

**BUILDING MATERIALS EVALUATION COMMISSION  
(BMEC)  
CONSOLIDATED - AUTHORIZATION REPORT**

<b>DATE OF AUTHORIZATION</b>	<b>January 27, 2000</b>
<b>BMEC AUTHORIZATION</b>	<b>BMEC # 00-01-241</b>
<b>BMEC Application</b>	<b># A 1999-11</b>
<b>BMEC AMENDMENT</b>	<b>July 27, 2000</b>
<b>BMEC Application</b>	<b># A 2000-11</b>
<b>BMEC AMENDMENT</b>	<b>February 28, 2002</b>
<b>BMEC Application</b>	<b># AR 2001-18</b>
<b>BMEC AMENDMENT</b>	<b>June 27, 2002</b>

\* Denotes a new or amended clause

**CLEARSTREAM ALTERNATE TERTIARY DISCHARGE SYSTEM**

<b>1. Applicant / Manufacturer</b>	<b>2. Manufacturing Facilities</b>
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**3.\* Description**

The Clearstream - Alternate Tertiary Discharge System consists of a septic tank connected to a 500N, 600N, 750N, 1000N or 1500N Model Clearstream Treatment Unit referenced in the Supplementary Guidelines to the Ontario Building Code 1997 as meeting the tertiary effluent quality criteria and which deliver effluent to an absorption system other than a leaching bed as referenced in Article 8.6.1.2. of the Ontario Building Code ("OBC").

The system requires influent sewage pretreatment in a standard two-compartment septic tank equipped with an effluent filter to screen out particles larger than 3.2 mm. Effluent from the septic tank flows to the Clearstream Treatment Unit, then passes through either a free access sand filter, a Model CS -1100 Effluent Filter or other filter that at minimum screens out particles larger than 100 microns. The filtered effluent then flows to an absorption system consisting of a layer of stone overlying a layer of sand as described in the Specific Terms and Conditions below. All below ground structures meet the 'General Requirements for All Tanks' as specified in the "CAN/CSA-B66-M90" Standard.

#### **4. Authorization requested**

The Applicant seeks to have the Clearstream - Alternate Tertiary Discharge System, incorporating a treatment unit meeting the tertiary effluent quality criteria referenced in Table 8.6.2.2.A. of the OBC, authorized for use as a Class 4 System connected to an absorption system other than the leaching bed referred to in Article 8.6.1.2. of the OBC.

#### **5. Assessment**

The Clearstream - Alternate Tertiary Discharge System incorporates a treatment unit meeting the tertiary effluent quality criteria referenced in Column 3 of Table 8.6.2.2.A. of the OBC, connected to an absorption system other than a leaching bed as referred to in Article 8.6.1.2. of the OBC. Reports and assessments provided, demonstrate that if constructed, installed, operated, maintained and monitored in accordance with the manufacturer's specifications and the conditions stated in this Authorization, the Clearstream - Alternate Tertiary Discharge System will provide a level of performance equivalent to that of a Class 4 Sewage System. .

Reports submitted and reviewed:

1. Clearstream Systems Owners Manual, Models 500N, 600N, 750N, 1000N, 1500N.
2. Branch Opinion letters relating to Ecoflo, ® ST-650 Biofilter System dated June 5th, 1998 and Waterloo Biofilter System, dated September 21, 1998.
3. CAN/CSA-B66-M90 - Prefabricated Septic Tanks and Sewage Holding Tanks, Plumbing Products and Materials - a National Standard of Canada.
4. Universal Laboratory, Inc., Garland, Texas, Test # 17158 dated 5-8-92.
5. Letter approving Models 500N, 600N, 750N, 1000N and 1500N from the Municipal Engineer, City of Colwood, File 6.1.2(a) dated May 19, 1995.
6. Letter approving Models 500N, 600N, 750N, 1000N and 1500N from Environmental Health Protection Services, Ministry of Health, Province of British Columbia dated October 6, 1994.

7. Gast Oilless and Lubricated Compressors Report.
8. Report of NSF International on Evaluation of Clearstream Wastewater Systems, Inc. (Model 500N) under provisions of NSF Standard No. 40 and dated August, 1991.
9. Universal Laboratory, Inc., Garland, Texas, Test # 24341 dated 6-6-97 and Certification of test by D. Greenfield, P.Eng., dated August 17th, 1999.
10. ASTM D 4021-92 Standard Specification for Glass-Fiber-Reinforced Polyester Underground Petroleum Storage Tanks.
11. NSF International Evaluation Report of Clearstream Wastewater Systems, Inc. Model 500N and Clearstream Wastewater Systems, Inc. Model 500N with a Clearstream Model 1100 Effluent Filter, under the provisions of ANSI/NSF Standard 40 and dated October 1999.
- \* 12. NSF International Evaluation Report of Clearstream Wastewater Systems, Inc. Model 500N and Clearstream Wastewater Systems, Inc. Model 500N with a Clearstream Model 1100 Effluent Filter, under the provisions of ANSI/NSF Standard 40 and dated November 1999.
- \* 13. The '*Continuing Maintenance Manual*' which lists the maintenance items to be conducted on the Clearstream - Alternate Tertiary Discharge System every six (6) months.

## 6. Authorization

- \* The Clearstream - Alternate Tertiary Discharge System incorporating;
- 1) a septic tank,
  - 2) a Clearstream Treatment Unit approved in the Supplementary Guidelines to the Ontario Building Code 1997 as meeting the tertiary effluent quality criteria in Table 8.6.2.2.A. of the OBC, and
  - 3) a free-access sand filter or a Model CS -1100 Effluent Filter or another filter that at minimum screens out particles larger than 100 microns;

is authorized for use as a Class 4 sewage system that may be connected to an absorption system other than a leaching bed as required by Article 8.6.1.2. of the OBC, when designed, installed, operated, maintained and monitored in accordance with the manufacturer's recommendations and the following terms and conditions:

**A. Specific Terms and Conditions**

1. Only manufacturer trained and authorized agents or employees shall install, maintain or service the Clearstream - Alternate Tertiary Discharge System.
- \* 2. The Service and Maintenance Agreement prescribed by Sentence 8.9.2.3.(2) of the OBC shall require that the persons authorized by the Manufacturer to service and maintain the Clearstream - Alternate Tertiary Discharge System, and who have entered into the agreement with the person operating the treatment unit, shall:
  - (a) conduct and record at least once during every six month period, an inspection and servicing as specified by the manufacturer of the Clearstream Treatment Unit in the "*Continuing Maintenance Manual*" copyrighted 07/00,
  - (b) provide a copy of the "*Continuing Maintenance Manual*" and a copy of each service record prepared in compliance with (a) above, to the person operating the Clearstream - Alternate Tertiary Discharge System, and
  - (c) conduct sampling and testing in accordance with the requirements of Clauses 8.9.2.4.(1)(a) and (b) of the OBC;
    - i) once during the first 12 months after the Clearstream - Alternate Tertiary Discharge System is put into use, and
    - ii) thereafter, once during every 48 month period after the previous sampling has been completed,
  - (d) promptly submit the sampling test results to the person operating the Clearstream - Alternate Tertiary Discharge System and to the Applicant / Manufacturer named in Part 1 of this Authorization, and
  - (e) promptly notify the chief building official in writing, if this maintenance agreement is terminated or access to permit any of the maintenance or monitoring requirements of this Authorization is denied by the person operating the Clearstream - Alternate Tertiary Discharge System.
3. The Applicant named in Part 1 of this Authorization shall retain records of the sampling test results for each Clearstream - Alternate Tertiary Discharge System received pursuant to Condition A. 2. (c) above, for a period of 10 years and shall promptly forward copies of those records to the chief building official upon request of the chief building official.

4. The Clearstream - Alternate Tertiary Discharge System shall only receive effluent from a septic tank or other treatment unit that:
  - a) is fitted with an effluent filter, the model and type as recommended by the manufacturer, provided that at minimum, such filter will screen out particles larger than 3.2 mm, and
  - b) has frost resistant and watertight maintenance ports accessible at grade.
- \* 5. All pipe connections joining the Clearstream - Alternate Tertiary Discharge System components, i.e., treatment units, accessory treatment units, tanks, pumps and filters where incorporated, shall be flexible and watertight. Where a pump is incorporated in a tank, the tank shall be made watertight.
- \* 6. Clearstream Treatment Units Models as detailed in the manufacturer's technical data sheets and listed as providing tertiary treatment in the Supplementary Guidelines to the Ontario Building Code 1997, shall be used in the Clearstream - Alternate Tertiary Discharge System in accordance with the following daily design sewage flows (DDSF):
 

500N -	DDSF of 850 L to 1900 L
600N -	DDSF of 1900 L to 2280 L
750N -	DDSF of 2280 L to 2850 L
1000N-	DDSF of 2850 L to 3800 L
1500N-	DDSF of 3800 L to 5700 L"
7. All components of the Clearstream - Alternate Tertiary Discharge System shall be waterproof and shall be insulated to manufacturer specifications. When components are totally or partially underground they shall be concrete, fibreglass-reinforced polyester or polyethylene structures that meet the Strength Test requirements of CAN/CSA-B66-M90 for Prefabricated Septic Tanks and Sewage Holding Tanks, and resist soil mineral degradation.
- \* 8. Effluent exiting either the free access sand filter, the Model CS -1100 Effluent Filter or other 100 micron filter identified in Part 3 above, shall be evenly distributed over an absorption system comprised of a stone layer overlying an unsaturated sand layer and having a total minimum depth of 500 mm, and:
  - a) the stone layer shall be a minimum 200 mm in depth and be comprised of stone meeting the requirements of either Subclause 8.7.3.3.(1)(b)(i) or (ii) of the OBC, and
  - b) the sand layer shall be a minimum 250 mm in depth and have a percolation time of six to 10 minutes per centimetre, provided that where the underlying native soil has a percolation time of less than six minutes per centimetre, the water table shall be a minimum of 600 mm below the bottom of the stone layer required in (a) above.

9. The stone layer required by Condition A. 8. (a) above, shall have a minimum area as specified by the manufacturer but be not less than the following:
- a) where the total daily design sanitary sewage flow does not exceed 3 000 L, the area shall be such that the loading on the surface of the stone layer does not exceed 75 L/m<sup>2</sup> per day or
  - b) where the total daily design sanitary sewage flow exceeds 3 000 L, the area shall be such that the loading on the surface of the stone layer does not exceed 50 L/m<sup>2</sup> per day.
10. The stone layer required by Condition A. 8. (a) above, shall be protected with a permeable geo-textile fabric in such a manner so as to prevent soil or leaching bed fill from entering the stone.
11. The sand layer required by Condition A.8. (b) above:
- a) shall have a minimum area that is the greater of;
    - i) the area of the stone layer required by Condition A. 9. above, and
    - ii) the area calculated on the basis of the following formula:
 
$$A = QT/850$$
 where:
      - A is the area of contact in m<sup>2</sup> between the base of the sand layer and the underlying native soil,
      - Q is the total daily design sanitary sewage flow in litres,
      - T is the percolation time of the underlying native soil in min/cm to a maximum of 50, and
  - b) in raised absorption systems, shall extend at least 15 m beyond the perimeter of the distribution pipes, in any direction which the effluent entering the soil will move horizontally.
- \* 12. Effluent exiting either the free access sand filter, the Model CS -1100 Effluent Filter or other 100 micron filter shall be evenly distributed by means of a header connecting to distribution pipes within the stone layer required by Condition A. 8. (a) above and the distribution pipes shall:
- a) be spaced evenly and not greater than 1.2 m apart over the area required by Condition A. 9 above,

- b) comply with the requirements of Clauses 8.7.3.3.(1)(a)-(d) and Sentences 8.7.3.3.(3)-(4) of the OBC, and
  - c) comply with the requirements of Article 8.2.1.6. of the OBC.
- \* 13. The absorption system required by Condition A. 8. above shall comply with the requirements of Subsection 8.7.2. of the OBC that apply to leaching beds.

**B. General Conditions**

- 1. The use of the Clearstream - Alternate Tertiary Discharge System must comply with the *Building Code Act, 1992* as amended or re-enacted from time to time and except as specifically authorized herein, with the Ontario Building Code as amended or remade from time to time.
  - 2. A copy of this Authorization shall accompany each application for a building permit and shall be maintained on the site of the construction with the building permit.
- \* 3. The Applicant named in Part 1 hereof shall promptly notify the BMEC of:
- (a) the failure of the Applicant, or of the material, system or building design that is the subject matter of this Authorization, to comply with any of the terms and conditions set out in 6. A. above; or
  - (b) the occurrence of any of the events described in Conditions 6. B. 4. (a) and (b) (ii) below.
- \* 4. The BMEC may amend or revoke this Authorization where it determines that:
- (a) any change has been made to:
    - (i) the material, system or building design that is the subject matter of this Authorization;
    - (ii) the address of the applicant specified in Part 1 of this Authorization; or,
    - (iii) the ownership of the applicant specified in Part 1 of this Authorization.
  - (b) the use of the material, system or building design authorized herein;
    - (i) does not comply with the *Building Code Act, 1992* or any relevant legislation as they may be amended or re-enacted from time to time; or

- (ii) provides an unsatisfactory level of performance, in situ.
- (c) the Applicant, or the material, system or building design that is the subject matter of this Authorization, has failed to comply with any of the terms and conditions set out in this Authorization; or
- (d) any Ontario Building Code provision relevant to this Authorization has been amended or remade.

Amended at Toronto on this 27<sup>th</sup> day of July 2000

**BUILDING MATERIALS EVALUATION COMMISSION**