

Before the Southland Regional Council (Environment Southland)
Hearing Commissioners

Under the Resource Management Act 1991 (**RMA**)
In the matter of the proposed Southland Water and Land Plan (**pSWLP**)

**Evidence of Malcolm Ronald Loan on behalf of Southland District Council (SDC),
Gore District Council (GDC) and Invercargill City Council (ICC)**

11 May 2017

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Introduction

- 1 My name is Malcolm Ronald Loan.
- 2 I am Invercargill City Council's Drainage and Solid Waste Manager. I have held this position with respect to the Drainage Activity for 31 years, and with respect to the Solid Waste Activity for 5 years. The role includes preparation and management of asset management plans and annual and long term budgets, management and supervision of staff involved in delivery of the activity, and procurement and management of consultant and contractor services required to meet the objectives of the activities.
- 3 I hold a Bachelor of engineering degree and am a member of the Institution of Professional engineers of New Zealand.

Key concerns – background

- 4 The Territorial Authorities, including ICC provide sewerage and stormwater drainage services within the urban areas of the region for the benefit of residents. These provide for the health and wellbeing of the community by removing sewage and stormwater from residential areas to protect the health of residents, and to reduce the risk of property damage due to flooding. The Councils have developed Asset Management Plans which include strategies to operate, maintain, develop and renew the drainage networks to ensure that the community's needs continue to be met in the future. The AMPs seek to reduce the impact of these services on the natural environment by treatment of sewage, and by protecting stormwater from contaminants.
- 5 The pSWLP provides policies and rules which seek to maintain and improve water quality in the region, but sets rules that for drainage networks will be difficult to attain, and which may render the provision of these networks as non-compliant or prohibited activities. Along with my counterparts from GDC and SDC I am concerned that parts of the pSWLP places unrealistic expectations on the drainage networks. While I agree and am concerned with the issues raised by GDC and SDC I would like to draw attention to the specific issues below of importance to ICC.

Rules 5, 6 & 15 Discharges from Reticulated Stormwater Network

- 6 Stormwater discharges are provided for by these rules. However, because discharges from reticulated stormwater systems can contain contaminants, most critically, sewage, these discharges will become non-complying activities under Rule 6. While the Councils are working to reduce the contamination of stormwater at source this is expected to take a significant period of time to achieve the required improvements. The Councils have submitted that because urban

stormwater systems are essential infrastructure for healthy communities, that the rules should provide for discharges from reticulated systems as discretionary activities, and sought changes to Rule 15 to provide for this.

Rule 33 Discharges from ponds or other structures used to contain effluent or biosolids

- 7 The rule is directed towards proving the structural integrity of the structure rather than measuring the effects of the discharge on the receiving water, and this seems inappropriate for a plan which has the intention of protecting water quality. ICC has oxidation ponds at Omaui and Otatara, and facultative ponds and sludge lagoons at its Clifton waste water treatment plant.
- 8 The oxidation ponds are clay lined, while the Clifton sludge lagoons and facultative ponds are unlined, but sited on highly impermeable estuarine sediments. It is expected and provided for in the design of these structures, that there will be minor leakage , particularly through the floors, but due to the nature of the structures these leakages will be difficult to identify, and may be dispersed across the pond. Sewage treatment ponds are designed to operate continuously, with constant inflows and outflows, and it is not possible to divert flows in order to inspect the structure while still maintaining treatment standards. The Omaui Oxidation pond was originally designed with a fresh water take from a local stream to maintain pond levels in the event that pond leakage and evaporation exceeded sewage inflows, particularly during warmer summer periods. This water take was discontinued in 2004 and since then there have been no discharges to the land disposal area, and the pump has been disconnected. While it is possible that evaporation over a twelve month period could balance the inflows from a small community with low water usage, it is likely that there is some leakage from the pond. ICC monitor the coastal water adjacent to the pond and ground water between the pond and the coastal water, and have not identified significantly elevated contaminants in this monitoring. The Clifton Wastewater Discharge Consent requires monitoring of benthic communities on the estuary intertidal zone, and this has shown a significant improvement in these areas since the facultative ponds were commissioned in 2003. I believe that monitoring parameters of concern in the vicinity of these ponds as is currently being done better achieves the intentions of the plan than certifying the structural integrity of the ponds.

Rule 47 Closed Landfills

- 9 This rule provides for Landfills with Low risk assessment as determined in accordance with the MfE screening system to be permitted activities, provided that the risk assessment was lodged by 1 November 2015. The Councils have submitted that the deadline date for lodgement of Landfill risk assessments be deleted to provide for newly discovered closed landfills with low risk assessments to be permitted activities. The Bluff Closed Landfill has been assessed as low risk, but because this assessment was not lodged by the deadline date, it becomes a discretionary activity requiring consent. Apart from the historic lodgement date, there appears to be no reason why the Bluff closed landfill could not be a permitted activity, and no reason why newly discovered closed landfills meeting the MfE should be required to apply for a consent and to monitor discharges of leachate.

Benefits and need for infrastructure

- 10 Invercargill's Drainage Networks were first established over 100 years ago to protect public health, to reduce the risk of property damage due to flooding, and to enhance the urban environment. Over the intervening years the systems have grown with the city, and have been improved to provide better separation of the two networks, and to improve their performance in terms of the protection of public health and of property, and to reduce adverse effects on the environment.
- 11 The sewerage network includes 364 km of pipes in Invercargill, Otatara, Omaui, and Bluff, 29 pump stations, and three treatment plants, located at Bluff, Omaui, and Clifton. The Clifton and Bluff treatment plants both produce tertiary quality effluent, and the Omaui Plant is consented to discharge to land. Discharges from each of the treatment plants consistently comply with their consented quality standards. The network collects and treats sewerage and tradewaste from more than 20,000 residential commercial and industrial properties. The removal and treatment of sewage and tradewaste provides health benefits to the community, and provides one of the building blocks for business to establish and contribute to the prosperity of the community. The sewerage activity has an Optimised Replacement Value of \$180M and the activity has an annual budget of \$6.4M, including an asset renewal budget of \$2.1M.
- 12 The stormwater network includes 414km of pipes in Invercargill and Bluff, and nine pump stations. The system discharges at more than 250 locations along the five streams through the city and within the Coastal Marine Area. The discharges to the fresh water streams have been consented since 2011. These consents expired in December 2016, and ICC have applied for new consents. Consents for discharges to the coastal marine area have not been required. The stormwater network collects rainwater from rooves of buildings, and from ground

level surfaces through mudsumps. Stormwater is susceptible to contamination from a number of sources including contaminants which can accumulate on the surfaces from which water is drained, cross connection or overflow from the sewerage system due to blockage or damaged pipes, and overloading of both drainage systems due to high intensity rainfall. The system receives stormwater from more than 20,000 residential, commercial, and industrial properties. The drainage of stormwater provides health benefits to the community and protects properties from damage due to flooding. Following the major flooding of Invercargill in 1984, the stormwater network has been significantly upgraded to provide sufficient capacity for similar storms in the future. The upgrade included new and larger pipes to all the areas flooded in 1984, and has provided trunk mains to extend improved drainage into areas not yet upgraded. This upgrade has contributed to improved stormwater quality by reducing the frequency of stormwater overflow to sewerage, which in turn reduces the risk of sewage overflows entering the stormwater system and the receiving waters. The stormwater activity has an Optimised Replacement Value of \$206M and the activity has an annual budget of \$ 3.3M including a renewal component of \$1.8M.

- 13 In addition to the public networks, each connected property has stormwater and sewerage pipes which in total exceed the length of the public networks. While installation of these private systems are subject to building consent issued and supervised by territorial Authorities, ongoing maintenance is the responsibility of property owners. These systems have similar age profiles to the public systems, and cross contamination can occur through open and failing joints or through damaged pipes, particularly in the older properties. Because both stormwater and sewerage pipes are typically laid in the same trench, cross contamination is more likely to occur within private systems. With maintenance of these systems being the owner's responsibility, maintenance is often neglected, and quick fix solutions to a problem can result in illegal work and direct cross connections between the two drainage systems. These issues can be difficult to identify, and ICC officers often spend many frustrating hours locating contaminant sources, but these must be clearly identified before property owners can be required to rectify.

Ongoing need for Infrastructure

- 14 The drainage infrastructure will continue to be required as long as the city is inhabited. To ensure the service is continually available, ICC has developed asset management plans which provide for the maintenance, development, upgrading, and renewal of assets.
- 15 Operators and maintenance contractors continuously maintain the pipe networks and mechanical plant to ensure continuing optimum performance, and are on 24 hour call to respond to emergency events including mechanical breakdown, blockage, system overflow, and contamination events.

- 16 The networks are regularly monitored for performance and condition using CCTV inspection, flow monitoring, and maintenance records, and assets are scheduled for renewal to ensure continued optimum performance. The oldest parts of the piped networks have now reached their anticipated asset life of 100 years, and renewal programmes for these assets are underway. Annual asset renewals are currently budgeted at \$2.1M for sewerage, and \$1.8M for stormwater (33% and 54% of respective activity budget) and are planned to increase to \$2.4M for sewerage and \$2.6M for stormwater by 2022 (35% and 65% of activity budget), and will then continue indefinitely. With the current drainage budget amounting to 17% of the total city rate draw, and this percentage expected to rise further as renewal programmes ramp up, these are very significant commitments on ICC's part to the maintenance and continual improvement of the drainage activities.
- 17 Notwithstanding the improvements that can be made to water quality through renewals of the drainage systems, the majority of stormwater contamination is believed to originate on private properties, and this is much more difficult for ICC to deal with. As the housing stock ages and is demolished and replaced, ICC can and does require new property drainage systems for the new structure, but where maintenance issues arise with aging systems serving buildings still in use, the issue must first be identified and proven before remedial work can be required. This can be a long and frustrating process.
- 18 As part of its recent stormwater consent application, ICC has considered the possibility of treatment of stormwater. Treatment systems are available which will remove sediments and attached contaminants from stormwater, but these come at very significant cost which is expected to at least double the total city rate draw over the 25 year anticipated life of the devices. Unfortunately, due to the high variance of stormwater flows, systems are not available to treat the contaminants of most concern, being nitrogen and phosphate nutrients, and sewage. ICC has therefore proposed in its consent application strategies to target and reduce contaminant sources as a means to improve stormwater quality. There is a concern that pSWLP is directed towards achieving major quality improvements over a very short time frame, and is not able to easily accommodate the historic issues of urban drainage networks.

The problem with the pSWLP

- 19 By categorising stormwater discharges as non-complying activities under Rule 6, because they contain some sewage, the pSWLP fails to recognise the historic development of the drainage systems, and the current benefits to the community and to the environment that they provide. These systems were developed in accordance with the prevailing standards of the time, and within the limits of available technology. Standards and technology have developed over time, and new assets have been constructed to the latest standards. The pSWLP requires

a major step change in discharge quality, although these requirements will be reviewed as limits are eventually developed. The pSWLP fails to recognise that these standards cannot be met by the current infrastructure, and may not be achievable even with the most current technologies, and does not give a sufficient time frame for Territorial Authorities to develop compliant systems.

Malcolm Loan

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Invercargill City council

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