BUSINESS PLAN

MEDWAY RIVER ACID RAIN MITIGATION PROJECT
GREENFIELD, N.S.

MEDWAY RIVER SALMON ASSOCIATION

Prepared by 2010 Steering Committee
Doug Lohnes
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FOREWARD

This Business Plan is an evolving document and as such will be regularly updated as new information becomes available, particularly information pertaining to project costs, revenue sources and progress made in generating new partnerships.

EXECUTIVE SUMMARY

Nova Scotia has suffered more than any other region of North America as a percent of fish habitat lost from the effects of acid rain. Acid rain has negatively impacted the salmon populations in at least fifty (50) of the sixty five (65) salmon rivers draining the coastal plain that extends the full length of the Atlantic coast of mainland Nova Scotia, the Southern Upland. The combined effects of acid rain and low marine survival are hastening the extirpation of all but a small number the Southern Upland salmon stocks.

The Atlantic Salmon Federation (ASF) and the Nova Scotia Salmon Association (NSSA) are in the process of coordinating the development of a comprehensive strategy to combat the effects of acid rain on the native salmon and trout populations of the Southern Upland of Nova Scotia. The parties participating in this strategy are committed to seeking ways to stopping the problem at its source and to working at the local level both to preserve the unique genetic populations and to implement mitigation measures. The strategy will be implemented through the many partners that have come together to combat the effects of acid rain on Nova Scotia's salmonid resources.

The Medway River Salmon Association (MRSA) has assumed the lead role in the delivery of an acid rain mitigation project for the Medway River. The Medway River Liming Project "The Project" will be assisted by significant support from the Atlantic Salmon Federation (ASF) and the Nova Scotia Salmon Association (NSSA) in conjunction with partnerships involving other stakeholders.

The first project on the West River Sheet Harbour is one of two dosing projects to be carried out in Nova Scotia. The other project, to which this business plan applies, is to be initiated by the MRSA, an affiliate of the NSSA.

The Medway River was identified by the NSSA's Acid Rain Mitigation Committee (ARMC) comprised of representation from NSSA, ASF, Trout Nova Scotia, Nova Scotia Power (EMERA) and both Federal and Provincial governments.

The ARMC's was guided by a report (2002) that detailed plans for liming four of the Southern upland rivers, the East and West Sheet Harbour rivers as well as the Lahave and Medway.

The report was prepared by Dr. Atle Hindar , a leading research scientist and Head of Regional Office South, of the Norwegian Institute of Water Research (NIVA).

The focus of the Project is the main stem of the Medway River system. The liming is to be conducted using two (2) sixty five (65) tonne dosers operated year round. The Project will mitigate high acidity affects on approximately forty eight (48) percent of the fourteen hundred (1400) square kilometer of the total catchment.

The proposed apparatus to be utilized is the Norwegian manufactured Kemira Kemwater lime system (the "Doser". This system is widely utilized in Norway. The Project will have a minimum life span of ten (10) years (i.e., 2 salmon life cycles). This term may be extended if water quality fails to improve sufficiently to sustain salmon reproduction and if no alternative action is warranted as a result of technology change.

The Project will be supported by an extensive monitoring program to track changes in water chemistry, fish species composition and abundance, and invertebrate community structure. The Project will also receive support from and provide assistance to other efforts to determine the effectiveness of different mitigation methods.

Although ultimate responsibility and long term sustainability of the project rests with the MRSA, the success of the project hinges on the efforts of many partners involved in the delivery of key activities (e.g. operating the doser, monitoring and research).

The commitment of the ASF and NSSA and other principal partners will be confirmed in a memorandum of understanding.

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INTRODUCTION

The signing of the Canada/USA Clean Air Agreement in 1990 was expected to produce a reduction in acid rain causing emissions and a resultant increase in the pH value in the affected areas. While sulphur-dioxide and nitrous oxide emissions are decreasing, pH levels are not increasing (DFO 2000). The outlook for the recovery of Nova Scotia's rivers affected by acid rain is long term.

The effects of acid rain on Nova Scotia's salmon stocks are accentuated by low marine survival, a condition experienced by all North American salmon stocks for more than a decade. The combined effects of these two factors are hastening the extirpation of all but a small number of the Southern Upland salmon stocks. Immediate action is required to preserve a genetic nucleus of these stocks.

Acid precipitation has killed the fish populations of fourteen rivers in Nova Scotia's southern upland region. Twenty (20) rivers have only ten percent (10%) of their Atlantic salmon left and another thirty (30) rivers are threatened.

"Nova Scotia receives some of the lowest acid rain deposition amounts in eastern North America, but has some of the most acidic surface waters on the continent due to the low acid buffering provided by regional bedrock. Although acid rain has decreased by about fifty percent (50%) in the last twenty five (25) years, concurrent reductions in soil and water calcium and other important minerals are reducing the ability of many streams and rivers to support aquatic life (Clair et al. 2007). Geochemical models predict that in large parts of the NS Southern Uplands, water chemistry will not recover to pre-acidification levels for at least another sixty (60) years. The challenge for conservationists is therefore to try to ensure the survival of native genetic salmon stock until water chemistry becomes suitable for allowing natural survival to occur. The liming of key habitats to allow valuable populations to survive is one method of assisting population survival."

Thomas A. Clair, PhD
Research Scientist
Environment Canada
Sackville, N.B.
Canada

The MRSA overall acid rain mitigation strategy will involve:

- Aerial liming
- Lake liming
- River liming

The first of these techniques to be tested, river dosing, is to be carried out on two (2) rivers in Nova Scotia – West River, Sheet Harbour and Medway River, Queens County. The West River Project commenced in the summer of 2005. The liming agent to be used is powdered limestone.

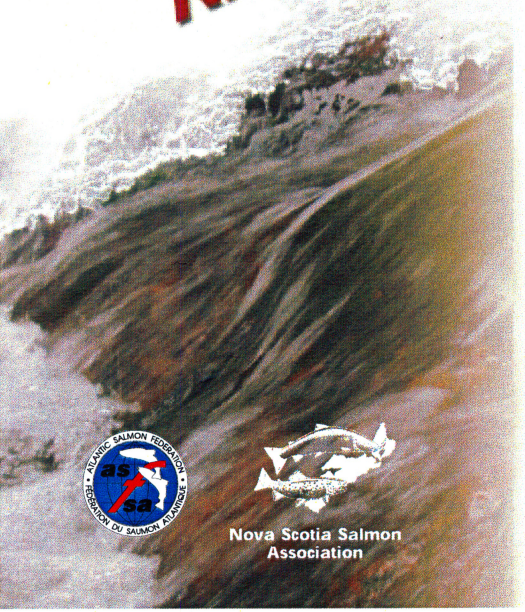
The Medway River differs from the West River Project in that it will involve two (2) sixty five (65) tonne dosers and the dose will be driven by pH levels upstream. The West River has only one (1) fifty (50) tonne doser and is driven by water flow as opposed to pH.

The Medway is a significantly larger watershed.

The following is the MRSA business plan for implementing the Medway River Project. The plan details what will be done and by whom, the schedule for Project construction and implementation, the projected costs, revenue sources, payment schedule and partnerships now in place and being developed to ensure success.

ACID RAIN

KILLS NOVA SCOTIA RIVERS



Nova Scotia Salmon Association

ACID rain is produced when fossil fuels are burned. Its main constituents are sulphur dioxide, released from coal and oil-fired boilers and ore smelters, and nitrogen oxide, released in exhaust fumes from motor vehicles.

These gases combine with water in the atmosphere forming nitric and sulphuric acids that are carried by winds and return to earth in the form of acid rain, snow, sleet, and fog.

Acid rain is devastating Nova Scotia! The province:

- receives more than twice the acid rain it can safely handle
- suffers from lost and damaged fish habitat
- has seen a decrease of 75% in Atlantic salmon runs to the Atlantic coast (from 45,000 historically to 10,500 in 2000)
- has completely lost salmon runs from 14 of these rivers
- has experienced declines in salmon populations of 90% in another 20 rivers
- receives about 85% of its acid rain from Central Canada and the US mid-west
- is observing a decline in the growth and health of trees and forests
- has moose populations with disturbingly high levels of cadmium

Sources

- *Nova Scotia State of the Environment Report*
- *Towards a National Acid Rain Strategy by the - - Acidifying Emissions Task Group*
- *Natural Resources Canada*
- *Acid Rain Program, US EPA*
- *Environment Canada's A Primer on Environmental Citizenship*
- *Unfinished Business: Why the Acid Rain Problem Is Not Solved – Clean Air Task Force*
- *Mainland Moose Study Progress Report (N.S.)*

Acid Rain kills and injures:

- forests and rivers
- fish and animals
- people

Acid Rain costs:

- our health care system
- our economic well-being
- our citizens, privately and publicly

Acid Rain cheats us of:

- a clean and healthy environment
- our cultural heritage
- our livelihoods

Acid Rain:

- leaches heavy metals, such as mercury, aluminum, and cadmium from soil and rock, allowing plants and animals to absorb them.
- contributes to decreased productivity in fisheries and forestry, resulting in lower profits and fewer jobs. Recreational fishing for Atlantic salmon and trout is worth $58 million annually.
- corrodes metals; deteriorates and soils stone and paint on homes, public buildings, and cultural structures, seriously depreciating their value.

Canada and the United States must cut acid rain emissions by 75%

Annually a 75% reduction would:

- prevent 830 premature deaths
- decrease asthma symptom days by 316,300
- reduce health care costs by up to $8 billion
- allow the environment to naturally accommodate acid rain and, in turn, allow rivers to recover

Acid Rain damage can be controlled by:

- reducing sulphur dioxide emissions by 75% in North America
- conducting government and industry-funded research to clearly determine the role of nitrogen oxide and guide reduction targets
- implementing mitigation and restoration programs
- developing and implementing Atlantic salmon recovery and reintroduction plans
- gene banking distinct Atlantic salmon populations to maintain their genetic diversity
- using hatcheries to maintain and restore Atlantic salmon
- liming rivers to maintain good pH levels

We need your help. Please

1. Urge the following to reduce acid rain causing emissions

- Government
- Polluting industries

2. Speak out on acid rain to

- Media
- Individuals, organizations and schools

3. Make responsible lifestyle choices

- Car pool, use public transportation, walk, cycle
- Recycle and conserve energy

4. Join a conservation organization

- Your local river association
- Nova Scotia Salmon Association
- Atlantic Salmon Federation

pH - The Acid Indicator:

Very small changes in a river's pH (the measure of acidity) can greatly affect Atlantic salmon, our biological indicator.

The pH scale is logarithmic, meaning that a river with a pH of 5.5. is 10 times more acidic than a river with a pH of 6.5.

PH level:

Neutral (neither alkaline nor acidic).

Measurements **below pH 7** indicate increasing acidity.

5.7:
The acidity level of natural rain...no effect.

5.4:
The lowest level Atlantic salmon can tolerate without threat to its survival.

5.3 to 5.1:
Reproduction is adversely affected.

5.0 to 4.7:
50% of the salmon eggs won't hatch; 30% of the fry born from these eggs will die.

4.6 and below:
No natural production occurs. Juvenile reproduction is 100% destroyed.

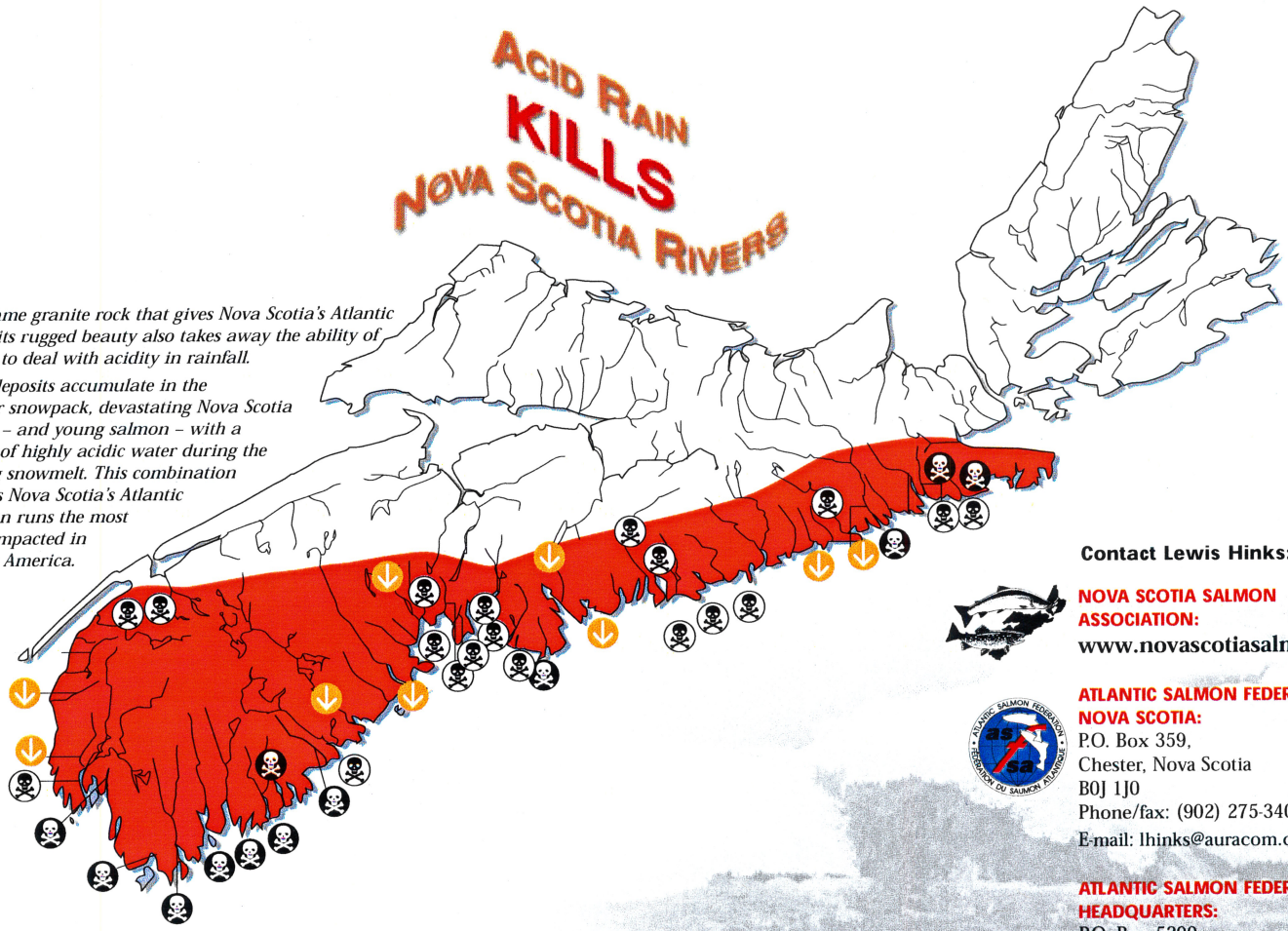
The pH of Nova Scotia's Atlantic coast rivers range from 5.3 (salmon reproduction adversely affected) to below 4.6 (no natural Atlantic salmon production occurs).

Source: Dr. Walton Watt, DFO

Acid Rain KILLS Nova Scotia Rivers

The same granite rock that gives Nova Scotia's Atlantic coast its rugged beauty also takes away the ability of rivers to deal with acidity in rainfall.

Acid deposits accumulate in the winter snowpack, devastating Nova Scotia rivers – and young salmon – with a 'plug' of highly acidic water during the spring snowmelt. This combination makes Nova Scotia's Atlantic salmon runs the most acid-impacted in North America.



EXTINCT. Native salmon runs are now extinct because of low pH levels due to acid rain.

REMNANT. Only remnant populations of Atlantic salmon survive in one or two higher pH tributaries.

DEPLETED. Salmon stocks have been depleted by acidification of some of the smaller triburaries, but over most of the river system salmon production appears normal.

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THE MEDWAY RIVER

The Medway River catchment encompasses approximately fourteen hundred (1400) square kilometers, a large watershed. From Port Medway where the river meets the Atlantic Ocean to its upper reaches at Lake Alma is about eighty (80) kilometers of river including Ponhook Lake (as the crow flies).

The river is characterized by being relatively long and more narrow than other river systems. This river system is divided into two (2) main parts in the upper half of the catchment. Alma Lake is the headwater lake of the main river and the Pleasant River system runs into the large Molega Lake before it joins with the main river system just upstream of Ponhook Lake.

The Medway River's storied salmon fishing heritage associates with the village of Ponoque which became Greenfield in 1850. Previous to 1883 the only connection the village had with the outside world was via the Medway River or coach from Liverpool.

Many sport fishermen began coming to the Medway prior to 1900 and were taken in as boarders by locals.

The Maple Leaf Hotel, as it was named by Boardman Hunt when purchased around 1900, became a must destination for salmon enthusiasts for many years.

In 1926 the Freeman House opened for business and continued the salmon fishing traditions that had become legendary on the Medway. Mr. Lew Freeman (picture insert) spent his whole life on the Medway River. He started at the Freeman House in nineteen hundred twenty six (1926) and stayed until nineteen hundred forty four (1944). The clientele, mostly American, came to fish Atlantic salmon and trout. There were about eighteen (18) to twenty (20) guides involved with the hotel.

Over the years, several lodges and cabins were built in the area driven by the great salmon fishing, helping to create a vibrant economy.

This statement from the book titled Markland or Nova Scotia by Robert R. McLeod, published by the Markland Publishing Company in nineteen hundred three (1903) says it all about the river at the time – "On the Port Medway River, Queens County, there is probably the best salmon fishing in the province, from the mouth upward some twelve (12) miles to Greenfield, where there is a pretty village at the foot of Ponhook Lake."

One cannot mention the Medway River without speaking of Harry Freeman. Harry, a lumberman and a scientist, devoted much of his life to the enhancement of the Medway River and the Greenfield area. He was recognized internationally as a scientist and developed laboratory research methods still in use today and, pioneered in studies of fish health, particularly that of the Atlantic Salmon.

Provided by Bryant Freeman

Lewis Freeman, my dad, spent his life in Nova Scotia, the Medway River, once the largest salmon producing river if N.S., was his river. He spent many years working for the preservation of the Atlantic salmon on this, and many other South Shore Rivers. Below is a note sent to the Atlantic Salmon Federation, and a copy of the letter was published in The Atlantic Salmon Journal, Number THREE in July 1977.

Save the Medway

Having been an active guide for over fifty years in this area of the Medway River, I have always had plenty to say and do with conservation of all fish and game in Nova Scotia, spending more time and money than I could afford. I have attended meetings, captured adult salmon for stripping and stocked other streams, and feel I have all I can do right here in this area. I am sitting at my desk looking out of a large picture window at the Medway, the best salmon stream in Nova Scotia, for which nothing is being done or has been done for years. A few hundred salmon and grilse are caught here each year. The main problem is, political bungling and poor management at the top level of the fishery protection, two guardians for fourteen miles of river work from night until five in daylight hours, five days each week. Numerous gill nets in the harbour block off free access to the river and kill many tagged smolt by entangling them in nylon mesh. I could go on for hours on this subject but what would be the use. I have watched a beautiful stream slowly die for lack of someone to take note of the serious problems.

In reading your magazines I note that things are being done for New Brunswick, Gaspe and Quebec, with good results in improved waters. I have a son who is lucky enough to have the opportunity to fish there. I have fished with and know a number of your members and have read of the many things you try to do to save our Atlantic salmon. Continue the good work, but please reach out to a few remote places like my river.

Lew Freeman Queens County Nova Scotia

Taken from the Atlantic Salmon Journal Number Three, July 1977

LEW FREEMEN 1914 - 1990

FREEMAN HOUSE, GREENFIELD, N.S.

THE MEDWAY RIVER SALMON ASSOCIATION

The MRSA, established in March 2007, is a non-profit association dedicated to the conservation, enhancement, and wise management of salmon and trout within the Medway watershed.

It is supported by some one hundred fifty (150) plus members and is an affiliate member of the Nova Scotia Salmon Association and the Atlantic Salmon Federation. The President is a member of the Board of Directors of the NSSA.

Over the past couple of years our work has centered on re-populating the Medway River with juvenile and captive reared salmon, as well as, sea run trout.
The releases: 35,000 parr; 2,400 smolt; 600 adult salmon; 30,000 sea run trout and 20,000 sea run trout eggs hatched in an incubation box at the Old Charleston Hatchery.

In 2008 and 2009 we carried out Kelt Experiments in April of both years in an effort to do a population estimate of adult salmon. We had limited success with these experiments, however, even with high water levels which limited fishing time, seventy seven (77) kelt were identified of which sixty nine (69) were wildfish. In 2010 we have an agreement with Fisheries and Oceans Canada (DFO) to conduct a Smolt Wheel population estimate on the Medway.

Agreement has been reached with DFO to provide the Greenfield School with salmon eggs for a Fish Friends project in co-operation with the Atlantic Salmon Federation. The Federation will provide the Greenfield School with the aquarium, chillers, etc. and Mersey Biodiversity Facility will provide three hundred (300) salmon eggs. The students will release the hatch back into the Medway River. The remaining eggs from the breeding of two captive reared salmon will be provided to our association for an incubation box rearing experiment at the Old Charleston hatchery.

Mike McNeil, of the McGowan Lake Fish Hatchery will, again this year, provide sea run trout eggs for the Old Charleston Fish Hatchery.

The Medway River Salmon Association Con't

In September of 2009, Dr. Tom Clair, Environment Canada, in conjunction with the Mersey Tobeatic Research Institute (MTRI), conducted a water quality seminar for river groups in Lunenburg and Queens Counties. A work project was developed and forty (40) water samples taken throughout the Medway Watershed. The MTRI did the pH testing and forwarded samples to Moncton for water quality testing. A meeting with Dr. Tom Clair and the MTRI was held on January 25, 2010 to discuss the results. pH numbers were encouraging while alkalinity needs improvement. It was agreed that another sampling be taken in early April during winter runoff conditions.

The MTRI is expected to recommend a location for aerial liming in three (3) catchment areas; Medway, Lahave and Gold Rivers. The pilot project site will be in one of the three (3) areas and be selected this summer.

PROGRESS TO DATE

In the fall of 2001, NSSA struck an Acid Rain Mitigation Committee (ARMC) to advise its Board of Directors on an acid rain mitigation program. Committee members include representatives from the NSSA, ASF, Trout Nova Scotia, EMERA, NSDAF, EC and DFO. The Committee was instructed by the NSSA Board to select a candidate river within the Southern Upland for purposes of initiating a liming project. The objectives of the Project were to demonstrate new mitigation technology and to focus research and attention on the effects of acid rain on Nova Scotia's salmon and trout resources.

On October 13th and 14th, 2009 two (2) Norwegian liming experts, Stale Ellingsen and Terje Lysnes toured the Medway Watershed along with ASF Director Lewis Hinks, George Ferguson, V.P. NSSA and George Mansfield, MRSA. This was a follow-up to Dr. Hindar's study and report on liming recommendations for the Medway River.

Following the meeting of October 13th and 14th, two (2) committees were formed from the MRSA. (1) Advisory Committee and (2) Project Committee in respect to our plans to lime the Medway River. This follows our meeting in October 2009 with two (2) representatives of Franzefoss Miljokalk of Norway in Bangs Falls. These representatives viewed the Medway Watershed from Port Medway to Lake Alma and east to Pleasant River. They re-visited the four (4) lime dozier sites previously recommended by Dr. Hindar in a 2002 study. At the conclusion of their work a meeting was held with the MRSA Environment Committee to which they recommended a two (2) dozier solution to the acidity levels in the Medway Watershed from McGowan Lake to the estuary. A sixty five (65) tonne dozier just below Eel Lake and a second sixty five (65) tonne dozier below the Greenfield highway bridge. In addition, there is a requirement to boat lime Ponhook Lake. If these recommendations are met they estimate that a pH level of 5.5 will be sustained at the estuary.

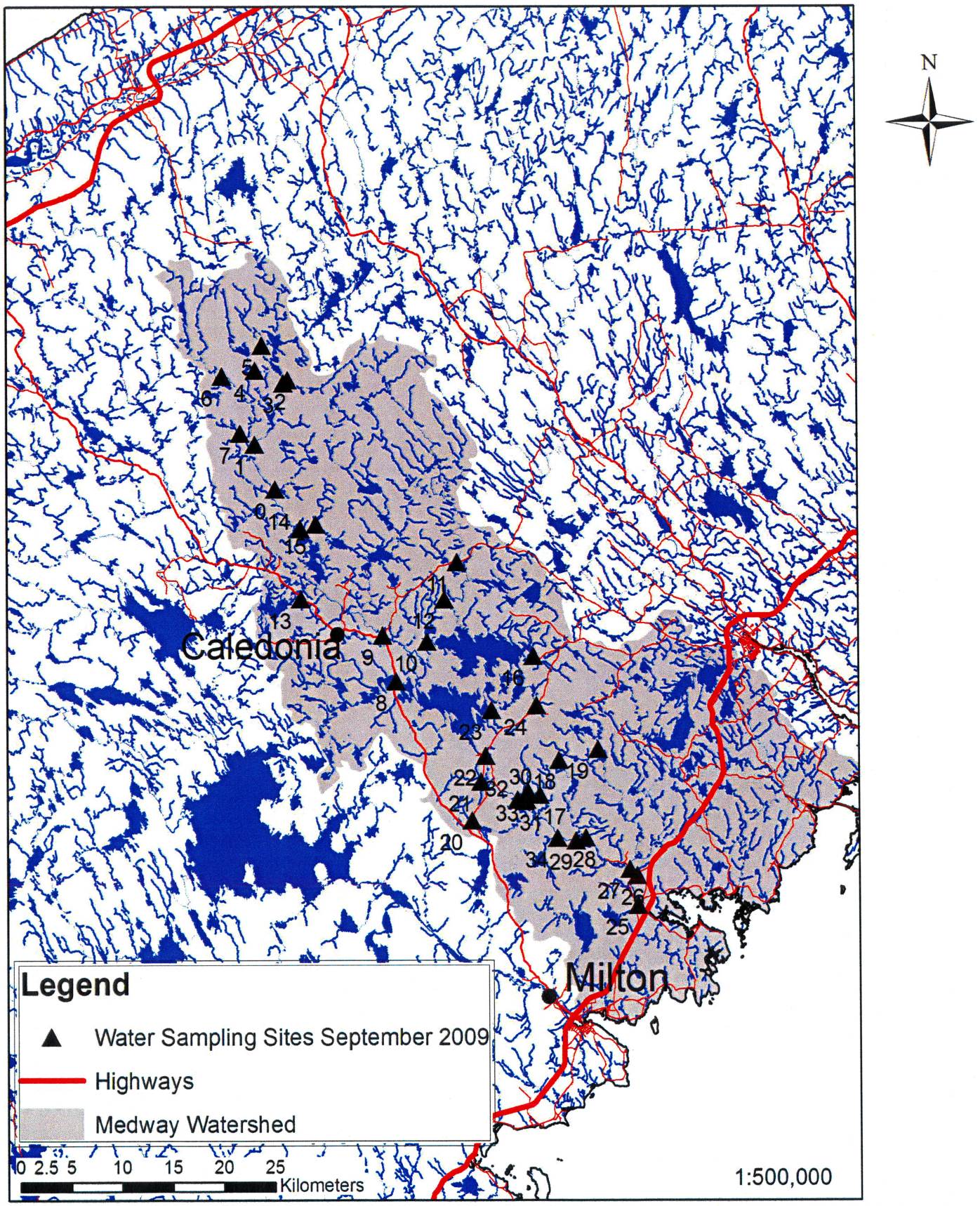
Water samples (35) were collected on September 27th and 28th, 2009 by MRSA, Queens County Fish and Game and Medway Tobeatic Research Institute. A report of the findings is included.

Mr. Thomas A. Clair, PhD, Research Scientist, Water Science and Technology Br. Environment Canada, Sackville, New Brunswick provided collection instruction and laboratory time for the alkalinity portion of the testing. The MTRI provided the pH results.

pH levels were higher than expected due to September providing quiet water with little rain.

Alkalinity numbers were low. Another set of samples will be taken in early April 2010 during winter runoff.

Water Samples Collected September 27th and 28th by Medway River Salmon Association, Queens County Fish and Game and Mersey Tobeatic Research Institute



		Easting	Northing	UTM Zone	Day	Month	Year	Site name, and location	Site description	Lat	Long	pH (Env. Can)	Alkalinity (mg/L)
1	AB 1	332388	4929403	20	28	9	2009	Brook from Porch lake to Medway River. 4m W of bridge	3m wide. 0.25m deep. Hemlock forest	44.4985	65.1093	5.05	0.31
2	AB 2	330391	4933699	20	28	9	2009	200m S of E&W branches of Midway. 8m S of bridge	2m wide. 0.75m deep. Deciduous forest	44.5367	65.1358	5.29	1.05
3	AB 3	333635	4939911	20	28	9	2009	Brook from Bawer lakes to Alma lake. 3m S of bridge	2m wide. 0.50m deep. Deciduous forest	44.5933	65.0970	4.81	0.33
4	AB 4	333208	4939602	20	28	9	2009	Medway R.E. branch below Almal ake. 15m N of bridge	4m wide 0.50m deep. Hemlock forest	44.5904	65.1023	5.28	1.03
5	AB 5	330427	4940823	20	28	9	2009	Randolf stream. 7m E of bridge	4m wide 0.25m deep. Hemlock forest	44.6008	65.1377	5.27	0.62
6	AB 6	331122	4943219	20	28	9	2009	Birch Bridge Brook into Almalake. 9m NW of bridge	3m wide. 1.00m deep. Hemlock forest	44.6225	65.1297	4.57	0.00
7	AB 7	327159	4940276	20	28	9	2009	West branch Medway River. 5m W. of bridge	5m wide. 0.25m deep.Deciduous forest & W. Pine	44.5951	65.1787	4.93	0.43
8	AB 8	328954	4934749	20	28	9	2009	Brook from Salmonlake to Medway. 5m NE. of bridge	3m wide 0.25m deep. Hemlock forest	44.5458	65.1542	5.00	1.02
9	QCF+GA 1	344225	4910879	20	28	9	2009	Christopher Lake. Upstream of Picnic Park. Off Route 8-Brook	30 FT wide. 2 FT deep. rocky+ mixed trees	44.3345	64.9548	5.66	1.27
10	QCF+GA 2	342913	4915298	20	28	9	2009	Main River-South Brookfield. Upstream of #208 road across from post office	40 FT wide. 2 FT deep. rocky + gravel	44.3740	64.9726	5.52	0.85
11	QCF+GA 3	350189	4922366	20	28	9	2009	Wildcat. River-Below. Hog Lake	60 FT wide. 3 FT deep. rocky	44.4370	64.9179	5.82	0.77
12	QCF+GA 4	350255	4922365	20	28	9	2009	Pleasant River above road . Route 208 Bridge.	25 FT wide. 2 Ft deep. gravel	44.4391	64.8825	4.86	0.34
13	QCF+GA 5	348998	4918788	20	28	9	2009	West Field River Below. Road Bridge on old Westfield RD.	30 FT wide. 2 FT deep. gravel	44.4066	64.8972	5.41	0.90
14	QCF+GA 6	334870	4918797	20	28	9	2009	Harmony Lake Brook Route 8 - gravel Bottom	6 FT wide. 2 FT deep. gravel	44.4036	65.0747	6.57	1.50
15	QCF+GA 7	334825	4925595	20	28	9	2009	Albany New - Main River. Below Bridge	30 FT wide. 2 FT deep. rocky + gravel	44.4648	65.0774	5.30	0.92
16	QCF+GA 8	336360	4925990	20	28	9	2009	Albany New - Moose Pit Brook - East of Main River	6 FT wide. 1 FT deep. rocky+ gravel	44.4687	65.0582	4.75	0.19
17	CS 1	357774	4913320	20	27	9	2009	Henley Brook,Chelsea. Below the highway bridge on henley Road	6 -12 Ft wide. 0.3-1 FT deep. grovel and stone bottom	44.3592	64.7855	5.96	1.78
18	CS 2	358332	4899928	20	27	9	2009	Upper Deans Brook, Greenfield. Above the bridge at the end of Harry Freeman	12 Ft wide. Low deep. very rocky with deep holes	44.2388	64.7749	5.82	2.43
19	CS 3	360273	4903289	20	27	9	2009	California Brook, Greenfield.Between little Wentworth and Wentworth Lake	6 -12 Ft wide. ?deep. rocky and gravel bottom	44.2694	64.7515	6.20	2.81
20	CS 4	364114	4904341	20	27	9	2009	Upper Salters Brook, Lapland. Below the bridge at the end of the Lapland Rd.	12 Ft wide. Deep pools shallow rock and gravel	44.2796	64.7036	6.14	1.77
21	CS 5	351653	4897474	20	27	9	2009	12mile of Upper Murry Brook.above the bridge on highway 210	8 Ft wide. With small shallow pools	44.2154	64.8578	5.34	0.94
22	CS 6	352537	4901212	20	27	9	2009	Fifteen Mile Brook, below the bridge on highway 210	6-10 FT wide. Low water level. gravel bottom	44.2492	64.8478	5.79	1.86
23	CS 7	353037	4903675	20	27	9	2009	Medway River, Greenfield, above the bridge in greenfield	lower water conditions	44.2715	64.8422	5.86	1.20
24	CS 8	353598	4908090	20	27	9	2009	Labelle Brook, Labelle, taken above the highway bridge on Labelle Rd.	rock and deep gravel bottom	44.3113	64.8365	6.31	1.74
25	CS 9	358038	4908572	20	27	9	2009	Browns Brook, Buckfield. Taken above the bridge on highway 210	low water, beaver activity, rock + gravel bottom	44.3165	64.7809	5.18	0.51
26	DN 1	368000	4889298	20	28	9	2009	Mill village, church BRK. cleanfield	2 FT wide. 8"deep.	44.1450	64.6511	5.68	0.33
27	DN 2	367921	4892192	20	28	9	2009	Limestone BRK. Alder young Hardwood	10 FT wide. 10" deep.	44.1710	64.6528	5.47	1.05
28	DN 3	367174	4892772	20	28	9	2009	Charlston Dam, Main River	2 FT deep at surce	44.1761	64.6623	5.81	1.26
29	DN 4	362881	4895835	20	28	9	2009	Wentworth Brook, Popler trees	10 FT wide. 6" deep.	44.2029	64.7168	6.09	2.40
30	DN 5	409828	4894709	20	28	9	2009	Shoal Grounds, Main River Spruce, Hardwood		44.2000	64.1290	5.80	1.19
31	DN 6	357045	4899455	20	28	9	2009	Lower Deans BRK. Pine, young Hardwood		44.2343	64.7909	5.51	1.22
32	DN 7	356881	4899319	20	28	9	2009	Rolls (Pine) (Main River)		44.2331	64.7929	5.92	1.43
33	DN 8	356155	4899476	20	28	9	2009	Buggyhole Pine Main River		44.2343	64.8020	6.00	1.37
34	DN 9	357156	4900272	20	28	9	2009	Buggy Hole Brook Pine, Hardwood		44.2417	64.7897	6.43	2.55
35	R.F.A. 1	360085	4895791	20	28	9	2009	2"brook, Runs out of Burnaby Lake, mixed wood		44.2019	64.7518	5.34	0.93

PROJECT DESCRIPTION

The Project involves liming the main system of the Medway system covering approximately forty eight percent (48%) of the fourteen hundred (1400) square kilometers watershed using two (2) sixty five (65) tonne stream side lime dosers.

One (1) dosing plant will be located in Greenfield, Queens County about twenty six (26) kilometers up river from the harbour. The second doser will be at Eel Lake northwest of Ponhook Lake and about fifty (50) kilometers from the outflow at Port Medway.

The Norwegian manufactured Kemira Kemwater lime system is the doser type selected for the Project. This particular design is widely utilized in Norway and was used in the West River Project.

The Project will have a minimum life span of ten (10) years (i.e. 2 salmon life cycles) from start-up. Prior to expiration of this term, the Project will be reviewed and continued if water quality has failed to improve sufficiently to sustain salmon reproduction and if no alternative action is warranted as a result of technology advances in mitigation techniques.

Monitoring programs will be carried out to track changes in water chemistry, fish species composition and abundance and invertebrate community structure. Water chemistry monitoring commenced in the fall of 2009. A smolt wheel will be installed on the river in the spring of 2010, (a first on the Medway), to try to determine the smolt population.

PROJECT IMPLEMENTATION

The MRSA is responsible for the delivery of the Project. The Project is to be managed through a Project Manager who will report to the MRSA Executive Committee. The MRSA is the owner of the dosers and thereby will be responsible for its operation and liabilities. Accordingly, the MRSA will require insurance coverage against potential property damage and personal liability claims.

Both the Board of Directors (Executive Committee) and the Project Manager will receive scientific and technical advice from the NSSA's ARMC Committee.

The Kemira Kemwater lime system will be supplied by Miljokalk Inc. of Norway. The site design work and associated engineering to install the liming system on site will be provided by Miljokalk Inc., and are included as part of the price of the dosers. The dosers will be powered by electricity with back-up power provided by either a gas generator or a series of batteries. MRSA will place an order for the dosers by March 1, 2011.

The dosers will be situated on Provincial crown land and/or private lands. Necessary permits for land access and placement of the dosers will be in hand prior to the placement of the manufacture order for the dosers.

Any road construction to access the selected sites will be the responsibility of the MRSA.

The site preparation work will be contracted locally according to engineering specifications provided by Miljokalk Inc. Similarly, local services will be contracted to install the dosers.

The Project is subject to the environmental legislation requirements of both the Federal and Provincial governments. Specifically, a water course alteration permit is required by the province to ensure that the construction activities and the application of limestone are not harmful to the environment as per both Federal and Provincial regulations. A screening under the Federal Canadian Environmental Assessment Act (CEAA) will be required in the event the Federal government provides any direct funding.

A letter was written to DFO Habitat and Environment and Labour, N.S. making them aware of the project and asking their earliest attention to facilitate the necessary approvals.

The dosers will be operated by volunteers from the MRSA. An operator will be required to visit each site once per week. The operators will be trained by a technician from Miljokalk Inc. The training is included in the cost of the dosers.

Annual maintenance costs for the dosers are not expected to exceed five thousand dollars ($ 5,000.00). The operators will maintain an Operations and Routine Maintenance Log and report regularly to the Project Manager. All operational concerns will be reported to the Project Manager for resolution.

The monitoring programs for water chemistry, fish and invertebrates are being developed. The programs will be carried out by several partners of the MRSA participating in the project. Currently those partners are;

Water Chemistry Monitoring Program
EC
MTRI
DFO

Fish Monitoring Program
DFO

Invertebrates Monitoring Program
DFO
MTRI
MRSA (biology student)

The Water Chemistry and Fish Monitoring Programs are expected to be carried out annually whereas the Invertebrates Monitoring Program is scheduled to take place only immediately before liming and after five (5) years of liming. Five years was assumed to be a sufficient time period for changes to occur in the invertebrates community.

The Project will be a focus for research on the effects of acid rain on the freshwater ecosystem and the effectiveness of the in-stream doser liming technique. The monitoring and research programs will be linked to other projects aimed at determining the effectiveness of different mitigation methods.

An effective communications program is an essential part of the Project. Specifically, communications are required to:

1) keep partners and NSSA members informed of on-going matters;
2) coordinate formal communications amongst partners;
3) communicate scientific results;
4) keep the general public apprised of the progress of the Project; and
5) ensure the integration of the Project with the Strategy to combat acid rain

One of the key events to be identified in the plan is a public meeting in the Liverpool area to inform community members about the project and to secure their buy-in and support for it.

A summary of the implementation schedule for the Project is provided in Appendix "A" to this plan.

TOMAL®
METERING SYSTEMS

BUDGET QUOTATION

Date
11.12.2009

Our order No
Canada_-_Medway_river[1].doc

Our ref.
Teddy Eriksson

Your reference

Address/invoice address
Nova Scotia Salmon Association,
P.O. Box 396,
Chester, Nova Scotia
BOJ 1JO, Canada

Project
Midway River

Qty	Description	Unit price CAD
2 nos.	**65 m3 (2 300 ft^3) silo and dosing plant for lime.** According to technical specification. Budget price:	**$ 343 000**

Time of dispatch: 12 weeks from signed contract.
Add 4-5 weeks transfer time.

Delivery address: Halifax harbour

Terms of delivery: **All prices net, including sea freight and package.**
Excluding customs, VAT.
Unloading and internal freight from Halifax harbour is not incl.

Customers undertakings: Supply a mobile crane for unloading at harbour and at erection at site.
Supply the foundation and tighten between the foundation and the skirt support ring.

General conditions: Orgalime S 2000.

Terms of payment: 30 % at order, 70 % at delivery.. Invoices at 30 days net.

Enclosures: Technical specification. GA-drawing Q10386.
Orgalime S2000.

The exchange rate used is 1.00 CAD = 6,40 SEK.
If the exchange rate, at the date of the invoice, deviates more than +/- 3 %, the price will be adjusted according to the new exchange rate.

.....

Yours sincerely
TOMAL AB Teddy Eriksson

TOMAL®
METERING SYSTEMS

TECHNICAL SPECIFICATION

STORAGE AND DOSING PLANT FOR LIME

Data:
Chemical: Lime stone
Chemical formula : $Ca(CO)_3$
Bulk density: 1,25 kg/dm^3
Particle size: unknown

1 no. **Silo,** Tomal, made of mild steel.
Volume 65 m^3.
The silo is placed outdoors.

- Silo mantel, 2,5 x 2,5 m.
- Manhole 600x600 mm.
- "Skirt" made of corrugated plate down to the foundation, which creates a machine room.
- Preconal aluminium door.
- Filling pipe DN 100, incl. coupling and cover. The pipe starts 1m over the foundation.
- Railing on the silo roof made of pipes. Height 1,2 m.
- Ladder with back guard.
- Air evacuation pipe

1 no. **Insulated machine room:** the skirt of the silo is internally insulated 70 mm and lined with corrugated steel plates, Lindab in light grey colour.

1 no. **Over pressure relief valve**
The relief valve will evacuate the airflow, at filling from a bulk vehicle, even if the air evacuation pipe is clogged.

3 nos. **Level indication** consisting of rotating paddle indicators Movipro RLI for full level, low level and empty/arch indication placed in the feeder.
1-phase 230 V.

1 no. **Arch breaking equipment** consisting of mechanical arch breaking sledgehammer, which hits the silo cone when an arch has been indicated by the arch indicator, placed in the feeder.
Material: mild steel.
Drive: ABB/Swedrive worm geared motor, 0,25 kW. 3x400 V/ 60 Hz.

1 no. **Crank operated shut-off valve** Tomal type 400 mounted at the silo outlet.
Manufactured in mild steel with slide plate in stainless steel AISI 304.
Connection flange 400 x 700 mm.
3 nos. adjustable gland seals.

1 no. **Tomal multiscrew feeder** type 405 in mild steel.
Connection flange 400 x 400 mm.
5 nos. interacting feeder screws with large active bottom surface for safe discharge.
The feeder is equipped with inspection hatch at the side of the housing and sight glass at the top of the outlet.
Capacity: XXX kg $Ca(CO)_3$ /h.
Straight discharge curve.
Feeding accuracy +-1-2 % at constant bulk density.
Self-cleaning feeder screws.
Drive: Nord gear IEC motor, 0,37 kW. 3x400 V/ 60 Hz.

1 no. **Wetting cone**, Ø 480, in AISI 304.
Complete with:

- Inspections cover.
- Armatures for water supply consisting of solenoid valve and regulating valve.

- The armatures are manufactured in brass and the piping in PVC.
- Water supply: approx 2500 l/h,
- Flow switch.
- Level float switch type ELB

1 no. **Hose for dust evacuation**
Mounted at the air evacuation pipe out through the silo side.

1 no. **Flexible outlet**
Mounted at the feeder outlet down to the foundation.

1 no. **Electrical equipment supplied from Franzefoss Miljøkalk**
Supply voltage : **3 x 400 V, 60 Hz.**
Control voltage: 230 V, 60 Hz
Complete automatic and electric control with Telemecanique PLC and Mitshubishi controller on the cabinet front door.
Tomal include electrical wiring to the cabinet including heating and lightning internally in machine room.
Design according to SS-EN60204-1.

1 no. **Site preparation and concrete pad**
Drawings and descriptions of all necessary work.

Surface treatment: Externally on silo, railing, filling pipe, shut-off valve and feeder:
Sandblasted to SA 2 ½.
40 µm alkyd primer.
60 µm acrylic topcoat in one colour.

Silo and feeding equipment internally: untreated.
Ladder with platform: hot galvanised.
Motors, gears etc. are delivered in the sub-contractors' standard surface treatment.

Documentation: 3 copies in English according to EU guideline 89/392 EWG.
Some data sheets for components are delivered in the supplier's standard language.

Norms and standards: the equipment and documentation is designed in conformity with the machinery guidelines 89/392/EEG and addition 91/368 EEG.

Quality Assurance: Tomal AB is certified according to SS-EN ISO 9001:2000.

PROJECT COSTS AND REVENUES

Total cost of the ten (10) year project is estimated @ one million seven hundred thousand dollars ($ 1,700,000.00). Some of this cost will be provided "in kind" by many partners who are participating in the Project. The "in kind" support from the partners includes critical activities such as day-to-day operations and both monitoring and research programs. The funds required to support an extensive research program are expected to be secured independently by the partners conducting the research. The single most significant cost to the MRSA is the two (2) dosers estimated @ three hundred ninety four thousand dollars ($ 394,000.00) landed in Halifax. A breakdown of the costs of the Project is appended.

Several potential revenue sources exist to fund the Project. One of these is the NSSA – ASF annual fundraising dinner from which the entire proceeds from 2004 & 2005 were dedicated to the West River Project, approximately one hundred thirty thousand dollars ($ 130,000.00). Other sources are donations from suppliers of goods and services (e.g., limestone, site construction work) and corporations, both federal and provincial government grant programs, and various local fundraising programs. A special effort will be directed towards federal and provincial grant programs to secure assistance to cover a portion of the start-up costs and to support an extensive research effort. The liming project will attract interest among perspective research organizations and funding for an extensive research effort is expected to be readily available from various granting agencies and business corporations.

Estimates of projected annual costs are provided in Appendix "B" to this plan. Notable for the cost and revenue projections is the forecast that revenues will preceed expenditures throughout the 10-year life of the Project.

ECONOMIC IMPACT

A project of this magnitude has many ongoing economic benefits to the local area as well as research opportunities for Nova Scotia universities and government departments both Federal and Provincial.

Using the number of fishing licenses sold in Nova Scotia annually at approximately fifty eight thousand (58,000), the number of salmon licenses sold represents 3.4%.

In New Brunswick where salmon rivers have been less impacted by acid rain and private ownership has positively impacted the enhancement of salmon stocks, the numbers are considerably higher. In recent years, approximately sixty thousand (60,000) to seventy thousand (70,000) licenses for angling are sold annually. Salmon licenses represents approximately 34% of the total, ten times Nova Scotia!!

Hand in hand with this is the purchase of overnight accommodation, meals, guiding services, equipment, etc. providing an unknown multiple to the Provincial economy. Although unavailable at time of writing, positive impact numbers would be, no doubt, similar for Newfoundland and Labrador.

The two million dollar ($2,000,000) Project cost, albeit significant to the local economy during the construction and start-up phase, will pale in comparison to the research opportunity benefits going forward.

The Medway River has been well documented as a one time vibrant salmon producing watershed. The steps taken by the implementation of this Project will provide opportunity to make the Medway River and Nova Scotia a sought after destination for salmon anglers from around the globe.

PARTNERSHIP ARRANGEMENTS

The MRSA will enter into a memorandum of understanding (MOU) with it's partners to confirm commitments from the NSSA and other partners to this Project and, potentially to a wider range of activities to combat acid rain. The MRSA will approach the following partners to be signatures to the MOU:

Acadia Fist Nations
Freemans Lumber
AbitibiBowater
McGowan Fish Hatchery
Mersey Biodiversity Center
Region of Queens Municipality
White Point Lodge (as well as other tourism detinations)
Economic Development N.S.
Lunenburg Queens Development Commission
Mersey Tobeatic Research Institute
Department of Environment
Atlantic Salmon Federation
NSSA
Emera
Queens County Fish and Game
Bluenose Coastal Action Foundation
DFO
Nova Scotia / Queens County Guides Association
N.S. Universities
N.S. Tourism Association
DNR
N.S. Forestry Association

It is the MRSA's intention that the MOU's with all agreed partners will be finalized prior to the commencement of liming.

ACKNOWLEDGEMETS

The MRSA wishes to acknowledge and thank it's partners who assisted with the development of this plan. These partners include ASF, NSSA, DFO, MTRI, Dept. of Environment, Dr. Tom Clair.

Letters attached.

REFERENCES

Dr. Walter Watt, DFO .....Acid Rain Kills N.S. Rivers
Hindar, A, 2001 ..... Recommended Liming Strategies for Salmon Rivers in N.S. Norwegian Institute of Water Research Report SNO4434-2001

Nova Scotia Salmon Association

The Nova Scotia Salmon Association

To: Darrell Tingley
President,
Medway River Salmon Assoc.
P.O. Box 1495,
Lunenburg, NS, B0J-2C0

From: The Nova Scotia Salmon Association
P.O. Box 396,
Chester, Nova Scotia
B0J 1J0

Dear Darrell,

Since the Autumn of 2005, the Nova Scotia Salmon Association, along with its partners, has operated an acid rain mitigation program on the West River, Sheet Harbour, Nova Scotia. The goal of the project is to increase the river's pH to facilitate the survival of Atlantic salmon. The focus of the project is on the main stem of the river, and the lime is being administered using a single Kemira Kemwater lime system.

As a result of the lime doser, the pH of the treated water has increased from 4.3-5.1 to 5.5-7.5. As the biologist responsible for monitoring the ecology of the river as it relates to the project, I have observed what I feel is an obvious biological response to the increased pH. As a result of the increased pH, the aquatic invertebrate community has more than doubled in overall abundance and species assumed to be acid-sensitive (i.e. certain mayflies) have increased their relative abundance. We expect to see a response from Atlantic salmon starting as early as 2010.

With proper planning and sufficient commitment, I feel that similar liming projects are a worthwhile endeavor on the Southern Upland of Nova Scotia. Atlantic salmon population of this area are facing several challenges, however the negative effects of acidification can be negated through liming. I wish you well in your efforts to initiate a liming project on the Medway river. Please contact me if I can be of any service for the project. I look forward to the day when I tour the lime dosers situated on the banks of the Medway.

Yours in Conservation,

E.A. Halfyard

Edmund A. Halfyard, BSc, MSc, PhD (Candidate)
Biologist – Nova Scotia Salmon Association

Mersey Tobeatic Research Institute

The Medway Salmon River Association
P.O. Box 93
Mill Station, NS
B0J 2H0

To Whom It May Concern:

The Mersey Tobeatic Research Institute (MTRI) affirms its support for both the Medway River Salmon Association (MRSA) and their Liming Project. The intention of this project is to enhance/restore optimal water quality conditions for salmonids on acid stressed portions of the Medway River through a dozier application of lime and lake liming by boat. The MRSA has proven to be a well organized and dedicated association who share aligning interests in salmonid habitat enhancement and restoration.

MTRI is willing to provide advice to on site selection based on a suite of criterion developed in co-ordination with Tom Clair of Environment Canada. This projects links well with our interest in overall Aquatic Health and Connectivity for migratory species such as Atlantic salmon (*Salmo salar*).

This project, as it is experimental in nature, has the potential to provide an invaluable understanding on the application of lime to acid stressed watersheds in Nova Scotia. This is an avenue worth exploring considering the questionable viability of salmonid populations under existing conditions and the unique water chemistry of rivers in Southwest Nova Scotia. The Mersey Tobeatic Research Institute looks forward to working with the Medway River Salmon Association and our partners in developing and implementing this project in the future.

Kind Regards,

A. Noto

Ashley Noto
Community Outreach Officer
Mersey Tobeatic Research Institute

Appendix "A"

PROJECT SCHEDULE

Main Steps	Date of Implementation
1. Select the river for liming	Completed
2. Select the Doser to be insatalled	Completed
3. Finalize formal agreements:	
- regarding the access road	Not completed
- regarding the site where doser located	Not completed
- with the operators of the doser (ESWA)	Not completed
4. Administrative matters:	
- develop the Business Plan	Completed Mar 2010
- fundraising	Not completed
- develop plan	Not completed
- implement plan	Not completed
- engage a Project Manager	Not completed
- develop Communications Plan	Not completed
5. Apply for Environmental Approvals	Not completed
- Water Course Alteration Permit	Not completed
- CEAA	
6. Conduct Community Meeting	Not completed
7. Order Doser	Not completed
8. Upgrade access road	Not completed
9. Provide electrical power to site	Not completed
10. Provide telephone land-line to site	Not completed
11. Establish dosing regime	Not completed
12. Complete site preparation work	Not completed
13. Complete doser installation	Not completed
14. Initiate monitoring:	
- Water chemistry	Not completed
- Fish	Not completed
- Invertebrates	Not completed
15. Train Operators	Not completed
16. MOU signing with the partners	Not completed
17. Initiate dosing	Not completed

Appendix "A"

PROJECT SCHEDULE

Main Steps	Date of Implementation
1. Select the river for liming	Completed
2. Select the Doser to be insatalled	Completed
3. Finalize formal agreements:	
- regarding the access road	Not completed
- regarding the site where doser located	Not completed
- with the operators of the doser (ESWA)	Not completed
4. Administrative matters:	
- develop the Business Plan	Completed Mar 2010
- fundraising	Not completed
- develop plan	Not completed
- implement plan	Not completed
- engage a Project Manager	Not completed
- develop Communications Plan	Not completed
5. Apply for Environmental Approvals	Not completed
- Water Course Alteration Permit	Not completed
- CEAA	
6. Conduct Community Meeting	Not completed
7. Order Doser	Not completed
8. Upgrade access road	Not completed
9. Provide electrical power to site	Not completed
10. Provide telephone land-line to site	Not completed
11. Establish dosing regime	Not completed
12. Complete site preparation work	Not completed
13. Complete doser installation	Not completed
14. Initiate monitoring:	
- Water chemistry	Not completed
- Fish	Not completed
- Invertebrates	Not completed
15. Train Operators	Not completed
16. MOU signing with the partners	Not completed
17. Initiate dosing	Not completed

Appendix "B"

ESTIMATED ANNUAL PROJECT COSTS

Cost Activity

Annual Project Costs	Greenfield	Eel Lake	Total Per Yr
	2011	**2011**	**2012-2021**
1. Project Manager			
- Service contract	5,000	5,000	10,000
- Regular expenses	2,500	2,500	5,000
2. Project communications	1,000	1,000	2,000
3. Doser purchase	196,500	196,500	
4. Doser shipping costs	3,750	3,750	
5. Electrical power			
- Installation		20,000	
- Service	1,000	1,000	2,000
6. Telephone			
- Installation	1,000	1,000	
- Regular service	700	700	1,400
7. Pad construction	8,000	8,000	
8. Dosing level determination	1,000	1,000	
9. Insurance premium cost	500	500	1,000
10. Land Lease			
- Development of lease			
- 10 yr fee			
11. Doser installation	7,000	7,000	
12. Limestone purchase	35,000	35,000	70,000
13. Doser operating expenses	5,000	5,000	10,000
14. Doser miscellaneous expenses	1,000	1,000	2,000
15. Doser routine maintenance	1,000	1,000	2,000
16. Monitoring			
- Water Chemistry	Inkind	Inkind	Inkind
- Invertebrates			
17. 15% contingency	11,018	14,018	15,800
TOTAL COSTS	**280,968**	**303,968**	**121,200**

APPENDIX "B" NOTATIONS

1. Project Manager position is part-time.

3. Taxes included @ 15%

4. Halifax to Greenfield > Crane at port
   Halifax to Eel Lake > Trucking to site

5. 1200 ft of 3 phase power line required at Eel Lake site ($20,000)

7. Includes pad, well, piping and taxes

11. Crane and road construction to two locations, well, set-up and erection of doser.

12. Limestone cost includes trucking to site but no increase in cost over the ten year period.

MEDWAY RIVER SALMON ASSOCIATION

Memorandum of Understanding

DRAFT

Nova Scotia has suffered more than any other region of North America as a percent of fish habitat lost from the effects of acid rain. Acid rain has negatively impacted the salmon populations in at least fifty (50) of the sixty five (65) salmon rivers draining coastal plain that extends the full length of the Atlantic coast of mainland Nova Scotia, the Southern Upland. The combined effects of acid rain and low marine survival are hastening the extirpation of all but a small number the Southern Upland salmon stocks. The outlook for recovery of Nova Scotia's rivers affected by acid rain is long-term, possibly in the order of 50-100 years.

The Atlantic Salmon Federation ("ASF") and the Nova Scotia Salmon Association ("NSSA") are in the process of coordinating the development of a comprehensive strategy to combat the effects of acid rain on the native salmon and trout populations of the Southern Upland of Nova Scotia. The strategy will be implemented through the many partners that have come together to combat the effects of acid rain on Nova Scotia's salmonid resources.

The Medway River was identified by the NSSA's Acid Rain Mitigation Committee (ARMC) comprised of representation from NSSA, ASF, Trout Nova Scotia, Nova Scotia Power (EMERA) and both Federal and Provincial governments.

The Medway Salmon Association (MRSA) has assumed the lead role in the delivery of an acid rain mitigation project for the Medway River. The Medway River Liming Project "The Project" will be assisted by significant support from the Atlantic Salmon Federation (ASF) and the Nova Scotia Salmon Association (NSSA) in conjunction with partnerships involving other stakeholders.

The dosing apparatus to be utilized is the Norwegian manufactured Kemira Kemwater lime doser ("Doser"). This system is widely utilized in Norway. The Project will have a minimum life span of approximately ten (10) years (i.e. – 2 salmon life cycles).

The various partners in this project all bring specific interests and abilities to this project. In order to maximize the relationship of these groups and so everyone can fully understand the roles they bring to this important project, this Memorandum of Understanding has been developed. It outlines the roles and responsibilities of each partner.

MOU Draft Con't

MRSA

- Project management
- Project liability insurance
- Land acquisition
- Doser maintenance
- Safety policy
- Project reporting post treatment years 2, 4, 6, 8, 10
- Volunteer training
- Public awareness

ASF – NSSA – MRSA

- Fundraising
- Communications strategy
- Committee support

DFO – NSDoAF – MRSA

- Fish population monitoring
- Committee support
- Invertebrates monitoring

Six (6) to ten (10) sites will be sampled years 1, 3, 5, 7, 9 and perhaps ten (10) to monitor what changes take place in fish densities, and assemblages within the Medway River, with one (1) year of pre-treatment sampling already completed (2009). The purpose of this sampling is to monitor what changes take place after the introduction of lime via dosers located on the main branch of the Medway.

DFO – MRSA

- pH monitoring equipment
- Lime dosage calculations
- Committee support
- Scientific Support
- Habitat assessment
- Impact study report
- Stock assessments (with NSDoAF)

MOU Draft Con't

Environment Canada – MTRI – MRSA

- Permitting
- Water chemistry analysis
- Lime dosage calculations
- Possible funding
- Committee support
- Interpretation of results

NSPower

- Flow gauge and hydrology
- Committee support

Nova Scotia Universities

- Effects of liming research
- Endless research possibilities