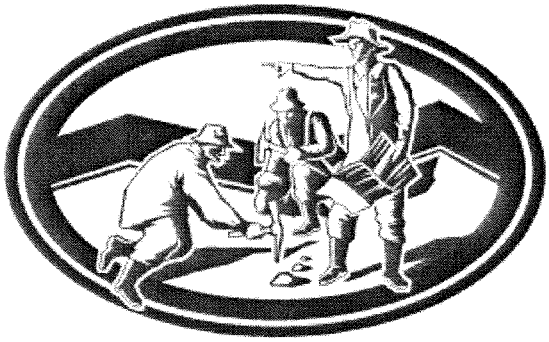

Manitouwadge Public Works

Presents:

Wastewater Collection System

Class II

and

Wastewater Treatment Plant

Class I

2012

ANNUAL REPORT

Prepared By: Kirk Tourout and Paul Richard

Date: February 28, 2013

ANNUAL REPORT
2012
Township of Manitouwadge
Public Works Department
Wastewater Collection System Class II
and
Wastewater Treatment Plant Class I

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ANNUAL REPORT
2012
Township of Manitouwadge
Public Works Department
Manitouwadge Wastewater Collection and Treatment System

1.0 INTRODUCTION

The Township of Manitouwadge, Public Works Department operates Manitouwadge Wastewater Collection System and Manitouwadge Wastewater Treatment System under a Certificate of Approval # 0031-86NKKA issued by the Ministry of the Environment on October 15, 2010.

As a condition of this Certificate of Approval, we are required to produce an Annual Compliance and Performance report for the benefit of the Ministry of the Environment and the residents of Manitouwadge within ninety days of the end of the calendar year.

Contained in this report you will find the information that we are required to keep in accordance with our Certificate of Approval from January 1, 2012 to December 31, 2012. As well, we include our accomplishments during the year.

Appendices in this report summarizes laboratory analysis test results for those parameters mandated by our Certificate of Approval as well as summarizes the annual daily flows, maximum daily flows, and minimum daily flow events for the year.

Currently the Manitouwadge Wastewater Collection System is classified as a Class II facility, and the Manitouwadge Wastewater Treatment System is classified as a Class I facility by the **O**ntario **E**nvironmental **T**raining **C**onsortium.

Kirk Tourout is fully licensed under Ontario Regulation 435/93 Utility Operator Licensing Program to operate these facilities. He is also designated by By-Law as the Operator in Overall Responsible Charge. He is assisted by Paul Richard who holds both Class I for Wastewater Treatment and a Class II for Wastewater Collections.

Our laboratory analysis for our Certificate of Approval sampling requirements are performed by Thunder Bay Analytical, a division of the ALS Laboratories who are accredited by the Ministry of the Environment.

For the purposes of this report these facilities provide collection and treatment for a population of 2106. Approximately 1292 households are connected to the collection system. Households are deemed to include residential, institutional, multiple unit residential and industrial locations. Please note that the households located on Station Road, Sault Road and Black Road are not connected to our facilities.

2.0 MANITOUWADGE WASTEWATER COLLECTION & TREATMENT SYSTEM

2.1 HISTORY

The Manitouwadge Wastewater Collection System is a gravity flow network of underground sewer mains that connect the households of three Residential Areas, a Commercial Area and an Industrial Area to a sewage lift station located adjacent to Manitouwadge Lake beside a pedestrian way that links Ohsweken Road with Mississauga Drive.

Due to the lack of a comprehensive storm sewer infrastructure our collection system is deemed to be a combined system. Simply put, this means that the majority of the service connections to the sanitary sewer system are also connected to the weeping tile systems of the households. Hence, not only the sewage from the households but the groundwater from the households is directed to the wastewater collection system.

The piping material used in our system ranges from vitreous clay, concrete, cement asbestos (transite) to P.V.C. pipe. The vitreous clay and concrete piping was laid in 2.5 foot lengths and the joints sealed with oakum and mortar. The transite pipe was laid in 6.5 foot to 13 foot lengths with ringtite joints. P.V.C. piping was laid in 20 foot lengths with ringtite joints.

Manitouwadge area soil composition consists of bedrock, sand, clay and muskeg. This creates real problems with the vitreous clay and concrete pipe because of their short lengths and numerous joints when the ground moves during our freeze and thaw cycles. This leads to infiltration of groundwater during our summer months and possible exfiltration of raw sewage during freeze up.

Prior to 1986 the sewage collection at the lift station was pumped via a 12" inch cement asbestos force main to a sedimentation tank located approximately 3 km distant at Rudder Lake.

The sedimentation tank was pumped semi-annually into a drying bed. After leaching off the water the accumulated sludge was bulldozed and allowed to decompose naturally.

With the Hemlo Gold field discovery the townships ability to handle the expansion of the residential areas was brought into question. The existing lift station was aging and subject to frequent failures. Hence, in 1986 the Township undertook a Sewage Works Upgrading with the provision of a new lift station, a new 400 mm force main and a new two celled aerated sewage lagoon.

The sewage lift station features a single chamber wet well with an operating volume of 24 cubic meters with two 100 horsepower submersible pumps each capable of pumping 151 liters per second. As a backup to the lift station there is an overflow bypass tank

with an operating volume of 114 cubic meters with an 88 horsepower submersible pump capable of pumping 101 liters per second.

Two Milltronics Enviroranger flow monitors one dedicated to the wet well and the other dedicated to the overflow bypass tank measure the flows leaving the lift station.

A 200 KW generator set provides emergency power for the lift station and one sewage pump during a power outage.

The lift station is connected to the aerated sewage lagoons by a 400 mm diameter force main approximately 3.2 km in length. The force main route parallels the area 1D trunk sewer from the lift station to Matachewan Road, along Matachewan Road extending cross country to the Caramat Road. It then follows the Caramat Road to the intersection with the Rudder Lake Lagoon Access Road. These locations represent the low points in the profile of the force main. The vacuum/air release chambers representing the high points in the force main profile are located at the end of Matachewan Road and on the east side of the Caramat Road adjacent to the Cemetery.

The sewage then enters the inlet/outlet works where it enters the primary cell of a two cell aerated facultative lagoon with an operating volume of approximately 61,500 cubic meters. At its rated capacity of 4,100 average cubic meters per day and at its normal operating depth of 4 meters this allows for a minimum retention time in excess of 12 days.

Following the primary cell the sewage then enters the second or polishing cell of these lagoons returning to the inlet/outlet works where it outfalls to a clay lined outfall ditch to Rudder Lake. Please note that water from Rudder Lake enters the Pic River watershed. This is worthy of note inasmuch as the Township water supply is drawn from an aquifer that is drained by the Black River watershed.

At the lagoon site there is a building that houses two 50 horsepower positive displacement blowers that supply the air for the treatment process maintaining a minimum dissolved oxygen level of 2.0 mg/L in the lagoon wastewater.

The flows entering the lagoons are measured by a modified Parshall Flume complete with a Milltronics OCM III flow monitor.

The Corporation of the Township of Manitouwadge is in the process of constructing a drying bed having a treatment surface area of 10,450 m^2. The location of the drying bed is at the Northwestern end of Cell #1 and Cell #2. Once the drying bed construction is completed the sludge will be directly pumped into the drying bed with the excess water flowing back into to Cell #1 and Cell #2 via gravity feed. The water will have to pass through many layers filtering out the water before entering the lagoons to insure that only the water and not the sludge is being reintroduced to the treatment Cells. Left behind will be a layer of sludge which will be left in the drying bed until it is dehydrated and then it will be shipped to the landfill site for disposal. Sludge removal will not only increase the

life of the lagoons but will also increase the airflow supplied to the lagoons by the two blowers.

Surrounding the drying bed are four (4) monitoring wells which are being sampled by KGS to develop a history before the completion of the drying bed. Therefore the historical data will allow us to see any possible impacts of leachate entering the ground water surrounding the drying bed and ponds.

3.0 THE TREATMENT PROCESS

Our sewage is treated by the AIR-AQUA aeration system.

The primary purpose of the aeration system is to replace the dissolved oxygen in facultative lagoons where both aerobic and anaerobic digestion of the sewage has depleted the oxygen content. This is accomplished by generating millions of small air bubbles at the bottom of the lagoons and allowing them to flow slowly upward. The upward flowing of mixed air and water replenishes the dissolved oxygen and circulates the entire liquid mass.

The AIR-AQUA aeration system provides a quiet and efficient source of dissolved oxygen to the liquid content of the lagoon to meet the Biochemical Oxygen Demand (BOD) of the sewage digestion process by the aerobic bacteria. The gentle action of the system gives complete dispersion of the dissolved oxygen in the water and allows a large proportion of the solids to settle to the bottom for eventual anaerobic digestion. The process is relatively odorless.

The air bubbles for the treatment process are produced by a patented designed polyethylene tubing which has precisely formed check valves on the top centerline for careful metering of the air. This provides small bubbles of the proper size, which in turn produce a low velocity upward flow of mixed air, water and very fine suspended solids. The tubing laid on the bottom of the lagoon features a lead keel.

The aeration tubing arranged in a carefully engineered pattern is to provide optimum oxidation of the sewage liquid. The tubing is closer at the influent end of the lagoon to meet the greater demand for oxygen required by the raw sewage. The liquid volume on each side of the aeration tubing axis operates as a dynamic treatment cell. Thus the lagoon has a series of individual sewage treatment cells which extend through its length.

The objectives for the effluent entering Rudder Lake are Suspended Solids (SS) 25mg/L, BOD_5 20mg/L at a pH within the range of 6 to 9. The effluent limits must not exceed 30 mg/L for Suspended Solids (SS) and 25 mg/L for BOD_5 at a pH within the range of 6.0 to 9.5 at all times.

4.0 SOME WASTEWATER FACTS

4.1 DATA

During the period January1, 2012 to December 31, 2012 we pumped and treated 467,515,870 liters of wastewater.

Appendix A-2 gives the reader a Summary of the Monthly Sewage Flows highlighting the Month Flows, Average, Maximum and Minimum Daily Flows.

Appendix A-3 shows the reader a Monthly Summary of the Maximum and Minimum Daily Flow Events juxtaposed with the day that they occurred.

On a per capita daily basis the Annual Flow translates to a figure of 606 liters of wastewater generated per person per day based on the 2011 figure of 508 liters per person per day this represents a 16 % increase in wastewater production. After review of the water report we showed that we had a 8 % decrease. The increase in sewage flows can be attributed to unmetered water losses (i.e. watering lawns, water breaks, fire hydrant usage).

On a household basis this figure becomes 989 liters per household per day of wastewater generation. Based on the 2011 figure of 905 liters per household per day this represents a 8 % increase in wastewater production. After review of the water report we showed that we had an 8 % decrease. This increase in sewage directly correlates with the increase in water consumption. The increase in sewage flows can be attributed to unmetered water losses (i.e. watering lawns, water breaks, fire hydrant usage).

During the period of January 1, 2012 to December 31, 2012 the Manitouwadge Water Treatment Plant Delivered 302,973,000 liters of potable water to its consumers. Relevant per capita water consumption generates figures of 394 liters per person per day and 642 liters per household per day.

It is a commonly held industry theory that a figure of 90 to 95 percent recovery of drinking water pumped returns to the Wastewater Collection and Treatment Systems

5.0 COMPLIANCE ISSUES

5.1 FLOW METERING

Our Certificate of Approval mandates that our raw sewage and final effluent meters must be within plus or minus 15 percent of each other. On September 18, 2012 Rob Kincaid, a Milltronics trained technician of Trans-West, out of Thunder Bay calibrated the flow meters at the lift station including the overflow and the lagoons. During the flow meter

meters at the lift station including the overflow and the lagoons. During the flow meter calibration Rob Kincaid confirmed that the flow meters were within 7.74 percent of each other for the lift station wet well pump #1 and #2. Also, during this timeframe the overflow pump was also calibrated which yielded a 2.15 percent difference of each other.

It is important to note that the Milltronics Enviro-Ranger ERS 500 uses a mathematical algorithm to calculate flows based upon the fill time and pump time of the vessel being measured. Because the Overflow Tank is used infrequently its measured volumes are questionable. However, when the tank is put into regular service its accuracy will mirror the volumes measured by the OCM III at the lagoons.

5.2 LABORATORY ANALYSIS

Our **C**ertificate **o**f **A**pproval mandates that we sample Raw Sewage and Final Effluent on a bi-monthly basis.

Raw Sewage samples are analyzed for the following parameters: Total Phosphorous (P), Biochemical Oxygen Demand, Total Suspended Solids, E-Coli, and pH. The results of our C of A Raw sewage sampling program are contained in Appendix B-1.

Final Effluent samples are analyzed for the following parameters: Ammonia (N), Total Phosphorous (P), Biochemical Oxygen Demand, Total Suspended Solids, E-Coli, and pH. The results of our C of A Final Effluent sampling program are contained in Appendix B-2. During the 2012 timeframe there was one exceedence of the C of A. A concentration of 32.5 mg/l was analysis for Total Suspended Solids.

Our C of A mandates that a Target Objective of 20 mg/L for **B**iochemical **O**xygen **D**emand be maintained with a Maximum Allowable Concentration of 25 mg/L. For **T**otal **S**uspended **S**olids a Target Objective of 25 mg/L is to be maintained with a Maximum Allowable Concentration of 30 mg/L.

To show the effectiveness of our Treatment Process we have appendices with the percentage reduction for the following parameters: Total Phosphorous (P) as Appendix B-3, B.O.D as Appendix B-4, T.S.S as Appendix B-5, and E-Coli as Appendix B-6.

On an Annual basis the reductions were as follows:

a) Total Phosphorous (P) 47.9 %
b) Biochemical Oxygen Demand 93.1 %
c) Total Suspended Solids 93.4 %
d) E-Coli 100 %

5.3 MAXIMUM AVERAGE DAILY FLOW EXCEEDENCES

Our Certificate of Approval allows an Average Daily Maximum Flow of 4,100 m^3 per day with a minimum retention time of twelve (12) days or 5,125 m^3 per day.

For 2012 there were three (3) exceedences of the C of A requirement of 4,100 m^3 per day.

This occurrence is contained in Appendix C together with the laboratory analysis results.

5.4 FINAL EFFLUENT DISSOLVED OXYGEN

As part of our C of A for the sewage lagoons we are required to monitor the Final Effluent for Dissolved Oxygen levels. Listed below is a table that was developed to show the data collected for the 2012 period. Readings were collected at the discharge from the lagoons system before exiting over the effluent weir plate. See Figure 1 below for data and Figure 2 below for graph.

Lagoon D.O. Readings

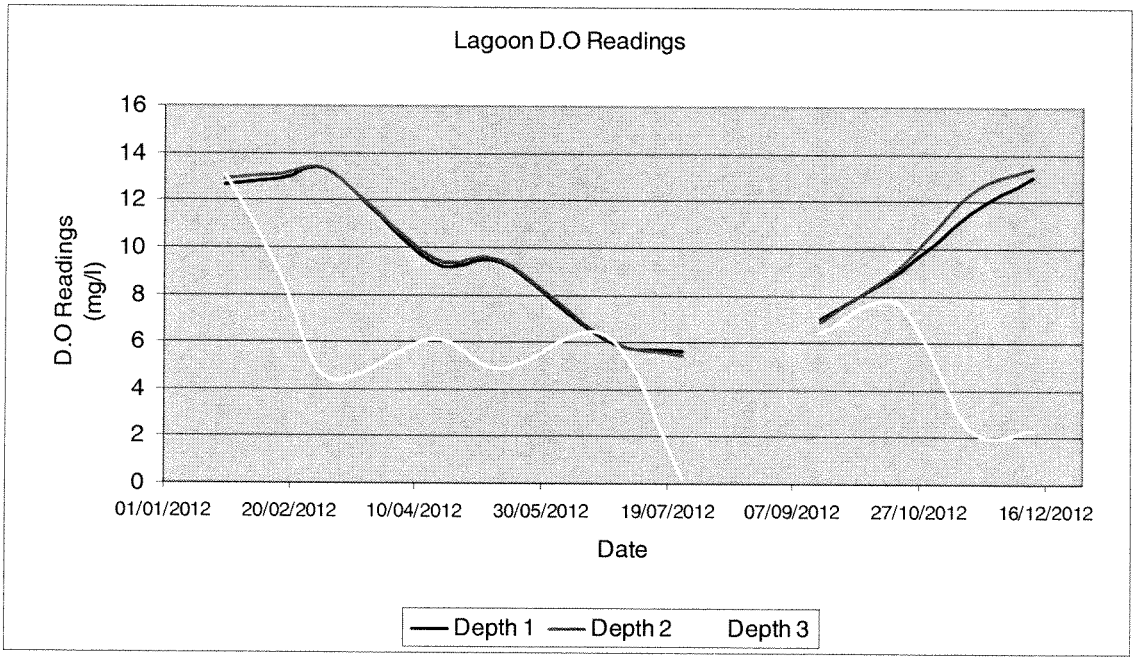
2012

Figure 1

Sample	Out Fall Location 4 Depth 1	Out Fall Location 4 Depth 2	Out Fall Location 4 Depth 3
Date	**mg/L**	**mg/L**	**mg/L**
25/01/2012	12.63	12.9	13.06
16/02/2012	12.88	13.08	8.87
07/03/2012	13.2	13.21	4.45
17/04/2012	9.36	9.54	6.16
14/05/2012	9.38	9.42	4.87
25/06/2012	6.08	6.15	6.24
25/07/2012	5.61	5.43	0.19
18/09/2012	7.05	6.92	6.46
19/10/2012	8.98	9.19	7.68
16/11/2012	11.48	12.34	2.32
11/12/2012	13.04	13.38	2.26
Min	**5.61**	**5.43**	**0.19**
Max	**13.2**	**13.38**	**13.06**
Average	**9.97**	**10.14**	**5.69**

**Depth 1 is approx 25% depth from surface
**Depth 2 is approx 50 % of the depth from surface
**Depth three is approx 75% of the depth from surface
Please note: DO probe out for calibration during the month of August.

Figure 2



5.5 CONSUMER COMPLAINTS

Feb 10, 2012

- Plugged sewer lateral at OPP Station and were instructed to call a plumber.

Feb 11, 2012

- Inspect sewer lateral 85 Warbler Dr.
- Advised home owner to call plumber.

Feb 12, 2012

- Inspect sewer backup 3 Minaki Place
- Camera sewer lateral 200 ft. and could not locate sewer main clean out.
- Sewer snaked to remove plug.

Feb 13, 2012

- Snake sewer lateral at 3 Minaki Place.

Mar 21, 2012

- Inspect sewer backup at 32 Shingwauk.Drive
- Sewermain clear and advise homeowner to call plumber.

Mar 03, 2012

- Backed up sewermain between Mississauga Drive and Forester Walk.
- Snake sewer from Mississauga Drive and Forester Walk.

Mar 26, 2012

- Slow sewer flow at sewer manhole in old trailer court.
- Snake sewermain from old trailer court to liftstation.

Mar 27, 2012

- Sewer backup complaint at 42 Otter Drive.
- Inspect sewermain and sewer flowing freely.
- Advise homeowner to call plumber.

Apr 1, 2012

- Backed up sewer at 56 Neebig Avenue.
- Backed up sewer lateral due to plugged sewermain on Shingwauk Drive.
- Snake sewer main.

Apr 5, 2012

- Camera sewer lateral 3 Minaki Place.

Apr 11, 2012

- Snake sewer lateral 3 Minaki Place.
- Camera sewer lateral to confirm blockage was removed.

Apr 30, 2012

- Potter's Environmental in to flush sewermain from Hospital to liftstation to remove rags.

May 15, 2012

- Inspect sewer manhole in Manitou Road and Neebig Avenue pedestrian way.
- Clean out sewer manhole.

May 16, 2012

- Flush sewermain in Manitou Road and Neebig Avenue pedestrian way.

July 12, 2012

- Lateral plugged at Lions Beach bathroom.
- Flush lateral to remove debris.

Aug 8, 2012

- Sewage backup at Golf Hutt
- Repair sewage pump in collections chamber.

Sept 2, 2012

- Snake sewermain Sandpiper Avenue.

Sept 21, 2012

- Inspect damaged manhole on FisherAvenue.
- Repair chamber and remove debris from manhole.

Sept 24, 2012

- Snake sewermain Sandpiper Avenue.

Oct 27, 2012

- Inspect sewer lateral 3 Warbler Drive
- Inspect sewermain and sewer flowing freely. Plugged lateral advised homeowner to call plumber.

Dec 24, 2012

- Inspect sewer lateral 7 Swallow.
- Lateral plugged.
- Snake lateral to remove obstruction.

6.0 ACCOMPLISHMENTS

In the 2012 period the Township of Manitouwadge contracted the services of Potter's Environmental to clean the wet well at the sewage liftstation. This involved bypassing and drawing down the wet well and the removal of all the accumulated rags and grease. During the cleaning we took the opportunity to inspect the wet well and pumps.

The replacement of 40 feet of underground PVC aeration headers to galvanized piping at the sewage lagoons. This was done to alleviate the constant splitting of the plastic pipe due to traffic.

Updating of the operations manual to include the methods employed to detect when maintenance is necessary and frequency of inspections.

The completion of the Standard Operating Procedures for the sanitary sewer system.

Also in the 2012 period the Township of Manitouwadge spent 11 regular hours and one O.T hour snaking sewer mains.

Operators spent 3 regular hours and 7 O.T hours flushing sewer mains.

Operators spent a total of 3 regular hours repairing sewer service repair.

Operators spent 77.5 regular hours, 26 O.T hours and 16 double time hours repairing the forcemain break

The Township of Manitouwadge operators utilized 2.5 regular hours using the camera to video sewer laterals.

The Township of Manitouwadge operators utilized 2 regular hours inspecting sewer laterals.

7.0 CONCLUSION

2012 was a busy year for the Manitouwadge Wastewater Collection and Treatment System. There were some consumer complaints in the 2012 period. Consumer complaints were dealt with in a timely fashion to insure consumer's satisfaction. The summary of these complaints are listed above in section 5.5 Consumer Complaints.

The drawing down and cleaning of the wet well at the sewage liftstation allowed us to conduct visual inspection of both wet well and pumps #1 and #2, this was very beneficial from a maintenance standpoint.

8.0 RECOMENDATIONS

From the operation stand point there are a few recommendations for the 2013 time frame. These recommendations are listed below.

1. The first would be the completion of the drying bed out at the lagoons.

2. Amending the waste management systems Certificate of Approval to accept sludge waste from the drying bed.

3. Servicing of one of the two of the Flygt pumps in the wet well.

4. The second would be the repair and straightening of the main aeration headers that surround the lagoons.

5. The third would be the replacement of the intrinsically safe heater in the hoist room of the liftstation.

ANNUAL PERFORMANCE REPORT

2012

DAILY SEWAGE FLOW

Appendix A-1

	January			February			March			April			May			June			July			August			September			October			November			December	
1	Sun	792.80	1	Wed	835.25	1	Thu	718.15	1	Sun	2061.86	1	Tue	1806.33	1	Fri	1775.41	1	Sun	1751.65	1	Wed	996.42	1	Sat	667.55	1	Mon	536.47	1	Thu	922.74	1	Sat	894.08
2	Mon	811.23	2	Thu	824.34	2	Fri	756.42	2	Mon	1795.75	2	Wed	1960.37	2	Sat	1804.22	2	Mon	1573.67	2	Thu	908.94	2	Sun	1140.96	2	Tue	635.16	2	Fri	883.89	2	Sun	896.20
3	Tue	817.07	3	Fri	864.28	3	Sat	814.71	3	Tue	1697.74	3	Thu	2349.47	3	Sun	1854.91	3	Tue	1583.28	3	Fri	852.77	3	Mon	1174.94	3	Wed	611.91	3	Sat	939.34	3	Mon	1392.41
4	Wed	838.08	4	Sat	993.50	4	Sun	763.82	4	Wed	1704.31	4	Fri	2219.44	4	Mon	2011.22	4	Wed	1489.92	4	Sat	853.17	4	Tue	637.84	4	Thu	667.43	4	Sun	959.10	4	Tue	1345.62
5	Thu	802.09	5	Sun	1005.91	5	Mon	727.67	5	Thu	1570.29	5	Sat	2137.02	5	Tue	1944.82	5	Thu	1443.81	5	Sun	852.31	5	Wed	625.50	5	Fri	646.67	5	Mon	893.40	5	Wed	1246.29
6	Fri	812.81	6	Mon	857.97	6	Tue	672.94	6	Fri	1594.76	6	Sun	2153.48	6	Wed	2415.13	6	Fri	1388.62	6	Mon	846.44	6	Thu	622.59	6	Sat	722.71	6	Tue	821.81	6	Thu	1290.65
7	Sat	847.22	7	Tue	888.41	7	Wed	957.04	7	Sat	1556.73	7	Mon	1955.14	7	Thu	3492.24	7	Sat	1492.53	7	Tue	1171.18	7	Fri	591.62	7	Sun	677.13	7	Wed	857.34	7	Fri	1179.91
8	Sun	867.93	8	Wed	939.28	8	Thu	761.31	8	Sun	1486.13	8	Tue	1684.37	8	Fri	5141.25	8	Sun	1225.30	8	Wed	741.81	8	Sat	616.97	8	Mon	792.59	8	Thu	872.39	8	Sat	1153.64
9	Mon	750.64	9	Thu	818.03	9	Fri	713.41	9	Mon	1466.88	9	Wed	1690.03	9	Sat	3739.44	9	Mon	1267.29	9	Thu	749.57	9	Sun	663.31	9	Tue	762.05	9	Fri	930.70	9	Sun	1149.23
10	Tue	780.35	10	Fri	734.88	10	Sat	816.18	10	Tue	1754.35	10	Thu	1609.24	10	Sun	3140.44	10	Tue	1255.12	10	Fri	706.10	10	Mon	597.07	10	Wed	745.30	10	Sat	1010.26	10	Mon	1054.45
11	Wed	767.79	11	Sat	802.33	11	Sun	887.71	11	Wed	1333.10	11	Fri	1637.76	11	Mon	2921.07	11	Wed	1227.16	11	Sat	745.94	11	Tue	623.20	11	Thu	751.56	11	Sun	1417.31	11	Tue	961.83
12	Thu	756.29	12	Sun	825.27	12	Mon	965.62	12	Thu	1381.13	12	Sat	1603.99	12	Tue	2523.78	12	Thu	1250.26	12	Sun	749.96	12	Wed	1183.40	12	Fri	733.05	12	Mon	1320.59	12	Wed	1022.66
13	Fri	742.46	13	Mon	756.43	13	Tue	1385.17	13	Fri	1337.33	13	Sun	1659.38	13	Wed	2460.01	13	Fri	1136.23	13	Mon	727.21	13	Thu	601.90	13	Sat	809.64	13	Tue	1217.67	13	Thu	907.44
14	Sat	804.27	14	Tue	752.35	14	Wed	1498.64	14	Sat	1393.12	14	Mon	1632.82	14	Thu	2175.24	14	Sat	1265.88	14	Tue	721.25	14	Fri	614.51	14	Sun	831.24	14	Wed	1124.78	14	Fri	881.01
15	Sun	824.50	15	Wed	745.60	15	Thu	1423.49	15	Sun	1517.80	15	Tue	2055.50	15	Fri	2069.37	15	Sun	1329.26	15	Wed	704.63	15	Sat	637.82	15	Mon	775.60	15	Thu	1121.60	15	Sat	929.66
16	Mon	747.54	16	Thu	768.34	16	Fri	1531.08	16	Mon	1415.24	16	Wed	1621.78	16	Sat	1947.00	16	Mon	2134.79	16	Thu	756.50	16	Sun	699.39	16	Tue	768.82	16	Fri	1045.77	16	Sun	946.27
17	Tue	773.08	17	Fri	755.28	17	Sat	2567.76	17	Tue	1412.49	17	Thu	1675.98	17	Sun	1735.78	17	Tue	1557.69	17	Fri	692.07	17	Mon	592.00	17	Wed	740.21	17	Sat	1095.53	17	Mon	897.80
18	Wed	774.83	18	Sat	798.96	18	Sun	3218.28	18	Wed	1419.42	18	Fri	1509.92	18	Mon	1270.06	18	Wed	1287.46	18	Sat	727.89	18	Tue	614.96	18	Thu	752.96	18	Sun	1067.04	18	Tue	891.67
19	Thu	767.05	19	Sun	748.98	19	Mon	3030.42	19	Thu	1527.30	19	Sat	1507.00	19	Tue	1218.16	19	Thu	1333.02	19	Sun	772.25	19	Wed	644.63	19	Fri	732.72	19	Mon	999.65	19	Wed	950.17
20	Fri	757.83	20	Mon	807.42	20	Tue	2370.26	20	Fri	1604.33	20	Sun	2625.07	20	Wed	1272.97	20	Fri	1258.56	20	Mon	704.08	20	Thu	721.20	20	Sat	781.21	20	Tue	967.80	20	Thu	899.40
21	Sat	815.28	21	Tue	703.54	21	Wed	2351.53	21	Sat	1816.35	21	Mon	2707.99	21	Thu	1135.60	21	Sat	1088.03	21	Tue	752.79	21	Fri	695.64	21	Sun	775.90	21	Wed	1002.64	21	Fri	844.44
22	Sun	833.64	22	Wed	733.58	22	Thu	2365.43	22	Sun	2354.99	22	Tue	2217.80	22	Fri	1112.90	22	Sun	1133.66	22	Wed	721.59	22	Sat	720.96	22	Mon	714.69	22	Thu	944.10	22	Sat	900.76
23	Mon	851.13	23	Thu	763.32	23	Fri	4207.36	23	Mon	2703.81	23	Wed	2044.99	23	Sat	1154.25	23	Mon	1041.03	23	Thu	697.00	23	Sun	743.12	23	Tue	776.48	23	Fri	898.04	23	Sun	867.16
24	Tue	834.66	24	Fri	714.85	24	Sat	4819.12	24	Tue	2782.86	24	Thu	1998.32	24	Sun	1175.24	24	Tue	1023.06	24	Fri	708.40	24	Mon	696.71	24	Wed	1244.63	24	Sat	951.27	24	Mon	875.80
25	Wed	839.48	25	Sat	766.65	25	Sun	3142.46	25	Wed	2585.59	25	Fri	1737.17	25	Mon	1228.53	25	Wed	1069.57	25	Sat	728.62	25	Tue	681.72	25	Thu	1563.73	25	Sun	959.04	25	Tue	810.71
26	Thu	833.67	26	Sun	807.28	26	Mon	2566.45	26	Thu	2767.86	26	Sat	1574.35	26	Tue	1179.92	26	Thu	1150.71	26	Sun	709.16	26	Wed	675.54	26	Fri	1398.28	26	Mon	892.53	26	Wed	828.96
27	Fri	844.33	27	Mon	737.29	27	Tue	2360.12	27	Fri	2179.48	27	Sun	3015.39	27	Wed	1226.35	27	Fri	927.70	27	Mon	685.73	27	Thu	643.00	27	Sat	1240.82	27	Tue	921.82	27	Thu	807.37
28	Sat	888.19	28	Tue	776.98	28	Wed	2314.18	28	Sat	2121.27	28	Mon	3356.58	28	Thu	1425.77	28	Sat	1039.04	28	Tue	858.00	28	Fri	627.65	28	Sun	1191.55	28	Wed	866.98	28	Fri	814.96
29	Sun	917.986	29	Wed	708.5104	29	Thu	1987.38	29	Sun	1931.83	29	Tue	3024.53	29	Fri	1254.66	29	Sun	958.88	29	Wed	863.00	29	Sat	697.48	29	Mon	1083.80	29	Thu	872.87	29	Sat	843.46
30	Mon	853.6728				30	Fri	1872.11	30	Mon	1874.20	30	Wed	2747.65	30	Sat	1151.48	30	Mon	950.19	30	Thu	575.68	30	Sun	711.12	30	Tue	1022.66	30	Fri	824.90	30	Sun	815.62
31	Tue	880.0673				31	Sat	1915.12				31	Thu	2551.55				31	Tue	929.01	31	Fri	1424.03										31	Mon	827.20
		25227.92			23234.8			56481.35			54148.3			64070.42			58957.21			39562.37			24704.49			21164.3			26457.68			29602.90			30126.825
	AVE	813.80		AVE	801.20		AVE	1821.98		AVE	1804.94		AVE	2066.79		AVE	1965.24		AVE	1276.21		AVE	796.92		AVE	705.48		AVE	853.47		AVE	986.76		AVE	971.83
	MAX	917.99		MAX	1005.91		MAX	4819.12		MAX	2782.86		MAX	3356.58		MAX	5141.25		MAX	2134.79		MAX	1424.03		MAX	1183.40		MAX	1563.73		MAX	1417.31		MAX	1392.41
	MIN	742.46		MIN	703.54		MIN	672.94		MIN	1333.10		MIN	1507.00		MIN	1112.90		MIN	927.70		MIN	575.68		MIN	591.62		MIN	536.47		MIN	821.81		MIN	807.37

ANNUAL REPORT
2012
SUMMARY OF SEWAGE MONTHLY FLOWS

Appendix A-2

Month	Total Flow	Daily Flows		
		m3/day		
	(m3)	Average	Maximum	Minimum
January	25,227.92	813.80	917.99	698.22
February	23,234.80	801.20	1,005.91	703.54
March	56,481.35	1,821.98	4,819.12	672.94
April	54,148.30	1,804.94	2,782.86	1,333.10
May	64,070.42	2,066.79	3,356.58	1,507.00
June	71,686.57	2,389.55	5,141.25	1,735.78
July	39,562.37	1,276.21	2,134.79	927.70
August	28,935.12	933.39	5,088.63	575.68
September	21,164.30	705.48	1,183.40	591.62
October	26,457.68	853.47	1,563.73	536.47
November	29,602.90	986.76	1,417.31	821.81
December	26,944.13	977.12	1,392.41	807.37
ANNUAL	**467,515.87**	**1,285.89**	**5,141.25**	**536.47**

ANNUAL REPORT
2012
Summary of Monthly Maximum and Minimum Daily Flow Events

Appendix A-3

Day	Date	Maximum Daily Flow	Month	Mimimum Daily Flow	Day	Date
		m3		m3		
Sunday	29th	917.99	**January**	742.46	Friday	13th
Sunday	5th	1,005.91	**February**	703.54	Tuesday	21st
Saturday	24th	4,819.12	**March**	672.94	Tuesday	6th
Tuesday	24th	2,782.86	**April**	1,333.10	Wednesday	11th
Monday	28th	3,356.58	**May**	1,507.00	Saturday	19th
Thursday	21st	5,141.25	**June**	1,735.78	Saturday	30th
Monday	16th	2,134.79	**July**	927.70	Friday	27th
Friday	31st	1,424.03	**August**	575.68	Thursday	30th
Wednesday	12th	1,183.40	**September**	591.62	Friday	7th
Thursday	25th	1,563.73	**October**	536.47	Monday	1st
Sunday	11th	1,417.31	**November**	821.81	Tuesday	6th
Monday	3rd	1,392.41	**December**	807.37	Thursday	27th
		5,141.25	**ANNUAL**	**536.47**		

ANNUAL SEWAGE REPORT
2012
Summary of Raw Sewage Laboratory Sampling Results

Appendix B-1

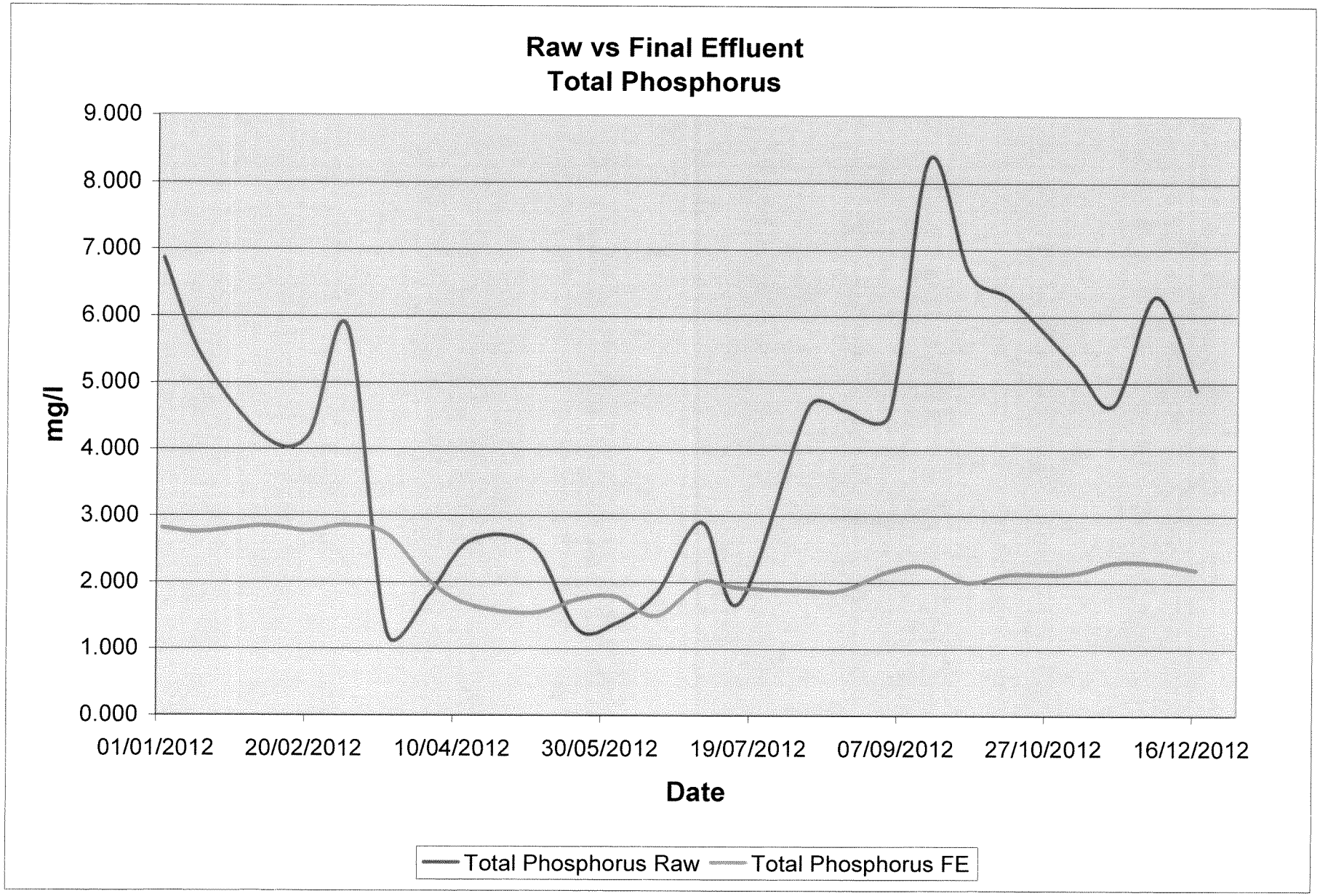
Laboratory Results							
Raw Sewage		Total Phosphorus (TP)	Biochemical Oxygen Demand	Total Suspended Solids	Temperature	E-Coli	pH
Month	Date	(mg/L)			°C	C.F.U./100ml	
January	03/01/2012	6.860	213	576	8.3	10,000,000	7.83
	16/01/2012	5.370	199	126	6.8	3,900,000	7.73
February	06/02/2012	4.180	177	123	7.6	8,700,000	7.86
	21/02/2012	4.200	163	136	7.7	3,100,000	7.96
March	05/03/2012	5.830	221	192	7	10,000,000	8.01
	19/03/2012	1.220	45.8	78	7.4	1,300,000	7.45
April	02/04/2012	1.800	64	76.5	7.4	1,500,000	7.65
	16/04/2012	2.620	93.1	151	6.8	3,300,000	7.81
May	07/05/2012	2.540	92.5	76	6.8	5,800,000	7.60
	22/05/2012	1.300	36.1	59.2	10.8	1,300,000	7.45
June	04/06/2012	1.370	32.5	54	10.9	830,000	7.48
	18/06/2012	1.830	57.9	104	14.6	4,900,000	7.47
July	03/07/2012	2.900	96.6	172	14.6	7,700,000	7.37
	16/07/2012	1.690	97.2	124	16.9	7,700,000	7.48
August	08/08/2012	4.650	135	152	15.9	5,200,000	7.81
	20/08/2012	4.590	122	162	16.3	13,000,000	7.77
September	04/09/2012	4.520	140	153	18.1	6,500,000	7.46
	17/09/2012	8.350	211	264	16.1	11,000,000	8.15
October	01/10/2012	6.640	216	402	15.2	4,100,000	7.58
	15/10/2012	6.270	134	218	12.2	5,800,000	8.21
November	05/11/2012	5.310	182	128	11.1	4,400,000	8.18
	19/11/2012	4.670	155	164	11.9	5,200,000	8.00
December	03/12/2012	6.300	175	279	7.8	3,300,000	8.06
	17/12/2012	4.890	105	176	6.9	20,000,000	8.18
Annual	Average	4.16	131.82	172.74	11.05	6,188,750	7.77

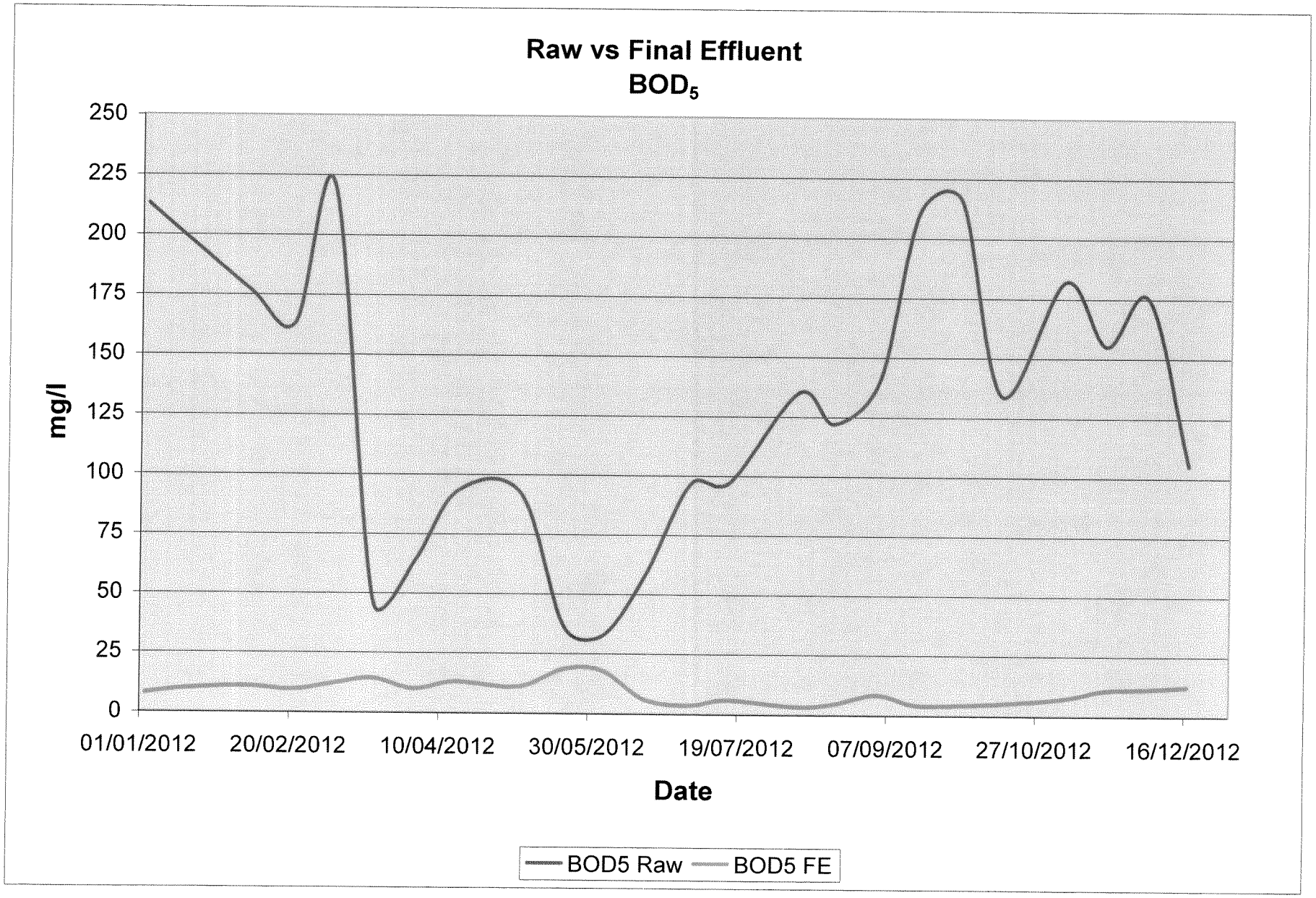
ANNUAL SEWAGE REPORT
2012
Summary of Final Effluent Laboratory Sampling Results

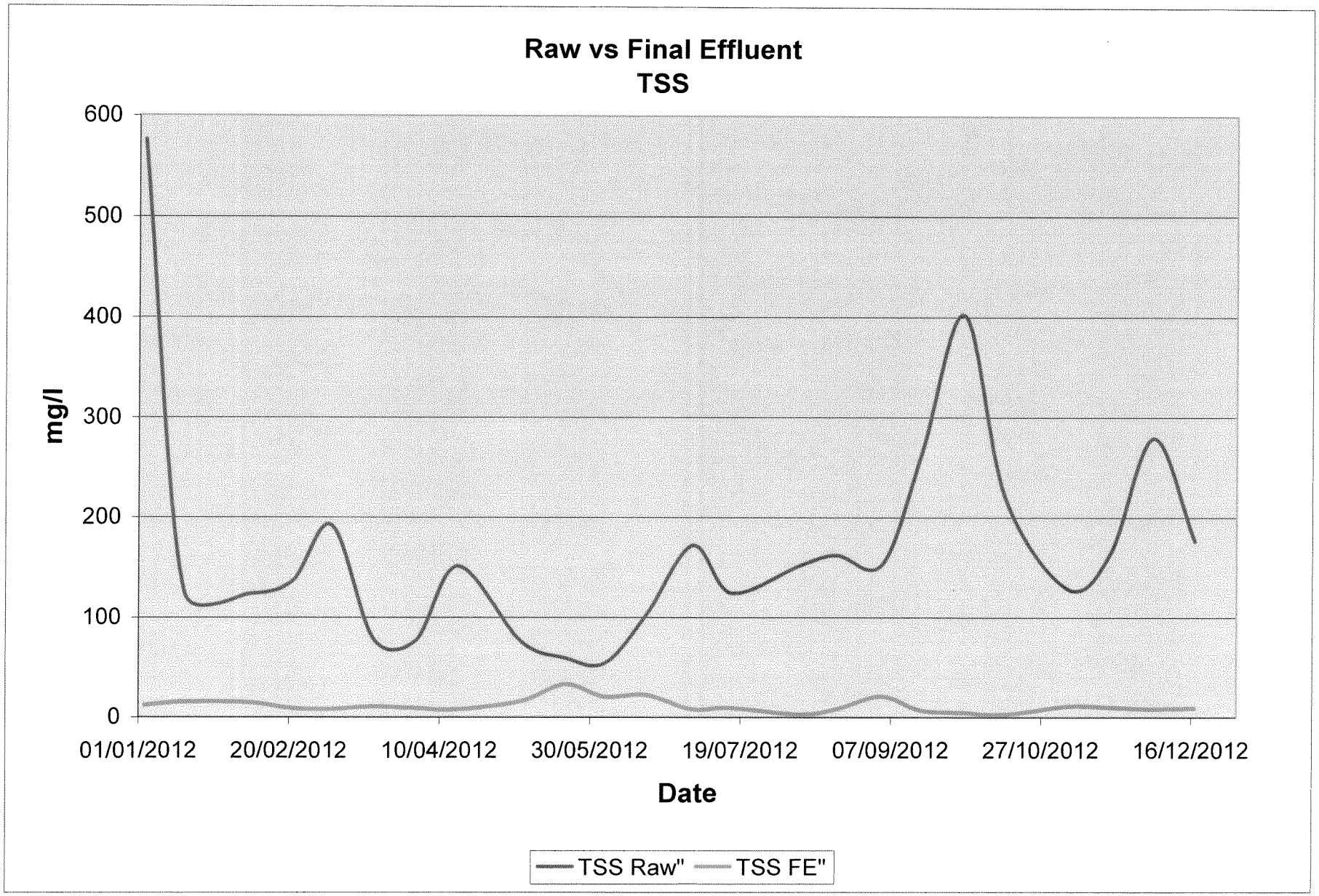
Appendix B-2

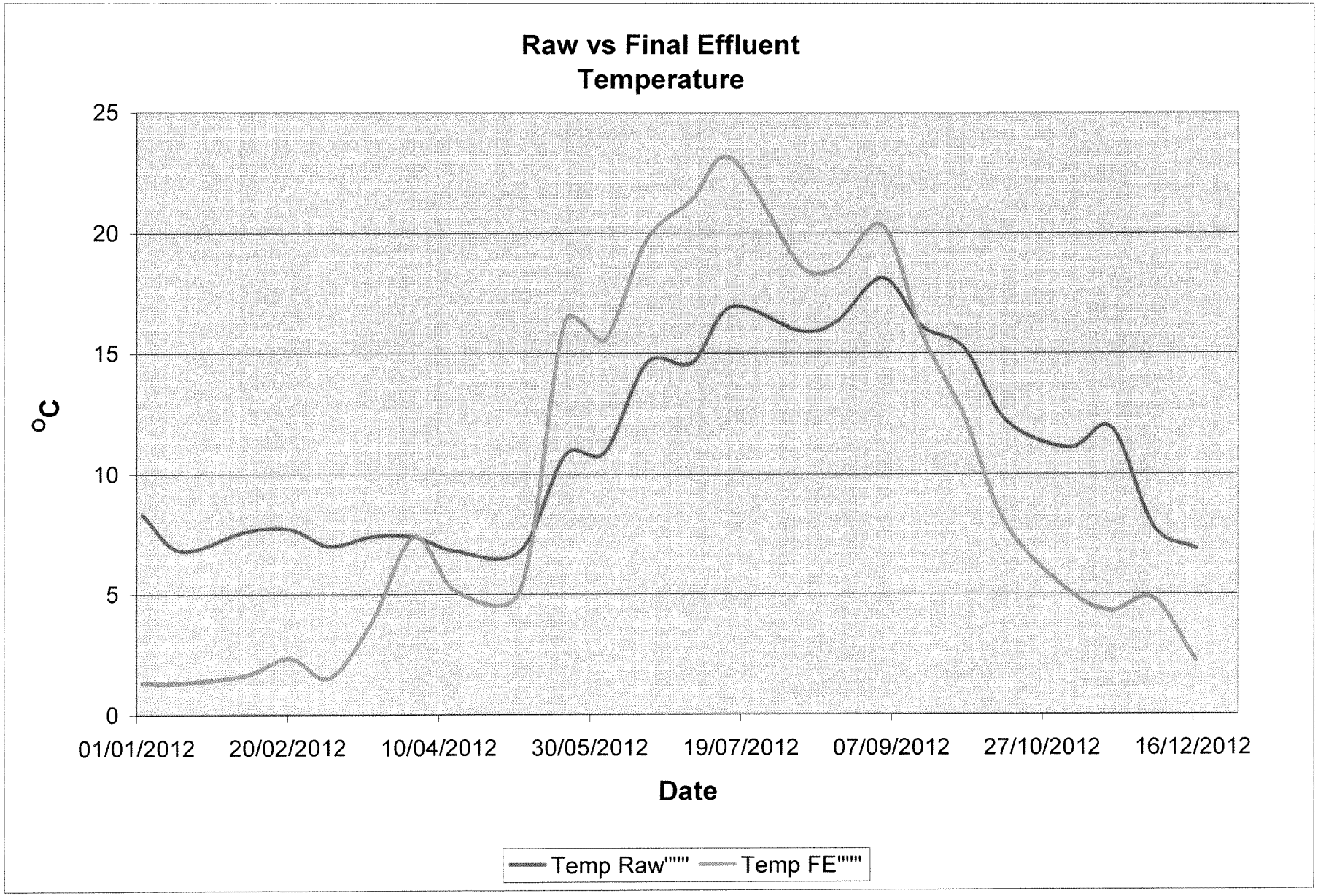
Laboratory Results										
Final Effluent		Ammonia (N)	Total Phosphorus	Biochemical Oxygen Demand	Total Suspended Solids	Temperature	E-Coli		pH	Exceedence
Month	Date	(mg/L)			(mg/L)	°C	C.F.U./100 ml			
January	03/01/2012	12.00	2.81	7.8	11.6	1.3	>	2,420	7.84	No
	16/01/2012	13.9	2.75	9.6	14.9	1.3		1,700	7.87	No
February	06/02/2012	16.70	2.84	10.8	14.5	1.6		1,300	7.77	No
	21/02/2012	17.20	2.77	9.4	8.7	2.3	>	2,420	7.78	No
March	05/03/2012	17.20	2.85	11.7	7.6	1.5		2,400	7.74	No
	19/03/2012	17.60	2.71	14.2	10.1	3.8	>	2,420	7.67	No
April	02/04/2012	11.10	2.02	9.9	8.8	7.4		2,400	7.83	No
	16/04/2012	9.11	1.65	12.9	7.5	5.1		1,700	7.86	No
May	07/05/2012	6.90	1.53	11	15.4	5.1		1,700	7.84	No
	22/05/2012	3.03	1.73	18.4	32.5	16.3		36	8.07	Yes
June	04/06/2012	3.01	1.78	17.9	20	15.5		220	8.02	No
	18/06/2012	3.63	1.49	6.1	22	19.7		99	7.78	No
July	03/07/2012	4.81	1.99	3.6	7.8	21.4		8	7.87	No
	16/07/2012	3.01	1.91	5.8	8.9	23.1		5	7.78	No
August	08/08/2012	0.96	1.87	3.3	2.5	18.6		72	7.96	No
	20/08/2012	0.89	1.88	4.3	7.9	18.5		120	7.79	No
September	04/09/2012	1.40	2.16	8.3	20.6	20.3		78	8.00	No
	17/09/2012	0.95	2.24	4.2	6.8	15.8		730	7.82	No
October	01/10/2012	0.87	2.00	4.2	4.5	12.4		870	7.77	No
	15/10/2012	1.56	2.12	5	2.6	7.9		2,400	7.80	No
November	05/11/2012	2.73	2.13	7.1	10.7	5.1	>	2,400	7.79	No
	19/11/2012	6.84	2.29	10.5	9.6	4.3	>	2,420	8.02	No
December	03/12/2012	7.99	2.29	11.2	8	4.8	>	2,420	7.86	No
	17/12/2012	10.30	2.19	12.2	8.7	2.2	>	2,420	7.86	No
Annual	Average	7.24	2.17	9	11	10		1,365	7.85	No

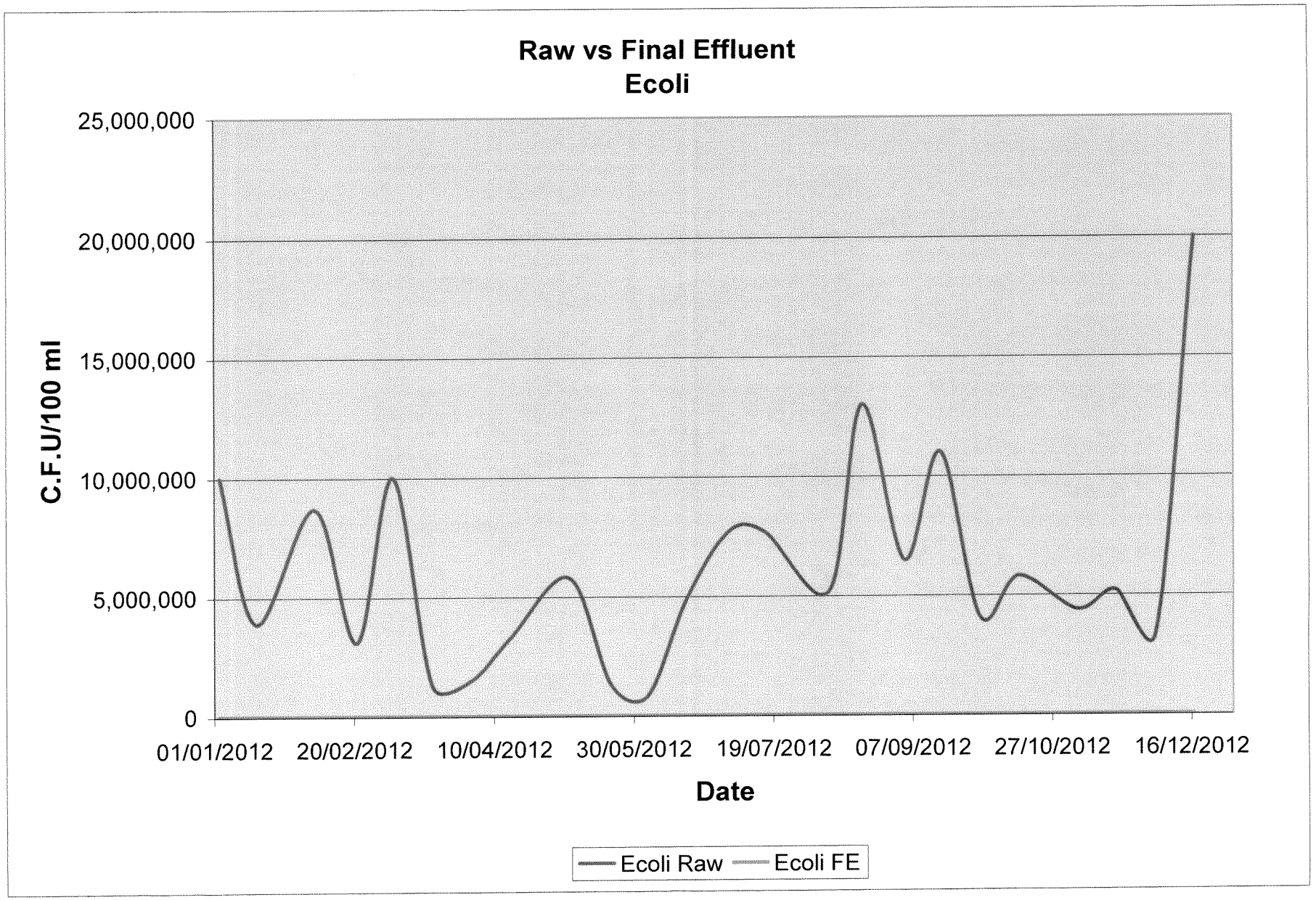
(1) The Ontario Spills Action Centre and the Ministry of Environment were notified
The final Effluent was resampled

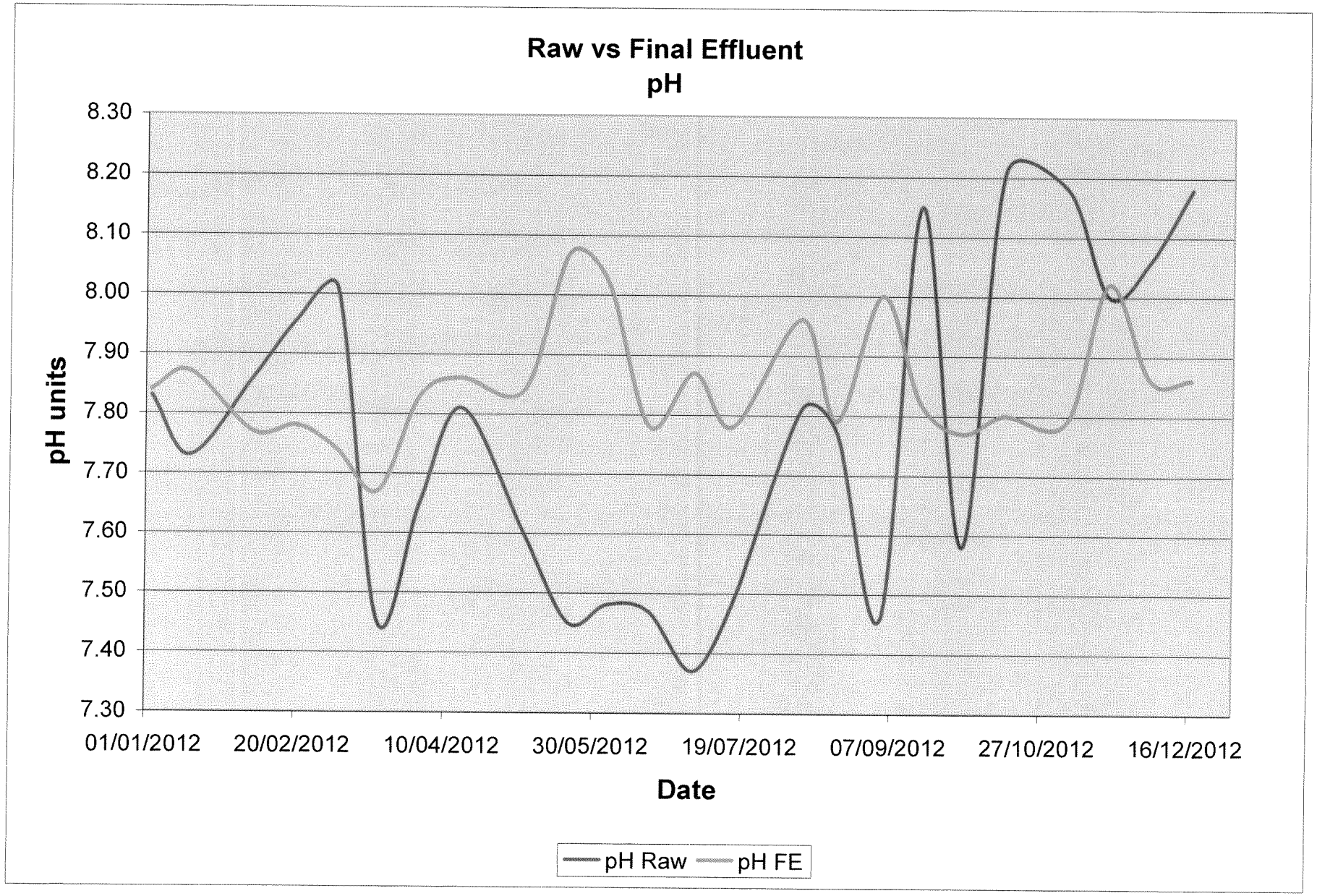

Raw vs Final Effluent
Total Phosphorus
9.000
8.000
7.000
6.000
5.000
4.000
3.000
2.000
1.000
0.000
mg/l
01/01/2012
20/02/2012
10/04/2012
30/05/2012
19/07/2012
07/09/2012
27/10/2012
16/12/2012
Date
Total Phosphorus Raw
Total Phosphorus FE

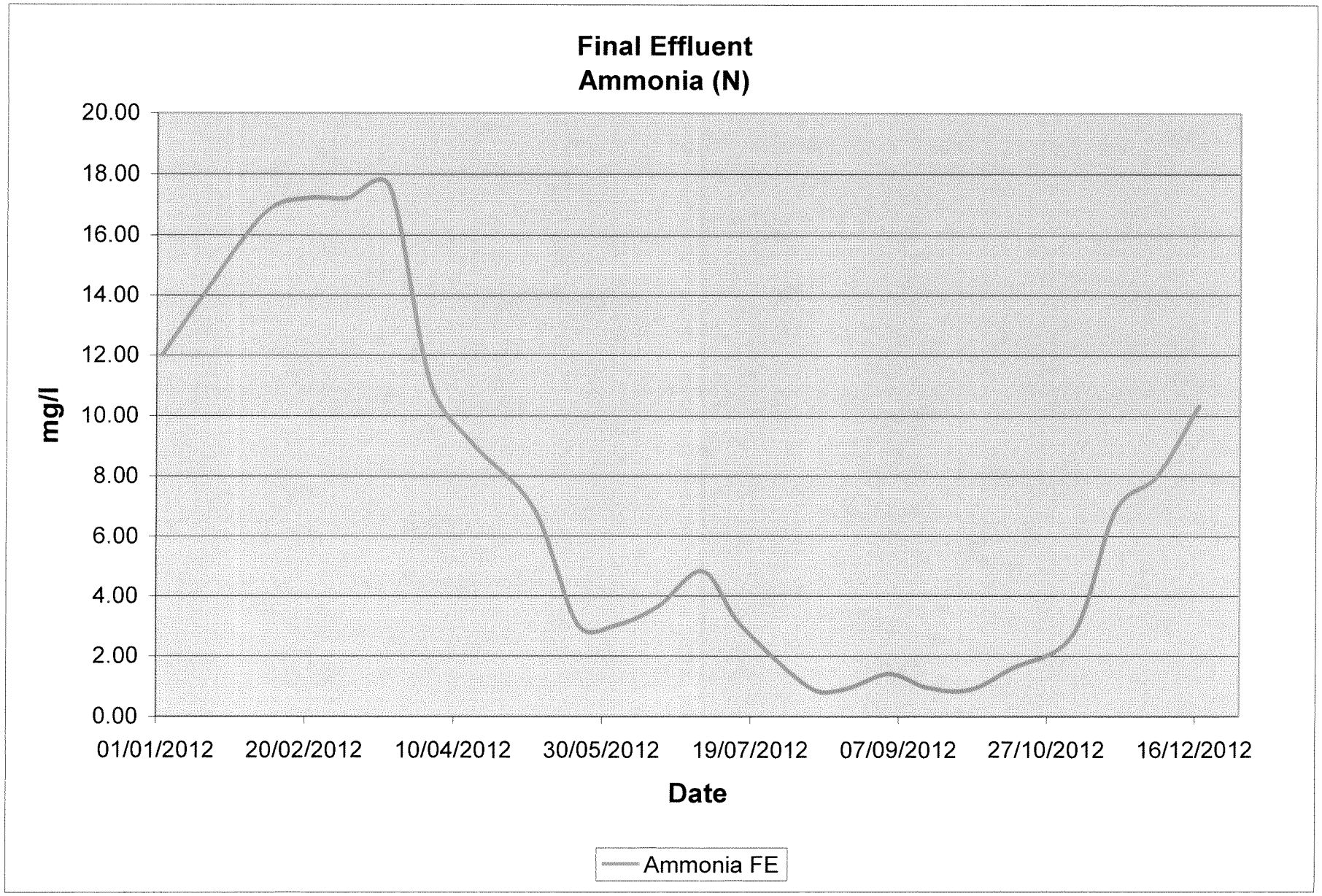

Raw vs Final Effluent
BOD5
250
225
200
175
150
125
100
75
50
25
0
mg/l
01/01/2012
20/02/2012
10/04/2012
30/05/2012
19/07/2012
07/09/2012
27/10/2012
16/12/2012
Date
BOD5 Raw
BOD5 FE


Raw vs Final Effluent
TSS
600
500
400
300
200
100
0
mg/l
01/01/2012
20/02/2012
10/04/2012
30/05/2012
19/07/2012
07/09/2012
27/10/2012
16/12/2012
Date
TSS Raw"
TSS FE"


Raw vs Final Effluent Temperature
25
20
15
10
5
0
°C
01/01/2012
20/02/2012
10/04/2012
30/05/2012
19/07/2012
07/09/2012
27/10/2012
16/12/2012
Date
Temp Raw""""
Temp FE""""


Raw vs Final Effluent
Ecoli
25,000,000
20,000,000
15,000,000
10,000,000
5,000,000
0
C.F.U/100 ml
01/01/2012
20/02/2012
10/04/2012
30/05/2012
19/07/2012
07/09/2012
27/10/2012
16/12/2012
Date
Ecoli Raw
Ecoli FE


Raw vs Final Effluent
pH
8.30
8.20
8.10
8.00
7.90
7.80
7.70
7.60
7.50
7.40
7.30
pH units
01/01/2012
20/02/2012
10/04/2012
30/05/2012
19/07/2012
07/09/2012
27/10/2012
16/12/2012
Date
pH Raw
pH FE


Final Effluent
Ammonia (N)
20.00
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
mg/l
01/01/2012
20/02/2012
10/04/2012
30/05/2012
19/07/2012
07/09/2012
27/10/2012
16/12/2012
Date
Ammonia FE

ANNUAL REPORT
2012
Summary of Sewage Laboratory Sampling Results
PERCENT REDUCTION

Appendix B-3

Raw Sewage				Final Effluent	
Total Phosphorus				Total Phosphorus	Percentage Reduction
mg/L	Date	Month	Date	mg/L	%
6.860	03/01/2012	January	03/01/2012	2.81	59.0%
5.370	16/01/2012		16/01/2012	2.75	48.8%
4.180	06/02/2012	February	06/02/2012	2.84	32.1%
4.200	21/02/2012		21/02/2012	2.77	34.0%
5.830	05/03/2012	March	05/03/2012	2.85	51.1%
1.220	19/03/2012		19/03/2012	2.71	-122.1%
1.800	02/04/2012	April	02/04/2012	2.02	-12.2%
2.620	16/04/2012		16/04/2012	1.65	37.0%
2.540	07/05/2012	May	07/05/2012	1.53	39.8%
1.300	22/05/2012		22/05/2012	1.73	-33.1%
1.370	04/06/2012	June	04/06/2012	1.78	-29.9%
1.830	18/06/2012		18/06/2012	1.49	18.6%
2.900	03/07/2012	July	03/07/2012	1.99	31.4%
1.690	16/07/2012		16/07/2012	1.91	-13.0%
4.650	08/08/2012	August	08/08/2012	1.87	59.8%
4.590	20/08/2012		20/08/2012	1.88	59.0%
4.520	04/09/2012	September	04/09/2012	2.16	52.2%
8.350	17/09/2012		17/09/2012	2.24	73.2%
6.640	01/10/2012	October	01/10/2012	2.00	69.9%
6.270	15/10/2012		15/10/2012	2.12	66.2%
5.310	05/11/2012	November	05/11/2012	2.13	59.9%
4.670	19/11/2012		19/11/2012	2.29	51.0%
6.300	03/12/2012	December	03/12/2012	2.29	63.7%
4.890	17/12/2012		17/12/2012	2.19	55.2%
4.163	Average	Annual	Average	2.17	**47.9%**

ANNUAL REPORT
2012
Summary of Sewage Laboratory Sampling Results
PERCENT REDUCTION

Appendix B-4

Raw Sewage				Final Effluent	
Biochemical Oxygen Demand				Biochemical Oxygen Demand	Percentage Reduction
mg/L	Date	Month	Date	mg/L	%
213	03/01/2012	January	03/01/2012	7.8	96.3%
199	16/01/2012		16/01/2012	9.6	95.2%
177	06/02/2012	February	06/02/2012	10.8	93.9%
163	21/02/2012		21/02/2012	9.4	94.2%
221	05/03/2012	March	05/03/2012	11.7	94.7%
45.8	19/03/2012		19/03/2012	14.2	69.0%
64	02/04/2012	April	02/04/2012	9.9	84.5%
93.1	16/04/2012		16/04/2012	12.9	86.1%
92.5	07/05/2012	May	07/05/2012	11	88.1%
36.1	22/05/2012		22/05/2012	18.4	49.0%
32.5	04/06/2012	June	04/06/2012	17.9	44.9%
57.9	18/06/2012		18/06/2012	6.1	89.5%
96.6	03/07/2012	July	03/07/2012	3.6	96.3%
97.2	16/07/2012		16/07/2012	5.8	94.0%
135	08/08/2012	August	08/08/2012	3.3	97.6%
122	20/08/2012		20/08/2012	4.3	79.8%
140	04/09/2012	September	04/09/2012	8.3	94.1%
211	17/09/2012		17/09/2012	4.2	98.0%
216	01/10/2012	October	01/10/2012	4.2	98.1%
134	15/10/2012		15/10/2012	5	96.3%
182	05/11/2012	November	05/11/2012	7.1	96.1%
155	19/11/2012		19/11/2012	10.5	93.2%
175	03/12/2012	December	03/12/2012	11.2	93.6%
105	17/12/2012		17/12/2012	12.2	88.4%
132	**Average**	**Annual**	**Average**	9	**93.1%**

ANNUAL REPORT
2012
Summary of Sewage Laboratory Sampling Results
PERCENT REDUCTION

Appendix B-5

Raw Sewage				Final Effluent	
Total Suspended Solids				Total Suspended Solids	Percentage Reduction
mg/L	Date	Month	Date	mg/L	%
576	03/01/2012	January	03/01/2012	11.6	98.0%
126	16/01/2012		16/01/2012	14.9	88.2%
123	06/02/2012	February	06/02/2012	14.5	88.2%
136	21/02/2012		21/02/2012	8.7	93.6%
192	05/03/2012	March	05/03/2012	7.6	96.0%
78	19/03/2012		19/03/2012	10.1	87.1%
76.5	02/04/2012	April	02/04/2012	8.8	88.5%
151	16/04/2012		16/04/2012	7.5	95.0%
76	07/05/2012	May	07/05/2012	15.4	79.7%
59.2	22/05/2012		22/05/2012	32.5	45.1%
54	04/06/2012	June	04/06/2012	20	63.0%
104	18/06/2012		18/06/2012	22	78.8%
172	03/07/2012	July	03/07/2012	7.8	95.5%
124	16/07/2012		16/07/2012	8.9	92.8%
152	08/08/2012	August	08/08/2012	2.5	98.4%
162	20/08/2012		20/08/2012	7.9	95.1%
153	04/09/2012	September	04/09/2012	20.6	86.5%
264	17/09/2012		17/09/2012	6.8	97.4%
402	01/10/2012	October	01/10/2012	4.5	98.9%
218	15/10/2012		15/10/2012	2.6	98.8%
128	05/11/2012	November	05/11/2012	10.7	91.6%
164	19/11/2012		19/11/2012	9.6	94.1%
279	03/12/2012	December	03/12/2012	8	97.1%
176	17/12/2012		17/12/2012	8.7	95.1%
173	Average	Annual	Average	11	**93.4%**

ANNUAL REPORT
2012
Summary of Sewage Laboratory Sampling Results
PERCENT REDUCTION

Appendix B-6

Raw Sewage				Final Effluent	
E-Coli				E-Coli	Percentage Reduction
C.F.U./100 ml	Date	Month	Date	C.F.U./100 ml	%
10,000,000	03/01/2012	January	03/01/2012	2,420	100.0%
3,900,000	16/01/2012		16/01/2012	1,700	100.0%
8,700,000	06/02/2012	February	06/02/2012	1,300	100.0%
3,100,000	21/02/2012		21/02/2012	2,420	99.9%
10,000,000	05/03/2012	March	05/03/2012	2,400	100.0%
1,300,000	19/03/2012		19/03/2012	2,420	99.8%
1,500,000	02/04/2012	April	02/04/2012	2,400	99.8%
3,300,000	16/04/2012		16/04/2012	1,700	99.9%
5,800,000	07/05/2012	May	07/05/2012	1,700	100.0%
1,300,000	22/05/2012		22/05/2012	36	100.0%
830,000	04/06/2012	June	04/06/2012	220	100.0%
4,900,000	18/06/2012		18/06/2012	99	100.0%
7,700,000	03/07/2012	July	03/07/2012	8	100.0%
7,700,000	16/07/2012		16/07/2012	5	100.0%
5,200,000	08/08/2012	August	08/08/2012	72	100.0%
13,000,000	20/08/2012		20/08/2012	120	100.0%
6,500,000	04/09/2012	September	04/09/2012	78	100.0%
11,000,000	17/09/2012		17/09/2012	730	100.0%
4,100,000	01/10/2012	October	01/10/2012	870	100.0%
5,800,000	15/10/2012		15/10/2012	2,400	100.0%
4,400,000	05/11/2012	November	05/11/2012	2,400	99.9%
5,200,000	19/11/2012		19/11/2012	2,420	100.0%
3,300,000	03/12/2012	December	03/12/2012	2,420	99.9%
20,000,000	17/12/2012		17/12/2012	2,420	100.0%
6,188,750	Average	Annual	Average	1,365	**100.0%**

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Summary of Exceedences of Certificate of Approval for Average Maximum Daily Flows

Appendix C

				Laboratory Results					
#	Date	Daily Flow (m^3)	Reason	Ammonia (N)	Total Phosphorus (TP)	Biochemical Oxygen Demand (BOD5)	Total Suspended Solids (TSS)	pH	Exceedence
				(mg/L)					
1	23-Mar-12	4207.36	Rain/Snow Melt	14.80	2.38	19.3	10.7	7.8	No
2	24-Mar-12	4819.12	Rain/Snow Melt	-	-	12	9.7	-	No
3	21-Jun-12	5141.25	Heavy Rain Fall	-	-	4.3	16.4	-	No

*1 Sample analysis concluded an exceedence on our C of A for BOD_5. The M.A.C is 25 mg/L and the Target is 20 mg/L. Samples were also collected on the following day and results show that we were in compliance according to our C of A.