Gulf Coast Testing, LLC

ENVIRO-FLO, INC
Model BioRobix NR
Wastewater Treatment System

Under the provisions of ANSI/NSF Standard 40 (2009)
Residential Wastewater Treatment Systems
SPE119

February 2011

EXECUTIVE SUMMARY

Gulf Coast Testing, LLC conducted testing and specific performance evaluation of the Enviro-Flo, Inc. BioRobix Model NR Wastewater Treatment System under the provisions of NSF/ANSI Standard 40 (2009) from April 18, 2010 to November 6, 2010. The test was conducted at Gulf Coast Testing's wastewater facility located in Ascension Parish, Louisiana using wastewater diverted from a lift station supplied by a residential neighborhood. The test consisted of three weeks of dosing with sampling to allow for plant start-up, sixteen weeks of dosing at design flow, seven and a half weeks of stress test and an additional two and one half weeks of dosing at design flow. Sampling started in the spring and continued into the fall, covering a wide range of operating temperatures. All data collected for the specific performance evaluation was collected pursuant to NSF/ANSI Standard 40 (2009) testing protocol and evaluated pursuant to Standard Methods for the Examination of Water and Wastewater 20th Edition.

The BioRobix Model NR Wastewater Treatment System produced an effluent that successfully met the performance requirements established by NSF/ANSI Standard 40 (2009) for Class I effluent:

- During the first month of the evaluation, the maximum 7-day arithmetic mean was 7 mg/L for $CBOD_5$ and 9 mg/L for suspended solids, both below the allowed maximums of 56 and 63 mg/L respectively. The 30-day arithmetic mean during the first month of testing was 6 mg/L for $CBOD_5$ and 7 mg/L for suspended solids, both below the allowed maximums of 35 and 42 mg/L respectively.

- During the final five months of the evaluation, the maximum 7-day arithmetic mean was 8 mg/L for $CBOD_5$ and 8 mg/L for suspended solids, both below the allowed maximum of 40 and 45 mg/L respectively. The maximum 30-day arithmetic mean was 6 mg/L for $CBOD_5$, below the allowed maximum of 25 mg/L. The maximum 30-day arithmetic mean was 6 mg/L for suspended solids, below the allowed maximum of 30 mg/L.

- The effluent pH during the entire evaluation ranged between 6.69 and 7.18, within the required range of 6.0 to 9.0. The plant met the requirements for noise levels with less than 60 dbA at a distance of 20 feet in four different directions, as well as the requirements for color, threshold odor, oily film and foam.

- The fecal Coliform was tested pursuant to WAC 246-272A-0110 for the State of Washington. The BioRobix Model NR Wastewater Treatment System produced an effluent and a UV effluent that successfully meets the fecal Coliform requirements established by the Washington State Department of Health for product performance. The Model NR produced an effluent of 310 colonies/100 mL for the entire sampling period, and no monthly geometric mean value exceeded the requirement of Category I, Level B of 1000 colonies per 100 mL for fecal coliform. The Model NR produced a UV effluent of 9 colonies/100 mL for the entire sampling period, and no monthly geometric mean value exceeded the requirement of Category I, Level A of 200 colonies per 100 mL for fecal coliform.

- The results of the NSF/ANSI Standard 40 (2009) test are valid without the UV attachment.

PREFACE

Specific performance evaluation of residential wastewater treatment systems is achieved within the provisions of NSF/ANSI Standard 40 (2009): Residential Wastewater Treatment Systems. Conformance with the Standard is recognized by issuance of the GCT Mark. This is not to be construed as an approval of the equipment, but a certification of the data provided by the test and an indication of compliance with the requirements expressed in these Standards.

Plants conforming to NSF/ANSI Standard 40 (2009) are classified as Class I or Class II plants according to the quality of effluent produced by the plant during the performance evaluation. Class I plants must also demonstrate performance consistent with the effluent color, odor, and oily film and foam requirements of the Standards. Additionally, Class I plants must meet the requirements of EPA Secondary Treatment Guidelines for five day carbonaceous biochemical oxygen demand, suspended solids and pH.

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

NSF/ANSI Standard 40 (2009) require the testing laboratory to provide the manufacturer of a residential wastewater treatment system a report including significant data and appropriate commentary relative to the performance evaluation of the plant. GCT policy specifies GCT will provide specific performance evaluation reports to appropriate state regulatory agencies at publication. Subsequent direct distribution of the report by GCT is made only at the specific request of or by permission of the manufacturer.

The following report contains all the data collected in accordance with the testing and evaluations within these Standards, a description of the plant, its operation, key process control equipment, and a narrative summary of the test program, including test location, procedures and significant occurrences. The plant represented herein reflects the equipment authorized to bear the GCT Mark.

CERTIFICATION CERTIFICATE

Gulf Coast Testing LLC's Residential Aerobic Wastewater Testing Program personnel have performed a complete specific performance evaluation of the BioRobix Model NR Wastewater Treatment System five hundred gallon per day (500 gpd), Single Family Residence Wastewater Treatment System, manufactured by Enviro-Flo, Inc of Flowood, Mississippi using the requirements and provision of the NSF/ANSI Standard 40 (2009) and the Gulf Coast Testing Wastewater Certification Quality Procedures Manual. The BioRobix Model NR Wastewater Treatment System has successfully completed all the requirements of the NSF/ANSI Standard 40 (2009) Class 1 effluent.

The observations, data, analyses and results contained in this report are hereby certified to be correct.

All unit feeding and data collection was performed by Gulf Coast Testing, LLC at their wastewater test site in Ascension Parish located at 14378 Park Avenue, Prairieville, Louisiana. All laboratory testing was performed at Gulf Coast Testing LLC's laboratory also located at 14378 Park Avenue, Prairieville, LA.

Enviro-Flo, Inc and Gulf Coast Testing, LLC hereby agree to comply with the continual follow-up certification procedures as specified in the Gulf Coast Testing LLC's Wastewater Certification Manual. All data contained in this report is the property of Gulf Coast Testing, LLC and can only be released with the consent of Gulf Coast Testing, LLC.

This certification is effective as of February 1, 2011 and good for seven (7) years ending on January 31 2018.

William B. Daniel IV **02/01/2011**
Program Manager

Nelle Fruge' **02/01/2011**
Quality Assurance Officer

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1.0 PROCESS DESCRIPTION

The Enviro-Flo, Inc. BioRobix Model NR uses extended aeration activation sludge processes to achieve treatment. The BioRobix Model NR also uses recirculation for nitrogen reduction. In the activated sludge process, microorganisms remove soluble contaminants from the wastewater, utilizing them as a source of energy for growth and production of new microorganisms. The organisms tend to be flocculent and forum clumps, or floc, that physically entrap particulate organic matter. The organic matter is attacked by extra cellular enzymes that solubilize the solid to make the available to the microorganisms as a food source. The conversion of the organic matter from soluble to biological solids allows for removal of the organic matter by settling of the solids in the treatment process. Recirculation returns a portion of the treated effluent to the pretreatment chamber. Treatment, along with recirculation, removes nitrogen from the wastewater.

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

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

2.0 PERFORMANCE EVALUATION

2.1 Description of Plant Evaluated

The BioRobix Model NR tested in this evaluation has a rated capacity of 500 gallons per day (gpd). An HP40-01XA aerator was used to provide aeration. The HP40-01XA aerator has an attached alarm. The unit tested was also equipped with a Salcor UV light apparatus. However, the results of the NSF/ANSI Standard 40 (2009) test are valid without the UV attachment. The tank is constructed of concrete. Specifications and drawings are included in Appendix A.

The system achieves treatment by a flow through process. Wastewater enters into the pretreatment chamber which has a hydraulic capacity of 310 gallons. The promotion of anaerobic microorganisms begins. Denitrification or the conversion of nitrate to nitrogen gas also takes place in the pretreatment chamber. Wastewater moved from the pretreatment chamber into an aeration chamber through a four inch tee located below the flow line. The aeration chamber has a hydraulic capacity of 450 gallons. Aeration is provided by a diffused air system that operates on a continuous cycle. Settling is accomplished in a clarification chamber (hydraulic capacity of 160 gallons) following the aeration chamber. Treated wastewater exits the plant through an outlet tee.

The aeration chamber provides a retention time of 21.6 hours at design flow. Aeration is achieved by release of air through a poly based air diffuser located at the bottom of the aeration chamber. The release of air causes the wastewater to rise in the chamber, establishing a circulation pattern. The diffused air provides oxygen for the aerobic bacteria, as well as mixing of the wastewater with bacteria. It is in the aeration chamber where biological nitrification begins. In the aeration chamber ammonia is oxidized in a two-step process: first to nitrite and then to nitrate.

From the aeration chamber, the wastewater passes by hydraulic displacement into the clarification chamber through a slot in the bottom of the wall dividing the clarification chamber from the aeration chamber. The quiescent design of the clarification chamber allows gravity settling of the solids. The bottom of the clarification chamber is sloped to help direct settled solids back toward the opening between the two chambers. The hydraulic roll created by the air system in the aeration chamber helps to draw settled solids from the bottom of the clarifier back into the aeration chamber. In the clarifier a portion of the wastewater, along with settled solids is returned to the pretreatment tank for denitrification.

After treatment by the activated sludge system, when necessary, the wastewater passes through an ultraviolet light to disinfect the wastewater. The ultraviolet light source for disinfection is mounted in a sub-assembly that can be inserted or removed through the top of the riser pipe for periodic servicing. The light source is mounted in the center of an anodized aluminum frame that divides the disinfection of the chamber in the half. The frame seals against the inner surface of the disinfection chamber to prevent flow bypass.

When fully inserted, the disinfection sub-assembly is properly located by pins mounted near the top of the disinfection chamber. It causes the wastewater entering one side of the unit to flow vertically downward, make 180 degree turn, and flow vertically upward and out the other side of the unit. The flow path is designed to give the proper fluid exposure time.

2.1.1 Exposed Surfaces

The exposed surfaces were evaluated pursuant to Section 5.1 of NSF/ANSI Standard 40 (2009).

2.1.2 Structural Integrity

A structural analysis was performed to evaluate the unit pursuant to Section 5.2 of NSF/ANSI Standard 40 (2009). The unit was determined to be structurally competent based on the use of 4000 psi concrete. An in situ visual inspection was performed both during and after the performance testing. The evaluation of the unit was found to be in compliance with this section.

2.1.3 Infiltration and Exfiltration

A 24 hour infiltration and exfiltration test was performed and evaluated pursuant to Section 5.3 of NSF/ANSI Standard 40 (2009). At the end of the 24 hour period, there was less than a 0.5% change in the initial water level of the system.

2.2 Test Protocol

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

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

Dosing was accomplished by operating a pump to deliver multiple doses in five gallon increments to the test plant. Doses were spread uniformly over each dosing period.

After a start up period of one week, the plant was subjected to the following loading sequence:

Design loading	16.0 weeks
Stress loading	7.5 weeks
Design loading	4.0 weeks

During the design loading periods, flow proportioned 24-hour composite samples were collected of the influent and effluent three days per week during design loading and twice during each stress recovery period (the week following completion of each of the stress simulations described below).

For NSF/ANSI Standard 40 (2009), the influent samples were analyzed for ph, total suspended solids and five-day biochemical oxygen demand. The effluent samples were analyzed for pH, five-day carbonaceous biochemical oxygen demand and total suspended solids concentrations.
On-site determinations of the effluent and influent temperature, pH, and dissolved oxygen were recorded.

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

During stress loading, influent and effluent 24-hour composite samples were collected on the day each stress condition was initiated. Twenty four hours after the completion of washday, working parent, and vacation stresses, influent and effluent 24-hour composite samples were collected for six (6) consecutive days. Forty eight hours after the completion of power/failure

stress, influent and effluent 24-hour composite samples were collected for five (5) consecutive days. The analyses and on-site determinations completed on the samples are the same as described for the design load testing.

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

(1) $CBOD_{5:}$ The 30-day average of effluent samples shall not exceed 25 mg/L and each 7-day average of effluent samples shall not exceed 40 mg/L.
(2) Suspended Solids: Each 30-day average of effluent samples shall not exceed 30 mg/L and each 7-day average of effluent samples shall not exceed 45 mg/L.
(3) pH: Individual effluent values remain between 6.0 and 9.0

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

2.3 Test Chronology

The system was installed under the direction of the manufacturer and the infiltration/exfiltration test was completed April 17, 2010. The plant was filled with 2/3 fresh water and 1/3 raw sewage and dosing was initiated at the rate of 500 gpd beginning April 18, 2010 and sampling started on May 9, 2010. The stress test sequence was started on August 22, 2010 and ended on October 14, 2010. Testing was completed on November 6, 2010.

3.0 ANALYTICAL RESULTS

3.1 Summary

Chemical analyses of samples collected during the evaluation were completed using the procedures in Standard Methods for the Examination of Water and Wastewater (20th Edition) and USEPA methods. All the data generated during the evaluation is included in Appendix D. A summary of the results of the chemical analyses and on-site observations and measurements made during the evaluation are included in Table 1.

For NSF/ANSI Standard 40 (2009), the criteria for evaluating the analytical results from the testing are described in Section 8.5. See Appendix B. In completing the pass/fail determination for the data, an allowance is made for effluent suspended solids and $CBOD_5$ during the first month of testing. The 30 and 7 day averages during this time may not equal or exceed 1.4 times the effluent limits required for the rest of the test. This provision recognizes that an immature culture of microorganisms within the system may require additional time to achieve adequate treatment efficiency. Effluent $CBOD_5$ and suspended solids concentrations during the first calendar month of testing were within the limits allowed under this provision.

		AVG	Std Dev	Min	Max	Med	1 Quart	2 Quart	3 Quart	4 Quart	Data Points
Dissolved Oxygen, mg/L	Aeration chamber	2.10	1.06	0.06	5.83	1.96	1.37	1.96	2.61	5.83	117
	Effluent	4.74	0.88	1.82	6.89	4.64	4.12	4.64	5.30	6.89	117
Ambient Temperature, oC	Influent	4.0	0.0	3.9	4.0	4.0	4.0	4.0	4.0	4.0	155
	Aeration chamber	27.0	1.8	21.2	29.8	27.4	25.8	27.4	28.6	29.8	117
	Effluent	4.0	0.0	4.0	4.1	4.0	4.0	4.0	4.0	4.1	117
pH	Influent	7.10	0.29	6.46	7.82	7.15	6.88	7.15	7.27	7.82	154
	Aeration chamber	6.78	0.12	6.51	7.23	6.76	6.70	6.76	6.86	7.23	117
	Effluent	6.91	0.10	6.69	7.18	6.91	6.86	6.91	6.96	7.18	117
BOD, mg/L	Influent	183	48	82	417	182	152	182	214	417	153
CBOD, mg/L	Effluent	5	3	1	14	4	3	4	6	14	114
Total Suspended Solids, mg/L	Influent	169	63	48	498	158	124	158	206	498	155
	Aeration chamber	2,550	2,430	320	15,200	1,920	1,010	1,920	2,930	15,200	119
	Effluent	5	2	0	12	6	4	6	7	12	114
Volatile Suspended Solids, mg/L	Influent	39	39	0	206	24	12	24	56	206	155
	Aeration chamber	360	865	8	5,750	120	60	120	220	57,50	113
	Effluent	12	59	0	560	2	0	2	4	560	114
Settleable Solids (mL/L)	Aeration chamber	53	26	10	175	50	35	50	65	175	116

Table 1 Summary of Analytical Data

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

Sections 3.6 and 8.2.1 of the NSF/ANSI Standards define influent wastewater characteristics as they apply to testing under the Standards. Typical domestic wastewater is defined as having a BOD_5 concentration between 100 and 300 mg/L and a suspended solids concentration between 100 and 350 mg/L. The 30-day average influent strength remained inside this specified range for the duration of this test.

3.2 Carbonaceous Biochemical Oxygen Demand

The Biochemical Oxygen Demand and the Carbonaceous Biochemical Oxygen Demand analyses were completed using method 5210 B of the Standard Methods for the Examination of Water and Wastewater, 20th edition. The results of the analyses completed on the samples collected during the testing are shown in Figure 1. All data collected for the testing period is included in the report sheets in Appendix D.

- Influent BOD_5:

The influent BOD_5 ranged from 82 to 417 mg/L during the evaluation, with an average concentration of 183 mg/L and a median concentration of 182 mg/L.

- Effluent $CBOD_5$:

The effluent $CBOD_5$ concentrations ranged from 1 to 14 mg/L over the course of the evaluation, with an average concentration of 5 mg/L. The median effluent $CBOD_5$ concentration was 4 mg/L.

For the first thirty days of the evaluation, NSF/ANSI Standard 40 (2009) requires that the effluent $CBOD_5$ not exceed 56 mg/L on a 7-day average or 35 mg/L on a 30-day average. For the remaining five months of the evaluation, the Standard requires that the effluent $CBOD_5$ not exceed 40 mg/L on a 7-day average or 25 mg/L on a 30-day average. Table 2 shows the 7 and 30 day average effluent $CBOD_5$ concentrations and the 30-day average influent $CBOD_5$ concentrations.

During the first thirty days of testing, the 7-day average effluent $CBOD_5$ ranged from 4 to 7 mg/L and the 30-day average was 6 mg/L. For the remaining six months of the

	Influent mg/L	Effluent mg/L	Data Points		Influent mg/L	Effluent mg/L	Data Points
Week 1	236	6	5	May	217	6	16
Week 2	223	6	5	June	195	6	22
Week 3	198	4	5	July	148	4	22
Week 4	163	7	5	August	163	3	21
Week 5	192	6	5	September	183	4	11
Week 6	228	3	5	October	197	6	17
Week 7	231	7	5	November	225	6	5
Week 8	133	5	5				
Week 9	138	3	5				
Week 10	143	5	5				
Week 11	179	5	5				
Week 12	141	2	5				
Week 13	162	3	5				
Week 14	168	4	5				
Week 15	150	2	5				
Week 16	199	5	3				
Week 17	166	3	3				
Week 18	152	3	5				
Week 19	233	NA	0				
Week 20	182	3	4				
Week 21	188	6	3				
Week 22	200	4	3				
Week 23	213	8	3				
Week 24	214	6	5				
Week 25	157	5	5				
Week 26	225	6	5				

Table 2 $CBOD_5$ and BOD_5 Averages

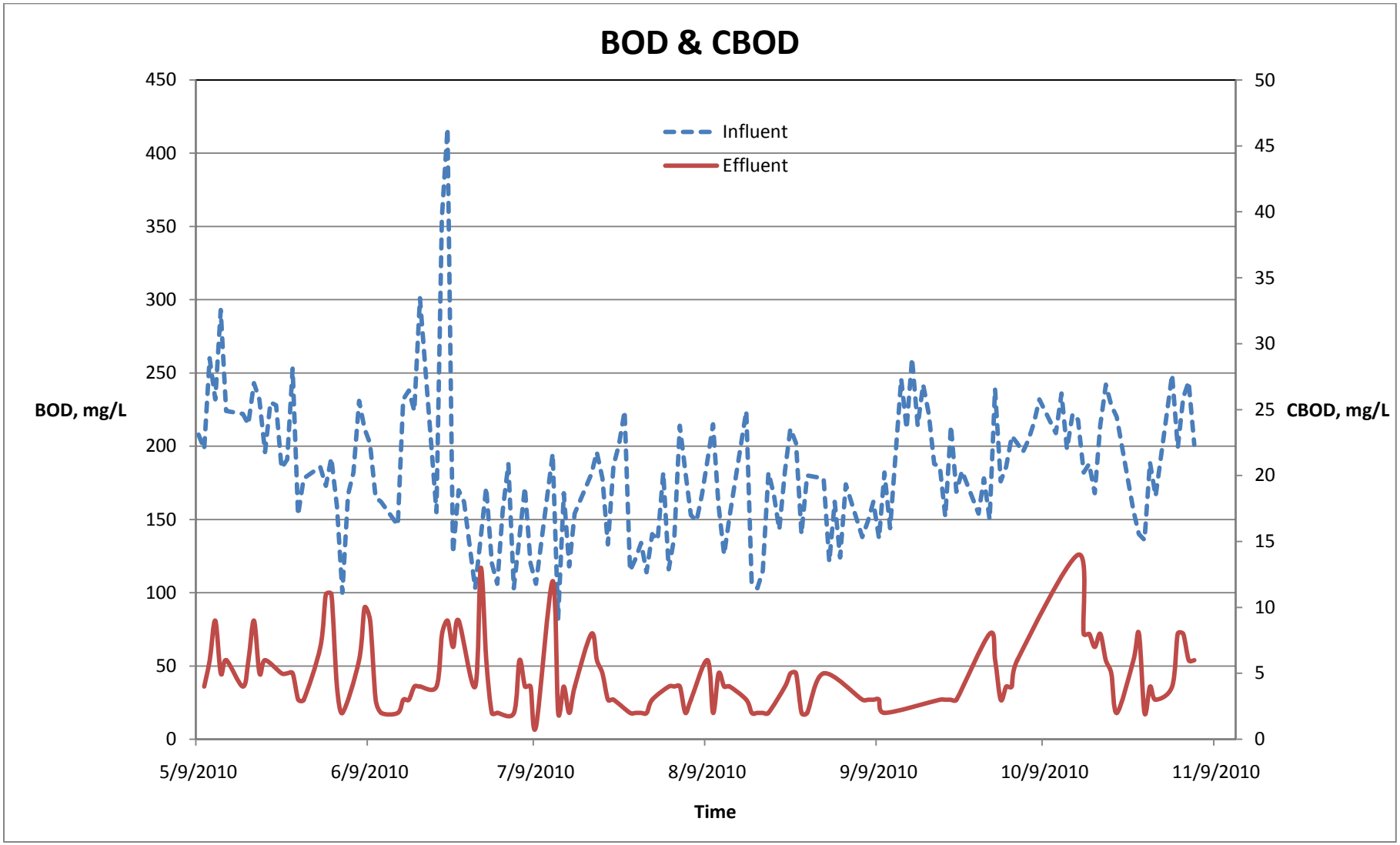

Figure 1 BOD_5 and $CBOD_5$ v. Time

evaluation, the 7-day average effluent $CBOD_5$ ranged from 2 to 7 mg/L. The 30-day average ranged from 4 to 6 mg/L. As shown in Table 2, the BioRobix Model NR Wastewater Treatment System met the requirements of NSF/ANSI Standard 40 (2009).

3.3 Suspended Solids

Suspended solids analyses were completed using Methods 2540D in Standard Methods for the Examination of Water and Wastewater (20th Edition). The results of the suspended solids analyses over the entire evaluation are shown in Figure 2. Data from the suspended solids analyses are summarized in Table 1. The data collected for the testing period is included in the report sheets in Appendix D.

- Influent suspended solids:

The influent suspended solids ranged from 48 to 498 mg/L during the testing, with an average concentration 169 mg/L. The median influent suspended solids concentration during the evaluation was 158 mg/L.

- Effluent Suspended Solids:

The effluent suspended solids concentration ranged from 0 to 12 mg/L during the evaluation, with an average concentration of 5 mg/L and a median concentration of 6 mg/L.

For the first thirty days of the evaluation, NSF/ANSI Standard 40 (2009) requires that the effluent suspended solids not exceed 63 mg/L on a 7-day average, or 42 mg/L on a 30-day average. For the remaining five months of the evaluation, the Standard requires that the effluent suspended solids not exceed 45 mg/L on a 7-day average or 30 mg/L on a 30-day average. Table 3 shows the 7 and 30 day suspended solids averages.

During the first calendar month of operation, the 7-day average effluent suspended solids ranged from 5 to 9 mg/L and the 30-day average was 7 mg/L. For the remaining five months of operation, the 7-day average suspended solids ranged from 2 to 8 mg/L and the 30-day averages ranged from 4 to 6 mg/L. As shown in Table 3, the Model NR unit met the requirements of NSF/ANSI Standard 40 (2009).

	Influent mg/L	Effluent mg/L	Data Points		Influent mg/L	Effluent mg/L	Data Points
Week 1	204	6	5	May	158	7	16
Week 2	111	5	5	June	176	6	22
Week 3	169	9	5	July	151	4	22
Week 4	147	6	5	August	162	6	21
Week 5	193	6	5	September	185	4	11
Week 6	244	6	5	October	176	6	17
Week 7	162	8	5	November	196	5	5
Week 8	98	5	5				
Week 9	126	6	5				
Week 10	176	5	5				
Week 11	154	3	5				
Week 12	168	2	5				
Week 13	197	6	5				
Week 14	146	6	5				
Week 15	152	6	5				
Week 16	125	6	3				
Week 17	149	6	3				
Week 18	152	3	5				
Week 19	233	NA	0				
Week 20	182	3	4				
Week 21	150	5	3				
Week 22	169	5	3				
Week 23	192	8	3				
Week 24	167	5	5				
Week 25	152	6	5				
Week 26	196	5	5				

Table 3 Total Suspended Solids Averages

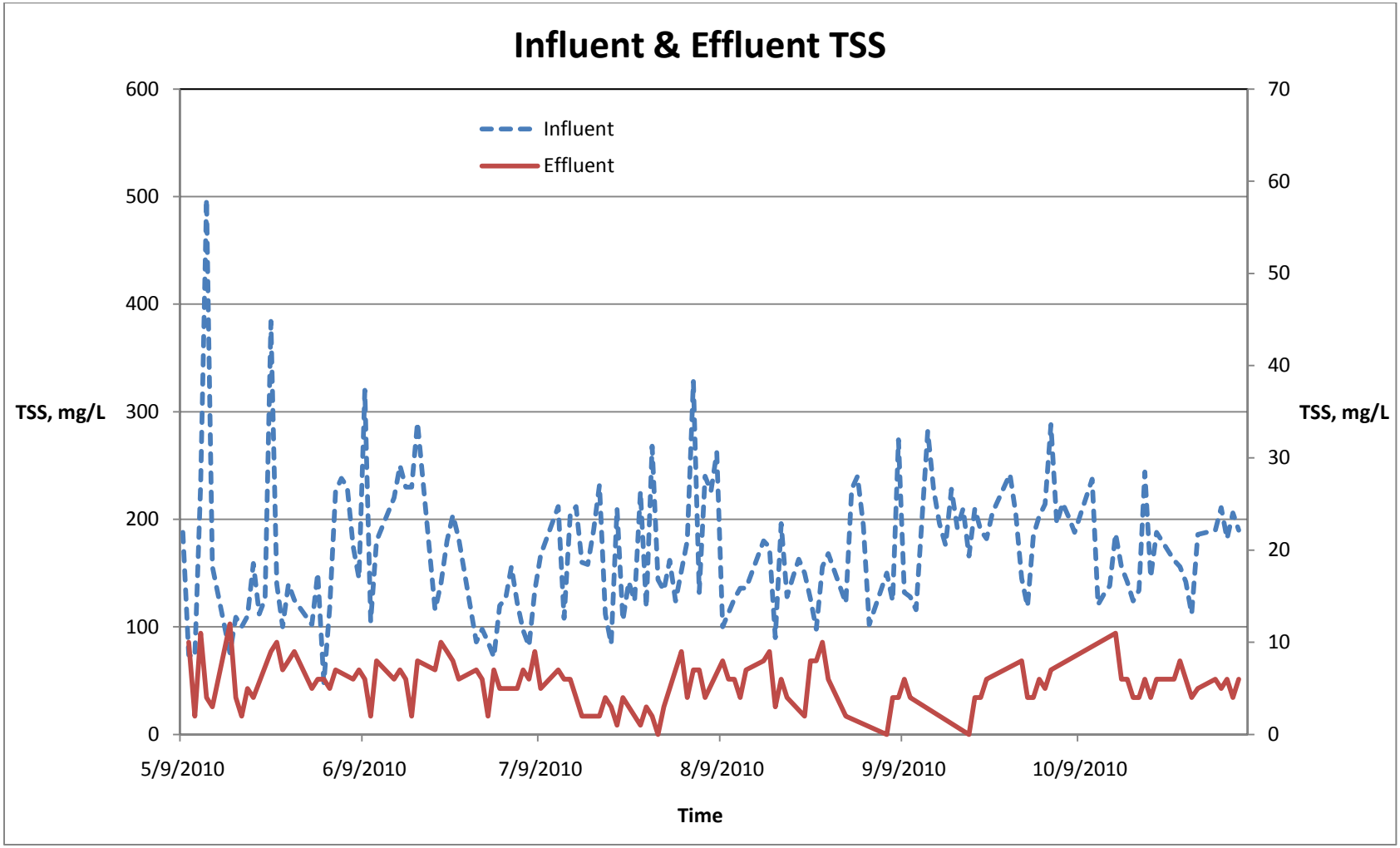

Figure 2 TSS v. Time

3.4 pH

Over the entire evaluation period, the influent pH ranged from 6.46 to 7.82 with an average of 7.10 and a median of 7.15. The effluent pH ranged from 6.6 to 7.5 during the evaluation with an average and a median of 7.1. The pH ranges were within the 6.69 to 7.18 range required by NSF/ANSI Standard 40 (2009). The data collected for the testing period is included in the report sheets in Appendix D and summarized in Table 1.

3.5 Temperature

Sampling started in the winter and continued into the summer, covering a wide range of operating temperatures. The effluent temperature ranged from 24.7°C to 28.3°C using the noon temperature reading. The average temperature and median temperature of the effluent using the noon reading was 26.5°C. The data collected for the testing period is included in the report sheets in Appendix D.

3.6 Dissolved Oxygen

Dissolved oxygen (DO) of the effluent was measured during the evaluation. The effluent DO of the AM reading ranged between 1.82 and 6.89 mg/L with an average of 4.74 mg/L and a median of 4.64 mg/L. The data collected for the testing period is included in the report sheets in Appendix D and summarized in Table 1.

3.7 Bacteriological Reduction – Fecal Coliform

Influent and effluent fecal Coliform samples were taken in accordance with the protocol described in the Rules and Regulations of the Washington State Board of Health, Chapter 246-272A-0130 and analyzed pursuant to Method 9222D of *Standard Methods for the Examination of Water and Wastewater, 20th Edition.* The analytical results over the entire evaluation period are located in Appendix D and summarized in Table 4. Samples were taken three days per week during the testing period except during the stress tests. The sample data was taken from the unit before and after the Salcor UV application.

- Influent Fecal Coliform

The influent Coliform ranged from 600,000 to 5,600,000 colonies per 100 mL during the evaluation. The average of the samples during the entire evaluation period was 1,700,000 colonies per 100 mL. The 30 day geometric means of the influent Coliform is reported in Table 4.

- Effluent Coliform Coliform

The effluent Coliform geometric means were computed monthly calendar period basis. The results of the geometric means are reported in Table 4.

	Geometric Mean of Fecal Coliform Colonies/ 100 mL			
	Influent	Effluent	Effluent UV	Data Points
May	1,500,000	230	29	10
June	1,500,000	72	6	13
July	1,100,000	430	5	13
August	1,400,000	800	7	13
September	1,700,000	280	8	13
October	1,700,000	570	15	10
November	2,200,000	270	14	3
Entire Test	1,500,000	310	9	75

Table 4 Geometric Mean of Fecal Coliform Analyzed on Monthly Basis

3.8 Color, Threshold Odor, Oily Film, Foam, Turbidity, & Flow Rate

Three samples of the effluent were analyzed for color, odor, oily film and foam as prescribed in NSF/ANSI Standard 40 (2009). The effluent was acceptable according to the requirements in NSF/ANSI Standard 40 (2009), with an average color of 23.1 color units for the three color samples. Three samples were analyzed for odor and the odor was determined to be non-offensive. Also, there was no visible evidence of oily film and no foam in three samples. The color, odor, and oily film and foam information is included in Appendix D. Additionally, samples were analyzed for color, turbidity, and flow rate pursuant to WAC 246-272A-0110 for the State of Washington. Those sample results are included in Appendix D.

3.9 Noise

A reading of the noise level at a distance of 20 feet in four directions from the plant was taken while the plant was in operation using a hand-held decibel meter. The reading was below the 60 dbA required under NSF/ANSI Standard 40 (2009).

4.0 REFERENCES

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