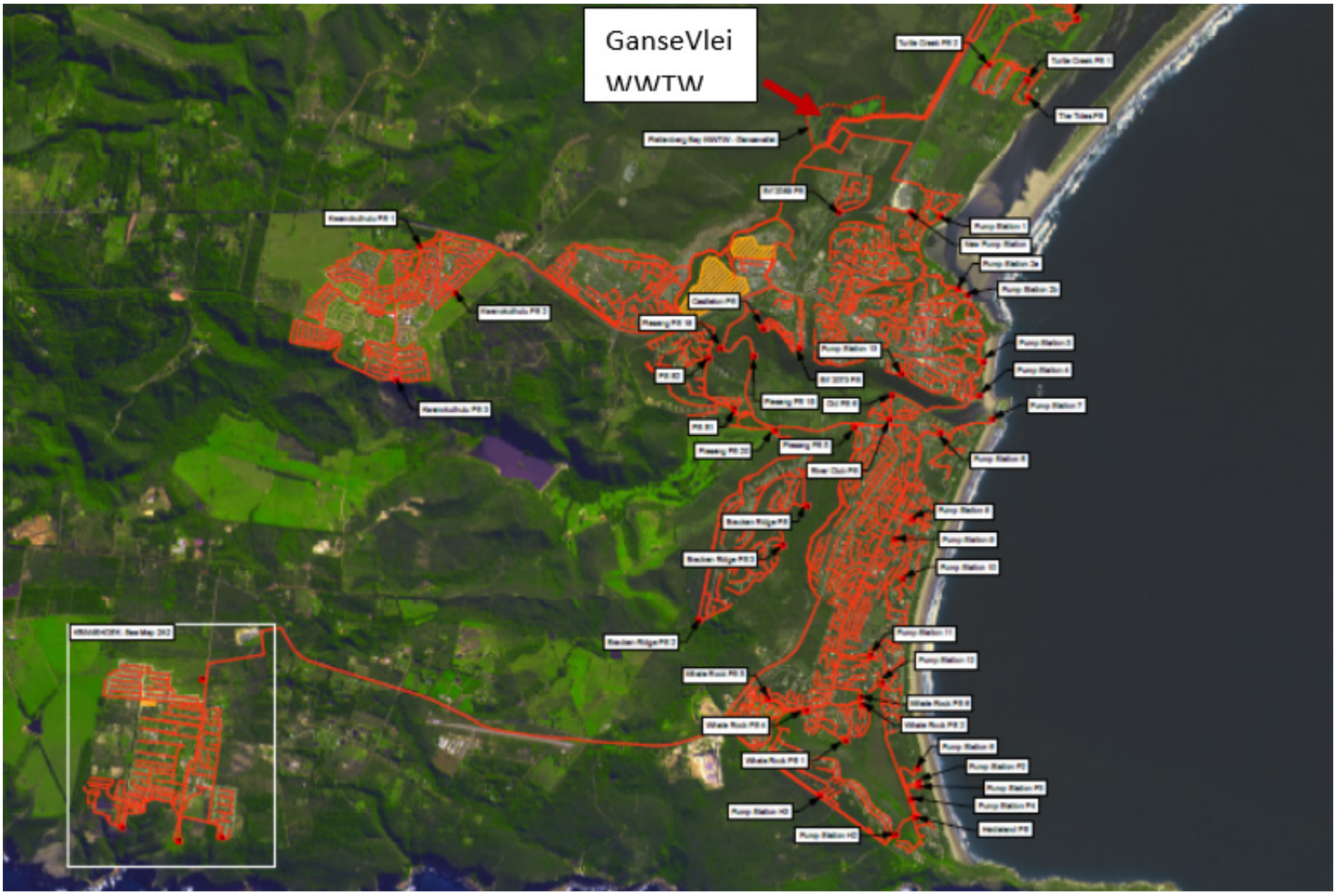
Waste Water Department – 2022 - Bill Alexander

Introduction

Plett's wastewater treatment facilities are generally in good shape. In a recently conducted Green Drop assessment by the Department of Water and Sanitation, based on a variety of criteria Plett scored in the top 3 nationally for which the Department is to be congratulated. The infrastructure can clearly cope with the current loading, but as with all infrastructure its capacity has to be assessed to ensure that it can meet future needs, particularly in a town such as Plett where the population is growing rapidly.

The layout of the Plett sewer system is shown below. It will be seen to serve Central Plett, Kranshoek, Kwanokuthula and Goose Valley. The whole system drains to the Gansevlei WWTW. The writing is not legible, but each of the white rectangles denotes a pumpstation so it will be seen that it is a relatively complex system, requiring electrical power to operate. This potentially creates problems due to load shedding.



It should be noted that the northern areas of Bitou including the Crags, Kurland and Natures Valley are not included in the plan and are served by their own treatment plant known as the Kurland WWTW.

The various aspects of the wastewater disposal system are discussed below:

Gansevlei Wastewater Treatment Works

The main sewage treatment works serving Plett is known as the Gansevlei WWTW and is located near Old Nick's.

An analysis of the influent to the Works has been undertaken to try to establish the load on the works. Several parameters are monitored on a works, but only two major ones are analysed here for the purposes of this report, namely the daily inflow rate and the daily Chemical Oxygen Demand (COD) concentration. The latter is a measure of the organic waste in the incoming sewage.

The principle involved is that it is universally accepted that every person generates between 100-120 gms of COD per day. The reason for the wide spread is because of diet, lifestyle differences etc. For this exercise the lower limit was used.

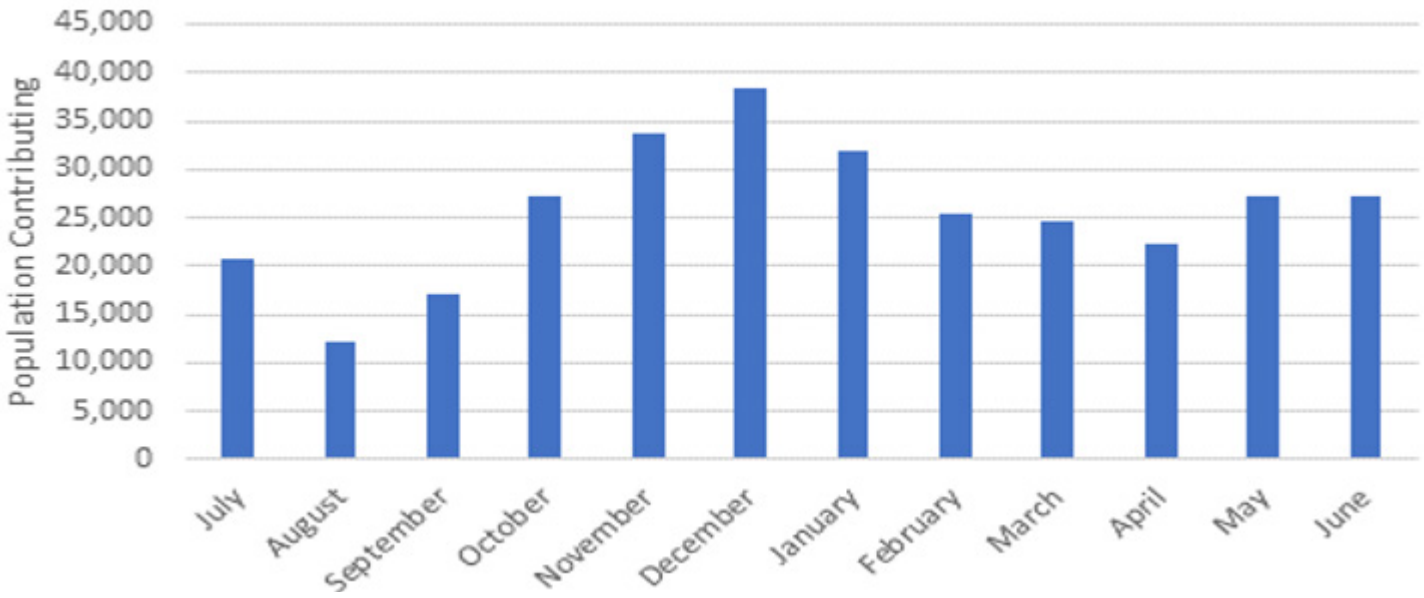
The mass of COD entering the works can be calculated and the number of persons contributing to the flow can be estimated by dividing that mass by 100gms.

Although data is available from July 2019 to June 2022, only the July 2019 to June 2020 is used here because it best illustrates the point being made. The monthly population estimates are presented in the table below and the graph shows the estimated average equivalent populations each month.

	Daily Ave Flow	COD Concentration	Daily COD Load	Estimated Population
July	3913	533	2086	20,856
August	3156	387	1221	12,215
September	4169	411	1713	17,133
October	4418	615	2717	27,173
November	4548	743	3379	33,790
December	5023	766	3848	38,478
January	4920	650	3198	31,982
February	4059	629	2553	25,532
March	3969	516	2471	24,710

April	3404	658	2240	22,397
May	4414	617	2723	27,235
June	3872	705	2730	27,298
Ave March - July	3914	606	2450	24,499
Ave Oct - Jan	4727	694	3278	32,785
Festive Season	5642	921	5196	51,963
Ave Design load	6250	600	3750	37,500
Peak Design load	9000	600	5409	54,090

POPULATION CONTRIBUTING TO SEWAGE FLOW 2019-2020



The following should be noted:

A It is not sure why August and September are so low.

B Assuming that March to July represent the permanent population, it follows that the permanent population contributing to the flow is about 25000; this is significantly less than the total population of 70000 currently estimated for the town.

C The peak festive season period (13 Dec- 13 Jan) contributing population is more than double the permanent population and the load is close to the design capacity of the plant.

D The Kurland WWTW treats the flow from approximately 3600 persons, calculated in the same way. It will be clear from the map above that the Gansevlei WWTW is treating very much more than approximately 40% of sewage being generated in the town.

E There are a finite number of explanations for this discrepancy:

i. The sewage is not reaching the works and is spilling into the environment. This is clearly not happening as it would be very noticeable.

ii. The flow to the Works or the COD concentrations are being incorrectly measured. Several attempts have been made over the last year to engage with the Municipal officials to discuss this disconnect, but so far they have refused.

F Based on this estimating method the peak capacity of the works is 54000 population equivalents. Considering that the off peak population is estimated to be approximately 70000 it is clear that serious consideration should be given to expanding the Works so that we can continue to provide good enough effluent quality to be rated amongst the top performers in the country.

It is of concern that the two most senior officials responsible for the operating of the whole sewerage system have both resigned. They leave with much institutional knowledge and it is hoped that competent replacements will be found.

Sewer Network and Pump Stations

The sewer network is generally in good working order. There are certain bottlenecks and blockages do occur, many due to sabotage and general misuse. These are normally efficiently handled, albeit at significant overtime expense and there is little evidence of significant spillage of sewage into the environment. The bottlenecks have been identified and plans made to correct them, but no budget is currently being made available for this purpose. Fixing them will lead to significant long term operational savings so this aspect should receive priority.

There are over 50 pumps stations in the network that are generally in good working order and well maintained. The major ones have standby generators so load shedding has not yet become a major issue. However, this aspect should be properly analysed and more generators purchased if necessary.

An attempt has been made to obtain data on the daily running hours of the major pumps so that an assessment can be made of what the load on them is relative to capacity. However it appears that this is currently not being monitored even though the major pump stations do have hour meters on their pumps as well as flow meters on their delivery lines. It is recommended that this regular data gathering be instituted as soon as possible as it will be very useful as follows:

A Assisting in solving the conundrum of the missing sewage

B Providing information on the sewage flows from the different sectors of the town that could be used in future planning and assessing the service viability of new developments.

Conclusions

The Bitou's sewerage infrastructure is generally in good shape and would be the envy of most towns in South Africa. However, the issue of the capacity of the Gansevlei WWTW to treat the actual current load on it should be addressed urgently. It seems likely that steps should be taken now to start the long-term process of upgrading it. Every effort must be made to upgrade and maintain the overall infrastructure to optimise operating costs and to ensure that it remains able to serve the growing needs of the town.