

IN THE MATTER

of the Resource Management Act 1991

AND

IN THE MATTER

of Resource Consents and Notices of Requirement for the Central Interceptor main project works under the Auckland Council District Plan (Auckland City Isthmus and Manukau Sections), the Auckland Council Regional Plans: Air, Land and Water; Sediment Control; and Coastal, and the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health

**STATEMENT OF EVIDENCE OF CRAIG JOHN MCILROY IN SUPPORT OF
APPLICATIONS BY WATERCARE SERVICES LIMITED
AUCKLAND COUNCIL STORMWATER**

1. INTRODUCTION

1.1 My full name is Craig John Mcilroy. I am the Manager of Stormwater at Auckland Council. I was previously a consultant with my own company providing strategic advice to the Auckland Water Industry. Prior to that I was employed by Watercare Services Limited ("**Watercare**") and its predecessor organisations for more than 20 years, with a number of different roles across the business, including General Manager Operations and subsequently General Manager Asset Management.

1.2 In my role as Manager Stormwater at Auckland Council I am responsible for managing, operating and maintaining an extensive network of infrastructure including 6,500km of pipe, 8,300km of stream, 370 ponds and 30 wetlands. As well as maintaining this infrastructure I am also responsible for the construction of new infrastructure and the education of industry and the wider community about stormwater.

- 1.3 Watercare has lodged Notices of Requirement and resource consent applications for the Central Interceptor main project works ("**Project**"). A number of submitters have suggested that a better option would be to separate the wastewater and stormwater sewers, and that if separation was to occur there would be no need for the Project.
- 1.4 There are two parts to that statement:
- (a) first, that separation of the combined sewer network is a better option to the Project; and
 - (b) secondly, if the combined sewer network was separated there would be no need for the Project.
- 1.5 The second part of the statement has been comprehensively addressed in the evidence that I have read of Mr Munro and Mr Cantrell. In short, the state of the lower portion of the Western Interceptor, and the risks that it poses to the Manukau Harbour, will not be addressed by separating the sewer network. In addition, separation would not address the need to augment capacity of the existing trunk sewer network to prevent dry weather overflows from occurring along the Orakei Interceptor within the next 10 to 15 years. From my own past experience, I am aware that these are significant factors to take into account.
- 1.6 That leaves the first part of the statement, which I will provide comments in response to. In short, sewer separation is not the preferred option for resolving wastewater issues in Auckland. I will explain the reasoning for this, including lessons learnt from past experience attempting to separate the combined sewer network.

2. ROLE OF THE AUCKLAND COUNCIL IN STORMWATER MANAGEMENT

- 2.1 Auckland Council Stormwater is responsible for the planning, delivery, operation and maintenance of all publicly owned stormwater assets and systems. A number of different departments of Auckland Council, in combination, are also responsible for stream management, flood management, contaminant management, sediment and erosion control, the control of stormwater discharges into networks (including

stormwater, wastewater and combined sewer networks) and into the environment.

2.2 While Watercare does not have any direct role in the separate stormwater systems in the region, it does work cooperatively with Auckland Council on matters of common interest. In respect of the Project, there has been extensive and ongoing collaboration and co-operation between Watercare and Auckland Council Stormwater. I am confident this will continue through the detailed design and consenting stages of the Project and that both parties will look to identify ways in which they can work to reduce the level of stormwater discharging into the combined sewer network and at particular sites. These future intentions are set out below in Section 4 of this evidence.

3. PRACTICABILITY OF SEPARATING THE COMBINED SEWER NETWORK

3.1 A number of submissions on the Project have commented that there are various other options other than the Project that would better address the existing wastewater overflows. Of all the alternative options, the majority of submitters who raise this issue consider that separation of the combined sewer (into a wastewater network and a separate stormwater network) is the best option.

3.2 As described in the evidence of Messrs Munro and Cantrell, while sewer separation has been undertaken in the past, the blanket separation of combined sewers is no longer a practicable option for Auckland. The key reasons for this are that sewer separation:

- (a) is expensive and would cost significantly more than the Project;
- (b) can result in problems and issues in terms of performance;
- (c) is far more disruptive to the public in terms of construction related effects;
- (d) is unable to achieve the level of benefits anticipated to be delivered by the Project, including in addition to reduced

wastewater overflows, duplication of the Western Interceptor and additional network capacity; and

- (e) can result in increased stormwater pollution, particularly from first flush stormwater runoff which can contain high levels of contaminants.

- 3.3 I agree with these comments. Combined sewer separation has been trialled in Auckland previously but has been largely discontinued due to the associated drawbacks of these works. I set out these drawbacks below.

The experience from previous separation works

- 3.4 Over the last 20 or so years the predecessors of Auckland Council and Metrowater have undertaken extensive works in an endeavour to improve the Auckland Isthmus combined sewer system. The most recent of these works was undertaken from 2004 and involved the sewer separation in the Motions catchment, which is an area of approximately 513 hectares, in order to resolve 56 overflow locations which generated around 140,000m³ on average per year.
- 3.5 The Motions South separation works were completed in 2008; however, the works were unavoidably disruptive, sometimes significantly, to individual property owners and local communities and they proved extremely expensive at a total cost of over \$52 million to separate 935 properties - which equated to approximately \$55,000 per property (and may have been even higher). In addition, despite the significant costs and disruption involved, complete separation was not actually achieved in Motions South, as it was not practical to disconnect all sources of stormwater from the wastewater system. This includes sources of stormwater from private property connections, which require homeowner intervention and expense to resolve.
- 3.6 Other examples include areas that were separated in Grey Lynn and Point Chevalier. In these areas significant investments in sewer separation were also made. Post separation monitoring and investigations showed that the wastewater systems still had a significant amount of stormwater present, to the point they still behave like combined sewer systems. Monitoring also revealed some

wastewater present in the separated stormwater systems, which means that small volumes of wastewater are discharging continuously as the separated stormwater lines discharge directly to local streams. In both Point Chevalier and Grey Lynn, some wastewater overflows continue to occur in spite of the investments in separation. Works are currently being carried out by Auckland Council Stormwater to address these outstanding problem areas.

- 3.7 It is also worth noting international experience with combined sewer separation. The United Kingdom arguably has more experience in addressing combined sewer overflows than any other nation, and in the 1970s the practice of separation was determined not to be cost-effective for similar reasons as those listed above. Similarly in North America most cities which have combined sewer systems have opted for solutions other than separation to address combined sewer overflows. In fact, in the City of Boston it was determined that a storage/conveyance tunnel (similar to the Central Interceptor Scheme) would have to collect stormwater from a small area which had been separated, in addition to the combined sewer overflows, to prevent the closure of local bathing beaches. This is because the first flush of stormwater from the separated area was found to be heavily contaminated. I discuss this "first flush" concept later in my evidence.

Separation must be undertaken in conjunction with remedial works

- 3.8 Separation alone would also not address all wastewater overflows targeted by the Project. Areas which drain to the existing overflows consist of purely combined sewer systems, and systems which have some separate stormwater drainage but still behave as combined sewer systems. Therefore, separation works have to be coupled with comprehensive remedial works to repair private property connections and leaky systems. This is due to direct stormwater connections from private property into the wastewater system, and leakage which occurs on both public and private sewer systems. As much as 50 to 60% of the stormwater leakage occurs along defective private property sewer lines (the pipes which connect the houses and businesses to the public sewer lines).

3.9 In order to reduce overflows in these areas a comprehensive separation and rehabilitation programme to address stormwater sources from public and private systems would be required. Such comprehensive rehabilitation of public and private sewers is very expensive. Local and international evidence shows that comprehensive rehabilitation results vary significantly, and that the most successful programmes only reduce the stormwater by approximately 50%. Therefore the results of sewer separation and comprehensive rehabilitation in reducing overflows would likely be much less than what is achieved by the proposed Project and also, as discussed below, be much more expensive and disruptive during construction.

Cost and benefit analysis

3.10 Sewer separation has significant cost implications that make this option excessively expensive when compared to the level of benefits that can be achieved.

3.11 I understand the Central Interceptor Scheme is estimated to cost \$800 million, but that only \$230 million of that cost relates to collection of the overflow volumes. The collection of overflows is therefore estimated to cost \$230 million to provide an 80% reduction in wastewater overflow volumes at 122 overflow locations. By comparison, combined separation works would cost approximately \$850 million, with the remedial works adding an estimated additional \$500 million. Even with such comprehensive remediation, it would still achieve a smaller reduction in wastewater overflow volumes. The Central Interceptor Scheme can achieve a reduction in overflow volumes for \$1 billion less than comprehensive separation and rehabilitation, yet provides a greater reduction in overflow volumes. It can also satisfy the other two key drivers, neither of which would be provided by sewer separation.

Project as the preferred and appropriate option

3.12 Auckland Council Stormwater supports the use of the Project to manage discharges from areas served by combined sewers within the Central Interceptor catchment area. It will provide more effective and reliable outcomes compared to sewer separation at substantially less cost and substantially less disruption to property owners and affected

communities. In addition, the Project is able to achieve overflow reductions that could not be achieved under a combined separation programme, and for a significantly lower cost.

4. INTERFACE BETWEEN THE CENTRAL INTERCEPTOR PROJECT AND STORMWATER MANAGEMENT

4.1 The following interfaces between the Project and stormwater management are being addressed cooperatively by Auckland Council Stormwater and Watercare. I outline the current and proposed methods for addressing each interface in each case.

Management of future increases in stormwater flows generated within areas served by the Central Interceptor

4.2 Wherever practicable, Auckland Council Stormwater will require future increases in stormwater flows to be discharged to the ground, where adequate soakage is available, or to local streams where it will not exacerbate existing flooding issues.

4.3 In recognition that this may have reduced application as development density increases, Auckland Council Stormwater is assessing alternative stormwater management options to provide adequate drainage and flood protection, and is coordinating with Watercare to assess opportunities for using these systems to reduce the amount of stormwater going into the wastewater system. Whilst these measures will not be sufficient to stop overflows, they will help reduce the amount of stormwater which the Project must cope with, and ultimately the amount of stormwater sent to the Mangere Wastewater Treatment Plant ("**Mangere WWTP**").

4.4 As part of a programme of continuous improvement, Auckland Council will investigate opportunities to reduce stormwater inflows to the combined sewer system where practicable alternatives exist. This includes further improvements to areas already separated, and targeted stormwater diversion from the wastewater networks where this is facilitated by stormwater drainage improvement schemes required to provide flood protection and cater for additional growth.

- 4.5 It should be noted that the Central Interceptor is not being designed to provide stormwater flood protection. The proposed target of reducing overflows by 80% on average relates to storm events which have a probability of occurring 6 to 8 times per year (i.e. small to moderate storm events). Alternative stormwater drainage and flood protection systems are designed to cope with storm events that are much larger than this, as the Central Interceptor tunnel would likely be full for anything larger than a one in 6 month storm.

Management of first flush stormwater pollution

- 4.6 Recent studies conducted overseas and in Auckland have determined that the initial volume of stormwater runoff, also referred to as “first flush runoff,” can be heavily contaminated with pollutants such as oils, heavy metals, nutrients, bacteria, and suspended solids. Many of these contaminants can have a long-term effect on the environment, including the health of urban streams and coastal areas, such as the Oakley and Meola Creeks and where they discharge into the Waitemata Harbour. The initial portion of runoff can be quite contaminated and ideally should be captured for treatment prior to being released into the environment.
- 4.7 The presence of first flush pollution from stormwater runoff can vary, but tends to be more pronounced in highly developed areas with significant road surfaces and other sources where contaminants can build up over time. Monitoring to date shows the presence of significant first flush pollution in larger combined sewer overflows (“CSO”), including the Lyon Avenue CSO which discharges into the Meola Creek. The Project will capture these first flush contaminants from 18 CSOs, in addition to the untreated wastewater component, with the wider Central Interceptor Scheme capturing a further 104 CSOs.
- 4.8 In conjunction with Auckland Council’s programme of continuous improvement to identify opportunities to divert stormwater away from the wastewater systems, the opportunities to utilise the Central Interceptor tunnel to capture first flush pollution from the initial small volumes of diverted runoff will also be investigated. In general, this will result in a net reduction of stormwater into the wastewater system, and a net reduction of stormwater pollution released into the environment.

Mr Cantrell's evidence addresses integration of the Central Interceptor tunnel with the Mangere WWTP. His evidence concludes that stormwater contaminants can be safely and efficiently removed at the Mangere WWTP, and that these overflow volumes represent a small fraction (2%) of the current volumes already treated by the Mangere WWTP on an annual basis.

Stream management

- 4.9 As noted in the evidence of Mr Cantrell, a number of construction sites are located in relatively close proximity to streams and in particular to Motions Creek, Meola Creek, Oakley Creek and the Whau Creek. Watercare has advised that it intends to reinstate sites on completion of the works but wishes to ensure any reinstatement is consistent with, and complements, the Auckland Council's wider stream management programmes and, to the extent practicable, local programmes being undertaken by voluntary organisations.
- 4.10 As noted earlier in my evidence, Auckland Council is responsible for stream management, which includes defining management objectives, preparing catchment management plans and watercourse management plans and ensuring works by other parties are consistent with the Auckland Council's requirements. In particular, Auckland Council will be responsible for making decisions about stream management relating to:
- (a) Stream day-lighting;
 - (b) Contaminant management;
 - (c) Ecological restoration of streams and enhancing amenity values;
 - (d) Public access to streams;
 - (e) Flood plain management; and
 - (f) Erosion management.
- 4.11 Decisions on stream day-lighting will need to be made primarily on the basis of stormwater management and aesthetic considerations, largely independent of the Project. However, until the Central Interceptor is

complete and overflows are mitigated, Auckland Council does not anticipate any significant stream day-lighting or improvements in access to streams, to ensure risks to public health are minimised. Care will be required to ensure that any local reinstatement works at individual construction sites in close proximity to streams undertaken as part of the Project are not found to be redundant because of Auckland Council's subsequent stream management activities.

4.12 It will be important that Watercare minimises any potential constraints on future stream management options available to Auckland Council as a result of the Project.

4.13 Therefore, to address these points, Watercare and Auckland Council are cooperating and will continue to cooperate to ensure that Central Interceptor reinstatement works are consistent with, complement, and where possible, enhance works undertaken by the Auckland Council and community groups. However details will be unable to be confirmed until the Auckland Council's planning is finalised. In some cases this could be after construction of the Central Interceptor has started.

Meola Creek catchment

4.14 Auckland Council Stormwater is part way through an investigation of alternatives to address habitable floor flood risk in the Meola Creek catchment. We are co-ordinating with Watercare to assess opportunities and to enhance the benefits provided by the Central Interceptor as a result of this work. I am confident that Auckland Council Stormwater and Watercare will continue to work collaboratively to ensure appropriate outcomes are achieved.

Walmsley Park

4.15 Auckland Council Stormwater is at the concept planning stage of a major restoration programme for the section of Oakley Creek through Walmsley Park. The Project's proposed Walmsley Park construction site is located at the eastern end of the park, just within the area included in the restoration programme. Watercare has indicated its willingness to work closely with Auckland Council Stormwater to ensure landscaping of the construction site is consistent with and complements the Auckland Council's final restoration plan.

May Road

- 4.16 Watercare is working with the Auckland Council to investigate ways of re-contouring parts of the proposed construction site to reduce the risk of flooding of nearby houses located within the 100-year flood plain.

Other sites

- 4.17 There are few, if any, interface issues between Auckland Council Stormwater's interests and the Project at other construction sites. However, if any issues arise in future, Auckland Council Stormwater and Watercare will work collaboratively to ensure appropriate outcomes are achieved.

5. CONCLUSIONS

- 5.1 In conclusion, I agree with the comments of Messers Munro and Cantrell and endorse the reasons why Watercare has determined that separation is not a practicable option for Auckland. Watercare has undertaken a thorough assessment of all the available options and, based on this assessment, correctly concluded that the Central Interceptor Scheme is the most appropriate option to achieve the highest level of benefits at the most cost-effective price. Separation works are, as has been illustrated by previous experience, more costly and disruptive and are unable to mitigate wastewater overflows to the same extent or efficiency as the Central Interceptor Scheme. Separation works would not achieve the key drivers of duplicating the Western Interceptor and providing additional capacity to the network. Furthermore, it is my opinion that the Project provides significant opportunities to enhance Auckland Council's programme of continuous improvement by offering a highly cost effective option to address first flush stormwater contaminants.
- 5.2 In addition, Watercare, the Auckland Council and Auckland Council Stormwater are committed to working collaboratively and cooperatively throughout the design and construction stages of the Project and the Council's own stormwater upgrades to ensure appropriate and consistent outcomes are achieved.

Craig Mcilroy
12 July 2013