

WASTEWATER TECHNOLOGY

NSF/ANSI Standard 40 - *Residential Wastewater Treatment Systems*

Final Report:

**Premier Tech Environment
STB-500 Wastewater Treatment System
04/04/2015/060**



NSF International
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**Evaluation Report:
Premier Tech Environment Ecoflo® Peat Filter STB-500
Wastewater Treatment System**

**Under the provisions of NSF/ANSI Standard 40
Residential Wastewater Treatment Systems**

November 2005

EXECUTIVE SUMMARY

Testing of the Premier Tech Environment Ecoflo[®] Peat Filter model STB-500, was conducted under the provisions of NSF/ANSI Standard 40 for Residential Wastewater Treatment Systems (November 2004 revision). NSF/ANSI Standard 40 was developed by the NSF Joint Committee on Wastewater Technology.

The performance evaluation was conducted at the NSF Wastewater Technology Test Facility located in Waco, Texas using wastewater diverted from the Waco municipal wastewater collection system, which serves predominantly residential development. The evaluation consisted of sixteen weeks of dosing at design flow, seven and one half weeks of stress testing and two and one half weeks of dosing at design flow. Sampling was initiated on August 23, 2004, however the test was officially started on August 30, 2004. Sampling started in the summer and continued into the winter, covering a range of operating temperatures.

Over the course of the evaluation, the average effluent CBOD₅ was 2 mg/L, ranging between <2 and 4 mg/L, and the average effluent total suspended solids was 2 mg/L, ranging between <2 mg/L and 8 mg/L.

The STB-500 produced an effluent that successfully met the performance requirements established by NSF/ANSI Standard 40 for Class I effluent:

The maximum 7-day arithmetic mean was 3 mg/L for CBOD₅ and 4 mg/L for total suspended solids, both below the allowed maximums of 40 and 45 mg/L respectively. The maximum 30-day arithmetic mean was 2 mg/L for CBOD₅ and 2 mg/L for total suspended solids, both below the allowed maximums of 25 mg/L and 30 mg/L respectively.

The effluent pH during the entire evaluation ranged between, 6.2 and 7.4, within the required range of 6.0 to 9.0. The STB-500 met the requirements for noise levels (less than 60 dbA at a distance of 20 feet), color, threshold odor, oily film and foam.

Although not required by Standard 40, Premier Tech Environment requested that effluent ammonia samples be taken from the STB-500. Samples were taken from January 24, 2005 through March 11, 2005. Effluent ammonia had an average of 0.33 mg/L. Premier Tech Environment also requested that fecal coliform and total coliform samples be taken from the septic tank effluent and Ecoflo peat filter effluent. Samples were taken from September 2, 2004 through March 14, 2005.

In addition to the six-month Standard 40 test, Premier Tech Environment requested that NSF conduct additional R&D testing on the STB-500 wastewater treatment system.

PREFACE

Performance evaluation of residential wastewater treatment systems is achieved within the provisions of NSF/ANSI Standard 40: Residential Wastewater Treatment Systems (revised November 2004), prepared by the NSF Joint Committee on Wastewater Technology and adopted by the NSF Board of Trustees.

Conformance with the Standard is recognized by issuance of the NSF Mark. This is not to be construed as an approval of the equipment, but a certification of the data provided by the test and an indication of compliance with the requirements expressed in the Standard.

Plants conforming to Standard 40 are classified as Class I or Class II plants according to the quality of effluent produced by the plant during the performance evaluation. Class I plants must also demonstrate performance consistent with the effluent color, odor, oily film and foam requirements of the Standard. Class I plants must meet the requirements of EPA Secondary Treatment Guidelines¹ for five day carbonaceous biochemical oxygen demand, suspended solids and pH.

Permission to use the NSF Mark is granted only after the equipment has been tested and found to perform satisfactorily, and all other requirements of the Standard have been satisfied. Continued use of the Mark is dependent upon evidence of compliance with the Standard and NSF General and Program Specific Policies, as determined by periodic reinspection of the equipment at the factory, distributors and reports from the field.

NSF Standard 40 requires the testing laboratory to provide the manufacturer of a residential wastewater treatment system, a report including significant data and appropriate commentary relative to the performance evaluation of the plant. NSF policy specifies provision of performance evaluation reports to appropriate state regulatory agencies at publication. Subsequent direct distribution of the report by NSF is made only at the specific request of or by permission of the manufacturer.

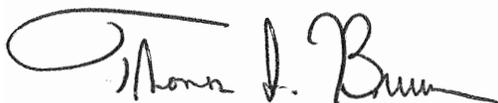
The following report contains results of the entire testing program, a description of the plant, its operation and key process control equipment, and a narrative summary of the test program, including test location, procedures and significant occurrences. The plant represented herein reflects the equipment authorized to bear the NSF Mark.

CERTIFICATION

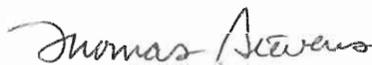
NSF International has determined by performance evaluation under the provisions of NSF/ANSI Standard 40 (revised November 2004) that the Ecoflo[®] Peat Filter model STB-500 manufactured by Premier Tech Environment, has fulfilled the requirements of NSF/ANSI Standard 40. The STB-500 has therefore been authorized to bear the NSF Mark so long as Premier Tech Environment continues to meet the requirements of Standard 40 and NSF General and Program Specific Policies.

General performance evaluation and stress tests were performed at the NSF Wastewater Technology Test Facility located in Waco, Texas. The raw wastewater used in the test was municipal wastewater. The characteristics of the wastewater during the test are included in the tabulated data of this report.

The observations and analyses included in this report are certified to be correct and true copies of the data secured during the performance tests conducted by NSF on the wastewater treatment system described herein. The manufacturer has agreed to present the data in this certification in its entirety whenever it is used in advertising, prospectuses, bids or similar uses.



Thomas J. Bruursema
General Manager
Wastewater Treatment Unit Certification



Thomas Stevens
Manager
Federal Programs

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- Appendix B - Standard 40 Section 9 - Performance testing and evaluation
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- Appendix E - Fecal and Total Coliform Results
- Appendix F - Additional Testing
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1.0 PROCESS DESCRIPTION

The ECOFLO® Peat Filter Model STB-500 is an attached growth packed bed filter, which uses organic fiber as filtering media. The ECOFLO® filter utilizes a natural process where physical, bio-chemical and microbiological reactions take place to purify septic tank effluent. As the wastewater trickles down through the filtering bed, the contaminants, particulates or soluble forms, are physically filtered or adsorbed by the fibers. The microorganisms naturally attached on the media degrade the contaminants through their metabolic reactions. The numerous fibers in the ECOFLO® media provide a high ratio of surface area to volume so the filter can support a relatively large amount of microbiological activity for a relatively small imprint. Moreover, the high porosity of the media combined with the design features of the shell allows a sufficient oxygenation rate in the filter.

2.0 PERFORMANCE EVALUATION

2.1 Description of Plant Evaluated

The STB-500 tested in this evaluation has a rated capacity of 420 gallons per day (gpd). Specifications and drawings are included in Appendix A.

Raw sewage enters the first compartment of a two-compartment concrete tank (1,000 gal volume) that provides about 37 hours of retention at the rated capacity. This compartment provides primary treatment; settleable solids accumulate on the bottom and floatable solids accumulate on the surface. Effluent from the clear layer flows into the second compartment of the tank (350 gal volume), which provides about 18 hours retention at the rated capacity. An effluent filter equipped with a flow regulator is located in the second compartment of the tank in the outlet tee. Effluent from the septic tank is transferred by gravity to the filtering media inside a filter pod. The water is directed in to a tipping bucket that distributes the effluent equally on the distribution plates on both sides of the central support. The plates include channels and orifices that distribute the effluent over the filtering media. Effluent percolates down through the media and is collected at the bottom of the filter pod. The treated effluent flows out through a pipe in the bottom of the pod. Aeration in the filter bed is provided by a combination of factors. First, the aeration system, composed of an air intake on the lid and air duct device integrated in the top of the shell, provides a controlled air renewal both at the surface and at the bottom of the filter bed. Moreover, the movements of the wastewater, being dosed by the tipping bucket to the distribution plates and to the filtering bed surface, combined with the percolation through the media, allow sufficient air convection and oxygen transfer to maintain the filter in aerobic conditions.

2.2 Test Protocol

Section 8 of NSF/ANSI Standard 40 protocol, "Performance Testing and Evaluation", is included in Appendix B. Start up of the plant was accomplished by filling the first compartment of the plant (septic tank) with 2/3 water and 1/3 raw sewage. The plant was then dosed at the design loading rate of 420 gpd as follows:

- 6 a.m. to 9 a.m. - 35 percent of daily rated capacity (147 gallons)
- 11 a.m. to 2 p.m. - 25 percent of daily rated capacity (105 gallons)
- 5 p.m. to 8 p.m. - 40 percent of daily rated capacity (168 gallons)

Dosing was accomplished by opening a pneumatic valve to feed wastewater to the test plant. Doses

were spread uniformly over each dosing period.

After a start up period (up to three weeks at the manufacturer's discretion), the plant is subjected to the following loading sequence:

Design loading	-	16 weeks
Stress loading	-	7.5 weeks
Design loading	-	2.5 weeks

During the design loading periods, flow proportioned 24-hour composite samples are collected of the influent and effluent five days per week. The influent samples were analyzed for five-day biochemical oxygen demand, and total suspended solids concentrations. The effluent samples were analyzed for five-day carbonaceous biochemical oxygen demand, and total suspended solids concentrations. On-site determinations of the effluent temperature and pH are made five days per week. Upon Premier Tech Environment's request, effluent ammonia, influent and effluent coliform (fecal and total), were also measured three days a week.

Stress testing is designed to evaluate how the plant performs under non-ideal conditions, including varied hydraulic loadings and electrical or system failure. The test sequence includes (1) Wash Day stress, (2) Working Parent stress, (3) Power/Equipment Failure stress, and (4) Vacation stress. Detailed descriptions of the stress sequences are shown in Appendix B.

During the stress test sequences, 24-hour composite samples are collected before and after each stress dosing pattern. The analyses and on-site determinations completed on the samples are the same as described for the design load testing. Each stress is followed by seven consecutive days of dosing at design rated capacity before beginning the next stress test. Sample collection is initiated twenty-four hours after completion of wash day, working parent, and vacation stresses, and beginning 48 hours after completion of the power failure stress.

In order for the plant to achieve Class I effluent it is required to produce an effluent, which meets the EPA guidelines for secondary effluent discharge¹:

- (1) CBOD₅: The 30-day average of effluent samples shall not exceed 25 mg/L and each 7-day average of effluent samples shall not exceed 40 mg/L.
- (2) Total suspended Solids: Each 30-day average of effluent samples shall not exceed 30 mg/L and each 7-day average of effluent samples shall not exceed 45 mg/L.
- (3) pH: Individual effluent values remain between 6.0 and 9.0.

Requirements are also specified for effluent color, odor, oily film and foam, as well as maximum noise levels allowed from the plant.

2.3 Test Chronology

The system was installed under the direction of the manufacturer on August 16, 2004. The infiltration/exfiltration test was completed on August 17, 2004. The plant was filled with 2/3 fresh water and

1/3 raw sewage and dosing was initiated at the rate of 420 gpd, beginning August 18, 2004. Sampling was initiated on August 26, 2004. However, the test was officially started on August 30, 2004 since there were only two sample days during the first week. The stress test sequence was started on December 20, 2004 and ended on February 9, 2005. Testing was completed on February 25, 2005.

3.0 ANALYTICAL RESULTS

3.1 Summary

Chemical analyses of samples collected during the evaluation were completed using the procedures in *Standard Methods for the Examination of Water and Wastewater*² and USEPA methods. Copies of the data generated during the evaluation are included in Appendix C. The results of the analyses performed during the first week of dosing are also included in Appendix C for informational purposes only. Results of the chemical analyses and on-site observations and measurements made during the evaluation are summarized in Table I.

TABLE I. SUMMARY OF ANALYTICAL RESULTS

	<u>Average</u>	<u>Std. Dev.</u>	<u>Minimum</u>	<u>Maximum</u>	<u>Median</u>	<u>Interquartile Range</u>
Oxygen demand (mg/L)						
<i>Influent (BOD₅)</i>	140	160	19	1,700	120	87 - 120
<i>Effluent (CBOD₅)</i>	2	0.3	<2	4	<2	2 - 2
Total Suspended Solids (mg/L)						
<i>Influent</i>	170	370	20	3,900	110	69 - 110
<i>Effluent</i>	2	0.7	<2	8	<2	2 - 2
pH						
<i>Influent</i>	-	-	6.6	7.4	7.0	6.9 - 7.0
<i>Effluent</i>	-	-	6.2	7.4	7.0	6.9 - 7.0
Temperature (°C)						
<i>Influent</i>	24	4	18	29	23	20 - 23
<i>Effluent</i>	23	5	15	30	22	18 - 22
Dissolved Oxygen (mg/L)						
<i>Effluent</i>	5.2	1.4	1.0	7.8	5.3	4.3 - 6.0

Notes: The median is the point where half of the values are greater and half are less.

The interquartile range is the range of values about the median between the upper and lower 25 percent of all values.

Criteria for evaluating the analytical results from the testing are described in Section 8.5 of NSF/ANSI Standard 40. In completing the pass/fail determination for the data, an allowance is made for effluent suspended solids and CBOD₅ during the first month of testing. The 30 and 7-day averages during this time

may not equal or exceed 1.4 times the effluent limits required for the rest of the test. This provision recognizes that an immature culture of microorganisms within the system may require additional time to achieve adequate treatment efficiency. Effluent CBOD₅ and suspended solids concentrations from the STB-500 during the first calendar month of testing were within the normal limits and did not need to use this provision.

Section 8.5.1.1 of the Standard provides guidance addressing the impact of unusual testing conditions, including sampling, dosing, or influent characteristics, on operation of a system under test. Specific data points may be excluded from 7- and 30 - day average calculations where determined to have an adverse impact on performance of the system, with rationale for the exclusion to be documented in the final report. There were no such conditions during this test.

Sections 3.6 and 8.2.1 of the Standard define influent wastewater characteristics as they apply to testing under the Standard. Typical domestic wastewater is defined as having a BOD₅ concentration between 100 and 300 mg/L and a suspended solids concentration between 100 and 350 mg/L. The influent strength remained within the specified range, with the exception of Month 4. During Month 4, the 30-day average influent total suspended solid was 75 mg/L. Following section 8.5.1.1 of the Standard, NSF made an assessment of the impact of the influent strength on the treatment system for month 4. NSF determined that the dosing strength did not adversely affect the treatment process due to the relatively consistent effluent quality during those periods. Effluent total suspended solids averaged 2 mg/L during month 4 and 2 mg/L for the entire test.

3.2 Biochemical Oxygen Demand

The five-day biochemical oxygen demand (BOD₅) and carbonaceous five-day biochemical oxygen demand (CBOD₅) analyses were completed using the EPA Method 405.1. The results of the analyses completed on the samples collected during the testing are shown in Figure 1.

Influent BOD₅:

The influent BOD₅ ranged from 19 to 1,700 mg/L during the evaluation, with an average concentration of 140 mg/L and a median concentration of 120 mg/L.

Effluent CBOD₅:

The effluent CBOD₅ concentrations ranged from <2 to 4 mg/L over the course of the evaluation, with an average concentration of 2 mg/L. The median effluent CBOD₅ concentration was 2 mg/L.

The Standard requires that the effluent CBOD₅ not exceed 40 mg/L on a 7-day average or 25 mg/L on a 30-day average. Table II shows the 7 and 30-day average effluent CBOD₅ concentrations and the 30-day average influent BOD₅ concentrations. The 7-day average effluent CBOD₅ ranged from 2 to 3 mg/L. The 30-day average remained at 2 mg/L throughout the test. As shown in Table II, the Ecoflo[®] Peat Filter model STB-500 met the requirements of Standard 40 for effluent CBOD₅.

BOD₅ Loading:

Over the course of the evaluation the influent BOD₅ loading averaged 0.49 lbs/day. The STB-500 achieved an average reduction of 0.483 lbs/day.

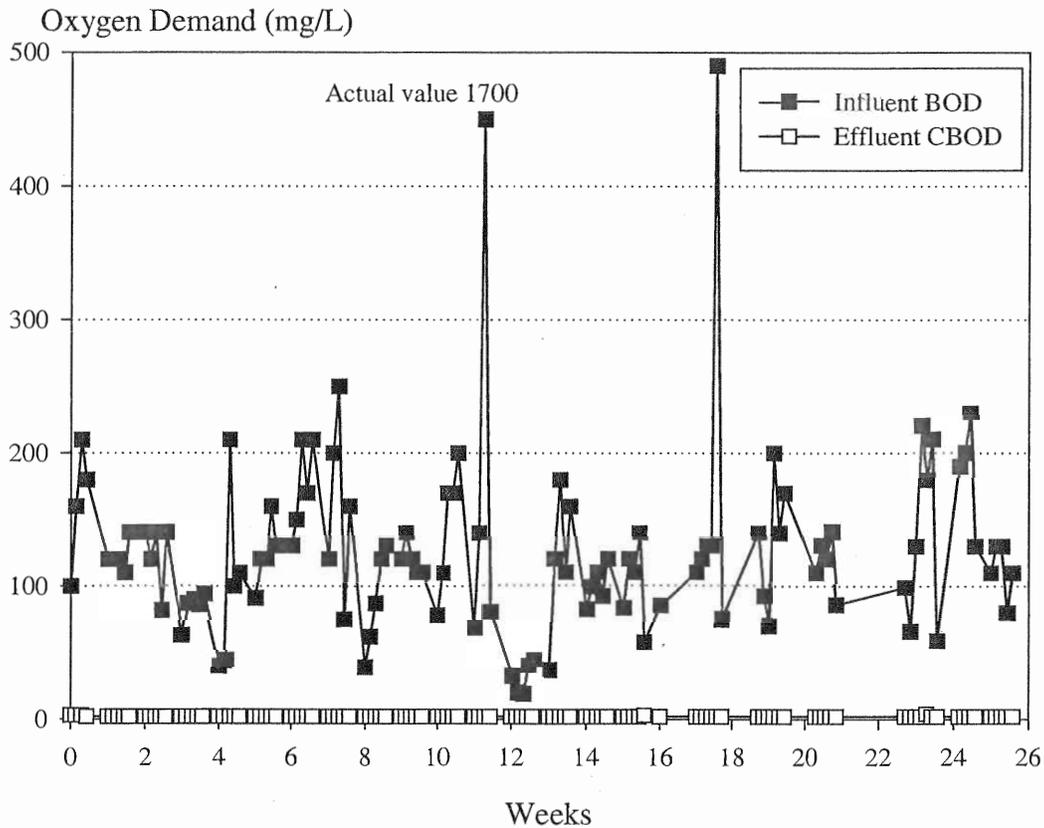


Figure 1. Biochemical Oxygen Demand

3.3 Total Suspended Solids

Total suspended solids analyses were completed using Methods 209C and 209D of *Standard Methods*. The results of the total suspended solids analyses over the entire evaluation are shown in Figure 2. Data from the total suspended solids analyses are summarized in Table I.

Influent total suspended solids:

The influent total suspended solids ranged from 20 to 3,900 mg/L during the evaluation, with an average concentration of 170 mg/L. The median influent total suspended solids concentration during the evaluation was 110 mg/L.

Effluent total Suspended Solids:

The effluent total suspended solids concentration ranged from <2 to 8 mg/L during the evaluation, with an average concentration of 2 mg/L and a median concentration of 2 mg/L.

Over the course of the evaluation, NSF/ANSI Standard 40 requires that the effluent total suspended solids not exceed 45 mg/L on a 7-day average or 30 mg/L on a 30-day average. Table III shows the 7- and 30-day total suspended solids averages.

The 7-day average effluent total suspended solids ranged from 2 to 4 mg/L and the 30-day average remained at 2 mg/L throughout the test. As shown in Table III, the Ecoflo® Peat Filter model STB-500 met the requirements of NSF/ANSI Standard 40 for effluent total suspended solids.

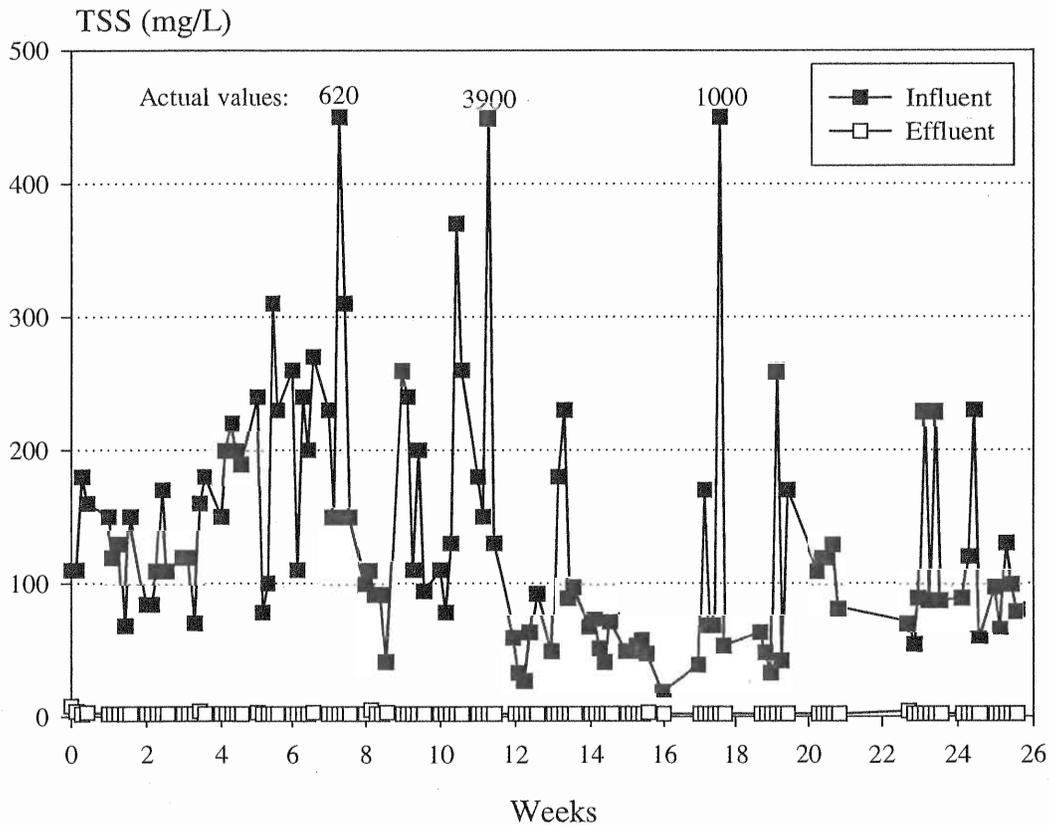


Figure 2. Total Suspended Solids

Table II. 7- and 30-day Average Effluent CBOD₅ and 30-day Average Influent BOD₅

Month	Week	7-day Average Effluent CBOD ₅ (mg/L)	30-day Average Effluent CBOD ₅ (mg/L)	30-day Average Influent BOD ₅ (mg/L)
1	1	3	2	110
	2	2		
	3	2		
	4	2		
2	5	2	2	140
	6	2		
	7	2		
	8	2		
3	9	2	2	180
	10	2		
	11	2		
	12	2		
	13	2		
4	14	2	2	110
	15	2		
	16	2		
	17	2		
5	18	2	2	150
	19	2		
	20	2		
	21	2		
	22	2		
6	23	2	2	140
	24	2		
	25	2		
	26	2		

Table III. 7- and 30-day Average Total Suspended Solids

Month	Week	7-day Average Effluent TSS (mg/L)	30-day Average Effluent TSS (mg/L)	30-day Average Influent TSS (mg/L)
1	1	4	2	130
	2	2		
	3	2		
	4	2		
2	5	2	2	200
	6	2		
	7	2		
	8	2		
3	9	3	2	330
	10	2		
	11	2		
	12	2		
	13	2		
4	14	2	2	75
	15	2		
	16	2		
	17	2		
5	18	2	2	160
	19	2		
	20	2		
	21	2		
	22	2		
6	23	3	2	110
	24	2		
	25	2		
	26	2		

3.4 pH

Over the entire evaluation period, the influent pH ranged from 6.6 to 7.4 (median of 7.0). The effluent pH ranged from 6.2 to 7.4 during the evaluation (median of 7.0), within the 6 to 9 range required by NSF/ANSI Standard 40. The pH data for the evaluation are shown in Appendix C.

3.5 Temperature

Influent temperatures over the evaluation period ranged from 18 to 29°C (median of 23°C). The temperature data are shown in Appendix C.

3.6 Color, Threshold Odor, Oily Film, Foam

Three samples of the effluent were analyzed for color, odor, oily film and foam as prescribed in NSF Standard 40. The effluent was acceptable according to the requirements in NSF Standard 40, with color less than 15 units, non-offensive threshold odor, no visible evidence of oily film and no foam.

3.7 Noise

A reading of the noise level at a distance of 20 feet from the plant was taken while the plant was in operation, using a hand-held decibel meter. The reading was below the 60 dbA required by ANSI/NSF Standard 40.

3.8 Ammonia

Although not required by Standard 40, Premier Tech Environment requested that effluent samples from the STB-500 be analyzed for ammonia. Chemical analyses of the samples collected during the evaluation were completed using the procedure from EPA Method 351.1. Copies of the data generated during the evaluation are included in Appendix D. During the evaluation all samples were 24-hour composite samples, collected by automatic samplers programmed to collect samples in coordination with the discharge of treated wastewater from the system. Samples were stored at 2 ± 2 °C and preserved with sulfuric acid at the time of collection. Effluent ammonia samples were taken from January 24, 2005 through March 11, 2005. The average effluent value was 0.3 mg/L (median of <0.05). The effluent values ranged from <0.05 to 2.21 mg/L.

3.9 Fecal and Total Coliform

Although not required by Standard 40, Premier Tech Environment requested that influent and effluent samples be collected from the STB-500 for analysis of fecal coliform and effluent samples be collected from the STB-500 for analysis of total coliform. Fecal Coliform grab samples were collected three days per week, during one of each of the three dosing periods and total coliform grab samples were collected one day during one dosing period defined under Section 8.2.2.1 of NSF/ANSI Standard 40-2004. Samples collected during the evaluation for fecal and total coliform analyses were analyzed by Aquatech Laboratories, a subcontract lab of NSF. The analyses were completed using Standard Method 9222D for fecal and total coliform. All fecal and total coliform data are shown in Appendix E.

3.10 Additional Testing

Although not required by Standard 40, Premier Tech Environment requested that additional stress tests be performed on their system following the 26 weeks of Standard 40 Test. The additional stress tests were performed during a period of 7 weeks in high flow rate conditions (1.7 to 2.0 design flow) alternating with rest periods of 2 or 3 days. Appendix F shows the dosing and sampling schedule for the Ecoflo® Peat Filter system as well as results from the sampling.

4.0 REFERENCES

1. "Environmental Protection Agency Guidelines for Secondary Treatment", Federal Register, Volume 28, No. 159, 1973.
2. APHA, AWWA, WPCF, Standard Methods for the Examination of Water and Wastewater, 20th Edition, American Public Health Association, Washington, D.C.
3. U.S. EPA, Methods for Chemical Analysis of Water and Wastes, U.S. Environmental Protection Agency, Washington, D.C.

APPENDIX A
PLANT SPECIFICATIONS

PLANT SPECIFICATIONS
Premier Tech Environment STB-500

Plant Capacity

Design Flow	420 gpd
Septic Tank Hydraulic Capacity (at Design Flow)	1,000 gallons
First compartment (septic tank)	600 gallons
Second compartment (septic tank)	400 gallons
Septic Tank Hydraulic Retention Time (at Design Flow)	
First compartment	34 hours
Second compartment	23 hours

Effluent Filter

Filter	Premier Tech EFT-080R
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Peat Filtering Bed

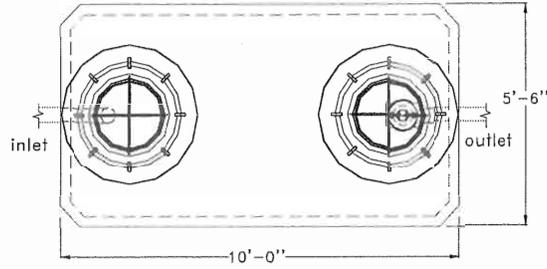
The filtering bed is 31.5 inches in height and it is composed of 2 layers having the following characteristics:

Top Layer

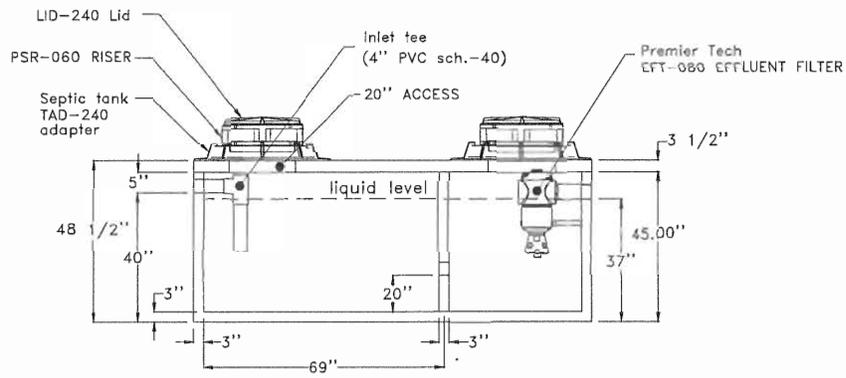
The top layer is made of well graded natural material having a fibrous and chunky texture. The material offers a porous organic medium characterized with a good water and air exchange capacity. The Dry bulk density is between 3.12 and 5.0 lb/ft³.

Bottom Layer

The bottom layer is made of natural material having a highly fibrous and lignin content. The material offers a support for the top layer and a porous medium characterized with a good water and air exchange capacity. The Dry bulk density is between 5.00 and 8.74 lb/ft³.



PLAN VIEW

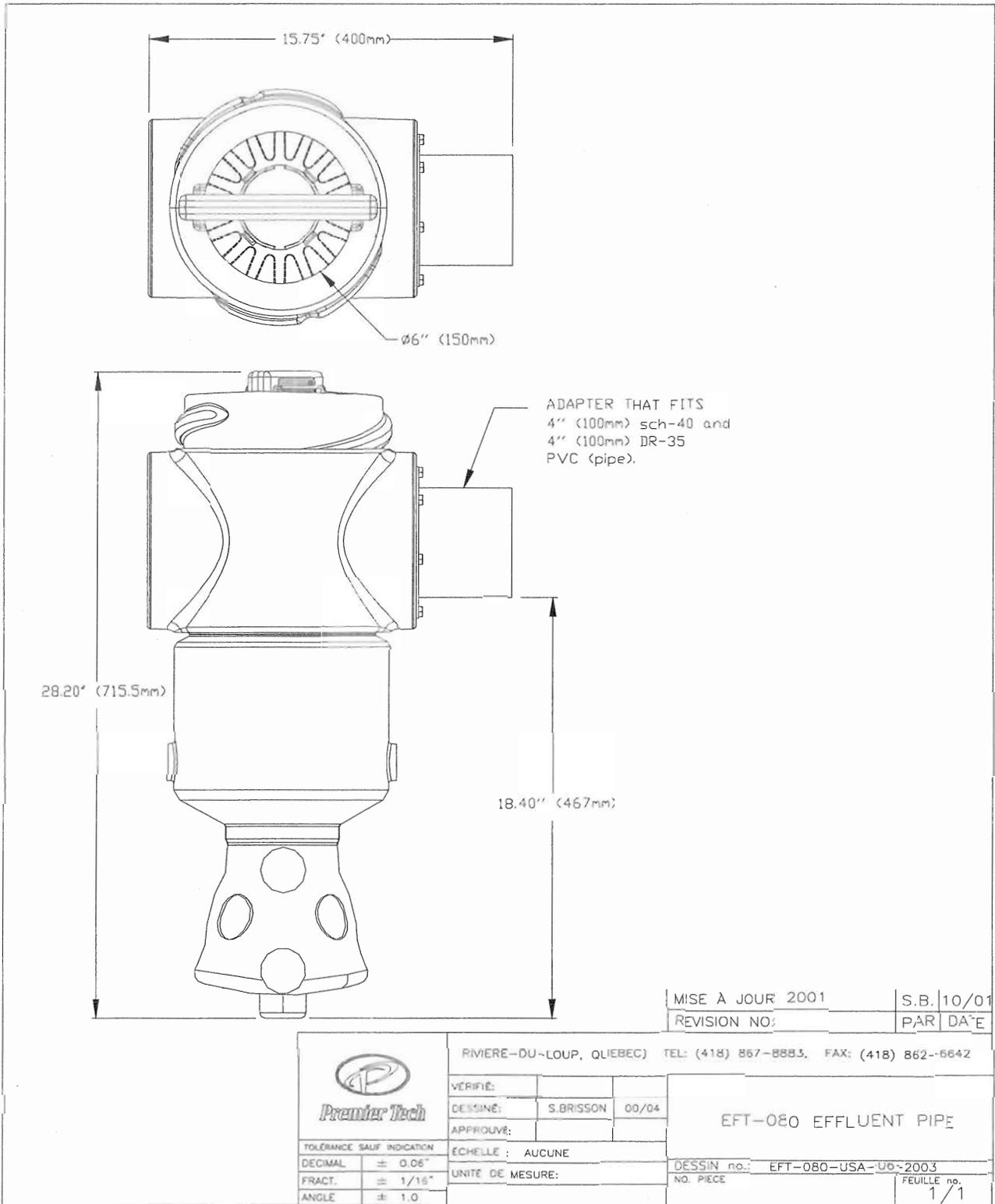


SECTION VIEW

SEPTIC TANK DETAILS

TEL QUE CONSTRUIT	S.B.	05/2005
REVISION NO.	PAR	DATE

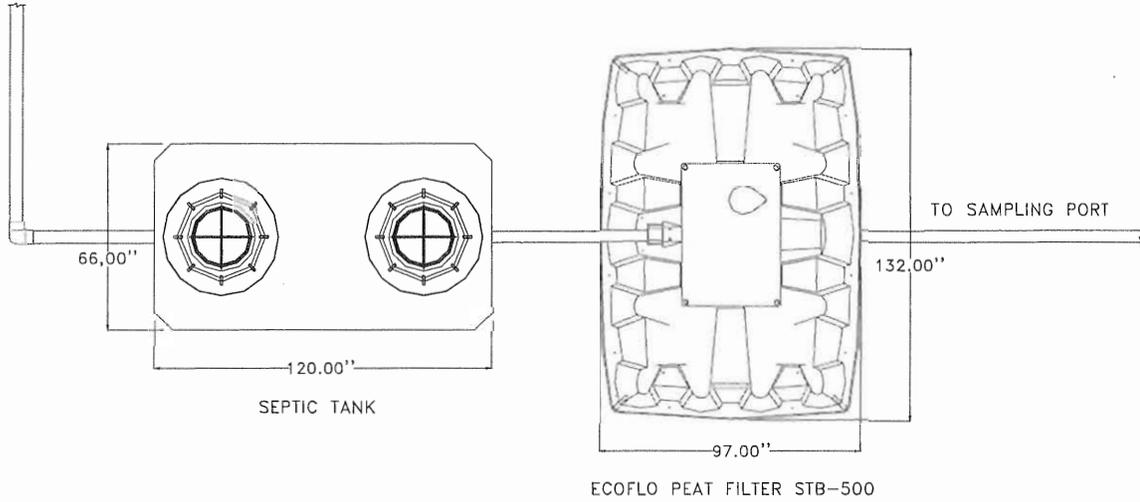
	RIVIERE-DU-LOUP, QUEBEC) TEL: (418) 867-8883, FAX: (418) 862-6642		ECOFLO PEAT FILTER INSTALLATION ON NSF BENCH TEST WACO, TEXAS
	DRAWN	S. BRISSON 08/2004	
	VERIFIED	YVES BERUBE 08/2004	
	APPROVED		
TOLERANCE SAUF INDICATION		SCALE : NONE	DRAW NO.: IMPLANTATION ECOFLO-NSF-V14 NO. PIECE
DECIMAL	UNIT: INCH		
FRACT.			
ANGLE			SHEET no. 3/3



MISE A JOUR 2001	S.B. 10/01
REVISION NO:	PAR DA'E

 Premier Tech	RIVIERE-DU-LOUP, QUEBEC TEL: (418) 867-8883, FAX: (418) 862-6642	
	VERIFIÉ:	
	DESSINÉ: S.BRISSON	00/04
	APPROUVÉ:	
TOLÉRANCE SAUF INDICATION		EFT-080 EFFLUENT PIPE DESSIN no.: EFT-080-USA-00-2003 NO. PIECE FEUILLE no. 1/1
DECIMAL	± 0.06"	
FRACT.	± 1/16"	
ANGLE	± 1.0	
ÉCHELLE : AUCUNE		
UNITÉ DE MESURE:		

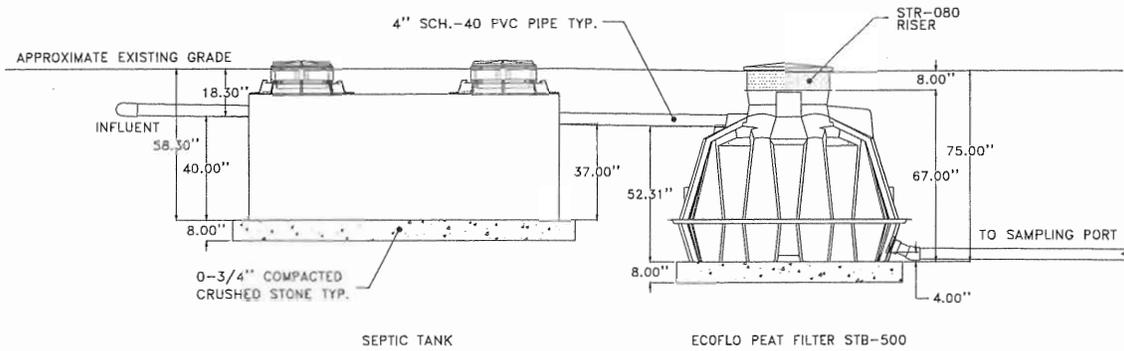
INFLUENT



PLAN VIEW

TEL QUE CONSTRUIT	S.B.	05/2001
REVISION NO:	PAR	DATE

		RIVIERE-DU-LOUP, QUEBEC TEL: (418) 867-8883. FAX: (418) 862-6642	
		DRAWN: S. BRISSON 08/2014 VERIFIED: YVES BENOISE 08/2014 APPROVED:	ECFCLO PEAT FILTER INSTALLATION ON NSF BENCH TEST WACO, TEXAS
1/30-00000 SAUF INDICATION SCALE: NONE UNIT: INCH		DRAW NO.: IMPLANTATION ECFCLO-NSF-v14 NO. PIECE:	
DETAIL: FRANCH. ANGLE:			SHEET NO. 1/3



PROFIL VIEW

TEL. DUE CONSTRUCTION		S.B.		05/2005	
REVISION NO.		PAR.		DATE	
RIVIERE-DU-LOUP, QUEBEC TEL: (418) 867-8883, FAX: (418) 862-6642					
DRAWN		I. BRISSON		08/2004	
VERIFIED		PYLES BEAUBIE		08/2004	
APPROVED					
TELEPHONE SALES INDICATOR		SCALE: NONE			
DECIMAL		UNIT: INCH			
FRACT.		DRAWN BY: IMPLANTATION ECOFLO-NSF		SHEET NO. 2/3	
ANGLE					

APPENDIX B

**NSF STANDARD 40 PERFORMANCE EVALUATION
METHOD AND REQUIREMENTS**

8 Performance testing and evaluation

This section describes the methods used to evaluate the performance of residential wastewater treatment systems. Systems shall be designated as Class I or Class II. The performance classification shall be based upon the evaluation of effluent samples collected from the system over a six-month period.

8.1 Preparations for testing and evaluation

8.1.1 The system shall be assembled, installed, and filled in accordance with the manufacturer's instructions.

8.1.2 The manufacturer shall inspect the system for proper installation. If no defects are detected and the system is judged to be structurally sound, it shall be placed into operation in accordance with the manufacturer's start-up procedures. If the manufacturer does not provide a filling procedure, $\frac{2}{3}$ of the system's capacity shall be filled with water and the remaining $\frac{1}{3}$ shall be filled with residential wastewater.

8.1.3 The system shall undergo design loading (see 8.2.2.1) until testing and evaluations are initiated. Sample collection and analysis shall be initiated within 3 weeks of filling the system and, except as specified in 8.5.1.2, shall continue without interruption until the end of the evaluation period.

8.1.4 If conditions at the testing site preclude installation of the system at its normally prescribed depth, the manufacturer shall be permitted to cover the system with soil to achieve normal installation depth.

8.1.5 Performance testing and evaluation of systems shall not be restricted to specific seasons.

8.1.6 When possible, electrical or mechanical defects shall be repaired to prevent evaluation delays. All repairs made during the performance testing and evaluation shall be documented in the final report.

8.1.7 The system shall be operated in accordance with the manufacturer's instructions. However, routine service and maintenance of the system shall not be permitted during the performance testing and evaluation period.

NOTE – The manufacturer may recommend or offer more frequent service and maintenance of the system but for the purpose of performance testing and evaluation, service and maintenance shall not be performed beyond what is specified in this Standard.

8.2 Testing and evaluation conditions, hydraulic loading, and schedules

8.2.1 Influent wastewater characteristics

The 30-d average BOD₅ concentration of the wastewater delivered to the system shall be between 100 mg/L and 300 mg/L.

The 30-d average TSS concentration of the wastewater delivered to the system shall be between 100 mg/L and 350 mg/L.

8.2.2 Hydraulic loading and schedules

The performance of the system shall be evaluated for 26 consecutive weeks. During the testing and evaluation period, the system shall be subjected to 16 weeks of design loading, followed by 7.5 weeks (52 days) of stress loading, and then an additional 2.5 weeks (18 days) of design loading.

8.2.2.1 Design loading

The system shall be dosed 7 days a week with a wastewater volume equivalent to the daily hydraulic capacity of the system. The following schedule shall be adhered to for dosing:

Time frame	% rated daily hydraulic capacity
6:00 a.m. to 9:00 a.m.	approximately 35
11:00 a.m. to 2:00 p.m.	approximately 25
5:00 p.m. to 8:00 p.m.	approximately 40

8.2.2.2 Stress loading

Stress loading is designed to evaluate a system's performance under four non-ideal conditions. Systems shall be subjected to each stress condition once during the 6-month testing and evaluation period, and each of the four stress conditions shall be separated by 7 days of design loading (see 8.2.2.1).

8.2.2.2.1 Wash-day stress

The wash day stress shall consist of 3 wash days in a 5-day period. Each wash day shall be separated by a 24-h period. During a wash-day, the system shall be loaded at times and capacities similar to those delivered during design loading (see 8.2.2.1), however during the first two dosing periods per day, the design loading shall include 3 wash loads (3 wash cycles and 6 rinse cycles).

8.2.2.2.2 Working-parent stress

For 5 consecutive days, the system shall be subjected to a working-parent stress. During this stress, the system shall be dosed with 40% of its daily hydraulic capacity between 6:00 a.m. and 9:00 a.m. Between 5:00 p.m. and 8:00 p.m., the system shall be dosed with the remaining 60% of its daily hydraulic capacity, which shall include 1 wash load (1 wash cycle and 2 rinse cycles).

8.2.2.2.3 Power/equipment failure stress

The system shall be dosed with 40% of its daily hydraulic capacity between 5:00 p.m. and 8:00 p.m. on the day the power/equipment failure stress is initiated. Power to the system shall then be turned off at 9:00 p.m. and dosing shall be discontinued for 48 hours. After 48 hours, power shall be restored and the system shall be dosed over a 3- h period with 60% of its daily hydraulic capacity, which shall include 1 wash load (1 wash cycle and 2 rinse cycles).

8.2.2.2.4 Vacation stress

On the day that the vacation stress is initiated, the system shall be dosed at 35% of its daily hydraulic capacity between 6:00 a.m. and 9:00 a.m. and at 25% between 11:00 a.m. and 2:00 p.m. Dosing shall then be discontinued for 8 consecutive days (power shall continue to be supplied to the system). Between 5:00 p.m. and 8:00 p.m. of the ninth day, the system shall be dosed with 60% of its daily hydraulic capacity, which shall include 3 wash loads (3 wash cycles and 6 rinse cycles).

8.2.3 Dosing volumes

The 30-d average volume of the wastewater delivered to the system shall be within $100\% \pm 10\%$ of the system's rated hydraulic capacity.

NOTE – All dosing days, except those with dosing requirements less than the daily hydraulic capacity, shall be included in the 30-d average calculation.

8.2.4 Color, odor, foam, and oily film assessments

During the 6-month testing and evaluation, a total of 3 effluent samples shall be assessed for color, odor, foam, and oily film. The assessments shall be conducted on effluent composite samples selected randomly during the first phase of design loading (weeks 1 – 16), the period of stress loading (weeks 17 – 23.5), and the second phase of design loading (weeks 23.5 – 26).

8.3 Sample collection

8.3.1 General

8.3.1.1 A minimum of 96 data days shall be required during system performance testing and evaluation. No routine service or maintenance shall be performed on the system whether the time period to achieve the 96 data days falls within or exceeds 6 months.

8.3.1.2 All sample collection methods shall be in accordance with APHA's *Standard Methods for the Examination of Water and Wastewater* unless otherwise specified.

8.3.1.3 Influent wastewater samples shall be flow-proportional, 24-h composites obtained during periods of system dosing. Effluent samples shall be flow-proportional, 24-h composites obtained during periods of system discharge.

8.3.2 Design loading

During periods of design loading, daily composite effluent samples shall be collected and analyzed 5 days a week.

8.3.3 Stress loading

During stress loading, influent and effluent 24-h composite samples shall be collected on the day each stress condition is initiated. Twenty-four hours after the completion of washday, working-parent, and vacation stresses, influent and effluent 24-h composite samples shall be collected for 6 consecutive days. Forty-eight hours after the completion of the power/equipment failure stress, influent and effluent 24-h composite samples shall be collected for 5 consecutive days.

8.4 Analytical descriptions

8.4.1 pH, TSS, BOD₅, and CBOD₅

The pH, TSS, and BOD₅ of the collected influent and the pH, TSS and CBOD₅ of the collected effluent 24-h composite samples shall be determined with the appropriate methods in APHA's *Standard Methods for the Examination of Water and Wastewater*.

8.4.2 Color, odor, oily film, and foam

8.4.2.1 General

The effluent composite samples shall be diluted 1:1000 with distilled water. Three composite effluent samples shall be tested during the 6-month evaluation period.

8.4.2.2 Color

The apparent color of the diluted effluent samples shall be determined with the visual comparison method described in APHA's *Standard Methods for the Examination of Water and Wastewater*.

8.4.2.3 Odor

A panel consisting of at least 5 evaluators shall qualitatively rate 200 mL aliquots of the diluted effluent samples as offensive or non offensive when compared to odor-free water prepared in accordance with APHA's *Standard Methods for the Examination of Water and Wastewater*.

8.4.2.4 Oily film and foam

Diluted effluent sample aliquots shall be visually evaluated for the presence of an oily film or foaming.

8.5 Criteria

8.5.1 General

8.5.1.1 If conditions during the testing and evaluation period result in system upset, improper sampling, improper dosing, or influent characteristics outside of the ranges specified in 8.2.1, an assessment shall be conducted to determine the extent to which these conditions adversely affected the performance of the system. Based on this assessment, specific data points may be excluded from the 7-d and 30-d averages of effluent measurements. Rationale for all data exclusions shall be documented in the final report.

8.5.1.2 In the event that a catastrophic site problem not described in this Standard including, but not limited to, influent characteristics, malfunctions of test apparatus, and acts of God, jeopardizes the validity of the performance testing and evaluation, manufacturers shall be given the choice to:

- 1) Perform maintenance on the system, reinitiate system start-up procedures, and restart the performance testing and evaluation; or
- 2) With no routine maintenance performed, have the system brought back to pre-existing conditions and resume testing within 3 weeks after the site problem has been identified and corrected. Data collected during the system recovery period shall be excluded from 7-d and 30-d averages of effluent measurements.

NOTE – Pre-existing conditions shall be defined as the point when the results of 3 consecutive data days are within 15% of the previous 30-d average(s).

8.5.1.3 A 7-d average discharge value shall consist of a minimum of 3 data days. If a calendar week contains less than 3 data days, sufficient data days may be transferred from the preceding calendar week to constitute a 7-d average discharge value. If there are not sufficient data days available in the preceding calendar week, the transfer of data days may take place from the following calendar week to constitute a 7-d average discharge value. No data day shall be included in more than one 7-d average discharge value.

8.5.1.4 A 30-d average discharge value shall consist of a minimum of 50% of the regularly scheduled sampling days per month. If a calendar month contains less than the required number of data days, sufficient data days may be transferred from the preceding calendar month to constitute a 30-d average discharge value. If there are not sufficient data days available in the preceding calendar month, the transfer of data days may take place from the following calendar month to constitute a 30-d average discharge value. No data day shall be included in more than one 30-d average discharge value.

8.5.1.5 During the stress loading sequence, consisting of wash-day, working-parent, power/equipment failure, and vacation stress loading periods, data shall be collected from a minimum of $\frac{2}{3}$ of the total scheduled sampling days and from at least 2 of the scheduled sampling days during any single stress loading period.

8.5.2 Class I systems

The following criteria shall be met in order for a system to be classified as a Class I residential wastewater treatment system.

All requirements for each parameter shall be achieved except as provided for in 8.5.2.2.

8.5.2.1 EPA secondary treatment guideline parameters

8.5.2.1.1 CBOD₅

The 30-d average of CBOD₅ concentrations of effluent samples shall not exceed 25 mg/L.

The 7-d average of CBOD₅ concentrations of effluent samples shall not exceed 40 mg/L.

8.5.2.1.2 TSS

The 30-d average of TSS concentrations of effluent samples shall not exceed 30 mg/L.

The 7-d average of TSS concentrations of effluent samples shall not exceed 45 mg/L.

8.5.2.1.3 pH

The pH of individual effluent samples shall be between 6.0 and 9.0.

8.5.2.2 Effluent concentration excursions

System performance shall not be considered outside the limits established for Class I systems if, during the first calendar month of performance testing and evaluation, 7-d average and 30-d average effluent CBOD₅ and TSS concentrations do not equal or exceed 1.4 times the effluent limits specified in 8.5.2.1.

NOTE – The technology utilized in many residential wastewater treatment systems is biologically based. The allowance of excursions from the effluent limits established in this Standard during the first calendar month of performance testing and evaluation reflects the fact that an immature culture of microorganisms within the system may require additional time to achieve adequate treatment efficiency.

The value of 1.4 is based on the USEPA Technical Review Criteria for Group I Pollutants, including CBOD₅ and TSS.

8.5.2.3 Color, odor, oily film, and foam

8.5.2.3.1 Color

The color rating of each of the 3 diluted composite effluent samples shall not exceed 15 units.

8.5.2.3.2 Odor

The overall rating of each of the three diluted composite effluent samples shall be non offensive.

8.5.2.3.3 Oily film and foam

Oily films and foaming shall not be visually detected in any of the diluted composite effluent samples.

8.5.3 Class II systems

The following criteria shall be met in order for a system to be classified as a Class II residential wastewater treatment system.

8.5.3.1 CBOD₅

Not more than 10% of the effluent CBOD₅ values shall exceed 60 mg/L.

TSS

Not more than 10% of the effluent TSS values shall exceed 100 mg/L.

APPENDIX C
ANALYTICAL RESULTS

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: August 29, 2004 Plant Code: Ecoflo
Weeks Into Test: 1
Weekend Dosing: Sunday 420 gallons Saturday 420 gallons Friday 420 gallons

	Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)	420	420	420	420	420
Dissolved Oxygen (mg/L)	effluent	5.4	5.6	5.2	d
	influent	29	29	28	d
Temperature (C)	effluent	30	29	30	d
	influent	7.3	7.2	7.1	7.1
pH	effluent	7.4	7.2	7.0	d
	influent	100	160	210	180
Biochemical Oxygen Demand (mg/L)	effluent	3	3	3	<2
	influent	110	110	180	160
Total Suspended Solids (mg/L)	effluent	8	4	2	3
	influent	100	92	150	130
Volatile Suspended Solids (mg/L)	effluent	8	2	2	3
	influent				

Notes: No sample on 9/3 due to laboratory error.
(a) Site problem
(b) Malfunction of system under test
(c) Weather problem
(d) Other

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: September 5, 2004 Plant Code: Ecoflo
Weeks Into Test: 2
Weekend Dosing: Sunday 420 gallons Saturday 420 gallons Friday 420 gallons

	Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)	420	420	420	420	420
Dissolved Oxygen (mg/L)	effluent	5.2	4.9	4.0	5.9
	influent	28	29	29	28
Temperature (C)	effluent	30	29	29	29
	influent	7.3	7.2	7.1	7.0
pH	effluent	7.2	7.2	7.2	7.2
	influent	180	120	120	110
Biochemical Oxygen Demand (mg/L)	effluent	2	<2	2	<2
	influent	150	120	130	68
Total Suspended Solids (mg/L)	effluent	2	2	2	2
	influent	120	96	110	50
Volatile Suspended Solids (mg/L)	effluent	2	2	2	<2
	influent				

Notes:
(a) Site problem
(b) Malfunction of system under test
(c) Weather problem
(d) Other

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: September 12, 2004 Plant Code: Ecoflo

Weeks Into Test: 3

Weekend Dosing: Sunday 420 gallons Saturday 420 gallons Friday 420 gallons

Dosed Volume (gallons)		Monday	Tuesday	Wednesday	Thursday	Friday
Dissolved Oxygen (mg/L)	effluent	3.8	3.2	3.4	3.6	3.8
	influent	29	29	29	29	29
Temperature (C)	effluent	29	30	30	30	30
	influent	7.2	7.2	6.9	7.0	7.1
pH	effluent	7.4	7.0	7.1	7.1	7.2
	influent	140	120	140	82	140
Biochemical Oxygen Demand (mg/L)	effluent (BOD ₅)	2	<2	<2	<2	<2
	effluent (CBOD ₅)	84	84	110	170	110
Total Suspended Solids (mg/L)	influent	<2	<2	2	<2	<2
	effluent	74	70	92	130	98
Volatile Suspended Solids (mg/L)	influent	<2	<2	2	<2	<2
	effluent					

Notes:
(a) Site problem
(b) Malfunction of system under test
(c) Weather problem
(d) Other

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: September 19, 2004 Plant Code: Ecoflo

Weeks Into Test: 4

Weekend Dosing: Sunday 420 gallons Saturday 420 gallons Friday 420 gallons

Dosed Volume (gallons)		Monday	Tuesday	Wednesday	Thursday	Friday
Dissolved Oxygen (mg/L)	effluent	4.8	4.4	4.0	3.9	3.2
	influent	29	29	29	29	29
Temperature (C)	effluent	30	30	30	30	29
	influent	7.3	7.0	7.0	7.2	7.1
pH	effluent	7.4	7.3	7.2	7.4	7.2
	influent	63	87	90	86	94
Biochemical Oxygen Demand (mg/L)	effluent (BOD ₅)	<2	<2	<2	<2	<2
	effluent (CBOD ₅)	120	120	70	160	180
Total Suspended Solids (mg/L)	influent	2	<2	<2	4	<2
	effluent	90	110	50	130	150
Volatile Suspended Solids (mg/L)	influent	<2	<2	<2	4	<2
	effluent					

Notes:
(a) Site problem
(b) Malfunction of system under test
(c) Weather problem
(d) Other

NSF International
Standard 40 - Residential Wastewater Treatment Systems

Plant Effluent

Week Beginning: September 26, 2004 Plant Code: Ecoflo

Weeks Into Test: 5
 Sunday 420 gallons Saturday 420 gallons
 Weekend Dosing: 420 gallons

	Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)	420	420	420	420	420
Dissolved Oxygen (mg/L)	effluent	5.1	4.2	4.7	5.3
	influent	28	29	29	28
Temperature (C)	effluent	29	29	29	28
	influent	7.3	7.0	6.8	6.8
pH	effluent	7.3	6.9	6.8	6.9
	influent	40	44	210	100
Biochemical Oxygen Demand (mg/L)	effluent	<2	<2	<2	<2
	influent	150	200	220	200
Total Suspended Solids (mg/L)	effluent	<2	<2	<2	<2
	influent	110	140	170	150
Volatile Suspended Solids (mg/L)	effluent	<2	<2	<2	<2
	influent	110	140	170	150

Notes:
 (a) Site problem
 (b) Malfunction of system under test
 (c) Weather problem
 (d) Other

NSF International
Standard 40 - Residential Wastewater Treatment Systems

Plant Effluent

Week Beginning: October 3, 2004 Plant Code: Ecoflo

Weeks Into Test: 6
 Sunday 420 gallons Saturday 420 gallons
 Weekend Dosing: 420 gallons

	Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)	420	420	420	420	420
Dissolved Oxygen (mg/L)	effluent	5.0	5.2	5.4	5.3
	influent	27	28	27	28
Temperature (C)	effluent	28	27	27	27
	influent	7.0	7.0	7.1	7.1
pH	effluent	6.9	7.0	6.9	6.8
	influent	91	120	120	160
Biochemical Oxygen Demand (mg/L)	effluent	<2	<2	<2	<2
	influent	240	78	100	310
Total Suspended Solids (mg/L)	effluent	3	<2	2	<2
	influent	150	70	80	220
Volatile Suspended Solids (mg/L)	effluent	<2	<2	<2	<2
	influent	150	70	80	220

Notes:
 (a) Site problem
 (b) Malfunction of system under test
 (c) Weather problem
 (d) Other

NSF International
Standard 40 - Residential Wastewater Treatment Systems
 Plant Effluent

Week Beginning: October 10, 2004 Plant Code: Ecoflo

Weeks Into Test: 7

Weekend Dosing: Sunday 420 gallons Saturday 420 gallons

	Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)	420	420	420	420	420
Dissolved Oxygen (mg/L)	effluent	7.0	6.8	7.7	6.6
	influent	27	27	27	26
Temperature (C)	effluent	27	27	26	26
	influent	7.0	7.2	7.0	7.1
pH	effluent	7.1	7.0	7.2	7.1
	influent	130	150	210	170
Biochemical Oxygen Demand (mg/L)	effluent (BOD ₅)	<2	<2	<2	<2
	influent (CBOD ₅)	260	110	240	200
Total Suspended Solids (mg/L)	effluent	<2	<2	<2	3
	influent	170	80	180	150
Volatile Suspended Solids (mg/L)	effluent	<2	<2	<2	<2
	influent				

Notes:

- (a) Site problem
- (b) Malfunction of system under test
- (c) Weather problem
- (d) Other

NSF International
Standard 40 - Residential Wastewater Treatment Systems
 Plant Effluent

Week Beginning: October 17, 2004 Plant Code: Ecoflo

Weeks Into Test: 8

Weekend Dosing: Sunday 420 gallons Saturday 420 gallons

	Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)	420	420	420	420	420
Dissolved Oxygen (mg/L)	effluent	5.0	4.3	3.8	4.2
	influent	27	27	28	28
Temperature (C)	effluent	27	27	27	28
	influent	7.0	6.9	7.1	7.0
pH	effluent	7.1	7.0	7.1	7.2
	influent	120	200	250	75
Biochemical Oxygen Demand (mg/L)	effluent (BOD ₅)	<2	<2	<2	<2
	influent (CBOD ₅)	230	150	620	310
Total Suspended Solids (mg/L)	effluent	<2	<2	<2	<2
	influent	170	96	440	220
Volatile Suspended Solids (mg/L)	effluent	<2	<2	<2	<2
	influent				

Notes:

- (a) Site problem
- (b) Malfunction of system under test
- (c) Weather problem
- (d) Other

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: October 24, 2004 Plant Code: Ecoflo
Weeks Into Test: 2
Weekend Dosing: Sunday 420 gallons Saturday 420 gallons Friday 420 gallons

	Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)	420	420	420	420	420
Dissolved Oxygen (mg/L)	effluent	4.4	d	d	d
Temperature (C)	inflow	26	27	27	27
pH	inflow	7.2	6.9	6.8	6.8
	effluent	7.0	6.8	6.7	6.8
Biochemical Oxygen Demand (mg/L)	inflow (BOD ₅)	39	62	87	120
	effluent (CBOD ₅)	<2	<2	<2	2
Total Suspended Solids (mg/L)	inflow	100	110	92	42
	effluent	<2	5	<2	3
Volatile Suspended Solids (mg/L)	inflow	72	68	70	82
	effluent	<2	3	<2	3

Notes:
(a) Site problem
(b) Malfunction of system under test
(c) Weather problem
(d) Other

Notes: Dissolved oxygen measurements not taken 10/27 through 10/27 due to a problem with the DO meter.

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: October 31, 2004 Plant Code: Ecoflo
Weeks Into Test: 10
Weekend Dosing: Sunday 420 gallons Saturday 420 gallons Friday 420 gallons

	Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)	420	420	420	420	420
Dissolved Oxygen (mg/L)	effluent	4.9	6.0	5.7	5.7
Temperature (C)	inflow	26	25	25	25
pH	inflow	6.6	6.7	6.8	7.1
	effluent	7.1	6.9	6.9	6.8
Biochemical Oxygen Demand (mg/L)	inflow (BOD ₅)	120	140	120	110
	effluent (CBOD ₅)	<2	<2	<2	<2
Total Suspended Solids (mg/L)	inflow	260	240	110	200
	effluent	<2	<2	<2	<2
Volatile Suspended Solids (mg/L)	inflow	190	170	82	150
	effluent	<2	<2	<2	<2

Notes:
(a) Site problem
(b) Malfunction of system under test
(c) Weather problem
(d) Other

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: November 7, 2004 Plant Code: Ecoflo

Weeks Into Test: 11

Weekend Dosing: Sunday 420 gallons Saturday 420 gallons Friday 420 gallons

	Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)	420	420	420	420	420
Dissolved Oxygen (mg/L)	effluent	5.4	5.3	5.7	5.6
	influent	25	25	24	25
Temperature (C)	effluent	24	24	24	24
	influent	7.0	7.0	6.6	6.6
pH	effluent	6.6	6.6	6.8	6.2
	influent	78	110	170	170
Biochemical Oxygen Demand (mg/L)	effluent (CBOD ₅)	<2	<2	<2	<2
	influent	110	78	130	370
Total Suspended Solids (mg/L)	effluent	<2	<2	<2	<2
	influent	82	62	100	340
Volatile Suspended Solids (mg/L)	effluent	<2	<2	<2	<2
	influent				

Notes:
(a) Site problem
(b) Malfunction of system under test
(c) Weather problem
(d) Other

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: November 14, 2004 Plant Code: Ecoflo

Weeks Into Test: 12

Weekend Dosing: Sunday 420 gallons Saturday 420 gallons Friday 420 gallons

	Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)	420	420	420	420	420
Dissolved Oxygen (mg/L)	effluent	4.4	5.2	5.5	5.8
	influent	24	24	23	21
Temperature (C)	effluent	22	22	22	22
	influent	6.8	6.7	6.6	6.7
pH	effluent	6.7	6.7	6.8	6.7
	influent	68	140	1700	80
Biochemical Oxygen Demand (mg/L)	effluent (CBOD ₅)	<2	<2	<2	<2
	influent	180	150	3900	130
Total Suspended Solids (mg/L)	effluent	<2	<2	<2	<2
	influent	150	120	2700	70
Volatile Suspended Solids (mg/L)	effluent	<2	<2	<2	<2
	influent				

Notes:
(a) Site problem
(b) Malfunction of system under test
(c) Weather problem
(d) Other

There was not enough sample on 11/19 to complete all effluent analyses due to a sampler malfunction.

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: November 21, 2004 Plant Code: Ecoflo

Weeks Into Test: 13 Sunday 420 gallons Saturday 420 gallons
Weekend Dosing: 420 gallons Friday 420 gallons

Dosed Volume (gallons)	Monday	Tuesday	Wednesday	Thursday	Friday
Dissolved Oxygen (mg/L)	6.2	5.8	5.8	6.1	6.0
Temperature (C)	23	22	22	22	22
	22	22	21	21	21
pH	7.0	6.9	7.0	7.0	7.2
	7.0	6.9	6.9	6.8	6.9
Biochemical Oxygen Demand (mg/L)	32	20	19	40	44
	<2	<2	<2	<2	<2
Total Suspended Solids (mg/L)	60	34	28	64	92
	2	<2	<2	<2	<2
Volatile Suspended Solids (mg/L)	48	18	22	46	64
	<2	<2	<2	<2	<2

Notes:

- (a) Site problem
- (b) Malfunction of system under test
- (c) Weather problem
- (d) Other

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: November 28, 2004 Plant Code: Ecoflo

Weeks Into Test: 14 Sunday 420 gallons Saturday 420 gallons
Weekend Dosing: 420 gallons Friday 420 gallons

Dosed Volume (gallons)	Monday	Tuesday	Wednesday	Thursday	Friday
Dissolved Oxygen (mg/L)	6.4	7.0	6.4	6.6	6.7
Temperature (C)	22	22	22	22	22
	20	20	19	19	20
pH	6.9	6.8	7.0	7.1	7.0
	6.9	7.0	6.9	6.9	6.9
Biochemical Oxygen Demand (mg/L)	37	120	180	110	160
	<2	<2	<2	<2	<2
Total Suspended Solids (mg/L)	50	180	230	90	98
	<2	<2	<2	<2	<2
Volatile Suspended Solids (mg/L)	44	130	170	-	-
	<2	<2	<2	-	-

Notes:

- (a) Site problem
- (b) Malfunction of system under test
- (c) Weather problem
- (d) Other

The TSS samples were not analyzed for VSS on 12/2 and 12/3 due to laboratory error.

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: December 5, 2004 Plant Code: Ecoflo

Weeks Into Test: 15

Weekend Dosing: Sunday 420 gallons Saturday 420 gallons Friday 420 gallons

	Monday	Tuesday	Wednesday	Thursday	Friday	
Dosed Volume (gallons)	420	420	420	420	420	
Dissolved Oxygen (mg/L)	effluent	4.3	5.3	3.8	3.8	3.3
	influent	22	22	23	22	22
Temperature (C)	effluent	19	19	19	19	19
	influent	7.0	7.0	7.1	7.0	7.4
pH	effluent	6.8	6.9	6.9	6.9	7.0
	influent	8.2	9.9	11.0	9.2	12.0
Biochemical Oxygen Demand (mg/L)	effluent	<2	<2	<2	<2	<2
	influent	68	74	52	42	72
Total Suspended Solids (mg/L)	effluent	<2	<2	<2	<2	<2
	influent	60	60	42	38	64
Volatile Suspended Solids (mg/L)	effluent	<2	<2	<2	<2	<2

- Notes:
- (a) Site problem
 - (b) Malfunction of system under test
 - (c) Weather problem
 - (d) Other

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: December 12, 2004 Plant Code: Ecoflo

Weeks Into Test: 16

Weekend Dosing: Sunday 420 gallons Saturday 420 gallons Friday 420 gallons

	Monday	Tuesday	Wednesday	Thursday	Friday	
Dosed Volume (gallons)	420	420	420	420	420	
Dissolved Oxygen (mg/L)	effluent	4.9	4.8	6.5	6.8	5.4
	influent	22	19	20	21	20
Temperature (C)	effluent	19	18	19	18	20
	influent	7.3	7.2	7.3	7.2	7.3
pH	effluent	7.0	7.0	7.1	7.0	7.3
	influent	8.3	12.0	11.0	14.0	5.8
Biochemical Oxygen Demand (mg/L)	effluent	<2	<2	<2	<2	3
	influent	50	50	54	58	48
Total Suspended Solids (mg/L)	effluent	<2	<2	<2	<2	3
	influent	44	44	48	54	34
Volatile Suspended Solids (mg/L)	effluent	<2	<2	<2	<2	2

- Notes:
- (a) Site problem
 - (b) Malfunction of system under test
 - (c) Weather problem
 - (d) Other

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: December 19, 2004

Plant Code: Ecoflo

Weeks Into Test: 17

	Sun	Mon	Tue	Wed	Thur	Fri	Sat
Dosed Volume (gallons)	420	420	420	420	420	420	420
Dissolved Oxygen (mg/L)	effluent	6.6					
	influent	21					
Temperature (C)	effluent	17					
	influent	7.3					
pH	effluent	7.2					
	influent	85					
Biochemical Oxygen Demand (mg/L)	effluent (CBOD ₅)	2					
	influent	20					
Total Suspended Solids (mg/L)	effluent	<2					
	influent	20					
Volatile Suspended Solids (mg/L)	effluent	<2					
	influent	20					

Notes: Wash day stress 12/20 through 12/24.

- (a) Site problem
- (b) Malfunction of system under test
- (c) Weather problem
- (d) Other

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: December 26, 2004

Plant Code: Ecoflo

Weeks Into Test: 18

	Sun	Mon	Tue	Wed	Thur	Fri	Sat
Dosed Volume (gallons)	420	420	420	420	420	420	420
Dissolved Oxygen (mg/L)	effluent	6.9	6.4	6.0	5.5	5.6	5.8
	influent	18	20	19	20	20	20
Temperature (C)	effluent	16	16	16	16	16	17
	influent	7.2	7.2	7.1	7.4	7.3	7.3
pH	effluent	7.2	7.2	7.0	7.0	7.0	7.0
	influent	110	120	130	130	490	75
Biochemical Oxygen Demand (mg/L)	effluent (CBOD ₅)	<2	<2	<2	<2	<2	<2
	influent	40	170	69	69	1000	54
Total Suspended Solids (mg/L)	effluent	<2	<2	<2	<2	<2	<2
	influent	35	130	58	59	600	47
Volatile Suspended Solids (mg/L)	effluent	<2	<2	<2	<2	<2	<2
	influent	<2	<2	<2	<2	<2	<2

Notes: Working Parent Stress started 1/1/05.

- (a) Site problem
- (b) Malfunction of system under test
- (c) Weather problem
- (d) Other

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: January 2, 2005

Plant Code: Ecoflo

Weeks Into Test: 19

	Sun	Mon	Tue	Wed	Thur	Fri	Sat
Dosed Volume (gallons)	420	420	420	420	420	420	420
Dissolved Oxygen (mg/L)	effluent						7.2
	influent						20
Temperature (C)	effluent						18
	influent						7.2
pH	effluent						7.1
	influent						140
Biochemical Oxygen Demand (mg/L)	effluent (CBOD ₅)						<2
	influent (BOD ₅)						64
Total Suspended Solids (mg/L)	effluent						<2
	influent						57
Volatile Suspended Solids (mg/L)	effluent						<2
	influent						

- Notes: Working Parent Stress completed 1/5.
- (a) Site problem
 - (b) Malfunction of system under test
 - (c) Weather problem
 - (d) Other

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: January 9, 2005

Plant Code: Ecoflo

Weeks Into Test: 20

	Sun	Mon	Tue	Wed	Thur	Fri	Sat
Dosed Volume (gallons)	420	420	420	420	420	420	0
Dissolved Oxygen (mg/L)	effluent	7.2	7.2	7.4	7.1	7.1	
	influent	20	20	21	20	20	
Temperature (C)	effluent	17	18	17	18	18	
	influent	7.1	7.3	7.2	7.1	7.1	
pH	effluent	7.1	7.0	7.2	7.1	7.0	
	influent (BOD ₅)	92	70	200	140	170	
Biochemical Oxygen Demand (mg/L)	effluent (CBOD ₅)	<2	<2	<2	<2	<2	
	influent	49	34	260	43	170	
Total Suspended Solids (mg/L)	effluent	<2	<2	<2	<2	<2	
	influent	41	30	200	36	150	
Volatile Suspended Solids (mg/L)	effluent	<2	<2	<2	<2	<2	
	influent						

- Notes: Power/Equipment Failure Stress 1/13 through 1/15.
- (a) Site problem
 - (b) Malfunction of system under test
 - (c) Weather problem
 - (d) Other

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: January 16, 2005

Plant Code: Ecoflo

Weeks Into Test: 21

Dosed Volume (gallons)		Sun	Mon	Tue	Wed	Thur	Fri	Sat
Dissolved Oxygen (mg/L)	effluent	420	420	420	420	420	420	420
Temperature (C)	inflow							
	effluent				3.4	3.6	3.2	3.0
pH	inflow							
	effluent				20	20	20	20
Biochemical Oxygen Demand (mg/L)	inflow							
	effluent (CBOD ₅)				16	17	16	17
Total Suspended Solids (mg/L)	inflow							
	effluent				7.1	7.0	7.1	7.1
Volatile Suspended Solids (mg/L)	inflow							
	effluent				7.1	7.0	7.2	7.1
Total Suspended Solids (mg/L)	inflow							
	effluent				110	130	120	140
Total Suspended Solids (mg/L)	inflow							
	effluent				<2	<2	<2	<2
Volatile Suspended Solids (mg/L)	inflow							
	effluent				110	120	120	130
Total Suspended Solids (mg/L)	inflow							
	effluent				<2	<2	<2	<2
Volatile Suspended Solids (mg/L)	inflow							
	effluent				94	96	110	110
Total Suspended Solids (mg/L)	inflow							
	effluent				<2	<2	<2	<2

Notes:

- (a) Site problem
- (b) Malfunction of system under test
- (c) Weather problem
- (d) Other

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: January 23, 2005

Plant Code: Ecoflo

Weeks Into Test: 22

Dosed Volume (gallons)		Sun	Mon	Tue	Wed	Thur	Fri	Sat
Dissolved Oxygen (mg/L)	effluent	252	0	0	0	0	0	0
Temperature (C)	inflow							
	effluent							
pH	inflow							
	effluent							
Biochemical Oxygen Demand (mg/L)	inflow (BOD ₅)							
	effluent (CBOD ₅)							
Total Suspended Solids (mg/L)	inflow							
	effluent							
Volatile Suspended Solids (mg/L)	inflow							
	effluent							
Total Suspended Solids (mg/L)	inflow							
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Volatile Suspended Solids (mg/L)	inflow							
	effluent							

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: January 30, 2005

Plant Code: Ecoflo

Weeks Into Test: 23

	Sun	Mon	Tue	Wed	Thur	Fri	Sat
Dosed Volume (gallons)	0	0	252	420	420	420	420
Dissolved Oxygen (mg/L)	effluent					5.2	6.6
	inflow					18	19
Temperature (C)	effluent					15	15
	inflow					7.0	7.1
pH	effluent					6.9	6.3
	inflow					d	99
Biochemical Oxygen Demand (mg/L)	inflow (BOD ₅)					d	<2
	effluent (CBOD ₅)					80	71
Total Suspended Solids (mg/L)	inflow					<2	4
	effluent					65	61
Volatile Suspended Solids (mg/L)	inflow					<2	2
	effluent						

- Notes:
- (a) Site problem
 - (b) Malfunction of system under test
 - (c) Weather problem
 - (d) Other
- Notes: Vacation Stress completed 2/1.
No BOD samples on 2/4 due to laboratory error.

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: February 6, 2005

Plant Code: Ecoflo

Weeks Into Test: 24

	Sun	Mon	Tue	Wed	Thur	Fri	Sat
Dosed Volume (gallons)	420	420	420	420	420	420	420
Dissolved Oxygen (mg/L)	effluent	6.5	5.8	7.0	7.8	7.7	5.4
	inflow	19	19	19	19	19	19
Temperature (C)	effluent	15	15	16	16	16	15
	inflow	6.8	7.1	6.9	7.0	7.1	7.2
pH	effluent	6.5	7.1	7.2	7.2	7.2	7.1
	inflow	66	130	220	180	210	59
Biochemical Oxygen Demand (mg/L)	inflow (BOD ₅)	<2	<2	<2	4	<2	<2
	effluent (CBOD ₅)	54	90	230	88	230	88
Total Suspended Solids (mg/L)	inflow	<2	<2	<2	<2	<2	<2
	effluent	47	86	180	66	160	78
Volatile Suspended Solids (mg/L)	inflow	<2	<2	<2	<2	<2	<2
	effluent						

- Notes:
- (a) Site problem
 - (b) Malfunction of system under test
 - (c) Weather problem
 - (d) Other

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: February 13, 2005 Plant Code: Ecoflo

Weeks Into Test: 25
Weekend Dosing: Sunday 420 gallons Saturday 420 gallons Friday 420 gallons

	Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)	420	420	420	420	420
Dissolved Oxygen (mg/L)	effluent	5.3	3.4	4.4	2.7
	influent	20	19	20	19
Temperature (C)	effluent	17	17	17	17
	influent	7.0	6.9	6.9	7.0
pH	effluent	7.0	7.0	7.0	7.0
	influent	d	190	200	230
Biochemical Oxygen Demand (mg/L)	effluent	<2	<2	<2	<2
	influent	d	90	120	230
Total Suspended Solids (mg/L)	effluent	2	<2	<2	<2
	influent	d	74	98	180
Volatile Suspended Solids (mg/L)	effluent	<2	<2	<2	<2
	influent	d	74	98	180

Notes: (a) Site problem (b) Malfunction of system under test (c) Weather problem (d) Other

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: February 20, 2005 Plant Code: Ecoflo

Weeks Into Test: 26
Weekend Dosing: Sunday 420 gallons Saturday 420 gallons Friday 420 gallons

	Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)	420	420	420	420	420
Dissolved Oxygen (mg/L)	effluent	1.2	2.2	2.4	4.5
	influent	20	21	20	20
Temperature (C)	effluent	18	18	18	18
	influent	7.0	6.9	7.0	7.0
pH	effluent	6.9	7.0	6.9	7.1
	influent	110	130	130	80
Biochemical Oxygen Demand (mg/L)	effluent	<2	<2	<2	<2
	influent	98	67	130	100
Total Suspended Solids (mg/L)	effluent	<2	<2	<2	<2
	influent	72	54	88	71
Volatile Suspended Solids (mg/L)	effluent	<2	<2	<2	<2
	influent	72	54	88	71

Notes: (a) Site problem (b) Malfunction of system under test (c) Weather problem (d) Other

APPENDIX D
AMMONIA RESULTS

Date	Effluent Ammonia (mg/L)
01/24/05	0.09
02/02/05	0.74
02/03/05	2.21
02/09/05	<0.05
02/10/05	<0.05
02/11/05	<0.05
02/14/05	<0.05
02/15/05	<0.05
02/16/05	0.06
02/17/05	0.07
02/18/05	0.14
02/21/05	1.20
02/22/05	0.72
02/23/05	1.02
02/24/05	0.68
02/25/05	0.31
02/28/05	*
03/01/05	<0.05
03/02/05	<0.05
03/03/05	<0.05
03/04/05	<0.05
03/07/05	*
03/08/05	0.05
03/09/05	<0.05
03/10/05	<0.05
03/11/05	<0.05

* Sample not taken due to laboratory error.

APPENDIX E

FECAL AND TOTAL COLIFORM RESULTS

Date	Fecal Coliform		Total Coliform System Effluent (#/100mL)
	Septic Effluent (#/100mL)	System Effluent (#/100mL)	
09/02/04	900,000	19,700	-
09/06/04	-	485	-
09/07/04	-	1,520	-
09/09/04	550,000	3,950	-
09/10/04	-	4,650	-
09/13/04	-	30	-
09/16/04	200,000	295	-
09/17/04	-	330	-
09/20/04	-	51	-
09/23/04	1,060,000	2,200	-
09/24/04	-	No sample	-
09/27/04	-	145	-
09/29/04	230,000	34	-
09/30/04	-	-	1,110
10/01/04	-	30	-
10/04/04	-	875	-
10/06/04	239,000	60	920
10/08/04	-	115	-
10/11/04	-	26	-
10/13/04	231,000	177	860
10/15/04	-	60	-
10/18/04	-	46	-
10/20/04	141,000	22	307
10/22/04	-	51	-
10/25/04	-	19	-
10/27/04	169,000	33	1760
10/29/04	-	133	-
11/01/04	-	41	-
11/03/04	230,000	375	1300
11/05/04	-	90	-

Date	Fecal Coliform		Total Coliform System Effluent (#/100mL)
	Septic Effluent (#/100mL)	System Effluent (#/100mL)	
11/08/04	-	14	-
11/10/04	655,000	39	2300
11/12/04	-	39	-
11/15/04	-	83	-
11/17/04	119,000	30	80
11/19/04		770	
11/22/04		300	
11/23/04	30,000	270	12,800
11/26/04		7	
11/29/04		4	
12/01/04	104,000	6	380
12/03/04		70	
12/06/04		36	
12/08/04	100,000	100	2250
12/10/04		476	
12/13/04		430	
12/15/04	<2000	85	740
12/17/04		9420	
12/20/04		10,600	
12/22/04	126,000	550	400
12/23/04		20	
12/27/04		570	
12/29/04	190,000	380	3800
12/30/04		320	
01/03/05		15	
01/05/05	26,000	4	240
01/07/05		960	
01/10/05		510	
01/12/05	133,000	74	1900
01/14/05		470	

Date	Fecal Coliform		Total Coliform System Effluent (#/100mL)
	Septic Effluent (#/100mL)	System Effluent (#/100mL)	
01/17/05		13	
01/19/05	98,000	670	3050
01/21/05		1720	
02/02/05	68,000	2200	70,000
02/04/05		6680	
02/07/05		200	
02/09/05	90,000	130	3000
02/11/05		143	
02/14/05		290	
02/16/05	73,000	850	4250
02/18/05		2600	
02/21/05		870	
02/23/05	150,000	1000	900
02/25/05		6400	
02/28/05		630	
03/02/05	60,000	50	300
03/04/05		10	
03/07/05		1560	
03/09/05	101,000	770	1450
03/11/05		240	
03/14/05		310	

APPENDIX F
ADDITIONAL TESTING

Dosing and Sampling Schedule

Week		Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	Date	13-Mar	14-Mar	15-Mar	16-Mar	17-Mar	18-Mar	19-Mar
	Dose (gpd)	420	420	420	700	700	420	420
	Samples		x	x	x	x	x	
2	Date	20-Mar	21-Mar	22-Mar	23-Mar	24-Mar	25-Mar	26-Mar
	Dose (gpd)	0	0	0	700	700	0	0
	Samples				x	x		
3	Date	27-Mar	28-Mar	29-Mar	30-Mar	31-Mar	1-Apr	2-Apr
	Dose (gpd)	420	700	700	700	700	420	420
	Samples		x	x	x	x	x	
4	Date	3-Apr	4-Apr	5-Apr	6-Apr	7-Apr	8-Apr	9-Apr
	Dose (gpd)	0	0	0	700	700	0	0
	Samples				x	x		
5	Date	10-Apr	11-Apr	12-Apr	13-Apr	14-Apr	15-Apr	16-Apr
	Dose (gpd)	0	700	700	700	700	700	0
	Samples		x	x	x	x	x	
6	Date	17-Apr	18-Apr	19-Apr	20-Apr	21-Apr	22-Apr	23-Apr
	Dose (gpd)	420	420	420	420	420	420	420
	Samples							
7	Date	24-Apr	25-Apr	26-Apr	27-Apr	28-Apr	29-Apr	30-Apr
	Dose (gpd)	420	840	840	840	840	840	0
	Samples		x	x	x	x	x	

Sampling: Samples will be taken from both the influent and the effluent of the treatment unit.

Influent samples analyzed for: TSS, BOD5, Temperature, pH, Fecal Coliform and ammonia.

Effluent samples analyzed for: TSS, CBOD5, Temperature, pH, Fecal Coliform and ammonia.

NSF International
R&D
Plant Effluent

Week Beginning: March 13, 2005 Plant Code: Ecoflo

Weeks Into Test: 1 Sunday 420 gallons Saturday 420 gallons
 Weekend Dosing: 420 gallons Friday 420 gallons

	Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)	420	420	700	700	420
Dissolved Oxygen (mg/L)	7.4	7.2	5.9	3.8	2.4
Temperature (C)	inflow	20	19	19	20
	effluent	18	17	16	18
pH	inflow	7.1	7.0	6.8	7.2
	effluent	7.2	7.2	7.3	7.1
Biochemical Oxygen Demand (mg/L)	inflow	44	82	220	150
	effluent	<2	<2	<2	<2
Total Suspended Solids (mg/L)	inflow	32	70	240	100
	effluent	2	<2	<2	<2
Volatile Suspended Solids (mg/L)	inflow	26	46	190	76
	effluent	<2	<2	<2	<2

Notes:
 (a) Site problem
 (b) Malfunction of system under test
 (c) Weather problem
 (d) Other

NSF International
R&D
Plant Effluent

Week Beginning: March 20, 2005 Plant Code: Ecoflo

Weeks Into Test: 2 Sunday 0 gallons Saturday 0 gallons
 Weekend Dosing: 0 gallons Thursday 700 gallons Friday 0 gallons

	Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)	0	0	700	700	0
Dissolved Oxygen (mg/L)			5.5	5.6	
Temperature (C)	inflow		21	21	
	effluent		19	19	
pH	inflow		7.2	7.1	
	effluent		6.7	6.6	
Biochemical Oxygen Demand (mg/L)	inflow		210	230	
	effluent		<2	<2	
Total Suspended Solids (mg/L)	inflow		84	230	
	effluent		<2	<2	
Volatile Suspended Solids (mg/L)	inflow		75	190	
	effluent		<2	<2	

Notes:
 (a) Site problem
 (b) Malfunction of system under test
 (c) Weather problem
 (d) Other

R&D
Plant Effluent

Week Beginning: March 27, 2005

Plant Code: Ecoflo

Weeks Into Test: 3

Weekend Dosing: Sunday 420 gallons Saturday 420 gallons Friday 420 gallons

Dosed Volume (gallons)	Monday	Tuesday	Wednesday	Thursday	Friday
Dissolved Oxygen (mg/L)	3.0	3.2	1.0	2.4	1.5
Temperature (C)	21	22	22	22	21
pH	19	20	20	20	19
Biochemical Oxygen Demand (mg/L)	6.9	7.2	7.0	7.2	7.2
Total Suspended Solids (mg/L)	6.8	7.0	6.7	6.8	7.1
Volatiles (mg/L)	34	120	230	100	140
Suspended Solids (mg/L)	<2	<2	<2	<2	<2
Total Suspended Solids (mg/L)	66	71	530	87	160
Volatiles (mg/L)	<2	2	<2	4	<2
Suspended Solids (mg/L)	56	61	380	73	130
Total Suspended Solids (mg/L)	<2	<2	<2	3	<2

Notes:
(a) Site problem
(b) Malfunction of system under test
(c) Weather problem
(d) Other

R&D
Plant Effluent

Week Beginning: April 3, 2005

Plant Code: Ecoflo

Weeks Into Test: 4

Weekend Dosing: Sunday 0 gallons Saturday 0 gallons Friday 0 gallons

Dosed Volume (gallons)	Monday	Tuesday	Wednesday	Thursday	Friday
Dissolved Oxygen (mg/L)	0	0	700	700	0
Temperature (C)			22	22	
pH			21	21	
Biochemical Oxygen Demand (mg/L)			7.1	7.1	
Total Suspended Solids (mg/L)			7.0	7.0	
Volatiles (mg/L)			170	210	
Suspended Solids (mg/L)			<2	<2	
Total Suspended Solids (mg/L)			59	210	
Volatiles (mg/L)			<2	<2	
Suspended Solids (mg/L)			53	180	
Total Suspended Solids (mg/L)			<2	<2	

Notes:
(a) Site problem
(b) Malfunction of system under test
(c) Weather problem
(d) Other

NSF International
R&D
Plant Effluent

Week Beginning: April 10, 2005

Plant Code: Ecoflo

Weeks Into Test: 5

Weekend Dosing: Sunday 0 gallons Saturday 0 gallons Friday 700 gallons

	Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)	700	700	700	700	700
Dissolved Oxygen (mg/L)	effluent	1.6	2.7	2.0	1.9
	influent	22	22	23	23
	effluent	22	21	19	21
Temperature (C)	influent	7.2	7.2	7.0	7.1
	effluent	6.8	7.4	7.1	7.4
pH	influent	7.6	160	280	260
	effluent	<2	<2	<2	<2
Biochemical Oxygen Demand (mg/L)	influent	42	90	48	240
	effluent	<2	<2	<2	<2
Total Suspended Solids (mg/L)	influent	36	72	40	200
	effluent	<2	<2	<2	<2

Notes: CBOD results on the influent due to laboratory error.
 (a) Site problem
 (b) Malfunction of system under test
 (c) Weather problem
 (d) Other

NSF International
R&D
Plant Effluent

Week Beginning: April 17, 2005

Plant Code: Ecoflo

Weeks Into Test: 6

Weekend Dosing: Sunday 420 gallons Saturday 420 gallons Friday 420 gallons

	Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)	420	420	420	420	420
Dissolved Oxygen (mg/L)	effluent				
	influent				
	effluent				
pH	influent				
	effluent				
Biochemical Oxygen Demand (mg/L)	influent				
	effluent				
Total Suspended Solids (mg/L)	influent				
	effluent				
Volatiles Suspended Solids (mg/L)	influent				
	effluent				

Notes: No samples taken during this week.
 (a) Site problem
 (b) Malfunction of system under test
 (c) Weather problem
 (d) Other

NSF International
R&D
Plant Effluent

Plant Code: Ecoflo

Week Beginning: April 24, 2005

Weeks Into Test: 7

Weekend Dosing: Sunday 420 gallons Saturday 0 gallons

		Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)		840	840	840	840	840
Dissolved Oxygen (mg/L)	effluent	1.0	0.8	0.7	0.8	1.0
	influent	23	23	23	24	24
Temperature (C)	effluent	23	23	23	24	23
	influent	7.2	7.1	7.1	7.0	7.0
pH	effluent	6.7	6.7	7.0	7.0	6.8
	influent	170	340	350	270	410
Biochemical Oxygen Demand (mg/L)	effluent	<2	<2	<2	<2	2
	influent	220	400	340	270	760
Total Suspended Solids (mg/L)	effluent	2	<2	3	<2	<2
	influent	170	320	280	220	640
Volatile Suspended Solids (mg/L)	effluent	<2	<2	3	<2	<2

Notes: CBOD results on the influent due to laboratory error.

- (a) Site problem
- (b) Malfunction of system under test
- (c) Weather problem
- (d) Other

R&D - Fecal Coliform Results		
Date	Influent (#/100mL)	Effluent (#/100mL)
03/14/05	180,000	310
03/15/05	420,000	620
03/16/05	520,000	58
03/17/05	3,700,000	8,800
03/18/05	3,700,000	70,400
03/23/05	3,000,000	395
03/24/05	2,150,000	14,100
03/28/05	600,000	1,120
03/29/05	1,600,000	7900
03/30/05	1,700,000	13,600
03/31/05	2,800,000	13,400
04/01/05	4,000,000	9,200
04/06/05	3,750,000	128
04/07/05	3,100,000	20,600
04/11/05	239,000	22,100
04/12/05	2,400,000	25,600
04/13/05	3,150,000	5,250
04/14/05	52,000,000	3,800
04/15/05	17,000,000	22,400

R&D - Ammonia Results		
Date	Influent	Effluent
03/14/05	19.8	0.26
03/15/05	15.8	0.06
03/16/05	12.8	<0.05
03/17/05	14.9	0.35
03/18/05	20.2	2.37
03/23/05	19.8	<0.05
03/24/05	16.8	0.54
03/28/05	20.3	<0.05
03/29/05	32	1.26
03/30/05	36.3	2.4
03/31/05	32	3.69
04/01/05	26.7	3.98
04/06/05	12.2	<0.05
04/07/05	21	1.55
04/12/05	23.5	3.69
04/13/05	23.7	<0.05
04/14/05	35.3	<0.05
04/15/05	25	0.39

APPENDIX G
OWNER'S MANUAL



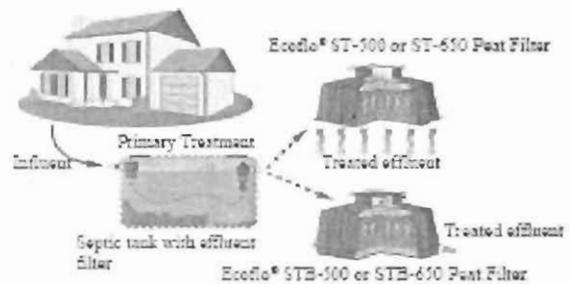
Congratulations on your purchase of an Ecoflo® Peat filter system. In choosing the Ecoflo® Peat filter system, you have wisely chosen to protect your health as well as the environment. This manual contains information on system operation and maintenance, guidelines for use and warranties. For additional information, contact our customer service at 1 877 295-5763.

Operating principle

The Ecoflo® Peat filter system is a wastewater treatment system designed to treat domestic wastewater. Your complete Ecoflo® Peat filter system includes a septic tank, an effluent filter, one or more Peat Filters and, depending on the type of installation, a pumping station and a flow divider.

System description

The Ecoflo® Peat Filter is made of a fibreglass shell including a natural filtering media especially selected to treat residential wastewater. A polyethylene lid securely fastened limits the access to the system. Under that lid is located a security panel that deflects the incoming air into 2 aeration channels to feed the filtering media. That lid also insulates the inside parts of the system.



The Ecoflo® Peat filter system has been tested and listed under standard 40. Each model of Ecoflo® Peat filter described here meets Class I requirements as per ANSINSEF standard 40.

Inside the Ecoflo® Peat filter, a central support acts as a stand for the tipping bucket that split equally the influent on both sides of the central support. Four distribution plates (2 on each side of the central support) including holes are located over the filtering media and feed it uniformly with wastewater.

Operating principle

To be treated, the wastewater goes first into the septic tank where it is submitted to a primary treatment. Then it goes across the effluent filter to prevent solids discharge to the effluent before reaching the Ecoflo® Peat filter. Once inside the Ecoflo®, the water is directed into the tipping bucket in order to be split equally on the distribution plates located on both sides of the central support. These plates include channels and orifices that distribute uniformly the effluent on the top of the filtering media. Then, wastewater trickles down into the filtering media where its organic content is consumed by the bacteria before entering the absorption bed located underneath or being collected to be discharged elsewhere (if possible into a watercourse or in an other leaching field)

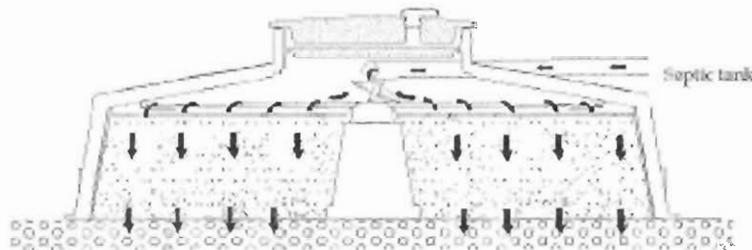


Figure 1 Water flow inside the Ecoflo® Peat filter ST-500/650

Model description

Capacity

The components of model the Ecoflo® Peat filter systems are described in the tables below.

Table 1 Ecoflo® Peat filter systems with opened bottom

Ecoflo® Peat filter system	Flow rate (gpd)	Septic tank capacity (gal)	Effluent filter model	Number of Ecoflo® Peat filter	
				ST-500	ST-650
ST-500	420	1000	EFT-080R	1	-
ST-650	600	1000	EFT-080R	-	1
ST-500-2	840	2000	EFT-080RH	2	-
ST-650-2	1200	2000	EFT-080RH	-	2
ST-650-3	1500	2500	EFT-080RH2	-	3

Table 2 Ecoflo® Peat filter systems with closed bottom

Ecoflo® Peat filter system	Flow rate (gpd)	Septic tank capacity (gal)	Effluent filter model	Number of Ecoflo® Peat filter	
				ST-500	ST-650
STB-500	420	1000	EFT-080R	1	-
STB-650	600	1000	EFT-080R	-	1
STB-500-2	840	2000	EFT-080RH	2	-
STB-650-2	1200	2000	EFT-080RH	-	2
STB-650-3	1500	2500	EFT-080RH2	-	3

Septic tank

The septic tank included in your Ecoflo® Peat filter system respect the following specifications.

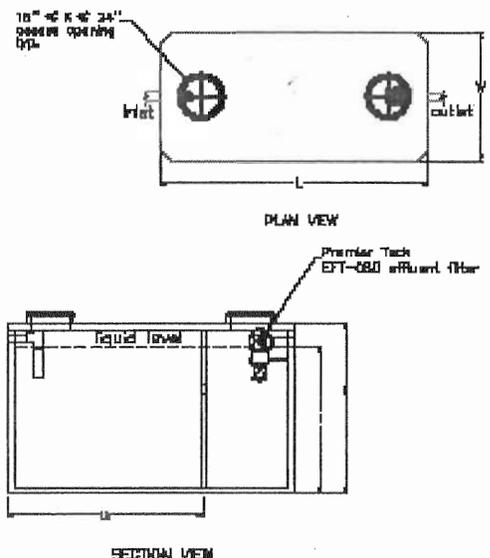
Criteria ¹	Objectives		
Shape	Rectangular		
Length to width ratio ²	$1.4 \leq L/W \leq 2.8$		
Liquid level	$1 \geq 36''$		
Air space over liquid level	$a \geq 7''$		
Access over inlet and outlet	$16'' \leq x \leq 24''$ (circular or rectangular)		
Internal baffle location from the inlet side ($\pm 5\%$)	$0.5 \leq L_p/L \leq 0.7$		
Invert of the opening(s) in internal baffle (from the bottom of the tank)	$\geq 30''$		
Inlet device	Baffle, tee or elbow ³		
	1000 gal	2000 gal	2500 gal
Length (L)	$95'' \leq L \leq 130''$	$135'' \leq L \leq 165''$	$135'' \leq L \leq 165''$
Width (W)	$47'' \leq W \leq 72''$	$62'' \leq W \leq 87''$	$62'' \leq W \leq 87''$
Height (total) (H)	$47'' \leq H \leq 75''$	$60'' \leq H \leq 85''$	$70'' \leq H \leq 93''$
Liquid level (l)	$36'' \leq l \leq 60''$	$45'' \leq l \leq 65''$	$60'' \leq l \leq 80''$
Outlet device (Could be inside or outside the septic tank ⁴)	EFT-080R effluent filter	EFT-080RH effluent filter	EFT-080RH2 effluent filter

1: Based on CSA and/or BNC criteria and/or on state regulation.

2: Based on external dimensions.

3: Minimum diameter of 4 inches for tee and elbow.

4: If the effluent filter is located in a separate container (such as Premier Tech TLF-240) after the septic tank, it could be the same type of device as specified for the inlet.



Tank material

The tank material must be made of concrete or polyethylene and respect the specifications described hereunder:

Concrete

- 28 days minimum compressive strength \geq 3600 psi (25 Mpa)
- The thickness of walls, top and bottom are at least 3 inches (75 mm);
- Tanks is reinforced to resist without structural cracking stresses caused during handling and installation;
- All reinforcement have a clear cover of at least 1 inch (25 mm).

Polyethylene

- Polyethylene comply with ASTM Standard D 1248, Class B (requiring an ultraviolet stabiliser) or Class C (requiring a minimum of 1% carbon black)
- Stress crack resistance \geq 150h when measured in accordance with ASTM Standard D 1693
- The thickness of walls, top, bottom and covers is at least $\frac{3}{16}$ inch (5 mm).

Quality control program

Septic tanks are subjected to a quality control program by the manufacturer. It consists of controlling:

- raw material in terms of specifications described above;
- wall thickness;
- watertightness;
- septic tank assembly.

Ecoflo® Peat filter

There are actually four different models of Ecoflo® Peat filter available.

Regarding the effluent discharge, there are two types of Ecoflo® Peat Filters. The first one has an opened bottom allowing the effluent disposal by infiltration directly underneath the filtering media. The second one includes an impermeable bottom able to collect and direct the treated effluent to a disposal field, a tertiary treatment or a direct discharge to a watercourse. These models are identified by two letters: ST (open bottom) and STB (collecting bottom).

There are also two sizes of Ecoflo® Peat filter that are currently available which are the ST(B)-500 and ST(B)-650. Both sizes have the same hydraulic loading rate. The ST(B)-500 models have a nominal filtering area of 49 ft² allowing a flow rate of 420 gal/d and the ST(B)-650 models have a nominal surface area of 70 ft² allowing a flow rate of 600 gal/d.

All of these models include a shell made of fibreglass.

Guidelines for Use

The Ecoflo® Peat Filter is a biofiltration system designed to treat domestic wastewater from a residential house. It is installed downstream of the septic tank equipped with an effluent filter. It can also be used to treat wastewater from Commercial, Communal and Municipal project. Please refer to the Commercial Design Guide for more information.

To ensure optimum treatment efficiency and operation of any septic installation (Ecoflo® Peat filter, leach field, etc.), you should always:

Avoid discharging any of the following substances into the sewer:

- water softener backwash
- oil and grease (engine oil, cooking oil, etc.)
- wax and resins
- paint and solvents
- petroleum products
- pesticides of any kind
- any kind of septic tank additive
- toxic substances
- anything not easily biodegradable (e.g. coffee beans, cigarette butts, sanitary napkins, tampons, condoms).



Avoid :

- using an automatic toilet bowl cleaner
- using a garbage disposal or sewage pump (upstream of the septic tank)

And never:

- cover or bury all the access lids of the Ecoflo® Peat filter system
- plant trees within 3 m (10') of the Ecoflo® Peat Filter
- open or enter the Ecoflo® Peat filter system without prior authorization
- connect a drainage pipe or roof gutter to the system.

Note:

There is **no** action to be taken if the system is to be used intermittently or if extended periods of non-use are anticipated

What You Should Know

Keep heavy weights off your septic installation

Never drive vehicles or place objects weighing over 200 kg (500 lb.) within 3m (10') of the lid. If you are planning to do some landscaping or any other type of work, **make sure you advise those involved so they do not damage your septic system.**

Do not shovel or blow snow so that it accumulates on top of the septic system. The overload could cause damage. Mark/indicate the location of system components.

With regard to your home

Your home must be equipped with a working air vent, and plumbing must conform to the local building Code. Any change in the use or function of your home, or any modification to your Ecoflo® Peat filter system must be authorized by the local authorities, and Premier Tech Environment must be informed. The warranty for the Ecoflo® Peat filter system will be void if this condition has not been fully respected.

Maintenance

Ecoflo® Peat Filter

The owner of a biofiltration system shall follow the manufacturer's recommendations respecting maintenance of the system. For that purpose, he must at all times have a valid contract with the manufacturer or its representative, and a copy of the contract must be filed with the local authorities in which the system is located.

Because maintenance is essential to the proper functioning of the Ecoflo® Peat Filter, it comes with a maintenance agreement binding Premier Tech Environment to service the Ecoflo® Peat Filter, free of charge for a limited period of time following its installation (please see maintenance agreement for more details). This agreement is automatically renewed with the purchase of a new filter bed from Premier Tech Environment. Every Ecoflo® Peat filter system sold has to be serviced annually for the duration of its useful life.

Bi-annual maintenance for the first two years and annual maintenance for the followings is carried out by Premier Tech Environment or an authorized agent. This service includes a visual inspection of all components to ensure the system is functioning properly and an effluent quality inspection consisting of a visual assessment for color turbidity and an olfactory assessment for odor. It also includes the raking of the filtering media on an annual basis. You will be given a maintenance record after each inspection, which you shall keep with this manual in a safe place. If a problem is observed during the inspection that cannot be remedied at the time of the inspection, the maintenance record will include an estimated date of correction.



The peat filter should normally be replaced every eight (8) years at the most, depending on use and compliance with the above guidelines. The filter bed is easily pumped with a regular sewage disposal truck. The replacement filter must be installed by an authorized agent. Easy access to the lid is essential for maintenance purposes. If the peat filter is still in good conditions, it is possible to extend the initial maintenance agreement on a case by case study.

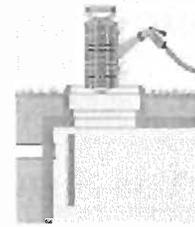
Septic tank

Emptying your septic tank as instructed helps to keep your septic system in proper working order. We recommend that you keep proof of pumping (invoice) with this owner's manual so as to keep a record of complete system maintenance. The pumping standards of the septic tank prescribed by local authorities must be respected. For main residences, the septic tank should be inspected yearly. It should be pumped out (first and second compartments) at least every 2 years or when a

maximum depth of sludge of 20 inches is reached in the first compartment, whichever comes first. However, when a by-law governing the pumping of septic tanks has been adopted by a municipality or county, a septic tank may be pumped by measuring the scum or sludge layer. Consult your local regulations for prescribed inspection and pumping frequency.

Premier Tech EFT-080R (H/H2) effluent filter

We recommend an inspection of the filter once a year. Cleaning of the effluent filter should be done each time the septic tank is pumped. However, the frequency of maintenance will depend on wastewater flow, regulation requirement and the type of establishment. Pull the cartridge out of its container and gently hose it off to remove any scum. You should do this while holding the filter over the septic tank first compartment so that scum washes back into the tank.



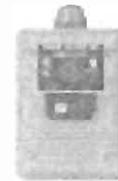
PSA-240, PSA-240H, PSA-240L pumping station (if needed)

Bottom sludge in the PSA-240, PSA-240H or PSA-240L pumping station should be pumped at the same time as the septic tank, or as needed.

Component Use

Visual and audio alarm Unit

The Ecoflo® Peat filter system is equipped with a high-water float (fixed to the effluent filter) connected to an alarm panel. This panel must be installed inside the residence so the alarm can be heard as soon as it comes on. The operation of this unit is described below.



If water reaches an unusually high level, the visual and audio alarm comes on. To turn it off, push the "SILENCE" button. It is important to note that this will not solve the problem. If this situation happens, call a service representative right away. You can test the alarm system to make sure it is operating properly by pushing the "TEST" button; the visual and audio signals should come on.

Who to Contact in Case of...

Flooding

Certain sites are prone to flooding or phreatic rise, which can cause malfunctioning of the Peat Filter or any other septic system. If this happens, contact Premier Tech Environment.

Backflow

Backflow rarely occurs in homes. It is generally caused by the septic tank. If it happens, the visual and audio alarms will come on. Your septic system installer or septic tank pumper can usually tell you what to do.

Odors

The positioning of the air vent, as well as other factors unrelated to the Peat Filter, can prevent proper dispersion of septic gases and lead to odors. If this happens, contact Premier Tech Environment for solutions.

Resurgence near the Ecoflo® Peat Filter

That situation rarely occurs. But it may happen if the soil is waterlogged, if there is excessive water consumption or if there is insufficient fill. If this happens, contact Premier Tech Environment for solutions.

To obtain information such as serial number, system capacity, system classification or service, you should refer to the system data plate located on the alarm panel or inside of the main access of the system by removing the plastic green lid. To access the system data plate in the Ecoflo® Peat filter main access, you have to unscrew the lag screws located at corner of the lid. Do not remove the blue insulating board located inside the main access which sealed the Peat Filter with Premier Tech ty-raps.

For further information, or to comment on our products, contact your local installer or Premier Tech at:

Premier Tech Environment
☎ 1-877-295-5763 / (415) 867-8883 / 📠 (415) 867-3896
✉ ecoflo@premiertech.com / www.premiertech.com

Disclaimer

The content of this guide is based upon the latest information available at the time of printing. No warranty or representation is hereby made by Premier Tech as to the accuracy of said information. Premier Tech is continually updating and improving its products and reserves the right to amend, discontinue, alter or change specifications and prices without prior notice.

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Certificate of Warranty for Ecoflo[®] Peat filter system

1. Preamble

Premier Tech 2000 ltd (hereinafter referred to as "Premier Tech") is proud to provide its customers with an exclusive wastewater treatment system guaranteed by an innovative warranty.

For the purpose of this warranty, "Customer" shall mean the original owner of an Ecoflo[®] Peat filter system ST-500, ST-650, ST-500-2, ST-650-2, ST-650-3, STB-500, STB-650, STB-500-2, STB-650-2 or STB-650-3 certified by NSF, which may be composed, depending on the type of system, of a EFT-080R, EFT-080RH or EFT-080RH2 effluent filter and a septic tank (the whole system being hereinafter referred to as "Ecoflo[®] Peat filter system"), and shall also mean, if and when applicable, any other person entitled to exercise, under the law or by virtue of section 8 of the present warranty, the rights granted to such original owner by virtue of this certificate of warranty.

2. Nature of the Warranty

Premier Tech warrants the components of its Ecoflo[®] Peat Filter as follow:

- Premier Tech warrants that the filter bed(s) of the Ecoflo[®] Peat filter system will function properly for a period of two (2) years starting on the date of its installation.
- Premier Tech warrants its EFT-080R, EFT-080RH and EFT-080RH2 effluent filter (parts) against manufacturing defects for a period of two (2) years from the date of its installation.
- Premier Tech warrants PT Aqua's PST-500 septic tank (parts) against manufacturing defects for a period of fifteen (15) years from the date of its installation.
- Premier Tech warrants any other type and model of septic tank against any manufacturing defects for a period of two (2) years from the date of its installation, provided that such septic tank complies with Premier Tech's specifications (SPEC), as detailed in the owner's manual.
- Except as otherwise prescribed in the present certificate, Premier Tech warrants the performances of the fibreglass and other components of the Ecoflo[®] Peat filter system against any manufacturing defects for a period of two (2) years starting on the date of installation.

The date of installation shall be the date written on the maintenance agreement.

This warranty of effectiveness, sound manufacture and durability is given by Premier Tech in addition to the legal warranties or other Customer's rights in accordance with any applicable law, but does not alter them in any way.

This conventional warranty of Premier Tech is expressly limited to the text of this certificate and is valid if the installation of the Ecoflo[®] Peat filter system has been made in accordance with applicable regulations and with the manufacturer's recommendations.

3. Notice

For this warranty to be valid, Premier Tech shall be notified in writing immediately upon appearance of any indication of anomaly or irregularity in the Ecoflo[®] Peat filter system.

This notice must be given by mail or by facsimile to Premier Tech's head office: 1, Avenue Premier, Rivière-du-Loup, Québec, G5R 6C1, fax: (418) 362-6642.

On receipt of such notice, Premier Tech will examine the situation and, where the terms of this warranty apply, take appropriate corrective measures.

4. Exclusions

The following damages or problems are excluded from the warranty:

- (a) Any damage or problem caused by a fortuitous event or "force majeure", such as, without limiting the generality of the foregoing, earthquake, flood, hurricane, landslide, explosion or dynamiting;
- (b) Any damage or problem caused by the fault or act of a third party;
- (c) Any damage or problem arising from a defective installation carried out by an Ecoflo[®] installer, or any installation, modification, correction or addition not carried out by an Ecoflo[®] installer;
- (d) Any damage or problem arising from any installation, modification, correction or addition to the Ecoflo[®] Peat filter system carried out after installation of the Ecoflo[®] Peat Filter without Premier Tech's prior written approval;
- (e) Any damage or problem caused by the use of a septic tank which does not comply with any applicable regulations and/or with Premier Tech's specifications (SPEC), as detailed in the owner's manual;
- (f) Any damage or problem, if it is demonstrated that the Ecoflo[®] Peat filter system was not used in accordance with the instructions guidelines contained in the owner's manual;
- (g) Any damage or problem, if the Ecoflo[®] Peat filter system has not been maintained by a person authorized by Premier Tech in accordance with the maintenance agreement;
- (h) Any damage or problem caused by the fault or action of the Customer including, without limiting the generality of the foregoing, refusal to allow access to the system for maintenance;
- (i) Any damage or problem, if it is found that the Customer has failed to notify Premier Tech of any change in the use of the property served by the

Certificate of Warranty for Ecoflo[®] Peat filter system

Ecoflo[®] Peat filter system that alters the nature or quality of wastewater being treated and/or that constitutes a violation of the applicable regulations.

- (j) Any damage or problem caused during the works performed in order to access to the Ecoflo[®] Peat filter system, including, without limiting the generality of the foregoing, excavation, snow-removal or demolition.
- (k) Any damage or problem arisen from site and/or soil prior condition not reported or not properly reported to Premier Tech by the Customer or the person performing the site investigation.

5. Particular Exclusions

It is further expressly understood that the Customer may not carry out or cause to be carried out any repair or verification of the Ecoflo[®] Peat filter system sold, or attempt to carry out any work whatsoever to apply any corrective measures whatsoever to said work, unless having notified Premier Tech in accordance with the provisions of section 3 of this warranty and having given Premier Tech the opportunity to assess the situation.

If the Customer carries out or causes to be carried out repairs, or attempts to repair or to apply corrective measures of any kind whatsoever to the Ecoflo[®] Peat filter system sold, without prior authorization from Premier Tech, this warranty shall be considered null and void and Premier Tech shall be considered completely discharged from any and all of its obligations under this warranty.

6. Indemnities and Damages

Premier Tech's liability and obligations under this warranty shall be limited to the replacement of any defective parts of the Ecoflo[®] Peat filter system and the related labour in accordance with sections 3 and 4.

7. Limitation of liability

Premier Tech may in no way be held liable for any other damage suffered/ claimed by the Customer. Premier Tech's compensation or indemnification obligation shall be limited to the provisions of section 6 of this warranty.

8. Transfer of Ownership

In the event of transfer of ownership, sale, assignment or disposition in any other way of Customer's property to a third party, this warranty shall continue to apply if and only if the new owner confirms in writing to Premier Tech that he/she is the new owner of the property, he/she understands and is aware of the content of this warranty certificate and accepts its terms and conditions.

The Customer undertakes to hand over to the new owner or to the new owner's successors, the warranty certificate remitted to the Customer upon completion of the work, as well as the owner's manual and the maintenance and environmental monitoring program for the Ecoflo[®] Peat filter system.

In order for the provisions of the first paragraph of this Section 8 to apply, the new owner or his/ her successors must, within a reasonable time, complete one of the

detachable parts of the warranty certificate and return it immediately to Premier Tech.

If the new owner or new owner's successors do not send such notice, this warranty shall no longer be in effect and shall be considered null and void.

9. Inspection

The Customer shall allow Premier Tech or its duly authorized representative to carry out all necessary monitoring and inspection as required for implementation of this warranty.

If the Customer makes a request to Premier Tech under this warranty and that it is found after inspection and verification that the Ecoflo[®] Peat filter system is performing in accordance with the standards and specifications of Premier Tech, a minimum charge of one hundred fifty U.S dollars (\$ 150.00 US) plus direct expenses shall be paid by the Customer for the cost of such inspection.

If the Ecoflo[®] Peat filter system is not performing as specified above, no charge shall be invoiced by Premier Tech.

10. Interpretation

The terms of this warranty shall be interpreted and governed by the law in force in the Province of Quebec.

11. Priority of the Certificate of Warranty

This warranty supersedes any contract or understanding, written or verbal, entered into between the Customer and Premier Tech.

The owner's manual and, where applicable, the maintenance and environmental monitoring program documentation remitted to the Customer shall be considered as complementing this warranty; in case of contradiction between this warranty and the owner's manual or, where applicable, the maintenance and environmental monitoring program documentation for the Ecoflo[®] Peat filter system, the terms of this warranty shall prevail.