APPENDIX D
Inflow & Infiltration Study

TOWNSHIP OF RED ROCK

SANITARY COLLECTION SYSTEM
INFLOW & INFILTRATION
DESKTOP STUDY

Submitted by:

Engineering Northwest Ltd.
Consulting Engineers
301 - 200 S. Syndicate Avenue
Thunder Bay, Ontario
P7E 1C9
(807) 623-3449 (phone)
(807) 623-5925 (fax)

PN 09080

May 2010

ENL

Engineering Northwest Ltd.

Consulting Engineers

May 31, 2010

PN 09080 – I&I Study

Ontario Clean Water Agency
1 Yonge Street, Suite 1700
Toronto, Ontario
M5E 1E5

Attention Ms. Shairose Alarakhia, P.Eng.

Dear Ms. Alarakhia:

Re: Township of Red Rock
Wastewater Treatment System Upgrades
I&I Study – Final Report

Please find attached three (3) copies of the Final I&I Study for your records. Two (2) additional copies have been delivered directly to the Township for their records.

If there are any questions or if any additional information is required, please do not hesitate to contact our office.

We appreciate the opportunity to work with OCWA and the Township and look forward to future opportunities to work together.

Yours very truly,

ENGINEERING NORTHWEST LTD.

K. Bemben, P.Eng.
KB:dc
Encl.

Cc. Mic Groulx – Township of Red Rock
Dave Pettersen – Township of Red Rock

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200 South Syndicate Ave., Suite 301, Thunder Bay, ON P7E 1C9 Telephone (807) 623-3449 Fax (807) 623-5925 Email: general@enl-tbay.com www.enl-tbay.com

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1.0 INTRODUCTION & BACKGROUND

One of the requirements of the Provincial funding for the wastewater treatment plant upgrade is for the Township to undertake an Inflow and Infiltration Study on the Township's sanitary sewer system. A previous study, *Water and Wastewater Optimization Study*, was completed by R.J. Burnside & Associates in October 1996. This study identified that extraneous flows represented a significant problem causing hydraulic overloading of the sewage treatment plant (STP). Since 1996 the Township has undertaken a number of corrective actions to improve the sanitary collection system by repairing and/or replacing sanitary sewers and manholes.

An updated report is required to document the work completed on the sanitary system by the Township since 1996 and if there has been a resultant decrease in extraneous inflow and infiltration as a result of the work. It should also be noted that an estimated 95% of the households have their weeping tile systems tied directly into the sanitary system, which is thought to cause a significant portion of the extraneous flows. Roof leader connections to the sanitary system are also a common problem within the community.

Watermain bleeders, necessary to maintain chlorine residuals in the potable water supply, result in a significant inflow of water into the sanitary system.

The objectives of this study are to:

- Review the 1996 optimization study;
- Review available historic flows, noting apparent flow changes;
- Identify effect of extreme weather events, if possible;
- Review repairs and/or replacements of sanitary sewers or other work undertaken by the Township to reduce flows to the existing plant;
- Identify existing and future anticipated flows;
- Identify the amount and potentially where the inflow and infiltration is originating (public or private);
- Draw conclusions from the available information and make recommendations for additional flow reduction undertakings.

2.0 REVIEW OF 1996 OPTIMIZATION STUDY

In October 1996 R.J. Burnside & Associates Limited completed a Water and Wastewater Optimization Study for the Township of Red Rock. The objectives of the study with respect to the sanitary system were to:

- Develop a priorities program to reduce infiltration and inflows to the sanitary sewers;
- Estimate the current and projected future demands for wastewater services;
- Make recommendations for a prioritized residential water use efficiency program;

With sole respect to the sanitary system, the report considered the following:

- Historical and projected wastewater loadings;
- Visual inspection of manholes;
- Video (CCTV) inspection of sanitary sewers;

The study's key findings with respect to the sanitary system are as follows:

- The age and condition of the sanitary sewer system varies greatly throughout the community. Extraneous flows represent a significant problem and cause hydraulic overloading of the plant;
- The extraneous flows were attributed to:
  - Foundation drains for houses being connected to the sanitary system;
  - Roof leaders being connected to the sanitary system.
  - Infiltration into the sanitary sewer due to cracked pipes, misaligned joints, collapsed pipes, manhole leakage etc.
  - Overland storm runoff entering the sanitary system through manhole covers;
- The reduction of inflow by means of disconnecting roof leaders and/or foundation drains would result in the most significant flow reductions, however the report stated it is not practical to direct the flows to the surface or to storm water systems.
- By means of mass balance calculation of water flows versus sewage flows, the report estimated that approximately 150,000 m^3/year of inflow/infiltration entered the waste water treatment plant.

A prioritized recommended action plan with respect to the sanitary system was provided in the 1996 Optimization Study. Generally, repairs to 20 manholes and approximately 500 m of sewer were recommended.

The report provided some discussion on water conservation measures that may be employed, such as, public education, by-laws on water usage and installation of water efficient fixtures.

3.0 REVIEW OF HISTORICAL FLOWS

Wastewater treatment plant flow data from 1996 to 2009 was provided by the Township. The data includes total, average, maximum and minimum monthly flows for The Domtar/Norampac/Red Rock Mill's (the "Mill") influent as well as the combined effluent. Similar data was provided for the water treatment plant flows. The data was summarized and several graphical Figures were constructed to assist in the analysis of the data (see Appendix A for data summary).

Figure #1 – Average Monthly Municipal Sewage Flows, displays the average of daily inflows to the treatment plant each month, excluding the inflow from the Mill.

Generally speaking, the data suggests that the monthly average flows are highly variable, and appear to be somewhat cyclical in nature, typically peaking in the spring months, while lower flows are typical of the winter months. The average day flows range from about 160 m^3/d in February 2006 to 1,721 m^3/d in June 2008.

Table 1 – 1996 to 2009 Wastewater, Treated Water & Population Comparison, compares the wastewater and treated water flows to the population. The figures exclude the Mill influent, and include only the domestic flows from the town, where available. As indicated on Table 1, the population was 1258 in 1996, compared to a population of 1063 for the most recent Stats Canada estimate in 2006. The population has therefore decreased by approximately 15.5% from 1996 to 2006. The corresponding overall decrease (1996 to 2006) in the total yearly and daily average sewage flows over this time period was estimated to be approximately 46%. Although there has been an overall decrease in the flows during this time period, there are several large fluctuations from year to year as evident in the change in flow from 1996 compared to the subsequent years. Extending forward to 2008, the average sewage flows are nearly at the 1996 levels, resulting in only a 3.5% decrease from 1996 compared to 2008. Although the 2008 population is unknown, it is estimated that it would be less than or similar to the 2006 level due to the poor economic environment within the Township. In 2009 the flow total is about 24% less than the 1996 levels, a large change compared to 2008, but not as significant as in previous years.

Over the period from 1996 to 2009 the corresponding average treated water flows and per capita consumption have essentially remained unchanged, despite a large decrease in population.

The average historical flows have been somewhat varied overtime. There have been decreases in flow in some years while the next year may see an increase in the average flow.

TABLE 1 - 1996 to 2009 Wastewater, Treated Water & Population Comparison

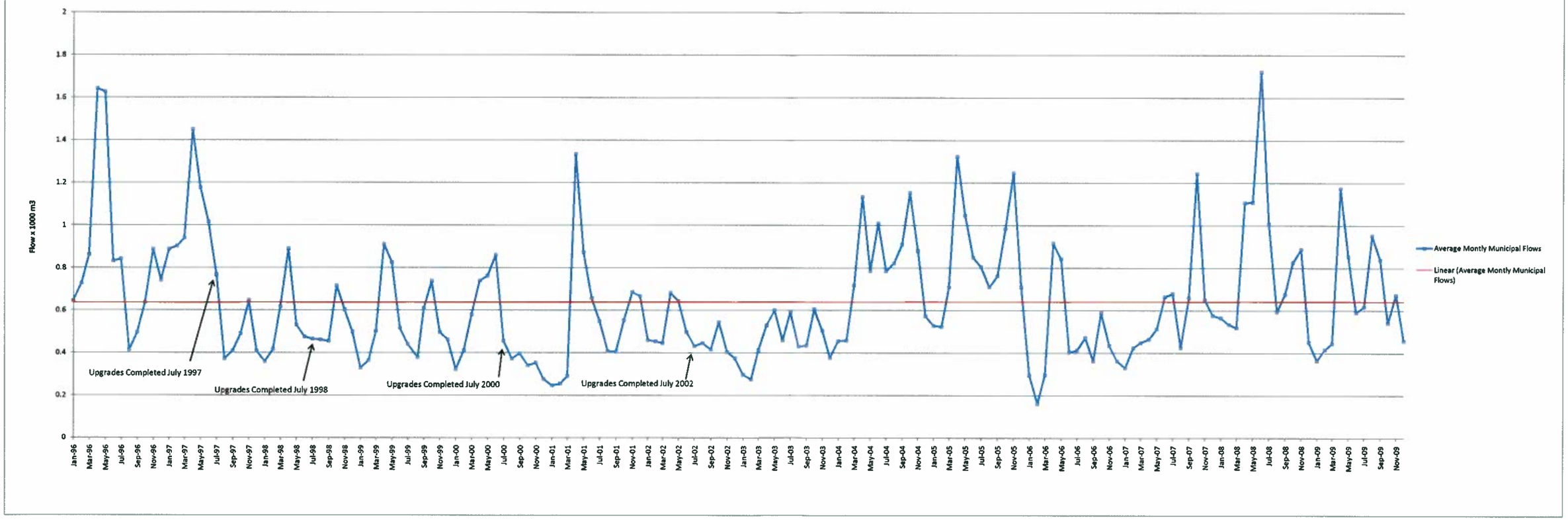
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2008	2007	2008	2009
Population	1258.00					1233.00					1063.00			
% Change in population from 1996						-1.99%					-15.50%			
Town Total Flow (x1000 m3)	315.344	286.835	196.983	199.831	178.517	210.41	175.651	167.984	See note 1	See note 1	171.028	215.276	304.347	240.81
% change in total wastewater flow from 1996		-9.04%	-37.53%	-36.83%	-43.39%	-33.28%	-44.30%	-46.73%	See note 1	See note 1	-45.76%	-31.73%	-3.49%	-23.64%
Average Daily Wastewater Flows, not including mill effluent (x1000 m3)	0.86	0.79	0.54	0.55	0.49	0.58	0.48	0.46	See note 1	See note 1	0.46	0.59	0.83	0.66
% change in wastewater average daily flow from 1996		-8.60%	-37.42%	-36.56%	-43.36%	-33.18%	-44.01%	-46.76%	See note 1	See note 1	-46.48%	-31.63%	-3.36%	-23.47%
Wastewater Flow - L/d/cap	683.60					470.40					432.70			
Average Treated Water Flows, not including Mill demand (x1000 m3)	0.51	0.52	0.52	0.48	0.44	0.47	0.50	0.46	0.41	0.49	0.43	0.54	0.60	0.49
Treated Water Flow - L/d/cap	405.41					381.18					404.52			

Notes:

1) Mill flow data was not available for 2004 and 2005, therefore the effluent from the Town only could not be calculated.

2) Population Data based on Statistics Canada Data for the years indicated.

Figure #1- Average Monthly Municipal Sewage Flows



4.0 REVIEW OF WEATHER EVENTS

Rainfall data was obtained from the water treatment plant monthly summary reports provided by the Township. The rainfall data was provided to the Township from the Mill's data collection. Available snowfall data was limited to 2005 and 2006 and has not been included in the analysis. Environment Canada does not operate a rainfall gauge in Red Rock and therefore, subsequent to the Mill closure in 2006, rainfall data was no longer available from 2007 – 2009.

Figure 2 – Average, Minimum & Peak Monthly Sewage Flows Vs. Rainfall Data, shows the Average, Minimum and Peak monthly sewage effluent flows compared to the available rainfall data. The data includes both the Town and Mill flows. Based on review of the resultant graph of the data, the following general conclusions can be made:

- The general trend is that with greater monthly rainfall the higher the average daily flows and monthly peak flows. However, this is not always the case and may rely more on duration and intensity of rainfall events and the number of rainfall events during the month. For example several small rainfall events over the month may not have as significant effect on peak flow as a single major rainfall event.

  Daily flow and rainfall data was provided by the Township in graphical format for the years 1996 to 2003. A sampling of this data is provided in Appendix B. Typically, the graphs generally indicate that larger rainfall events have a greater impact on flows, illustrated by peaks after rainfall events.

- The lowest peak and average flows tend to occur during two distinct periods; mid-summer (July) and mid-winter (January). During the summer and winter, the groundwater level may be lower resulting in less infiltration. Also, the inflow (i.e. roof leaders, manhole covers) during the winter should essentially be zero as there is no liquid precipitation (rainfall).

- Higher peak and average flows tend to occur during the spring season (March to May), which is likely a result of snow melt and/or precipitation. This may occur as infiltration (groundwater) and/or inflow (roof leaders, weeping tiles, manhole covers etc.).

Another consideration in the assessment of the effect of wet weather events and the amount of inflow and infiltration is to compare the Biological Oxygen Demand (BOD) to the plant flow and the recorded precipitation. Typically, the BOD of raw municipal sewage measures 200 mg/L. As the amount of inflow/infiltration increases, the raw sewage is diluted, thus a lower BOD concentration will be measured. *Figure 3 - BOD Vs. Sewage Flow Rate*, compares the BOD to the maximum, minimum and average monthly flow rates. *Figure 4 – BOD Vs. Rainfall*, plots the plant BOD as compared to the total monthly rainfall. Based on the data presented in these two graphs, the following general conclusions can be made:

- Generally, the higher flows are characterized by lower BOD measurements, although this is not always the case. As noted above, higher flows are typical in wet weather and the spring months (March to May) when snow melt is occurring;
- Lower BOD concentrations are typical during the wet spring months (March to May) as compared to the winter months (December to February) with little liquid precipitation or snow melt when the BOD is higher.

In light of the above, there are significant fluctuations in BOD from month to month, which are not necessarily explained by rainfall or higher flows. Currently, one daily composite sample is obtained for BOD each month. Depending on when this sample is obtained (i.e. before or after a rain event), the resulting BOD concentration may be higher or lower.

It should also be noted that there are several watermain bleeders operated within the community in order to maintain adequate chlorine residuals in the potable water supply. The flow from the bleeders directed to the sanitary system may have an effect on diluting the sewage strength and therefore decreasing the BOD. The flow from the bleeders is generally constant and consistent year round. Therefore, any effect on BOD caused by the bleeders is independent of that caused by the other inflow/infiltration.

Figure 2- Average, Minimum & Peak Monlthy Sewage Flows Vs. Rainfall Data

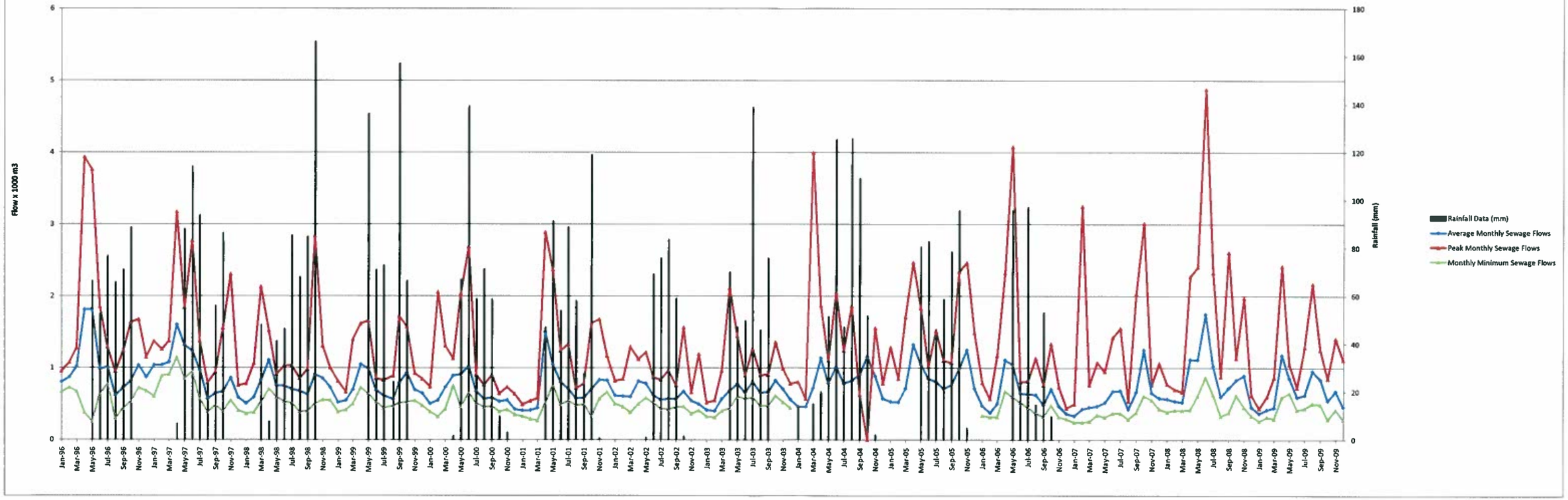


Figure 3 - BOD Vs. Sewage Flow Rate

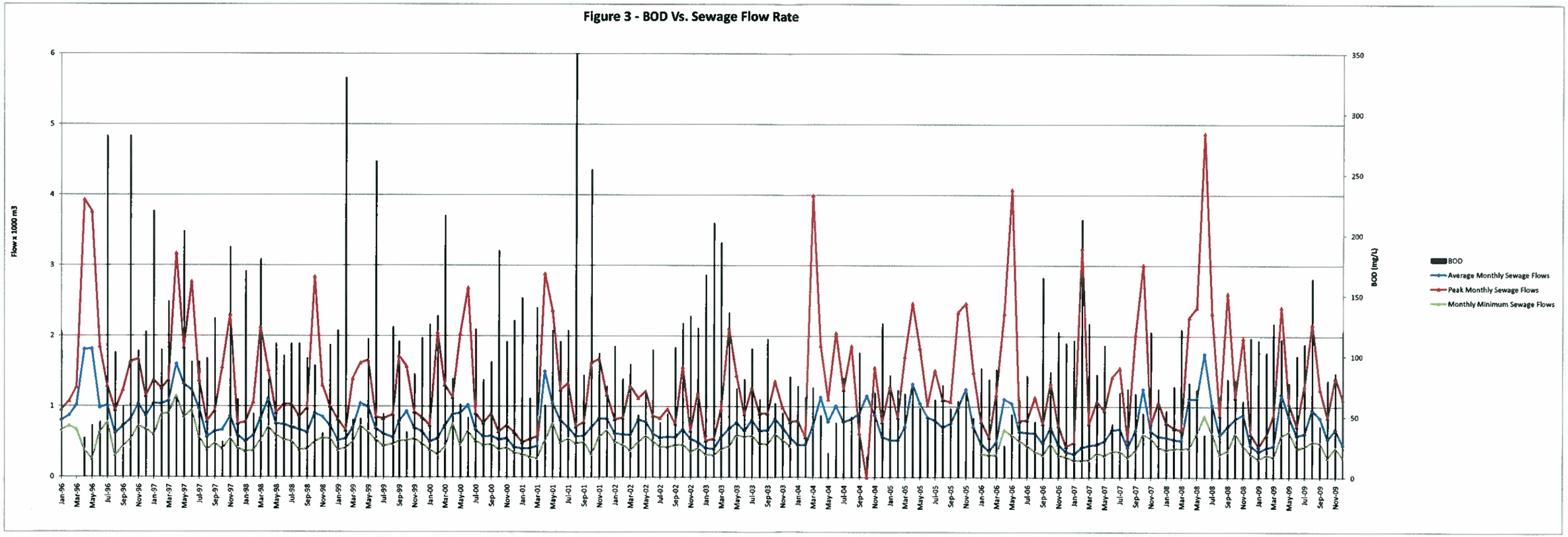
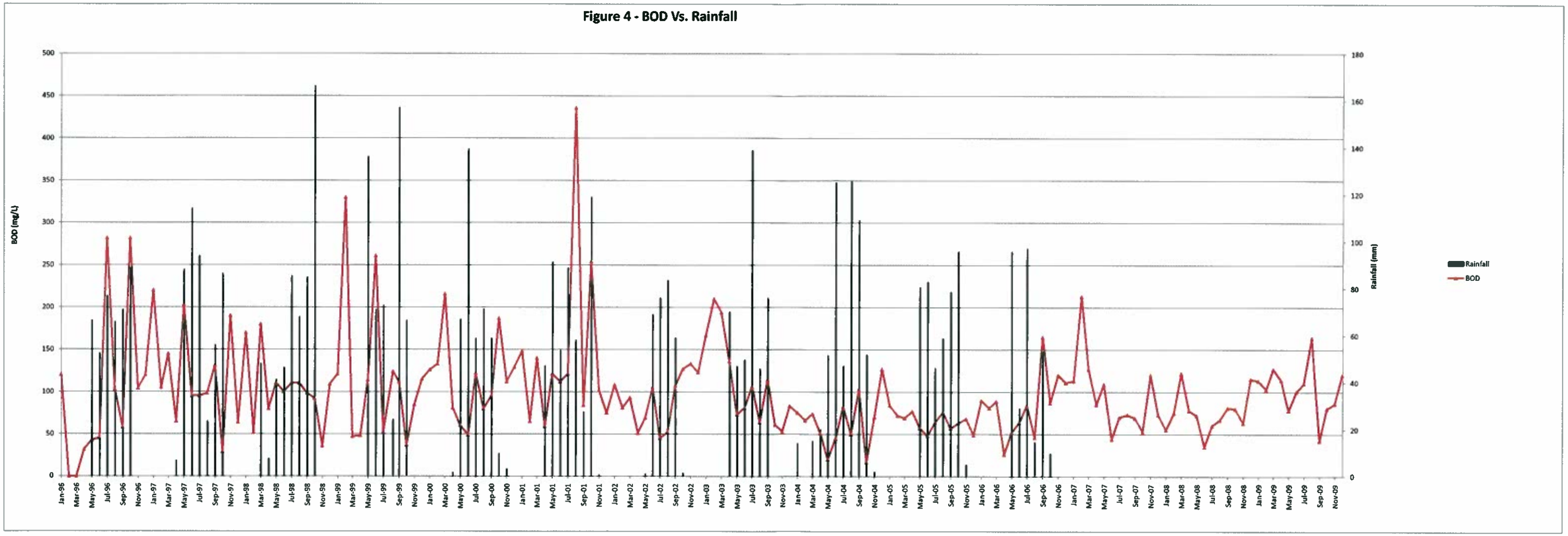


Figure 4 - BOD Vs. Rainfall



5.0 ESTIMATE OF INFLOW & INFILTRATION

There are several ways in which the inflow and infiltration can be estimated in a collection system depending on the type of data available. *The Infiltration/Inflow Control/Reduction for Wastewater Collection Systems Infraguide*, produced by the Federation of Canadian Municipalities and National Research Council suggests methods if continuous and/or daily flow data is available.

For the purposes of this report the inflow and infiltration (I&I) is estimated based on a theoretical wastewater production rate compared to the actual sewage flows recorded at the plant. This method was adopted from the above noted document, and amended to use monthly instead of daily flows. The mill water demands and sewage effluent have been removed from the calculations as there are significant water demands at the mill that is not returned to the sanitary sewer which would be difficult to account for.

Watermain bleeders directed to the sanitary system will account for a portion of the estimated inflow, however, insufficient flow information is available to differentiate the inflow from the bleeders. The following bleeders are installed on the system:

- Hwy #628 – This bleeder has been in service since 2003. In 2009, the total flow from this bleeder was 8,480 m^3.
- Bell Building on Frost St. – This bleeder was not metered until the fall of 2009. Since installation of the meter in the fall of 2009, 5,242 m^3 of water has been discharged to the sanitary system to March 2010.
- Sewage Plant – the chlorine residual analyzer for the distribution system is located at the sewage plant drawing a constant sample of water. The flows are estimated to be 10 L/min, sometimes higher in order to ensure a fresh sample for analysis. This flow is not metered.
- Brompton Rd. – This bleeder discharges to a ditch and therefore does not impact the sanitary system.

The Theoretical Wastewater Production (TWWP) is determined from the monthly treated water flow totals of the water treatment plant. As the *Infraguide* suggests, the TWWP assumes that 90% of the treated water flow is returned to the sanitary collection system during the winter months (January – May and September – December), while only 70% is returned in the summer months (June – August), which accounts for lawn/yard watering. The TWWP is represented by the green line on *Figure 5 – Estimated Inflow & Infiltration*, while the Estimated Minimum Monthly Flows are shown in purple and the actual Monthly Flow Totals are shown in red.

The amount of Infiltration is estimated by subtracting the TWWP from the Estimated Minimum Monthly Flow. The Minimum Monthly flow is an estimate of the dry weather flows and assumes that inflow (i.e. weeping tiles, roof leaders etc.) is at a minimum. Therefore, any value above the TWWP is an estimate of the groundwater infiltration.

The amount of inflow is estimated by subtracting the TWWP and the estimated infiltration from the monthly flow total. The monthly flow total is the entire flow measured at the plant for the month and includes all extraneous I&I. Subtracting the TWWP and the

estimated infiltration provides an indication of the amount of inflow from sources such as weeping tile connections, roof leaders and watermain bleeders.

Table 2 below notes the Total Estimated I&I, the percentage of the total sewage flows contributed by I&I and an estimate of the both the Inflow and Infiltration as a percentage of the Total I&I Flow.

Table 2 – I&I Estimates

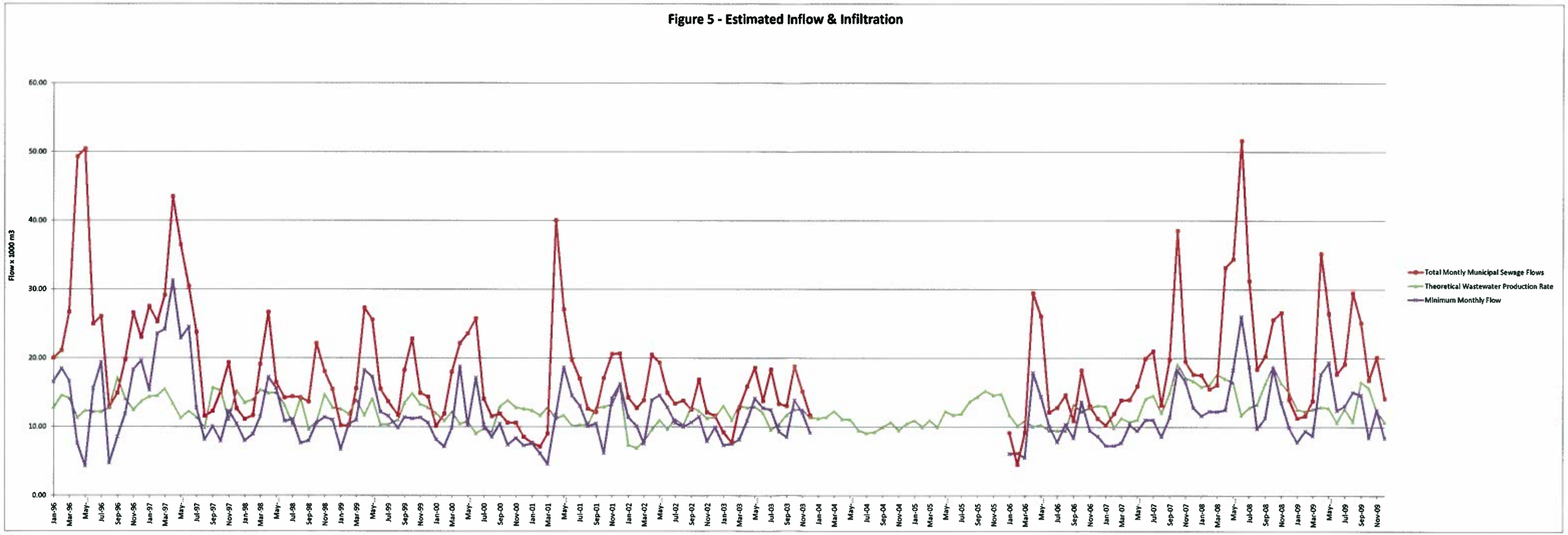
Year	Total Sewage Flow (x1000 m^3)	Total Water Treatment Plant Flow (x 1000 m^3)	Total Estimated I&I (x 1000 m^3)	I&I Percentage of Total Sewage Flow	% of Total I&I as Infiltration	% of Total I&I as Inflow
1996	315.34		158.28	50	21	79
1997	286.84		133.43	47	47	53
1998	196.98		43.61	22	8	92
1999	199.83		54.08	27	24	76
2000	178.52		54.95	31	31	69
2001	210.41		79.23	38	20	80
2002	175.56		54.70	31	34	66
2003	167.98		32.90	20	19	81
2004	-		-	-	-	-
2005	-		-	-	-	-
2006	171.03		52.71	31	28	72
2007	215.28		53.90	25	0	100
2008	304.35		120.37	40	18	82
2009	240.81		90.62	38	20	80

There are some gaps in the data, namely 2004 and 2005. In 2004 and 2005 monthly sewage flows from the Mill were not available, therefore the Municipal sewage flows could not be calculated.

Typically, the inflow is estimated at a significantly higher proportion (2-4 times) of the total I&I compared to infiltration.

Figure #5 indicates the same general trends noted previously; the lowest flows are typically occurring in the winter season (December-February), while the peak flows are typically occurring in the spring season (March-May), smaller peak flows are typical of the fall season (September-November).

Figure 5 - Estimated Inflow & Infiltration



6.0 ASSESSMENT OF REDUCTION IN INFLOW/INFILTRATION WITH RESPECT TO WORK COMPLETED BY THE TOWNSHIP

6.1 SANITARY REPAIR/REPLACEMENT COMPLETED BY THE TOWNSHIP

Table 3 below summarizes the sanitary sewers and manholes replaced by the Township subsequent to the 1996 Optimization Study. Figure 6 provides an overall plan of the Sanitary System and identifies the location and condition of the sewer lines and manholes as determined in the 1996 Optimization Study and the location where repairs were completed by the Township:

Table 3 – Sanitary Sewer & Manhole Replacements

Recommended Sewer Line Repairs Manhole - Manhole (prioritized per 1996 study)	**Date Completed**
J-I	July 1997
H-G	July 1997
I-H	July 1997
31-23	July 1998
32A-31	July 1998
19-18	July 2002
18-17	July 2002
50-6	July 2000
Other Sanitary Repairs Completed Manhole - Manhole	
17-10	July 2002
19A - 19	July 2002
R32 – Treatment Plant	July 1997
Treatment Plant – J	July 1997
G-F	July 1997
32A-46	July 2000
46-47	July 2000
Recommended Manhole Repairs (prioritized per 1996 study)	**Date Completed**
I	July 1997
H	July 1997
G	July 1997
D	NC
C	NC
B	NC
A	NC
2	NC

3	NC
20	NC
21	NC
22	NC
23	July 1998
31	July 1998
32A	July 2000
19	July 2002
18	July 2002
17	July 2002
50	NC
6	July 2000
Other Manhole Repairs Completed	**Date Completed**
MH10	July 2002
MH 46	July 2000
MH R32	July 1997
MH STP	July 1997
MH J	July 1997

NC = Not Complete

All of the prioritized sewer line repairs that were recommended in the 1996 report have been completed, as well as about half of the prioritized manholes. Additional reaches of sanitary piping and some manholes were replaced over and above the prioritized list.

6.1.1 OTHER WORKS COMPLETED

In addition to the above replacements, the Township has recently installed water meters throughout the community.

No action has been taken to disconnect roof leader and weeping tile connections to the sanitary system.

There are presently no Township supported plans, bylaws or incentives requiring the installation of water saving devices. However, when building permits are applied for, the residents are reminded of the requirements set forth in the Building Code regarding fixture efficiency. It is proposed that any new buildings will not be allowed to tie weeping tiles into the sanitary system.

6.2 EFFECTIVENESS OF REPAIRS & REPLACMENTS COMPLETED

Figure 7 – I&I Estimates as Percentage of Total Municipal Sewage Flow notes the percentage of the total sewage flows contributed by I&I, and an estimate of both the Inflow and Infiltration as a percentage of the I&I. It also notes when work was completed on the sanitary system.

All of the prioritized sewer line repairs as per the 1996 report have been completed, as well as about half of the manholes. Additional reaches of sanitary piping and some manholes were replaced over and above the prioritized list. However, as shown on Figure 6 many manholes and several small reaches of sewer identified in 1996 as being below satisfactory condition remain unchanged. Much of the remaining infrastructure dates to the 1980's and earlier.

Based on the estimated percentage of I&I flows in 1996 and 1997, 50% and 47% of the total sewage flow was estimated to be I&I respectively. Compared to subsequent years when significant repairs were made to the sanitary system, the estimated I&I has been reduced. Based on this information, the repair work conducted after 1996 appears to have had some affect on reducing the total I&I to the sanitary system, however there are significant fluctuations from year to year. Based on 2008 and 2009 estimates, the total percentage of I&I appears to be increasing towards the 1996 levels.

Typically, inflow is estimated to be 2-4 times higher than the infiltration to the system. This would suggest that roof leaders, weeping tile systems and watermain bleeders cause the majority of the extraneous flows.

The installation of water meters may provide some benefit in reducing water consumption and therefore sewage flows. However, the results will not be known for some time until sufficient flow data can be collected.

THE POSITION OF POLE LINES, CONDUITS, WATERMAIN, SEWERS & OTHER OVERGROUND & UNDERGROUND UTILITIES & STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWING, & WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES & STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL UTILITIES & STRUCTURES, & SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM

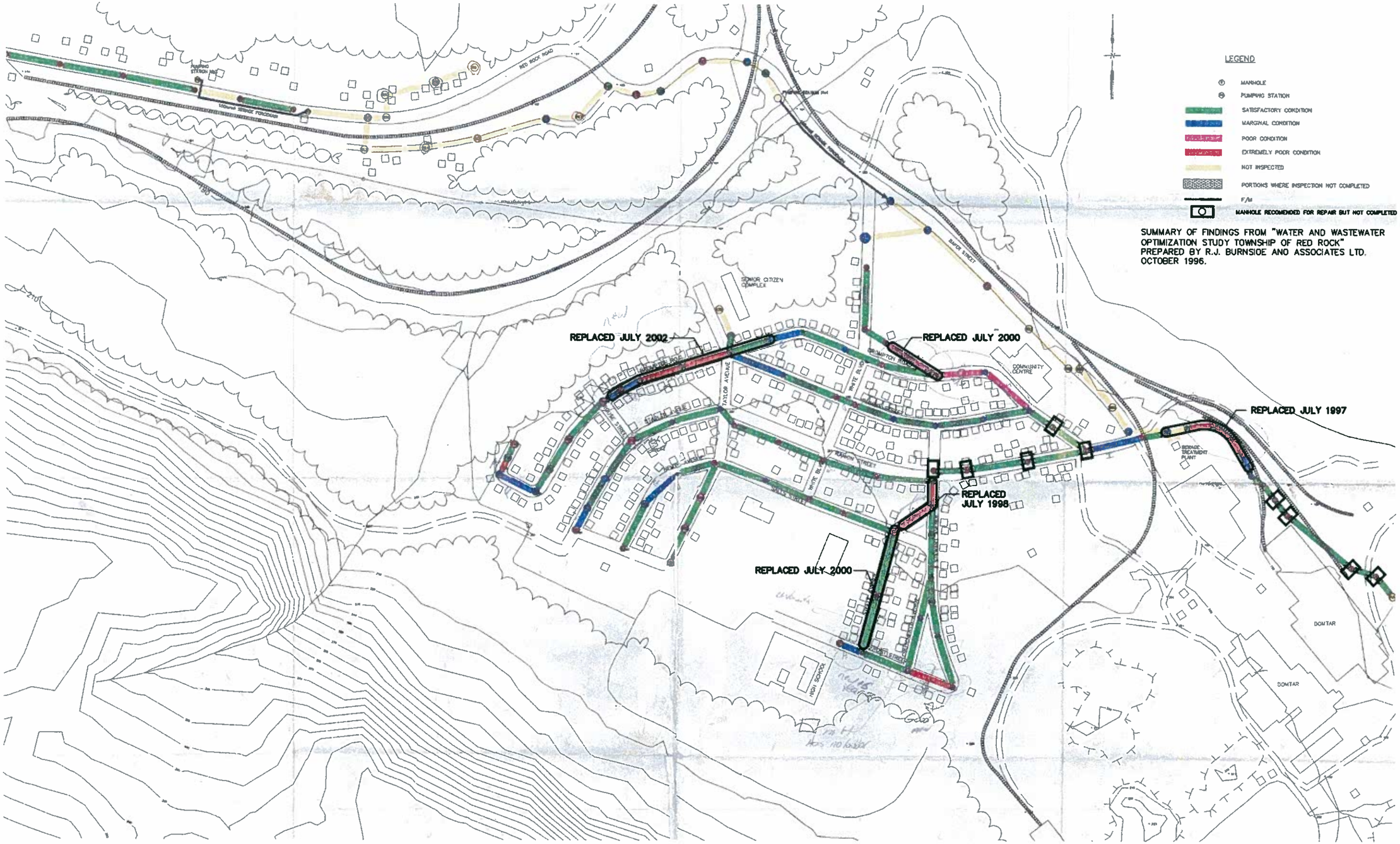


FIGURE 6 : TOWNSHIP OF RED ROCK SANITARY SYSTEM UPGRADES 1997 to 2009

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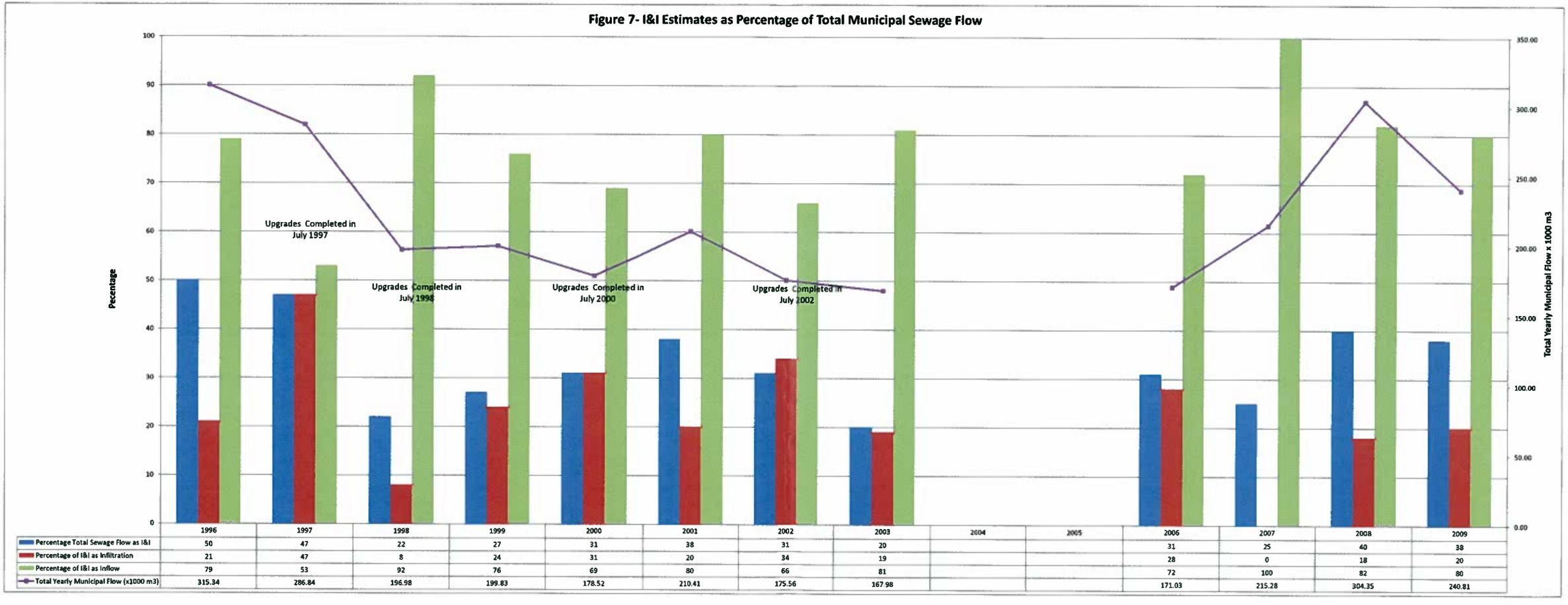
Figure 7- I&I Estimates as Percentage of Total Municipal Sewage Flow



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Percentage Total Sewage Flow as I&I	50	47	22	27	31	38	31	20			31	25	40	38
Percentage of I&I as Infiltration	21	47	8	24	31	20	34	19			28	0	18	20
Percentage of I&I as Inflow	79	53	92	76	69	80	66	81			72	100	82	80
Total Yearly Municipal Flow (x1000 m3)	315.34	286.84	196.98	199.83	178.52	210.41	175.56	167.98			171.03	215.28	304.35	240.81

7.0 EXISTING & FUTURE SEWAGE FLOWS

As noted on Table 1 of this report, the comparison between 1996 and 2009 flows indicates that the there has been an approximate decrease of 24% in the total sewage flow. The total wastewater effluent flow in 2009 was 241,000 m^3.

In planning for future sewage flows, community growth and the potential for future increases in population and/or serviced areas must be taken into consideration. In the case of the Township of Red Rock, there is limited space for infilling within the existing serviced area, therefore increases in domestic sewage flows are unlikely.

It must be assumed that a similar industry will operate within the Town as some point in the future, which will result in an increase in the population as well as exert similar demands on the water and sewer systems.

It is estimated that I&I entering into the sanitary system represents about 38% of the total sewage flows, based on the 2009 flows. Without controlling the I&I it is unlikely that the total sewage flows will decline to any great extent despite any subsequent decreases in population.

8.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the data available, it is apparent that there appears to be an excessive amount of inflow and infiltration to the sanitary sewer system in Red Rock, estimated to be 38% in 2009.

Some benefit from the repair work completed between 1997 and 2009 may have been realized, however, infiltration and to a greater extent inflow continue to plague the system.

The practices outlined in the *Assessment and Evaluation of Storm and Wastewater Collection Systems Infraguide* produced by the Federation of Canadian Municipalities and National Research Council or a similar type of guidance document should be employed to fully assess the condition of the sanitary collection system. This will provide the basis to implement a strategy to reduce and control the infiltration and inflow to the collection system. Tools to help assess the inflow and infiltration include:

- Camera inspection of the collection system to determine condition;
- Smoke testing to determine the extent of weeping tile and roof leader connections;
- Ground water level monitoring;
- Flow monitoring during dry and wet weather flows for specific reaches of the system to assist in determining inflow and infiltration;
- Monitoring early morning flows (i.e. 2am to 6am) to gather further insight into infiltration;

There may be no practical way to eliminate the existing weeping tile connections to the sanitary system. The storm water system is at a higher elevation than the sanitary system and would therefore require a pumped connection from each home to discharge into the storm system, an expensive renovation. Disconnecting roof leader connections to the sanitary system might be possible and this should be explored further. New construction should not allow these connections to the sanitary system.

As noted previously, many of the manholes identified in the 1996 Optimization Study remain in sub satisfactory condition. Depending on the condition of the manholes, there may some relatively easy and inexpensive repairs that could be completed to assist in reducing infiltration. These repairs may include raising the manhole to grade, parging the joints between sections of the manhole and installing a manhole infiltration protector (a device which sits below the manhole cover catching any rainwater entering through the cover). Each manhole will need to be individually assessed.

APPENDIX A

APPENDIX A - DATA SUMMARY

	January-96	February-96	March-96	April-96	May-96	June-96	July-96	August-96	September-96	October-96	November-96	December-96
Combined Sewage Effluent (x 1000 m3)												
Average Flow	0.80	0.87	1.01	1.81	1.61	0.98	1.01	0.61	0.72	0.81	1.03	0.87
Maximum Flow	0.95	1.07	1.27	3.93	3.76	1.85	1.29	0.95	1.23	1.63	1.67	1.15
Minimum Flow	0.66	0.72	0.87	0.38	0.25	0.64	0.77	0.30	0.44	0.53	0.72	0.67
Total Monthly Flow	24.81	25.17	31.43	54.22	56.13	28.31	31.38	19.04	21.61	25.24	30.94	26.84
Mill Sewage Influent (x 1000 m3)												
Average Flow	0.16	0.14	0.15	0.17	0.18	0.15	0.17	0.20	0.23	0.16	0.15	0.13
Maximum Flow	0.20	0.21	0.21	0.25	0.29	0.19	0.27	0.31	0.34	0.36	0.20	0.19
Minimum Flow	0.11	0.11	0.11	0.12	0.11	0.12	0.13	0.14	0.15	0.13	0.11	0.02
Total Flow	4.83	4.13	4.73	4.94	5.72	4.38	5.31	6.25	6.74	5.52	4.36	3.88
Town Sewage Flows (x1000 m3)												
Average Flow	0.64	0.73	0.86	1.64	1.63	0.83	0.84	0.41	0.50	0.64	0.89	0.74
Minimum Flow	0.55	0.62	0.56	0.25	0.14	0.52	0.65	0.16	0.28	0.40	0.61	0.65
Estimated Minimum Monthly Flow (min flow x30) [1]	16.53	16.45	16.65	7.56	4.26	15.60	19.35	4.68	8.49	11.88	18.30	19.59
Town Total Flow	19.98	21.06	26.70	49.29	50.41	24.93	26.06	12.79	14.67	19.72	26.58	22.96
WTP Flows (x 1000 m3)												
Mill Consumption	14.02	12.49	14.69	15.45	15.93	18.20	16.66	17.45	15.03	17.21	15.30	10.58
Municipal Consumption	14.16	18.17	15.70	12.53	13.71	17.37	17.36	18.16	18.99	15.60	13.80	15.16
Daily average	0.91	0.99	0.98	0.94	0.96	1.19	1.16	1.08	1.07	1.06	0.97	1.02
Maximum Daily	1.22	1.29	1.17	1.10	1.29	2.05	1.47	1.24	1.37	1.54	1.16	1.26
Monthly Rainfall (mm)	NR	NR	NR	NR	66.20	52.40	76.70	65.70	70.90	88.60	NR	NR
Influent BOD (mg/L)	120.00	NA	NA	32.00	42.40	45.40	282.00	103.00	58.00	282.00	104.00	120.00
Theoretical Wastewater Production Rate [2]	12.77	14.56	14.13	11.29	12.34	12.16	12.15	12.71	17.09	14.04	12.42	13.64
Estimated Infiltration [3]	3.78	3.89	2.52	0.00	0.00	3.44	7.20	0.00	0.00	0.00	5.88	5.95
Estimated Inflow [4]	3.45	2.60	10.05	38.01	38.07	9.33	6.71	0.08	0.00	5.68	8.28	3.37
Total I&I Estimate [5]	7.21	6.49	12.57	38.01	39.07	12.77	13.91	0.08	0.00	5.68	14.17	6.32
% *Inflow*	48	40	80	100	100	73	48	100	0	100	58	36
% *Infiltration*	52	60	20	0	0	27	52	0	0	0	42	64

NR = None Recorded
NA = Not Available

Notes:

[1] The *Estimated Minimum Monthly Flow* is determined by multiplying the minimum flow for the month by 30 days to obtain an estimate of the minimum monthly total flow. This provides an estimate of the dry weather flow for that period and is therefore used to estimate the amount of infiltration.

[2] The *Theoretical Wastewater Production Rate* is calculated by assuming 90% of the treated water flow measured at the water treatment plant is returned to the sanitary collection system during the winter months (January to May and September to December), while 70% of the treated water flow is returned in the summer months (June to August). This is calculated using only the Town's treated water consumption as some of the mill water demands are not returned to the sanitary system and would be difficult to estimate.

[3] The *Estimated Infiltration* is determined by subtracting the *Theoretical Wastewater Production Rate* from the Town's *Estimated Minimum Monthly Sewage Flows*. Negative values are assumed to be zero.

[4] The *Estimated Inflow* is determined by subtracting the *Theoretical Wastewater Production Rate* and the *Estimated Infiltration* from the Monthly *Total Town Sewage Flow*. Negative values are assumed to be zero.

[5] The *Total I&I Estimate* is the sum of the *Estimated Inflow* plus the *Estimated Infiltration*.

APPENDIX A - DATA SUMMARY

	January-97	February-97	March-97	April-97	May-97	June-97	July-97	August-97	September-97	October-97	November-97	December-97
Combined Sewage Effluent (x 1000 m3)												
Average Flow	1.03	1.04	1.08	1.60	1.31	1.23	0.97	0.57	0.64	0.67	0.86	0.58
Maximum Flow	1.37	1.26	1.37	3.17	1.84	2.77	1.37	0.79	0.94	1.55	2.30	0.75
Minimum Flow	0.60	0.89	0.90	1.14	0.85	0.94	0.56	0.39	0.47	0.40	0.54	0.41
Total Monthly Flow	32.04	29.02	33.35	47.94	40.84	36.95	29.96	17.53	19.26	20.67	25.68	16.14
Mill Sewage Influent (x 1000 m3)												
Average Flow	0.15	0.14	0.14	0.15	0.14	0.22	0.20	0.19	0.23	0.16	0.21	0.18
Maximum Flow	0.27	0.21	0.21	0.22	0.18	0.35	0.31	0.30	0.38	0.23	0.32	0.34
Minimum Flow	0.09	0.10	0.10	0.10	0.09	0.13	0.14	0.12	0.14	0.13	0.14	0.06
Total Flow	4.54	3.78	4.25	4.45	4.16	6.52	6.21	6.01	7.03	5.53	6.33	5.49
Town Sewage Flows (x1000 m3)												
Average Flow	0.89	0.90	0.94	1.45	1.16	1.02	0.77	0.37	0.41	0.49	0.65	0.41
Minimum Flow	0.51	0.79	0.80	1.04	0.76	0.82	0.42	0.27	0.34	0.26	0.41	0.35
Estimated Minimum Monthly Flow (min flow x30) [1]	15.30	23.55	24.12	31.29	22.83	24.51	12.72	8.10	10.05	7.89	12.27	10.44
Town Total Flow	27.50	25.23	29.11	43.46	36.45	30.43	23.74	11.52	12.23	15.13	19.35	12.65
WTP Flows (x 1000 m3)												
Mill Consumption	16.13	15.62	16.36	15.12	17.25	16.06	16.29	19.55	16.74	17.12	17.69	13.85
Municipal Consumption	15.93	16.10	17.21	14.83	12.50	17.49	16.27	14.06	17.44	16.92	12.23	16.93
Daily average	1.03	1.13	1.06	0.91	0.96	1.12	1.05	1.08	1.14	1.10	0.99	0.99
Maximum Daily	1.85	1.62	1.43	1.16	1.26	1.59	1.29	1.27	1.44	1.35	1.21	1.26
Monthly Rainfall (mm)	NR	NR	NR	6.60	67.90	114.00	93.80	23.40	55.80	86.20	NR	NR
Influent BOD (mg/L)	220.00	105.00	145.00	65.00	203.00	95.00	95.00	98.00	131.00	29.00	190.00	64.00
Theoretical Wastewater Production Rate [2]	14.34	14.49	15.48	13.35	11.25	12.24	11.39	9.84	15.70	15.23	11.01	15.24
Estimated Infiltration [3]	0.96	9.06	6.64	17.94	11.58	12.27	1.33	0.00	0.00	0.00	1.26	0.00
Estimated Inflow [4]	12.20	1.68	4.99	12.20	13.62	5.92	11.02	1.68	0.00	0.00	7.08	0.00
Total I&I Estimate [5]	13.17	10.74	13.62	30.14	25.20	16.16	12.35	1.68	0.00	0.00	8.34	0.00
% Inflow	93	16	37	40	54	33	89	100	0	0	85	0
% Infiltration	7	84	63	60	46	67	11	0	0	0	15	0

APPENDIX A - DATA SUMMARY

	January-98	February-98	March-98	April-98	May-98	June-98	July-98	August-98	September-98	October-98	November-98	December-98
Combined Sewage Effluent (x 1000 m3)												
Average Flow	0.50	0.59	0.83	1.10	0.75	0.75	0.70	0.67	0.63	0.90	0.85	0.73
Maximum Flow	0.78	1.06	2.13	1.52	0.91	1.03	1.03	0.85	0.98	2.84	1.30	1.00
Minimum Flow	0.36	0.38	0.52	0.70	0.59	0.53	0.51	0.39	0.40	0.50	0.55	0.55
Total Monthly Flow	15.59	16.47	25.67	33.10	23.29	22.35	21.75	20.85	18.85	28.00	25.52	22.48
Mill Sewage Influent (x 1000 m3)												
Average Flow	0.15	0.17	0.21	0.22	0.22	0.27	0.24	0.21	0.17	0.19	0.25	0.23
Maximum Flow	0.32	0.40	0.40	0.33	0.37	0.41	0.32	0.31	0.22	0.24	0.37	0.31
Minimum Flow	0.10	0.08	0.14	0.13	0.07	0.17	0.14	0.13	0.13	0.15	0.17	0.18
Total Flow	4.52	4.84	6.58	6.43	6.86	8.14	7.38	8.60	5.23	5.83	7.48	7.03
Town Sewage Flows (x1000 m3)												
Average Flow	0.36	0.42	0.62	0.89	0.53	0.47	0.46	0.46	0.45	0.72	0.60	0.50
Minimum Flow	0.27	0.30	0.38	0.57	0.52	0.36	0.37	0.25	0.27	0.35	0.38	0.37
Estimated Minimum Monthly Flow (min flow x30) [1]	7.95	8.91	11.46	17.22	15.60	10.60	11.07	7.59	7.95	10.56	11.37	11.01
Town Total Flow	11.07	11.64	19.09	26.86	16.43	14.21	14.37	14.24	13.62	22.17	16.04	15.45
WTP Flows (x 1000 m3)												
Mill Consumption	15.06	10.97	17.48	17.46	11.18	17.50	15.10	13.00	11.24	11.73	13.51	13.06
Municipal Consumption	14.99	15.45	17.06	18.53	19.60	18.79	14.83	20.28	10.71	11.85	16.32	14.20
Daily average	0.94	0.98	0.95	0.94	1.01	1.07	1.13	0.96	0.99	0.93	0.97	0.91
Maximum Daily	1.22	1.10	1.15	1.17	1.30	1.51	1.57	1.44	1.42	1.21	1.32	1.08
Monthly Rainfall (mm)	NR	NR	47.90	7.50	41.10	46.30	85.20	67.80	84.70	166.10	NR	NR
Influent BOD (mg/L)	170.00	52.00	180.00	80.00	110.00	100.00	110.00	110.00	98.00	92.00	36.00	109.00
Theoretical Wastewater Production Rate [2]	13.49	13.90	15.36	14.99	14.94	13.15	10.38	14.19	8.84	10.67	14.69	12.78
Estimated Infiltration [3]	0.00	0.00	0.00	2.34	0.66	0.00	0.69	0.00	0.00	0.00	0.00	0.00
Estimated Inflow [4]	0.00	0.00	3.73	9.44	0.83	1.06	3.30	0.05	3.98	11.50	3.35	2.67
Total I&I Estimate [5]	0.00	0.00	3.73	11.79	1.50	1.06	3.99	0.05	3.98	11.50	3.35	2.67
% *Inflow*	0	0	100	80	56	100	83	100	100	100	100	100
% *Infiltration*	0	0	0	20	44	0	17	0	0	0	0	0

APPENDIX A - DATA SUMMARY

	January-99	February-99	March-99	April-99	May-99	June-99	July-99	August-99	September-99	October-99	November-99	December-99
Combined Sewage Effluent (x 1000 m3)												
Average Flow	0.52	0.54	0.69	1.05	0.99	0.69	0.61	0.56	0.79	0.93	0.69	0.64
Maximum Flow	0.61	0.66	1.39	1.62	1.65	0.85	0.83	0.69	1.72	1.57	0.92	0.84
Minimum Flow	0.38	0.41	0.50	0.72	0.64	0.52	0.44	0.47	0.51	0.52	0.54	0.47
Total Monthly Flow	16.03	15.20	21.46	31.34	30.67	20.58	18.96	17.35	23.70	28.76	20.82	19.98
Mill Sewage influent (x 1000 m3)												
Average Flow	0.19	0.18	0.19	0.14	0.16	0.17	0.17	0.18	0.18	0.19	0.20	0.18
Maximum Flow	0.30	0.27	0.28	0.16	0.25	0.22	0.22	0.21	0.21	0.32	0.24	0.24
Minimum Flow	0.16	0.07	0.13	0.11	0.06	0.12	0.06	0.14	0.13	0.15	0.17	0.12
Total Flow	5.87	5.05	5.94	4.04	5.08	5.09	5.32	5.68	5.45	5.97	5.94	5.64
Town Sewage Flows (x1000 m3)												
Average Flow	0.33	0.38	0.50	0.91	0.83	0.52	0.44	0.38	0.61	0.74	0.50	0.46
Minimum Flow	0.22	0.35	0.36	0.61	0.58	0.41	0.39	0.33	0.38	0.37	0.38	0.35
Estimated Minimum Monthly Flow (min flow x30) [1]	6.69	10.38	10.92	18.24	17.25	12.15	11.55	9.61	11.37	11.16	11.31	10.59
Town Total Flow	10.16	10.15	15.54	27.30	25.59	15.50	13.64	11.67	18.25	22.61	14.88	14.34
WTP Flows (x 1000 m3)												
Mill Consumption	12.58	14.42	16.02	14.62	15.39	15.86	20.46	19.27	19.00	16.80	18.72	14.48
Municipal Consumption	13.95	13.14	15.44	12.91	15.63	14.73	14.69	15.70	14.91	16.48	14.73	14.20
Daily average	0.66	0.98	1.02	0.92	1.00	1.02	1.13	1.13	1.13	1.13	1.05	0.92
Maximum Daily	1.03	1.44	1.20	1.21	1.25	1.35	2.13	1.33	1.38	1.31	1.16	1.15
Monthly Rainfall (mm)	NR	NR	NR	NR	136.10	70.90	72.70	24.10	157.00	66.30	NR	NR
Influent BOD (mg/L)	121.00	330.00	47.00	48.00	114.00	281.00	52.00	124.00	112.00	37.00	85.00	115.00
Theoretical Wastewater Production Rate [2]	12.55	11.62	13.89	11.62	14.07	10.31	10.29	10.99	13.42	14.84	13.26	12.76
Estimated Infiltration [3]	0.00	0.00	0.00	6.82	3.18	1.84	1.27	0.00	0.00	0.00	0.00	0.00
Estimated Inflow [4]	0.00	0.00	1.65	9.06	8.34	3.35	2.09	0.69	4.63	7.97	1.62	1.56
Total I&I Estimate [5]	0.00	0.00	1.65	15.88	11.53	5.19	3.36	0.69	4.63	7.87	1.62	1.56
% Inflow	0	0	100	58	72	65	62	100	100	100	100	100
% Infiltration	0	0	0	42	28	35	38	0	0	0	0	0

APPENDIX A - DATA SUMMARY

	January-00	February-00	March-00	April-00	May-00	June-00	July-00	August-00	September-00	October-00	November-00	December-00
Combined Sewage Effluent (x 1000 m3)												
Average Flow	0.50	0.55	0.73	0.89	0.91	1.02	0.67	0.57	0.58	0.53	0.55	0.42
Maximum Flow	0.73	2.05	1.30	1.13	2.03	2.68	0.90	0.78	0.90	0.84	0.73	0.63
Minimum Flow	0.38	0.32	0.43	0.75	0.46	0.65	0.51	0.45	0.46	0.39	0.42	0.35
Total Monthly Flow	15.57	15.87	22.54	26.65	28.12	30.48	20.75	17.63	17.44	16.47	16.43	13.07
Mill Sewage Influent (x 1000 m3)												
Average Flow	0.16	0.14	0.15	0.15	0.15	0.16	0.22	0.20	0.19	0.19	0.20	0.15
Maximum Flow	0.26	0.26	0.18	0.18	0.17	0.28	0.26	0.25	0.24	0.22	0.24	0.25
Minimum Flow	0.12	0.08	0.10	0.13	0.12	0.08	0.17	0.17	0.12	0.15	0.14	0.10
Total Flow	5.50	3.99	4.58	4.49	4.55	4.72	8.68	6.12	5.55	5.89	5.88	4.57
Town Sewage Flows (x1000 m3)												
Average Flow	0.32	0.41	0.58	0.74	0.76	0.86	0.46	0.37	0.40	0.34	0.35	0.28
Minimum Flow	0.27	0.24	0.33	0.63	0.34	0.57	0.34	0.26	0.35	0.25	0.26	0.24
Estimated Minimum Monthly Flow (min flow x30) [1]	8.13	7.08	9.84	18.78	10.20	17.13	10.29	8.49	10.41	7.35	8.34	7.26
Town Total Flow	10.08	11.88	17.96	22.16	23.57	25.76	14.08	11.51	11.89	10.58	10.55	8.50
WTP Flows (x 1000 m3)												
Mill Consumption	16.74	16.00	19.53	18.25	17.89	17.31	19.43	20.05	18.81	17.85	17.60	17.67
Municipal Consumption	13.26	12.05	13.47	11.55	11.94	12.67	13.84	13.10	14.37	15.34	14.20	14.00
Daily average	0.97	1.09	1.08	0.99	0.96	1.00	1.07	1.07	1.11	1.07	1.06	1.00
Maximum Daily	1.17	1.32	1.27	1.16	1.09	1.54	1.22	1.41	1.27	1.22	1.22	1.10
Monthly Rainfall (mm)	NR	NR	NR	1.60	66.80	139.30	58.70	71.20	58.70	9.70	3.00	NR
Influent BOD (mg/L)	126.00	133.00	216.00	61.00	60.00	49.00	122.00	80.00	95.00	187.00	112.00	129.00
Theoretical Wastewater Production Rate [2]	11.93	10.85	12.12	10.39	10.75	9.01	9.69	9.17	12.94	13.81	12.78	12.60
Estimated Infiltration [3]	0.00	0.00	0.00	8.39	0.00	8.12	0.60	0.00	0.00	0.00	0.00	0.00
Estimated Inflow [4]	0.00	1.04	5.84	3.38	12.82	8.63	3.79	2.34	0.00	0.00	0.00	0.00
Total I&I Estimate [5]	0.00	1.04	5.84	11.77	12.82	16.75	4.39	2.34	0.00	0.00	0.00	0.00
% *Inflow*	0	100	100	28	100	52	86	100	0	0	0	0
% *Infiltration*	0	0	0	71	0	48	14	0	0	0	0	0

APPENDIX A - DATA SUMMARY

	January-01	February-01	March-01	April-01	May-01	June-01	July-01	August-01	September-01	October-01	November-01	December-01
Combined Sewage Effluent (x 1000 m3)												
Average Flow	0.40	0.41	0.44	1.49	1.04	0.80	0.71	0.57	0.58	0.70	0.83	0.82
Maximum Flow	0.49	0.54	0.57	2.89	2.36	1.24	1.33	0.71	0.76	1.62	1.67	1.16
Minimum Flow	0.32	0.28	0.27	0.51	0.75	0.49	0.54	0.48	0.49	0.32	0.57	0.66
Total Monthly Flow	12.49	11.42	13.60	44.63	32.28	24.04	21.85	17.77	17.47	21.70	24.61	25.50
Mill Sewage Influent (x 1000 m3)												
Average Flow	0.16	0.16	0.15	0.16	0.17	0.15	0.16	0.17	0.18	0.15	0.15	0.16
Maximum Flow	0.21	0.22	0.20	0.20	0.23	0.16	0.20	0.21	0.22	0.18	0.18	0.16
Minimum Flow	0.07	0.08	0.11	0.12	0.13	0.00	0.10	0.14	0.14	0.12	0.10	0.12
Total Flow	4.86	4.33	4.62	4.80	5.22	4.35	4.88	5.19	5.35	4.83	4.35	4.86
Town Sewage Flows (x1000 m3)												
Average Flow	0.25	0.25	0.29	1.33	0.87	0.66	0.55	0.41	0.40	0.55	0.89	0.67
Minimum Flow	0.25	0.20	0.15	0.39	0.62	0.48	0.44	0.33	0.35	0.21	0.47	0.54
Estimated Minimum Monthly Flow (min flow x30) [1]	7.56	6.09	4.56	11.67	18.66	14.49	13.05	10.02	10.44	6.15	14.10	16.20
Town Total Flow	7.63	7.09	8.98	40.03	27.05	19.69	16.97	12.58	12.12	17.07	20.56	20.64
WTP Flows (x 1000 m3)												
Mill Consumption	19.90	16.29	16.01	16.69	16.49	12.09	17.84	18.83	17.64	16.06	16.37	13.95
Municipal Consumption	13.71	12.89	14.21	12.39	12.92	14.48	14.62	14.63	14.09	14.31	14.66	17.67
Daily average	1.05	1.04	1.04	0.97	0.95	0.89	1.05	1.08	1.06	1.04	1.03	1.02
Maximum Daily	1.51	1.21	1.17	1.18	1.07	1.48	1.34	1.35	1.26	1.36	1.15	1.36
Monthly Rainfall (mm)	NR	NR	NR	47.00	91.20	53.80	88.70	57.90	27.40	118.90	0.60	NR
Influent BOD (mg/L)	148.00	65.00	140.00	59.00	121.00	112.00	121.00	436.00	84.00	254.00	102.00	75.00
Theoretical Wastewater Production Rate [2]	12.34	11.60	12.79	11.15	11.63	10.13	10.23	10.24	12.68	12.88	13.19	15.91
Estimated Infiltration [3]	0.00	0.00	0.00	0.52	7.03	4.36	2.82	0.00	0.00	0.00	0.61	0.29
Estimated Inflow [4]	0.00	0.00	0.00	28.36	8.39	5.20	3.92	2.35	0.00	4.19	6.46	4.44
Total I&I Estimate [5]	0.00	0.00	0.00	28.89	15.43	9.55	6.74	2.35	0.00	4.19	7.37	4.73
% Inflow	0	0	0	98	54	54	58	100	0	100	88	94
% Infiltration	0	0	0	2	46	46	42	0	0	0	12	8

APPENDIX A - DATA SUMMARY

	January-02	February-02	March-02	April-02	May-02	June-02	July-02	August-02	September-02	October-02	November-02	December-02
Combined Sewage Effluent (x 1000 m3)												
Average Flow	0.61	0.60	0.60	0.61	0.76	0.62	0.55	0.57	0.56	0.67	0.54	0.49
Maximum Flow	0.82	0.84	1.29	1.12	1.21	0.87	0.83	0.96	0.75	1.56	0.66	1.19
Minimum Flow	0.50	0.46	0.38	0.50	0.58	0.51	0.43	0.42	0.45	0.46	0.36	0.41
Total Monthly Flow	19.01	16.90	18.45	24.37	23.36	16.44	17.16	17.63	16.90	20.79	16.22	15.30
Mill Sewage Influent (x 1000 m3)												
Average Flow	0.15	0.15	0.15	0.13	0.14	0.12	0.12	0.12	0.15	0.13	0.14	0.12
Maximum Flow	0.18	0.17	0.19	0.22	0.16	0.16	0.23	0.17	0.18	0.18	0.17	0.15
Minimum Flow	0.12	0.12	0.13	0.03	0.10	0.08	0.08	0.09	0.10	0.08	0.10	0.08
Total Flow	4.76	4.21	4.64	3.90	4.07	3.54	3.82	3.83	4.43	3.94	4.13	3.72
Town Sewage Flows (x1000 m3)												
Average Flow	0.46	0.45	0.45	0.68	0.64	0.50	0.43	0.45	0.42	0.54	0.40	0.37
Minimum Flow	0.38	0.34	0.25	0.46	0.46	0.43	0.35	0.33	0.35	0.38	0.26	0.33
Estimated Minimum Monthly Flow (min flow x30) [1]	11.37	10.08	7.53	13.86	14.55	12.81	10.56	9.96	10.62	11.46	7.86	9.93
Town Total Flow	14.25	12.69	13.81	20.47	19.30	14.90	13.35	13.79	12.47	16.85	12.10	11.58
WTP Flows (x 1000 m3)												
Mill Consumption	0.73	0.76	0.73	0.70	0.89	0.79	0.90	0.79	0.77	0.74	0.08	0.70
Municipal Consumption	6.14	7.65	8.69	10.64	12.16	13.76	15.85	14.56	14.30	t3.65	12.47	12.68
Daily average	0.67	0.90	0.86	0.83	0.62	0.94	1.11	0.93	0.94	0.88	0.83	0.82
Maximum Daily	1.01	1.21	1.63	0.99	0.92	1.23	1.37	1.16	1.13	1.02	1.02	0.93
Monthly Rainfall (mm)	NR	NR	NR	NR	1.00	69.00	75.90	83.50	59.00	1.40	NR	NR
Influent BOD (mg/L)	108.00	91.00	93.00	51.00	69.00	105.00	45.00	52.00	107.00	127.00	133.00	123.00
Theoretical Wastewater Production Rate [2]	7.33	6.89	7.62	9.58	10.94	9.63	11.10	10.19	12.87	12.29	11.22	11.41
Estimated Infiltration [3]	4.04	3.20	0.00	4.31	3.61	3.18	0.00	0.00	0.00	0.00	0.00	0.00
Estimated Inflow [4]	2.66	2.61	5.99	6.58	4.75	2.09	2.25	3.60	0.00	4.56	0.87	0.17
Total I&I Estimate [5]	6.63	5.61	5.99	10.90	8.35	5.27	2.25	3.60	0.00	4.56	0.87	0.17
% Inflow	42	45	100	60	57	40	100	t00	0	100	100	t00
% Infiltration	58	55	0	40	43	60	0	0	0	0	0	0

APPENDIX A - DATA SUMMARY

	January-03	February-03	March-03	April-03	May-03	June-03	July-03	August-03	September-03	October-03	November-03	December-03
Combined Sewage Effluent (x 1000 m3)												
Average Flow	0.41	0.40	0.57	0.68	0.77	0.66	0.81	0.65	0.65	0.82	0.70	0.56
Maximum Flow	0.52	0.54	0.96	2.11	1.44	0.99	1.27	0.90	0.91	1.36	0.99	0.78
Minimum Flow	0.32	0.31	0.40	0.44	0.60	0.57	0.59	0.47	0.47	0.61	0.52	0.44
Total Monthly Flow	12.74	11.11	17.53	20.49	23.96	19.71	24.97	20.31	19.83	25.48	21.04	17.26
Mill Sewage Influent (x 1000 m3)												
Average Flow	0.12	0.12	0.16	0.16	0.17	0.20	0.21	0.23	0.23	0.22	0.20	0.18
Maximum Flow	0.14	0.15	0.19	0.19	0.24	0.24	0.32	0.28	0.31	0.28	0.25	0.22
Minimum Flow	0.08	0.08	0.13	0.08	0.13	0.15	0.17	0.17	0.19	0.15	0.12	0.14
Total Flow	3.56	3.41	4.81	4.65	5.37	5.98	6.63	7.00	6.84	6.67	5.92	5.62
Town Sewage Flows (x1000 m3)												
Average Flow	0.30	0.28	0.41	0.53	0.60	0.46	0.59	0.43	0.43	0.81	0.50	0.38
Minimum Flow	0.24	0.25	0.27	0.36	0.47	0.42	0.42	0.31	0.28	0.46	0.40	0.30
Estimated Minimum Monthly Flow (min flow x30) [1]	7.28	7.50	8.10	10.89	14.10	12.69	12.45	9.27	8.46	13.83	11.97	9.09
Town Total Flow	9.18	7.70	12.73	15.84	18.59	13.73	18.33	13.32	12.99	18.79	15.11	11.66
WTP Flows (x 1000 m3)												
Mill Consumption	12.62	11.27	12.23	11.07	12.64	11.81	15.04	15.57	13.61	11.30	11.30	10.59
Municipal Consumption	14.48	12.18	14.46	14.18	14.32	17.14	13.66	14.73	12.98	13.64	13.65	12.61
Daily average	0.84	0.84	0.86	0.84	0.87	0.87	0.93	0.88	0.89	0.81	0.83	0.75
Maximum Daily	1.14	0.96	0.98	1.18	1.06	1.40	1.17	1.22	1.18	1.31	1.02	0.91
Monthly Rainfall (mm)	NR	NR	NR	70.00	46.90	49.60	138.70	45.78	75.80	NR	NR	NR
Influent BOD (mg/L)	187.00	210.00	194.00	136.00	73.00	81.00	106.00	64.00	114.00	61.00	53.00	83.00
Theoretical Wastewater Production Rate [2]	13.01	10.96	13.01	12.76	12.89	12.00	9.56	10.31	11.66	12.45	12.47	11.35
Estimated Infiltration [3]	0.00	0.00	0.00	0.00	1.21	0.69	2.89	0.00	0.00	1.38	0.00	0.00
Estimated Inflow [4]	0.00	0.00	0.00	3.08	4.49	1.04	5.88	3.00	1.31	4.96	2.65	0.31
Total I&I Estimate [5]	0.00	0.00	0.00	3.08	5.70	1.73	8.77	3.00	1.31	8.33	2.65	0.31
% *Inflow*	0	0	0	100	79	60	67	100	100	78	100	100
% *Infiltration*	0	0	0	0	21	40	33	0	0	22	0	0

APPENDIX A - DATA SUMMARY

	January-04	February-04	March-04	April-04	May-04	June-04	July-04	August-04	September-04	October-04	November-04	December-04
Combined Sewage Effluent (x 1000 m3)												
Average Flow	0.46	0.46	0.72	1.13	0.79	1.01	0.78	0.82	0.91	1.15	0.88	0.57
Maximum Flow	0.80	0.57	4.00	1.87	1.10	2.05	1.24	1.86	0.63	NA	1.56	0.78
Minimum Flow	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Monthly Flow	14.12	13.24	22.24	34.03	24.34	30.29	24.30	25.45	27.26	35.75	26.41	17.74
Mill Sewage Influent (x 1000 m3)												
Average Flow	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Maximum Flow	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Minimum Flow	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Flow	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Town Sewage Flows (x1000 m3)												
Average Flow	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Minimum Flow	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Estimated Minimum Monthly Flow (min flow x30) [1]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Town Total Flow	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WTP Flows (x 1000 m3)												
Mill Consumption	8.21	70.39	11.90	10.42	12.79	13.87	14.26	13.57	13.18	12.01	14.31	15.33
Municipal Consumption	12.43	12.65	13.61	12.33	12.24	13.52	12.91	13.18	11.03	11.81	10.51	11.58
Daily average	0.60	0.89	0.82	0.76	0.81	0.91	0.88	0.86	0.84	0.79	0.83	0.87
Maximum Daily	0.76	0.86	1.07	0.90	1.01	1.57	0.99	1.22	1.04	1.08	1.06	1.22
Monthly Rainfall (mm)	14.00	NR	15.00	20.00	51.50	125.30	47.04	125.70	109.10	51.60	2.00	NR
Influent BOD (mg/L)	75.00	66.00	74.00	51.00	20.00	45.00	82.00	50.00	103.00	17.00	70.00	127.00
Theoretical Wastewater Production Rate [2]	11.19	11.38	12.25	11.10	11.01	9.46	9.03	9.21	9.93	10.63	9.46	10.42
Estimated Infiltration [3]												
Estimated Inflow [4]												
Total I&I Estimate [5]												
% *Inflow*												
% *Infiltration*												

APPENDIX A - DATA SUMMARY

	January-05	February-05	March-05	April-05	May-05	June-05	July-05	August-05	September-05	October-05	November-05	December-05
Combined Sewage Effluent (x 1000 m3)												
Average Flow	0.53	0.52	0.71	1.32	1.05	0.85	0.81	0.71	0.76	0.98	1.25	0.71
Maximum Flow	1.29	0.85	1.71	2.47	1.83	1.02	1.51	1.10	1.07	2.34	2.47	1.49
Minimum Flow	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Monthly Flow	16.36	14.65	21.96	39.70	32.46	25.46	24.97	21.97	22.82	30.52	37.39	22.01
Mill Sewage Influent (x 1000 m3)												
Average Flow	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Maximum Flow	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Minimum Flow	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Flow	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Town Sewage Flows (x1000 m3)												
Average Flow	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Minimum Flow	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Estimated Minimum Monthly Flow (min flow x30) [1]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Town Total Flow	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WTP Flows (x 1000 m3)												
Mill Consumption	15.90	14.38	16.94	15.50	14.96	15.35	16.00	16.49	16.23	13.78	12.63	11.82
Municipal Consumption	12.11	11.06	12.15	11.01	13.57	16.68	16.97	19.42	15.94	16.90	16.20	16.37
Daily average	0.90	0.91	0.94	0.86	0.92	1.07	1.06	1.16	1.07	0.99	0.96	0.91
Maximum Daily	1.13	1.16	1.18	1.09	1.06	1.55	1.30	1.43	1.19	1.14	1.31	1.00
Monthly Rainfall (mm)	NR	NR	NR	NR	80.50	82.80	46.10	58.60	78.50	95.70	5.00	NR
Influent BOD (mg/L)	84.00	72.00	69.00	77.00	57.00	48.00	84.00	76.00	57.00	63.00	68.00	49.00
Theoretical Wastewater Production Rate [2]	10.90	9.96	10.93	8.91	12.21	11.67	11.88	13.59	14.35	15.21	14.58	14.73
Estimated Infiltration [3]												
Estimated Inflow [4]												
Total I&I Estimate [5]												
% *Inflow*												
% *Infiltration*												

APPENDIX A - DATA SUMMARY

	January-06	February-06	March-06	April-06	May-06	June-06	July-06	August-06	September-06	October-06	November-06	December-06
Combined Sewage Effluent (x 1000 m3)												
Average Flow	0.47	0.38	0.50	1.11	1.05	0.65	0.63	0.63	0.48	0.70	0.47	0.36
Maximum Flow	0.79	0.57	1.17	2.32	4.08	0.80	0.81	1.13	0.76	1.33	0.73	0.44
Minimum Flow	0.33	0.31	0.32	0.67	0.60	0.52	0.45	0.37	0.32	0.48	0.32	0.29
Total Monthly Flow	14.66	10.50	15.42	35.20	32.49	19.36	19.60	19.37	14.50	21.78	13.99	11.20
Mill Sewage Influent (x 1000 m3)												
Average Flow	0.16	0.22	0.20	0.19	0.21	0.24	0.22	0.15	0.12	0.11	0.03	0.00
Maximum Flow	0.27	0.27	0.61	0.27	0.34	0.46	0.26	0.30	0.23	0.20	0.15	0.01
Minimum Flow	0.13	0.11	0.13	0.08	0.12	0.16	0.19	0.02	0.04	0.02	0.00	0.00
Total Flow	5.55	6.03	6.27	5.75	6.42	7.25	6.84	4.75	3.66	3.53	0.96	0.01
Town Sewage Flows (x1000 m3)												
Average Flow	0.29	0.16	0.30	0.92	0.84	0.40	0.41	0.47	0.36	0.59	0.43	0.36
Minimum Flow	0.20	0.21	0.16	0.60	0.49	0.33	0.26	0.35	0.28	0.45	0.32	0.29
Estimated Minimum Monthly Flow (min flow x30) [1]	6.06	6.15	5.52	17.85	14.37	10.02	7.77	10.35	8.34	13.59	9.45	8.81
Town Total Flow	8.10	4.47	9.15	29.44	26.07	12.11	12.76	14.63	10.84	16.23	13.03	11.18
WTP Flows (x 1000 m3)												
Mill Consumption	12.33	11.08	12.80	12.02	12.24	13.07	12.98	13.84	12.66	13.80	14.15	14.64
Municipal Consumption	12.99	11.25	12.97	11.13	11.41	13.51	13.48	13.45	14.66	13.60	14.15	14.54
Daily average	0.82	0.80	0.80	0.77	0.76	0.89	0.85	0.85	0.92	0.80	0.57	0.47
Maximum Daily	1.03	0.86	0.90	0.93	0.91	1.19	1.11	1.05	1.16	1.13	1.09	0.61
Monthly Rainfall (mm)	NR	NR	NR	NR	95.70	29.00	97.10	14.60	53.20	9.80	NA	NA
Influent BOD (mg/L)	90.00	81.00	89.00	26.00	52.00	64.00	84.00	46.00	165.00	87.00	120.00	111.00
Theoretical Wastewater Production Rate [2]	11.69	10.13	10.66	10.02	10.27	9.45	9.44	9.41	13.19	12.24	12.73	13.08
Estimated Infiltration [3]	0.00	0.00	0.00	7.83	4.10	0.57	0.00	0.94	0.00	1.35	0.00	0.00
Estimated Inflow [4]	0.00	0.00	0.00	11.59	11.70	2.09	3.32	4.28	0.00	4.64	0.29	0.00
Total I&I Estimate [5]	0.00	0.00	0.00	19.42	15.80	2.66	3.32	5.22	0.00	5.99	0.29	0.00
% Inflow	0	0	0	60	74	79	100	82	0	77	100	0
% Infiltration	0	0	0	40	26	21	0	18	0	23	0	0

APPENDIX A - DATA SUMMARY

	January-07	February-07	March-07	April-07	May-07	June-07	July-07	August-07	September-07	October-07	November-07	December-07
Combined Sewage Effluent (x 1000 m3)												
Average Flow	0.33	0.42	0.45	0.47	0.52	0.67	0.68	0.42	0.66	1.25	0.65	0.58
Maximum Flow	0.49	3.25	0.76	1.07	0.95	1.42	1.55	0.54	2.03	3.01	0.76	1.06
Minimum Flow	0.24	0.24	0.25	0.34	0.31	0.37	0.37	0.29	0.38	0.61	0.55	0.43
Total Monthly Flow	10.22	11.89	13.95	13.98	15.97	20.09	21.12	13.14	19.84	38.66	19.49	17.89
Mill Sewage Influent (x 1000 m3)												
Average Flow	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Maximum Flow	0.00	0.01	0.06	0.01	0.02	0.03	0.02	0.00	0.02	0.05	0.00	0.00
Minimum Flow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Flow	0.00	0.01	0.06	0.07	0.06	0.17	0.09	0.01	0.05	0.13	0.00	0.27
Town Sewage Flows (x1000 m3)												
Average Flow	0.33	0.42	0.45	0.46	0.51	0.66	0.68	0.42	0.66	1.24	0.65	0.58
Minimum Flow	0.24	0.24	0.25	0.34	0.31	0.37	0.37	0.29	0.38	0.61	0.55	0.43
Estimated Minimum Monthly Flow (min flow x30) [1]	7.23	7.23	7.62	10.26	9.39	11.01	11.01	8.55	11.37	18.27	16.53	12.76
Town Total Flow	10.22	11.88	13.67	13.92	15.89	19.92	21.03	13.13	19.79	38.53	19.49	17.62
WTP Flows (x 1000 m3)												
Mill Consumption	0.08	2.01	0.00	0.06	0.01	0.00	0.00	0.00	0.01	0.01	0.02	0.06
Municipal Consumption	14.41	10.90	12.51	11.65	12.28	20.08	20.77	17.17	16.56	21.24	19.00	18.50
Daily average	0.47	0.46	0.40	0.40	0.37	0.87	0.87	0.55	0.56	0.69	0.63	0.00
Maximum Daily	0.65	0.70	0.61	0.46	0.50	0.97	1.20	0.79	0.90	0.93	0.93	0.74
Monthly Rainfall (mm)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Influent BOD (mg/L)	113.00	213.00	127.00	85.00	109.00	44.00	70.00	73.00	69.00	53.00	120.00	73.00
Theoretical Wastewater Production Rate [2]	12.97	9.81	11.26	10.66	11.05	14.05	14.54	12.02	14.91	19.11	17.10	16.65
Estimated Infiltration [3]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Estimated Inflow [4]	0.00	2.07	2.61	3.25	4.84	5.86	6.49	1.11	4.89	19.42	2.39	0.97
Total I&I Estimate [5]	0.00	2.07	2.61	3.25	4.84	5.86	6.49	1.11	4.89	19.42	2.39	0.97
% *Inflow*	0	100	100	100	100	100	100	100	100	100	100	100
% *Infiltration*	0	0	0	0	0	0	0	0	0	0	0	0

APPENDIX A - DATA SUMMARY

	January-08	February-08	March-08	April-08	May-08	June-08	July-08	August-08	September-08	October-08	November-08	December-08
Combined Sewage Effluent (x 1000 m3)												
Average Flow	0.57	0.53	0.52	1.11	1.11	1.75	1.02	0.60	0.72	0.83	0.89	0.45
Maximum Flow	0.77	0.70	0.66	2.27	2.40	4.88	2.32	0.88	2.60	1.13	1.97	0.62
Minimum Flow	0.38	0.41	0.41	0.42	0.61	0.67	0.62	0.32	0.38	0.62	0.45	0.33
Total Monthly Flow	17.52	15.49	16.10	33.41	34.44	52.38	31.69	16.44	21.47	25.60	26.63	14.00
Mill Sewage Influent (x 1000 m3)												
Average Flow	0.00	0.00	0.00	0.01	0.00	0.03	0.02	0.00	0.04	0.00	0.00	0.00
Maximum Flow	0.00	0.00	0.03	0.05	0.01	0.13	0.04	0.01	0.15	0.00	0.01	0.00
Minimum Flow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Flow	0.00	0.00	0.04	0.22	0.05	0.76	0.47	0.05	1.21	0.00	0.01	0.00
Town Sewage Flows (x1000 m3)												
Average Flow	0.57	0.53	0.52	1.11	1.11	1.72	1.01	0.59	0.68	0.83	0.89	0.45
Minimum Flow	0.39	0.41	0.41	0.42	0.61	0.97	0.62	0.32	0.38	0.62	0.45	0.33
Estimated Minimum Monthly Flow (min flow x30) [1]	11.58	12.27	12.21	12.45	18.27	26.01	18.72	9.72	11.28	18.48	13.53	9.90
Town Total Flow	17.52	15.49	16.06	33.19	34.38	51.63	31.22	16.39	20.26	25.59	26.62	14.00
WTP Flows (x 1000 m3)												
Mill Consumption	0.01	0.01	0.04	0.02	0.07	0.05	0.03	0.09	0.11	0.96	1.76	0.31
Municipal Consumption	17.57	17.92	16.58	16.87	16.32	16.70	16.25	16.92	16.12	20.83	16.20	16.71
Daily average	0.57	0.62	0.83	0.63	0.59	0.58	0.59	0.61	0.61	0.70	0.67	0.55
Maximum Daily	0.64	0.61	0.83	0.70	0.77	0.83	0.73	0.76	0.77	0.88	1.16	0.73
Monthly Raintall (mm)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Influent BOD (mg/L)	55.00	75.00	122.00	78.00	72.00	35.00	60.00	67.00	61.00	80.00	63.00	115.00
Theoretical Wastewater Production Rate [2]	15.61	16.13	17.63	16.99	16.49	11.69	12.78	13.24	16.31	18.75	16.38	15.04
Estimated Infiltration [3]	0.00	0.00	0.00	0.00	1.76	14.32	5.94	0.00	0.00	0.00	0.00	0.00
Estimated Inflow [4]	1.70	0.00	0.00	16.20	16.12	25.62	12.50	5.14	3.95	6.84	10.24	0.00
Total I&I Estimate [5]	1.70	0.00	0.00	16.20	17.90	39.94	18.44	5.14	3.95	6.84	10.24	0.00
% *Inflow*	100	0	0	100	90	64	68	100	100	100	100	0
% *Infiltration*	0	0	0	0	10	36	32	0	0	0	0	0

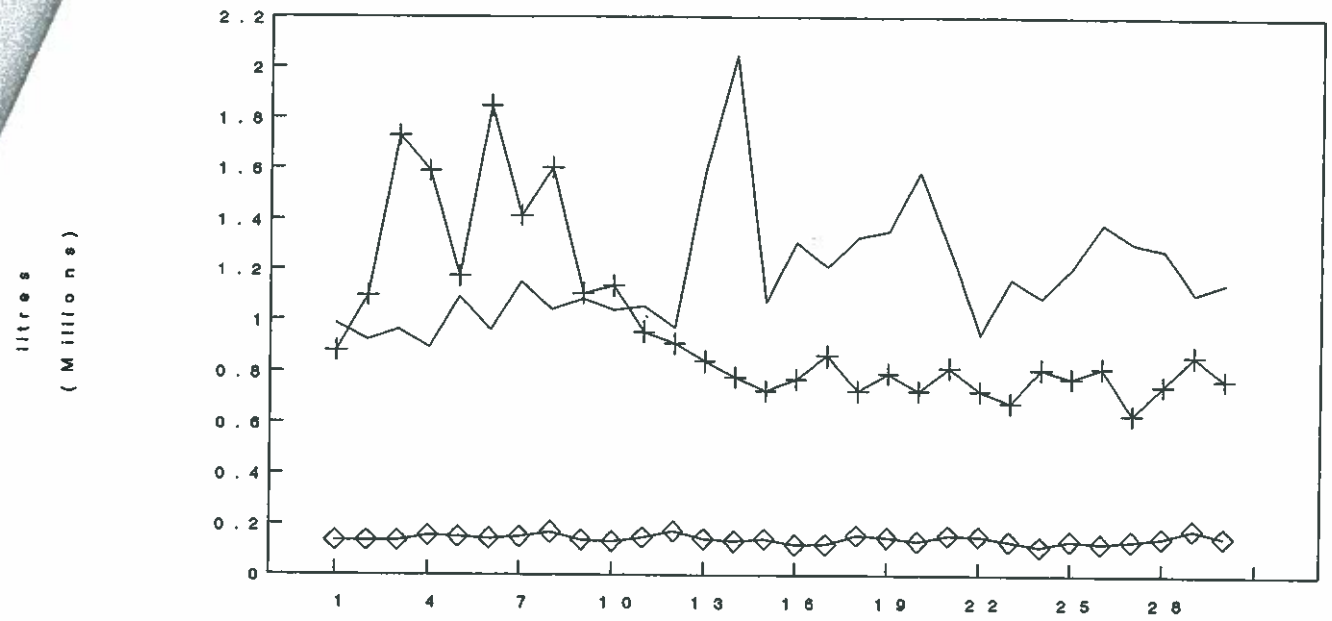
APPENDIX A - DATA SUMMARY

	January-09	February-09	March-09	April-09	May-09	June-09	July-09	August-09	September-09	October-09	November-09	December-09
Combined Sewage Effluent (x 1000 m3)												
Average Flow	0.36	0.42	0.44	1.17	0.85	0.59	0.62	0.95	0.84	0.54	0.67	0.46
Maximum Flow	0.43	0.60	0.67	2.41	1.04	0.72	1.29	2.17	1.25	0.85	1.41	1.11
Minimum Flow	0.26	0.31	0.29	0.59	0.65	0.41	0.43	0.50	0.49	0.28	0.42	0.28
Total Monthly Flow	11.25	11.61	13.77	35.21	26.48	17.69	18.13	29.53	25.14	16.78	20.16	14.14
Mill Sewage Influent (x 1000 m3)												
Average Flow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum Flow	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.03	0.01	0.00	0.01	0.01
Minimum Flow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Flow	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.03	0.01	0.00	0.02	0.01
Town Sewage Flows (x1000 m3)												
Average Flow	0.36	0.42	0.44	1.17	0.85	0.59	0.62	0.95	0.84	0.54	0.67	0.46
Minimum Flow	0.26	0.31	0.29	0.59	0.65	0.41	0.43	0.50	0.49	0.28	0.42	0.26
Estimated Minimum Monthly Flow (min flow x30) [1]	7.71	9.39	8.70	17.67	19.35	12.38	13.02	15.03	14.64	8.40	12.45	8.34
Town Total Flow	11.25	11.61	13.76	35.20	26.47	17.69	18.13	29.50	25.13	16.78	20.16	14.13
WTP Flows (x 1000 m3)												
Mill Consumption	0.00	0.00	0.00	0.02	0.49	0.13	0.20	0.08	0.07	0.18	0.11	0.00
Municipal Consumption	13.96	13.63	13.94	14.32	14.13	15.17	18.01	15.41	18.39	17.39	13.62	11.89
Daily average	0.45	0.49	0.45	0.48	0.47	0.51	0.59	0.50	0.62	0.57	0.46	0.38
Maximum Daily	0.52	0.55	0.69	0.62	0.65	0.71	0.70	0.59	0.75	0.72	0.55	0.55
Monthly Rainfall (mm)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Influent BOD (mg/L)	113.00	103.00	127.00	114.00	78.00	100.00	110.00	184.00	42.00	80.00	86.00	120.00
Theoretical Wastewater Production Rate [2]	12.56	12.27	12.55	12.89	12.72	10.62	12.61	10.78	16.55	15.65	12.26	10.70
Estimated Infiltration [3]	0.00	0.00	0.00	4.78	6.63	1.77	0.41	4.25	0.00	0.00	0.19	0.00
Estimated Inflow [4]	0.00	0.00	1.21	17.53	7.12	5.30	6.11	14.47	6.58	1.13	7.71	3.43
Total I&I Estimate [5]	0.00	0.00	1.21	22.31	13.75	7.07	9.52	18.71	6.58	1.13	7.90	3.43
% Inflow	0	0	100	79	52	75	94	77	100	100	98	100
% Infiltration	0	0	0	21	48	25	9	23	0	0	2	0

APPENDIX B

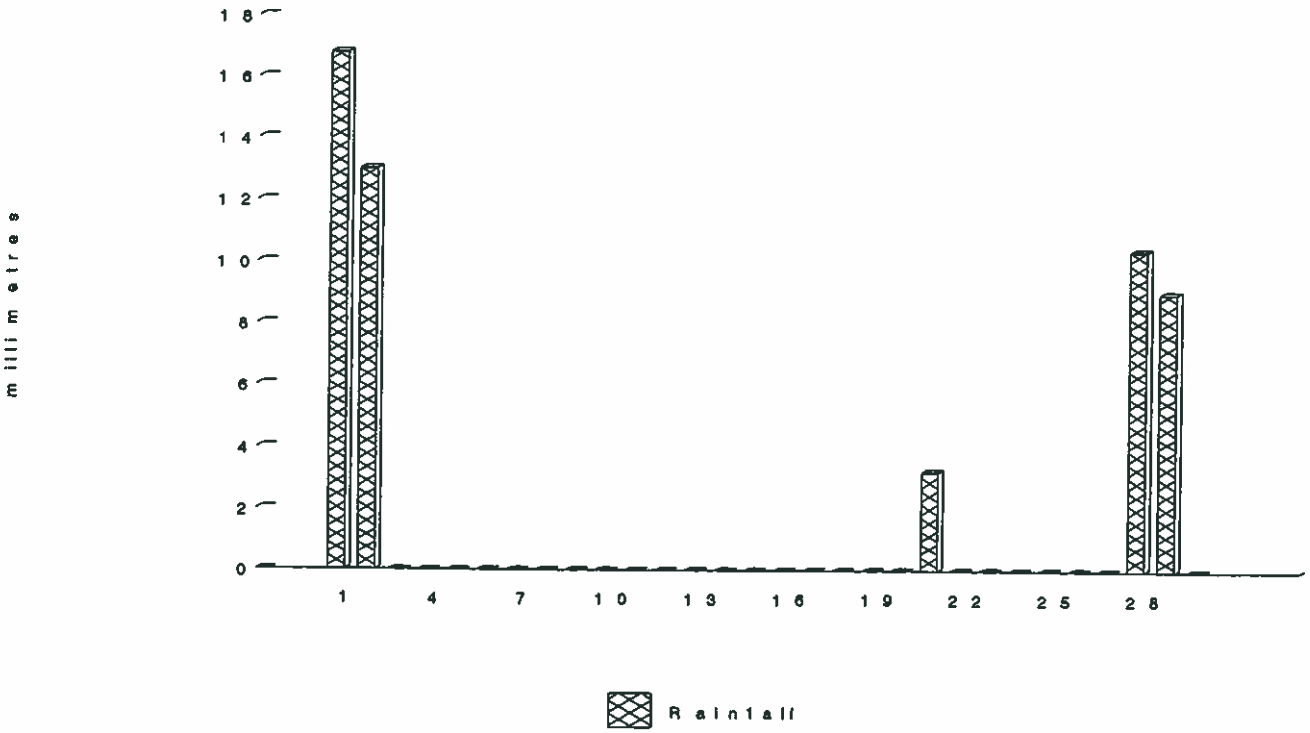
WTP & WWTP FLOWS

June 1998



Treated Water + Total Effluent ◇ Domtar's Influent

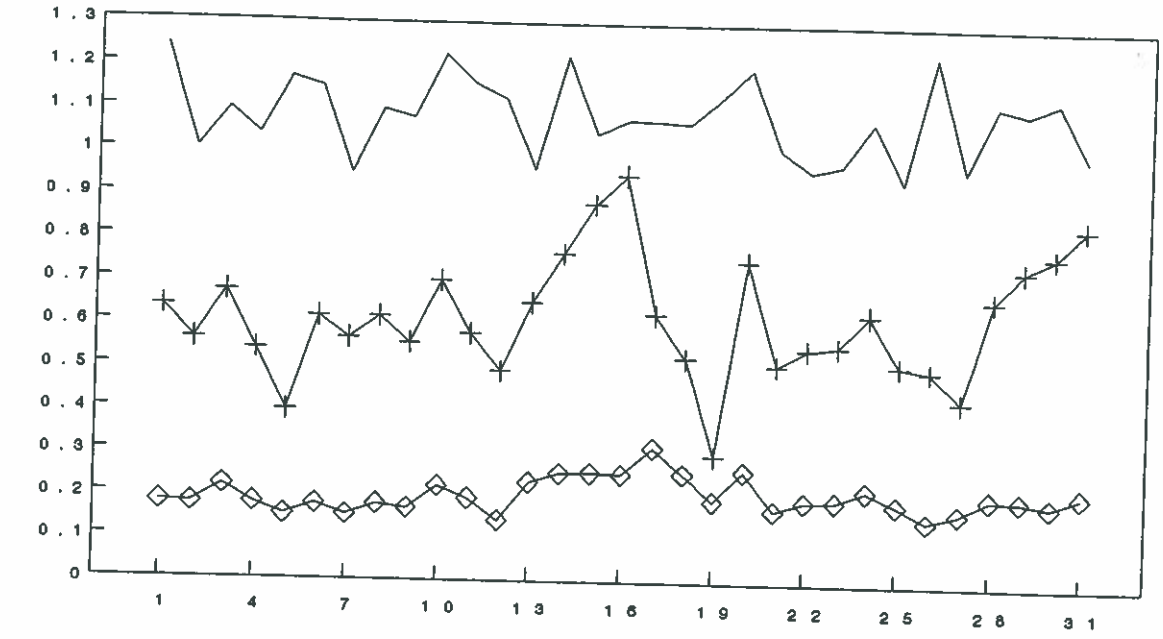
Domtar's Rainfall Data



Rainfall

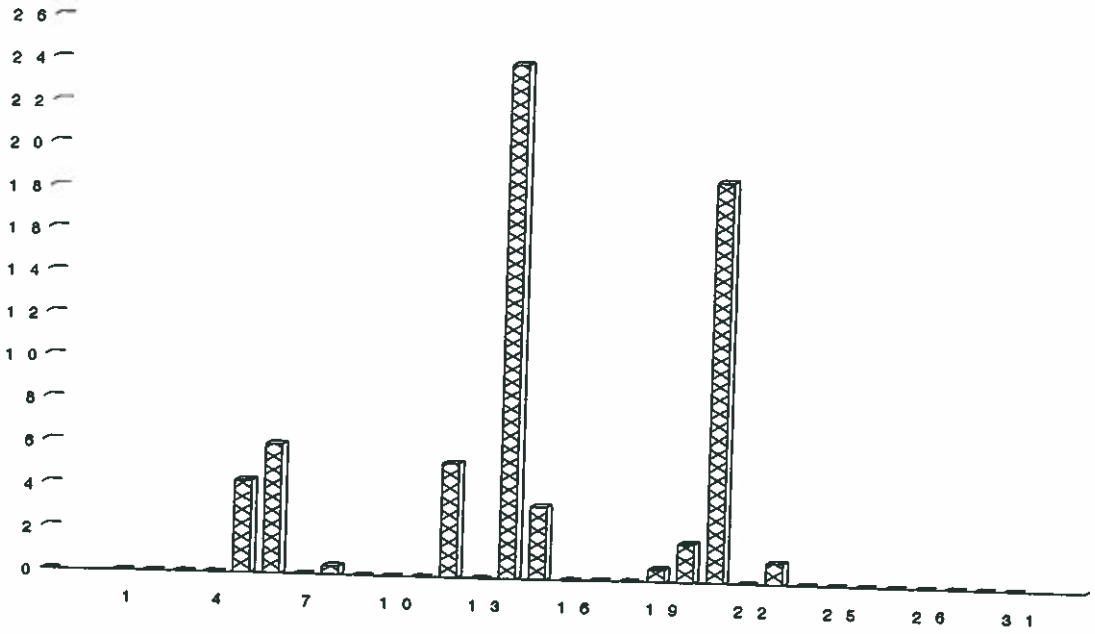
WTP & WWTP FLOWS

August 1996



Treated Water + Total Effluent ◇ Domtar's Influent

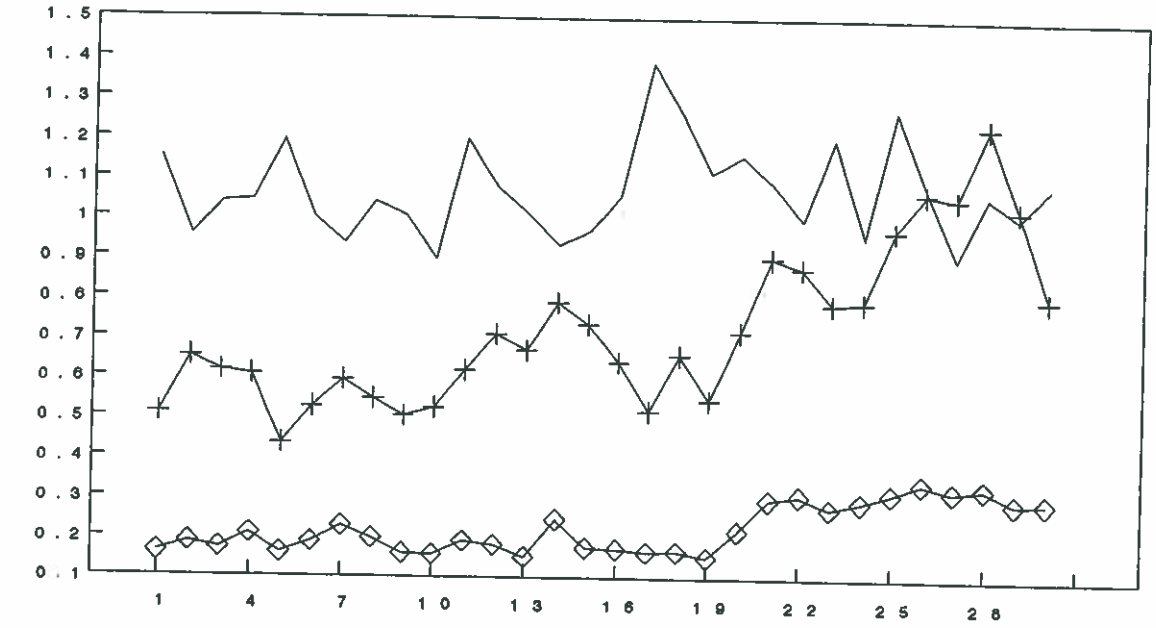
Domtar's Rainfall Data



Rainfall

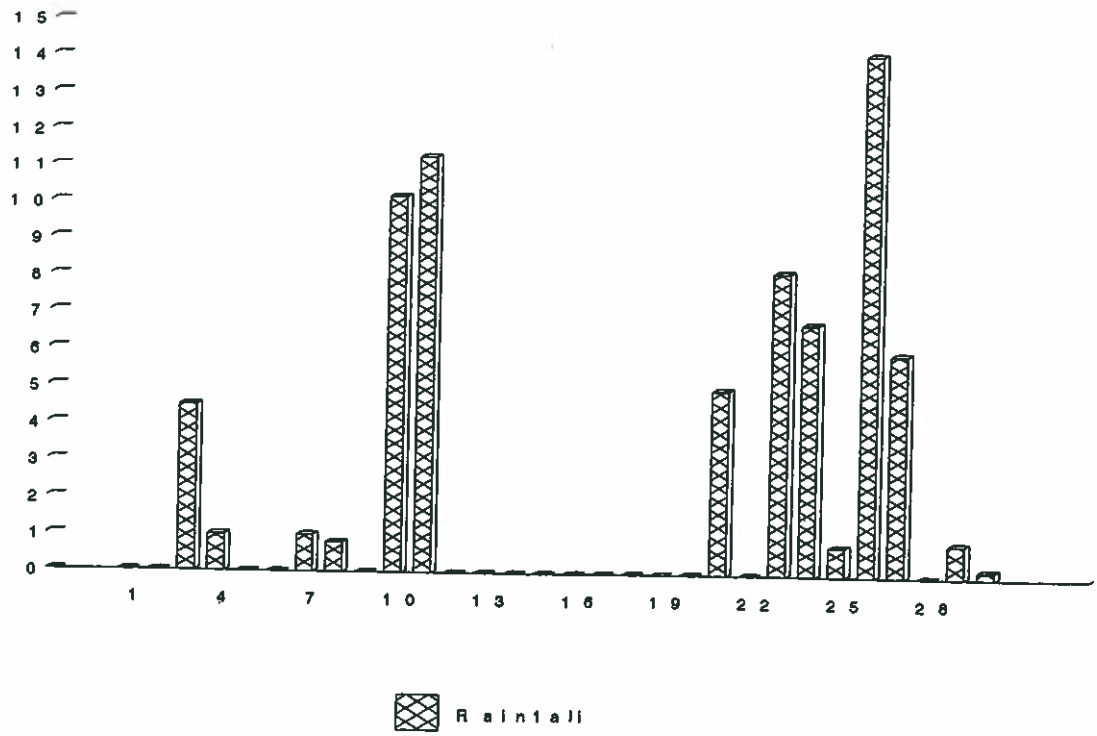
WTP & WWTP FLOWS

September 1996



Treated Water + Total Effluent ◇ Domtar's Influent

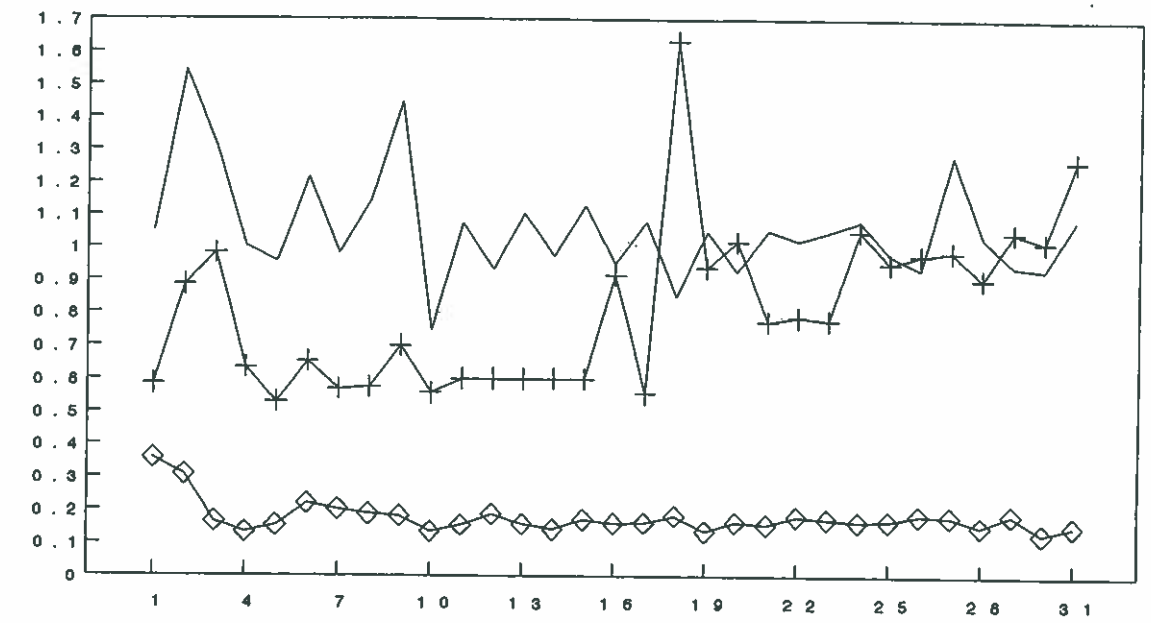
Domtar's Rainfall Data



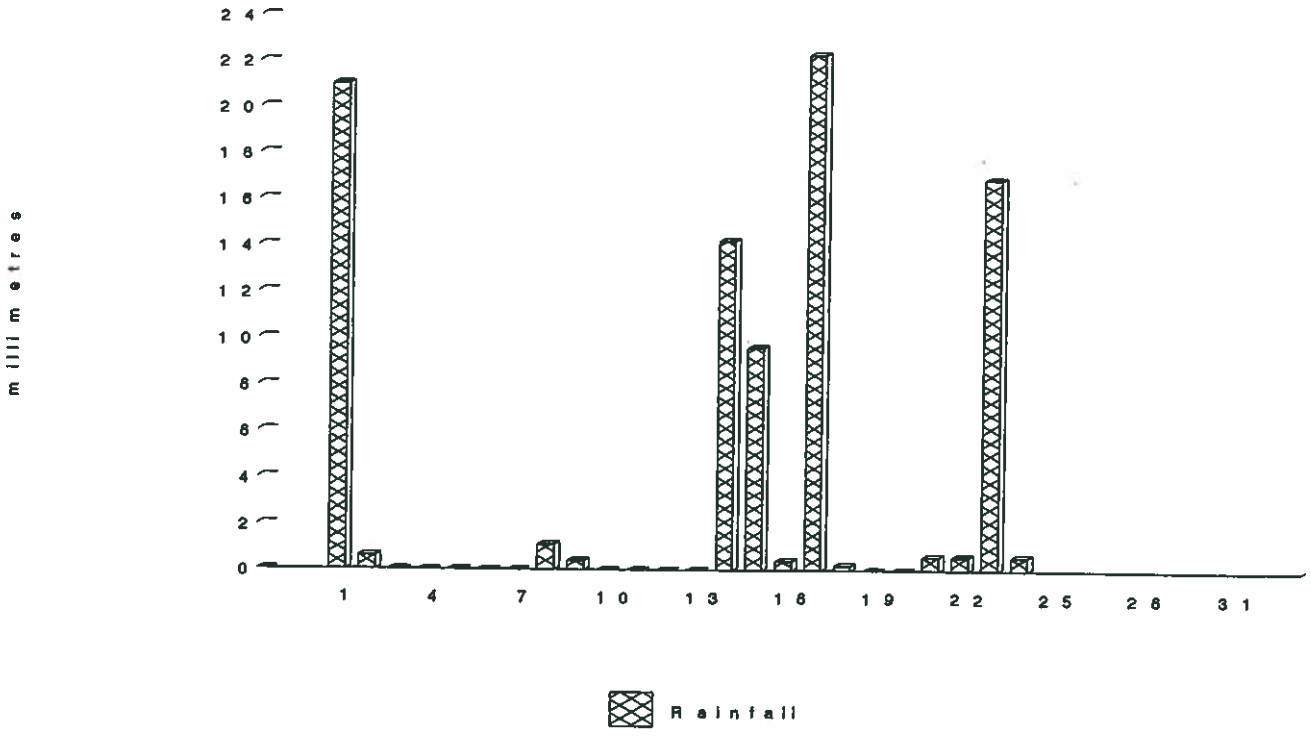
Rainfall

WTP & WWTP FLOWS

October 1996

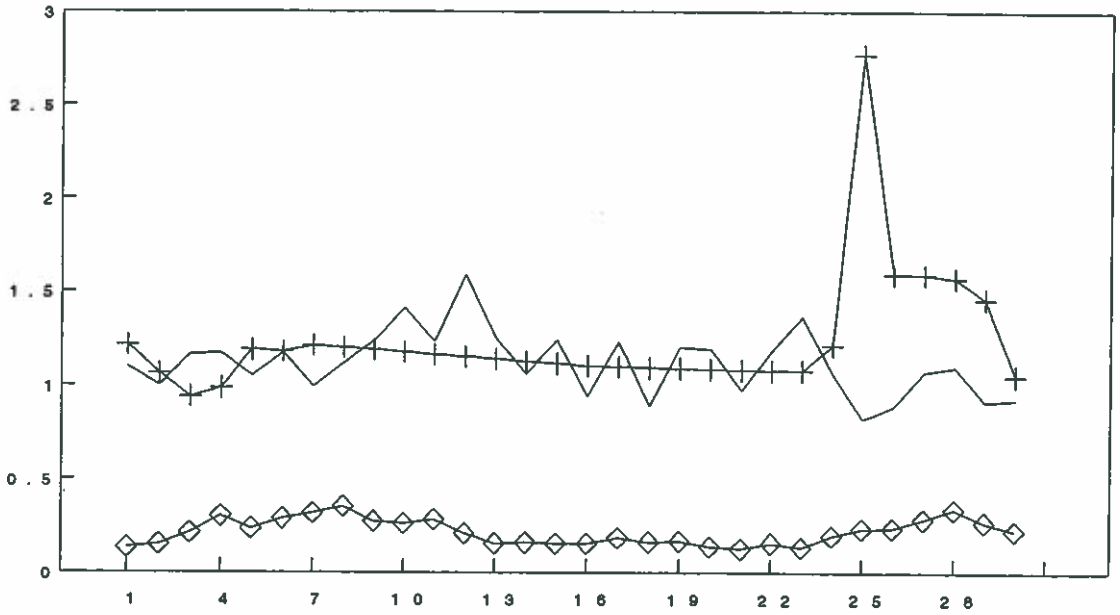


Domtar's Rainfall Data



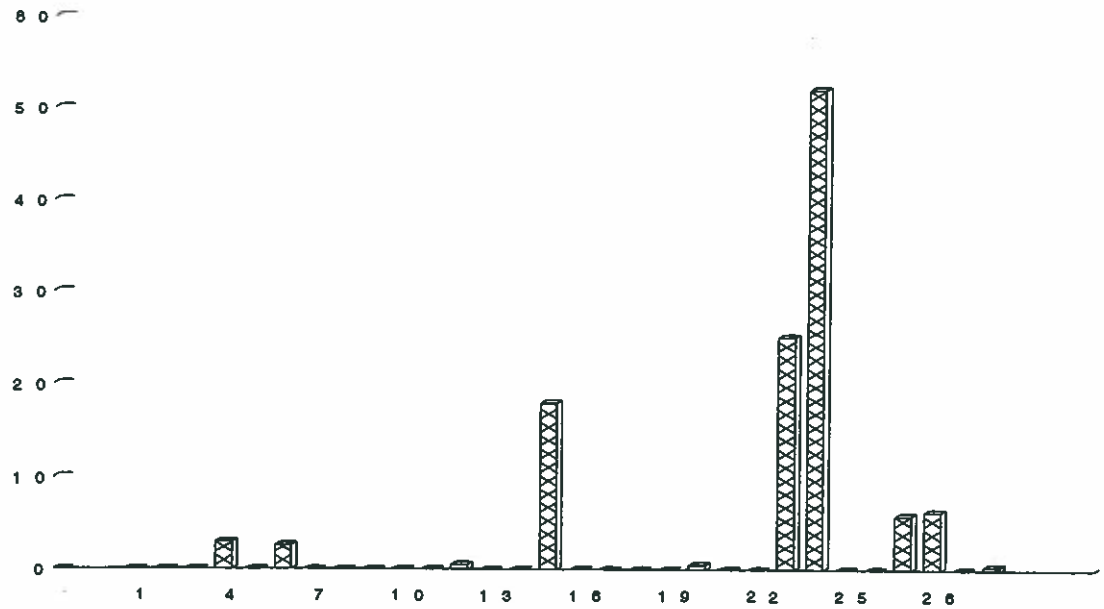
WTP & WWTP FLOWS

June 1997



Treated Water + Total Effluent ◇ Domtar's Influent

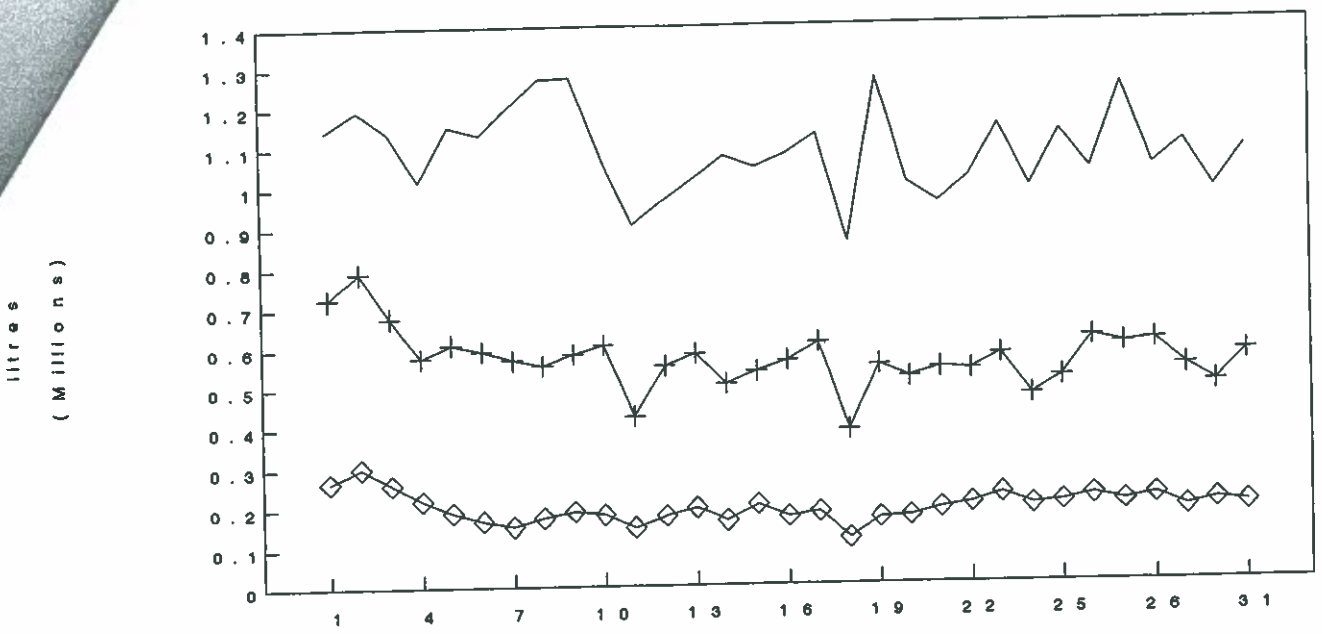
Domtar's Rainfall Data



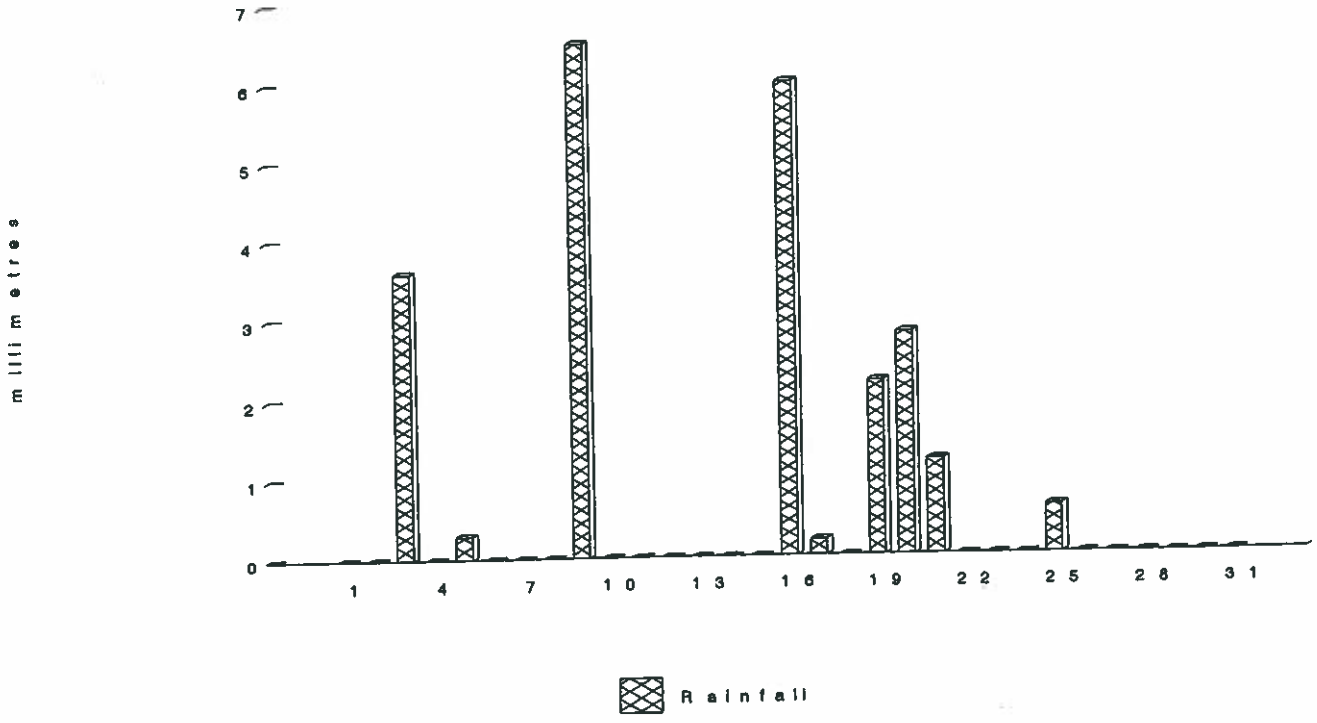
Rainfall

W T P & W W T P F L O W S

A u g u s t 1 9 9 7

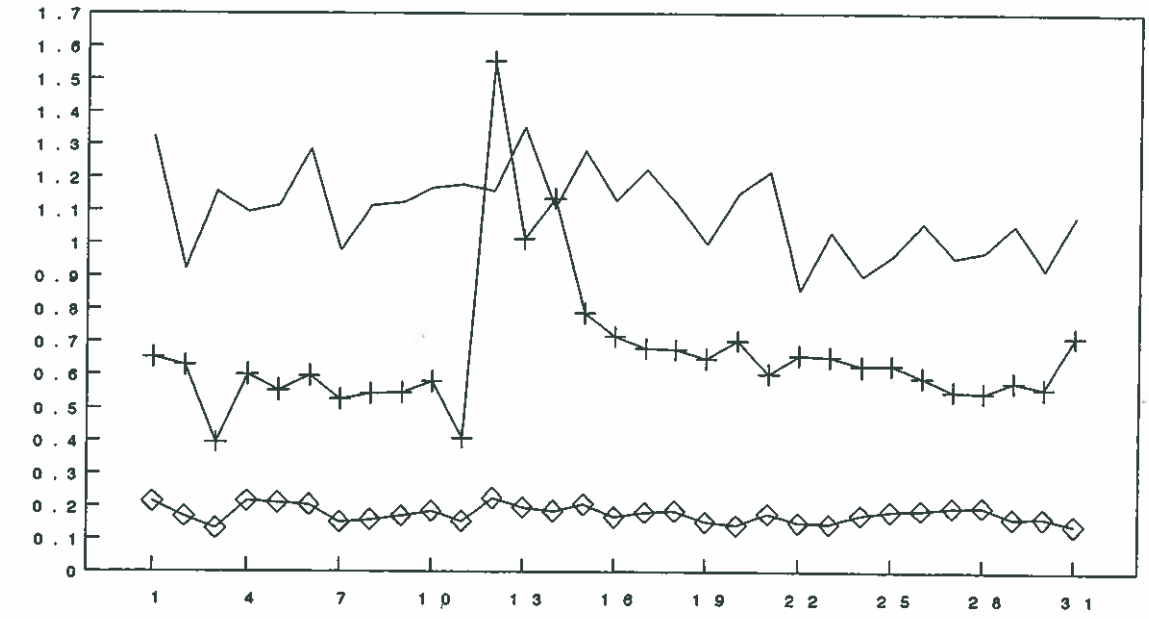


D o m t a r ' s R a i n f a l l D a t a



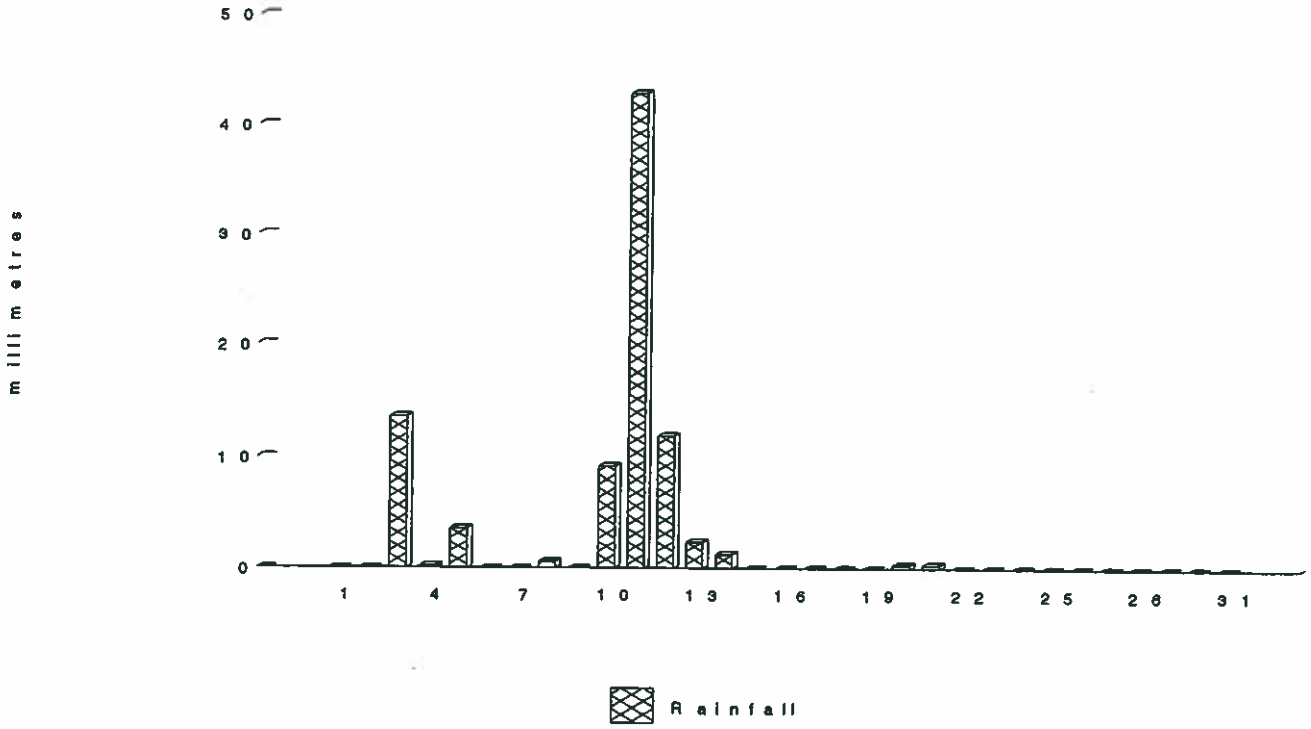
WTP & WWTP FLOWS

October 1997



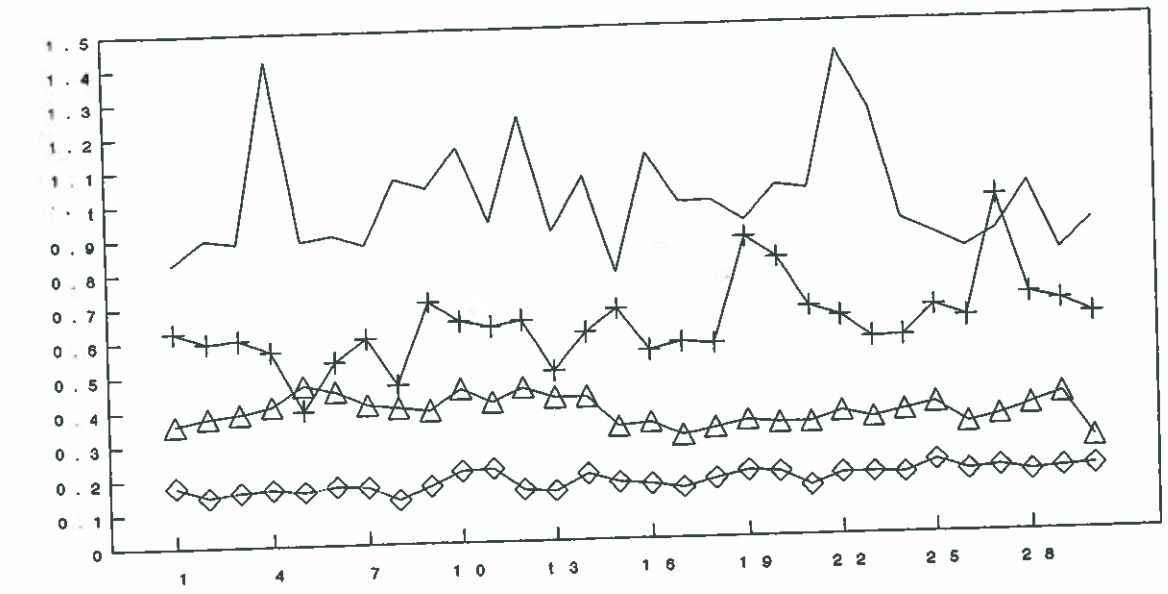
Treated Water + Total Effluent ◇ Domtar's Influent

Domtar's Rainfall Data

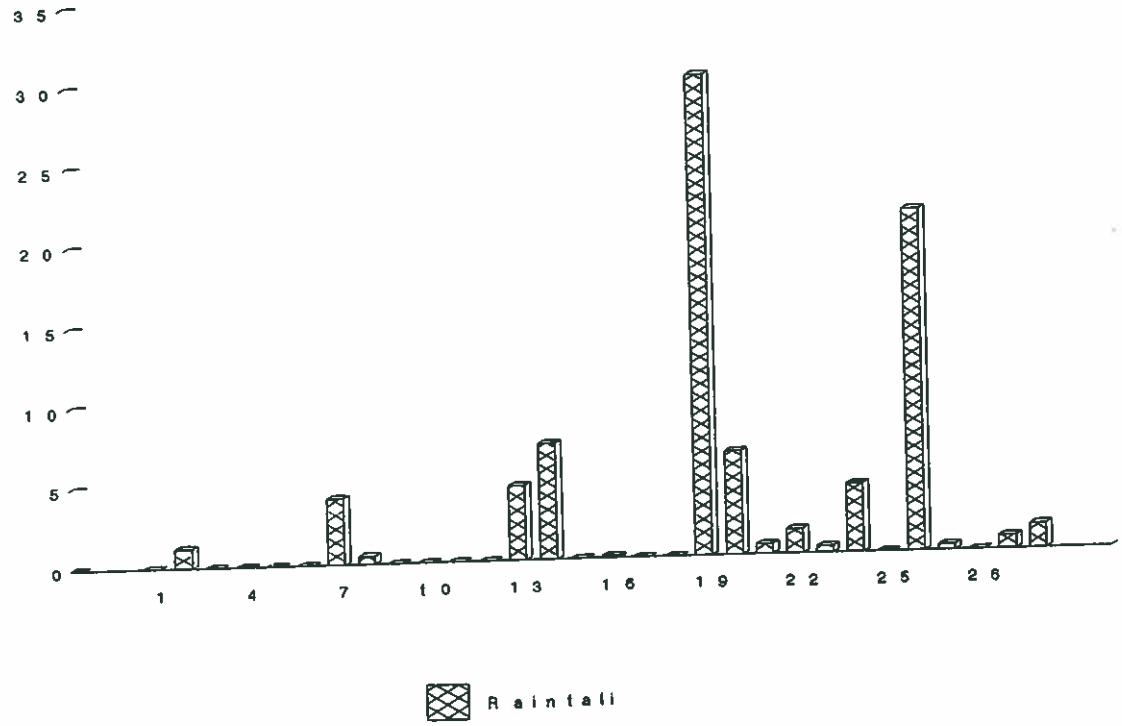


WTP & WWTP FLOWS

September 1998

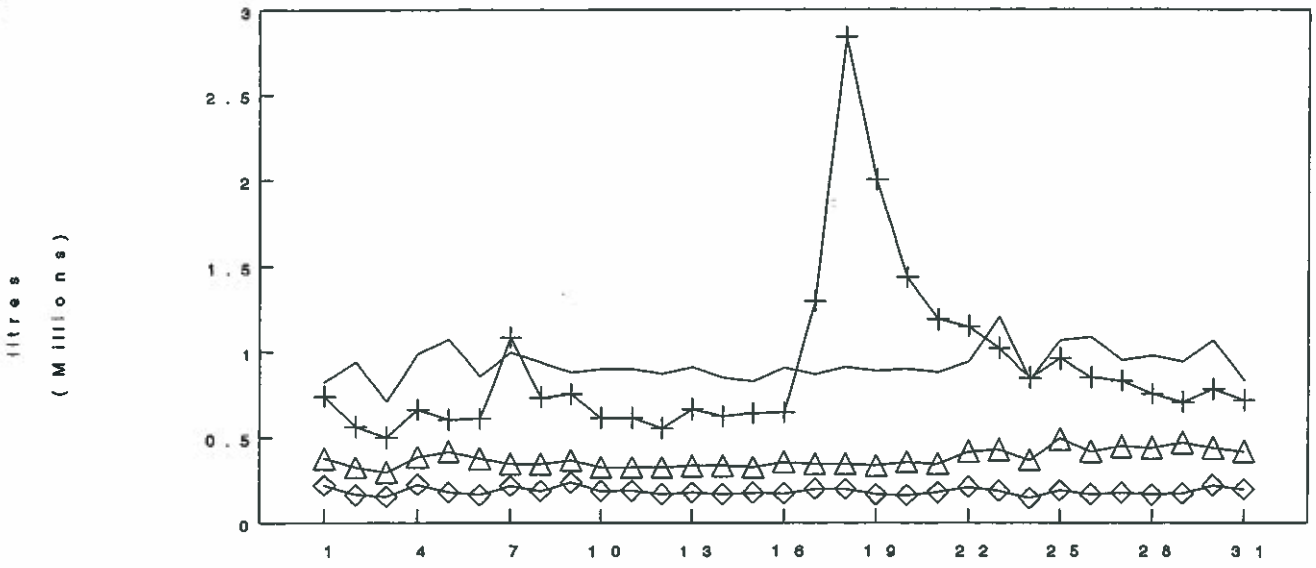


Norampac's Rainfall Data



WTP & WWTP FLOWS

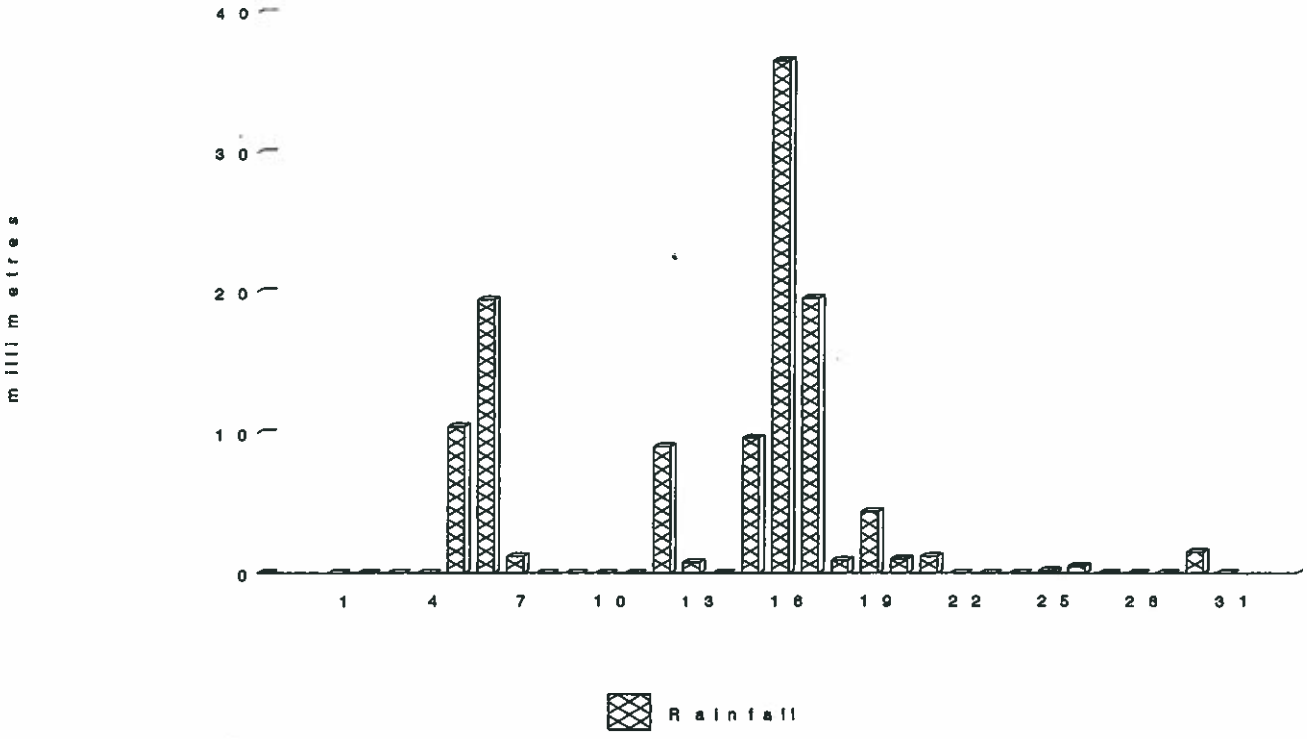
October 1998



Treated Water + Total Effluent ◇ Norampac's Influent

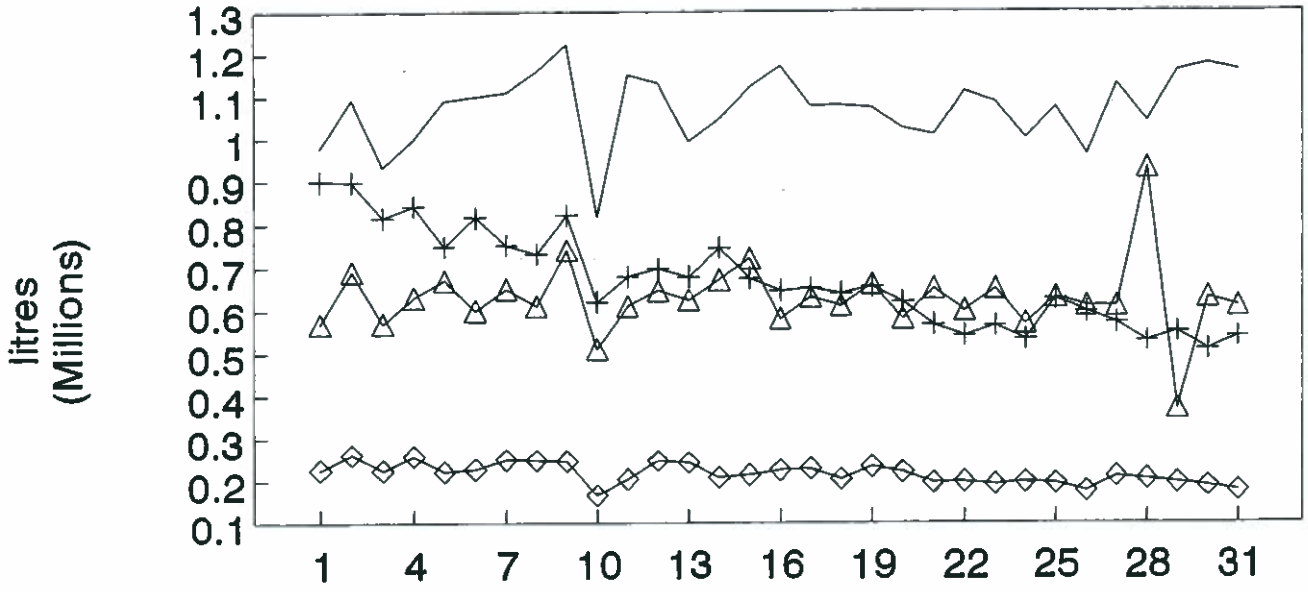
△ Norampac Water Use

Norampac's Rainfall Data



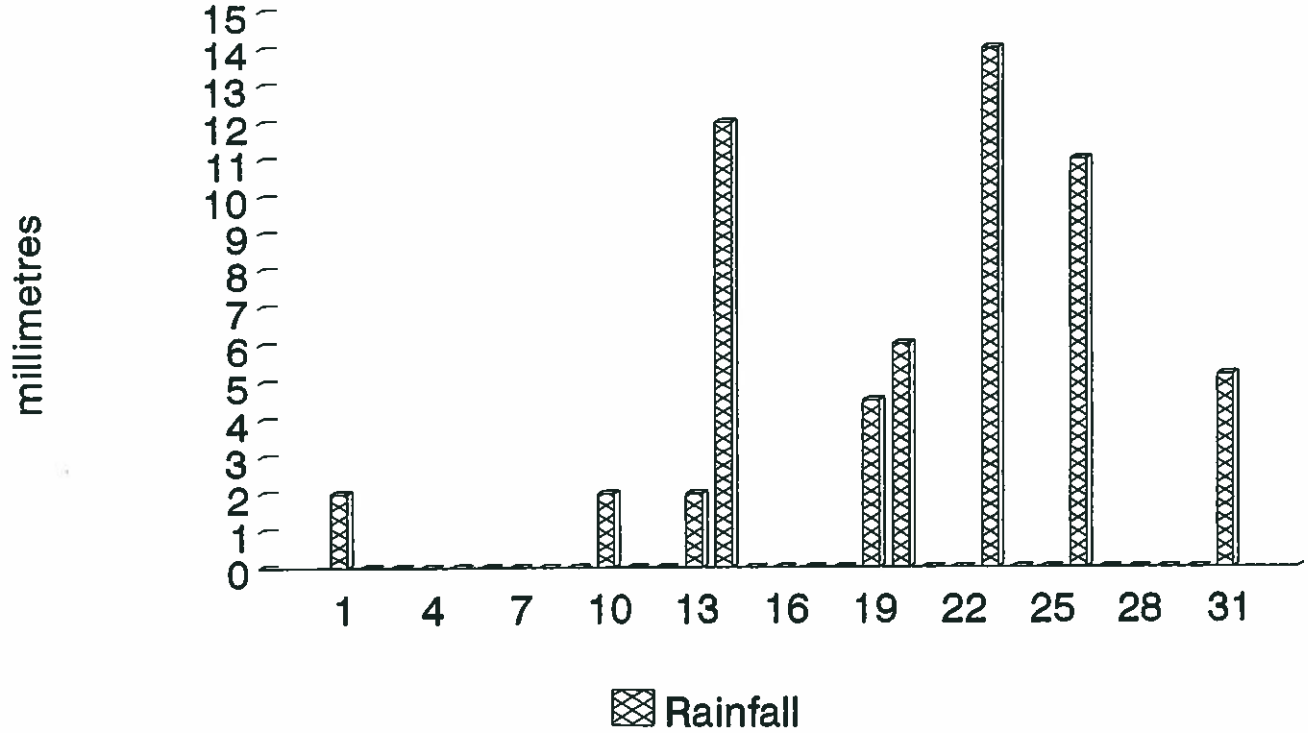
Rainfall

WTP & WWTP FLOWS
July 2000

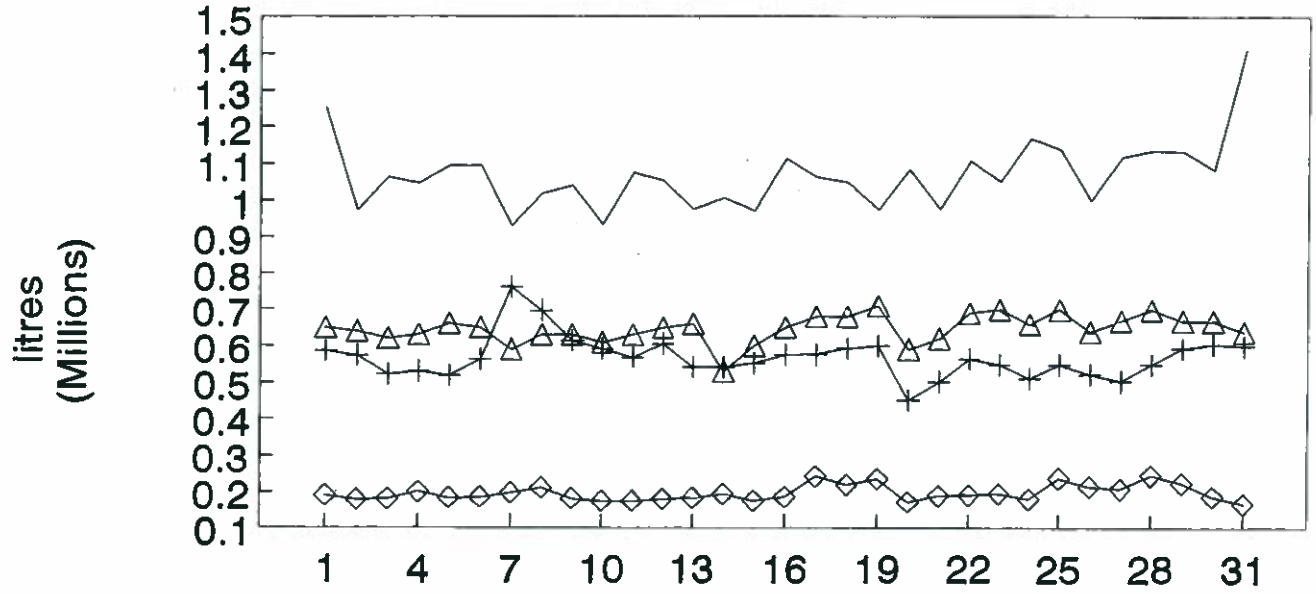


— Treated Water + Total Effluent ◇ Norampac's Influent
△ Norampac Water Use

Norampac's Rainfall Data
July 2000

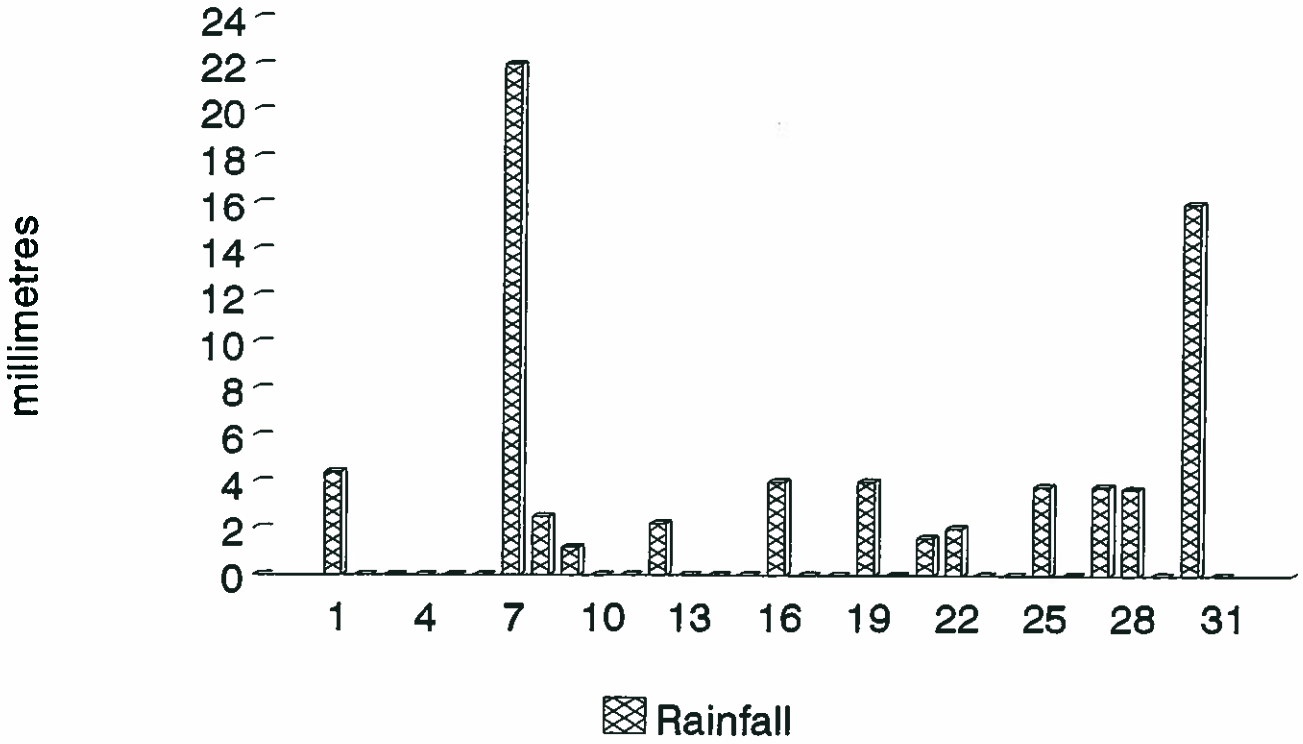


WTP & WWTP FLOWS
August 2000

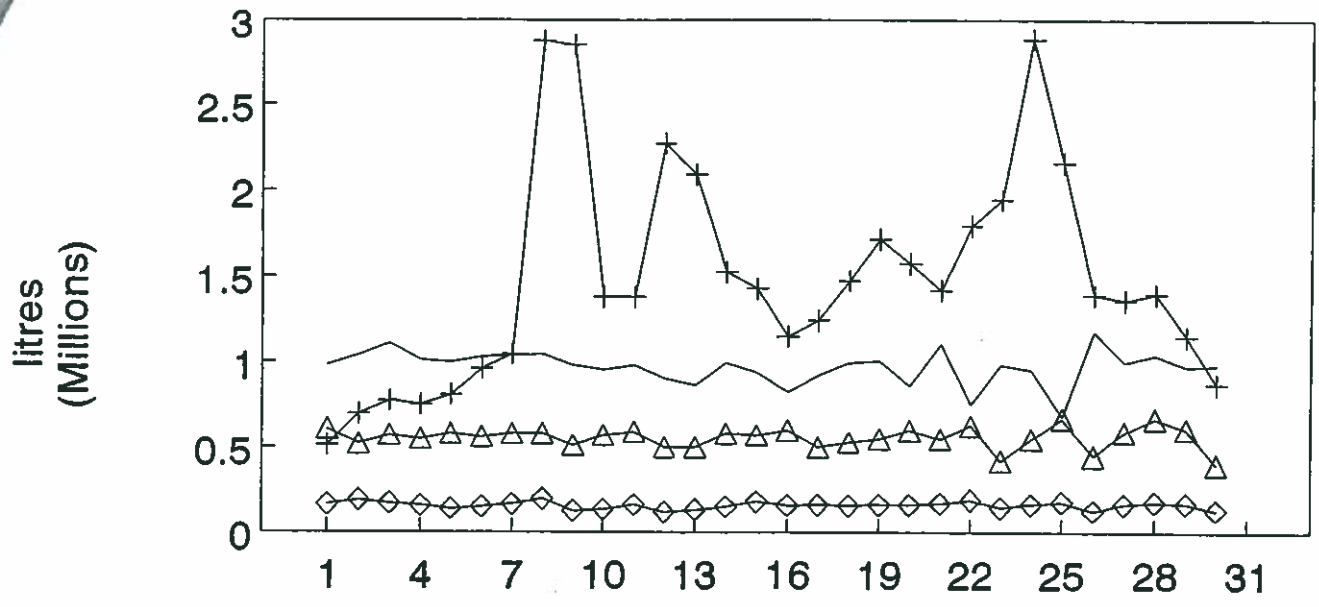


— Treated Water + Total Effluent ◇ Norampac's Influent
△ Norampac Water Use

Norampac's Rainfall Data
August 2000

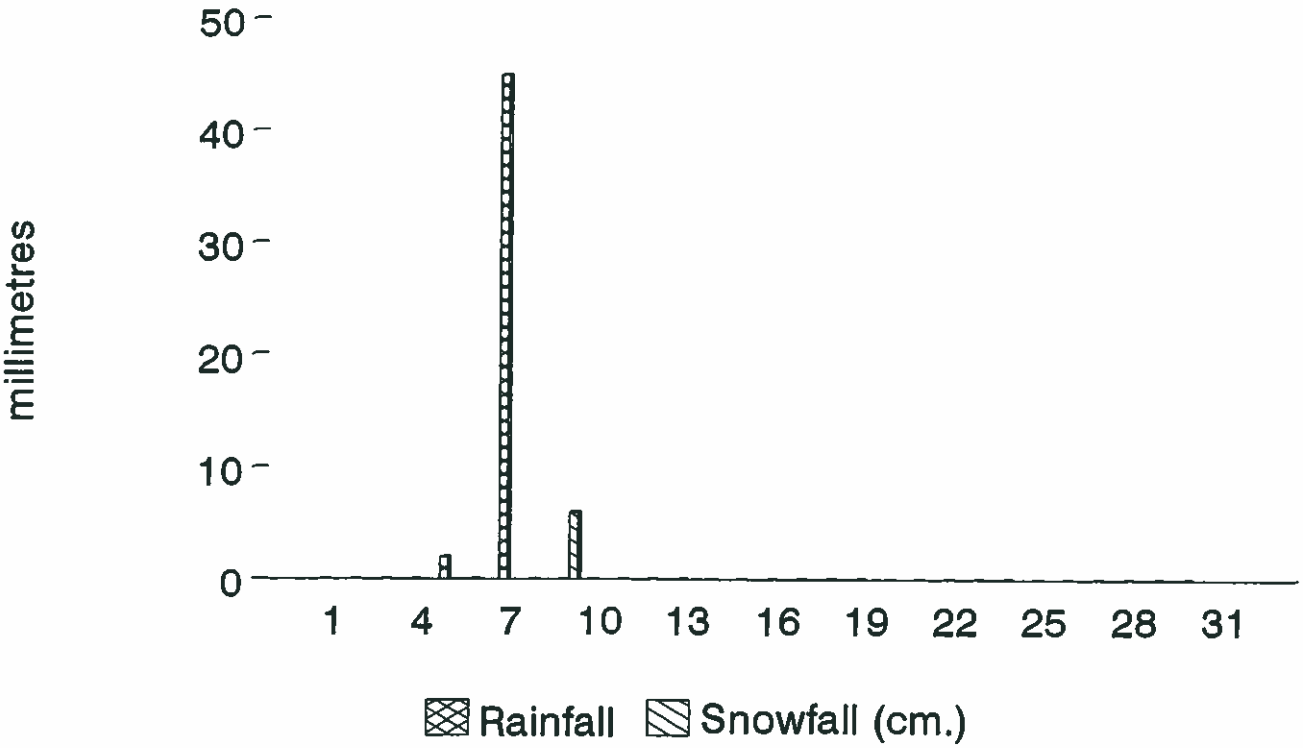


WTP & WWTP FLOWS
April 2001

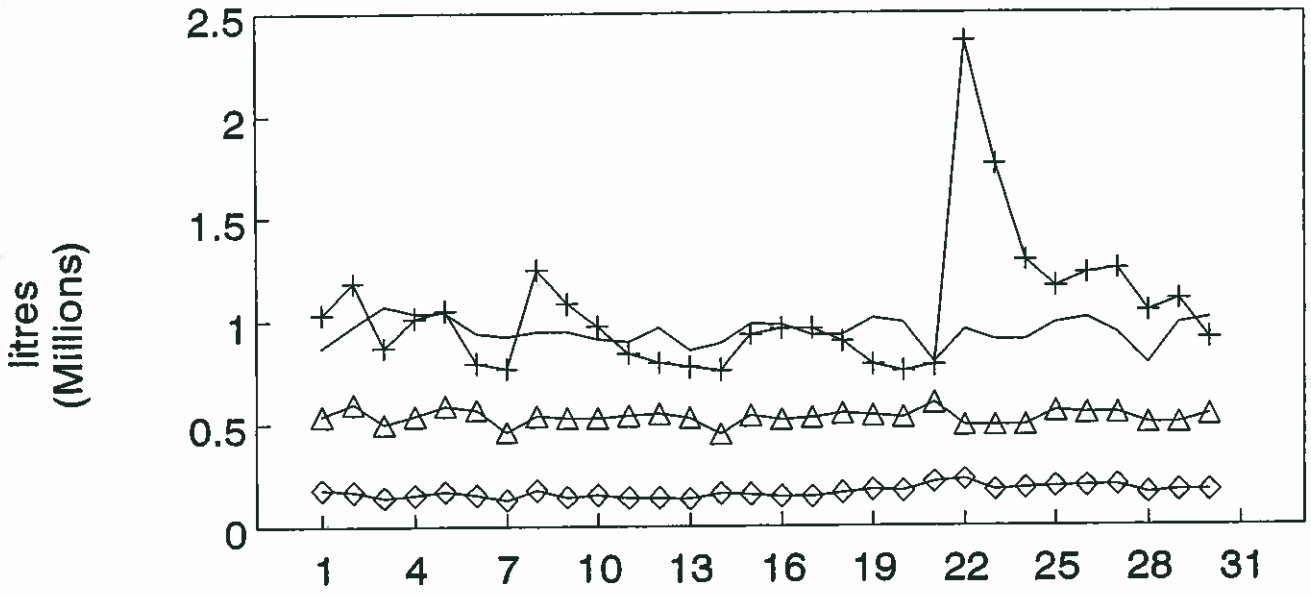


— Treated Water + Total Effluent ◇ Norampac's Influent
△ Norampac Water Use

Norampac's Rainfall Data
April 2001

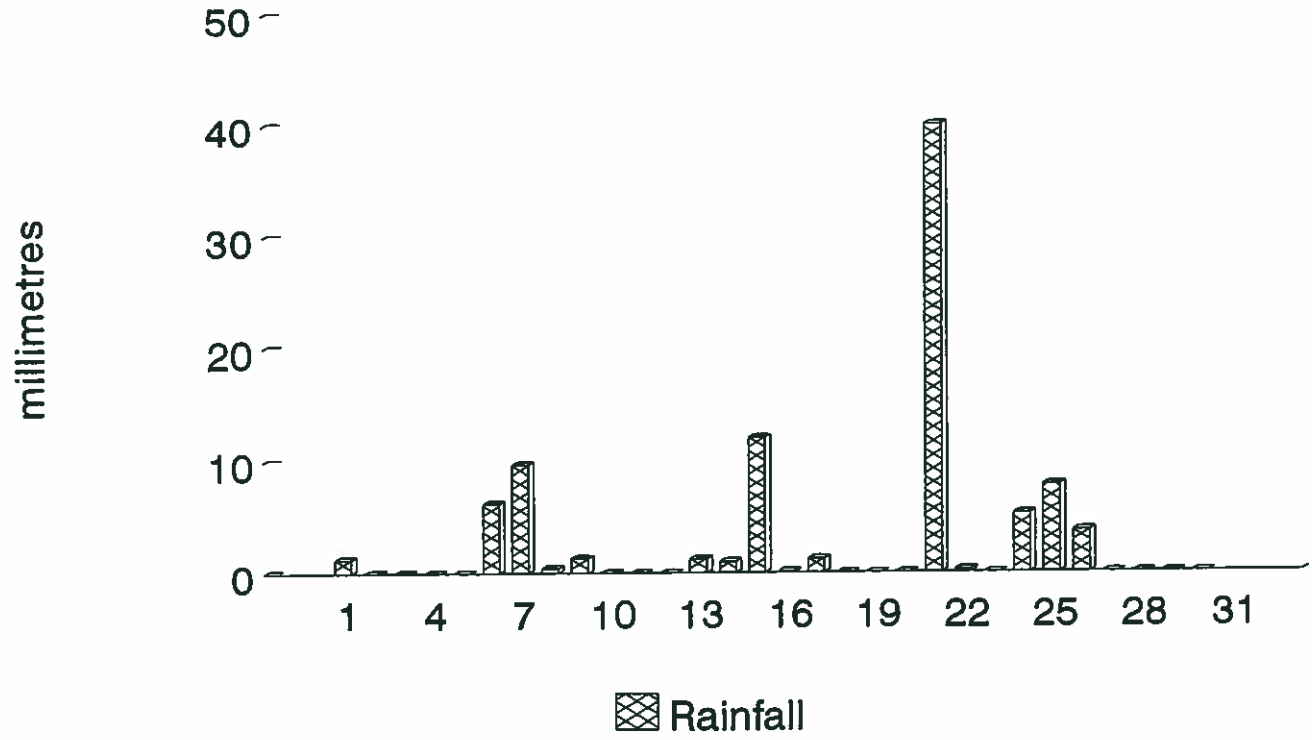


WTP & WWTP FLOWS
May 2001

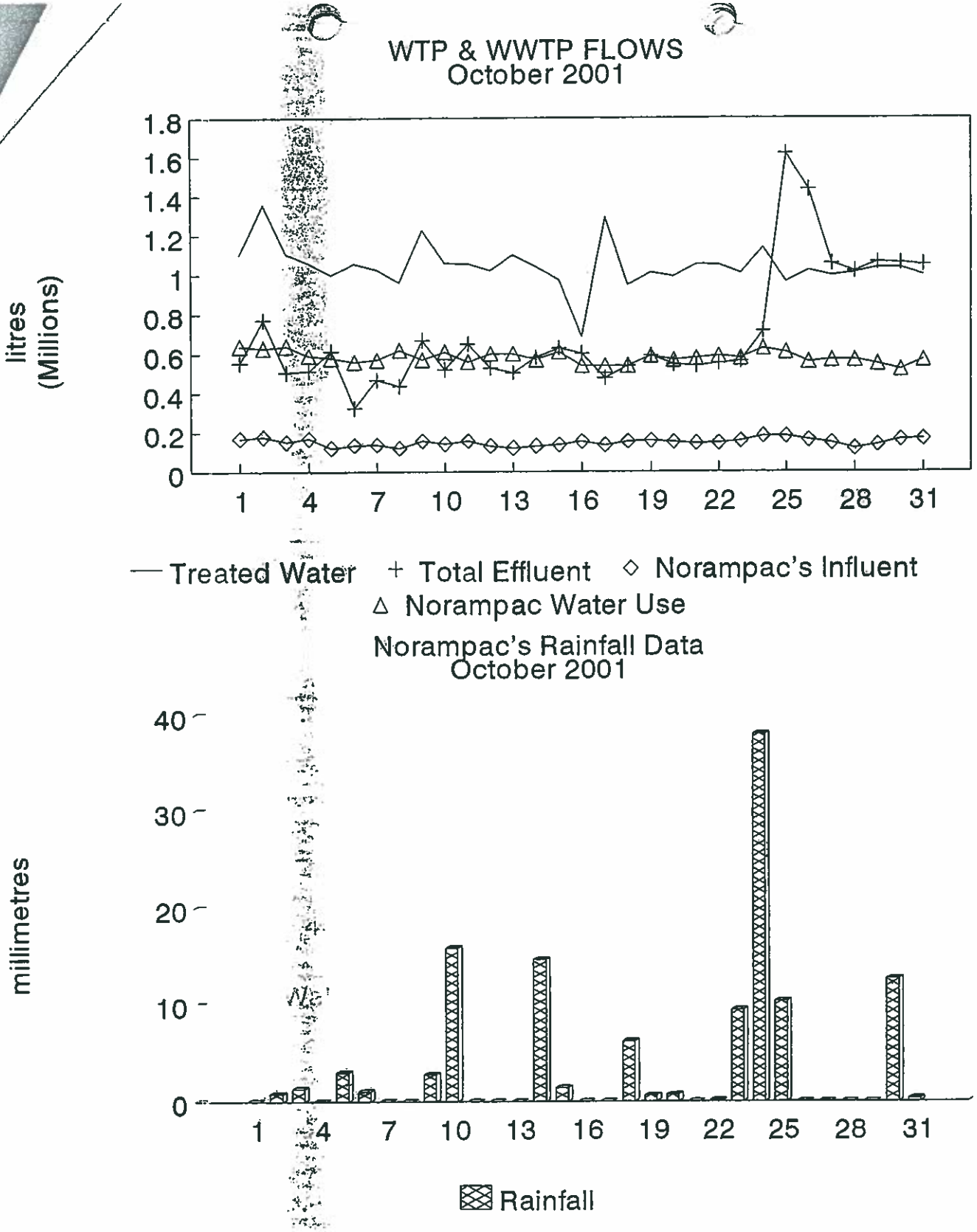


— Treated Water + Total Effluent ◇ Norampac's Influent
△ Norampac Water Use

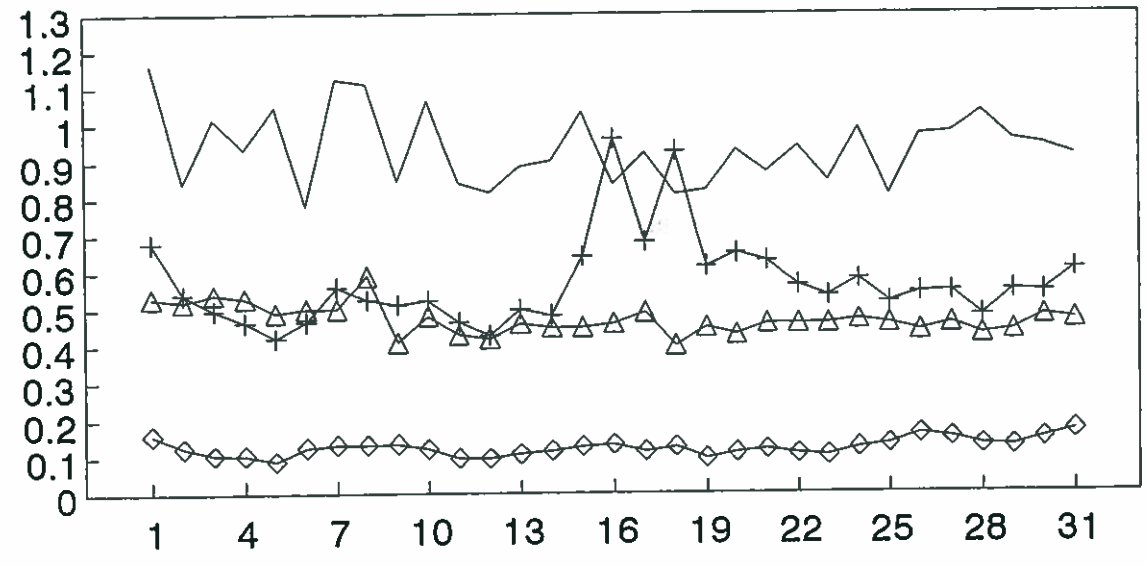
Norampac's Rainfall Data
May 2001



▨ Rainfall

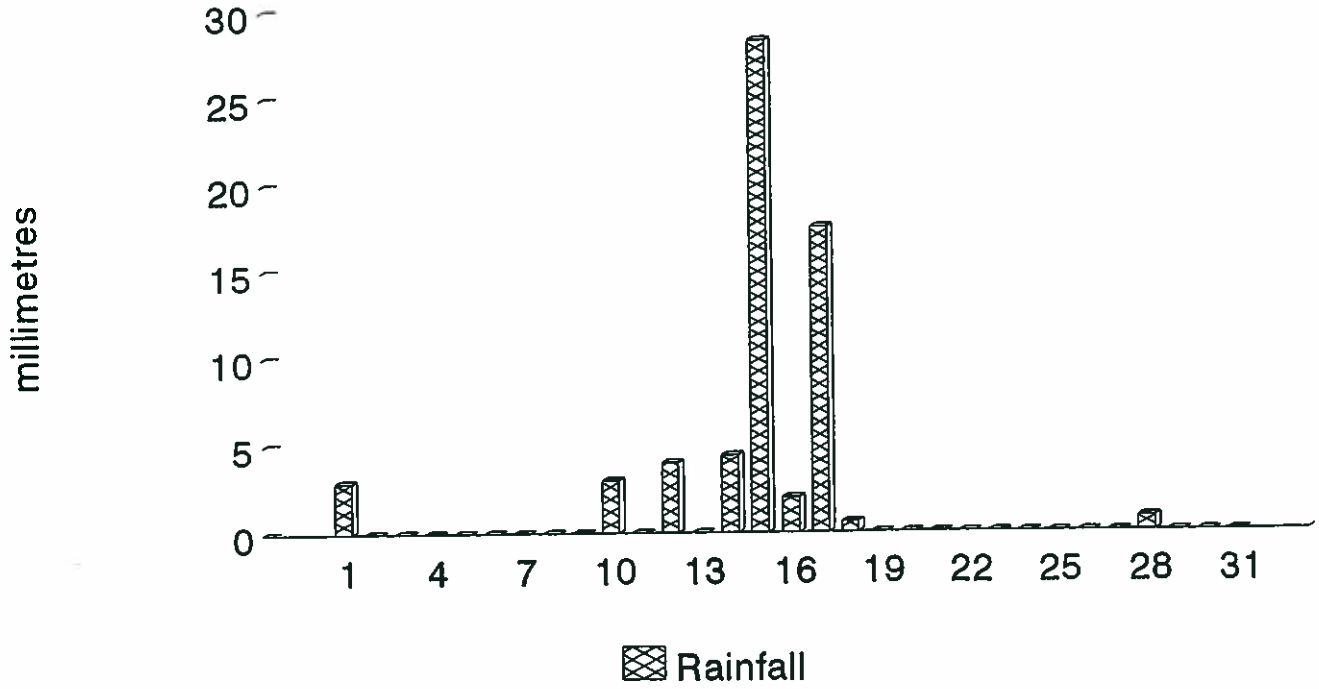

WTP & WWTP FLOWS
October 2001
litres
(Millions)
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
1
4
7
10
13
16
19
22
25
28
31
Treated Water
Total Effluent
Norampac's Influent
Norampac Water Use
Norampac's Rainfall Data
October 2001
millimetres
40
30
20
10
0
Rainfall

WTP & WWTP FLOWS
August 2002

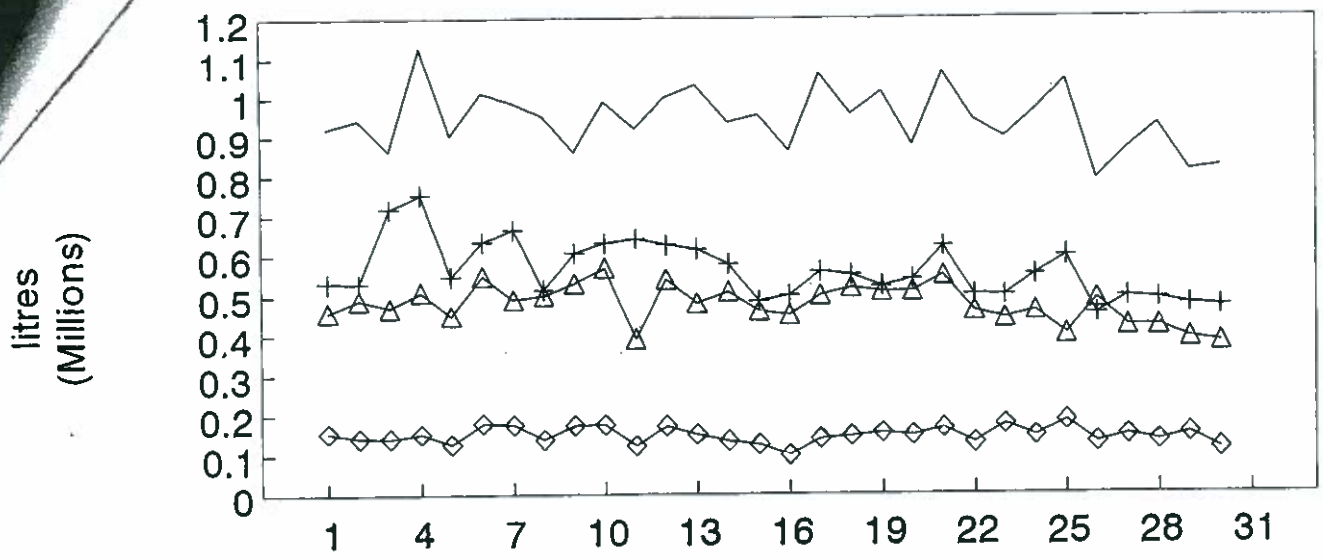


— Treated Water + Total Effluent ◇ Norampac's Influent
△ Norampac Water Use

Norampac's Rainfall Data
August 2002

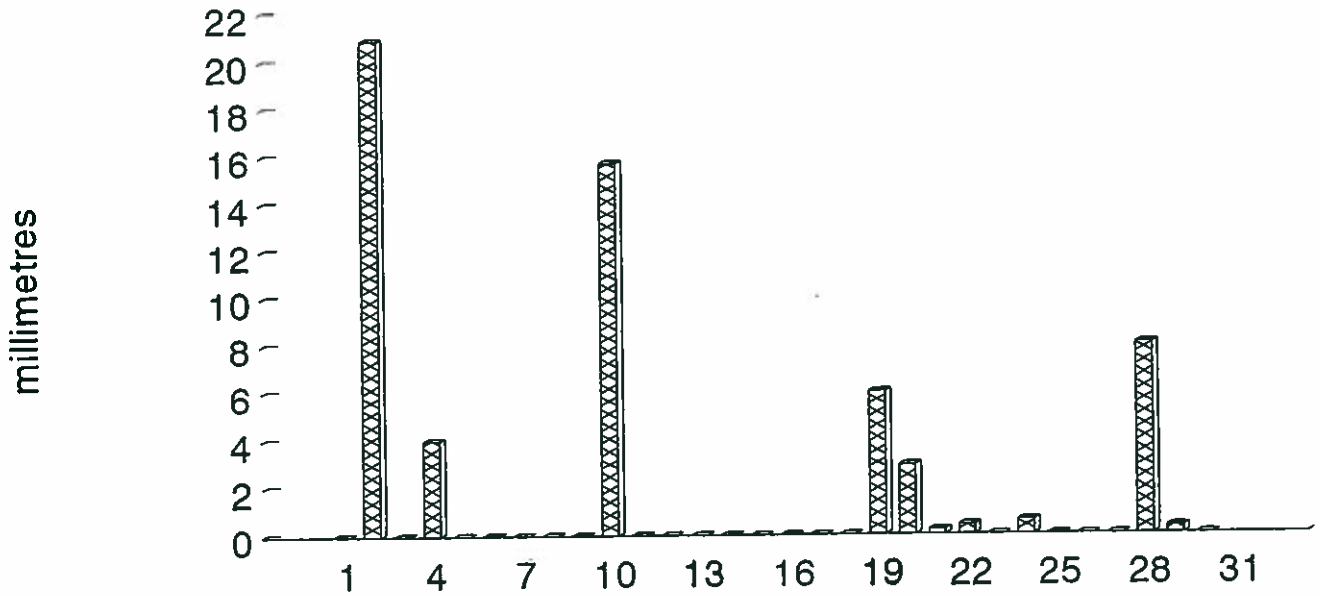


WTP & WWTP FLOWS
September 2002



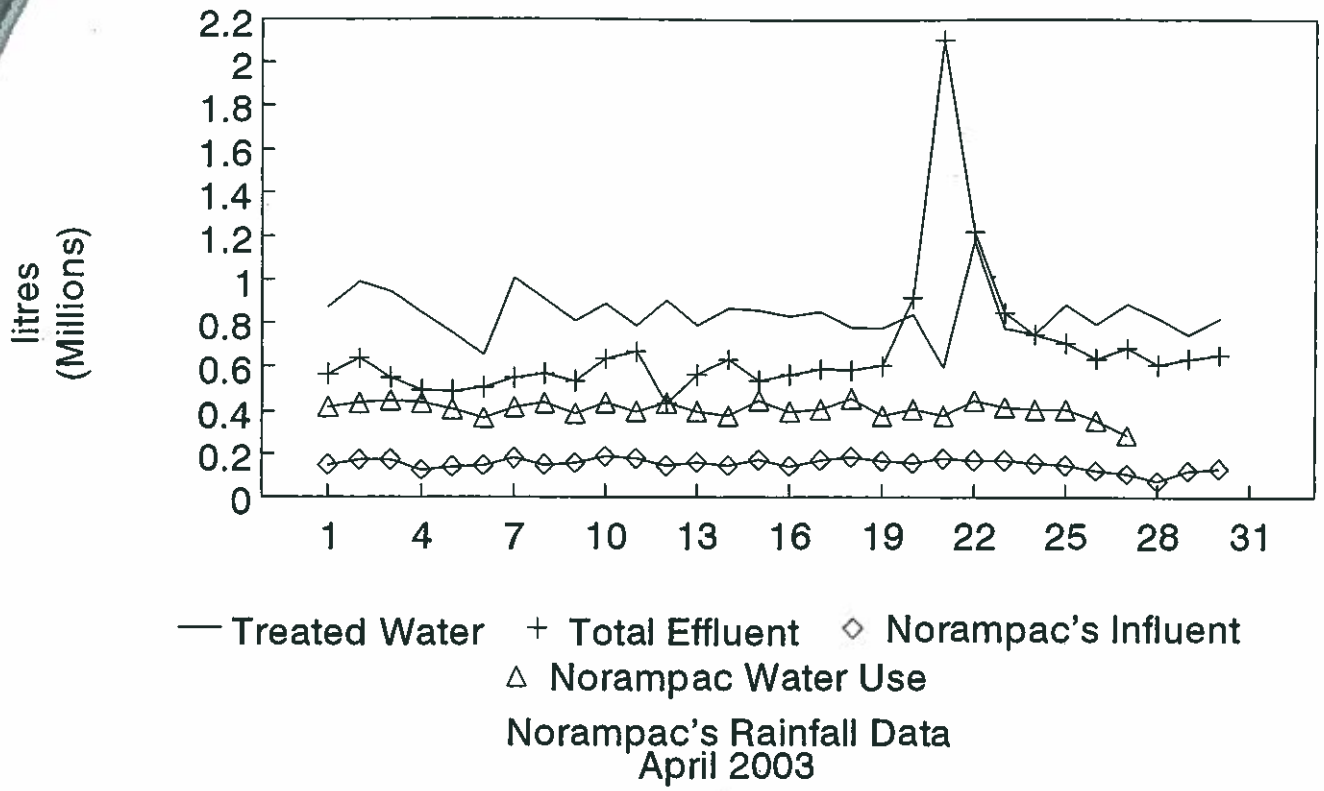
— Treated Water + Total Effluent ◇ Norampac's Influent
△ Norampac Water Use

Norampac's Rainfall Data
September 2002

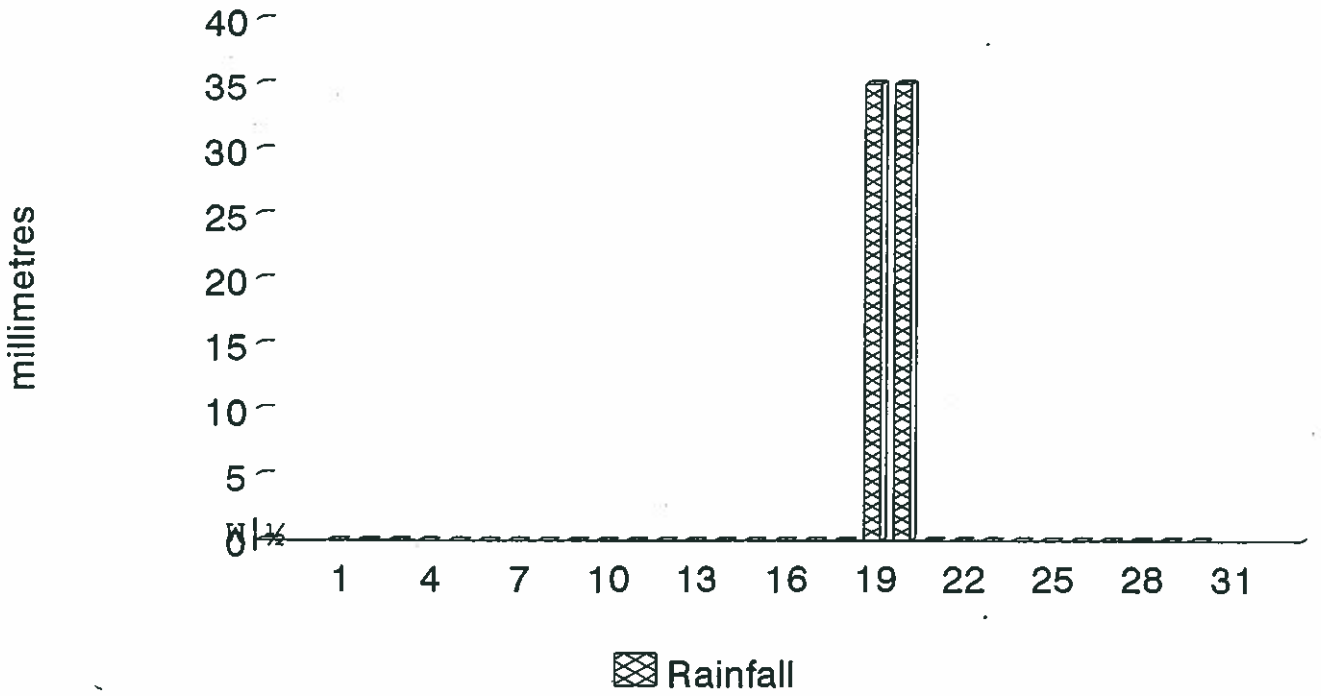


▨ Rainfall

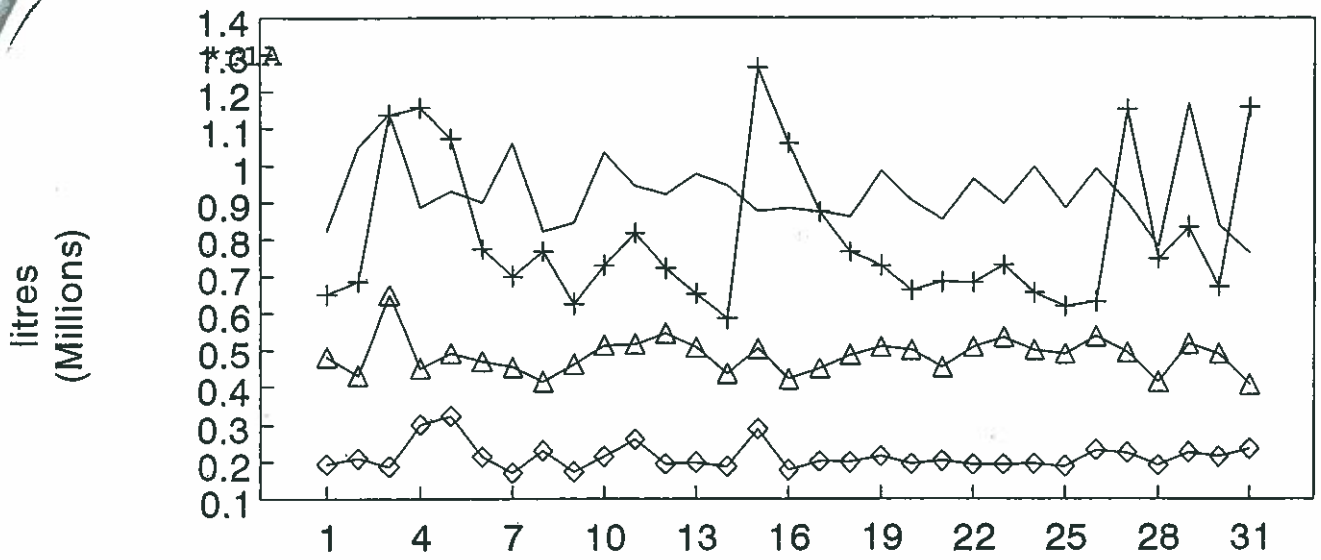
WTP & WWTP FLOWS
April 2003



Norampac's Rainfall Data
April 2003

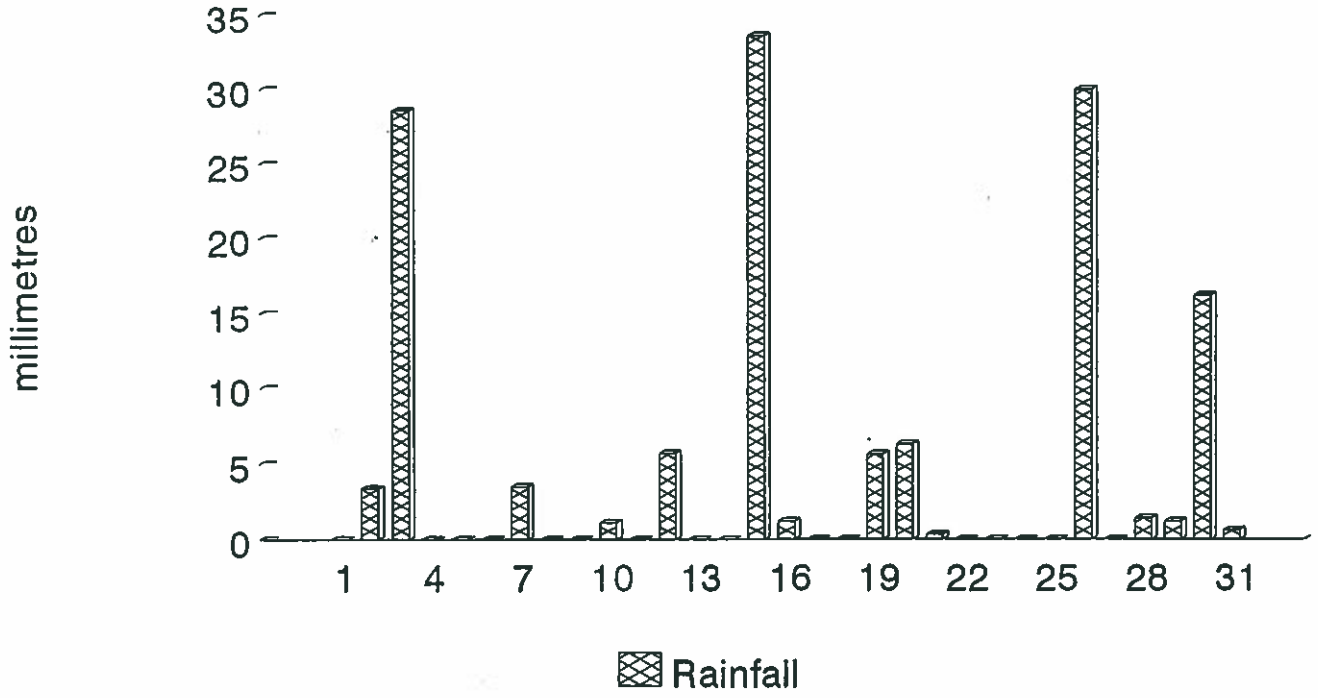


WTP & WWTP FLOWS
July 2003



— Treated Water + Total Effluent ◇ Norampac's Influent
△ Norampac Water Use

Norampac's Rainfall Data
July 2003



▨ Rainfall