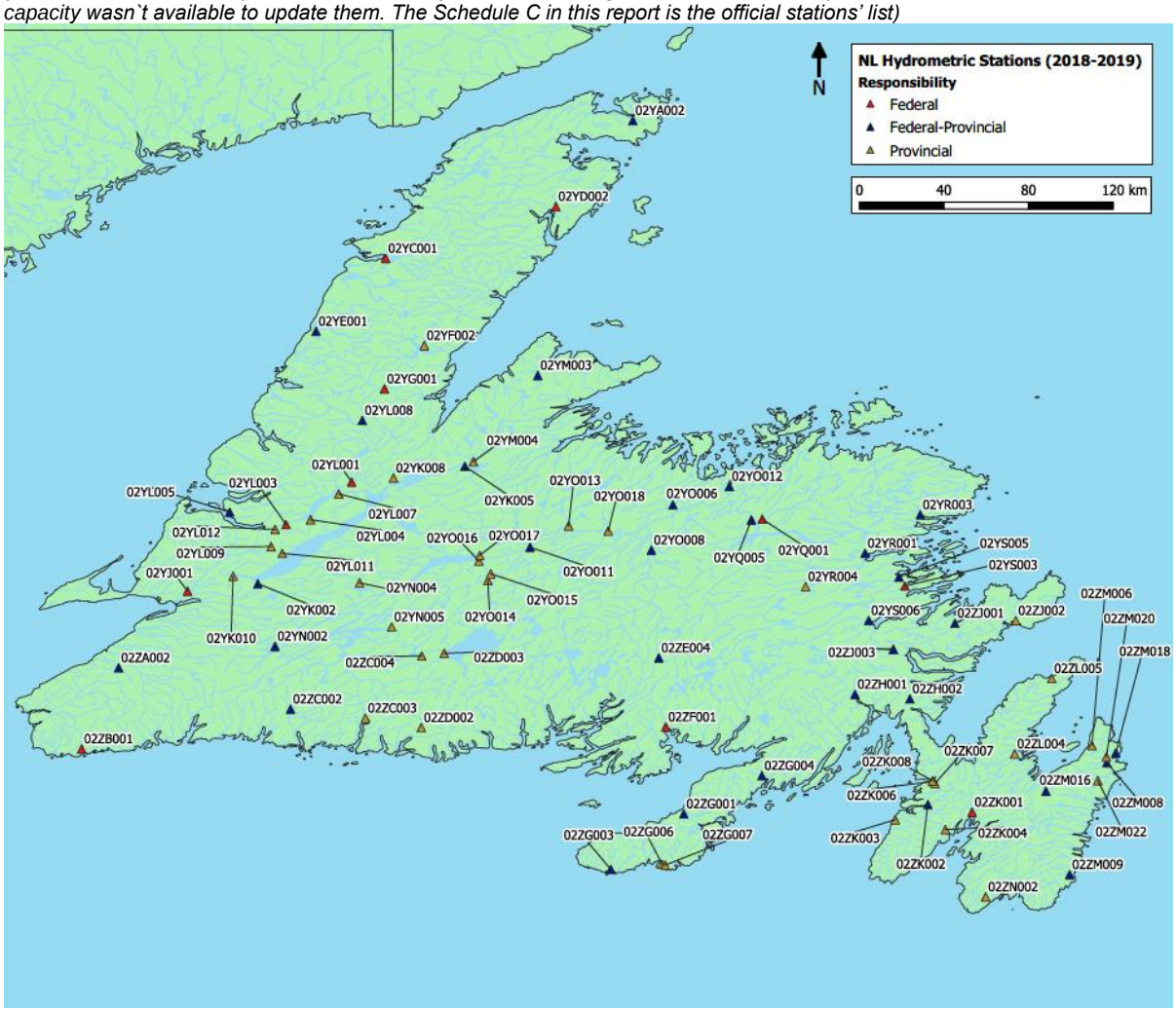
NEWFOUNDLAND AND LABRADOR			
CLASSIFICATION	**ISLAND**	**LABRADOR**	**TOTAL**
FEDERAL	11	5	**16**
FED-PROV	32	0	**32**
PROVINCIAL	36	27	**65**
TOTAL	**79**	**32**	**111**

Graph 3.1: *Distribution of station classification for Newfoundland and Labrador*



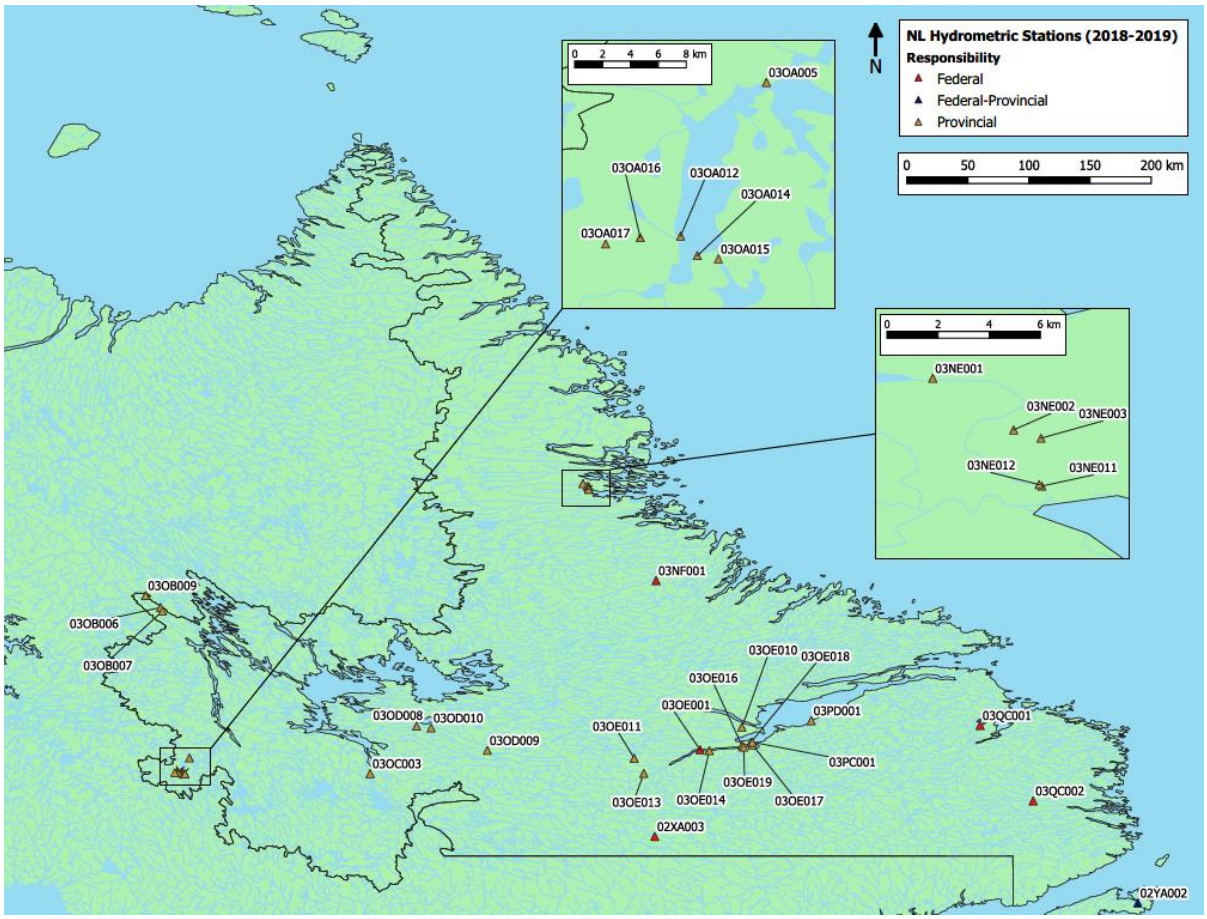
Graph 3.2: *Location and designation of the hydrometric network in Newfoundland*

(Please note that this map is for reference only and are showing stations for the fiscal year 2018-2019. Due to Covid, GIS capacity wasn`t available to update them. The Schedule C in this report is the official stations' list)



Graph 3.3: *Location and designation of the hydrometric network in Labrador*

(Please note that this map is for reference only and are showing stations for the fiscal year 2018-2019. Due to Covid, GIS capacity wasn`t available to update them. The Schedule C in this report is the official stations' list)



5.0 OPERATIONS

A true costing approach has been utilized to derive the station costs for this fiscal year in accordance with the agreement. The costs were apportioned based on the station classification and then totaled to determine each parties share. Employee benefit costs on salary and data management costs have been included and attributed to all parties as agreed on by the National Administrator's meeting in Quebec City, October 1999. The Newfoundland and Labrador Department of Environment and Climate Change was credited with the total amount of $33,855 for the contribution to the Partnership. The details of those contributions are listed in the next table.

The following table summarizes the estimated and the actual costs to operate the provincial share of the stream gauging network in Newfoundland and Labrador for 2020-2021.

STREAMFLOW AND WATER LEVEL COSTS FOR NEWFOUNDLAND AND LABRADOR

	2020/21	2020/21
OPERATIONAL	**Planned**	**Actuals**
Salaries (Including benefits 27%)	$ 553,812	$ 563,173
Hydrometric Operations O&M	$ 359,740	$325,310
Capital	$55,543	$48,405
Real Property Credit	-$9,600	-$9,600
Real Time Web Cam	-$7,350	-$7,350
Weather Station	-$4,305	-$4,305
Special Project (Network Anaysis)	$-12,600	-$12,600
Construction & Major Maintenance	$40,000	$31,777
Equipment purchased by the province *	$39,509	
TOTALS	**$1,014,749**	**$934,810**

* The equipment purchased by the province was not part of the signed schedule D but it accounted for a provincial contribution to the program.

SUMMARY OF TOTAL EXPENDITURES 2020-2021

CATEGORY	FEDERAL	NEWFOUNDLAND AND LABRADOR	TOTAL
Hydrometric operations (O&M)	$153,087	$325,310	**$478,397**
Capital	$22,769	$48,405	**$71,184**
Salaries + 27%	$265,022	$ 563,173	**$828,195**
Construction & Major Maintenance	$167,523	$31,777	**$199,300**
TOTAL	**$602,995**	**$968,665**	**$1,577,066**

The signed version of the Schedule D can be found in the Appendix B

O&M Expenditures Details

ITEM	EXPENDITURE (Fiscal year 20/21)
043 - SCIENTIFIC AND RESEARCH SERVICES	6,720
325 - MISCELLANEOUS EXPENDITURES	92
070 - UTILITY SERVICES	1,199
044 - TRAINING AND EDUCATIONAL SERVICES	1,543
022 - TELECOMMUNICATION SERVICES	3,773
122 - ACQUISITION OF INFORMATICS EQUIPMENT AND PARTS	3,929
025 - TRAVEL-PUBLIC SERVANTS	26,108
021 - POSTAGE, FREIGHT, EXPRESS, AND CARTAGE	4,934
040 - BUSINESS SERVICES	1,235
065 - REPAIR OF MACHINERY AND EQUIPMENT	30,009
112 - MINERAL PRODUCTS	10,607
115 - PERSONAL GOODS	12,634
056 - RENTAL OF AIRCRAFT AND SHIPS	114,649
124 - ACQUISITION OF EQUIPMENT AND FURNITURE INCLUDING PARTS	85,290
117 - MISCELLANEOUS GOODS AND PRODUCTS	5,917
123 - ACQUISITION OF OFFICE EQUIPMENT AND FURNITURE INCLUDING PARTS	85
082 - SPECIAL FEES AND SERVICES	431
046 - PROTECTION SERVICES	2,943
114 - WOOD, PAPER AND WOOD PRODUCTS	21
126 - ACQUISITION OF OTHER VEHICLES AND PARTS	6,038
121 - ACQUISITION OF MACHINERY AND MACHINERY PARTS	7,081
116 - METALS AND METAL PRODUCTS	72
TOTAL	$ 325,310

6.0 CONSTRUCTION & SPECIAL PROJECTS

For fiscal year 2020-21, the overall strategy for infrastructure and construction in Newfoundland and Labrador is to prioritize renewal work at sites with multiple issues. These priorities include the following: decommissioning inactive cableways, assessing and remediation of environmental liabilities, decommissioning inactive stilling wells with poor condition shelters, replacing poor condition shelters with OHS issues, and dismantling inactive station shelters.

These priorities include decommissioning cableways that are inactive and no longer required or able to be retrofitted to BOCs. The majority of cableways in Newfoundland have wooden A-frames and many are treated with creosote as a wood preservative. These A-frames are generally aging and at the end of their lifespan. Some of the cableways have creosote foundation blocks that require special environmental consideration.

Another priority for Newfoundland and Labrador is to characterize historical environmental liabilities and remediate or risk assess them where needed. This includes re-visiting potentially mercury-contaminated stations where other work is to be conducted at the station. Specifically, this work targets the end-of-life of the shelters and addresses the remaining potential mercury impacts under the shelters. This past year the potential for minor PHC contamination in some of the stilling wells was encountered. This was legacy contamination from PHC products used historically as an anti-freeze agent in the wells. In addition, there is some potential for lead paint use in older-style shelters. As well, there are creosote-treated wood products at two stilling wells and used in the cableways that can have associated environmental and handling considerations.

To address the environmental aspects of the priority work for 2020 – 2021 fiscal, Public Services and Procurement Canada (PSPC) was retained to coordinate environmental site assessments at five stations in Newfoundland. This work was conducted to better understand the potential environmental risk at the stations and prepare for decommissioning work and site closure in 2021 – 2022.

Priorities also include decommissioning of inactive stilling wells that are under shelters in poor condition that may pose an OHS fall risk. We are finding that many of these wells also have legacy PHC contamination that requires special consideration and procedures for decommissioning. In the short term, reduction of the risk associated with this includes pumping out the stilling well water and associated PHC product.

Finally, other important priorities include the replacement of poor condition shelters, especially where there is OHS risks or potential environmental liabilities. These include the stations that are remotely accessed in Labrador that are logistically challenging to access and conduct new construction. There are still some shelters that are inactive but have not been dismantled, which require re-visiting.

The province undertook GNSS surveys for CVGD2013 datum conversion at the following sites in 2020-21:

02ZG003	SALMONIER RIVER NEAR LAMALINE
02ZK002	NORTHEAST RIVER NEAR PLACENTIA
02ZK003	LITTLE BARACHOIS RIVER NEAR PLACENTIA

02ZK004	LITTLE SALMONIER RIVER NEAR NORTH HARBOUR
02ZL004	SHEARSTOWN BROOK AT SHEARSTOWN
02ZL005	BIG BROOK AT LEAD COVE
02ZM016	SOUTH RIVER NEAR HOLYROOD
02ZM020	LEARYS BROOK AT PRINCE PHILIP DRIVE

Appendix A

SCHEDULE C 2020-2021 – STATION LIST

FEDERAL

02ZF001	BAY DU NORD RIVER AT BIG FALLS
02YQ001	GANDER RIVER AT BIG CHUTE
02YJ001	HARRYS RIVER BELOW HIGHWAY BRIDGE
02YL003	HUMBER RIVER AT HUMBER VILLAGE BRIDGE
02ZB001	ISLE AUX MORTS RIVER BELOW HIGHWAY BRIDGE
02YG001	MAIN RIVER AT PARADISE POOL
02YD002	NORTHEAST BROOK NEAR RODDICKTON
02ZK001	ROCKY RIVER NEAR COLINET
02YS003	SOUTHWEST BROOK AT TERRA NOVA NATIONAL PARK
02YL001	UPPER HUMBER RIVER NEAR REIDVILLE
02YC001	TORRENT RIVER AT BRISTOL'S POOL
03QC002	ALEXIS RIVER NEAR PORT HOPE SIMPSON
03OE001	CHURCHILL RIVER ABOVE UPPER MUSKRAT FALLS
03QC001	EAGLE RIVER ABOVE FALLS
02XA003	LITTLE MECATINA RIVER ABOVE LAC FOURMONT
03NF001	UGJOKTOK RIVER BELOW HARP LAKE

FEDERAL - PROVINCIAL

02YA002	BARTLETTS RIVER NEAR ST. ANTHONY
02ZH002	COME-BY-CHANCE RIVER NEAR GOOBIES
02ZE004	CONNE RIVER AT OUTLET OF CONNE POND
02YO011	EXPLOITS RIVER BELOW NOEL PAULS BROOK
02ZG001	GARNISH RIVER NEAR GARNISH
02ZC002	GRANDY BROOK BELOW TOP POND BROOK
02YO008	GREAT RATTLING BROOK ABOVE TOTE RIVER CONFLUENCE
02YE001	GREAVETT BROOK ABOVE PORTLAND CREEK POND
02ZA002	HIGHLANDS RIVER AT TRANS CANADA HIGHWAY
02YR003	INDIAN BAY BROOK NEAR NORTHEAST ARM
02YK002	LEWASSEECHJEECH BROOK AT LITTLE GRAND LAKE
02YN002	LLOYDS RIVER BELOW KING GEORGE IV LAKE
02YR001	MIDDLE BROOK NEAR GAMBO
02ZK002	NORTHEAST RIVER NEAR PLACENTIA
02YO006	PETERS RIVER NEAR BOTWOOD
02ZH001	PIPERS HOLE RIVER AT MOTHERS BROOK
02ZG004	RATTLE BROOK NEAR BOAT HARBOUR
02YL005	RATTLER BROOK NEAR MCIVERS
02YQ005	SALMON RIVER NEAR GLENWOOD

02ZG003	SALMONIER RIVER NEAR LAMALINE
02ZM009	SEAL COVE BROOK NEAR CAPPAHAYDEN
02YK005	SHEFFIELD BROOK NEAR TRANS CANADA HIGHWAY
02ZJ003	SHOAL HARBOUR RIVER NEAR CLARENVILLE
02ZM016	SOUTH RIVER NEAR HOLYWOOD
02ZJ001	SOUTHERN BAY RIVER NEAR SOUTHERN BAY
02YO012	SOUTHWEST BROOK AT LEWISPORTE
02YM003	SOUTH WEST BROOK NEAR BAIE VERTE
02YS005	TERRA NOVA RIVER AT GLOVERTOWN
02YL008	UPPER HUMBER RIVER ABOVE BLACK BROOK
02ZM018	VIRGINIA RIVER AT PLEASANTVILLE
02YS006	NORTHWEST RIVER AT TERRA NOVA NATIONAL PARK
02ZM008	WATERFORD RIVER AT KILBRIDE

PROVINCIAL

02ZL005	BIG BROOK AT LEAD COVE
02YK008	BOOT BROOK AT TRANS-CANADA HIGHWAY
02YL009	CORNER BROOK LAKE AT LAKE OUTLET
02YL007	DEER LAKE NEAR GENERATING STATION
02YO015	EAST POND BROOK BELOW EAST POND
02YO014	TRIBUTARY TO GILL'S POND BROOK
02YK010	GRAND LAKE EAST OF GRAND LAKE BROOK
02YO013	EXPLOITS RIVER AT BADGER
02YO016	EXPLOITS RIVER NEAR MILLERTOWN
02YO018	EXPLOITS RIVER at Charlie Edwards Point
02YO017	Red Indian Lake at Indian Point
02ZC004	GRANITE LAKE AT EAST END
02ZD002	GREY RIVER NEAR GREY RIVER
02YM004	INDIAN BROOK DIVERSION ABOVE BIRCHY LAKE
02ZM020	LEARYS BROOK AT PRINCE PHILIP DRIVE
02ZK003	LITTLE BARACHOIS RIVER NEAR PLACENTIA
02ZK004	LITTLE SALMONIER RIVER NEAR NORTH HARBOUR
02ZK007	RATTLING BROOK BIG POND
02ZK006	RATTLING BROOK BELOW BRIDGE
02ZK008	Rattling Brook below Plant Discharge
02ZM006	NORTHEAST POND RIVER AT NORTHEAST POND
02ZM022	RAYMOND BROOK AT OUTLET OF BAY BULLS BIG POND
02ZJ002	SALMON COVE RIVER NEAR CHAMPNEYS
02ZL004	SHEARSTOWN BROOK AT SHEARSTOWN
02YL004	SOUTH BROOK AT PASADENA
02YL012	Steady Book above Confluence of Humber river

02ZN002	ST. SHOTTS RIVER NEAR TREPASSEY
02YN004	STAR BROOK ABOVE STAR LAKE
02YR004	TRITON BROOK ABOVE GAMBO POND
02YN005	VICTORIA LAKE AT NORTHEAST CONTROL STRUCTURE
02ZD003	R.R. POND NEAR GRANITE LAKE
02YF002	CAT ARM RESERVOIR NEAR SPILLWAY
02ZC003	WHITE BEAR RIVER ABOVE BIG INDIAN BROOK
02ZG006	OUTFLOW OF GREBES NEST POND
02YO019	Badger Brook Below Foot Bridge
02ZG007	OUTFLOW OF UNNAMED POND SOUTH OF LONG POND
03OC003	ATIKONAK RIVER ABOVE PANCHIA LAKE
03NE003	CAMP POND AT SOUTHWEST END
03NE002	CAMP POND BROOK BELOW CAMP POND
03OA012	Luce Brook below Tinto Pond
03OA014	Wabush Lake at Dolamite Rd
03OA005	Wabush Lake at Lake Outlet
03OE011	PINUS RIVER
03NE011	REID BROOK Below Tributary
03NE001	REID BROOK AT OUTLET OF REID POND
03NE012	TRIBUTARY to Reid Brook
03OE013	CHURCHILL RIVER ABOVE GRIZZLE RAPIDS
03OE014	CHURCHILL RIVER 6.15KMS BELOW MUSKRAT FALLS
03PC001	Churchill River at English Point
03OB006	Goodream Creek above Triangle Lake
03OB007	Elross Creek below Pinette Lake Inflow
03OA015	Flora Creek below Trans Labrador Highway
03OB009	Joan Brook below outlet of Joan Lake
03OA016	Dumbell stream above Dumbell Lake
03OD008	Churchill River Above Churchill Falls Tailrace
03OD009	Churchill River below Metchin River
03OD010	Churchill River Below Churchill Falls Tailrace
03OE017	Mud Lake at outlet tributary at Mud Lake
03OA017	Pumphouse Stream above Drum Lake
03OE019	Churchill River Below Outlet of Traverspine River
03OE018	Churchill River at End of Mud Lake Road
03PD002	Churchill River Outlet at Rabbit Island
03OE016	Churchill River at Happy Valley

PROVINCIAL-CONTRIBUTED

NLENHM0001	GOOSE RIVER AT BRIDGE

NLENHM0002	RAMBLER OUTFLOW OF THE STEADY
NLENHM0003	HUMBER RIVER AT NICHOLSVILLE BRIDGE
NLENHM0004	EXPLOITS RIVER AT BISHOP'S FALLS TRESTLE

Appendix B SIGNED SCHEDULE D 2020-2021

NEWFOUNDLAND AND LABRADOR 2020-2021

SCHEDULE D

This schedule provides a summary of the annual payment. The details of the calculations for operation and construction are available and have been jointly reviewed by the officers of each party.

ANNUAL PAYMENT FOR 2020-2021 TO BE PAID TO THE RECEIVER GENERAL FOR CANADA BY THE PROVINCE OF NEWFOUNDLAND AND LABRADOR

NEWFOUNDLAND and LABRADOR SHARE

	O&M	Salary	Capital	Total
a) Streamflow and Water Level Installations - Island	$124,892	$343,963	$36,311	$505,165
b) Streamflow and Water Level Installations - Labrador	$234,848	$209,849	$19,232	$463,930
c) Construction & Major Maintenance (LCM)	$40,000	$0	$0	$40,000
d) Station Decommissioning	$0	$0	$0	$0
e) Hydrometric Workstation	$0	$0	$0	$0
f) Real Property Credit for Federal stations on Provincial Crown Land	($9,600)	$0	$0	($9,600)
g) Real Time Webcam	($7,350)	$0	$0	($7,350)
h) Weather Stations	($4,305)	$0	$0	($4,305)
i) Basin Delineation & Information	$0	$0	$0	$0
j) Special Projects* FY20/21 Credit for Network Analysis of NL Hydrometric Network Using Cluster Analysis	($2,846)	($9,754)	$0	($12,600)
TOTAL	$375,639	$544,058	$55,543	$975,240

2 June 08, 2020

Haseen Khan, P.Eng. Date
Director
Water Resources Management Division
Department of Environment and Climate Change
Administrator for Province of Newfoundland and Labrador

Alain Pietroniro Date
Executive Director
National Hydrological Service
Meteorological Service of Canada
Environment and Climate Change Canada

*** Special Projects that contribute to the ongoing integrity of the program will be credited upon agreement by both parties.**

Appendix C Summary of Cumulative Annual Costs 1975-76 to 2020-21

SUMMARY OF ACTUAL ANNUAL COSTS AND PAYMENTS 1975-76 TO 2020- 2021													
	SCHEDULE "D" PAYMENTS BY PROVINCE OF NEWFOUNDLAND							ACTUAL PROVINCIAL SHARE				PROVINCIAL +CREDIT	
YEAR	Hydrometric Op.	Humber River Met Station	Inkind Equipment Purchased by NL	In kind Equipment Credit	Sediment	Construction	Total	Hydromet	Sediment	Construction	Total	Debit	Curent Balance
1975-76	$ 37,800				$ -	$ 3,600	$ 41,400	$ 36,238	$ -	$ 2,177	$ 38,415	$ 2,985	$ 2,985.00
1976-77	$ 32,340				$ -	$ 12,000	$ 44,340	$ 37,840	$ -	$ 1,573	$ 39,413	$ 4,927	$ 7,912.00
1977-78	$ 35,520				$ -	$ 24,480	$ 60,000	$ 38,700	$ -	$ 13,963	$ 52,663	$ 7,337	$ 15,249.00
1978-79	$ 56,775				$ 1,400	$ 11,825	$ 70,000	$ 51,371	$ 679	$ 26,000	$ 78,050	-$ 8,050	$ 7,199.00
1979-80	$ 68,338				$ 933	$ 25,729	$ 95,000	$ 62,256	$ 896	$ 22,476	$ 85,628	$ 9,372	$ 16,571.00
1980-81	$ 78,639				$ 1,475	$ 6,000	$ 86,114	$ 83,518	$ 1,064	$ 7,703	$ 92,285	-$ 6,171	$ 10,400.00
1981-82	$ 83,523				$ 3,750	$ 14,000	$ 101,273	$ 100,726	$ 3,114	$ 16,560	$ 120,400	-$ 19,127	-$ 8,727.00
1982-83	$ 96,542				$ 3,744	$ 55,000	$ 155,286	$ 102,735	$ 5,886	$ 47,224	$ 155,845	-$ 559	-$ 9,286.00
1983-84	$ 141,457				$ 4,470	$ 38,000	$ 183,927	$ 136,917	$ 6,906	$ 37,864	$ 181,687	$ 2,240	-$ 7,046.00
1984-85	$ 168,244				$ 7,350	$ 52,000	$ 227,594	$ 168,247	$ 5,295	$ 48,662	$ 222,204	$ 5,390	-$ 1,656.00
1985-86	$ 195,563				$ 7,650	$ 36,787	$ 240,000	$ 191,580	$ 6,324	$ 39,203	$ 237,107	$ 2,893	$ 1,237.00
1986-87	$ 211,706				$ 6,975	$ 34,641	$ 253,322	$ 222,843	$ 4,413	$ 35,136	$ 262,392	-$ 9,070	-$ 7,833.00
1987-88	$ 213,634				$ 6,975	$ 42,000	$ 262,609	$ 220,934	$ 3,597	$ 47,957	$ 272,488	-$ 9,879	-$ 17,712.00
1988-89	$ 245,221				$ 6,300	$ 15,000	$ 266,521	$ 237,249	$ 4,683	$ 16,148	$ 258,080	$ 8,441	-$ 9,271.00
1989-90	$ 253,392				$ 5,173	$ 30,000	$ 288,565	$ 274,004	$ 5,571	$ 21,264	$ 300,839	-$ 12,274	-$ 21,545.00
1990-91	$ 260,691				$ 5,925	$ -	$ 266,616	$ 266,058	$ 4,809	$ 2,532	$ 273,399	-$ 6,783	-$ 28,328.00
1991-92	$ 264,591				$ 6,450	$ -	$ 271,041	$ 234,222	$ 5,649	$ -	$ 239,871	$ 31,170	$ 2,842.00
1992-93	$ 276,655	-$ 3,173			$ 3,825	$ -	$ 277,307	$ 254,430	$ 4,713	$ -	$ 259,143	$ 18,164	$ 21,006.00
1993-94	$ 274,156	-$ 3,173			$ 3,700	$ 21,000	$ 295,683	$ 276,163	$ 3,505	$ 20,496	$ 300,164	-$ 4,481	$ 16,525.00
1994-95	$ 303,700	-$ 8,200			$ 3,200	$ -	$ 298,700	$ 288,835	$ 3,220	$ -	$ 292,055	$ 6,645	$ 23,170.00
1995-96	$ 310,272	-$ 16,232			$ 1,375	$ -	$ 295,415	$ 292,860	$ 1,180	$ -	$ 294,040	$ 1,375	$ 24,545.00
1996-97	$ 236,427	-$ 6,784			$ -	$ -	$ 229,643	$ 229,643	$ -	$ -	$ 229,643	$ -	$ 24,545.00
1997-98	$ 172,334	-$ 5,165			$ -	$ -	$ 167,169	$ 175,042			$ 175,042	-$ 7,873	$ 16,672.00
1998-99	$ 151,439	-$ 4,808			$ -	$ -	$ 146,631	$ 154,159	$ -	$ -	$ 154,159	-$ 7,528	$ 9,144.24
1998-99		Adjustment credit to modernization				$ -		$ -	$ -	$ -		-$ 24,677	-$ 15,532.76
1999-00	$ 147,934	-$ 4,686			$ -	$ -	$ 143,248	$ 152,829	$ -	$ -	$ 152,829	-$ 9,581	-$ 25,113.89
2000-01	$ 165,270	-$ 5,231			$ -	$ -	$ 160,039	$ 158,561	$ -	$ -	$ 158,561	$1,477.67	-$ 23,636.22
2001-02	$ 166,997	-$ 5,119			$ -	$ -	$ 161,878	$ 158,634	$ -	$ -	$ 158,634	$3,244.05	-$ 20,392.17
2002-03	$ 172,639	-$ 5,369			$ -	$ -	$ 167,270	$ 169,865	$ -	$ -	$ 169,865	-$2,595.38	-$ 22,987.55
2003-04	$ 178,699	-$ 4,924			$ -	$ -	$ 173,775	$ 175,735	$ -	$ -	$ 175,735	-$1,960.00	-$ 24,947.55
2004-05	$ 420,834	-$ 5,395			$ -	$ -	$ 415,439	$ 407,849	$ -	$ -	$ 407,849	$7,590.00	-$ 17,357.55
2005-06	$ 425,082	-$ 5,395	$ 5,077	$ 1,523	$ -	$ -	$ 421,210	$ 393,104	$ -	$ -	$ 393,104	$28,105.88	$ 10,748.33
2006-07	$ 477,365	-$ 5,395	$ 20,400	$ 6,120	$ -	$ 1,500	$ 479,590	$ 445,337	$ -	$ 1,144	$ 446,481	$33,108.73	$ 43,857.06
2007-08	$ 548,813	-$ 6,697	$ 67,600	$ 20,280	$ -	$ 1,368	$ 563,764	$ 537,469	$ -	$ 3,663	$ 541,131	$22,632.70	$ 66,489.75
2008-09	$ 605,612	-$ 8,258	$ 56,400	$ 16,900	$ -	$ 14,404	$ 628,658	$ 622,512	$ -	$ 8,998	$ 631,510	-$2,852.00	$ 63,637.75
2009-10	$ 647,777	-$ 8,125	$ 11,000	$ 3,300	$ -	$ 20,500	$ 663,452	$ 669,641	$ -	$ 21,068	$ 690,709	-$27,257.00	$ 36,380.75
2010-11	$ 677,540	-$ 8,110	$ 35,663	$ 10,699	$ -	$ 15,000	$ 695,129	$ 692,904	$ -	$ 34,502	$ 727,406	-$32,277.00	$ 4,103.75
2011-12	$ 694,839	$ 9,291	$ 57,837	$ 17,351			$ 721,481	$ 826,078			$ 826,078	-$104,597.00	-$ 100,493.25
2012-13	$ 806,826	-$ 9,983	$ 18,040	$ 5,412			$ 802,255	$ 804,546			$ 804,546	-$2,291.00	-$ 102,784.25
2013-14	$ 832,689	-$ 9,983	$ 16,821	$ 5,046			$ 827,752	$ 806,657			$ 806,657	$21,095.30	-$ 81,688.95
2014-15	$ 861,167	-$ 10,133	$ 44,046	$ 13,214			$ 864,248	$ 806,396			$ 806,396	$57,851.80	-$ 23,837.15
2015-16	$ 803,974	-$ 10,133	$ 3,343	$ 1,003			$ 794,844	$ 785,933			$ 785,933	$8,911.00	-$ 14,926.15
2016-17	$ 750,644	-$ 10,133	$ 15,551	$ 4,665			$ 745,176	$ 817,843			$ 817,843	-$72,666.70	-$ 87,592.84
2017-18	$ 987,293	-$ 10,133	$ 9,255	$ 2,777			$ 979,937	$ 929,538			$ 929,538	$50,398.50	-$ 37,194.34
2018-19	$ 981,142		$ 18,594	$ 5,578			$ 986,720	$ 988,310			$ 988,310	-$1,589.80	-$ 38,784.15
2019-20	$ 977,768		$ 20,437	$ 6,131			$ 983,899	$ 1,001,763			$ 1,001,763	-$17,863.90	-$ 56,648.05
2020-21	$ 975,240		$ 39,509	$ 11,853			$ 987,093	$ 934,810			$ 934,810	$52,282.70	-$ 4,365.35
											Net total		-$ 4,365.35
NOTES.	A positive net total indicates funds owed to the Province.												