

In the Environment Court of New Zealand
Christchurch Registry

I Te Koti Taiao o Aotearoa
Ōtautahi Rohe

ENV-2018-CHC-26 to 50

Under the Resource Management Act 1991 (**RMA**)

In the matter of appeals under clause 14 of Schedule 1 of the RMA relating to the proposed Southland Water and Land Plan (**pSWLP**)

Between **Gore District Council, Southland District Council and Invercargill City Council (TLAs)**

Appellants in ENV-2018-CHC-31, and section 274 party to appeals: ENV-2018-CHC-37 Southland Fish & Game Council; ENV-2018-CHC-39 Alliance Group Limited; ENV-2018-CHC-40 Federated Farmers of New Zealand; ENV-2018-CHC-50 Royal Forest and Bird Protection Society of New Zealand; ENV-2018-CHC-41 Heritage New Zealand Pouhere Taonga; ENV-2018-CHC-47 Te Rūnanga o Ngāi Tahu, Hokonui Rūnaka, Waihopai Rūnaka, Te Rūnanga o Awarua & Te Rūnanga o Oraka Aparima

And **Southland Regional Council (Environment Southland)**

Respondent

Evidence of Matthew Bayliss

22 March 2019

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**anderson
lloyd.**

Introduction

- 1 My name is Matthew Paul Bayliss.
- 2 I am currently employed as the 3 Waters Asset Manager for the Gore District Council (**GDC**).
- 3 I graduated from Canterbury University with a Bachelor in Engineering with Honours specialising in Natural Resources Engineering in 2010.
- 4 I have over 8 years post graduate experience in civil and environmental engineering and management of 3 waters infrastructure.

Executive summary

- 5 GDC serves a population of 12,033 (2013 Census). One of GDC's core functions is the provision of reticulated wastewater and stormwater services for the urban areas in the district.
- 6 The provision of reticulated wastewater and stormwater services is a critical requirement for the health and well-being of the community.
- 7 The GDC's wastewater and stormwater systems have been developed over many generations. During this time, various issues and limitations have been identified with the way infrastructure has historically been designed and constructed. While engineering design standards and construction methodologies have been improved to ensure these mistakes are not repeated the issues with the historical infrastructure remain.
- 8 In addition to this changing trends in the way communities are developed (i.e. housing intensification and a higher percentage of impermeable surfaces) and an increased awareness of environmental impacts has put increased pressure and expectations on our existing infrastructure.
- 9 Some of the key challenges that GDC currently face as a result of this include the provision of an appropriate level of wastewater treatment, separation of stormwater and wastewater networks, and aging infrastructure requiring renewal.
- 10 To address these issues, in its 30 Year Infrastructure Strategy 2018-2048 (**Infrastructure Strategy**) GDC has committed to investing \$56 million to renewing and improving its wastewater and stormwater systems.
- 11 However due to the complexities of providing and upgrading community infrastructure rapid improvement or significant changes to the way existing infrastructure fundamentally functions is generally not practicable.

- 12 My key concern with the current pSWLP is that it classifies discharges essential to allowing GDC's existing infrastructure to continue to operate as non-complying activities. This is expected to make the processes of obtaining these consents very difficult.
- 13 It is believed the unintended consequence of this will be that the GDC will need to focus its resources and attention on obtaining the necessary consents for it to continue to provide wastewater and stormwater services as opposed to resolving the historical issues with its infrastructure.
- 14 For this reason it is believed that the pSWLP would have a greater ability to achieve its intended outcomes if it recognises the critical nature of existing discharges from local authority wastewater and stormwater systems and enables their operation, maintenance and upgrade over time.

Background

- 15 GDC is a local authority situated in the Southland region of the South Island which was established in 1989 as a result of amalgamation driven by central government.
- 16 The Gore District covers 1251km² and neighbours the Southland District and Clutha District.
- 17 The Mataura River runs through the Gore District with both the townships of Gore and Mataura situated on its banks. The river is a focus for this district and provides many recreational opportunities.
- 18 The Gore District has a population of 12,033 (2013 Census). Gore is the largest urban area with a population of 7350. The Mataura township has a population of 1509.
- 19 The Gore District has a strong agricultural-led economy with complementary industries established.
- 20 One of the core functions of GDC is to provide reticulated water, wastewater and stormwater services in the urban areas of the district.
- 21 GDC holds a total of 18 resource consents issued by Environment Southland associated with the provision of these services; ten which relate to the provision of water supply and eight which relate to treatment and disposal of wastewater and stormwater.

Scope of evidence

- 22 The pSWLP has the potential to impact on GDC's ability to provide water, wastewater and stormwater services.
- 23 However it is expected the impact will most significantly affect the provision of wastewater and stormwater activities.
- 24 For this reason my evidence will focus on GDC's existing stormwater infrastructure systems including the key challenges it faces and implications of the pSWLP.
- 25 Specifically my evidence will cover:
- (a) A description of GDC's existing wastewater and stormwater infrastructure;
 - (b) Benefits to the community from the provision of wastewater and stormwater services.
 - (c) A brief history as to how the GDC wastewater and stormwater infrastructure has been developed;
 - (d) Key issues and challenges that GDC faces with its infrastructure and how it plans to resolve these;
 - (e) Complexities associated with provision of reticulated services and the challenges this presents; and
 - (f) Key concerns with promoted changes to objectives of the pSWLP by Appellants.

Description of the GDC's existing wastewater and stormwater infrastructure

- 26 GDC owns, operates and maintains three wastewater schemes which service Gore, Mataura and Waikaka. These schemes comprise approximately 103km of pipelines and three treatment plants.
- 27 GDC currently holds five resource consents issued by Environment Southland associated with the treatment of wastewater for these schemes.
- 28 The Gore Wastewater scheme comprises 81.0km of reticulation with 4,206 connections servicing a population of 7,665 residents. In addition to this it also services a wide variety of industrial and commercial users.
- 29 The Gore wastewater reticulation system discharges into a pump station at Grassland Road. From the pump station it passes through a 3mm step screen and flow meter before being discharged into a 10ha primary oxidation pond. The

pond is mechanically aerated and effluent is eventually passed into a second 10ha pond for polishing. The two oxidation ponds were originally constructed in 1973. The final effluent passes through an Actiflo plant (installed in 2008) designed to remove phosphorus and further increase effluent quality prior to discharge to the Mataura River. The Actiflo plant is operated when the river is below 60m³/s, as prescribed in the resource consent.

- 30 In 2018 GDC constructed an additional waste activated treatment plant specifically designed to treat tradewaste from the Matarua Valley Milk processing plant located at McNab, to the north of Gore. Treated wastewater from this system is discharged into GDC's existing oxidation ponds for final treatment prior to being discharged to the environment.
- 31 The average daily flow through the Gore treatment plant is 6300m³.
- 32 The Mataura Wastewater scheme comprises 20km of reticulation with 836 connections servicing a population of 1,790 residents. The wastewater reticulation system discharges into a 3ha oxidation pond (constructed in 1962) followed by a wetland (developed in 2009) before being discharged by gravity into the Mataura River. The average daily flow through the Mataura treatment plant is 500m³.
- 33 The Waikaka Wastewater scheme comprises of 3km of reticulation with 54 connections servicing a population of 132 residents. The wastewater reticulation system discharges into oxidation ponds located near a tributary of the Waikaka Stream where final effluent is discharged. The treatment plant was originally constructed in 1986. The average daily flow through the treatment plant is 14m³.
- 34 The combined replacement value of these three schemes was estimated to be \$40.9 million in June 2016.
- 35 GDC also owns, operates and maintains stormwater schemes in Gore, Mataura, Waikaka, Pukerau and Mandeville.
- 36 GDC currently holds three resource consents issued by Environment Southland for the discharge of stormwater to water for these schemes.
- 37 These networks consist of 48km of pipework and 4 pump stations. This network allows water to be conveyed from within the urban environment to 25 discharge points located along the Matarua River and its tributaries.
- 38 The estimated replacement cost of these schemes was estimated to be \$23.4 million in June 2016.

Benefits to the community from provision of wastewater and stormwater infrastructure

- 39 The provision of wastewater and stormwater services is a critical requirement for the health and wellbeing of the community. This is based on the provision of adequate systems for the safe collection and disposal of wastewater and stormwater.
- 40 As well as enhancing social well-being, there are aspects of cultural wellbeing that are reliant on appropriate wastewater and stormwater systems.
- 41 In addition to this, economic wellbeing is supported by the availability to households and businesses of an affordable and accessible wastewater and stormwater service.
- 42 One of the most effective ways of disposing of wastewater and stormwater in urban areas is by reticulated networks.
- 43 A reticulated system allows GDC to spread the associated costs over a wide population base and still maintain high standards and efficient infrastructure management. This ensures these services are provided to individual users at an affordable cost.
- 44 In addition to this, through the efficiencies gained by reticulated wastewater and stormwater systems, sophisticated treatment systems and increased levels of monitoring are more financially viable.
- 45 The outcome of this is a far greater ability to understand any environmental impacts and ability to minimise these impacts.
- 46 The Local Government Act 2002 determines infrastructure services, including wastewater and stormwater, to be core services provided by local authorities and this legislation provides guidance on the way that the service is managed and reported upon.
- 47 Section 23 of the Health Act 1956 also dictates that it is every local authority's duty to "improve, promote and protect public health within its district".
- 48 These statutory obligations of GDC highlight the importance and criticality that has been placed on the provision of reticulated wastewater and stormwater systems.
- 49 Methodologies, technologies and expectations regarding the conveyance and treatment of wastewater and stormwater can be expected to change with time. However, as a result of this their fundamental importance to the health and

prosperity of communities and benefits in minimising environmental impacts are only expected to increase with time.

A brief history as to how the GDC wastewater and stormwater infrastructure has been developed;

- 50 Since the first establishment of communities in the district, the necessary infrastructure to provide the essential services to support the health and wellbeing of these communities has developed and evolved.
- 51 The Gore and Mataura wastewater and stormwater networks have been progressively developed since the early 1900s.
- 52 Initially these networks were constructed as combined systems with no treatment provided. The reticulation was designed to collect both wastewater and stormwater and discharge it directly to the Mataura River and its tributaries at multiple locations.
- 53 During the 1960s and 1970s, oxidation pond based treatment systems were installed to provide treatment prior to the wastewater being discharged to the environment. As part of this work “collector” mains were installed connecting the existing discharge points to the treatment systems.
- 54 These collector mains were only ever designed to take the dry weather flows (and some stormwater) from the wastewater network. To prevent untreated wastewater and stormwater from overflowing within the township and potentially creating public health issues, the existing outfalls to the river were left in place and/or modified to allow the system to continue to discharge to the river during large rainfall events.
- 55 This was a significant improvement at the time when previously all wastewater had been discharged directly to the river without any form of treatment.
- 56 Since the construction of the oxidation ponds in the 1960s and 1970s a number of stormwater separation projects have been undertaken in Gore and Mataura. These projects have involved installing separate stormwater reticulation to reduce the amount of stormwater entering the wastewater network therefore reducing the frequency and volume of overflows from the wastewater network.

Key issues and challenges that GDC faces with its infrastructure and how it plans to resolve these

- 57 While providing a critical function to ensure the health, well-being, and prosperity of the community, due to the evolving nature of the GDC’s infrastructure, there are a number of issues with the existing infrastructure.

58 The key challenges that GDC currently faces associated with its wastewater and stormwater networks and what the GDC is doing to address these issues are described below.

Appropriate level of wastewater treatment

59 GDC currently holds resource consents to discharge treated wastewater to surface water for the following treatment plants:

- (i) Gore Wastewater Treatment plant (which expires in December 2023);
- (ii) Mataura Wastewater Treatment plant (which expires in May 2021);
and
- (iii) Waikaka wastewater treatment plant (which expires in September 2027).

60 Due to the impending expiry of the Gore and Mataura wastewater discharge consents, GDC embarked on a project to renew these consents in 2018.

61 The first phase of this project (which is currently underway) is to complete a detailed assessment of the performance of the existing treatment systems and an identification of potential upgrade options.

62 This assessment will form the basis for which GDC will consult with identified affected stakeholders.

63 This process will allow the various treatment technologies and disposal options to be considered against all affected stakeholders requirements, ensuring that the most appropriate long term sustainable treatment strategy for both the community and environment is identified.

64 Following in-depth consultation and refinement of these upgrade options an assessment of the environmental impacts will be completed and a consent application submitted to Environment Southland.

65 It is anticipated that the consent application for both Gore and Mataura wastewater discharges will be submitted by the end of 2020.

Stormwater separation

66 As previously described in my evidence, the Gore and Mataura wastewater and stormwater networks were originally combined systems with multiple discharge locations into the Mataura River.

- 67 Due to these networks historically being combined systems large stormwater flows are still experienced within GDC's wastewater networks. The two main reasons for this are:
- (a) Separation of the entire networks has not yet been fully completed; and
 - (b) Where projects have been completed there are still a number of stormwater connections to the wastewater system. These are largely private property connections which are still combined systems connecting directly to the wastewater network.
- 68 These large stormwater flows in the wastewater network result in flooding of private properties and the road reserve, and overflows to the environment during large rainfall events.
- 69 The combined nature of the system also results in high flows through the wastewater treatment plants affecting their performance. This is expected to complicate future upgrades of the wastewater treatment plants required under a renewed wastewater discharge consent.
- 70 Unfortunately as a result of the way the stormwater network has been developed, mainly due to a lack of stormwater modelling technology available at the time, the existing stormwater network essentially has no spare capacity.
- 71 This issue has been further exacerbated by a historical trend of increasing impermeable surface in developed areas leading to increased peak runoff volumes.
- 72 This has led to a situation where, before completing further separation works, GDC must carefully consider the potential downstream capacity issues and in most cases complete significant upgrades to the existing stormwater network before further separation works can be progressed.
- 73 Considering the complexity of the combined wastewater network and scale of investment required, a need for a Stormwater Master Plan (**SMP**) was identified. The objective of the SMP was to consider the issues regarding capacity, combined wastewater flows, overflows, and flooding on a network wide basis. Through taking this approach it will enable GDC to develop a framework to allow informed decision making and support financial forecasting that better informs GDC and the community when considering long-term obligations and decision-making in developing a substantial capital works programme.
- 74 The first stage of the SMP was formally adopted by Council in August 2018.
- 75 Two of the key outcomes of Stage One of the SMP and resulting work streams currently being progressed are as follows:

- (a) The Elizabeth Street area was identified as the highest priority area for stormwater separation. As a result of this the first of three stages of separation for this catchment area is currently being progressed with an expected completion date of June 2020. The estimated cost to complete this project which includes the renewal of the existing wastewater and stormwater main in Elizabeth Street is \$2.4 million; and
- (b) A stormwater implementation plan is being developed. This will identify specific projects that are necessary to resolve the highest priority capacity issues in the existing network. This in turn will allow GDC to ensure the appropriate resources are allocated to implement these projects in an acceptable timeframe.

Renewal of existing infrastructure

- 76 It is currently estimated that approximately 78% of GDC's piped wastewater infrastructure and 76% of its piped stormwater infrastructure will come to the end of its useful life and require replacement in the next 30 years.
- 77 The current cost to replace this infrastructure over the next 30 years is estimated to be \$34.4 million.
- 78 The replacement of this infrastructure will provide an opportunity to improve the performance and capacity of the networks which would in turn reduce the frequency and size of overflows that occur from the wastewater network.
- 79 One of the major projects GDC is currently undertaking is the upgrade of the Ajax Wastewater Pumping Station.
- 80 Investigation work completed on this pump station identified it as being undersized and overflowing regularly. Over a nine month monitoring period 24 overflows were recorded from the pump station.
- 81 Initial investigations to improve the capacity of the pump station did not identify any "quick fixes".
- 82 As a result of this GDC is currently in the construction stage of a \$4.1 million dollar upgrade of the pump station and associated pipework. This project is expected to be completed by June 2019.
- 83 This project will increase the capacity of the pump station to be able to cope with flows during a storm events with a greater than 50% Annual Exceedance Probability (**AEP**) (a 1 in 2 year storm event).

- 84 Through further upgrades to the network it is expected the pump station will eventually be able to cope with predicated flows during a storm events up to a 10% AEP (a 1 in 10 year storm event).
- 85 The current upgrade will also include a significant improvement in the monitoring systems at the pump station in line with current best practice. This will ensure that the pump station can be constantly monitored and recorded. An automatic alarm system will also be set up so that operational staff are instantly aware of any issues with the pump station and/or overflows.
- 86 This improved monitoring will not only ensure that details of all overflows at the pump station are recorded but also allow for prompt responses to these events.
- 87 In addition to the upgrading of the pump station, the rising main from the pump station will be rerouted to pump directly into the Gore wastewater treatment facility. Currently the pump station pumps into the wastewater gravity reticulation upstream of the wastewater treatment facility.
- 88 Rerouting of the rising main will reduce the flows in the gravity reticulation upstream of the wastewater treatment plant. The net effect of this will be a reduction in the frequency and volume of overflows from the wider network during heavy rainfall events.
- 89 This project is one of the largest capital projects GDC has completed in recent times.
- 90 However as indicated in GDC's current 2018 – 2028 Long Term Plan and Infrastructure Strategy it is anticipated that several similar projects will need to be completed over the next 30 years to ensure GDC meets community expectations and its statutory obligations.

Funding

- 91 In GDC's Long Term Plan it has outlined a plan to invest approximately \$56 million over the next 30 years on renewing and improving its wastewater and stormwater networks¹.
- 92 For comparison purposes the current estimated replacement value of GDC's existing wastewater and stormwater systems that have been developed over the past 100 or more years is approximately \$64 million.

¹ Pg 57 of GDC 10 Year Plan 2018-2028

- 93 This expenditure is spread relatively evenly throughout the next 30 years. This ensures that investment is completed in an efficient and cost effective manner, providing value for money to the ratepayer.
- 94 Should the need arise to deliver these projects over a significantly shortened period it is likely this would put considerable pressure not only on GDC's internal resources but also local contracting resources, and of course ratepayers to fund this capital work.
- 95 On the contrary, should GDC not be able to obtain the necessary resource consents to give it the long term certainty that it requires, this may delay the planned upgrading of its infrastructure.

Complexities associated with provision of reticulated services and the challenges this presents

- 96 There are a number of issues with the existing infrastructure and challenges GDC faces when attempting to upgrade its infrastructure. A summary of the challenges are as follows:
- (a) Due to the gradual development of the existing networks over many generations the existing infrastructure is made up of various materials and construction methodologies, some of which through the test of time have been proven to be inadequate;
 - (b) A lack of the necessary technology has meant that accurate records of historical infrastructure have not been kept. This often requires significant investigation work to be completed at the beginning of a project and/or results in delays to work being completed;
 - (c) The community's expectations regarding the expected level of service has changed since the majority of the infrastructure was constructed;
 - (d) Given the importance of the function this infrastructure performs, only minimal interruption to the provision of the service is acceptable;
 - (e) Due to its nature the majority of the infrastructure is located in areas where concentrated populations reside. This requires any potential impacts on regular daily activities to be carefully managed; and
 - (f) The infrastructure is essentially owned by the community and due to this there is a requirement to consult with the community regarding proposed changes, alterations and costs. Given the varying perspectives and personal circumstances this shared ownership has a tendency to complicate and protract decision making processes.

- 97 It is essential that all upgrades and improvements to GDC's infrastructure must be carefully considered and well planned. This ensures the work is completed to meet the requirements of the community and GDC's statutory obligations for as long as possible.
- 98 Unfortunately this significantly limits the agility of the GDC to make changes and improvements to its infrastructure.

Key concerns and conclusion

- 99 My key concern with the pSWLP as notified is that discharges essential to allowing GDC's existing infrastructure to continue to operate are proposed to be non-complying activities. Appeals that seek to move away from objectives that enable the effective development, operation and maintenance of such infrastructure is not considered an appropriate recognition of the importance and practicalities of this infrastructure.
- 100 GDC rely on Mr Janan Dunning's expert evidence for detailed analysis and specific detail regarding the objectives of the pSWLP and potential implications that this will have.
- 101 As described in paragraph 56 to 90 of my evidence there are a number of historical issues with GDC's existing infrastructure.
- 102 However due to the complexities associated with upgrading GDC's infrastructure (refer paragraph 96 of my evidence), these discharges cannot practicably be stopped, or materially altered in the immediate future.
- 103 In order for GDC to meet its statutory obligations it will have no option but to continue to pursue the necessary consents to continue with these discharges.
- 104 The consequences of objectives not enabling these existing discharge activities or making them a non-complying activity is that GDC is likely to be required to invest significant time and financial resources into obtaining these consents.
- 105 This in turn will shift the focus away from making meaningful improvements to resolve the historical issues with GDC's infrastructure.
- 106 For this reason it is believed the pSWLP would be have a greater ability to achieve its intended outcomes if it does enable the operation, maintenance and upgrade of existing reticulation, treatment and discharges from local authority wastewater and stormwater systems.

Conclusion

- 107 The ongoing provision of reticulated wastewater and stormwater networks are critical to the health and wellbeing of the communities they serve.
- 108 GDC is committed to and has the appropriate plans in place to ensure the continual improvement of its infrastructure, reducing its environmental impacts.
- 109 However due to the various historical issues with GDC's infrastructure and the complexities associated with upgrading this infrastructure immediate change to the way the systems fundamentally function is generally not practicable.
- 110 GDC supports the outcomes to the PSWLP covered by Mr Dunning in his evidence.

A handwritten signature in black ink, appearing to read 'M Bayliss', written in a cursive style.

Matthew Bayliss