ONSITE
WASTEWATER NEWS
ONTARIO ON-SITE WASTEWATER ASSOCIATION NEWSLETTER

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Technical Review
Doug Joy

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The Effluent Filter — What Role Does it Play in a Sewage System? — by Terry Davidson

The effluent filter plays many roles in the successful treatment and disposal of wastewater and the following is a brief explanation of these different roles.

The three keys to proper onsite wastewater disposal is proper design, installation and maintenance. I suggest that if regulators and contractors follow the rules, proper design and installation takes place a large percentage of the time. However, it is the third key to proper onsite wastewater disposal that often gets ignored (i.e., maintenance). The decision to service a system, that is, to determine if and when it should be serviced, is usually left to the homeowner. This is the only part of the on-site wastewater program that is dependent on the knowledge of a non-professional (i.e., most homeowners). Such dependence on the homeowner for service of the on-site wastewater system is the greatest contributor to the reluctance of local and provincial governments to entertain arguments supporting the viability of onsite wastewater systems as economical alternatives to sewer systems.

Homeowners can actually do three things that negatively affect the performance and life span of their onsite wastewater system. First, they put things down the toilet that don't belong, secondly they hydraulically overload the system, and thirdly, they only perform system maintenance when the system backs up.

One answer to the requirement for regular system maintenance is the requirement for effluent filters in all onsite wastewater systems. If the homeowner discards inappropriate material in the tank, the filter keeps it in the tank. Secondly, if the homeowner hydraulically overloads the system, the filter protects the soil absorption field by not allowing solids to be carried over by the excess flow. Finally, if the homeowner has maintenance performed only when the system backs up, the filter will protect the soil absorption field.

To understand how an effluent filter does these things, we must know certain wastewater characteristics. Organic materials in wastewater is measured as biological oxygen demand (BOD) and suspended solids (SS). This organic material, if not removed in the septic tank, becomes food for microorganisms in the soil absorption field. The more organic food for these organisms, the more slime (i.e., biomat) they produce. As wastewater is added over time to the soil absorption field, infiltration rates decrease which eventually leads to failure of the soil absorption field.

If effluent filters are installed, BOD and Suspended Solids are reduced which requires the soil to do less treatment than if unfiltered septic tank effluent were applied to the soil. This results in reduced soil plugging and thereby extends the service life of the soil absorption field.

Another area where effluent filters can play a major role is for grease produced in a restaurant application. Most restaurants use an internal grease trap that are usually undersized and/or poorly maintained. Also, the use of degreasers and super heated water keeps the grease emulsified through the grease trap and possibly through the septic tank. Grease can clog the soil absorption bed quickly.

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Frequently Asked Questions — About Sewage Systems and the Building Code

Q ▸ How often should the septic tank be pumped?

A ▸ Section 8.9.3.4.(1) of the OBC states "Septic tanks and other treatment units shall be cleaned whenever sludge and scum occupy 1/3 of the working capacity of the tank. The interval between required cleaning is highly variable and will depend on factors such as volume and type of waste entering the septic tank and tank size.

Q ▸ When establishing residential design flows concerning the finished area, what, if any areas (closets, hallways, foyers, basements, etc.) can be omitted from the calculation?

A ▸ The total area of each floor above grade, measured to the interior face of the outside walls, less the openings to the floor below, but including stairs and landings are to be used in the calculation of design flow.

Q ▸ How do you decide if the floor is considered a basement or a first storey?

A ▸ The OBC has 3 definitions that help at arriving at such a determination. These are as follows:

FIRST STOREY means the storey with its floor closet to grade and having its ceiling more than 1.8 m (5 ft 11 in) above grade.

GRADE means the average level of proposed or finished ground adjoining a building at all exterior walls.

BASEMENT means a storey or storeys of a building located below the first storey.

Membranes in Wastewater Treatment — by Anna Crolla

Since their development membranes have always been recognized as a technology that could have wide application for the treatment, remediation, recovery and further processing of waste streams. Membranes have traditionally had a place in drinking water purification, including reverse osmosis for the desalination of seawater, nanofiltration for water softening, ultrafiltration for the removal of viruses and emulsions, and microfiltration for the removal of Cryptosporidium, Gardia, bacteria, iron and manganese. Membranes may also be used in municipal treatment plants to replace typical clarifiers and tertiary filters. Because membrane systems are highly effective in wastewater treatment there may be a role for membranes to be integrated into on-site wastewater treatment systems.

An example of this integration is the ZenoGem®/Cycle-Let® System developed by Zenon Municipal Systems Inc., Ann Arbor, Michigan. This system processes the wastewater through a series of steps achieving tertiary treatment. The treated wastewater can then be used as flushwater in toilets or any non-potable application. The wastewater is first collected in a storage tank that provides gross solid retention and grit removal. The system then passes the wastewater through two treatment modules: a combined biological treatment and membrane microfiltration module that provides anoxic and aerobic treatment. The final step in the system is a UV disinfection process.

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For information and registration, contact
- Remo Petrongolo, University of Guelph
  phone: 519-824-4120 ext. 3064
- Doug Joy, University of Guelph
  phone: 519-824-4120 ext. 3048

Letter to the Editor

Dear Sir/Madam

The 2001 building season marks the pinnacle of my frustration with the sewage system industry in Ontario. As a current regulatory inspector under Part 8 of the *Ontario Building Code* (OBC) and former wastewater consultant and installer, I feel that I possess a somewhat unique perspective on this industry.

This perspective has allowed me to see the growing level of hypocrisy and neglect of duty of design consultants, installers, regulators and policy makers. Perhaps it is time to review our respective roles in this industry and remind ourselves of our ultimate goal: to achieve a professional onsite wastewater treatment industry that is as respected as any other building trade.

As such, I have prepared a summary of the key roles of industry members for reflection and consideration:

Design Consultants

The role of the design consultant is to provide their client with the most appropriate design given such factors as site conditions, access, and cost. It is also the consultant's role to educate the client on the importance of a properly designed and installed onsite wastewater system and to provide advice on operation and maintenance requirements.

To fulfill this role, the consultant must be familiar with all pertinent technologies at their disposal and ensure that the client is made aware of these. If the consultant fails to provide the client with enough information in which to base an informed decision on the appropriate treatment option, then they have failed that client.

The Installer

The role of the installer is to construct the on-site wastewater treatment system to the specified design tolerances using appropriate materials, aggregate and good construction practices. The installer's role is also extended to that of the design consultant in cases where the installer becomes the designer also.

The installer must be competent in the construction of all onsite wastewater treatment systems approved in the OBC. If the installer finds that they lack the competence to either design or install a particular system whether conventional or otherwise to the necessary OBC regulations and design tolerances, then they must either upgrade their skills, or inform the client of the situation. The client must be allowed to make an informed decision; it is the client who must rely upon the treatment system long after the installer has left the site.

The Regulator

The role of the regulator is to ensure that the best available technology is utilized in any given instance and to conduct all aspects of the regulatory approvals process with fairness and consistency. As such the regulator must be as familiar with the site conditions and available technologies as the design consultant and must be as familiar with the appropriate construction practices as the installer. Ultimately it is the regulator's role to protect public health and the environment-now and in the future.

The Policy Maker

It is the role of the policy maker to promote the protection of our natural resources by enacting and maintaining legislation that reflects such a policy. All regulations must constantly be reviewed for their appropriateness and must also be amended should changes be necessary. It is in this review process that the policy maker must not fail; they must not be concerned more with building bureaucracy than with the enforcement and regulation of on-site wastewater treatment systems.

In short, it is our duty as members of the on-site wastewater treatment industry to review our roles, and those of our colleagues, in order to do our jobs competently.

Robert A. Passmore
Part 8 Inspector

Ontario On-site Wastewater Association —
Sub-Committee Update September to November 2001

The Ontario Onsite Wastewater Association has four sub-committees actively working on behalf of its members. Recently, a questionnaire was mailed out to solicit member's input for upcoming projects. About one quarter of the membership responded, providing valuable direction for the sub-committees to take into consideration.

The surveys indicated that there is a strong desire to see OOWA act as a resource/information hub for the membership and the public. The public relations committee recognizes the importance of expanding the oowa.org website to include some type of forum, 'Frequently Asked Questions', information pages and links. They will be presenting a proposal at the Board of Directors meeting in December, along with the outline of a new and improved septic system care booklet for homeowners (in cooperation with other agencies) and a draft "who and what is OOWA" pamphlet for distribution to prospective members and the public.

Expanding on this initiative, the membership committee, responsible for attracting new members and providing services to current ones, will participate in the aforementioned website improvements. They have arranged for a booth to be at the OASIS annual conference in November, attended by Doug Joy and Tom Musgrove. In addition, the committee is in the process of arranging OOWA introductory presentations across Ontario. This is intended to be the first step in creating local geographical chapters. If you would like to participate or know a region with interested parties, please contact Jocelyn Chandler.

The research committee is considering the many suggestions sent in by members to determine what projects they should initiate. Finally the government relations committee received a very good indication on where the membership stands in regards to re-certification of installers and septic inspectors, as well as a range of comments on how tertiary sampling and testing should be managed. They have concluded that OOWA should act as a facilitator and thus are proposing to arrange a roundtable meeting in January with various stakeholders to discuss these issues. A copy of the survey results is available on oowa.org. A final note; input and comments from members are always welcome and will be relayed to the appropriate people. Jocelyn Chandler at 1-800-459-5975 ext.137 or jchandler@rideauvalley.on.ca.

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The microfiltration step is highly effective in removing a large percentage of the suspended solids and microorganisms, which ultimately reduces the build-up of deposit on the UV lamp, therefore increasing the effectiveness of disinfection. The effluent water from this system has an average TSS of 2 mg/L and a faecal coliform count of <3 counts/100mL (Innovative and Alternative On-site Wastewater Treatment Technologies Handbook by Eric Winkler, University of Massachusetts Amherst, August 2000, p. 3–39). This system is suited for large wastewater volumes, for example from small shopping centres (strip malls), golf courses, housing complexes, etc.

Membranes are an effective filtration system that can be added to conventional treatment systems to greatly enhance the treatment process. With their relatively higher capital cost though, the economics of such components become favourable when larger volumes of wastewater are processed. With increasing research and technology transfer being conducted in the field of membrane filtration, the costs associated with these components are decreasing.

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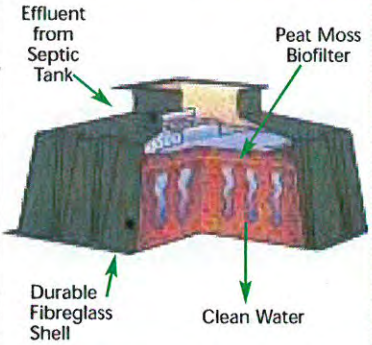

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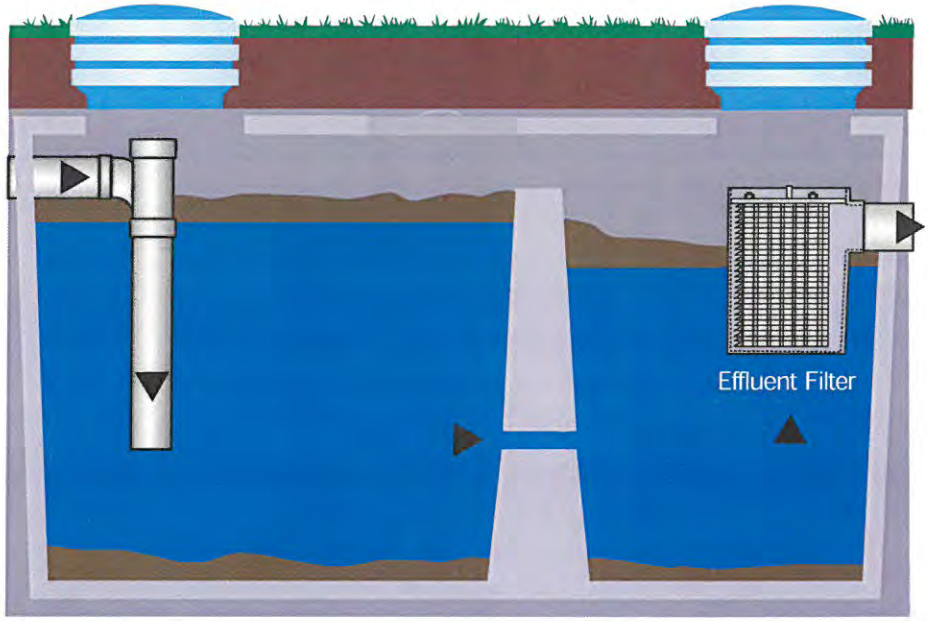
continued from page 1

One common type of effluent filter uses disc dam filters which provide settling plates, plus weirs to achieve high performance in higher strength wastes at larger flow rates. Another common type is a slotted filter which promotes sloughing of material back into the tank. Also, common tube type filters are designed to slough off material the same as a slotted filter.

Two or more filters of the same kind may be installed to increase daily flow capacity or to increase the interval between servicing for the recommended flow capacity.

Ultimately, the result of installing effluent filters is more profit for the installer, but it will also improve the effluent quality being discharged to the environment. Therefore, we should look forward to the regulations being amended to require effluent filter installation on all new on-site wastewater systems; to do anything other wise is turning our back on the Environment.

In summary, it's only fair to the homeowner and the environment to consider all aspects of the sewage system design and performance so that the best possible system will be installed on any given lot. With the effluent filter being inexpensive insurance for any on-site wastewater system, why would you not install one?



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▶ On-Site System Inspection, Troubleshooting and Remediation	March 27, 2002
▶ Alternative Technologies	March 27, 2002
▶ Design of Communal On-Site Wastewater Systems	March 27, 2002
▶ Agricultural Wastewater Treatment	March 27, 2002
▶ Introduction to Soils for On-site Technologies — Soils 100	April 12, 2002
▶ Evaluation of Soils for On-site wastewater technologies — Soils 101	April 19, 2002
▶ Field Inspection of On-Site Wastewater Systems for Home Inspectors	April 25, 2001

Eastern Ontario Courses — Kars ON	Date
Installer and Regulator Courses	
▶ Installer & Inspector OBC Certification Course	January 7 to 10, 2002
▶ Alternative Technologies	January 17, 2002
▶ On-Site System Inspection, Troubleshooting and Remediation	February 13, 2002
▶ Pumps and Controls	March 6, 2002
▶ Introduction to Soils for On-site Technologies — Soils 100	April 3, 2002
▶ Evaluation of Soils for On-site wastewater technologies — Soils 101	April 10, 2002
▶ Field Inspection of On-Site Wastewater Systems	April 17, 2001

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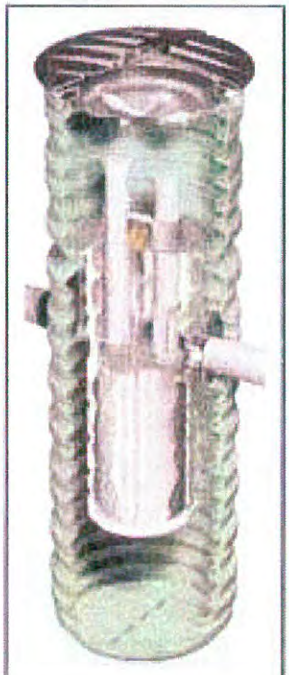

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