What's happening with Wairoa's wastewater

WAIROA'S wastewater discharge consent will expire in May 2019.

Currently, Wairoa's wastewater is treated in two ponds and then the treated wastewater is discharged into the Wairoa River's estuary at night on a falling tide.

But is this current system of treatment and discharge acceptable?

Are there alternatives for treatment and discharges?

The best option needs to be selected before the end of the year so that consent applications can be lodged.

Wairoa man Don Smith knows a thing or two about water.

He worked as Wairoa District Council (WDC) utilities engineer for eight years.

He was responsible for the general overseeing of maintenance for local water reticulation, stormwater drainage and waste water systems.

Mr Smith says, "all three of the water systems have their shortcomings due to age and general deterioration".

But he believes the most significant, in terms of ongoing issues, is the wastewater system.

"That is particularly significant at present as the Hawke's Bay Regional Council (HBRC) consents to operate the present wastewater treatment and disposal system at Pilot's Hill is scheduled for renewal in the near future," he says.

The consents deal primarily with how the effluent, once accumulated, is treated and discharged.

While the present treatment system, which was installed in the 1980s, has generally met all of the consent requirements of the day, Mr Smith believes it will need some significant review and upgrading to meet likely, more stringent consents, particularly with regard to treatment and/or discharge.

Mr Smith says the council's engineers and consultants are obviously working on developing a strategy to deal with the consents but it could be useful, he believes, in light of some recent comments about irregular effluent discharges, for him to provide a general picture of the system for the general public.

Wairoa's wastewater

The Wairoa wastewater system consists of three major parts.

The first is the underground pipe system that drains effluent from each property and transports the waste to accumulation stations.

The second part is the accumulation stations that pump the effluent to the treatment plant.

The third part is the treatment of effluent before discharge to the estuary.

There are miles of underground sewer pipes in the town ranging in size from about 150mm to 400mm in diameter.

These pipes are made of various materials including concrete and asbestos cement, but the majority of the smaller pipes are glazed vitreous china known as EW (earthenware). They are located at various depths around the town and are arranged to allow effluent flow by gravity to the nearest accumulation/pumping station.

This is the main drainage network and it is generally located between adjacent properties.

Each house is then connected to the network by a 100mm diameter pipe installed by a plumber or drain layer.

❑ **Former utilities manager for the Wairoa District Council Don Smith says while the present treatment system, which was installed in the 1980s, has generally met all of the consent requirements of the day, it will need some significant review and upgrading to meet likely, more stringent consents, particularly with regard to treatment and/or discharge.**

While some of the more modern connections are PVC pipe, most of the older connections are EW.

Ageing pipe work

One problem that arises is due to the age of the pipe work, particularly the EW pipes, which can date from the 1930s.

They may have moved due to ground changes, accidental damage or simply because the joints between the relatively short (about 1-metre) lengths of pipe have separated.

This means effluent can leak from the pipe.

Because the pressure and flow in the pipe is usually fairly low, a greater concern is the pressurised water in the water table surrounding the pipes tends to push water into the pipes.

The buried sewer network can potentially operate as a water table drain.

This is known as infiltration and can be a major problem for aging systems as it increases the inflow, which then requires more pumping and treatment.

Infiltration is not limited to the council sewer, but can also occur at each house.

Individual houses can have 10 metres of drain which is smaller in diameter and laid much closer to the surface where it is more susceptible to damage.

The problem is also compounded in some cases where stormwater from the house roof is routed into a convenient gully trap which connects to the sewer.

Pumping Station

The effluent from the town flows in these pipes by gravity into one of four accumulation/pumping stations although one of these, at the junction of Rutherford and Kitchener Streets, is quite small and really only drains effluent from the Athletic club rooms.

The other three were all built in the 1940s, including two virtually identical stations located at the river end of

and what's the future of the Wairoa River?

Freyberg Street and adjacent to the Community centre at Alexander Park.

There is a much larger station, located on Kopu Road, which is twice the size of the others and before the construction of the treatment plant in the 1980s it was the terminal station which discharged untreated effluent into the river opposite the station.

The Freyberg station drains the whole of the area north of the river, while the Alexander Park station drains the area on the south of the river along Mitchell Road and some of the area to the west of Paul Street.

The Kopu Road station drains the rest of the town.

The effluent from Freyberg and Alexander Park was originally piped to Kopu Road, but after the completion of treatment this was discontinued and a new large diameter main was laid along Achilles Street and up Kitchener Street to the junction of McLean Street where it connected with another newly laid main from the Kopu Road station to direct all the town effluent to a new pumping station on Fitzroy Street where it is pumped up to the treatment plant on Pilot's Hill.

All of these stations are provided with a limited storage capacity, automatic pumping capability and an emergency feature that permits discharge directly to the river adjacent to the sites if the storage/pumping capability is exceeded.

The stations were well designed and are generally able to deal with normal effluent inflows without recourse to spilling.

❑ **The large Kopu Road pump station.**

However, if, as sometimes occurs, the incoming volume exceeds the pumping capacity of the station, the level in the storage chamber rises and can then flow into the Wairoa river near the skate park, at the end of Freyberg Street, opposite the pumping station on Kopu Road or at the end of Fitzroy Street.

Every endeavour is made to try to avoid this occurrence but it can and does occur, particularly during periods of heavy rainfall where the inflow to the pumping station, which often includes a large quantity of either direct or indirect water infiltration, exceeds the pumping capacity.

If, or when, this occurs it is possible to discharge untreated, but highly diluted, effluent into the river at these four sites.

The Fitzroy station, which pumps the accumulated effluent up to the treatment plant, is the newest and largest of the pump stations and is fitted with four Flygt pumps, each capable of pumping approximately 25 litres per second. However, the pipe configuration, pipe size and delivery head tends to limit the maximum discharge capacity, with all four pumps operating, to around 8000 m3/day.

This is more than enough to deal with even the largest inflows, although there have been times during heavy protracted rain where the inflow has even exceeded this pumping capacity and some overflow has eventuated.

The normal levels of effluent generated from Wairoa amounts, on average, to around 1600 to 1900 m3/day during normal weather, which still includes some infiltration.

This inflow can double, triple or even quadruple during heavy or protracted bad weather due to increased infiltration into the sewer network.

While even the highest inflows seldom comprise the operation of the Fitzroy pumping capacity, they can have a significant effect on the operation of the third part of the system — the treatment plant.

Treatment plant

The treatment plant consists essentially of two large ponds that oxidise the incoming effluent.

The first and smallest of the ponds is provided with large aerators that blow air through the water in the body to provide a level of oxidation.

The outflow from the aeration pond flows into a larger deeper natural oxidation pond where, theoretically, the effluent is retained for a period of time to allow stabilisation of the effluent before it is discharged into the river estuary at the end of Fitzroy Street.

The discharge of effluent is limited by the current HBRC consents to occur only between the hours of darkness, on an outgoing tide, which effectively limits the time of the discharge to about five hours a day.

Because the discharge is by gravity under a variable head and through a long pipe, the practical daily discharge is limited to around 3000 m3/day.

This is more than adequate for normal inflows but can be rapidly and frequently exceeded when the inflows increase due to heavy rain.

There is some limited storage in the treatment ponds, but several days of elevated inflows would quickly increase the level in the treatment plant discharge point where it would spill into the estuary without regard for either the time of day or state of the tide.

Mr Smith says during his employment at Wairoa District Council he was instrumental in developing some of the systems to monitor and to control the flows.

While some improvement may have been made in the last three years, he believes the basic problems of an aging system with high infiltration remain and will undoubtedly be addressed by the new consents, he says.