9.5 WATER FACILITY REGULATIONS TESTING AND ACTION PLAN PROCEDURES

The South Shore Regional School Board has thirty-two schools that will require water testing on a regular basis. All of these schools are classified as "registered" supplies. See appendix G for list of schools.

Monitoring for Microbiological Quality will be done on a quarterly basis and monitoring for chemical and physical quality will be done on an annual basis for surface water and at least every two years for groundwater supplies.

All samples are to be sent to an approved testing lab. The approved testing lab for the Tri County Region is Yarmouth Regional Hospital, 50 Vancouver St., B5A 2P5.

TESTING

MICROBIOLOGICAL QUALITY:

"REGISTERED FACILITIES"

1. The Team Leader will take the water samples at these schools once every three months, December, March, June, and September.

2. The samples will be taken to an approved testing lab immediately for analysis.

3. All results of the tests will remain on file with the S.S.R.S.B. for a period of 2 years.

4. A copy of any positive test result will be forwarded to the Department of Environment immediately.

5. In the event of a positive report the protocol plan of action will begin immediately (see action plan).

CHEMICAL AND PHYSICAL QUALITY:

FREQUENCY

1. Surface water shall be monitored annually.

2. Groundwater shall be monitored at least once every two years.

3. Two samples shall be taken, one from the raw water source and one from a point after treatment by the Team Leader.

4. The same sample points shall be used each year.

DAILY OPERATIONAL MONITORING

DISINFECTION RESIDUAL

Any supply using a disinfection system shall be monitored daily for disinfection residual by the head custodian. Daily disinfection residuals shall be recorded and made available to NSDOE upon request.

TURBIDITY

The head custodian shall measure source and treated water turbidity at least once per day on any supply using chemically assisted filtration. Daily turbidity measurements shall be recorded and made available to NSDOE upon request.

FLOURIDE

The head custodian shall monitor fluoride daily at a representative location within the water works system on any system using fluoridation. Daily fluoride measurements shall be recorded and made available to NSDOE upon request.

ACTION PLAN

CORRECTIVE ACTION WHEN BACTERIA IS PRESENT

1. Notify NSDOE immediately.

2. No E.coli (or fecal coliforms) present and less than 10 % of samples test positive for total coliforms:
   a) resample as soon as possible
   b) check disinfection residual

3. With E.coli (or fecal coliforms) present or more than 10 % of samples positive for total coliforms:
   a) resample all regular sampling locations
   b) enumerate coliforms in samples
   c) evaluate effectiveness of treatment
   d) evaluate integrity of the water works system
   e) consider determining species of coliforms
   f) review past history of system

4. Supply alternate drinking water to the school until the water supply has been approved for drinking. (maintenance staff)

5. Post signs that water is unsafe to drink. (school principal)

6. It is the responsibility of the operations department to notify the school Principal and the SSRSB OH&S officer of a positive water test.

7. It is the responsibility of the principal to notify the Superintendent and the School OH&S committee of a positive water test at their school.

8. It is the responsibility of the Superintendent to notify the school board of a positive water test.

Sample collection shall follow the procedures outlined in appendix A, sample collection and preservation – microbiological quality, Canadian Drinking Water Guidelines.

APPENDICES:

Appendix A	Sample Collection and Preservation – Microbiological Quality
Appendix B	Sample Collection and Preservation – Chemical/Physical Quality
Appendix C	The Growth of Biofilm in a Waterworks System
Appendix D	Draft Press Release for Boil Water Advisory
Appendix E	Fact Sheet when Boil Advisory in Effect
Appendix F	Users Particular Precautions During A Boil Advisory
Appendix G	List of Schools South Shore Region
Appendix H	South Shore Region Daily Monitoring
Appendix I	South Shore Region Chemical and Physical Quality

APPENDIX A

Sample Collection and Preservation – Microbiological Quality

1) Sterile microbiological sampling containers, containing sodium thiosulphate (to neutralize chlorine), should be used to collect all samples.

2) Sample containers should be kept clean and free from contamination before and after collecting the sample. They should not be opened prior to collecting the sample.

3) At locations at which the sample must be collected from a tap, inspect the outside of the faucet. If water leaks around the outside of the faucet, select a different sampling site. Remove any aerators, strainers, hose attachments, mixing type faucets, and purification devices from the tap.

4) Run the cold water for at least three minutes before sample collection.

5) Reduce the tap flow rate before taking the sample. The flow rate should be low enough to ensure that no splashing occurs as the container is filled. At some sampling points the water runs continuously so you can't adjust the rate.

6) Label all bottles and complete the corresponding requisition. All raw water samples are to be noted and analysed for numbers of total and fecal coliforms.

7) Measure chlorine residual. Normally free chlorine residual is measured, however, total chlorine residuals may be required on occasion. In either case, the requisition form is to be marked "F" or "T" indicating free or total chlorine residual.

8) While holding the sample container at the base, remove plastic seal around cap before attempting to open the bottle. The cap is removed with the free hand, care being exercised not to touch the edge or the bottom of the cap or top or neck of bottle. If the cap is found to be loose or cracked, if it contains no seal, if the seal pulls away from the cap, if the bottle appears dirty, or if there are any other conditions which places the quality of the bottle of doubt, the bottle is to be rejected and a proper container used. Care is to be exercised to prevent breathing on the cap or bottle. The cap is to be held in one hand during the entire bottle filling operation; it is not to be laid down.

9) Sampling points will not normally be flamed. In some circumstances the tap can be flamed or disinfected at the sampler's discretion.

10) The sampling container is to be filled to the "fill line" leaving enough air space in the container to allow for mixing by shaking in the lab. The cap is carefully replaced.

11) Samples shall be transported to an approved water quality laboratory within 24 hours. Samples shall be kept in a refrigerator or cooler with ice packs until delivered to the lab.

APPENDIX B

Sample Collection and Preservation – Chemical and Physical Quality

Container

- For most basic parameters, use a clean polyethylene bottle available from the local hospital or water quality laboratory. For additional or specialized parameters, discuss the requirements with the laboratory or a trained professional before sampling.
- Label the bottle with water supply owner's name, address, location of the water source, date and time.
- Make sure all information on the requisition is filled out completely.

Flush the System

- If the sample is to be taken from a tap or pump, run the cold-water tap 10 minutes, if possible. This will help to remove stagnant water that may have artificially elevated metal concentrations from the distribution system.

Collect the Sample

- Rinse the bottle and cap 2 or 3 times.
- Turn flow volume down so that water runs gently.
- Sample for sensitive parameters (organics, metals) first. Filtration and preservation may be necessary for metals, depending on the purpose of sampling.
- Fill bottle to top (overflow) and cap tightly with no air gap.

Storage and Transportation

- Refrigerate the sample immediately or place in a cooler and store at 4°C in the dark.
- Transport the sample to the laboratory as soon as possible, preferably within 24 hours.

APPENDIX C

The Growth of Biofilm in a Water works System

Introduction

Biofilm refers to organic or inorganic surface deposits in a water works system consisting of microorganisms, microbial products and debris. Biofilm may occur on interior pipe surfaces, in sediments, inorganic tubercles, suspended particles or virtually any substratum immersed in the aquatic environment. Biofilm may be evenly distributed or occur as sporadic random patches on the surface.

Public Health Significance

Portions of a biofilm lining the interior of a water pipe may be periodically sloughed off into the passing water thereby seeding it with microorganisms contained in the biofilm. If such bacteria are coliforms, the occupancy must be considered a public health concern until it is proven that a treatment failure or contamination has not occurred. It is difficult to distinguish between a true biofilm event and an unexplained coliform occurrence. Determination of coliform contamination due to biofilm is usually a negative conclusion; that is, there are no observable coliforms in the treatment plan effluent, no identified breakdown in treatment barriers, no apparent cross-connection or other contamination of the water works system (breaks, construction, etc.). While a true coliform biofilm event may not in itself signal a public health risk it may mask a real contamination event and therefore must be viewed with concern. The onus is on the owner to show that these coliform occurrences are a result of biofilm release into the water supply.

Characteristics of a Situation Where Biofilm May be the Cause of Bacteria Counts Within a Water Works System

- No coliforms are detected in treatment plant effluent.
- Coliform bacteria persist in a water works system samples despite the maintenance of a disinfectant residual.
- Seasonal increase in coliform densities with highest recovery in warm summer months, decreasing in the fall.
- The duration of the coliform episode is prolonged for years.
- Growth of heterotrophic bacteria (HPC) frequently occurs before coliforms are detected.
- Coliform growth occurs as randomized pattern in the water works system.
- Some predominant coliform species can be identified, such as *Klebsiella*, *Entrobacter* or *Citrobacter*.

- Coliform occurrence persist despite proper operation and maintenance practices being carried out, including; consistently maintaining positive pressure in the water works system, implementing aggressive cross-connection control, thoroughly flushing and disinfecting pipes after construction and repair, providing efficient treatment.

APPENDIX D

Draft Press Release for Boil Water Advisory
(Revise as necessary to fit specific circumstances)

Due to apparent contamination of the _____ public drinking water supply and the possibility of unsafe water, consumers are advised to boil all water for at least 2 minutes before drinking, making ice cubes, washing foods, brushing teeth or any other activity requiring human consumption. This is to be done until further notice.

The water utility is doing all it can to determine the cause of the problem and to remedy it as quickly as possible. The water utility, the Nova Scotia Department of the Environment and the Medical Officer of Health are continuing to monitor the water quality closely and are working in close consultation.

Fact sheets on water usage when a boil water advisory is in effect are available from the water utility or the local office of the Nova Scotia Department of the Environment.

For further information regarding this notice call:

APPENDIX E

Fact Sheet on Domestic Water Usage When a Boil Advisory is in Effect

Disinfecting water

Water can be disinfected in a number of ways including boiling or adding household bleach which contains chlorine. Please see the table below for the details on disinfecting water.

	Method	**Amount**	**Time**
Boiling	Bring water to a rapid boil and continue to boil for at least 2 minutes		Boil for at least 2 minutes
Adding Bleach	Use household bleach (5.25% sodium hypochlorite)		
	a) for washing dishes in the sink	A capful (10ml) of bleach per sink of water	Mix and let sit for 1 minute before use
	b) for bathing in the bathtub	3 ounces (85ml) of bleach per standard tub	Mix and let sit for 10 minutes
	c) for whirlpool tubs	follow manufacturers instructions	

Only boiled water should be used for:

- drinking
- use in formulas or mixing juice or other drinks
- making ice cubes

Only disinfected water (boiled or bleached) should be used for:

- washing and bathing
- washing dishes
- humidifiers
- washing food that will be consumed uncooked such as fruit or vegetables

Note: Showering is not recommended if water contains fecal coliforms.

It is not necessary to use disinfected water for:

- laundry
- washing floors and other household cleaning

Point of use treatment units on the consumer's tap or water line cannot be depended upon to adequately disinfect water.

APPENDIX F

Users That Must Take Particular Precautions During a Boil Advisory

Restaurants

It is necessary to boil water:

- All drinking water
- Soft drink post-mix machines
- Ice cubes and any ice products (shaved or block ice) used in food or drinks
- Washing any food that would not be cooked
- Vending machines that use water that does not reach boiling temperature as part of their design.

It is not necessary to boil water for:

- Soft drink pre-mix machines
- Cooking and baking
- Coffee machines which achieve boiling temperature as part of their design

Food Production

- Dairy Plants- The contaminated water must not contact products following the pasteurization procedure and water used in clean-in-place procedures and in cleaning of product related equipment must be properly chlorinated.

- Bottling Plants- Pre-superchlorination and chlorine removal must be a part of production procedure.

- Ice Making- It is prohibited to make ice for domestic purposes or for cooling or preservation of food from water that is likely to make the ice impure or is liable to produce disease.

Hospitals, Schools, Special Care Facilities, Dental or Physician Clinics, etc.

- Bottled water or use alternate potable water supply in all applications of tap water intended for consumption or treatment procedures where a risk of infection is possible. Assess all water usage in consultation with infection control personnel.

Water Vending Outlets (Includes Wine and Beer Vending)

- Assess each system individually.

APPENDIX G

LIST OF SCHOOLS

SOUTH SHORE REGIONAL:

"Registered" Supplies

Arcadia Consolidated – Yarmouth County
Barton Consolidated – Digby County
Cape Sable Island Elementary – Shelburne County
Carleton Consolidated – Shelburne County
Clark's Harbour Elementary – Shelburne County
Drumlin Heights School- Yarmouth County
Digby Neck Consolidated – Digby County
Evelyn Richardson Mem. Elem. – Shelburne County
Islands Consolidated – Digby County
Plymouth Consolidated – Yarmouth County
Port Maitland Consolidated – Yarmouth County
Westport Village Elementary – Digby County
Weymouth Consolidated School – Digby County
Barrington Municipal High – Shelburne County

APPENDIX H

SOUTH SHORE REGIONAL: Daily Operational Monitoring

School	**Treatment**
Plymouth Consolidated	chlorination
St. Mary's Bay Academy	chlorination

APPENDIX I

SOUTH SHORE REGIONAL: Monitoring for Chemical and Physical Quality

School	Type of Supply	Frequency
Arcadia Consolidated	drilled well	every two years
Drumlin Heights	drilled well	every two years
Barton School	drilled well	every two years
Barrington Mun. High	drilled well	every two years
Carleton Consolidated	drilled well	every two years
Clark's Harbour School	drilled well	every two years
C.S.I. Elementary School	drilled well	every two years
Digby Neck Consolidated	drilled well	every two years
E.R.M.E.S	drilled well	every two years
Islands Consolidated School	drilled well	every two years
Plymouth Consolidated	drilled well	every two years
Port Maitland School	drilled well	every two years
Westport Village School	drilled well	every two years
Weymouth Consolidated	drilled well	every two years