2008 Hamlet of Tuktoyaktuk Annual Water Licence Report

Prepared by AECOM for the Hamlet of Tuktoyaktuk

October 28, 2009

1.0 Introduction

In 2008, the community infrastructure systems providing water, sewage and solid waste management to the residents of the Hamlet of Tuktoyaktuk were operated and maintained by the community. Figure 1 shows the general layout of the water and sewer systems.

2.0 Water Use

Tuktoyaktuk obtains its drinking water from Kudlak Lake. Water for winter use is pumped from Kudlak Lake to a raw water storage reservoir; in July 2008, the Hamlet pumped 56,315 cubic metres of water into this reservoir.

In 2008 the community used a total of 41,930 cubic metres (m^3) of potable water.

Monthly water use is shown in the table below. The estimated potable water use is 120 liters per capita per day based upon the 2007 estimated population of 956 (NWT Bureau of Statistics).

Table 1: Water Consumption

Month	Quantity Used (m^3)
January	3,464
February	3,248
March	3,330
April	3,418
May	3,230
June	3,453
July	3,459
August	4,035
September	3,969
October	3,510
November	3,336
December	3,478
Total	**41,930**

3.0 Surveillance Network Program Monitoring

Water sample data is collected periodically to check the performance of the water and waste systems. As of June 28, 2005 when the community received its latest water licence, the SNP station numbers are:

- 0714-1 Supply line to reservoir

- 0714-2 Effluent discharge structure at the Sewage Disposal Facilities
- 0714-3 Water contained within the Solid Waste Lagoon

The Hamlet collected only one sample during the 2008 lagoon decant, instead of three samples as usual, because of poor weather. The pH, suspended solids, and biochemical oxygen demand of this sample were within allowable limits. SNP sampling results for 2008 (from Taiga Labs electronic records) are presented in Table 2.

In 2008, to the best of the community's knowledge, the community infrastructure systems providing water, sewage and solid waste management were operating within the water quality criteria of the water licence.

4.0 System Abandonment and Restoration Work

No abandonment or restoration work was completed during 2008.

5.0 System Studies and Inspections

A Municipal Water Licence Inspection was carried out by Jan Davies of INAC on November 24, 2008. Mr. Davies noted some concerns surrounding the sewage lagoon truck discharge area, solid waste site signage, and the pipeline connection on the fuel tank. He also identified several water licence non-compliance items involving the O&M Plans, solid waste lagoon floating intake, submission of annual reports, and sampling requirements of SNP.

6.0 System Discharges

The community infrastructure system providing water, sewage and solid waste management to Tuktoyaktuk residents has two licensed discharges. The sewage lagoon discharge is seasonal from the sewage lagoon into a saltwater inlet leading to Kugmallit Bay. The solid waste lagoon discharges into the mouth of a small, adjacent bay.

44,000 m^3 of treated wastewater was decanted from the sewage lagoon in 2008.

7.0 System Excavations

In 2008, there were no trench or sump excavations associated with the community's water, sewer and solid waste management systems.

8.0 Lagoon Sludge

In 2008, there was no removal of sludge from the sewage lagoon.

9.0 Operation and Maintenance Plans

There were no changes to the Operation and Maintenance documentation during 2008.

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Table 2: SNP Sampling Results – Water Licence N7L3-0714

Location	Assumed SNP #	Sample Date	Fecal Coliforms CFU/100 mL	BOD_5 mg/L		Suspended Solids mg/L		pH (6-9)	Hexane Extractable Material mg/L	NO_2/NO_3 mg/L	NH_3 mg/L
			grab	grab	MAC	grab	MAC	grab	grab	grab	grab
Sewage – Facility	0714-2	Aug 19 2008	2900	28	120	50	180	7.56	2.8		13.3

Appendix A

Taiga Labs Sample Testing Results

2008 Taiga Labs electronic records for Tuktoyaktuk

270604.xls

Client Name	Taiga Sample ID	Client Sample ID	Sample Type	Sampling Location	Sample Collect Date	mple Received D	Lab Section	Parameter Name	Result Flag	Reported Result	Units	Calc MDL	mple Result Quali	lysis Result Qual	Analysis Date	Prep Method	Test Method
Hamlet of Tuktoyaktuk	280508-001	N7L3-0714-2	Sewage	Facility	8/19/2008	19-Aug-08	Nutrients	Nitrogen		13.3	mg/L	0.005			8/26/2008	Split/Preserved	SM4500-NH3:G
Hamlet of Tuktoyaktuk	280508-001	N7L3-0714-2	Sewage	Facility	8/19/2008	19-Aug-08	Nutrients	Oxygen		28	mg/L	2			8/20/2008	None	SM5210:B
Hamlet of Tuktoyaktuk	280508-001	N7L3-0714-2	Sewage	Facility	8/19/2008	19-Aug-08	Physicals	pH		7.56	pH units				8/22/2008	None	SM4500-H:B
Hamlet of Tuktoyaktuk	280508-001	N7L3-0714-2	Sewage	Facility	8/19/2008	19-Aug-08	Physicals	Suspended		50	mg/L	3			8/25/2008	None	SM2540:D
Hamlet of Tuktoyaktuk	280508-001	N7L3-0714-2	Sewage	Facility	8/19/2008	19-Aug-08	Microbiology	Coliforms, Fecal		2900	CFU/100mL	100			8/20/2008	None	SM9222:D
Hamlet of Tuktoyaktuk	280508-001	N7L3-0714-2	Sewage	Facility	8/19/2008	19-Aug-08	Organics	Extractable		2.8	mg/L	2.0			8/20/2008	None	EPA1664A

Appendix B

INAC Inspection Report

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WATER LICENCE INSPECTION FORM

DATE:	Novermber 24, 2008	**COMPANY REP:**	Debbie Raddi
LICENCEE:	Incorporated Hamlet of Tuktoyaktuk	**LICENCE #:**	N7L3-0714

WATER SUPPLY

Source:	Kudlak Lake	Quantity Used:	~40, 207 m^3

Owner/Operator: Hamlet of Tuktoyaktuk

Indicate: A - Acceptable U - Unacceptable N/A - Not Applicable N/I - Not Inspected

Intake Facilities	N/I	Storage Structures	A	Treatment Systems	A	Chem. Storage	A
Flow Meas. Device	A	Conveyance Lines	A	Pumping Stations	A		

Comments:
Concerns:
1. Fuel tank and piping - see Fuel Storage Section.

Note:
- Intake Facility located at Kudluk Lake were not inspected.
- New Water Treatment Plant is planned for the Fall of 2009. Discussed the new facility and a better fuel storage system.
- Due to the spill that occurred in 2004 at the Kudluk Lake (Spill #04-572) water intake facility there are a number of measures being used. A propane motor is being used to run the pump and there is a diesel backup. The Raw Water Resevoir is filled over a 3 week period during which time there is a 24hr watch of the pump station a Kudluk Lake and it is checked 3 times a day.

WASTE DISPOSAL

Sewage	Sewage Treatment System (primary, secondary, or tertiary)		primary lagoon				
	Natural Water Body	✓	Continuous Discharge (land or water)				
	Seasonal Disch.	✓	Wetlands Treatment		Trench		
Solid Waste	Owner/Operator:	Hamlet of Tuktoyaktuk					
	Landfill	✓	Burn & Landfill	Conditionally acceptable	Other		

Indicate: A - Acceptable U - Unacceptable N/A - Not Applicable N/I - Not Inspected

Discharge Quality	A	Construction	N/A	Disch. Meas. Dev.	A	Freeboard	N/I
Decant Structures	U[6]	O&M Plan	U[5]	Dams, Dykes	N/I	Seepages	N/I
Dyke Inspections	N/A	A&R Plan	N/A	Erosion	N/I	Spills	U[2]
Periods of Discharge	Late Fall		Effluent Discharge Rate	Equal to pump rate			

Comments:
Concerns
1. Sewage discharge chute knocked off position by vacuum truck and will need to be put back in place. Curbs or tire stop blocks should be installed to prevent truck from hitting chutes or backing up too far.
2. There was spillage of sewage from the vacuum truck on the discharge chute turnaround pad at the sewage lagoon. Ensure the operators know to close valve before pulling away. A loader or grader needs to be used to scrape this up and properly dispose of it in the sewage lagoon. Further spillage needs to be reported to ensure timely cleanup.
3. Signage was present at the Solid Waste Disposal Facilities(SWDF) however, additional signage is needed to further increase public guidance and waste segregation. Signs should be posted for but not limited to the following areas: domestic garbage, waste tires, waste appliances(washers/dryers, etc.), wood waste, bulky metal wastes, empty drums, honey bag pit, waste animal pit and hazardous waste(waste oil, batteries etc.).
4. Very little cover material to cover solid waste. This is required to ensure proper maintenance of the SWDF. This would also assist with controlling windblown debris. (see Figure 2)
5. It is apparent that the SWDF and Sewage Disposal Facility Operation and Maintenance Plans(O&M Plan) need to be updated and components of the O&M Plan are not being followed. Ensure that Hamlet Personnel are familiar with the O&M Plan and that it is being properly implemented. It is recommended that a copy of the approved O&M Plan be readily available to Hamlet staff.
6. As per the 2007 Water Licence Inspection Report concerning the floating intake (see Part D, section 16) that sinks to the bottom because the line is so heavy once full of water and consquently plywood is used under the intake instead, it will be necessary to apply to the Northwest Territories Water Board for a modification (see Part E) to the Licence.

Note:
- Due to snow there was limited access to the Solid Waste and Sewage Disposal Facilities during the inspection.
- Only the Sewage Disposal Facility decanted this year, Solid Waste Lagoon was not decanted.
- Waste oil collected at Hamlet Maintenance Garage to be later burned with waste oil burner at E-Grubens Transport.
- Batteries collected at Hamlet Four Bay Garage and put on pallet to send out with contractor.
- Continue to control access to northside of SWDF – only for vehicles/ATVs emptied of all fluids, appliances, waste metal etc.
- As per the 2007 Municipal Water Licence Inspection – Ensure that groundwater monitoring wells all around the SWDF are properly maintained such as being covered and locked to prevent contamination of groundwater and future samples.

FUEL STORAGE

Owner:	Hamlet of Tuktoyaktuk	Operator:	Hamlet of Tuktoyaktuk	Condition of tanks:	Fair, has rusty connection points[1]
Berms & Liners	N/A	Water within Berm:	N/A	Evidence of Leaks:	None detected during inspection

Drainage Pipes	N/A	Pump Station and Catchment Berm	N/A
Pipeline Condition	Poor, corroded, hose flex connector mis-aligned[1]	Not Applicable:	N/A

Comments:
Concerns:
1. Fuel tank and hose flex connector is out of alignment. The pipeline connection to the tank needs to be repaired. Further movement of the tank and pipeline connection can cause a spill. Fuel tank has rust/corrosion at the connection points and should be replaced. Recommend moving the pipeline so it draws from the top of the tank so as to prevent future spills. (see Figure 1)

Notes
- Since fuel is stored at the intake facilities it is recommended to have spill kits on site to respond to any spills that might occur.

SURVEILLANCE NETWORK PROGRAM

Samples Collected Hamlet		Hamlet collected sample prior to decant of sewage lagoon.[1]	
DIAND		No samples taken	
Signs Posted: SNP	Not inspected	Warning	Sewage Lagoon sign present. Need to identify the Solid Waste Disposal Facility and provide signage to ensure proper waste segragation and instructions for batteries and waste oil disposal.

Record & Reporting	2003-2008 Annual Reports not submitted. Annual Reports are due as per Water Licence Criteria.[2]
Geotechnical Inspection	N/A

Comments:
Concerns:
1. Hamlet is required to conduct further sampling as per the Surveillance Network Program to monitor water quality annually at the Solid Waste Lagoon and during the decant of the Sewage Disposal Facility.
2. Ensure Annual Reports are submitted as per Water Licence Criteria Part B1.

Non-Compliance of Act or Licence:	1. Part B, section 1. 2003-2008 Annual Reports not submitted. 2. Part B, section 2. The Licensee shall comply with the "Surveillance Network Program" 3. Part D, section 16. Water shall be removed from the Solid Waste Lagoon using a floating intake. 4. Part E, section 2. Written approval from the board is needed for a modification to the Decanting Process. 5. Part H, section 2. Operation and Maintenance Plan needs to be properly implemented.

Inspector's Signature: _____

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(Continued)

Date:	November 24, 2008	Licence #:	N7L3-0714

Inspection Images:

Figure 1

Fuel Tank has rusted connection points, the flex connector is mis-aligned and piping could leak. The piping system needs to be repaired.

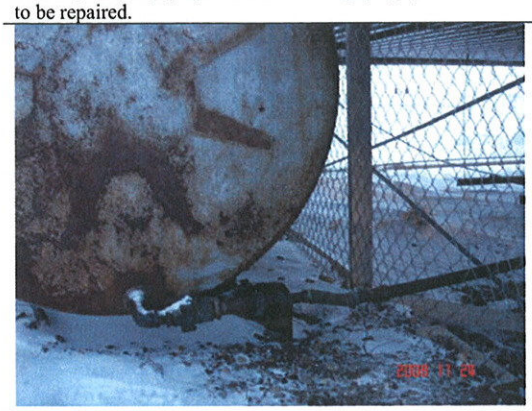

Figure 2

Additional cover material is needed to cover solid waste and this will assist with controlling windblown debris.