Water

Town of Fort Smith

Water Licence Renewal Background Report Volume 1

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Project Number:

60164818

Date:

January, 2011

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January 24, 2011

Jean Soucy
Director of Waterworks
Town of Fort Smith
P.O. Box 147
Fort Smith NT X0E 0P0

Dear Mr. Soucy:

Project No: 60164818

Regarding: Background Report for Fort Smith Water Licence Renewal

AECOM is pleased to submit the Background Report for Water Licence Renewal for the Town of Fort Smith, which includes Volume 1 - background report and Volume 2 - associated appendices. Copies of this report have also been submitted to the Mackenzie Valley Land and Water Board to assist the Board in its review of the Town's application for the water licence renewal.

If you have any questions, please contact the undersigned at 780-453-0910.

Sincerely,
AECOM Canada Ltd.

Ken Johnson, P.Eng
Ken.Johnson@aecom.com

KRJ:pw
Encl.
cc: Executive Director, MVLWB

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Revision Log

Revision #	Revised By	Date	Issue / Revision Description
0	Ken Johnson		First Issue

AECOM Signatures

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1. Introduction

In preparation for their water licence renewal, the Town of Fort Smith (Town) retained the service of AECOM to prepare a background report to supplement their application for water license renewal. The Type A water licence (No. MV2003L3-0006) was issued to the Town on November 1, 2003 and expires on October 31, 2011.

This background report provides a description of the water, wastewater and solid waste infrastructure systems, provides an overview of the operation of the infrastructure and recent improvements made. The Town's annual reports and the INAC bi-annual inspection reports are presented in Volume 2, Appendices A-G and H respectively.

2. Community Profile

Fort Smith is located on Highway 5, along the Slave River in the South Slave Region of the Northwest Territories adjacent to the Northwest Territories/Alberta border. (Latitude 60^{o}00' N and Longitude 111^{o}53' W.)

The 2009 population was 2,466 (GNWT Bureau of Statistics). The economy is primarily based on federal, territorial and aboriginal government along with education and tourism.

Climate

- High and low mean temperatures in July: 23^{o}C and 10^{o}C;
- High and low mean temperatures in January: -19^{o}C and -30^{o}C;
- Precipitation: 4.6 cm of rainfall and 15.1 cm of snowfall annually

3. Infrastructure Description

The municipal infrastructure under the water licence includes potable water, wastewater and solid waste. The location of the infrastructure is indicated on the site plan, Figure 1.

3.1 Water Supply System

The water supply, treatment and distribution system consists of the following components:

- Slave River raw water intake pumphouse;
- Settling ponds (two 2,500 cubic metre ponds) and pumphouse ;
- Water treatment plant and distribution pumps;
- Elevated treated water storage reservoir;
- At grade (partially buried) treated water storage reservoir with pump station;
- Piped distribution system.

The components of the water supply system are shown schematically in Figure 2.

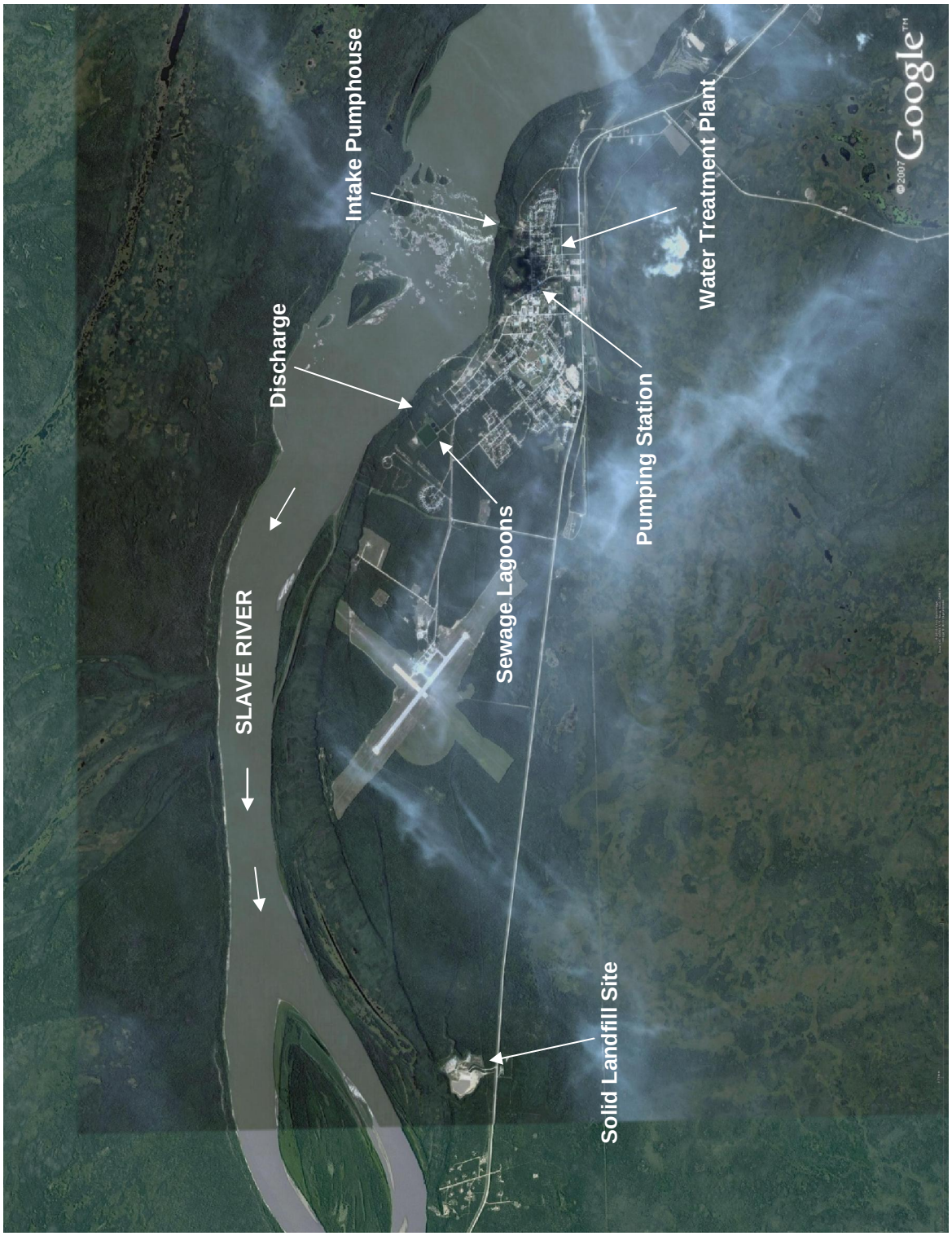

Figure 1 Fort Smith Water, Wastewater And Solid Waste Disposal Facilities

Figure 1 Fort Smith, Wastewater and Solid Waste Disposal Facilities

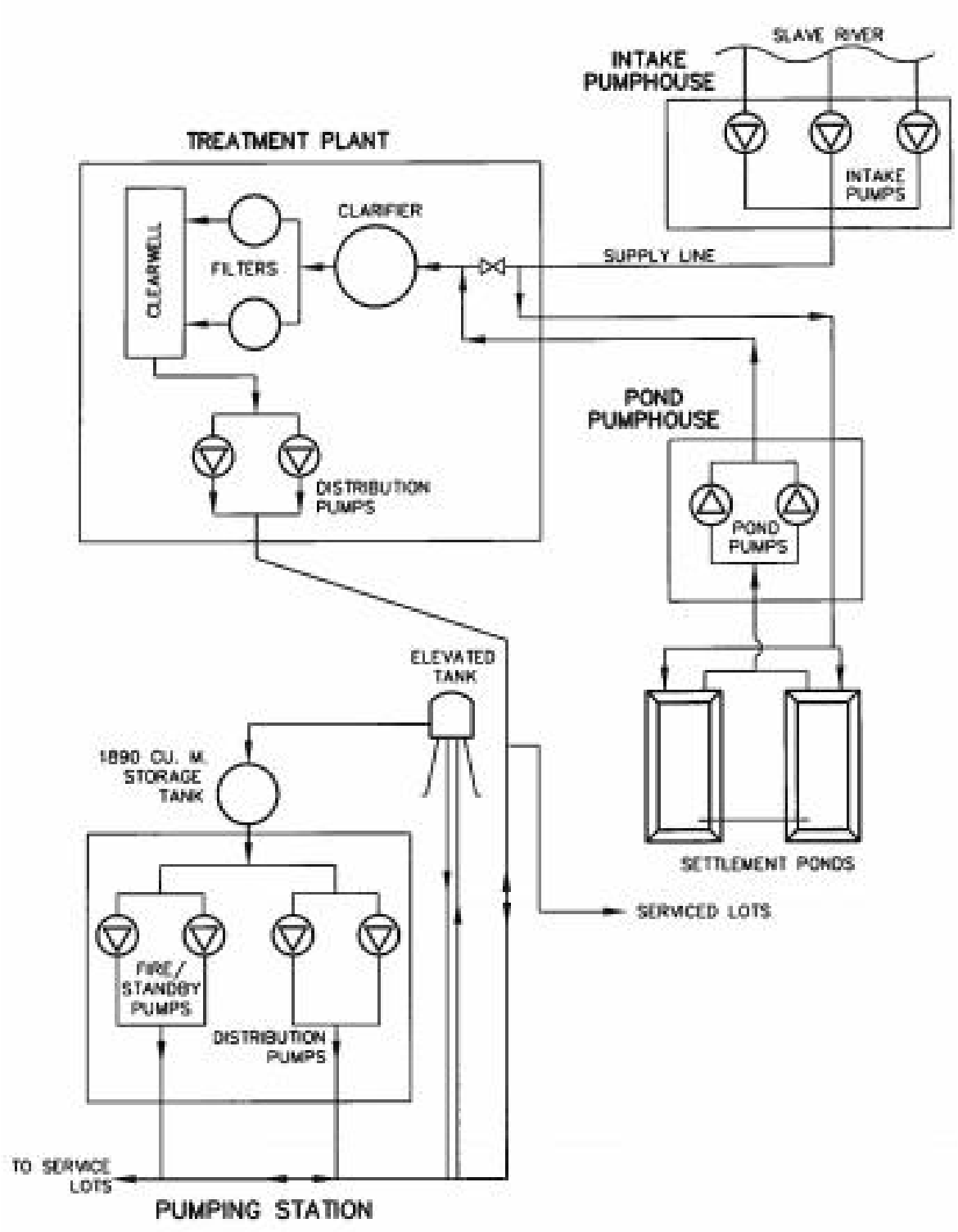

Figure 2 Fort Smith Water System Schematic

3.1.1 Raw Water Supply Pumphouse

The intake pumphouse was constructed in 1958–1959, on the shore of the Slave River, immediately upstream of the "Rapids of the Drowned". The pumphouse has 3 vertical turbine pumps that draw water from a wetwell located beneath the ground floor, and pump it through a 200mm pipeline to the water treatment plant.

Water from the river enters the wetwell via 6 ports (openings) located at various levels along the wall of the wet well. The water flows through a system of screens in the wet well before it is drawn.

The pipeline from the intake pumphouse to the top of the riverbank consists of an above ground insulated steel pipe (See Figure 3), and from the top of the riverbank to the water treatment plant the pipeline consists of a buried, high density polyethylene pipe.

3.1.2 Raw Water Settling Ponds

During periods of high turbidity in the summer (May to September), raw water is diverted into two settling ponds located adjacent to the water treatment plant, prior to entering the clarifier in the treatment plant. The settling ponds, each with a volume of 2,500 cubic metres, and the associated pumphouse, were constructed in 1993 (See Figure 4). The ponds operate in series with water spilling from the first pond to the second pond. PAC-plus polymer is added to the water as a flocculent to achieve approximately 98% removal of the turbidity in the settling ponds.

3.1.3 Water Treatment Plant

The water treatment plant, built in 1992–1993, is located at the corner of Primrose Lane and Pelican Street. The plant incorporates the water treatment process, a clear well and distribution pumps (for treated water supply and filter backwash) and two fuel oil-fired boilers.

The water treatment process consists of coagulation, flocculation, sedimentation and filtration. The components of the process include a clarifier, two mixed media filters and chemical feed pumps. Disinfection in the form of chlorine gas occurs immediately before and after the mixed media filters. Sodium fluoride is also added after filtration. The water enters a clear well prior to either distribution or storage.

Two distribution pumps move the treated water from the clear well to the elevated and ground level storage reservoirs, and to the Town's piped distribution system.

Backwash water from the water treatment plant, and the residual water from the settling ponds, is pumped into the Town's sewer system. The practice of discharging the backwash/residual water into the Slave River during the summer months was discontinued in 2008.

3.1.4 Treated Water Storage

Treated water storage is provided by:

- A clear well, consisting of a steel tank located outside treatment plant (capacity 350 m^3);
- Elevated tower located adjacent to the Town Pumping Station (capacity 380 m^3);
- Ground level reservoir, consisting of a concrete, partially buried reservoir located adjacent to pumping station (capacity 1,890 m^3)

The elevated storage reservoir and the ground level concrete reservoir are located beside the Town's pumping station, (northwest of the intersection of Portage Avenue and Primrose Lane).

The ground level storage reservoir is filled from the overflow of the elevated storage reservoir.

Figure 3 Site Plan Showing Intake Pumphouse

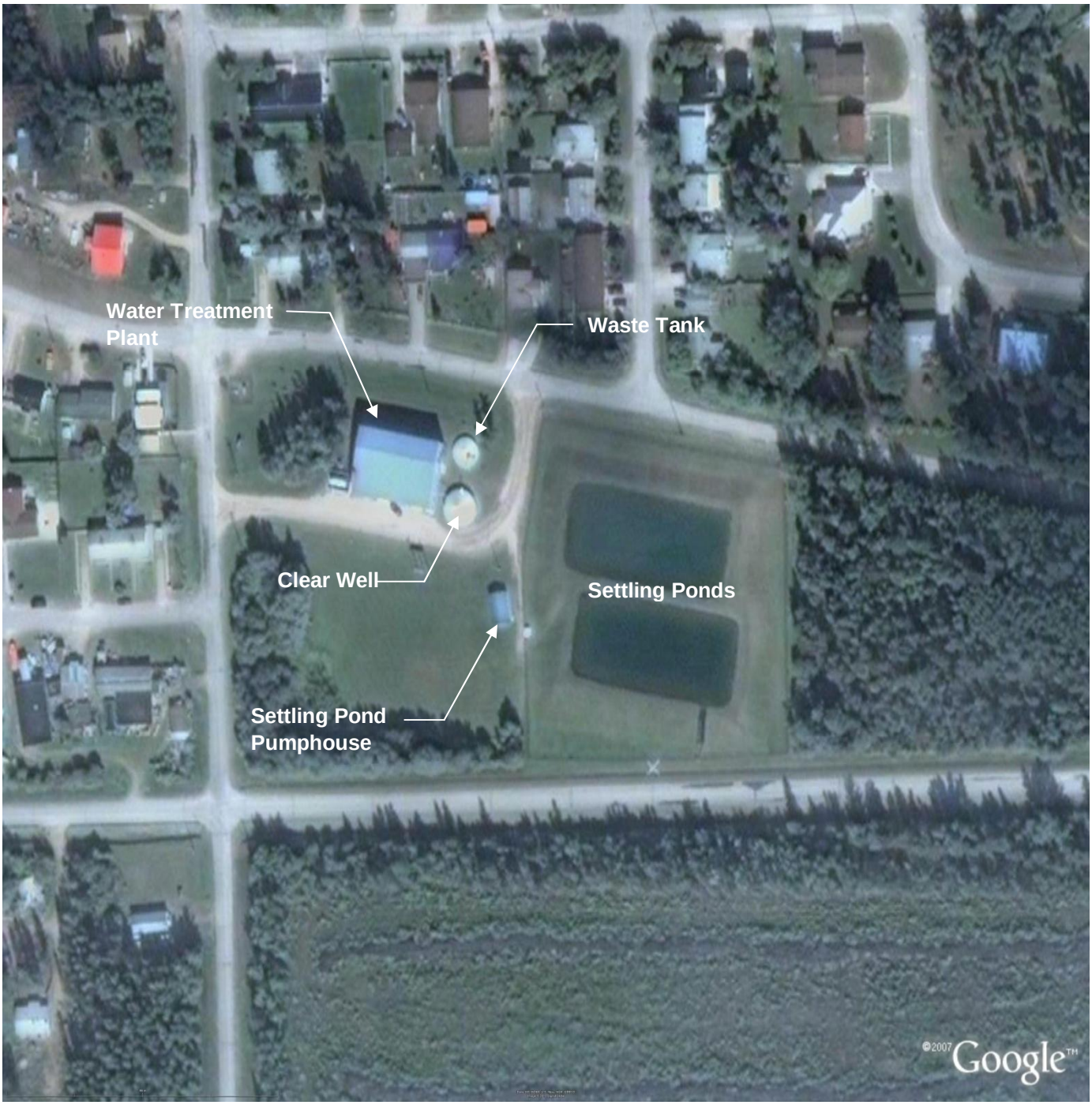

Figure 4 Site Plan Showing Water Treatment Plant

3.1.5 Pumping Station

The Town's Pumping Station is used to pump water out of the ground level storage reservoir into the Town's piped distribution system. This station houses three electrical pumps and one diesel driven pump, with associated controls.

3.1.6 Piped Distribution System

The water distribution network in Fort Smith consists mainly of asbestos-cement mains and some polyvinyl chloride (PVC) mains in sizes ranging from 100 mm to 300 mm. Water mains installed after 1978 are made of 150 mm, 200 mm, or 250 mm PVC.

Table 1 lists the types and number of clients on the Town's piped water distribution system. With the exception of residential mobile homes, all houses and buildings are on a metered system.

Table 1. Fort Smith's Piped Water Distribution Clients

Client Type	Meter Reading Frequency	No. of Clients
Industrial	Monthly	42
Commercial	Twice Yearly	73
Residential	Three Times Yearly	834
Residential Mobile Home (Unmetered)	None (Flat Monthly Rate)	39

3.1.7 Truck Services

While most buildings are on a piped water distribution system, approximately 68 buildings are serviced by trucks. These buildings are generally located in areas where the piped system is not available (i.e. Bell Rock, between Calder Avenue and Highway No.5, and Carl's Drive).

3.2 Sanitary Sewage System

The sanitary sewage collection, treatment and discharge system consists of the following components:

- Buried gravity collection and force main system;
- Main lift station on McDougal Road;
- Towering Pines Lift Station;
- Frontier Village Lift Station;
- Klondike/Caribou Lift Station;
- Pelican/Primrose Lift Station;
- Primary and secondary sewage lagoons;
- Above ground sewage discharge pipeline into Slave River

3.2.1 Piped Sewage

The buried piped sewage collection system comprises of both gravity sewers and force mains. The gravity system was constructed of asbestos-cement pipes, clay tile pipes, concrete pipes, and PVC pipes, in sizes ranging from

200mm to 300mm. Sewage flows by gravity to one of the five lift stations located throughout the town, as in Section 3.2.2

3.2.2 Lift Stations

Lift station locations are shown in Figure 5. There are two, 200mm diameter forcemains arriving at the sewage lagoon. One carries the discharge from the Main Lift Station; the other forcemain carries the discharge from the Towering Pines and the Frontier Village Lift Stations. Only the Frontier Village Lift Station has a back-up power generator.

3.2.2.1 Main Lift Station

This lift station consists of two Flygt pumps of 47 L/s capacity each. It was renovated in 1992 with new pumps, heating and ventilation system and electrical and control systems.

The Main Lift Station is fed by gravity mains from the adjacent neighbourhood, and also by the forcemains from the Klondike/Caribou lift station, and from the Pelican/Primrose lift station. Sewage from the Main Lift Station is pumped to the sewage lagoon.

3.2.2.2 Towering Pines Lift Station

This lift station, installed in 1984, is a prefabricated Flygt wet well type lift station. The capacity of the pump is 34 L/s. This lift station pumps sewage to the sewage lagoon.

3.2.2.3 Frontier Village Lift Station

This lift station was constructed in 1984 and is a Flygt automatic pumping station. The capacity of each pump is 56 L/s. This lift station pumps sewage to the sewage lagoon.

3.2.2.4 Klondike/Caribou Lift Station

This station has a prefabricated Flygt wet well with submersible pumps. It was originally constructed in 1979, and upgraded in 1997 with the replacement of all equipment with the exception of the wet well and some piping. The capacity of each of the pump is 25 L/s. This lift station pumps sewage to the Main Lift Station.

3.2.2.5 Pelican/Primrose Lift Station

The Pelican/Primrose lift Station has a prefabricated Flygt wet well and was originally installed in 1959. The station was completed renovated in 1989 with two new pumps of 10 L/s capacities each. This lift station pumps sewage to the Main Lift Station.

3.2.3 Trucked Sewage Pumpout

Similar to the water system, some buildings are currently serviced by sewage pumpout trucks. These buildings are generally located in areas where piped services are not available (i.e. Bell Rock, between Calder Avenue and Highway No.5, and Carl's Drive). Trucked sewage is discharged directly into the sewage lagoon.

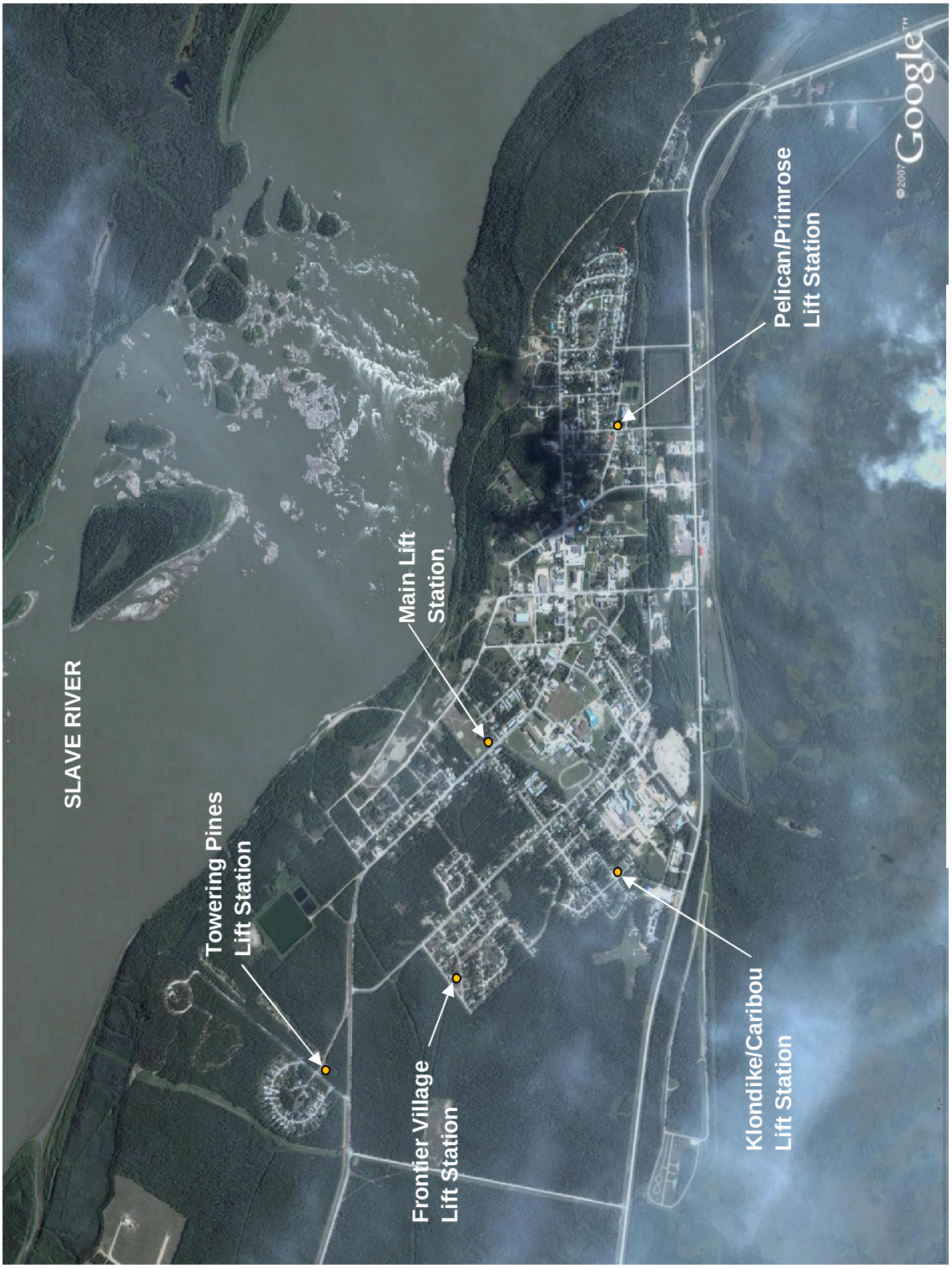

Figure 5 Fort Smith Sewage Lift Station Locations

3.2.4 Sewage Lagoon

The sewage lagoon is located on the northwest edge of the community. The layout of the lagoon is shown in Figure 6.

The lagoon consists of two 50 m x 50 m x 3.85 m (19,250m^3) anaerobic primary cells and one 210 m x 210 m x 1.4m (61,740 m^3) facultative retention pond (secondary treatment). All cells are lined with an impermeable membrane.

Based on current storage volume and a 6-day hydraulic detention time (HTD), the anaerobic cells have a capacity of 3,200m^3/day (19,250m^3 / 6 days). The secondary cell has a capacity of 1,029 m^3/day (61,740 m^3 / 60 days) based on a 60-day HDT.

3.2.5 Sewage Lagoon Discharge Pipeline

Sewage from the lagoon discharges continuously into the Slave River via a 250m long above ground pipeline, at the location shown on Figure 6. The pipeline consists of a 250mm diameter high density polyethylene (HDPE) pipe, insulated with polyurethane foam and protected by a metal jacket.

Figure 6 Site Plan Showing Sewage Lagoons and Discharge Pipeline

3.3 Solid Waste Disposal Facility

The solid waste disposal facility is located approximately seven kilometres west of the town, on the north side of Highway No 5. The layout of the site is shown in Figure 7. The facility is operated and maintained by the Town. Scavenging is not permitted at the site.

The solid waste facility consists of the following components:

- An access road from Highway 5 and access roads within the site;
- A fence surrounding the facility (from the highway to the very back near the ravine) with entrance gate, and an electric fence surrounding the municipal waste site to keep animals out ;
- A site attendant trailer; located at the entrance to the municipal landfill. All vehicles entering the landfill must report to the office before proceeding to the municipal landfill;
- A berm along the east and the west sides of the municipal waste site; forming part of the disposal cell structure for the municipal landfill. The electric fence runs the full length of these berms. Along the east berm the fence is 1.5m high, along the west berm the fence is 1.8m high,
- Groundwater monitoring wells; placed in the landfill in 2001 in response to a request by the Department of Indian and Northern Affairs (DIAND) to monitor potential contaminant migration into the groundwater, as a result of the land farming activities. A total of 16 wells were installed both up-gradient and down-gradient around the site (see Figure 8).
- A burn pit; (approximate area = 270 m^2) is situated adjacent to the west side berm. Combustible materials such as untreated wood, paper, cardboard and brush are burned in this area on a daily basis. Burning is only permitted when the site attendant is present and during appropriate weather conditions.

In June of 1999, as part of the Town's fire abatement program, several areas within the fenced area were cleared for future expansion. A 30-m buffer zone was left standing between the access road and the cleared areas. A portion of this area is now a landfarm for hydrocarbon-impacted soils.

The site is located in a ravine area so that much of the runoff flows to a natural stream discharging at the north end of the landfill, which in turn flows to a wetland before entering the Slave River. The landfill site is underlain by sand, so some of the runoff infiltrates through the sand layer.

3.3.1 Designated Disposal Areas

The site has designated areas (as described below) for different types of waste, as described below:

- Municipal waste: Collected twice per week and on a call out basis by a truck operated by the Town. The Town has a backup truck for emergency use. The waste is compacted and covered on a weekly basis. There is no recycling program for municipal waste. For two weeks in the spring and fall the Town will pick-up residential garbage on a callout basis.

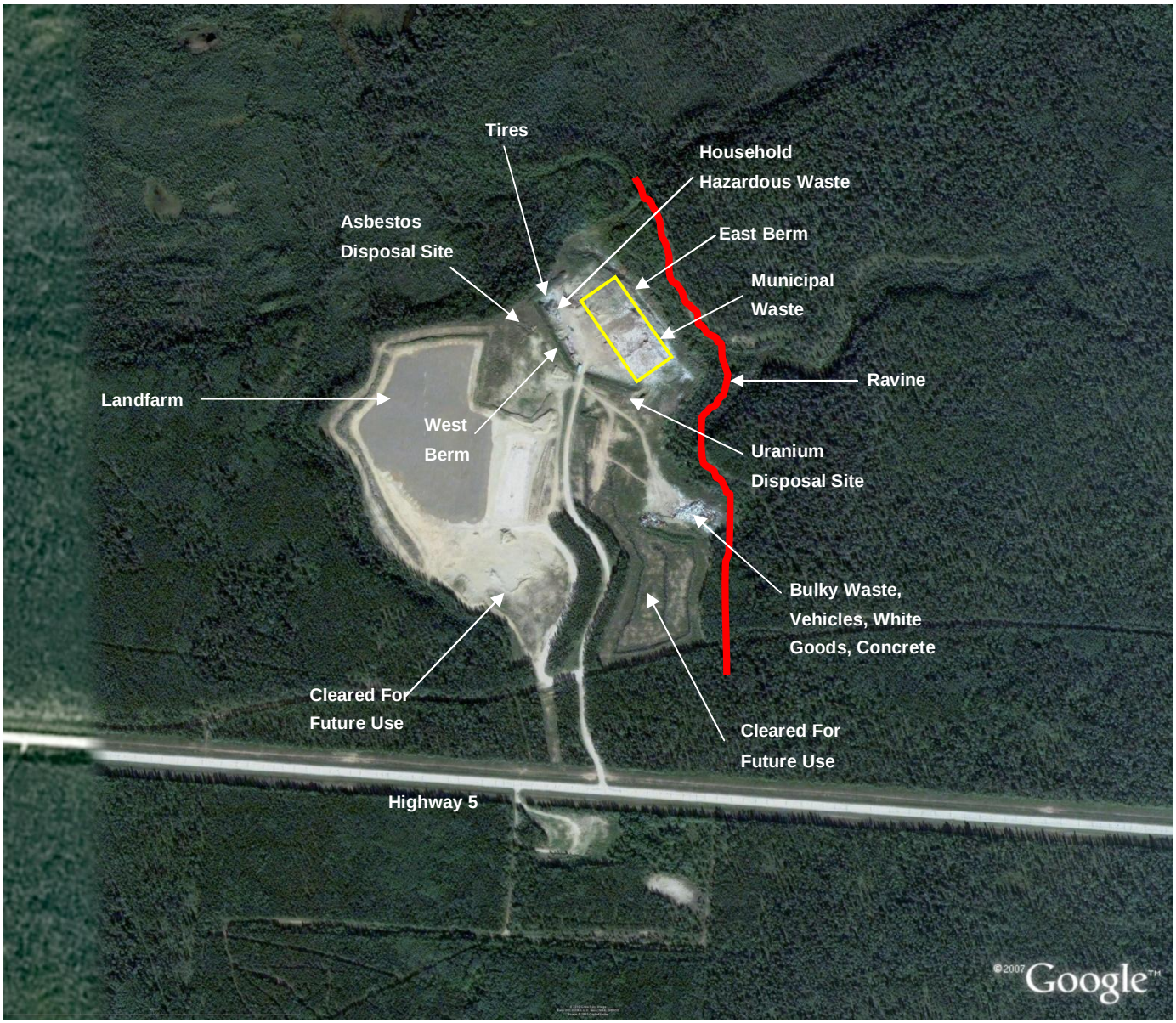

Figure 7 Plan Showing Solid Waste Facility

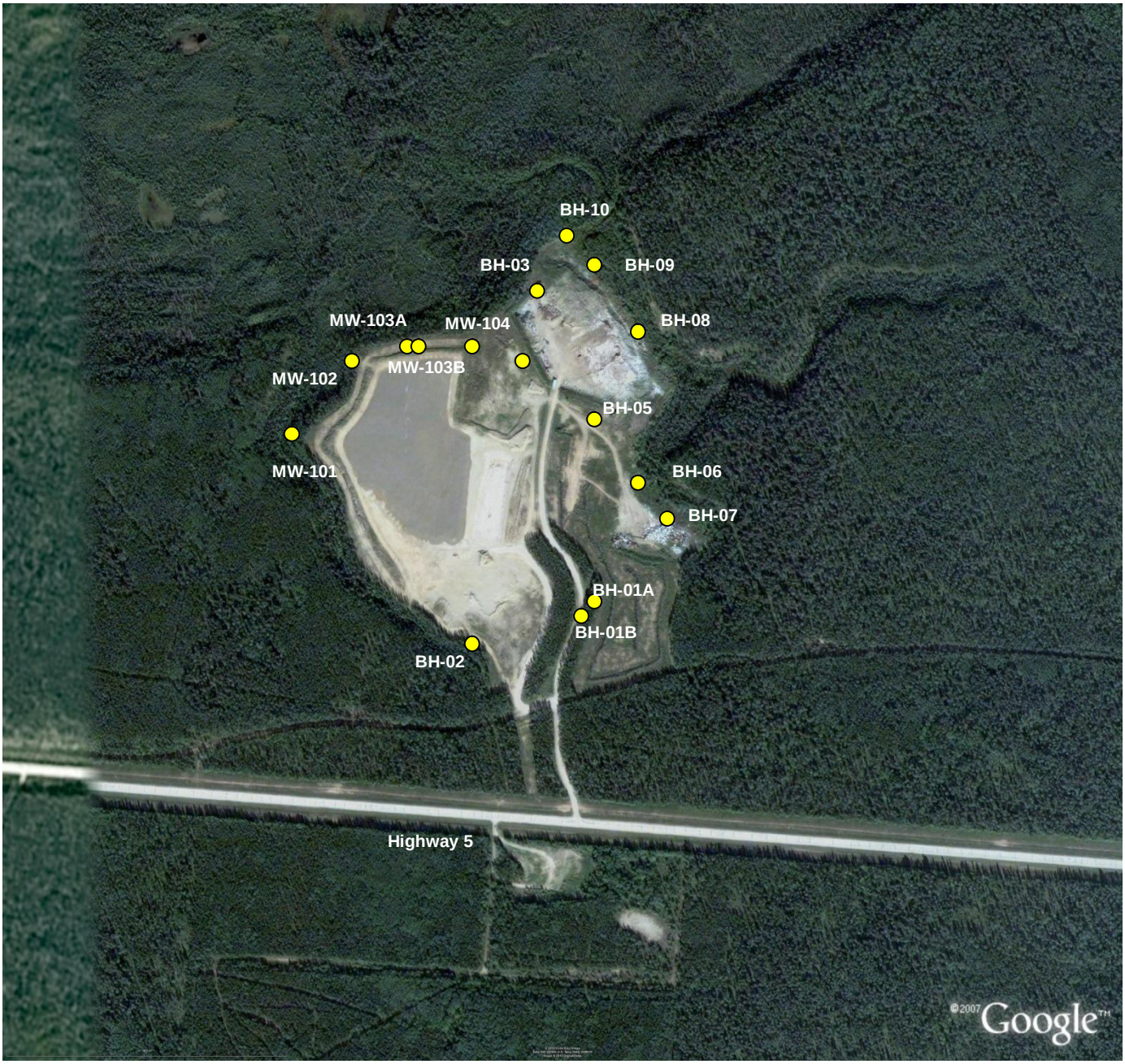

Figure 8 Plan Showing Groundwater Monitoring Wells

- Bulky waste, vehicles and appliances: During October 2008, the Town hired a contractor to crush, remove and transport approximately 430 vehicles to Alberta. In November 2010 the Town crushed approximately half of the appliances, the rest will be completed in Spring 2011.

- Construction and Demolition Concrete.

- Uranium Burial Site: Established in the fall of 1998 by the Atomic Energy of Canada, this area contains uranium contaminated floor materials from Northern Transportation Company Ltd. (NTCL)'s warehouse. The 7 m by 20 m area is fenced with warning signs.

- Asbestos Burial Site: Established in 2003 and located at the far west corner of the landfill is marked with warning signs.

- Landfarm for Hydrocarbon-Impacted Soils: During the spring and summer of 2001, a portion of the area prepared in 1999 for future expansion, was developed by the GNWT Department of Public Works and Services (DPW) into a landfarm for the remediation of hydrocarbon-impacted soils from the clean-up of the Aurora College site. A lined area (45 m x 85 m) adjacent to the landfarm was also constructed for the treatment of soils saturated with hydrocarbons.

  The landfarm had been managed by DPW since it was established. However, it is currently being transferred from DPW to the Town. A separate "Type B" Water Licence application was submitted by the Town in August of 2009 to address the control and operation of the landfarm. As contaminated soil is reclaimed it will be used as cover for the landfill.

- Burn Pit.

- Batteries, House Paint and Paint Containers (household hazardous waste).

- Tires.

The Town hires companies such as Precision North Recycling annually to take away heavy metals, vehicles, appliances, tires and batteries.

4. System Improvements

This section summarizes the operational and infrastructure improvements to the infrastructure since the beginning of the current license term (November 2003).

4.1 Water System

4.1.1 Raw Water Supply System

A comprehensive intake assessment in 2006 revealed that a leak from a deteriorated 4 inch steel pipe going through the wall of the wet well was letting water enter the wet well uncontrolled. The section of pipe was removed and, as it is not required with the current operation, the hole in the wall of wet well was sealed with epoxy in 2007. (See Volume 2, Appendix I)

The section of the above ground raw water supply line from the intake pumphouse up the slope (approximately 270 metres) was rehabilitated in 2006 as part of an initiative by the Town to stabilize the riverbank in the area. The work included re-grading of the entire slope, realigning the water supply line, construction of a new access road, and replacement of the power line.

One of the intake pumps and its pump shaft were completely replaced in 1989. The pump shafts for the other two intake pumps in the intake pumphouse were replaced between 2008 and 2009. A major renovation of this pumphouse is planned in 2012.

4.1.2 Water Treatment Plant

A third filter was added to the water treatment system in September 2008, which increased the water treatment plant's capacity by 33 percent. Two chlorinators were replaced in 2003 and 2004, and a new ultrasonic flowmeter was installed in 2004 on the distribution side to improve water flow measurements.

4.1.3 Water Reservoir

Renovations were completed at the at-grade water reservoir in 2003 and 2004. The work included:

- Internal concrete reinforcing and re-surfacing the exterior with aluminum sheeting (at grade reservoir);
- Installation of a new vent cap to prevent frost built up;
- Installation of new man way hatches;
- Installation of a safe break from vandalism.

The elevated reservoir tank was sand blasted and painted internally and externally, a new fall arrest harness system was installed, and so was a new side access manway.

4.1.4 Distribution System

The water mains on Conibear Crescent were extended in 2009 with a 220m long, 150mm diameter new PVC pipe.

The Town plans to install a booster pump to improve fire flow capabilities at the airport within the next five years.

4.1.5 Trucked Services

The Town currently has one water delivery truck and plans to replace it in 2011.

4.2 Sanitary Sewer System

4.2.1 Piped Collection System

In 2009 and 2010, the Town carried out 16 spot repairs of the sewer mains, and approximately 970m of line replacement to correct deficiencies identified by video inspection. The majority of line replacements were on Conibear Crescent, McDougal Road, Pine Crescent, Wood Bison Avenue and St. Ann's Street.

4.2.2 Main Lift Station

The Main lift station was built in 1958 and had a major rehabilitation in 1991. It is scheduled for renovations again in 2015 with new pumps and control panel. In 2006, it was painted, both inside and outside.

4.2.3 Towering Pines Lift Station

Two new pumps were installed at this lift station in 2009 and 2010. Electrical upgrading was completed in February 2010.

4.2.4 Frontier Village Lift Station

A new roof was installed and minor exterior repairs were completed in 2005. A major rehabilitation is planned for 2011. The project will involve electrical upgrading from single to three phase power and replacement of existing pumps.

4.2.5 Sewage Lagoon

Maintenance of the sewage lagoon involves removal of sludge from the cells and removing cattails every four to five years. This work was last completed in the summer and fall of 2010.

4.2.6 Sewage Lagoon Discharge Pipeline

The discharge pipeline is located within a landslide area on the west bank of the Slave River, immediately north of the Town. It was replaced after a landslide.

The pipeline was completely destroyed by a significant landslide in 2004. Construction of a new pipeline discharge system was completed in 2004 and 2005. The new pipeline was constructed with a new 250mm diameter high density polyethylene (HDPE) pipe insulated with polyurethane foam protected by a metal jacket. The repair work included regrading of the entire slope, installing an anchoring manhole at the top of the slope, installing 250 metres of new insulated HDPE pipe, and installation of a rip rap at the discharge end of the pipe. The site was fenced off after the repair work was completed.

To address unstable ground conditions, two support configurations were used for the new pipeline. The upper support system consists of an I-beam “on edge” structure that cradles the pipe, and anchors it to the upper stable portion of the slide area; the I-beam is in turn supported by wood sleepers resting on the ground. The lower support system consists of wooden sleepers with restraints bolted to each side. (See technical paper in volume 2, Appendix J)

4.2.7 Trucked Sewage

The Town currently has one sewage pumpout truck and a backup truck for emergency use. The Town plans to purchase a new sewage pumpout truck in 2012.

4.3 Solid Waste Facility

4.3.1 Electric Fence

An electric fence was installed within the inner perimeter of the landfill site in 2006, primarily to keep out animals.

4.3.2 Future Expansion

Based on the historical expansion rate at the landfill, it is expected that the site will have sufficient capacity for the next 20 years and possibly beyond. Future expansion is possible in the area identified in Figure 7. Once the hydrocarbon-impacted soil at the landfarm is reclaimed, it can be used as landfill cover material and the area can be used for expansion.

Preparation for landfill remediation following the closure of the active area will commence once the expansion has started.

5. Management Challenges

This section provides a general overview of the management challenges associated with the Town's infrastructure. The list includes those items which have been identified either by the Town, INAC or in previous engineering reports.

5.1 Water System

5.1.1 Water Supply System

The Town's raw water supply pumphouse is located within the Restricted Development Zone and is at risk of damage due to landslides. The rehabilitation work in 2006 has reduced the landslide risk by regrading the slope. A 1989 water quality study of the Fort Smith area indicated that the Slave River is the only viable water source for the community, and because of this, it would be cost prohibitive to relocate the water intake and raw water supply line out of the Restricted Development Zone.

5.1.2 Fuel Storage

Fuel storage for the water treatment plant is stored in one aboveground tank constructed with secondary containment dykes. At the pump station, fuel is stored in the aboveground double wall tank with secondary containment dykes.

5.1.3 Chemical Storage

Chemicals used in the water treatment process are stored at the water treatment plant. All chemicals are stored and handled in accordance with the appropriate regulations and guidelines. The chemicals that are used include:

- PAC-plus polymer;
- Sodium hydroxide;
- Liquid hydrofluosilicic acid (fluoride); and
- Chlorine gas.

5.1.4 Sludge Disposal

The waste tank, located on the east side of the water treatment plant next to the clear well, contains backwash wastewater and clarifier sludge. The contents of this tank, and the sludge removed from the settling ponds at the water treatment plant, are disposed of into the Town's sewer system. The practice of discharging into the Slave River during the summer months was discontinued in 2008.

5.2 Sanitary Sewer System

5.2.1 Lift Stations

The Town's five lift stations all contain two pumps. The capacity of each pump is equivalent to the full design flow rate for that station. If one pump fails, the second pump can handle the flow.

Only the Frontier Village Lift Station has a standby generator. When the power is interrupted to the other four lift stations, sewage collects in the station sump, and eventually backs-up into the collection piping.

In the event of a power outage, the Town has portable equipment to re-distribute the sewage within the system to prevent any sewage from backing up into buildings or from overflowing any manhole.

The Main lift station has an overflow line which discharges to the Frontier Village Lift Station, which has a standby generator and pumps sewage directly to the sewage lagoon.

5.2.2 Sewage Lagoon and discharge pipeline

The sewage lagoon system is operated with the appropriate level of attention from the Town for sampling, sludge removal and cutting cattails every four to five years.

Maintaining the fence around the area of the discharge pipeline is a challenge because it is constantly damaged by people wanting to take a short cut through the area.

5.2.3 Private Sewage Disposal System

There is a discrepancy between the number of buildings receiving trucked water, and those having regular sewage pumpout. It is assumed that the majority of these buildings have their private septic system to treat the sewage. The Territorial Environmental Health Officer for the Fort Smith area is aware of this discrepancy.

5.2.4 Hazardous Waste

The Town does not allow the disposal of hazardous waste into the sanitary sewer system.

5.3 Groundwater Monitoring Program – Landfill Site

In 2001, when the GNWT Department of Public Works and Services (DPW) developed a landfarm at the landfill site, 16 groundwater monitoring wells were installed at the request of DIAND. The 16 wells were collectively labelled "station 567-5" for the purpose of the Surveillance Network Program (SNP). Initially, the collection of groundwater samples from this monitoring station was twice per year (Spring and Fall). Parameters that were measured from station 567-5 included:

- Field Parameters (Temperature, pH, Dissolved Oxygen, and Conductivity);
- ICP-MS Metal Scan (Total);
- Major Ions;
- Benzene, Toluene, Ethylbenzene, Xylene (BTEX);
- Total Volatile Hydrocarbons (TVH);
- Mineral Oil and Grease (MOG);
- Total Extractable Hydrocarbons (TEH).

Following a study by AECOM (then Earth Tech) in 2006, the MVLWB accepted to reduce the number of wells to be monitored from 16 to 11, to reduce the sampling frequency from twice per year to once, and to monitor the following parameters:

- Groundwater elevation,
- pH,
- Sulphate,
- Sodium,
- Chloride,
- Major Ions, and
- ICP-MS Metal Scan (Dissolved).

6. Environmental Studies

Two environmental studies were conducted during the term of the water license. As referenced below:

- Fort Smith Landfill Wetlands Characterization; Submitted by IEG Environmental to the MVLWB on January 7, 2005;

- Groundwater Monitoring Program Evaluation – Fort Smith Municipal Landfill, Fort Smith, NT; Submitted to The Town of Fort Smith by Earth Tech Canada Inc., May 2006.

7. Water Licence Annual Reports and Compliance Inspections

7.1 Water Licence Annual Reports

Copies of the annual reports submitted by the Town are contained in Volume 2, Appendices A - G. The quantity of water use fluctuates between 294,177 to 389,196 cubic meters per year, which is far below the license quantity limit of 600,000 cubic meters per year.

7.2 Water Licence Compliance Inspection Reports

INAC's Water Resources Officer conducts bi-annual inspections of the facilities under the water license. Copies of the reports are contained in Volume 2, Appendix H.

During the current license period the inspections were conducted on the following dates:

- October 20, 2010
- February 24, 2010
- October 28, 2009
- February 18, 2009
- September 18, 2008
- February 13, 2008
- October 10, 2007
- March 14, 2007
- August 2, 2006
- February 15, 2006
- August 3, 2005
- February 23, 2005
- July 8, 2004
- February 18, 2004

7.2.1 Water Supply

The inspection reports indicate that the water supply facilities were all acceptable and no non-compliance items were identified throughout the water license period. The facilities include water intake, storage structures, water treatment plant, chemical storage, pumping stations, flow measurement devices, and distribution lines. The reports include frequent positive comments on the Town's water supply system.

7.2.2 Wastewater and Solid Waste Disposal

The inspection reports indicate that waste disposal facilities were all acceptable, except for two non-compliance items. The first non-compliance item related to elevated fecal coliform count obtained at SNP-2 during the inspection of February 13, 2008. The other non-compliance item related to submission of an updated Operation & Maintenance (O&M) Plan, which was submitted to the MVLWB in 2007.

Table 2. Summary of Compliance Inspection Reports (Waste Disposal)

Inspection Date	Sewage	Solid Waste
October 20, 2010	• Effluent quality sampling at station 567-2 showed all parameters within licence limits.	• The solid waste landfill was being well managed with waste streams being separated by type.
February 24, 2010	• Effluent quality sampling at station 567-2 showed all parameters within licence limits.	• The solid waste landfill was being well managed with an attendant directing waste deposition to the appropriate areas. • All waste is recorded on entry and separated by type, and the facility is fenced to prevent scavenging by animals.
October 28, 2009	• Effluent quality sampling at station 567-2 showed all parameters within licence limits.	• The solid waste landfill was being well managed with waste streams being separated by type.
February 18, 2009	• An effluent quality sample collected during the	• The solid landfill was being well managed with refuse

Inspection Date	Sewage	Solid Waste
	inspection showed all parameters to be within approved license criteria.	separated by type, and waste deposition taking place in an orderly fashion.
September 18, 2008	• An effluent quality sample showed excellent treatment results with all parameters, which were well within the water license discharge criteria.	• The solid landfill was being well managed with refuse separated by type, and dumping occurring in an orderly fashion.
February 13, 2008	• Effluent discharge of fecal coliform counts at 2.2 million/100mL exceeded the water licence threshold of 1 million/100mL. The result was abnormally high so additional duplicate samples were collected on March 10, 2010, and the counts were 1.6 and 1.4 million/100mL respectively.	• The solid landfill was being well managed with refuse separated by type, and dumping is taking place in an orderly fashion.
October 10, 2007	• The new lagoon discharge line continuous to work well, and effluent has not been collected as yet, but Mr. Soucy has been in contact with Environment Canada and is making arrangements to have it shipped to the lab in Edmonton.	• The solid landfill was being well managed with refuse separated by type, and dumping is taking place in an orderly fashion.
March 14, 2007	• No comment was given on the quality of effluent.	• The solid landfill was being well managed with refuse separated by type, and dumping is taking place in an orderly fashion.
August 2, 2006	• At the sewage lagoon the first primary cell was dark grey in color while the second was a little lighter shade of grey, and the large secondary pond was a healthy green color. • No comment was given on the quality of effluent.	• The solid landfill was being well managed with refuse separated by type, and dumping is taking place in an orderly fashion.
February 15, 2006	• The cells of the sewage lagoon were frozen over and covered with snow. • No comment was given on the quality of effluent.	• The solid landfill was being well managed with refuse separated by type, and dumping is taking place in an orderly fashion.
August 3, 2005	• At the sewage lagoon the first primary cell was in the process of being drained and cleaned of sludge, and the secondary pond was a healthy green color. • No comment was given on the quality of effluent.	• The solid landfill was being well managed with refuse separated by type, and dumping is taking place in an orderly fashion.
February 23, 2005	• The cells of the sewage lagoon were frozen over and covered with snow. • No comment was given on the quality of effluent.	• The solid landfill was being well managed with refuse separated by type, and dumping is taking place in an orderly fashion.
July 8, 2004	• The two primary cells of the sewage lagoon were dark grey in color, and the large secondary pond had a healthy green appearance. Lush cattail and sedge growth surrounds all cells, and no evidence of containment berm instability was observed. • No comment was given on the quality of effluent.	• The solid landfill was being well managed with refuse separated by type, and domestic garbage compacted and periodically covered with soil.
February 18, 2004	• All cells of the sewage lagoon were frozen over except for a small section of open water in the center of the first Primary. • No comment was given on the quality of effluent.	• The solid landfill was being well managed with refuse separated by type, and domestic garbage compacted and periodically covered with soil.

7.2.3 Surveillance Network Program

The inspection reports indicate that all samples were collected and all Surveillance Network Program (SNP) records were updated. Figure 9 shows the approximate location of SNP stations.

8. Operation and Maintenance Plans

8.1 Water System

The Town operators follow operational and maintenance procedures as detailed in the document entitled *"Water Treatment Plant Operation and Control Philosophy"*. A copy of this document may be obtained from the Town of Fort Smith.

8.2 Sanitary Sewer System and Solid Waste Facility

An updated O & M Plan for the wastewater and solid waste disposal facilities was prepared by the Town and submitted to the MVLWB in 2007.

Figure 9 Location of SNP Stations