TSIIGEHTCHIC
CHARTER COMMUNITY
P.O. Box 4, Tsiigehtchic, NT, X0E 0B0 - Phone: 867-953-3201 Fax: 867953-3302

September 14, 2016

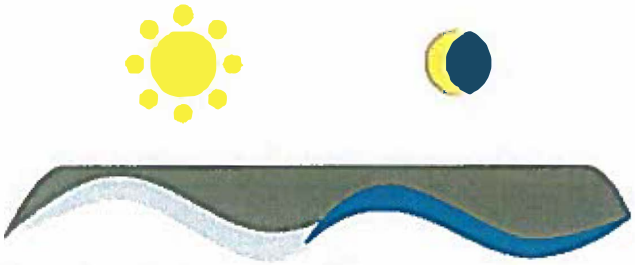
Mr. Leonard DeBastien
Gwich'in Land and Water Board
Box 2018
Inuvik, NT, X0E 0T0

Dear Mr. DeBastien,

Please find the Renewal Application for the Water Licence for Charter Community of Tsiigehtchic. Enclosed also is our cheque of $50.00 in payment of the renewal fee.

Sincerely

Marjorie Dobson
Senior Administrative Officer



TSIIGEHTCHIC
CHARTER COMMUNITY

Application for Renewal of Water Licence

Licence # G99L3-renewal

September 14, 2016

GWICH'IN LAND AND WATER BOARD
Box 2018 Inuvik, NT X0E 0T0
Ph 867-777-4954
Fx 867-777-2304
www.glwb.com

APPLICATION FOR A NEW WATER LICENCE, AMENDMENT OF LICENCE, OR RENEWAL OF LICENCE

	Application/Licence No: (amendment or renewal only) G99L3-004 - renewal

1. Name and Mailing Address of Applicant	2. Address of Head Office in Canada if Incorporate
Charter Community of Tsiigehtchic General Delivery Tsiigehtchic, NT X0E 0B0 Telephone: 867-953-3201 Fax: 867-953-3302 email sao@tsiigehtchic.ca	same

3. Location of Undertaking (Describe and attach a map, indicating watercourses and location of any proposed waste deposits).

Latitude 67°26'30" N Longitude 133°44'20" W

4. Description of Undertaking (Describe and attach plans)

Municipal water use and disposal of waste

5. Type of Undertaking.

1. Industrial
2. Mining and Milling
3. Municipal x
4. Power
5. Agriculture
6. Conservation
7. Recreation
8. Miscellaneous

6. **Water Use**

To obtain water x	Flood control
To cross a watercourse	To divert water
To modify the bed or bank of a watercourse	To alter the flow of, or store water
Other (describe): deposit of waste	

7. **Quantity of water involved (litres per second, litres per day or cubic meter per year), including both quantity to be used and quality to be returned to source.**

approx. 6,000 cubic meters of water per year from Tso Lake for municipal water supply (allowable use on the current licence is 20,000 cubic meters per year; the Charter Community would like to maintain this quantity to ensure municipal supply into the future)

discharge approx. 6,000 cubic meters of treated wastewater per year to the Mackenzie River

- see Appendix 2 for more details

8. **Waste deposited (quantity, quality, treatment and disposal)**

deposit household waste and bulky waste in the landfill

deposit honey bags into designated pit at the landfill

deposit domestic sewage into the sewage lagoon

- see Appendix 3 and 4 for more detail

9. **Other persons or properties affected by this Undertaking (give name, mailing address and location). Attach a list if necessary.**

n/a

10. **Predicted environmental impacts of Undertaking and proposed mitigation.**

- See Section 1.3 for details

11. **Contractors and sub-contractors (names, addresses and functions).** n/a

12. **Studies undertaken to date. Attach a list if necessary.**
2003 - Earth Tech Water Upgrades; 2005 - Earth Tech Lagoon and Landfill O/M plans; 2011 AECOM Landfill Expansion Report; 2012/13 Mackenzie DataStream Water Quality

13. **Proposed time schedule.**

Start date: **November 1, 2016** Completion date: October 31, 2026

Name (print): Marjorie Dobson Signature: _____

Title (print): SAO Date: September 14/2016

Please make all cheques payable to "Government of the Northwest Territories"

FOR OFFICE USE ONLY

Application Fee Amount: **$ 30.00** **Receipt No:** _____

Water Use Deposit Amount: **$**_____ **Receipt No:** _____

Application by

Tsiigehtchic Charter Community
to the
Gwich'in Land and Water Board

for the Renewal of Water Licence G99L3-004
to use water for municipal purposes and
to dispose of municipal wastes

Submitted by: Bill DeYoung, Fort Good Hope NT
To: AlecSandra Macdonald, Regulatory Specialist, GLWB, Inuvik NT
Date: 2016 SEP 12; revised 2016 SEP 21

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1.0 Water Licence Type B, G99L3-004

Municipal Water Use and Disposal of Waste, Charter Community of Tsiigehtchic (67° 26' 30" N; 133° 44' 20" W)

The Water Licence G99L3-004 is to permit Tsiigehtchic Charter Community to use water for municipal purposes and to dispose of municipal wastes. The operations and management of these are described in more detail in subsequent sections of this report. In brief, the use of water and disposal of municipal wastes is described here.

to use water for municipal purposes

Tsiigehtchic draws water from the freshwater inland lake, Ts'oh Vàn, of the Tsiigehnjik (Arctic Red River) subwatershed. The adjacent Water Treatment Plant (WTP) is the source of a trucked water supply to the community. Wastewater is hauled by vacuum trucks and pumped out at the E-Lake Lagoon (WWTS). Wastewater cascades through a natural open-system three-tier network of tundra wetlands and ponds that provides a facultative sewage treatment system (seasonally and stratigraphically anaerobic and aerobic). Wastewater, thus treated, discharges to Nagwichoonjik (Mackenzie River) over a distance of 1.03 km and a change in elevation of 56 m. There are four water sample stations established to obtain samples of biological and chemical water quality parameters. These are the basis of the Surveillance Network Program (SNP) and identified as SNP 1557-(3,4,5,6).

to dispose of municipal wastes

To the west of the E-Lake Lagoon is the Solid Waste Facility (SWF) that has three components: (a) temporary storage of hazardous waste, (b) a white goods and vehicle storage yard and (c) a sanitary landfill.

1.1 Conditions of the Water Licence G99L3-004

Conditions attached to the Water Licence issued by the Gwich'in Land and Water Board (GLWB) for the period 2015 AUG 1 to 2016 JUL 31 (extended to 2016 OCT 31 require (1) the submission of a complete application, (2) compliance with terms and conditions for annual reports by March 31 (B1) monitoring (SNP B2, B3), (3) operation and maintenance (G1).

The Charter Community of Tsiigehtchic has due regard and due diligence for its compliance with the regulatory standards associated with the Water Licence. Adherence to the Operations and Maintenance Plans ensure effective operation of the facilities. Monitoring and reporting provide quality assurance that the Community is meeting the regulatory standards to protect and maintain water quality in the Arctic Red River and Mackenzie River watersheds. This report provides the Board with documentation to demonstrate that the Community has due regard and due diligence in compliance with regulatory standards associated with the Water Licence.

1.2 Organization of this submission

There are five separate files that address the purpose and conditions of the water licence (1) the municipal water supply (WTP), (2) the wastewater treatment system (WWTS), (3) the solid waste management (SWF), (4) the monitoring of the quality of water returned to the receiving environment (SNP) and (5) a spill contingency plan (SCP). Each of the four main elements of the Water Licence (WTP, WWTS, SWF, SNP) have been reviewed for the current state, the operations, maintenance activities, management plans and performance. Recommendations are then presented with some fact sheets to provide information for community engagement and to inform staff followed by the operations and management plans (OMP) using the templates provided by the Mackenzie Valley Land and Water Board(MVLWB).

The next section provides a one page synopsis of the environmental resource effects and then a site description and map are presented.

1.3 Environmental Resource Effects

Assessment of Environmental Resource Effects

Overall, the effects of water taking, wastewater treatment and solid waste management at Tsiigehtchic are as predicted for these undertakings that have acceptable localized effects (Table 1.); nevertheless, there is an on-going need for monitoring and the assessment of biological and chemical effects on water quality. Brief recommendations are mentioned here and elaborated later in the report.

Table 1. Environmental Resource Effects

Parameter	Observation	Effect	Recommendation
Water			
change in flow	drawing from Arctic Red River watershed and discharging to Mackenzie River	no net effect	
change in quantity	Tso Van and Arctic Red River watershed	acceptable localized effects	
	Mackenzie River watershed	no net effect	
change in quality	wastewater treatment system is a functional open system receiving a dilution and flush effect from Pond A	effects reported through SNP	consistent monitoring and assessment
Land			
geological structure		none observed	
soil contamination	localized within a site such as the limits and surrounds of the Water Treatment Plant (WTP), ponds and wetlands of the Wastewater Treatment System (WWTS) and the Solid Waste Facility (SWF)	acceptable localized effects	containment of waste in designated footprint of SWF; manage wind-blown debris
settling / erosion	localized within the sites (WTP, WWTS, SWF)	acceptable localized effects	
permafrost	localized changes to WWTS due to "warm" water input to E-Lake Lagoon	acceptable localized effects	
Vegetation			
species composition, abundance	minor occurrence of weeds at WTP, SWF	acceptable localized effects of non-native species	
	minor changes at E-Lake Lagoon and Wetland A	acceptable localized effects	
	natural ponds converted to facultative lagoon system	effects as predicted for WWTS	assessment of biological and chemical water quality; heavy metals in pond sediment; and, pond depth measurements to monitor continued performance
Fauna			
species composition, abundance	at WTP	no net effects	management of beaver on-going
	at WWTS	no net effects on regional wildlife	
	natural ponds converted to facultative lagoon system	effects as predicted for WWTS	benthic macroinvertebrate monitoring
	at SWF	increase in scavengers	OMP BMP cover material

1.4 Site Map

The name Tsiigehtchic in the Gwichya Gwich'in dialect means "at the mouth of the iron river", an apt description of this community at the mouth of Tsiigehnjik, the Arctic Red River (CHRS 2016). The land area of the community is approximately 7 672 ha (MACA 2010) and the community has a population of about 190.

Figure 1. Site map showing locations of the Water Treatment Plant (WTP), the Wastewater Treatment System (WWTS) and the Solid Waste Facility (SWF).

The Water Treatment Plant (WTP) is adjacent to the shore of the freshwater supply, Ts'oh Vàn in the Arctic Red River subwatershed, and is about 2.7 km from the community centre. The Wastewater Treatment System (WWTS) begins at the Wastewater Chute and cascades through a network of natural wetlands and ponds to the Wastewater Discharge on the shore of Nagwichoonjik (Mackenzie River). The Solid Waste Facility (SWF) is about 1.5 km from the community centre in the Mackenzie River Basin.