Section 3
Water Licence Application
Supplementary Questionnaire
For Municipalities

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NUNAVUT WATER BOARD
NUNAVUT
MALIRIYIN KATIMAYING

Water Licence Application
Supplementary Questionnaire
for Municipalities

I. GENERAL

1. Date: January 2003

2. Applicant:

Municipality and Region: The Hamlet of Sanikiluaq, Flaherty Island, Nunavut

Contacts:

Name of Contact: Brian Flemming
Position: Senior Administrative Officer
Telephone: 867-266-8874
Fax: 867-266-8903

4. Community Status:

__ Village
__ Town
__ City
√ Hamlet
__ Settlement Corporation

5. Indicate the status of the municipality's licence on the date of the application.

√ New Application
__ Renewal Water Licence #

II. ATTACHMENTS

1. Attach current or up-to-date detailed map(s) showing the locations of the:

a. Raw water intake
b. Water storage and treatment facilities
c. Fuel and chemical storage
d. Sewage treatment facilities (lagoon, honey bag pit, wetland)
e. Wastewater treatment area and discharge outlets
f. Solid waste disposal areas
g. Hazardous waste disposal area
h. Transportation access routes
i. Existing water bodies/courses and any changes to these water bodies/courses that have or may occur as a result of water use or waste disposal facilities, locations of environmental monitoring sites
j. Outline drainage basin
k. Traditional use areas outlined on site map and areas around the community used for recreation, camping, fishing, etc.

l. Abandoned and/or restored water treatment, sewage, and solid waste disposal facilities.

Are maps attached?

___ Yes ___ No

If no, please indicate when they will be available.

Indicate which organization has provided the various maps or diagrams.

III. WATER SUPPLY

Water Source

1. Type of source:

   _√_ Lake
   ___ River
   __ Well
   __ Other

2. Name of water source and alternative, if any.

   Primary Source: *Sanikiluaq Lake*
   Secondary Source:

3. Usual break-up & freeze-up period:

   Break-up:
   Freeze-up:

Water Intake

1. Please provide short descriptions for the following:

   a. Freshwater intake facility

   Prior to construction of the water pumping station in 1980, the Hamlet drew water from Sanikiluaq Lake year-round. The Lake, which is replenished by snow melt and rain, has a surface area of 139 ha, a depth of approximately 5 m and a volume estimated at 4.3 million m^3

   A new pumping station was constructed by the Department of Public Works to obtain water year-round from a greater depth than was possible directly from the tank truck. This also eliminated the need to keep an ice hole open in the winter.

The water intake screen is located 129 m from the lakeshore at a depth of 4.7 m. The intake is supported on a steel framework, which holds the screen approximately one metre above the bottom. Water velocity at the intake is insufficient to disturb the sediments below.

In October 1984, the screen was raised and set horizontally 1.2 m above the previous level. The lowest part of the original screen was 4.3 m below the water surface. This is now reduced to 3.1 m. Similarly, where the screen was originally 0.8 m above the bottom, this distance has now been increased to 1.9 m.

Water is delivered directly to the tank truck by manual control.

b. Operating capacity of pumps used:

c. Intake screen size

Water Storage

1. Type of water storage facility. (Check where applicable)

___ Reservoir/Pond
___ Storage tank
_√_ None

Other

Description:

2. If "reservoir" checked:

Is the reservoir lined?

What type of liner?

When was it installed?

Water Treatment

1. Indicate the quality of the water.

Summer:	_√_ good	___ fair	___ poor
Fall:	_√_ good	____ fair	___ poor
Winter:	_√_ good	____ fair	___ poor
Spring:	_√_ good	____ fair	___ poor

2. Describe

The 2001 INAC inspection report stated that concentrations of all tested parameters are well within the recommended levels.

3 Type of water treatment.

___ Filtration and chlorination
_√_ Chlorination only
___ None
____ Other

Description:

Water is delivered directly to the tank truck by manual control. At the pump house, a single hypochlorinator delivers measured doses of chlorine solution by single piston stroke to the discharge line several meters upstream from the flexible exterior discharge pipe. A 65% chlorine calcium hypochlorite powder is added to the solution tank and mixed with a propeller agitator. The chlorinator, controls, water meter, and delivery piping are all within the insulated truckfill building, sitting at the edge of the lake.

Water Use And Distribution

1. Volume of water use:

Distribution	Estimated number of people on the system **A**	Estimated average water consumption (Litres/capita/day) **B**	Total water consumption (Litres/day) **A x B**
PIPED	0	0	0
TRUCKED	836	107.3	89,687
TOTAL			89,687

General Condition of the water supply facilities

1. General condition of the:

Water supply facility

_√_ Satisfactory __ Unsatisfactory

If unsatisfactory, explain.

b. Storage facility

_√_ Satisfactory __ Unsatisfactory

If unsatisfactory, explain.

c. Distribution system

_√_ Satisfactory ___Unsatisfactory

If unsatisfactory, explain.

Modifications

1. Are there any changes *planned* for the water supply system?

_√_ No ___Yes

If yes, please attach a copy of the plan, or describe changes. Provide information on the implementation schedule.

2. Does the community believe changes needed to the water supply, storage or treatment facilities? Describe.

Identification

1. Are there signs identifying drinking water sources presently used by the municipality?

__ Yes __ No

IV. SEWAGE DISPOSAL

1. What type(s) of sewage treatment does the community have?

_√_ Lagoon
___ Mechanical system
_√_ Wetland
_√_ Honey bag
___ Combination/Other: describe

Annak Lake, 2.9 km west of the Hamlet, is the treatment site area for both pumpout sewage and honey bags. Despite having only a two hectare surface area, it is 4.5 m deep at its deepest point and has a mean depth of 1.9 m. The active area of the lake is 21,600 m², while the area of honey bag disposal is 10,000 m².

The lake has gravel barriers in place at discharge point, to increase retention time

and act as a permeable barrier. (INAC 1998)

Annak Lake, minus sewage inputs, has an average minimum retention time of 58 days from precipitation without evaporation or transpiration. The hydrologic effect of dumping wastewater into the lake is minimal

Lagoon *(if applicable)*

1. Have there been any operating problems with the lagoon?

___ Yes _√_ No

If yes, describe

Mechanical System *(if applicable)*

1. Describe (type, specifications, operation and maintenance program for the mechanical wastewater treatment system).

2. Are sludges produced? ___ Yes ___ No

If yes, describe how the sludges are disposed of:

Wetland *(if applicable)*

1. Describe the Wetland wastewater treatment system.

There is seasonal discharge overland to the ocean. According to the 2001 INAC Inspection Report there is extensive vegetation along the discharge path.

Honey Bag Pit

1. Does the municipality use a honey bag pit?

_√_ Yes ___ No

If yes, describe the location, drainage and operation/maintenance of the site:

Annak Lake, 2.9 km west of the Hamlet, is the treatment site area for both pumpout sewage and honey bags. The area of honey bag disposal is 10,000 m^2.

Commercial, Industrial and/or Hazardous Wastes

1. Are there any sources of commercial or industrial *liquid* waste being discharged or deposited to the wastewater treatment system that may affect the quality of the effluent or leachate produced? *(The municipality should be aware that any*

commercial or industrial discharge has to be approved by the municipality)

___ Yes _√_ No

If yes, indicate sources, types and quantities.

Sewage Discharge

1. Are fish, shellfish and other wildlife harvested in or near the discharge area?

___Yes __ No

General Condition of the sewage treatment facilities

1. General conditions

a. Sewage collection system

__ Satisfactory _√_ Unsatisfactory

If unsatisfactory, explain.

Collected sewage is being discharged from the trucks along the side of the road, instead of into the lagoon.

b. Discharge control system

_√_ Satisfactory __ Unsatisfactory

If unsatisfactory, explain.

c. Dams, diversion dykes, berms

_√_ Satisfactory __ Unsatisfactory

If unsatisfactory, explain.

Modifications

1. Are there any changes *planned* in the sewage treatment facilities?

_√_ No __ Yes

If yes, please attach a copy of the plan, or describe changes, provide information on the implementation schedule.

2. Does the municipality or residents believe changes are needed to the sewage treatment facilities? Describe:

Abandonment and Restoration

1. List and describe abandoned or restored sewage treatment facilities. Refer to original attachment maps.

Identification

Are there signs identifying past and present sewage disposal sites?

___ Yes ___ No

V. SOLID WASTE DISPOSAL

1. Briefly describe how solid wastes are collected and delivered to the disposal area.

Garbage is placed in wooden boxes by the roadside and collected three times per week using a 1987 Ford model F-310 stake truck. The spring clean up is scheduled each June.

2. Is the solid waste site fenced?

___ Yes _√_ No

3. Is the fence adequate?

___ Yes ___ No

If no, describe:

Waste Reduction

1. Does the municipality burn garbage?

_√_Yes __No

If yes, describe how and when this is done.

Wastes are burned at the disposal site when necessary. Covering of wastes is difficult since the ground consists of very hard clay soil, mixed with boulders.

2. Has the municipality considered measures for waste reduction such as recycling or reuse?

___ Yes _√_No

If yes, describe

Animal Carcasses Pit

1. Does the municipality have an area for the disposal of animal carcasses?

__ Yes _√_ No

If yes, describe the location, drainage and operation/maintenance of the site

Waste Oil Pit

1. Describe the waste oil storage area.

Waste oil is disposed of in the furnace at the hamlet garage.

Bulky Scrap Metal Waste Disposal Area

1. Does the municipality have a scrap metal or bulky waste disposal area?

_√_ Yes __ No

Bulky wastes are disposed of at a separate site (250,000 m²).

Commercial, Industrial and/or Hazardous Wastes Disposal Area

1. Are there any commercial or industrial waste being discharged or deposited in the solid waste disposal area? *(The municipality should be aware that any discharge of commercial or industrial waste has to be approved by the municipality)*

___ Yes ___ No

2. Will the municipality use a hazardous waste storage area?

_√_ Yes ___ No

If yes, describe:

a. Location Land fill site

b. Structure Sealift container

c. Operation and maintenance

General Condition of the Solid Waste Disposal Area

1. Comment on the general conditions of the:

a. Solid waste disposal area

___ Satisfactory _√_ Unsatisfactory

If unsatisfactory, explain.

Improvements need to be made at the solid waste facility to better contain garbage within the fenced area.

Modifications

1. Are there any changes planned for the solid waste disposal area?

_√_ No __Yes

If yes, attach a copy of the plan, or describe changes. Provide information on the implementation schedule.

2. Are changes needed to the solid waste disposal area? Describe.

Fencing, better segregation of bulky metal wastes needed.

Abandonment and Restoration

1. List and describe abandoned or restored solid waste facilities.
Indicate their location on a map.

Identification

1. Are there signs identifying past and present solid waste disposal sites?

__ Yes ___ No

VI. INSPECTION AND MONITORING

1. When were municipal facilities inspected by:

_√_ Indian and Northern Affairs Inspector Date: June 22, 2002
___Community Government and Transportation Date:
__ Other: Date:

2. Is there a system in place for reporting spills?

_√_ Yes ___ No

If yes, describe.

RWED spill line.

3. Is there a contingency plan for clean up of spills?

___ Yes ___ No

If yes, describe.

4. Have any spills occurred in the past five years?

_√_ Yes ___ No

If yes, describe and show on a map the locations of the spills. What action has been taken to clean the affected areas?

See attached spill report from RWED.

Monitoring Program

1. Is water sampling and analysis done?

_√_ Yes ___No

If Yes, answer questions a through e

a. Briefly describe how samples are taken and sent to the laboratory.

Done by INAC

b. Briefly describe any monitoring done for wastewater effluent and leachate.

Sewage discharge samples are taken by INAC

c. Who is responsible for water sampling?

Name:
Position:
Telephone:
Fax:
Level of training:

d. Recognized laboratory performing analysis of samples.

Name:	Taiga Environmental Laboratory
Address:	4601-52nd Ave., Box 1500
	Yellowknife, NT
	X1A 2R3
Telephone:	(867) 669-2788
Fax:	(867) 669-2718

e. Are any changes planned in the water quality monitoring program?

___ Yes _√_ No

If yes, describe.

VII. PUBLIC CONCERNS

1. What concerns does the municipality or residents have regarding the municipal water supply or waste disposal facilities? List the concerns and describe what steps have been taken to address those concerns.

VIII. PUBLIC HEALTH

Help may be obtained from the Regional Environmental Health Officer if you have difficulty with this section.

1. Date:
2. Municipality:
3. Contact: Phillip Reeve
   Telephone: (867) 975-4815
   Fax: (867) 975-4830

4. Have there been any problems or health/environmental concerns with drinking water?

___ Yes _√_ No

If yes, describe

5. Have there been any problems or health/environmental concerns with sewage disposal/treatment?

___ Yes _√_ No

If yes, describe

6. Have there been any problems or health/environmental concerns with solid waste disposal?

___ Yes _√_ No

If yes, describe

Monitoring Program

1. Does the Regional Health Board perform water quality sampling?

___No ___ Yes

If Yes, answer questions (a) to (e)

a. Briefly describe the sampling methodology.

b. Briefly describe any monitoring of wastewater effluent and leachate.

c. Who is responsible for sampling?

Name:
Position:
Telephone #:
Fax #:
Level of training:

d. Recognized laboratory performing analysis of samples.

Name:
Address:

Telephone #:
Fax #:

e. Are any changes planned in the water quality monitoring program?

___ Yes ___No

If yes, describe

IX. TECHNICAL INFORMATION

Assistance may be obtained from the Regional Community Government (CG&T) office if you have difficulty with this section.

1. Date:
2. Municipality:
3. Contact:
   Telephone #
   Fax #
4. Population (according Hamlet Government):
5. Estimated growth rate over next 5 years:
6. Has any baseline data collection and evaluation been undertaken with respect to the physical, biological, and chemical characteristics of the main water bodies in the area?

   __Yes _√ No

   If yes, provide a summary of program details or site title, authors, cities, and dates:

   If no, are such studies being planned?

   _√ No ___Yes

   (If yes, when and by whom):

7. Have Elders been consulted in the collection of baseline data on main water bodies in the area?

   _√ No __Yes

   If yes, specify

8. Has any baseline data collection and evaluation been undertaken with respect to the various biophysical components of the environment potentially affected by the project?

   _√ No ___Yes

   If yes, provide details below.

   Prepared by:
   Title:
   Completion Date:

If no, are such studies being planned?

_√_No __Yes

If yes, specify:

Attachments

1. Attach detailed plan or drawing(s) of the present *solid waste disposal area*. Include the following information:

   a. Details of pond size and elevation:
   b. Details of all retaining structures:
   c. Details of the drainage basin, and existing and proposed drainage modifications:
   d. Details of all decant, siphon mechanisms etc., treatment facilities:
   e. Details regarding direction and path of wastewater flow from the area:
   f. Distance from watercourses and fish bearing waters:
   g. Location and construction of liners:
   h. Leachate and groundwater collection systems; and control structures:

2. Attach detailed plan or drawing(s) of the present *sewage treatment system*. The drawing(s) should include the following:

   a. Details of all retaining structures:
   b. Details of the drainage basin, and existing and proposed drainage modifications:
   c. Details regarding direction and path of wastewater flow from the area:
   d. Indications of the distance from watercourses and fish bearing waters:
   e. All sources of seepage presently encountered near these areas, including volumes (m^3/day) and directions:
   f. The volume of seepage flow (m^3 / day):
   g. The direction of each flow:

3. Are drawings for the solid waste disposal area and sewage treatment system attached?

   ___ Yes _√_No

   If yes, who has provided them?

   If no, indicate when they will be available.

Hydrology

1. Effects on surface water flow:

   Are any stream channels altered?

___ Yes _√ No

Is the natural storage or water level of any lake or pond changed?

___ Yes _√ No

Are there changes in water flow downstream of the project?

___ Yes _√ No

Is a storage reservoir created in a natural channel?

___ Yes _√ No

If yes to any of the above, briefly describe the expected change in flow or storage:

2. Drainage Area:

What is the drainage area:

What is the average elevation of the drainage basin?

17.5 m to 0 m (drains to Eskimo Harbour)

Is the drainage basin outlined on an attached map?

___ Yes _√ No

Describe the drainage basin characteristics, (vegetation, general soil type, lakes, swamps and permafrost areas, etc.)

The Hamlet rests in the Hudson Physiographic Region. Sedimentary and volcanic rocks of the Proterozoic Age account for the islands' formation.
The surficial material is dominantly glacial till, with bedrock exposures. Extensive granular beaches are the result of retreating and resurging ice movement from the Larentide glacier. Glacial action is also responsible for the deposition of fine-grained sediments. Colluvial deposits are common along steeper slopes and limited alluvial deposits have been formed along streams.
The Hamlet is within the zone of widespread discontinuous permafrost. Most subsurface materials beneath a thin active zone are perennially frozen to a substantial depth.
Mosses and lichens appear in small patches. Soil cover consists of a layer of dark brown peat up to 150 mm in thickness.

3. Channel characteristics:

Is the course of any channel changed?

___ Yes _√_ No

If yes, describe measures to maintain streambed and bank stability.

4. Will the cross-section of any watercourse be changed?

___ Yes _√_ No

If yes, describe the change and its effect on the flow capacity of the channel.

Water Supply

1. What is the rate of withdrawal from the source?

Water consumption is estimated to be 75 m^3 per day

2. Is water drawn from the source

___ intermittently
_√__ continuously

3. If it is drawn intermittently, during what month(s) is it drawn?

4. For what period is it drawn (days/weeks/months)?

5. What is the rate of flow of source (if river) or size (if lake)?

The lake has a surface area of 139 ha, a depth of approximately 5 m and a volume estimated at 4.3 million m^3.

6. At the intended rate of water usage, describe the effects on the river or lake from which water will be drawn.

Sanikiluaq Lake is replenished by snowmelt and rain; effects of water use should be iinsignificant.

Water Storage

1. Is a dam or dyke being used to store or alter the flow of water?

___ Yes _√__No

2. What are the dimensions of the dam or dyke?

3. Does the proposed dam create a reservoir in a natural watercourse?

   If yes, what is the storage capacity and surface area of the reservoir?

4. Will the dam or dyke affect fish migration or movement?

   If yes, describe all measures for compensation of fish habitat lost due to the dam or dyke, and mitigation for fish migration or movement.

Water Treatment

1. Indicate the capacity of the treatment facility:

2. What is the capacity of the water storage facility:

3. Describe the method of water treatment (i.e., backwash, flocculation, sedimentation, chemicals used), and provide the results of the most recent bacteriological and chemical analysis. Attach a diagram, if possible.

   A 65% chlorine calcium hypochlorite powder is added to the solution tank and mixed with a propeller agitator. The chlorinator, controls, water meter, and delivery piping are all within the insulated truckfill building, sitting at the edge of the lake.

4. Are there any changes planned in the water treatment facilities?

   _√_ No ___Yes

   If yes, attach a copy of the plan or indicate changes and include an implementation schedule. Include excerpt from MACA Capital Plan if available.

Sewage Disposal

1. Indicate the level of sewage treatment:

   ___ primary
   _√_ secondary
   ___ tertiary

   Pre-treatment (if applicable):

   ___ screening
   ___ maceration

   Lagoons (if applicable):

   ___ anaerobic

___ aerobic
___ facultative

2. Indicate the capacity of the sewage treatment facility:

   Annak Lake, 2.9 km west of the Hamlet, is the treatment site area for both pumpout sewage and honey bags. Despite having only a two hectare surface area, it is 4.5 m deep at its deepest point and has a mean depth of 1.9 m. The active area of the lake is 21,600 m², while the area of honey bag disposal is 10,000 m².

   Annak Lake, minus sewage inputs, has an average minimum retention time of 58 days from precipitation without evaporation or transpiration. The hydrologic effect of dumping wastewater into the lake is minimal

3. Based on current population projections, the facility will meet the needs of the community until the year:

4. Average depth of the wastewater lagoon

   The mean depth is 1.9 m.

5. What is the design freeboard:

6. Indicate the retention time of the sewage while in the treatment facility in days:

   Annak Lake, minus sewage inputs, has an average minimum retention time of 58 days from precipitation without evaporation or transpiration. The hydrologic effect of dumping wastewater into the lake is minimal.

7. Indicate the estimated rate of discharge of wastewater:

8. Indicate the location of the discharge point:

9. Is the discharge:

   ___ seasonal
   _√_ continuous

   If the discharge is seasonal, during what month(s) is it done?

   What is the duration of the discharge (days/weeks/months)?

10. Are there any changes planned in the sewage disposal facilities?

    _√_ No ___Yes

If yes, attach a copy of the plan or indicate changes and include an implementation schedule. Include excerpt from MACA Capital Plan if available.

Solid Waste Disposal

1. Indicate the capacity of the disposal area: 360 000 m^2

2. The *average* depth of the solid waste disposal site

3. The current facility will meet community needs until the year

4. Do any natural watercourse enter the solid waste disposal area? What methods are used to decrease the amount of runoff water entering these areas?

5. Indicate the volume of water that may enter these areas from any source(s) and attach all pertinent details of the diversions.

   Source:
   Volume:

6. Please describe any diversions of watercourses:

7. Are there any changes planned in the solid waste disposal facilities?

   _√_ No __Yes

   If yes, attach a copy of the plan or indicate changes and include an implementation schedule. Include excerpt from MACA Capital Plan if available.

Other

1. Describe any additional details on the existing municipal facilities which should be considered by the Nunavut Water Board during its review.