

BEFORE THE CANTERBURY REGIONAL COUNCIL

UNDER THE

Resource Management Act 1991

AND

IN THE MATTER

of application CRC190445 by the Christchurch City Council for a comprehensive resource consent to discharge stormwater from within the Christchurch City area and Banks peninsula settlements on or into land, into water and into coastal environments

**SUMMARY OF EVIDENCE OF
MARK JAMES PINNER FOR CHRISTCHURCH CITY COUNCIL
Dated 5 November 2018**

TABLED AT HEARING

Application: *CRC190445*.....

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Date: *6 Nov, 2018*.....

CHRISTCHURCH CITY COUNCIL
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INTRODUCTION

1. My full name is Mark James Pinner. I here summarise key points of my evidence, focusing on an overview of why the Council sweeps the road corridor, what it is limited to, and what the road sweeping level of service requirements are.

SUMMARY OF EVIDENCE

2. Street sweeping is an economic and flexible mitigation option to reduce the contaminant load downstream of roads, which can readily be adapted as traffic demands and patterns, and/or land use, change.
3. I consider that the Council's current practices achieve a good balance of focusing on where there is an increased likelihood of contaminant load, and follows Best Practice. Council follow similar principles as other Territorial Roding Authorities, as New Zealand Transport Agency (NZTA) does for its State Highway network.
4. Council monitors the needs of the road network continuously to identify where the highest potential for mitigation of contaminant load by sweeping or sump cleaning will be.
5. Stormwater discharges from residential and commercial properties, their driveways and other impervious areas are not able to be mitigated by street sweeping.
6. Not sweeping is not an option due the secondary flooding, safety or aesthetic concerns. The higher level of sweeping in certain areas is often desired for amenity and aesthetic reasons rather than for efficient environmental mitigation.
7. Council inspects, and empties, as required, sumps at a six monthly interval. The Council is recording the frequency that sumps need emptying to build up a good picture of where the demands are most extensive.

The Purpose of sweeping – directly in the road corridor

8. The historic purpose of road sweeping is to maintain drainage, safety, prevention of asset and private property damage, cleanliness and amenity.
9. A road's shape is typically designed to shed water to its lower outer edges, where water is typically channelled via a form feature to a low point. Keeping drainage paths free of restrictions limits the likelihood of stormwater forming uncontrolled secondary flow paths that could damage private property or the roads own support, especially on hillside areas where the flow speeds and volumes are more considerable.
10. Good drainage not only prevents asset damage, it reduces the risk of creating safety issues such as aqua-planing or drivers suddenly deviating from their path.
11. The public expects an urban environment to be free of debris and rubbish. This debris can also pose safety implications, for example glass.
12. The stormwater that is discharged from the road contains adjoining properties stormwater also; these volumes are at times far more considerable than that generated in the road carriageway footprint itself, and often has no control measures itself.

The Purpose of sweeping – downstream of the road corridor

13. In established urban areas the space to construct and/or readily maintain best practice structures such as infiltration facilities is limited. Road sweeping is likely to be one of the most economic and practicable solutions in these areas.
14. Pollutants on the road, and those that adjoin and discharge into it, accumulate until they are washed off in a rain event or are swept away. Council generally has sweeping frequencies where there is higher traffic use or commercial activity, to be more likely to capture, or reduce, these loads in between storms.

Councils' Level of Service (LoS) for Sweeping

15. The Council's requirement for contractors is for sweeping to remove, and dispose, of debris by mechanical and/or manual means from the roads kerb and channel, sump tops, dish channel, and under vehicle crossings.
16. The frequency of sweeping is specified, by Council, street by street, accessway, cycleway, mall or other footpath area.
17. Council requires its Contractors to inspect each of its sumps twice a year, and at all times ensure they are clear of debris to 50mm below the invert of the outlet; otherwise the sump is to be immediately scheduled to be fully emptied.
18. Given the number of sumps, over 30,000 across the City, it is not efficient nor economic, to clean all of the sumps routinely.
19. From April to July additional leaf fall is also collected within the street, for both safety reasons (i.e. not being able to see the kerb and channel), and to reduce the likelihood of sumps getting blocked.
20. Areas known to be susceptible to flooding are swept before, during and after a significant weather event; rainfall expected to be >20mm over 2 hours or more.
21. In preparation of planned large scale public events specific road sweeping is occasionally undertaken; prior to the event for amenity reasons, and after the event to remove waste that is left behind.

Assets and features Council sweeps in the road corridor

22. Council sweeps 44,800km of road each year; kerb and channel and dish channel form the bulk length of what is swept, but it also includes abutting areas such as island, and intersection heads, for example.
23. Approximately 8 sweepers are continuously engaged over the entire network. Although the plant is of different age and type across and within the contractors, all currently use vacuum sweepers.

24. Sweeping by hand is required if access is reduced due to parked cars. Some sweeper units are fitted with suction snorkels to enable cleaning under the bridge blocks. For smaller, narrower, sections such as cycleways and footpaths/accessways, bespoke plant is used.
25. Sweeping is paid as a Lump sum per month. The weight removed is paid in addition by the tonne at the Transfer Station. In FY1718 (01 July 2017 to 30th June 2018), the cost of all of these operations across the City was approximately \$3.0m per annum (inclusive of \$800k of waste (9,150T)).

Councils' Performance Requirements for Sweeping

26. The Council's current contract requirements for sweeping are that:
 - 26.1 Post sweeping, no debris remains, within 1.0m from the kerb face into the road, vehicle crossings are clear of material, sump tops are cleared and that no windrows of detritus remain;
 - 26.2 The scheduled frequency scheduled is delivered;
 - 26.3 Full network coverage is provided; ; GPS information is provided (in real time) of where the operation is undertaken, including proof when sweeping unit is in use;
 - 26.4 For leaf collection, less than 75 Customer Services Requests are received by Council from the public per month Specific flood prone areas are cleaned prior, during and after high intensity rainfall (>20mm in 2 hour period)

Determining the Frequency of road sweeping

General Principles

27. Generally the highest frequency sweeping is undertaken where there is:
 - 27.1 high pedestrian or commercial usage areas, such as malls;
 - 27.2 high volume, multi lanes roads (large surface area etc);
 - 27.3 hillside locations where flow is significant;

27.4 flood prone areas; or

27.5 significant leaf falls occurs.

28. The frequency of sweeping is re-adjusted within Council's Contracts every six months, to meet changing activity needs. This is done to balance risk, environmental effects and customer experience within the funding that is available to ensure that the Council targets resources to areas of highest need.

Unique traffic demand and activity criteria for Christchurch

29. Christchurch has had significant and rapid changes with regards to traffic demand and its distribution since the 2011 earthquakes. The change in distribution of traffic demand will, I believe, likely take another 5 to 10 years to reach a point where it is less marked.

NIWA Study¹ (Appendix A to my evidence in chief)

30. The Report is a literature review of studies relating to the potential for sweeping to yield improvements in stormwater quality, so Nelson Council could consider how they could implement Environmental sweeping. The Report aims to summarise best practice, and is one of the most recent to have been undertaken by an independent and recognised authority in NZ. This is therefore equally valid for Christchurch City Council.
31. The Report (Executive Summary and 3.4.2) indicated that Vacuum sweepers are the most efficient sweepers at present. Council Contractors utilise vacuum sweepers.
32. The Report (3.4.2 and 4.2.2) found that finer particulates (125 to 250um, or even smaller) were only effectively able to be picked up by vacuum sweepers.

1 NIWA Studies; Depree April 2011 "Street sweeping: an effective non-structural Best Management Practice (BMP) for improving stormwater quality in Nelson?"

33. One of the key findings of the Report (Executive summary and 4.1.3) is that “The most important parameter determining the effectiveness of sweeping to reduce stormwater contaminant load is the time interval between storms.”
34. The Report (4.3.1) indicates that the recommended sweeping frequencies for streets with high traffic volumes is between weekly and a fortnight, commercial streets typically between fortnightly and monthly, and residential areas between monthly and each quarter. Council’s frequency range is in line with these levels.
35. The Report (4.2.1) suggest that the greatest benefits from sweeping will be in catchments where the street pollutant load makes a large contribution to the total catchment runoff load (e.g. for arterial roads with commercial activity). Council’s aims to more frequently sweep known areas of commercial activity, where higher loads off the road are expected.
36. The Report (4.2.5) suggests even if street loads are a minor contributor, some industrial areas, particularly in the automotive field would benefit from increased sump cleaning. I acknowledge demands across the network are always changing and hence why flexibility to this is key. I agree that there is merit in the Council undertaking the street sweeping and sump cleaning investigation and trials referred to in proposed condition 38.
37. The Report (4.3.2) states that it is estimated that whilst street particulates are not uniformly distributed over the road, between 80-90% of it resides between the kerb face and 300mm into the road. Council sweeps 1.0m from kerb face, which should capture the majority of contaminants off of the road.
38. The Report (3.4.2) suggests that removal efficiency is directly linked to street load. Council’s average rate of removal of 206kg/km, in the Year July 2017 to June 2018, is in the upper levels of maximum efficiency. However, I acknowledge that the high level of construction activity in Christchurch may have contributed to higher levels of sediment than typical for a “Normal” street load.
39. The Report (4.3.2) suggested good maintenance of plant and equipment, and application, is necessary to maximise removal. Council is increasing its audits of

the work undertaken, in the field and through desktop analysis, so that failure to meet requirements is picked up more routinely. Failure to obtain the required Level of Service now has meaningful monetary impact to the Contractors, to illicit the required performance.

MARK PINNER

5 November 2018