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NUNAVUT WATER BOARD
NUNAVUT IMALIRIYIN KATIMAYINGI

Water Licence Application
Supplementary Questionnaire
For Municipalities

I. GENERAL

1. Date: __November 24, 2003_____

2. Applicant: _City of Iqaluit_____
   Municipality and Region

3. Contacts: __Brad Sokach_____
   Name of Contact

   ____Director of Engineering____
   Position

   ___867-975-8501_____ ___867-975-8505_____
   Telephone # Fax #

4. Community Status: __ Village __ Town _v_ City
   __ Hamlet __ Settlement Corporation

5. Indicate the status of the municipality's licence on the date of the application.
   ___ New Application
   _v_ Renewal Water Licence # NWB31QA9900__

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 and drainage patterns;
   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. (Outline drainage basin);
   j. Traditional use areas outlined on site map and areas around the community used for recreation, camping, fishing, etc.
   k. abandoned and/or restored water treatment, sewage, and solid waste disposal facilities.

   Are maps attached? v Yes __ No
   If no, please indicate when they will be available.

Indicate which organization has provided the various maps or diagrams.

Town of Iqaluit Water Licence Renewal – Overall Plan: Dillon Consulting Ltd.
Town of Iqaluit Waste Management Plan – Existing Waste Disposal Sites: UMA Engineering Ltd.
Solid Waste Disposal Area: UMA Engineering Ltd.

III. WATER SUPPLY

Water Source

1. Type of source: _v_ Lake __ River __Well __ Other _____

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

Lake Geraldine _____ (Primary Source) _____ (Secondary Source)

3. Usual break-up & freeze-up period: June (Break-up) October (Freeze-up)

Water Intake

1. Please provide short descriptions for the following:

a. Freshwater intake facility

Raw water leaves Lake Geraldine and enters the water treatment plant through a 360 m long, 250 mm diameter cast iron intake pipe, insulated with 50 mm of foam glass and protected with a gauge metal jacket. The injection of tempered water from the plant prevents the line from freezing.

b. Operating capacity of pumps used

Raw water supply is gravity fed to the water treatment plant.

c. Intake screen size

Not applicable as there is no intake screen.

Water Storage

1. Type of water storage facility. (check where applicable)
v Reservoir/Pond _v_ Storage tank ____ None ____ Other

Description:

2. If "reservoir" checked:

Is the reservoir lined? ____ Yes __v_ No

What type of liner? _____ When was it installed?_____

Water Treatment

1. Indicate the quality of the water.

Summer:	_v_ good	___ fair	___ poor
Fall:	__v_ good	____ fair	___ poor
Winter:	__v__ good	____ fair	___ poor
Spring:	_v___ good	____ fair	___ poor

2. Describe.

The water is of good to excellent chemical quality for domestic use. The water is clear and low in dissolved solids. Treated water is below the recommended limit with respect to corrosiveness.

3. Type of water treatment.

___Filtration and chlorination
___ Chlorination only
___ None
v__ Other __UV, Chlorination, Filtration, Caustic Soda addition_

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	3600	277	997,200
TRUCKED	2400	123	295,200
TOTAL			1,292,400

General Condition of the water supply facilities

1. General condition of the:

   a. Water supply facility
   _v_ Satisfactory __ Unsatisfactory

   If unsatisfactory, explain.

   b. Storage facility
   _v_ Satisfactory __ Unsatisfactory

   If unsatisfactory, explain.

   c. Distribution system
   _v_ Satisfactory __Unsatisfactory

   If unsatisfactory, explain.

Modifications

1. Are there any changes *planned* for the water supply system?
   v_ No ___Yes

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

The City's Water Treatment Plant was recently upgraded as per the following:

1. Increased the capacity of the water treatment plant by constructing 4 new filters, extending the existing building structure to house them and installed new backwash pumps.

2. Utilized UV treatment as the primary means of disinfection.

3. Replaced the existing lime handling system with a caustic soda system.

4. Provided a PLC – based control system and desktop computer, to automate certain plant functions and provide data logging capability.

The water treatment plant upgrades were commissioned in May of 2004.

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

No

Identification

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

_v_ Yes __ No

IV. SEWAGE DISPOSAL

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

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

Lagoon *(if applicable)*

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

___ Yes _v__ No

If yes, describe

Mechanical System *(if applicable)*

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

N/A

2. Are sludges produced?
   __ Yes __v__ No
   If yes, describe how the sludges are disposed of:

Wetland *(if applicable)*

1. Describe the Wetland wastewater treatment system.

N/A

Honey Bag Pit

1. Does the municipality use a honey bag pit?
   ___ Yes _v__ No
   If yes, describe the location, drainage, and operation/maintenance of the site:

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 __v__No

   If yes, indicate sources, types and quantities.

Sewage Discharge

1. Are fish, shell fish and other wildlife harvested in or near the discharge area?
   ___ Yes _v___ No

If yes, indicate species harvested, and level of harvest.

General Condition of the sewage treatment facilities

1. General condition of the:

   a. Sewage collection system
      _v_ Satisfactory __ Unsatisfactory
      If unsatisfactory, explain.

   b. Discharge control system
      _v_ Satisfactory __ Unsatisfactory
      If unsatisfactory, explain.

   c. Dams, diversion dykes, berms
      _v_ Satisfactory __ Unsatisfactory
      If unsatisfactory, explain.

Modifications

1. Are there any changes *planned* in the sewage treatment facilities?
   __ No _v_ Yes
   If yes, please attach a copy of the plan, or describe changes. Provide information on the implementation schedule.

Municipality is currently in the pre-design stage of converting the non-commissioned sewage treatment plant to a conventional secondary activated sludge treatment plant.

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

Yes, in general the public may perceive that the retention time and treatment of sewage is not adequate, i.e. that the quality of discharge could be improved. The lagoon was design to provide only primary treatment. The new facility will address these concerns.

Abandonment and Restoration

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

N/A

Identification

Are there signs identifying past and present sewage disposal sites?
__ Yes _v_ No

V. SOLID WASTE DISPOSAL

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

Residential waste is placed into waste box or holding room by residents. It is picked up twice a week by the Municipality. Commercial waste is placed in waste box or waste room and picked up daily by the Municipality.

2. Is the solid waste site fenced? _v_ Yes __ No

3. Is the fence adequate? _v_ Yes __ No

   If no, describe

Waste Reduction

1. Does the municipality burn garbage?
   __Yes _v_No
   If yes, describe how and when this is done.

2. Has the municipality considered measures for waste reduction such as recycling or reuse?
   _v_ Yes __ No

   If yes, describe

Municipality currently employs a recycling program.

Animal Carcasses Pit

1. Does the municipality have an area for the disposal of animal carcasses?
   __ Yes _v_ 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 currently collected and stored at Public Works yard. It is separated from the regular waste stream and given to a private contractor who sends the waste to a southern destination for disposal or uses it for heating fuel.

Bulky Scrap Metal Waste Disposal Area

1. Does the municipality have a scrap metal or bulky waste disposal area?
   _v_ Yes __ No
   If yes, briefly describe its location and operation plan.

Scrap metal and bulky waste is currently stored at the existing landfill. It is separated and compacted.

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)*
   _v__ Yes ___ No
   If yes, please indicate sources, types and quantity.

Commercial waste is classified as waste which does not come from a residential area. It includes waste which comes from businesses, office buildings and schools etc. This does not include hazardous waste.

2. Will the municipality use a hazardous waste disposal area?
   _v__ Yes ___ No
   If yes, describe its:

a. Location

Hazardous waste is stored inside the fenced Solid Waste site on the northeast side. Commercial and Industrial waste is held at the place of business generating it and disposal is the responsibility of the generator.

b. Structure

N/A

c. Operation and maintenance (describe special handling/disposal methods for these wastes)

A Household Hazardous waste collection program takes place four times per year and individuals may also bring it to the facility throughout the year. After each collection the waste is neutralized or recycled. Every two to four years waste that cannot be neutralized or recycled is shipped south for proper disposal.

General Condition of the Solid Waste Disposal Area

1. Comment on the general conditions of the:

a. Solid waste disposal area

_v_ Satisfactory __ Unsatisfactory

If unsatisfactory, explain.

Modifications

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

_v_ 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.

No

Abandonment and Restoration

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

Upper Base, North 40 Dump, Dump Site #1 - Sylvia Grinnell Park Dump, Dump Site #2 – Summer Camp Dump, Dump Site #3 – The Existing Landfill, Dump Site #4 – Municipal Dump, Dump Site #5 – Apex Dump.

Identification

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

__ Yes _v_ No

VI. INSPECTION AND MONITORING

1. When were municipal facilities inspected by:

____ Indian and Northern Affairs Inspector	Date: Unknown_____
____ Municipal and Community Affairs	Date: Unknown_____
____ Other:	Date: _Unknown_____

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

_v_ Yes ___ No

If yes, describe.

The Department of Public Works and Engineering personnel with the City of Iqaluit have access to vehicular mobile radios and in some cases, cellular phones; they are therefore able to communicate immediately with City dispatch who in turn can contact a response team.

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

___ Yes _v_ No

If yes, describe.

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

_v_ 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?

Please see attached Spill Reports

Monitoring Program

1. Is water sampling and analysis done?

_v_ Yes __No

If Yes, answer the questions a to e

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

Water sampling started in September 2003. Results will be made available as soon as possible.
In general sampling and analysis is conducted in accordance with the methods prescribed in the current edition of the "Standard Methods for Examination of Water and Wastewater."

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

No monitoring done.

c. Who is responsible for water sampling?

Name: Bob Brouillet

Position: Water Treatment Plant Operator

Telephone #: 867-979-5643

Fax #: 867-979-4166

Level of training: Water Treatment Plant Operator Level I

d. Recognized laboratory performing analysis of samples.

Name: Taiga Environmental Laboratory

Address: Box 1500, 4601 – 52nd Avenue, Yellowknife, NWT

Telephone #: 867-669-2788

Fax #: 867-669-2718

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

v Yes ___ No

If yes, describe.

The City plans to monitor water quality as per the Surveillance Network Program.

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.

None

VIII. PUBLIC HEALTH *(Help may be obtained from the Regional Environmental Health Officer if you have difficulty with this section.)*

1. Date: November 15, 2004

2. Municipality: Iqaluit

3. Contact: (Environmental Health Officer Contact) Phillip Reeve, C.P.H.I.(C)

   Telephone #: 867-979-4815

   Fax #: 867-979-4833

4. Have there been any problems or health/environmental concerns with drinking water?
   ___ Yes __v_ No

   If yes, describe

5. Have there been any problems or health/environmental concerns with sewage disposal/treatment?
   __v__ Yes ____ No

   If yes, describe

There have been concerns that the sewage lagoon dykes are unsafe and unstable. Some seepage has been identified.

6. Have there been any problems or health/environmental concerns with solid waste disposal?
   _v__ Yes ____ No

   If yes, describe

There have been concerns with drainage of surface water at the landfill. Environmental Health would like to know the long term plan for sustainable solid waste disposal.

Monitoring Program

1. Does the Regional Health Board perform water quality sampling?
___No __v_If Yes, answer questions (a) to (e)

a. Briefly describe the sampling methodology.

Standard vacuum filtration method. Coli-blue broth testing for Total Coliform and E.Coli.

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

Currently being performed annually by DIAND.

c. Who is responsible for sampling?

Name: Environmental Health Officer

Position: As Above

Telephone #: 867-975-4800

Fax #: 967-975-4833

Level of training: All board certified Public Health Inspectors

d. Recognized laboratory performing analysis of samples.

Name: Dept. of Health and Social Services

Address: Iqaluit Public Health, Bldg.155, Box 1000, stn.1046, Iqaluit X0A 0H0

Telephone #: 867-975-4800

Fax #: 867-975-4833

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

__ Yes _v_No

If yes, describe.

IX. TECHNICAL INFORMATION *(Assistance may be obtained from the Regional Community Government (CG&T) office if you have difficult with this section).*

1. Date: November 15, 2004

2. Municipality: Iqaluit

3. Contact: Todd Parsons
(Community Government and Transportation Representative)

Telephone #: 867-975-5314

Fax #: 867-975-5355

4. Population (according to most recent census results): 2003 Census: 5959

5. Estimated growth rate over next 5 years: Estimated population projection: 6289

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

Unknown

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

Prepared by	Title	Completion Date

If no, are such studies being planned?

___ No ___Yes (If yes, when and by whom):

Unknown

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

If yes, specify.

Unknown

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

Unknown

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 (dimensions, materials of construction, etc.);
c. details of the drainage basin and existing and proposed drainage modifications;
d. details of all decant, siphon mechanisms etc., including sewage 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
i. 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 (dimensions, materials of construction, etc.);
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); and
g. The direction of each flow.

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

If yes, who has provided them?

Solid Waste Disposal area – UMA Engineering Ltd.
Sewage treatment Facilities -

If no, indicate when they will be available.

Hydrology

1. Effects on surface water flow:
Are any stream channels altered? __ Yes _v_ No
Is the natural storage or water level of any lake or pond changed? _v_ Yes __ No
Are there changes in water flow downstream of the project? v_ Yes __ No

Is a storage reservoir created in a natural channel? v Yes __ No

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

There are no expected changes; all are from previous projects that have been approved and in operation for several years.

2. Drainage Area:
What is the drainage area? 3.85 km^2
What is the average elevation of the drainage basin? 110 metres ASL
Is the drainage basin outlined on an attached map? _v__Yes ___No

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

A rolling terrain surrounds the community. The subsoil is made up of glacial drifts over a predominantly granite Precambrian bedrock. The layer of overburden, silty sand, gravel and boulders vary from 0 to 18 m thick and has numerous surface depressions. As a result ponds are prevalent in the summer months. The depth of thaw in the permafrost ranges from 1 to 1.8 m. The water table is very high and segregated lenses may be found. The vegetation consists of lichens, mosses, hardy flowers and grasses.

3. Channel characteristics:
   Is the course of any channel changed? ____ Yes __v_No

   If yes, describe measures to maintain stream bed and bank stability.

4. Will the cross-section of any watercourse be changed? ___ Yes _v_ 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? __2000___ m^3/day.

2. Is water drawn from the source ___ intermittently _v__continuously

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

4. For what period is it drawn (days/weeks/months)? Continuously 365days/year

5. What is the rate of flow of source (if river) or size (if lake)? Approximately 20ha

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

No effect

Water Intake

1. Please provide short descriptions of the following:
   a. freshwater intake facility

Raw water leaves Lake Geraldine and enters the water treatment plant through a 360 m long, 250 mm diameter cast iron intake pipe, insulated with 50 mm of foam glass and protected with a gauge metal jacket. The injection of tempered water from the plant prevents the line from freezing.

b. operating capacity of the pumps

Raw water supply is gravity fed to the water treatment Plant.

c. intake screen size

Not applicable as there is no intake screen.

Water Storage

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

2. What are the dimensions of the dam or dyke?
   Length: 117.3 m Width: 1.63 m Height: 8.14 m
   U/S slope: 1.25H:1.0V D/S slope: 1.5H:1V – 3H:1V

3. Does the proposed dam create a reservoir in a natural watercourse?
   _v__ Yes ___No
   If yes, what is the storage capacity and surface area of the reservoir?
   586,000 m^3 20 ha.

4. Will the dam or dyke affect fish migration or movement?
   ___ Yes __v__ No

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. 1050 m^3/day

2. What is the capacity of the water storage facility? 2967 m^3

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.

UV treatment provides primary disinfection. Water is then filtered using sand filters. Caustic soda is then added to adjust Ph levels. At the end of the system chlorine is added to provide continuous disinfection. Water is then stored.

4. Are there any changes planned in the water treatment facilities?
___ No _v__ 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.

1. Increase the capacity of the water treatment plant by constructing 4 new filters, extending the existing building structure to house them and install new backwash pumps.

2. Utilize UV treatment as the primary means of disinfection.

3. Replace the existing lime handling system with a caustic soda system.

4. Provide a PLC – based control system and desktop computer, to automate certain plant functions and provide data logging capability.

Water treatment plant upgrade is currently underway and scheduled for completion in February 2004.

Sewage Disposal

1. Indicate the level of sewage treatment:
   __v__ primary ___ secondary ___ tertiary
   Pre-treatment (if applicable): ___ screening ___ maceration
   Lagoons (if applicable): ___ anaerobic ___ aerobic __v__facultative

2. Indicate the capacity of the sewage treatment facility 18,900 m^3

3. Based on current population projections, the facility does not currently meet the community's needs.

4. Average depth of the wastewater lagoon 2.0 m.

5. What is the design freeboard? 1.0 m.

6. Indicate the retention time of the sewage while in the treatment facility 7 days.

7. Indicate the estimated rate of discharge of wastewater 17 L/sec.

8. Indicate the location of the discharge point West Dyke at Koojesse Inlet.

9. Is the discharge: ___seasonal ___v__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 _v_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.

Municipality is currently in the pre-design stage of converting the non-commissioned sewage treatment plant to a conventional secondary treatment plant.

Solid Waste Disposal

1. Indicate the capacity of the disposal area 250,000 m^3.

2. The *average* depth of the solid waste disposal site 4.5-5.0 m.

3. The current facility will meet community needs until the year 2009-2010.

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?

A drainage ditch has been constructed to divert water around the facility.

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

   This is currently being studied.

Source	Volume

6. Please describe any diversions of watercourses:

   Ditches have been constructed around the landfill to divert water from entering the facility.

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

The Municipality of Iqaluit is devoted to being responsible environmentally to the community and complying with the regulatory requirements set out in the water licence. It strives to supply the highest level of service possible to the fast growing community. It not only responds to current needs but is committed to solid planning for the future. The Municipality is dedicated to continuously improving infrastructure associated with the water supply system, solid waste management and sewage treatment facilities.