P.O. Box 16
Cambridge Bay, NU.
X0B 0C0
Ph: (867) 983-4650
Fax: (867) 983-2193

August 28 / 2007

Nunavut Water Board
Box 190
Gjoa Haven, NU
X0E 1J0
Attention: Mr. Thomas Kabloona, Acting Chair

Dear Mr. Kabloona:

RE: APPLICATION FOR RENEWAL OF LICENCE FOR THE HAMLET OF CAMBRIDGE BAY, NU (Licence No NWB3CAM0207).

The Hamlet of Cambridge Bay is very pleased to submit to the Nunavut Water Board the attached application for renewal of our water licence. Ten copies of an accompanying report entitled "Cambridge Bay Water Licence Background Report 2007" have been sent to the Water Board under a separate cover.

We realize that we have been late in submitting our renewal request, however, we have been addressing a number of items simultaneously to the water licence renewal, which are important to the renewal itself. With the help of the Government of Nunavut, we have undertaken a comprehensive waste management planning study, which has led to the design of improvements to both the lagoon site and the solid waste site, as well as the identification of a future waste management site for the community. The designs for the improvement projects will be submitted to the Board in the next several weeks.

We are hopeful that this planning work and the forthcoming design documentation will provide a milestone to our efforts to incrementally improve our practices to reflect the public health and environmental responsibilities of the Hamlet, and our responsibilities to fulfill the conditions of our water licence.

We hope that the Water Board will find our supporting documentation to the water licence renewal to be a valuable tool to the water licence renewal process. In anticipation of the need to consider our application beyond the August 31, 2007 expiry date of our current licence, we are requesting a 90 day extension to our current licence.

We appreciate your patience in this matter. If you have any questions regarding the information to our water licence renewal, please contact Ken Johnson, P.Eng. at 1 780 453 0910.

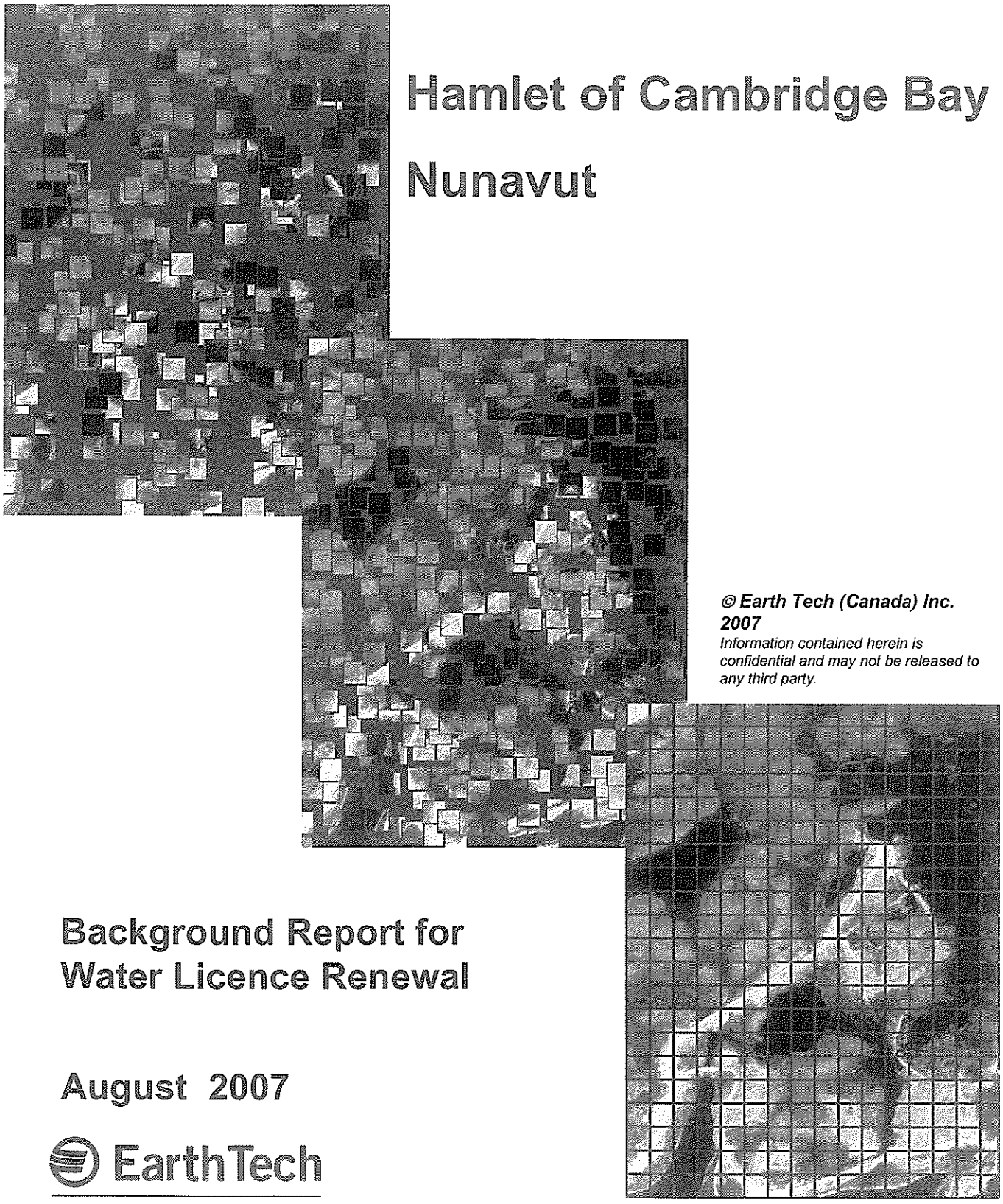
Sincerely,

Hamlet of Cambridge Bay

A / SAO
Derrick Anderson

Hamlet of Cambridge Bay

Nunavut



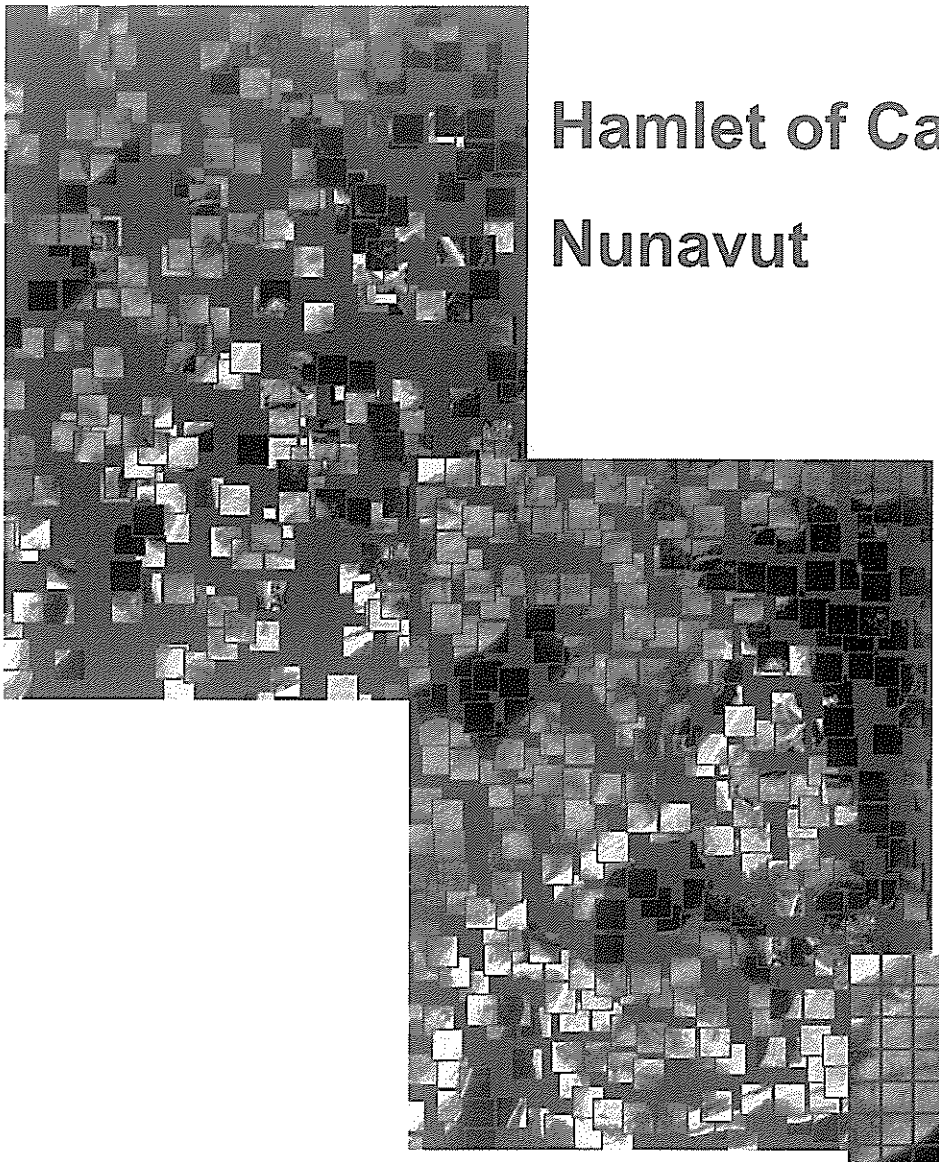
Background Report for Water Licence Renewal

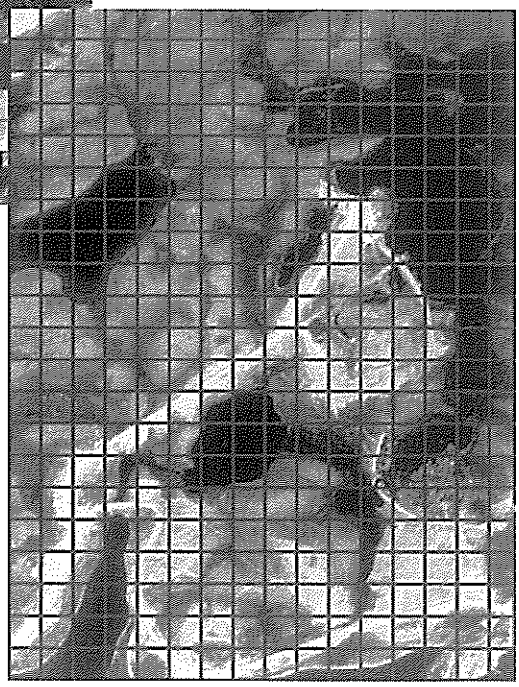
August 2007

EarthTech
A tyco International Ltd. Company

Hamlet of Cambridge Bay

Nunavut





Background Report for Water Licence Renewal

August 2007

EarthTech

A tyco International Ltd. Company

Hamlet of Cambridge Bay Background Report For Water Licence Renewal

Prepared for:
Government of Nunavut
P.O. Bag 200
Cambridge Bay, NU X0B 0C0

Prepared by:
Earth Tech (Canada) Inc.
17203 – 103rd Avenue
Edmonton, AB T5S 1J4
(780) 488-6800

August 2007
Project No. 91011-03

TABLE OF CONTENTS

SECTION	TITLE	PAGE NO.
1.0	**INTRODUCTION**	1
2.0	**COMMUNITY BRIEF**	1
3.0	**INFRASTRUCTURE DESCRIPTION**	3
3.1	Water System	4
3.1.1	Raw Water Supply and Intake Pumphouse	4
3.1.2	Water Treatment and Distribution	4
3.2	Sanitary Sewage System	5
3.2.1	Trucked Sewage Pump-out	6
3.2.2	Lagoon Access Road and Sewage Truck Discharge Area	6
3.2.3	Sewage Lagoon	6
3.2.4	Effluent Discharge	6
3.3	Solid Waste Facilities	7
3.3.1	Municipal Solid Waste Disposal Area	7
3.3.2	Metal Disposal Area	8
4.0	**STUDIES AND REPORTS DURING WATER LICENCE PERIOD**	8
4.1	Water Licence Amendment 1, 2005	8
4.2	Sewage Lagoon and Waste Facilities Assessment, 2005	8
4.3	Sewage and Solid Waste Facilities Planning Report, 2006	8
4.4	Sewage Analysis Report, 2006	9
4.5	Waste Diversion Strategy Study Report, 2007	9
4.6	Sewage lagoon Redevelopment Preliminary Engineering Report, 2007	9
4.7	Solid Waste Site Improvement Preliminary Engineering Report, 2007	9
5.0	**WATER LICENSE COMPLIANCE INSPECTIONS REPORTS**	10
5.1	Water Supply	10
5.2	Waste Disposal	10
5.3	Surveillance Network Program	11
6.0	**FACILITY REDEVELOPMENT PLANS**	12
6.1	Sewage Lagoon Redevelopment Detailed Design	12
6.2	Solid Waste Site Redevelopment Detailed Design	15
7.0	**REFERENCES**	15

LIST OF FIGURES

Figure 1 Hamlet of Cambridge Bay, NU. 2
Figure 2 Facilities Location of Cambridge Bay, NU. 3
Figure 3 Water System, Cambridge Bay, NU. 4
Figure 4 Sewage Lagoon System, Cambridge Bay, NU. 5
Figure 5 Solid Waste Management System, Cambridge Bay, NU. 7
Figure 6 Sewage Lagoon Improvement and Discharge 13

LIST OF TABLES

Table 1 Summary of the Brief Profile of the Hamlet of Cambridge Bay, NU. 1
Table 2 Results of Sewage Effluent Sampling, 2000-2006. 6
Table 3 Summary of Compliance Inspection Reports: Water Use 10
Table 4 Summary of Compliance Inspection Reports: Waste Disposal 11
Table 5 Summary of Compliance Inspection Reports: SNP 12

1.0 INTRODUCTION

The Hamlet of Cambridge Bay, in preparation for their water license (NWB3CAM0207) renewal, has prepared a background report to accompany the renewal application. The intention of this background report is to provide an overview of the water and waste infrastructure system within the community based upon the compilation of existing information. In addition, this report also aimed to provide a valuable communication tool for the community to address questions and concerns raised by the mayor, council, senior administration, residents, and other potential stakeholders on the community's infrastructure.

The scope of the report includes background information review on water supply and distribution, sewage collection and treatment, and solid waste management. This review is presented with a combination of figures to provide a complete understanding of the community's infrastructure, particularly emphasized on the visual information including regional maps and aerial photos. This provides the necessary flexibility to address the various stakeholders in the application process.

2.0 COMMUNITY BRIEF

The Hamlet of Cambridge Bay, whose Inuit name is "Iqaluktuuttiaq", means "Good Fishing Place", is the largest community in the Kitikmeot Region of Nunavut. In 1839 during an expedition to delineate the north coast of the continent, the site was named by the Hudson's Bay Company for H.R.H. Adolphus Frederick, Duke of Cambridge.

The Hamlet is geographically situated on the Dease Strait between the Queen Maud Gulf and the Coronation Gulf in the North West Passage (see **Figure 1**). Cambridge Bay has been the site of summer gatherings for hundreds of years. The people of the area are referred to as "Copper Eskimos" since they made a variety of implements from native copper. The First Hudson's Bay Company trading post was built there in 1921. The RCMP has operated a detachment at Cambridge Bay since1926.

It was not until the construction of a LORAN (Long Range Navigation) Navigational Beacon in 1947 and of a Distant Early Warning (DEW) Line in 1955 that the community started to grow. The settlement became the key transport and supply centre for all the DEW Line sites in the region. In April 1981, the Hamlet became the regional headquarters for the Kitikmeot Administrative Region (Ref: Canadian Arctic Profiles – Indigenous Culture).

Table 1 is a brief profile of the Hamlet based on the size, terrain, climate and socio-economic characteristics of the community.

Table 1 – Summary of the Brief Profile of the Hamlet of Cambridge Bay, NU.

Category		Description
❑	Population:	1,477 in 2006 (Statistics Canada)
❑	Residences:	524 in 2006 (Statistics Canada)
❑	Location:	Latitude 69° 07' N and Longitude 105° 03' W
❑	Proximity:	960 air kilometers northeast of Yellowknife, NWT; and 1,700 air kilometers west of the City of Iqaluit, NU.

Category		Description
❑	Weather:	High and low mean temperatures in July: 12.3 °C and 4.6 °C High and low mean temperatures in January: -29.3 °C and -36.3 °C
❑	Precipitation:	6.96 cm of rainfall and 82.10 cm of snowfall annually
❑	Vegetation:	Some hardy grasses grow in lower wet areas where there is a thin layer of soil cover. Rock outcrops support lichens on their surfaces. Clusters of willows manage to grow to a height of 0.5m in well sheltered areas.
❑	Transportation:	Cambridge Bay can be reached by air from Yellowknife with daily jet service and turboprop service. Cambridge Bay can also be reached by sealift in summer from the Hay River in mid July.
❑	Economy:	Major none-government activities are tourism, hunting and fishing.
❑	Services:	Public school, health centre, RCMP station.
❑	Geology/Terrain:	The Hamlet is situated in an area of continuous permafrost. The bedrock geology of the Cambridge Bay area comprises Paleozoic sedimentary rocks (carbonates, shales and sandstones). Bedrock is generally exposed at sporadic locations close to sea level. Where exposed, the bedrock comprises layers of dolomite and shale, and is jointed and frost shattered. The general area is covered by numerous relatively shallow lakes of various sizes. The shore is generally flat, close to the water, and rises to an elevation of approximately 15 meters.

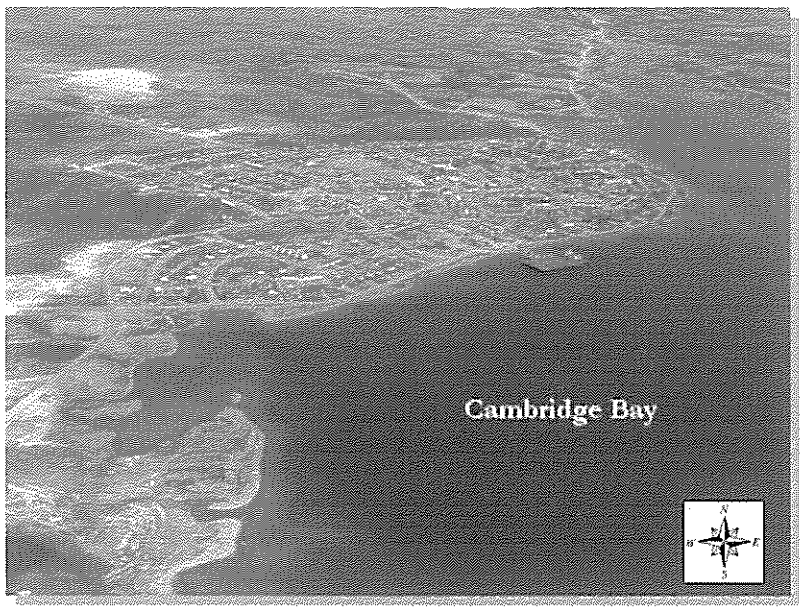


Figure 1 Hamlet of Cambridge Bay, NU.

3.0 INFRASTRUCTURE DESCRIPTION

The facilities infrastructure consists of water, sewer and solid waste infrastructure identified by its location to the community as shown in **Figure 2**. The water use and waste disposal in the Hamlet is regulated by a Type 'B' Water License.

The water intake facility is located approximately 2.0 kilometers north of the community on the south shore of Water Lake. Raw water is drawn at intake pumphouse chlorinated and transmitted through a water pipeline to the truckfill distribution pumphouse at the center of the Hamlet where water is stored prior to discharge.

The existing waste management system is located approximately 1.5 km north east of the community, where the sewage lagoon is adjacent to the solid waste disposal (municipal solid waste disposal and metal disposal areas) sites.

More detailed description on the each individual infrastructure components are presented in the specific sections of this report.

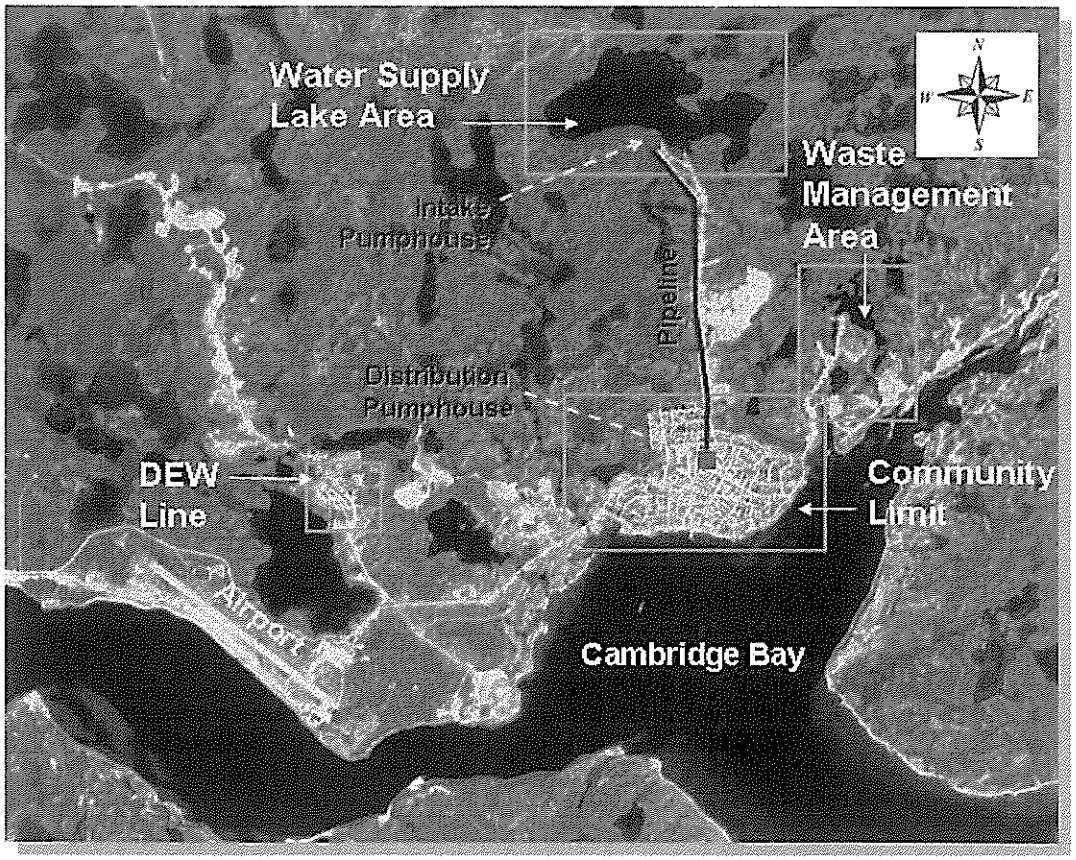


Figure 2 Water and Waste Facilities Location of Cambridge Bay, NU.

3.1 Water System

3.1.1 Raw Water Supply and Intake Pumphouse

The raw water source is Water Supply Lake, 2.0 kilometers north of the community. The catchments area for the Lake is 231 hectares (571 acres). The summer storage of Water Supply Lake is approximately 1,738,000 m^3 and winter storage volume is about 544,000 m^3 with 2.5 meters of ice. Water source is located in an area away from human activities and, as such, is relatively free from potential contamination.

The intake facilities extend 20 meters into Water Supply Lake to a depth of approximately 4 meters below the surface. The intake pump discharge line consists of a 100mm diameter HDPE pipe. This pipeline is coupled to submersible pump at the intake pumphouse and rests with a HDPE intake shaft or casing pipe.

3.1.2 Water Treatment and Distribution

A 2,900 meters water supply pipeline runs from the intake facilities to the distribution pumphouse at the centre of community. The 150mm waterline is freeze protected with insulation and a 50mm recirculation waterline.

The water is chlorinated at the intake pumphouse prior to pumping to the distribution pumphouse. There is a 260 m^3 storage tank located beside the distribution pumphouse. **Figure 3** exhibits the distribution pumphouse, truckfill station and storage tank beside the building.

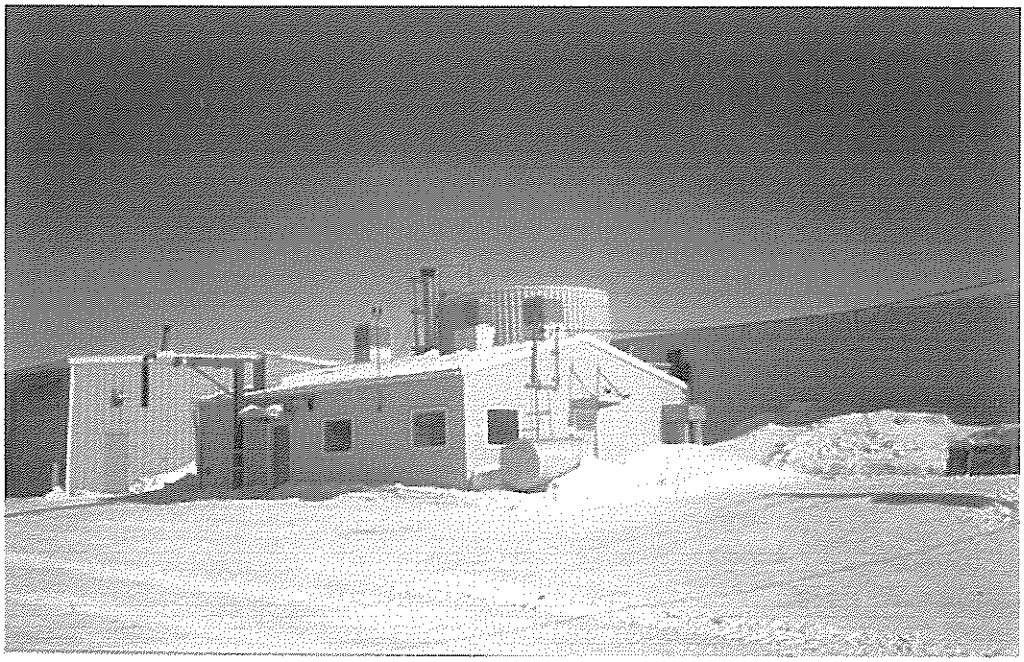


Figure 3 Water Distribution Pumphouse

Water distribution system consists of a truckfill station, water truck delivery service, and water tanks within each residence in the community. Water delivery is provided to the residents by the Hamlet using 12,000 litre water trucks.

Water use from Water Lake is estimated of a total of 87,600 m^3 per year[1]. Whereas the present water license allows for the removal of 70,000 m^3 of water from Water Lake annually.

3.2 Sanitary Sewage System

The community's annual sewage generation is estimated to be 87,600 m^3 per year. As noted above, the present water license allows for the use of 70,000 m^3 of water annually. The community's sewage collection relies on trucked pump-out services. The collected sewage is treated through series of natural lake lagoons as shown in **Figure 4**.

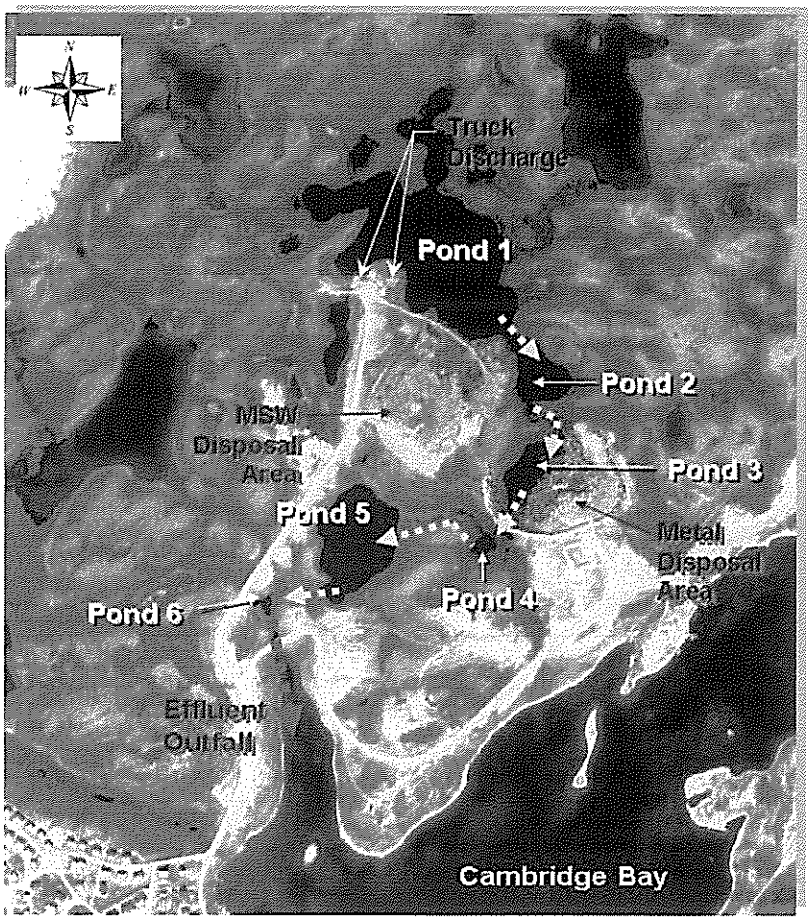


Figure 4 Sewage Lagoon System

[1] IEG Consultant Ltd., 2005, Cambridge Bay Municipal Sewage Lagoon and Waste Facilities Assessment (GN Project No. 04-4807). October 2005.

Effluent from the sewage lagoon is continually discharged throughout the spring, summer and fall, which enters a series of ponds and wetland areas, and ultimately discharges into the Cambridge Bay. During the winter months the discharge path through ponds freezes, and therefore only limited discharge occurs.

3.2.1 Trucked Sewage Pump-out

Sewage is collected from houses by a vacuum truck with a 9,000 liter tank, which empties the individual holding tanks within each house. Currently on average 20 truckloads of sewage are collected from the community each day.[2] The Hamlet provides pump-out service to the community.

3.2.2 Lagoon Access Road and Sewage Truck Discharge Area

The vacuum truck transfers the sewage from holding tanks to a natural lake lagoon, which is located 1.5 kilometres east of community, adjacent to the landfill area. The lagoon facility is accessible by an all weather gravel road off the main road from the community. The truck discharge area into the lagoon consists of a gravel turnaround area with a discharge chute.

3.2.3 Sewage Lagoon

The current system consists of six (6) natural ponds connected in series, namely Pond 1, through Pond 6, as shown in **Figure 4**. The lagoon volume is approximately 72,000 m^3 based on the normal water level in the lagoon ponds (IEG, 2005). The sewage is discharged into Pond 1 of the lagoon by tanker trucks at truck discharge site. The sewage flows through the series of channels and ponds, and ultimately discharges into the Cambridge Bay.

3.2.4 Effluent Discharge

As noted above, effluent from the sewage lagoon is discharging throughout the spring, summer and fall months; and the discharge discontinues when the stream and pond system freezes during the winter months. The effluent from the lagoon enters a series of natural lakes and wetland areas, and ultimately discharges into an embayed area of the Cambridge Bay, approximately 450 meters east of the community.

Table 2 is the summary of results of effluent taken for the period from 2000 to 2006. The result shows that all monitoring parameters were under the limits of Water Licence.

Table 2 – Results of Sewage Effluent Sampling, 2000-2006.

Parameter	June 2006	Oct. 2003	Aug. 2002	Aug. 2001	July 2000
Faecal Coli., CFU/100ml	<1*	38	-	-	10
BOD_5, mg/L	26	15	-	-	25
TSS, mg/L	41	21	4	-	41
Oil& Grease, visible sheen	n/a	none	none	none	none
pH	8.2	-	7.9	8.6	9.1

Note: *Result is not reliable due to equipment error as reported by the Norwest Lab;
All samples were taken near outlet of pond #2 (see Figure 4); 2001, 2002, 2003 and 2006 data generated from single "grab" samples; 2000 data generated from the average of multiple samples.

[2] IEG Consultant Ltd., 2005, Cambridge Bay Municipal Sewage Lagoon and Waste Facilities Assessment (GN Project No. 04-4807). October 2005.

3.3 Solid Waste Facilities

The solid waste facility consists of municipal solid waste (MSW) disposal area and metal disposal area, as shown in **Figure 5**. This facility is a typical landfill system in northern region of Canada, which was developed in a fashion of convenience with limited "engineering" of the waste disposal areas. It could be assumed that the current site has been in use for over thirty (30) years, by considering the fact that there was no record of any previous solid waste sites in the Hamlet.

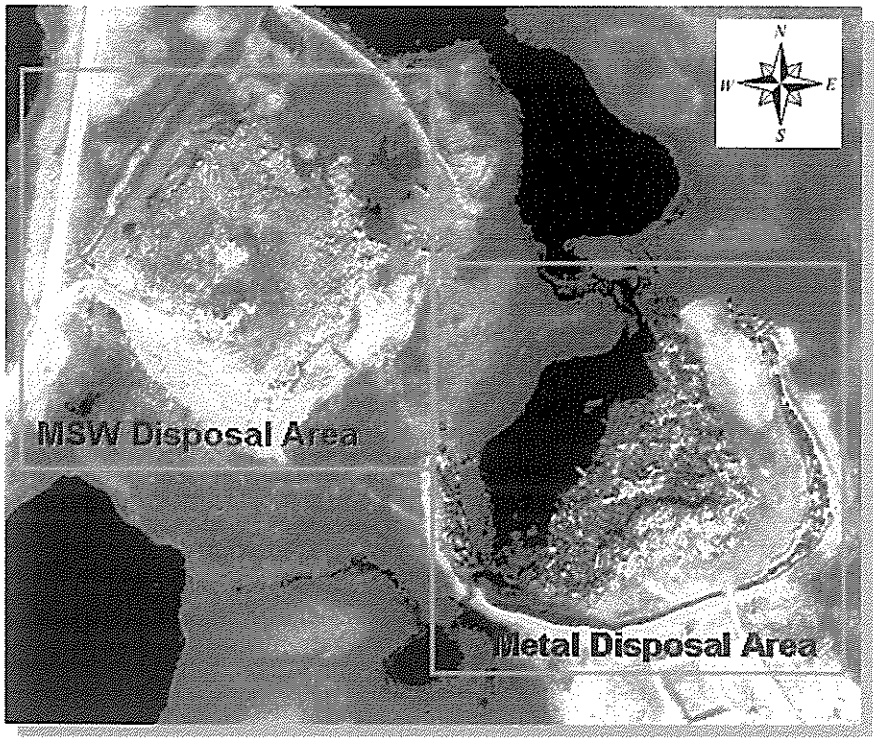


Figure 5 Solid Waste Management System

3.3.1 Municipal Solid Waste Disposal Area

The MSW disposal area is located adjacent to the west side of the sewage lagoon (see **Figure 5**). Typically Nunavut communities' MSW sites contain primarily bagged household wastes and a few household hazardous wastes, such as paints, solvents, waste oil or batteries, etc. For the Hamlet, MSW site contains all of these waste components and some industrial related activities associated with the DEW line operation occurs.

The cut and fill or trench method has had been used to operate the MSW facility until the mid-1990s. Since then the solid waste has been deposited throughout the landfill area and burned when the prevailing winds are away from the community. The burned wastes were periodically covered with granular material.

The facility is not fenced and as such, wind-blown litter occurs occasionally. The Hamlet does not control any of activities at the landfill.

3.3.2 Metal Disposal Area

The metal disposal area is immediately adjacent to the east side of the sewage lagoon (**Figure 5**). It consists of a pile of waste metal and other bulky wastes.

4.0 STUDIES AND REPORTS DURING WATER LICENCE PERIOD

4.1 Water Licence Amendment 1, 2005

In February 2005, the Nunavut Water Board issued Amendment 1 to Licence No. NWB3CAM0207. The intention of the Amendment 1 is to allow the Hamlet to contract the remediation of petroleum-impacted soils at Hydrocarbon-Impacted Soil Landfarm Treatment Facility. Initial construction of the facility has been completed; further work on the facility including installation of a liner is required before the facility will be operational.

4.2 Sewage Lagoon and Waste Facilities Assessment, 2005

In October 2005, IEG Environment Consulting Limited prepared a Municipal Sewage Lagoon and Waste Facilities Assessment for the Government of Nunavut, on behalf of the Hamlet of Cambridge Bay.

This document provides a complete package of assessment information on the sewage and solid waste disposal sampling, operation and maintenance in consideration of current common practices for a sewage and waste disposal operation and maintenance in the Nunavut.

4.3 Sewage and Solid Waste Facilities Planning Report, 2006

In June 2006, Earth Tech (Canada) Inc. completed analysis for site selection of a new waste management site for the Cambridge Bay Waste Management Facilities. The objective of this planning analysis was to provide site planning information for selected waste management sites based upon a landfill configuration for solid waste management, and a lagoon/wetland for sewage treatment.

A planning analysis of potential landfill sites was completed based upon sites identified during a council workshop. A total of eight (8) sites were analyzed within a 5 kilometers radius of the community. The analyses included: area requirements; proximity issues to human activity and natural features; road access; capital cost; operation and maintenance cost; and development configurations. Three of the potential sites were eliminated because of the proximity issues, and the reminder of the sites was recommended for further consideration through community consultation and detailed site investigations.

4.4 Sewage Analysis Report, 2006

In August 2006, Earth Tech (Canada) Inc. conducted a sewage analysis for Cambridge Bay Waste Facility Improvements. The report presented the summary of sewage lagoon system samples collected in 1998, 2003 and 2006, and provided an overview of sewage characteristics and treatment efficiency of the existing lagoon system.

The results showed that the concentration of all the effluent discharge parameters collected from the "lagoon" and "pond" sampling points were below the Guidelines for the Discharge of Treated Municipal Wastewater in the Northwest Territories (MWWE), 1992. It suggested that the lagoon system of treatment was working satisfactorily to reduce the concentration of sewage to the acceptable level prior to discharge into the environment (the Bay).

4.5 Waste Diversion Strategy Study Report, 2007

In February 2007, Earth Tech (Canada) Inc. prepared a waste diversion strategy for the Hamlet of Cambridge Bay. The intention of this study was to provide the Hamlet a framework to start the waste diversion from the landfill. The study was also intended to introduce an incremental diversion program to the community with the following actions:

- Promote public(community, territorial governments and local business) awareness and education to waste diversion program;
- Initiate environmental fee charge, such as beverage containers, electronic products (territorial legislation required);
- Establish waste diversion management center to organize various activities in the community by initiating a variety of diversion programs including household hazardous waste, beverage container, paper products, bulk wastes (tire, metal waste and *e*-waste, etc).

4.6 Sewage lagoon Redevelopment Preliminary Engineering Report, 2007

In April 2007, Earth Tech (Canada) Inc. prepared a preliminary engineering draft report on existing Sewage Lagoon Redevelopment in the Hamlet. The report concluded that the existing lagoon system appears to be functioning to reduce sewage contaminants to an acceptable level prior to discharge into the environment. The existing facility may also be redeveloped for a 20-year planning horizon. The report recommended a series of improvements to engineer the lagoon system with the following features: relocation of the outfall; construction of runoff diversion berms; construction of a retention berm; and implementation of a seasonal discharge.

4.7 Solid Waste Site Improvement Preliminary Engineering Report, 2007

In June 2007, Earth Tech (Canada) Inc. prepared a preliminary engineering draft report on Solid Waster Site Improvement in the Hamlet. The report concluded that the site may be redeveloped for a ten (10) year horizon. The report recommended a series of improvements to engineer the site with the following features: cells for municipal solid waste; a cell for controlled burning of selected waste; specific areas for honey bags, hazardous waste and tires; runoff control features; perimeter fencing; and implementation of an operation and maintenance plan.

5.0 WATER LICENSE COMPLIANCE INSPECTIONS REPORTS

In this section, annual Inspection and Compliance Reports for the Hamlet for the period from 2003 to 2004 are summarized. These reports, including water use, waste (sewage and landfill) disposal and surveillance network program (SNP), are prepared by the Indian and Northern Affairs Canada (INAC) to report on the Hamlet's compliance with their water license.

5.1 Water Supply

The Compliance Inspection Reports indicated that all water licence conditions were in compliance. However Hamlet has exceeded its allowable water licence limits of 70,000 m^3 from Water Lake. Currently the water consumption of the Hamlet is approximately of 87,600 m^3 annually.[3]

The Inspection Forms indicated that the listed water supply facilities and equipment were all "Acceptable" and no "Non-Compliance of Act or License" items were identified. **Table 3** is the summary of the comments of the water supply system.

Table 3 –Summary of Compliance Inspection Reports: Water Use

Year	Water use (m^3)	Comment
2003 (August 4)	N/A	• The Water Intake and Treatment Facility was well maintained, and in good condition; • Installation of a meter at Water Intake Facility was needed as required of the Water Licence ; • A berm was required for the Fuel tank at Treatment Plant.
2004 (July 20)	N/A	• Water use and chlorine level were not recorded regularly; • Spill kit should be kept at pumphouse in case any sodium hypochlorite spills that may occurred; • All samples were within both the Licensed Guidelines and the Canadian Council of Ministries of the Environment (CCME) *Summary of Guidelines for Canadian Drinking Water Quality.*

5.2 Waste Disposal

The Municipal Waste Disposal Inspection Forms indicated that the listed waste disposal facilities and equipment were all "Acceptable", except a contravention of "Act or License" item, namely "observed drums of waste at Cambridge Bay with markings used to identify Nunavut Power Corp property", was identified in September 4, 2003.

[3] IEG Consultant Ltd., Cambridge Bay Municipal Sewage Lagoon and Waste Facilities Assessment (GN Project No. 04-4807). October 2005.

Table 4 is the summary of the comments on the Hamlet's Waste Disposal Facilities in the inspection reports.

Table 4 – Summary of Compliance Inspection Reports: Waste Disposal

Year	Comment
2003 (August 4, and September 4)	• Drums of waste oils, waste fuel and solvent were deposited at the MSW site; • Evidence of disposal of industrial waste (waste oil, fuel and solvent) at the metal dump was identified; • MSW disposal facility was not fenced and operated in fashion of a burn and bury operation; the burnt waste at MSW site had not been covered with aggregate for some time; • Hazardous Waste from a private company Kitnuna were allowed deposited at the metal dump; • A compliance Pan for Abandonment and Restoration of the petroleum storage area used by Kitnuna Corp at the metal dump was required; • An out of date O&M plan was used for Sewage and Solid Waste Disposal Facilities.
2004 (July 20)	**Sewage Lagoon:** • Large amount of waste was visible on the shore of the lagoon; any future plan for landfill or sewage treatment option should not allow further mixing of sewage effluent and metal waste; • All samples took at CAM-3 (N69°07'19.5" W105°02'15.1") had met the requirement of the *Guidelines for the Discharge of Treated Municipal Wastewater in the Northwest Territories*, except for Iron parameter (464>300µg/L). **Landfill/Metal Dump/Waste Oil:** • The Landfill is a burn and bury facility and appears to be approaching its capacity, and thus covering of waste is sporadic at best; • The landfill was not fenced, no sign identifying the site and no segregation of hazardous waste; • None of segregation of waste was carried out in the metal dump and no measures was in place to prevent runoff from the metal disposal areas mixing with the sewage lagoon; • All samples took at CAM-2 (N69°07'26.2" W105°01'43.6") had met the requirement of the *Guidelines for the Discharge of Treated Municipal Wastewater in the Northwest Territories* except for Iron (963>300µg/L).

5.3 Surveillance Network Program

In August 2003, the Water Resource Officer (WRO) identified the placement the Surveillance Network Program (SNP) stations at Water Supply Intake (CAM-1), Solid Waste Disposal Facilities Seepage (CAM-2) and Sewage Lagoon Discharge (CAM-3). In addition, the Solid Waste Disposal Facility runoff (CAM-2), Metal Dump runoff and Sewage Lagoon Effluent were combined prior to the SNP CAM-3. **Table 5** is the summary of SNP stations required for the compliance of Water Licence.

Table 5 – Summary of Compliance Inspection Reports: SNP

Year	Location of SNP
2003 (August 4)	• Placement was identified to SNP stations at Water Supply Intake (CAM-1), Solid Waste Disposal Facilities Seepage (CAM-2) and Sewage Lagoon Discharge (CAM-3).
2004 (July 20)	• Extra samples need to be collected at SNP station of CAM-2 and CAM-3, during the periods of flow. • Signs need to be installed at SNP station, including waste disposal sites and freshwater intake facility

Notes: CAM-1: Raw water supply prior to water treatment;
CAM-2: Runoff fro the solid waste disposal facilities;
CAM-3: Effluent discharge from the sewage disposal facilities.

6.0 FACILITY REDEVELOPMENT PLANS

Cambridge Bay, with assistance from the Government of Nunavut, Department of Community and Government Services, Kitikmeot Region, is undertaking engineered improvements to the Cambridge Bay Waste Facility Improvements project (GN Project No. 04-4807).

Based upon the input from Community Meetings, and the direction provided by the Government of Nunavut, the preliminary engineering for redevelopment of the existing sewage treatment and solid waste management has been completed.

6.1 Sewage Lagoon Redevelopment Detailed Design

In the preliminary engineering report, the sample results indicated that the concentration of the effluent discharge parameters is below the concentration required by Water License, which also suggests that the lagoon system has been working satisfactorily to reduce the concentration of sewage contaminants to the acceptable level prior to discharge into the environment. **Figure 6** presents the scheme for the detailed design of the sewage lagoon improvement.

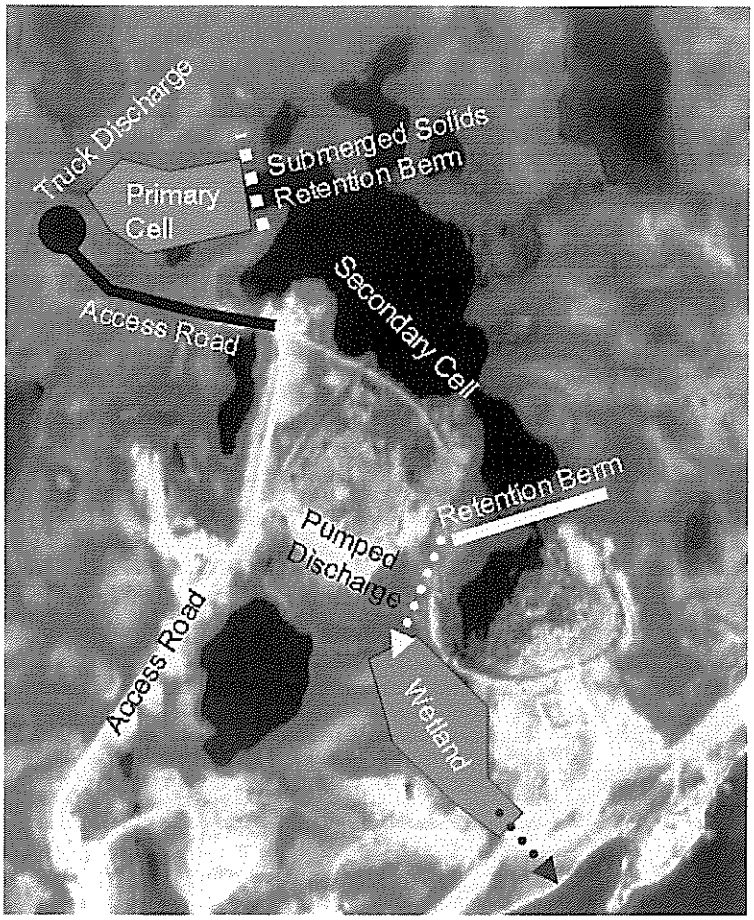


Figure 6 Sewage Lagoon Improvement and Discharge

Based on the detailed engineering design, the existing lagoon system could still serve the Hamlet as a sewage treatment facility for the next twenty (20) years after completing improvements that address a number of issues as follows:

a) ***Capacity Increase***

The current annually sewage generation rate is approximately 70,080 m^3 with high water level of approximately 8.85 m. By the year of 2025 the sewage generation rate would be approximately 120,000 m^3 per year. The lagoon improvements will accommodate the increases by construction and reinforcement of berms to increase water level of 9.5 m. A future downstream wetland will polish the effluent from the lagoon before it enters to the Cambridge Bay. The lagoon is designed as a seasonal discharge lagoon. The treated sewage would be discharged once a year in the late summer or early fall.

b) ***Primary Cell***

In order to improve the operating performance of the lagoon, a primary cell will be constructed at the northwest portion of the lagoon (**Figure 6**). A submerged berm will be constructed to separate the primary cell and secondary cell. Much of the suspended solids are expected to be settled within the primary cell before sewage enters the secondary cell.

c) ***Discharge Flume***

The discharge flume for the sewage truck will be located at the west end of the primary cell. The sewage truck will use discharge flume to deposit sewage into the primary cell.

d) ***Decant System***

A portable pump will be used to provide a decant system at the opposite end of the lagoon to the truck discharge flume. The lagoon will be discharged annually by pumping effluent over the retention berm.

e) ***Spillway***

A spillway will control the lagoon high water level and protect the retention berm in the event of an extreme runoff situation. Any water above high water level (9.6 m) will overflow through the spillway.

f) ***Polishing Wetland***

An engineered wetland will be constructed to further treat the effluent discharge from the lagoon system.

g) ***Discharge Route***

The sewage effluent will be diverted via a proposed berm along the west side of the metal disposal site. The effluent will enter an engineered wetland before crossing the existing road. This discharge route will avoid the conflict to the proximity to the community.

h) ***Runoff Diversion***

Runoff diversion berms are based on the watershed contours. These runoff diversion berms compliment the proposed diversion berms for the bulk metal area, which will divert the majority of surface runoff away from the landfill area.

i) ***Access Roads***

The existing access road will be extended 350 meters in order to reach the truck discharge flume at northwest end of the primary cell, and another 150 meters road will be constructed to the decant location.

The redevelopment of the lagoon facility may be implemented in stages based on the priorities of each portion of the improvement, and this will give the community flexibility towards completing all of the improvements.

6.2 Solid Waste Site Redevelopment Detailed Design

The site will be partitioned for honey bag waste and carcasses, plastic and bulky wastes (including tires), hazardous waste, and MSW areas. The existing metal dump site will still be used for waste metal disposal after the isolation berm between the lagoon and the site has been built.

The improvements also include runoff management to divert off-site runoff away from the site, and to collect on-site runoff for a controlled discharge. A perimeter fence will be constructed around the entire site.

In addition, the operation and maintenance documentation will be prepared for the solid waste disposal site to address: active areas within site, compaction, waste covering, fire control and protection, snow accumulation, litter and dust control, access road control and maintenance, directional signs, hazardous waste and performance monitoring.

7.0 REFERENCES

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