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NUNAVUT WATER BOARD
NUNAVUT IMALIRIYIN KATIMAYINGI
OFFICE DES EAUX DU NUNAVUT

Water Licence Application
Supplementary Questionnaire
For Municipalities

I. GENERAL

1. Date: February 12, 2009

2. Applicant: Hamlet of Chesterfield Inlet, Kivalliq Region
Municipality and Region

3. Contacts: Rick Van Horne
Name of Contact

Senior Administrative Officer
Position

(867) 898 – 9926 (867) 898 – 9108
Telephone # Fax # Email

4. Community Status: __Village __ Town __ City __X__Hamlet
__ Settlement Corporation

5. Indicate the status of the municipality's license on the date of the application.
___ New Application
__X__ Renewal Water License # NWB3CHE0308

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? __X__ Yes __No

If no, please indicate when they will be available.

Indicate which organization has provided the various maps or diagrams.

Nunami Jacques Whitford Ltd.

III. WATER SUPPLY

Water Source

1. Type of source: _X_ Lake ___ River ___Well ___Other _____

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

First Lake	
Primary Source	Secondary Source

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

Water Intake

1. Please provide short descriptions for the following:

   a. Freshwater intake facility
      Freshwater is pumped from First Lake into a 30,000 m^3 reservoir via an overland pipeline. First Lake is located approximately 3 km southwest of the Hamlet while the reservoir is situated immediately west of the Hamlet; the reservoir is filled annually (summer). Water is pumped from the reservoir into trucks for community distribution; it is chlorinated at the truck fill station prior to distribution into trucks.

   b. Operating capacity of pump used
      225 L/min

   c. Intake screen size
      8 inches

Water Storage

1. Type of water storage facility. (Check where applicable)
   _X_ Reservoir/Pond ___ Storage tank ___ None ___Other _____

   Description: The Reservoir is filled annually in the summer; it measures approximately 26 m x 107 m, totaling approximately 2782 m^2. Depth is unknown however capacity in the previous water license suggests the volume is 30,000 m^3.

2. If "reservoir" checked:

Is the reservoir lined? ___ Yes __X__ No

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

Water Treatment

1. Indicate the quality of the water.

Summer:	**X** good	___ fair	___ poor
Fall:	**X** good	___ fair	___ poor
Winter:	**X** good	___ fair	___ poor
Spring:	**X** good	___ fair	___ poor

2. Describe.

3. Type of water treatment.

___ Filtration and chlorination
__X__ Chlorination only
___ None
___ Other _____
Description:

Water Use And Distribution

1. Volume of water use:

Distribution	Estimated number of people on the system **A**	Estimated average water consumption (Liters/capita/day) **B**	Total water consumption (Day/day) **A x B**
PIPED	-	-	-
TRUCKED	377[1]	100	37,700
		TOTAL	**37,700**

[1] Population estimate from *Schematic Design Report for Tundra Wetland Sewage Treatment System Design* – Nunami Jacques Whitford, January 2009

General Condition of the water supply facilities

1. General condition of the:

a. Water supply facility

X Satisfactory __ Unsatisfactory

If unsatisfactory, explain.

b. Storage facility

X Satisfactory __ Unsatisfactory

If unsatisfactory, explain.

c. Distribution system

X Satisfactory __Unsatisfactory

If unsatisfactory, explain.

Modifications

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

X 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?

No

Identification

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

X Yes ___ No

IV. SEWAGE DISPOSAL

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

___ Lagoon
___ Mechanical system
X Wetland **(Natural)**
___ Honey bag
___ Combination/Other: Describe:

Lagoon *(if applicable)* **N/A**

1. Has there been any operating problems with the lagoon? ___ Yes **X** No

   If yes, describe: However, please see attached *Schematic Design Report for Tundra Wetland Sewage Treatment System Design* by Nunami Jacques Whitford (January 2009)

Mechanical System *(if applicable)* **N/A**

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

2. Are sludge's produced ? __ Yes _ _ No

   If yes, describe how the sludge's are disposed of:

Wetland *(if applicable)*

1. Describe the Wetland wastewater treatment system.
   Please see attached *Schematic Design Report for Tundra Wetland Sewage Treatment System Design* by Nunami Jacques Whitford (January 2009)

Honey Bag Pit

1. Does the municipality use a honey bag pit?
   ___ Yes **X** 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)*

   X Yes ___ No

   If yes, indicate sources, types and quantities.
   Please see attached *Schematic Design Report for Tundra Wetland Sewage Treatment System Design* by Nunami Jacques Whitford (January 2009)

Sewage Discharge

1. Are fish, shellfish and other wildlife harvested in or near the discharge area?
___ Yes **X** 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 **X** Satisfactory __ Unsatisfactory

   If unsatisfactory, explain.

b. Discharge control system __ Satisfactory **X** Unsatisfactory

   If unsatisfactory, explain.
   Please see attached *Schematic Design Report for Tundra Wetland Sewage Treatment System Design*

c. Dams, diversion dykes, berms ___ Satisfactory __ Unsatisfactory **X** None

   If unsatisfactory, explain.
   However, please see attached *Schematic Design Report for Tundra Wetland Sewage Treatment System Design*

Modifications

1. Are there any changes *planned* in the sewage treatment facilities? __ No **X** Yes
   Please refer to the attached *Schematic Design Report for Tundra Wetland Sewage Treatment System Design* for the proposed changes to the sewage treatment facility.

2. Does the municipality or residents believe changes are needed to the sewage treatment facilities?
   Concerns has been expressed on the long-term integrity of the sewage treatment facility and that materials and/or leachate from former and existing solid waste sites nearby may be entering the downstream portion of the Tundra Wetland and negatively affecting the quality of the Tundra Wetland's effluent. Please see Report of the Environmental Study and Evaluation of the Water and Sewage Treatment for a more detailed description.

Abandonment and Restoration

1. List and describe abandoned or restored sewage treatment facilities.
   There is one abandoned sewage treatment facility in Chesterfield Inlet

Identification

1. Are there signs identifying past and present sewage disposal sites? **X** Yes _ No

V. SOLID WASTE DISPOSAL

1. Briefly describe how solid wastes are collected and delivered to the disposal area.
   Solid waste is collected on a scheduled daily basis and transported by truck to the current solid waste disposal facility.

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

3. Is the fence adequate? **X** Yes ___ No

   If no, describe:

Waste Reduction

1. Does the municipality burn garbage?
   X Yes ___No

   If yes, describe how and when this is done:
   The Hamlet burns combustible waste within the solid waste facility regularly (Monday to Friday). Combustible waste is segregated and placed within the burn area. The landfill is compacted and covered annually.

2. Has the municipality considered measures for waste reduction such as recycling or reuse?
   ___ Yes **X** No
   If yes, describe:

Animal Carcasses Pit

1. Does the municipality have an area for the disposal of animal carcasses?
   __ Yes **X** 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 segregated from municipal waste and is stored at the waste oil depot, approximately 1.7 km west of the community. The depot area is not lined and it is not fenced.

Bulky Scrap Metal Waste Disposal Area

1. Does the municipality have a scrap metal or bulky waste disposal area?
   X Yes __ No

   If yes, briefly describe its location and operation plan.
   The scrap metal and bulky waste disposal area is located outside the municipal solid waste facility; it is not fenced. It is located approximately 200 m south of the current solid waste facility.

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)
   X Yes __ No

   If yes, please indicate sources, types and quantity.
   Contractors from the community do deposit waste into the solid waste facility, primarily building materials. The quantity of materials is unknown.

2. Will the municipality use a hazardous waste disposal area?
   X Yes ___ No

   If yes, describe its:
   a. Location: The hazardous waste disposal area is located within the current solid waste facility. It is presently an area that is separate from the general refuse disposal area; it is used to store old sewage tanks.

   b. Structure: Not lined

   c. Operation and maintenance: None

General Condition of the Solid Waste Disposal Area

1. Comment on the general conditions of the:

a. Solid waste disposal area **X** Satisfactory ___ Unsatisfactory

Please see attached *Schematic Design Report for Tundra Wetland Sewage Treatment System Design*

Modifications

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

__ No **X** Yes

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

Please see attached *Schematic Design Report for Tundra Wetland Sewage Treatment System Design*

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

Yes. Leachate flow should be directed into the upstream portion of the Tundra Wetland for treatment. Currently leachate flows into the downstream portion and may be negatively affecting the quality of the Tundra Wetland's effluent.

Please see attached *Schematic Design Report for Tundra Wetland Sewage Treatment System Design*.

Abandonment and Restoration

1. List and describe abandoned or restored solid waste facilities.

Location of decommissioned landfill can be viewed on the site map in the *Schematic Design Report for Tundra Wetland Sewage Treatment System Design;* a more detailed description of the decommissioned landfill can also be found here.

Identification

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

__Yes **X** No

VI. INSPECTION AND MONITORING

1. When were municipal facilities inspected by?

   _X_ Indian and Northern Affairs Inspector Date: August 1, 2008
   ___ Municipal and Community Affairs Date: _____
   ___ Other: _____ Date: _____

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

   _X_ Yes __ No

   If yes, describe.

   The Hamlet follows the Government of Nunavut Department of Environment procedures for reporting spills

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

   ___ Yes _X_ No

   If yes, describe.

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

   _X_ 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?

ENR Spill Reports:

2005284: 15 L heating oil (P-50) spill (May 2005) was reported at a housing unit in the community; unknown if cleaned up
2005325: Less than 135 gallons jet fuel spill (June 2005) was reported at the Airport; spill was cleaned up and file was closed.
2005530: Greater than 100 L heating oil spill (Nov. 7, 2005) was reported at the Community Complex; spill was cleaned up and file was closed.
2006304: 800 L of heating oil spill (Aug. 2, 2006) was reported at Building #175; spill was cleaned up
2007262: Spill (Jun. 9, 2007) was reported at the Hamlet Trade Shop, but product not reported; spill was cleaned up and file was closed
2008248: Heating oil was spilled (1 m^2; May 27, 2008) at housing unit #31 fuel tank; spill was cleaned up and file was closed.
2008291: Less than 100 L of heating oil (May 28, 2008) was reported behind the Northern Store; spill was cleaned up and file was closed
2008511: 10 – 15 gallon spill of P-50 heating oil (Oct. 22, 2008) was reported at the Tank Farm; spill was cleaned up and file was closed

Monitoring Program

1. Is water sampling and analysis done?

X Yes ___No

If Yes, answer the questions a to e:

a. Briefly describe how samples are taken and sent to the laboratory.
Samples are taken once per month and are sent the laboratory in Rankin Inlet. Samples are taken at the pump house.

b. Briefly describe any monitoring done for wastewater effluent and leachate.
None

c. Who is responsible for water sampling?

Name: Unknown

Position: Water Truck Driver

Telephone **#:** Unknown

Fax #: Unknown

Level of training: Unknown; however he has been trained to take samples

d. Recognized laboratory performing analysis of samples.
Please see SectionVIII Public Health

Name: _____

Address: _____

Telephone #: _____

Fax #: _____

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

X Yes ___ No

If yes, describe.
Please refer to the attached *Schematic Design Report for Tundra Wetland Sewage Treatment System Design*.

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.

   Unknown. However, no concerns have been raised to date by the municipality or residents regarding the municipal water supply or waste disposal facilities.

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

1. Date: January 19, 2009

2. Municipality: Chesterfield Inlet

3. Contact: (Environmental Health Officer Contact) Wanda Joy

   Telephone # (867) 975 – 4817

   Fax #: _____

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

   ___ Yes **X** No

   If yes, describe:

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

   ___ Yes **X** No

   If yes, describe

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

   ___ Yes **X** No

   If yes, describe:

Monitoring Program

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

   X Yes ___ No

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

a. Briefly describe the sampling methodology.
   Samples are taken on a monthly basis and submitted to the Regional Environmental Health Officer in Rankin Inlet for bacteriological testing

b. Briefly describe any monitoring of wastewater effluent and leachate.
   This is completed by Indian and Northern Affairs Canada (INAC)

c. Who is responsible for sampling?
   Unknown – individual at the Hamlet
   Name: _____

   Position: _____

   Telephone #: _____

   Fax #: _____

   Level of training: _____

d. Recognized laboratory performing analysis of samples.

   Name: Laboratory at the Kivalliq Regional Hospital

   Address: Rankin Inlet, NU

   Telephone #: (867) 645 – 8331

   Fax #: _____

e. Are any changes planned in the water quality-monitoring program?
   __ Yes **X** 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: _____

2. Municipality: Hamlet of Chesterfield Inlet

3. Contact: _____

   Telephone #: _____

   Fax #: _____

4. Population: 377

5. Estimated growth rate over next 5 years**:** 1% annual increase

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?

   X Yes ___No

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

   Please refer to the attached *Schematic Design Report for Tundra Wetland Sewage Treatment System Design*.

   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 Unknown

   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 **X** Yes

   If yes, provide details below.

   Please refer to the attached *Schematic Design Report for Tundra Wetland Sewage Treatment System Design*.

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, 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?

X Yes ___No

If Yes, who has provided them?

Nunami Jacques Whitford Ltd. Please refer to the attached *Schematic Design Report for Tundra Wetland Sewage Treatment System Design*.

If no, indicate when they will be available.

Hydrology

1. Effects on surface water flow:

Are any stream channels altered? __ Yes **X** No

Is the natural storage or water level of any lake or pond changed? __ Yes **X** No

Are there changes in water flow downstream of the project? __ Yes **X** No

Is a storage reservoir created in a natural channel? __Yes **X** No

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

2. Drainage Area: N/A
   What is the drainage area? _____km^2
   What is the average elevation of the drainage basin?_____metres
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.)

3. Channel characteristics: N/A
   Is the course of any channel changed? ____ Yes __No

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

4. Will the cross-section of any watercourse be changed? __ Yes __ No
   N/A
   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? 324 (approx) m^3/day

2. Is water drawn from the source **X** intermittently ____continuously

3. If it is drawn intermittently, during what month(s) is it drawn? Summer months (July/August)

4. For what period is it drawn (days/weeks/months)? 7 days only

5. What is the rate of flow of source (if river) or size (if lake)? Lake size is approximately 1.9 km x 0.7 km, totaling approx.1.3 km^2 for surface area; depth of First Lake is unknown

1. At the intended rate of water usage, describe the effects on the river or lake from which water will be drawn. As the filling of the reservoir occurs one time, over 7 days of the year, this represents a small volume of First Lake water and no adverse effects to the lake or its biota are expected.

Water Intake

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

      Freshwater is pumped from First Lake into a 30,000 m^3 reservoir via an overland pipeline. First Lake is located approximately 3 km southwest of the Hamlet while the reservoir is situated immediately west of the Hamlet; the reservoir is filled annually (summer). Water is pumped from the reservoir into trucks for community distribution; it is chlorinated at the truck fill station prior to distribution into trucks.

   b. Operating capacity of the pumps 225 L/min

   c. Intake screen size: 8 inches

Water Storage

1. Is a dam or dyke being used to store or alter the flow of water? ___Yes **X** No

2. What are the dimensions of the dam or dyke? N/A
   Length:_____ Width: _____ Height:_____
   U/S slope: _____ D/S slope: _____

3. Does the proposed dam create a reservoir in a natural watercourse? N/A
   ___ Yes ___No

   If yes, what is the storage capacity and surface area of the reservoir?
   ____ m^3 _____ ha.

4. Will the dam or dyke affect fish migration or movement ? N/A
   ___ Yes ___ 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. 1210 L/min

2. What is the capacity of the water storage facility Unknown litres

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.

Chlorine, used as a disinfectant, is fed automatically to the water distributed from the truckfill station. Chlorine levels in the water are tested more than once per day. The test results are documented in a logbook.

Most recent bacteriological and chemical analyses were unavailable.

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

Please refer to the attached *Schematic Design Report for Tundra Wetland Sewage Treatment System Design*

1. Indicate the level of sewage treatment:

X primary ___ secondary ___ tertiary
Pre-treatment (if applicable): ___ screening ___ maceration
Lagoons (if applicable): ___ anaerobic ___ aerobic ___facultative

2. Indicate the capacity of the sewage treatment facility 13,776 m^3

3. Based on current population projections, the facility will meet the needs of the community until the year 2010.

However with the planned improvements to the tundra wetland sewage treatment system, the wetland system will meet the needs of the community until 2029

4. Average depth of the wastewater lagoon N/A m

5. What is the design freeboard? N/A m

6. Indicate the retention time of the sewage while in the treatment facility N/A days.

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

8. Indicate the location of the discharge point

Please refer to the attached *Schematic Design Report for Tundra Wetland Sewage Treatment System Design*

9. Is the discharge: ___ seasonal **X** 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 **X** Yes

If yes, attach a copy of the plan or indicate changes and include an implementation schedule.
Please refer to the attached *Schematic Design Report for Tundra Wetland Sewage Treatment System Design*

Include excerpt from MACA Capital Plan if available: N/A

Solid Waste Disposal

1. Indicate the capacity of the disposal area Unknown m^3

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

3. The current facility will meet community needs until the year 2034.

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?
No

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

Source	Volume

6. Please describe any diversions of watercourses: _____

7. Are there any changes planned in the solid waste disposal facilities? __No **X** Yes

If yes, attach a copy of the plan or indicate changes and include an implementation schedule
Please refer to the attached *Schematic Design Report for Tundra Wetland Sewage Treatment System Design*

Other

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

   Please see attached *Schematic Design Report for Tundra Wetland Sewage Treatment System Design*.