Flooding Response 1:

This is an overview in response to the recent flooding of low-lying land in Whangamata

The response is limited to the flooding caused by run off surface rainwater. It does not include supplementary or additional effects caused to properties by inundation by sea level rise or storm surge, or the combination of these and rainwater.

This document brings together the Special Report and a working group discussion and is to now be circulated to interested parties for further comment.

What the working group require is you to read this document and provide additional information and comment and recommendations we can then include. We will then consolidate a number of recommendations and with the support of the community work towards engagement with TCDC for an action plan.

Do not use this document for legal purposes as we have not yet obtained vital information to complete our assessments. TCDC and WRC are co-operating under information requests which take time to process, receive and analyse. We believe that the content in this report needed to be released as TCDC has provided limited information and time to enable robust submissions to the 2023/24 Annual Plan. We have been advised verbally TCDC will however accept late submissions.

This report was commissioned by the Rate Payers Association who will be preparing recommendations to its members for the purposes of being heard and contributing to the Annual Plan and ongoing needs of Whangamata residents and industry.

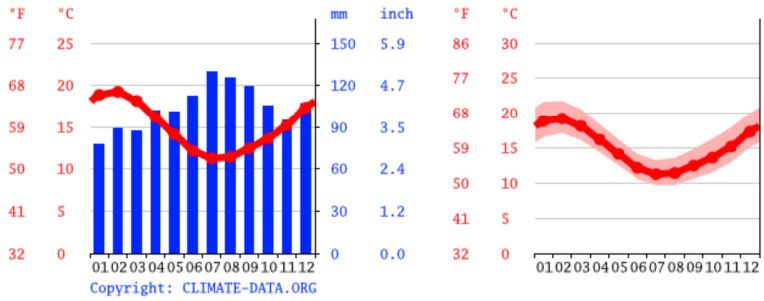
Introduction:

New Zealand, on average, is affected by about 1 of the 10 cyclones that form in the South Pacific between November and April each year. Often randomly the larger cyclones arrive in February or March. Recently Gabrielle and Hale arrived early.

Whangamata rain gauges recorded around 1.6m of rain between mid-December 2022 and late February 2023. This is over 10 times the normal average rain fall (of 136mm) during this period.

WHANGAMATA CLIMATE (NEW ZEALAND)

DATA AND GRAPHS FOR WEATHER & CLIMATE IN WHANGAMATA



WRC have advised me under LGOIMA that TCDC created its own resource plan ***for 'all the storm water and disposal systems throughout Whangamata' and self-consented it in 2011***. It is highly improbable TCDC has the power to self-consent without input from WRC or Environment Waikato. To self-issue and self-monitor would void independence and monitoring by Environmental protection groups.

My understanding is the RMA 1991 provided some sort of amnesty to Territorial Authorities to tidy up all the historical hap hazard storm water systems within 20 years. The timeframe was to allow budgets in annual plans to cope with CAPEX required spread over 20 years.

The only visible changes I can see in the Whangamata storm water system is the construction of the weir at Williamson Park. This work was done subsequently to the 2011 plan. This work must be an amendment to the 2011 plan.

Background:

Without yet obtaining a copy of the 2011 'Whangamata storm water and disposal systems policy' our task force has identified the following infrastructure within Whangamata:

- A limited network of sealed roads with curb and channel with collection sumps some with pipes draining to about 10 locations along the Wentworth sediment river, about 3 into the Otahu river and the Williamson duck pond and Rangi marsh.
- General roading has soak pits every so often intended to provide collection areas for surface water to soak into the aquifer.
- A standing policy for residential homes to still require soak pits to discharge roof rainwater into the aquifer.

There are reports being found which we have not had time to fully digest. A report on the aquifer does exist. It is "Whangamata Groundwater Monitoring Summary Report" Opus Consultants, October 2012. A copy has been located but not included in full detail at this stage.

The aquifer level rises with rainfall and then falls afterwards as the water flows out to sea. The higher the water table the less ability it has to drain water from the surface. So after the recent high rainfall the aquifer would have been at a high level and the soak pits have been less effective.

I have found no TCDC plan on what balance of soak pits to piping is required or desirable to maintain or support the freshwater level within the aquifer.

A recent Geotech report for a new build explains the aquifer beneath us is formed of Holecene sands some 12,000 years ago. The consistency of the Holocene is unknown. It is not known if it has been layered with volcanic debris, or been submersion by rising Oceans, or to what extent vegetation and tree fall has created relatively impermeable layers within the sands.

The mechanics of the aquifer is rainwater soaks into the sand which drains through the sand to the sea as the aquifer level is always above the sea level.

In summer droughts the freshwater soaks away which lowers the water level to nearer to sea level.

One owner behind Williamson 5th green, the 'blue bore', is an old drilling to 25 feet (7.62m) which found sea water intrusion below fresh water. That is about 3m below sea level.

The aquifer freshwater level is continually being affected by Ocean water force intrusion along the Coast, a mixture of fresh water and tidal water on the boundaries of Wentworth and Otahu from the sides, the spring water feeding out of the high ground up The Drive and rainwater precipitation on land soaking in and recharging the aquifer.

This is the foundation concept for soak pits. They are the cheapest form of infrastructure to drain water in sandy soils. We need all the rainwater we can get to soak into the ground to maintain good depth of fresh water to prevent sea water intrusion.

If we capture rainwater and drain it to the Ocean without it going into the aquifer, we lose this water recharge.

What we don't know is the impact on the aquifer caused by development. Obviously the more impermeable surfaces mean surface water is being transported away and may then overload soakage rates when it meets permeable soils. The situation is worse when surfaces are less permeable.

Development has altered the absorbency rates into the aquifer.

- Large impervious areas like road surfaces and concrete have been created which prevents absorption to these areas.
- Larger and larger roofs as batches are turned into permanent new homes. These drain to soak pits but are not evenly distributed over the whole section.
- Commercial and industry roofs covering even larger areas often have no impermeable area in close proximity.
- Wider carriage ways, carparks and compacted sidewalks that have over time become impermeable surfaces now incapable of passing water to the aquifer
- Recreational areas requiring topsoil's and mulching has creates semi-impermeable ground

- Surface water becomes concentrated to low lying areas and basins which now have developed semi-impermeable surfaces. A classic example is the localised ponding on Williamson Golf course. Organic material is preventing soakage into the aquifer.
- Drainage network that removes rainwater directly to the Ocean

We have found no records evaluating what impact this has had on the overall aquifer system. This is an important information gap as if we overcorrect with more draining into the Ocean the aquifer could be overconsumed in drier periods.

We have filled all the old stream beds. Now surface water is left to pool in the basins that were not filled. These old streams no longer drain surface water away.

Early settlers drilled bore holes through the aquifer below bed rock into the Rhyolite artesian aquifer. This Rhyolite formation is understood to extend well up into the Wentworth where Whangamata currently draws its drinking water from.

There are reported to be over 330 active bores in Whangamata. None of these will be affecting the upper aquifer of fresh rainwater. Drawing this water up has minimal effect on the freshwater aquifer.

In theory the soakage pits extend into the sand which is very permeable. Precipitation must get through the more organic soils near the surface which can be 100's to 1,000's of times less permeable. What this means is a well maintained soak pit will dispose of more water than its own size.

The big problem with long term reliance on soakage pits is that they must be maintained so must have a provision for maintenance. It is highly likely that most soak pits are not working or not working well because they are filled up with organic matter (leaves etc) and silt and sand from the roofs and paths that they serve. The road soakage pits perform even less without regular maintenance as these take all the rubbish off the road. The soak pit lining progressively becomes less permeable as progressive cemented layers of sand builds up which lessens infiltration. Household soak pit are buried with no provision for maintenance.

Over time we have changed the organic material makeup of the top soils which have become less permeable resulting in longer and longer periods of resting surface water which has become a nuisance to us.

The water that is flowing in the drains to Williamson Park is draining the aquifer down to this level. When the lake is full the drains do not discharge at the same volume. When the pipes are full water back flows into the aquifer preventing the water table level to drop below the pipes.

The Opus report states 50mm of rain increases the height of the water table 100mm. What that means is the recent 1.6m of rain required the water table to be at sea level 3.2m down. It wasn't. The lowest it could be was the water level of the pond. This is estimated to be about 1m down so the maximum rainfall the aquifer could sustain was only 500mm before surface flooding and storm water entering the pipes, which were at 50% capacity as they were not free draining into the pond.

The pond is well undersized to collect the volume of rain water. The pond and weir have not been maintained which meant the weir overflowed with contaminated road water and caused the beach erosion.

Basically the aquifer is full. Whilst this would be good approaching dry summers it is a problem as we approach winter. Plant roots are flooded and cannot get oxygen. Trees will start dying.

The pond level will never be higher than the aquifer level so the flow should remain from the pipes to the pond and not the other way. Provided the pipes have seals and do not leak.

If the pond level is kept lower this helps lower the total water table and lessons the risk of flooding and helps the soak pits to work.

TCDC soak pit policy (16B soak pits) requires the compacted stones at the base of the soak pits to be above the winter water table level. Building consents are issued without verification of water table levels. In any event the water table level is always varying depending on the level of precipitation. TCDC does not require bubble up chambers. The consequence is in heavy rainfall events overloads private soak pits. They fill rapidly and push water up through the grass and flood the low lying areas. Surface water then forms a flow path (the secondary flow path) and floods the adjacent lower lying property. This contravenes the building code E1 Surface water.

The "Whangamata Groundwater Monitoring Summary Report" Opus Consultants, October 2012 contains records of water levels. But these vary depending on rainfall recharge and droughts draw down of the aquifer.

The water levels will always be above sea level. The actual level above sea level will depend on how close they are to the sea and or how much rain has fallen. Other items like stormwater pipes with or without rubber rings will also affect the level.

From the Opus report at the monitoring bore at the Williamson Golf course the water level at the end of summer is typically 3.4-3.8m below ground level. Following 2 rainfall events in February 2011 with a total of about 340mm of rain the aquifer level rose to 1.7m below ground level. VERY roughly the water level appears to rise 2-3 times as much as the depth of rainfall. Rainfall of just 900mm would cause a rise to above ground level over large parts of the golf course.

The situation may be that we are going to have to live with the fact we will always have surface flooding In high rainfall events. Without pipes the secondary flow paths do not have the gradient to remove water fast.

Obviously, some balance is required. Normally the roading network is intentionally lower than the properties they service so secondary flow paths are directed to run down the roads and escape into waterways.

What we do know is the water table in January is normally well below the surface. This year in many low-lying areas the water table is above the ground itself.

What is the problem?

1. The natural water table is too high. We can lower the water table between rainfall events by allowing the ground water into the pipes and keeping Williamson Pond low so that the aquifer has more capacity when it does rain, and it can be lowered quicker when it stops raining.

2. The soak pits are not working. They are not perfect but without them the situation would be a lot worse. They allow the water table to be lowered during fine periods to give it capacity for rainfall events.
3. The existing network of pipes are obsolete, undersized, and dysfunctional. Many are leaking and flooding the water table with contaminated water.
4. TCDC has failed to conduct maintenance to soak pits, the ponds and outlets and probably storm water pipes as well. These are not working efficiently and can no longer soak or deliver water to the aquifer. The policy of soak pits the soak pits can be made to work in most areas. They just need.

    - To be built with provision for maintenance
    - Given regular maintenance.
    - When installed have a digger or post hole drilled below them for 2(?) m to break up any less permeable layers?

5. New builds with soak pits must include designs to allow maintenance. Soak pits are needed to recharge the aquifer but not to levels as high as we currently have because plant roots will rot, trees will die and we will have surface flooding.
6. The 1.6m of rain cannot be absorbed as the water level in the aquifer was too high before it rained.
7. In places the roading system is not correctly designed to restrain surface water which escapes as trespass water and floods properties with low lying ground. More work needs to be done to road runoff, so it is delivered to the aquifer.
8. TCDC has developed roads by cutting and filling to attain flatter roads. These roads have blocked the original surface water flow paths and created low lying areas
9. TCDC has consented buildings to be constructed in basins that hold water. Floor levels have been constructed with floor levels below the building code requirement of 150mm above the crown of the road or have a 1:25 undisturbed slope away to a water course. These homes and land have flooded. This is a breach of the building code.
10. TCDC has over time created storm water infrastructure on a piecemeal basis to manage one off crisis's. Then abandoned the overall plans. The Park Avenue open drain and detention flood system seems to be one of these.
11. As long as the pond retains water, lowering the water table is likely impossible. If the pond was empty the water table in the Williamson Pond will lower which will allow the aquifer to discharge. This is critical as we approach winter. The 20mm of rain over the weekend flooded the same areas.
12. It is doubtful TCDC has the correct resource consents for the pond for the collection, detention, or discharge of contaminated water or to empty for cleaning maintenance. Whangamata's main asset is the surf Beach. Erosion and pollution are the two biggest enemies. Williamson and Rangi ponds are both offenders. We will be examining whether the pond and Rangi collection areas are compliant with the RMA.
13. The existing storm water pipes cannot effectively lower the water table to a level below the pipes themselves. But they will help. As the winter rains come, we will be expecting on average 100mm per month. It is hard to see how the aquifer will cope.
14. At the current water table heights, and average winter rains, we could be expecting flooding right through to summer.

The higher the aquifer water level is, the greater the outflow to the sea, providing the pond level is dropped and the pipes drain.

Many of the owners of low-lying property claim surface water flooding only began in 2017 when the weir was upgraded with the new one about 2m further back. We are waiting on designs but we understand the new weir is supposed to be able to drain through pods beneath the sand into the Ocean. The lack of maintenance has likely allowed sludge build up within the pods underneath and is now impermeable.

The gradual release of water through the sand dunes should not affect the stability of the sand or cause erosion. However, the Island Rd discharge into that pond is exactly in line with the coastal retreat. The Williamson Pond has been built on the old overflow stream where the coast has retreated to the weir.

The Williamson Pond overflows into the Ocean in rain events and requires pumping out to be cleaned. This is contaminated road water and is filled with biota. It is understood the pond and Rangi are operated within the TCDC 2011 Stormwater consent. This began as a 2001 non-notifiable resource application prior to the 2003 amendment to the RMA. There has been no public submission process. Uncontrolled discharges, contaminated discharges and discharge for maintenance purposes is a totally undesirable practice for our clean surf beach, for swimmers and for our sand. Stop press - We have just received the 2011 resource consent for all of Whangamata storm water collection and discharge. We have some serious questions to ask as we digest this consent.

My calculation is 1.6 Billion litres of water needs removing to lower the water table to a level a future high intensity rain can then be capable of soaking and delivering it into the aquifer. The water level may have dropped 100-200mm in the last month. Most of this is attributable to the drains cut into the Golf course. An owner on Kiwi has measured the water table and said it has dropped 200mm since January.

The building code allows as a minimum design storm water systems must manage a 1:10 year event. Above that surface water is tolerated but must be free draining and not pond for extended periods. Normally carriage ways and detention areas are designed to manage excess run off.

TCDC recently installed a dry detention pond off Lowe Street behind Blackies inside Williamson Park. This is to collect excess surface water off the road that the pipe to the pond cannot handle to prevent flooding into the basements of the Lowe dwellings. TCDC did this to deal with the known surface flooding so understands it has a duty of care to flooded owners. TCDC has demonstrated it has design capability and has implemented a plan to manage excess surface water when it is obvious if they don't these affected owners would sue for water trespass. This is useful precedent.

TCDC must have included this dry retention area into the 2011 resource consent.

Whilst the weir is full this can no longer be called a 'detention pond'. Detention means temporary restraint of water. Any part of the 2011 storm water consent that utilises or encompasses the pond is unlikely compliant to the 2003 RMA Amendment.

There are some difficult questions and decisions to be made.

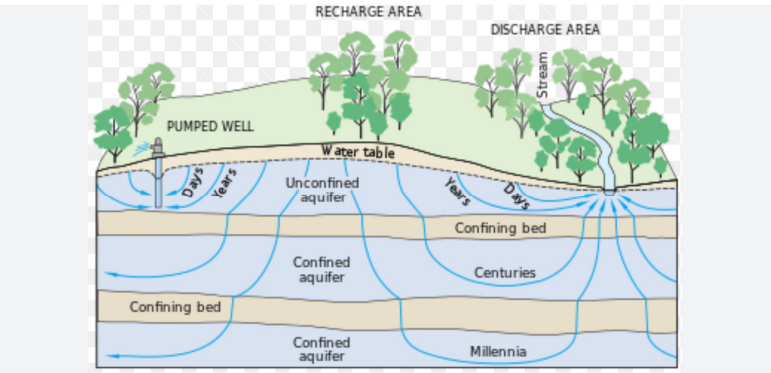
1. Whilst the pipes were likely designed to a capacity diameter to discharge at the pond empty conditions when the pond is full the capacity is in the order of 50%. If more roads are connected with pipes this will seriously effect the capacity of the pond.
2. We will be questioning the validity of the discharge pipes into the likes of the Williamson Pond that are intended to then discharge into the Ocean (same with Rangi)

3. The old Williamson stream bed catchment area has been extensively expanded beyond its natural catchment area with pipes coming from Archilles, Williamson and Ocean. These all discharge into the old stream bed which causes an adverse effect on the amount of discharge onto the beach. The erosion is greater, and the amount of contaminated water is increased. This discharges onto our surf beach. This cannot continue.
4. The Williamson Pond is being labelled as a sediment pond. It has no foam system to collect oils or plastics, it has no filters, it has no properly designed sediment retrieving pads and it has no monitoring of oxygen, nitrogen, or sulphur or of microbes. I am concerned these deficiencies are the reason for the 2001 application prior to these more stringent requirements. In a worst case scenario, something like a major oil spill the adverse effect on our beach would be severe to catastrophic.
5. The validity of pumping stagnant contaminated water out of the pond into the Ocean to maintain the pond sludge, or in emergency is permitted in the 2011 consent but only with effective monitoring. We are yet to find testing of any sort of the water-to-water discharge, mixing of water.
6. The validity of creating an artificial lake so close to the Ocean should have been debated in submissions. The pond changes the natural flow of water which has an adverse effect of creating a water table at the coastal interface.
7. The validity of allowing and promoting recreational activities like BBQ's within close proximity to the Williamson and Rangi detention ponds is dangerous. Imagine if a child drowned in an unrestrained polluted water body.
8. The design of the Williamson and Rangi detention ponds are dangerous as the sides are too steep for children to escape if they fall in. Minimum slopes are recommended.
9. The fact several TOMOs have been reported is of concern. This may be because of leakage in or out of pipes.
10. We are yet to see engineering designs of the existing storm water pipes along Williamson and Archilles. It may be that these are undersize to even consider extending into Mary, Sylvia, Bellona, the Golf Course, Kiwi and Tui. This still does not include more streets back to Rangi and Port Road.
11. There is no current proposal in any plan we have found to include pipes or stormwater upgrade in this area.

What is an aquifer?

An aquifer is **an underground layer of water-bearing, permeable rock, rock fractures, or unconsolidated materials (gravel, sand, or silt)**. In many towns the water supply is drawn from an aquifer. Those owners with bores are drawing fresh water from the aquifer.

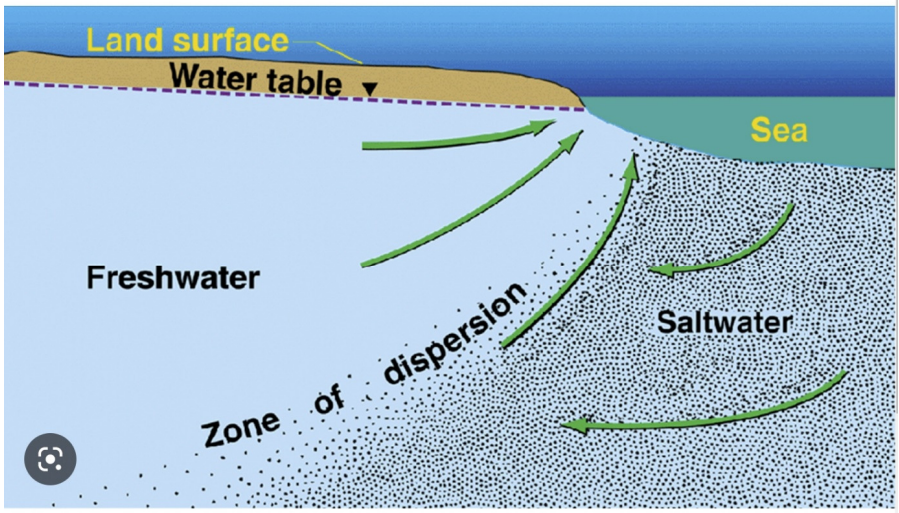
Wikipedia



Aquifer - Wikipedia Visit

Because we are by the sea atop the Holecene sand build up our aquifer works something like this

California Water Science Center



Seawater Intrusion - SGMA | USGS CA Water Science Center Visit

What feeds the fresh water of the aquifer is rainwater and to an extent the springs along the hill below The Grand.

When we have droughts the sea water intrudes and when we have rain the sea water retreats. The balance is critical to what level beneath us is the intruding sea water. We need data over time to measure the intrusion level – if it intrudes too far the vegetation like tree roots will die.

The natural consequence: Flooding

From this understanding it is clear that flooding will continue until TCDC implements a radical change. Inundation from sea level rise will add to the complexity of the solution. Higher rain intensity and duration will also be variables that must be included in designs.

What can be done?

New builds and alterations since the RMA 1991:

New builds and alterations going through the building consent process were required to be checked by council under section 36 of the Building Act 1991 and section 71 of the 2004 Building Act.

S36(1) of Building Act 1991:

Limitations and Restrictions on Building Consents

36. Building on land subject to erosion, etc.—(1) Except as provided for in subsection (2) of this section, a territorial authority shall refuse to grant a building consent involving construction of a building or major alterations to a building if—

(a) The land on which the building work is to take place is subject to, or is likely to be subject to, erosion, avulsion, alluvion, falling debris, subsidence, inundation, or slippage; or

NB: Inundation is flooding.

S71 of Building Act 2004

Limitations and restrictions on building consents: Construction of building on land subject to natural hazards

71 Building on land subject to natural hazards

(1) A building consent authority must refuse to grant a building consent for construction of a building, or major alterations to a building, if—

(a) the land on which the building work is to be carried out is subject or is likely to be subject to 1 or more natural hazards; or

(b) the building work is likely to accelerate, worsen, or result in a natural hazard on that land or any other property.

(2) Subsection (1) does not apply if the building consent authority is satisfied that adequate provision has been or will be made to—

(a) protect the land, building work, or other property referred to in that subsection from the natural hazard or hazards; or

(b) restore any damage to that land or other property as a result of the building work.

(3) In this section and sections 72 to 74, **natural hazard** means any of the following:

(a) erosion (including coastal erosion, bank erosion, and sheet erosion):

(b) falling debris (including soil, rock, snow, and ice):

(c) subsidence:

(d) inundation (including flooding, overland flow, storm surge, tidal effects, and ponding):

(e) slippage.

Compare: 1991 No 150 s 36(1)

We have just received a schedule of all building consents issued since the Building Act 1991. This list needs analysing but contains 7070 building consents worth $515Million. It includes Whangamata Ward, Onemana and Opoutere.

We will be matching these to requests for service.

One local builder claimed he set the floor levels TCDC had nothing to do with it.

One resident had flooding immediately after CCC was issued. This house floor level is below the crown of the road and the section is in a basin.

In essence Parliament is requiring councils to put a form of 'tag' on property files for land that is subject to hazards. This will end up in LIM and various other forms of advice to stop flooding. The 'tag' will then exempt council from civil liability when the building or owner suffers damage arising from that natural hazard. The consequence to the owner of the land with 'tags' is the Earthquake Commission then has discretion to decline cover. Insurers may decline cover as well.

The protections to avoid damage or loss are included in the building code E1 surface water include:

1. New builds floor levels must be 150mm above the crown of the road or have an undisturbed natural fall of 1:25 away from the boundaries to a natural water way.
2. Secondary flow paths must be managed.

Councils must not issue building consents unless surface water is managed.

Developing low lying land subject to flooding must be tagged onto LIM and property files

None of the new builds or alterations can suffer surface water flooding in 1:10 year events when E1 surface water is compliant.

From what can be seen around Whangamata is a systemic failure of TCDC compliance team to comply with the building code and Building Act.

Existing homes before the RMA 1991

The 150mm and 1:25 has been part of permits for more than 50 years so nothing is different. What is different is many of these older homes have had changes made to the land outside their property boundaries. These changes include new roading and foot paths, new homes on boundaries, new walkways and other changes to the 'natural ground'. Many of these older homes are now low lying- in respect to the new higher ground created or reformed around them so are the subject of flooding.

For example, one home on Archilles was built on wooden piles so the floor was well above the natural 1:25 fall away into the Golf Course. The storm water pipes depth along Archilles are above the natural ground that slopes down to the Golf Course. These could bleed when the weir is full and the pipes are not discharging. The following then happened over a period of time.

- The Golf course carpark was levelled well above the natural ground
- Then it was tar sealed and made impervious.
- The car park has two sumps
- These are connected to each other to the far corner sump by the club house.
- Rainwater is collected by the sumps and directed to the soak pit under the larger sump by the club house
- The sump pit has a PVC pipe taking excess water to another soak pit around the back of the club house.
- Another PVC pipe takes excess water to another soak pit 75 meters along the edge of the first fairway.
- The weir was left full for many years which prevented natural lowering of the aquifer.
- Continual rain has kept feeding the two soak pits and the land around them has become saturated.
- More rain has caused the soak pits to overflow and become surface water
- The secondary flood path is the club house, inside the club house, the putting green and the first fairway.
- The neighbour has built and retained that land
- Another neighbour has altered that house
- Both these are below the secondary flow path
- The front house with the deeper basin now floods
- Pumping all day but refills overnight
- After many weeks the pumping worked
- Then 20mm of rain fell and water started pooling again.
- There is no way this land will remain dry this winter

This is very likely an example of soak pits that were likely not correctly designed for the capacity or built correctly and have never been maintained. It is doubtful soak pits would have ever worked when the aquifer was at such a high level.

The unintended consequence is long term flooding at the golf course and both properties. The sand is saturated and incapable of soaking further water. The car park sump is above the water table so has a head pressure which has likely broken the PVC joint in the sump. The soak pits are buried under water so serve no useful purpose.

The common denominator is TCDC approved all these changes and in the case of the carpark own the land that they lease to the Golf Club they have now flooded and has been closed.

The annual plan has nothing in it to compensate these people or provide them with any form of solution. As far as TCDC is concerned they have walked away from their obligations.

So far our investigation has shown a common denominator – TCDC:

- They approved and formed the roads with cutting and filling which created higher ground
- They formed the impervious surfaces,
- They failed to manage or monitor surface water or secondary flow paths,
- They consented buildings that then created basins,
- They consented buildings with floor levels below that required in the building code,
- They required building consents to include soak pits which are now submerged
- They approved building consents with soak pits that could not be maintained,
- They approved building consents requiring soak pits to be above winter water table levels without asking for verification according the building code E1/VM1
- They failed to tag buildings with the natural hazards'
- They created the natural hazard which is now causing an adverse affect of loss and damage
- They failed to provide adequate flow paths along roads for storm events that exceed the 1 in 10 year intensity levels.

With the added complication low lying areas receiving trespass water have no capability of dissipating that water when the water table is so high.

TCDC has exercised its power to authorise the surrounding developments to create the low-lying owner. This issue now needs solutions so owners can regain undisturbed use of their land.

Whilst the events portrayed have happened many years ago trespass water is event based. The reason is it is TCDC responsibility to adopt a storm water management system to prevent nuisance water – it has the authority, power and control to manage this. A responsible council would adopt a plan with urgency to give relief to those it has disadvantaged. This is not new. Flooding is a foreseeable event. Whangamata has experienced rain ever since the sand dunes were formed.

How will we correct flooding?:

The process to correction becomes:

1. Identify each property subject to flooding. It may be useful to include those properties projected to start flooding as inundation comes with predicted rising water tables. I add this cautionary note. Many people do not accept sea level rise. That is not the point here. Parliament has crafted laws in case and these laws must be followed.
2. List the causes of the flooding.
3. Choose from the 'toolbox' a solution for each owner.
4. Conduct the work.
5. Monitor that the solution has reduced or stopped the flooding and
6. No adverse effects have been created as a result.

These are wholly holistic and unachievable to the flooded property owners with the current TCDC policies and responses to request for service. For example, the simplest solution is to ***fill the low lying land.***

TCDC currently run a culture policy to issue abatement orders where that fill could cause erosion of sand or fill onto the neighbour's property or council-controlled land. They call these adverse effects.

The TCDC policy covering adverse effects is currently:

- **Nil Effects**
  No effects at all.
- **Less than Minor Adverse Effects**
  Adverse effects that are discernible day-to-day effects, but too small to adversely affect other persons.
- **Minor Adverse Effects**
  Adverse effects that are noticeable but will not cause any significant adverse impacts.
- **More than Minor Adverse Effects**
  Adverse effects that are noticeable that may cause an adverse impact but could be potentially mitigated or remedied.
- **Significant Adverse Effects that could be remedied or mitigated.**
  An effect that is noticeable and will have a serious adverse impact on the environment but could potentially be mitigated or remedied.
- **Unacceptable Adverse Effects**
  Extensive adverse effects that cannot be avoided, remedied or mitigated.

The way TCDC administer this is defined by the attitude of the day and whoever the council officer is that investigates a 'Request for Service'. For example, if fill was 'washed' into the neighbours lower lying property it would be seen as an adverse effect to that neighbour but a positive effect to raise that land above the flood water level. The sand would not have eroded or washed down if the neighbours land was higher. It must be lower and therefore in the secondary flood path so must already be in flood.

Getting approval to fill basins or low lying land can fall under the principles within Schedule 1 exemptions. If the benefit outweighs any negative effect, then it is likely to comply with the building code. Filling is such a benefit. If a neighbour challenges the erosion it means they accept they will always be in the flood path and suffer an even greater adverse effect – the water. Water damages land and property. Sand does not.

If two side neighbours ***fill the low-lying land*** but the middle property does not they will by default have self inflicted themselves with the low lying problem. They had it before but it may become worse for them.

TCDC has the power to approve ***fill the low-lying land*** under schedule 1. Exemptions are issued where the owner can demonstrate the positive effect ie less flooding overcomes the adverse effect of some sand erosion. The negative effect is self inflicted by the owner who refuses to participate.

The issue TCDC must deal with is they are the common denominator that caused the situation now requiring the lower land to be filled. If TCDC object to ***fill the low-lying land*** that is clearly a breach of their fiduciary duty. Where TCDC has raised the road above more than 1 property TCDC has a duty of care to all those owners concurrently, so they all act together or stay flooded by TCDC refusing to act.

It seems absurd that if the owners refused to ***fill the low-lying land*** if TCDC approves this solution within an open policy the courts would refuse the claim as it would be seen as contributory negligence of there own violition.

Precedent exists in recent 'leaky homes' cases involving body corporates. Remediation decisions can be irksome. Often just minorities wish to do something to protect the value of their homes. The majority may be obstinate. What the Courts have made of this is 'doing nothing is not a decision, it is obstinance. It is seen as obstructing those who genuinely care to take the effort to protect their investment'. The Courts decisions have approved the minorities wishes. Doing nothing is not acceptable at law where it disadvantages those who want to do something positive to protect there asset.

The same applies here. For example, if TCDC declines to do anything about flooding the courts may decide the decision to deny relief to stop further damage is an abuse of their power. The same may apply to neighbours.

Who shall pay and what might be fair?

The decision who shall pay can be determined by precedent or by negotiation. Normally precedent is long winded and relies on the propensity of claimants to outlast the power of TCDC using the claimants and collective community rates to do so.

If the mandate was directed by the ratepayers that TCDC was not to defend with rate money TCDC would have difficulty remaining obstructive.

If the rate payers presented a viable and cost effective solution Courts may see red if TCDC ran a legal defense objection.

The issue is how to allow TCDC to accept solutions to the very problems they create often negligently. Acceptance is seen as admission which then means TCDC has no possible defence.

If claims were run the interesting thing is if the claim size was substantial TCDC insurer Risk Pool will be fronting the defence and ultimate pay-out. Ratepayers would be funding the excess. This would set back solutions forever.

As it stands without any direction or policy each trespass can result in a civil claim against TCDC.

The obvious and sensible thing to do is to encourage TCDC to assist affected property owners to reduce future loss and damage.

That assistance can be in the form of:

1. Councils can waive the requirement for building consents under Schedule 1 section 2 of the Building Act on the basis the ***fill the low-lying land*** with sand will not create a worse adverse effect than a positive effect. This then complies with the building code.

2.0 Territorial and regional authority discretionary exemptions

> Any building work in respect of which the territorial authority or regional authority considers that a building consent is not necessary for the purposes of this Act because the authority considers that—
>
> **(a)** the completed building work is likely to comply with the building code; or
>
> **(b)** if the completed building work does not comply with the building code, it is unlikely to endanger people or any building, whether on the same land or on other property.

2. Council can enact its existing district plan rules and standards. Earthworks can be carried out as long as they don't breach any of the standards or the RMA. This is outlined below.
   - **A) The district plan rules/standards** – you cannot place fill to an area larger than 250m2 or with a volume of 250m3. There are the setback distances. If you meet the area and volume standards, you can have fill placed on site as long as it is set back from any boundary a distance equal to the height of the placed fill. This is often hard to measure, but this must be accurate. The set back distance is measured from the legal boundary. However, anything related to your fill cannot damage the boundary fence if this is a shared fence or the fence is fully on another property, nor can sediment leave your property. These would be considered adverse effects (see below).
     ***COMMENT**: TCDC has failed to take into account the adverse effect it created on the low-lying property when it raised the road, carparks and allowed neighbours to create higher ground. If TCDC was consistent with itself then this policy it would not be needed*
   - **B) The RMA itself** – even if you comply 100% with the district plan standards, if adverse effects are still occurring from your activity (i.e., from the placing of that fill), then you will have to remedy those effects. So, you need to satisfy council that the placement of the fill on site complies with both the district plan and s17 RMA (not creating an adverse effect on the neighbours). If there are differing opinions on what has occurred (he said/she said), the person carrying out the activity may have to provide expert confirmation of compliance. This could be a survey to establish location of boundaries, the amount of fill and original ground levels and / or an engineer's report confirming water flow directions etc….
     ***COMMENT**: TCDC has failed to take into account the adverse effect it created on the low lying property when it raised the road, carparks and allowed neighbours to create higher ground. If TCDC was consistent with itself then this policy it would not be needed*

This is the Table for compliance.

Thames-Coromandel District Plan - Appeals Version - October 2021 » PART VIII - ZONE RULES » Section 54 - Residential Zone » 54.4 Permitted Activities » **Rule 5 Earthworks**

Table 1 - Earthworks Standards		
1.	Maximum area per site per calendar year, where any slope in the area subject to earthworks is > 1:8 gradient	100 m^2
2.	Maximum area per site per calendar year where 1. above does not apply (i.e. all slopes ≤ 1:8 gradient)	250 m^2

Table 1 - Earthworks Standards			
3.	Maximum volume per site per calendar year, where any slope in the area subject to earthworks is > 1:8 gradient		100 m^3
4.	Maximum volume per site per calendar year where 3. above does not apply (i.e. all slopes ≤ 1:8 gradient)		250 m^3
5.	Maximum height of any fill and/or cut		1.5 m
6.	Maximum height of any cut or fill that is retained by a legally established retaining wall		2.5 m
7.	Maximum duration of work within any calendar year		3 months
Minimum Setback Distance of Earthworks			
8.	From a site boundary, a building foundation, or a cliff (1:2 gradient or steeper)	to the toe of a fill (without a legally established retaining wall)	Equal to the maximum height of the fill
9.		to the toe of a cut (without a legally established retaining wall)	Equal to 1.5 times the maximum depth of the cut (also see 10. below)
10.		to the crest of a cut (without a legally established retaining wall)	0.3 m (also see 9. above)
11.		to the top or bottom of a legally established retaining wall supporting a cut or a fill	Equal to the maximum height of the retaining wall
NOTE *1. For diagrams illustrating the above setback distances, refer to 'Earthworks' in Section 3 Definitions.*			
12.	From buried Council-owned wastewater, stormwater or water pipe		The depth of the pipe plus the pipe radius (i.e. a 45° setback zone either side of the pipe)

3. Where a neighbour or TCDC refuse to co-operate TCDC itself must be made responsible to retain any placed fill on the boundary to offset the adverse effect of soil erosion TCDC created in the first place. TCDC must be given the right to on-charge this and issue tags to those who refuse to co-operate.
4. Where TCDC refuse a request to co-operate TCDC must be placed on legal notice they will be held solely responsible for any future flooding or loss of value to that property. Risk Pool must be notified.
5. To start this process TCDC must start tagging any property subject to flooding subject to:
NB: If TCDC started a tag policy it would be self-imposing claims on itself for the adverse effects TCDC has itself caused to low lying property owners. Each tag would be the evidence of poor TCDC decisions and become the points of claim. The usefulness of a policy solution being part of the tag directive is the support to remedy would outweigh the cost to claim. This would be a beneficial policy to all the ratepayers and especially beneficial to those owners when the flooding stops.

a. Owners must be assisted to work through the 'process to correct flooding of low lying land'.
b. Owners to be provided with monetary incentives to undertake filling – the benefit to TCDC and all ratepayers, is this will remove future claims for trespass.
c. For those owners who undertake corrective action the tag will be removed
d. This re-establishes loss of value and removes the flood risk.
e. Those owners who refuse to co-operate will retain the tags:

The incentives:

The use of incentives is commonplace in building work. There are plenty of precedents to follow. Energy savings grants are available for heat pumps and insulation. Same with insulation. Same with Māori who claim hardship with rates. The same can apply here.

With energy grants owners can elect to cash the grant to discount the installation or agree to the amount becoming a loan with interest and instalments being added into rates. When they sell the amount of the load is deducted from the sale proceeds.

This is a win win for council as they get marginal interest and recover the full loan when the home is sold. No loss to council. TCDC would actually profit from the interest differential. TCDC and all ratepayers would be protected from claims and pay-outs.

The energy grant is designed to encourage warmer homes and healthy families. The underlying reasons these became grants came from a Regional council concept it was better for the community to have warm homes and healthy children to learn and prosper and not need hospitals and health care. Eventually other councils joined in as the benefits were social improvement and healthier children. Then it became national policy. We can start this here and now. This is how the energy grant came about.

a) The building code H1 failed to keep up with warmer homes. A home would get CCC with thin ceiling batts but fail the warmer homes until more insulation was added. This is a regulatory failure which was covered by providing grants to uplift insulation rather than claims.
b) The extra insulation and heating meant warmer homes which has a net positive effect. Warmer bedrooms translate to lower humidity which translates to less children with asthma
c) Warmer rooms mean children will grow up having less immunity issues and contribute more to the workplace ie less sick days and more productivity. Dunedin University claimed each healthy child saved NZ Health and increased productivity by over $1m dollars during that child's adult life.
d) Healthier children means less demand for hospital beds and after care.

Whilst flooding is not in the same boat so to speak what must be considered is:

a) Damp homes because foundations and surrounding soils remain waterlogged. This applies to services as well. Insulation is not useful when homes are flooded.
b) Durability issues with submerged and wet subfloors many who have installed polythene to stop rising damp. Now the polythene is submerged and hard to dry the land or drain off it
c) Durability issues for wall framing that becomes soaked and wet. Many homes built after 1991 do not have the correct hazard class timber to stop rot. Most homes between 1998

and 2003 have untreated timber throughout which means all the framing, not just external walls is wet and at risk of decay.

d) Energy systems in the homes is affected as the wall insulation becomes wet and difficult, if at all possible, to dry out without cavities. GIB needs removing and H1 and untreated timber need post applied treatments.
e) Damage to the house furnishings and personal effects. Although covered by insurance this is likely to become contentious as homes in hazard areas may become uninsurable – at least from the second or third flood. This loss of insurance means owners will seek claims against TCDC.
f) In major flooding there will be less claims under Earthquake and War Damage Act as gradually owners fill land there will be less flooding.
g) In 1:10 intensity events there will be less claims against TCDC for trespass water. NB: whilst these sorts of claims are considered rare at the moment once affected owners realise the 'requests for service' were not properly determined to prevent future flooding they will then have more chance of a successful claim.
h) Flood water often has and recently did contain sewage during power outages. Extreme events is when services are more at risk and likely down. The toxic and then stagnant water is full of biota which is a health hazard to residents and animals. Clean ups and disruption to people, work and enjoyment are hard to quantify until you become the victim.

Filling has its own problems – often it moves the problem elsewhere. Low lying areas that do not have dwellings on them can provide places to "store" water to give it time to soak away or for undersize stormwater pipes to take the water away after the main storm has passed. The "fill" used should be sand but if it isn't it needs mixing with sand or will be far less permeable than the existing soils so will lessen the infiltration into the aquifer and hence increase the total amount of surface flooding and length of time of ponding. Good examples of this would be owners can gradually fill away to a corner slowly moving the flood water at each flood event.

The reason ***fill the low-lying land*** is that this process is a long term solution not reliant on further work, or maintenance, or services staying live for pumping or supplying fuel to generators. It is a quiet permanent solution. It will also raise the land in preparation for inundation rise and provide drier land on sections.

Other measures that can be considered to reduce flooding:

There are a few more obvious ones. some have advantages and disadvantages. Until we have some data on the aquifer, I am reluctant to claim pumps, pipes and discharge are a better answer than ***fill the low lying land***.

1. **Pumps:** The advantage is speed of retreat of surface water. Pumps remove surface water quickly. Residential pumps will never combat flood water – just trespass water. Pumps need

power or fuel so are more of a temporary solution. They also need somewhere to discharge water to. Here lies the reason we need data on the aquifer.
Pumps could force fresh rainwater water down into the aquifer. This is called managed aquifer recharge. There are several sites in New Zealand with operational MAR and TCDC has worked with engineers to consider this into the Wentworth Wells. One such place investigated for this was Port Road to be used as an underground freshwater reservoir should summer peak water requirements exceed the bore water draw down rates.

MAR's are generally deep wells which can be cased to restrain water from bubbling back to the surface. Pumping surface water down into only 10-12m of sand overlay above solid bedrock will in part likely return to the surface to recycle. Usefulness would need exploring.

The engineering study for Port may be a useful start. It is unlikely this would be 100% successful once the aquifer became full.

The golf course land could provide a valuable place to draw down the water table for alternate use water to reduce the water table in preparation for winter rains. It could have larger pumps installed to remove surplus aquifer to drains if the data showed it was better to remove than store. The downside is we often have droughts as well. If the aquifer was emptied we would have a dry spell and trees would suffer and die.

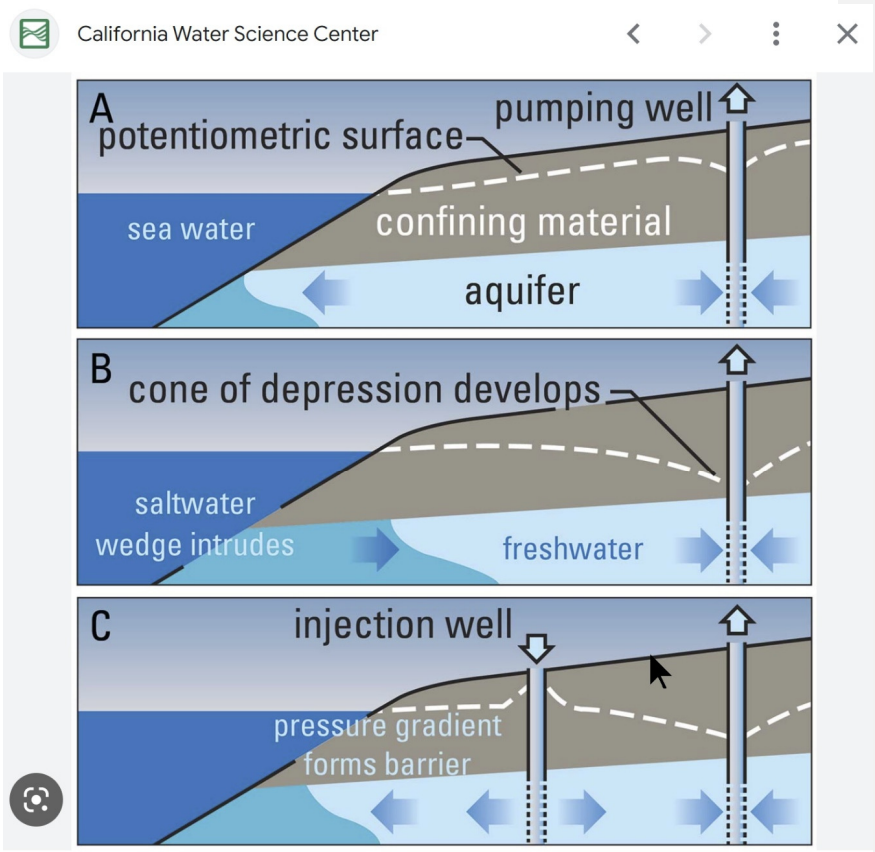
The next image shows what happens when fresh water is pumped out. Fresh water displaces the drawn down water but with less aquifer sea water intrusion occurs. In many coastal areas around the world over extraction of aquifers is leading to sea water intrusion and poor-quality water difficult to treat to drinking standards.

To reverse the lowering quality of bore water pumps are used to inject fresh water into the aquifer. This is how the Gisborne MAR operates that supplies water to its water supply. They inject massive quantities during the winter when rivers are high.

I am not suggesting we need to do this, but we do need to collect reliable data of the water table levels, sea water intrusion and whether we can lower the water table quicker than natural soakage. If we don't consider things like this and Opus is correct that 100mm of rain will increase the water table by 200mm that is greater than the soakage rate reducing the water table as being measured on Kiwi Road. If we don't collect the date our Engineers are just guessing and the solution will be as haphazard as we have had in the past.

By the end of winter, we will get some idea of the severity by measuring the number of instances we still have surface flooding and how bad it is compared to daily rainfall.

Pumping in or out may be something to consider.



2. **Drains and channels**. These merely redirect water from A to B. B must always be lower than A and have no restrictions along the way. There are many of these already around carriage ways. They are designed to move surface water to a discharge point. That is normally a storm water sump or outlet which is water lost. In flood times if the water is not needed to replenish the aquifer, then this is a cheap way of moving water away, especially when services are down. The drawbacks are TCDC has failed to keep key grates clear of debris and failed to consider alternate existing infrastructure like Park Avenue concrete channels.

   Cleaning grates is important but in extreme events they soon block again with debris washed off the surrounding area. Why these block is the grates like throygh Park Avenue are one dimensional. If the front is blocked or chocked water stops flowing away and then quickly back fills and floods everything.

   .

One resident backing onto Park Reserve has a photo dated 2017 of the entire area in flood. I suspect the grates at Avalon or Apperley were blocked. These are single plane ones but are sloped to add grate space

One resident along the Park Ave Res canal had to clean the grate during the night as water flooded over the culvert. TCDC refused to assist. I now have the maintenance log but have not had time to review it.

The larger problem in Whangamata is that many of the grates you see along roads only go to a soak pit that has likely never been maintained. These are not connected to drains.

3. **Pipes.** The last the working group meeting started a discussion on piping. I am firmly of the belief the Williamson Pond and Rangi marsh must be decommissioned ASAP. Unfortunately if this was done without an alternative already commissioned the flooding would become worse. What must happen now is the Engineering team get to work on an alternate piping system that will survive the next 50-100 years.

Commented [ET1]: NO!!! These may not be good but the removal of them will only make all the flooding problems a lot worse

There is no valid reason to cling to the 'she'll be right lets keep polluting our greatest resource – the surf beach' when we have two amazing good flowing river courses nearby and room to install sedinet cleaning, foaming and filtering for water to water discharges.

In the end it will be cheaper to make the big decisions like scrapping the existing dysfunctional stuff now than trying to band aid the old system we all know is not working and never will.

Discharging water to water (this is the term for clean water into equally clean water) is far simpler into rivers than Oceans. They do not need protection from surges or sand dune retreat.

It is accepted we are stuck in transition with what we have. TCDC are planning to pipe bypass the weir to lower the water level to below the invert level of the discharge pipes. I am concerned this will be done by amending the 2011 consent rather than meet the 2003 RMA amendment. This will be disastrous to the health of the beach, swimmers, and animals. If is became permanent we can likely see the beach turn into another poor decision like the Mangroves.

The existing pipes are dysfunctional, undersized, and discharging into the pond and soon have a pipe discharge directly to the Beach. The 2011 resource consent application in 2001 was agreed with WRC to be a non-notifiable consent so had no public submission. I expect the secrecy about the pipe bypass is yet another behind the backdoor move. Would you be happy for your grandchildren to be playing and drinking the contaminated water in the pond as it washes down the beach?

The pond is inadequate for sediment collection, does not have room for foam treatment and has no filters. The water is contaminated and beside a playground. The banks are steep by the BBQ area, and it may only be time before a toddler is caught.

We recently reviewed the infrastructure along Park Avenue Reserve. The park land was levelled as a flood detention area. It has a open drain around it that looks like it has never been maintained. It is a mosquito haven. Further down opposite McKellar the opposite Bank also has a flood plain – or appears to be. The discharge pipes along Otahu do not seem to be causing any erosion. I understand erosion is less likely with well-designed outlets into estuaries. The estuary already has about 5 outlets. None are causing any sort of erosion or threat to the coastline. There are two good areas for suitable for sediment and filtering stations. I believe an engineering study should be undertaken to utilise this area better. The below image could be one option for drains.

One issue is any proposal put forward will have objectors. This will have been the driving force behind the non-notified 2001-2011 resource consent. Residents are losing patience and confidence TCDC has a plan or any plan that is positive to help alleviate the obvious flooding. The recent proposal is only to prevent floors from flooding – not dealing with surface flood water.

TCDC have a working group studying options. The names change as staff leave. Ideas are lost and new people have to start again. What we see is the action plans TCDC comes up with then gets shut down with budget cuts. I do not believe TCDC has a solid plan. If they did, they would be telling us in no uncertain terms so we can see something is being done.

The reason I chose this pipe layout was the infrastructure already exists, the land is easily accessible especially with the Golf Course being shut, and the land is already designated flood areas. Not a lot of properties will be disturbed for a long term plan. The area was well

tested in 2017 when all of Park Reserve was flooded in water. I will be trying to get the maintenance logs for the grates at this time as the reasonable explanation is it was blocked. The flood plane certainly worked as intended and the outlet into the estuary is clear of the spring tide level. It would be a better place for bigger pump stations if the sea level did rise. One day we may have to pump the water table out continuously. The Golf Course is the ideal spot.

There is sufficient ground and power at Park Avenue with the existing sewer and water pumping stations already in place. There is enough room for sediment and filtering. The ground is consistently lower than Otahu, Williamson, Archilles and Ocean.

Using the open land to lay the central network through the golf course would save millions in CAPEX. The pipe pathway traverses roads almost to Park Reserve. Properties will be required to be purchased and compensated.

TCDC say we have no money. That is untrue. We estimate Whangamata Ward will be providing $30 million in rates this year but the community board is fighting to get just $1.2 million invested back. That is clearly unacceptable allocation.

It is 32 years since the RMA was introduced as legislation. TCDC had a 20-year amnesty to upgrade. Instead of upgrading in that period they started a 2001 consent to avoid the upgrade cut-off. By my reckoning in today's dollars TCDC has collected around $900Million in rates from the Whangamata Ward. If 10% was spent on storm water and sewer that would be $90M that should have been allotted which could have gone a long way to avert the flooding, we now face. If 20% was directed at storm water, we would surely have an excellent infrastructure that meets the 2003 amendment RMA and bode well for he next 50-100 years.