

Wastewater Treatment System Overview

Crestfield Drive, Residential Development (Hammonds Plains, Halifax, NS)

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Proposed Treatment System Overview

Crestfield Drive Residential Development

BACKGROUND INFORMATION

The proposed system is required to facilitate the construction of four multi-unit townhomes and one apartment complex and one recreation complex/guest home unit on Crestfield Drive as proposed by Bower Construction.

CONFIGURATION OVERVIEW

The preliminary system design assumes that raw sewage will flow from new sanitary lines to primary stage treatment tanks. This compartment includes a filtered STEP pump system that will transport primary effluent, through a small diameter effluent sewer, to the secondary treatment system primary tankage.

Primary effluent would flow by gravity, through this primary tank effluent filter, into the AdvanTex recirculation/blend tank where it will be recirculated on a timed and intermittent basis through the AdvanTex AX100 packed-bed textile filters. A portion of this effluent will drop into the discharge tank during each recirculation sequence. Periodically, on either a demand or timed sequence, treated secondary effluent will be discharged by pump through the flow meter to the soil dispersal system.

KEY CONSIDERATIONS AND SCOPE

The general requirements for system design, construction and operation include:

1. The system is designed to accommodate maximum peak and average loading from the primary stage treatment as outlined below:

Expected Average Loading Limits:

Avg. Flow: 23,505 LPD (6,210 USGPD)

Peak Loading Limits (on a rare or intermittent peaking occasion):

Peak Flow: 47,010 LPD (12,420 USGPD)

2. Wastewater will be treated through primary settling and secondary aerobic treatment processes before discharging by pump on a timed and intermittent basis to the soil bed.
3. The treatment system will be required to function reliably in the northern maritime coastal climate of Halifax, NS, operating 24 hours per day and 365 days per year.

4. All system components shall be designed to function appropriately in all seasons of the year including cold weather and freezing conditions.
5. All system components shall be made of corrosion resistant materials designed for the application environment and will be engineered and installed such that they are readily accessible for removal, inspection, maintenance and/or repair as required.

PRELIMINARY DESIGN RATIONALE

Site constraints necessitate the use of a proven system with a relatively small footprint. Orenco's AdvanTex treatment systems include these characteristics and have been used extensively for onsite treatment in Atlantic Canada for over 20 years. More recently, over the past few years, the AdvanTex technology has been utilized in similar applications for several local residential developments including:

- 10 Beaches Subdivision - 80 mini-homes in Hubbards, NS
- Seven Lakes Development - 100 home 1st phase of 600 home project in Porters Lake, NS
- Forest Lakes Community – Three residential single-family home and multi-unit developments for 50-100 units each in Hants County, NS
- Conquerall Bank, MODL - Treatment upgrade for 70+ homes in Riverside & Shore Drive Subdivisions in Bridgewater, NS
- Meadow Ridge Development - 24 homes, first Phase of potential 100 home development in Sackville, NS
- Voyager Lake Pinto Place - 43 townhomes with effluent sewer and AdvanTex Halifax, NS

The preliminary treatment system design for Crestfield Drive utilizes Orenco's AdvanTex AX100 modular, textile, secondary treatment technology followed timed and intermittent soil dispersal as supplied locally by Atlantic Purification Systems Ltd. (APS). The design rationale for equipment and sizing, as well as key features of the AdvanTex treatment system, and ancillary components, will be detailed at the design stage.

ADVANTEX PACKED BED TEXTILE FILTER TREATMENT TECHNOLOGY

The AdvanTex textile treatment system modules are packed bed, passive filtration and biological treatment systems that incorporate several attractive performance and maintenance design features that include:

- Textile filters have very high loading rates resulting in a footprint that is several times smaller (10-20 times smaller) than traditional sand filter treatment options.
- Modular technologies come fully assembled and ready for connection to the treatment system so on-site construction activities are minimized.
- The filter configuration is also modular allowing users to minimize the initial system configuration and add additional filters as required to achieve any desired treatment capacity level.

- The textile filter material is also readily accessible for inspection and maintenance through retracting covers and can easily be cleaned with a hose and hot water if the material is ever fouled or overloaded. Periodic inspection of the system facilitates advance notification of any pending issue with the treatment media before it ever becomes a major issue.
- The on-going operating costs of AdvanTex systems are significantly lower than traditional extended aeration or activated sludge processes as AdvanTex utilizes passive septic system processes to treat sewage.

AdvanTex domestic treatment systems of this nature are producing effluent qualities in the range of 5/5-30/30 mg/l of BOD/TSS depending on the treatment requirements and media surface area utilized in the design. Third party and NSF testing on the AdvanTex treatment system provided results in the order of 5/5 mg/l of BOD and TSS or lower on residential domestic sewage.

SOIL DISPERSAL SYSTEM

Treatment system effluent disposal is site dependent. In this case we are assuming that the high-quality effluent can be discharged to an approved subsurface dispersal system as per the design information noted below. Given the high-quality secondary effluent and the approved bed configuration, disinfection is not expected to be required by NSE.

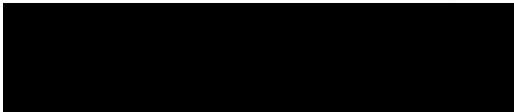
The dispersal bed has been selected based on soil characteristics and the underlying soil horizons that can impact the vertical and horizontal flow of effluent once in the soil. The size of the area required for dispersal is application specific and very dependent on the site soils and topography.

For subsurface dispersal/disposal applications, Advantex and other secondary pre-treatment systems are typically afforded higher loading rates as they apply high quality secondary wastewater effluent (30-30 mg/l BOD & TSS and lower) to the soil. Since modern secondary treatment processes can virtually eliminate most of the BOD and TSS before the effluent is applied to the soil, the full treatment capacity of the soil, microbes, fungi and plant roots is made available to address everything else in the wastewater including nutrients such as nitrogen & phosphorus, and emerging contaminants.

We believe the system as presented is ideal for the site constraints and it is well suited to address this development. If you have any questions or concerns with respect to the information provided, please contact me directly at the coordinates noted below.

Regards,

Servant, Dunbrack, McKenzie & MacDonald Ltd.



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