Discussion Document: Stormwater Management at Williamson Park Whangamata

Request for Discussion and Explanation in the matter of CSDC 105667

Parties:

TCDC as the Territorial Authority

WRC as the Regional Council and

Whangamata Community Board

Author: Ian Holyoake acting on behalf of Whangamata Stormwater Action Group

Date Presented: 18 June 2024

Date Response Required: 18 July 2024 (30 days)

This discussion document is prepared from information provided to me and as researched. Being the operational Territorial Authority and Regional Council (the authorities) you will have greater access to resources than me. The issue is in the absence of meaningful engagement and consultation I have independently reviewed why certain decisions have been made relating to the Whangamata CSDC 105667.

The objective of my request is to have a full, detailed, reasoned and technically supported statement prepared by and agreed between the Authorities that supports the recent works being undertaken within the Williamson Park. This report is to be provided to the community to model how and why this decision was made. If this cannot be achieved, I seek the Community Board appoint an independent commissioner to investigate under a term of reference agreed by the CB.

Contents

Summary

Councils' decision to proceed with stormwater work to Williamson Park appears to be a continuation of an existing plan to increase and deal with catchment into Williamson Park.

The Williamson Pond was originally formed as an infiltration device sometime in the 1960's. Over the years progressive councils have increased the catchment and corresponding discharge influent to a stage infiltration no longer copes. The result is the pipe network remains charged and operates well under desired capacity.

Planned maintenance was not done to remove blockages and when it was done lowered the pond basin until it fell below the surrounding water table resulting in still water that warms to suitable conditions for algae bloom.

In my investigation I cannot find any evidence

of public consultation for the increase in catchment to Williamson Park. The Opus pipe overview in 2019 is not public so I cannot work out how the pond was intended to function with the increased discharge. If defenders were required, they would have been installed during this pipe upgrade.

Councils' current decision was made knowing any decision would be contentious and that community had developed strong views. The current mood of community is 'at least council is doing something'. That something is unfortunately in my findings another error of thinking, a waste of money and will cost ratepayers more in the future to undo this work to protect our most valuable assets the beach and Williamson Park.

Councils' decision was made prematurely and not set within an overall Master Plan as promised by council in March 2023. Council restricted community engagement to 6 workshops. Staff have stated they were under instructions not to engage and not to provide documents to the stakeholder representatives and that staff were entitled to make decisions in workshops contrary to LGA and the Ombudsman's directions.

Council then advised the public that work was commencing without any formal dialogue.

My research is irreputable evidence the need for including a wetland and defenders cannot be justified. Councils claims the stormwater road run-off is contaminated to a level it needs to be treated with wetlands or defenders is incorrect and misleading. The traffic counts do not even justify the need to require testing of the discharge water quality. Despite council failing to have catchpits cleaned regularly is not of itself evidence to support TSS overload in discharge.

I have been asked by councillors and staff if the decision is irreversible. Whilst works can be undone and changed what is irreversible is councils and councillors' contempt at democracy. Community's interests have not been served. That is a breach of trust that cannot be undone.

Council is fully aware of the controversy around Williamson Park stormwater systems. It is incumbent on them to have undertaken a full investigation into what was going wrong and what options were available to remedy the issues. Everything in this discussion document should have been

satisfactorily answered by the consultants in written form so those in the community who could be affected or have an interest in could understand and test its conclusions.

I seek an independent investigation into the management of the CSDC for Williamson Park discharge going back at least to 2002 when the second weir was constructed. The community board must form the terms of reference and be the reporting body.

I request a written response, or alternatively a meeting between the parties chaired by the Whangamata Community Board.

Objective: Community Consultation

The Whangamata Stormwater Action Group (SAG) was formed in February 2023 after cyclone Hale. TCDC responded to the community's concern by forming a Stormwater Workshop and inviting two SAG members to represent community as stakeholders. There have been 6 workshops. The objective as set in workshop 1 was to have the Master Plan completed by 23 November 2023 which was understood to be timed to be included in the LTP 2024-2034 so it could proceed through the LTP consultation process[1]. The Master Plan has not yet been delivered yet the project Williamson Park proceeding.

TCDC has set aside a considerable CAPEX[2] for Whangamata Stormwater Improvements.

This document is to seek retrospective answers that should have been provided as engagement[3] and during workshops. TCDC has failed to voluntarily engage or provide documents that would, if provided, explained why the decision to undertake works at Williamson Park were made.

Over 20 LGOIMA have been requested. Many consultant reports, previous drawings, specifications and maintenance schedules have been withheld, some on the basis the content is too contentious for the community to view. To what extent these relate to the decision at Williamson Park is unknown.

I remind the Authorities that the underlying requirement of engagement and consultation is so the community can be well informed, be able to understand the reasoning behind decisions and to have faith the decisions are in the best interests of community. This is the 'duty of care' to community.

I have been informed by the community this is perhaps the third such action group since 1999. The need for action at Williamson Park is not new and been the subject of much debate.

The decision made for Williamson Park was to form a wetland and install a defender. This decision has subsequently been questioned by me. I have been given several versions of when and how the decision was made. The fact it was made without consultation and outside the LTP is of concern.

WRC is not expected to comment on this but is requested to place a 'watch' on any future decision TCDC makes under CSDC 105667 until the Master Plan has been put through the correct approval processes at council.

[1] LGA s83 Special consultative procedure
[2] CAPEX as per 2024-2034 LTP $9.17M and current Annual Plan $1.5M
[3] LGA s82 Principles of consultation and TCDC Significance and Engagement Policy 2023

This is not an isolated matter:

1. The Office of the Auditor General report on stormwater 2018 highlighted TCDC as one of three councils investigated that invariably responds to storm events by getting a consultant report but then does little if anything to mitigate future flooding. The reason of failure to carry out recommended works in these consultant reports has not been disclosed.
2. The Opus reports 2003/2005, 2012 and 2018 recommendations remain outstanding. I requested at workshop 1 for council to prepare a schedule of stormwater works completed since the Opus 2005 report so we could see what parts were working and what parts were still required to be completed. Council has not shared this with us.
3. I understand that following cyclone Cook in 2017 council engaged Opus to upgrade pipe capacity to Williamson Park. The pipes into Williamson Park were upgraded to the current sizes but this report has not been provided. What is important in this report is the infiltration rates of how Opus expected the Williamson Pond to cope with greater influent volume.
4. I understand that following cyclone Cook in 2017 council engaged HAL and Metis to create 'modelling' of stormwater under certain flood and tidal conditions. Council has withheld these reports on the basis they are too contentious for community to view. I was shown one overhead with an explanation up to 400 properties could be flooded in certain conditions.
5. I am aware council has re-engaged HAL and Metis to create new modelling. I have not been provided with reports or recommendations from this modelling. I was told by councillors that the new modelling shows up to 1900 properties could be flooding under the new scenarios whatever they are.
6. I am aware of councils revised 'complaints[4]' process now called RFS (Request for Service). I requested at workshop 1 for council to prepare a schedule of RFS to ensure unresolved stormwater 'complaints' were included in the considerations for the Master Plan. Unresolved RFS would become part of proposed works schedules with options and priority ratings assigned.
7. The 2005 Opus report included the findings of the Opus community stormwater questionnaire. There were 461 responses relating to flooding. Of these many (maybe 200) related to property flooding. I requested council to investigate how these could be recorded and if unresolved would be included in the considerations for the Master Plan. The questionnaire responses were not at that time a formal 'complaint' but advice as to flooding to assist Opus prepare recommendations. Council has not shared this with us.
8. I have discovered that at least one of the owner's questionnaire responses has resulted in council placing a hazard Tag on the LIM if requested. This involves a process at council so all these 'tags' need to be put into a schedule and matched to recent modelling or subsequent RFS so they can be attended to.
9. Whangamata is a rapidly evolving town. Old batches are being purchased by owners and developers to subdivide and build new homes. This changes surface flooding significantly. WRC Stormwater Management states that surface water can increase by up to 4 times at 50% impermeable surfaces. The catchment into Williamson Park includes many new homes since the 'pond' was built. The extra surface run off must affect influent rates and ultimate delay of infiltration.

[4] Complaints are mentioned in CSDC 105667 as requiring council to follow up these and include reporting in its updates to WRC. I have read councils 2020 update and no RFS are included.

10. Whangamata being located within the Southerly Pacific flow paths of tropical cyclones will continue being hit in El Nino weather events. NIWA is predicting these weather patterns are becoming more frequent and possibly more severe.
11. Whangamata is an Ocean seaside settlement and subject to the predictions of coastal changes. This means any infrastructure must be built to be resilient in such predictions.
12. TCDC District Plan is not consistent with TCDC Risk and Assurance, public published TCDC Stormwater Guidelines on its websites or the KTB Stormwater Management Plan. It is my view none of these statements are in keeping with the stormwater expectations of the community. There are substantial discrepancies into what the stormwater bottom line policy to manage flood risk are and what is to be expected in the Master Plan.
13. A recent 2023 poll of Whangamata community by Whangamata Ratepayers Association put stormwater as its number one priority. This indicates clearly that stormwater is of very high significance to community. This means any money spent must be well scrutinised or at least able to be understood, plausible and meet community expectations.
14. The decision to wetland was made in a Workshop which is contrary to TCDC policy, LGA and the Ombudsman's 'Open for Business' report. Media have published TCDC issued statements that claim a formal 'vote' took place including contractors who ended up getting the contract, the consultants and council staff. This is not acceptable to the community.
15. I have made pleas and requests for council to investigate and to report back why the Williamson Pond was not working. In every failure there are prime reasons. It is more than likely failure has evolved following increased influent, failure to maintain, defective design or failure to construct to plans. I have LGOIMA both TCDC and WRC for plans, specifications and maintenance requirements. I have not been provided with any details that can explain the infiltration rates, influent volume or catchment sizes until after the decision to wetland was made. I have tracked down the local engineer who was credited with its design, but he won't provide a copy of the plans or specifications.
16. I have done my own investigation (which is not the purpose of community engagement). It is SAG position that no work should have started on the pond until it was understood why it failed and what could be done to correct that failure.
17. Recent LGOIMA has discovered emails between TCDC consultants and WRC claiming amongst other things 'they had the community on board' and that 'one person objected but that should not stop the project'. These statements are incorrect.
18. TCDC advised the community on 27 May 2024 a wetland was to be constructed starting 4th June 2024. This notice period does not comply with either the TCDC Significance and Engagement Policy or s83 of the LGA.
19. It is acknowledged that TCDC has changed the development at Williamson Park to a Dry Basin.

This change does not alter the above concerns but does to some degree demonstrate council was prepared to engage with the community but only after contracts had been let and could not be undone. The community as far as SAG has been able to determine is the land cannot be used for stormwater devices[5].

[5] Williamson Gift Deed yet to be discovered but relying on the Concert decision where the land must remain available to the community 24/7

The objective of this document is for the parties to meet and work out how the management of CSDC 105667 will progress, to an extent it meets community expectations as to engagement, information and procedure.

Consultation not mandatory but foolish not to

Whilst the RMA does not mandate consultation the fact decisions are being made that affect community and rates money is apportioned to such work overrides this principle.

The Watercare case is sufficient directive for a competent council (and WRC) that wishes to meet its duty of care to community. Quote:

Section 36A of the Resource Management Act 1991 (RMA) states that an applicant and a local authority do not have a duty under the RMA to consult any person about resource consent applications. Nevertheless, ***the Court has stated that "consultation is best practice and it is foolish for a party not to consult with those with a known interest in a proposal.*** *Consultation is actively encouraged (if not directed) by the Court". (Watercare Services Ltd v Auckland Council [2011] NZEnvC 155)*

It is noted the Whangamata CSDC application was done under 'urgency' which implies that time is of the essence to avoid delays caused by consultation processes. S83 of LGA puts consultation periods at 30 days so any time longer than that can be accommodated within the meaning of LGA.

Council lodged CSDC 105667 in 2002. There has been no consultation since. This is an abuse of the democratic rights of community.

It appears councils' decision to wetland and defender Williamson Park was made sometime in either:

(i) 2019 when Opus recalculated pipe sizing into Williamson Park. It is obvious increased discharge would exceed prior infiltration rates so would need an alternate discharge process
(ii) In December 2023 workshop when two options were presented, and council determined just the wetland one had merit. Other options were dismissed
(iii) In February and March 2024 communications between Metis and WRC when the dry basin model was proposed.
(iv) In April 2024 Metis communication with WRC

None of this is urgent to a point consultation rights of community can be ignored.

RMA provides (water discharges)

Section 105 of the RMA requires a discharge to water (or to land that may result in contaminants entering water) to have ***regard to any possible alternative methods of discharge, including discharge into any other receiving environment.***

(b) Clause 4(6)(1)(d) of the 4th Schedule to the RMA requires a discharge of a contaminant to provide a description of "any possible alternative methods of discharge, including discharge into any other receiving environment."

(c) The definition of the term ***"best practicable option" includes having regard to the financial implications, and the effects on the environment, of that option when compared with other options.***

SAG believes it is incumbent on any design to take these requirements into consideration.

TCDC has varying Stormwater Statements

Examining council websites, annual plans and LTP I have found a number of different statements relating to stormwater and the intent to inform community. Generally, councils define these as 'level of service'

District Plan s222

TCDC District Plan explains our district is subject to flooding hazards and that we should become a well-educated community that understand the risk from hazards. The plan is silent on methods.

It is SAG position that the District Plan is inconsistent with other stormwater descriptions by council. In one description TCDC have as its minimum achievements if less than 4 floors per thousand flood the stormwater plan is acceptable. This does not represent the community's views.

Stormwater management plan

Table below explains the LoS for the 2015-2022 periods to be no more than 15 habitable areas will be flooded in a 10%AEP

Customer level of service	Customer Performance Measure(s)	Baseline	2012/13	2013/14	2014/15	2015/16 - 2021/22
The Council's stormwater services protect habitable areas from flooding	Number of dwellings inundated with stormwater during a storm event with a 10% estimated return period[1]	<20	<20	<22	<25	<15
	% of operational resource consent conditions complied with throughout the year	100%	100%	100%	100%	100%
The Council provides a responsive stormwater complaint service	% of routine requests for service responded to within one day[2]	90%	90%	90%	90%	90%
	% of residents and non-resident ratepayers satisfied with the stormwater systems	70%	70%	70%	70%	75%

The long term view (over the 10 year period) is that there are no changes anticipated for the current level of service. It is, however, recognised that the possibility and severity of changing weather patterns, may bring a range of implications such as the need for upgrades and improvement programmes.

The weather bomb[6] according to the NZ Insurance Council was 82 floors got flooded. Council does not keep rainfall data to claim either a 2%AEP or 10%AEP is exceeded.

[6] Trying to find date but was between this period 2015-2022

TCDC Risk and Assurance Stormwater Policy

The writer has sighted this within LTP which states 4/1000 floors being flooded is an acceptable level of risk for council to manage. This appears to relate to the LoS in the SWMP table above.

TCDC Website Statement

Google summaries TCDC website as:

Our aim is to: ***Maintain a reliable stormwater network to manage runoff and reduce surface water ponding****. Ensure stormwater is controlled and, if necessary, treated and disposed of to protect public health and safety, land and property.*

TCDC Website statement in detail as of 18 June 2024

Stormwater

What is Stormwater?

Stormwater is the runoff of water from land generated by rainfall or melting snow.

If stormwater is not managed properly, it can flood streets and pose a threat to public health and safety, property, and have an environmentally damaging effect on the district's waterways and seas. Therefore, management of stormwater requires an extensive pipe network to collect and transport stormwater, treatment systems and pumping, and all these come at a cost to the community.

You can help to reduce stormwater runoff entering our waterways and seas by collecting and using this rainwater on your property to water your garden, flush your toilets, wash your car and even as your own water supply.

Our aim is to:

- Maintain a reliable stormwater network to manage runoff and reduce surface water ponding
- Ensure stormwater is controlled and, if necessary, treated and disposed of to protect public health and safety, land and property
- Protect and enhance the life-supporting properties and quality of streams, estuaries and harbours
- Ensure new developments undertake effective stormwater management and control.

More information on our Council's stormwater management can be found here.

For more details on how you can help keep our waterways clean, please refer to 'The Stormwater drains are for rain only' - Information brochure at the bottom of this page.

If any building work on your property involves work at or near a Council stormwater asset such as a pipeline or a manhole, please refer to our Build Over Policy and our

Council's Engineering Code of Practice for Subdivisions, for further details on procedures to be followed.

By clicking on the more information found here this is the web link

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Whangamata Stormwater Master Plan 2019

Council master plan in 2019[7] as submitted to the Community Board:

Whangamata Stormwater Master Plan Update

TO	All of Council Committee
FROM	Jonathan Smith - Water Services Asset Engineer
DATE	9 April 2019
SUBJECT	**Whangamata Stormwater Master Plan Update**

1 Purpose of report

To provide an update on the development Whangamata Stormwater Master Plan.

2 Background

Historically, the primary stormwater management approach has been via ground soakage. However, the increase of infill subdivision and construction of larger properties or second dwellings has increased hard stand areas (impermeable surfaces). This reduces the area where stormwater runoff can be used as soakage and increases the likelihood of ponding / flooding on private properties and road reserves.

3 Issue

Recent storm events have caused flooding and have raised concerns about the extent and capacity of the existing stormwater system, and the potential impacts of climate change need to be accounted for in TCDC's future planning.

4 Discussion

It is understood this began the procurement for the 1.050m diameter pipe into Williamson Pond. The Master Plan included statements like how council will communicate with community and likely consequences are controversial

[7] Found in Whangamata Community Board meeting minutes

4 Discussion

To address the above issue TCDC has engaged Hydraulic Analysis Ltd and Morphum Environmental Ltd to undertake a study and provide recommendations.

The objective of this study is to develop a strategic Stormwater Master Plan (SMP). This SMP will enable TCDC to achieve the following key outcomes:

- Develop and implement a prioritised 10 year works programme to improve stormwater management and mitigate flooding in Whangamata.
- Enable urgent projects to get underway in the 2019/2020 and 2020/2021 years.
- Mitigate future adverse effects through recommendations for updated planning rules and specifications.
- To be able to communicate to internal and external stakeholders how the Stormwater Master Plan will address their area(s) of concern.
- Where appropriate, determine cost vs Level of Service (LoS) to enable the community to make informed decisions about cost against acceptable level of service.
- To inform Council asset and financial planning processes (including business cases if required).

increasing the capacity of the pond - Completed

5 Significance and engagement

The significance of the decision is due to the impact this project will have in association with the following:

- Level of financial impact to the Council and the Local Community;
- Stormwater level of service affected significantly; and
- Likely consequences are controversial.

Since then, the community has been in a vacuum.

WRC WRSP/Stormwater guidelines

WRC extracts: section 2.3.3 First Flush

Managing water quality also requires an understanding of the "first flush" event where the initial runoff from a surface contains (by volume) the highest proportion of contaminant load compared to runoff in the remainder of the storm. The first flush is generally characterised by a peak in some pollutant loads (such as sediments and metals) immediately prior to the peak in flow volumes.

Best practice for water quality improvement promotes the capture and treatment of at least the first flush event, as this is often more practical and cost effective than treating flow volumes from the entire storm event.

Page 28 (altered to allow ToC)

- *A fully urbanised catchment completely reticulated and with approximately **50% impervious cover, will increase the peak discharge of a 2-year ARI event by approximately four times.***
- *Large floods of low frequency, such as 50-year or 100-year ARI events, show a relatively lesser effect from urbanisation, with their peak flows increasing about **2.5 times**.*

Pg 32 (ToC)

- *Settling occurs least along open coasts and harbour entrances due to their being high energy environments. Most sedimentation occurs in upper estuaries where flow velocities are reduced, and salt tends to flocculate finer particles. The headwaters of most estuaries are poorly flushed because much of the water draining on the ebb tide returns on the following*

flood tide. In contrast, open coastal regions are well flushed by tides and contaminants can be re-mobilised into the water column by wave, current and tidal action and are widely dispersed.

- *Upper estuaries are therefore regarded as highly sensitive to stormwater contamination, because they act as retention zones where suspended solids are deposited, and where contaminants continually accumulate. There is a higher rate of build-up of contaminants near stormwater outfalls. Concentrations then decrease with increasing distance from individual stormwater outfalls.*

These are all common-sense requirements which need further background. First flush concentrations are affected by the time between storm events, the volume of road water run-off to be detained and the nature of pollutants themselves.

The Expert Reports

Council authorised media releases claimed 'we need to take the advice of the experts'.

I have sought LGOIMA for these. There are none.

In the absence of reports decisions were made.

The following section of the discussion document focusses on what the experts should have been taking into account to ensure the community was well informed of the reasons for decisions and whether any options were available.

What are the pollutants

The web is full to overflowing with scientific reports and case studies from dozens of countries, Universities, Research Centres, councils and Government Authorities. It's like take your pick.

I have chosen 4 references I found very useful.

228 Characterisation of run off from NZ roads.pdf

395 NIWA Enhancing the contaminants from NZ roads.pdf

tr2016-010 Auckland Council Golder management of hydrocarbons in stormwater-runoff.pdf

NIWA C CALM Efficiency of Stormwater Systems

What I am seeking to determine is the foundation documents that support councils' statement that the road run-off is contaminated to an extent it needed a wetland and a defender.

The catchment into Williamson Park is 110,000 sqm [8] consisting of impervious tar sealed roads with a network of catchpits and pipes feeding two pipes discharging into the pond.

Table 1.1 Source Transfund NZRR 228-Characteristics of runoff 2002

Table 1.1 Urban land use and typical pollutant loads in the runoff (kg/ha/yr) (Livingston 1997).

Land use	TSS	Pb	Zn	Cu	TP	TKN	NH_4	NO_x	BOD	COD
Freeway	986	5.0	2.4	0.41	1.0	8.8	1.7	4.7	-	-
Parking lot	448	0.9	0.9	0.04	0.8	5.7	2.24	3.24	53	302
High-density residential	470	0.9	0.8	0.03	1.1	4.7	0.9	2.2	30	190
Medium-density residential	213	0.2	0.2	0.15	0.5	2.8	0.5	1.6	14	80
Low-density residential	11	0.01	0.04	0.01	0.04	0.03	0.02	0.11	-	-
Commercial industrial	1120	3.0	2.4	0.45	1.7	7.5	2.1	3.5	69	470
Park	3.3	0.005	-	-	0.03	1.6	-	0.33	-	2.2
Construction	67 200	-	-	-	90	-	-	-	-	-

TSS = total suspended solids,
Pb = lead,
Zn = zinc,
Cu = copper,
TP = total phosphorus,
TKN = total kjeldahl nitrogen,
NH_4 = ammonium,
NO_x = nitrogen oxides,
BOD = biochemical oxygen demand,
COD = chemical oxygen demand

Important considerations are:

(i) Pb was phased out of petrol in the 1990's since the Livingston 1997 report and is no longer regarded a vehicle pollutant as such

(ii) Whangamata dwellings all have soakage devices so the Zinc values are not relevant – except in as much as rust from vehicles which is also now minimal since anti corrosion coatings have been mandatory. It is accepted some of the 400 various manufacturer brake systems could have Zinc, but this is rare.

(iii) Copper pollutants from brake pad wear increases in heavy braking areas like downhill, approaching intersections and traffic congestion. Whangamata roads around Williamson are flat and traffic is sparce.

(iv) The low-density residential values are significantly lower than freeways almost to the tune of 100.

(v) Whangamata roads with curb and channel all have catchpits. Council has failed to maintain these to any resemblance of the NIWA study. What this means is fines above the 1/3 level mark in catchpit holding chambers re-suspends and enters pipe networks. If these were maintained at the correct level the fines would remain in the catchpits. Correctly designed and maintained catchpits could collect up to 40%-60% of all TSS.

(vi) Whangamata is subject to high onshore winds coming off the Ocean and offshore winds down the Otahu and Wentworth valleys. Wind reduces pollutants by airborne loss. All our roading around Williamson is exposed to this wind.

(vii) Whangamata beach often has 'windblow' to an extent fine sand becomes airborne and dropped around the inner residential areas including roads. These sands (part of TSS) absorb the pollutants Cu and PAHs to either be blown away (reports state this could be

[8] LGOIMA Council response.

as much as 20-40%) or left on the roads. If a regular sweeping program was conducted after 'wind blow' a significant TSS reduction can be achieved (upwards of 80%).

(viii) If after testing TSS persist entering pipe networks filter cloths can be inserted into existing catchpits. Trials claim up to 100% of fines down can be captured[9].

(ix) Many cars are now electric with different braking systems to recharge batteries. These do not use brake pads except in emergency braking so do not have the same degree of pollutant.

(x) Many of the owners of batches have European cars that have Ceramic brake pads. These do not contain Cu.

(xi) The residential roads to Williamson Park have little heavy vehicles. HV pollute between 29-160 times as much as private cars.

TSS is the medium for PAH's and metals to bind to. Of significance is the difference between low-density residential at 1% of Commercial Industrial.

Whangamata CSDC requires regular monitoring of 5 discharge points including the commercial area off Casement and these do not cause concern.

What are the acceptable water quality guidelines:

It seems from an observers view that New Zealand and Australia are working with USEPA to set trigger and high value mineral and other values as pollutants in our water systems. The following Table 2.7 of ANZECC

[9] Fines capture depends on mesh size and regular cleaning

Table 2.7 ANZECC trigger values and USEPA national recommended water quality criteria for concentrations of selected contaminants in freshwater (ANZECC and ARMCANZ 2000; USEPA 2006). All units µg l^{-1}.

Contaminant	ANZECC trigger values				USEPA recommended water quality criteria	
	Level of protection[a]					
	99%	95%	90%	80%	CMC[b]	CCC[c]
Copper[d,e]	1.0[f] (2.5–9.0)	1.4[f] (3.5–13)	1.8[f] (4.5-16)	2.5[f] (6.3–23)	13.0[g]	9.0[g]
Zinc[d,e]	2.4[f] (6–22)	8.0[f] (20–72)	15[f] (38–140)	31[f] (78–250)	120[g]	120[g]
PAHs	ID[h,i]	ID[h,i]	ID[h,i]	ID[h,i]	NS[j]	NS[j]
Oils & petroleum hydrocarbons	ID[h]	ID[h]	ID[h]	ID[h]	Narrative statement	

Notes:

a) Percentage of species protected.

b) Criteria Maximum Concentration: an estimate of the highest concentration to which an aquatic community can be exposed briefly without resulting in an unacceptable effect.

c) Criterion Continuous Concentration: an estimate of the highest concentration to which an aquatic community can be exposed indefinitely without resulting in an unacceptable effect.

d) ANZECC (2000) trigger values are for comparison with total metal concentrations followed by, in the event of exceedance, comparison with dissolved metal concentrations.

e) USEPA criteria are for dissolved metal concentrations.

f) Trigger values for low hardness (30mg/L $CaCO_3$): for moderately to extremely hard waters, these trigger values are multiplied by a factor in the approximate range 2.5 to 9 (giving the range of values shown in brackets).

g) Criteria corresponding with hardness of 100mg/L $CaCO_3$.

h) ID = insufficient data to derive a reliable trigger value.

i) ANZECC trigger values available for naphthalene (a specific PAH), but not generically for PAHs or other specific PAHs.

j) NS = not specified.

A water quality guideline is a numerical concentration limit designed to support, on best scientific evidence, a particular environmental value. These are embodied in the new Guideline documents that have been endorsed by the Australian States and Territories, and New Zealand's environment and natural resource ministers.

*The new Guidelines introduce the term guideline **trigger values**. The word trigger was chosen to imply that, if this value was exceeded, it should be the trigger for either further measurement to ascertain the true impact of the exceedance, or a trigger for management (remedial) action.*

A water quality objective is an agreed water quality target or guideline that is agreed upon by stakeholders after due consideration of social, cultural, economic and political factors. It is quite feasible for stakeholders to agree to manage a particular water body more or less stringently than normally expected either because the water has special value or significance, or because a small reduction in water quality might have agreed socio-economic value to the stakeholders.

What is the purpose of Detention at Williamson Park:

Williamson Park is at the very end of stormwater discharge to water. It does not drain or influence any overland flow path, streams or waterways that are prone to overtopping or another pipe network. Reasons for detention:

1. Temporary detention if a flooding event occurred at peak tides and discharge was not hydraulically possible. TCDC experts have not provided calculations for storage in tidal defence.
   The weir is 3.2Rml which is deliberately lower than Ocean Road or most surrounding properties. If tidal level rose above the weir more regularly this may change. As sea level rise occurs the weir spreader beam will need lifting. At that time water overtopping a higher weir could flood surrounding properties.
2. Detention to treat first flush. TCDC states that the catchment area into Williamson is.
   - *Road catchment is roughly 91,000m^2 for the 1050mm pipe and 20,000m^2 for the 900mm pipe. Total catchment including roofs and green areas is roughly 700,000m^2 for the 1050mm pipe and 150,000m^2 for the 900mm pipe.*
   - *Current pond area is 2700m^2 at 3mRL NZVD2016.*

Using AEP 2% (E1/AS1 Appendix A) of 137mm/hr this equates the 10-minute first flush for the 110,000sqm catchment area detained in the 2700sqm Williamson basin will lift water level approximately 1m.

Amend 11
Nov 2020

Table A: **Rainfall Intensities continued**
10 minute duration rainfall intensities for various locations in New Zealand

Location	Latitude degrees	Longitude degrees	10% AEP intensity mm/hr	2% AEP intensity mm/hr
WAIKATO				
Coromandel	-36.74	175.5	96	132
Pauanui	-37.02	175.86	97	137
Te Puru-Thornton Bay	-37.04	175.52	91	127
Thames	-37.14	175.53	88	124
Whangamatā	-37.21	175.86	97	137

The discharge invert is 2.3 Rml and the weir height spreader beam is 3.2 Rml so the detention bason will approximately receive the first flush at a 2%AEP.

Journals state first flush treatment normally requires a 12-hour settling period to achieve up to 50% of some TSS and 20% of other pollutants. Williamson pond has no bypass system so once the pond is charged by the first flush any further road runoff water entering will cause the first flush to be diluted, mixed and overtop the weir. This would throw doubt on whether any form of treatment system (e.g. Wetland) would provide any realistic benefit.

NB: Residents report a wave of water coming down Williamson Road in the 2017 cyclone, crossing Ocean and flooding the pond and exiting the weir. This became an overland flow path.

Pipes and infrastructure involving design of overland flow paths are not required to include provision for treatment above the 10%AEP[10]. It is understood this is because dilution is extreme and treatment systems for this volume of water are cost prohibitive, require too much land and unwarranted.

The Opus 2019 report on design upgrade of the two pipes into Williamson Park has not yet been extended to the 700,000sqm catchment area. If the pipe upgrade was to gather in this extended catchment the current detention pond would be undersized by a factor of 7.

The present height of the weir being overtopped will not of itself cause localised residential property floors being flooded. The issue is discharging of the pipe network so catchpits can still operate to remove road run-off.

It is therefore unknown why any form of detention system is required.

Policy document for the use of Williamson Park:

Williamson Park was generously bequeathed to the community of Whangamata in 1929

Quote Anne Stewart website:

I am of the view, that due to the recent changes to Williamson Park in the last two years since 2016, that we are in grave danger of losing a part of Whangamata's intangible cultural heritage, along with the very reason we had this Park in the first place. Especially if we ignore the stories and special things about this park, passed down in our family stories to future generations.

The very fact that we, as people on the Coromandel Peninsula, inherited from past generations, who lived at Whangamata in the early 1900s, this park. ***That because of the generosity of the Williamson family we were bestowed this park as a gift in 1929 for the benefit of future generations.***

I am of the view that active effort is required, on the part of many, who have enjoyed the benefits of this park, to safeguard it for future generations - along with the stories and the intangibles, before they are lost, forgotten or trundled over by those with little regard to preserving cultural heritage. Who would, in fact, bring to this park, an imported culture, not necessarily chosen by the majority of the ratepayers and residents of Whangamata.

During workshops disparaging statements were made[11] relating to the use of part of the Williamson Park for a wetland. These statements would not have been said in open forum.

In recent years the Friends of Williamson Park Society challenged councils' decision to allow companies to profit by staging shows at Williamson Park. The commissioner overturned these included in reasoning that the deed of gift provided for community to be able to use all of the

[10] Need citation for this. E1/AS1 references both 10% and 2%AEP

[11] Statements made were not by staff

Williamson Park 24/7 and that fencing an area off for sole use of concert goers was in breach of the gift. This ruling is enforceable in courts.

I have not been provided with either the Williamson Deed of Gift or council 'Policy' on how the Deed of Gift is to be honoured and managed.

I recommend that Anee Stewarts concerns are supported and that the Community Board begin research, talk to historians and prepare for public consultation a policy on how the Williamson Deed of Gift is to be honoured. Perhaps this could be done as a 100-year anniversary.

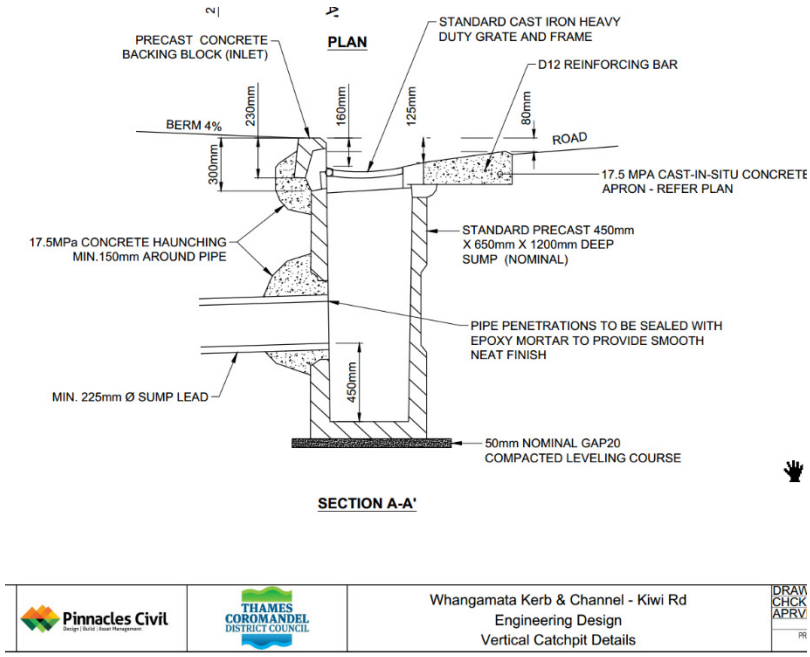
What is the purpose of Catchpits in relation to sediment (TSS) capture

The discharge to Williamson Park is solely through a pipe network feed only by roading. Roading has specific design within TCDC various policy. This includes regular cesspits (catchpits) that are of standard design 1800mm deep. They are all grated. Some have baffles. The design is used all over the world.

These primarily catch sediment and refuse by settling within the chamber below the grate. The Kiwi Rd design is used as a depiction.

My investigation found the chambers to be about on average 1800mm deep. Many have outlets at about 600mm below the chamber top.

Over time these fill and require maintenance in the form of pumping out the sediments captured.



NIWA C-CALM: A well designed catch-pit and maintained can retain up to 35-40% of removal efficiencies of the annual sediment load in stormwater (Pitt and Field, 1998). However, sediments retained tend to be coarse grained – typically in the 250 – 2000 µm size range. Pitt and Field (2004) measured the solids removal effectiveness of 100 catch-pits and concluded that solids removal is principally a function of the rate of incoming gutter flow. Removal rates for TSS approach 45% when the inflow is discharging less than 0.005 m3 /s and is negligible for flow rates in excess of 0.139 m3 /s.

I have done studies of particulate sizing in plaster aggregate formulations. Table 8.4.2 Sediment properties is a normal distribution of particulates expected.

8.4.2 Sediment properties

Table 8.4.1 Grain size classification of sediments

Grain size	Classification
<0.06 µm	Fine clay
0.06–0.2; 0.2–0.63 µm	Medium clay
0.63–2 µm	Coarse clay
2–6.3 µm	Fine silt
6.3–20 µm	Medium silt
20–63 µm	Coarse silt
>63 µm	Sand
>2 mm	Coarse material, rocks, detritus

(Mudroch et al. 1997)

As water velocity increases the finer particulates resuspends and is carried into the pipe network. Whilst this is of concern the issue is when in suspension the sediment remains in suspension until the water body becomes still and has time to settle. Even at velocities as low as 0.09m/h finer particulates can remain in suspension.

Table 10 Fall velocities and PSD used to develop the performance rules (Semadeni-Davies, 2008)

Band	Particle mass in stormwater (%)	Density* (kg/m^3)	Medium Grain - NURP		Fine Grain		Medium Fine Grain		Medium Coarse Grain		Coarse Grain	
			Velocity (m/h)	Grain size (µm)	Velocity (m/h)	Grain size (µm)	Velocity (m/h)	Grain size (µm)	Velocity (m/h)	Grain size (µm)	Velocity (m/h)	Grain size (µm)
1	0-20	1300	0.009	4	0.001	1	0.005	3	0.014	5	0.09	5
2	20-40	1600	0.091	9	0.009	3	0.046	6	0.137	11	0.91	17
3	40-60	1900	0.457	16	0.046	5	0.229	11	0.686	20	4.57	37
4	60-80	2300	2.134	29	0.213	9	1.067	20	3.200	35	21.34	80
5	80-100	2650	19.812	78	1.981	25	9.906	55	29.718	96	198.12	380**

* Densities taken from CRCCH (2005)

** Calculated using Rubey's equation

What this means is catchpits can only be effective if the depth of the chamber can reduce turbulence to an extent the lighter particulates can remain as deposits within the chamber to be later removed as part of maintenance. I have lost the reference that stated once the catchpit chamber is 1/3 full (below the outlet) it requires maintenance.

LGOIMA has provided the 2013 KTB Stormwater Management Plan which included KTB stating they had examined all the service contracts for schedules of maintenance. The KTB report states cesspits to be cleaned each May of every year.

This has not been done. TCDC has not provided a schedule of when they were cleaned. Residents say they never have.

TCDC policy appears to be that residents that notice flooding can file a RFS which may trigger an inspection of the nearby catchpits. If these are found to be blocked or full of debris the service provider will attend and if needed pump it out.

SAG has issues with this:

1. Maintenance is a preventative process ie maintain before failure.
2. TCDC current process is reliant on someone responding after the failure
3. Residents may not understand or work out that the cesspit is the cause of localised flooding
4. Approximately 50% of houses are holiday homes so do not have permanent residents that will even examine the cesspits
5. The average age of residents in Whangamata is over 50 years with many in the 80+ age group. It is unreasonable for this age group to weather storms and wade into flood waters to see if the catchpits are working
6. This RFS process is not a maintenance program because if blocked that means the sediment is likely to now be only coarse particles as the fines have been resuspended and flowed down the network.
7. By failing to clear out catchpits, even heavier sediment and organic matter will enter pipe networks and end up at Williamson Pond
8. Ratepayers have paid for the programmed service that has not been done
9. Discussions in workshops claim catchpits should be cleaned twice a year. It is apparent there is no actual program of maintenance.
10. Despite these facts the forebay at the Williamson Pond does not contain sediment.

The decision to wetland and install a defender is flawed as the defender is in series and will be subject to water velocities even greater than catchpits so will not capture fines.

Despite the failure by council to keep the catchpits cleaned there is no proof or any valid reason to now warrant this defender.

What enters the catchpit is surface material. This can be by wind blow or water suspending solids. Whangamata is beside two large beaches with prevailing winds that suspend sand and drop it onto the roads. The sand settles and washes to the curb and channel. Council has never swept this sand up off the roads before it travels to catchpits. The result is this sand drifts into the curb and channel and then in rain erodes into the catchpits.

Roads closer to the beaches are subject to more sand deposits from wind blow than those further away (arbitrary). Some cesspits along the dunes fill up in any wind blow. Sound maintenance procedures would include sweeping the curb and channels at least those subject to windblown sand and regular cleaning of catchpits.

NB: Catchpit design should be modified to have deeper chambers in locations like beach settlements subject to wind blown lighter sand particulates.

Whangamata is considered a ‘dry’ coastal area because of its sand base and often prolonged dry periods. As a consequence, certain trees like Banksia and Pohutukawa are popular as they are hardier. These trees drop cones and leaves that do not readily compost during dry weather. These drift and blow into the curb and channel and into catchpits.

This means some catchpits nearby such trees will need additional cleaning to coincide with organic material droppings and wind blows.

The consultants have provided no reasoning or justification to require a ‘defender’.

What is the purpose of the Defender in relation to sediment capture

The purpose of a defender is to remove a portion of TSS. The current works involve two defenders, one on each pipeline. One line has a catchment of 4.5 hectares (91,000sqm) and the other 2 hectares (20,000sqm). To claim TSS is required to be removed must be supported by evidence TSS or some component of it is toxic or undesirable to an extent it will have adverse effects (as to water quality) on the Beach and Ocean so must be removed.

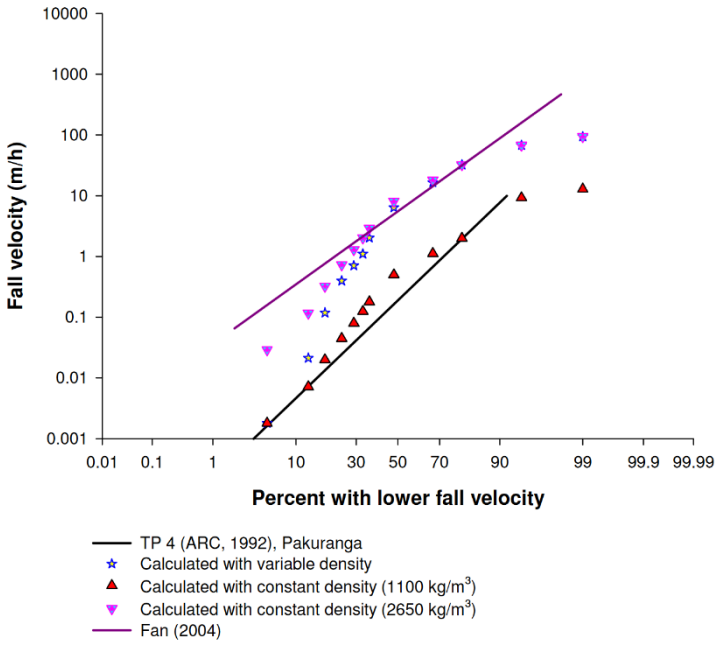
I cannot find any current evidence why two defenders are now required when the proper and sensible time to have installed them was in 2019 when Opus did the pipe upgrade.

There is plenty of web related stories about claims of defender type systems. These are promotions by the manufacturers.

Humes, ARC and NIWA produced Figure 22 fall velocities based on Pakuranga soils not Whangamata beach sand.

This graph demonstrates lighter particulate size remains in suspension to a factor of about 10 compared to heavier density like coarse sand, pebbles and stones.

Figure 22
Fall velocities calculated (assuming spherical particles in water at 20°C) from the mean NIWA (Reed and Timperley, 2004; Timperley *et al.*, 2004 a and b) PSD for Auckland City compared to fall velocities in Pakuranga (ARC, 1992) and Fan (2004).



The start point is that clays do affect shellfish and invertebrate species as the clay fines clog their systems. The correlation required for Whangamata is how much of the fines are inorganics that can affect shellfish and invertebrates.

The second entry discussion is have windblown fines absorbed (bound to) anything that could be toxic to aquatic life forms. In the absence of testing no defender required decision has substance.

The fact Whangamata stormwater road run-off may contain TSS is not of interest if it is just sand washed up as windblow from the beach. This sand can be returned safely to the beach unless it is proven to have been changed into something toxic of sufficient scale to warrant any form of treatment (removal).

The decision to install two defenders, one to a catchment of just 20,000sqm is an example of over engineering to the highest order.

TCDC claim Whangamata has 31 discharge outlets to water bodies. SAG can only locate 21. If all these are to need defenders where will this money come from in priority to mitigating flooding?

Literature claims finer (lighter) sediment absorbs PAHs and metals to a greater extent than coarse matter. If PAHs and attached metal solids were to be trapped a defender is not the device to remove this. Mesh screens would be the only way but only required if the test results determined concentrations exceeded ANZECC trigger values to an extent treatment was required to prevent Ocean poisoning.

The 'total length of roads' feeding Williamson Park is less than 2 kilometres. If it was true, that defenders were required every 2km of roading NZ state highways alone would need 5500 of them. TCDC claims it has 504km of sealed roads. Does this mean 252 defenders are required?

SAG is concerned TCDC claims defenders are required is akin to another Meth testing debacle. Other councils are not doing this.

SAG has already provided the TR2016 010 Golder Associates report which does not specify this level of TSS management.

My position on defenders is wait until after the catchment has been reduced, then see what is left to be tested. It is pointless to install defenders now without scientific basis and then when catchment is reduced being left with assets to maintain that have no purpose.

What is required to be done to the road water run off?

SAG requires a debate on the merits of what the road runoff water is. Is it toxic and to what extent? If it is toxic what effect will that have on the receiving water? How is it to be verified?

Quality of water. This appears to be the driving force behind the wetland/defender decision. It is accepted wetlands have been an obstacle to developers mainly for farming, highways, commercial exploitation and Forestry. The fact wetlands are vanishing for commercial exploitation is not justification to now require one in Urban areas where land is scarce.

Promoting an argument for water quality in first flush is only reasonable if testing was done, that the community wanted to meet or exceed a specific water quality guideline and all other options had been considered and tested once in service.

Fertilizers with N or K mostly attach to sand to form what lay people could describe as 'sludge' when in solution. This is also trapped in the catchpits. It is also part of the sludge makeup in the base of the Williamson Pond. However, the volume of N and K has not been tested. N and K do not fall onto impervious roads. If N and K are entering wate ways e.g. from the golf course, this can be managed by grass swales that the golf course can be specifically required to refrain from fertilizing. Grass swales are the most efficient of all stormwater treatment systems, especially on a sand base.

In LGOIMA TCDC stated it was **not worth the cost or effort to test the discharge pipe water** into Williamson Pond. They will rely on WRC figures.

Testing must be the starting point of any justification for any treatment system. Until testing there is no basis whatsoever the water needs to be treated to meet any water quality guidelines.

In 2017 residents on the then stormwater action group claim council did water testing in the pond discharge pipe and found it to be clear and not toxic. These tests will need producing. Council will need to do the testing and then consider all options under RMA 105 available to the community.

If the Williamson Pond contained toxic substances or polluted water, why did council instruct contractors to pump it out 3 times since March 2023. Surely the first flush concentrations (sludge) over the past 5 years with no maintenance would have been at peak or critical levels of toxicity. Regardless council pumped out pond water and sludge onto the Beach. The pumps used can pump and suspend solid objects up to 100mm. Sludge was pumped out and what couldn't be pumped was carted away to some local site. If this was at all toxic council had a duty to have this treated to avoid ecological issues in the future.

What case studies are available as reference?

TCDC is a smaller council so does not have the resources to conduct case studies and trials like larger councils like Auckland.

Auckland has become involved in worldwide studies of water quality studies. The following is one of Auckland Councils study areas[12].

[12] Report 395 page 26

Road runoff samples were collected manually at equal time intervals during runoff sampling events at each of these locations, and composite samples were analysed for total copper and zinc concentrations to provide an estimate of the EMC of each metal for each event. Table 2.4 below summarises the concentrations of the mean and range of copper and zinc EMCs in samples collected at each of these three sites.

Table 2.4 Total zinc and total copper EMCs in road runoff samples (FRST-funded research 2006–07)

Location	Traffic volume – AADT[a] (vpd)	Copper (g m^{-3})		Zinc (g m^{-3})	
		Mean	Range	Mean	Range
SH17 (nr Horseshoe Bush Rd), Dairy Flat	6,387	0.038	0.035–0.041	0.207	0.188–0.226
SH17 (nr Green Rd), Dairy Flat	6,387	0.152	0.099–0.185	0.910	0.53–1.090
East Coast Rd, North Shore City	20,040	0.071	0.053–0.089	0.448	0.391–0.498

Note:

a) Source: Transit NZ (2007)

Note that there is considerable uncertainty around the extent to which these EMC estimates can be considered representative. The range of events sampled was limited to relatively short-duration events of small rainfall depths. The concentrations presented in table 2.4 for each site may not be representative of contaminant concentrations associated with all rainfall events, as greater dilution of

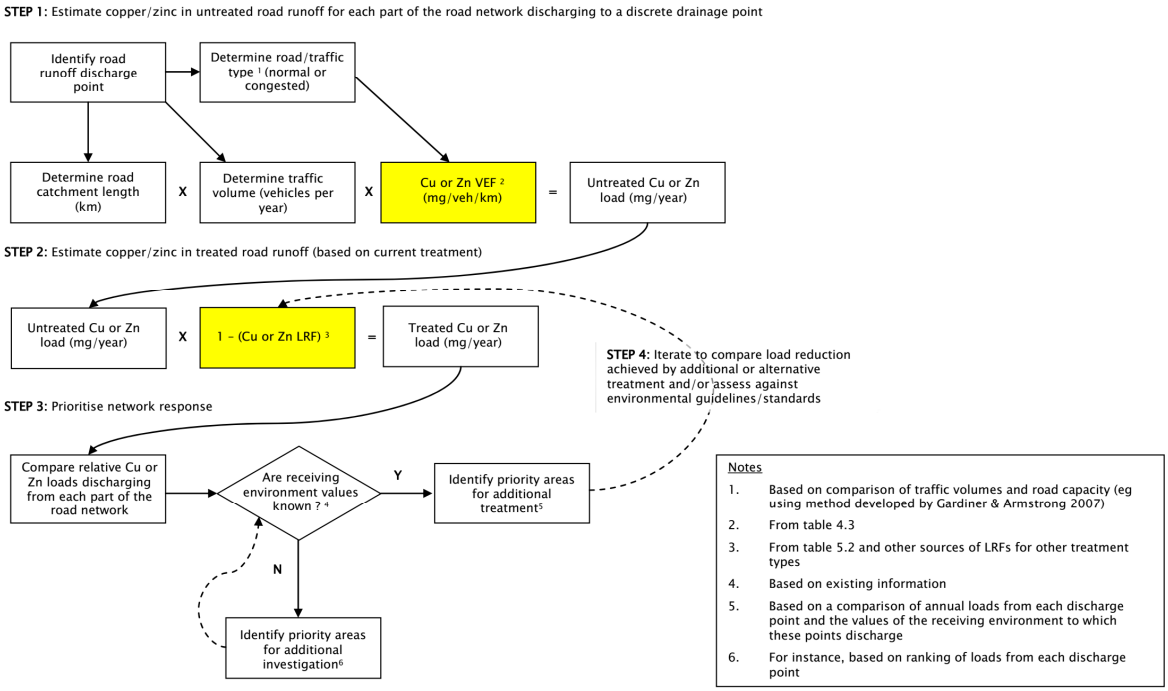
7 Recommendations

7.1 Application of the results of this study

Section 1.3 of this report provided an overview of the information requirements, and the way in which this information would need to be evaluated, in order to decide how to prioritise the control of road runoff contaminants discharged to aquatic receiving environments. It was noted that the extent to which the discharge of contaminants in road runoff presents a problem requires an assessment of both the loads discharged and the values of the aquatic receiving environment. As noted in section 1.3, some relatively sophisticated methods have been developed for evaluation of the effects or risk of contaminant discharges to receiving environments (Gardiner and Armstrong 2007; Moores et al 2009a). One way in which the results of this study can be used is to provide input data for relatively detailed assessments of the effects of road runoff discharges, using these types of tools. The VEFs and LRFs recommended here can be used as an alternative to current values, subject to due consideration being given to the origin and applicability of competing data sources.

However, not all roading and stormwater managers necessarily have access to the resources required to apply the methods referred to above. In recognition of this, and with the aim of ensuring that the results of this study are of wider practical value, an alternative four-step method is presented here as a way of using these VEF and LRF estimates in a 'first-cut' approach to identifying those parts of a road network most in need of treatment or requiring further, more detailed, investigations (see figure 7.1)

Figure 7.1 Method for 'first-cut' prioritisation of location of road runoff treatment (yellow text boxes indicate the application of the results of this study)



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SAG is concerned council and WRC have failed to consider existing peer reviewed processes other councils are using.

I have not done a traffic count along Willaimson or Ocean Roads, but I would expect it to be in the order of 200-400 vehicles per day. There is only a single stop T intersection, no hills and no congestion. The contaminants would be negligible and possibly so low that samples would return a no detected result.

How will the water testing be done?

The writer is a weathertightness expert focussing on building code clauses E2 and B2 and occasionally E1 Surface Water.

The building code is a performance-based code. It has several layers to demonstrate performance. In simplest terms these are included in column 1. I have cited what I believe would be expected under RMA in column 2:

Building Code	RMA/E1 Surface water (incl water quality)
Acceptable Solutions. These are authorised documents under the Building Act issued by MBIE that describe specific designs that if done	WRC Stormwater Guidelines. These are approved methods that WRC has put through the consultation process and from historical

in the prescribed manner are 'deemed to comply' with the code and Act.	successful methodologies ideally of accepted methods adopted by all Regional Councils
Code Mark: Products that go through a rigorous scientific and expert review can have Code Mark status (approved by MBIE) that are also 'deemed to comply'	MfE? – these are national guidelines that the Government has sanctioned to be the minimum standard or performance required of stormwater management. Some comes from the Building Code and some from RMA
Determinations: MBIE function is to 'compare' the material or product to the Acceptable Solutions and if MBIE are of the opinion, supported by MBIE appointed experts, that the system, product etc is likely to comply 'on reasonable grounds' will issue status for it so council can adopt and accept the BC	MfE – these are particular systems that Government has reviewed and approved (or by the Courts) that will achieve the minimum performance criteria. These are normally one off in nature or specific to a particular project so are not considered to become cited. Other Regional Councils may use these as evidence of compliance for similar design.
Alternate Solutions: This comes with a 'toolbox' for architects, engineers and owners to follow. This can include expert reports, peer reviews, testing by way of standards, historical performance of similar methods, comparison of departures etc from Acceptable Solutions.	These are individual applications by council that are reviewed by WRC. Council must include supporting documentation to verify the specified system would meet at least one of the above methods.

I have included this table showing how the building code functions so designers, architects, builders, engineers, product manufacturers and councils can function to an extent the community has faith in the final outcome so that buildings will meet the minimum durability and performance criteria within the building code.

Council therefore can understand its role within the Building Act.

As a lay person I expect to see a similar structure within the existence of CSDC 105667.

If this structure does not exist what confidence can community have that councils will act reasonably or at all?

What performance is being set to be achieved? How is testing to be done, over what period, what standards are to be used, historically what have other councils done (result wise), what is internationally accepted and what are MfE requirements etc?

SAG are representatives of community. We have no access to this sort of information. We expect to be able to rely on the decisions being made by council to not only be based on research, what is appropriate, what is needed and what other options are available, but that WRC has approved it.

The wetland decision was made by council staff in a workshop. There was no testing, no guideline documents presented, no expert report stating why or how those options were formed.

I asked for one example of an artificial wetland anywhere in the world that is on a sand base, adjacent to the Ocean and in a climate like Whangamata. Neither the experts nor council can provide one example. There is no historical success for an artificial wetland.

This is not how community expects future decisions to be made.

The Dry Basin System

The Dry Basin system was promoted by SAG in December 2023. This was the temporary step awaiting the Master Plan that was to include reducing the catchment into Williamson Park so infiltration may again be possible and avoid any discharges onto the beach.

Metis prepared a proposal to WRC in February 2023.

This system was promoted to avoid:

1. Planting within a stormwater flow path. ARC is at pains right now to daylight streams and overland flow paths by removing obstacles like vegetation. Community does not want vegetation washing onto the beach.
2. Losing prime land generously gifted by the Williamson family for the undisturbed use of community. The land taken for the existing pond was claimed originally to be a water feature for community to enjoy. This is untrue as it is stormwater run-off. There are existing decisions about losing the 24/7 use of the Willaimson Park. Council has no right to set aside land for stormwater systems.
3. Makes no change to discharge into the Ocean. Whatever the system nothing will change the volume of discharge to Ocean. SAG on behalf of the community take objection to discharge to Ocean and want the catchment reduced to something manageable and finally totally removed.
4. Further tension between council and the community would be improved if community could see the Williamson Park not have controversial stormwater assets.

There are many more reasons but for now this will do.

It seems to me that the only reason for standing water could be oxygenation of the water. Quotes from USEPA

USEPA

Dissolved oxygen (DO) refers to the concentration of oxygen gas incorporated in water. Oxygen enters water by direct absorption from the atmosphere, which is enhanced by turbulence (see Figure 1).

***Figure 1**. This natural stream in a forest setting has water flowing over boulders, causing turbulence and aeration.*

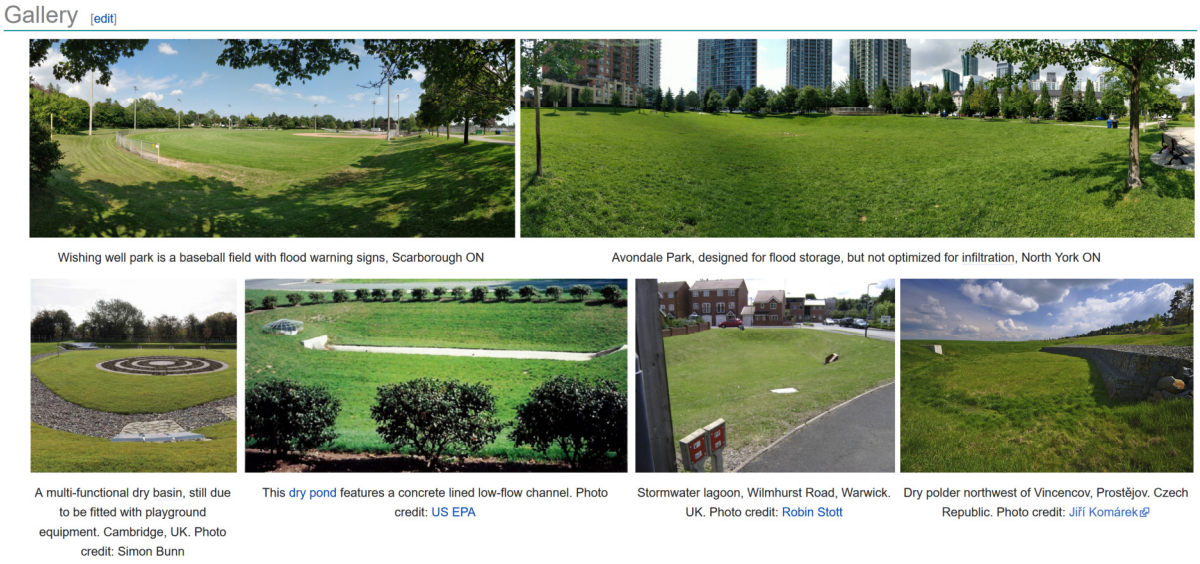
***The more turbulence that a stream or river displays, such as waterfalls or rapids, the more oxygen is absorbed into the water**. Also, turbulence on the surface of a body of water caused by wind tends to increase levels of dissolved oxygen.*

If the sole remaining reason is the need for oxygenation the most logical solution is to discharge it before it has time for settling and oxygen depletion. Turbulence assists oxygenation but at the cost of sediment suspension. All things said the discharge is going to sand so once that happens the balance of chemistry is complete.

What does need consideration is the design of the Dry Basin needs to consider:

1. Keep the temperature of the water down to reduce algae growth etc. To achieve this, planting would be helpful.
2. The base needs a central concrete spillway to:
    a. Prevent sludge forming (N plus K plus sand = sludge).
    b. Have gently slopped sides (1:20 maximum) so flood water can run back into the spillway so grass areas can drain and act as natural filters.
    c. Be able to be cleaned of ground-based material entering after discharge.
    d. Allow mowing and maintenance up to the defined spillway.
    e. Spillway could have ripples to model stream rapids for oxygenation.
3. The overall slope from the discharge pipes to the weir pipe will containment in the form of a liner or concrete spillway (concrete preferred)
4. Alternatively, the dry basin is replaced with pipes.

The below images are some of the Gallery stock on Google.



Google has many references to Dry Ponds which I am sure TCDC and WRC have at their disposal.

None of this has been discussed and consequently we have had to do our own research and that leads to questions about how the wetland decision was made and how future decisions intend being made.

Website from another council:

Dry ponds are recommended as flood control structures to accommodate occasional excess overflow downstream of other structural BMPs. They should be integrated into the landscape as useful, accessible public space.

Dry ponds are ideal for:

- *Managing infrequent extreme flow events,*
- *incorporating into parks and other green recreational spaces,*

- *distributing across a larger development site*

Planning considerations

Dry ponds are a useful tool for managing flooding during larger storm events. They are well suited to being placed downstream of other smaller distributed BMPs for occasional backup flood protection. Where possible they should be integrated into amenity space, given that users rarely wish to continue outdoor activities during such intense rainstorms.

Compared to wet ponds "Dry ponds… …are less expensive to install, require less maintenance and may involve less liability for the communities around them."
https://www.fairfaxcounty.gov/soil-water-conservation/understanding-stormwater-ponds

What options are available to reduce adverse effects

During workshop discussions SAG put it to the experts the only way to resolve the Williamson Pond adverse effects on the land and beach erosion is to reduce the catchment area feeding the pond. By reducing the volume of discharge the infiltration rate may successfully reduce the discharge volume to the Ocean.

The experts agreed with this summation.

The question of first flush needs to consider these variables:

(i) Whangamata experienced 6M of rain last year. This quantity of rainwater significantly reduces the concentration of any toxic material
(ii) Whangamata normally experiences lots of regular rainfall events meaning surface contaminates regularly get washed away and diluted
(iii) Whangamata experiences lots of onshore and offshore breezes that blow fine sands that toxic matter attaches to away.
(iv) Most of the greater catchment area has grass swales along the roads which are the most effective stormwater treatment system available
(v) Testing would need to be done to determine if fines do need removing and if so what types of mesh filters would work best.
(vi) The outfall pipe in the weir could be closed off for periods after first flush if settling becomes the last resort.
(vii) More infill housing accelerates surface water 4 times (WRC)

Whatever the future debate is required.

To date Metis have not prepared any expert report identifying the options and how successful each option could be. Because of the contentious nature of the Williamson Park this expert report should have been independently peer reviewed by a practicing expert like Golder Associates.

If the catchment area was reduced at least 60% this may have negated the need for any of the works at Williamson Park.

Detention of water cannot be long term

It is not feasible or practical to have long duration water at the 'end of the network' in sand-based stormwater management systems. All private residential roofs and many roads rely on ground soakage which recharges the water table which then must feed to the Ocean.

Installing detention devices without liners or with long duration ponds like wetlands along the perimeter of the aquifer will clog it up and reduce/slow and delay the critical release point to the Ocean.

This delay adversely affects the natural process of infiltration to the Ocean and is likely one of the contributory factors in causing ground water levels lifting to break outs and private soakage pits filling to the extent they are overwhelmed and then flood the surrounding properties.

The aquifer is in need of special design to assist infiltration to the waterways and Ocean, not having recharging around the perimeter.

WRC statements in section 2.3.3 WRC WRSP attest to this fact.

Investigation to include impact on underlying Aquifers

Whilst discussion focusses on surface water runoff and its management consideration must also include the function of the underground aquifers. Has the prior Williamson Pond and the excavation works interfered with the functioning of the underground aquifers.

This is important in respect to Fire Services[13] and to the water table levels on the surrounding ground.

It is important for the Fire Service to have ready access to water to fight fires.

It is important that properties inland from Williamson Park relying on ground water soakage do not have aquifer flow impeded.

Outcomes and how will future decisions be made?

Council has committed to creating a Master Plan by 23 November 2023. We have not received a copy or are aware of any drafts or a new timeframe.

Despite this council made a decision about Williamson Park and implemented that work.

What SAG seeks is:

1. An independent commissioner is appointed to:
    a. Review the Williamson Park decision. It is noted consultants have cost over $153,000 to date, the cost of the Williamson works is over $700,000 and prior Opus reports

[13] It is understood the Fire Service rely on well points into aquifer flows to charge fire hoses in fire call outs.

and pipe extensions in 2019 have an unknown cost. It is likely over $1M has been spent without adequate research, logic or community engagement.

b. Chair the workshops and meetings, manage the consultants and deliver the Master Plan to the point of handover to the Community Board
c. Remain engaged until the stormwater works are completed. This will avoid the Waihi failure to complete after SWAT agreement with council.
d. Terms of reference to include councils land use consenting, building code FFL levels, RFS management and reporting through the Community Board
e. Has the authority to unwind decisions around land use, building consents, section 73 waivers and LIM natural hazard flooding warnings.

2. The Community Board will appoint representatives of community to become engaged with the independent commissioner to represent the views of community for the various areas of Whangamata requiring stormwater improvements.