Before The Independent Hearings Commissioners
for Gisborne District Council as Consent Authority

IN THE MATTER	of the Resource Management Act 1991
AND	An application from Gisborne District Council (the Applicant)
FOR	Overflow Discharges from the municipal wastewater network

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SUMMARY OF EVIDENCE – WASTEWATER ENGINEERING AND INFLOW & INFLITRATION

Simon Aiken

For Consent Authority

14July 2021

Introduction

1. My full name is Simon James Aiken. I am a Senior Water Resources Consultant at Tonkin + Taylor Ltd. I have the qualifications and experience set out in my technical memo attached the S42A report.

Summary of Evidence

2. The Applicant has presented a large body of technical information and assessment to support the application and has also demonstrated a genuine commitment to improving the performance of the network in wet and dry weather.
3. I agree with the evidence of Mr Garside and Mr West that inflow and infiltration has a significant impact on the performance of the Gisborne District Council (GDC) wastewater network.
4. I agree with Mr West that the design of GDC wastewater network design is consistent with engineering practice seen elsewhere in New Zealand and that based on benchmarking the GDC wastewater system performance is comparable to national practice. It is worthwhile noting that WWOs in the GDC network are not automatic and require manual opening and closing. This does allow GDC a higher degree of control and monitoring of WWOs occurrences than other councils.
5. I agree with Mr Garside, Mr West and Mr Kanz that, in the first instance identifying and removing sources of direct stormwater inflow into the wastewater network is a pragmatic and prudent management approach to reduce the frequency and volume of wet weather overflows.
6. I believe that the DrainWise programme is comprehensive and multifaceted in its approach and is a suitable initiative to progressively reduce the frequency and volume of wet weather overflows (WWOs).
7. Notwithstanding the above, I support the ongoing renewal and replacement of public pipework, manhole risers or manhole covers that are in poor structural condition or where there is clear evidence of infiltration occurring.
8. For the reasons outlined in my technical memo I believe that the 85% reduction in direct inflow is an optimistic target. Despite this I believe the applicant has managed the risk of not achieving the desired reduction through provision of 'capital' upgrades to the wastewater network.
9. In the matter of WWOs I agree with Mr Garside and Mr Kanz that wastewater network investigations and fixes take a significant amount of time to implement.

10. In the matter of monitoring or quantifying improvements I understand that the applicant has one permanent flow monitoring device installed in the wastewater network and as part of the Long-Term Plan (LTP) funding has been allocated to purchase and install two further units. I fully support the purchase and installation of additional permanent and temporary flow monitoring devices.

11. I believe that continuous flow monitoring is critical to track the effectiveness of the interventions undertaken as part of the DrainWise programme. As the conditions currently stand the requirements for continuous flow monitoring are insufficient.

12. I agree with Mr West that GDC cannot be expected to actively manage the full extent of wastewater network and with Mr Mayhew that the statistical prediction of DWOs from informal locations within the wastewater network is impossible. However, the risk profile for the occurrence of dry weather overflows will vary across the network. Prioritisation of maintenance works can be optimised to reflect this risk. I acknowledge that GDC already approaches proactive maintenance of the network along these lines.

13. In his EIC Mr West notes that GDC has undertaken a successful trial of a depth sensor/level measuring device at the Turenne St manhole to aid in the early identification of conditions that could lead to a potential DWO[1].

14. I understand that GDC has allocated budget in the LTP to purchase and install a number of depth sensors in known 'hotspots' or at other key locations within the network to actively monitor water levels and identify deviations away from 'normal' flow patterns. In this manner potential DWOs can be detected and prevented. I fully support this initiative and believe that this approach would exceed national best practise if implemented.

15. Based on the level of redundancy at pumpstations alongside GDCs operational procedures which avoided DWOs during a 30-hour power outage and have prevented DWOs since 2015 the elimination of DWOs from pump stations would seem an achievable target in all but the most extreme cases or events. I believe the distinction between DWOs that occur at sewer pump stations versus other locations is important.

16. I have not undertaken an exhaustive review of consent conditions for wastewater discharges across New Zealand, however the selective elimination of DWOs from

[1] Para 93

pump stations can be achieved. For example, the Nelson Region Sewage Business Unit (NRSBU) discharge consent permit (RM 105388V1) stipulates that there shall be no DWO discharges from selected pump stations where a DWO could potentially reach the receiving environment. I acknowledge that this is context dependent.

17. As various experts have already touched upon the relationship between wet weather overflow frequency and rainfall alone is difficult to quantify. The implication of this is that a performance measure based on rainfall is problematic. A Long-Term Simulation (as opposed to a design storm) using the wastewater hydraulic model could reveal a more robust performance metric.

18. I support the condition for ongoing hydrological analysis of WWO events. In my experience the application of rain-radar in addition to local rainfall gauges is useful, and that further analysis that examines shallow groundwater level, antecedent moisture conditions could assist the applicant in refining the relation between overflow performance and environmental conditions.

19. In response to Mr Gibson's submission, I do not necessarily believe that the observations he has made are at odds with the Applicant's own understanding of Inflow and infiltration sources. I would note that it is important to differentiate the impact different inflow and infiltration sources have on both peak flow(s) and volume of sewerage within the network.

20. I disagree with Mr Gibson that removal of stormwater connections to the wastewater network is ineffective. There is a clear hydrological and hydraulic basis for the removal of cross-connected downpipes. Further, there is clear evidence from flow monitoring surveys that the wastewater network shows a strong response to rainfall.

21. While I cannot speak for Mr Garside I note his evidence[2] distinguishes between direct and indirect stormwater inflow and that the dominant RDII factor is direct stormwater inflow.

22. In response to submitters and the request for an independent review of the DrainWise Programme, my engagement with GDC included a high-level review of the suitability of the DrainWise programme. Noting my reservations with the 85% reduction in direct inflow and a preference for more monitoring within the sewer network I believe the DrainWise programme is both comprehensive and extensive in scope and can be considered good practise nationally.

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[2] Para 27

23. Finally, I believe the Applicant through the DrainWise programme is making a genuine attempt to reduce the frequency, duration, and volume of overflows. I support the progressive improvement approach. Managing Inflow and infiltration is difficult and the critical aspect from my perspective is that sufficient provision is made for ongoing flow and depth monitoring. Flow monitoring to support reporting on the targets detailed in Wastewater Overflow Consent Objectives and Targets provided by the Applicant will be required to determine how effective the DrainWise programme is in the short, medium and long term.

Simon James Aiken

14 July 2021