

### **Seymour Road/Turenne Street**

1. It is inconceivable that the Applicant should seek to legitimise the discharge of raw sewerage from the Turenne Street/Seymour Rd intersection manhole onto the carriageway and down an overland pathway along the grass berm to a city drain. The consent should not ordinarily be granted.
2. The pathway is adjacent to the footpath which is regularly used by students from 2 schools. It is also a pedestrian link and regularly used by walkers and commuters.
3. The discharge, when it occurs, makes its way into the Owen Drain and along the rear of the properties at nos 14-24 Seymour Rd. It also passes the right hand side of no. 12 and is at the rear of the Ilminster School field. The Drain is the common boundary between those properties and the School. The drain continues down to its confluence with the Waimata River.
4. I have lived at no. 18 Seymour Road since 1984. I vividly recall during rainfall events wastewater overflow bubbling up out of the manhole and flowing down the grass verge.
5. It has not been at all prevalent in the past couple of years. For this I am grateful and I acknowledge the work the Gisborne District Council has undertaken to alleviate these horrible discharges.
6. I note from the projected evidence that the Council will remove this point source discharge as a Primary Overflow Point and convert it to a Tertiary Overflow Point. I also note that due to proposed mitigation work further overflows from this manhole are unlikely to occur. This is pleasing news.
7. The proposed Condition 19) is clumsy. Quite simply the consent for this discharge should be granted with an expiry date of (say) 30 June 2023. That's 2 generous years. It's up to the Applicant to sort out how its carries out its works programme.

### **Other matters**

8. The Fitzmaurice report on the sewer system, presented to the Gisborne City Council in 1988, drew attention to the folly of putting stormwater through a treatment process. It recommended a concentrated 5 year programme to remedy the situation. Consistent with that was Council's own Wastewater Strategy in the early 1990s to get rid of as much as possible of stormwater infiltration into the wastewater system so it didn't have to be treated. When the decision of the Council's Special Commissioners, who granted a consent to extend the use of the marine discharge outfall, went on appeal the Planning Tribunal (now the Environment Court) in its 1993 ephemeral decision did note that between 2003 and 2006 the Council planned to continue basic corrections to sewer and stormwater systems so as to minimise rainwater infiltration and hence minimise costs of further stages.
9. At least 2 Council engineers have reported to the Council on this.<sup>1</sup>
10. As we know the job is far from finished and not helped by diversion of Drainwise money and underspending.

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<sup>1</sup> Report 16-006 28 January 2016 and report 16-016 3 March 2016

11. There is something unsavoury about sanctioning a discharge of untreated wastewater into a municipal river especially that the problem still exists after 40 years.
12. I can't speak for local Maori. They will, I am sure but this discharge must violate Tikanga and the RMA?
13. I struggle to see that the Applicant can meet the gateway test in section 104D. It must satisfy you that either the adverse effects on the environment will be minor or that the proposed activity will not be contrary to the objectives and policies of a plan,
14. Dr Dada's evidence<sup>2</sup> is that viruses from overflows .....*"can persist for several weeks or months in the shellfish gut and the environment"*.....but there are *".....large uncertainties...."*.
15. Later<sup>3</sup> he says *"Shellfish tissue virus levels are not being currently monitored"*. He then notes a proposed reviewed monitoring regime.
16. So if the Applicant doesn't know whether shell fish in the riverbed or foreshore are virused as a result of overflows, how can it declare the adverse effects are no more than minor?
17. It is probable that overflow discharges will breach section 107 (in that after reasonable mixing there will be conspicuous change in the colour or visual clarity of the receiving waters). While WWOs will occur in times of heavy fresh water flows when water is likely discoloured with sediment and other runoff, the tidal nature of the receiving waters may well mean there are ebbs and flows of discharged material. Thus a large mixing zone exists and section 107 has to be complied with throughout the zone.
18. The evidence of Mr Mayhew<sup>4</sup> suggests (seemingly in the alternative) that the discharges are of a temporary nature and consent can be granted under one of several exceptions. The discharge must be consistent with the purpose of the RMA (minor effects?)
19. The argument is whether the term of the discharge consent is short enough to be termed "temporary" or whether each actual discharge as a result of a WWO can be said to be of a temporary nature. When WWOs will occur cannot be predicted. They could occur at any time, for substantial periods of time or with varying time elapses between events. The discharge itself may be of a short duration but within (say, a 20 year consent term) there could be many. The combined effect will not be temporary.
20. In **Bell v Wellington Regional Water Board 6 NZTPA 165** the then Planning Tribunal adopted Counsel for the Respondent's submission and accepted that *"temporary is not permanent"*. The Panel might well think that a carte blanche of discharges over a 20 year period is permanent. In **Brown** the discharge was considered temporary for 7 months until a new trade waste pipe was installed.
21. I submit that the "exceptional circumstances" outlined at paragraph 7.125 of Mr Mayhew's evidence have existed for nearly 40 years. It should not be allowed to last much longer.
22. Finally, on substantive matters, The panel should take into account section 104 RMA and *"any other matter the consent authority considers relevant and reasonably necessary to determine the application"*
23. Under that head may well come a consideration of what happens when the stormwater infiltration is removed from the wastewater network and to find the City endures flooding or ponding during episodic events because the reticulated pipework can't handle the excessive stormwater flows.

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<sup>2</sup> Para 33

<sup>3</sup> Para 34

<sup>4</sup> Para 7.125

**Where to from here?**

24. While it is unthinkable that a modern city should allow such discharges to happen and that it should in anyway be countenanced, the RMA consent processes do allow it. A balance is required between quickly resolving the environment effects of such discharges and not being in breach of the Act. The solution is not a 20 year term and nor is refusing a consent simply because the Applicant and its predecessor have been dilatory in the past. As a citizen I want to see a prompt solution and one that is legal.
25. The works programme for Drainwise is general in its programme and times. For example most recent reports to GDC Council meetings on Drainwise progress indicate that.....*"the programme may only start showing visible results towards the second half of the Long Term Plan period"*.
26. Is that not the Council's own signal? Align the consent duration with the Long Term Plan? In essence a 10 year consent term.
27. Mr Wilson's response<sup>5</sup> to a shorter term consent is that (the Applicant) *".....considers that better environmental outcomes will be achieved by providing the Applicant with a longer term consent and targets which are required to be met at key points"*.
28. That raises two points. Firstly, the sooner there are no overflow discharges the better. Secondly, the Applicant's targets set out in Mr Mayhew's Appendix B and the programme in Mr Kanz's are less than specific. The difficulty is understandable as causes may still not be properly known and solutions (which may be dependent on further engineering studies or property owner buy in) not worked out.
29. My suggestion is let the Applicant sort out what it has to do and how as long as it's completed over a 10 year term. Its checks will be expenditure measured against an already set budget, enquiring ratepayers and diligent application by the service delivery section of the Council. This is a unitary authority and I am sufficiently comfortable with the scrutiny form the regulatory arm of the Council that the job will get done.
30. This is not a consent for new green fields work. Rather it is to further avoid decades of poor environmental processes by sound engineering involvement and good practice. If what is to be done can only lead to an improved environmental outcome then what's the point of comprehensive monitoring, reporting, committees etc as this happens over a relatively short period? Are we not as a City best to say you know what has to be done, get on a do it and don't come back until it's finished in less than 10 years?

*Gordon Webb*

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G R Webb

6 July 2021

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<sup>5</sup> Para 55

**Subject:** Wastewater Discharges Reduction Workshop One – What is the Problem?

**Prepared by:** Joss Ruifrok (Stormwater Team Leader)

**Meeting Date:** 28 January 2016

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## Report to FUTURE TAIRAWHITI Committee for noting

### SUMMARY

The purpose of this report is to:

- Confirm what we currently know and what the issues appear to be.
- Outline some of the historic actions and activities that have taken place with regard to the Wastewater Discharges Reduction Project and Inflow & Infiltration.
- Discussion around what we currently know and understand about the Wastewater Discharges Reduction Project.
- Clarify benefits associated with why we are doing the project.
- Provide awareness about what's coming up for the project and next steps moving forward.

A presentation will also be made to the Committee to support this report and will include three ratepayers' individual experiences during wet weather.

What is the Problem?

- We have high frequency of wastewater discharges to our rivers during wet weather.
- We have high frequency of uncontrolled wastewater overflows on to private property during wet weather.
- There is a reasonable number of properties who cannot use their toilets/showers during wet weather events.
- There are potentially significant health issues within our community due to property flooding which is also contributing to our discharges and overflows.
- We have not seen the level of discharge reduction that was expected for the level of investment and intervention/enforcement to date.
- Discharges and overflows are a direct result of stormwater entering the wastewater network.


## RECOMMENDATIONS

That the Committee

1. receives the report.



Joss Ruifrok  
Stormwater Team Leader



Barry Vryenhoek  
Operations Group Manager

## 1. INTRODUCTION

Over the last year or so, Council staff have given several presentations to the Infrastructure Services Committee about the Wastewater Discharges Reduction Project.

The December **Report 15-486** to the Infrastructure Services Committee proposed a 4-stage approach to be completed by June 2016:

- 1) The Problem.
- 2) The Resolution – Options to address the problem.
- 3) Funding.
- 4) Adoption of a strategy taking into account steps 1 to 3.

This report covers Stage 1 of the above process.

## 2. BACKGROUND

### 2.1 The Journey So Far

- We are still having discharges and problems in small to medium rain events (<2yr ARI), we expected to see greater reductions in discharges by now. \Stormwater is still entering the wastewater network.
- Wastewater overflows onto private property occur during most large wet weather events, even when the scour valves are opened to relieve the network. The extent of this is unknown as property owners have come to treat this as the norm and have stopped complaining to Council.
- Inflow & Infiltration Project
  - Goes back to Gisborne City Council days.
  - Systematic property inspections have been ongoing since the 1980s.
  - Focus was primarily on the public system which included renewing old assets and undertaking some pipe capacity upgrades (Council owned assets)
  - The approach was structured to have a low financial burden on the private property owner. The remedial works required, on private property were not always permanent fixes and therefore did not ensure a sustainable result long-term (i.e. just requiring disconnection of downpipes from the gully trap without also requiring connection to the piped network).
  - Still seeing similar problems, with no significant reduction of overflows to rivers or private property.
- Stormwater
  - In the 1970s Gisborne City Council was under pressure to pipe a number of open drains for safety reasons. The extent of this has not been researched but examples we are aware of suggest that the service the open drains provided has been reduced, which will result in more flooding.
  - \$18 million spent on the stormwater system upgrades, following city wide questionnaire to identify key areas, followed by detailed catchment studies.
  - Recent stormwater modelling indicates that the pipe mains have sufficient capacity to accommodate most wet weather events, however most stormwater from private property is just not getting to Council's network.

- The stormwater upgrades which started in mid-1990 did not require property owners to connect to the new reticulation. If they were connected to the old reticulation they were reconnected to the new reticulation.
- It was thought that property owners with property flooding would connect during the upgrades but this appears to not be the case.
- Catchment studies identified the need to raise gully traps but these were not actioned until flooding issues were resolved.
- Stormwater is managed through the primary system and secondary flowpaths. The primary system is generally pipes and open drains. When the capacity of the primary system is exceeded water will flow across land (secondary flowpath). Secondary flowpaths are not controlled and managed and contribute to property flooding.
- Wastewater
  - There is an increased awareness by the public about wastewater being discharged during wet weather into city rivers and they find this unacceptable. Until recently there has been less awareness of overflows onto private property.
  - Wastewater pipe renewal work has been ongoing based on condition, capacity and criticality. This reduces the level of infiltration by replacing leaky pipes.
  - To reduce wet weather discharges to rivers so that no discharge occurs for <2 year rain event, containment of the overflow in storage tanks and pumping back into reticulation once the rain had subsided was proposed. This approach was based on the North Shore approach. From the recent modelling undertaken in the last 18 months we believe that this approach will not address significant private property issues of wastewater overflows and property flooding. Dealing with the on property issues provides greater community benefit, more long term sustainable solution and will still achieve the discharge reduction to our rivers.

## 2.2 What Do We Currently Know?

In the last 18 months significant modelling of the wastewater and stormwater networks has been completed which has allowed a better integrated view of how the stormwater related issues impact on the wastewater network. The wastewater model through flow logging has confirmed that better management of gross stormwater will have the greatest benefit to reducing overflows and discharges. The results of reducing the gross water are depicted in the attached appendices:

- Appendix A - shows the current position, the black dots depicts where overflows are likely to occur in a 2-year rain event and are extensive. It also shows the areas contributing the most stormwater to the wastewater network.
- Appendix B - shows the result of reducing the gross water component which consists of removing private property stormwater downpipes that discharge directly into the sewer network and reducing on property flooding which enters through private property gully traps. This shows a significant reduction in overflow points within the network.
- Appendix C - shows where there are under capacity wastewater pipes and if they are upgraded largely removes the remaining overflows for a 2-year rain event.

The wastewater model assumed that there was no reduction of stormwater entering the wastewater network through leaky pipes.

- Stormwater can only get into the wastewater system four ways: Gully traps, Private Property Laterals, Council's mains and Manholes (please refer to questionnaire infographic attached in the Appendices). The consequence of this results in:
  - Discharges to the Rivers: Occurs when wastewater pipe capacity is exceeded and scour valves are opened to relieve network. This can impact on Public Health and the Environment (considered low risk) and creates dissatisfaction within our community.
  - Discharges onto Private Property: Occurs when wastewater pipe capacity is exceeded, can result in uncontrolled overflows from gully traps on private property, this can impact on Public Health (considered high risk) and Environment (considered low risk).
  - The impact of on property flooding besides overflows mentioned above are the associated health issues due to stormwater regularly ponding under houses and for period well after each rain event Public Health (considered high risk).
- Actual/measured wastewater flow monitoring data tells us that the worst locations for stormwater inflow are in Kaiti, Whataupoko and the CBD as highlighted in red and yellow (refer to Appendix A graphic showing BECA model outputs). The wastewater modelling also tells us that:
- Leaky pipes form the next largest source of stormwater entering the Wastewater network:
  - Council owned: Earthenware pipes (clay pipes) are considered the leakiest pipes and they account for around 54km of the 220km of the Council wastewater pipes in Gisborne city.
  - Privately owned: The largest portion of private property laterals are constructed of earthenware and it has been estimated they account for about 150km of the estimated 220km of the private wastewater pipes in Gisborne city.
- Current Public vs Private Management Approach of the Wastewater Network

	Public	Private
Condition Assessments	YES	Generally NO. Apart from some commercial buildings
CCTV / Inspection checks	YES	
Scheduled maintenance (e.g. jetting)	YES	
Planned Renewals & Upgrades	YES	
Proactive Maintenance	YES	
<b>% split of wastewater network (by pipe length)</b>	<b>50%</b>	<b>50%</b>

- The private wastewater network is considered to have a greater impact on overflows from leakiness than Councils network. With no coordinated renewal/replacement approach in place the private network continues to deteriorate over time and as a result the level of 'leakiness' is expected to increase. Feedback from drain layers is, 90-99% of the repair work they do on private property are isolated spot-repairs to get the system functioning again. It is very rare for them to do a full renewal of private property wastewater pipes.



- Level of Service Status

Current Status	Existing Target
Wastewater discharges occurring in <2yr storm event (3-4 x per year)	No overflows or discharges to rivers occurring in a <2yr storm event.

- Building Act Requirements

Current	Target
<p>Gully Traps are required to be installed a minimum of 25mm above paved areas and 100mm above unpaved areas where they are not in a flooding areas.</p> <p>If they are within a flooding area Gully Traps are required to be installed above the 10yr (10% AEP) flood level.</p> <p>Up until now this level has been very difficult to confirm &amp; enforce by the Building Dept, therefore the default (25mm &amp; 100mm) minimum heights tend to have been applied.</p> <p>Gully Traps are a major contributor to Gross Water entering the wastewater network.</p>	<p>Utilising new stormwater modelling data now available to us, new Gully Trap levels will be required to be installed at a minimum 10yr flood level for those properties that:</p> <ul style="list-style-type: none"> <li>- have a history of flooding,</li> <li>- are adjacent to a watercourse,</li> <li>- are located in a low lying area,</li> <li>- are located in a secondary flowpath</li> </ul>

- There a two case studies run concurrently to ensure that we have identified all the issues and as strategies are agreed will be used a proof of concept and implement to reduce any associated risks

### 2.3 Wastewater Discharge Containment (Storage)

To reduce wet weather discharges to rivers to no discharge for <2 year rain event was originally focused around containment of the overflow in storage tanks and pumping back into reticulation once the rain had subsided, this was based on the North Shore approach.

- From the recent modelling undertaken in the last 18 months we believe that this approach will not address significant private property issues of wastewater overflows and property flooding. Dealing with the on property issues provides greater community benefit, more long term sustainable solution and will still achieve the discharge reduction to our rivers.
- The installation of 'storage' (to contain excess flows until rain/flow reduces) will eliminate point discharges to rivers, but not overflows on private property. We currently mimic storage when we open scour valves, from observations when all scour valves are open, both within the network and at key river locations we still have private property issues. This means that there will still need to be some level of gross water management for storage to be effective. To reduce overflows to private property, storage will need to be dispersed throughout the network rather than at 1 storage point.
- There are additional benefits to reducing stormwater entering the wastewater network and that is the impact on the treatment process. Our wastewater treatment is a biological process and relies on nutrients within the wastewater which are diluted when it rains. The more we can reduce stormwater dilution the better our treatment process

is and the less we have to bypass during rain events. Looking towards the future there will also be significant benefits realised for any potential wetlands project as well.

## 2.4 Benefits of Undertaking the Wastewater Discharges Reduction Project (WWDRP)

The greatest benefit of the WWDRP resides on private property. If we can resolve the on-property issues we will also resolve the discharges to river issues.

The inadequate management of on-property stormwater contribute to rising damp and moisture issues under a home. This limits a home's insulation ability, even if a home is insulated. This in turn will affect the health and wellbeing of the occupier, and also the use and enjoyment of private property.

Issue	Benefit of undertaking the WWDR Project
<u>Discharges to Rivers</u>	<ul style="list-style-type: none"> <li>- Minimising risk of contamination, (Health)</li> <li>- Minimising environmental impacts,</li> <li>- Improving social and community expectations,</li> <li>- Tourism not negatively affected,</li> </ul>
<u>On-Property Overflows</u> (gully trap discharges)	<ul style="list-style-type: none"> <li>- Can use toilets/showers during a wet weather event,</li> <li>- Health risk reduced as no discharge of wastewater,</li> <li>- Can safely use property grounds during and after wet weather,</li> <li>- No longer inconvenienced by having to go elsewhere to use toilet,</li> <li>- No shame or stigma,</li> <li>- Property values are not negatively affected,</li> <li>- No clean-up work required to disinfect the area.</li> </ul>
<u>On-Property Flooding</u>	<ul style="list-style-type: none"> <li>- Health benefits by reducing ponding under houses (mould, damp),</li> <li>- House insulation more effective resulting in warmer houses (Health Benefits),</li> <li>- Reduction in asset deterioration/rot of building from moisture,</li> <li>- Can use property grounds during and after wet weather,</li> </ul>
<u>Wastewater Treatment</u>	<ul style="list-style-type: none"> <li>- Improved treatment during wet weather,</li> <li>- Reduced operating costs,</li> <li>- Reducing amount bypassed to outfall during wet weather,</li> <li>- Cost savings for potential wetlands.</li> </ul>

## 2.5 Risks Associated with this Project

Description	Risk
Resource Consent required to discharge point source discharges of untreated sewage after 1st July 2020. (Unable to be agreed with the community)	High
Public have no tolerance for continued discharge of diluted wastewater being discharged during rain events into rivers and onto private property. (Level of reduction is too slow)	High
Exceed the 10yr timeline to achieve agreed levels of reduction. (The extent of work on private property is largely unknown)	High
Dealing only with Gross Water will not achieve agreed level of reduction. (Modeling indicates significant improvement, there is still potential that removing gross water [inflow] will allow groundwater to enter at a greater rate [infiltration])	Medium
Property owners are not happy with them undertaking improvements to their property, and do not see themselves as part of the solution	High

### **3. SUMMARY (WHAT IS THE PROBLEM?)**

- We have a high frequency of wastewater discharges to our rivers during wet weather.
- We have a high frequency of uncontrolled wastewater overflows on to private property during wet weather.
- There is a reasonable number of properties who cannot use their toilets/showers during wet weather events.
- There are potentially significant health issues within our community due to property flooding which is also contributing to our discharges and overflows.
- We have not seen the level of discharge reduction that was expected for the level of investment and intervention/enforcement to date.
- Discharges and overflows are a direct result of stormwater entering the wastewater network.

#### **3.1 Where to from here?**

In the next workshop we will cover the resolution - Options to address the problem.

We will discuss the four ways that stormwater enters the wastewater network:

- what are the strategies to manage each and if possible prioritise
- consider the level of service we are trying to achieve which will determine the options to develop the potential costs for workshop 3

We then need to discuss the timeframes to achieve strategies promoted.

### **4. WORKSHOP / AGENDA**

#### **Meeting Agenda**

- Note that a PowerPoint presentation will be made to complement this report.
- Real life examples (discussion with residents that experience issues/overflows during wet weather).
- What is the Problem?
  - Discussion around what do we currently know and understand about the WWDR Project
  - Information sharing to fill knowledge gaps
- Discuss and outline 'where to from here?' regarding future workshops in 2016:
  - Workshop discussions 2, 3 & 4.

### **5. SIGNIFICANCE**

This is a significant issue for Council:

- history of wide public interest
- involves strategic assets (wastewater/stormwater)
- cultural significance with human waste into water
- financially significant due to the large budget allocated to this project.

## **6. COMMUNITY OUTCOMES**

This project will contribute considerably to the following Council Outcomes:

- Environmentally Sustainable Tairāwhiti
- Healthy Tairāwhiti
- Connected Tairāwhiti
- Safe Tairāwhiti

## **7. STRATEGIC CHALLENGES**

The strategic challenge areas that this project will contribute to are:

- (SC4): Major Projects
- (SC5): Natural Resource Use
- (SC6): Financial Sustainability
- (SC10): Customer Needs

## **8. POLICY**

This project will result in better alignment with likely discharge related policies in the Regional Freshwater Plan.

## **9. LEVELS OF SERVICE**

The project will contribute to the stated wastewater level of service for Gisborne City:

*We contribute to a Healthy, Safe, Prosperous, Environmentally Sustainable and Connected Tairāwhiti through the provision of a well-managed wastewater reticulation system which protects public health and the physical environment.*

## **10. FINANCIAL**

Currently Council has committed funding through the LTP over a ten year period

## **11. LEGAL**

Not applicable to this report.

## **12. CONSULTATION**

Consultation for this project has been undertaken through the current Long Term Plan process.

## **13. OTHER CONSIDERATIONS**

There are no other considerations.

## **14. APPENDICES**

- Councillor Questionnaire
- BECA wastewater model outputs

Questionnaire

[Please send completed questionnaire to [joss@gdc.govt.nz](mailto:joss@gdc.govt.nz) at least a week prior to the meeting]

Name: \_\_\_\_\_

The purpose of this questionnaire is to ensure Council staff cover key issue/concerns/questions that you have about the wastewater discharges reduction project.

There have been a series of reports presented to the Infrastructure Services Committee over the last year. These reports have given an overview of what the problem is and some of the methods and strategies employed to address the issues.

1. What worries you the most about the Wastewater Discharges Reduction Project?

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2. What aspects would you like covered in more detail during the meeting with regard to the Wastewater Discharges Reduction Project?

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3. Any other comments:

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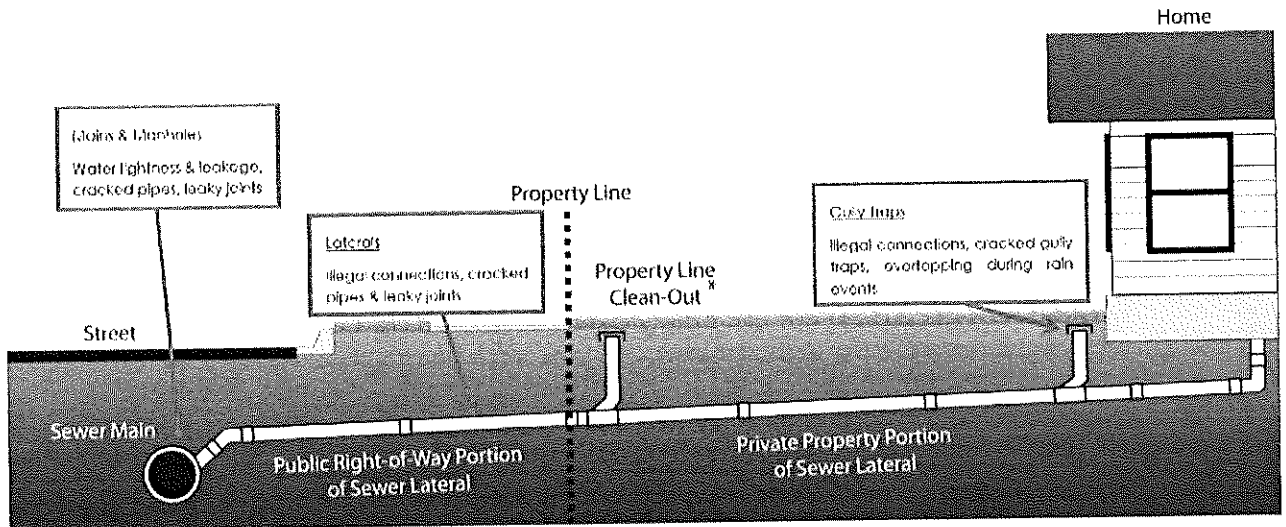
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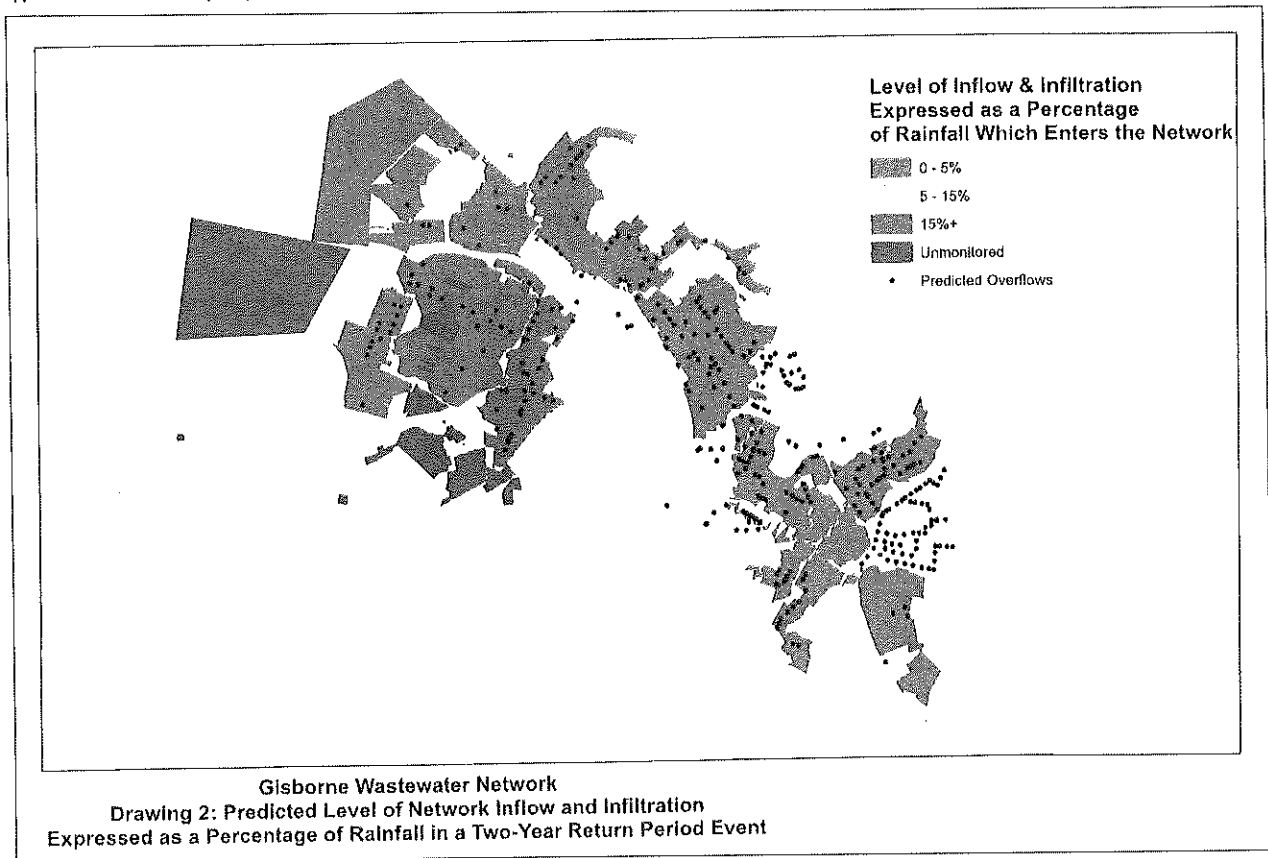
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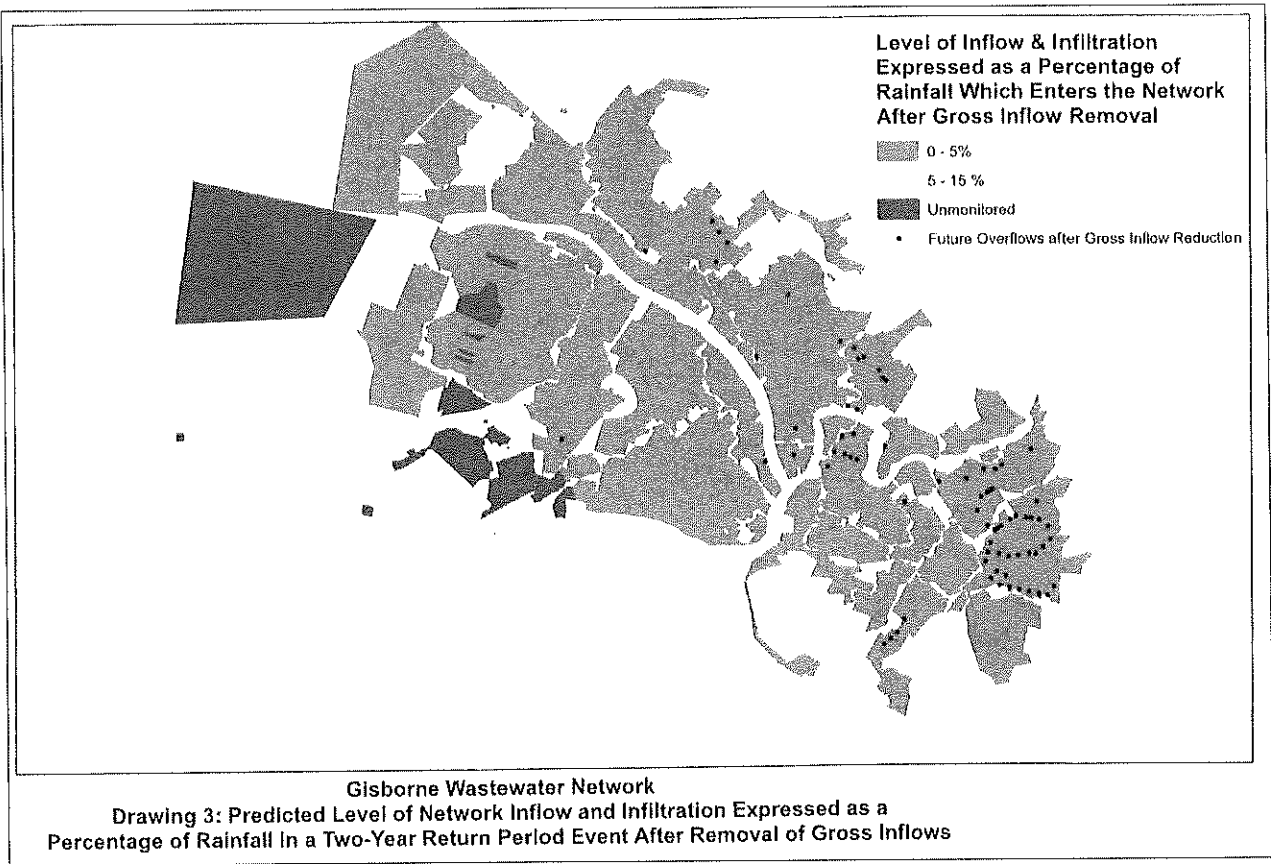
As a reminder there are only 4 possible way's that stormwater can gain access to the wastewater system. Please refer to the diagram below.

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|--|--|
| 1) Council wastewater pipes/manholes   | (poor quality, faults & cracked pipes) |
| 2) Private pipes                       | (poor quality, faults & cracked pipes) |
| 3) Gully Traps                         | (flooding, overtopping & faults)       |
| 4) Illegal connections to pipes & GT's | (roof downpipes, cross connections)    |



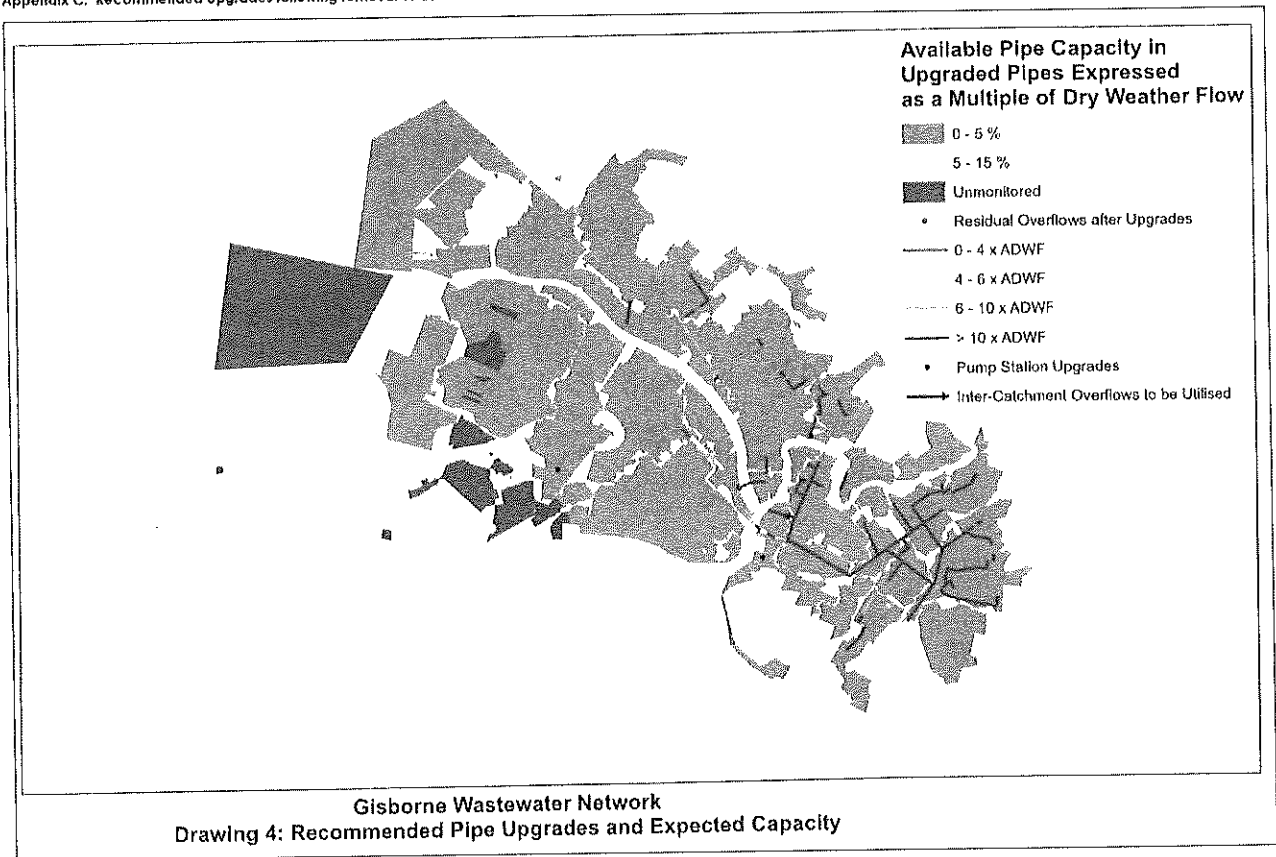
Appendix A: BECA model output 2 yr AEP - Current Predicted Level of Network Inflow and Infiltration







Appendix C: Recommended Upgrades following removal of Gross Inflow Removal



**Subject:** Wastewater Discharge Reduction – Workshop 2

**Prepared by:** Neville West (Water Utilities Manager)

**Meeting Date:** 3 March 2016

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## Report to FUTURE TAIRĀWHITI for noting

### SUMMARY

The purpose of this report is to:

- discuss options for resolutions to issues which are outlined in this document
- consider what levels of reduction will be set
- develop a draft strategy for discussion purposes at workshop number 3.

This is workshop 2 of 4. Workshop 1 covered "The Problem" and Workshop 2 "The resolution".

There are some key strategies/principles that require consideration as they drive the rate of implementation and potential costs. They are:

- Length of time for resolution of issues to reduce inflow and infiltration: High (1 to 12 months), Medium (1 to 10 years), Low (>10 years) once identified.
- The target level of discharge reduction (protection) of diluted wastewater into rivers from a wet weather event:
  - 2 year ARI (Average Recurrence Interval) (50% AEP (Annual Exceedance Probability) - 50% probability of it occurring annually) by 30 June 2026
  - 5 year ARI (20% AEP - 20% probability of it occurring annually) over a 30 year timeframe.
- Progressively reduce high levels of inflow (gross stormwater) by 85% over a 10 year period, reduce medium and low levels of inflow and infiltration over a 30 year period.
- Progressively remove stormwater off private property to an approved outlet where it could cause overtopping of the property gully trap/s for a 10 year ARI (10% AEP - 10% probability of it occurring annually).
- Raise gully trap heights above the 10 year ARI as required by the Building Act following any property flooding mitigation measures.
- Remove property downpipes discharging into the wastewater network and direct to an approved stormwater outlet.
- Develop a prioritised renewal strategy for private property sewer laterals to address rain derived infiltration issues which is considered to be medium/high inflow and infiltration. This will run in parallel with gross water reduction.

- Replacement of private sewer laterals is the responsibility of the property owner.
- Council to budget to clean stormwater outlets up to the property boundary as part of routine maintenance.
- Drainage of on property flooding is the responsibility of the property owner unless it serves to drain three or more properties and provides a wider public benefit, in which case Council may assist or construct and make a public drain that is owned and maintained by Council.
- For new building consents with wastewater implications, require existing and new gully trap/s to be installed and/or raised above the 10 year ARI flood level as required by the Building Act.

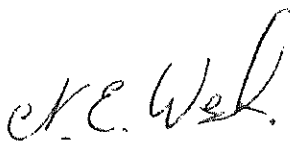
In agreeing guiding strategies/principles we need to consider:

- What priority/timeframe do we place on reducing overflows to rivers and onto private property so that property owners can use their toilets and services during wet weather events?
- Any land based treatment of wastewater will not benefit from having large quantities of stormwater to manage which could compromise treatment quality and add significant cost for storage (buffering).
- From 1 July 2020 emergency wastewater overflows will no longer be a permitted activity (resource consent required), and will require an assessment of environmental effects to water and land, including development of best practical options.
- Recognition of the risks associated with this project due to the amount of unknown issues on private property. This could impact on time and cost.

## RECOMMENDATIONS

That the Committee

1. receives the report.



Neville West  
Water Utilities Manager



Marianne Gillies  
Acting Operations Group Manager

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**Keywords:** Wastewater, Discharge, Reduction, Overflow, Stormwater

## 1. BACKGROUND

There was general acceptance at the last workshop that reducing stormwater entering the wastewater network on private property provided the greatest benefit and also the greatest level of discharge reduction onto private property and into our rivers.

This was supported by evidence from the wastewater model which shows the number of overflows reduced by first removing 85% of gross water (high), then undertaking some upgrading of sewer mains (refer Appendix A1 – current situation, A2 - 85% of gross water (high) removed, A3 – 85% of gross (high) water removed and option of increased capacity of some sewer mains).

### 1.1 Target Reduction Levels

The current reduction target is no overflows to rivers and streams up to a 2 year ARI or 50% AEP – (50% probability of it occurring annually).

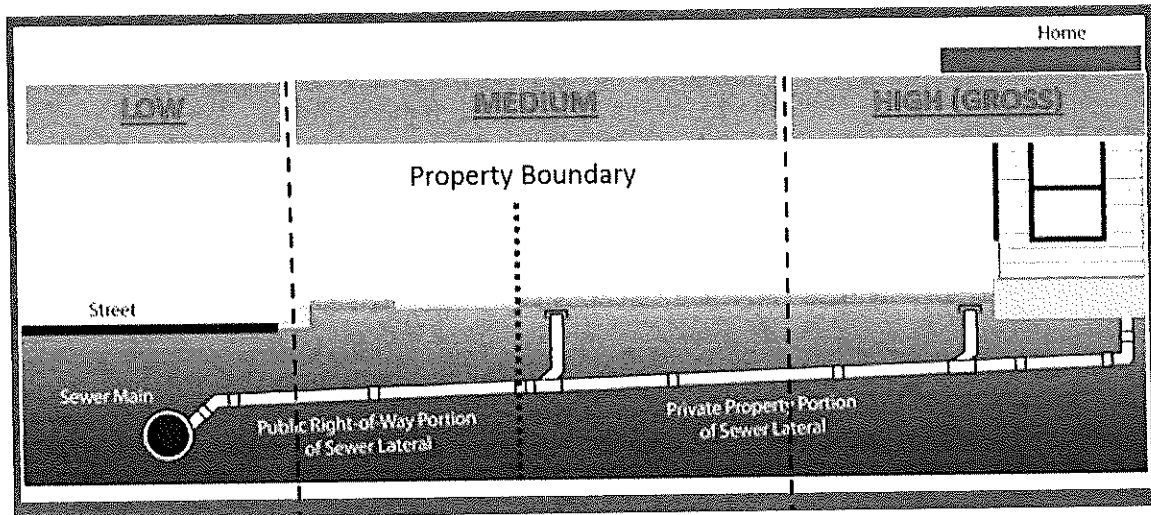
The overriding factor to achieve this is currently set by the Building Act which requires the protection of other property, surface water, resulting from an event having a 10% probability of occurring annually and shall be disposed of in a way that avoids the likelihood of damage or nuisance to other property. It is unrealistic to set a target of no overflows for a 10 Year ARI (10% AEP) for an already established residential area and network. Targeting 10% AEP at the property level should ensure the 2 year level of protection is obtainable and over time a 5 year level of protection is achievable if medium and low levels are also managed in parallel.

### 1.2 Quantity of Stormwater Entering the Wastewater Network

The wastewater network model has been calibrated using three levels of inflow and Infiltration (high, medium and low). This has been based on actual flow logging during wet weather events and the three rates represent the levels of stormwater entering the wastewater network.

- **High** levels of stormwater (gross water) entering the wastewater network comes from on property stormwater flooding which overflows into gully traps or is directly connected to the private property wastewater lateral, faulty gully traps that leak stormwater into it, and downpipes that discharge directly into gully traps.
- **Medium** levels of stormwater entering the wastewater network comes from the wastewater lateral that runs from Council's main to the house and are a combination of groundwater infiltration and rainfall dependent infiltration. Some medium inflow also comes from public manholes where rainwater makes its way into the system.
- **Low** levels of stormwater entering the wastewater network comes from Council's mains and manholes in the road and are a result of groundwater infiltration seeping through cracks in the mains and form a base flow and are less reactive to rain events.

Figure 1: Levels of Inflow and Infiltration



We are unlikely to remove all the high level sources of stormwater entering the network and therefore have assumed that it is possible to remove 85%, which has been modelled. The model anticipates a very good level of reduction of overflows if this target is achieved. This does not mean that medium/low levels are ignored and it is assumed there will still need to be some remedial work progressing in parallel, but not to the same level of urgency or enforcement. We are certain there will be some overlaps, hence the need to run parallel interventions.

## 2. DISCUSSION

### 2.1 General

It is accepted the status quo is not an option and is unacceptable to the community.

The use of storage tanks to capture any discharge to rivers provides no improvement to private property, does not prevent overflows on to private property and therefore is not a valid solution by itself.

Increasing the size and capacity (pipes, pumps, treatment) of the wastewater system to account for greater volumes of stormwater inputs (i.e. just allowing gross inputs to continue) is not seen as a sustainable solution – and how much do we design for? At some point stormwater inflows would exceed our design assumptions. Capital, operational and depreciation costs would also increase. Combining both the stormwater and wastewater system is not seen as a viable option due to the level of infrastructure required to be built and would prove difficult to treat.

**Direction Sought:** *Are any of the above options worthy of any further investigation?*

### 2.2 Target Levels of Reduction

It is essential to set targets for reduction to ensure expectations are clear. As already stated the Building Act sets a gully trap protection level for a storm event that has a 10% probability of happening in any given year, which is equivalent to a 10 Year ARI rain event at an individual property level. This level of protection does not exist and would be the benchmark for improvements. Given these are existing residential sites and given the level of investigation required over 12,800 houses to reduce gross water by 85%, the net improvement at rivers and streams will be much less.

For our case study we know that 4 out of 130 houses with their downpipes connected to the sewer can inundate that part of the network. When this is extrapolated to the whole city it demonstrates the enormity of the task ahead.

### 2.3 High Levels of Stormwater

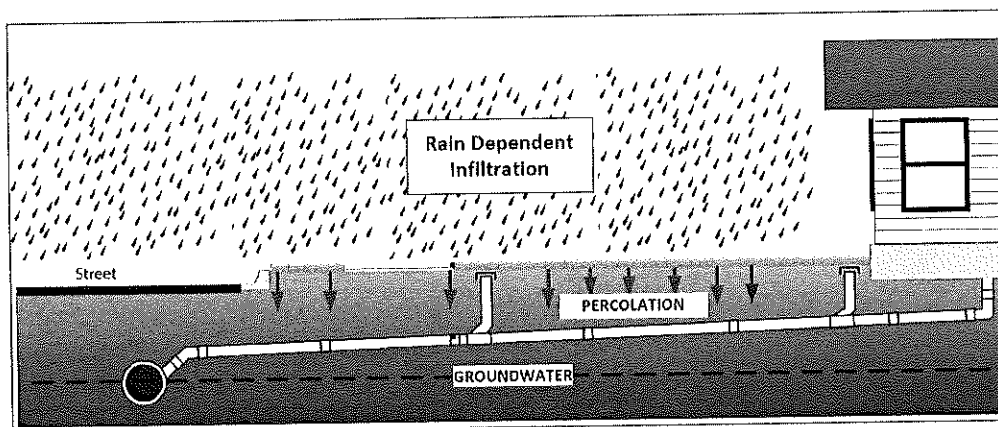
To achieve 85% reduction of high sources of stormwater for a 2 year ARI means that the following issues need to be addressed:

- Flooding on private property that could cause a nuisance to the wastewater network needs to be controlled, managed and discharged to an approved outlet.
- Gully traps need to be raised above an agreed flood level when they are within a flooding area. There are significant risks if only the gully trap is raised and the property flooding issues are not addressed at the same time. If flooding is not resolved but the gully trap is raised it is likely that at some time in the future an illegal connection will be made into the property sewer lateral to drain the stormwater.
- Faulty gully traps can allow large quantities of stormwater to enter the wastewater system and are required to be repaired. These can account for similar amounts of water getting into the wastewater system as the overtopping gully traps, and are more commonly found to be an issue.
- Roof downpipes and illegal cross connections that discharge into gully traps need to be removed and redirected to an approved stormwater outlet, to ensure that they are not redirected back into the gully trap at some time in the future.

### 2.4 Medium Levels of Stormwater

Medium levels of stormwater entering the wastewater network are predominantly through the private property sewer laterals, being the shallowest component. Rainfall dependent infiltration (RDI) occurs with sewer laterals that are close to the surface and, when it rains, stormwater percolates into the cracked pipes, in addition to any groundwater infiltration happening at a baseline flow during dry weather.

**Figure 2: Rain Dependent Infiltration**



Plumbers and drainlayers state that most property owners choose to undertake spot repairs to their sewer laterals rather than comprehensively replace (cost dependent). The property owners have no active requirement to replace any old and leaking pipes and Council has no strategy to require them to replace.

There is a level of overlap between high, medium and low levels of stormwater entering the wastewater network and therefore some management of medium levels needs to be addressed in parallel.

**Direction Sought:** *Would the development of an enforceable prioritised renewal strategy of private property laterals be worthwhile?*

## 2.5 Low Levels of Stormwater

Low levels of stormwater are a result of infiltration in Council mains and are largely from groundwater derived sources due to the fact that our mains are generally laid below the winter watertable. Addressing the 'low' issue is asset related to a renewal programme based on structural failure rather than just leakage.

- There are about 226km of Council sewer mains which are managed separately to this project but are prioritised based on leakiness. There will be mains that will be replaced due to structural issues rather than just leakiness or capacity reasons.

## 3. OPTIONS

### 3.1 Remediation Options – High Level

#### On Property Flooding Reduction

New Zealand Building Code Clause E1 Surface Water

#### OBJECTIVE

E1.1 The objective of this provision is to:

- (a) Safeguard people from injury or illness, and other property from damage, caused by surface water, and
- (b) Protect the outfalls of drainage systems.

#### FUNCTIONAL REQUIREMENT

E1.2 Buildings and sitework shall be constructed in a way that protects people and other property from the adverse effects of surface water.

#### PERFORMANCE

E1.3.1 Except as otherwise required under the Resource Management Act 1991 for the protection of other property, surface water, resulting from an event having a 10% probability of occurring annually and which is collected or concentrated by buildings or sitework, shall be disposed of in a way that avoids the likelihood of damage or nuisance to other property.

E1.3.2 Surface water, resulting from an event having a 2% probability of occurring annually, shall not enter buildings.

E1.3.3 Drainage systems for the disposal of surface water shall be constructed to:

- (a) Convey surface water to an appropriate outfall using gravity flow where possible,
- (b) Avoid the likelihood of blockages,
- (c) Avoid the likelihood of leakage, penetration by roots, or the entry of ground water where pipes or lined channels are used,
- (d) Provide reasonable access for maintenance and clearing blockages,
- (e) Avoid the likelihood of damage to any outfall, in a manner acceptable to the network utility operator, and
- (f) Avoid the likelihood of damage from superimposed loads or normal ground movements.

#### LOCAL GOVERNMENT ACT

Sect 459: Council may require owners of land in certain cases to provide private drains

Sect 462: Council may declare private drain to be public drain

Sect 467: Unlawful connection of private drain

A stormwater model has been constructed and one of the outputs was the city digital terrain contour map to identify low points where stormwater will accumulate if not drained. Based on this information an analysis of Kaiti area indicates that there are potentially 1,080 properties that could be affected by property flooding. An unknown proportion of these will be managing their stormwater appropriately. This is a conservative estimate and can only be verified by property inspections, questionnaires and wet weather inspections.

There is certainty that there are sufficient properties experiencing on property flooding that is significantly impacting on the wastewater network. Based on Catchment 20 (our case study catchment), 2 properties out of 130 that are flooding, and the stormwater is flowing into the gully trap, will use the full capacity of the sewer network leading to overflows.

**Table 1: Potential property flooding Kaiti**

<b>Kaiti Area 1</b>	<b>Hectares</b>	<b>Houses Affected</b>	<b>Public (# Drains)</b>	<b>Private (# Drains)</b>
Medium Risk	90 Ha	960	40	720
High Risk	10 Ha	120	15	30
<b>TOTAL</b>	<b>100 Ha</b>	<b>1080</b>	<b>55</b>	<b>750</b>

Currently to resolve on property flooding it is necessary to construct a piped or open drain to manage the flooding, this would be either a public drain which Council constructs and maintains or a private drain which the property owner will be required to construct and maintain. Where there is a wider benefit Council has either contributed financially or constructed a public drain. Currently drainage of 3 or more properties could result in Council constructing a public drain provided there is a wider community benefit which is assessed on a case by case basis. We have examples of flats or subdivided land developments which have created the problem and property owners are looking to Council to resolve.

Our first objective is to ensure that people are able to drain their land to an approved outlet, then secondly for it be drained efficiently.

- Direction Sought:**
- *Should Council require the management or drainage of stormwater where it is at risk of entering the wastewater network on private property, thereby creating a nuisance?*
  - *Should Council adopt the minimum level of protection of 10% AEP to manage stormwater on private property as required in the Building Code?*
  - *When should Council own and maintain a stormwater drain (piped or open) on private property?*
  - *Should all high level stormwater issues be required to be resolved within 1-12 months from date of notification?*

### **Gully Trap Heights**

The Building Code sets a minimum gully trap level for nuisance resulting from an event having a 10% probability of occurring annually. This is equivalent to a 10 Year ARI and is the current minimum for setting a gully trap height where they are within a flood area.

- Direction Sought:**
- *Should Council adopt the minimum 10% rain event probability for setting gully trap heights above that flood level?*
  - *Should gully traps be required to be raised before on property flooding is resolved? Note that this may raise the flood level in the short term until stormwater is properly managed.*



- *Should gully traps be required to be raised to be above the flood level for all new Building Consents when there are implications on the sewer network?*

### Faulty Gully Traps

#### Gully Traps not in a flood area

- 3.3.1 All gully traps shall be constructed to prevent the ingress of surface water and foreign bodies likely to cause a blockage, shall be located within the legal boundary of the land on which the building is erected, and shall have:
- a) The overflow level of the gully dish no less than:
    - i) 25 mm above paved surfaces, or
    - ii) 100 mm above unpaved surfaces,
  - b) A grating that will allow surcharge,
  - c) A minimum outlet pipe diameter of 100 mm,
  - d) A water seal depth of at least 65 mm,
  - e) At least one discharge pipe discharging to the gully trap to avoid water seal evaporation,
  - f) Waste pipes that discharge to the gully trap arranged to permit easy cleaning of the gully trap,
  - g) Waste pipe outlets located at least 20 mm above water seal level, and at least 20 mm below the grating,
  - h) The top of the water seal no more than 600 mm below the top of the gully dish,
    - i) Adequate support from bedding and backfilling with:
      - i) concrete no less than 75 mm thick surrounding the entire gully dish and which is separated from the building foundation, where the gully trap is likely to be damaged, or
      - ii) compacted bedding material complying with Paragraph 2.2.1, in other areas, and
  - j) A minimum of 600 mm clear access space above the gully dish.
- 3.3.2 In order to provide overflow relief for the drainage system, every building used for Housing shall be provided with at least one gully trap which shall:
- a) Be positioned so that the top of the gully dish is no less than 150 mm below the overflow level of the lowest sanitary fixture served by the drainage system,
  - b) Have a grating that will allow surcharge,
  - c) Be located in a visible position, and
  - d) Be installed so that surcharge cannot enter into or under buildings.

Currently Council staff undertake minor repairs to gully traps as it is considered the most cost effective approach.

Where raising a gully trap is required to meet height requirements or a new gully trap is required the property owners are notified to undertake the repairs.

- Direction Sought:**
- *Should staff continue to enforce compliance with the Building Code for gully traps?*
  - *Should staff continue to undertake minor repairs to gully traps?*

### Removal of Stormwater Downpipes Discharging into Sewer

Based on Catchment 20, 4 houses out of 130 with downpipes flowing into the gully trap will use the full capacity of the sewer network, leading to overflows. The current response is to immediately serve notice to remove and redirect to an approved outlet and complete within the minimum timeframes allowed in the Local Government Act which equates to 40 days. Historically we have not required connection to an approved outlet, just removed from the gully trap.

**Direction Sought:** *Should staff continue to immediately serve notice and impose the minimum compliance times for removal of downpipes from the sewer?*

### 3.2 Remediation Options - Medium Level

#### Private Property Lateral Replacements

Requirements under the Building Code - G13.3.1  
 The plumbing system shall be constructed to:

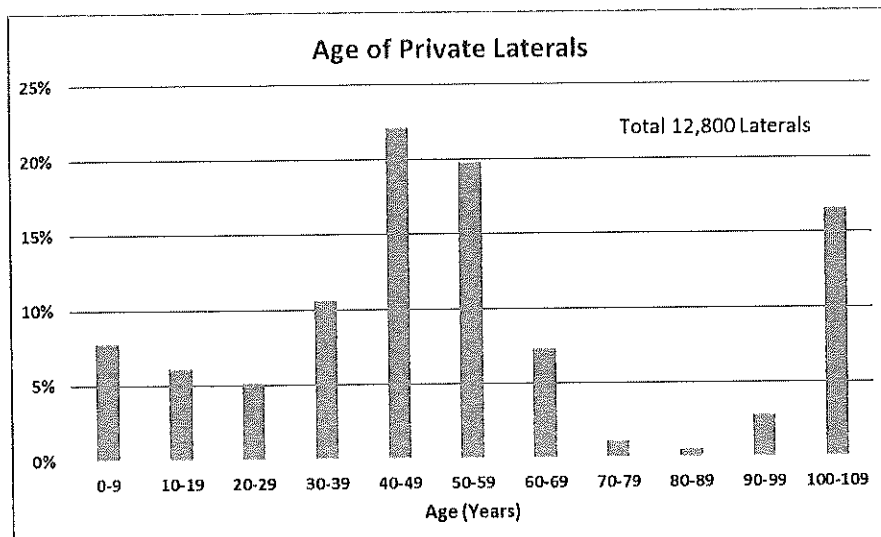
- (a) convey foul water from buildings to a drainage system,
- (b) avoid the likelihood of blockage and leakage,
- (c) avoid the likelihood of foul air and gases entering buildings, and
- (d) provide reasonable access for maintenance and clearing blockages.

Based on the age of Council's mains the age profile of private sewer laterals is estimated to be:

**Table 2: Age of Private Property Laterals**

Age	%	Comment
<50 years Old	52%	Over the next 30 years a further 38% of laterals will be older than 50 years
>50 Years Old	48%	Likely to require replacement over the next 15 - 30 years (20%)
>60 Years Old	28%	Likely to require replacement over the next 10 - 20 years (8%)
>75 Years Old	20%	This would average 256/yr renewals over the next 10 years (20%)

**Figure 2: Age profile of Private Property Laterals**



There is currently no active renewal programme of private property sewer laterals. CCTV inspections suggest there is a need for a renewal strategy. When Council replaces the sewer main in the road it also replaces the sewer lateral from the main to the property boundary but the private property owner does not replace their portion. Over the last 10 years any inspections of the private lateral has only required spot repairs rather than full replacement. Given the age profile of private property laterals a renewal strategy is required to target the oldest and most leaky laterals.

**Direction Sought:** *Should a private property renewal strategy be developed, agreed and implemented?*

The cost to replace individual sewer laterals on private property is in the range of \$5,000 - \$9,000, and will be largely determined by length, location of the sewer lateral relative to established driveways, footpaths, gardens and any other underground services. The private lateral is considered to have 100% private benefit.

There are two options for undertaking the replacement of the private property sewer lateral:

- 1) Property owners manage the replacement of their own sewer lateral with their drain layer.
- 2) Council runs a contract on behalf of property owners for multiple lateral replacements.

There are significant risks for Council to run multiple private property contracts:

- Council will add on additional costs to each job for scoping, tendering and supervision.
- High financial risk of people not paying or slow payers.
- Potential disputes around reinstatement/workmanship adding on additional Council costs.
- Local drainlayers might miss out if contracts are too large or specialised renewal methods are adopted.
- Less flexibility for property owners to when work will be undertaken.

Assuming a 42 week construction year, to replace all laterals 75 years or older would require 6 replacements per week. This will be in addition to any on property stormwater work.

Some local contractors have indicated that they are prepared to resource for additional work provided that there a consistent ongoing work stream.

It is intended to monitor costs and also work with contractors to develop a sustainable workload and remediation options, and review annually to confirm if the strategy is still appropriate.

Council also owns the portion of lateral from the property boundary to the main and it would seem sensible to replace our portion at the same time as the property owner upgrades theirs, given that we will still need to continue to replace sewer mains and, with competing needs for funding, we need to remain flexible. The construction of our portion of the lateral will be much more expensive due to the increased depth, services in the road and the higher level of costs for reinstatement in the road.

- Direction Sought:**
- *Who should manage the replacement of the private property sewer lateral?*
  - *Should Council replace its portion of the sewer lateral at the same time the private property owner replaces theirs?*
  - *Should all medium level stormwater issues be required to be resolved within 1-10 years from date of notification?*

### **3.3 Remediation Options - Low Level**

Council's sewer mains consist of a wide range of material types. The leakiest and structurally the poorest condition is earthenware of which there is approximately 54km which represent 24% of the Council's sewer mains. There are several options for the remediation of this type of pipe being:

- total replacement
- relining, using an internal liner
- chemical grouting.

It is likely that all 3 options will be used and will be determined from condition assessments using CCTV and timing of mains replacement.

**Direction Sought:** *Does a renewal strategy need to be developed for Council's sewer mains for earthenware pipe to reduce groundwater infiltration and reduce the risk of pipe collapse?*

### **3.4 Other Issues**

#### **Sewer Main Upgrades**

The sewer network model has identified sewer pipes that are required to be upgraded on the assumption that gross inflow has been significantly reduced (refer Appendix A3). The upgrade costs will be a combination of renewal budget and new capital.

There will be further work required to optimise the required upgrades to match pipe grade and diameter to ensure self-cleansing velocities can be achieved. This will avoid additional jet cleaning of pipes to remove solids deposition which will impact on the network performance and optimize operational costs.

**Direction Sought:** *Should part of the strategy to reduce overflows include for some sewer mains to be upsized as shown by the wastewater network model?*

#### **Stormwater Upgrades**

The integrated stormwater model recently developed for Kaiti will enable future pipe upgrades to be determined but the initial assessment suggests that the piped reticulation generally has sufficient capacity. The primary pipe system is supported by a secondary flowpath which operates once the primary pipe system is full. This secondary flowpath is surface water flowing towards a stream and may flow across private property and/or along roads and caters for very large storm events. It is important to define these secondary flowpaths and ensure they operate correctly when required. These have yet to be clearly defined within the model and are proposed to be identified in the District Plan, once determined.

There is one outstanding upgrade, which is Rutene Road (De Lautour Road to Harris Street). This has been deferred until we have an operative stormwater model which will be used for this upgrade to optimise the design. At this stage we are not aware of any further upgrades

in the Kaiti area. The stormwater model has not yet been developed for the rest of the city, west of the Waimata and Turanganui Rivers.

Open roadside drains require property owners to install entranceway culverts to gain access to their property. There are ongoing issues with the size of the pipes that have been installed being under-capacity and/or not maintained. Ownership and responsibility of these remain with the property owner but there is sufficient argument to say that it should be the responsibility of Council to upgrade them. It is proposed that Council will upgrade these culverts as required but the ongoing ownership will still be with the property owners.

**Direction Sought:** *Should Council renew any under-capacity or inadequate entranceway culverts that restrict the efficient flow of stormwater or increase the risk of blockages?*

### **Efficient Network**

The improvements will need to be supported by a comprehensive ongoing maintenance strategy and inspections to ensure the network will continue to operate effectively. By way of example, ensure that a sewer main cleaning programme is in place to ensure the full capacity of the pipe is available and not filled with sediment and fat deposits. Stormwater grates on private property are regularly inspected to ensure they have not been covered over or blocked in some way. As work progresses maintenance plans will be regularly reviewed, updated and budget promoted to support them.

A check of private property stormwater lines which discharge into the kerb and channel was undertaken; 70% of the pipes were blocked. We see no efficient way of ensuring private stormwater systems are maintained other than by education and reminders. The most efficient way is for Council to jet clean private lines (kerb and channel to property boundary) on a 5 yearly basis but not own the private property connection.

Currently property owners are expected to keep their entranceway culverts clean and operative to ensure an efficient network; the overall performance can be compromised if they are not cleaned and they are largely not maintained.

**Direction Sought:**

- *Should we clean private stormwater lines on a routine basis (kerb and channel to property boundary)?*
- *Should we keep the culverts clean/operative to ensure an efficient network?*

### **Customer Focus**

Property owners should be advised of all improvement works required on the property regardless of the fact that these may have differing deadlines for completing the work, depending on the issue (principle 'touch once'). There is the potential regardless of timelines for it to be cheaper, more efficient and less disruptive to undertake some work together.

This will mean that should any inspections identify an issue requiring fixing then a comprehensive survey will be completed and a full summary of findings will be provided to the property owner so they are aware of all the outstanding issues on the property.

**Direction Sought:** *Should we adopt a "One Touch" approach with property owners?*

## **4. SUMMARY OF DIRECTION SOUGHT**

### **4.1 Discussion - General**

- Are any of the following worthy of any further investigation (status quo, storage, combined stormwater/wastewater system)?

### **4.2 Remediation Options - High Level**

- Should Council require the management or drainage of stormwater where it is at risk of entering the wastewater network on private property thereby creating a nuisance?
- Should Council adopt the minimum level of protection of 10% probability to manage stormwater on private property?
- When should Council own and maintain a stormwater drain (piped or open) on private property?
- Should all high level stormwater issues be required to be resolved with 1-12 months from date of notification?
- Should Council adopt the minimum 10% rain event probability for setting gully trap height above that flood level?
- Should gully traps be raised before on property flooding is resolved?
- Should gully traps be required to be raised to be above the flood level for all new building consents when there are implications on the sewer network?
- Should staff continue to enforce compliance with the Building Code for gully traps?
- Should staff continue to undertake minor repairs to gully traps?
- Should staff continue to immediately serve notice and impose the minimum compliance times for removal of downpipes from the sewer?

### **4.3 Remediation Options - Medium Level**

- Should a private property renewal strategy be developed, agreed and implemented?
- Who should manage the replacement of the private property sewer lateral?
- Should Council replace its portion of the sewer lateral at the same time the private property owner replaces theirs?
- Should all medium level stormwater issues be required to be resolved within 1-10 years from date of notification?

### **4.4 Remediation Options - Low Level**

- Does a renewal strategy need to be developed for Council's sewer mains for earthenware pipe to reduce ground water infiltration and reduce the risk of pipe collapse?

### **4.5 Sewer Main Upgrades**

- Should part of the strategy to reduce overflows include for some sewer mains to be upsized as shown by the wastewater network model?

#### 4.6 Stormwater Upgrades

- Should Council renew any under-capacity or inadequate entranceway culverts that restrict the efficient flow of stormwater or increase the risk of blockages?

#### 4.7 Efficient Network

- Should Council clean private stormwater lines on a routine basis (kerb and channel to property boundary)?
- Should Council keep the culverts clean/operative to ensure an efficient network?

#### 4.7 Customer Focus

- Should Council adopt a "One Touch" approach with property owners?

### 5. RISKS

A summary of risks is provided in the table below. Of particular note is the extent of on property issues that are unknown and we do not believe that it is cost-effective to undertake all the investigation work first as this will delay remediation work by years. We have adopted a case study approach to run in parallel so that we can confirm strategies and effectiveness of remediation options but the case study is reliant on wet weather to confirm improvements.

**Table 3: Potential Risks**

Risk	Level	Mitigation Options
Unable to meet the ten year target due to increase in issues identified on private property	H	<ul style="list-style-type: none"> <li>• Prioritise remediation work to largest contributors of stormwater (risk based approach)</li> <li>• Extend target dates</li> <li>• Modify levels of service and objectives</li> <li>• Increase staffing numbers</li> </ul>
Private property cannot afford the repairs	H	<ul style="list-style-type: none"> <li>• Investigate alternative technology to speed up productivity and reduce construction costs</li> <li>• Reprioritise work to an affordable level and extend timelines</li> <li>• Incentivise owners to commit to expenditure</li> <li>• Look for alternative funding options</li> <li>• Balance Council expenditure requirements against public spend</li> <li>• Explore efficiencies of scale,</li> <li>• Extend repair timeframes for lower risk repairs (med &amp; Low only)</li> </ul>
Not enough contractors to complete the work when required (Public/Private)	H	<ul style="list-style-type: none"> <li>• Inform contractors of direction to determine their resourcing capability</li> <li>• Spread work deadlines and reprioritise</li> <li>• Investigate alternative technology to open cut</li> <li>• Advise outside contractors of potential work</li> <li>• Council organise and tender the private work (additional resourcing required)</li> <li>• Organise a constant work programme to allow resourcing to align with demand</li> </ul>
Improvements don't achieve objectives	M	<ul style="list-style-type: none"> <li>• Reduce gross inflow and check improvements for Kaiti or sub catchment with Kaiti</li> <li>• Use case study areas to confirm strategy and re-evaluate</li> </ul>
Inspection information collected is unreliable and of low quality	M	<ul style="list-style-type: none"> <li>• QC auditing processes put in place of completed inspections to provide confidence in the data and ensure that our methodologies are robust.</li> </ul>

## **6. SIGNIFICANCE**

This is a significant issue for Council:

- history of wide public interest
- involves strategic assets (wastewater/stormwater)
- cultural significance with human waste into water
- financially significant due to the large budget allocated to this project.

## **7. COMMUNITY OUTCOMES**

This project will contribute considerably to the following Council Outcomes:

- Environmentally Sustainable Tairāwhiti
- Healthy Tairāwhiti
- Connected Tairāwhiti
- Safe Tairāwhiti.

## **8. STRATEGIC CHALLENGES**

The strategic challenge areas that this project will contribute to are:

- (SC4): Major Projects
- (SC5): Natural Resource Use
- (SC6): Financial Sustainability
- (SC10): Customer Needs.

## **9. POLICY**

This project will result in better alignment with likely discharge related policies in the Regional Freshwater Plan. There ultimately will lead to policy requirements to give effect to an agreed strategy.

## **10. LEVELS OF SERVICE**

The project will contribute to the stated wastewater level of service for Gisborne city:

*We contribute to a Healthy, Safe, Prosperous, Environmentally Sustainable and Connected Tairāwhiti through the provision of a well-managed wastewater reticulation system which protects public health and the physical environment.*

## **11. FINANCIAL**

Currently Council has committed funding through the Long Term Plan over a ten year period.

## **12. LEGAL**

May require the development of a Drainage Bylaw to ensure strategies can be implemented.

## **13. CONSULTATION**

Consultation for this project has been undertaken through the current Long Term Plan process.

## **14. OTHER CONSIDERATIONS**

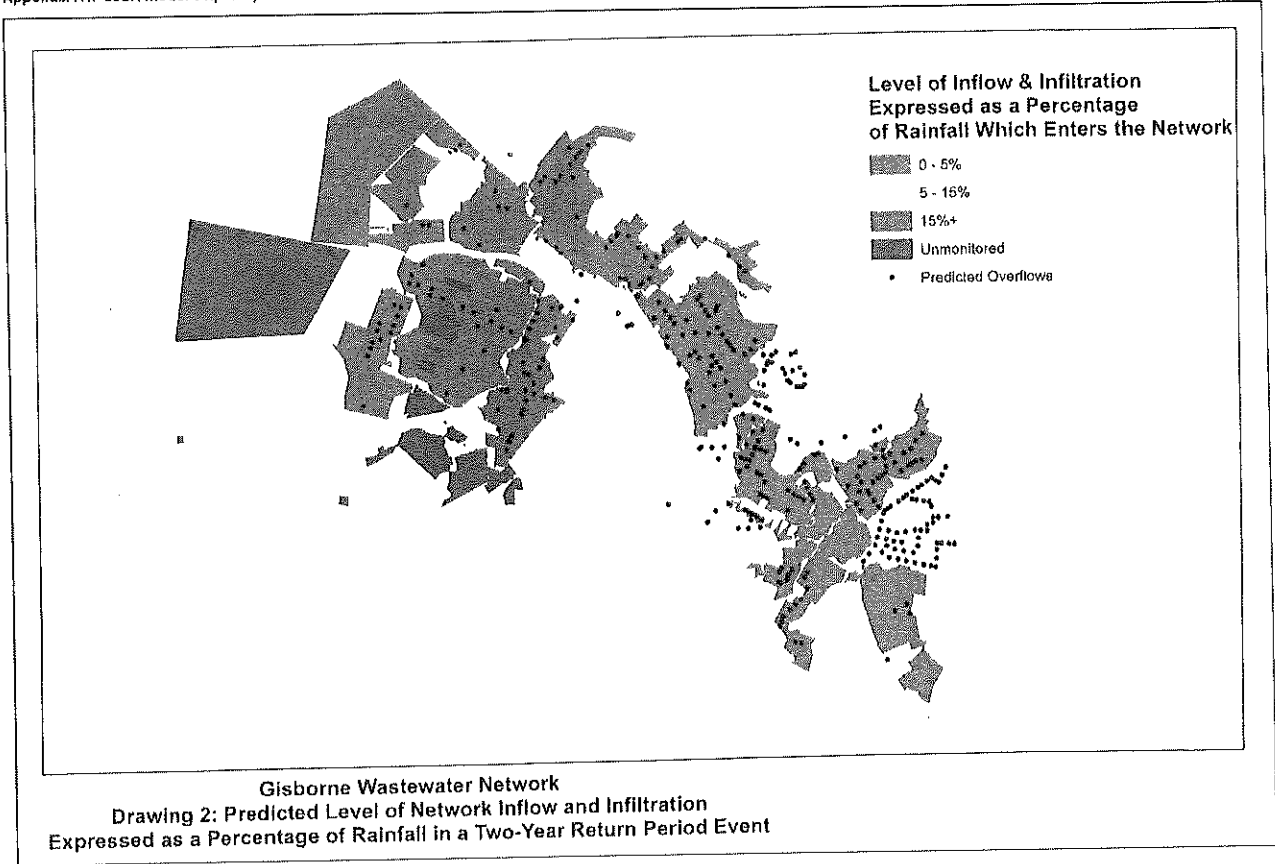
There are no other considerations.

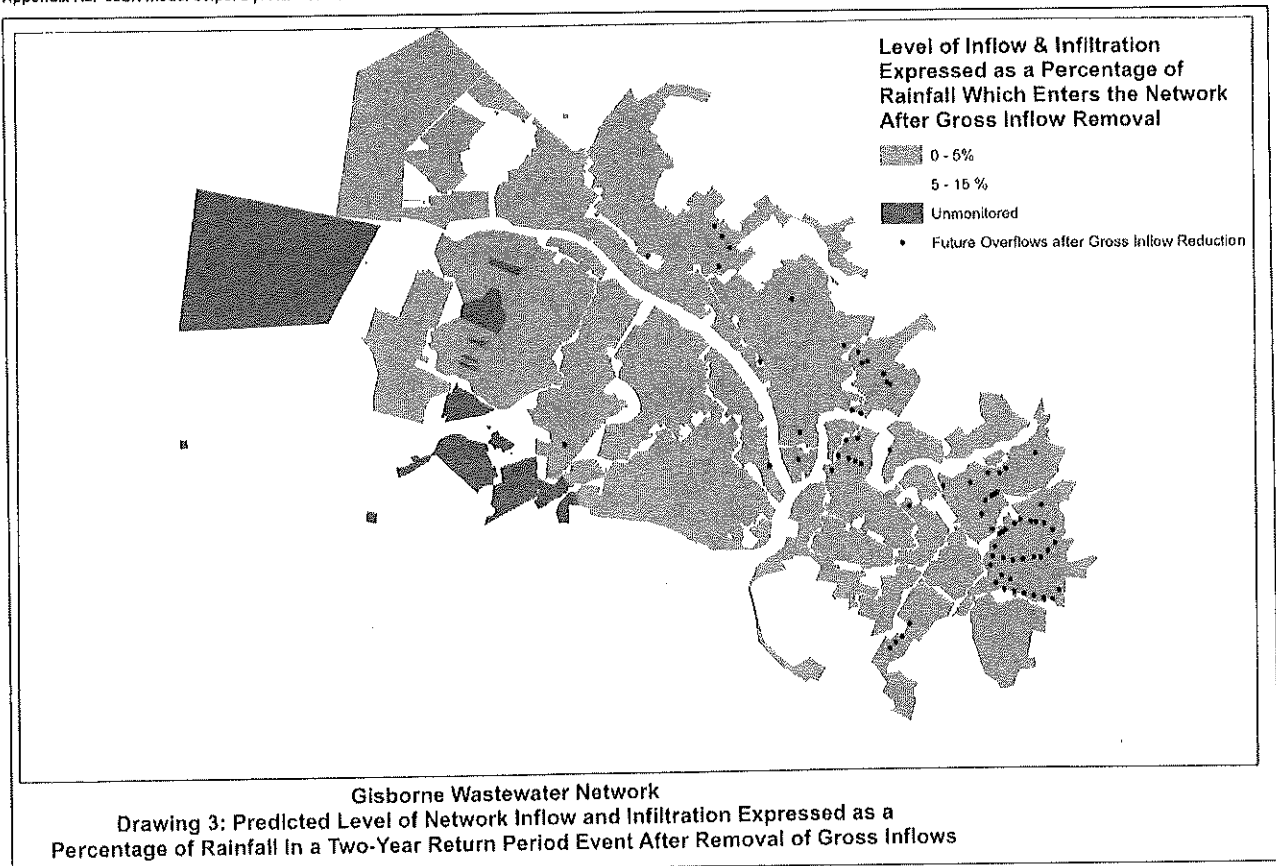
## **15. APPENDICES**

- BECA wastewater model outputs (3 Plans) - Appendix A1, A2, A3

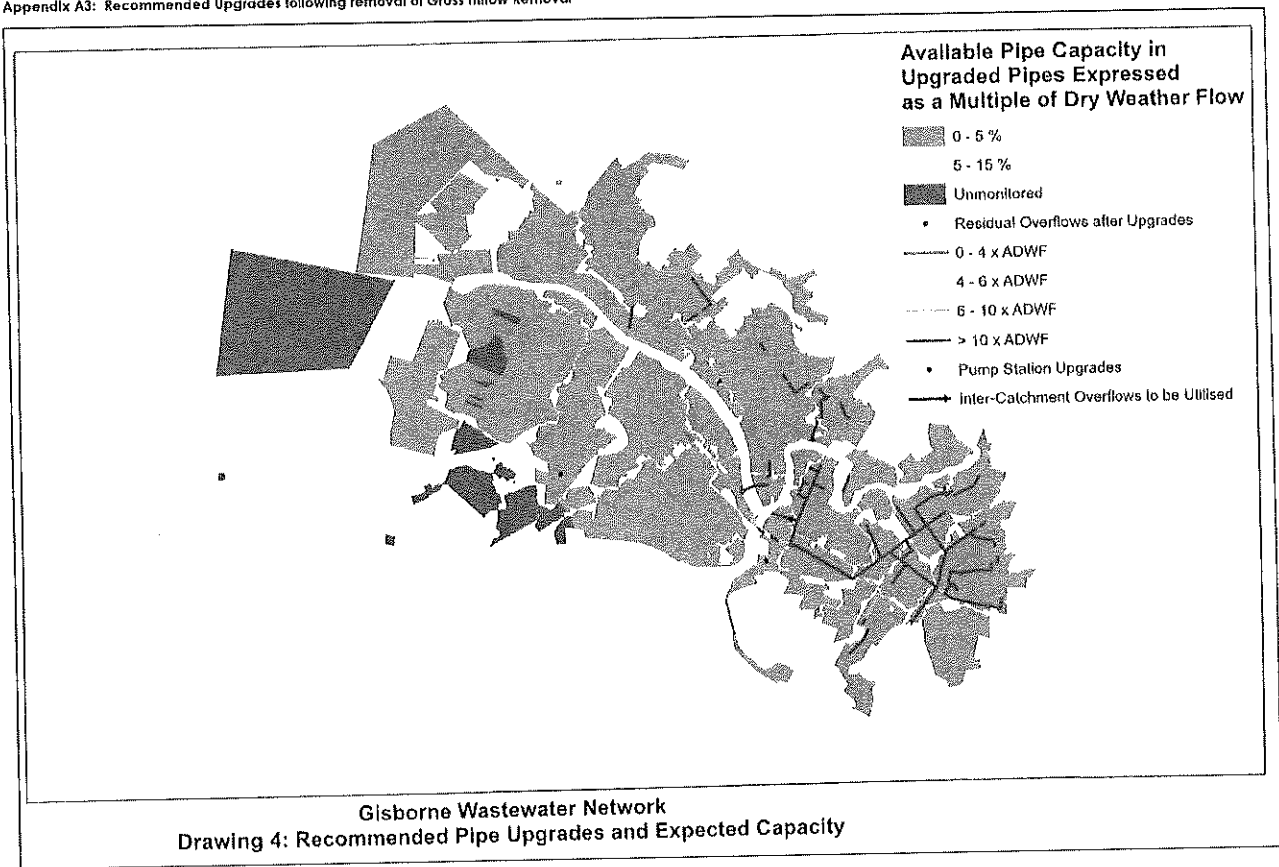


Appendix A1: BECA model output 2 yr AEP – Current Predicted Level of Network Inflow and Infiltration





Appendix A3: Recommended Upgrades following removal of Gross Inflow Removal



**Subject:** Wastewater Discharge Reduction – Workshop 2

**Prepared by:** Neville West (Water Utilities Manager)

**Meeting Date:** 3 March 2016

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## Report to FUTURE TAIRĀWHITI for noting

### SUMMARY

The purpose of this report is to:

- discuss options for resolutions to issues which are outlined in this document
- consider what levels of reduction will be set
- develop a draft strategy for discussion purposes at workshop number 3.

This is workshop 2 of 4. Workshop 1 covered "The Problem" and Workshop 2 "The resolution".

There are some key strategies/principles that require consideration as they drive the rate of implementation and potential costs. They are:

- Length of time for resolution of issues to reduce inflow and infiltration: High (1 to 12 months), Medium (1 to 10 years), Low (>10 years) once identified.
- The target level of discharge reduction (protection) of diluted wastewater into rivers from a wet weather event:
  - 2 year ARI (Average Recurrence Interval) (50% AEP (Annual Exceedance Probability) - 50% probability of it occurring annually) by 30 June 2026
  - 5 year ARI (20% AEP - 20% probability of it occurring annually) over a 30 year timeframe.
- Progressively reduce high levels of inflow (gross stormwater) by 85% over a 10 year period, reduce medium and low levels of inflow and infiltration over a 30 year period.
- Progressively remove stormwater off private property to an approved outlet where it could cause overtopping of the property gully trap/s for a 10 year ARI (10% AEP - 10% probability of it occurring annually).
- Raise gully trap heights above the 10 year ARI as required by the Building Act following any property flooding mitigation measures.
- Remove property downpipes discharging into the wastewater network and direct to an approved stormwater outlet.
- Develop a prioritised renewal strategy for private property sewer laterals to address rain derived infiltration issues which is considered to be medium/high inflow and infiltration. This will run in parallel with gross water reduction.

- Replacement of private sewer laterals is the responsibility of the property owner.
- Council to budget to clean stormwater outlets up to the property boundary as part of routine maintenance.
- Drainage of on property flooding is the responsibility of the property owner unless it serves to drain three or more properties and provides a wider public benefit, in which case Council may assist or construct and make a public drain that is owned and maintained by Council.
- For new building consents with wastewater implications, require existing and new gully trap/s to be installed and/or raised above the 10 year ARI flood level as required by the Building Act.

In agreeing guiding strategies/principles we need to consider:

- What priority/timeframe do we place on reducing overflows to rivers and onto private property so that property owners can use their toilets and services during wet weather events?
- Any land based treatment of wastewater will not benefit from having large quantities of stormwater to manage which could compromise treatment quality and add significant cost for storage (buffering).
- From 1 July 2020 emergency wastewater overflows will no longer be a permitted activity (resource consent required), and will require an assessment of environmental effects to water and land, including development of best practical options.
- Recognition of the risks associated with this project due to the amount of unknown issues on private property. This could impact on time and cost.

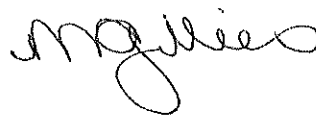
## RECOMMENDATIONS

That the Committee

1. receives the report.



Neville West  
Water Utilities Manager



Marianne Gillies  
Acting Operations Group Manager

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**Keywords:** Wastewater, Discharge, Reduction, Overflow, Stormwater

## 1. BACKGROUND

There was general acceptance at the last workshop that reducing stormwater entering the wastewater network on private property provided the greatest benefit and also the greatest level of discharge reduction onto private property and into our rivers.

This was supported by evidence from the wastewater model which shows the number of overflows reduced by first removing 85% of gross water (high), then undertaking some upgrading of sewer mains (refer Appendix A1 – current situation, A2 - 85% of gross water (high) removed, A3 – 85% of gross (high) water removed and option of increased capacity of some sewer mains).

### 1.1 Target Reduction Levels

The current reduction target is no overflows to rivers and streams up to a 2 year ARI or 50% AEP – (50% probability of it occurring annually).

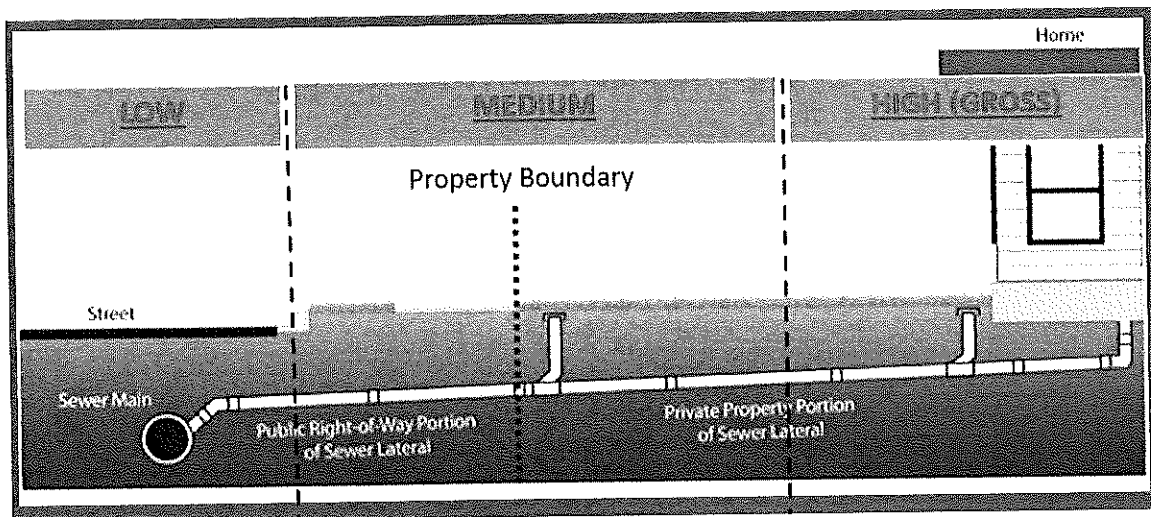
The overriding factor to achieve this is currently set by the Building Act which requires the protection of other property, surface water, resulting from an event having a 10% probability of occurring annually and shall be disposed of in a way that avoids the likelihood of damage or nuisance to other property. It is unrealistic to set a target of no overflows for a 10 Year ARI (10% AEP) for an already established residential area and network. Targeting 10% AEP at the property level should ensure the 2 year level of protection is obtainable and over time a 5 year level of protection is achievable if medium and low levels are also managed in parallel.

### 1.2 Quantity of Stormwater Entering the Wastewater Network

The wastewater network model has been calibrated using three levels of inflow and infiltration (high, medium and low). This has been based on actual flow logging during wet weather events and the three rates represent the levels of stormwater entering the wastewater network.

- **High** levels of stormwater (gross water) entering the wastewater network comes from on property stormwater flooding which overflows into gully traps or is directly connected to the private property wastewater lateral, faulty gully traps that leak stormwater into it, and downpipes that discharge directly into gully traps.
- **Medium** levels of stormwater entering the wastewater network comes from the wastewater lateral that runs from Council's main to the house and are a combination of groundwater infiltration and rainfall dependent infiltration. Some medium inflow also comes from public manholes where rainwater makes its way into the system.
- **Low** levels of stormwater entering the wastewater network comes from Council's mains and manholes in the road and are a result of groundwater infiltration seeping through cracks in the mains and form a base flow and are less reactive to rain events.

Figure 1: Levels of Inflow and Infiltration



We are unlikely to remove all the high level sources of stormwater entering the network and therefore have assumed that it is possible to remove 85%, which has been modelled. The model anticipates a very good level of reduction of overflows if this target is achieved. This does not mean that medium/low levels are ignored and it is assumed there will still need to be some remedial work progressing in parallel, but not to the same level of urgency or enforcement. We are certain there will be some overlaps, hence the need to run parallel interventions.

## 2. DISCUSSION

### 2.1 General

It is accepted the status quo is not an option and is unacceptable to the community.

The use of storage tanks to capture any discharge to rivers provides no improvement to private property, does not prevent overflows on to private property and therefore is not a valid solution by itself.

Increasing the size and capacity (pipes, pumps, treatment) of the wastewater system to account for greater volumes of stormwater inputs (i.e. just allowing gross inputs to continue) is not seen as a sustainable solution – and how much do we design for? At some point stormwater inflows would exceed our design assumptions. Capital, operational and depreciation costs would also increase. Combining both the stormwater and wastewater system is not seen as a viable option due to the level of infrastructure required to be built and would prove difficult to treat.

**Direction Sought:** *Are any of the above options worthy of any further investigation?*

### 2.2 Target Levels of Reduction

It is essential to set targets for reduction to ensure expectations are clear. As already stated the Building Act sets a gully trap protection level for a storm event that has a 10% probability of happening in any given year, which is equivalent to a 10 Year ARI rain event at an individual property level. This level of protection does not exist and would be the benchmark for improvements. Given these are existing residential sites and given the level of investigation required over 12,800 houses to reduce gross water by 85%, the net improvement at rivers and streams will be much less.

For our case study we know that 4 out of 130 houses with their downpipes connected to the sewer can inundate that part of the network. When this is extrapolated to the whole city it demonstrates the enormity of the task ahead.

### 2.3 High Levels of Stormwater

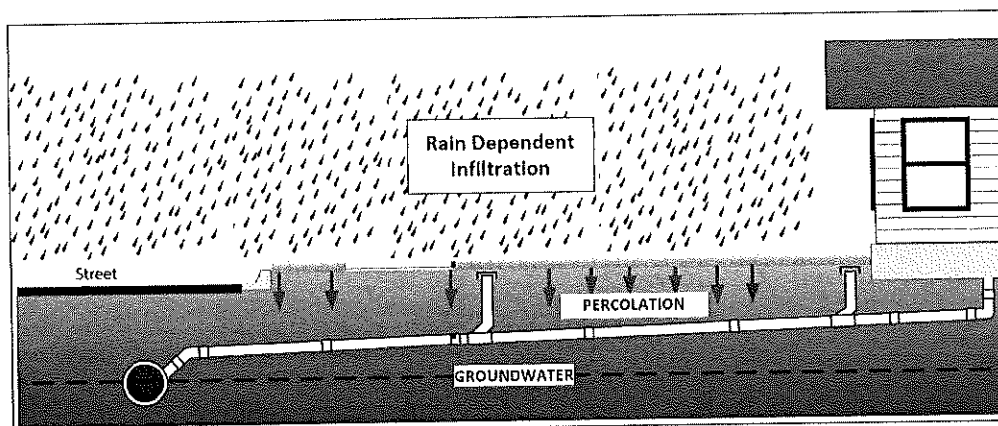
To achieve 85% reduction of high sources of stormwater for a 2 year ARI means that the following issues need to be addressed:

- Flooding on private property that could cause a nuisance to the wastewater network needs to be controlled, managed and discharged to an approved outlet.
- Gully traps need to be raised above an agreed flood level when they are within a flooding area. There are significant risks if only the gully trap is raised and the property flooding issues are not addressed at the same time. If flooding is not resolved but the gully trap is raised it is likely that at some time in the future an illegal connection will be made into the property sewer lateral to drain the stormwater.
- Faulty gully traps can allow large quantities of stormwater to enter the wastewater system and are required to be repaired. These can account for similar amounts of water getting into the wastewater system as the overtopping gully traps, and are more commonly found to be an issue.
- Roof downpipes and illegal cross connections that discharge into gully traps need to be removed and redirected to an approved stormwater outlet, to ensure that they are not redirected back into the gully trap at some time in the future.

### 2.4 Medium Levels of Stormwater

Medium levels of stormwater entering the wastewater network are predominantly through the private property sewer laterals, being the shallowest component. Rainfall dependent infiltration (RDI) occurs with sewer laterals that are close to the surface and, when it rains, stormwater percolates into the cracked pipes, in addition to any groundwater infiltration happening at a baseline flow during dry weather.

*Figure 2: Rain Dependent Infiltration*



Plumbers and drainlayers state that most property owners choose to undertake spot repairs to their sewer laterals rather than comprehensively replace (cost dependent). The property owners have no active requirement to replace any old and leaking pipes and Council has no strategy to require them to replace.

There is a level of overlap between high, medium and low levels of stormwater entering the wastewater network and therefore some management of medium levels needs to be addressed in parallel.



**Direction Sought:** *Would the development of an enforceable prioritised renewal strategy of private property laterals be worthwhile?*

## 2.5 Low Levels of Stormwater

Low levels of stormwater are a result of infiltration in Council mains and are largely from groundwater derived sources due to the fact that our mains are generally laid below the winter watertable. Addressing the 'low' issue is asset related to a renewal programme based on structural failure rather than just leakage.

- There are about 226km of Council sewer mains which are managed separately to this project but are prioritised based on leakiness. There will be mains that will be replaced due to structural issues rather than just leakiness or capacity reasons.

## 3. OPTIONS

### 3.1 Remediation Options – High Level

#### On Property Flooding Reduction

New Zealand Building Code Clause E1 Surface Water

#### OBJECTIVE

E1.1 The objective of this provision is to:

- (a) Safeguard people from injury or illness, and other property from damage, caused by surface water, and
- (b) Protect the outfalls of drainage systems.

#### FUNCTIONAL REQUIREMENT

E1.2 Buildings and sitework shall be constructed in a way that protects people and other property from the adverse effects of surface water.

#### PERFORMANCE

E1.3.1 Except as otherwise required under the Resource Management Act 1991 for the protection of other property, surface water, resulting from an event having a 10% probability of occurring annually and which is collected or concentrated by buildings or sitework, shall be disposed of in a way that avoids the likelihood of damage or nuisance to other property.

E1.3.2 Surface water, resulting from an event having a 2% probability of occurring annually, shall not enter buildings.

E1.3.3 Drainage systems for the disposal of surface water shall be constructed to:

- (a) Convey surface water to an appropriate outfall using gravity flow where possible,
- (b) Avoid the likelihood of blockages,
- (c) Avoid the likelihood of leakage, penetration by roots, or the entry of ground water where pipes or lined channels are used,
- (d) Provide reasonable access for maintenance and clearing blockages,
- (e) Avoid the likelihood of damage to any outfall, in a manner acceptable to the network utility operator, and
- (f) Avoid the likelihood of damage from superimposed loads or normal ground movements.

#### LOCAL GOVERNMENT ACT

Sect 459: Council may require owners of land in certain cases to provide private drains

Sect 462: Council may declare private drain to be public drain

Sect 467: Unlawful connection of private drain

A stormwater model has been constructed and one of the outputs was the city digital terrain contour map to identify low points where stormwater will accumulate if not drained. Based on this information an analysis of Kaiti area indicates that there are potentially 1,080 properties that could be affected by property flooding. An unknown proportion of these will be managing their stormwater appropriately. This is a conservative estimate and can only be verified by property inspections, questionnaires and wet weather inspections.

There is certainty that there are sufficient properties experiencing on property flooding that is significantly impacting on the wastewater network. Based on Catchment 20 (our case study catchment), 2 properties out of 130 that are flooding, and the stormwater is flowing into the gully trap, will use the full capacity of the sewer network leading to overflows.

**Table 1: Potential property flooding Kaiti**

<b>Kaiti Area 1</b>	<b>Hectares</b>	<b>Houses Affected</b>	<b>Public (# Drains)</b>	<b>Private (# Drains)</b>
Medium Risk	90 Ha	960	40	720
High Risk	10 Ha	120	15	30
<b>TOTAL</b>	<b>100 Ha</b>	<b>1080</b>	<b>55</b>	<b>750</b>

Currently to resolve on property flooding it is necessary to construct a piped or open drain to manage the flooding, this would be either a public drain which Council constructs and maintains or a private drain which the property owner will be required to construct and maintain. Where there is a wider benefit Council has either contributed financially or constructed a public drain. Currently drainage of 3 or more properties could result in Council constructing a public drain provided there is a wider community benefit which is assessed on a case by case basis. We have examples of flats or subdivided land developments which have created the problem and property owners are looking to Council to resolve.

Our first objective is to ensure that people are able to drain their land to an approved outlet, then secondly for it be drained efficiently.

- Direction Sought:**
- *Should Council require the management or drainage of stormwater where it is at risk of entering the wastewater network on private property, thereby creating a nuisance?*
  - *Should Council adopt the minimum level of protection of 10% AEP to manage stormwater on private property as required in the Building Code?*
  - *When should Council own and maintain a stormwater drain (piped or open) on private property?*
  - *Should all high level stormwater issues be required to be resolved within 1-12 months from date of notification?*

### **Gully Trap Heights**

The Building Code sets a minimum gully trap level for nuisance resulting from an event having a 10% probability of occurring annually. This is equivalent to a 10 Year ARI and is the current minimum for setting a gully trap height where they are within a flood area.

- Direction Sought:**
- *Should Council adopt the minimum 10% rain event probability for setting gully trap heights above that flood level?*
  - *Should gully traps be required to be raised before on property flooding is resolved? Note that this may raise the flood level in the short term until stormwater is properly managed.*

- *Should gully traps be required to be raised to be above the flood level for all new Building Consents when there are implications on the sewer network?*

### Faulty Gully Traps

#### Gully Traps not in a flood area

- 3.3.1 All gully traps shall be constructed to prevent the ingress of surface water and foreign bodies likely to cause a blockage, shall be located within the legal boundary of the land on which the building is erected, and shall have:
- a) The overflow level of the gully dish no less than:
    - i) 25 mm above paved surfaces, or
    - ii) 100 mm above unpaved surfaces,
  - b) A grating that will allow surcharge,
  - c) A minimum outlet pipe diameter of 100 mm,
  - d) A water seal depth of at least 65 mm,
  - e) At least one discharge pipe discharging to the gully trap to avoid water seal evaporation,
  - f) Waste pipes that discharge to the gully trap arranged to permit easy cleaning of the gully trap,
  - g) Waste pipe outlets located at least 20 mm above water seal level, and at least 20 mm below the grating,
  - h) The top of the water seal no more than 600 mm below the top of the gully dish,
  - i) Adequate support from bedding and backfilling with:
    - i) concrete no less than 75 mm thick surrounding the entire gully dish and which is separated from the building foundation, where the gully trap is likely to be damaged, or
    - ii) compacted bedding material complying with Paragraph 2.2.1, in other areas, and
  - j) A minimum of 600 mm clear access space above the gully dish.
- 3.3.2 In order to provide overflow relief for the drainage system, every building used for Housing shall be provided with at least one gully trap which shall:
- a) Be positioned so that the top of the gully dish is no less than 150 mm below the overflow level of the lowest sanitary fixture served by the drainage system,
  - b) Have a grating that will allow surcharge,
  - c) Be located in a visible position, and
  - d) Be installed so that surcharge cannot enter into or under buildings.

Currently Council staff undertake minor repairs to gully traps as it is considered the most cost effective approach.

Where raising a gully trap is required to meet height requirements or a new gully trap is required the property owners are notified to undertake the repairs.

- Direction Sought:**
- *Should staff continue to enforce compliance with the Building Code for gully traps?*
  - *Should staff continue to undertake minor repairs to gully traps?*

### Removal of Stormwater Downpipes Discharging into Sewer

Based on Catchment 20, 4 houses out of 130 with downpipes flowing into the gully trap will use the full capacity of the sewer network, leading to overflows. The current response is to immediately serve notice to remove and redirect to an approved outlet and complete within the minimum timeframes allowed in the Local Government Act which equates to 40 days. Historically we have not required connection to an approved outlet, just removed from the gully trap.

**Direction Sought:** *Should staff continue to immediately serve notice and impose the minimum compliance times for removal of downpipes from the sewer?*

### 3.2 Remediation Options - Medium Level

#### Private Property Lateral Replacements

Requirements under the Building Code - G13.3.1

The plumbing system shall be constructed to:

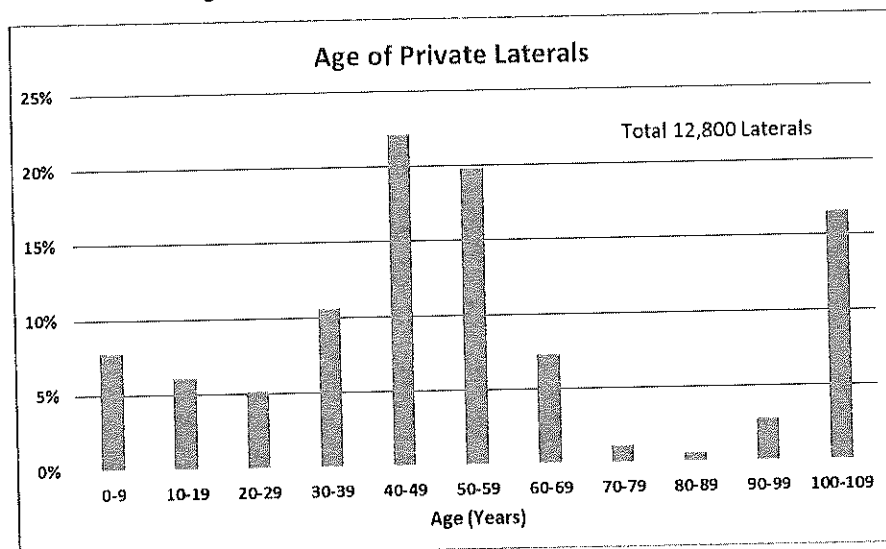
- (a) convey foul water from buildings to a drainage system,
- (b) avoid the likelihood of blockage and leakage,
- (c) avoid the likelihood of foul air and gases entering buildings, and
- (d) provide reasonable access for maintenance and clearing blockages.

Based on the age of Council's mains the age profile of private sewer laterals is estimated to be:

**Table 2: Age of Private Property Laterals**

Age	%	Comment
<50 years Old	52%	Over the next 30 years a further 38% of laterals will be older than 50 years
>50 Years Old	48%	Likely to require replacement over the next 15 - 30 years (20%)
>60 Years Old	28%	Likely to require replacement over the next 10 - 20 years (8%)
>75 Years Old	20%	This would average 256/yr renewals over the next 10 years (20%)

**Figure 2: Age profile of Private Property Laterals**



There is currently no active renewal programme of private property sewer laterals. CCTV inspections suggest there is a need for a renewal strategy. When Council replaces the sewer main in the road it also replaces the sewer lateral from the main to the property boundary but the private property owner does not replace their portion. Over the last 10 years any inspections of the private lateral has only required spot repairs rather than full replacement. Given the age profile of private property laterals a renewal strategy is required to target the oldest and most leaky laterals.

**Direction Sought:** *Should a private property renewal strategy be developed, agreed and implemented?*

The cost to replace individual sewer laterals on private property is in the range of \$5,000 - \$9,000, and will be largely determined by length, location of the sewer lateral relative to established driveways, footpaths, gardens and any other underground services. The private lateral is considered to have 100% private benefit.

There are two options for undertaking the replacement of the private property sewer lateral:

- 1) Property owners manage the replacement of their own sewer lateral with their drain layer.
- 2) Council runs a contract on behalf of property owners for multiple lateral replacements.

There are significant risks for Council to run multiple private property contracts:

- Council will add on additional costs to each job for scoping, tendering and supervision.
- High financial risk of people not paying or slow payers.
- Potential disputes around reinstatement/workmanship adding on additional Council costs.
- Local drainlayers might miss out if contracts are too large or specialised renewal methods are adopted.
- Less flexibility for property owners to when work will be undertaken.

Assuming a 42 week construction year, to replace all laterals 75 years or older would require 6 replacements per week. This will be in addition to any on property stormwater work.

Some local contractors have indicated that they are prepared to resource for additional work provided that there a consistent ongoing work stream.

It is intended to monitor costs and also work with contractors to develop a sustainable workload and remediation options, and review annually to confirm if the strategy is still appropriate.

Council also owns the portion of lateral from the property boundary to the main and it would seem sensible to replace our portion at the same time as the property owner upgrades theirs, given that we will still need to continue to replace sewer mains and, with competing needs for funding, we need to remain flexible. The construction of our portion of the lateral will be much more expensive due to the increased depth, services in the road and the higher level of costs for reinstatement in the road.

- Direction Sought:**
- *Who should manage the replacement of the private property sewer lateral?*
  - *Should Council replace its portion of the sewer lateral at the same time the private property owner replaces theirs?*
  - *Should all medium level stormwater issues be required to be resolved within 1-10 years from date of notification?*

### **3.3 Remediation Options - Low Level**

Council's sewer mains consist of a wide range of material types. The leakiest and structurally the poorest condition is earthenware of which there is approximately 54km which represent 24% of the Council's sewer mains. There are several options for the remediation of this type of pipe being:

- total replacement
- relining, using an internal liner
- chemical grouting.

It is likely that all 3 options will be used and will be determined from condition assessments using CCTV and timing of mains replacement.

- Direction Sought:** *Does a renewal strategy need to be developed for Council's sewer mains for earthenware pipe to reduce groundwater infiltration and reduce the risk of pipe collapse?*

### **3.4 Other Issues**

#### **Sewer Main Upgrades**

The sewer network model has identified sewer pipes that are required to be upgraded on the assumption that gross inflow has been significantly reduced (refer Appendix A3). The upgrade costs will be a combination of renewal budget and new capital.

There will be further work required to optimise the required upgrades to match pipe grade and diameter to ensure self-cleansing velocities can be achieved. This will avoid additional jet cleaning of pipes to remove solids deposition which will impact on the network performance and optimize operational costs.

- Direction Sought:** *Should part of the strategy to reduce overflows include for some sewer mains to be upsized as shown by the wastewater network model?*

#### **Stormwater Upgrades**

The integrated stormwater model recently developed for Kaiti will enable future pipe upgrades to be determined but the initial assessment suggests that the piped reticulation generally has sufficient capacity. The primary pipe system is supported by a secondary flowpath which operates once the primary pipe system is full. This secondary flowpath is surface water flowing towards a stream and may flow across private property and/or along roads and caters for very large storm events. It is important to define these secondary flowpaths and ensure they operate correctly when required. These have yet to be clearly defined within the model and are proposed to be identified in the District Plan, once determined.

There is one outstanding upgrade, which is Rutene Road (De Lautour Road to Harris Street). This has been deferred until we have an operative stormwater model which will be used for this upgrade to optimise the design. At this stage we are not aware of any further upgrades

in the Kaiti area. The stormwater model has not yet been developed for the rest of the city, west of the Waimata and Turanganui Rivers.

Open roadside drains require property owners to install entranceway culverts to gain access to their property. There are ongoing issues with the size of the pipes that have been installed being under-capacity and/or not maintained. Ownership and responsibility of these remain with the property owner but there is sufficient argument to say that it should be the responsibility of Council to upgrade them. It is proposed that Council will upgrade these culverts as required but the ongoing ownership will still be with the property owners.

**Direction Sought:** *Should Council renew any under-capacity or inadequate entranceway culverts that restrict the efficient flow of stormwater or increase the risk of blockages?*

### **Efficient Network**

The improvements will need to be supported by a comprehensive ongoing maintenance strategy and inspections to ensure the network will continue to operate effectively. By way of example, ensure that a sewer main cleaning programme is in place to ensure the full capacity of the pipe is available and not filled with sediment and fat deposits. Stormwater grates on private property are regularly inspected to ensure they have not been covered over or blocked in some way. As work progresses maintenance plans will be regularly reviewed, updated and budget promoted to support them.

A check of private property stormwater lines which discharge into the kerb and channel was undertaken; 70% of the pipes were blocked. We see no efficient way of ensuring private stormwater systems are maintained other than by education and reminders. The most efficient way is for Council to jet clean private lines (kerb and channel to property boundary) on a 5 yearly basis but not own the private property connection.

Currently property owners are expected to keep their entranceway culverts clean and operative to ensure an efficient network; the overall performance can be compromised if they are not cleaned and they are largely not maintained.

**Direction Sought:**

- *Should we clean private stormwater lines on a routine basis (kerb and channel to property boundary)?*
- *Should we keep the culverts clean/operative to ensure an efficient network?*

### **Customer Focus**

Property owners should be advised of all improvement works required on the property regardless of the fact that these may have differing deadlines for completing the work, depending on the issue (principle 'touch once'). There is the potential regardless of timelines for it to be cheaper, more efficient and less disruptive to undertake some work together.

This will mean that should any inspections identify an issue requiring fixing then a comprehensive survey will be completed and a full summary of findings will be provided to the property owner so they are aware of all the outstanding issues on the property.

**Direction Sought:** *Should we adopt a "One Touch" approach with property owners?*

## **4. SUMMARY OF DIRECTION SOUGHT**

### **4.1 Discussion - General**

- Are any of the following worthy of any further investigation (status quo, storage, combined stormwater/wastewater system)?

### **4.2 Remediation Options - High Level**

- Should Council require the management or drainage of stormwater where it is at risk of entering the wastewater network on private property thereby creating a nuisance?
- Should Council adopt the minimum level of protection of 10% probability to manage stormwater on private property?
- When should Council own and maintain a stormwater drain (piped or open) on private property?
- Should all high level stormwater issues be required to be resolved with 1-12 months from date of notification?
- Should Council adopt the minimum 10% rain event probability for setting gully trap height above that flood level?
- Should gully traps be raised before on property flooding is resolved?
- Should gully traps be required to be raised to be above the flood level for all new building consents when there are implications on the sewer network?
- Should staff continue to enforce compliance with the Building Code for gully traps?
- Should staff continue to undertake minor repairs to gully traps?
- Should staff continue to immediately serve notice and impose the minimum compliance times for removal of downpipes from the sewer?

### **4.3 Remediation Options - Medium Level**

- Should a private property renewal strategy be developed, agreed and implemented?
- Who should manage the replacement of the private property sewer lateral?
- Should Council replace its portion of the sewer lateral at the same time the private property owner replaces theirs?
- Should all medium level stormwater issues be required to be resolved within 1-10 years from date of notification?

### **4.4 Remediation Options - Low Level**

- Does a renewal strategy need to be developed for Council's sewer mains for earthenware pipe to reduce ground water infiltration and reduce the risk of pipe collapse?

### **4.5 Sewer Main Upgrades**

- Should part of the strategy to reduce overflows include for some sewer mains to be upsized as shown by the wastewater network model?



#### 4.6 Stormwater Upgrades

- Should Council renew any under-capacity or inadequate entranceway culverts that restrict the efficient flow of stormwater or increase the risk of blockages?

#### 4.7 Efficient Network

- Should Council clean private stormwater lines on a routine basis (kerb and channel to property boundary)?
- Should Council keep the culverts clean/operative to ensure an efficient network?

#### 4.7 Customer Focus

- Should Council adopt a "One Touch" approach with property owners?

### 5. RISKS

A summary of risks is provided in the table below. Of particular note is the extent of on property issues that are unknown and we do not believe that it is cost-effective to undertake all the investigation work first as this will delay remediation work by years. We have adopted a case study approach to run in parallel so that we can confirm strategies and effectiveness of remediation options but the case study is reliant on wet weather to confirm improvements.

**Table 3: Potential Risks**

Risk	Level	Mitigation Options
Unable to meet the ten year target due to increase in issues identified on private property	H	<ul style="list-style-type: none"> <li>• Prioritise remediation work to largest contributors of stormwater (risk based approach)</li> <li>• Extend target dates</li> <li>• Modify levels of service and objectives</li> <li>• Increase staffing numbers</li> </ul>
Private property cannot afford the repairs	H	<ul style="list-style-type: none"> <li>• Investigate alternative technology to speed up productivity and reduce construction costs</li> <li>• Reprioritise work to an affordable level and extend timelines</li> <li>• Incentivise owners to commit to expenditure</li> <li>• Look for alternative funding options</li> <li>• Balance Council expenditure requirements against public spend</li> <li>• Explore efficiencies of scale,</li> <li>• Extend repair timeframes for lower risk repairs (med &amp; Low only)</li> </ul>
Not enough contractors to complete the work when required (Public/Private)	H	<ul style="list-style-type: none"> <li>• Inform contractors of direction to determine their resourcing capability</li> <li>• Spread work deadlines and reprioritise</li> <li>• Investigate alternative technology to open cut</li> <li>• Advise outside contractors of potential work</li> <li>• Council organise and tender the private work (additional resourcing required)</li> <li>• Organise a constant work programme to allow resourcing to align with demand</li> </ul>
Improvements don't achieve objectives	M	<ul style="list-style-type: none"> <li>• Reduce gross inflow and check improvements for Kaiti or sub catchment with Kaiti</li> <li>• Use case study areas to confirm strategy and re-evaluate</li> </ul>
Inspection information collected is unreliable and of low quality	M	<ul style="list-style-type: none"> <li>• QC auditing processes put in place of completed inspections to provide confidence in the data and ensure that our methodologies are robust.</li> </ul>

## **6. SIGNIFICANCE**

This is a significant issue for Council:

- history of wide public interest
- involves strategic assets (wastewater/stormwater)
- cultural significance with human waste into water
- financially significant due to the large budget allocated to this project.

## **7. COMMUNITY OUTCOMES**

This project will contribute considerably to the following Council Outcomes:

- Environmentally Sustainable Tairāwhiti
- Healthy Tairāwhiti
- Connected Tairāwhiti
- Safe Tairāwhiti.

## **8. STRATEGIC CHALLENGES**

The strategic challenge areas that this project will contribute to are:

- (SC4): Major Projects
- (SC5): Natural Resource Use
- (SC6): Financial Sustainability
- (SC10): Customer Needs.

## **9. POLICY**

This project will result in better alignment with likely discharge related policies in the Regional Freshwater Plan. There ultimately will lead to policy requirements to give effect to an agreed strategy.

## **10. LEVELS OF SERVICE**

The project will contribute to the stated wastewater level of service for Gisborne city:

*We contribute to a Healthy, Safe, Prosperous, Environmentally Sustainable and Connected Tairāwhiti through the provision of a well-managed wastewater reticulation system which protects public health and the physical environment.*

## **11. FINANCIAL**

Currently Council has committed funding through the Long Term Plan over a ten year period.

## **12. LEGAL**

May require the development of a Drainage Bylaw to ensure strategies can be implemented.

## **13. CONSULTATION**

Consultation for this project has been undertaken through the current Long Term Plan process.

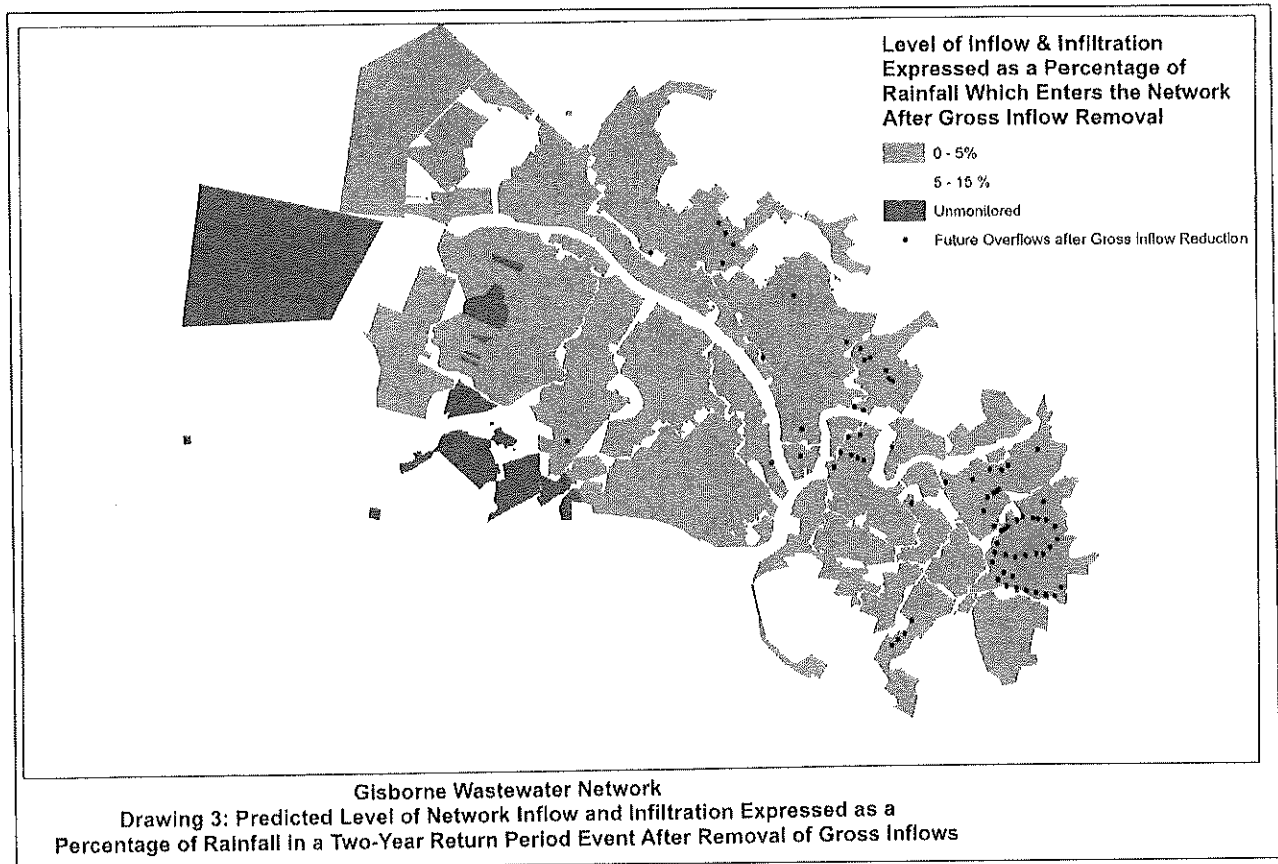
## **14. OTHER CONSIDERATIONS**

There are no other considerations.

## **15. APPENDICES**

- BECA wastewater model outputs (3 Plans) - Appendix A1, A2, A3

Appendix A2: BECA model output 2 yr AEP - Predicted level of Network inflow and Infiltration - Gross Inflow Removal



Appendix A3: Recommended Upgrades following removal of Gross Inflow Removal

