FLORIDA DEPARTMENT OF HEALTH

Charlie Crist
Governor

Ana M. Viamonte Ros, M.D., M.P.H.
State Surgeon General

INTEROFFICE MEMORANDUM

INFORMATION
HSES 10-009

DATE: July 21, 2010

TO: County Health Department Directors/Administrators
ATTN: Environmental Health and Engineering Directors

THROUGH: Lisa Conti, D.V.M., M.P.H., Dipl. ACVPM, Director
Division of Environmental Health

FROM: Gerald Briggs, Chief
Bureau of Onsite Sewage Programs

SUBJECT: ANSI/NSF Standard 40, Class I, Aerobic Treatment Unit (new listing)

INFORMATION ONLY

Aero-Tech models AT-500, AT-600, AT-750, and AT-1000 Wastewater Treatment System Aerobic Treatment Unit (ATU) have been certified as meeting all of the requirements of ANSI/NSF Standard 40. It has been added to the listing of ATUs acceptable for use in the State of Florida. Please note that the drawings in the NSF certification report do not show how the electrical lines will enter the unit. Upon inspection verify that they enter as per s. 64E-6.013(9)(c), FAC. Also per the manufacturer, the pre-treatment tank must be purchased with the unit from Aero-Tech. The following tanks manufactured by Aero-Tech have been approved for use with the above listed ATUs.

Number	Comments
70-147-AT500-C3	Houses Aero-Tech 500 GPD aerobic treatment units Also serves as 500 gallon pretreatment tank
70-147-AT600-C3	Houses Aero-Tech 600 GPD aerobic treatment units Also serves as 600 gallon pretreatment tank
70-147-AT750-C3	Houses Aero-Tech 750 GPD aerobic treatment units Also serves as 750 gallon pretreatment tank
70-147-AT1000-C3	Houses Aero-Tech 1000 GPD aerobic treatment units Also serves as 1000 gallon pretreatment tank

Please direct any questions to Kim Duffek at (407)317-7325.

WASTEWATER TECHNOLOGY

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

Final Report:

Aero-Tech Aerobic Treatment Units
Model AT-500 Wastewater Treatment System
07/33/055/0030

NSF International
789 N. Dixboro Road
PO Box 130140
Ann Arbor, Michigan 48113-0140 USA

Evaluation Report:
Aero-Tech Aerobic Treatment Units
Model AT-500
Wastewater Treatment System

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

March 2009

EXECUTIVE SUMMARY

Testing of the Aero-Tech Model AT-500 was conducted under the provisions of NSF/ANSI Standard 40 for Residential Wastewater Treatment Systems (August 2005 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 a 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. Dosing was initiated on January 14, 2008. After a three-week start up period, sample and data collection for the test was officially started on February 4, 2008. Sampling started in the winter and continued into the summer, covering a range of operating temperatures.

Over the course of the evaluation, the average effluent $CBOD_5$ was 5 mg/L, ranging between <2 and 39 mg/L, and the average effluent total suspended solids was 6 mg/L, ranging between <2 mg/L and 56 mg/L.

The Aero-Tech Model AT-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 17 mg/L for $CBOD_5$ and 28 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 16 mg/L for $CBOD_5$ and 12 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, 6.8 and 7.2, within the required range of 6.0 to 9.0. The Model AT-500 met the requirements for noise levels (less than 60 dbA at a distance of 20 feet), color, threshold odor, oily film and foam.

PREFACE

Performance evaluation of residential wastewater treatment systems is achieved within the provisions of NSF/ANSI Standard 40: Residential Wastewater Treatment Systems (revised August 2005), 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 meet the requirements of EPA Secondary Treatment Guidelines[1] for five day carbonaceous biochemical oxygen demand ($CBOD_5$), total suspended solids (TSS) and pH. Class I plants must also demonstrate performance consistent with the effluent color, odor, oily film and foam requirements of the Standard. Class II plant effluent must have no more than 1% of samples exceeding 60 mg/L $CBOD_5$ and 100 mg/L TSS.

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 August 2005) that the Aero-Tech Model AT-500 manufactured by Aero-Tech Aerobic Treatment Units has fulfilled the requirements of NSF/ANSI Standard 40. The Model AT-500 has therefore been authorized to bear the NSF Mark so long as Aero-Tech 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
Technical Manager
Federal Programs

TABLE OF CONTENTS

This page intentionally blank

1.0 PROCESS DESCRIPTION

The Aero-Tech Model AT-500 is an extended aeration, activated sludge process. In the activated sludge process, microorganisms remove soluble contaminants from the wastewater, utilizing them as sources of energy for growth and production of new microorganisms. The organisms tend to be flocculent and form clumps, or floc that physically entrap particulate organic matter. The organic matter is attacked by extracellular enzymes that solubilize the solids to make them available to the microorganisms as a food source. The conversion of the organic matter from soluble to biological solids allows for the removal of the organic matter by settling of the solids in the treatment process[3].

Extended aeration is a modification of the activated sludge process in which the microorganism are allowed to remain in the treatment process for long periods of time. The large inventory of biological solids in the process provides a buffer for shock loading of organic matter. The long aeration period allows for the organisms in the system to consume themselves reducing the total amount of solids produced by the treatment process.

The organisms primarily responsible for the degradation of the organic matter are aerobic bacteria. As such, the transfer of oxygen in to the wastewater by an aeration system is critical to the treatment process. The aeration system also provides for the mixing of the wastewater and organisms to provide contact between the organic contaminants in the wastewater and the organisms that provide for removal of the contaminants. For this reason, an activated sludge process is referred to as a suspended growth system.

2.0 PERFORMANCE EVALUATION

2.1 Description of Plant Evaluated

The Aero-Tech Model AT-500 system tested in this evaluation has a rated capacity of 500 gallons per day (gpd). Specifications and drawings are included in Appendix A.

Raw Sewage enters a 4" inlet pipe from the home. The wastewater is then infused with air from the submersible aerator pump at the bottom of the aerobic treatment plant. This powerful, highly effective pump mixes air from the surface with wastewater in the bottom of the tank. The venture created by the pump pulls fresh air from the surface and mixes it with the effluent from the bottom of the tank, the finely diffused air bubbles are then pushed through the exhaust ports into the mixing chamber in a swirling motion. As the finely diffused air rises, it creates a swirling motion, keeping the sludge in a constant state of suspension. As new wastewater enters the mixing chamber, it hydraulically displaces the mixed liquor into the clarifying cone.

In the clarifying chamber, the liquid is suspended in the quiet zone, allowing the remaining suspended solids to settle back into the mixing chamber to be further treated. The clear water in the upper clarifying chamber is then discharged through the surge resistant puck up into the leachfield.

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 plant with 2/3 water and 1/3 raw sewage. The plant was then dosed at the design loading rate of 500 gpd as follows:

6 a.m. to 9 a.m. - 35 percent of daily rated capacity (175 gallons)
11 a.m. to 2 p.m. - 25 percent of daily rated capacity (125 gallons)
5 p.m. to 8 p.m. - 40 percent of daily rated capacity (200 gallons)

Dosing was accomplished by opening an electrically actuated valve to feed wastewater to the test plant. Five gallon doses were spread uniformly over each dosing period to comprise the total dose volume for the 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 influent and effluent samples are collected five days per week. The influent samples are analyzed for five-day biochemical oxygen demand (BOD_5) and total suspended solids (TSS) concentrations. The effluent samples are analyzed for carbonaceous five-day biochemical oxygen demand ($CBOD_5$), and total suspended solids (TSS) concentrations. On-site determinations of the effluent temperature and pH are made five days per 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/Equipment 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 discharge[1]:

(1) $CBOD_5$: 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) TSS: 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 January 7, 2008. The infiltration/exfiltration test, during which the entire system was tested for leaks, was completed on January 9, 2008. The septic tank was filled with 500 gallons of wastewater and the treatment tank was filled with 2/3 fresh water and 1/3 raw sewage and dosing was initiated at the rate of 500 gallons per day beginning January 14, 2008. Sampling was initiated on February 2, 2008. The stress test sequence was started on May 26, 2008 and ended on July 17, 2008. Testing was completed on August 1, 2008.

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*[2,3] and USEPA methods[4]. Copies of the data generated during the evaluation are included in Appendix C. 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

	Average	Std. Dev.	Minimum	Maximum	Median	Interquartile Range
Biochemical Oxygen Demand (mg/L)						
Influent (BOD_5)	230	64	90	400	220	190 - 260
Effluent ($CBOD_5$)	5	7	<2	39	2	2 - 4
Total Suspended Solids (mg/L)						
Influent	210	47	120	390	200	170 - 240
Effluent	6	9	<2	56	3	2 - 6
pH						
Influent	-	-	6.8	7.6	6.9	6.9 – 6.9
Effluent	-	-	6.8	7.2	6.9	6.9 – 6.9
Temperature (°C)						
Influent	23	2	10	27	23	21 - 25
Effluent	22	3	17	27	21	19 - 25
Dissolved Oxygen (mg/L)						
Aeration Chamber	4	0.6	3	6.7	3.9	3.7 – 4.3
Effluent	4	0.7	3	7.1	4.0	3.7 – 4.3

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 TSS and $CBOD_5$ during the first month of testing. The 30 and 7-day averages during this time may 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 $CBOD_5$ and TSS concentrations from the Aero-Tech Model AT-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 30-day average BOD_5 concentration between 100 and 300 mg/L and a 30-day average TSS concentration between 100 and 350 mg/L. The 30-day average influent remained inside this specified range for the duration of the test.

3.2 Biochemical Oxygen Demand

The five-day biochemical oxygen demand (BOD_5) and carbonaceous five-day biochemical oxygen demand ($CBOD_5$) 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 BOD_5:

Individual influent BOD_5 concentrations ranged from 90 to 400 mg/L during the evaluation, with an average concentration of 230 mg/L and a median concentration of 220 mg/L. Thirty day average concentrations ranged from 160 to 260 mg/L.

Effluent $CBOD_5$:

Effluent $CBOD_5$ concentrations ranged from 2 to 39 mg/L over the course of the evaluation, with an average concentration of 5 mg/L. The median effluent $CBOD_5$ concentration was 2 mg/L.

The Standard requires that the effluent $CBOD_5$ not exceed 40 mg/L on a 7-day average or 25 mg/L on a 30-day average. As presented in Table II, over the course of the test the 7-day average effluent $CBOD_5$ ranged from 2 to 17 mg/L and the 30-day average ranged from 2 to 16 mg/L. The Aero-Tech Model AT-500 met the requirements of Standard 40 for effluent $CBOD_5$.

BOD_5 Loading:

Over the course of the evaluation the influent BOD_5 loading averaged 0.96 lb/day. The Aero-Tech Model AT-500 achieved an average reduction of 0.94 lbs/day. The system achieved a 98% reduction in biological oxygen demand.

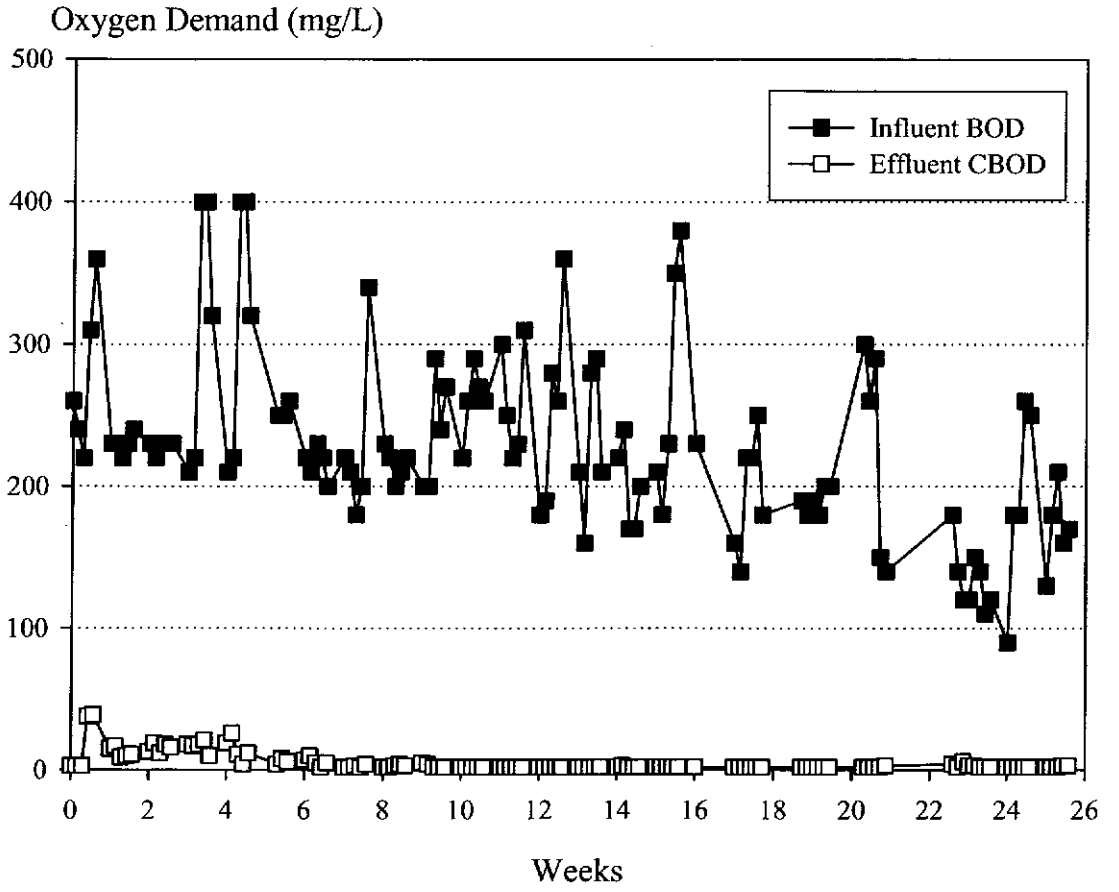


Figure 1. Biochemical Oxygen Demand

3.3 Total Suspended Solids

TSS and volatile suspended solids (VSS) analyses were completed using Methods 209C and 209D of *Standard Methods*. The TSS results over the entire evaluation are shown in Figure 2. Data from both analyses are summarized in Table I.

Influent TSS:

The influent TSS ranged from 120 to 390 mg/L during the evaluation, with an average concentration of 210 mg/L and a median concentration of 200 mg/L. The 30-day average concentrations during the test ranged from 190 to 230 mg/L.

Effluent TSS:

The effluent TSS concentration ranged from <2 to 56 mg/L during the evaluation, with an average concentration of 6 mg/L and a median concentration of 3 mg/L.

Over the course of the evaluation, NSF/ANSI Standard 40 requires that the effluent TSS 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 TSS ranged from 2 to 28 mg/L and the 30-day average ranged from 2 to 12 mg/L during the test. The Aero-Tech Model AT-500 met the requirements of NSF/ANSI Standard 40 for effluent TSS.

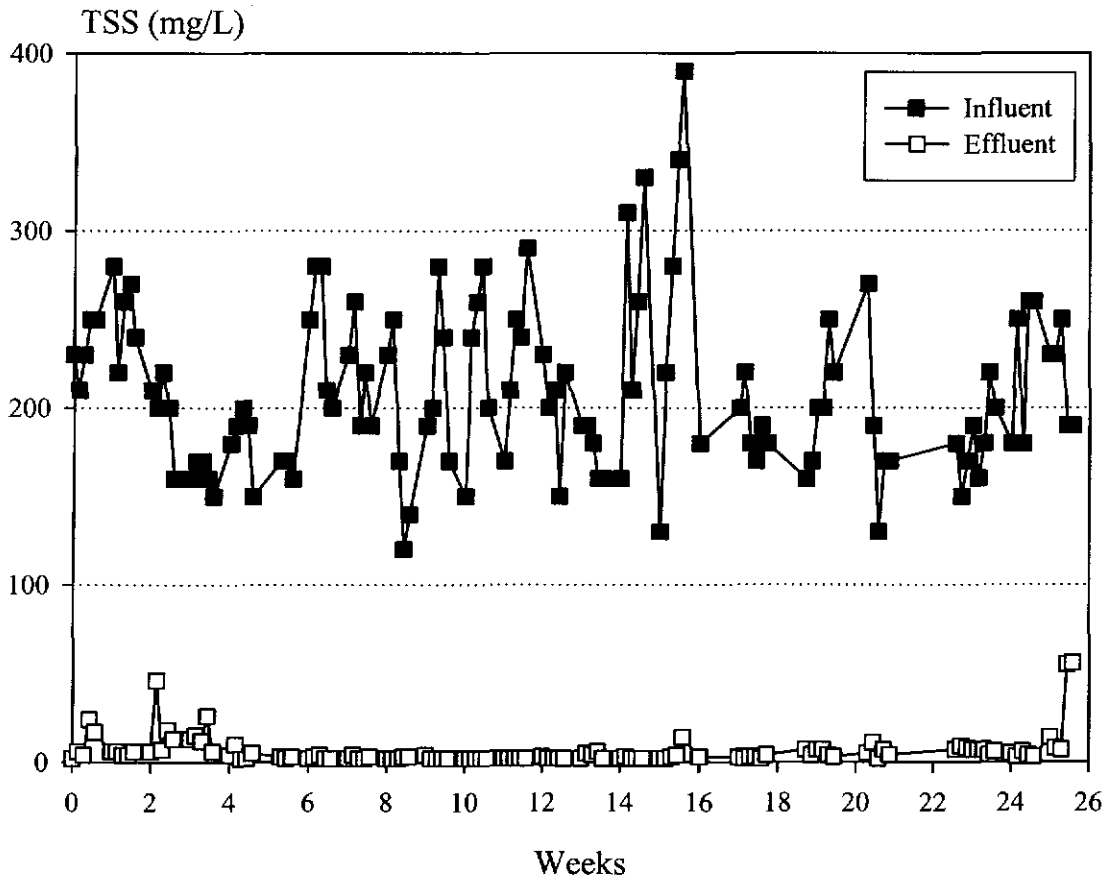


Figure 2. Total Suspended Solids

Table II. 7- and 30-day Average Effluent $CBOD_5$ and 30-day Average Influent BOD_5

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	17	16	260
	2	12		
	3	16		
	4	17		
2	5	14	5	250
	6	6		
	7	6		
	8	3		
3	9	3	2	250
	10	3		
	11	2		
	12	2		
	13	2		
4	14	2	2	230
	15	2		
	16	2		
	17	2		
5	18	2	2	200
	19	2		
	20	2		
	21	2		
	22	2		
6	23	4	3	160
	24	2		
	25	2		
	26	3		

Table III. 7- and 30-day 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	11	12	210
	2	5		
	3	18		
	4	14		
2	5	5	3	210
	6	3		
	7	3		
	8	3		
3	9	2	2	220
	10	2		
	11	2		
	12	2		
	13	2		
4	14	4	4	230
	15	2		
	16	2		
	17	7		
5	18	3	5	190
	19	4		
	20	5		
	21	6		
	22	4		
6	23	8	12	200
	24	6		
	25	4		
	26	28		

3.4 pH

Over the entire evaluation period, the influent pH ranged from 6.8 to 7.6. (median of 6.9). The effluent pH ranged from 6.8 to 7.2 during the evaluation (median of 6.9); 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 10 to 27°C (median of 23°C). The temperature data are shown in Appendix C.

3.6 Dissolved Oxygen

Dissolved Oxygen (DO) was measured in the aeration chamber and effluent during the evaluation. The aeration chamber DO ranged between 3.0 and 6.7 mg/L (median of 3.9 mg/L), while the effluent DO ranged between 3.0 to 7.1 mg/L (median of 4.0 mg/L). All dissolved oxygen data are shown in Appendix C.

3.7 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.

3.8 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.

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.

This page intentionally blank

APPENDIX A

PLANT SPECIFICATIONS

PLANT SPECIFICATIONS

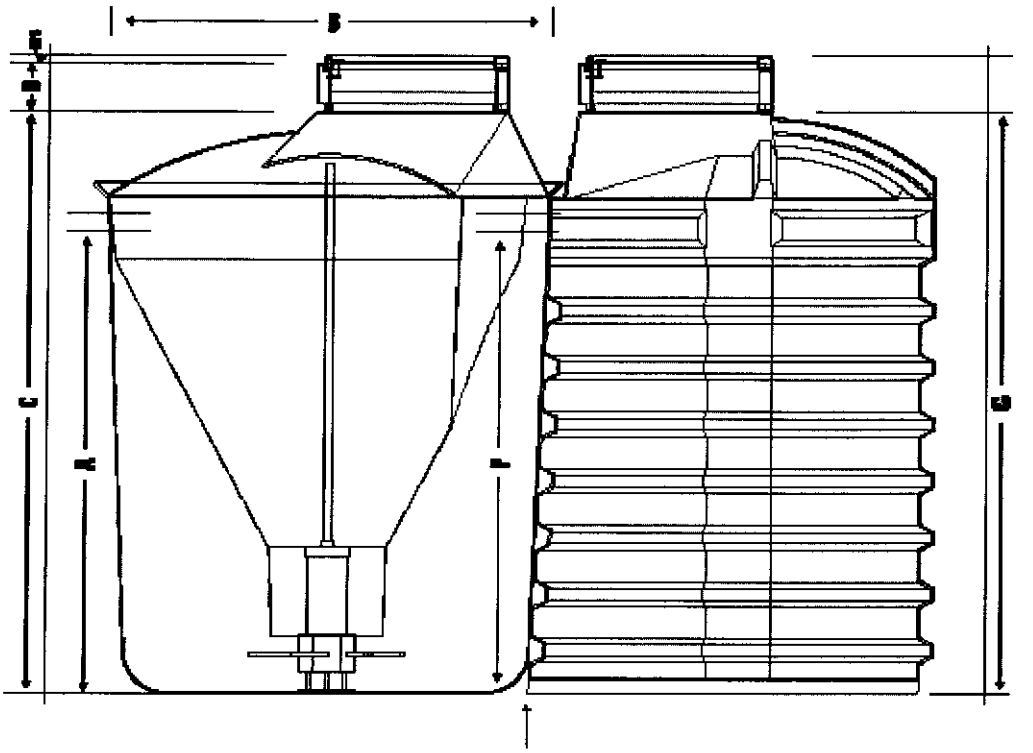
Aero-Tech, Inc.
Model AT-500

Plant Capacity

Design Flow	500 gpd
Plant Hydraulic Capacity	
1-compartment Pretreatment Tank	500 gallons
Process Tank	835 gallons
Average Hydraulic Retention Time (at Design Flow)	
1-compartment Pretreatment Tank	24 hours
Process Tank	40 hours

Aerator Specifications

SA02 Submersible Aerator



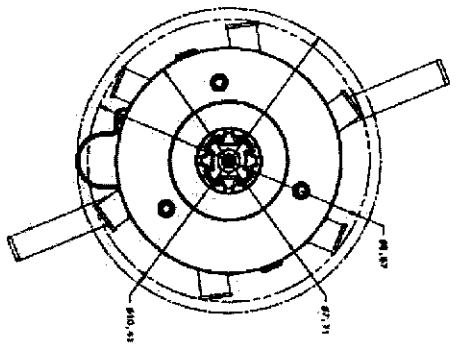
MODEL	A	B	C	D	E	F	G
AT-500	66"	64"	84¾"	6"	1"	66"	84¾"
AT-600	66"	64"	84¾"	6"	1"	66"	84¾"
AT-750	66"	72"	84¾"	6"	1"	66"	84¾"
AT-1000	66"	84"	86¾"	6"	1"	66"	84¾"
AT-1500	72"	96"	96¼"	6"	1"	72"	84¾"

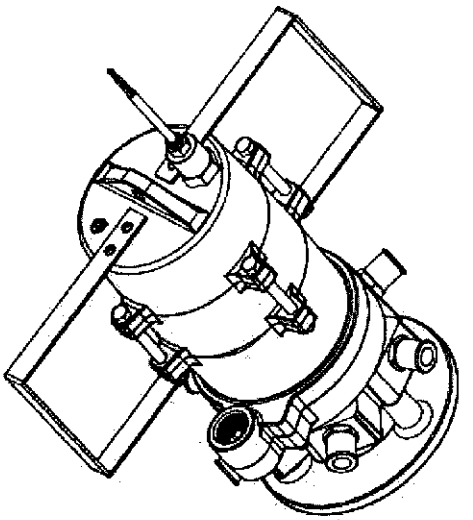
ATU- Fiberglass
Wall and Lid Thickness shall be no less than ¼" thick
Pretreatment Tank can be
Polyethylene or Concrete

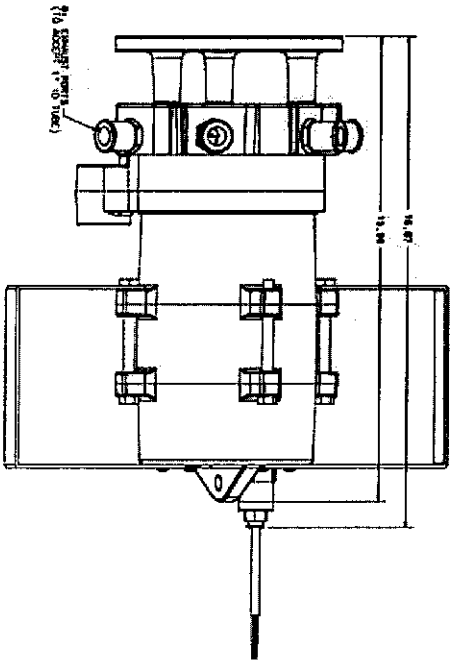
Patent Pending

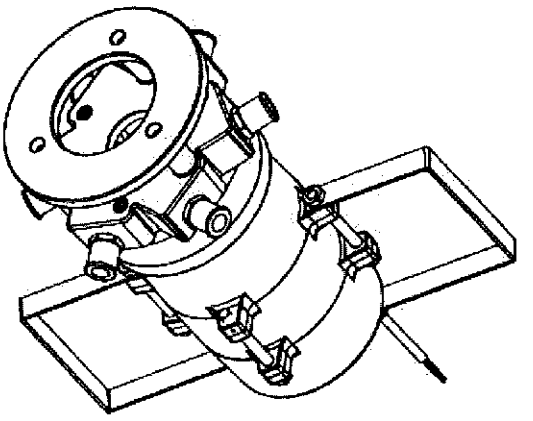
5

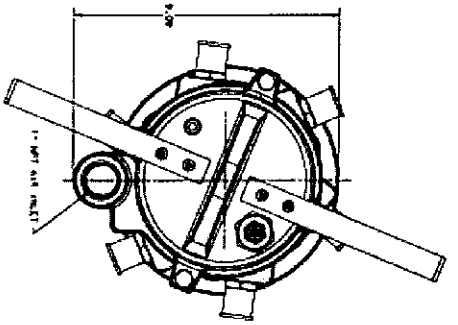
This page intentionally blank





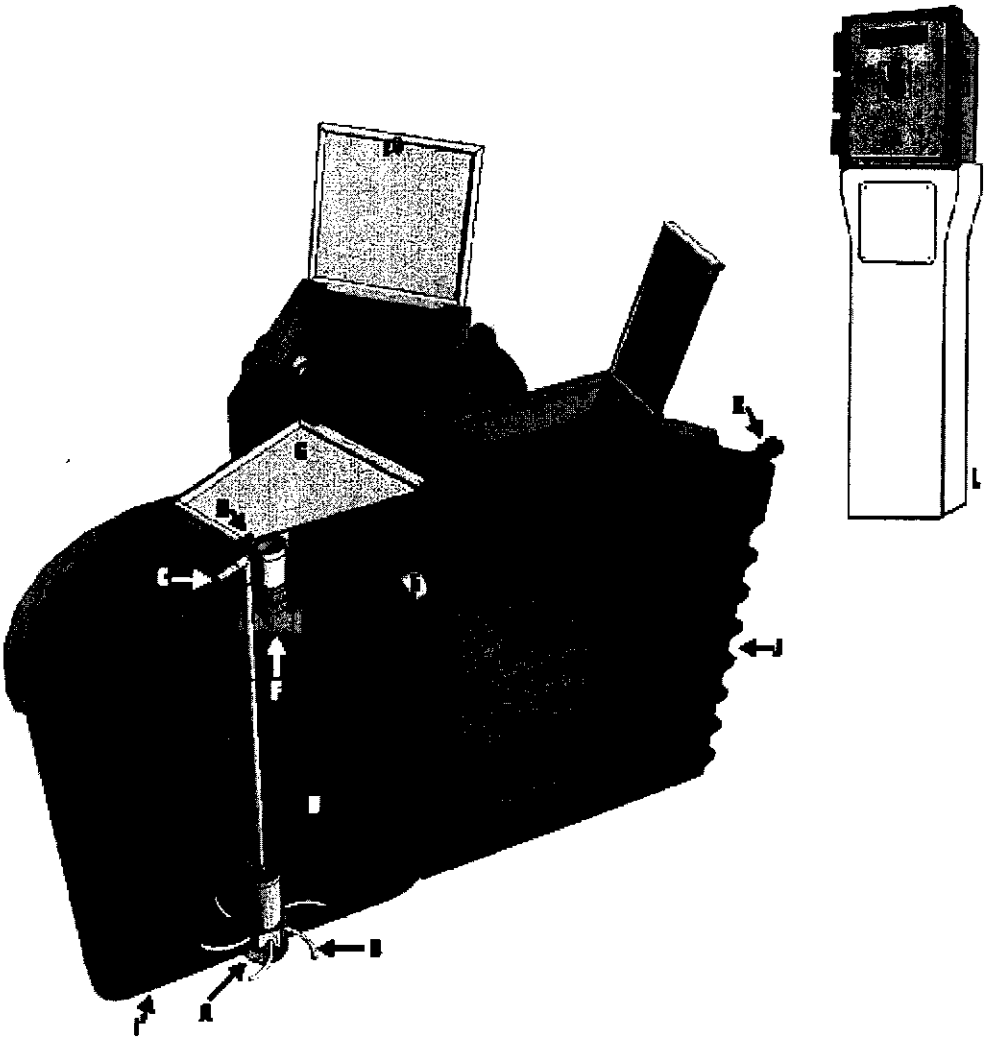






Aero-Tech

SA02 Submersible Aerator



A. Submersible Aerator
B. Discharge Hoses
C. Air Intake
D. Clarifier
E. Inlet Pipe
F. Discharge Assembly Pipe
G. Hatch/Access Cover
H. Lock Assembly
I. Fiberglass Tank
J. Pretreatment Tank
K. Inlet From House
L. Control Panel

Patent Pending

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, ⅔ of the system's capacity shall be filled with water and the remaining ⅓ 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 BOD_5 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% ± 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, BOD_5, and $CBOD_5$

The pH, TSS, and BOD_5 of the collected influent and the pH, TSS and $CBOD_5$ 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 ⅔ 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 $CBOD_5$

The 30-d average of $CBOD_5$ concentrations of effluent samples shall not exceed 25 mg/L.

The 7-d average of $CBOD_5$ 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 $CBOD_5$ 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 $CBOD_5$ 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 $CBOD_5$

Not more than 10% of the effluent $CBOD_5$ values shall exceed 60 mg/L.

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

This page intentionally blank

APPENDIX C

ANALYTICAL RESULTS

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: 3-Feb-08 Plant Code: Aero-Tech

Weeks Into Test: 1

Weekend Dosing: Sunday 300 gallons Saturday 300 gallons

		Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)		300	300	300	300	288
Dissolved Oxygen (mg/L)	aeration chamber	6.3	6.6	6.7	6	6.2
	effluent	7.0	7.1	7.0	4.2	5.6
	sand filter effluent	5.9	6.9	7.3	7.3	7.3
Temperature (C)	influent	20	10	20	21	21
	aeration chamber	38	38	38	29	25
	effluent	17	17	17	25	25
	sand filter effluent	11	11	11	29	25
pH	influent	7.1	7.1	7.1	7.6	7.2
	aeration chamber	6.9	6.9	6.9	7.2	7.0
	effluent	7.1	7.1	7.0	7.2	7.1
	sand filter effluent	6.9	7.0	6.9	7.2	7.2
Biochemical Oxygen Demand (mg/L)	influent (BOD_5)	260	240	220	310	360
	effluent (CBOD5)	3	3	3	38	39
	SF effluent ($CBOD_5$)	<2		<2		16
Suspended Solids (mg/L)	influent	230	210	230	230	250
	aeration chamber	160	310	110	120	14
	effluent	2	6	4	24	17
	sand filter effluent	4		5		10
Volatile Suspended Solids (mg/L)	influent	170	180	170	210	210
	aeration chamber	11	22	14	71	7
	effluent	<2	4	3	20	13
	sand filter effluent	<2		<2		6
45 Minute Settleable Solids (mL/L)	aeration chamber	<1	<1	<1	<1	<1

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

Notes: Low dosing on 2/8 caused by a problem with the NSF test site dosing system

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: 10-Feb-08 Plant Code: Aero-Tech

Weeks Into Test: 2

Weekend Dosing: Sunday 300 gallons Saturday 300 gallons

		Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)		300	300	300	300	300
Dissolved Oxygen (mg/L)	aeration chamber	5.9	5.2	5.3	4.9	5.1
	effluent	5.4	5.6	5.2	5.3	5.0
	sand filter effluent	5.0	5.2	5.1	5.2	5.1
Temperature (C)	influent	22	21	21	21	21
	aeration chamber	32	31	31	31	31
	effluent	20	20	20	20	19
	sand filter effluent	19	19	19	19	19
pH	influent	7.1	7.0	7.1	6.9	7.0
	aeration chamber	7.0	7.1	7.0	7.0	7.0
	effluent	6.9	7.0	7.0	7.0	6.9
	sand filter effluent	6.9	6.9	7.0	7.0	7.0
Biochemical Oxygen Demand (mg/L)	influent (BOD_5)	320	230	220	230	240
	effluent (CBOD5)	15	17	9	10	11
	SF effluent ($CBOD_5$)					
Suspended Solids (mg/L)	influent	230	220	260	230	240
	aeration chamber	12	17	27	26	25
	effluent	6	6	4	4	6
	sand filter effluent					
Volatile Suspended Solids (mg/L)	influent	230	170	190	190	170
	aeration chamber	11	14	20	19	17
	effluent	5	6	2	3	5
	sand filter effluent					
45 Minute Settleable Solids (mL/L)	aeration chamber	<1	<1	<1	<1	<1

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

Notes:

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: 17-Feb-08 Plant Code: Aero-Tech

Weeks Into Test: 3

Weekend Dosing: Sunday 300 gallons Saturday 300 gallons

Dosed Volume (gallons)		Monday 300	Tuesday 300	Wednesday 300	Thursday 300	Friday 300
Dissolved Oxygen (mg/L)	aeration chamber	4.9	5.0	4.9	4.0	4.7
	effluent	5.2	5.3	5.2	5.2	5.1
	sand filter effluent	5.0	5.1	5.2	5.1	4.9
Temperature (C)	influent	21	21	21	21	21
	aeration chamber	32	32	32	32	32
	effluent	20	20	20	19	20
	sand filter effluent	19	19	19	19	19
pH	influent	6.9	7.0	6.9	6.8	6.9
	aeration chamber	6.9	6.9	6.9	6.9	6.9
	effluent	6.9	6.9	6.9	6.9	6.9
	sand filter effluent	6.9	6.9	6.9	6.9	6.9
Biochemical Oxygen Demand (mg/L)	influent (BOD_5)	230	220	230	230	230
	effluent (CBOD5)	13	19	12	13	16
	S.F effluent ($CBOD_5$)					
Suspended Solids (mg/L)	influent	210	200	230	200	160
	aeration chamber	15	19	31	30	30
	effluent	6	46	7	18	13
	sand filter effluent					
Volatile Suspended Solids (mg/L)	influent	170	150	140	170	130
	aeration chamber	12	13	26	25	26
	effluent	5	40	6	16	11
	sand filter effluent					
45 Minute Settleable Solids (ml/L)	aeration chamber	<1	<1	<1	<1	<1

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

Notes:

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: 24-Feb-08 Plant Code: Aero-Tech

Weeks Into Test: 4

Weekend Dosing: Sunday 300 gallons Saturday 300 gallons

Dosed Volume (gallons)		Monday 300	Tuesday 300	Wednesday 300	Thursday 300	Friday 300
Dissolved Oxygen (mg/L)	aeration chamber	4.0	4.1	4.1	4.0	4.0
	effluent	4.3	4.3	4.2	4.4	4.4
	sand filter effluent	4.9	4.9	4.9	3.2	3.0
Temperature (C)	influent	21	21	21	21	21
	aeration chamber	32	32	32	32	32
	effluent	19	19	19	19	19
	sand filter effluent	19	19	19	19	19
pH	influent	6.9	7	6.9	6.9	6.8
	aeration chamber	6.9	6.9	6.9	6.9	6.9
	effluent	6.9	6.9	6.9	6.9	6.9
	sand filter effluent	6.9	6.9	6.9	6.9	6.9
Biochemical Oxygen Demand (mg/L)	influent (BOD_5)	210	220	400	400	320
	effluent (CBOD5)	13	17	18	21	10
	S.F effluent ($CBOD_5$)			4		
Suspended Solids (mg/L)	influent	160	170	170	160	150
	aeration chamber	30	24	25	23	23
	effluent	13	15	12	26	6
	sand filter effluent			3		
Volatile Suspended Solids (mg/L)	influent	130	140	130	120	130
	aeration chamber	24	20	19	16	20
	effluent	12	14	10	19	6
	sand filter effluent			<2		
45 Minute Settleable Solids (ml/L)	aeration chamber	<1	<1	<1	<1	<1

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

Notes:

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: 2-Mar-08 Plant Code: Aero-Tech

Weeks Into Test: 3

Weekend Dosing: Sunday 500 gallons Saturday 500 gallons

		Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)		500	500	500	500	500
Dissolved Oxygen (mg/L)	aeration chamber	3.7	3.8	3.8	3.8	3.6
	effluent	4.2	4.3	4.2	4.2	4.1
	[illegible] effluent	4.8	4.6	4.2	4.3	4.2
Temperature (C)	influent	21	21	21	21	21
	aeration chamber	32	32	32	32	32
	effluent	19	19	19	19	19
	sand filter effluent	19	19	19	19	19
pH	influent	6.9	6.9	6.8	6.9	6.9
	aeration chamber	6.9	6.9	6.9	6.8	6.9
	effluent	6.9	6.9	6.9	6.9	6.9
	sand filter effluent	6.9	6.9	6.9	6.9	6.9
Biochemical Oxygen Demand (mg/L)	influent (BOD_5)	210	220	400	400	320
	effluent (CBOD5)	19	26	11	4	12
	SF effluent ($CBOD_5$)			15		
Suspended Solids (mg/L)	influent	130	190	200	190	150
	aeration chamber	18	10	16	11	11
	effluent	4	10	<2	<2	5
	sand filter effluent			3		
Volatile Suspended Solids (mg/L)	influent	130	170	160	140	120
	aeration chamber	14	8	12	9	10
	effluent	3	9	<2	<2	5
	sand filter effluent			<2		
45 Minute Settleable Solids (mL/L)	aeration chamber	<1	<1	<1	<1	<1

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

Notes:

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: 9-Mar-08 Plant Code: Aero-Tech

Weeks Into Test: 4

Weekend Dosing: Sunday 500 gallons Saturday 500 gallons

		Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)		500	500	500	500	500
Dissolved Oxygen (mg/L)	aeration chamber	3.9	4.1	3.8	3.8	3.9
	effluent	4.1	4.0	4.0	4.1	4.1
	[illegible] effluent	4.8	4.7	4.7	4.8	4.9
Temperature (C)	influent	21	21	21	21	21
	aeration chamber	32	32	32	32	32
	effluent	19	19	19	19	19
	sand filter effluent	19	19	19	19	19
pH	influent	6.8	6.9	6.9	6.9	6.9
	aeration chamber	6.8	6.9	6.9	6.9	6.9
	effluent	6.9	6.9	6.9	6.9	6.9
	sand filter effluent	6.9	6.9	6.9	6.9	6.9
Biochemical Oxygen Demand (mg/L)	influent (BOD_5)	d	d	250	250	260
	effluent (CBOD5)	d	d	4	8	6
	SF effluent ($CBOD_5$)	d	d	3		
Suspended Solids (mg/L)	influent	d	d	170	170	160
	aeration chamber	d	d	13	13	17
	effluent	d	d	3	2	3
	sand filter effluent	d	d	21		
Volatile Suspended Solids (mg/L)	influent	d	d	140	130	140
	aeration chamber	d	d	5	5	7
	effluent	d	d	3	2	2
	sand filter effluent	d	d	3		
45 Minute Settleable Solids (mL/L)	aeration chamber	<1	<1	<1	<1	<1

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

Notes: Influent and effluent chemical analyses not done on 3/10 and 3/11 due to lab error.

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: 16-Mar-08 Plant Code: Aqua-Tech

Weeks Into Test: 7

Weekend Dosing: Sunday 500 gallons Saturday 500 gallons

		Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)		500	500	500	500	500
Dissolved Oxygen (mg/L)	aeration chamber	3.8	3.9	3.9	4.0	3.9
	effluent	4.0	4.0	3.8	3.9	3.9
	[illegible]	4.7	4.7	4.5	4.6	4.5
Temperature (C)	influent	21	21	21	21	21
	aeration chamber	32	32	32	32	31
	effluent	19	19	19	19	19
	sand filter effluent	19	19	19	19	19
pH	influent	6.9	6.9	6.9	6.9	6.8
	aeration chamber	6.9	6.9	6.9	6.9	6.9
	effluent	6.9	6.9	6.9	6.9	6.9
	[illegible]	6.9	6.9	6.9	6.9	6.9
Biochemical Oxygen Demand (mg/L)	influent (BOD_5)	220	210	230	220	200
	effluent (CBOD5)	7	10	5	<2	5
	[illegible] (CBOD5)			<2		
Suspended Solids (mg/L)	influent	230	230	280	210	200
	aeration chamber	10	10	17	6	7
	effluent	<2	3	4	<2	<2
	sand filter effluent			9		
Volatile Suspended Solids (mg/L)	influent	190	220	190	160	160
	aeration chamber	8	7	6	4	5
	effluent	<2	2	3	<2	<2
	sand filter effluent			<2		
45 Minute Settleable Solids (ml/L)	aeration chamber	<1	<1	<1	<1	<1

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

Notes:

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: 23-Mar-08 Plant Code: Aqua-Tech

Weeks Into Test: 8

Weekend Dosing: Sunday 500 gallons Saturday 500 gallons

		Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)		500	500	500	500	500
Dissolved Oxygen (mg/L)	aeration chamber	4.2	4.1	4.1	4.1	4.2
	effluent	4.2	4.2	4.2	4.2	4.1
	[illegible]	4.0	4.1	4.2	4.0	4.1
Temperature (C)	influent	22	22	22	22	22
	aeration chamber	32	32	32	32	32
	effluent	19	19	19	20	20
	sand filter effluent	19	19	19	19	19
pH	influent	6.9	6.9	6.9	6.9	6.9
	aeration chamber	6.8	6.9	6.9	6.9	6.9
	effluent	6.9	6.9	6.9	6.9	6.9
	[illegible]	6.9	6.9	6.9	6.9	6.9
Biochemical Oxygen Demand (mg/L)	influent (BOD_5)	220	210	180	200	340
	effluent (CBOD5)	2	2	3	2	4
	[illegible] (CBOD5)			<2		
Suspended Solids (mg/L)	influent	230	260	190	220	190
	aeration chamber	13	16	20	25	13
	effluent	<2	4	<2	<2	3
	sand filter effluent			6		
Volatile Suspended Solids (mg/L)	influent	190	210	160	180	170
	aeration chamber	10	12	17	20	10
	effluent	<2	4	<2	<2	3
	sand filter effluent			2		
45 Minute Settleable Solids (ml/L)	aeration chamber	<1	<1	<1	<1	<1

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

Notes:

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: 30-Mar-08 Plant Code: Aero-Tech

Weeks Into Test: 9

Weekend Dosing: Sunday 500 gallons Saturday 500 gallons

		Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)		500	500	500	500	500
Dissolved Oxygen (mg/L)	aeration chamber	4.3	4.4	4.2	4.4	4.2
	effluent	4.2	4.2	4.3	4.1	4.2
	[illegible]	4.2	4.2	4.1	4.3	4.2
Temperature (C)	influent	22	22	22	22	22
	aeration chamber	32	32	32	32	32
	effluent	20	20	20	20	20
	sand filter effluent	19	19	19	19	19
pH	influent	6.8	6.9	6.9	6.9	6.9
	aeration chamber	6.8	6.8	6.9	6.9	6.9
	effluent	6.9	6.8	6.9	6.9	6.9
	[illegible]	6.8	6.8	6.9	6.9	6.9
Biochemical Oxygen Demand (mg/L)	influent (BOD_5)	230	220	200	230	220
	effluent (CBOD5)	<2	<2	3	4	3
	[illegible]			4		
Suspended Solids (mg/L)	influent	230	250	170	120	140
	aeration chamber	39	54	55	110	120
	effluent	<2	<2	<2	3	3
	sand filter effluent			<2		
Volatile Suspended Solids (mg/L)	influent	180	190	140	100	120
	aeration chamber	34	43	46	90	100
	effluent	<2	<2	<2	3	3
	sand filter effluent			<2		
45 Minute Settleable Solids (mL/L)	aeration chamber	<1	<1	<1	<1	<1

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

Notes:

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: 6-Apr-08 Plant Code: Aero-Tech

Weeks Into Test: 10

Weekend Dosing: Sunday 500 gallons Saturday 500 gallons

		Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)		500	500	500	500	500
Dissolved Oxygen (mg/L)	aeration chamber	4.4	4.3	4.3	4.2	4.2
	effluent	4.2	4.1	4.2	4.3	4.4
	[illegible]	4.2	4.2	4.2	4.1	4.3
Temperature (C)	influent	22	22	22	22	22
	aeration chamber	32	32	32	32	32
	effluent	20	20	20	20	20
	sand filter effluent	19	19	19	19	19
pH	influent	6.8	6.8	6.9	6.9	6.9
	aeration chamber	6.8	6.8	6.8	6.9	6.9
	effluent	6.8	6.8	6.9	6.8	6.9
	[illegible]	6.8	6.8	6.8	6.9	6.9
Biochemical Oxygen Demand (mg/L)	influent (BOD_5)	200	200	290	240	270
	effluent (CBOD5)	5	4	<2	<2	<2
	[illegible]			2		
Suspended Solids (mg/L)	influent	190	200	280	240	170
	aeration chamber	340	340	410	450	450
	effluent	4	<2	<2	<2	2
	sand filter effluent			<2		
Volatile Suspended Solids (mg/L)	influent	150	150	220	190	140
	aeration chamber	270	260	320	360	350
	effluent	4	<2	<2	<2	2
	sand filter effluent			<2		
45 Minute Settleable Solids (mL/L)	aeration chamber	<1	<1	<1	<1	<1

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

Notes:

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: 13-Apr-09 Plant Code: Aero-Tech

Weeks Into Test: 11

Weekend Dosing: Sunday 500 gallons Saturday 500 gallons

		Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)		500	500	500	500	500
Dissolved Oxygen (mg/L)	aeration chamber	4.3	4.3	4.3	4.2	4.1
	effluent	4.3	4.3	4.2	4.4	4.3
	[illegible]	4.2	4.3	4.2	4.1	4.2
Temperature (C)	influent	22	23	22	23	22
	aeration chamber	32	32	32	32	32
	effluent	21	20	21	21	21
	sand filter effluent	20	20	20	20	20
pH	influent	6.9	6.9	6.9	6.8	6.9
	aeration chamber	6.9	6.9	6.9	6.9	6.9
	effluent	6.9	6.9	6.9	6.9	6.9
	[illegible]	6.9	6.9	6.9	6.9	6.9
Biochemical Oxygen Demand (mg/L)	influent (BOD_5)	220	260	290	270	280
	effluent (CBOD5)	<2	<2	<2	<2	<2
	[illegible]			<2		
Suspended Solids (mg/L)	influent	150	240	260	280	200
	aeration chamber	490	520	510	520	530
	effluent	<2	<2	<2	<2	<2
	sand filter effluent			<2		
Volatile Suspended Solids (mg/L)	influent	130	200	220	210	150
	aeration chamber	390	420	400	400	400
	effluent	<2	<2	<2	<2	<2
	sand filter effluent			<2		
45 Minute Settleable Solids (mL/L)	aeration chamber	30	30	20	30	30

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

Notes:

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: 20-Apr-09 Plant Code: Aero-Tech

Weeks Into Test: 12

Weekend Dosing: Sunday 500 gallons Saturday 500 gallons

		Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)		500	500	500	500	500
Dissolved Oxygen (mg/L)	aeration chamber	4.3	4.2	4.3	4.4	4.4
	effluent	4.3	4.3	4.2	4.3	4.3
	[illegible]	4.1	4.2	4.3	4.3	4.2
Temperature (C)	influent	23	23	23	23	23
	aeration chamber	32	32	32	32	32
	effluent	21	21	21	21	21
	sand filter effluent	20	20	20	20	20
pH	influent	6.9	6.9	6.9	6.9	6.9
	aeration chamber	6.9	6.9	6.9	6.9	6.9
	effluent	6.9	6.9	6.9	6.9	6.9
	[illegible]	6.9	6.9	6.9	6.9	6.9
Biochemical Oxygen Demand (mg/L)	influent (BOD_5)	300	250	220	230	310
	effluent (CBOD5)	<2	<2	<2	<2	<2
	[illegible]			<2		
Suspended Solids (mg/L)	influent	170	210	250	240	290
	aeration chamber	600	610	340	660	740
	effluent	<2	<2	2	<2	2
	sand filter effluent			<2		
Volatile Suspended Solids (mg/L)	influent	150	180	190	180	230
	aeration chamber	450	470	280	510	560
	effluent	<2	<2	<2	<2	<2
	sand filter effluent			<2		
45 Minute Settleable Solids (mL/L)	aeration chamber	40	40	40	60	70

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

Notes:

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: 27-Apr-08 Plant Code: Aero-Tech

Weeks Into Test: 13

Weekend Dosing: Sunday 500 gallons Saturday 500 gallons

		Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)		500	500	500	500	500
Dissolved Oxygen (mg/L)	aeration chamber	4.2	4.5	4.3	4.3	4.0
	effluent	3.0	3.5	3.3	3.4	3.3
	[illegible]	4.1	4.2	4.1	4.1	3.9
Temperature (C)	influent	23	23	23	23	23
	aeration chamber	32	32	32	32	31
	effluent	23	22	23	23	23
	sand filter effluent	20	21	23	23	23
pH	influent	6.8	6.8	6.9	6.9	6.9
	aeration chamber	6.8	6.9	6.8	6.9	6.9
	effluent	6.8	6.9	6.9	6.9	6.9
	[illegible]	6.8	6.9	6.8	6.8	6.9
Biochemical Oxygen Demand (mg/L)	influent (BOD_5)	180	190	280	260	360
	effluent (CBOD5)	<2	<2	<2	<2	<2
	[illegible] (CBOD5)			<2		
Suspended Solids (mg/L)	influent	230	200	210	150	220
	aeration chamber	650	640	680	640	580
	effluent	3	<2	<2	2	<2
	sand filter effluent			<2		
Volatile Suspended Solids (mg/L)	influent	180	160	170	120	180
	aeration chamber	480	480	500	470	440
	effluent	<2	<2	<2	2	<2
	sand filter effluent			<2		
45 Minute Settleable Solids (mL/L)	aeration chamber	50	60	80	70	40

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

Notes:

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: 4-May-08 Plant Code: Aero-Tech

Weeks Into Test: 14

Weekend Dosing: Sunday 500 gallons Saturday 500 gallons

		Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)		500	500	500	500	500
Dissolved Oxygen (mg/L)	aeration chamber	4.2	3.3	3.7	3.6	3.7
	effluent	3.1	3.2	3.4	3.3	3.7
	[illegible]	3.9	3.5	3.7	3.6	3.6
Temperature (C)	influent	23	23	23	23	23
	aeration chamber	31	31	31	31	31
	effluent	23	23	24	23	24
	sand filter effluent	23	23	23	23	23
pH	influent	6.9	7	6.9	6.9	6.9
	aeration chamber	6.9	6.9	6.9	6.9	6.9
	effluent	6.9	6.9	6.9	6.9	6.9
	[illegible]	6.9	6.9	6.9	6.9	6.9
Biochemical Oxygen Demand (mg/L)	influent (BOD_5)	210	160	280	290	210
	effluent (CBOD5)	<2	<2	<2	<2	<2
	[illegible] (CBOD5)			<2		
Suspended Solids (mg/L)	influent	150	150	180	160	160
	aeration chamber	840	850	1000	1000	1000
	effluent	<2	5	4	6	<2
	sand filter effluent			<2		
Volatile Suspended Solids (mg/L)	influent	150	130	120	120	120
	aeration chamber	610	600	710	730	700
	effluent	<2	4	3	4	<2
	sand filter effluent			<2		
45 Minute Settleable Solids (mL/L)	aeration chamber	40	50	60	50	60

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

Notes:

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: 11-May-08 Plant Code: Aero-Tech

Weeks Into Test: 15

Weekend Dosing: Sunday 500 gallons Saturday 500 gallons

		Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)		500	500	500	500	500
Dissolved Oxygen (mg/L)	aeration chamber	3.9	4.0	4.1	3.7	3.9
	effluent	3.8	3.9	4.0	3.9	4.0
	[illegible]	4.0	3.9	3.8	3.6	3.8
Temperature (C)	influent	24	24	24	24	24
	aeration chamber	31	31	30	30	30
	effluent	24	24	24	24	24
	sand filter effluent	23	23	23	23	23
pH	influent	6.8	6.8	6.8	6.9	6.9
	aeration chamber	6.9	6.8	6.8	6.8	6.9
	effluent	6.9	6.8	6.8	6.8	6.8
	[illegible]	6.9	6.8	6.8	6.8	6.8
Biochemical Oxygen Demand (mg/L)	influent (BOD_5)	220	240	170	170	200
	effluent (CBOD5)	<2	<2	<2	<2	<2
	[illegible]			<2		
Suspended Solids (mg/L)	influent	350	310	210	260	330
	aeration chamber	1200	1200	1200	1300	1500
	effluent	<2	3	<2	<2	<2
	sand filter effluent			<2		
Volatile Suspended Solids (mg/L)	influent	130	240	190	180	230
	aeration chamber	860	860	830	880	1000
	effluent	<2	3	<2	<2	<2
	sand filter effluent			<2		
45 Minute Settleable Solids (mL/L)	aeration chamber	60	70	70	60	60

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

Notes:

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: 18-May-08 Plant Code: Aero-Tech

Weeks Into Test: 16

Weekend Dosing: Sunday 500 gallons Saturday 500 gallons

		Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)		500	500	500	500	500
Dissolved Oxygen (mg/L)	aeration chamber	3.9	3.8	3.9	4.0	4.1
	effluent	4.0	3.9	3.9	3.9	4.0
	[illegible]	3.8	3.9	3.7	3.8	3.9
Temperature (C)	influent	24	25	25	25	25
	aeration chamber	30	30	30	31	31
	effluent	24	24	24	24	24
	sand filter effluent	23	24	24	24	24
pH	influent	6.9	7.0	6.9	6.9	6.8
	aeration chamber	6.9	7.0	7.0	7.0	6.9
	effluent	6.9	6.9	7.0	7.0	7.0
	[illegible]	6.9	7.0	7.0	7.0	6.9
Biochemical Oxygen Demand (mg/L)	influent (BOD_5)	210	180	230	350	380
	effluent (CBOD5)	<2	<2	<2	<2	2
	[illegible]			<2		
Suspended Solids (mg/L)	influent	130	220	280	340	390
	aeration chamber	1200	1300	1100	1500	1600
	effluent	<2	<2	3	4	14
	sand filter effluent			3		
Volatile Suspended Solids (mg/L)	influent	110	170	200	260	300
	aeration chamber	860	940	750	1000	1100
	effluent	<2	<2	<2	3	8
	sand filter effluent			<2		
45 Minute Settleable Solids (mL/L)	aeration chamber	70	60	60	60	70

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

Notes:

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: 25-May-08 Plant Code: Aero-Tech

Weeks Into Test: 17

		Sun	Mon	Tues	Wed	Thurs	Fri	Sat
Dosed Volume (gallons)		500	500	500	500	500	500	500
Dissolved Oxygen (mg/L)	aeration chamber		3.9					
	effluent		3.8					
	[illegible]							
Temperature (C)	influent		25					
	aeration chamber		31					
	effluent		24					
	sand filter effluent							
pH	influent		6.9					
	aeration chamber		6.9					
	effluent		6.9					
	[illegible]							
Biochemical Oxygen Demand (mg/L)	influent (BOD_5)		230					
	effluent (CBOD5)		<2					
	[illegible]							
Suspended Solids (mg/L)	influent		180					
	aeration chamber		1700					
	effluent		3					
	sand filter effluent							
Volatile Suspended Solids (mg/L)	influent		140					
	aeration chamber		1100					
	effluent		2					
	sand filter effluent							
45 Minute Settleable Solids (mL/L)	aeration chamber		70					

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

Notes: Week day stress 5/26 through 5/30.

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: 1-Jun-08 Plant Code: Aero-Tech

Weeks Into Test: 18

		Sun	Mon	Tues	Wed	Thurs	Fri	Sat
Dosed Volume (gallons)		500	500	500	500	500	500	500
Dissolved Oxygen (mg/L)	aeration chamber		3.8	3.9	3.8	3.8	3.8	3.7
	effluent		3.7	3.7	3.8	3.7	3.8	3.8
	[illegible]							
Temperature (C)	influent		25	25	25	25	25	25
	aeration chamber		31	31	31	31	31	31
	effluent		24	24	25	25	25	25
	sand filter effluent							
pH	influent		6.9	6.9	6.9	6.9	6.8	6.9
	aeration chamber		6.9	6.9	6.9	6.9	6.9	6.8
	effluent		6.9	6.9	6.9	6.9	6.9	6.8
	[illegible]							
Biochemical Oxygen Demand (mg/L)	influent (BOD_5)		160	140	220	220	250	180
	effluent (CBOD5)		<2	<2	<2	<2	<2	<2
	[illegible]							
Suspended Solids (mg/L)	influent		200	220	180	170	190	180
	aeration chamber		3300	1900	1700	2000	1600	1900
	effluent		3	2	3	3	<2	4
	sand filter effluent							
Volatile Suspended Solids (mg/L)	influent		150	160	140	130	160	150
	aeration chamber		2100	1200	1100	1300	1000	1200
	effluent		<2	<2	2	<2	<2	3
	sand filter effluent							
45 Minute Settleable Solids (mL/L)	aeration chamber		80	80	80	90	90	90

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

Notes: Working parent stress started on 6/7.

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: 8-Jun-08 Plant Code: Aero-Tech

Weeks Into Test: 19

		Sun	Mon	Tues	Wed	Thurs	Fri	Sat
Dosed Volume (gallons)		500	500	500	500	500	500	500
Dissolved Oxygen (mg/L)	aeration chamber							3.7
	effluent							3.8
	[illegible]							
Temperature (C)	influent							25
	aeration chamber							31
	effluent							25
	sand filter effluent							
pH	influent							6.9
	aeration chamber							6.9
	effluent							6.9
	[illegible]							
Biochemical Oxygen Demand (mg/L)	influent (BOD_5)							150
	effluent (CBOD5)							2
	[illegible]							
Suspended Solids (mg/L)	influent							160
	aeration chamber							1700
	effluent							7
	sand filter effluent							
Volatile Suspended Solids (mg/L)	influent							130
	aeration chamber							1100
	effluent							5
	sand filter effluent							
45 Minute Settleable Solids (mL/L)	aeration chamber							100

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

Notes: Working parent strain completed on 6/11.

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: 15-Jun-08 Plant Code: Aero-Tech

Weeks Into Test: 20

		Sun	Mon	Tues	Wed	Thurs	Fri	Sat
Dosed Volume (gallons)		500	500	500	500	500	0	300
Dissolved Oxygen (mg/L)	aeration chamber	3.7	3.6	3.7	3.8	3.7		
	effluent	3.7	3.7	3.7	3.5	3.8		
	[illegible]							
Temperature (C)	influent	25	26	26	26	26		
	aeration chamber	31	31	31	31	31		
	effluent	25	25	25	25	25		
	sand filter effluent							
pH	influent	6.8	6.8	6.9	6.9	6.9		
	aeration chamber	6.9	6.8	6.8	6.8	6.9		
	effluent	6.9	6.8	6.8	6.8	6.9		
	[illegible]							
Biochemical Oxygen Demand (mg/L)	influent (BOD_5)	180	150	180	200	200		
	effluent (CBOD5)	<2	<2	<2	<2	<2		
	[illegible]							
Suspended Solids (mg/L)	influent	170	200	200	250	220		
	aeration chamber	1700	1300	1400	1200	2000		
	effluent	4	7	7	4	3		
	sand filter effluent							
Volatile Suspended Solids (mg/L)	influent	140	160	130	180	170		
	aeration chamber	1100	(d)	(d)	(d)	1800		
	effluent	3	5	5	2	<2		
	sand filter effluent							
45 Minute Settleable Solids (mL/L)	aeration chamber	100	110	100	100	110		

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

Notes: Power/equipment failure stress 6/19 through 6/21.
Aeration chamber V28 missed on 6/16, 6/17, and 6/18 due to laboratory error.

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: 22-Jun-08 Plant Code: Aero-Tech

Weeks Into Test: 21

		Sun	Mon	Tues	Wed	Thurs	Fri	Sat
Dosed Volume (gallons)		500	500	500	500	500	300	500
Dissolved Oxygen (mg/L)	aeration chamber				3.6	3.6	3.7	3.7
	effluent				3.7	3.7	3.8	3.6
	[illegible]							
Temperature (C)	influent				26	26	26	26
	aeration chamber				31	31	31	31
	effluent				26	26	26	26
	sand filter effluent							
pH	influent				6.8	6.9	6.9	6.9
	aeration chamber				6.8	6.8	6.9	6.9
	effluent				6.8	6.9	6.9	6.9
	[illegible]							
Biochemical Oxygen Demand (mg/L)	influent (BOD_5)				300	280	290	150
	effluent (CBOD5)				<2	2	<2	<2
	[illegible]							
Suspended Solids (mg/L)	influent				270	150	130	170
	aeration chamber				1700	1600	1600	1500
	effluent				5	11	2	7
	sand filter effluent							
Volatile Suspended Solids (mg/L)	influent				200	140	100	130
	aeration chamber				1100	1000	1000	900
	effluent				4	7	<2	4
	sand filter effluent							
45 Minute Settleable Solids (mL/L)	aeration chamber				110	110	120	110

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

Notes:

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: 29-Jun-08 Plant Code: Aero-Tech

Weeks Into Test: 22

		Sun	Mon	Tues	Wed	Thurs	Fri	Sat
Dosed Volume (gallons)		300	0	0	0	0	0	0
Dissolved Oxygen (mg/L)	aeration chamber	3.8						
	effluent	3.7						
	[illegible]							
Temperature (C)	influent	26						
	aeration chamber	31						
	effluent	26						
	sand filter effluent							
pH	influent	6.9						
	aeration chamber	6.9						
	effluent	6.9						
	[illegible]							
Biochemical Oxygen Demand (mg/L)	influent (BOD_5)	140						
	effluent (CBOD5)	3						
	[illegible]							
Suspended Solids (mg/L)	influent	170						
	aeration chamber	1600						
	effluent	4						
	sand filter effluent							
Volatile Suspended Solids (mg/L)	influent	120						
	aeration chamber	1000						
	effluent	2						
	sand filter effluent							
45 Minute Settleable Solids (mL/L)	aeration chamber	110						

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

Notes: Vacation at new started on 6/29.

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: 6-Jul-08 Plant Code: Aero-Tech

Weeks Into Test: 23

		Sun	Mon	Tues	Wed	Thurs	Fri	Sat
Dosed Volume (gallons)		0	0	300	500	500	500	500
Dissolved Oxygen (mg/L)	aeration chamber						3.7	3.7
	effluent						3.7	3.6
	[illegible]							
Temperature (C)	influent						26	26
	aeration chamber						31	31
	effluent						26	26
	sand filter effluent							
pH	influent						6.9	6.9
	aeration chamber						6.9	6.9
	effluent						6.8	6.9
	[illegible]							
Biochemical Oxygen Demand (mg/L)	influent (BOD_5)						180	140
	effluent (CBOD5)						4	2
	[illegible]						<2	
Suspended Solids (mg/L)	influent						180	150
	aeration chamber						1200	1300
	effluent						7	9
	sand filter effluent						6	
Volatile Suspended Solids (mg/L)	influent						150	140
	aeration chamber						840	920
	effluent						6	8
	sand filter effluent						3	
45 Minute Settleable Solids (mL/L)	aeration chamber						130	130

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

Notes: Vacation stress completed on 7/8.

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: 13-Jul-08 Plant Code: Aero-Tech

Weeks Into Test: 24

		Sun	Mon	Tues	Wed	Thurs	Fri	Sat
Dosed Volume (gallons)		500	500	500	500	500	500	500
Dissolved Oxygen (mg/L)	aeration chamber	3.8	3.7	3.6	3.6	3.6	3.7	
	effluent	3.6	3.7	3.7	3.6	3.6	3.7	
	[illegible]		3.5	3.6	3.6	3.6	3.7	
Temperature (C)	influent	26	26	26	26	26	26	
	aeration chamber	31	31	31	31	31	31	
	effluent	26	26	26	26	26	26	
	sand filter effluent		26	26	26	26	26	
pH	influent	6.9	6.9	6.8	6.8	6.9	6.9	
	aeration chamber	6.9	6.9	6.9	6.8	6.8	6.9	
	effluent	6.8	6.9	6.9	6.8	6.8	6.9	
	[illegible]		6.9	6.9	6.8	6.8	6.9	
Biochemical Oxygen Demand (mg/L)	influent (BOD_5)	120	120	150	140	110	120	
	effluent (CBOD5)	6	3	3	2	<2	<2	
	[illegible]				<2	<2	<2	
Suspended Solids (mg/L)	influent	170	190	160	180	220	200	
	aeration chamber	1300	1300	1400	1400	1500	1400	
	effluent	8	7	7	7	4	6	
	sand filter effluent				<2	<2	<2	
Volatile Suspended Solids (mg/L)	influent	150	160	140	160	140	130	
	aeration chamber	920	880	1000	1000	1000	960	
	effluent	8	6	7	6	4	5	
	sand filter effluent				<2	<2	<2	
45 Minute Settleable Solids (mL/L)	aeration chamber	130	130	130	130	120	130	

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

Notes:

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: 20-Jul-08 Plant Code: Aero-Tech

Weeks Into Test: 25

Weekend Dosing: Sunday 500 gallons Saturday 500 gallons

		Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)		500	500	500	500	500
Dissolved Oxygen (mg/L)	aeration chamber	3.6	3.7	3.7	3.6	3.7
	effluent	3.6	3.7	3.6	3.5	3.7
	sand filter effluent	3.7	3.6	3.6	3.7	3.8
Temperature (C)	influent	26	26	26	26	26
	aeration chamber	31	31	31	31	31
	effluent	26	26	26	26	26
	sand filter effluent	27	27	27	27	26
pH	influent	6.8	6.8	6.9	6.9	6.9
	aeration chamber	6.9	6.8	6.8	6.9	6.9
	effluent	6.8	6.8	6.8	6.9	6.9
	sand filter effluent	6.8	6.8	6.8	6.9	6.9
Biochemical Oxygen Demand (mg/L)	influent (BOD_5)	50	180	180	260	250
	effluent (CBOD5)	<2	<2	<2	<2	<2
	sand filter effluent	<2		<2		<2
Suspended Solids (mg/L)	influent	180	250	180	260	260
	aeration chamber	1400	1500	1500	1600	1600
	effluent	5	3	6	4	3
	sand filter effluent	<2		<2		<2
Volatile Suspended Solids (mg/L)	influent	140	190	150	210	210
	aeration chamber	1000	1000	1100	1100	1200
	effluent	4	3	5	3	2
	sand filter effluent	<2		<2		<2
45 Minute Settleable Solids (mL/L)	aeration chamber	130	130	130	140	130

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

Notes:

NSF International
Standard 40 - Residential Wastewater Treatment Systems
Plant Effluent

Week Beginning: 27-Jul-08 Plant Code: Aero-Tech

Weeks Into Test: 26

Weekend Dosing: Sunday 500 gallons Saturday 500 gallons

		Monday	Tuesday	Wednesday	Thursday	Friday
Dosed Volume (gallons)		500	500	500	500	500
Dissolved Oxygen (mg/L)	aeration chamber	3.7	3.7	3.6	3.8	3.6
	effluent	3.5	3.6	3.6	3.5	3.6
	sand filter effluent	3.8	3.7	3.6	3.7	3.7
Temperature (C)	influent	27	27	27	27	27
	aeration chamber	31	31	31	31	31
	effluent	27	27	27	27	27
	sand filter effluent	27	27	27	27	27
pH	influent	7.0	7.0	7.1	7.0	7.0
	aeration chamber	6.9	7.0	7.0	7.0	7.0
	effluent	6.9	7.0	7.0	7.0	7.0
	sand filter effluent	7.0	7.0	7.0	7.0	7.0
Biochemical Oxygen Demand (mg/L)	influent (BOD_5)	130	180	210	160	170
	effluent (CBOD5)	2	<2	<2	3	3
	sand filter effluent	<2		<2		
Suspended Solids (mg/L)	influent	230	230	250	190	190
	aeration chamber	1800	1800	1900	2000	2000
	effluent	14	8	7	55	56
	sand filter effluent	<2		<2		
Volatile Suspended Solids (mg/L)	influent	170	190	200	160	160
	aeration chamber	1200	1300	1400	1400	1400
	effluent	9	6	5	33	36
	sand filter effluent	<2		<2		
45 Minute Settleable Solids (mL/L)	aeration chamber	140	140	140	130	140

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

Notes:

APPENDIX E

OWNER"S MANUAL

Aero-Tech
Aerobic Treatment Units

2900 Gary Drive • Plymouth, IN 46563
Phone 574-935-0908 • Fax 574-935-0910

Class 1 ANSI/NSF Standard 40
Wastewater Treatment Plant

AT Series

Owners Instruction Manual
Installation Manual, Operating Manual,
Design Drawings and Specifications, Service Policy,
Limited Warranty

Model AT-500	500 G.P.D.
Model AT-600	600 G.P.D.
Model AT-750	750 G.P.D.
Model AT-1000	1000 G.P.D.
Model AT-1500	1500 G.P.D.

NSF

Certified to NSF/ANSI Standard 40

INTRODUCTION

AERO-TECH is one of the world's finest aerobic treatment systems. The **AERO-TECH** system converts wastewater from your home or business into a clear odorless liquid. Our efficient operating system offers a lower operating cost than other units do. The long lasting submersible aerator pump helps to make **AERO-TECH** the most trouble free aerobic treatment system on the market today. This low cost, highly effective system is one that will continue to be looked at as the standard-bearer for the onsite wastewater industry for years to come.

This manual contains information on the AT-500, AT-600, AT-750, AT-1000, and AT-1500 wastewater treatment plants. These units are to be installed with our RLC panel (remote located control panel) and a pre-treatment tank. In addition, the system may have a pump tank, dosing tank, alarm system, chlorinator, de-chlorinator, and various disposal systems (drip irrigation, spray irrigation, gravel drain field, pressure dosing).

PROCESS DESCRIPTION

The AERO-TECH *AT Series aerobic treatment plant is extended aeration, activated sludge process.*

Wastewater enters the 4" inlet pipe from the home or business. The wastewater is then infused with air from the submersible aerator pump at the bottom of the aerobic treatment plant. This powerful, highly effective pump mixes air from the surface with wastewater in the bottom of the tank. The venturi created by the pump pulls fresh air from the surface and mixes it with the effluent from the bottom of the tank, the finely diffused air bubbles are then pushed through the exhaust ports into the mixing chamber in a swirling motion. As the finely diffused air rises, it creates a swirling motion, keeping the sludge in a constant state of suspension. As new wastewater enters the mixing chamber, it hydraulically displaces the mixed liquor into the clarifying cone.

In the clarifying chamber, the liquid is suspended in the quiet zone, allowing the remaining suspended solids to settle back into the mixing chamber to be further treated.

The clear water in the upper clarifying chamber is then discharged through the surge resistant pick up into the disposal system of your choice.

OPERATING INSTRUCTIONS

If a problem occurs with your **AERO-TECH** Aerobic Wastewater Treatment system or service is required, please call your service provider listed on the control panel cover. The local **AERO-TECH** dealer who installed your unit will perform routine maintenance on it for the first two years at no cost to the customer. After the initial two year warranty period provided by the initial installer, you may obtain a continuing service policy on an

annual basis from a local service company that has been trained and certified by **AERO-TECH.** Regular scheduled maintenance is required to keep your plant operating at its highest level. This service is available at a nominal fee.

After your unit has been started by your installer, all you need to do is begin using the facilities (kitchen, laundry, toilets) as normal. The bacteria in the wastewater from your home will start the process working. Do not add any over the counter products or home remidies to the system. These will do more harm than good and can void your warranty.

The following items are **not** to be put into your aerobic treatment system:

1. Non-biodegradable items such as cigarette butts, match sticks, disposable diapers, feminine hygiene products, condoms, hair, coffee grounds, rags, paper towels, bandages, or other similar products. All of these items should be disposed of in your regular trash service.
2. No fats, oils or grease. This includes all cooking grease as well as all cooking oils.
3. No paints paint thinners or other household chemicals including most cleaning compounds and mop water.
4. No water softener backwash into the treatment plant.
5. No pesticides, herbicides, or other toxic chemicals.
6. No lemons, oranges, grapefruit or other citrus products.
7. No antibiotics or other medicines.
8. Disinfectants and bleaches, especially those with chlorine and ammonia.
9. Antibacterial soaps and antibacterial laundry detergents to reduce the risk of killing the aerobic bacteria.
10. Kitchen garbage disposals should only be used at a minimum. All food waste should be put into the solid waste disposal bin. Food waste will overload the system and cause a malfunction and more frequent pump-outs.

The proper use of the Aero-Tech Aerobic Treatment System or any other on-site sewage system depends on the proper organic loading and the life of the micro-organisms. Aero-Tech is not responsible for the in-field operation of the system, other than the structural and mechanical workings of the system. Abuse and/or overloading of the system can only be corrected by the user of the system.

Our system is rated for a maximum volume throughput per day, AT-500 is 500 gallons per day (GPD), AT-600 is 600 gallons per day (GPD), etc. ONLY household wastewater from sinks, tubs, washing machines, toilets, etc should be allowed into the unit. Volumetric overloading is a very serious abuse of the system. Volumetric overloading means putting more than the rated amount of wastewater through the system during a 24 hour period. To avoid volumetric overloading of your system, please observe the following:

1. Constantly watch for flowing/leaking toilets and facets. Repair immediately.
2. Use low flow devices whenever possible.
3. Avoid multiple wash loads in one day. Laundry should be spread out during the week; not all in one day.
4. Be on the alert for all excessive water use.

INITIAL SERVICE POLICY

Our company_____, will inspect and service your AERO-TECH Aerobic Treatment System for the first two years from the date of installation. There will be a minimum of four inspections during this time, or more as local regulations dictate. This is to include inspecting and adjusting all mechanical, electrical, and other components as needed.

An effluent quality inspection will be done at this time. This will consist of a visual check for color, turbidity, sludge build up, scum overflow and odor.

At the conclusion of this initial service policy, our company will offer a continuing service policy to cover labor for normal maintenance, inspection and repairs. This is available for a nominal cost on a yearly basis.

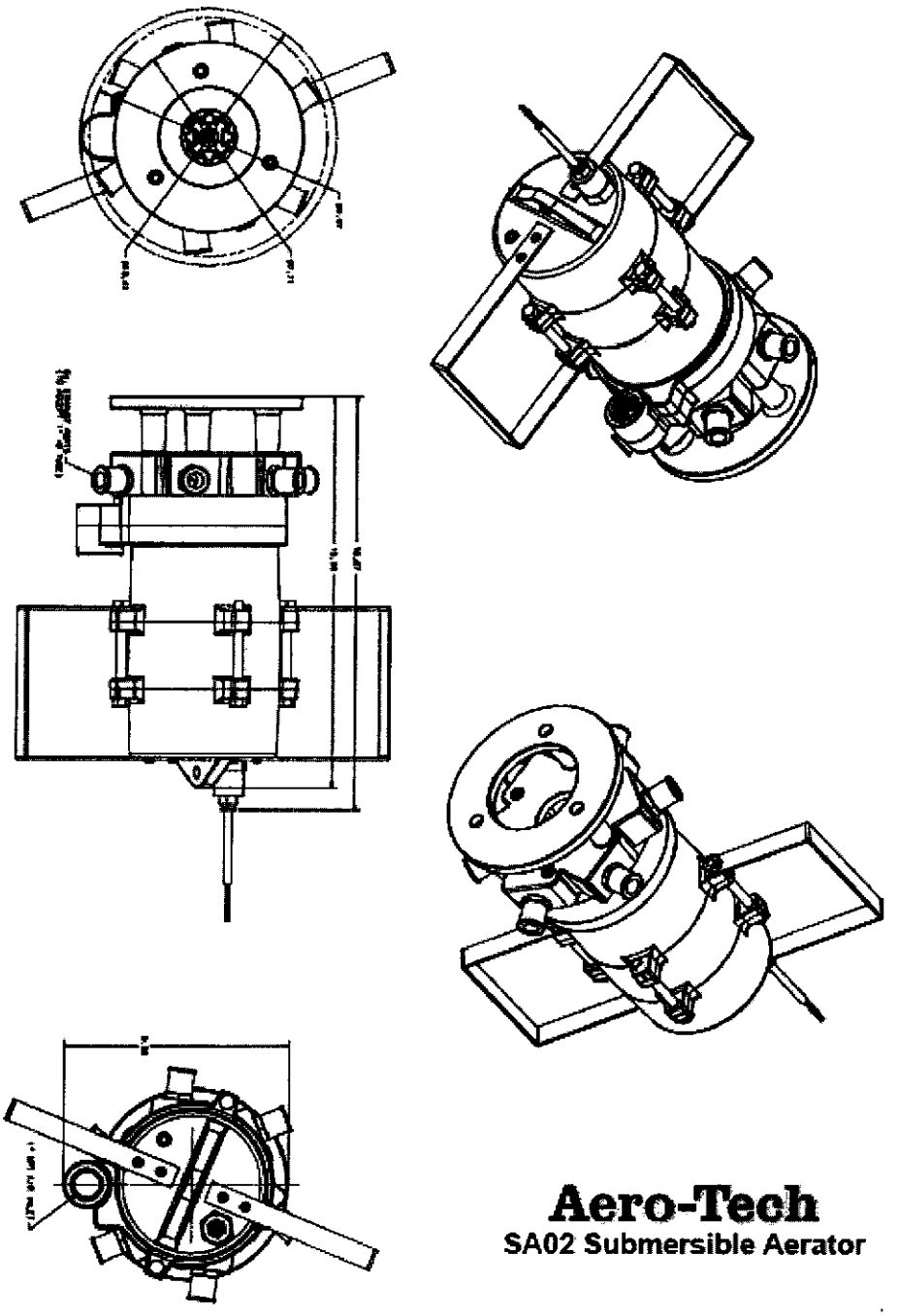
User/owner operation instructions must be strictly followed or warranties can be voided. This is to include shutting off power to the system, disconnecting the alarm, restricting air intake, overloading the system, introducing excessive amounts of harmful matter into the system Or any other form of system abuse.

The owner shall be immediately notified in writing of improper operation that cannot be corrected at the time of the routine inspection or emergency service with an estimated date of correction.

IF NECESSARY, PUMPING OF SLUDGE FROM THIS UNIT IS NOT INCLUDED IN THIS POLICY.

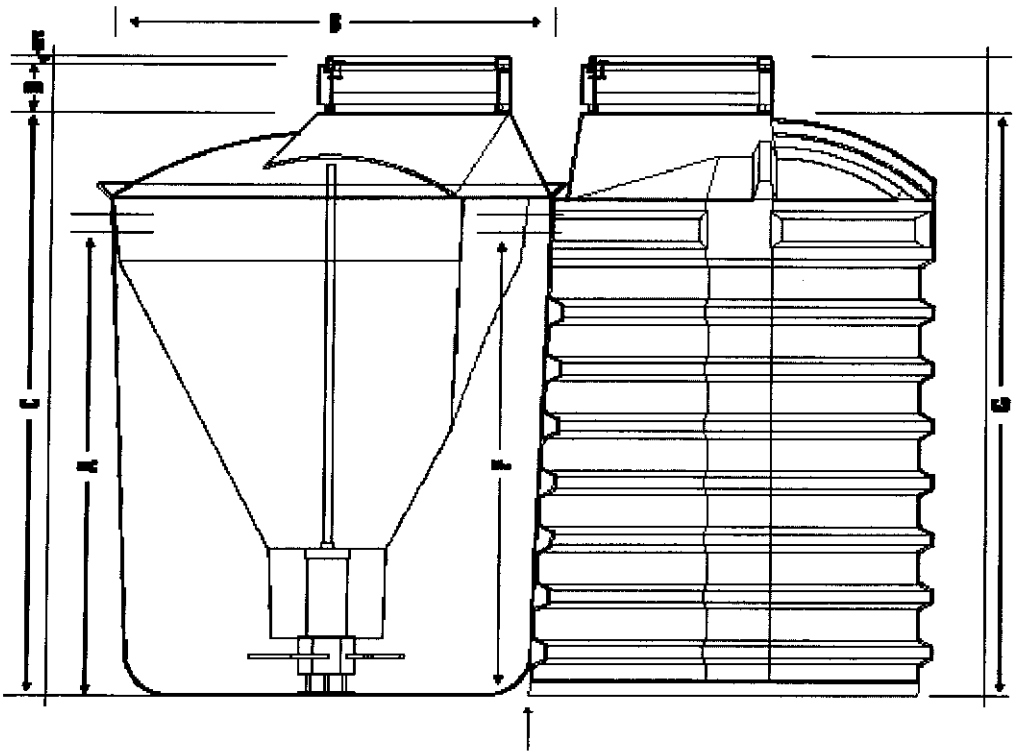
OWNER		SERVICE DEALER
_____	Company:	_____
_____	Address:	_____
_____	City/State/Zip:	_____
_____	Phone:	_____
Date:_____		Date:_____

3



Aero-Tech
SA02 Submersible Aerator

4

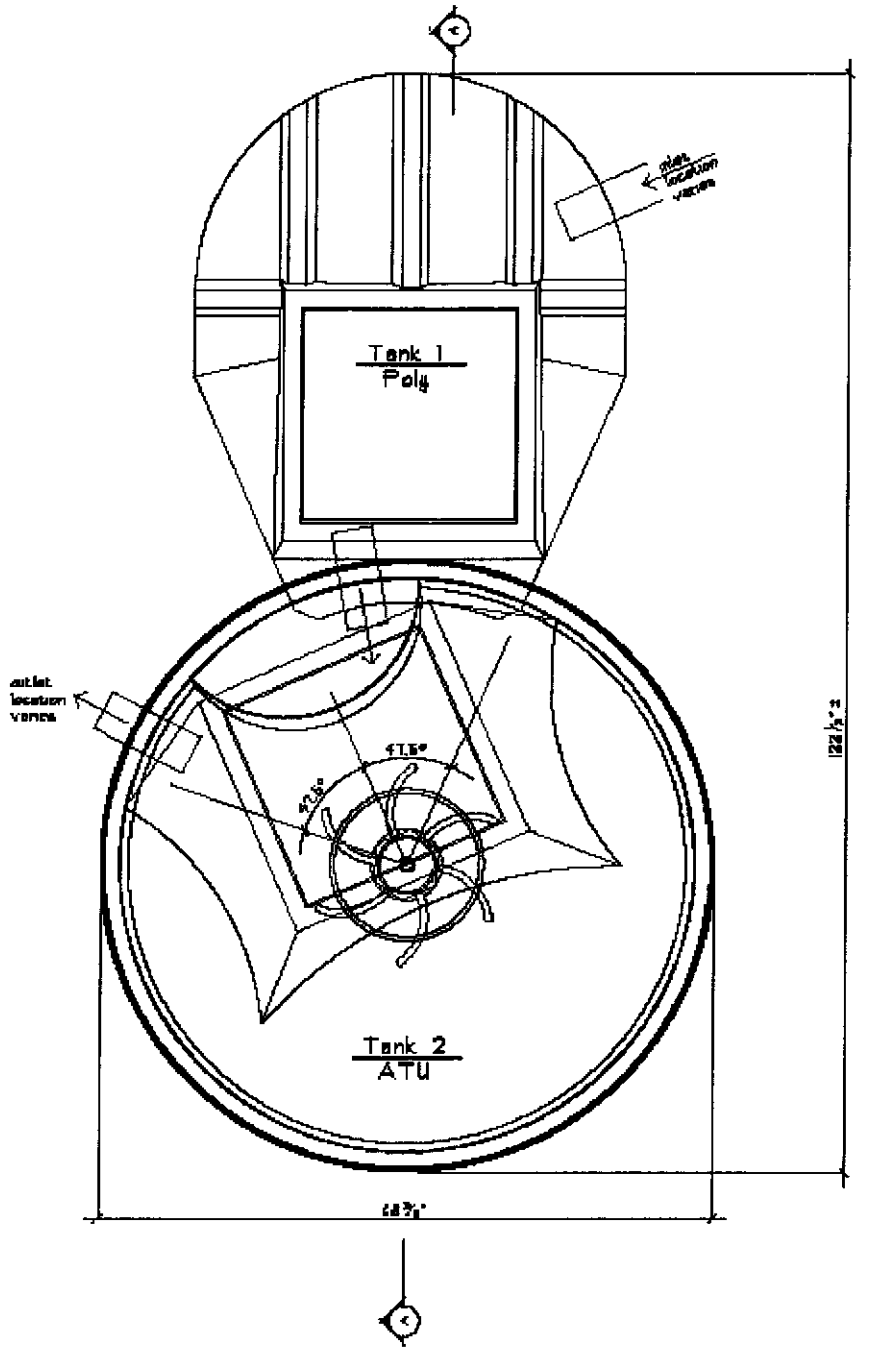


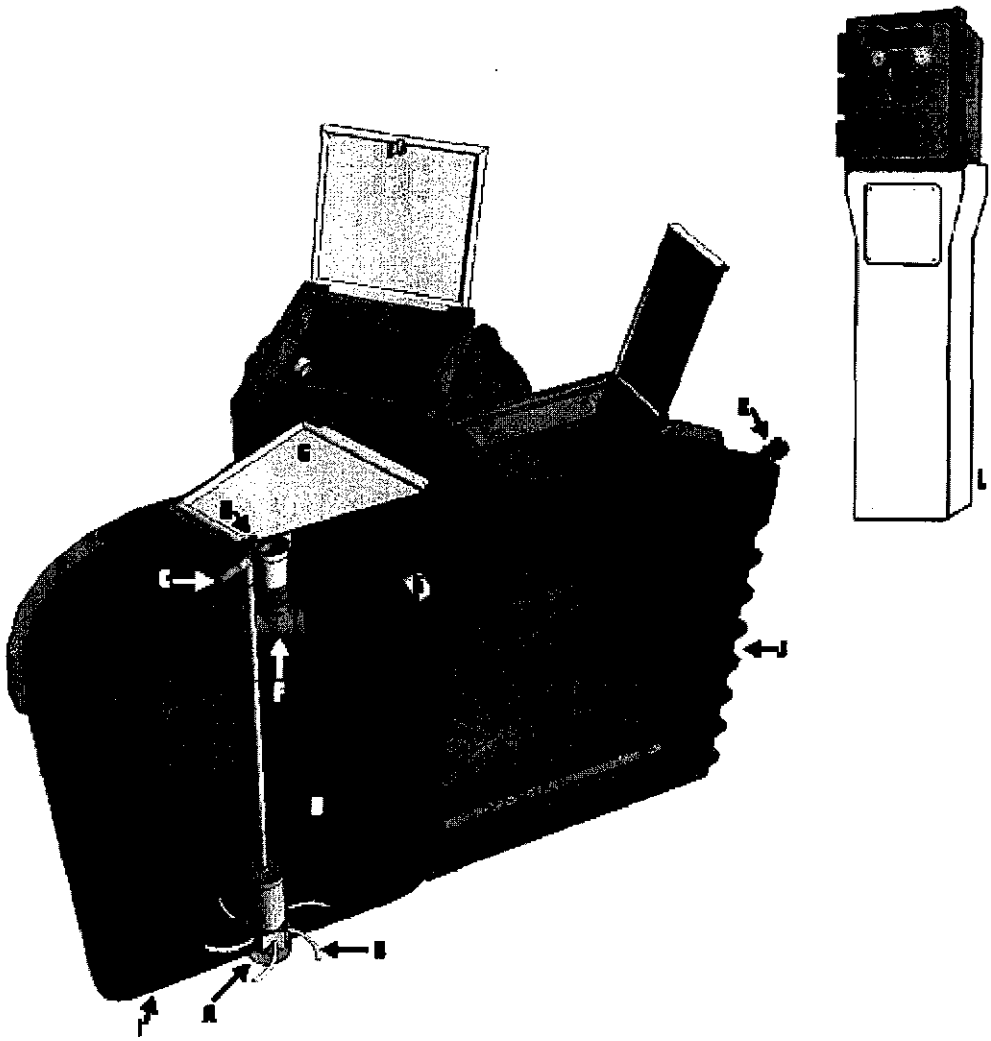
MODEL	A	B	C	D	E	F	G
AT-500	66"	64"	84¼"	6"	1"	66"	84¼"
AT-600	66"	64"	84¼"	6"	1"	66"	84¼"
AT-750	66"	72"	84¼"	6"	1"	66"	84¼"
AT-1000	66"	84"	86¼"	6"	1"	66"	84¼"
AT-1500	72"	96"	96¼"	6"	1"	72"	84¼"

ATU- Fiberglass
Wall and Lid Thickness shall be no less than ¼" thick
Pretreatment Tank can be
Polyethylene or Concrete

Patent Pending

5



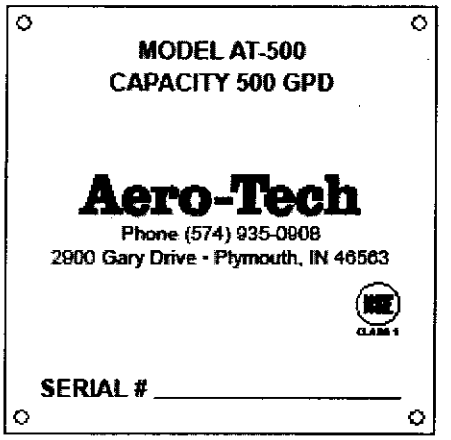


A. Submersible Aerator
B. Discharge Hoses
C. Air Intake
D. Clarifier
E. Inlet Pipe
F. Discharge Assembly Pipe
G. Hatch/Access Cover
H. Lock Assembly
I. Fiberglass Tank
J. Pretreatment Tank
K. Inlet From House
L. Control Panel

Patent Pending

7

Aero-Tech
Aerobic Treatment Units



Patent Pending

8

Aero-Tech
Aerobic Treatment Units

Patent Pending

9

ROUTINE SERVICE

If the control panel alarm light and/or buzzer are activated or your system needs repair or replacement parts, call your local service dealer. The name, address, and phone number should be noted on the front cover of the control panel. If the dealer information is missing, call AERO-TECH at 574-935-0908 for your nearest service dealer. Please refer to the data plate attached to the lid of the unit for the serial number in the event a problem occurs.

On-site inspections for proper operation and routine service for the first two years of service from the date of installation shall be performed by the dealer who installed your AERO- TECH Aerobic Wastewater Treatment System. The installer will inspect and service the system at no charge unless additional service is required that is not warranty related. After the first two years the dealer should offer a continuing service policy for a nominal yearly fee. Only service people trained and certified by AERO-TECH are allowed to maintain and service this unit.

The initial service contract and the extended service policies are requirements of the NSF/ANSI Standard 40 and the NSF International Certification Policies for Wastewater Treatment Devices. State or local regulations may require service or monitoring at more frequent intervals. Check with your state or local regulatory authority for current site specific laws that apply to your system.

In addition to your normal routine service, your system will require other services. The expected services associated with your system includes:

1. Clear the scum in the clarifier compartment	6 months to 2 years
2. Clear air vents on the control pedestal	6 months to 2 years
3. Repair or replace submersible aerator	5 to 10 years
4. Pump sludge from aeration tank	2 to 5 years*
5. Pump sludge from pretreatment tank	2 to 4 years*

*Sludge removed from any part of the system must be disposed of in accordance with all local, state, and federal laws and will be the owner's expense.

Shutting down your system for summer/winter homes or selling your home should be performed by your local service provider shortly after your home is vacated. The pumper or service provider shall pump the effluent from all of the tanks and immediately refill the tanks with water. Filling the tanks with water will insure that the tanks do not float or collapse while not in use and will be necessary for the re-start up for the next owners or new season. The power can be shut off at this time.

INSTALLATION INSTRUCTIONS

In order to help insure that your Aero-Tech Aerobic Treatment System is installed properly, only factory authorized representatives should install this unit. Any modifications to the control panel, aerator, or the treatment plant will result in the loss of warranty and invalidation of the NSF certification. Please make sure that all instructions are followed. In the event that there is a problem that requires replacement of parts or components of the system, please contact the service provider listed on the control panel label or call AERO-TECH for your nearest provider.

In addition, all national, state and local plumbing and electrical codes will be followed. If

in doubt, please call the local building department or local health department for clarification. The control panel and aerator will be protected by a disconnect panel and appropriate breakers. In most cases this will be a 30 amp protection in the main electrical box. The plumbing will be 4" PVC schedule 40 into the pre-treatment tank and also into the ATU. The outlet pipe will be sized according to code for the dispersal field requirements. A one and a half inch PVC air intake will run from the ATU to the control panel pedestal where it will terminate inside near the air vents. The vents should always be kept clear and free from dust, dirt, vegetation and anything else that could block air flow.

AERO-TECH TANK INSTALLATION

1. Tank location: Locate the Aero-Tech Aerobic Wastewater Treatment Plant in an area that provides surface water run-off and good venilation. Do not locate the aerobic plant in low lying areas or where seasonal groundwater is high.
2. Excavation of site: Prepare the excavation hole that there is a minimum of six inches all around the tank. Do not over dig as this can cause more settling and shift the tank at a later time. The bottom of the tank should be dug level to allow sand fill to be added.
3. Additional two risers: Never bury the tank deeper than a depth that would require an additional two risers. Your Aero-Tech unit will come with one six inch riser attached from the factory. Never install the tank where more than 18 inches of total risers are required. If more than 18 inches of riser is required, install a lift station upstream of the unit to pump the effluent to the ATU at a normal grade. If a lift station is needed, contact Aero-Tech for sizing, location, and maximum flow and dosing requirements.
4. Level bottom w / 6" of sand fill: Before installing the tanks, place at least 6" of compacted sand into the bottom of the hole. This is done to insure that no rocks or sharp objects come into contact with the bottom of the tank.
5. Lifting of tanks: Use the lifting eyes provided on the plant for placing the tanks into the excavation site. Never lift any of the tanks unless they are empty of all liquids. Always use a spreader bar and other devices that have been designed and tested by Aero-Tech.
6. Inlet connection: As the tank is being set, make sure the 4"PVC inlet is aligned with the outlet coming from the house.
7. Unit must be level: To insure proper functioning of the unit it must be level. To level the tank a 4' level should be placed over the access opening. The tank can be shifted to make sure that is level in all directions.
8. Fill tanks: Once all tanks are level and properly positioned, begin filling them with clean water. As the tanks are filling, periodically check for level and water tightness on the tank and all fittings.
9. Hook up 4" line. As the tanks are filling attach the 4" incoming line from the house to the pretreatment tank. The Aero-Tech unit must be attached to a properly vented and plumbed structure that meets all local and state plumbing codes.
10. Backfill in 6" lifts: While the tanks are filling with water, begin to fill the excavation site in six inch increments with material that will settle and compact around the unit. Tamp around the unit and use water as necessary to help settle the soil around the tank. Slope dirt so that all water run-off will flow from the installation.
11. Secure the access hatch by locking the tamper resistant latch.

12. Before completing backfill make sure that conduit and airlines have been laid to the control panel.

AERO-TECH CONTROL PANEL INSTALLATION

1. Location of panel: Locate control panel and pedestal next to house in a visible location. Make sure that the control panel is visible and easily noticed by the occupants.
2. Secure control panel: Attach the control panel to the house using the correct length fasteners through the back of the panel. If the control panel/pedestal are to be free standing, a 8" hole 18" deep will have to be dug to allow for a 4"x 4" treated post to be installed.
3. Place treated 4"x 4" in hole and tamp Slide pedestal over the post. Anchor with 2" galvanized screws.
4. Disconnect: A disconnect panel should be placed in line before the control panel. Run the 115 Volt 60Hz power from the disconnect box to the control panel, attaching them to the bottom of the L1, N, G terminals.
5. Wiring diagram: Use the wiring diagram provided for each version of the Aero-Tech Control Panel Model series.
6. Install air and power: Run 11/2" schedule 40 airlines and 1" schedule 40 power conduits into the bottom of the pedestal. The airline should extend to the bottom of the vents on the side of the pedestal. The conduit for the power lines should extend to approximately one foot above the ground level.
7. Connect the power lines from the aerator to the X1, N, G terminals on the power bar of the control panel.
8. Air bell: The 1/4" air line from the air bell should be attached by pushing it on to the barb from air compressor.

START UP PROCEDURES

After completing the Tank Installation and the Control Panel Installation, it is time to start your AERO-TECH Aerobic Treatment Unit. Please make sure you have read all instructions in this manual prior to use of this unit. It is extremely important that this start-up is done only by factory trained and certified people. If you have any questions, call, write or fax AERO-TECH.

1. Check to make sure that the tanks are filled with water. The submersible aerator is made to only run in liquid. Running your submersible aerator without being in water, can harm the seals, bearings and other parts of the motor. This will void your warranty.
2. Make sure that the disconnect panel is turned on. Check to make sure that the breakers are turned on in the control panel.
3. After turning on the submersible aerator, visually check to make sure that it is running. You will see air bubbles come to the surface inside the mixing chamber of the ATU indicating that the unit is on.
4. The high water alarm may come on, this consists of a light and horn on the control panel. The horn may be silenced by touching the hand outline on the front of the control panel. The light will stay on until the water is at a normal level.

5. If the unit fails to start, go through the start up procedures again. If there is no change, please call your local AERO-TECH dealer or the manufacturer for further instructions.

PROPER PERMITTING

Aero-Tech units may only be installed after first obtaining all permits and approval from the local officials. All state and federal environmental laws and codes must be followed at all times. Under no circumstances should an Aero-Tech unit be installed by anyone other than licensed and certified Aero-Tech installers.

INSPECTION/SERVICE PROCEDURE

The routine inspection and service can be performed easily and quickly by an AERO-TECH trained and certified technician. Due to different disposal methods, each site is unique and should be inspected as such. Please proceed with the following instructions.

1. After arriving at the site, use the tamper-proof latch key to unlock and open the hatch(es) on the unit.
2. Take a one liter sample of the activated sludge from the aeration chamber. Set the sample aside to allow it to settle while you perform the rest of the service.
3. Take a visual inspection of the mixed liquor in the aeration chamber. This should be chocolate brown in color and you should see the air bubbles rising to the top; while the clarifying chamber remains still.
4. The rising bubbles indicate that the submersible aerator is working properly.
5. If there is scum (dead bacteria) in the top of the clarifying chamber, take a small net of fine mesh and scoop it back into the mixing chamber. This is still food for the bacteria.
6. During this time you should also be taking an olfactory (smell) test of the unit. There should be little or no smell to the system. There may be a small earthy loam smell and this will be normal. If there is a strong septic smell, proceed with the inspection to determine the cause.
7. At this time you will take sludge judge readings from all of the tanks to determine the level of sludge and also the health of the unit. Start by taking a reading in the pre-treatment tank. When the solids reach 24-28" make arrangements for the tank to be pumped. Next take a reading in the aeration chamber of the ATU. When the solids reach a level of 3-4" make arrangements for the tank to be pumped. If there is a pump tank, take a reading there also. When the solids reach 6-8" make arrangements for the tank to be pumped. Make a note of all levels of sludge on your inspection report.
8. Shut off the breaker to the submersible aerator. The alarm should sound. Silence the alarm by pushing the "hand" sign on the front of the control panel. Reset the breaker at this time.
9. Make sure the air vents on the pedestal are cleared and free of dust lint and debris at this time.
10. Now return to the sample you pulled from the aeration chamber. Take a visual inspection of the sample for the amount of settleable solids and amount flock in the system. The sample should be a brown in color if operating correctly. If the mixed liquor sample is gray or black it is operating in an anaerobic condition is not desirable.
11. Take a sample of the system effluent. The effluent should be clear with few light brown

solids in suspension. If the color is dark or turbid or is clear with a great deal of light brown solids the system is not working properly.

12. Effluent samples must be taken as the effluent enters the pump tank or a sample port must be added downstream. The sample port should be installed so that effluent cannot remain below the discharge water line and build up solids.
13. To meet NSF Standard 40 the effluent should be less than 25mg/l CBOD and less than 30mg/l TSS with a PH range of 6-9.

FIVE YEAR LIMITED WARRANTY

AERO-TECH WASTEWATER SYSTEMS warrants each AERO-TECH Aerobic Wastewater Treatment System to be from defects in material and workmanship for a period of five years from the date of sale by an authorized AERO-TECH dealer when the unit is properly registered with AERO-TECH. The sole remedy under the LIMITED WARRANTY is as follows: AERO-TECH may at its sole option, replace or exchange any component part F.O.B. factory, that in AERO-TECH'S judgment shows evidence of defects in material or workmanship, provided said component part has been paid for and is returned through an authorized AERO-TECH dealer transportation prepaid, to AERO-TECH at 2900 Gary Drive, Plymouth, IN 46563. The warrantee must also specify the nature of the defect to the manufacturer. The LIMITED WARRANTY does not make a provision for an informal dispute settlement agreement.

The warranty does not cover treatment processes/systems that have been flooded, by external means, or that has been disassembled by unauthorized persons, improperly installed, subjected to external damage, or damage due to altered or improper wiring or overload protection.

Recommendations for special applications will be based on the best available expertise of AERO-TECH and published industry information. Such recommendations do not constitute a warranty of satisfactory performance under the end user's specific conditions.

This warranty applies only to the treatment system and does not include any residential wiring, plumbing, and drainage, installation of system or disposal system. AERO-TECH is not responsible for any delay or damages caused by defective components or materials, for loss incurred because of interruption of service, or for any other special or consequential damages or incidental expenses arising from the manufacture, sale or use of the system.

AERO-TECH reserves the right to revise, change, or modifies the construction and design of the treatment system or any component part thereof, without incurring; any obligation to make such changes for modifications in previously sold equipment. AERO-TECH also reserves the right, in making replacements of component parts under this warranty, to furnish a component part, which, in its judgment, is equivalent to the company part, replaced.

Under no circumstances will AERO-TECH be responsible to the warrantee for any other direct or consequential damages, including but not limited to lost profits, lost income, labor charges, delays in production, and or idle production, which result from defects in material and/or workmanship of the system. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty is expressly in lieu of any other expressed or implied warranty, merchantability, or fitness, and of any other obligation on the part of AERO-TECH.

Aero-Tech
Aerobic Treatment Units

WARRANTY REGISTRATION

Aero-Tech
574-935-0908 • 2900 Gary Drive • Plymouth, IN 46563

The dealer must file this form with Aero-Tech within 30 calendar days after the installation of the unit or all warranties are void.

Owner/User: _____

Address: _____

City/State/Zip: _____ Phone: _____

Dealer/Installer: _____

Address: _____

City/State/Zip: _____ Phone: _____

Distributor: _____

Service will be performed by: _____

Name: _____

City/State/Zip: _____ Phone: _____

Type of installation: _____ Residential ___ Commercial ___

Number of occupants: _____ Garbage disposal: Yes ___ No ___

Date installed: _____

Plant Model number: _____ Control Panel number: _____

Plant Serial number: _____ Air Pump Serial number: _____

Effluent disposal method and equipment used: _____

Authorizing Agency: _____

Sanitarian: _____

Address: _____

City/State/Zip: _____ Phone: _____