Maine Center for Disease Control and Prevention
An Office of the Department of Health and Human Services
John E. Baldacci, Governor Brenda M. Harvey, Commissioner

Department of Health and Human Services
Maine Center for Disease Control and Prevention
286 Water Street
11 State House Station
Augusta, Maine 04333-0011
Tel: (207) 287-5689
Fax: (207) 287-3165; TTY: 1-800-606-0215

July 9, 2009

Hoot Aerobic Systems, Inc.
Attn. Ronald J. Suchecki, Jr.
2885 Highway 14 East
Lake Charles, LA 70607

Subject: Product Registration, Hoot Aerobic System, Various Models

Dear Mr. Suchecki:

The Division of Environmental Health has completed a review of a registration application for your company's product. This information was submitted pursuant to Section 1802 of the Maine State Plumbing Code, Subsurface Wastewater Disposal Rules (Rules), for code registration, for use in Maine.

The Hoot Aerobic System consists of a multiple compartment tank with a pre-treatment/stilling well, and an aerobic treatment compartment with an integral clarifier. The following models are included in this registration:

Model Number	Capacity, GPD
ANR-450	450
H-500A	500
H-600A	600
H-750A	750
H-1000A	1,000
LA-500	500
LA-500S	500
LA-1000	1,000
LA-1000S	1,000

According to the information you provided, the Hoot Aerobic System has been certified by the National Sanitation Foundation (NSF)pursuant to ANSI/NSF Standard 40 for residential wastewater treatment systems. On the basis of the information submitted, the Division has determined that the Hoot Aerobic System is acceptable for use in the State of Maine, provided that it is installed, operated, and maintained in conformance with the manufacturer's directions.

Because installation and owner maintenance has a significant effect on the working order of onsite sewage disposal systems, including their components, the Division makes no representation or guarantee as to the efficiency and/or operation of Hoot Aerobic Systems. Further, registration of this product for use in the State of Maine does not represent Division preference or recommendation for this product over similar or competing products.

If you have any questions please feel free to contact me at (207) 287-5695.

Sincerely,

James A. Jacobsen

James A. Jacobsen, Environmental Specialist IV
Wastewater and Plumbing Control Program
Division of Health Engineering
e-mail: james.jacobsen@state.me.us

/jaj
Enc: Chapter 18, CMR 241
xc: Product File

Maine Department of Health and Human Services
Bureau of Health
Division of Health Engineering
Wastewater and Plumbing Control Program

APPLICATION FOR REGISTRATION OF EXPERIMENTAL SYSTEM/INNOVATIVE TECHNOLOGY OR ONSITE SEWAGE DISPOSAL SYSTEM PRODUCT

Please complete the following Sections. Please print or type.

Applicant

Company Name: Hoot Aerobic Systems, Inc.

Contact Person: Ron Suchecki

Address: 2885 Highway 14 E.

Town/City: Lake Charles State/Province: LA Zip Code: 70607

Country:

Telephone: (888) 878-4668 e-mail: ron@hootsystems.com

Product

Product Name: H-Series

Model: H-500, 600, 750 & 1000

Product Classification (choose one)

Primary or Secondary Treatment Unit

[ ] Septic Tank [X] Extended Aerobic Treatment Unit [ ] Recirculating Aerobic Unit

[ ] Aerobic Fixed Film Unit [ ] Other (specify) _____

Effluent Filter

[ ] Septic Tank Outlet Filter [ ] Post-Tank Filter [ ] Other (specify) _____

Disposal Device

[ ] Gravel-less Disposal Pipe [ ] Gravel-less Disposal Bed [ ] Chamber, Plastic

[ ] Chamber, Other [ ] Other (specify) _____

Miscellaneous

[ ] Pipe [ ] Effluent Flow Distribution Device [ ] Other (specify) _____

Claim

Describe the product's features (attach additional sheets if necessary).

Please see the attached letter and diagram which addresses the process description located in Appendix A.

Describe the product's performance (attach additional sheets if necessary).

CBOD5 = < 3 (See Attachment C. Standard 40 Report, Conducted by Baylor University)

TSS = < 2 (See Attachment C. Standard 40 Report, Conducted by Baylor University)

NH3 = < 0.5 (See Attachment D. Study By Baylor University)

Fecal = 688 , without disinfection (See Attachment D. Study By Baylor University)

Fecal = 54, with UV disinfection (See Attachment E. Letter from NSF)

Has the product received National Sanitation Foundation or Canadian Standards Authority approval?

[ ] No [X] Yes (If "yes", enclose a copy of the certification.) (Please See Attachment B For NSF Listing and Attachment C for the Copy of the Report)

IMPORTANT NOTE!

Don't forget to enclose relevant product literature, engineering specifications, studies, and third party certifications with this application.

I, Ronald J. Suchecki, Jr., am the [X] applicant [ ] agent for the applicant of the subject product.
(print name)
I state that the information submitted is correct to the best of my knowledge and understand that any falsification is reason for the Department to deny registration for use of the product in Maine.

[X] Signature of Applicant
[ ] Signature of Agent for Applicant

June 22, 2009
Date

Jacobsen, James

From: Ron Suchecki [ron@hootsystems.com]
Sent: Monday, June 22, 2009 2:58 PM
To: Jacobsen, James
Subject: FW: Hoot Approval/Registration Request
Follow Up Flag: Follow up
Flag Status: Red
Attachments: Hoot Application ME.pdf

This got returned to me... It is James.. not Jim.

From: Ron Suchecki [mailto:ron@hootsystems.com]
Sent: Monday, June 22, 2009 1:44 PM
To: 'jim.jacobsen@maine.gov'
Cc: 'russell.martin@maine.gov'; 'Mike Dunn'
Subject: Hoot Approval/Registration Request

Jim –

Please find the attached application. I spoke with Russ and he told me that you would ultimately review the application and he gave me your e-mail address. For formality sake I addressed the application to the attention of Russ.

I will have a copy printed and deliver it to him tomorrow so you will have something on paper for the file.

Should you have any questions regarding the submission, please contact me at any of the below listed methods.

Sincerely,

Ron Suchecki
General Manager
Research Director
Hoot Systems, LLC
Web: www.hootsystems.com
Direct: (254) 299-0821
Fax: (254) 299-0822
Email: ron@hootsystems.com

Please consider the environment before printing this e-mail.

June 22, 2009

Department of Health and Human Services
Wastewater & Plumbing Program
Russell G. Martin, Program Director
286 Water Street, 3rd Floor
11 State House Station
Augusta, ME 04333-0011

Submitted electronically via e-mail and Hand Delivered at NEHA

Dear Russ,

Thank you for taking the time to speak with me about the approval process in Maine. I have attached an electronic copy of the application and my response for your review.

I plan to have a hard copy made and deliver it to you at the SORA meeting here in Atlanta tomorrow.

If you have any questions regarding this submission please feel free to contact me.

Sincerely,

Ron Suchecki
General Manager
Research Director
Hoot Systems, LLC
Web: www.hootsystems.com
Direct: (254) 299-0821
Fax: (254) 299-0822
Email: ron@hootsystems.com

Appendix A

Claim

Describe the product's features (attach additional sheets if necessary).

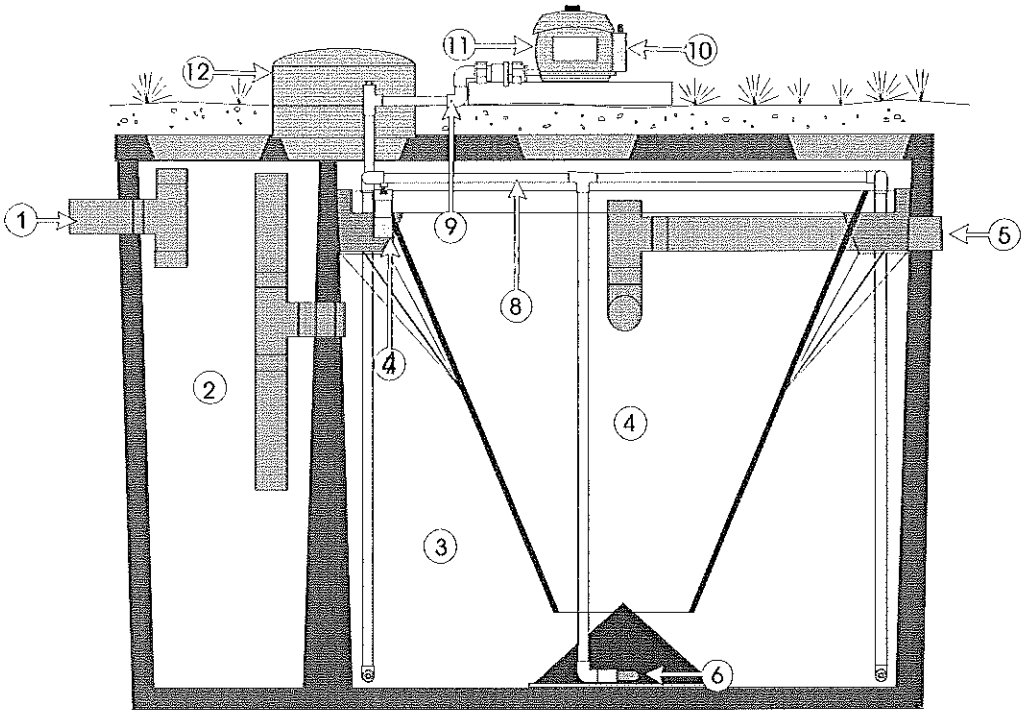
The treatment system is comprised of five components, namely a Pretreatment Tank, Aeration Chamber, Clarifier,

Pre-treatment Tank: contains the volume of approximately 1 day of true flow of the system. The Pre-Treatment or Trash Trap, aides in the anaerobic decomposition of the influent by providing a storage area for non-biodegradables which are inadvertently added to the system. This tank functions like a septic tank, providing a space for floatables, things that are lighter than water, to float (mainly things such as fats oils and grease - that should not be added to the system in the first place) and a place for things to settle out (hair, dirt and other non-biodegradable solids). A reduction of at least 50% of the Total Settleable Solids (TSS) occurs within this tank and approximately 25% of the Biochemical Oxygen Demand (BOD5). This chamber contains a mid-level, baffled crossover is provided to allow the liquid waste effluent to leave the compartment and enter into the:

Aeration Chamber: This is the heart of the activated sewage treatment of the plant. By means of the Troy Air Blower, oxygen is incorporated into the sewage. This introduction of oxygen is done in such a manner as to intimately mix the organics of the sewage with the bacterial populations in the aeration chamber. Reduction of the organics is accomplished by these organisms. Excess oxygen not needed for the organic decomposition is utilized by nitrifying bacteria to convert ammonia into the more stable form on nitrogen known as Nitrate. Movement of sewage in the aeration chamber causes the activated sludge that settled in the final clarifier to be re-introduced into the aeration chamber. As the solids settle out in the:

Clarifier: a still chamber located within the Aeration Chamber provides a quiescent zone in where the clear odorless effluent rises through to the outlet, located 6 inches below the surface of the clarifier. This chamber holds approximately ½ day's capacity of effluent which passes from the clarifier into the:

Final Clarifier/Pump Tank (optional): is located as the last treatment component before the discharge to the drainfield or other disposal method. This chamber contains a screening device that provides for a place for settled solids to be stored before the final effluent leaves the tank for discharge to the disposal method chosen. This storage in the bottom keeps the solids away from the pump so that pump will run cool and last longer.



The HOOT Aerobic Treatment System Diagram

1. **Inlet:** How sewage enters the system (where the indigenous bacteria, which are contained in the wastewater, enter the system through a 4" inlet pipe.)
2. **Pretreatment Tank**: Or Trash Trap, for Settling and Floating of non liquid waste.
3. **Aeration Chamber:** Where Air is introduced to digest organic waste.
4. **Clarifier:** a still chamber where a clear, odorless, effluent rises.
5. **Outlet:** Where the treated effluent leaves the system.
6. **Diffuser:** How dissolved oxygen is added to the system.
7. **High Water Alarm:** Float that activates the high water alarm.
8. **Aeration Manifold:** How compressed air is delivered to the Diffusers.
9. **Air Line:** Delivers air to the aeration manifold and eventually the diffusers.
10. **Intergraded Alarm Panel**: Provides both High water and compressor failure alarms.
11. **Linear Air Compressor:** Provides the compressed air to operate the system.
12. **At Grade Access Riser:** Provides access to the Pre-Treatment, Aeration and Clarifier chambers for servicing and pump out.

Appendix B

NSF/ANSI STANDARD 40
Residential Wastewater Treatment Systems

HOOT AEROBIC SYSTEMS, INC.
2885 HIGHWAY 14 EAST
LAKE CHARLES, LA 70607
337-474-2804

Model Number	Rated Capacity Gallons/Day	Classification
ANR-450	450	Class I
H-500A[1]	500	Class I
H-600A[2]	600	Class I
H-750A[3]	750	Class I
H-1000A[4]	1000	Class I
LA-500[6] [8]	500	Class I
LA-500S[5] [6]	500	Class I
LA-1000[7]	1000	Class I
LA-1000S[5] [7]	1000	Class I

[1] Model H-500A also as a component of the models H-500 AN/AW/AS/AT/AND/ASD/ATD. These complete models have not been tested by NSF.
Complete models:
H-500AN/AW/AND include a 760 gallon pump tank.
H-500AS/AT/ASD/ATD include a 1010 gallon pump tank.
[2] Model H-600A also as a component of the models H-600AN/AT/AND. These complete models have not been tested by NSF. Complete models H-600AN/AT/AND include a 1010 gallon pump tank.
[3] Model H-750A also as a component of the models H-750AN/AW/AH/AND. These complete models have not been tested by NSF. Complete models H-750AN/AW/AH/AND include a 1700 gallon pump tank.
[4] Model H-1000A also as a component of the models H-1000AD/AN/AW/AND. These complete models have not been tested by NSF. Complete models H-1000 AD/AN/AW/AND include a 1469 gallon pump tank.
[5] Suffix S denotes a straight walled, one piece tank with lid.
[6] Models LA-500 and LA-500S also as components of the models LA-500TP and LA-500TPS respectively. These complete models have not been tested by NSF.
Complete models:
LA-500TP includes a pretreatment and pump tank.
LA-500TPS denotes a straight walled tank with a pretreatment and pump tank.
[7] Models LA-1000 and LA-1000S also as components of the models LA-1000TP and LA-1000TPS respectively. These complete models have not been tested by NSF.
Complete models:
LA-1000TP includes a pretreatment and pump tank.
LA-1000TPS denotes a straight walled tank with a pretreatment and pump tank.
[8] Average influent wastewater characteristics were outside the 30-day averages specified by NSF/ANSI Standard 40, but were within the average for the overall test, supporting that mass loading of the influent was adequate. The 30-day effluent values were 10 mg/L or less with no effluent values discarded despite the influent variability.

Appendix C

TM

Performance Testing and Evaluation Certification Report

Baylor University
Department of Environmental Studies
Individual On-Site Waste Water Treatment System
Testing and Certification Program
on the

Hoot 500
With Model Series 750, and 1000
(Also designated as H-500, H-750 and H-1000)

Hoot Aerobic Systems, Inc.
Lake Charles, Louisiana, U.S.A.

Original Report: December 14, 2001

WATER TEST PERFORMANCE EVALUATION REPORT

The Baylor University, Department of Environmental Studies, Individual On-Site Waste Water Treatment System Testing and Certification Program has determined by a thorough performance evaluation under the provisions of the NSF/ANSI Standard 40, 2000, that the residential wastewater treatment system Hoot 500, manufactured by Hoot Aerobic Systems, Inc., of Lake Charles, Louisiana, USA has successfully fulfilled all the requirements of NSF/ANSI Standard 40, 2000, and has achieved effluent water quality consistent with a Class I effluent residential wastewater treatment system.

All tests were performed at the Waco Metropolitan Area Regional Sewerage System Treatment Plant (WMARSS), Waco, Texas operated by the Brazos River Authority (BRA). Laboratory analysis of samples, including CBOD, TSS, and VSS were conducted at the BRA Laboratory by BRA personnel. Affidavits regarding non-involvement of all Baylor Staff and BRA Staff and laboratory personnel are on file. Characteristics of the raw influent sewage are included in the tabulated data of this report.

The observations and analyses included in this report are certified to be correct and detailed descriptions and analyses are described herein. Additional information about the testing agency, test site, equipment, data collection procedures, QA/QC protocols, etc. is provided to State environmental regulatory authorities under separate cover.

The certified data is the property of the manufacturer of the residential wastewater treatment system and can be released only with the manufacturer's permission. The manufacturer has agreed to present the data in this certification in its entirety whenever it is used in advertising, prospecting, bids, or similar uses.

I certify that the attached document is an official report issued by the Baylor University Individual On-Site Waste Water Treatment System Testing and Certification Program. The original of this document is neither a public record nor a publicly recordable document. The original bench data is retained in the files of Baylor University.

Mr. David L. Jumper

Signed before me this 9th day of April 2003

Sharon A. Sloan
My commission expires: Sept. 7, 2003

Dudley J. Burton, Ph.D.
Project Director, Individual On-Site
Waste Water Treatment System
Testing and Certification Program
Department of Environmental Studies
P. O. Box 97261
Baylor University, Waco, Texas.76798-7261
Phone: (254) 710-3405 Fax: (254) 170-3409

Date: Dec. 17, 2001

This Page is Intentionally Left Blank

PREFACE

This report describes the results of the performance evaluation conducted by the Baylor University, Department of Environmental Studies, Individual On-Site Waste Water Treatment System Testing and Certification Program, Waco, Texas, with the cooperation of the Brazos River Authority, Waco, Texas, on the residential wastewater treatment system, Hoot 500 GPD, manufactured by Hoot Aerobic System, Inc., in Lake Charles, Louisiana.

All laboratory tests were performed at the Waco Metropolitan Area Regional Sewerage System Treatment plant (WMARSS) operated by the Brazos River Authority (BRA). In-situ tests and sample collection were performed by Baylor personnel. All statistical analysis was performed by Baylor personnel using Microsoft Excel 5.0. Statistical summaries are included in Appendix A.

This report contains results of the testing protocol, a description of the residential wastewater treatment system, its operation and key process control equipment, and a narrative summary of the test program, including test location, procedures and significant occurrences.

The purpose of this evaluation is to determine the efficacy of the Hoot residential wastewater treatment system for distribution and design application. All phases of this evaluation were conducted in accordance with the provisions and specifications set forth by NSF International in the NSF/ANSI Standard 40, 2000 for residential wastewater treatment systems capable of producing Class I effluent.

NSF/ANSI Standard 40, 2000

Performance evaluation of residential wastewater treatment systems is achieved within the provisions of NSF/ANSI Standard 40, 2000 prepared by the NSF Joint Committee on special Processes or Devices used in Treating Wastewater and adopted by the NSF Board of Trustees, and adopted by the Baylor University Individual On-Site Waste Water Treatment System Testing and Certification Program.

The standard is consistent with the methodology established by NSF International in the development of standards and criteria for special equipment having a bearing on public health and/or the environment. It provides for uniformity of requirements and interpretation applicable to processes intended to treat wastewater from individual homes and other sources having similar types and volumes of liquid wastes.

There are five fundamental principles which relate to application of the standard:

a. The standard represents minimum and basic requirements for evaluation.

b. Performance evaluation is independent of design and construction although the evaluation recognizes structural weaknesses, undesirable noise, and other detriments to the environment as part of the test results.

c. Installation and operation of the equipment is performed according to the instructions of the manufacturer consistent with actual field installation and use.

d. Appropriate warranties and service provisions must support field applications of the equipment to enable continuous operation within the demonstrated performance characteristics of the residential wastewater treatment system or process.

e. Sample collection, preservation and storage, and analytical methods by the testing agency are in accordance with Standard Methods for the Examination of Water and Wastewater, Eighteenth Edition, and Manual of Methods for Chemical Analysis of Water and Wastes, when applicable, and the data produced is certified as a true and accurate record of performance under the known conditions of the test.

Conformance with the standard is not to be construed as a blanket guarantee of the equipment in all applications. Rather it is a certification that the residential wastewater treatment system was appropriately tested and that if the residential wastewater treatment system is manufactured, installed and maintained as it was tested, documented as reported herein and maintained as required by the manufacturer, it will usually produce water quality in accordance with the standard.

Residential wastewater treatment systems conforming to NSF/ANSI Standard 40, 2000 are classified as Class I or Class II residential wastewater treatment systems according to the quality of effluent produced by the residential wastewater treatment systems during their performance evaluation. Class I residential wastewater treatment systems must also demonstrate performance consistent with the odor, oily film and foam requirements of the standard. With the 1978 revision of the standard, Class I residential wastewater treatment systems must satisfy requirements of the EPA's Secondary Treatment Guidelines for five day biochemical oxygen demand, suspended solids and pH quality requirements.

PERFORMANCE EVALUATION

This report is applicable to the residential wastewater treatment system manufactured by Hoot Aerobic Systems, Inc. of Lake Charles, Louisiana, U.S.A and referred to as the Hoot. This residential wastewater treatment system is marketed as a complete home aerobic treatment system and has a rated capacity of 500 gallons per day. This residential wastewater treatment system is represented by the drawings, parts list, and specifications included as Appendix D.

NSF/ANSI Standard 40, 2000 delineates a standard method for the performance evaluation of residential wastewater treatment systems. A copy of the NSF/ANSI Standard 40, 2000 can be ordered by writing to:

NSF International
3475 Plymouth Road
PO Box 130140
Ann Arbor, Michigan 48113-0140

Sampling points and their associated analytical parameters are outlined in Table I. The samples were collected seven days per week which exceeds the NSF/ANSI Standard 40, 2000 guidelines, to produce a more accurate representation of the residential wastewater treatment system's performance. Lab analysis was done on 5 days per week during part of the test. Composite samples of the effluent were taken daily, proportional to the flow, by an automatic sampler activated by a timer synchronized with the dosing timer. All other samples were grab samples, or the measurements were made in-situ.

TABLE 1 SAMPLING SCHEDULE

	DO	CBOD	TSS/VSS	pH	Temp.	Sett. Sol.	Color	Odor	Oily Film	Foam
Influent	I	C	C	I	I					
Aeration Chamber	I		G	G	I	G				
Effluent	I	C	C	I	I		G	G	G	G

G = GRAB SAMPLE C = COMPOSITE SAMPLE I = IN SITU MEASUREMENT

Shown in Table II is a statistical summary of the numerous observations for each analytical parameter, expressed in terms of the median, minimum and maximum values, and the inter-quartile range for each parameter. The median and inter-quartile range indicate, respectively, the central tendency and variability of the parameter in a manner that is free from assumptions with regard to the overall distribution of data.

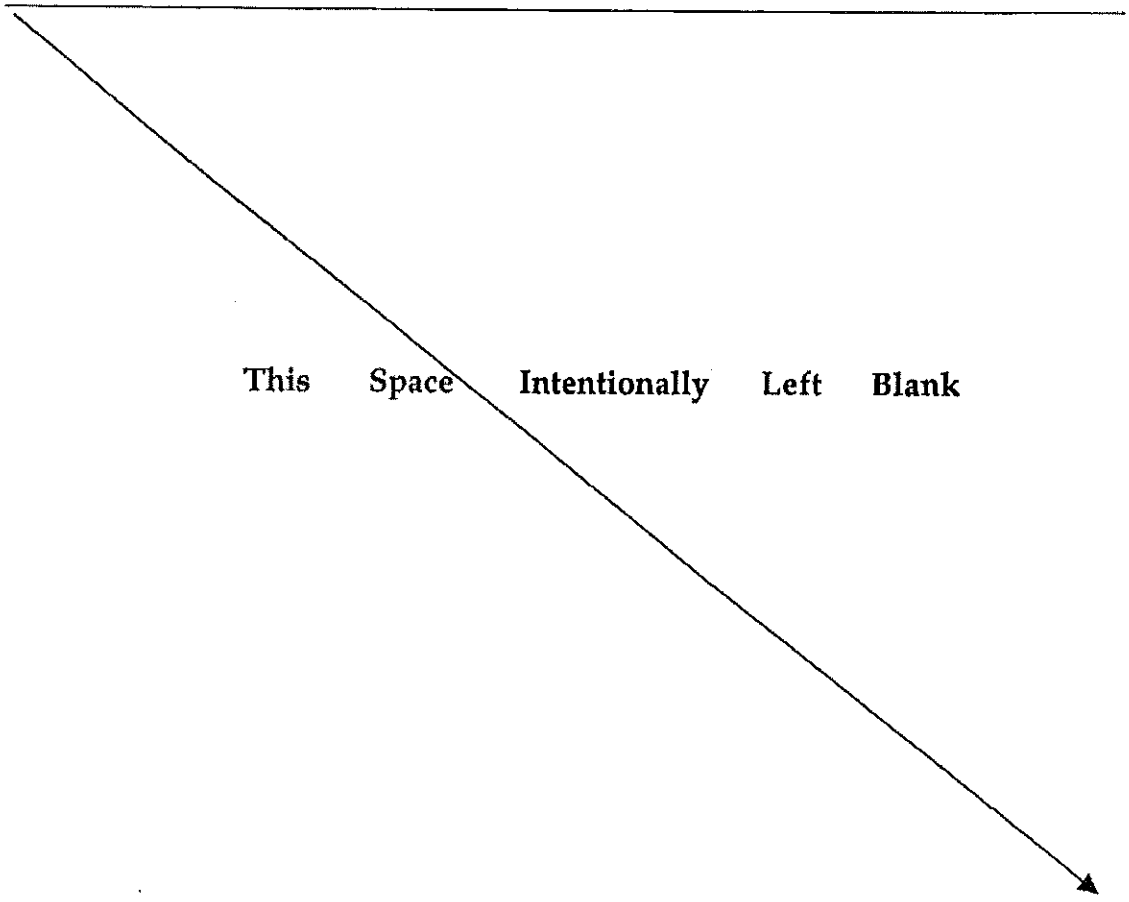


TABLE II. SUMMARY OF PERFORMANCE DATA

		MEDIAN	MINIMUM	MAXIMUM	INTERQUARTILE RANGE
Dissolved Oxygen (mg/l)	aeration	3.80	0.37	8.95	2.62 – 4.79
	Effluent	6.12	2.24	7.67	5.37 – 6.49
Temperature (C)	influent	28.08	2.049	31.65	25.84 – 30.29
	aeration	27.46	22.75	31.17	25.63 – 29.75
	effluent	26.92	6.00	238.44	24.36 – 28.98
pH	influent	7.37	6.43	8.01	7.23 – 7.50
	aeration	7.74	5.07	8.92	7.60 – 7.90
	effluent	7.89	7.01	9.27	7.77 – 8.17
5 day Biochemical Oxygen Demand (mg/l) (CBOD)	influent	147	9	1071	92 – 240
	effluent	2.00	2.00	15.60	2.00 – 2.00
Suspended Solids (mg/l)	influent	132	40	1540	84 – 228
	aeration	1165	206	3165	658 – 1525
	effluent	1.0	0.00	59.0	0.5 – 1.8
Volatile Suspended % Solids	influent	75	7	92	71 – 78
	Aeration	690	7.5	1880	458.75 – 880
	effluent	0.8	0.0	1120.0	0.5 – 1.4
Settleable Solids (ml/l) 45-min.	aeration chamber	7	1	25	5 – 9.25

Median: Fifty percent of the values are less than or equal to this value.
Inter-quartile Range: The range of variability about the median which is sufficient to contain 50% of the observations. The inter-quartile range lies between the upper and lower 25% of the observations.

Table III summarizes the effluent five day biochemical oxygen demand ($CBOD_5$) and suspended solids measurements, which demonstrated a level of performance by the Hoot residential wastewater treatment system consistent with the Class I effluent requirements of NSF/ANSI Standard 40, 2000.

TABLE III. EFFLUENT QUALITY SUMMARY

Parameter	Number of Observations	Minimum	Maximum	Median	Interquartile Range	Confidence Limit 90%
CBOD mg/L	154	2.0	15.6	2.0	2.0 – 2.0	2.0 – 2.14
Suspended Solids	160	0.0	59.0	1.0	.5 – 1.8	.4 – 2.4

Table IV presents removal efficiencies calculated from the mean influent and effluent values, the mean values being more conventional indicators of overall efficiency.

TABLE IV. REMOVAL EFFICIENCIES

Parameter	Influent Mean	Effluent Mean	Reduction	% Reduction
CBOD	196	2.33	193.66	98.8
Suspended Solids	194	2.35	191.65	98.7

Table V represents the analytical results performed to determine the quality of the effluent.

TABLE V. EFFLUENT QUALITY ANALYSIS

	TSS Inf.	CBOD Inf.	Eff. CBOD 30-day Mean (mg/L)	Eff. TSS 30-day Mean (mg/L)	Eff. CBOD 7-day Mean (mg/L)	Eff. TSS 7-day Mean (mg/L)	CBOD Reduction 30-day (%)	TSS Reduction 30-day (%)
Minimum	4.0	0.9	2.0	.61	2.0	.4	98.2%	99.3%
Maximum	1540	1071	2.68	3.85	4.38	13.24	99.2%	98.7%
Median	132	147	2.0	1.02	2.0	1.0	98.8%	99.4%

ANALYTICAL RESULTS

During the 26 weeks of operation, the Hoot 500 residential wastewater treatment system produced a treated effluent quality consistent with the Class I requirement. Based on a 500 gallon per day flow, the Hoot 500 maintained an average $CBOD_5$ effluent of 2.35 mg/L and suspended solids of 1.8 mg/L. On a 90 percentile basis, the residential wastewater treatment system performed with $CBOD_5$ effluent between 2.0 and 2.14 mg/l and suspended solids between 0.4 and 2.4 mg/l. The samples were taken in accordance with and complied to the requirements of the NSF/ANSI Standard 40, 2000 guidelines. The laboratory results summarized and presented in Table II are described herein as follows:

BIOCHEMICAL OXYGEN DEMAND ($CBOD_5$)

A. INFLUENT

Based on 158 observations, the range of $CBOD_5$ values was from 9.0 mg/L to 1071. The median value was 147 mg/L with 50 percent of the values in the range from 91 to 237 mg/L.

B. HOOT RESIDENTIAL WASTEWATER TREATMENT SYSTEM EFFLUENT

$CBOD_5$, determined in 154 observations, ranged from a minimum value of 2.0 mg/L to a maximum value of 15.6 mg/L with a median value of 2.0 mg/L. The interquartile range of values, i.e., the range of variability about the median that lies between the upper and lower 25 percent of the observations, was 2.0 to 2.0 mg/L. The effluent quality summary, as shown in Table III, indicates that at least 90 percent of the samples had values greater than 2.0 and less than 2.14 mg/L. The analysis performed on the quality of the effluent, as demonstrated in Table V, indicates that the arithmetic mean of all effluent samples collected in a period of 30 consecutive sampling days has a maximum value of 2.68 mg/L. The arithmetic mean for all effluent samples collected in a period of 7 consecutive sampling days has a maximum value of 4.38 mg/L. The analysis indicates that the average reduction for $CBOD_5$ is 98.2 %. The values used in determining removal efficiency are presented in Table IV.

SUSPENDED SOLIDS

A. INFLUENT

The values for suspended solids in the residential wastewater treatment system influent ranged from a minimum of 40 mg/L and a maximum value of 1540 mg/L. The interquartile range of values was between 84 and 228 mg/L which bounded a median value of 132 mg/L.

B. HOOT RESIDENTIAL WASTEWATER TREATMENT SYSTEM EFFLUENT

A median value of 1.8 mg/L was established for effluent suspended solids, based upon 160 observations. The inter-quartile range was between 0.5 and 1.8 mg/L with 90 percent of the

values being greater than 0.4 and less than 2.4 mg/L. Table III displays the effluent quality summary while Table IV shows the removal efficiencies of $CBOD_5$ and SS. As shown in Table V, the maximum value for the effluent suspended solids is 59 mg/L, and the maximum value for the 7-day mean of effluent suspended solids is 13.24 mg/L. Also demonstrated in Table V, the effluent does satisfy the suspended solids criteria set forth by NSF/ANSI Standard 40, 2000, following EPA's Secondary Treatment Guidelines for Class I.

Table IV presents the mean influent and effluent suspended solids values used to calculate percent reduction accomplished by this residential wastewater treatment system which was greater than 99 % removal of suspended solids.

AERATION CHAMBER SUSPENDED SOLIDS

The concentration of suspended solids in the aeration chamber ranged from a minimum value of 206 mg/L to a maximum value of 3165 mg/L, with a median of 1165 mg/L. The range of variability about the median which contains fifty percent of the observations ranged from 658 to 1525 mg/L. During the test period, aeration chamber suspended solids concentration did not vary in any consistent or predictable manner with respect to time.

DISSOLVED OXYGEN (D.O.)

A. AERATION CHAMBER

The Hoot system demonstrated the capacity to maintain an aerobic environment in the aeration tank contents. The minimum value for dissolved oxygen was 0.37 mg/L with a median of 3.8 mg/L and an inter-quartile range of 5.37 to 6.49 mg/L.

B. HOOT RESIDENTIAL WASTEWATER TREATMENT SYSTEM EFFLUENT

A. median of 6.12 mg/L D.O. was obtained based on determinations of effluent dissolved oxygen. The minimum value recorded for dissolved oxygen was 2.24 mg/L with an inter-quartile range of 5.37 to 6.49 mg/L.

COLOR, THRESHOLD ODOR, OILY FILM, FOAM

NSF/ANSI Standard 40, 2000 specifies limits for Class I effluent with respect to color, threshold odor, oily film, and foam. Special attention was devoted to these parameters each sampling day as well as several random checks throughout the 26 weeks, including weekends. Hoot residential wastewater treatment system effluent was within limits specified in NSF/ANSI Standard 40, 2000:

1. Effluent color was less than 15 units
2. Threshold Odor - non-offensive
3. There was no evidence of oily film or foam.

NOISE

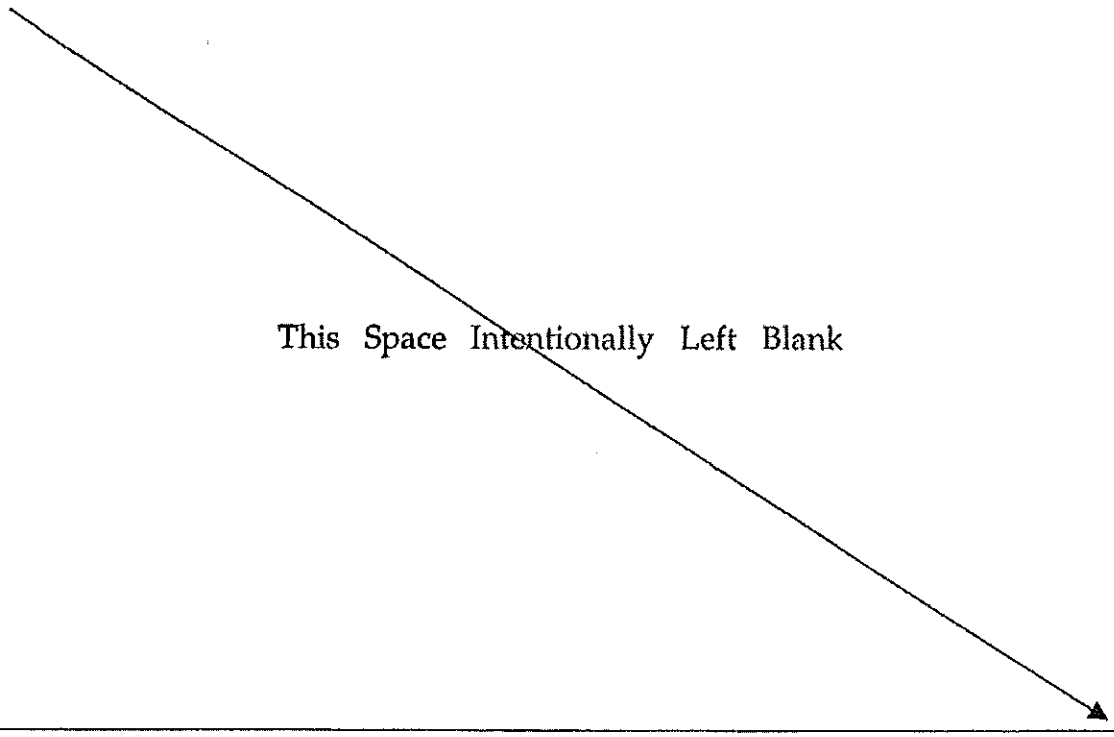
Noise level measurements were taken in accordance with NSF/ANSI Standard 40, 2000 and LSC, Chapter 13 Section A,6.4.2:(t). The measured level, including background noise, was within the limits of the NSF/ANSI Standard 40, 2000 and the LSC.

STRESS TESTING

Stress loading of the Hoot was conducted as shown by the shaded data in Appendix C and is designed to evaluate residential wastewater treatment system capabilities and performance under simulated use conditions of wash day loading, working mother loading, equipment or power failure, and return from nine days vacation with the typical attendant shock loading. As can be seen from the results depicted in Figure 1 for effluent five day Biochemical Oxygen Demand ($CBOD_5$) and Figure 2 for effluent Suspended Solids, the performance of Hoot was consistent with the effluent quality requirements of NSF/ANSI Standard 40, 2000 protocol contained in this document. During the seven day period immediately following each stress condition, the effluent values did remain within the limits of Class I effluent quality.

SUMMARY

Overall, the Hoot residential wastewater treatment system performed admirably during this extended test and under a wide variety of operating conditions. There were no repairs or maintenance work done on the residential wastewater treatment system during the test period. During the course of the test, the basic flow system and residential wastewater treatment system operations were stable and consistent.



APPENDIX A

STATISTICAL SUMMARIES

This Page Intentionally Left Blank

7 DAY AVERAGES

This Page Intentionally Left Blank

Hoot Aerobic Systems, Inc. - Hoot
7 Day Averages

	CBOD influent	CBOD inf avg	CBOD effluent	CBOD eff avg	TSS influent	TSS inf avg	TSS effluent	TSS eff avg
	258		15.60		68		15.0	
	89		3.84		50		4.3	
	293		2.74		56		1.7	
	110	179	2.39	4.37	70	151.14	1.0	3.76
	299	153	2.00	2.42	74	155.43	1.3	1.93
	118	150	2.00	2.16	608	154.57	1.3	1.56
	86	150	2.00	2.06	132	159.43	1.7	1.50
	78	200	2.00	2.00	98	209.43	2.2	1.39
	67	212	2.00	2.01	44	279.43	1.7	1.46
	291	201	2.00	2.01	90	213.14	1.3	1.36
	460	205	2.00	2.01	420	202.00	0.2	1.31
	386	226	2.04	2.25	564	201.71	1.8	1.31
	36	248	2.06	2.25	144	214.00	0.6	1.36
	120	221	2.00	2.25	54	224.57	1.4	1.74
	224	176	3.67	2.25	96	180.29	2.2	2.03
	220	145	2.00	2.25	130	124.00	2.0	1.97
	104	159	2.00	2.24	164	129.71	4.0	2.09
	139	162	2.00	2.26	110	136.00	2.2	2.03
	174	143	2.00	2.03	170	143.43	1.4	1.91
	134	120	2.00	2.29	184	132.86	1.4	1.89
	136	114	2.18	2.29	98	118.29	1.0	1.57
	92	111	2.00	2.29	148	110.14	1.4	1.31
	62	93	3.88	2.29	56	99.00	1.8	1.26
	63	96	2.00	2.29	62	79.00	1.8	1.37
	118	108	2.00	2.29	53	74.14	0.4	1.34
	45	102	2.00	2.29	92	64.43	1.0	2.03
	159	101	2.00	2.02	44	64.71	2.2	1.97
	216	101	2.15	2.02	64	65.29	0.8	1.89
	51	94	2.00	2.02	80	70.29	6.2	2.06
	58	95	2.00	2.02	58	70.57	1.4	2.23
	57	81	2.00	2.02	66	86.00	1.2	2.26
	73	59	2.00	2.00	88	85.43	1.6	2.57
	53	64	2.00	2.21	94	82.29	2.2	2.03
	58	72	2.00	2.39	152	84.57	2.4	2.14
	66	77	2.00	3.22	60	87.14	3.0	2.40
	83	74	3.48	3.22	58	91.71	2.4	2.34
	111	75	3.28	3.22	74	85.71	2.2	2.34
	92	104	7.80	3.22	84	72.00	3.0	2.20
	54	131	2.00	3.22	120	71.43	1.2	1.91
	64	136	2.00	3.01	52	84.86	2.2	1.71
	256	134	2.00	2.83	56	88.29	1.4	1.54
	258	172	2.00	2.00	56	85.57	1.0	1.20
	118	192	2.00	2.00	152	165.57	1.0	1.09
	94	223	2.00	2.00	98	221.00	1.0	0.91
	363	208	2.00	2.00	65	311.57	0.6	0.97

Hoot Aerobic Systems, Inc. - Hoot
7 Day Averages

	189	198	2.00	2.00	680	377.86	0.4	0.94
	286	203	2.00	2.00	440	413.86	1.0	1.00
	147	209	2.00	2.00	690	444.14	1.8	1.03
	192	218	2.00	2.00	520	476.57	0.8	1.06
	152	255	2.00	2.00	404	430.29	1.4	1.23
	133	230	2.00	2.00	310	413.14	1.2	1.20
	426	231	2.00	2.00	292	354.00	0.8	1.06
	446	214	2.00	2.00	356	317.71	1.6	1.11
	114	201	2.00	2.00	320	286.29	0.8	1.20
	157	211	2.00	2.00	276	265.71	0.8	1.07
	70	188	2.00	2.00	266	247.71	1.2	1.24
	64	145	2.00	2.00	184	226.57	2.0	1.19
	200	148	2.00	2.00	166	194.57	0.3	1.16
	266	151	2.00	2.00	166	172.86	2.0	1.07
	145	167	2.00	2.00	208	149.14	1.2	0.90
	134	176	2.00	2.00	96	138.86	0.6	0.76
	180	192	2.00	2.00	124	137.71	0.2	0.71
	177	186	2.00	2.00	100	130.57	0.0	0.51
	129	193	2.00	2.00	112	127.14	1.0	0.40
	310	270	2.00	2.00	158	128.86	0.0	0.61
	226	334	2.00	2.00	116	128.86	0.6	1.27
	197	339	2.00	2.00	184	159.57	0.4	1.37
	672	337	2.00	2.00	108	161.29	2.1	1.27
	627	308	2.00	2.00	124	161.86	4.8	1.34
	214	303	2.00	2.00	315	164.43	0.7	1.34
	110	300	2.00	2.00	124	157.57	0.3	1.31
	110	235	2.00	2.24	162	164.43	0.5	1.30
	192	175	2.00	2.24	134	166.71	0.6	0.70
	172	172	2.00	2.24	136	157.14	0.2	0.66
	218	180	3.69	2.24	156	169.71	2.0	0.68
	211	188	2.00	2.24	140	174.43	0.6	0.71
	190	185	2.00	2.25	248	178.71	0.4	0.70
	169	176	2.00	2.25	212	177.86	0.5	0.73
	167	164	2.00	2.01	195	173.86	0.7	0.52
	165	155	2.05	2.01	164	163.86	0.5	0.72
	112	149	2.00	2.01	130	149.86	0.5	0.69
	136	170	2.00	2.01	128	130.29	0.5	0.72
	146	184	2.00	2.01	70	122.29	2.0	0.68
	147	193	2.00	2.00	150	115.14	0.2	0.71
	314	191	2.00	2.00	75	116.57	0.7	0.81
	269	184	2.00	2.00	139	115.43	0.4	0.81
	225	179	2.00	2.00	114	119.71	0.8	0.60
	97	281	2.00	2.00	140	117.14	1.1	0.67
	90	257	2.00	2.00	120	123.29	0.5	0.64
	112	240	2.00	2.00	100	119.71	0.5	0.73
	861	226	2.00	2.00	132	110.57	0.7	0.75
	148	230	2.00	2.00	118	113.43	0.5	0.70

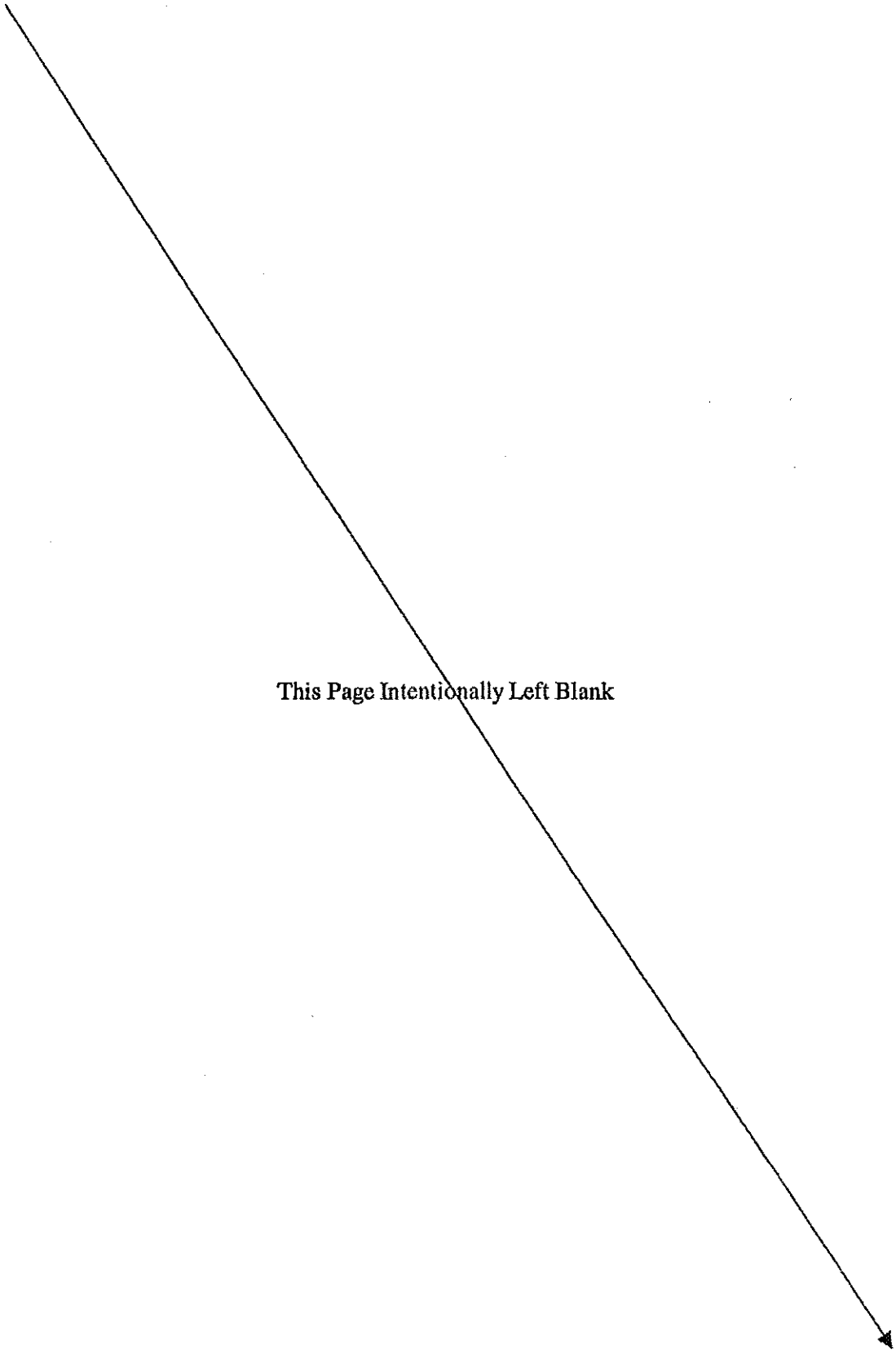
Hoot Aerobic Systems, Inc. - Hoot
7 Day Averages

	149	229	2.00	2.11	114	316.29	1.1	0.98
	127	221	2.00	2.11	50	324.57	0.9	1.06
	122	112	2.00	2.11	160	323.14	0.8	1.02
	82	103	2.74	2.11	1540	319.71	2.4	1.32
	61	95	2.00	2.11	158	322.29	1.1	1.28
	94	91	2.00	2.11	122	334.86	0.4	1.20
	85	86	2.00	2.11	94	322.57	2.6	1.16
	93	90	2.00	2.00	132	112.00	0.8	0.87
	101	96	2.00	2.00	138	99.86	0.3	0.76
	84	96	2.00	2.00	74	92.43	0.5	0.79
	110	101	2.00	2.00	66	87.29	0.4	0.66
	104	103	2.00	2.00	73	77.71	0.3	0.63
	68	103	2.00	2.00	70	73.14	0.6	0.91
	114	122	2.00	2.00	58	81.71	1.7	0.99
	102	118	2.00	2.00	65	84.33	0.6	1.05
	106	113	2.00	2.00	106	103.83	2.3	1.25
	194	105	2.00	2.00	134	117.50	1.0	1.36
	89	100	2.00	2.00	130	129.17	0.9	1.41
	70	87	2.00	2.00	190	185.67	1.7	1.46
	63	99	2.00	2.00	152	187.00	1.87	1.17
	77	102	2.00	2.00	128	177.67	2.0	1.21
	9	95	2.00	2.00	404	166.00	0.9	1.16
	188	98	2.00	2.00	114	149.43	0.6	0.98
	221	109	2.00	2.00	78	138.57	1.2	0.91
	40	129	2.00	2.00	96	132.29	0.6	0.68
	88	160	2.00	2.00	74	94.00	0.6	0.58
	141	225	2.00	2.00	76	87.14	0.5	0.56
	217	277	2.00	2.00	84	93.86	0.4	0.43
	224	312	2.00	2.00	136	105.14	0.2	0.40
	643	352	2.00	2.00	66	127.71	0.4	0.40
	583	369	2.00	2.00	125	156.29	0.3	0.43
	291	396	2.00	2.00	175	192.29	0.4	0.50
	365	398	2.00	2.00	232	222.00	0.6	0.53
	260	360	2.00	2.00	276	245.14	0.7	0.53
	406	308	2.00	2.68	336	304.43	0.9	0.56
	237	307	2.00	3.40	344	308.57	0.4	0.51
	380	306	2.00	3.81	228	310.86	0.4	0.52
	214	422	6.78	4.08	540	309.71	0.5	0.49
	288	416	7.02	4.08	204	300.57	0.0	0.48
	358	418	4.84	4.08	248	318.86	0.7	0.48
	1071	398	3.91	4.08	268	334.29	0.5	0.52
	364	435	2.00	4.38	272	289.71	0.8	0.51
	254	465	2.00	3.66	472	334.86	0.4	0.57
	236	491	2.00	3.26	336	381.14	0.7	0.54
	477	373	8.88	2.98	228	440.00	0.4	0.47
	496	375	2.00	2.98	520	463.29	0.5	8.79
	537	415	2.00	2.98	572	469.43	0.5	9.40

Hoot Aerobic Systems, Inc. - Hoot
7 Day Averages

	249	407	2.00	2.98	680	494.29	0.0	10.84
	375	357	2.00	2.00	435	548.86	59.0	12.19
	532	297	2.00		515	528.29	4.7	12.71
	184	233	2.00		510	483.00	10.8	12.97
	128	205	2.00		610	407.86	9.8	13.24
	75	160	2.00		376	364.86	4.2	5.00
	91	91	2.00		255	304.71	2.3	4.47
	52	52	2.00		154	241.57	1.9	3.07
	56	56	2.00		134	160.14	1.3	1.77
	49	49	2.00		94	133.86	1.0	1.28
		30	2.00		68	110.29	1.0	1.15
		69	2.59		40		0.7	1.03
		105	2.00		192		0.7	1.16
		193	2.00		90		1.4	1.22
		224	2.00				1.1	1.33
		226	2.00				2.2	1.49
		75	2.00				1.4	1.67
		194	2.00				1.8	1.74
		352	2.00				1.8	
		328	2.00				2.0	
							1.9	
							2.5	
AVERAGE	196.66	194.71	2.34	2.29	193.68	197.30	1.78	1.69
MEDIAN	146.50	179.71	2.00	2.00	132.00	159.43	1.00	1.17
MINIMUM	9.00	30.00	2.00	2.00	40.00	64.43	0.00	0.40
MAXIMUM	1071.00	490.71	15.60	4.38	1540.00	548.86	59.00	13.24
QUARTILE LC	91.60	105.32	2.00	2.00	84.00	114.29	0.50	0.71
QUARTILE HI	240.00	231.93	2.00	2.25	228.00	282.86	1.80	1.55
90% LOW	62.64	90.21	2.00	2.00	60.20	84.74	0.40	0.52
90% HIGH	381.80	354.64	2.43	3.22	433.50	370.06	2.40	2.25
NUMBER OF	148.00	156.00	159.00	138.00	152.00	147.00	160.00	154.00
7day average	CBOD influent	CBOD inf avg	CBOD effluent	CBOD eff avg	TSS influent	TSS inf avg	TSS effluent	TSS eff avg

30 DAY AVERAGES



This Page Intentionally Left Blank

Hoot Aerobic Systems, Inc. - Hoot
30 Day Averages

	BOD influent	BOD inf avg	CBOD effluent	BOD eff avg	TSS influent	TSS inf avg	TSS effluent	TSS eff avg
	258		15.60		68		15.0	
	89		3.84		50		4.3	
	293		2.74		56		1.7	
	110		2.39		70		1.0	
	299		2.00		74		1.3	
	118		2.00		608		1.3	
	86		2.00		132		1.7	
	78		2.00		98		2.2	
	67		2.00		44		1.7	
	291		2.00		90		1.3	
	460		2.00		420		0.2	
	386		2.00		564		1.8	
	36		2.06		144		0.6	
	120		2.00		54		1.4	
	224		3.67		96		2.2	
	220	156	2.00	2.68	130	136.03	2.0	2.22
	104	149	2.00	2.23	164	135.97	4.0	1.76
	139	149	2.00	2.17	110	137.23	2.2	1.67
	174	141	2.00	2.14	170	138.50	1.4	1.69
	134	139	2.00	2.13	184	141.23	1.4	1.74
	136	131	2.18	2.13	98	140.77	1.0	1.79
	92	130	2.00	2.18	148	122.43	1.4	1.83
	62	131	3.88	2.22	56	120.50	1.8	1.85
	63	132	2.00	2.42	62	120.03	1.8	1.87
	118	131	2.00	2.42	53	122.57	0.4	1.86
	45	124	2.00	2.42	92	121.30	1.0	1.89
	159	117	2.00	2.42	44	109.17	2.2	1.93
	216	113	2.15	2.42	64	92.23	0.8	1.90
	51	115	2.00	2.41	80	92.50	6.2	1.91
	58	114	2.00	2.41	58	93.97	1.4	1.90
	57	119	2.00	2.36	66	92.93	1.2	1.85
	73	118	2.00	2.36	88	111.27	1.6	1.79
	53	124	2.00	2.36	94	120.47	2.2	1.69
	58	124	2.00	2.36	152	139.80	2.4	1.68
	66	125	2.00	2.36	60	151.47	3.0	1.66
	83	126	3.48	2.36	58	158.80	2.4	1.66
	111	125	3.28	2.35	74	165.87	2.2	1.67
	92	137	7.80	2.35	84	170.67	3.0	1.65
	54	149	2.00	2.29	120	180.67	1.2	1.64
	64	151	2.00	2.29	52	189.27	2.2	1.61
	256	152	2.00	2.29	56	196.70	1.4	1.62
	258	153	2.00	2.29	56	202.50	1.0	1.63
	118	150	2.00	2.29	152	207.17	1.0	1.62
	94	150	2.00	2.29	98	210.57	1.0	1.60
	363	157	2.00	2.29	65	213.43	0.6	1.46

Hoot Aerobic Systems, Inc. - Hoot
30 Day Averages

	BOD influent	BOD inf avg	CBOD effluent	BOD eff avg	TSS influent	TSS inf avg	TSS effluent	TSS eff avg
	189	160	2.00	2.29	680	218.43	0.4	1.46
	286	162	2.00	2.29	440	219.43	1.0	1.44
	147	166	2.00	2.29	690	220.63	1.8	1.39
	192	170	2.00	2.29	520	220.83	0.8	1.32
	152	172	2.00	2.29	404	219.50	1.4	1.27
	133	180	2.00	2.29	310	222.77	1.2	1.17
	426	185	2.00	2.24	292	224.70	0.8	1.11
	446	188	2.00	2.19	356	228.37	1.6	1.05
	114	207	2.00	2.00	320	229.17	0.8	1.02
	157	226	2.00	2.00	276	229.30	0.8	1.14
	70	231	2.00	2.00	266	238.07	1.2	1.09
	64	227	2.00	2.00	184	240.33	2.0	1.05
	200	222	2.00	2.00	166	243.87	0.3	1.04
	266	224	2.00	2.00	166	243.27	2.0	1.02
	145	227	2.00	2.00	208	244.53	1.2	1.00
	134	222	2.00	2.00	96	247.57	0.6	1.04
	180	223	2.00	2.00	124	229.57	0.2	1.05
	177	219	2.00	2.00	100	223.17	0.0	1.03
	129	220	2.00	2.00	112	207.23	1.0	0.99
	310	219	2.00	2.00	158	196.40	0.0	0.98
	226	220	2.00	2.00	116	188.40	0.6	0.95
	197	219	2.00	2.00	184	182.40	0.4	0.93
	672	209	2.00	2.00	108	176.93	2.1	0.92
	627	199	2.00	2.00	124	167.40	4.8	0.93
	214	200	2.00	2.00	315	161.73	0.7	0.91
	110	206	2.00	2.00	124	155.03	0.3	0.91
	110	212	2.00	2.00	162	150.80	0.5	0.88
	192	218	2.00	2.00	134	148.47	0.6	0.84
	172	214	2.00	2.00	136	147.60	0.2	0.87
	218	208	2.00	2.00	156	146.07	2.0	0.82
	211	207	2.00	2.00	140	142.47	0.6	0.79
	190	232	2.00	2.00	248	143.67	0.4	0.80
	169	230	2.00	2.00	212	143.47	0.5	0.81
	167	230	2.00	2.00	195	143.93	0.7	0.84
	165	229	2.05	2.00	164	141.87	0.5	0.84
	112	223	2.00	2.00	130	141.93	0.5	0.86
	136	218	2.00	2.00	128	189.40	0.5	0.92
	146	214	2.00	2.00	70	188.53	2.0	0.95
	147	195	2.00	2.00	150	189.00	0.2	0.89
	314	177	2.00	2.00	75	188.00	0.7	0.82
	269	172	2.00	2.00	139	181.90	0.4	0.82
	225	172	2.00	2.00	114	182.37	0.8	0.82
	97	171	2.00	2.00	140	179.43	1.1	0.82
	90	169	2.00	2.00	120	177.17	0.5	0.81
	112	166	2.00	2.00	100	175.07	0.5	0.82

Hoot Aerobic Systems, Inc. - Hoot
30 Day Averages

	BOD influent	BOD inf avg	CBOD effluent	BOD eff avg	TSS influent	TSS inf avg	TSS effluent	TSS eff avg
	861	165	2.00	2.00	132	172.20	0.7	0.77
	148	161	2.00	2.00	118	169.47	0.5	0.81
	149	158	2.00	2.00	114	163.37	1.1	0.81
	127	156	2.00	2.00	50	159.83	0.9	0.88
	122	157	2.00	2.00	160	157.80	0.8	0.89
	82	154	2.00	2.00	1540	157.59	2.4	0.90
	61	153	2.00	2.00	158	159.66	1.1	0.94
	94	150	2.00	2.00	122	160.48	0.4	0.95
	85	148	2.00	2.00	94	162.48	2.6	0.95
	93	143	2.00	2.00	132	171.24	0.8	0.98
	101	139	2.00	2.00	138	172.59	0.3	0.97
	84	137	2.00	2.00	74	170.48	0.5	1.00
	110	131	2.00	2.00	66	169.86	0.4	1.00
	104	130	2.00	2.00	73	167.59	0.3	0.98
	68	132	2.00	2.00	70	166.07	0.6	0.98
	114	136	2.00	2.00	58	165.52	1.7	0.97
	102	114	2.00	2.00	65	165.66	0.6	0.96
	106	131	2.00	2.00	106	163.86	2.3	0.95
	194	146	2.00	2.00	134	164.24	1.0	0.93
	89	152	2.00	2.00	130	168.55	0.9	0.91
	70	160	2.00	2.00	190	171.03	1.7	0.91
	63	166	2.00	2.00	152	127.45	1.87	0.85
	77	178	2.00	2.00	128	133.59	2.0	0.84
	9	183	2.00	2.00	404	141.24	0.9	0.84
	188	193	2.00	2.00	114	145.86	0.6	0.76
	221	197	2.00	2.16	78	159.93	1.2	0.75
	40	204	2.00	2.33	96	162.21	0.6	0.74
	88	213	2.00	2.42	74	168.21	0.6	0.75
	141	246	2.00	2.49	76	175.17	0.5	0.75
	217	255	2.00	2.49	84	182.03	0.4	0.77
	224	255	2.00	2.49	136	195.90	0.2	0.76
	643	259	2.00	2.49	66	205.48	0.4	0.73
	583	272	2.00	2.49	125	211.10	0.3	0.72
	291	285	2.00	2.49	175	225.38	0.4	0.66
	365	296	2.00	2.49	232	240.48	0.6	0.64
	260	302	2.00	2.49	276	255.13	0.7	0.61
	406	312	2.00	2.49	336	263.30	0.9	2.59
	237	327	2.00	2.49	344	275.40	0.4	2.66
	380	331	2.00	2.49	228	288.13	0.4	2.95
	214	335	6.78		540	295.00	0.5	3.25
	288	331	7.02		204	303.73	0.0	3.37
	358	327	4.84		248	309.63	0.7	3.41
	1071	327	3.91		268	311.57	0.5	3.45
	364	326	2.00		272	313.57	0.8	3.47
	254		2.00		472	314.17	0.4	3.49

Hoot Aerobic Systems, Inc. - Hoot
30 Day Averages

	BOD influent	BOD inf avg	CBOD effluent	BOD eff avg	TSS influent	TSS inf avg	TSS effluent	TSS eff avg
	236		2.00		336	313.63	0.7	3.51
	477		2.00		228	310.43	0.4	3.53
	496		2.00		520	314.63	0.5	3.54
	537		2.00		572		0.5	3.58
	249		2.00		680		0.0	3.60
	375		2.00		435		59.0	3.65
	532		2.00		515		4.7	3.68
	184		2.00		510		10.8	3.71
	128		2.00		610		9.8	3.75
	75				376		4.2	3.81
	91				255		2.3	3.85
	52				154		1.9	
	56				134		1.3	
	49				94		1.0	
	30				68		1.0	
	69				40		0.7	
	105				192		0.7	
	193				90		1.4	
	224						1.1	
	226						2.2	
	75						1.4	
	194						1.8	
	352						1.8	
	328						2.0	
							1.9	
							2.5	
AVERAGE	195.58	187.97	2.30	2.16	193.68	185.68	1.78	1.50
MEDIAN	147.00	172.17	2.00	2.00	132.00	171.24	1.00	1.02
MINIMUM	9.00	112.52	2.00	2.00	40.00	92.23	0.00	0.61
MAXIMUM	1071.00	334.89	15.60	2.68	1540.00	314.63	59.00	3.85
QUARTILE LOW	91.20	146.93	2.00	2.00	84.00	148.03	0.50	0.87
QUARTILE HIGH	236.75	219.90	2.00	2.32	228.00	219.47	1.80	1.78
90% LOW	62.64	125.50	2.00	2.00	60.20	128.68	0.40	0.79
90% HIGH	376.50	261.79	2.12	2.47	433.50	253.62	2.40	3.45
NUMBER OF OBS	158.00	119.00	144.00	114.00	152.00	123.00	160.00	131.00
30 day avg	BOD influent	BOD inf avg	CBOD effluent	BOD eff avg	TSS influent	TSS inf avg	TSS effluent	TSS eff avg

STATISTICAL DATA BASE

This Page Intentionally Left Blank

Hoot Aerobic Systems, Inc. - Hoot
Statistical Data Base

	DO effluent	DO aeration	Temp influent	Temp aeration	Temp effluent	pH influent	pH aeration	pH effluent	CBOD influent	CBOD effluent	TSS influent	TSS aeration	TSS effluent	VSS Inf (%)	VSS aeration	VSS effluent	SS 45 m.
		5.77	20.49	22.85		6.59	7.86		258	15.60	68	1045	15.0	80	535	13.0	25
	3.35	3.30	23.59	22.90	21.79	7.31	7.63	7.86	89	2.00	50	920	4.3	72	680	4.0	18
	4.76	2.64	23.99	23.20	22.28	7.25	7.59	7.89	293	2.00	56	930	1.7	89	700	4.0	17
	5.18	2.25	24.31	23.42	22.08	7.18	7.57	7.91	110	2.39	70	815	1.0	69	590	1.7	15
	6.14	5.31	24.04	23.70	22.60	7.39	7.65	7.82			74	745	1.3	68	550	1.3	14
	5.81	6.00	23.33	22.75	22.10	7.38	7.74	7.86				740	1.3		565	1.3	14
	4.49	7.58	22.45	23.46	20.73	7.11	7.91	7.66	299	2.00	608	545	1.7	64	385	1.0	10
	5.10	7.95	22.07	23.17	20.60	7.29	8.06	7.71	118	2.00	132	555	2.2	68	395	1.0	9
	6.62	1.44	22.97	23.53	22.45	7.49	7.52	7.91	86	2.00	98	510	1.7	59	350	1.3	8
	6.64	5.42	23.36	23.44	22.53	7.56	7.71	7.90	78	2.00	44	430	1.3	91	325	1.3	6
	6.58	7.79	23.24	23.57	22.41	7.50	7.96	8.00	67	2.00	90	380	0.2	84	310	0.2	5
	6.73	4.74	24.06	23.79	22.90	7.64	7.69	8.06	291	2.00	420	416	1.8	83	320	1.6	9
	6.37	4.10	25.03	24.22	23.54	7.27	7.62	7.85	460		564	424		79	312		6
	6.69	2.82	25.18	24.48	24.06	7.31	7.60	7.88	386		144	370		79	320		5
	6.37	3.01	24.73	24.63	23.30	7.58	7.60	7.80	36		54	355		67	260		3
	5.78	3.91	24.83	24.69	24.15	7.56	7.71	7.86		2.00		370	0.6	85	290	0.6	4
	5.22	3.87	24.53	24.79	24.35	7.32	7.74	7.89		2.04		460	1.4	7	355	1.4	3
	5.22	1.06	24.82	25.04	24.72	7.38	7.59	7.86	120	2.06	96	455	2.2	83	345	2.2	3
	3.35	6.83	25.32	25.15	22.68	7.21	7.87	7.77	224	2.00	130	530	2.0	75	385	1.4	3
	5.04	2.28	25.39	25.28	24.88	7.39	7.58	7.85	220	3.67	164	590	4.0	71	430	2.8	3
	5.27	1.29	25.53	25.54	25.24	7.21	7.57	7.85	104	2.00	110	616	2.2	74	452	1.6	3
	3.74	0.82	25.27	25.64	24.90	7.46	7.51	7.65	139	2.00	170	640	1.4	74	476	1.4	6
	5.11	0.86	24.74	25.47	24.72	7.57	7.49	7.70	174	2.00	184	615	1.4	78	455	1.2	8
	5.39	0.87	24.98	25.41	24.93	7.57	7.55	7.73	134	2.00	98	730	1.0	71	540	1.0	9
	5.82	0.65	25.29	25.61	25.56	7.55	7.53	7.67	136	2.00	148	750	1.4	70	555	1.4	6
	4.35	0.54	25.34	25.86	24.91	7.51	7.55	7.63	92	2.18	56	988	1.8	82	736	1.4	11
	4.78	0.51	25.22	25.99	25.79	7.61	7.56	7.62	62	2.00	62	916	1.8	82	696	1.8	16
	5.52	0.84	25.40	25.84	25.86	7.60	7.59	7.70	63	3.88	53	780	0.4	75	575	0.4	17
	6.64	6.71	24.88	25.67	23.00	7.27	7.87	7.72	118	2.00	92	690	1.0	70	515	1.0	11
	5.47	5.55	25.58	25.58	24.97	7.22	7.63	7.88	45	2.00	44	650	2.2	54	480	1.8	10
	5.31	3.39	25.91	25.66	25.15	7.21	7.46	7.72	159	2.00	64	645	0.8	56	485	0.8	8
	6.20	3.56	26.18	25.83	25.49	7.25	7.45	7.73	216	2.00	80	605	6.2	50	440	1.0	7
	6.16	4.40	26.45	26.06	25.25	7.38	7.59	7.83	51	2.00	58	650	1.4	72	490	1.2	5
	6.45	6.32	27.25	26.32	25.59	7.40	7.70	7.81	58	2.00	66	650	1.2	71	455	1.6	5
	6.08	5.49	27.37	26.63	26.20	7.44	7.70	7.86	57	2.00	88	465	1.6	73	310	2.2	3
	6.18	4.88	27.09	26.82	26.37	7.36	7.68	7.86	73	2.00	94	206	2.2	74	140	2.0	2
	6.01	6.02	27.63	26.91	26.36	7.32	7.79	7.93	53	2.00	152	380	2.4	70	255	2.2	2
	7.16	4.43	27.73	27.03	26.61	7.36	7.71	7.84	58	2.00	60	285	3.0	67	140	2.2	2
	5.58	5.21	27.50	27.14	25.92	7.30	7.84	7.96	66	2.00	58	745	2.4	55	465	1.2	2
	5.96	5.31	27.31	27.12	26.99	7.32	7.83	7.89	83	2.00	74	424	2.2		268	1.6	2
	5.31	4.38	27.24	26.98	26.44	7.31	7.75	7.93	111	3.48	84	488	3.0	76	304	1.0	2
	6.43	4.36	27.21	26.92	26.60	7.34	7.73	7.99	92	3.28	120	460	1.2	77	295	2.0	2

Hoot Aerobic Systems, Inc. - Hoot
Statistical Data Base

	DO effluent	DO aeration	Temp influent	Temp aeration	Temp effluent	pH influent	pH aeration	pH effluent	CBOD influent	CBOD effluent	TSS influent	TSS aeration	TSS effluent	VSS inf (%)	VSS aeration	VSS effluent	SS 45 m.
	6.27	4.68	27.49	26.98	26.54	7.38	7.74	7.88	54	7.80	52	535	2.2	81	355	1.4	4
	6.36	5.49	27.99	27.10	25.60	7.37	7.94	8.18	64	2.00	56	550	1.4	89	340	1.0	2
	6.53	4.80	28.22	27.34	27.06	7.40	7.76	8.00	256	2.00	56	485	1.0	86	305	1.0	2
	5.95	5.15	27.71	27.56	26.98	7.21	7.87	8.07	258	2.00	152	510	1.0	74	315	1.0	2
	5.95	5.07	27.32	27.67	27.11	7.00	7.89	8.06	118	2.00	98	520	1.0	76	320	0.6	2
	6.52	4.64	27.20	27.47	26.04	7.03	7.80	8.00	94	2.00	65	665	0.6	74	425	2.2	3
	6.32	6.96	27.17	27.43	26.08	7.07	7.92	7.90	363	2.00	680	740	0.4		460	0.8	6
	6.19	6.75	27.33	27.35	25.56	7.11	7.90	7.86	189	2.00	440	850	1.0	65	520	0.8	7
	5.87	2.68	27.81	27.21	25.62	7.12	7.67	8.04	286	2.00	690	885	1.8	64	555	0.8	6
	5.72	3.72	28.08	27.26	26.87	7.14	7.69	7.83	147	2.00	520	940	0.8	65	575	1.2	6
	6.08	3.66	28.23	27.43	26.11	7.14	7.73	7.88	192	2.00	404	960	1.4	64	540	0.8	4
	5.46	3.22	28.29	27.62	26.82	7.18	7.73	7.86	152	2.00	310	884	1.2	65	592	1.4	6
	5.84	2.73	28.00	27.64	26.63	7.29	7.65	7.89	133	2.00	292	992	0.8	67	620	0.8	5
	6.12	2.87	27.71	27.54	26.42	7.29	7.66	7.83	426	2.00	356	1025	1.6	65	560	0.8	4
	6.23	4.46	27.94	27.45	26.67	7.23	7.78	7.87	446	2.00	320	925	0.8	70	705	0.8	8
	6.91	5.32	28.42	27.44	25.70	7.21	7.83	7.94	114	2.00	276	1180	0.8	77	690	2.0	8
	7.03	4.42	28.57	27.58	25.81	7.28	7.78	8.03	157	2.00	266	1220	1.2	70	715	0.8	6
	6.36	4.46	28.65	27.79	26.25	7.40	7.75	7.97	70	2.00	184	1165	2.0	64	785	0.8	7
	6.62	4.04	28.72	27.95	26.44	7.11	7.77	7.97	64	2.00	166	1265	0.3	73	895	0.4	5
	6.02	3.11		28.13	27.55		7.70	7.89	200	2.00	166	1430	2.0	65	835	0.2	7
			28.36			7.07		7.94	266	2.00	208	1650	1.2	92	780	0.0	12
	5.98	3.83	28.18	28.15	27.32	7.55	7.80	7.95	145	2.00	96	1395	0.6	74	768	0.6	9
	6.10	5.72	28.59	27.98	27.41	7.29	7.94	7.97	134	2.00	124	1325	0.2	78	668	0.0	9
	6.20	3.27	28.92	27.93	27.17	7.32	7.78	7.95	180	2.00	100	1264	0.0	78	604	0.4	8
	6.32	2.94	29.04	28.07	27.43	7.43	7.72	7.96	177	2.00	112	1144	1.0	77	932	0.4	7
	6.19	3.83	29.32	28.24	27.42	7.30	7.81	7.98	129	2.00	158	1004	0.0	74	895	0.6	7
	6.29	4.05	29.25	28.62	238.44	7.18	7.80	8.01	310	2.00	116	1604	0.6	77	825	3.7	8
	5.63	5.08	29.55	28.57	27.80	7.33	7.90	7.92	226	2.00	184	1525	0.4		905		9
	6.03	1.84	29.46	28.75	27.97	7.42	7.65	7.97	197	2.00	108	1435	2.1	51		0.3	6
	5.31	4.30	29.36	28.89	28.06	7.26	7.80	7.93	672	2.00	124	1560	4.8	31	880	1120.0	9
	5.88	3.25	29.61	29.01	28.39	7.29	7.67	7.93	627	2.00	315	1670	0.7	77	870	0.6	8
	5.97	1.39	30.00	29.14	28.13	7.30	7.60	8.08	214	2.00	124	1500	0.3	75	880	0.2	8
	6.66	2.96	30.05	29.29	27.64	7.39	7.72	7.86	110	2.00	162	1485	0.5	76	830	1.3	8
	7.67	2.60	30.29	29.40	28.52	7.37	7.68	7.85	110	2.00	134	1500	0.6	75	920	1.7	10
	5.78	3.03	29.97	29.53	29.02	7.38	7.68	7.67	192	2.00	136	1425	0.2	76	975	0.4	9
	5.54	2.35	29.98	29.67	28.77	7.44	7.60	7.77	172	2.00	156	1610	2.0	74	660	0.3	10
	6.08	4.03	30.22	29.73	28.21	7.43	7.70	7.79	218	2.00	140	1670	0.6	74	740	0.5	10
	5.08	2.67	30.49	29.81	28.98	7.38	7.68	7.67	211	3.69	248	1165	0.4	81	944	0.5	8
	5.92	2.03	30.50	29.99	29.15	7.37	7.56	7.75	190	2.00	212	1305	0.5		780		9
	5.91	2.89	30.58	29.96	29.53	7.33	7.64	7.67	169	2.00		1644	0.7	80		0.4	9
	5.60	1.47	30.39	30.17	29.19	7.30	7.55	7.76	167	2.00	195	1368	0.5	80	785	0.3	7
	5.86	7.92	30.09	30.30	29.29	7.36	7.58	7.86	165	2.00	164	1380		75	750	2.0	8

Hoot Aerobic Systems, Inc. - Hoot
Statistical Data Base

	DO effluent	DO aeration	Temp influent	Temp aeration	Temp effluent	pH influent	pH aeration	pH effluent	CBOD influent	CBOD effluent	TSS influent	TSS aeration	TSS effluent	VSS inf (%)	VSS aeration	VSS effluent	SS 45 m.
	6.20	2.90	30.08	30.31	29.27	7.43	7.64	7.76	112	2.05	130	1310	0.5	80	850	0.2	7
	6.38	4.11	30.49	30.29	28.98	7.39	7.71	7.86	136	2.00	128	1560	0.5	49	1005	0.5	7
	6.75	4.38	30.79	30.34	28.48	7.37	7.75	7.78	146	2.00	70	1800	2.0	72	750	0.1	6
	6.11	4.30	31.09	30.48	29.69	7.39	7.75	7.80	147	2.00	150	1330	0.2		605	0.6	8
	6.12	3.02	30.96	30.60	29.53	7.46	7.69	7.82	314	2.00	75	1090	0.7	75		0.8	8
	6.32	2.84	30.42	30.70	30.33	7.38	7.67	8.12	269	2.00	139	1390	0.4	77	790	0.8	6
	6.41	2.80	30.68	30.71	29.61	7.41	7.78	8.16	225	2.00	114	1325	0.8	77	750	0.4	8
	6.69	4.11	31.22	30.86	29.76	7.23	7.89	8.29	97	2.00	140	1525	1.1	74	875	0.4	7
	6.65	3.19	31.06	30.48	29.20	7.45	7.91	8.33	90	2.00	120	1755	0.5	82	970	0.7	8
	7.09	3.21	31.01	30.58	30.09	7.18	7.93	8.56	112	2.00	100	1955	0.5	82	1110	0.5	8
	6.02	1.66	31.09	30.78	29.99	7.47	7.81	8.37	861	2.00	132	1625	0.7	77	910	0.8	9
	6.50	2.84	30.79	30.82	30.63	7.48	7.92	8.26	148	2.00	118	1410	0.5	78	805	0.4	9
	6.71	1.21	30.55	30.88	30.28	7.22	7.85	7.85	149	2.00	114	1525	1.1	79	860	0.7	7
	5.97	2.44	31.20	30.86	30.16	7.48	7.67	7.87	127	2.00	50	1375	0.9	88	775	1.5	7
	6.48	3.34	31.06	30.78	30.06	7.59	7.76	8.12	122	2.00	160	1415	0.8	78	800	0.8	7
	6.86	2.16	31.36	30.76	30.44	7.54	7.74	8.15	82	2.00	1540	1756	2.4	78	988	0.8	7
	6.80	2.63	31.40	30.87	30.20	7.52	7.74	8.09	61	2.74	158	1235	1.1	75	7.5	0.3	7
	6.48	2.61	31.00	30.92	30.06	7.50	7.82	8.19	94	2.00	122	1325	0.4	76	785	0.3	6
	6.29	4.97	31.35	30.91	30.10	7.74	8.00	8.21	85	2.00	94	1120	2.6	85	630	1.7	6
	6.31	4.95	31.25	30.85	30.99	7.12	7.75	8.17	93	2.00	132	1340	0.8	74	760	0.5	5
	6.80	3.29	31.22	31.04	29.22	7.23	7.71	8.28	101	2.00	138	1105	0.3	81	645	0.3	6
	6.17	7.15	31.41	30.87	30.09	7.57	8.15	7.97	84	2.00	74	1005	0.5	76	580	0.4	5
	6.33	2.79	31.46	30.84	30.22	7.31	7.80	8.06	110	2.00	66	1075	0.4	84	625	0.3	5
	6.46	3.44	31.64	30.91	30.68	7.67	7.87	8.06	104	2.00	73	1335	0.3	79	760	0.3	6
	6.40	2.91	31.64	31.06	30.28	7.67	7.87	8.30	68	2.00	70	1295	0.6	78	750	0.5	6
	5.46	3.80	31.28	30.94	30.20	7.66	7.99	7.77	114	2.00	58	1390	1.7	75	815	1.7	5
	7.05	6.41	31.25	30.99	30.78	7.63	7.80	7.60	102	2.00	65	1270	0.6	69	720	0.6	4
	6.52	2.51	31.39	30.98	29.20	7.59	7.69	8.04	106	2.00	106	1130	2.3	71	640	1.4	6
	6.94	4.60	31.55	30.86	30.21	7.60	7.97	7.85	194	2.00	134	635	1.0	67	440	0.7	5
	6.62	4.04	31.57	30.86	29.26	7.66	7.87	8.43	89	2.00	130	790	0.9	72	440	0.6	3
	6.86	5.13	31.64	30.90	30.24	7.63	8.16	8.40	70	2.00	190	560	1.7	75	320	0.8	2
	6.84	4.13	31.58	31.04	30.15	7.66	8.01	8.33	63	2.00	152	612	1.87	13	336	.93	2
	6.33	2.78	31.65	31.08	30.36	7.75	8.02	8.49	77	2.00	128	700	2.0	74	412	1.7	2
	6.68	2.65	31.41	31.11	30.29	7.72	8.05	8.27	9	2.00	404	550	0.9	79	315	0.8	2
	6.34	2.24	30.73	31.17	29.76	7.60	7.90	8.41	188	2.00	114	625	0.6	78	370	0.5	4
	6.10	4.31	30.02	31.14	28.61	7.33	8.12	8.54	221	2.00	78	805	1.2	76	480	0.5	3
	6.29	7.02	30	30.85	28.08	7.55	8.40	8.53	40	2.00	96	1055	0.6	74	895	0.5	1
	6.84	7.41	29.44	30.36	29.53	8.01	8.47	8.57	88	2.00	74	1655	0.6	79	940	0.4	6
	6.92	5.63		29.87	28.94		8.26	8.25	141	2.00	76	1205	0.5	82	690	0.5	4
	5.29	5.54		29.44			8.15		217	2.00	84	1605	0.4	82	895	0.4	5
					28.54			8.26	224	2.00	136	1145	0.2	74	665	0.2	2
	5.96	4.05	29.58	29.14	29.10	8.00	7.97	8.34	643	2.00	66	2330	0.4	74	660	0.3	4

Hoot Aerobic Systems, Inc. - Hoot
Statistical Data Base

	DO effluent	DO aeration	Temp influent	Temp aeration	Temp effluent	pH influent	pH aeration	pH effluent	CBOD influent	CBOD effluent	TSS influent	TSS aeration	TSS effluent	VSS inf (%)	VSS aeration	VSS effluent	SS 45 m.
	6.64	3.79	29.92	29.11	29.00	7.71	7.95	8.17	583	2.00	125	1000	0.3	80	565	0.3	4
	6.55	8.07	29.75	29.18	28.82	7.47	5.07	8.28	291	2.00	175	975	0.4	78	550	0.4	4
	6.25	4.68	29.17	29.33	29.71	7.18	8.06	8.45	365	2.00	232	915	0.6	77	520	0.5	6
	6.13	4.55	29.58	29.34	27.53	7.32	8.02	8.44	260	2.00	276	1435	0.7	75	805	0.4	5
	6.47	3.91		29.18	28.52		7.96	8.55	406	2.00	336	1295	0.9	75	725	0.3	
	5.67	4.14		29.16	28.46		8.04	8.51	237	2.00	344	1475	0.4	82	830	0.3	
	6.30	3.81		29.24	28.51		7.91	8.50	380	2.00	228		0.4	76		0.3	
	6.01		29.28	27.10		7.66	7.27		214			1440	0.5	78	825	0.3	7
			29.45		27.76	7.62		8.71	288		540		0.0			0.0	12
	6.21	4.37	29.48	29.01	27.99	7.61	8.11	8.18	358		204						10
	6.53	4.84	29.56	28.72	27.05	7.61	8.10	8.41	1071		248	1495			850		12
	6.54	3.02	29.22	28.72	27.88	7.55	7.90	7.33			268	1865	0.7		1740	0.7	13
	5.90	3.81		28.80	28.77		7.95	8.19				2090	0.5		1205	0.5	13
	6.48	7.15		28.61	27.92		8.21	8.17	364		272	2045	0.8	78	1195	0.5	
	5.93	4.11		28.96	27.92		7.97	8.48	254			2450	0.4	78	1440	0.2	10
	5.73	5.06		28.89			7.96		236	2.00		2130	0.7	77	1230	0.5	7
								7.58	477	6.78		1965	0.4		1170	0.3	
	6.08	4.03					7.39		496	7.02		1590	0.5	78	950	0.4	6
									537	4.84		1225	0.5	77	710	0.5	
					28.30			8.11	249	3.91	472		0.0	74			
	7.09	2.70		24.30	26.10		7.49	8.23	375	2.00	336	1035	59.0	76	580	33.0	
	4.21	1.24		28.70	9.70		7.45	8.37	532	2.00	228			77			
	6.20	1.58		26.60	8.40		7.52	8.85	184	2.00	520						
	6.51	1.73		27.00	7.80		7.76	8.85	128	8.88	572			70			
	6.52	1.58		25.40	6.00		7.63	8.91		2.00	580						5
	6.88	1.56		26.30	6.10		8.45	9.10		2.00	435						2
	6.96	3.25		25.80	9.70		8.73	9.23			515						6
	6.81	4.79		25.70	24.80		8.23	9.27	75	2.00	510	288		74	160		8
	4.93	6.56		27.20			8.20		91	2.00	610	510	4.7	71	325	2.8	12
					24.40			8.77	52	2.00	376	1110	10.8	74	680	8.2	15
	4.48	8.23		23.60			8.92		56	2.00		1890	9.8		1155	7.4	14
									49	2.00		2300	4.2	70	1415	3.4	14
									30	2.00		2550	2.3		1555	1.8	15
									69	2.59	255	1600	1.9	90	950	1.8	15
									105	2.00	154	2605	1.3	77	1590	0.9	15
			26.01		23.20	6.43		7.38	193	2.00	134	2710	1.0	75	1640	1.0	15
	6.28	8.95	27.46	25.23	23.03	6.96	8.27	7.80	224	2.00	94	2365	1.0		1420	0.6	18
	7.55	8.33	27.77	25.13	25.01	6.44	8.09	7.40	226	2.00	68	2000	0.7		1240	0.5	
	3.34	4.76	27.77	26.17	24.03	6.84	7.68	7.37	75	2.00			0.7			0.5	15
	2.24	3.09	27.71	26.34	25.30	6.85	7.47	7.41	194	2.00	40	1315			760		17
	3.55	1.21	26.40	26.62	24.60	6.85	7.32	7.35	352	2.00	192	2740	1.4		1620	1.0	14
	6.51	0.68	25.81	26.65	25.99	7.46	7.37	7.38	328	2.00	90	2745	1.1		1645	1.0	13

Hoot Aerobic Systems, Inc. - Hoot
Statistical Data Base

	DO effluent	DO aeration	Temp influent	Temp aeration	Temp effluent	pH influent	pH aeration	pH effluent	CBOD influent	CBOD effluent	TSS influent	TSS aeration	TSS effluent	VSS inf (%)	VSS aeration	VSS effluent	SS 45 m.
	4.03	1.22	25.86	26.63	24.93	6.87	7.34	7.01				3165	2.2		1880	1.6	13
	4.46	1.63	25.84	26.59	22.94	7.06	7.83	7.46				2370	1.4		1430	1.0	
	4.67	1.86	25.89	26.27	24.05	6.89	7.39	7.46				2365	1.8		1415	1.0	11
	3.17	0.63	25.81	25.47	21.24	6.78	7.37	7.62				2220	1.8		1310	1.0	11
	3.76	2.44	25.94	25.17	23.30	7.01	7.46	7.59					2.0			1.4	14
	3.28	2.35	26.41	24.88	23.06	7.21	7.45	7.56				2800			1610		14
	3.09	1.65	25.50	24.84	23.26	7.41	7.48	7.61				2135			1260		
	3.55	0.50	26.44	24.95	23.79	7.25	7.48	7.60				2225	1.9		1295	1.3	
	3.50	1.05	26.00	25.20	24.17	7.41	7.60	7.57					2.5			1.1	
	3.26	0.37	25.23	25.12	22.99	7.68	7.51	7.65									
	3.59	4.23	25.98	25.50	23.25	7.55	7.56	7.64									
	3.22	4.40	26.21	25.70	22.36	7.43	7.84	7.80									
	4.05	5.59		25.50	23.72		7.69	7.71									
	4.91	4.58	25.69	25.70		7.48	7.63										
			25.79		23.18	7.26		7.84									
	3.68	3.44	25.56	24.80	22.52	6.98	7.57	7.66									
	3.39	3.17	25.52	24.49	22.37	7.11	7.71	7.70									
	3.32	1.04		24.35	22.59		7.47	7.62									
	2.34	0.89		24.24			7.45										
AVERAGE	5.77	3.75	28.01	27.62	27.25	7.35	7.76	7.98	196	2.33	194	1209	1.8	73.4615	722.941	8.4	7.64375
MEDIAN	6.12	3.80	28.08	27.46	26.62	7.37	7.74	7.89	147	2.00	132	1165	1.0	75	690	0.8	7
MINIMUM	2.24	0.37	20.49	22.75	6.00	6.43	5.07	7.01	9	2.00	40	206	0.0	7	7.5	0.0	1
MAXIMUM	7.67	8.95	31.65	31.17	238.44	8.01	8.92	9.27	1071	15.60	1540	3165	59.0	92	1880	1120.0	25
QUARTILE LOW	5.37	2.62	25.84	25.63	24.36	7.23	7.60	7.77	91	2.00	84	658	0.5	71	458.75	0.5	5
QUARTILE HIGH	6.49	4.79	30.29	29.75	28.98	7.50	7.90	8.17	237	2.00	228	1525	1.8	78	880	1.4	9.25
90% LOW	3.74	1.22	24.82	24.48	22.51	7.07	7.48	7.62	63	2.00	60	486	0.4	65	319.5	0.3	2
90% HIGH	6.80	6.40	31.25	30.86	30.15	7.63	8.06	8.44	377	2.14	434	2122	2.4	82	1242	2.1	14
NUMBER OF OBS	172.00	172.00	153.00	172.00	170.00	153.00	173.00	172.00	158	154.00	152	163	160.0	143	160	158.0	160
summary	DO effluent	DO aeration	Temp influent	Temp aeration	Temp effluent	pH influent	pH aeration	pH effluent	CBOD influent	CBOD effluent	TSS influent	TSS aeration	TSS effluent	VSS inf (%)	VSS aeration	VSS effluent	SS 45 m.

This Page Intentionally Left Blank

APPENDIX B

BAYLOR WORKSHEETS

This Page Intentionally Left Blank

BAYLOR UNIVERSITY

Wastewater Treatment System Evaluation
Brazos River Authority (WMARSS) Data Sheet

SAMPLES	SS ml/l (45 min.)	Temp °C	pH	D.O. mg/l	Color (D,M,L)
RAW					
PRETREAT					
Unit 1 Red					
Unit 2 Yellow					
Unit 3 Dr. Blue					
Unit 4 Gray					
Unit 5 Green					
AERATION #1					
Unit 1 Red					
Unit 2 Yellow					
Unit 3 Dr. Blue					
Unit 4 Gray					
Unit 5 Green					
EFFLUENT #2					
Unit 1 Red					
Unit 2 Yellow					
Unit 3 Dr. Blue					
Unit 4 Gray					
Unit 5 Green					
COMP. (ref.)		of Refrigerat			
Unit 1 Red					
Unit 2 Yellow					
Unit 3 Dr. Blue					
Unit 4 Gray					
Unit 5 Green					

Date Sample Secured_____

Time Sample Secured_____

Name(s) of Sampler(s):

_____

_____

Outside Temperature °F_____

_____

Comments:

If anything is written in this box you must inform David Jumper at 710-3405 or 710-6556, leave message.

Page 2 of Data Sheet Collection Sheet

Full Name of:

Person Recording Data: _____

Person obtaining samples: _____

Below, Initial **EVERY** Blank

T -Cross Cleaned

	Cleaned by	Checked by
Unit 1	_____	_____
Unit 2	_____	_____
Unit 3	_____	_____
Unit 4	_____	_____
Unit 5	_____	_____

All Caps, Bottles and graduated cylinders present: _____ _____

YSI 610-DM Meter present and working:

Probe put in Water _____ _____

Phone call made to 710-3405 _____ _____

I have obtained the samples and conducted testing to Standard Methods, 18th Edition procedures and have, to the best of my ability, insured safe and accurate recording of said results.

_____ _____

I, as a representative of the Brazos River Authority, state that I have received the samples in good condition and take responsibility for them from Baylor University.

_____ _____

Signature of Baylor University Representative Signature of B.R.A. WMARSS Representative

BU/WWT/BW/601
Rev. 08/03/2002

Baylor Wastewater Treatment Program

Stress Sequence Evaluation

Stress A-1

Wash Day:

Added three times in one five day week.

_____DAY 1 - 8:30 am - 11:30 am 3 wash loads = 105 gallons (3 wash and 6 rinse cycles)
_____DAY 2 - Collect extra grab sample
_____DAY 3 - 8:30 am - 11:30 am 3 wash loads = 105 gallons (3 wash and 6 rinse cycles)
_____DAY 4 - Collect extra grab sample
_____DAY 5 - 8:30 am - 11:30 am 3 wash loads = 105 gallons (3 wash and 6 rinse cycles)

* This Stressing is followed by a SEVEN day rest period of Normal Loading

Stress A-2

Working Parents:

No Loading 9:00 am to 5:00 pm for 5 consecutive days.

_____DAY 1 - Load 6-9:00 am 40% flow. Load 5-8:00 pm 60% flow including 1 wash load.
_____DAY 2 - Load 6-9:00 am 40% flow. Load 5-8:00 pm 60% flow including 1 wash load.
_____DAY 3 - Load 6-9:00 am 40% flow. Load 5-8:00 pm 60% flow including 1 wash load.
_____DAY 4 - Load 6-9:00 am 40% flow. Load 5-8:00 pm 60% flow including 1 wash load.
_____DAY 5 - Load 6-9:00 am 40% flow. Load 5-8:00 pm 60% flow including 1 wash load.

* This Stressing is followed by a SEVEN day rest period of Normal Loading

Stress A-3

Equipment Power Failure:

All power to residential wastewater treatment system off for 48 hours, one time only.
Feed off 8:00 pm on stress rest day seven.

_____DAY 1 - No Loading
_____DAY 2 - No Loading until 9:00 pm. 9-12(midnight) 60% flow inc. 1 wash load.

* This stressing is followed by a SEVEN day rest period of Normal Loading.

Stress A-4

One Week Vacation:

No loading over 9-day period but all power on and sudden shock when family returns home.
Normal Loading 6-9:00 am, 11-2:00 pm. Then feed off at 5:00 pm. on rest day seven.

_____DAY 1 - Feed Off
_____DAY 2 - Feed Off
_____DAY 3 - Feed Off
_____DAY 4 - Feed Off
_____DAY 5 - Feed Off
_____DAY 6 - Feed Off
_____DAY 7 - Feed Off
_____DAY 8 - Feed Off
_____DAY 9 - 5-8:00 pm 60% flow including 3 wash loads.

* This stressing is followed by a three week period of Normal Loading.

This Page Intentionally Left Blank

APPENDIX C

OFFICIAL DATA REPORT

This Page Intentionally Left Blank

This Page Intentionally Left Blank

Hoot Aerobic Systems, Inc. - Hoot
Official Unit Data Report

Date	DO effluent	DO aeration	DO pretreat	Temp influent	Temp aeration	Temp pretreat	Temp effluent	pH influent	pH aeration	pH pretreat	pH effluent	CBOD influent	CBOD effluent	TSS influent	TSS aeration	TSS effluent	VSS inf (%)	VSS aeration	VSS effluent	SS 45 m.	Dosing GPD	
5/3/2001	5.18	2.25		24.31	23.42		22.08	7.18	7.57		7.91	110	2.39	70	815	1	69	590	1.7	15	500	
5/4/2001	6.14	5.31		24.04	23.7		22.6	7.39	7.65		7.82	ns	ne/bt	74	745	1.3	68	550	1.3	14	500	
5/5/2001	5.81	6		23.33	22.75		22.1	7.38	7.74		7.86	ns	ne/bt	pf	740	1.3	ns	565	1.3	14	500	
5/6/2001	4.49	7.58		22.45	23.46		20.73	7.11	7.91		7.66	299	1.36	608	545	1.7	64	385	1	10	500	
5/7/2001	5.1	7.95		22.07	23.17		20.5	7.29	8.06		7.71	118	1.8	132	555	2.2	68	395	1	9	500	
5/8/2001	6.62	1.44		22.97	23.53		22.45	7.49	7.52		7.91	86	1.28	98	510	1.7	59	350	1.3	8	500	
5/9/2001	6.64	5.42		23.36	23.44		22.53	7.56	7.71		7.9	78	1	44	430	1.3	91	325	1.3	8	500	
5/10/2001	6.58	7.79		23.24	23.57		22.41	7.5	7.96		8	66.8	1.19	90	380	0.2	84	310	0.2	5	500	
5/11/2001	6.73	4.74		24.06	23.79		22.9	7.64	7.69		8.06	291	1.67	420	416	1.8	83	320	1.6	9	500	
5/12/2001	6.37	4.1		25.03	24.22		23.54	7.27	7.62		7.85	460	ns	564	424	ns	79	312	ns	6	500	
5/13/2001	6.69	2.82		25.18	24.48		24.06	7.31	7.6		7.88	386	ns	144	370	ns	79	320	ns	5	500	
5/14/2001	6.37	3.01		24.73	24.63		23.3	7.56	7.6		7.8	36	ns	54	355	ns	67	260	ns	3	500	
5/15/2001	5.78	3.91		24.83	24.69		24.15	7.56	7.71		7.86	ns	1.22	ns	370	0.6	85	290	0.6	4	500	
5/16/2001	5.22	3.87		24.53	24.79		24.35	7.32	7.74		7.89	ns	2.04	ns	460	1.4	7	355	1.4	3	500	
5/17/2001	5.22	1.06		24.82	25.04		24.72	7.38	7.59		7.86	120	2.06	96	455	2.2	83	345	2.2	3	500	
5/18/2001	3.35	6.83		25.32	25.15		22.68	7.21	7.87		7.77	224	0.69	130	530	2	75	385	1.4	3	500	
5/19/2001	5.04	2.28		25.39	25.28		24.88	7.39	7.58		7.85	220	3.67	164	590	4	71	430	2.8	3	500	
5/20/2001	5.27	1.29		25.53	25.54		25.24	7.21	7.57		7.85	104	1.88	110	616	2.2	74	452	1.6	3	500	
5/21/2001	3.74	0.82		25.27	25.64		24.9	7.46	7.51		7.65	139	1.39	170	640	1.4	74	476	1.4	6	500	
5/22/2001	5.11	0.86		24.74	25.47		24.72	7.57	7.49		7.7	ns	ne/bt	ns	615	1.4	ns	455	1.2	8	500	
5/23/2001	5.39	0.87		24.98	25.41		24.93	7.57	7.55		7.73	174	1.62	184	730	1	78	540	1	9	500	
5/24/2001	5.82	0.65		25.29	25.61		25.56	7.55	7.53		7.67	134	1.73	98	750	1.4	71	555	1.4	6	500	
5/25/2001	4.35	0.54		25.34	25.86		24.91	7.51	7.55		7.63	136	1.91	148	988	1.8	70	736	1.4	11	500	
5/26/2001	4.78	0.51		25.22	25.99		25.79	7.61	7.56		7.62	91.8	2.18	56	916	1.3	82	696	1.8	16	500	
5/27/2001	5.52	0.84		25.4	25.84		25.86	7.6	7.59		7.7	ns	0.32		780	0.4		575	0.4	17	500	
5/28/2001	6.64	6.71		24.88	25.67		23	7.27	7.87		7.72	61.8	3.88	62	690	1	82	515	1	11	500	
5/29/2001	5.47	5.55		25.58	25.58		24.97	7.22	7.63		7.88	63	1.3	53	650	2.2	75	480	1.8	10	500	
5/30/2001	5.31	3.33		25.91	25.66		25.15	7.21	7.46		7.72	118	1.23	92	645	0.8	70	485	0.8	ne/bt	500	
5/31/2001	6.2	3.56		26.18	25.83		25.49	7.25	7.45		7.73	45	1.52	44	605	6.2	54	440		8	500	
6/1/2001	6.16	4.4		26.45	26.06		25.25	7.38	7.59		7.83	159	0.8	64	650	1.4	56	490	1	7	500	
6/2/2001	6.45	6.32		27.25	26.32		25.59	7.4	7.7		7.81	216	2.15	80	650	1.2	50	455	1.2	5	500	
6/3/2001	6.08	5.49		27.37	26.63		26.2	7.44	7.7		7.86	51	1.44	58	465	1.6	72	310	1.6	5	500	
6/4/2001	6.18	4.88		27.09	26.82		26.37	7.36	7.68		7.86	58	1.69	66	206	2.2	71	140	2.2	3	500	
6/5/2001	6.01	6.02		sf	26.91		26.36	sf	7.79		7.93	57.3	1.32	88	380	2.4	73	255	2	2	500	
6/6/2001	7.16	4.43		27.63	27.03		26.61	7.32	7.71		7.84	73	1.55	94	285	3	74	140	2.2	2	500	
6/7/2001	5.58	5.21		27.73	27.14		25.92	7.36	7.84		7.96	53	1.62	152	745	2.4	70	465	2.2	2	500	
6/8/2001	5.96	5.31		27.5	27.12		26.99	7.3	7.83		7.89	58	1.61	60	424	2.2	67	268	1.2	2	500	
6/9/2001	5.31	4.38		27.31	26.98		26.44	7.32	7.75		7.93	66	1.37	58	488	3	55	304	1.6	2	500	
6/10/2001	6.43	4.36		27.24	26.92		26.6	7.31	7.73		7.99	83.1	3.48	74	460	1.2	ne	295	1	2	500	
6/11/2001	6.27	4.68		27.21	26.98		26.54	7.34	7.74		7.88	111	3.28	84	535	2.2	76	355	2	2	500	
6/12/2001	6.36	5.49	0.33	27.49	27.1	27.19	25.6	7.38	7.94	7.33	8.18	92.1	7.8	120	550	1.4	77	340	1.4	4	500	
6/13/2001	6.53	4.8	0.24	27.99	27.34	27.57	27.06	7.37	7.76	7.33	8	54	1.28	52	485	1	81	305	1	2	500	
6/14/2001	5.95	5.15	0.41	28.22	27.56	27.82	26.98	7.4	7.87	7.35	8.07	63.6	1.21	56	510	1	89	315	1	2	500	
6/15/2001	5.95	5.07	0.56	27.71	27.67	27.51	27.11	7.21	7.89	7.5	8.06	256	1.02	56	520	1	86	320	1	2	500	
6/16/2001	6.52	4.64	0.42	27.32	27.47	27.3	26.04	7	7.8	7.24	8	258	ne	152	665	0.6	74	425	0.6	2	500	
6/17/2001	6.32	6.96	0.44	27.2	27.43	27.21	28.08	7.03	7.92	7.21	7.9	118	1.25	98	740	0.4	76	460	2.2	3	500	
6/18/2001	6.19	6.75	0.44	27.17	27.35	27.05	25.56	7.07	7.9	7.25	7.86	94	1.07	65	850	1	74	520	0.8	6	500	
6/19/2001	5.87	2.68	0.36	27.33	27.21	27.06	25.62	7.11	7.67	7.24	8.04	363	0.75	680	885	1.8	ne	ne	ne	7	500	
6/20/2001	5.72	3.72	0.61	27.81	27.26	27.28	26.87	7.12	7.69	7.32	7.83	189	0.64	440	940	0.8	65	555	0.8	6	500	
6/21/2001	6.08	3.66	0.18	28.08	27.43	27.42	26.11	7.14	7.73	7.27	7.88	288	1.09	690	960	1.4	64	575	0.8	8	500	
6/22/2001	5.46	3.22	0.41	28.23	27.62	27.52	26.82	7.14	7.73	7.11	7.86	147	0.37	520	884	1.2	65	540	1.2	4		
6/23/2001	5.84	2.73	0.3	28.29	27.64	27.62	26.63	7.18	7.65	7.11	7.89	192	1.73	404	992	0.8	64	592	0.8	6		

la = Lab Accident
pf = pump failure
sf = sonde failure
bt = bad test
mc = missed cutoff time
ne = no entry by lab
ns = no sample
unk = unknown

Hoot Aerobic Systems, Inc. - Hoot
Official Unit Data Report

Date	DO effluent	DO aeration	DO pretreat	Temp influent	Temp aeration	Temp pretreat	Temp effluent	pH influent	pH aeration	pH pretreat	pH effluent	CBOD influent	CBOD effluent	TSS influent	TSS aeration	TSS effluent	VSS inf (%)	VSS aeration	VSS effluent	SS 45 m.	Dosing GPD
6/24/2001	6.12	2.87	0.17	28	27.54	26.37	26.42	7.29	7.66	7.07	7.83	152	1.2	310	1025	1.6	65	620	1.4	5	
6/25/2001	6.23	4.46	0.3	27.71	27.45	27.35	26.67	7.29	7.78	7.28	7.87	133	1.03	292	925	0.8	67	560	0.8	4	
6/26/2001	6.91	5.32	0.7	27.94	27.44	27.4	25.7	7.23	7.83	7.28	7.94	426	0.85	356	1180	0.8	65	705	0.8	8	
6/27/2001	7.03	4.42	0.33	28.42	27.58	27.6	25.81	7.21	7.78	7.3	8.03	446	0.72	320	1220	1.2	70	690	0.8	8	
6/28/2001	6.36	4.46	0.15	28.57	27.79	27.84	26.25	7.28	7.75	7.29	7.97	114	1.61	276	1165	2	77	715	2	6	
6/29/2001	6.62	4.04	0.11	28.65	27.95	28.09	26.44	7.4	7.77	7.35	7.97	157	1.1	266	1265	0.3	ne	ne	ne	7	
6/30/2001	6.02	3.11	0.14	28.72	28.13	28.27	27.55	7.11	7.7	7.34	7.89	ne	ne	184	1430	2	70	785	0.8	5	
7/1/2001	5.98	3.53	0.32	28.36	28.15	28.17	27.32	7.07	7.8	7.42	7.94	70	0.8	166	1650	1.2	64	895	0.8	7	500
7/2/2001	6.1	5.72	0.24	28.18	27.98	27.92	27.41	7.55	7.94	7.54	7.95	64	0.54	166	1395	0.6	73	835	0.4	12	500
7/3/2001	6.2	3.27	0.36	28.59	27.93	27.95	27.17	7.29	7.78	7.44	7.97	200	1.85	208	1325	0.2	65	780	0.2	9	500
7/4/2001	6.32	2.94	0.13	28.92	28.07	28.27	27.43	7.32	7.72	7.46	7.95	266	0.03	96	1264	0	92	768	0	9	500
7/5/2001	6.19	3.83	0.23	29.04	28.24	28.45	27.42	7.43	7.81	7.51	7.96	145	0.08	124	1144	1	74	668	0.6	8	500
7/6/2001	6.29	4.05	0.31	29.32	28.62	28.67	238.44	7.3	7.8	7.51	7.98	134	0.41	100	1004	0	76	604	0	7	500
7/7/2001	5.63	5.08	0.19	29.25	28.57	28.72	27.8	7.18	7.9	7.44	8.01	180	<2.0	112	1604	0.6	78	932	0.4	7	500
7/8/2001	6.03	1.84	0.4	29.55	28.75	28.93	27.97	7.33	7.65	7.4	7.92	177	0.52	158	1525	0.4	77	895	0.4	8	500
7/9/2001	5.31	4.3	0.21	29.46	28.89	29	28.06	7.42	7.8	7.61	7.97	129	1.48	116	1435	2.1	74	825	0.6	9	500
7/10/2001	5.88	3.25	0.2	29.36	29.01	29.1	28.39	7.26	7.67	7.47	7.93	310	1.09	184	1560	4.8	77	905	3.7	6	500
7/11/2001	5.97	1.39	0.45	29.61	29.14	29.18	28.13	7.29	7.6	7.39	7.93	226	1.55	108	1670	0.7	la	la	la	9	500
7/12/2001	6.66	2.96	0.21	30	29.29	29.38	27.64	7.3	7.72	7.4	8.08	197	1.56	124	1500	0.3	77	880	0.3	8	500
7/13/2001	7.67	2.6	0.29	30.05	29.4	29.46	28.52	7.39	7.68	7.41	7.86	672	1.34	315	1485	0.5	31	870	1120	8	500
7/14/2001	5.78	3.03	0.18	30.29	29.53	29.69	29.02	7.37	7.68	7.51	7.85	627	1.29	124	1500	0.6	77	880	0.6	8	500
7/15/2001	5.54	2.35	0.27	29.97	29.67	29.82	28.77	7.38	7.6	7.48	7.67	214	0.48	162	1425	0.2	75	830	0.2	10	500
7/16/2001	6.08	4.03	0.21	29.98	29.73	29.8	28.21	7.44	7.7	7.51	7.77	110	0.47	134	1610	2	76	920	1.3	9	500
7/17/2001	5.08	2.67	0.28	30.22	29.81	29.89	28.98	7.43	7.68	7.46	7.79	110	0.46	136	1670	0.6	75	975	1.71	10	500
7/18/2001	5.92	2.03	0.16	30.49	29.99	30.11	29.15	7.38	7.56	7.42	7.67	192	0.76	156	1165	0.4	76	660	0.4	10	500
7/19/2001	5.91	2.89	0.27	30.5	29.96	30.09	29.53	7.37	7.64	7.52	7.75	172	0.41	140	1305	0.47	74	740	0.27	8	500
7/20/2001	5.6	1.47	0.12	30.58	30.17	30.36	29.19	7.23	7.55	7.45	7.67	218	0.6	248	1644	0.7	74	944	0.5	9	500
7/21/2001	5.86	7.92	0.27	30.39	30.3	30.34	29.29	7.3	7.58	7.47	7.76	211	3.69	212	1368	0.5	81	780	0.5	9	500
7/22/2001	6.2	2.9	0.15	30.09	30.31	30.27	29.27	7.36	7.64	7.35	7.88	190	0.77	la	la	la	la	la	la	7	500
7/23/2001	6.38	4.11	0.18	30.08	30.29	30.26	28.98	7.43	7.71	7.52	7.76	169	0.64	195	1380	0.47	80	785	0.4	8	500
7/24/2001	6.75	4.38	0.15	30.49	30.34	30.35	28.48	7.39	7.75	7.51	7.86	167	0.63	164	1310	0.47	80	750	0.33	7	500
7/25/2001	5.11	4.3	0.12	30.79	30.48	30.53	29.69	7.37	7.75	7.56	7.78	bt	bt	130	1560	2	75	850	2	7	500
7/26/2001	6.12	3.02	0.13	sf	30.6	30.68	29.53	sf	7.69	7.39	7.8	bt	bt	128	1800	0.2	80	1005	0.2	6	500
7/27/2001	6.32	2.84	0.14	31.09	30.7	30.78	30.33	7.39	7.67	7.41	7.82	bt	bt	70	1330	0.7	49	750	0.5	8	500
7/28/2001	6.41	2.8	0.18	30.96	30.71	30.69	29.61	7.48	7.78	7.51	8.12	165	1.16	150	1090	0.4	72	605	0.13	8	500
7/29/2001	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
7/30/2001	6.69	4.11	0.1	30.42	30.86	30.69	30.81	7.38	7.89	7.5	8.16	112	2.05	75	1390	0.75	75	790	0.56	6	500
7/31/2001	6.65	3.19	0.36	30.68	30.48	30.54	29.76	7.41	7.91	7.66	8.29	136	0.75	139	1325	1.13	77	750	0.8	8	500
8/1/2001	7.09	3.21	0.16	31.22	30.58	30.72	29.2	7.23	7.93	7.39	8.33	146	0.37	114	1525	0.5	77	875	0.4	7	500
8/2/2001	6.02	1.66	0.37	31.06	30.78	30.95	30.09	7.45	7.87	7.46	8.56	147	1.08	140	1755	0.5	74	970	0.4	8	500
8/3/2001	6.5	2.84	0.31	31.01	30.82	30.87	29.99	7.18	7.92	7.56	8.37	314	1.12	120	1955	0.7	82	1110	0.7	8	500
8/4/2001	6.71	1.21	0.31	31.09	30.88	30.96	30.63	7.47	7.85	7.55	8.26	269	0.56	100	1625	0.5	82	910	0.5	9	500
8/5/2001	5.97	2.44	0.31	30.79	30.858	30.79	30.28	7.48	7.67	7.6	7.85	225	1.26	132	1410	1.06	77	805	0.75	9	500
8/6/2001	6.48	3.34	0.41	30.55	30.78	30.8	30.16	7.22	7.76	7.68	7.87	la	1.19	118	1525	0.88	78	860	0.44	7	500
8/7/2001	6.86	2.16	0.31	31.2	30.76	30.84	30.06	7.48	7.74	7.63	8.12	97	0.24	114	1375	0.75	79	775	0.69	7	500
8/8/2001	6.8	2.63	0.22	31.06	30.87	31.03	30.44	7.59	7.74	7.63	8.15	90	0.83	50	1415	2.44	88	800	1.5	7	500
8/9/2001	6.48	2.81	0.15	31.36	30.92	31.03	30.2	7.54	7.82	7.55	8.09	112	0.56	160	1756	1.1	78	988	0.8	7	500
8/10/2001	6.29	4.97	0.16	31.4	30.91	31.03	30.06	7.52	8	7.61	8.19									7	500
8/11/2001	6.31	4.95	0.18	31	30.85	31.1	30.1	7.5	7.75	7.57	8.21										500
8/12/2001	6.8	3.29	0.57	31.35	31.04	31.26	30.99	7.74	7.71	7.69	8.17	861	0.59	1540	1235	0.4	ne	7.5	0.3		500
8/13/2001	6.17	7.15	0.41	31.25	30.87	31.07	29.22	7.12	8.15	7.76	8.28	148	0.91	158	1325	2.6	78	785	1.7	6	500
8/14/2001	6.33	2.79	0.35	31.22	30.84	30.99	30.09	7.23	7.8	7.65	7.97	149	0.6	122	1120	0.8	75	630	0.5	6	500

la = Lab Accident
pf = pump failure
sf = sonde failure
bt = bad test
mc = missed cutoff time
ne = no entry by lab
ns = no sample
unk = unknown

Hoot Aerobic Systems, Inc. - Hoot
Official Unit Data Report

Date	DO effluent	DO aeration	DO pretreat	Temp influent	Temp aeration	Temp pretreat	Temp effluent	pH influent	pH aeration	pH pretreat	pH effluent	CBOD influent	CBOD effluent	TSS influent	TSS aeration	TSS effluent	VSS inf (%)	VSS aeration	VSS effluent	SS 45 m.	Dosing GPD	
8/15/2001	6.46	3.44	0.16	31.41	30.91	31.09	30.22	7.57	7.87	7.65	8.06	127	0.74	94	1340	0.3	76	760	0.3	5	500	
8/16/2001	6.4	2.91	0.23	31.46	31.06	31.35	30.68	7.31	7.87	7.71	8.06	122	0.78	132	1105	0.5	85	645	0.4	6	500	
8/17/2001	5.46	3.8	0.36	31.64	30.94	31.1	30.28	7.57	7.99	7.78	8.3									5	500	
8/18/2001	7.05	6.41	0.27	31.64	30.99	31.16	30.2	7.67	7.8	7.53	7.77										500	
8/19/2001	6.52	2.51	0.31	31.28	30.98	31.06	30.78	7.66	7.69	7.67	7.6	82	2.74	138		0.4	74		0.3		500	realigning the san
8/20/2001	6.94	4.6	0.47	31.25	30.85	31	29.2	7.53	7.97	7.79	8.04	61	1.1	74	1005	0.3	81	580	0.3	5	500	on effluent and ac
8/21/2001	6.82	4.04	0.36	31.39	30.86	31.06	30.21	7.59	7.87	7.74	7.85	94	0.89	68	1075	0.6	76	625	0.5	6	500	TSS/VSS Data
8/22/2001	6.86	5.13	0.2	31.55	30.9	31.04	29.26	7.6	8.16	7.68	8.43	85	0.81	73	1335	1.7	ne	760	1.7	6	500	
8/23/2001	6.84	4.13	0.36	31.57	31.04	31.17	30.24	7.66	8.01	7.69	8.4	93	0.98	70	1295	0.8	84	750	0.6	5	500	
8/24/2001	6.33	2.78	0.13	31.64	31.08	31.2	30.15	7.63	8.02	7.66	8.33	101	1.35		1390			815		4	500	
8/25/2001	6.68	2.65	0.44	31.58	31.11	31.3	30.36	7.66	8.05	7.79	8.49	84	0.6								500	
8/26/2001	6.34	2.24	0.29	31.65	31.17	31.3	30.29	7.75	7.9	7.69	8.27	110	0.83	58		2.3	79		1.4		500	
9/1/2001	5.98	4.05	0.35		29.14	28.99	28.54		7.97	7.68	8.26	ns	0.69	ns	612	0.9	ns	336	0.8		500	
9/2/2001	6.64	3.79	0.42		29.11	29.13	29.1		7.95	7.7	8.34	114	1.17	190	700	0.56	67	412	0.5		500	
9/3/2001	6.55	8.07	0.53	29.58	29.18	29.33	29	8	5.07	7.76	8.17	102	1.36	152	550	1.2	72	315	0.5	2	500	
9/4/2001	6.25	4.68	0.1	29.92	29.33	29.51	28.82	7.71	8.06	7.82	8.28	106	0.67	128	625	0.6	75	370	0.5	2	500	
9/5/2001	6.13	4.55	0.19	29.75	29.34	29.4	29.71	7.47	8.02	7.7	8.45	194	0.47	404	805	0.6	13	480	0.4	4	500	
9/6/2001	6.47	3.91	0.24	29.17	29.18	29.14	27.53	7.18	7.96	7.64	8.44	89	0.93	114	1055	0.5	no	895	0.5	3	500	
9/7/2001	5.67	4.14	0.24	29.58	29.16	28.09	28.52	7.32	8.04	7.76	8.55			ns	1655	0.4	ns	940	0.4	1	500	
9/13/2001	6.54	3.02	0.25	29.48	28.72	28.99	27.05	7.61	7.9	7.7	8.41	188	1.27	84	975	0.7	74	550	0.4	4	500	
9/14/2001	5.9	3.81	0.17	29.56	28.8	28.97	27.86	7.61	7.95	7.63	7.33	ns	0.19	ns	915	0.9	ns	520	0.3	4	500	
9/15/2001	6.48	7.15	0.06	29.22	28.61	29.11	28.77	7.55	8.21	7.67	8.19	221	0.9	136	1435	0.4	79	805	0.3		500	
9/16/2001	5.93	4.11	0.24	ns	28.96	29.02	27.92	ns	7.97	7.77	8.17	40	0.84	66	1295	0.4	82	725	0.3		500	
9/17/2001	5.73	5.06	0.06	ns	28.89	28.84	27.92	ns	7.96	7.76	8.48	87.8	1.61	125	1475	0.5	82	830	0.3	6	500	
9/18/2001	sfs	sf	no	readings	taken							141	0.49	175		0.04	74		0.04	5	500	
9/19/2001	6.08	4.03	sf	sf	sf	sf	sf	sf	7.39	sf	7.58	217	ne	232	1440	ne	74	825	ne		500	
9/22/2001	7.09	2.7	sf	sf	24.3	sf	28.3	sf	7.49	sf	8.11	583	<2.0	336	1495	0.5	ne	850	0.5	7	500	
9/23/2001	4.21	1.24	sf	sf	28.7	sf	26.1	sf	7.45	sf	8.23	291	0.62	ne	1865	0.8	ne	1740	0.5	12	500	
9/24/2001	6.2	1.58	sf	sf	26.6	sf	9.7	sf	7.52	sf	8.37	365	1.6	344	2090	0.4	78	1205	0.2	10	500	
9/25/2001	6.51	1.73	sf	sf	27	sf	8.4	sf	7.76	sf	8.85	260	0.56	228	2045	0.7	77	1195	0.5	12	500	
9/26/2001	6.52	1.58	sf	sf	25.4	sf	7.8	sf	7.63	sf	8.85	ns	0.78	ns	2450	0.4	ns	1440	0.3	13	500	suspect abnormally high ph's due to a drift in the SHA ph meter to the upper end of the ph
9/27/2001	6.88	1.56	sf	sf	26.3	sf	6	sf	8.45	sf	8.91	406	0.46	540	2130	0.5	75	1230	0.4	13	500	
9/28/2001	6.96	3.25	sf	sf	25.8	sf	6.1	sf	8.73	sf	9.1			204	1965	0.5	75	1170	0.5		300	

la = Lab Accident
pf = pump failure
sf = sonde failure
bl = bad leaf
mc = missed cutoff time
ne = no entry by lab
ns = no sample
unk = unknown

Hoot Aerobic Systems, Inc. - Hoot
Official Unit Data Report

Date	DO effluent	DO aeration	DO pretreat	Temp influent	Temp aeration	Temp pretreat	Temp effluent	pH influent	pH aeration	pH pretreat	pH effluent	CBOD influent	CBOD effluent	TSS influent	TSS aeration	TSS effluent	VSS inf (%)	VSS aeration	VSS effluent	SS 45 m.	Dosing GPD
10/8/2001	7.55	8.33	0.26	26.01	25.13	25.56	23.03	6.43	8.09	7.14	7.8	254	6.78	336	288	10.8	78	160	8.2	5	500
10/9/2001	3.34	4.76	0.12	27.46	26.17	26.15	25.01	6.96	7.68	6.98	7.4	236	7.02	228	510	9.8	77	325	7.4	2	500
10/10/2001	2.24	3.09	0.51	27.77	26.34	26.48	24.03	6.44	7.47	7.01	7.37	477	4.84	520	1110	4.2	ne	680	3.4	6	500
10/11/2001	3.55	1.21	0.86	27.77	26.62	26.88	25.3	6.84	7.32	7.02	7.41	496	3.91	572	1890	2.3	78	1155	1.8	8	500
10/12/2001	6.51	0.68	0.43	27.71	26.65	26.74	24.6	6.85	7.37	7	7.35	537	2	680	2300	1.9	77	1415	1.8	12	500
10/13/2001	4.03	1.22	0.33	26.4	26.63	26.42	25.99	6.85	7.34	7.04	7.38	249	1.51	435	2550	1.3	74	1555	0.9	15	500
10/14/2001	4.46	1.63	0.24	25.81	26.59	25.64	24.93	7.46	7.83	7.55	7.01	375	0.88	515	1600	1	76	950	1	14	500
10/15/2001	4.67	1.86	0.21	25.86	26.27	25.61	22.94	6.87	7.39	6.87	7.46	532	8.88	510	2605	1	77	1590	0.6	14	500
10/16/2001	3.17	0.63	0.15	25.84	25.47	25.46	24.05	7.06	7.37	6.99	7.46	184	1.05	610	2710	0.7	ne	1640	0.5	15	500
10/17/2001	3.76	2.44	0	25.89	25.17	25.19	21.24	6.89	7.46	6.99	7.62	128	0.82	376	2365	0.73	70	1420	0.5	15	500
10/18/2001	3.28	2.35	0.19	25.81	24.88	25.01	23.3	6.78	7.45	6.96	7.59	ns	ns		2000			1240		15	500
10/19/2001	3.09	1.65	0.16	25.94	24.84	24.98	23.06	7.01	7.48	6.99	7.56	ns	ns			1.4			1	15	500
10/20/2001	3.55	0.5	0.09	26.41	24.95	25.08	23.26	7.21	7.48	7.1	7.61				1315	1.1		780	1	18	500
10/21/2001	3.5	1.05	0.33	25.5	25.2	25.4	23.79	7.41	7.6	7.2	7.6	75	0.82	255	2740	2.2	74	1620	1.6		500
10/22/2001	3.26	0.37	0.08	26.44	25.12	25.24	24.17	7.25	7.51	7.24	7.57	91	0.88	154	2745	1.4	71	1645	1	15	500
10/23/2001	3.59	4.23	0.99	26	25.5	25.1	22.99	7.41	7.56	7.15	7.65	52	0.5	134	3165	1.8	74	1880	1	17	500
10/24/2001	3.22	4.4	0.58	25.23	25.7	25.8	23.25	7.68	7.84	7.27	7.64	56	0.82	94	2370	1.8		1430	1	14	500
10/25/2001	4.05	5.59	0.54	25.98	25.5	25.4	22.36	7.55	7.69	7.21	7.8	49	0.34	68	2365	2	70	1415	1.4	13	500
10/26/2001	4.91	4.58	0.23	26.21	25.7	25.5	23.72	7.43	7.63	7.28	7.71				2220			1310		13	500
10/27/2001												30	1.13	40			90				500
10/28/2001	3.68	3.44	0.26	25.69	24.8	24.6	23.18	7.48	7.57	7.17	7.84	69	2.59	192	2800	1.9	77	1610	1.3	11	500
10/29/2001	3.39	3.17	0.08	25.79	24.49	24.59	22.52	7.26	7.71	7.28	7.66	105	1.74	90	2135	2.5	75	1260	1.1	11	500
10/30/2001	3.32	1.04	0.03	25.56	24.35	24.64	22.37	6.98	7.47	7.17	7.7	193	1.1	114	2225	1.5	81	1295	1.1	14	500
10/31/2001	2.34	0.89	0.06	25.52	24.24	24.44	22.59	7.11	7.45	7.19	7.62	224	0.77	128	2460	1.5	78	1435	1.1	14	500
11/1/2001	2.8	0.21	0.05	25.46	24.34	24.48	22.97	6.93	7.26	7.13	7.59	226	1.33	128	2750	4.9	69	1610	1.1	17	500
11/2/2001	2.29	0.31	0.02	25.69	24.47	24.56	21.93	7	7.41	7.13	7.47				2980			1760		16	500
11/3/2001	2.33	2.26	0.02	25.54	24.62	24.73	23.03	7.02	7.48	7.13	7.57										500
11/4/2001	2.37	0.66	0.04	25.75	24.66	24.69	23.36	7.05	7.35	7.16	7.65	75	0.85	93		1.1	78		0.9		500
11/5/2001	2.09	1.58	0.15	25.43	24.63	24.74	21.93	7.48	7.61	7.34	7.65	194	ne	214	2065	11.7	77	1230	7.4	11	500
11/6/2001	2.54	1.67	0.19	22.1	24.58	24.67	21.61	7.48	7.58	7.29	7.67	352	0.9	288	2030	1.5	75	1210	1	12	500
11/7/2001	2.52	1.86	0.11	25.75	24.42	24.44	21.32	7.03	7.57	7.25	7.71	328	0.67	316	1905	1.2	76	1120	1	14	500
11/8/2001	2.57	1.94	0.12	25.45	24.24	24.25	21.68	6.9	7.6	7.24	7.7	343	0.98	274	1835	1.5	78	1085	1	12	500
11/9/2001	2.47	2.21	0.22	25.53	24.22	24.24	21.56	6.86	7.58	7.3	7.65	409	0.79		2265			1365		13	500
11/10/2001	2.16	1.33	0.31	25.29	23.96	23.89	22.24	7.08	7.52	7.28	7.63	250	0.95								500
11/11/2001	2.35	1.45	0.08	25.42	23.85	23.01	21.14	7.36	7.5	7.21	7.61	321	0.5	544		1.8	74		1.3		500
11/12/2001	2.44	4.8	0.3	24.36	24	24	21.47	7.55	7.5	7.26	7.6	442	0.76	244	2895	2.13	72	1735	1.33	14	500
11/13/2001	2.22	5.5	0.77	23.88	23.8	23.8	21.33	7.24	7.33	7.2	7.63			320	2545	4.6	78	1515	2.8	13	500
11/14/2001	2.03	0.23	0.29	23.64	23.8	23.8	20.87	7.43	7.63	7.41	7.65			480	2335	2.1	73	1415	1.3	13	500
11/15/2001	2.06	3.11	0.22	24.62	24.3	23.8	21.52	7.28	7.59	7.32	7.64			268	2450	0.47	74	1690	4.7	12	500
11/16/2001	1.89	3.7	0.7	23.32	23.7	23.8	22.82	7.65	7.64	7.23	7.61				1585			1265		10	500
11/17/2001	1.88	0.59	-0.14	23.89	23.43	23.35	22.32	7.48	7.5	7.23	7.67									12	500
11/18/2001	1.55	0.83	0.09	24.42	23.42	23.58	22.61	7.36	7.58	7.38	7.66			136		2	74		1		500
11/19/2001	3.05	0.18	0.06	24.37	23.48	23.53	23.01	7.31	7.6	7.26	7.72				2225			1345		11	500
11/20/2001	2.23	1.05	0.11	23.72	23.15	23.14	22.22	7.37	7.61	7.33	7.5									11	500
																					500

la = Lab Accident
pf = pump failure
sf = sonde failure
bt = bad test
mc = missed cutoff time
ne = no entry by lab
ns = no sample
unk = unknown

This Page Intentionally Left Blank

APPENDIX D

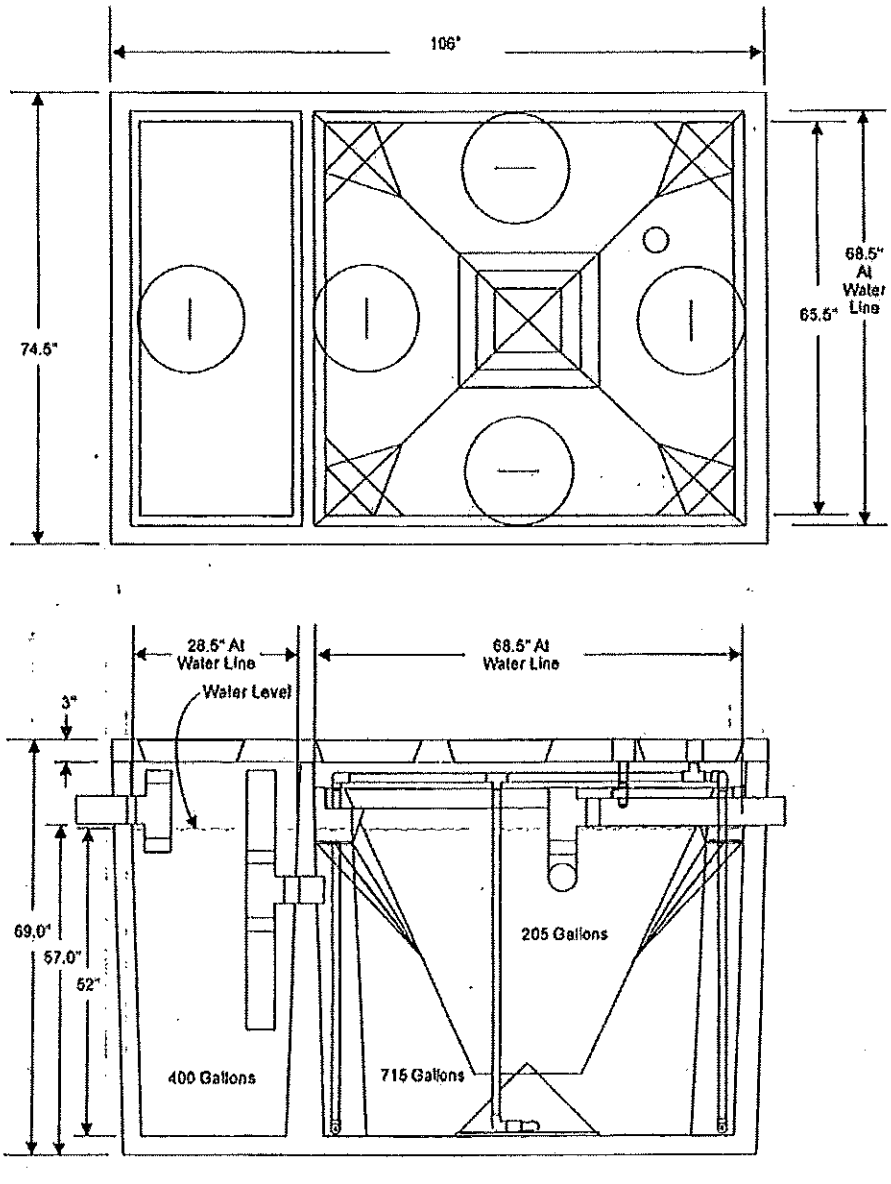
RESIDENTIAL WASTEWATER TREATMENT SYSTEM SPECIFICATIONS

This Page Intentionally Left Blank

DRAWINGS

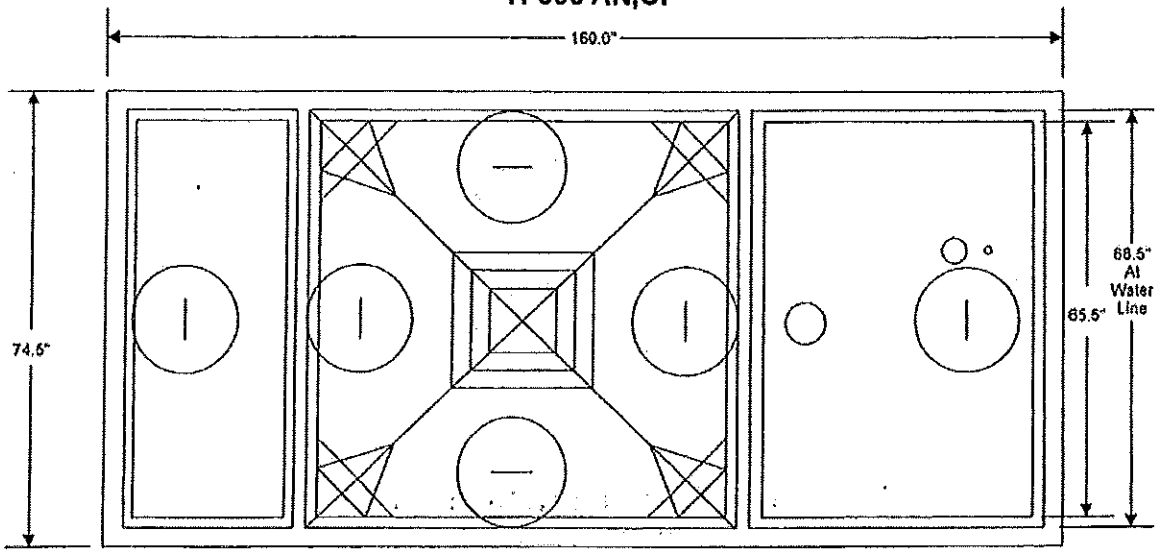
This Page Intentionally Left Blank

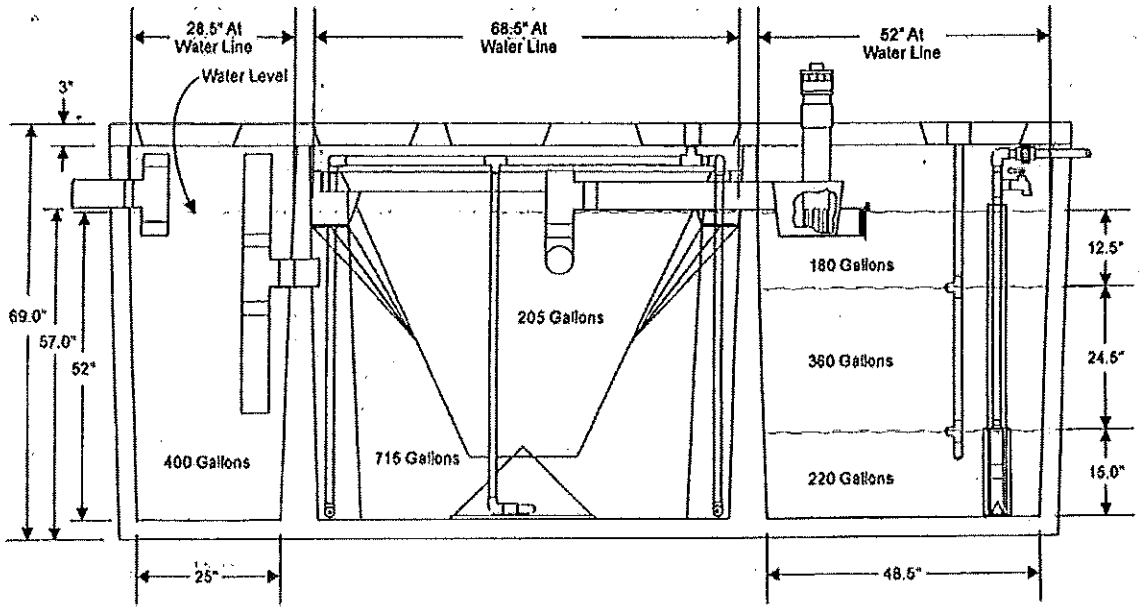
500 GPD GRAVITY DISCHARGE SYSTEM
H-500 A,CP



2.229' Avg. Length
5.600' Avg. Width
4.333' Depth

500 GPD NIGHT PUMPING SYSTEM
H-500 AN,CP





2,229' Avg. Length
5,600' Avg. Width
4,333' Depth

4,187' Avg. Length
5,600' Avg. Width
4,333' Depth

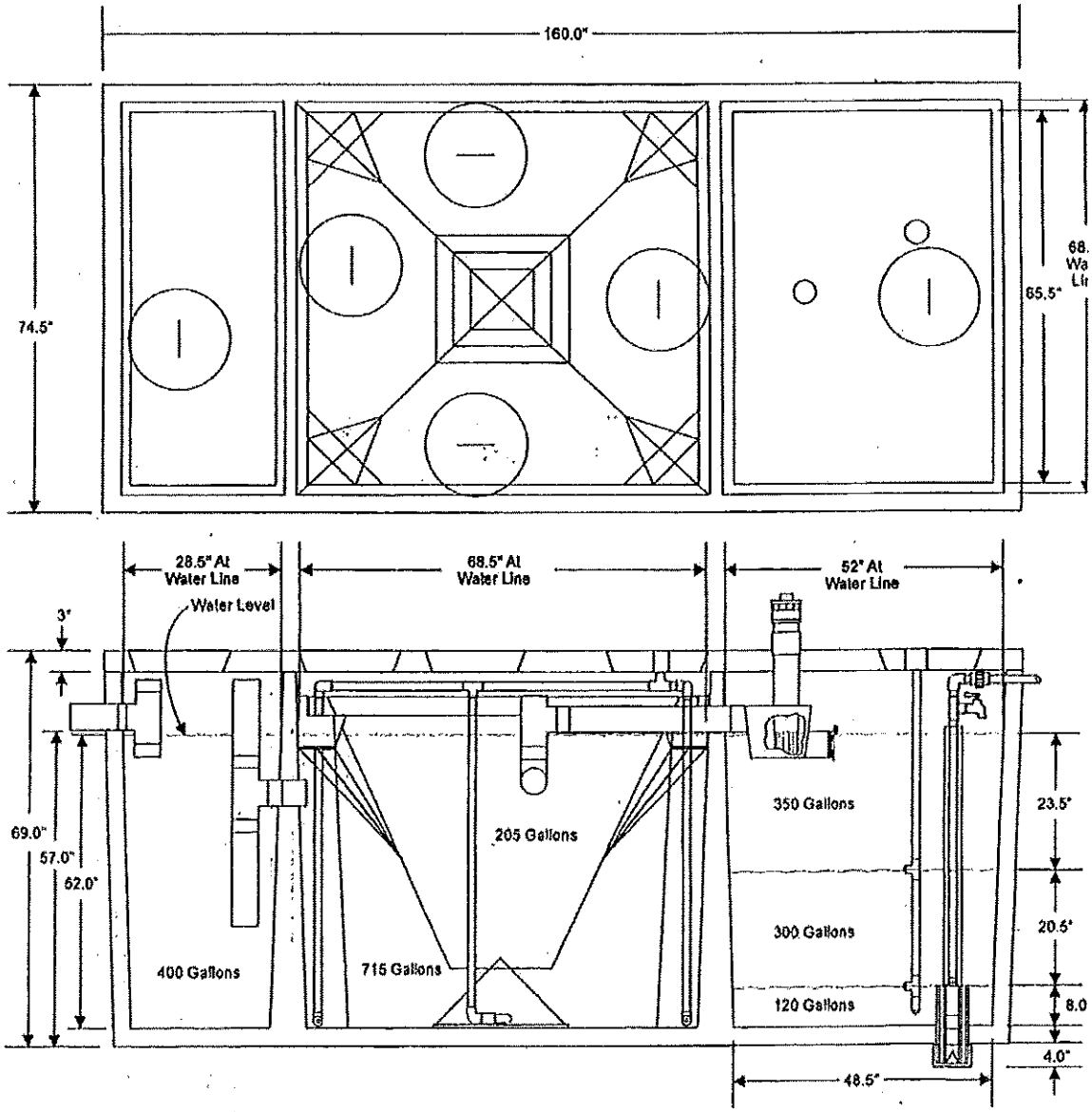
760 Gallons
220 Gallons Remaining In Tank

540 Gallons Holding Capacity

Rev. 07

6/08/99

500 GPD NIGHT PUMPING SYSTEM
H-500 AH,CP



2.229' Avg. Length
5.600' Avg. Width
4.333' Depth

4.167' Avg. Length
5.600' Avg. Width
4.333' Depth

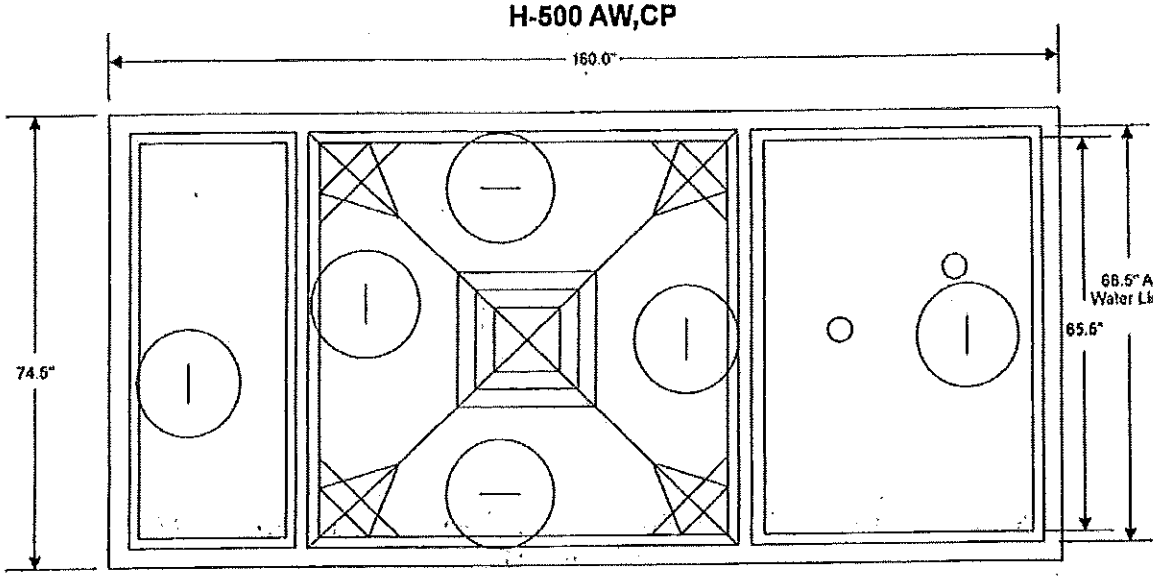
760 Gallons
110 Gallons Remaining In Tank

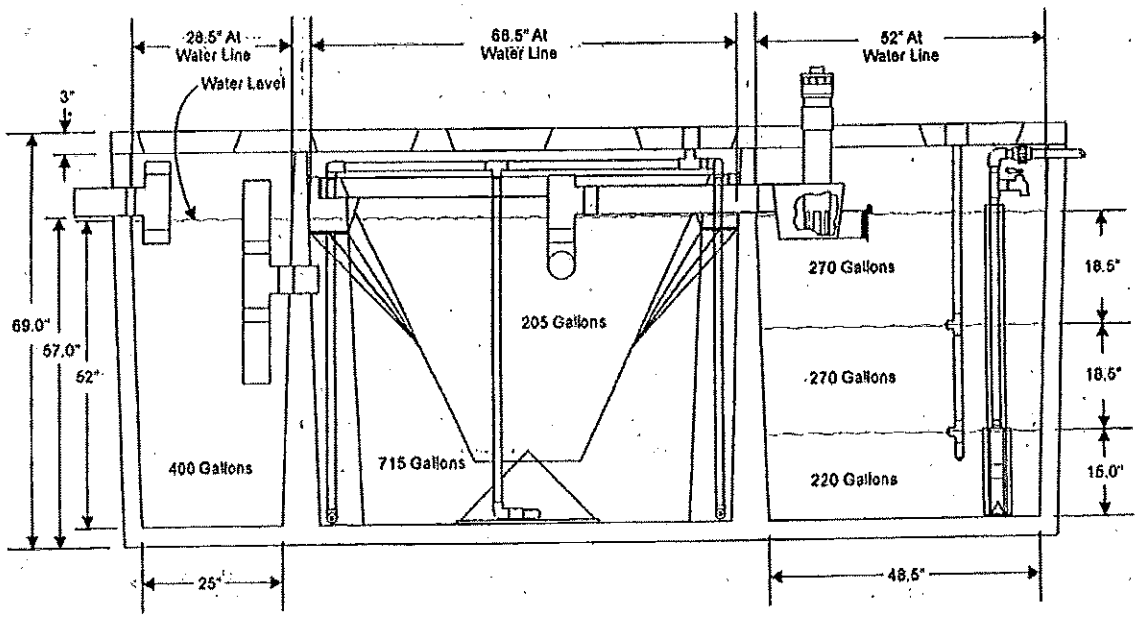
650 Gallons Holding Capacity

Rev. 04

6/08/99

500 GPD NIGHT PUMPING SYSTEM WITH FULL DAY ABOVE ALARM
H-500 AW,CP





2.229' Avg. Length
5.600' Avg. Width
4.333' Depth

4.187' Avg. Length
5.600' Avg. Width
4.333' Depth

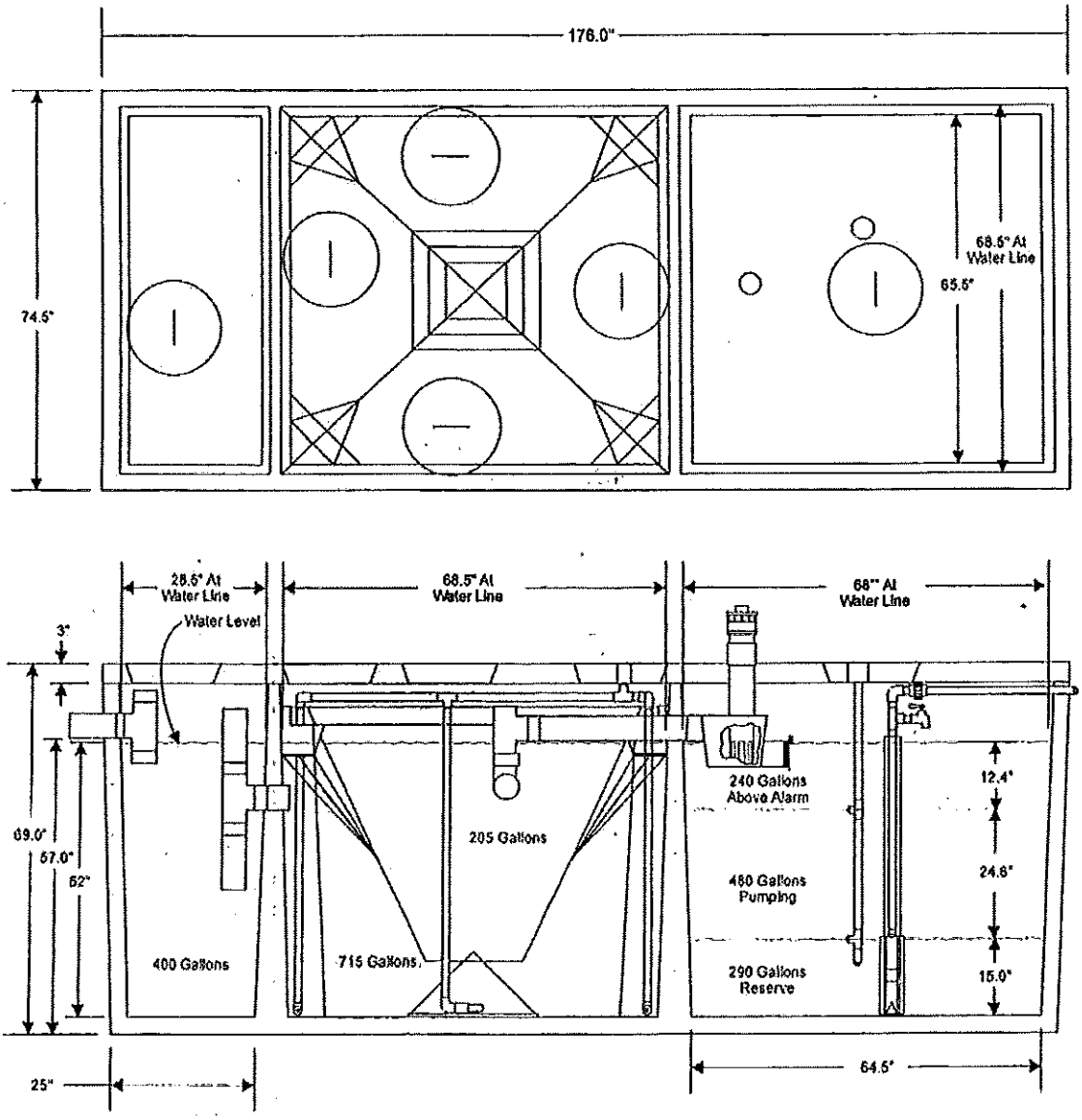
760 Gallons
220 Gallons Remaining In Tank

540 Gallons Holding Capacity

Rev. 02

6/08/99

500 GPD NIGHT PUMPING SYSTEM
H-500 AS,CP



2.229' Avg. Length
5.600' Avg. Width
4.333' Depth

5.521" Avg. Length
5.600' Avg. Width
4.333' Depth

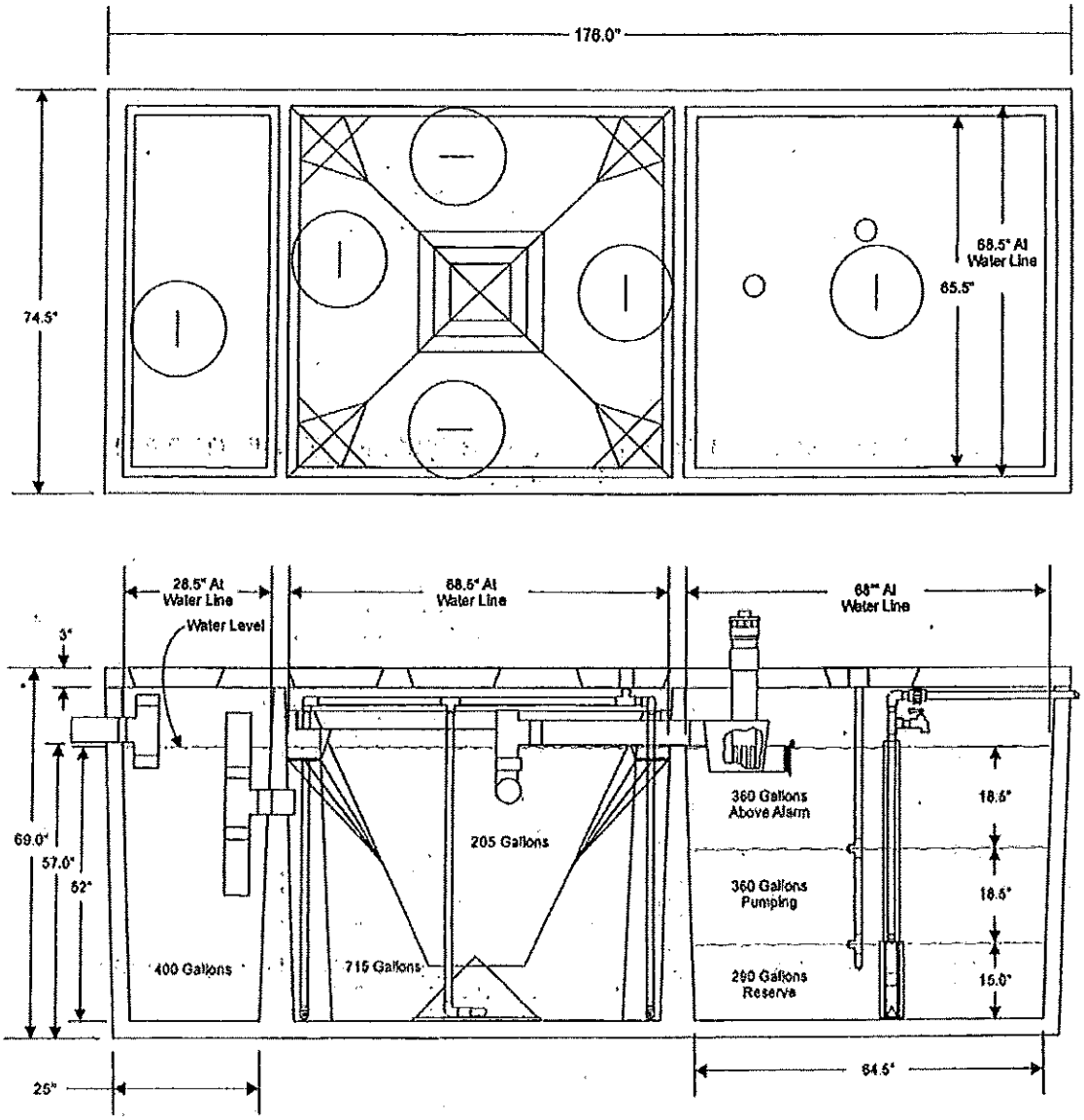
1010 Gallons
290 Gallons Remaining In Tank

720 Gallons Holding Capacity

Rev. 02

8/15/99

500 GPD NIGHT PUMPING SYSTEM WITH FULL DAY ABOVE ALARM
H-500 AT,CP



2.229' Avg. Length
5.600' Avg. Width
4.333' Depth

5.521" Avg. Length
5.600' Avg. Width
4.333' Depth

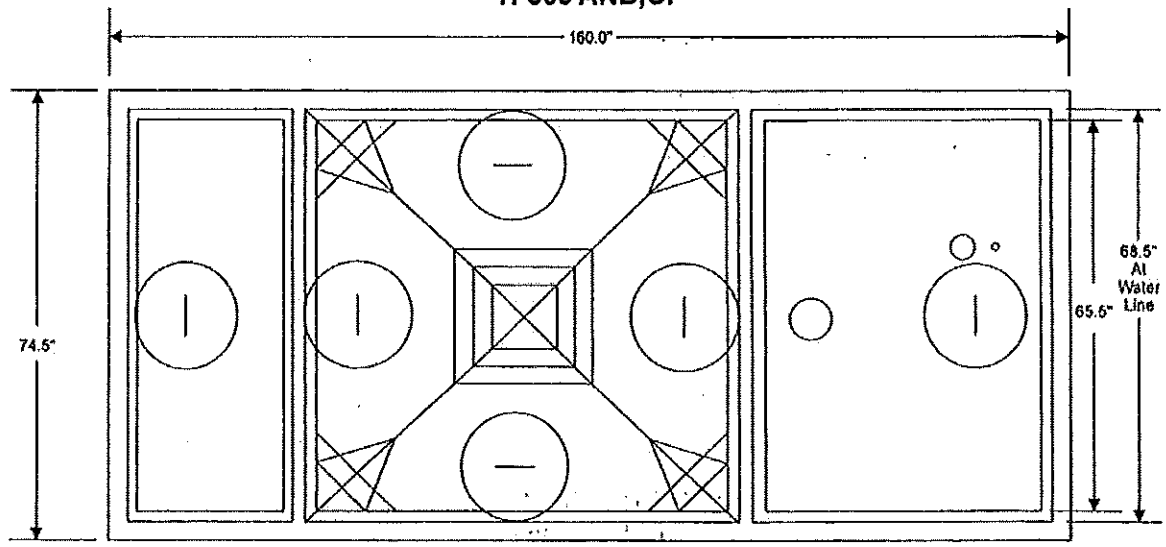
1010 Gallons
290 Gallons Remaining In Tank

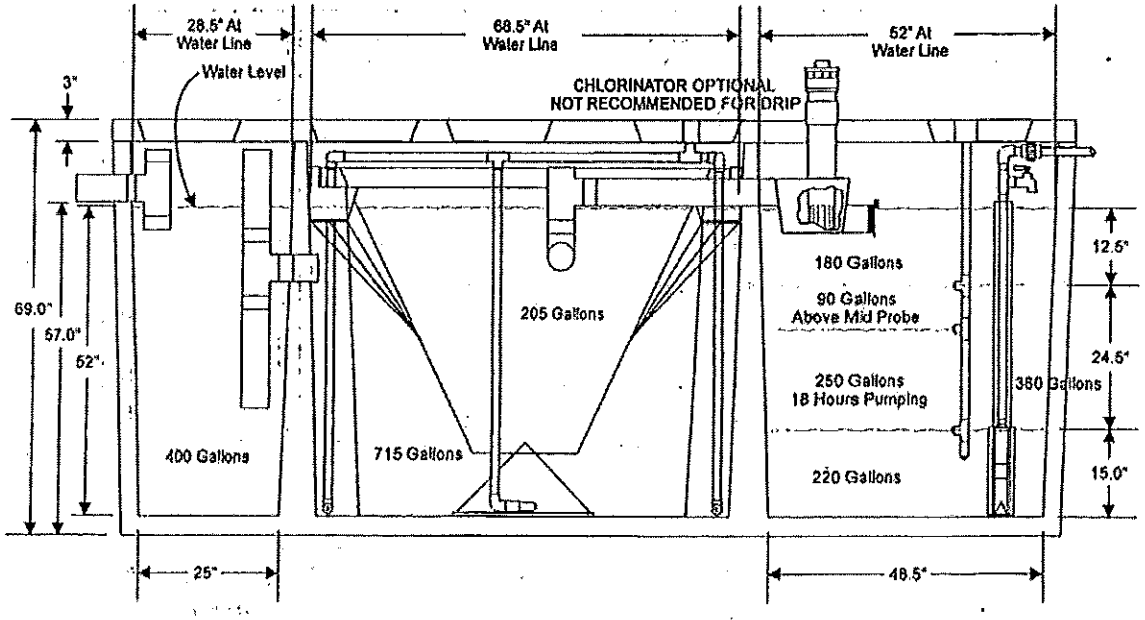
720 Gallons Holding Capacity

Rev. 03

6/08/99

500 GPD DRIP SYSTEM
H-500 AND,CP





2.229' Avg. Length
5.600' Avg. Width
4.333' Depth

4.187' Avg. Length
5.600' Avg. Width
4.333' Depth

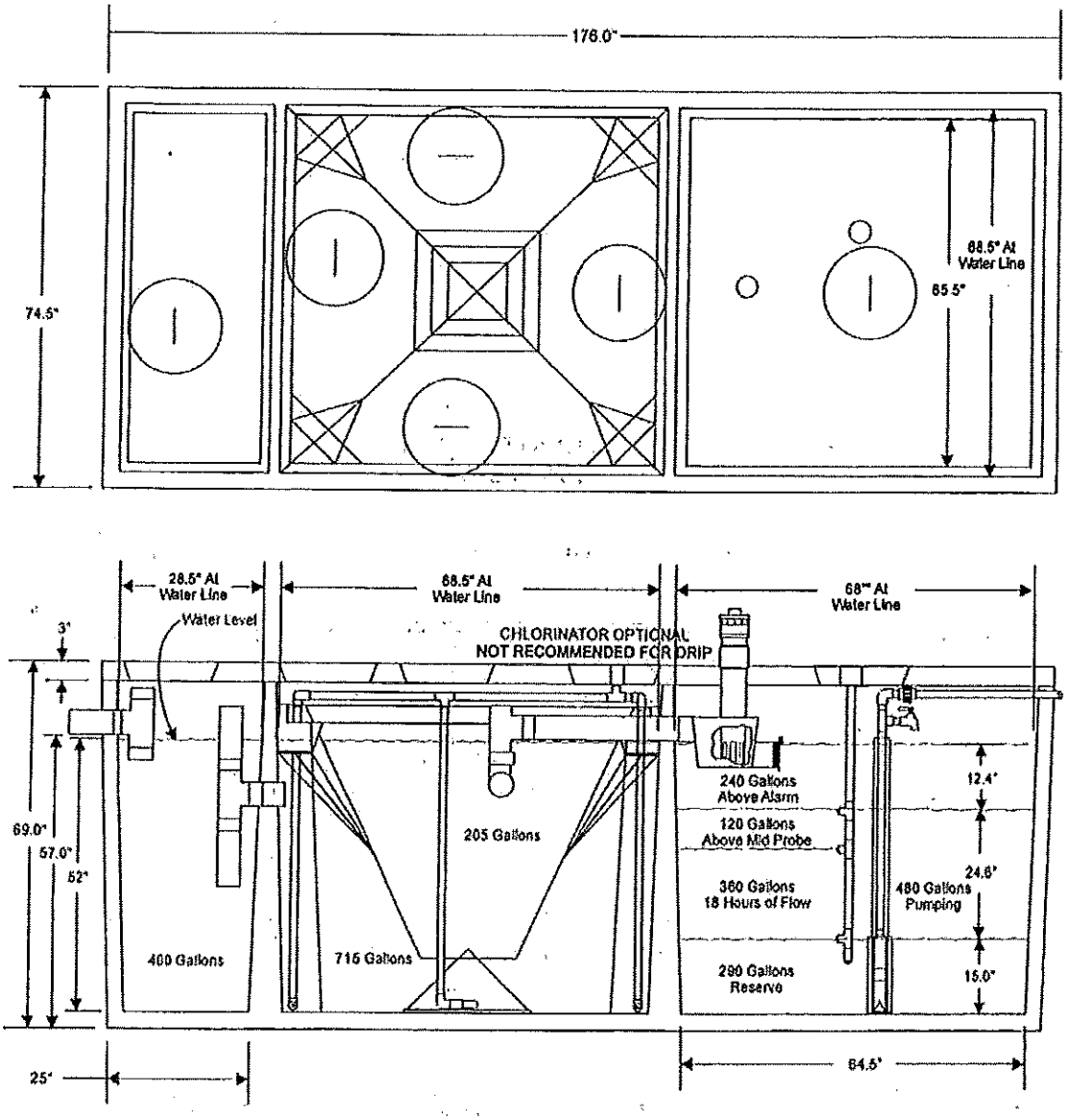
760 Gallons
220 Gallons Remaining In Tank

540 Gallons Holding Capacity

Rev. 03

2/27/01

500 GPD DRIP SYSTEM
H-500 ASD,CP



2.229' Avg. Length
5.600' Avg. Width
4.333' Depth

5.521"' Avg. Length
5.600' Avg. Width
4.333' Depth

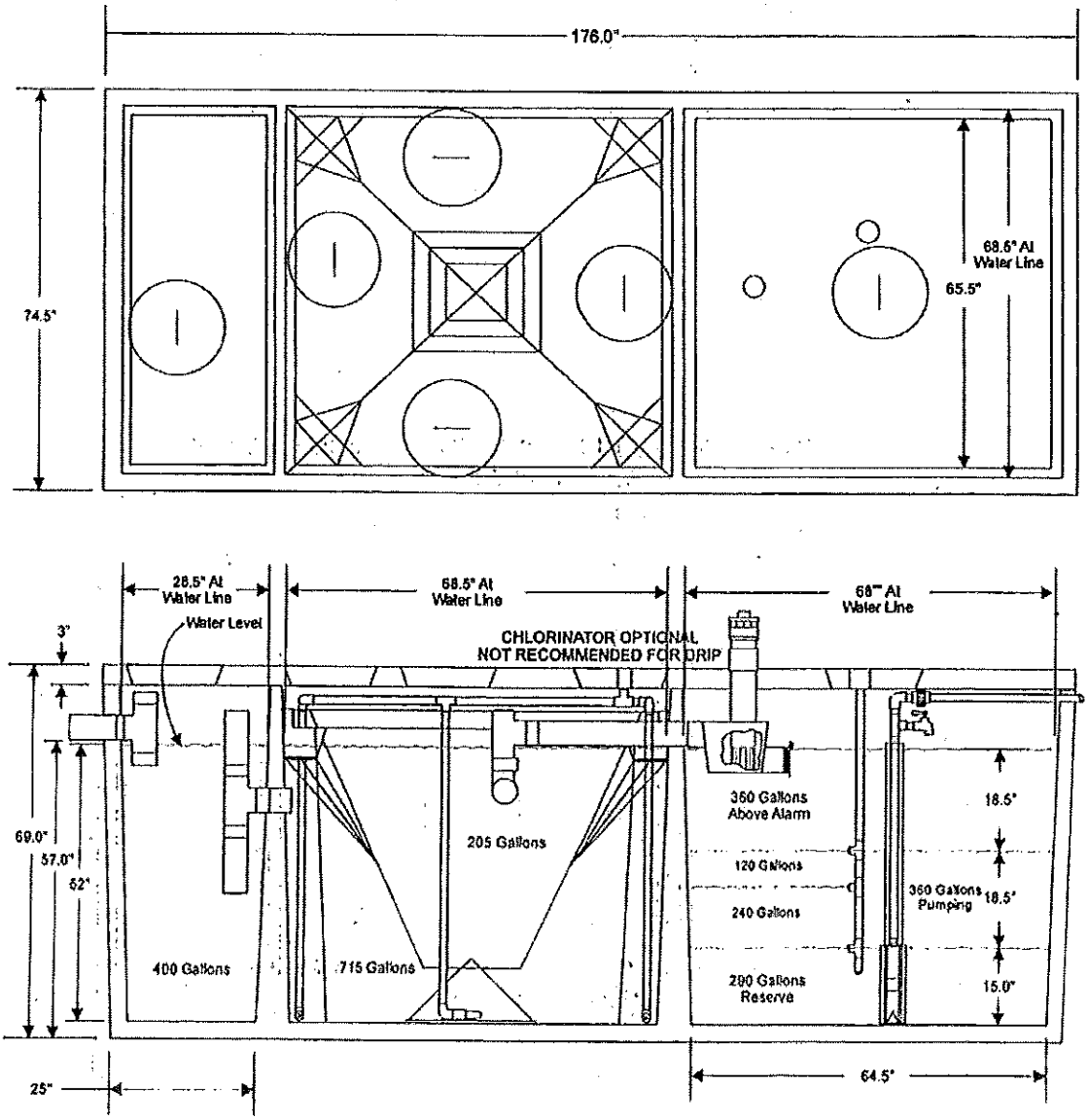
1010 Gallons
290 Gallons Remaining In Tank

720 Gallons Holding Capacity

Rev. 03

2/27/01

500 GPD DRIP SYSTEM WITH FULL DAY ABOVE ALARM
H-500 ATD,CP



2,229' Avg. Length
5,600' Avg. Width
4.333' Depth

5,521" Avg. Length
5,600' Avg. Width
4.333' Depth

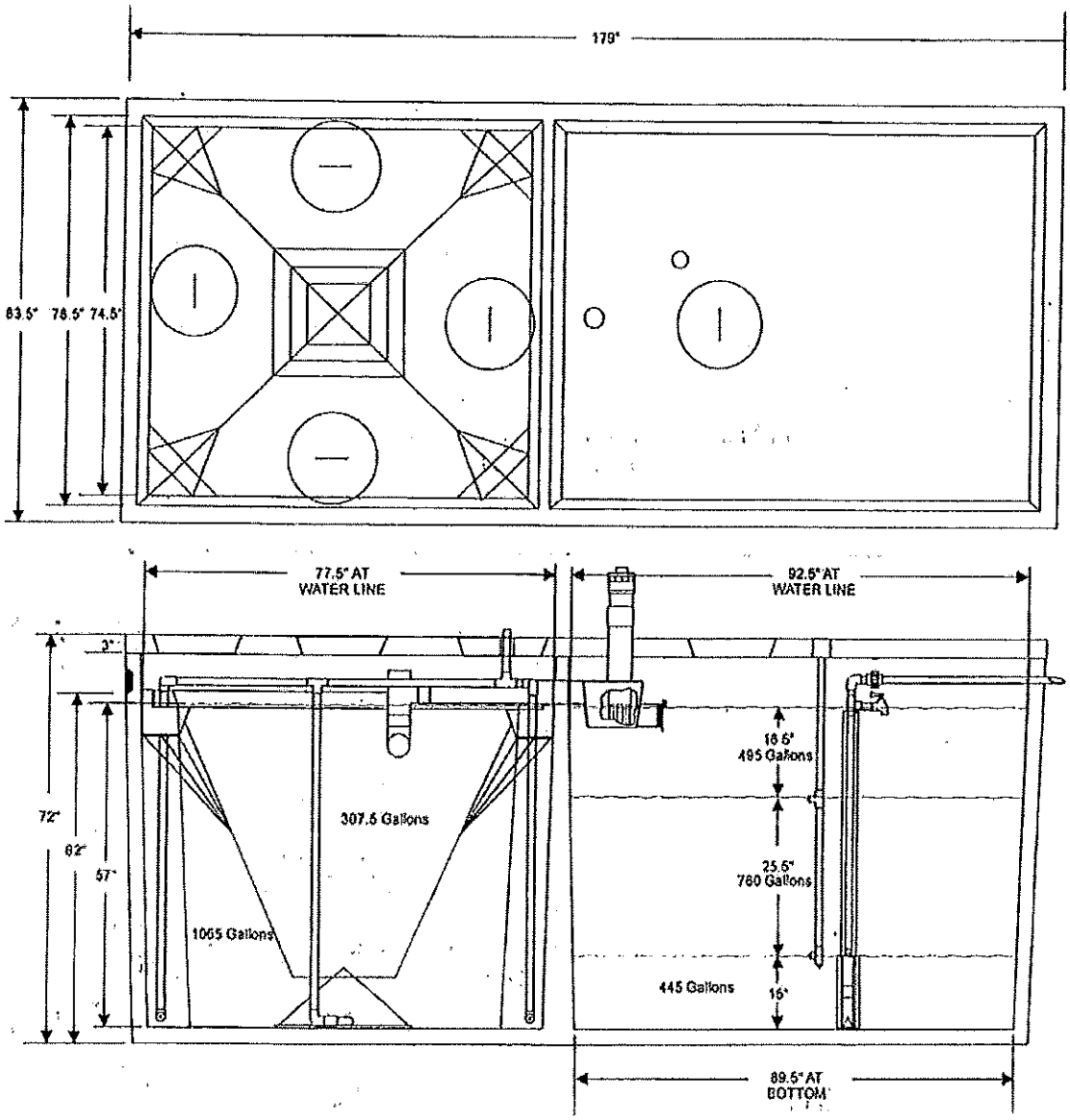
1010 Gallons
290 Gallons Remaining In Tank

720 Gallons Holding Capacity

Rev. 02

2/27/01

750 GPD NIGHT PUMPING SYSTEM
H-750 AN,CP



76" Avg. Length
76" Avg. Width
57" Depth

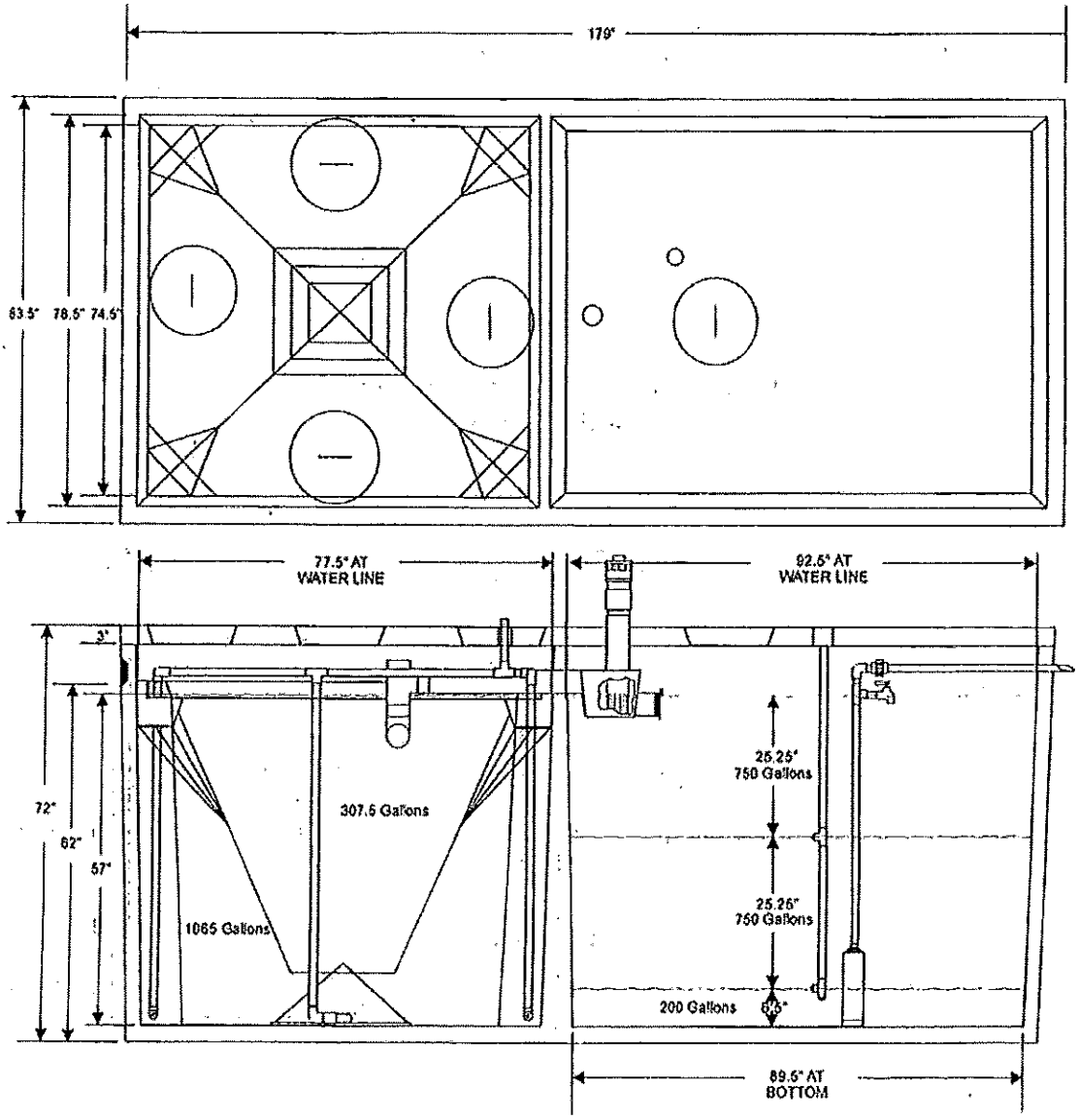
91" Avg. Length
76" Avg. Width
57" Depth

1700 Gallons
445 Gallons Remaining In Tank
1255 Gallons Pumping Capacity

Rev. 06

5/08/01

750 GPD NIGHT PUMPING SYSTEM
H-750 AH,CP



76" Avg. Length
76" Avg. Width
57" Depth

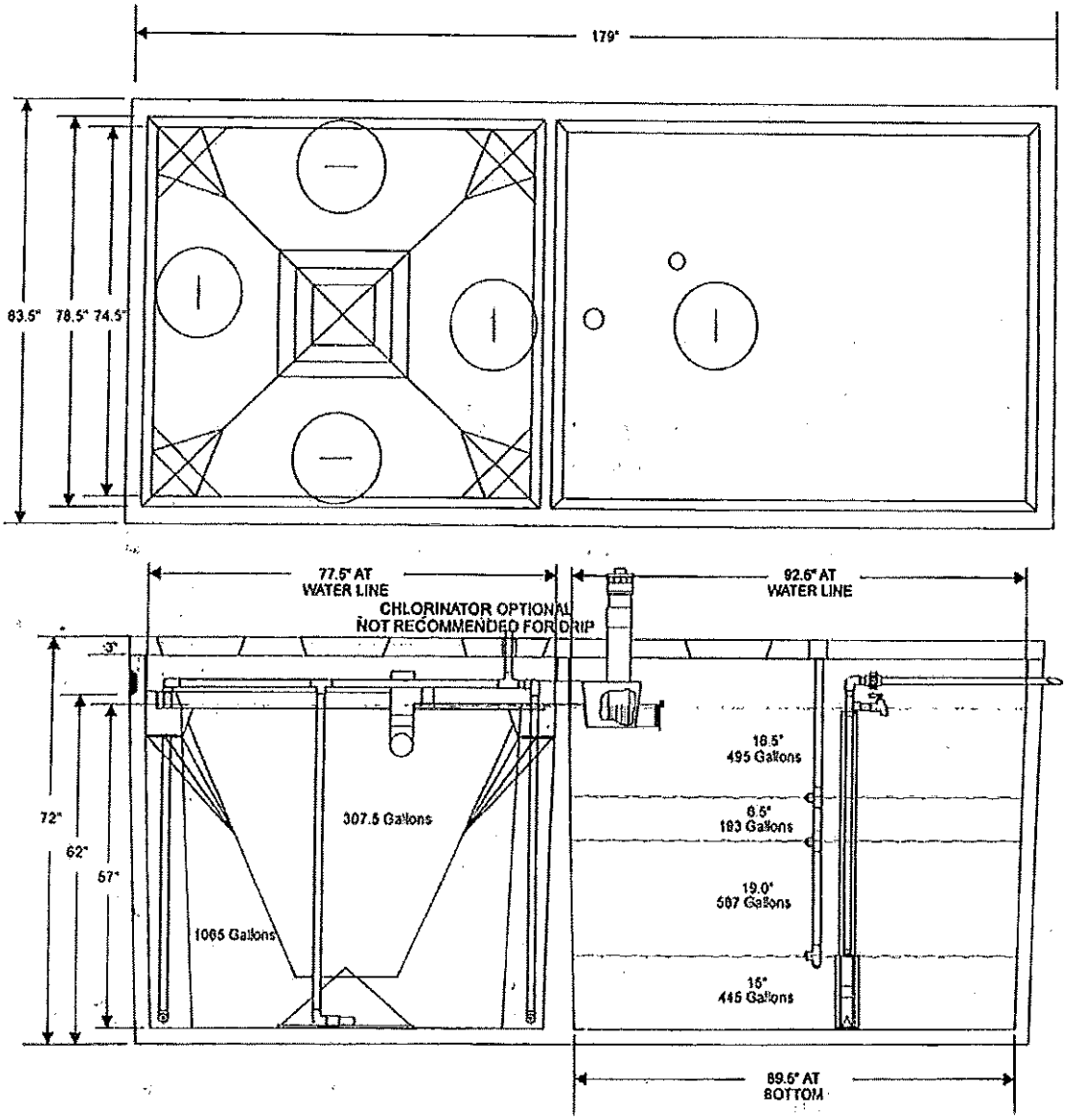
91" Avg. Length
76" Avg. Width
57" Depth

1700 Gallons
200 Gallons Remaining In Tank
1500 Gallons Pumping Capacity

Rev. 04

5/08/01

750 GPD DRIP SYSTEM
H-750 AND,CP



76" Avg. Length
76" Avg. Width
57" Depth

91" Avg. Length
76" Avg. Width
57" Depth

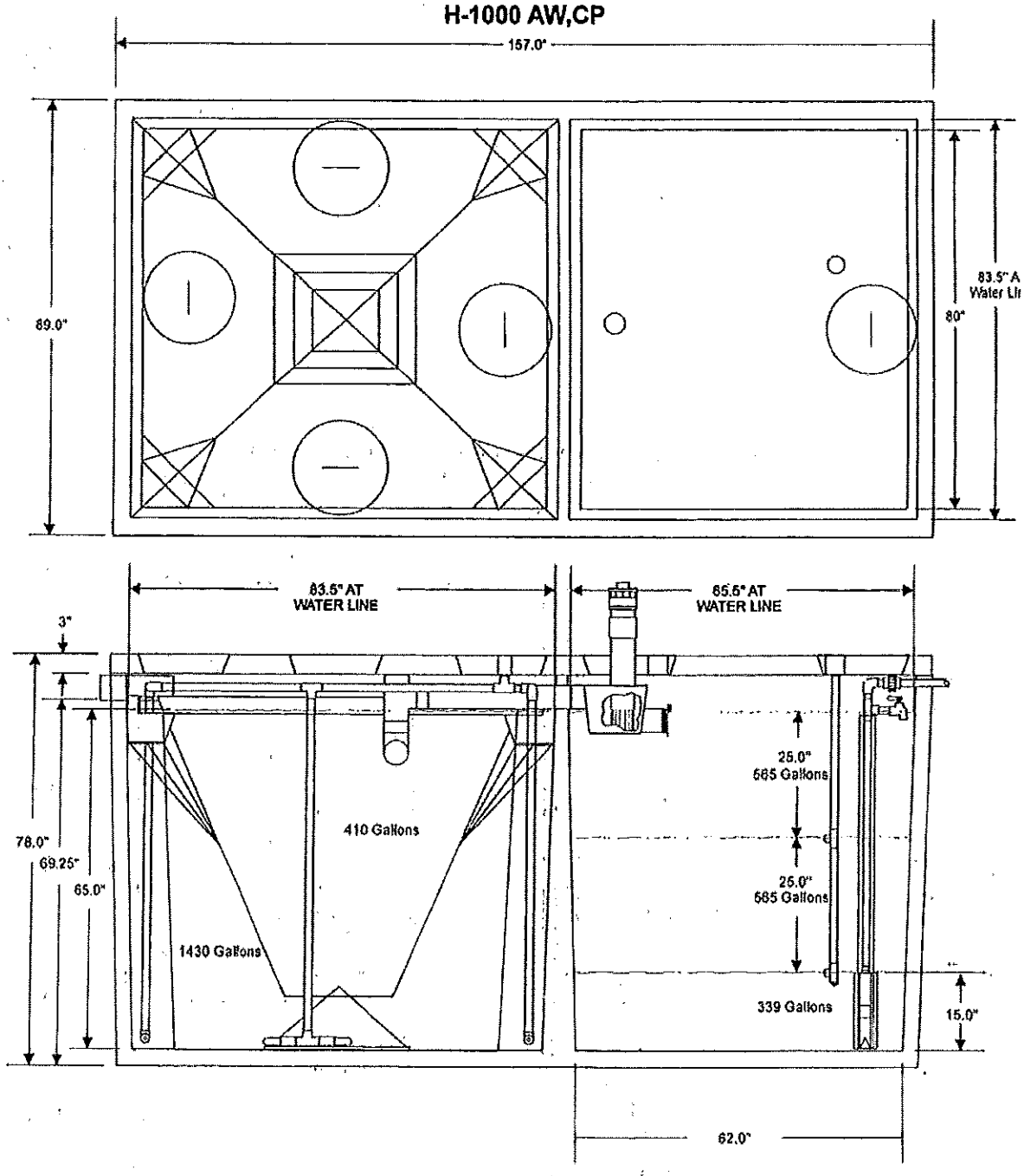
1700 Gallons
445 Gallons Remaining In Tank

1255 Gallons Pumping Capacity

Rev. 01

12/01/01

1000 GPD DEMAND / NIGHT PUMPING SYSTEM
H-1000 AW,CP

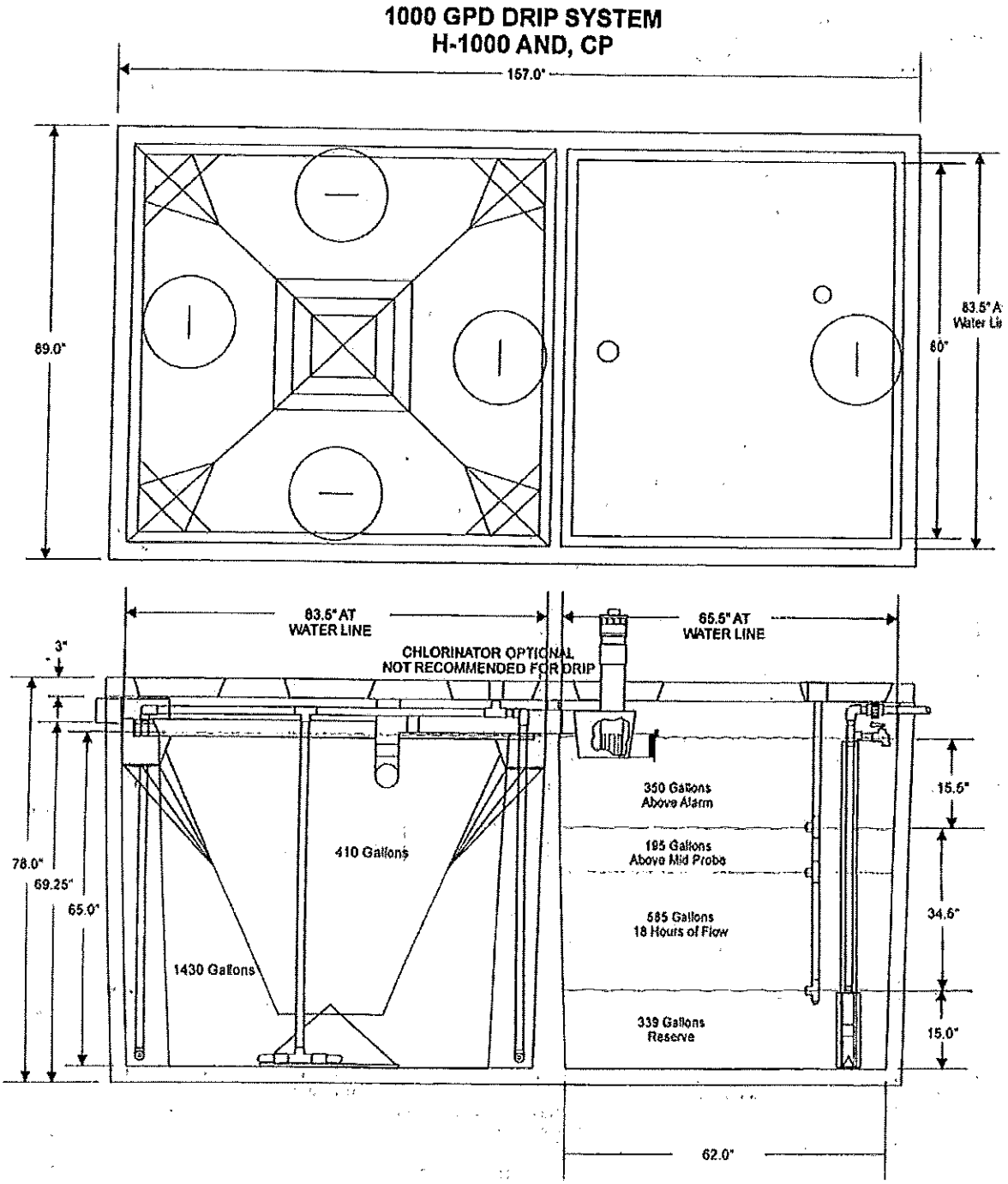


5.312' Avg. Length
6.812' Avg. Width
5.416' Depth

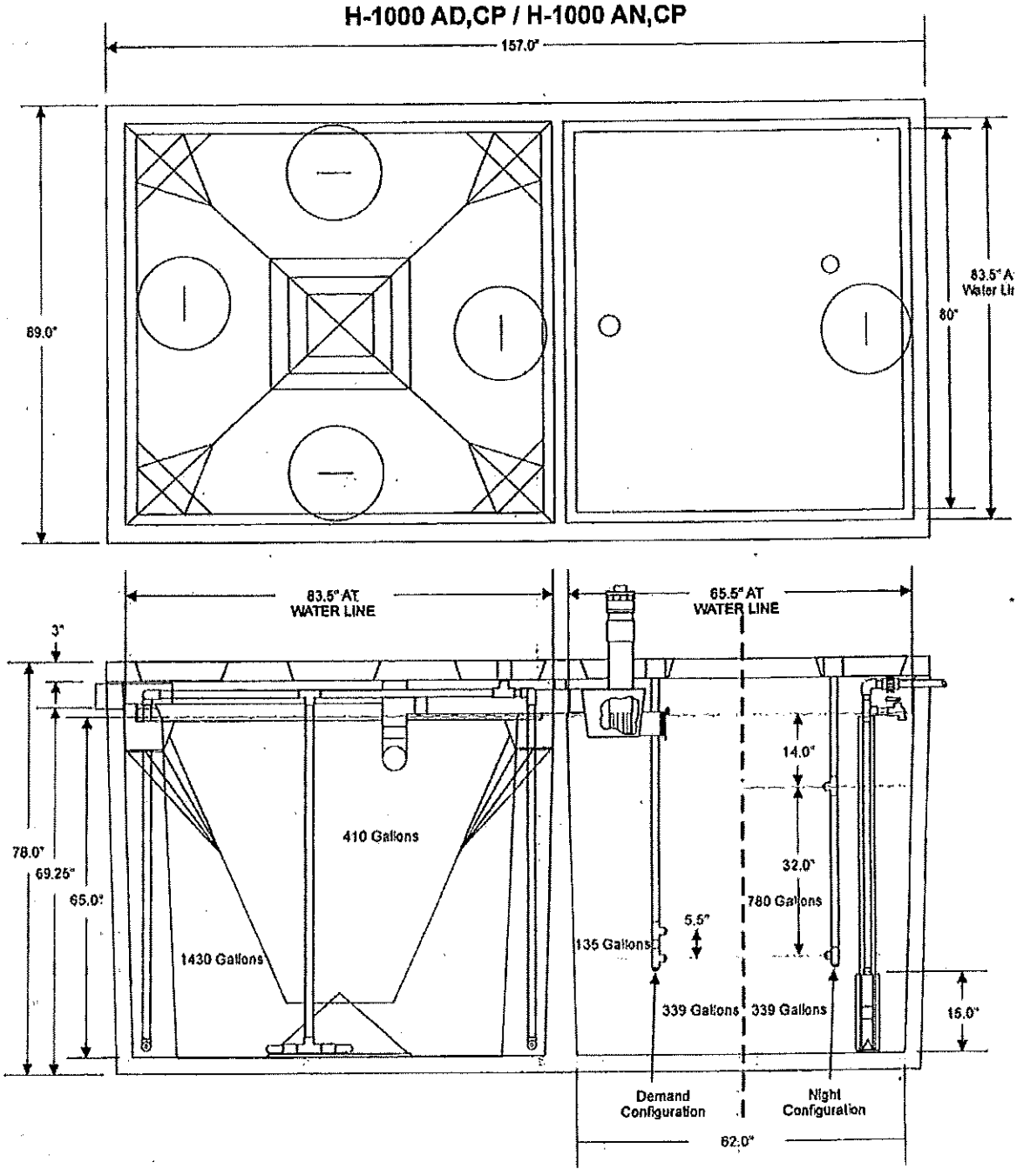
1469 Gallons
339 Gallons Remaining In Tank
1130 Gallons Pumping Capacity

Rev. 02

2/27/01


1000 GPD DRIP SYSTEM
H-1000 AND, CP
157.0"
89.0"
83.5" A
Water Li
80"
83.5" AT
WATER LINE
65.5" AT
WATER LINE
3"
CHLORINATOR OPTIONAL
NOT RECOMMENDED FOR DRIP
350 Gallons
Above Alarm
195 Gallons
Above Mid Probe
585 Gallons
18 Hours of Flow
339 Gallons
Reserve
410 Gallons
1430 Gallons
78.0"
69.25"
65.0"
15.6"
34.6"
15.0"
62.0"
5.312' Avg. Length
6.812' Avg. Width
5.416' Depth
1469 Gallons
339 Gallons Remaining In Tank
1130 Gallons Pumping Capacity
Rev. 02
12/01/01

1000 GPD DEMAND / NIGHT PUMPING SYSTEM
H-1000 AD,CP / H-1000 AN,CP



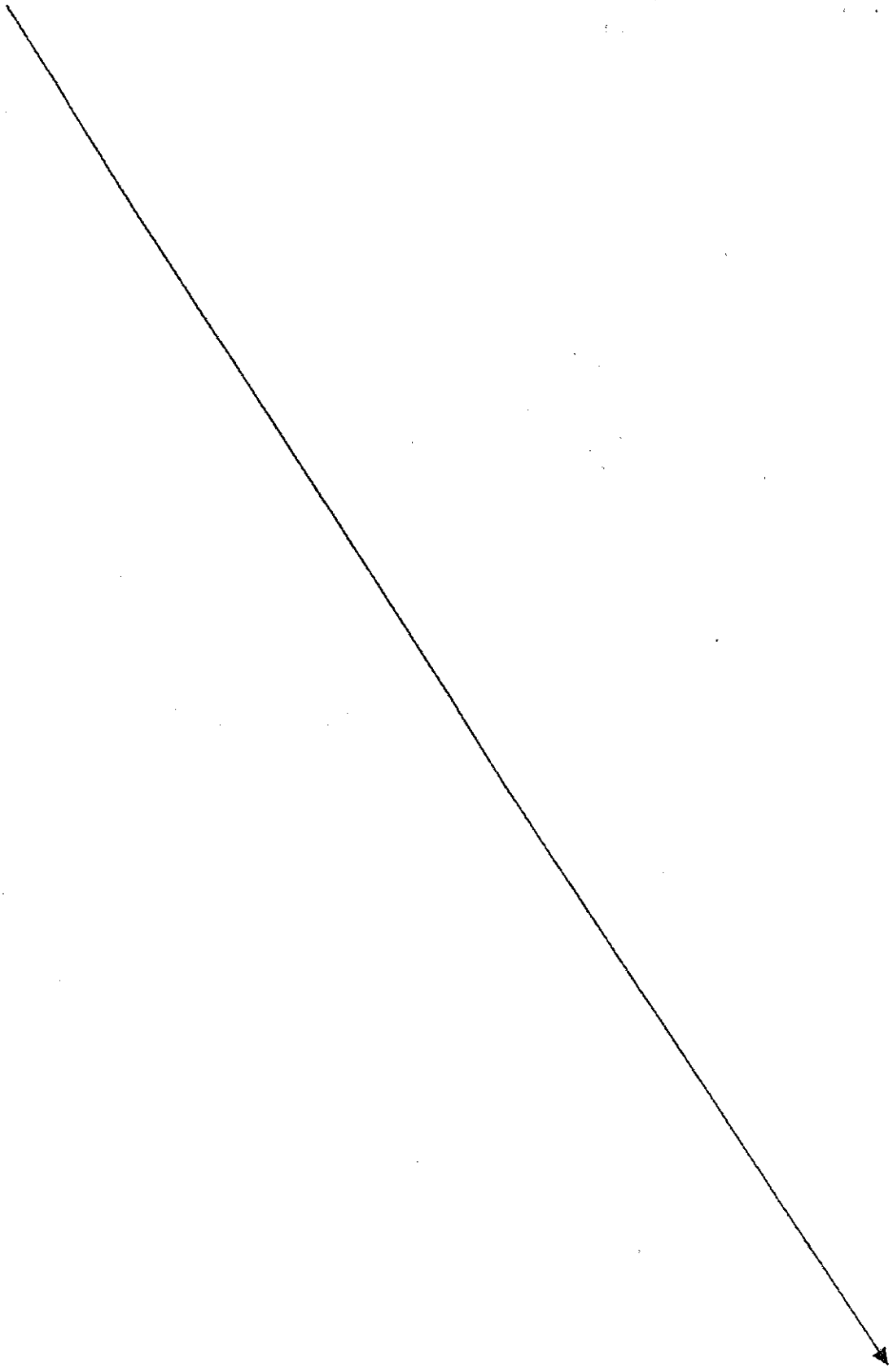
5.312' Avg. Length
6.812' Avg. Width
5.416' Depth

1469 Gallons
339 Gallons Remaining in Tank

1130 Gallons Pumping Capacity

Rev. 07

12/01/01



HOME OWNER'S MANUAL

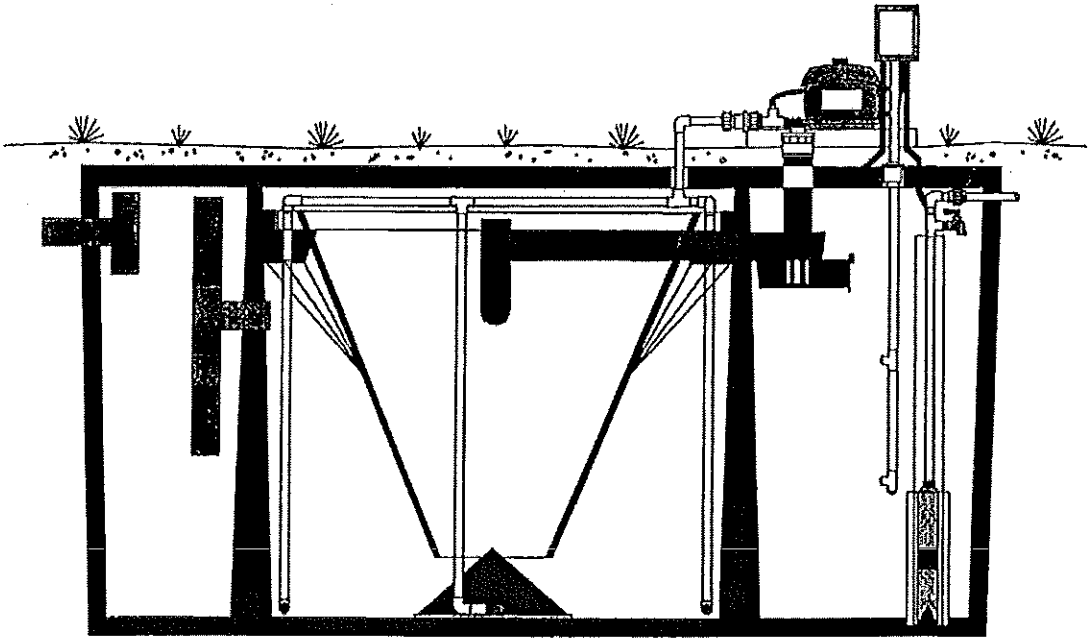
This Page Intentionally Left Blank

HOOT AEROBIC TREATMENT SYSTEMS

HOOT Aerobic Systems, Inc.
2885 Highway 14 East Lake Charles, Louisiana 70607
(337) 474-2804 phone (337) 477-7904 fax

Homeowners Manual

This Product has been tested in accordance with the criteria set forth in the ANSI/NSF Standard 40 and is hereby certified as a Class I Aerobic Wastewater Treatment Plant.



The HOOT Aerobic Treatment System
Declaration of Warnings

WARNING! TO PREVENT MALFUNCTION OF YOUR SEWAGE SYSTEM, DO NOT DISCHARGE THE FOLLOWING MATERIALS INTO THE SYSTEM: Plastic Materials ! Cloth ! Cigarette Stubs ! Paper towels ! Large quantities of acids or caustics, soaps or cleaning materials which have a high or low pH factor (Use low suds detergents) ! Throw-away Diapers ! Rubber products ! Kleenex, some toilet tissues which do not decompose readily in water ! Rainwater from Gutters ! Excess grease or fatty materials (Use garbage disposal sparingly) ! Oily materials, motor oils, grease, kerosene, gasoline, Paints, etc. ! **BACKWASH WATER FROM WATER SOFTENERS OF ANY TYPE** ! Other materials which do not disintegrate in water ! A/C Discharge ! Sump pump discharge

WARNING! TO FUNCTION PROPERLY, THE HOOT SYSTEM MUST BE MAINTAINED BY A QUALIFIED PROFESSIONAL AT LEAST EVERY SIX (6) MONTHS FOR THE LIFE OF THE SYSTEM. FAILURE TO MAINTAIN THE HOOT SYSTEM VOIDS THE LIMITED WARRANTY AND MAY CAUSE SERIOUS BODILY INJURY OR ILLNESS TO PEOPLE AND PETS AND MAY CAUSE SERIOUS DAMAGE TO THE HOOT SYSTEM OR OTHER PROPERTY.

DANGER! ONLY A QUALIFIED PROFESSIONAL SHOULD ATTEMPT TO REPAIR OR FIX THE HOOT SYSTEM. ATTEMPTED REPAIR BY ANYONE OTHER THAN A QUALIFIED PROFESSIONAL MAY CAUSE SERIOUS BODILY INJURY OR DEATH TO THE HOMEOWNER OR OTHER PERSONS AND MAY CAUSE SERIOUS DAMAGE TO THE HOOT SYSTEM AND OTHER PROPERTY.

DANGER! DO NOT DISCONNECT THE POWER TO THE HOOT SYSTEM. DISCONNECTION OF THE POWER FROM THE SYSTEM MAY CAUSE SERIOUS ILLNESS OR DEATH TO THE HOMEOWNER AND OTHER PERSONS AND MAY CAUSE SERIOUS DAMAGE TO THE HOOT SYSTEM AND OTHER PROPERTY.

WARNING! IN CASE OF IMMINENT FLOOD, IMMEDIATELY TURN OFF THE ELECTRICAL POWER TO THE HOOT SYSTEM AT THE INDEPENDENT BREAKER LOCATED ON THE HOUSE. FAILURE TO TURN OFF THE ELECTRICAL POWER MAY CAUSE SERIOUS INJURY OR DEATH TO THE HOMEOWNER AND OTHER PERSONS AND MAY CAUSE SERIOUS DAMAGE TO THE HOOT SYSTEM AND OTHER PROPERTY.

WARNING! IF THE UNIT FAILS TO FUNCTION PROPERLY, DO NOT USE THE BATHROOM FACILITIES UNTIL QUALIFIED PERSONNEL FIX THE PROBLEM. USE OF THE BATHROOM FACILITIES DURING A SYSTEM FAILURE MAY CAUSE SERIOUS INJURY, ILLNESS, OR DEATH TO PERSONS AND MAY CAUSE SERIOUS DAMAGE TO THE HOOT SYSTEM AND OTHER PROPERTY.

WARNING! DO NOT ALLOW CHILDREN TO PLAY ON OR AROUND THE AEROBIC TREATMENT SYSTEM, THE SPRINKLER SYSTEM, OR OTHER OVER-LAND DISCHARGE AREA. ALLOWING CHILDREN TO PLAY IN THESE AREAS MAY CAUSE SERIOUS BODILY INJURY, ILLNESS, OR DEATH TO THE CHILDREN AND OTHER PERSONS AND MAY CAUSE DAMAGE TO THE HOOT SYSTEM AND OTHER PROPERTY.

DANGER! DO NOT OPEN CONTROL PANEL WITHOUT ELECTRICITY DISCONTENTED AND LOCKED OUT ON THE SYSTEM. FAILURE TO DO SO COULD CAUSE SEVERE INJURY OR DEATH

Table Of Contents

Overview of Sewage Treatment

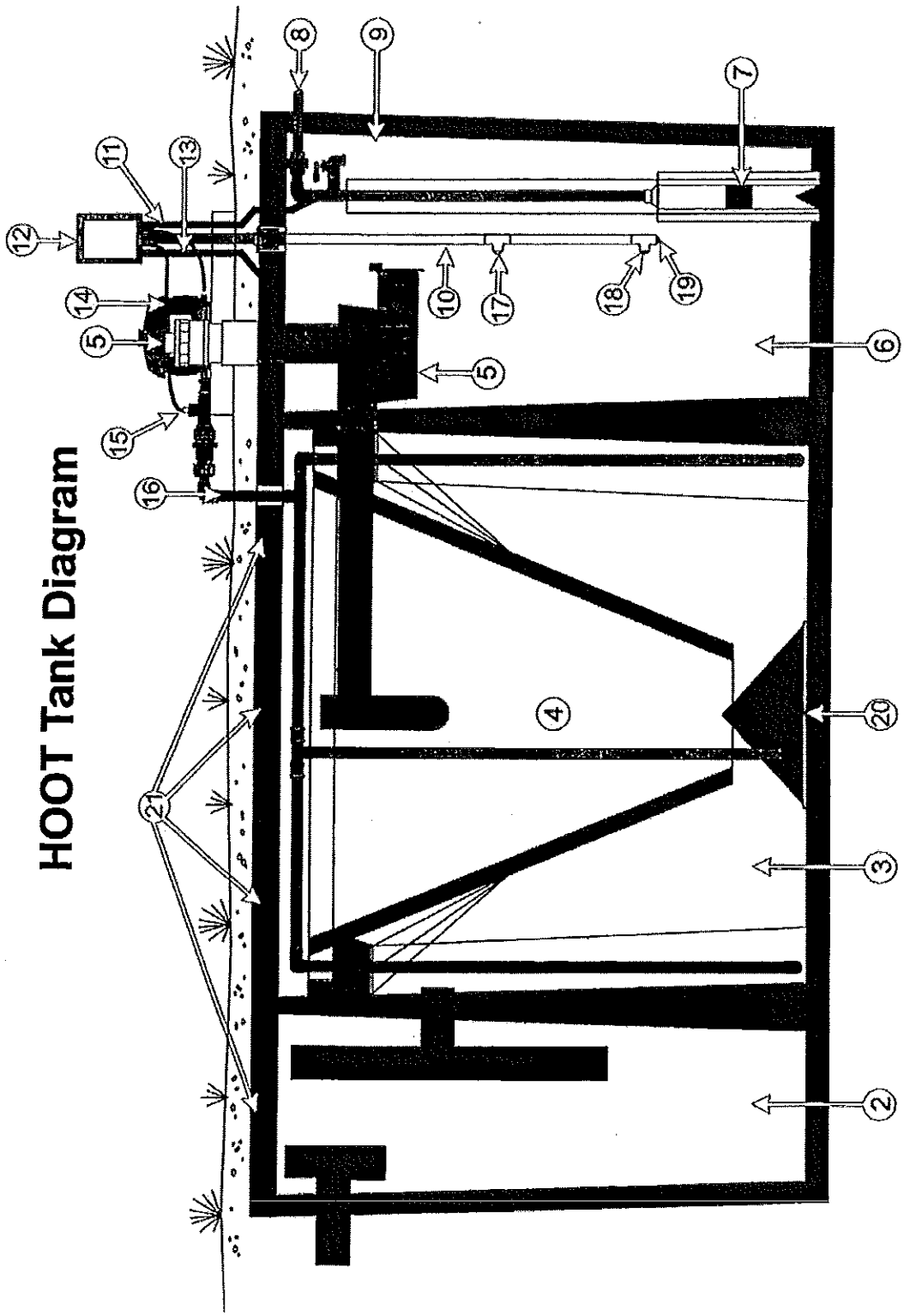
The treatment system is comprised of four components, namely a pretreatment tank, aeration chamber, final clairfier and a disinfection device. The pre-treatment tank aids in the anaerobic decomposition of the influent and provides a storage area for non-biodegradables which are inadvertently added to the system. The aeration chamber is the heart of the activated sewage treatment plant. By means of a blower, oxygen is incorporated into the sewage. This introduction of oxygen is done in such a manner as to intimately mix the organics of the sewage with the bacterial populations in the aeration chamber. Reduction of the organics is accomplished by these organisms. Movement of sewage in the aeration chamber causes the activated sludge that settled in the final clarifier to be re-introduced into the aeration chamber. As the solids settle out in the clairifier, a clear odorless effluent is produced which passes through the disinfection device, and into the pump tank for discharge at a later time. All HOOT systems have a minimum of a ½ days flow above the alarm to give ample time for service personnel to arrive and correct any problem which may occur.

The ANSI/NSF Standard 40 requires a minimum removal efficiency for the performance of Aerobic Wastewater Treatment Systems. For a system to be certified as a Class I Treatment unit the arithmetic mean of all effluent samples collected in a seven day period must be less than 45 mg/L. The HOOT Aerobic System had an average $CBOD_5$ of 2.4 and a Suspended Solids average of 1.8 with both averaging 99% removal efficiency.

The effluent quality was found to meet or exceed state and federal standards for all other required parameters. According to these results, the HOOT unit is the most efficient wastewater treatment systems on the market today.

The HOOT Aerobic Treatment System Diagram

1. **Inlet** - where the wastewater enters the system from the home
2. **Pretreatment Tank** - where anaerobic digestion occurs and storage for non-biodegradeable materials
3. **Aeration Chamber** - where air is introduced into the sewage for digestion
4. **Clarifier** - a still chamber where solids settle out and the clear effluent rises
5. **Chlorinator** kills any remaining biological activity in the water entering the pump tank.
6. **Pump Tank** - where the treated and disinfected effluent is stored prior to discharge
7. **Effluent Pump** - how the treated water is discharged from the system
8. **Discharge Line** - to the disposal method prescribed by law or chosen by installer
9. **Sampling Port** - used by service personnel to inspect effluent quality
10. **Probe** - turns on and off the pump based on water level
11. **Pump Wire** - from pump to the control panel
12. **HOOT System Controller** - operates and regulates the control of the system
13. **Power Line (30 Amp)** - independent breaker provided by homeowner, builder or qualified electrician, necessary for proper operation of the system
14. **Troy Air Linear Air Blower** - long life, efficient linear blower which compresses atmospheric air and under pressure delivers it to the tank
15. **Air Manifold** - delivers the air from the line to the stones for diffusion into the sewage
16. **Aeration line** - delivers the air from the pump to the manifold
17. **High Water Probe** - turns the pump on - also alarm probe if pump fails to come on
18. **Low Water Probe** - the off switch for the pump
19. **Probe Ground** - generates the low level signal in the water which is sensed by the probes
20. **Aeration Stone** - air is finely diffused from the stone into the aeration chamber
21. **15" Covers** - provide access to each component of the system for service. Are usually brought to grade level to meet local regulations and for serviceability.


HOOT Tank Diagram
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21

Chlorine Maintenance

ADD CHLORINE light will come on when the tablet level is between 1 and 2 tablets remaining. According to state law, it is the homeowners responsibility to maintain a chlorine residual in the pump tank of at least 1.0 mg/L. This can be achieved by keeping tablets, designed for the disinfection of wastewater in your chlorinator. To add tablets, remove the tube and follower, and clean out old tablets and residue. HOOT recommends filling the tube with approximately 1 months supply or 3 to 5 tablets, depending on use. A general rule is 1 tablet, per person, per month. Regulations may require more to be added at a time. Monitor the chlorine use, as well as the light, to determine when to add tablets to the tube. Carefully lower the dispenser tube into the chlorinator and reinstall the follower. Do not drop a tube filled with tablets. Damage to the dispenser, tube or tablets will occur and will not be covered by the warranty.

Chlorine Misuse Warning

Improper chlorine use can cause sever damage to the probe, pump and other components integral to the Hoot System. It can also create hazardous health conditions for those with exposure to the application area. The proper chlorine tablets are available from every Hoot Installer. They are specially formulated for small waste water flows and are an anti-wicking Calcium Hypochlorite formula. They are EPA registered and minimize excess residuals in the environment which may prove harmful to human or other life.

Environmental Protection Agency personnel are targeting the misapplication of chlorine products for more stringent enforcement. According to the E.P.A. the use of swimming pool chlorine in the treatment of waste water effluent is a violation of the Federal Insecticide, Fungicide, and Rodenticide Act Sections 136n-2g and 136j(a)g. The F.H.F.R.A . regulations essentially state anyone who is using a chlorine product for applications other than those stated on the product's labeling is potentially subject to fines or imprisonment. Individual users can be fined $500.00 for the first offenses and $2000.00 for subsequent violations.

Service Policy

The initial service policy, which covers the first two years of system operation, is included in the purchase price of every HOOT Aerobic Treatment System. During the first two years of system ownership, the homeowner is entitled to all service, sampling and inspection calls required by local regulatory officials. This will include a complete inspection of each component of the system, and any adjustments or servicing necessary to any electrical, mechanical and other component parts to ensure proper function. During the inspection, an effluent quality observation will be made as well. If there are any items which need corrected and can not be immediately remedied, you, the installer/inspector, will inform the home owner, in writing, of the conditions and the estimated repair date. Following the initial two year service policy, the installer, must make available, for purchase, a continued service policy comparable to the initial service policy. Our manufacturers will stock any and all replacement parts necessary to ensure that the HOOT Aerobic Treatment System will operate properly as long as you own your home. To service a HOOT System, a service representative must be certified on an annual basis by HOOT Aerobic Systems, Inc., or their qualified representatives.

TREATMENT SYSTEM INITIAL SERVICE POLICY

2885 Highway 14 East Lake Charles, Louisiana 70607
(337) 474-2804 phone (337) 477-7904 fax

Our Company,_____, will operate and maintain the Hoot Aerobic System located at_____, (legal description only)
Permit #_____, for the period of 2 years beginning_____and ending_____.

This contract will provide for all required inspections, testing and service of your HOOT Aerobic Treatment System. The policy will include the following:

1. _____ inspections a year/service calls (at least one every _____ months), for a total of _____ over the two-year period including inspection, adjustment and servicing of the mechanical, electrical and other applicable component parts to ensure proper function. This includes inspecting the control panel, air pumps, air filters, diffuser operation, and replacing or repairing any component not found to be functioning correctly.

2. An effluent quality inspection consisting of a visual check for color, turbidity, scum overflow and examination for odors. A test for chlorine residual and pH will be taken and reported as necessary.

3. If any improper operation is observed, which cannot be corrected at the time of the service visit, you will be notified immediately in writing of the conditions and estimated date of correction.

4. The Homeowner is responsible for maintaining a chlorine residual of at least 1mg/L in the treatment system. This can be accomplished by using chlorine tablets designed for wastewater use, NOT SWIMMING POOL TABLETS. Upon visit, if the system needs chlorine tablets the service provider will add them and charge the customer. If the customer fails in their responsibility to add the chlorine tablets, they are in violation of law and appropriate action will be taken.
Initials of Installer_____ Initials of Homeowner_____

5. Any additional visits, inspections or sample collections required by specific Municipalities, Water/River Authorities, County Agencies the TNRCC or any other regulatory agency in your jurisdiction will be covered by this policy.

At the conclusion of the initial service policy, the Service Provider will make available, for purchase on an annual basis, a continuing service policy to cover labor for normal inspection, maintenance and repair. According to state law, all owners of aerobic systems must maintain a factory authorized service provider for the lifetime of the system.

With 48 hours of a request for service (weekends and holidays excluded), your system will be visited by the service provider listed below or their authorized agent. If there are any items which need correction and can not be immediately remedied, the service provider will inform the home owner, in writing, of the conditions and the estimated repair date.

The HOOT Homeowners Manual must be strictly followed or warranties are subject to invalidation. Pumping of sludge build-up, for reasons other than due to warrantied mechanical failure, are not covered by this policy and will result in additional charges. By signing this form, both Installer and Homeowner agree to the terms of this policy. By signing this form, both the Installer and the Homeowner agree that the Homeowner has received a copy of the Homeowners Manual and the Installer has made a reasonable effort to explain all pertinent information to the Homeowner.

HOOT is not responsible for service, it is the SERVICE PROVIDER indicated below.

HOME OWNER	SERVICE PROVIDER
_____ Name	_____ Name of Service Company Representative
_____ Address	_____ Address
_____ City	_____ City
(____) _____ - _____ Phone	(____) _____ - _____ Phone
_____ Signature of Home Owner	_____ Signature of Service Provider and License #.

Homeowner Trouble Shooting

If both **AERATION PROBLEM** and **WATER LEVEL PROBLEM** occur, the photocell cannot tell the difference between daylight and darkness. This occurs when the computer "sees" that either day or night is greater than 32 hours. To correct this problem, redirect or turn off any overhead light that comes on a dusk, on at dawn.

If you have re-directed or turned off an overhead light, you will need to reset the controller to clear the alarm. To do this, you simply need to turn off the power to the system at your panel box for 10 seconds and then turn it back on. If the problem re-occurs approximately 30 hours later, you have a problem with your photocell and you will need to call your qualified Hoot Service Provider for assistance.

If you do not have an overhead light, then there is a problem with the photocell and you need to call your qualified Hoot Service Provider.

If **AERATION PROBLEM** occurs there has been a problem with your air delivery system. This is the most critical part of the treatment system and the problem must be corrected as quickly as possible. There are two problems that a homeowner can correct:

1. The air line from the blower to the control panel has come loose or been disconnected.

   Check first to see if the black line from the aerator is not pinched, and is properly installed into each end of the compression fittings. If this has been pulled loose, then turn off the power to the system at your panel box for 10 seconds and then turn it back on. If an aeration problem occurs again, then call for assistance.

If a **WATER LEVEL PROBLEM** and an audible alarm occurs, first determine if it is a problem also with an **AERATION PROBLEM** (See Above).

There are no homeowner repairs that can be made to the effluent delivery system. Please look directly at the panel and note wether the light is steady, slow or fast flashing. This will aid the installer in coming to the quickest resolution of your problem.

If **POWER FAILURE ALARM** occurs

1). Circuit Breaker to system - from house - is tripped.
2). Circuit Breaker at house panel box for remote breaker is tripped.

If **ADD CHLORINE** comes on

When the tablet level is between 1-2 tablets remaining, the **ADD CHLORINE** Indicator light will light and beep, and remain lit until chlorine has been added to the system. See directions on page 5 under **Chlorinator Maintainance.**

How The Night Pumper System Works

The system controls the pump based on a time clock principle. Each day at sun up, an internal clock begins a count down. 20 hours after sun up the system will pump out the tank. Upon initial start up of system, or after a power failure, the internal clock assumes daylight just occurred. The system starts the 20 hour clock till pump down. If night comes, and daylight then occurs before the 20 hours has passed, then the pump will automatically pump out at daybreak.

Water Over-Use

If at any time more than 360 gallons of water enter the system between pump cycles, (the maximum allowed for a 5 bedroom home) then the system must come on in a demand configuration mode. Thirty seconds prior to pumping, the system will turn on an audible alarm, with two short beeps in a row. After 30 seconds, the alarm will silence and turn the pump on for maximum of 4 minutes. If the level drops below the high probe, the pump will run an additional 4 minutes.

If this does not lower the level below the high probe the pump will jog 10 times and will pump for an additional 4 minutes. If this does not lower the water level below the high probe, a **WATER LEVEL PROBLEM** will occur with a **SYSTEM ALARM** red light and audible alarm. This might occur if a hot tub, Jacuzzi or other large volume of water is released into the system all at once. It should be noted that hot tub or Jacuzzi water should never be released into an aerobic system. This alarm is designed to tell the warn Home Owner that a large volume of water being released into the system all at once can disturb the process and should be metered in more slowly. If the system persistently comes on in a demand configuration, then it should be noted that the household either, uses too much water and is sized too small, is wasteful with water, or has running toilets, etc. It should also be noted that no Aerobic system can function correctly if too much water is run through the system. To determine if there is a plumbing leak check the clean-out located before the tank inlet by sprinkling a small amount of dry dirt or sand. If the dirt washes away, the width of the stream can indicate how much water is being wasted. A stream as little as 1/8" wide can indicate a leak of as great as 150 gallons a day.

Electrical System Warning

The HOOT Aerobic System features a custom designed control panel made of proprietary parts. Just like the rest of the treatment system, it may only be serviced by a certified HOOT Installer/Service Provider. Although an electrician may be employed by an installer to make the final hook-up, an electrician is not qualified to do service on our control panel unless under the direct supervision of a HOOT Certified Service provider.

LIMITED WARRANTY AND REGISTRATION

HOOT Aerobic Systems, Inc.

2885 Highway 14 East Lake Charles, Louisiana 70607
(337) 474-2804 phone (337) 477-7904 fax

NO GENERAL WARRANTY: HOOT AEROBIC SYSTEMS, INC. DISCLAIMS ANY AND ALL WARRANTIES, EITHER EXPRESS OR IMPLIED, AND **EXPRESSLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

HOOT LIMITED WARRANTY: HOOT Aerobic Systems, Inc. ("HOOT") warrants faulty workmanship or construction of the HOOT treatment system for three (3) years from the date of purchase, subject to the following condition: If HOOT determines that the fault in workmanship or construction of the HOOT treatment system is not the result of improper installation, improper maintenance, failure to service, natural disaster, an act of God (including flood, lightning or fire ants), or tampering by any means, then, at HOOT's discretion, HOOT has the right to provide a replacement for such faulty component. The faulty component will be replaced with a rebuilt or new component to the Service Provider for the first three (3) years from the date of purchase. This Warranty extends to the HOOT Service Provider ONLY. During the initial 2 year service policy, the component will be replaced at no charge to the Homeowner. During the third year, components will be provided only to a qualified HOOT Service Provider, at no charge, however any and all installation charges will be the responsibility of the homeowner.

SOLE REMEDY

HOOT's liability for any accident, injury, or damage to any person or property shall be limited to the purchase price of the HOOT Aerobic Treatment System. HOOT is not and shall not be liable for any incidental or consequential damages or injury, regardless of fault, to any person or property resulting from misdesign or mismanufacture of the HOOT Aerobic Treatment System, failure to warn, failure to label, or inadequate instructions in the manual. This clause is effective to the full extent allowed by law and shall be void where prohibited.

WARRANTY REGISTRATION

FOR THE ABOVE WARRANTY TO BE EFFECTIVE, THE HOMEOWNER AND ANY USER ATTEMPTING TO CLAIM ANY RIGHT UNDER THIS WARRANTY MUST COMPLETE THIS FORM AND RETURN A SIGNED COPY TO HOOT WITHIN THIRTY (30) DAYS FROM THE DATE OF INSTALLATION. The cost of pumping or cleaning of any component or compartment of the sewage treatment system, which becomes necessary for causes other than malfunction of the equipment, is the responsibility of the homeowner.

By signing this Service Policy, the Home Owner and the Service Provider agree to the terms of this policy. HOOT is not responsible for service, it is the SERVICE PROVIDER indicated below.

HOME OWNER	SERVICE PROVIDER
Name	Name of Service Company Representative
Address	Address
City	City
( ) -	( ) -
Phone	Phone

-9-

Signature of Home Owner
Provider and License #.

Signature of Service

Service and Inspection Form

(This is an example only, please check State and Local Requirements)

This testing and reporting shall be completed, signed and dated after each inspection. One copy shall be retained by the maintenance company. The second copy is sent to the local permitting authority and the third copy is sent to the system owner along with an invoice for services by the maintenance company.

1. Actual Date of Visit: _____

2. System Inspection of:
   Owner: _____
   Address: _____
   City, St., Zip: _____

Inspected Items:	Operational	Inoperative	Not Applicable
Aerator	☐	☐	☐
Aeration Plumbing	☐	☐	☐
Air Filter	☐	☐	☐
Effluent Pump	☐	☐	☐
Chlorinator	☐	☐	☐
OK System Light	☐	☐	☐
Probe	☐	☐	☐
Sprinkler/Drip Backwash	☐	☐	☐
Photocell Test	☐	☐	☐
Battery	☐	☐	☐

Battery must be replaced once each year. Air Filter must be cleaned each service visit. Operation of effluent disposal system must be made each visit, including chlorine residual test, effluent pump operation and sprinkler operation/ drip backwash.

3. Repairs to system (list all components replaced):_____

4. Tests Required and Results:

Test	Required	Results	Test Method
BOD (Grab)	☐	_____	_____
TSS (Grab)	☐	_____	_____
Fecal Coliform	☐	_____	_____
Chlorine Residual	☐	_____	_____

5.Comments:_____
_____
_____

Signature of Inspector:_____Installer II or WW Lic # _____

For Additional Information, Please Contact:

HOOT Aerobic Systems, Inc.
2885 Highway 14 East Lake Charles, LA 70607
(337) 474-2804 phone (337) 477-7904 fax

www.hootsystems.com

INSTALLATION MANUAL

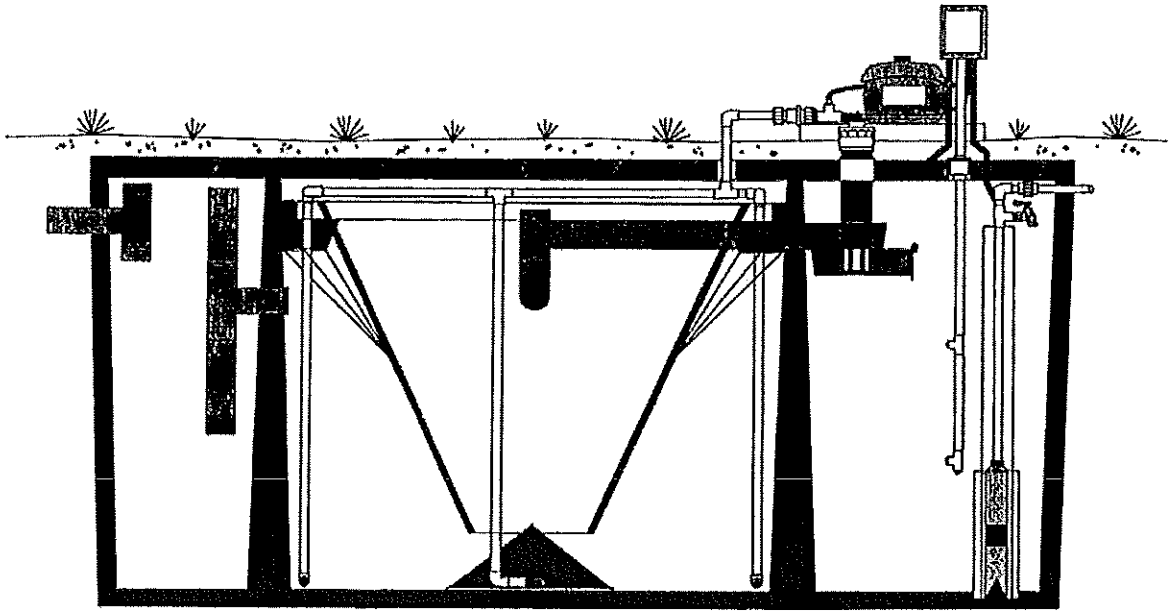
This Page Intentionally Left Blank

HOOT AEROBIC TREATMENT SYSTEMS

HOOT Aerobic Systems, Inc.
2885 Highway 14 East Lake Charles, Louisiana 70607
(337) 474-2804 phone (337) 477-7904 fax

2001 Installers Manual

This Product has been tested in accordance with the criteria set forth in the ANSI/NSF Standard 40 and is hereby certified as a Class I Aerobic Wastewater Treatment Plant.



The HOOT Aerobic Treatment System Declaration of Warnings

WARNING! TO PREVENT MALFUNCTION OF YOUR SEWAGE SYSTEM, DO NOT DISCHARGE THE FOLLOWING MATERIALS INTO THE SYSTEM: Plastic Materials ! Cloth ! Cigarette Stubs ! Large quantities of acids or caustics, soaps or cleaning materials which have a high or low pH factor (Use low suds detergents) ! Throw-away Diapers ! Baby wipes ! Paper Towels ! Kleenex & some toilet tissues which do not decompose readily in water ! Rubber products ! Excess grease or fatty materials (Use garbage disposal sparingly) ! Oily materials, motor oils, grease, kerosene, gasoline, Paints, etc. ! Backwash water from water softeners (in accordance with TNRCC regulations) ! Any other materials which do not disintegrate readily in water ! SUMP PUMP DISCHARGE

WARNING! TO FUNCTION PROPERLY, THE HOOT SYSTEM MUST BE MAINTAINED BY A QUALIFIED PROFESSIONAL AT LEAST EVERY SIX (6) MONTHS FOR THE LIFE OF THE SYSTEM. FAILURE TO MAINTAIN THE HOOT SYSTEM VOIDS THE LIMITED WARRANTY AND MAY CAUSE SERIOUS BODILY INJURY OR ILLNESS TO PEOPLE AND PETS AND MAY CAUSE SERIOUS DAMAGE TO THE HOOT SYSTEM OR OTHER PROPERTY.

DANGER! ONLY A QUALIFIED PROFESSIONAL SHOULD ATTEMPT TO REPAIR OR FIX THE HOOT SYSTEM. ATTEMPTED REPAIR BY ANYONE OTHER THAN A QUALIFIED PROFESSIONAL MAY CAUSE SERIOUS BODILY INJURY OR DEATH TO THE HOMEOWNER OR OTHER PERSONS AND MAY CAUSE SERIOUS DAMAGE TO THE HOOT SYSTEM AND OTHER PROPERTY.

DANGER! DO NOT DISCONNECT THE POWER TO THE HOOT SYSTEM. DISCONNECTION OF THE POWER FROM THE SYSTEM MAY CAUSE SERIOUS ILLNESS OR DEATH TO THE HOMEOWNER AND OTHER PERSONS AND MAY CAUSE SERIOUS DAMAGE TO THE HOOT SYSTEM AND OTHER PROPERTY.

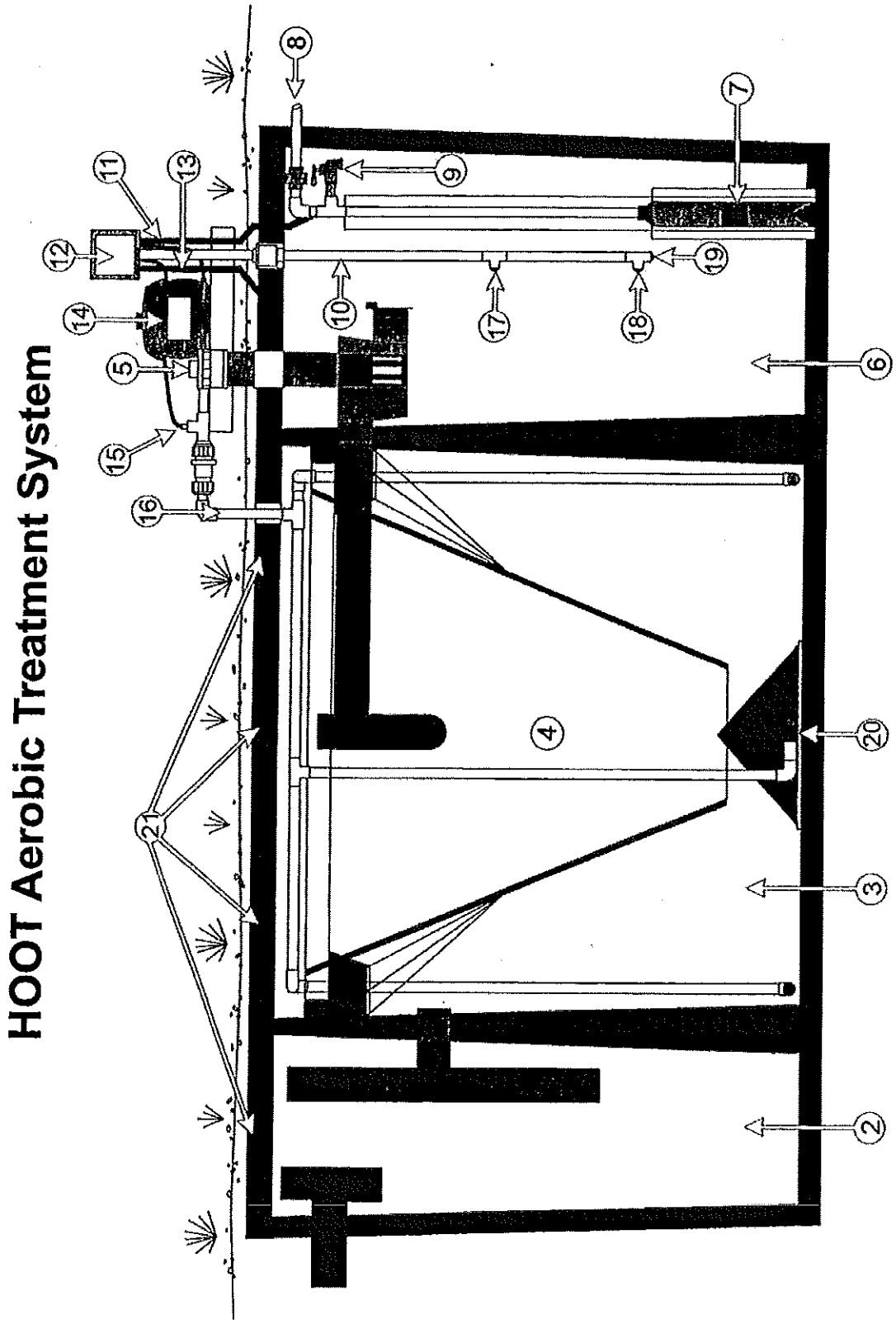
WARNING! IN CASE OF IMMINENT FLOOD, IMMEDIATELY TURN OFF THE ELECTRICAL POWER TO THE HOOT SYSTEM AT THE INDEPENDENT BREAKER LOCATED ON THE HOUSE. FAILURE TO TURN OFF THE ELECTRICAL POWER MAY CAUSE SERIOUS INJURY OR DEATH TO THE HOMEOWNER AND OTHER PERSONS AND MAY CAUSE SERIOUS DAMAGE TO THE HOOT SYSTEM AND OTHER PROPERTY.

WARNING! IF THE UNIT FAILS TO FUNCTION PROPERLY, DO NOT USE THE BATHROOM FACILITIES UNTIL QUALIFIED PERSONNEL FIX THE PROBLEM. USE OF THE BATHROOM FACILITIES DURING A SYSTEM FAILURE MAY CAUSE SERIOUS INJURY, ILLNESS, OR DEATH TO PERSONS AND MAY CAUSE SERIOUS DAMAGE TO THE HOOT SYSTEM AND OTHER PROPERTY.

WARNING! DO NOT ALLOW CHILDREN TO PLAY ON OR AROUND THE AEROBIC TREATMENT SYSTEM, THE SPRINKLER SYSTEM, OR OTHER OVER-LAND DISCHARGE AREA. ALLOWING CHILDREN TO PLAY IN THESE AREAS MAY CAUSE SERIOUS BODILY INJURY, ILLNESS, OR DEATH TO THE CHILDREN AND OTHER PERSONS AND MAY CAUSE DAMAGE TO THE HOOT SYSTEM AND OTHER PROPERTY.

DANGER! DO NOT OPEN CONTROL PANEL WITHOUT ELECTRICITY DISCONTENTED AND LOCKED OUT ON THE SYSTEM. FAILURE TO DO SO COULD CAUSE SEVERE INJURY OR DEATH

Table of Contents


HOOT Aerobic Treatment System
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21

The HOOT Aerobic Treatment System Diagram

1. Inlet
2. Pretreatment Tank
3. Aeration Chamber
4. Clarifier
5. Chlorinator
6. Pump Tank
7. Hoot Blaster Pump
8. Pump line out
9. Control valve
10. Probe
11. Pump wire
12. System Controller
13. Power Line (20 amp)
14. Linear Air Pump
15. Air Manifold
16. Aeration line
17. High Water Probe
18. Low Water Probe
19. Probe Ground
20. Aeration Stone
21. 15" Covers

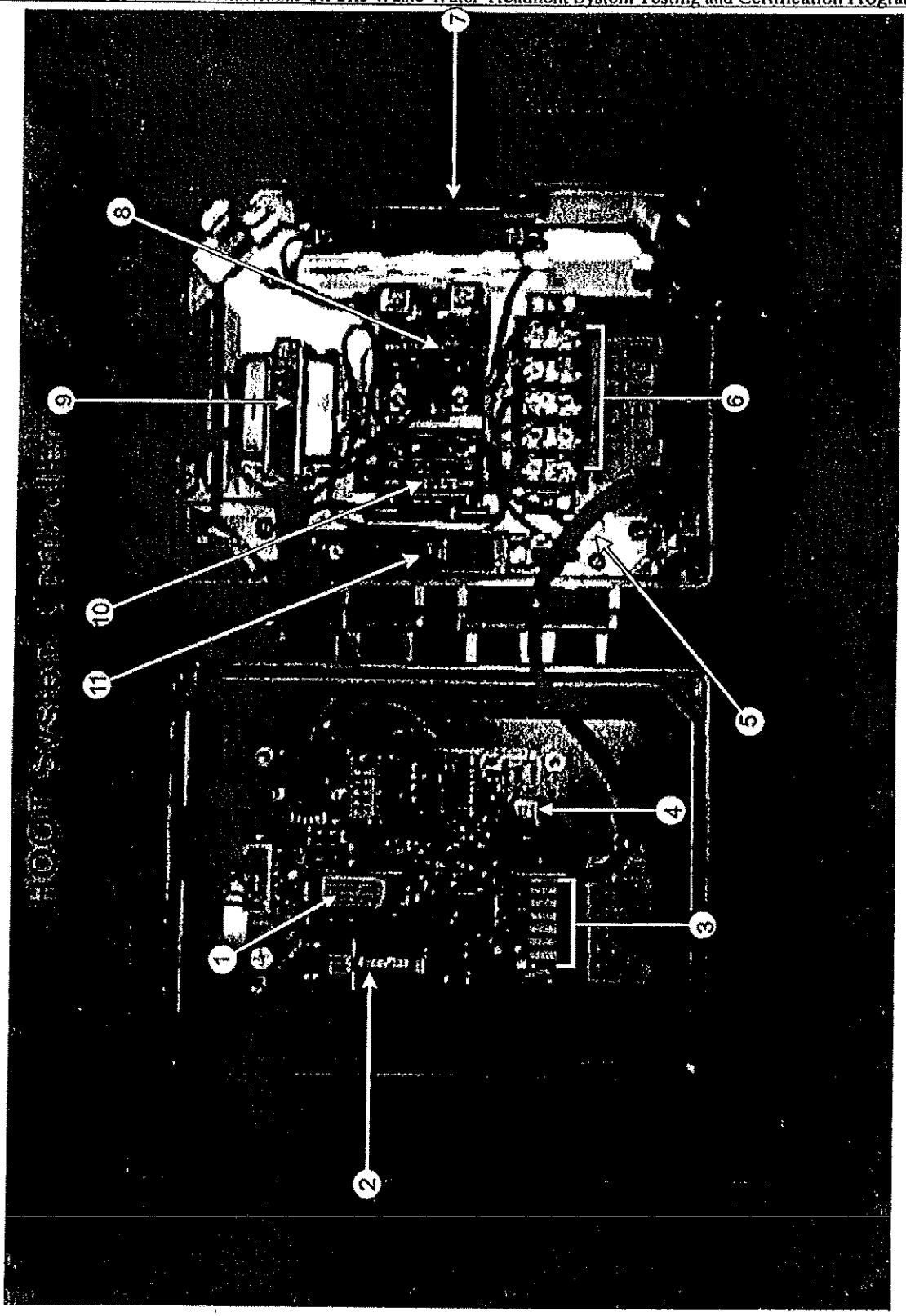
Tank Installation Instructions

1. See Tank dimensions section and dig hole approximately one foot larger than the tank all the way around - proper grade with smooth and level bottom.
2. Fill out Installation and Delivery Tracking Form. Driver will not leave tank at jobsite until this filled out.
3. Delivery driver will place tank in hole - and confirm it is level within 1 inch from center of tank to any corner.
4. Connect Schedule 40 inlet and Tee into one or more openings to the Pre-Treatment Tank, and Schedule 40 1" line out to sprinklers - back-fill with dirt and fill tank with water.
5. Bring required access ports to grade.
6. Follow the instructions for the System Controller Installation.
7. Hook up blower plumbing - including sensor line to the Aeration Tee.
8. Hook up water pump to sprinkler system. Make sure you have a minimum of 3 spray heads and that the orifices add up to a total of 12 Gallons Per Minute. If your plans call for only two heads, then place 2 back to back, with 180° radii to achieve a 360° with two spray heads, for a total of 3 spray heads.
9. Place cover over aerator - be sure not to pinch air line.
10. Power up system - it is ready to accept sewage.
11. Fill in Warranty Registration and Service Policy, and give to homeowner.

SPECIAL INSTRUCTIONS - PLEASE NOTE!

HOUSE WIRING MUST HAVE 30 AMP INDEPENDENT BREAKER AND MUST MEET NATIONAL - STATE - AND LOCAL REGULATIONS. INSTALLATION AND OPERATION MUST BE IN COMPLIANCE WITH STATE WATER REGULATIONS, COUNTY AND LOCAL PLUMBING AND ELECTRICAL CODES.

FAILURE TO COMPLY TO THE INSTRUCTIONS FOR THE INSTALLATION OF THE TANK AND THE SYSTEM CONTROLLER WILL VOID ANY AND ALL WARRANTIES PROVIDED BY HOOT AEROBIC SYSTEMS, INC., AND WILL PLACE THE BURDEN OF WARRANTY COVERAGE ON THE INSTALLER. FAILURE TO FOLLOW INSTALLATION INSTRUCTIONS PROPERLY MAY CAUSE SERIOUS INJURY, ILLNESS, OR DEATH TO PERSONS AND MAY CAUSE SERIOUS DAMAGE TO THE HOOT SYSTEM AND OTHER PROPERTY.


1
2
3
4
5
6
7
8
9
10
11

System Controller Installation

System Controller Diagram

1. Controller Chip
2. Nickel Metal Hydride 9 volt battery
3. Probe & CL hook-up
4. Dip Switches
5. Grounding Lug
6. Terminal Strip
7. 20 Amp Water Pump Breaker
8. 45 Amp Water Pump Relay
9. Transformer
10. Aeration Relay
11. 15 Amp Aeration Breaker

***A 30 Amp Service Box** - within sight of the unit, must be provided by the homeowner before the unit can be installed. Installer must have a qualified electrician bring a line out to the area where the unit is being installed for hook-up.

DETAILED INSTRUCTIONS

1. Unscrew the two screws securing the cover of the box.
2. Determine and cut the length of 1" PVC Conduit needed so that the box will be mounted taller than the blower housing.
3. Cut the conduit and glue it to the probe base on the Tank - feeding the probe wires through.
4. Mount the controller box to the top of the 1" conduit, feeding the probe wires through into the box.
5. Cut the probe wires so that there is approx. 12 inches of wire coming out of the box.
6. Strip back each of the wires, lift lever and insert wires according to the sticker under the board.
7. Feed the aerator cord through the compression connector, through the flex conduit and into the box. Then screw conduit into the connector on the box and glue conduit to compression adapter. Pull wire into the box, leaving approx. 1' of wire between the end of the conduit and the blower.
8. Connect the black wire to the + Blower screw on the terminal strip .
9. Bring the sprinkler pump wires and gray chlorinator sensor wires through flex conduit, screw flex conduit into the connector on the bottom of the box, then fill the stub on the tank, and each end of the flex conduit with Silicone II.**(Failure Silicone II flex pipe will void the warranty!)**
10. Connect one of the black pump wires + Pump screw on the terminal strip.
11. Strip back the gray wires and connect to the board next to the probe wires.
12. Make sure 30 amp circuit breaker,(power from house, supplied by owner) is turned off.
13. Bring the power wire through flex conduit, screw conduit into the connector on the box and fill each end of the flex conduit with Silicone II **(failure to Silicone II flex pipe will void the warranty!)**
14. Connect the hot wire (+) to space provided on the terminal strip.
15. Connect the neutral (-) from power line to the space provided on the terminal strip.
16. Connect the 2nd sprinkler pump wire and aerator to the neutrals space on the terminal strip.
17. Connect the ground from the power line, sprinkler pump and aerator to the grounding lug.
18. Turn both breakers in control box off, then on again to reset.
19. Hook up black air line to the brass compression fitting on the aeration tee.
20. Turn on 30 amp breaker at the house
21. Install the 9 volt battery into the connector on the board.
22. Re-install cover with the two screws, do not use screw gun or box damage may occur.
23. Turn Control box so that it faces the house or driveway.

HOOT Trouble Shooting Section

Problems at Start Up or After Power Loss

If **AERATION PROBLEM** occurs on Power up - Check Aerobic Chamber. The center tank should be full to the point where the pre-treatment tank is full and water flows into the pump tank. If it is not filled within 1 foot of the top in the Aeration tank, a **AERATION PROBLEM** will occur on start up. This occurs because there is not enough back pressure being developed, fill the tank and restart. If there is still a problem, check air line for leaks, black line and compression fittings, check valve, and inside tank for a lose or broken diffuser line or blown out/broken stone.

If **SYSTEM ALARM** red light on panel comes on only, no audible alarm occurs, and water pump begins to pump, there is too much water in the pump tank. This feature will pump the tank down for a maximum of one (1) hour. If pump does not come on, check breakers on bottom of panel, reset if necessary. If it has tripped, confirm it is the 20 amp breaker. If it is not, check the wiring inside the box and confirm we have not made an error during manufacturing. If it is the 20 amp breaker, the check valve on the top of the water pump is likely stuck. Remove the plumbing from the pump, turn the pump upside down and dislodge it. Be careful when you re-assemble the plumbing. If the water level is high only in the pump tank, the pump will be able to pump it down in the first hour of operation. If the entire system has been overfilled, you will get an alarm after one (1) hour of pumping. To pump the system down the rest of the way, simply cycle the power off, wait 5 seconds, and power back up. If there is still water above the high probe then the water pump will continue to pump. If the water level is between the low and the high probes, the system will go to normal operation.

If **SYSTEM ALARM** red light on panel comes on only, no audible alarm occurs, and nothing on the system functions, check to make sure that the computer chip is in the socket. If it is, make sure it is in the right direction, with the notch lined up.

If you get a fast flashing **WATER LEVEL PROBLEM** light, the probe has been incorrectly hooked up. Confirm that all connections to the board are good and to the proper locations according to the diagram on page 25 of this manual. If this not the problem, try a new controller board and chip, then probe.

If a FAST FLASHING **AERATION PROBLEM** occurs on Power up check for diffuser operation. If no Air is coming out, then the check valve has likely been installed backwards. Check that the arrow flows away from the air pump to the tank.

2000 System Troubleshooting Chart

RED **SYSTEM ALARM** YELLOW **AERATION PROBLEM** YELLOW **WATER LEVEL PROBLEM**	This is a Photocell Problem - First check for overhead light - if not- see (page 30)
RED **SYSTEM ALARM** YELLOW **AERATION PROBLEM**	Yellow Light is: **Steady** - Is Aeration Tank Full? Check for Air leaks, then see Aeration Problem (page 19) **Fast Flashing** - Air pump is dead headed - reverse check valve or stones completely clogged. (page 11)
RED **SYSTEM ALARM** YELLOW **WATER LEVEL PROBLEM**	Yellow Light is: **Steady** - Pump unable to lower below high probe **Slow Flashing** - Pump ran greater than 1 hour **Fast Flashing** - Wiring problem, bad probe or board. (pages19 &20)
RED **SYSTEM ALARM**	Will occur on start-up or after power failure if water is above high probe (page 20)
GREEN **SYSTEM OK** YELLOW **WATER LEVEL PROBLEM**	System has received greater than its daily rated capacity of water, will clear yellow light at pump out. (Pages 21)
GREEN **SYSTEM OK** YELLOW **AERATION PROBLEM**	Aeration pressure is too high. Check for excessive solids build up or clogged stones. (pages 10 &11)
RED FLASHING **SYSTEM ALARM**	Power is off to system or bad transformer. Pg. 20
GREEN **SYSTEM OK** RED FLASHING **SYSTEM ALARM**	Battery not installed/not yet charged or battery cannot hold charge and needs replacement.

If both **AERATION PROBLEM** and **WATER LEVEL PROBLEM** occur, the system cannot tell the difference between daylight and darkness. If either day, or night is greater than 32 hours, both the Aeration and Water Level lights, along with System Alarm red light and audible alarm. Air pump will be running.

1. Power down the controller. Place a piece of black electrical tape over the photocell. Make sure the tape is light tight and completely covers the photocell window. It only takes a small amount of light to give a false indication.
2. Turn the power on and observe green light. If you get a red light, pump system down until the water level is between low and high probe and reset system. Make certain there is water a least 3" over low probe.
3. Wait 3 minutes.
4. Remove the tape and wait about 2 minutes.5. The pump should start and will empty the tank to the low probe.

If the above works, you have an overhead light in the area, re-direct the light or controller.

If **AERATION PROBLEM** occurs go through this list in order, until the problem has been discovered and corrected. This is the quickest and most efficient way of solving and correcting and aeration problem.

Aeration Delivery System Diagnosis

1). Check to see that black air line is not pinched, and is properly installed into the end of the compression fitting. Make certain there is no debris in the compression fitting.
2). Confirm that check valve has been installed with arrow going away from aerator and with the flat part on top, check each end for leaks.
3). Listen for leaks at each fitting on top of tank.
4). Remove covers over each aerator stone, check for a loose or broken connections on top of hopper.
5). Restart system and visually check that each stone is delivering approximately an equal amount of air. If only one section is functioning, this indicates a broken or missing diffuser.

Electrical System Diagnosis

7). Check if 15 amp circuit breaker in controller is tripped
8). Check for loose connections inside control box

If a **WATER LEVEL PROBLEM** and audible alarm occurs, first determine if it is a problem with a **AERATION PROBLEM** (See Above) or STEADY, FAST or SLOW FLASHING, and find section below to trouble shoot and fix. Go through this list in order, until problem has been discovered and corrected. This is the quickest and most efficient way of solving and correcting and problem.

If a STEADY **WATER LEVEL PROBLEM** and audible alarm occurs the pump has been unable to lower the level below the high probe.

1). Check to see if 20 Amp Circuit breaker for water pump is tripped, reposition and restart.
2). Check valve on top of water pump stuck, remove pipe and check for proper movement and operation.
3). Sprinkler head pressure relief valve open too wide.
4). One or more sprinkler heads clogged (every system must have a minimum of 12 GPM of spray heads - check orifice size!)
5). Sprinkler pump is clogged.

If SLOW FLASHING **WATER LEVEL PROBLEM** and audible alarm occurs

This indicates that the pump has run greater than 1 hour and it has still not emptied the tank. This can occur if power has been off to the system for any extended period of time and the system has continued to be used or if one of the problems is present with the spray system. This problem may occur months into system operation due to a great number of factors.

1). Only 2 or less spray heads on the system. If there are only two called for in the system design, then place two heads back to back, each having a 180° radius to complete, together one, 360° radius.

2). Spray head orifices do not add up to 12 Gallons Per Minute. Install the right number and rating of orifices to equal a total of 12 GPM.

3). Sampling port in tank has been opened, or left open too much, not allowing for proper pump down of tank.

4). One or more spray heads is not working, or has a very limited amount of water movement. Clean out screen on head, or replace if necessary.

5). If Problem occurs only after a rain, then suspect infiltration into system. Also make certain gutters are not hooked up to Aerobic System

If FAST FLASHING **WATER LEVEL PROBLEM** and audible alarm occurs
1). Probe wires hooked up wrong or loose, confirm proper placement.
2). Problem with controller board.
3). Problem with probe.

If **SYSTEM ALARM** red light on panel comes on only, no audible alarm occurs, and nothing on the system functions, check to make sure that the computer chip is in the socket. If it is, make sure it is in the right direction, with the notch lined up.

If Flashing **SYSTEM ALARM** occurs with Green **SYSTEM OK** light
1) Battery not installed, Charged or is dead

If Flashing **SYSTEM ALARM** occurs only:
1). Circuit to system - from house - is tripped.
2). Circuit at house panel box for remote breaker is tripped.
3). Improper connection in controller box - see installation instructions.
4). Power line to unit is cut or broken, check for voltage with meter.
5). If power is present, then check for bad connection to transformer, from transformer to board, and finally replace transformer if necessary. If transformer has blown, this usually indicates that the system has been hooked up to 220 volts or that the system has suffered a lightening strike. Either way, expect that other damage have occurred.

Installer Self Test - All systems

This is a simple test designed to prevent you from needing to return because of a faulty installation As you know, you install the finest product available, to ensure you get off to a good start with the system owner, go through the following test. Failure to follow these procedures will normally result in a SYSTEM ALARM within the first 12 hours of operation.

1. Confirm that the water level in the Aeration (Center) Tank is less than 12" from the lid of the tank.
2. Confirm that the water level in the pump tank is between the low probe and high probe and is at least 12 inches above the sprinkler pump.

   If water level is above the high probe, turn on power - you will get a red light and the sprinkler pump will turn on. There will be no audible alarm. It will run for up to 1 hour to lower the water level, if it cannot in this amount of time you will get an alarm, reset system and pump down again. When level is between low and high probe, power down system for 5 seconds and restart. You should get a green light. Do Not Leave until all instructions below have been carried out.
3. Power up - turn independent 30 amp breaker on, you will hear a beep and all the lights will come on for 2 seconds, then the SYSTEM OK green light will flash.
4. The SYSTEM OK light flashes for 15 seconds, if there is enough air, the system will continue to operate, if not an AERATION PROBLEM will occur.
5. Check diffuser operation over each of the openings on the aeration chamber. If air is only coming out of one opening, then there is a missing or damaged stone. If no air is coming out, confirm check valve is in the right direction, then listen for air inside tank.
6. If enough air is being supplied, and there are no leaks, then you should continue to have operation. If not, and alarm will sound, check trouble shooting section for help.
7. Check sprinkler pump operation and spray pattern with any of the methods listed on page 10.
8. To stop sprinkler pump operation, power down, (turn off breaker, wait 5 seconds) confirm water is between low and high probes and restart system.
9. The SYSTEM OK light should come on and stay steady after 15 seconds. If not, see start-up troubleshooting on next page.

To Inspect Water Pump Operation

To prevent damage to the pump, the computer will not allow you to start the pump unless there is water over the low probe. To make the pump turn on to observe spray pattern, empty the tank or for inspection visits and sampling, you have four ways to turn it on:

1. With system running fill tank until water level reaches the high probe. This will turn on the pump for 4 minutes if it is a night pumper, or for one complete cycle if it is a day pumper.
2. Hold system alarm switch in the up position when you power up the system at the breaker. This will empty the tank to the level of the low water probe.
3. Unscrew the compression nut (where the black hose attaches) on the aeration tee. This will create an aeration failure, and the water pump will automatically lower the water level to the low water probe level.
4. Power up the controller and observe green light. Confirm that there is water over the low water probe, but not above the high probe. Wait 3 minutes. Place a piece of black electrical tape over the photocell and wait an additional 3 minutes. Remove the tape. Approximately 2 minutes later the pump will activate and confirm that the photocell is working correctly.

To Create A High Water Alarm for Inspection

To create a high water alarm for inspection purposes is a simple operation. Disconnect the Schedule 80 gray connection inside the tank which connects the pump to the application method chosen. Be sure to not loose the O-ring, it would be safe to remove it at this time. Rotate pump so that outlet faces a side wall (to minimize spray out of the system) Make sure system is on and you have a Green light SYSTEM OK. Next, fill the tank until the water level reaches the high water probe and continue filling tank during the test. This will activate the night pumper warning circuit if it is a night system for 30 seconds, then turn on the pump. If the system is a day or demand pumping configuration, then it will immediately turn on the pump. After four (4) minutes of operation, the system will realize that the water level has not dropped, it will attempt to clear what it thinks is a clogged pump. It will do this by electronically "jogging" it, turning it on for one (1) second, off for two (2) seconds ten (10) times in an attempt to loosen any debris that may be caught in the pump. The pump will then continue to pump down for an additional four (4) minutes. Since the water level has not lowered below the high water probe, a SYSTEM ALARM will occur, HIGH WATER PROBLEM. Silence alarm, reconnect pump (using O-Ring) and power down system. Wait 5 seconds and power up again.

If this does not produce an alarm, (common to day pumpers) then leave everything as it is above (pump scd. 80 disconnected) and disconnect the blue probe wire. Observe a green light on the front of the control panel. Fill the tank to two inches above the high probe and while you still have a green light on, reconnect the blue probe wire, resume test as is above. This is necessary because on a day pumping system the pump kicks on immediately and may break contact with the high probe, running the pump for one hour before giving an alarm.

Probe Operation and Maintenance

The PVC probe is activated by the Stainless Steel bolts which come in contact with the water as the tank level rises. They require little maintenance, contain no moving parts, so there is nothing to wear out or break. An a/c current runs through the bolts (which is equivalent to a watch battery) to prevent corrosion. A simple brushing of the bolt heads during the regular scheduled service is all the maintenance necessary for proper operation.

When water touches the high water probe, it turns on the HOOT Blaster effluent pump. The Day Pumping system will pump for up to four (4) minutes and look at the high water probe again. Under normal operation it will pump below the surface of the bolt and then continue to pump until the low water probe is reached.

If after four (4) minutes of pumping, the water level has not dropped below the surface of the high water probe, the system will attempt to clear the clogged pump. It will do this by electronically "jogging" it, turning it on for one (1) second, off for two (2) seconds ten (10) times in an attempt to loosen any debris that may be caught in the pump. The pump will then continue to pump down for an additional four (4) minutes. If the water level has not lowered below the high water probe, a SYSTEM ALARM will occur, HIGH WATER PROBLEM. To assist you with fixing the problem, please see the troubleshooting section.

On a Night Pumping system each time water touches the high probe, it will turn on the pump for four (4) minutes once it clears the high water probe. This cycle will repeat until 20 hours after sun up when the system will pump out the entire pump tank.

HOOT LIMITED WARRANTY AND REGISTRATION

HOOT Aerobic Systems, Inc.
2885 Highway 14 East Lake Charles, Louisiana 70607
(337) 474-2804 phone (337) 477-7904 fax

NO GENERAL WARRANTY: HOOT AEROBIC SYSTEMS, INC. DISCLAIMS ANY AND ALL WARRANTIES, EITHER EXPRESS OR IMPLIED, AND **EXPRESSLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

HOOT LIMITED WARRANTY: HOOT Aerobic Systems, Inc. ("HOOT") warrants faulty workmanship or construction of the HOOT treatment system for three (3) years from the date of purchase, subject to the following condition: If HOOT determines that the fault in workmanship or construction of the HOOT treatment system is not the result of improper installation, improper maintenance, failure to service, natural disaster, an act of God (including flood, lightning or fire ants), or tampering by any means, then, at HOOT's discretion, HOOT has the right to provide a replacement for such faulty component. The faulty component will be replaced with a rebuilt or new component to the Service Provider for the first three (3) years from the date of purchase. This Warranty extends to the HOOT Service Provider ONLY. During the initial 2 year service policy, the component will be replaced at no charge. During the third year, components will be provided only to a qualified HOOT Service Provider at no charge, however any and all installation charges will be the responsibility of the homeowner. All warranties are null and void if the system is not maintained under continual service contract.

SOLE REMEDY

HOOT's liability for any accident, injury, or damage to any person or property shall be limited to the purchase price of the HOOT Aerobic Treatment System. HOOT is not and shall not be liable for any incidental or consequential damages or injury, regardless of fault, to any person or property resulting from misdesign or mismanufacture of the HOOT Aerobic Treatment System, failure to warn, failure to label, or inadequate instructions in the manual. This clause is effective to the full extent allowed by law and shall be void where prohibited.

WARRANTY REGISTRATION

FOR THE ABOVE WARRANTY TO BE EFFECTIVE, THE HOMEOWNER AND ANY USER ATTEMPTING TO CLAIM ANY RIGHT UNDER THIS WARRANTY MUST COMPLETE THIS FORM AND RETURN A SIGNED COPY TO HOOT WITHIN THIRTY (30) DAYS FROM THE DATE OF INSTALLATION. The cost of pumping or cleaning of any component or compartment of the sewage treatment system, which becomes necessary for causes other than malfunction of the equipment, is the responsibility of the homeowner.

By signing this Service Policy, the Home Owner and the Service Provider agree to the terms of this policy. HOOT is not responsible for service, it is the SERVICE PROVIDER indicated below.

HOME OWNER	WARRANTY SERVICE PROVIDER
Name	Name of Service Company Representative
Address	Address
City	City
( ) -	( ) -
Phone	Phone
Signature of Home Owner	Signature of Service Provider and License #.

White Copy - Home Owner Yellow Copy - Installer Pink Copy - HOOT

TREATMENT SYSTEM INITIAL SERVICE POLICY

HOOT Aerobic Systems, Inc.
2885 Highway 14 East Lake Charles, Louisiana 70607
(337) 474-2804 phone (337) 477-7904 fax

Our Company,_____, will operate and maintain the Hoot Aerobic System located at_____, (legal description only)
Permit #_____, for the period of 2 years beginning_____and ending_____.

This contract will provide for all required inspections, testing and service of your HOOT Aerobic Treatment System. The policy will include the following:

1. _____ inspections a year/service calls (at least one every _____ months), for a total of_____ over the two-year period including inspection, adjustment and servicing of the mechanical, electrical and other applicable component parts to ensure proper function. This includes inspecting the control panel, air pumps, air filters, diffuser operation, and replacing or repairing any component not found to be functioning correctly.
2. An effluent quality inspection consisting of a visual check for color, turbidity, scum overflow and examination for odors. A test for chlorine residual and pH will be taken and reported as necessary.
3. If any improper operation is observed, which cannot be corrected at the time of the service visit, you will be notified immediately in writing of the conditions and estimated date of correction.
4. The Homeowner is responsible for maintaining a chlorine residual of at least 1mg/L in the treatment system. This can be accomplished by using chlorine tablets designed for wastewater use, NOT SWIMMING POOL TABLETS. Upon visit, if the system needs chlorine tablets the service provider will add them and charge the customer. If the customer fails in their responsibility to add the chlorine tablets, they are in violation of law and appropriate action will be taken.
   Initials of Installer_____ Initials of Homeowner_____
5. Any additional visits, inspections or sample collections required by specific Municipalities, Water/River Authorities, County Agencies the TNRCC or any other regulatory agency in your jurisdiction will be covered by this policy.

At the conclusion of the initial service policy, the Service Provider will make available, for purchase on an annual basis, a continuing service policy to cover labor for normal inspection, maintenance and repair. According to state law, all owners of aerobic systems must maintain a factory authorized service provider for the lifetime of the system.

With 48 hours of a request for service (weekends and holidays excluded), your system will be visited by the service provider listed below or their authorized agent. If there are any items which need correction and can not be immediately remedied, the service provider will inform the home owner, in writing, of the conditions and the estimated repair date.

The HOOT Homeowners Manual must be strictly followed or warranties are subject to invalidation. Pumping of sludge build-up, for reasons other than due to warrantied mechanical failure, are not covered by this policy and will result in additional charges. By signing this form, both Installer and Homeowner agree to the terms of this policy. By signing this form, both the Installer and the Homeowner agree that the Homeowner has received a copy of the Homeowners Manual and the Installer has made a reasonable effort to explain all pertinent information to the Homeowner.

HOOT is not responsible for service, it is the SERVICE PROVIDER indicated below.

HOME OWNER	SERVICE PROVIDER
Name	Name of Service Company Representative
Address	Address
City	City
( ) - Phone	( ) - Phone
Signature of Home Owner	Signature of Service Provider and License #.

THIS BOX MUST BE COMPLETED BY THE SERVICE PROVIDER

HOOT Model #_____ Blower/Panel Serial # _____ HOOT Mold # _____ - _____ - _____ - _____

White Copy - Home Owner Yellow Copy - Installer Pink Copy - HOOT Goldenrod Copy - Regulatory Agency

Service and Inspection Form

(This is an example only, please check State and Local Requirements)

This testing and reporting shall be completed, signed and dated after each inspection. One copy shall be retained by the maintenance company. The second copy is sent to the local permitting authority and the third copy is sent to the system owner along with an invoice for services by the maintenance company.

1. Actual Date of Visit: _____
2. System Inspection of Owner: _____
   Address: _____
   City, St., Zip: _____

Inspected Items:	Operational	Inoperative	Not Applicable
Aerator	☐	☐	☐
Aeration Plumbing	☐	☐	☐
Air Filter	☐	☐	☐
Effluent Pump	☐	☐	☐
Chlorinator	☐	☐	☐
OK System Light	☐	☐	☐
Probe	☐	☐	☐
Sprinkler Operation	☐	☐	☐
Photocell Test	☐	☐	☐
Battery	☐	☐	☐

Battery must be replaced once each year. Air Filter must be cleaned each service visit. Operation of effluent disposal system must be made each visit, including chlorine residual test, effluent pump operation and sprinkler operation.

3. Repairs to system (list all components replaced): _____

4. Tests Required and Results:

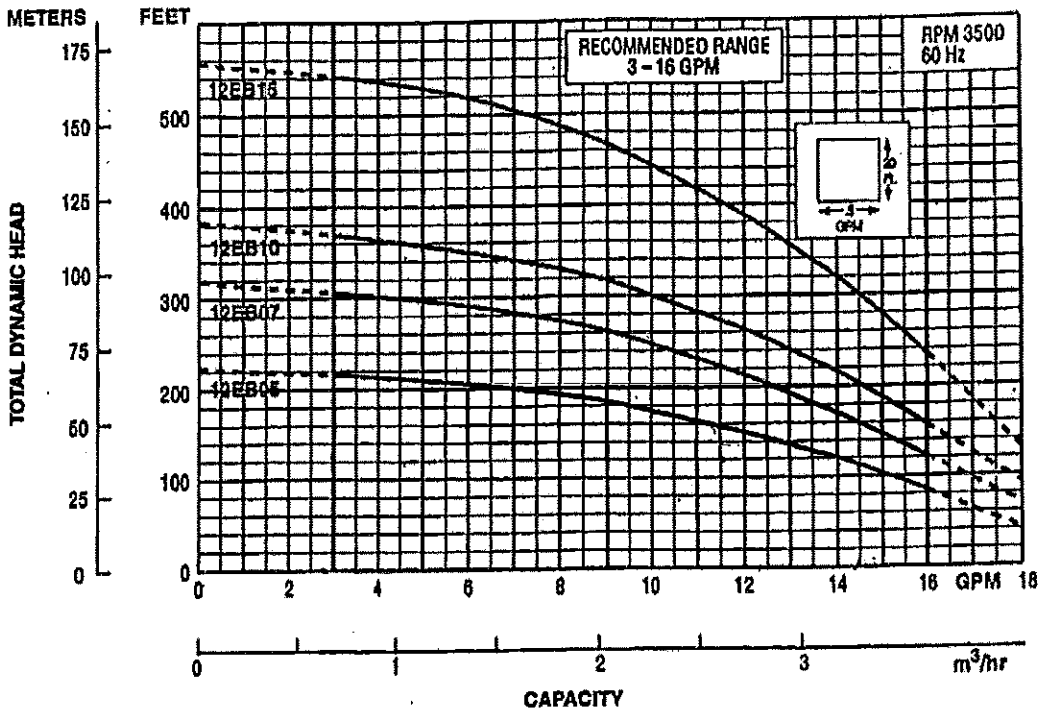
Test	Required	Results	Test Method
BOD (Grab)	☐	_____	_____
TSS (Grab)	☐	_____	_____
Fecal Coliform	☐	_____	_____
Chlorine Residual	☐	_____	_____

5. Comments: _____

Signature of Inspector: _____ Installer II or WW Lic # _____

Model 12EB

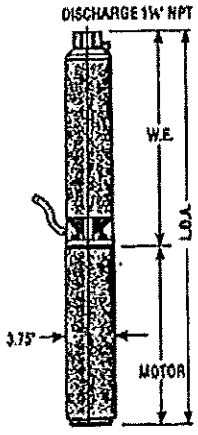
FILTERED EFFLUENT BLASTER.



DIMENSIONS AND WEIGHTS

Order Number	HP	Phase	Stages	Length (inches)			Weight (lbs.)		
				W.E.①	Motor	L.O.A.②	W.E.	Motor	Total
12EB0522, 12EB0521	½	1	7	11.0	9.5	20.5	4	18	22

① W.E. = water end or pump without motor.
② L.O.A. = length of assembly – complete pump – water end and motor.



HOOT BLASTER® Filtered Effluent Pump

SPECIFICATIONS

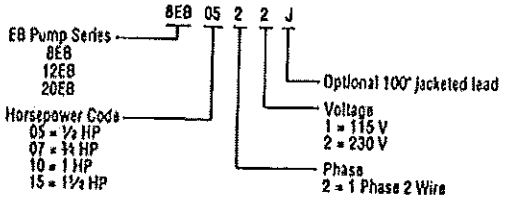
Model	Flow Range GPM	Horsepower Range	Best Eff. GPM	Discharge Connection	Maximum Solids Size	Rotation①
12EB	3–16	½–1½	10	1¼	¼" dia.	CCW
20EB	6–28	½–1½	16	1¼	¼" dia.	CCW

① Rotation is counterclockwise when observed from pump discharge end.

"EB" SERIES MATERIALS OF CONSTRUCTION

Part Name	Material
Discharge Head	Glass Filled Ultrathane
Check Valve Poppet	Ultrathane
Check Valve O-ring	E P Rubber
Bearing Spider – Upper	Glass Filled Polycarbonate
Bearing	Urethane
Kipring	AISI 301 SS
Diffuser	Glass Filled Polycarbonate
Impeller	
Bowl	AISI 304 SS
Shim	AISI 304 SS
Spacer	AISI 304 SS, Powder Metal
Inlet Strainer	Glass Filled Ultrathane
Motor Adapter	Glass Filled Ultrathane
Casing	AISI 304 SS
Shaft	
Coupling	AISI 304 SS, Powder Metal

ORDER NUMBER CODE



FEATURES

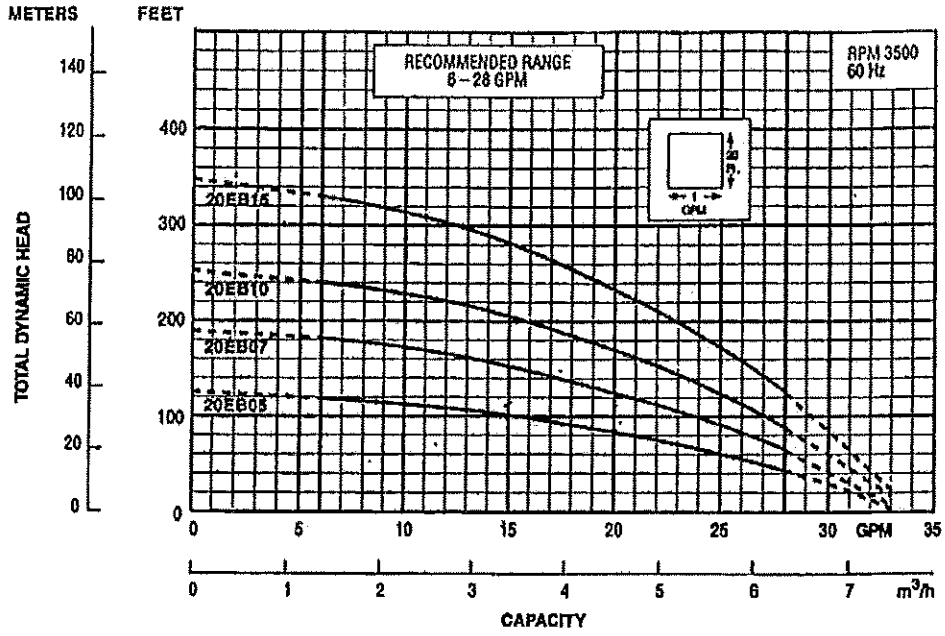
■ Designed for pumping filtered effluent from processed septic systems only.
■ **Field Serviceable:** Pump can be rebuilt in the field to like new condition with common tools and readily available spare parts. **NOTE: The Model EB has left hand casing threads.**
■ **Powered for Continuous Operation:** All ratings are within the working limits of the motor as recommended by the motor manufacturer. Pump can be operated continuously without damage to the motor.
■ **Metal Parts are Stainless Steel:** AISI types 301 and 304 are corrosion resistant.
■ **Non-Metallic Parts are Effluent Compliant:** Impellers, diffusers and bearing spiders constructed of glass filled polycarbonate, an engineered composite. This material is corrosion resistant.
■ **Discharge Head:** State of the art engineered composite material for superior strength and corrosion resistance. Loop for safety line molded into head.
■ **Motor Adapter:** State of the art engineered composite material with high rigidity to provide accurate alignment of liquid end to motor. Generous space for removal of motor mounting nuts with regular open-end wrench.
■ **Bowls:** Stainless steel for strength and abrasive resistance.
■ 100" 3 wire motor lead standard.
■ Consult factory for recommendations involving long run cycles followed by short off cycles to assure proper motor cooling flows.
■ **Check Valve:** Built-in check valve assembly on all models.
■ Warranted for one year against failure due to workmanship and materials. Solids plugged pumps are not covered. Pumps used for liquids other than filtered effluent are not covered.
■ **Stainless Steel Casing:** Polished stainless steel is attractive and durable in the most corrosive effluent.
■ **Hex Shaft Design:** Six sided shafts for positive impeller drive.
■ **Inlet Strainer:** Molded suction strainer built into motor adapter.
■ **Urethane Upper Bearings:** Fluted design for free passage of abrasives.
■ **Franklin Electric Motor:**
- Corrosion resistant stainless steel construction.
- Built-in surge arrestor is provided on single phase motors.
- Stainless steel splined shaft.
- Hermetically sealed windings.
- Replaceable motor lead assembly.
- UL 778 and CSA recognized.
- NEMA mounting dimensions.

■ Optional 100' jacketed power cord available.
■ **Agency Listings:** All complete pump/motor assemblies are UL778 and CSA listed. All Franklin Electric Motors are UL778 recognized.
■ All models have ⅛" diameter bypass in discharge head to ensure venting on start up.

Underwriters Laboratories File no. E174426
Canadian Standards Association File no. 38549

-Model 20EB

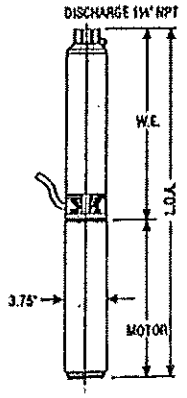
FILTERED EFFLUENT BLASTER.



DIMENSIONS AND WEIGHTS

Order Number	HP	Phase	Stages	Length (inches)			Weight (lbs.)		
				W.E.①	Motor	L.O.A.②	W.E.	Motor	Total
20EB0522, 20EB0521	½	1	4	9.6	9.5	19.1	3	18	21

① W.E. = water end or pump without motor.
② L.O.A. = length of assembly – complete pump – water end and motor.



Printed on recycled paper.

Specifications are subject to change without notice.

Effective April, 1996
Printed in the U.S.A.
BBLASTER

For Additional Information, Please Contact:

HOOT Aerobic Systems, Inc.
2885 Highway 14 East Lake Charles, LA 70607
(337) 474-2804 phone (337) 477-7904 fax

www.hootsystems.com

Printed in U.S.A. Rev.12 TxHOOT 12/01

This Page Intentionally Left Blank

Appendix D

BAYLOR
UNIVERSITY

December 14, 2007

Rebecca Fugitt
Ohio Department of Health
Water and Sewage Program
246 North High Street
Columbus, OH 43215

Mr. Ron Suchecki of Hoot Systems requested that I make additional statistical calculations to include the geometric mean for fecal coliforms in the report entitled "OSSF Nutrient Reduction Report for the Murphy Cormier Contractors Hoot #1 Wastewater Treatment System Completed by the Baylor University Wastewater Research Program" dated August 16, 2003.

The revised copy of this report, dated December 14, 2007 includes an additional column entitled "Geometric Mean." The geometric mean for fecal coliform during the 80-week period of 6-11, 2001 through 12-24, 2002 was 688.49 Colonies/100ml for Hoot #1.

If you have any questions, or concerns please contact us at your earliest convenience.

Sincerely,

Joe C. Yelderman Jr.

Dr. Joe C. Yelderman Jr., Director
Baylor Wastewater Research Program

WASTEWATER RESEARCH PROGRAM · DEPARTMENT OF ENVIRONMENTAL STUDIES
ONE BEAR PLACE #97266 · WACO, TEXAS 76798-7266 · (254) 710-4195 · FAX (254) 710-3409
E-MAIL wastewater_office@baylor.edu

OSSF Nutrient Reduction Report
for the
Murphy Cormier Contractors
Hoot #1
Wastewater Treatment System
Completed by the
Baylor University
Wastewater Research Program

August 16, 2003

Introduction

The following report details the results of extended effluent sampling and evaluation of the performance of the Hoot #1 wastewater treatment system by the Baylor University Wastewater Research Program to determine reduction of nutrient levels found in a documented raw influent wastewater stream.

Nutrients measured for the report include; Total Kjeldahl Nitrogen (TKN), ammonia, nitrate, nitrite, total phosphorous and phosphate. In addition, fecal coliform bacteria counts were made on the effluent only. TKN measures the total organic nitrogen and ammonia nitrogen. TKN plus nitrates and nitrites equal the total nitrogen in the influent or the effluent. In the decomposition of wastewater, organic nitrogen is converted into ammonia nitrogen, which in turn is converted into nitrate and nitrite. Nitrite is usually the lowest concentration and is sometimes omitted from the analysis of wastewater but is included in this study.

The mean, maximum, and minimum values in the raw and treated effluent for each of these parameters are reported in tabular and graphic form and may be found in the appendices included.

It is pertinent to note that the evaluation reported here took place during a period of time when the Hoot #1 system was undergoing an evaluation under the NSF/ANSI Standard 40 certification testing protocol at the Baylor University Testing and Certification test facility in Waco, Texas. The test was conducted from April 15, 2002 until December 24, 2002 and samples were taken on a weekly basis.

Systems undergoing this test protocol are dosed every day with the full gallons per day dose commensurate with the system daily rated capacity (in this case the Hoot #1 system was dosed with exactly 500 gallons per day in the beginning and later changed to 600 gallons per day). Notably the Standard 40 protocol also includes a six-month evaluation period of daily dosing and four stress sequences of non-ideal dosing conditions, designed to test the system's ability to perform under adverse conditions. Systems installed in the field under normal conditions are typically considered to receive somewhat less daily dosing volumes.

Executive Summary

Significant reductions occurred in total nitrogen and organic nitrogen. Specifically, phosphorous, phosphate, TKN and ammonia were reduced but nitrites and nitrates increased as the TKN and ammonia were converted to nitrates and nitrites. Variations or peaks do not seem to correlate directly with stress periods and weekly analyses may not provide enough detail to evaluate the specific effects of individual stresses. However, the stress periods did not appear to impact the treatment system's performance in overall reduction of nutrient levels in the treatment processes. Fluctuations in dosing and influent values may have had a greater impact on effluent concentrations. Generally, the system reduced nutrients and average effluent nutrient values were not at levels of health concern.

Summary Table

Raw Influent	mg/l	Treated Effluent	mg/l	
TKN	24.75	TKN	03.59	
Ammonia	14.80	Ammonia	02.62	
Nitrate	01.34	Nitrate	09.99	
Nitrite	00.25	Nitrite	00.39	**Reduction**
Total N	26.34	Total N	13.97	**47 %**
Total Organic N	09.95	Total Organic N	00.97	**90 %**
Phosphorous	08.78	Phosphorous	03.59	**59 %**
Phosphate	05.93	Phosphate	03.38	**43 %**

Fecal Coliform
Fecal coliform bacteria are often of concern in evaluating water quality. This study calculated the numbers of colonies per 100 ml of sample from the effluent only and the numbers varied widely from 10-28000 colonies/100ml. The average (mean) number of colonies/100ml was approximately 2800 (2779) but the median was 1200 (1195). The wide variability produced a standard deviation of 5000 (4983) colonies/100ml which was even greater than the average or the median value. The low and high values for the treated effluent were interspersed throughout the study but the highest values occurred during late 2001 and early 2002. Graphical and tabular data for fecal coliform bacteria are included in the appendices.

Total Kjeldahl Nitrogen (TKN)
The raw influent averaged 24.8 mg/l TKN (mean) and ranged from a low of 2.18 mg/l TKN on April 22, 2002 to a high of 196.00 mg/l TKN on Feb. 25, 2002. Only one of 82 samples exceeded 100 mg/l with only 5 samples exceeding 50 mg/l. The treated effluent averaged 3.6 mg/l TKN (mean) and ranged from a low of .05 mg/l TKN on June 4, 2001, to a high of 27.10 mg/l TKN on April 23, 2001. The median TKN value for the treated effluent was 1.5 mg/l and although this value is over 2 mg/l less than the mean value for the treated effluent it is more than 23 mg/l less than the mean value for the raw effluent. Only 3 of 82 samples exceeded 20 mg/l with only 8 samples exceeding 10 mg/l. The difference between the mean raw influent value and the mean effluent value is 16.98 mg/l which represents a decrease of over 85%. Only on three occasions did the treated effluent values exceed the raw influent values and 2 of these were the first few weeks in the study. Graphical and tabular data for TKN are included in the appendices.

Ammonia
The raw influent averaged 15 mg/l of ammonia (mean) and ranged from a low of .05 mg/l ammonia on April 22, 2002 to a high of 63.50 mg/l ammonia on September 30, 2002. Only 2 in 82 samples exceeded 50 mg/l and only 5 samples exceeded 30 mg/l but 22 samples exceeded 20 mg/l. The treated effluent averaged 2.6 mg/l ammonia (mean) and ranged from a low of .05 mg/l ammonia on numerous occasions to a high of 27.2 mg/l ammonia on August 26, 2002. The median ammonia value for the treated effluent was .16 mg/l and this value is almost 2.5 mg/l less than the mean value for the treated effluent and it is more than 14.5 mg/l less than the mean value for the raw influent. The lowest values for the treated effluent were in fall 2001 when values averaged close to .05 mg/l. The difference between the mean raw influent values for ammonia and the mean treated effluent values is approximately 12 mg/l which is a decrease of approximately 80 percent. The treated effluent values exceed the raw influent values on only three occasions of which 2 were in the first 2 weeks of the study. Graphical and tabular data for ammonia are included in the appendices.

Nitrate
Nitrate is the byproduct of nitrification of the ammonia. The raw influent averaged 1.3 mg/l of nitrate (mean) and ranged from a low of .05 mg/l nitrate on numerous occasions to a high of 31.50 mg/l nitrate on April 15, 2002. Only 1 in 81 samples exceeded 10 mg/l and only 4 values were greater than 5 mg/l. The treated effluent averaged 10 mg/l nitrate (mean) and ranged from a low of .05 mg/l nitrate on two occasions to a high of 26.10 mg/l nitrate on November 12, 2001. Only 6 in 81 samples exceeded 20 mg/l but 38 values were greater than 10 mg/l. The median nitrate value for the treated effluent was 9.7 mg/l. This value is about .3 mg/l less than the mean value for the treated effluent but it is more than 8 mg/l greater than the mean value for the raw influent. The lowest values for the treated effluent were in the first 2 weeks of the study when values were only .05 mg/l. The difference between the mean raw values for nitrate and the mean treated effluent values is an increase of over 8 mg/l. Graphical and tabular data for nitrate are included in the appendices.

Nitrite
Nitrite is the byproduct of nitrification of the ammonia. The raw influent averaged .26 mg/l of nitrite (mean) and ranged from a low of .05 mg/l nitrite on numerous occasions to a high of 1.99 mg/l nitrite on February 4, 2002. Only 7 in 80 samples exceeded 1 mg/l. The treated effluent averaged .39 mg/l nitrite (mean) and ranged from a low of .05 mg/l nitrite on numerous occasions to a high of 5.22 mg/l nitrite on

July 8, 2002. The median nitrite value for the treated effluent was .11 mg/l and this value is almost .3 mg/l less than the mean value for the treated effluent and .15 less than the mean value for the raw influent. The difference between the mean raw values for nitrite and the mean treated effluent values is an increase of about .13 mg/l. Graphical and tabular data for nitrite are included in the appendices.

Nitrogen Summary

The TKN is the sum of the ammonia nitrogen and the organic nitrogen. Therefore, the total organic nitrogen is the mean TKN value minus the mean ammonia value. The mean organic nitrogen calculated for the raw influent is 9.95 mg/l. The total nitrogen is the sum of the TKN, nitrate and nitrite. Therefore, the total mean nitrogen for the raw influent is 26.34 mg/l. The organic mean nitrogen for the treated effluent is .97 mg/l and the total mean nitrogen for the treated effluent is 13.97 mg/l. This is a reduction of approximately 90% of the organic mean nitrogen and approximately 47% of the total mean nitrogen.

Phosphorous

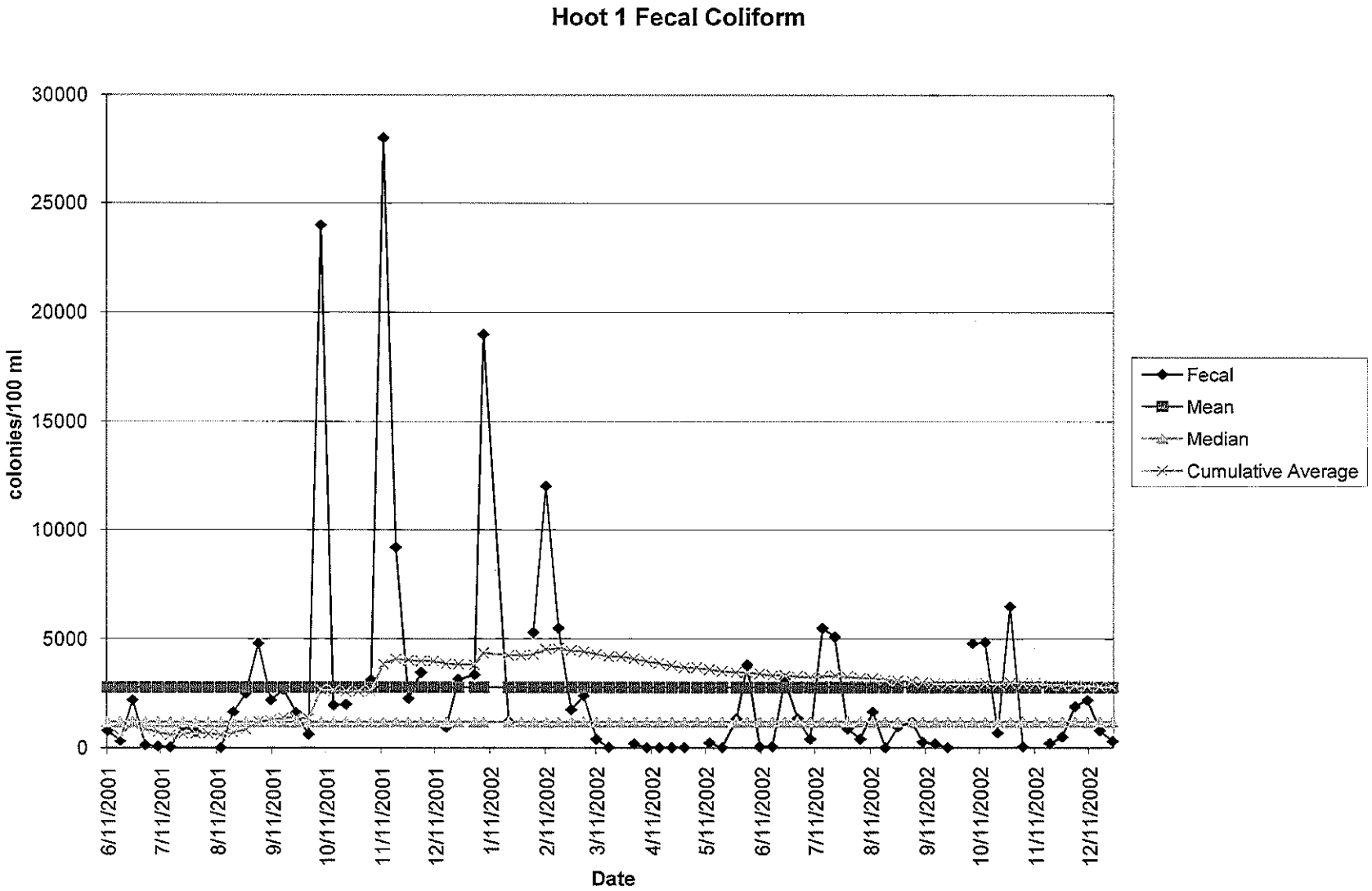
The raw influent averaged 8.78 mg/l of phosphorous (mean) and ranged from a low of 1.16 mg/l phosphorous on April 22, 2002, to a high of 79.3 mg/l phosphorous on August 13, 2001. Only 1 in 82 samples exceeded 50 mg/l but 4 exceeded 20 mg/l and 18 exceeded 10 mg/l. The treated effluent averaged 3.6 mg/l phosphorous (mean) and ranged from a low of .21 mg/l phosphorous on September 16, 2002, to a high of 7.4 mg/l phosphorous on August 26, 2002. The median phosphorous value for the treated effluent was 3.4 mg/l and although this value is about .5 mg/l less than the mean value for the treated effluent, it is over 5 mg/l less than the mean value for the raw influent. The difference between the mean raw values for phosphorous and the mean treated effluent values is 5.2 mg/l which is a decrease of over 59 percent. On several occasions the treated effluent values exceeded the raw influent values but toward the end of the test, the raw was always greater than the effluent. Graphical and tabular data for phosphorous are included in the appendices.

Phosphate

The raw influent averaged 5.9 mg/l of phosphate (mean) and ranged from a low of .67 mg/l phosphate on April 8, 2002, to a high of 40.50 mg/l phosphate on September 3, 2001. The treated effluent averaged 3.4 mg/l phosphate (mean) and ranged from a low of .21 mg/l phosphate on June 10, 2002, to a high of 6.97 mg/l phosphate on August 5, 2002. The median phosphate value for the treated effluent was 3.3 mg/l and although this value is almost identical to the mean value for the treated effluent, it is over 2 mg/l less than the mean value for the raw influent. The difference between the mean raw values for phosphate and the mean treated effluent values is about 2.5 mg/l which is a decrease of approximately 43 percent. On several occasions the treated effluent values exceeded the raw influent values. Graphical and tabular data for phosphate are included in the appendices.

Appendix I

Graphical data


Hoot 1 Fecal Coliform
30000
25000
20000
15000
10000
5000
0
colonies/100 ml
6/11/2001
7/11/2001
8/11/2001
9/11/2001
10/11/2001
11/11/2001
12/11/2001
1/11/2002
2/11/2002
3/11/2002
4/11/2002
5/11/2002
6/11/2002
7/11/2002
8/11/2002
9/11/2002
10/11/2002
11/11/2002
12/11/2002
Date
Fecal
Mean
Median
Cumulative Average

Hoot 1

Fecals

Obs	DATE	Fecal	Mean	Median	Cumulative Average	Geo Mean
		col/100 ml	col/100 ml	col/100 ml	col/100 ml	col/100 ml
1	6/11/2001	800	2778.61	1195.00		688.49
2	6/18/2001	330	2778.61	1195.00	565.00	688.49
3	6/25/2001	2200	2778.61	1195.00	1110.00	688.49
4	7/2/2001	130	2778.61	1195.00	865.00	688.49
5	7/9/2001	80	2778.61	1195.00	708.00	688.49
6	7/16/2001	40	2778.61	1195.00	596.67	688.49
7	7/23/2001	1010	2778.61	1195.00	655.71	688.49
8	7/30/2001	740	2778.61	1195.00	666.25	688.49
9	8/6/2001		2778.61	1195.00	666.25	688.49
10	8/13/2001	10	2778.61	1195.00	593.33	688.49
11	8/20/2001	1640	2778.61	1195.00	698.00	688.49
12	8/27/2001	2500	2778.61	1195.00	861.82	688.49
13	9/3/2001	4800	2778.61	1195.00	1190.00	688.49
14	9/10/2001	2200	2778.61	1195.00	1267.69	688.49
15	9/17/2001	2700	2778.61	1195.00	1370.00	688.49
16	9/24/2001	1600	2778.61	1195.00	1385.33	688.49
17	10/1/2001	630	2778.61	1195.00	1338.13	688.49
18	10/8/2001	24000	2778.61	1195.00	2671.18	688.49
19	10/15/2001	1960	2778.61	1195.00	2631.67	688.49
20	10/22/2001	2000	2778.61	1195.00	2598.42	688.49
21	10/29/2001		2778.61	1195.00	2598.42	688.49
22	11/5/2001	3120	2778.61	1195.00	2624.50	688.49

Fecals

Obs	DATE	Fecal	Mean	Median	Cumulative Average	Geo Mean
		col/100 ml	col/100 ml	col/100 ml	col/100 ml	col/100 ml
23	11/12/2001	28000	2778.61	1195.00	3832.86	688.49
24	11/19/2001	9200	2778.61	1195.00	4076.82	688.49
25	11/26/2001	2280	2778.61	1195.00	3998.70	688.49
26	12/3/2001	3460	2778.61	1195.00	3976.25	688.49
27	12/10/2001		2778.61	1195.00	3976.25	688.49
28	12/17/2001	950	2778.61	1195.00	3855.20	688.49
29	12/24/2001	3150	2778.61	1195.00	3828.08	688.49
30	1/2/2002	3350	2778.61	1195.00	3810.37	688.49
31	1/7/2002	19000	2778.61	1195.00	4352.86	688.49
32	1/21/2002	1200	2778.61	1195.00	4244.14	688.49
33	1/28/2002		2778.61	1195.00	4244.14	688.49
34	2/4/2002	5300	2778.61	1195.00	4279.33	688.49
35	2/11/2002	12000	2778.61	1195.00	4528.39	688.49
36	2/18/2002	5500	2778.61	1195.00	4558.75	688.49
37	2/25/2002	1750	2778.61	1195.00	4473.64	688.49
38	3/4/2002	2400	2778.61	1195.00	4412.65	688.49
39	3/11/2002	400	2778.61	1195.00	4298.00	688.49
40	3/18/2002	20	2778.61	1195.00	4179.17	688.49
41	3/25/2002		2778.61	1195.00	4179.17	688.49
42	4/1/2002	190	2778.61	1195.00	4071.35	688.49
43	4/8/2002	10	2778.61	1195.00	3964.47	688.49
44	4/15/2002	10	2778.61	1195.00	3863.08	688.49

Obs	DATE	Fecal	Mean	Median	Cumulative Average	Geo Mean
		col/100 ml	col/100 ml	col/100 ml	col/100 ml	col/100 ml
45	4/22/2002	10	2778.61	1195.00	3766.75	688.49
46	4/29/2002	10	2778.61	1195.00	3675.12	688.49
47	5/6/2002		2778.61	1195.00	3675.12	688.49
48	5/13/2002	240	2778.61	1195.00	3593.33	688.49
49	5/20/2002	10	2778.61	1195.00	3510.00	688.49
50	5/28/2002	1330	2778.61	1195.00	3460.45	688.49
51	6/3/2002	3800	2778.61	1195.00	3468.00	688.49
52	6/10/2002	50	2778.61	1195.00	3393.70	688.49
53	6/17/2002	60	2778.61	1195.00	3322.77	688.49
54	6/24/2002	3150	2778.61	1195.00	3319.17	688.49
55	7/1/2002	1350	2778.61	1195.00	3278.98	688.49
56	7/8/2002	410	2778.61	1195.00	3221.60	688.49
57	7/15/2002	5500	2778.61	1195.00	3266.27	688.49
58	7/22/2002	5100	2778.61	1195.00	3301.54	688.49
59	7/29/2002	880	2778.61	1195.00	3255.85	688.49
60	8/5/2002	410	2778.61	1195.00	3203.15	688.49
61	8/12/2002	1650	2778.61	1195.00	3174.91	688.49
62	8/19/2002	10	2778.61	1195.00	3118.39	688.49
63	8/26/2002	970	2778.61	1195.00	3080.70	688.49
64	9/3/2002	1190	2778.61	1195.00	3048.10	688.49
65	9/9/2002	270	2778.61	1195.00	3001.02	688.49
66	9/16/2002	190	2778.61	1195.00	2954.17	688.49

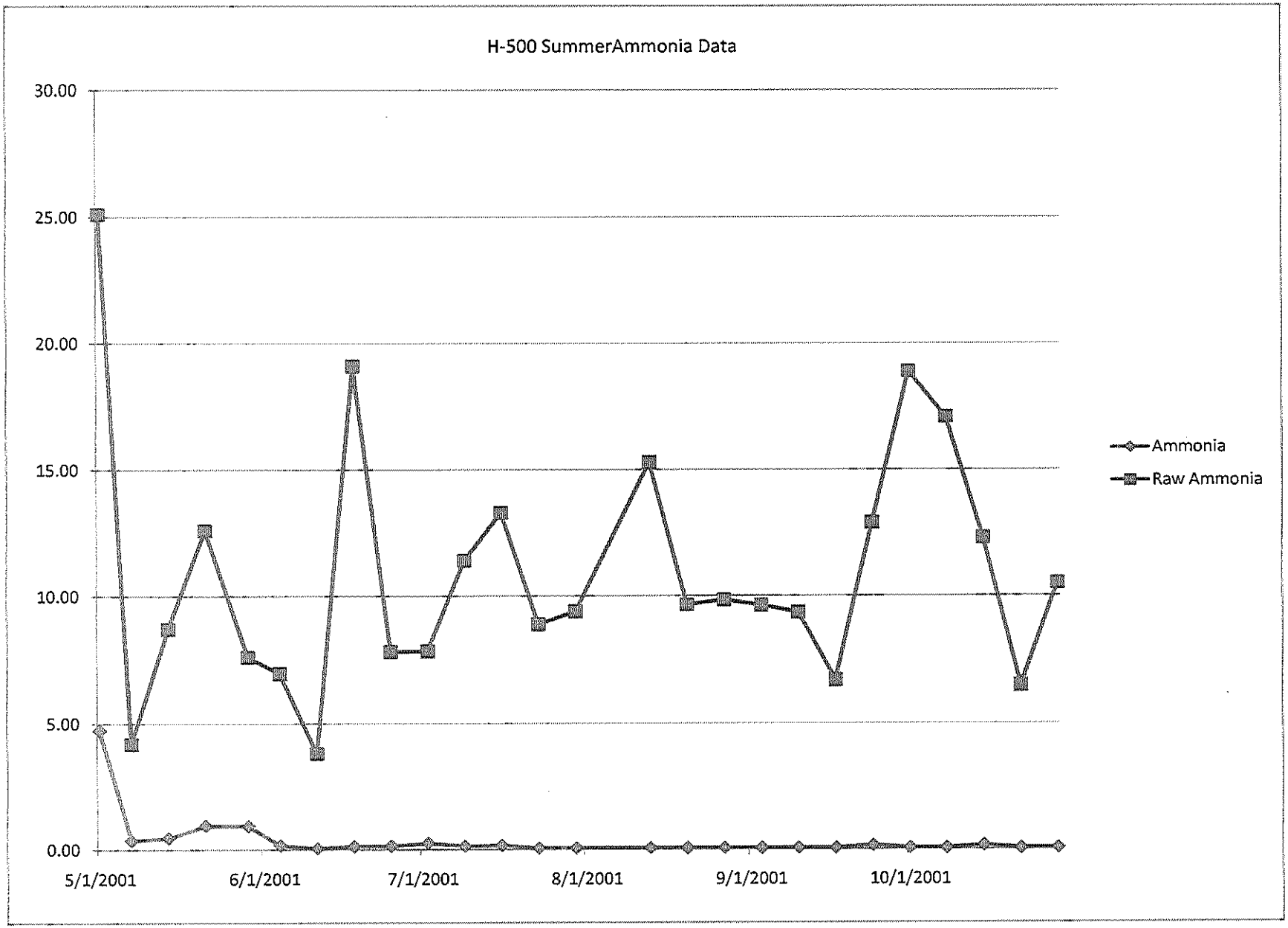
Hoot 1 Fecals

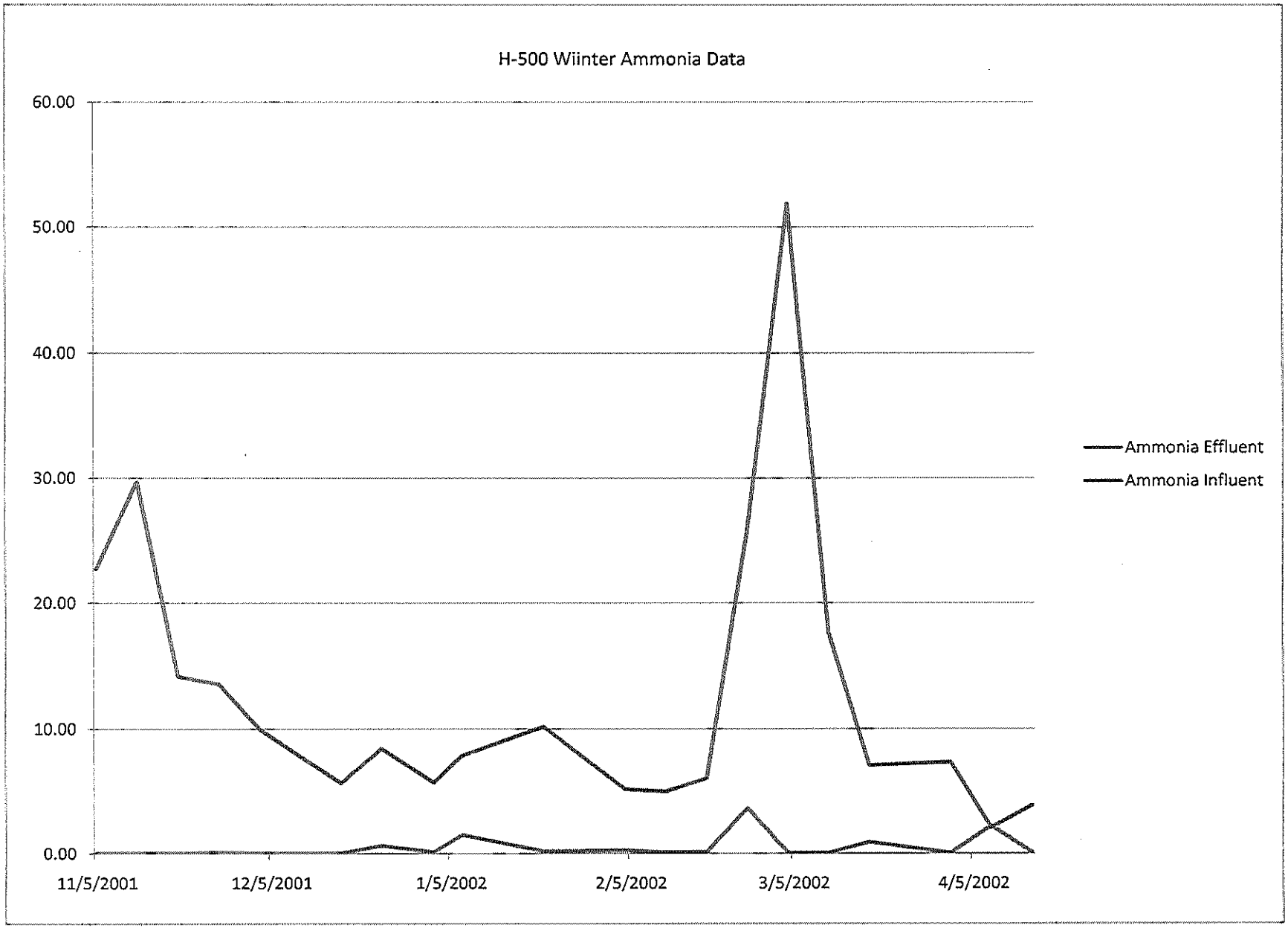
Obs	DATE	Fecal	Mean	Median	Cumulative Average	Geo Mean
		col/100 ml	col/100 ml	col/100 ml	col/100 ml	col/100 ml
67	9/23/2002	10	2778.61	1195.00	2905.90	688.49
68	9/30/2002		2778.61	1195.00	2905.90	688.49
69	10/7/2002	4800	2778.61	1195.00	2936.45	688.49
70	10/14/2002	4860	2778.61	1195.00	2966.98	688.49
71	10/21/2002	690	2778.61	1195.00	2931.41	688.49
72	10/28/2002	6500	2778.61	1195.00	2986.31	688.49
73	11/4/2002	50	2778.61	1195.00	2941.82	688.49
74	11/11/2002		2778.61	1195.00	2941.82	688.49
75	11/19/2002	200	2778.61	1195.00	2900.90	688.49
76	11/26/2002	500	2778.61	1195.00	2865.59	688.49
77	12/3/2002	1900	2778.61	1195.00	2851.59	688.49
78	12/10/2002	2200	2778.61	1195.00	2842.29	688.49
79	12/17/2002	800	2778.61	1195.00	2813.52	688.49
80	12/24/2002	300	2778.61	1195.00	2778.61	688.49

H-500 A Summer and Winter Ammonia Data

Summer Ammonia Numbers		
DATE	Ammonia	Raw Ammonia
	mg/l	mg/l
5/1/2001	4.73	25.10
5/7/2001	0.36	4.19
5/14/2001	0.46	8.71
5/21/2001	0.95	12.60
5/29/2001	0.94	7.60
6/4/2001	0.16	6.96
6/11/2001	0.05	3.80
6/18/2001	0.13	19.10
6/25/2001	0.13	7.81
7/2/2001	0.25	7.83
7/9/2001	0.13	11.40
7/16/2001	0.16	13.30
7/23/2001	0.05	8.89
7/30/2001	0.05	9.39
8/13/2001	0.05	15.30
8/20/2001	0.05	9.66
8/27/2001	0.05	9.84
9/3/2001	0.05	9.63
9/10/2001	0.05	9.35
9/17/2001	0.05	6.70
9/24/2001	0.15	12.90
10/1/2001	0.05	18.90
10/8/2001	0.05	17.10
10/15/2001	0.16	12.30
10/22/2001	0.05	6.48
10/29/2001	0.05	10.50
Average	0.36	10.97
Median	0.09	9.65
Max	4.73	25.10
Min	0.05	3.80

Winter Ammonia Numbers		
DATE	Ammonia	Raw Ammonia
	mg/l	mg/l
11/5/2001	0.05	22.70
11/12/2001	0.05	29.70
11/19/2001	0.05	14.20
11/26/2001	0.11	13.60
12/3/2001	0.06	10.00
12/17/2001	0.05	5.66
12/24/2001	0.64	8.46
1/2/2002	0.13	5.72
1/7/2002	1.52	7.92
1/21/2002	0.20	10.20
2/4/2002	0.27	5.17
2/11/2002	0.09	5.00
2/18/2002	0.15	6.05
2/25/2002	3.66	25.70
3/4/2002	0.05	51.90
3/11/2002	0.05	17.70
3/18/2002	0.93	7.09
4/1/2002	0.05	7.37
4/8/2002	2.23	2.08
4/15/2002	0.10	3.87
Average	0.52	13.00
Median	0.11	8.19
Max	3.66	51.90
Min	0.05	2.08


H-500 SummerAmmonia Data
30.00
25.00
20.00
15.00
10.00
5.00
0.00
5/1/2001
6/1/2001
7/1/2001
8/1/2001
9/1/2001
10/1/2001
Ammonia
Raw Ammonia


H-500 Wiinter Ammonia Data
60.00
50.00
40.00
30.00
20.00
10.00
0.00
11/5/2001
12/5/2001
1/5/2002
2/5/2002
3/5/2002
4/5/2002
Ammonia Effluent
Ammonia Influent

Appendix E

NSF International

January 21, 2009

Minnesota Pollution Control Agency
Attn: Ms. Barbara McCarthy
520 Lafayette Road North
St. Paul, MN 55155-4194

Dear Ms. McCarthy,

I am writing you on behalf of Hoot Aerobic Systems, Inc. The attached reports are for E-Coli and Fecal effluent from a Salcor 3G UV system, which was set up behind 3 different configurations of Hoot Aerobic Systems, Inc. H-Series treatment systems. There were 3 different flow rates, of 450, 500 and 600 gallons per day. NSF obtained and tested samples 3 times per week, each sample during a different loading event for both E-Coli and Fecal.

The 450 Gallon per Day Test was done simultaneous to a Standard 40/245 Performance Evaluation for the Hoot-ANR Treatment System.

The 500 Gallon per Day Test was done simultaneous over a 30 day "Post Aeration" test required for approval in the State of Ohio.

The 600 Gallon per Day Test is underway and simultaneous to a Standard 40/245 performance Evaluation for the Hoot-BNR Treatment System.

All three of the systems utilize the same tank and same, single Salcor 3G UV unit.

Please reference the attached sheets for the performance of the system during the various configurations. All of the configurations produced results with a 30 day Geomean <200 fcu.

As an ANSI accredited third party certifier, NSF International verifies that the Fecal and E-Coli data is correct and true. Please review this information immediately upon receipt. Should you have any questions, please contact me directly.

Sincerely,

Sharon Steiner

Sharon Steiner — 734-827-6846 (Voice)
Business Unit Manager — 734-827-7750 (Fax)
Wastewater Treatment Unit Program — steiner@nsf.org (E-mail)

cc: corporate correspondence (0W770)
Ron Suchecki- Hoot

Date	Influent (2D)	UV Effluent (2G)	Geomean
05/08/06	2,600,000	100	
05/10/06	200,000,000	600,000	
05/12/06	8,000,000	100	
05/15/06	5,350,000	20	
05/17/06	4,400,000	10	
05/19/06	10,200,000	50	
05/22/06	10,200,000	10	161
05/24/06	5,350,000	40	
05/26/06	8,800,000	200	
05/29/06	12,400,000	1,140	
05/31/06	16,800,000	1,110	
06/02/06	30,400,000	390	
06/05/06	14,200,000	20	
06/07/06	19,200,000	770	
06/09/06	12,800,000	180	
06/12/06	12,600,000	10	
06/14/06	41,600,000	10	
06/16/06	52,800,000	10	
06/19/06	13,600,000	10	
06/21/06	32,800,000	10	23
06/23/06	25,800,000	290	
06/26/06	5,600,000	10	
06/28/06	13,200,000	10	
06/30/06	18,700,000	10	
7/3/2006	6,950,000	10	
7/5/2006	19,400,000	10	
7/7/2006	14,000,000	10	
7/10/2006	9,600,000	210	
7/12/2006	15,400,000	10	
7/14/2006	27,600,000	10	
7/17/2006	21,700,000	10	
7/19/2006	13,400,000	10	
7/21/2006	8,200,000	300	134
7/24/2006	15,120,000	7,700	
7/26/2006	15,000,000	170	
7/28/2006	8,100,000	4,700	
07/31/06	8,980,000	100	
08/02/06	9,400,000	2,800	
08/04/06	8,960,000	410	

Date	Influent (2D)	UV Effluent (2G)	Geomean
08/07/06	1,400,000	10	
08/09/06	8,000,000	10	
08/11/06	13,200,000	370	
08/14/06	12,000,000	10	
08/16/06	6,200,000	10	
08/18/06	18,600,000	40	45
08/21/06	9,000,000	10	
08/23/06	18,400,000	165	
08/25/06	19,100,000	d	
08/28/06	3,500,000	1,000	
09/04/06	19,600,000	150	
09/06/06	36,000,000	10	
09/08/06	28,000,000	1,150	
09/18/06	8,400,000	10	143
09/20/06	13,500,000	750	
09/27/06	18,000,000	70	
09/29/06	28,300,000	1,405	
10/16/06	20,500,000	10	
10/18/06	44,000,000	90	
10/20/06	14,400,000	10	
10/23/06	24,000,000	320	
10/25/06	14,400,000	60	33
10/27/06	16,800,000	270	
10/30/06	9,400,000	10	
11/01/06	19,000,000	30	
11/03/06	17,000,000	10	
11/06/06	12,000,000	10	

(d) Sample was not analyzed due to a laboratory error.

Hoot -Salcor G3 Effleunt Results with Post Aeration

Date	Influent Fecal	Effluent Post-lamp Fecal	Effluent Post-lamp E-Coli
02/18/08	3,200,000	<10	1
02/20/08	4,200,000	<10	No Data
02/22/08	5,350,000	<10	2
02/25/08	14,600,000	<10	<1
02/27/08	6,400,000	<100	<1
02/29/08	10,000,000	<10	<1
03/03/08	4,100,000	90	107
03/05/08	4,500,000	300	86
03/07/08	6,600,000	40	18
03/10/08	10,600,000	260	166
03/12/08	1,900,000	350	321
03/14/08	5,250,000	630	650
03/17/08	2,200,000	200	118
03/19/08	3,200,000	10	21
03/21/08	12,400,000	80	45
Geo Mean	**5.3E+06**	**54**	**20**

Hoot-BNR 600

Date	Raw Influent Fecal	Effluent Fecal	Fecal Geomean	Raw Influent E. Coli	Effluent E. Coli	E.Coli Geomean
09/15/08	6,100,000	100		4,940,000	3	
09/17/08	27,600,000	60		5,010,000	8	
09/19/08	9,600,000	60		10,700,000	28	
09/22/08	5,300,000	70		4,400,000	44	
09/24/08	5,800,000	10		4,340,000	44	
09/26/08	9,200,000	50		2,880,000	24	
09/29/08	2,900,000	10	29	2,720,000	2	16
10/01/08	4,700,000	98		5,350,000	22	
10/03/08	12,600,000	80		7,360,000	3	
10/06/08	3,000,000	4		12,600,000	44	
10/08/08	4,950,000	14		11,200,000	10	
10/10/08	2,800,000	16		11,000,000	23	
10/13/08	4,300,000	10		16,100,000	85	
10/15/08	5,400,000	64		12,400,000	54	
10/17/08	4,150,000	4		14,900,000	51	
10/20/08	3,700,000	10		14,400,000	156	
10/22/08	5,700,000	6		12,600,000	2	
10/24/08	5,250,000	260		37,800,000	89	
10/27/08	4,900,000	144	44	23,400,000	211	71
10/29/08	2,600,000	112		15,200,000	331	
10/31/08	5,350,000	66		13,600,000	163	
11/03/08	3,000,000	40		7,000,000	88	
11/05/08	7,200,000	150		15,300,000	40	
11/07/08	6,050,000	38		13,900,000	91	
11/10/08	1,800,000	40		5,720,000	113	
11/12/08	4,300,000	34		9,580,000	41	
11/14/08	5,300,000	14		5,290,000		
11/17/08	2,200,000	66		9,100,000	168	
11/19/08	4,000,000	10	45	10,400,000	6	79
11/21/08	12,200,000	140		12,900,000	105	
11/24/08	1,500,000	46		6,130,000	120	
11/26/08	4,300,000	10		22,000,000	37	
11/28/08	2,200,000	120		10,000,000	488	
12/01/08	2,600,000	400		6,160,000	96	
12/03/08	2,800,000	56		7,500,000	76	
12/05/08	2,900,000	45		8,880,000	110	
12/08/08	2,600,000	85		2,440,000	150	
12/10/08	4,000,000	268		2,440,000	550	
12/12/08	4,850,000			3,690,000	272	
12/15/08	2,000,000	120		2,860,000	79	
12/17/08	3,850,000	5	116	1,780,000	1	139
12/19/08	3,350,000	410		4,500,000	488	
12/22/08	1,800,000	135		2,320,000	117	
12/24/08	1,500,000	170		2,160,000	387	
12/26/08	1,050,000	145		2,140,000	488	
12/29/08				2,420,000	84	
12/31/08	7,600,000	1100		5,530,000	517	