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SUMMER VILLAGE OF NORRIS BEACH (SVNB)

SELECTION AND INSTALLATION OF A WASTEWATER HOLDING TANK

GENERAL GUIDELINES

PURPOSE

This document is intended to offer some general guidelines and suggestions when considering:

- the replacement of an existing wastewater holding tank or existing wastewater treatment field with a new holding tank;
- the installation of a new on-site wastewater disposal system (a holding tank) at a new development.

INTRODUCTION

Current SVNB bylaws do not allow the installation of (new) treatment fields within the Summer Village, thus a wastewater holding tank must be installed at new developments and at existing sites where the existing treatment field and related tankage is deemed ineffective and in need of replacement.

A wastewater transmission system is being planned for the Pigeon Lake area; however it may be a number of years before a wastewater collection system is installed in the Summer Village and connected to such a transmission system. Therefore existing holding tanks (and new ones) must be expected to serve for a number of years (and be emptied by a vacuum truck which delivers to the Mulhurst Lagoon). When a collection system is available a pump will have to be installed in all of the holding tanks and then the tank(s) will be tied into the collection system at the Property Owner's expense. The collection system will be a small diameter "low pressure" type of system, i.e., not a gravity system, thus the need of the pump being installed in the tank when the collection system is in place.

Village residents may hesitate to install a new holding tank thinking that the new tank will not be compatible with the collection system of the future. Such fears are unfounded if a few general guidelines are followed.

GUIDELINES

Location of the Tank

In the case of Norris Beach (back lots) – it has been determined that the collection system piping will most likely be installed in the Reserve properties that exist behind the back lots. *Thus new tanks should be preferably installed in a position that they are in line-of-site of the Reserve without obstructions existing between the tank and the property line. It should be kept in mind the vacuum trucks will not be allowed, now or in the future, to access the Reserve to pump a holding tank.*

Again, in the case of Norris Beach, for the lots that do not back onto a reserve (such as those on Marine Drive, 6th Street or the lake front lots) their collection system piping will be located in the right-of-way of the front street thus new tanks should be installed in close proximity to the front street.

Directional drilling technology, which prevents the need of lengthy and deep open excavations, will be used to the degree possible for the installation of the wastewater collection piping on municipal property. Directional drilling is also an effective way for residents to complete connection to the collection system with minimal disturbance to their property. Directional drilling equipment will drill a hole and then pull the plastic collection piping into the same hole. Open excavations (bell holes) will be required at the locations where the homeowner's piping meets the tank and the collection line. Directional drilling can go under buildings, around buildings and target the final location with great accuracy. However, for future maintenance and cost reduction the target (in this case the holding tank) should be as close as possible to the future municipal collection system piping to reduce the drilling cost. The current estimate for directional drilling is approximately \$30 to \$40/metre not including pipe, fittings, cost of bell holes for the connections and the piping connections themselves.

Type of Holding Tank

If the collection system was being installed tomorrow there would be no need of a holding tank. Rather a cistern type of tank (i.e. a dedicated pump basin/vault) could be installed only for the purpose of holding the wastewater delivery pump and would not have a large storage volume. However, in the meantime, a large holding tank is required to satisfy the existing storage requirements of the property. The advantage of this large holding tank, now or in the future, is it provides an emergency storage capacity far beyond the cistern type of (small) storage in the event the future collection system has a service interruption.

The following is recommended:

- A holding tank with compartments and baffles be installed, rather than a tank with no internal compartments. The advantage of this type of tank is it will enable a conventional submersible pump being installed in the last chamber, which becomes the pump chamber/vault, rather than a grinder pump. Close tolerance grinder pumps have a history of being difficult and costly for the homeowner. The disadvantage of this compartmentalized type of tank is that the first compartment(s) will require periodic pumping using a vacuum truck to remove the solids even when the collection system is in place. Pumping intervals can range from 2 - 6 years if the tank is sized by current standards and is dependant on the home's occupant load. Thus the need for the tank being accessible now or in the future. (Note that a single compartment tank could be used in future however a filtration screen package will likely be required to prevent solids entering the small diameter collection system, and this will require additional maintenance.)
- The tank should have a 24-inch unobstructed manhole access opening which will accommodate the future installation of a pump, piping and instrumentation.
- Consideration be given to the purchase and installation of a one-piece holding tank that minimizes the use of seams or bonds on the vertical or bottom edges.
- Consideration be given to pre-plumbing the inside and outside of the tank to prepare for the future installation of a pump thus reducing the need of entering the tank in the future. Exit piping from the tank would be 35 mm (1.5 inch) minimum for the low pressure system of the future.
- Loading conditions must be considered. For example, the tank must not be subject to external loads or vehicle traffic.
- Consideration be given to the need of electrical leads for the future pump. A dedicated electrical circuit will be required for the pump and an independent circuit will be required for an alarm system. All wiring conduits shall be water and gas tight.

Owners of existing treatment fields may consider converting an existing septic field tank system into a holding tank configuration. In this case the owner should consider that:

- the resulting size of storage volume is unlikely to economically serve the purpose;
- all tanks will require inspection and testing to confirm their integrity;
- the siphon tube will require removal and the exit to the field plugged.

Size of Holding Tank

The size of a holding tank can only be determined by the homeowner; however a 6,800 L (1,500 Imp. gal) holding tank serves the majority of family homes with balance between tank cost and wastewater hauling costs. The referenced Standard of Practice requires a single family dwelling to have a holding tank storage capacity of *not less than* 4,500 L (1,000 Imp. gal). Some residents have installed two tanks (side by side) in order to satisfy their personal requirements. Regardless of tank size, water conservation equipment such as low flush toilets is highly recommended.

Type and Size of Pump

The type and size of pump do not have to be decided at this time. This will be determined by future engineering.

REGULATORY REQUIREMENTS for Holding Tanks

Note this is not a complete list of the regulatory requirements. Please refer to the referenced Standard of Practice and the Municipal Land Use Bylaw.

The installation of a wastewater holding tank requires that:

- A development permit must be obtained from the Summer Village;
- The installation must be made in accordance with the *referenced "Alberta Private Sewage Systems Standard of Practice 2009"*;
- The referenced Standard of Practice requires a single family dwelling to have a storage capacity of *not less than* 4,500 L (1,000 Imp. gal);
- The installation must be made by a certified installer who has a PSDS ticket. The Village Office or the Municipal Affairs web site can supply a list of certified installers;
- The holding tank shall be designed and manufactured in accordance with the referenced CSA B66-05 Standard and shall be certified by an accredited testing agency;
- Holding tanks be constructed of concrete, fiberglass reinforced polyester or polyethylene;
- All grey water (sinks, showers, etc.) must be plumbed to the holding tank;
- A holding tank that has less than 1.2 m (4 ft.) of earth cover to protect it from freezing conditions shall be insulated to provide the equivalent of R-8 insulation value at the top and sides of the tank to a minimum depth of 1.2 m (4 ft.) below grade OR insulated in some other acceptable manner to achieve a level of protection from freezing that is equivalent to a tank that has a minimum 1.2 m (4 ft.) cover of the in situ soil;
- All tank access openings shall be equipped with a secure lid or cover to increase safety and prevent accidental entry. All manhole access openings shall be properly insulated to R8 insulation value;
- All manhole access openings shall be brought above grade – they cannot be buried.
- Above grade tank access openings shall be located at a height above the surrounding landscape that ensures surface water will drain away from the access openings;
- Where high ground water conditions are identified at the location and elevation, the design of the system shall address:
 - anti-flotation measures required;
 - the ability of the tank to withstand structural stresses caused by hydrostatic pressure and buoyancy, and
 - maintaining the elevation of piping connections above the projected water table to ensure no infiltration.
- The completed new installation must be inspected by a Safety Codes Officer.

- The Standard of Practice requires that holding tanks shall not be located within:
 - 10 m (33 feet) from a water source;
 - 10 m (33 feet) from a water course;
 - 1 m (3.25 feet) from a property line (3 m preferred to accommodate maintenance and upgrading);
 - 1 m (3.25 feet) from a building, (3 m preferred to accommodate maintenance and upgrading).

REFERENCES

1. Wastewater Collection System Concept Design Study (for the Summer Village of Norris Beach) conducted by Associated Engineering.
2. Alberta Private Sewage Systems Standard of Practice 2009 published by the Alberta Safety Codes Council (available from the Alberta Learning Resources Centre)
3. Alberta Onsite Wastewater Management Association (AOWMA) (see their website)
4. National Standard of Canada – CAN/CSA-B66-05 “*Design, Material, and Manufacturing Requirements for Prefabricated Septic Tanks and Sewage Holding Tanks*”
5. *Bylaw No. 73, A Bylaw of the Summer Village of Norris Beach, in the Province of Alberta, to Control Land Use Planning and Development*