

**ENVIRONMENT CANADA'S INTERVENTION**

**RESPECTING THE**

**GOVERNMENT OF NUNAVUT – COMMUNITY  
AND GOVERNMENT SERVICES  
APPLICATION FOR NEW TYPE A WATER  
LICENCE**

**FOR THE**

**HAMLET OF ARVIAT**

Submitted to the  
**Nunavut Water Board**

July 2<sup>nd</sup>, 2010



**Canada**

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# 1. Introduction

Environment Canada is a science-based Department whose business is to help Canadians live and prosper in an environment that needs to be conserved and protected. Contributing to making sustainable development a reality in Canada's North is a priority for Environment Canada. The Department focuses on provision of scientific expertise for incorporation into decisions on developments, such that all parties working together can ensure that there is minimal impact on the natural environment, and that ecosystem integrity is maintained and preserved for future generations. To this end, Environment Canada has reviewed the Government of Nunavut – Community and Government Services (GN-CGS) water license application and supporting information for the Hamlet of Arviat.

## **1.1 Mandate, Role and Responsibilities of Environment Canada**

The mandate of Environment Canada is determined by the statutes, regulations, guidelines, policies, federal, territorial, and international agreements, and related programs that it is assigned by Parliament to administer. The overall objective is to foster harmony between society and the environment for the economic, social and cultural benefit of present and future generations of Canadians. The Department shares this goal with other federal agencies, provinces, territories, Inuit and First Nations.

The *Department of the Environment Act* provides Environment Canada with general responsibility for environmental management and protection. Its obligations extend to and include all such matters over which Parliament has jurisdiction, which are not by law assigned to any other department, board, or agency of the Government of Canada. These include matters related to preservation and enhancement of the quality of the natural environment (e.g. water, air, soil), renewable resources including migratory birds and other non-domestic flora and fauna, water, meteorology, coordination of policies and programs respecting preservation and enhancement of the quality of the natural environment, development of standards and guidelines, promotion of sound environmental practices, and providing advice to federal government agencies. In delivering on these obligations Environment Canada has responsibility for specific legislation, regulations, policies, and agreements.

Of particular concern and interest for the current project are the responsibilities conferred on the Department by legislation and standards such as the: *Canadian Environmental Protection Act*; and, *Fisheries Act* (Sections 36-42).

Subsection 36 (3) of the *Fisheries Act* prohibits the deposit of deleterious substance into fish bearing waters unless authorized by a regulation under the Act or by another law of Parliament. Environment Canada, on behalf of the Minister of DFO, administers section 36 of the *Fisheries Act*.

Please see Appendix A for a brief description of the above instruments.

Environment Canada is participating in the review of the Hamlet of Arviat water license application in order to provide specialist expertise, information, and knowledge to the Nunavut Water Board as part of the regulatory process.

## ***1.2 Background***

GN-CGS has applied for a new Type A Water License from the Nunavut Water Board for a five year term for the Hamlet of Arviat in the Kivalliq Region of Nunavut to allow for the municipal use of water and to deposit waste. The Hamlet's previous Type B Water License (3AM-ARV0308) expired in 2008. Environment Canada participated in the Pre-Hearing Technical Meeting held by teleconference on the 30<sup>th</sup> and 31<sup>st</sup> of March 2010. This intervention presents issues which are still outstanding, and summarizes several areas of agreement on issues which have been resolved. Should new or additional relevant information be brought forward in the course of the public hearings this submission will be re-examined. Within the context of the additional information, any changes in EC's recommendations and position will be brought to the attention of the Board and the proponent.

## **2. Technical Comments and Recommendations**

EC's review of the water licence application submitted by GN-CGS on December 23<sup>rd</sup>, 2008 includes the Type A Water Licence application and supporting documents issued up to March 24<sup>th</sup>, 2010.

Our review focuses on areas which fall under the Department's mandated responsibilities, with our comments organized under the following headings:

- General Comments
- Sewage Disposal Facility
- Solid Waste Facility
- Landfarming of Contaminated Soils

Within each category, comments are organized by specific issue, with reference to the appropriate document section, and detailing our concerns and recommendations.

### **2.1 General**

Environment Canada was pleased overall with the format of the water licence application materials. Our review has identified several areas needing further work or clarification, as outlined in the following technical comments and recommendations. Where possible, we have suggested how the water licence may address such concerns, and provide recommended water licence conditions for the NWB's consideration.

### **2.2 Sewage Disposal Facility**

#### References:

Sewage Treatment Facility Operation and Maintenance (O&M) Plan, Hamlet of Arviat. Prepared by Nuna Burnside Engineering and Environmental Ltd. May 2009. File No. N-O 15746.

#### **2.2.a Lagoon and Wetland Design and As Built Drawings**

The Sewage Disposal Facility consists of a single engineered cell, discharging by twice-annual decant and by ongoing seepage through the berm, with effluent flowing through a wetland prior to its marine discharge to Hudson Bay. In the absence of design documents, it is unclear whether the effluent is intended to seep at the locations and rates that they are described in the application documents. Effective management and operation of a lagoon and wetland facility requires understanding of its function and design to mitigate environmental impacts.

At the Pre-Hearing Conference presentation, held on March 30th, 2010, the GN-CGS made the recommendation that an evaluation of the lagoon and its current and predicted long term impacts to the environment was required, and suggested

that the license include “Conditions” to conduct studies and provide the findings with recommendations by December 31, 2010.

EC’s recommendations:

1. EC agrees with GN-CGS’s recommendation and suggests a timeline of 12 months beyond issuance of the licence.
2. EC recommends the licence include a condition to provide As-Built Drawings of the lagoon and engineered features of the wetland within 12 months of issuance of the licence.
3. EC recommends the licence include a condition to provide to the Board with the Sewage Lagoon and Wetland design plan and drawings within 6 months of issuance of the licence.

### **2.2.b Abandoned lagoon cells**

Adjacent to the current Sewage Disposal Facility are two abandoned lagoon cells. Although not in use, there has been no abandonment or remediation work or planning done for the old lagoon cells. The GN-CGS recommended that a site assessment be done, and an Abandonment and Restoration plan be developed by Dec. 31, 2010 (Recommendation #2, March 23rd, 2010 Response letter to comments).

EC’s recommendation:

1. EC concurs with GN-CGS’s recommendation and recommends a timeline of 12 months following the issuance of the licence to provide an Abandonment and Restoration Plan for approval to the Board.

### **2.2.c Monitoring**

In order to evaluate the treatment achieved by the lagoon and the wetlands area, it is necessary to have data for the effluent quality. No water quality results have been provided with the application, and no sampling is known to have been done by the licensee, although monitoring was required under the expired license. Work done by Fleming College indicates that the level of treatment in the lagoon is not optimal, and that the flow path of effluent through the wetlands is not well enough understood to be confident that the compliance discharge point (ARV-4) is appropriate.

EC’s recommendations:

1. EC recommends that the proponent conduct a thorough lagoon discharge and wetland hydrology study, which includes effluent and water quality samples and a flow pattern assessment, be completed within 12 months of issuance of the licence. Submission of a study design to the Board for approval could be set as a licence condition, with the implementation of the approved study to follow Board approval.

2. Upon completion of the study, steps should be taken to optimize operation of the system. This could include management aspects such as manner and timing of decant, or engineering solutions such as installation of retention berms in the wetland area.
3. The Sewage O&M Plan should be updated to reflect best practices for operation in order to maximize treatment.

#### **2.2.d Effluent Bioassay Testing**

In order to monitor the whole effluent toxicity, EC recommends including a Pass/Fail Bioassay test at an appropriate sampling location prior to effluent discharge to the receiving environment. Toxicity testing provides an evaluation of effluent quality that integrates all the measured parameters and provides the proponent with an indication of overall effluent characterization with respect to deleteriousness. This will give the proponent and the regulators a means to evaluate the treatment and the potential for harm to the receiving environment.

EC's recommendation:

1. EC recommends the licence include a condition requiring annual sampling of effluent between June and September at ARV-4 or, when flow volume is not sufficient, at an upstream location where adequate flow volume exists. This sample should be sent to an approved laboratory for acute toxicity testing using the rainbow trout pass/fail static bioassay test.

#### **2.2.e Sludge Management**

Accumulation of sludge in the lagoon will occur over time, and will result in reduced capacity and retention time, and less treatment of the effluent. As part of the operation of a lagoon system, it is prudent to monitor sludge accumulations, plan for removal, and identify appropriate disposal options for the sludge. It is indicated in the licence application that sludge removal should be considered starting in 2014.

EC's recommendations:

1. EC recommends that the licence include the condition that the Hamlet develop a sludge management plan by December 31st, 2013.
2. EC also recommends that the licence require sludge management, assessment, and disposal techniques be detailed in the Sewage Facility Operation and Maintenance Plan, and that this update to the plan be submitted to the Board for approval.

## **2.3 Solid Waste Facility**

### References:

Solid Waste Management Facility Operation and Maintenance (O&M) Plan, Hamlet of Arviat. Prepared by Nuna Burnside Engineering and Environmental Ltd. January 2009. File No. N-O 15746.

Environmental Monitoring Program and Quality Assurance/Quality Control Plan, Hamlet of Arviat. Prepared by Nuna Burnside Engineering and Environmental Ltd. May 2009. File No. N-O 15746.

Environmental Emergency Contingency Plan, Hamlet of Arviat. Prepared by Nuna Burnside Engineering and Environmental Ltd. May 2009. File No. N-O 15746.

### **2.3.a. Hazardous Waste**

Hazardous Waste is stored beside the Public Works Garage. Very little detail is provided about this site except the descriptions that “the area is not fenced or controlled” and that it “is out of compliance with regulations”. EC recommends that the site be improved to control the access of to the hazardous waste and that appropriate containment be in place to reduce spills or leaching into the natural environment.

EC’s recommendation:

1. EC recommends that there be a licence condition requiring the proponent to plan for and implement appropriate Hazardous Waste containment and segregation.

### **2.3.b. Bulky Metal Storage**

A separate Solid Waste site (Bulky Metal Storage and Contaminated Soil Site) has been identified at a location 500 m south of the community, containing vehicles, heavy equipment, tires, appliances, snowmobiles, and 45 gallon drums as well as hydrocarbon-contaminated soil. Leachate from this site is unmanaged. EC recommends that this site be captured by the new Type A water license and require appropriate bulky waste management as well as landfarming and monitoring of the contaminated soil. EC recommends decommissioning and restoring this site as soon as an appropriately lined site becomes available. In the meantime, leachate sampling would provide useful information to identify the potential extent of contamination.

EC’s recommendations:

1. EC recommends the licence include a condition requiring monitoring of leachate from the Bulky Waste Site with an additional Surveillance



Network Program sampling site to be sampled twice annually when surface water is present.

2. The Solid Waste Facility Operation and Maintenance Plan should include a section specific to the Bulky Waste Site.

### **2.3.c. Solid Waste Water Management**

The Solid Waste Facility contains leachate-impacted surface water within the fenced area of the facility as well as adjacent to the site. Containment, treatment and drainage control are required both while the facility is in the operational and decommissioning phases.

EC's recommendation:

1. A licence condition for a Solid Waste Water Management Plan to be submitted for approval to the Board within 6 months of issuance of the licence. This plan should cover water containment, treatment and drainage control of water within the boundaries of the Solid Waste Facility.

### **2.3.d. Landfarming of Contaminated Soils**

The application documents indicate that 750 m<sup>3</sup> of diesel-contaminated soil is present at the Bulky Metals Sites. Additional contaminated materials are located in the community, and should be inventoried and appropriate remediation identified. No operational instruction is outlined in the O&M plan on the proper handling and disposal of hydrocarbon contaminated soil. EC recommends including landfarming methods, containment, and sampling as part of the O&M Plan.

EC's recommendation:

1. EC agrees with GN-CGS's recommendation to include a licence condition to conduct an inventory and assessment of all contaminated soil in the community, and develop a plan for treatment and disposal of the soil. EC recommends this inventory, assessment as well as the treatment and disposal plan be submitted within 6 months of issuance of the licence.

### **3.0 Conclusion**

Environment Canada would like to thank the NWB for the opportunity to comment on the GN-CGS/Hamlet Arviat's water licence application, and we hope that these technical comments and recommendations are useful to the Board in their decision-making process. Environment Canada requests the opportunity to submit additional written comments after the public hearing to address any new information brought forward at the hearing. Environment Canada staff are available to review a draft water licence and we look forward to further discussions at the July 20-22, 2010 Public Hearing.

## APPENDIX A: RELEVANT LEGISLATION, POLICIES AND GUIDELINES

### ***Department of the Environment Act***

The Department of the Environment Act (DOE Act) provides EC with general responsibility for environmental management and protection. Its obligation extend to and include all matters over which Parliament has jurisdiction, and have not by law been assigned to any other department, board, or agency of the Government of Canada as related to:

- Preservation and enhancement of the quality of the natural environment (e.g. water, air, and soil)
- Renewable resources including migratory birds and other non-domestic flora and fauna
- Water
- Meteorology
- Coordination of policies and programs respecting preservation and enhancement of the quality of the natural environment

The DOE Act states that EC has a mandated responsibility to advise heads of federal departments, boards and agencies on matters pertaining to the preservation and enhancement of the quality of the natural environment. As such, this mandate is extremely broad.

### ***Canadian Environmental Protection Act, 1999***

Proclaimed on March 31, 2000, the new Canadian Environmental Protection Act, 1999 (CEPA 1999, referred to hereinafter as CEPA) is an Act respecting pollution prevention and the protection of the environment and human health in order to contribute to sustainable development. CEPA shifts the focus away from managing pollution after it has been created to preventing pollution. The Act provides the federal government with new tools to protect the environment and human health, establishes strict deadlines for controlling certain toxic substances, and requires the virtual elimination of toxic substances which are bioaccumulative, persistent and result primarily from human activity.

For substances that are declared “toxic” under CEPA and are added to the List of Toxic substance in Schedule 1 of the Act, instruments will be proposed to establish preventive or control actions for managing the substance and thereby reduce or eliminate its release into the environment. These tools may be used to control any aspect of the substance’s life cycle, from the design and development stage to its manufacture, use, storage, transport and ultimate disposal.

Examples of preventive and control instruments include:

- Regulations;
- Pollution prevention plans;
- Environmental emergency plans;
- Environmental codes of practice;
- Environmental release guidelines; and

- Pre-notification and assessment of new substances (chemicals, biochemicals, polymers, biopolymers, and animate products of biotechnology).

Authority to require emergency plans for toxic or other hazardous substances is provided in Part 8 of CEPA. Environmental emergency plans for such a substance(s) must cover prevention, preparedness, response and recovery.

### ***Fisheries Act – Pollution Prevention Provisions***

The Minister of Fisheries and Oceans is legally responsible to Parliament for administration and enforcement of all sections of the Fisheries Act. However, under a Prime Ministerial Instruction (1978) and a Memorandum of Understanding (1985), EC administers and enforces those aspects of the Act dealing with the prevention and control of pollutants affecting fish. In this context, EC works to:

- Advance pollution prevention technologies;
- Promote the development of preventative solutions; and
- Work with the provinces, territories, industry, other government departments and the public on issues relating to the pollution provisions of the Fisheries Act.

The main pollution prevention provision is found in subsection 36(3) of the Act, and is commonly referred to as the “general prohibition”. This subsection prohibits the deposit, into fish-bearing waters, of substances that are deleterious to fish. The legal definition of “deleterious substance” provided in subsection 34(1) of the Act, in conjunction with court rulings, provides a very broad interpretation of deleterious and includes any substance with a potentially harmful chemical, physical or biological effect on fish or fish habitat. One measure of a deleterious substance (such as a liquid discharge) is acute lethality as measure by the standard 96 hour fish bioassay test.

Pertinent regulations under the Fisheries Act include the Metal Mining Effluent Regulations (MMER's). The MMER's were registered and became national law on June 6, 2002. The regulations apply to all metal mines in Canada, including gold mines. The MMER's take a three tiered approach to monitoring, including end of pipe physical/chemical quality, end of pipe biological quality (through biological testing of lethality), and downstream environmental effect monitoring. The MMER's also have a requirement for comprehensive Environmental Effects Monitoring (EEM). An EEM program is a scientific assessment to evaluate the effects of mine effluent on the aquatic environment, specifically fish, fish habitat and the use of fisheries resources as defined in the Fisheries Act. An “effect” is defined in the MMER's as a statistically significant difference between fish or benthic invertebrate community measurements taken from exposure and reference areas (or along a gradient of effluent exposure). Environment Canada staff are available to assist in the development of EEM.