

**BEFORE INDEPENDENT HEARING COMMISSIONERS
IN CHRISTCHURCH**

TE MAHERE Ā-ROHE I TŪTOHUA MŌ TE TĀONE O ŌTAUTAHI

UNDER of the Resource Management Act 1991 (RMA)

AND

IN THE MATTER of the hearing of submissions on Plan Change 14
(Housing and Business Choice) to the Christchurch
District Plan

AND

IN THE MATTER of the Canterbury Regional Council (submitter 689)

**STATEMENT OF EVIDENCE OF JESSICA NEWLANDS ON BEHALF OF THE
CANTERBURY REGIONAL COUNCIL**

STORMWATER (PORT HILLS)

20 September 2023

Canterbury Regional Council's Solicitor
PO Box 4341 CHRISTCHURCH 8140
DX WX11179
Tel +64 3 379 7622
Fax +64 3 379 2467

WYNN WILLIAMS

Solicitor: M A Mehlhopt
(michelle.mehlhopt@wynnwilliams.co.nz)

INTRODUCTION

- 1 My full name is Jessica Mary Newlands.
- 2 I am a Resource Management Technical Lead at the Canterbury Regional Council (**Regional Council**). I have held that position since November 2022. From July 2021 to November 2022, I was employed by the Regional Council as a Senior Resource Management Officer. From November 2018 to July 2021, I was employed by the Bay of Plenty Regional Council as a Senior Regulatory Project/Compliance Officer specialising in three waters compliance. From February 2014 to November 2018, I was employed by AECOM (formerly URS) as a Water Resources Engineer.
- 3 In my current role I provide technical advice and training to Regional Council staff on stormwater quality and quantity, wastewater treatment, erosion and sediment control matters, Resource Management Act obligations and enforcement and various other environmental compliance matters. I also monitor compliance of Christchurch City Council (**City Council**) with the Comprehensive Stormwater Network Discharge Consent.
- 4 In total I have 9 years' experience in Water Resources Engineering and Environmental Compliance.
- 5 I hold a Bachelor of Engineering degree with Honours from the University of Canterbury in Natural Resources Engineering.
- 6 I have been asked by the Regional Council (submitter number 689) to prepare evidence in respect of Plan Change 14 to the Christchurch District Plan (**PC14**).
- 7 Whilst I am an employee of the Regional Council, I have prepared this evidence in my capacity as an expert and, although I acknowledge that this is not an Environment Court hearing, I confirm that I have read and am familiar with the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2023. I have complied with the Code of Conduct in preparing this evidence and I agree to comply with it while giving any oral evidence during this hearing. Except where I state that I am relying on the evidence of another person, my evidence is within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

SCOPE OF EVIDENCE

- 8 I have been asked by the Regional Council to provide evidence on the matters arising from the Regional Council's submission on PC14 in respect of the expected adverse effects of PC14 on stormwater quantity and quality generated from development within the residential suburbs of the Port Hills.
- 9 My evidence addresses:
- a. PC14;
 - b. Characteristics of the Port Hills; and
 - c. Adverse effects of stormwater discharges on the Port Hills.
- 10 In preparing my evidence, I have reviewed the following documents and evidence:
- a. The relevant parts of the City Council's s32 Qualifying Matters Evaluation Report;
 - b. The relevant s42A reports;
 - c. The memorandum titled "Stormwater Infrastructure Constraint for Plan Change 14 (MDRS)" prepared by Tom Parsons, Surface Water Engineer and Brian Norton, Senior Stormwater Planning Engineer;
 - d. Christchurch City Council Three Waters and Waste Unit Onsite Stormwater Mitigation Guide; and
 - e. The Christchurch City Council Waterways Wetlands and Drainage Guide.

EXECUTIVE SUMMARY

Stormwater quantity

- 11 The intensification of housing enabled by PC14 will increase the imperviousness of affected suburbs on the Port Hills, which will in turn generate higher stormwater flows and increased stormwater runoff volumes. At present, only parts of Cashmere and Huntsbury appear to be zoned for medium density, however the restrictions on intensification

in the balance Port Hills areas are not primarily for stormwater and so could be removed due to considerations not related to stormwater.

- 12 Whilst an increase in stormwater quantity can be partially mitigated by stormwater storage provided by developers within the individual lot boundaries, there are physical and topographical limitations as to the range of storm events that can be effectively captured and mitigated. These systems also require ongoing maintenance.
- 13 These higher stormwater flows, and increased volumes, will exacerbate localised nuisance flooding and contribute to flood hazards in the Opawaho/Heathcote River corridor. This may compromise the ability of the City Council to meet its obligations under the Comprehensive Stormwater Network Discharge Consent for Christchurch and Banks Peninsula.
- 14 Whilst the City Council asserts that it does not yet have a comprehensive set of quality, detailed, flood information which would allow it to identify areas which are suitable for a flood effects or stormwater Qualifying Matter, the likely effects of the intensification which will occur as a result of PC14 on stormwater quantity is generally accepted and understood and have been acknowledged by City Council staff.

Stormwater quality

- 15 The intensification of housing enabled by PC14 will increase the disturbance of highly erodible and dispersive soils (loess) during site preparation works and building construction. The sediment laden construction phase stormwater generated from this disturbance is difficult to control on steep hill sites.
- 16 The intensification of housing enabled by PC14 will increase the quantity of stormwater discharged (either controlled or uncontrolled) to highly erodible hill land after construction has finished, as it is not always possible to capture all stormwater generated within a site and to direct it to the stormwater network, where that network can carry the stormwater to the base of the hill to discharge into a receiving waterway.
- 17 The increase in the discharge of sediment laden stormwater from construction and after construction has finished is likely to result in an

increase in sedimentation in receiving waterways. This will contribute to an ecological decline of natural waterways and coastal estuary systems.

- 18 If the proposed re-development can occur as a permitted activity under the District Plan and the Regional Plan, then the only form of compliance and inspection for construction phase stormwater discharges will be at the building consent stage. A Residential Building Site Erosion Sediment Control Compliance Survey undertaken by the City Council in 2022 looked at compliance with Building Act requirements for erosion and sediment runoff. The Survey found that 100% of sites failed to meet one or more of the conditions of the site-specific erosion and sediment control plans. Despite this, the Survey found that for the same period, the houses on these sites passed their building inspections and no erosion and sediment control issues were noted by building inspectors.

PROPOSED PLAN CHANGE 14 TO THE CHRISTCHURCH DISTRICT PLAN

- 19 PC14 allows for intensification of most residential zoned land within the City, unless a qualifying matter is applied. The majority of the Port Hill suburbs¹ are not proposed to be intensified as they are covered by a “Low Public Transport Accessibility Area” Overlay (to be renamed “Suburban Hill Density Precinct” if s42A recommendations are adopted). This Low Public Transport qualifying matter is directed primarily at low public transport access and general three waters infrastructure servicing restraints, not specific stormwater issues. There is no specific stormwater qualifying matter covering the Port Hill suburbs.
- 20 There is also a qualifying matter for smaller, isolated Slope Instability Areas – which are the Cliff Collapse Management Area 1, Cliff Collapse Management Area 2 and Rockfall Management Area 1 carried over from the operative District Plan.
- 21 However, large areas of two Port Hill suburbs (lower Cashmere and lower Huntsbury) are intended to be rezoned to Medium Density Residential and have medium density standards enabled. Applying medium density residential standards to Cashmere and Huntsbury means:

¹ Kennedys Bush, Redmund Spur, Westmorland, Cracroft, Hillsborough, Heathcote Valley, Mt Pleasant, Redcliffs, Clifton / Richmond Hill, Sumner, Scarborough.

- a. An increase in the number of houses permitted per site from one primary and one minor unit to three units;
 - b. An increase in the permitted building coverage from 35% to 50%. This building coverage cap doesn't include other impervious surfaces, such as driveways, decks, balconies, eaves;
 - c. Like the operative District Plan, there are no restrictions on total impervious surface area. Mr Norton in his s42A evidence for the City Council, assumed that the impervious area in medium density areas could be as large as 80%² ; and
 - d. A minimum landscaped area of 20%, which could be made up of grass or plants, or tree canopy cover regardless of the ground treatment beneath it.
- 22 An increase in the number of houses and building coverage will result in an increase in impervious area, and a reduction in vegetation. This reduces the amount of rain that can infiltrate into the ground and will therefore result in an increase in the quantity of stormwater discharged from the intensified sites.

CHARACTERISTICS OF THE PORT HILL SUBURBS

- 23 The Port Hills consists mainly of volcanic colluvium with varying layers of loess deposition. Loess is a wind-blown material, sourced from braided river flood plain deposits.³
- 24 Loess is highly erodible, fine grained, and highly dispersive when entrained in water. Loess dominates the lower Port Hills slopes and flatter ridge top positions.
- 25 There are many surveys and studies undertaken on soil and erosion in the Port Hills by Bruce Trangmar. Of note, a report titled "Soil Conservation on the Port Hills" prepared by Bruce Trangmar of Landcare Research was released in May 2003. This report was commissioned by the Christchurch City Council. Environment Canterbury commissioned Manaaki Whenua to extend the Trangmar

² Brian Norton's s42A evidence at page 6, paragraph 31.

³ Christchurch City Council Waterways, Wetland and Drainage Guide, Section 7.3.

work, and map erosion features of the wider Banks Peninsula, including the Port Hills in 2017.

- 26 The updated Manaaki Whenua 2018 report found that the main erosion types identified and mapped were shallow landslide, tunnel gully, streambank, sheet, wind and rill erosion. The key erosion features and sediment sources are concentrated on the lower to mid elevation slopes mantled with loess-dominated regoliths, although locally stream bank and bed erosion may be a significant contributor of sediment directly to waterways.⁴ It is worth noting here that this report is applicable to the unmodified rural landscape, as opposed to the modified and engineered terrain associated with infrastructure development and urbanisation – however, many of the findings in relation to soil type and associated erosion risk are considered relevant.
- 27 Stormwater on the Port Hills is managed by private landowners and the City Council.
- 28 The management of stormwater on the Port Hills changed with the commencement of the Interim Stormwater Global Consent, and subsequently the Comprehensive Stormwater Network Discharge Consent (the **CSNDC**). See paragraphs 52 to 59 of my evidence for further information on the CSNDC. Where possible (based on site constraints), stormwater is collected and discharged into the Christchurch City Council's reticulated stormwater network. If topography allows, the reticulated stormwater network then conveys the stormwater down the hill and discharges it via outfalls into the Ōpāwaho/Heathcote River, or into smaller receiving water bodies such as drains and the Cashmere Stream.
- 29 Where topography is more challenging, stormwater has been discharged to hill sides via outfall structures. These outfall structures are either owned and managed by the City Council, or are privately owned. The CSNDC which commenced in 2019 does not allow the discharge of stormwater to land where the average site slope exceeds 5 degrees.

⁴ Manaaki Whenua Landcare Research, Best practice erosion and sediment control measures for the rural landscape of the Port Hills – a literature review, August 2018

- 30 The City Council's reticulated stormwater network on the Port Hills is comprised of pipes (and associated structures), drains and waterways, kerbs and channels, swales and detention ponds, and outfall structures.
- 31 The below ground network (primary system) has a limited, fixed capacity and is designed to cater for the more frequent rainfall events up to and including the 20% Annual Exceedance Probability (**AEP**) rainfall event. The above ground network (secondary system) must convey over-design events without inundation hazard to house floors and building platforms at least to the 2% AEP storm, including occasions when there are blockages in the primary drainage system.⁵
- 32 Development or redeveloped sites are required to install attenuation tanks. The outlet from these tanks is directed to the reticulated stormwater network. Where stormwater cannot be intercepted and discharged, or directed towards the road, it will discharge onto neighboring property (either rural or residential).

ADVERSE EFFECTS OF STORMWATER DISCHARGES

- 33 The adverse effects that are most relevant to the PC14 proposal can be split into two categories:
- a. Potential sedimentation impacts on the receiving environment caused by stormwater discharges during and after intensification on the Port Hills; and
 - b. Potential flooding impacts caused by an increase in stormwater quantity generated on the Port Hills.

Stormwater quality

- 34 The Residential Hills Zones in the operative District Plan are located over loess soil deposits. As loess is fine grained, highly mobile and dispersive, all residential development and the subsequent discharge of stormwater within these zones can cause adverse effects on stormwater and receiving water quality.

⁵ As described in the Christchurch City Council Infrastructure Design Standard, Part 5 Stormwater and Land Drainage.

- 35 The discharge of construction phase⁶ stormwater during development of sites in the Residential Hills Zones can result from:
- a. The disturbance of soil during site preparation including existing building demolition and topsoil removal;
 - b. Excavation and fill;
 - c. Contouring;
 - d. Cut slopes for accessways; and
 - e. Installation of services.
- 36 The discharge of operational phase⁷ stormwater onto loessial soils from development in the Residential Hills Zones can occur via:
- a. Existing City Council hillside stormwater outfalls;
 - b. Existing privately owned hillside stormwater outfalls;
 - c. Runoff from new or existing impervious surfaces that isn't captured by stormwater infrastructure;
 - d. Overflow from improperly maintained rainwater tanks; and
 - e. Increased runoff from compacted soils.
- 37 Sediment laden water generated from operational stormwater discharges, or construction phase stormwater, can then enter stormwater infrastructure, drains, streams, and rivers – the Ōpāwaho/Heathcote River, or the Halswell/Huritini River. These rivers discharge into the Ihutai/Avon-Heathcote Estuary and Lake Te Waihora.
- 38 Sediment inputs into receiving waterways can increase suspended sediment and deposit sediment onto the stream bed. Suspended sediments can clog fish and invertebrates gills, decrease light availability for aquatic plants, and reduce visibility for fish. The deposition of sediment can smother the stream bed and reduce available habitat and

⁶ Construction-phase stormwater is defined in the Canterbury Land and Water Regional (CLWRP) as “water, sediment and entrained contaminants resulting from precipitation on exposed or unstabilised land and which arises from construction or demolition activities, or the development of a building site.”

⁷ Stormwater is defined in the CLWRP as “runoff water and entrained contaminants arising from precipitation on the external surface of any structure or any land modified by human action, and that has been channelled, diverted, intensified or accelerated by human intervention. It excludes construction-phase stormwater, sediment-laden water and drainage water which are separately defined”.

food⁸. Sediment inputs can adversely affect instream ecology, and reduce Mahinga Kai values.

- 39 Sedimentation may also block drains, pipes, and gutters during storm events causing localised flooding and property damage. Sedimentation within stormwater networks and receiving waterways is likely to increase costs of capital works and maintenance of waterways to ensure attenuation/flow capacity is available.

Stormwater quantity

- 40 An increase in stormwater quantity, and a change in drainage patterns as a result of intensification, can result in both localised and more general adverse effects.
- 41 The existing stormwater network outlined in paragraphs 30 and 31 of my evidence would have been designed and sized using assumptions of imperviousness of the catchment as a function of zoning density. The Christchurch City Council's Waterways, Wetlands and Drainage Guide Part B Section 21 provides the following parameters for average effective impervious surface coverage in the Residential Hill Zones: 45% impervious, 55% pervious. If the catchments that are not covered by a Qualifying Matter are rezoned to Residential Medium Density (with an assumed imperviousness of 80%, which is 100% impervious minus 20% the required landscaped area), and is fully developed as such, the existing primary pipe system will be undersized.
- 42 If the existing pipe system becomes undersized, it will increase the reliance on the secondary system (above ground). This can lead to increased surface flooding and increased surface flow with high velocity due to the steep nature of the roadways. High velocity surface flow can cause erosion and scour, and damage to private and public property and infrastructure.
- 43 Erosion and scour at stormwater discharge points can cause damage to private property and public infrastructure. Examples include:
- a. Tunnel gullies under building foundations;

⁸ Christchurch City Council Waterways, Wetlands and Drainage Guide.

- b. Collapse of stormwater pipe outlet structures;
 - c. Slips on productive land; and
 - d. Undercutting of accessways, driveways and roads.
- 44 An increase in the volume and rate of stormwater being discharged to the receiving waterways can contribute to flooding of private land, homes and public infrastructure.
- 45 It is well documented that parts of the Ōpāwaho/Heathcote River catchment are already prone to flooding. The Ōpāwaho/Heathcote River channel has a narrow, incised floodplain scarcely wider than the river-side roads. The river today is deeper and wider than it originally was but still overtops its banks frequently and in places deeply. Early development within the river corridor occurred without full understanding of flood risk. Flooding in many locations was exacerbated by ground level changes that occurred during the 2010 and 2011 earthquakes. Investigations and projects designed to control flooding have taken place since the 1970's.⁹
- 46 The City Council is currently in the final stages of an \$80 million programme for floodplain management.
- 47 The City Council floodplain management projects are largely targeted at the upper catchment of the Ōpāwaho/Heathcote River. These large attenuation facilities (for example the Sutherlands Hoon Hay Eastman Wetlands storage basins, the Cashmere Worsleys flood storage basin and the Cashmere Dam) will not capture the additional stormwater generated in areas of intensification (Cashmere and Huntsbury) which are downstream of these facilities.

REGULATORY METHODS AVAILABLE TO CONTROL STORMWATER ON THE PORT HILLS

- 48 The Regional Council is responsible for managing the effects of the taking and use of freshwater, discharges of contaminants into or onto land, air or water and the control of the use of land for the purposes of the maintenance and enhancement of the quality and quantity of water

⁹ Summarised from the Ōpāwaho-Heathcote River Stormwater Management Plan, 2021 (not yet certified by the Regional Council).

and ecosystems in water bodies and coastal water by developing regional policy statements, regional plans and the processing of resource consents. It is charged with the integrated management of the natural and physical resources of Canterbury. Traditionally, the Regional Council has been the primary authority for approving discharges of stormwater from individual sites in Christchurch City, via permitted activity rules and resource consents issued under the Canterbury Land and Water Regional Plan (**CLWRP**) and pursuant to the Resource Management Act 1991 (**RMA**). However, stormwater from individual sites is now primarily managed by the City Council via its Comprehensive Stormwater Network Discharge Consent (the **CSNDC**). These two scenarios are discussed in further detail below.

- 49 The City Council also has a range of its own powers to manage stormwater, complementing and assisting its obligations under the CSNDC. These are also discussed below.

Traditional scenario - stormwater management directly under the Regional Plan

- 50 The CLWRP, administered by the Regional Council is, under the traditional scenario, the main regulatory instrument for controlling stormwater discharges. Some discharges of stormwater can occur as permitted activities, whilst others will require an authorisation by way of a resource consent. Resource consents considered “high risk” according to criteria set out in the Regional Council Compliance Monitoring and Enforcement 5-year plan are monitored for compliance by Regional Council resource management officers. The Regional Council can use enforcement tools set out under the RMA. Penalties for breaching the RMA can range from infringement notices to prosecution.
- 51 Resource management officers can issue on the spot infringement notices for discharges of construction phase stormwater to land where it may enter water. An infringement notice requires the payment of a \$750 fee. This can act as an effective deterrent. For more serious offending the matter is taken to an internal panel, where the most appropriate course of enforcement action is decided upon.

Current scenario - stormwater management under the CSNDC

- 52 The CLWRP contains policies relevant to management of reticulated stormwater networks in urban areas. It was these policies, following on

from those set out in the previous Natural Resources Regional Plan, and the formation of a “Planning and Consents Protocol for Surface Water Management” that lead to the Council obtaining the CSNDC from the Regional Council.

- 53 The CSNDC commenced in December 2019. The CSNDC allows City Council to manage the quantity and quality of all stormwater directed to and conveyed by the reticulated stormwater system, as well as any stormwater generated within the boundaries of Christchurch District (subject to a number of exclusions and conditions). The CSNDC also requires the City Council to improve the quality of stormwater that enters the network and is discharged to the environment.
- 54 In most situations, the discharge of stormwater from intensified sites on the Port Hills will be covered by the CSNDC and will not require a separate discharge resource consent from the Regional Council. The City Council is therefore responsible for managing the discharge.
- 55 If the discharge from a site is excluded from coverage of the CSNDC then the site owner is required to obtain a separate discharge permit from the Regional Council as a non-complying activity¹⁰.
- 56 The CSNDC is comprised of 65 conditions and 10 schedules. Whilst all of these are relevant, I will refer to the most pertinent conditions for this evidence.
- 57 Schedule 10 sets receiving environment attribute target levels for water quantity. Modelled flood levels cannot increase more than the stipulated maximum increase when compared to the impervious scenario baseline year using City Council flood models. For the Ōpāwaho/Heathcote River, the maximum permissive increase in modelled flood levels is 30 mm when compared to a 1991 baseline year. For the Huritini/Halswell, the maximum permissive increase in modelled flood levels is 0 mm when compared to a 2016 baseline year.
- 58 Condition 4 requires the City Council to submit Stormwater Management Plans for certification to the Regional Council. The Stormwater Management Plans need to (amongst other things) demonstrate the

¹⁰ Rule 5.93A of the CLWRP requires that all discharges have written permission from the stormwater network owner, otherwise the activity is non-complying under Rule 5.97 for discharges within Christchurch City.

means by which; the quality of stormwater discharges will be progressively improved, and, how the receiving environment attribute target levels set out in Schedule 10 will be met. The Stormwater Management Plans need to be catchment specific, and plan the works required to mitigate the effects of stormwater discharges to the extent required by the CSNDC. The Huritini/Halswell and Ōpāwaho/Heathcote Stormwater Management Plans were submitted to the Regional Council, however they are yet to be certified as the Regional Council considered that they did not meet the requirements of the CSNDC. These plans were based on a pre-PC14 level of expected intensification.

- 59 Schedule 6 of the CSNDC sets out general city conditions for the management of stormwater quantity and quality for areas that are not yet covered by a Stormwater Management Plan. This Schedule outlines the minimum mitigation that is required for stormwater discharges in three scenarios (for both large and small sites), these are; from/during land disturbance activities, from new/re-development residential roof and hardstand activities, and from new/re-development non-residential roof and hardstand activities. The conditions for the first two scenarios are relevant to this evidence.

Christchurch City Council's other regulatory tools

- 60 To complement and assist its obligations under the CSNDC, the City Council has a range of regulatory instruments to manage the effects of, and on, development, and to manage the reticulated stormwater network.
- 61 The City Council promulgated the Stormwater and Land Drainage Bylaw 2022 (the **Bylaw**) under sections 145 and 146 of the Local Government Act 2002. The Bylaw allows the City Council to manage discharges into the stormwater network. No person may, without the Council's written approval connect to, or alter an existing connection to, the stormwater network or, discharge stormwater to the stormwater network. At the time of application for approval the potential effects on the network are considered by the Stormwater and Waterways Asset Planning Team.
- 62 If the development or re development can occur as a permitted activity under the District Plan, and no other regional consents (e.g. for earthworks) are required under the CLWRP, then the need for a

stormwater approval will only be triggered during the building consent application.

- 63 The City Council Three Waters and Waste Unit Onsite Stormwater Mitigation Guide (**Onsite Stormwater Mitigation Guide**) provides guidance to developers on what level of mitigation is required for development and re-development of sites in order to be issued with a written stormwater approval. This is based on the CSNDC's Schedule 6 conditions but contains further detail.

Stormwater quantity management under current scenario

- 64 Under the Onsite Stormwater Mitigation Guide, all hill sites are required to provide stormwater storage – the standard mitigation is to provide 5m³ of storage per 100 m² of additional impervious area unless there is a City Council stormwater facility that has been designed to manage stormwater within the catchment. For the most part, there is no City Council stormwater facility downstream of the Residential Hills Zones. Sites larger than 5,000m² require specific engineering design of their stormwater mitigation systems and are typically required to achieve either hydraulic neutrality or full flood attenuation (attenuation of the 2% AEP, 48 hour storm) depending on the receiving environment.

Stormwater quality management under current scenario

- 65 The CSNDC requires that City Council prepares a Sediment Discharge Management Plan to be used across its jurisdiction. This plan is to set out processes and practices to ensure that discharges of construction-phase stormwater are adequately mitigated.
- 66 The stormwater approval process detailed under paragraph 61 also controls construction phase stormwater discharges. Standard conditions are included in the written stormwater approvals, which give effect to the Sediment Discharge Management Plan. Examples of these are:
- a. An approved Erosion and Sediment Control Plan shall be implemented on the development site prior to commencement of earthworks activities;
 - b. The concentration of total suspended solids (**TSS**) in construction phase stormwater discharges as measured where the site

discharges into the Council stormwater network shall not exceed 50 milligrams per litre; and

- c. The discharge of stormwater during site construction shall be via best practicable erosion and sediment control measures to minimise erosion of land and the discharge of sediment-laden stormwater into the Council stormwater drainage network and the receiving environment.

- 67 If discharges of construction phase stormwater exceed 50 mg/l total suspended solids, the City Council expects that managers make improvements on site such as; reducing the area exposed to erosion by stabilisation or improving the efficiency of treatment. If a discharge occurs when the works are authorised by a building consent, the Building Control Officers can issue a Notice to Fix. If a discharge occurs when the works are authorised by a City Council land use resource consent, the City Council Compliance and Investigations Team can consider enforcement action.
- 68 The City Council undertook a Residential Building Site Erosion Sediment Control Compliance Survey (the **Survey**) over 2022 and the start of 2023. This survey covered fifty sites across Christchurch City that had been issued with building consents between 29 August 2022 and 4 September 2022. The Survey was undertaken by Council Quality Assurance inspectors. The Survey found that 100% of sites failed to meet one or more of the conditions of the site-specific erosion and sediment control plans. Despite this, the Survey found that for the same period, the houses on these sites passed their building inspections and no erosion and sediment control issues were noted by building inspectors. This Survey has found that there is inadequate attention and remedial action being undertaken by building contractors to ensure erosion and sediment control best practice.¹¹
- 69 If the proposed re-development can occur as a permitted activity under the District Plan, then the only form of compliance and inspection will be at the building consent stage. The risk of a discharge of construction phase stormwater from the site is therefore greatly increased, as

¹¹ Christchurch City Council Residential Building Site Erosion Sediment Control Compliance Survey 2022.

demonstrated by the results of the Residential Building Site Erosion Sediment Control Compliance Survey.

- 70 If inappropriate discharges of construction phase stormwater from sites occur, the Regional Council is unable to take enforcement action, including issuing infringement notices, as the discharge is authorised by the CSNDC.

ARE THE AVAILABLE REGULATORY METHODS ADEQUATE FOR INTENSIFICATION ENABLED BY PC14?

Practical constraints on stormwater quality management on the Port Hills

- 71 As noted in paragraph 24 of my evidence, loess is fine grained, highly mobile and dispersive. Loess is difficult to remove once entrained in water, as it does not settle and will remain in the water column. Water treatment chemicals are used in conjunction with temporary impoundment devices (sediment retention ponds) on larger construction sites to remove loess from the construction phase stormwater prior to discharge. On small steep redevelopment sites, such as those will be affected by PC14, it is not practical to construct impoundment devices, and therefore water treatment chemicals are not used.
- 72 The Survey discussed above at paragraph 68 concluded that the residential building construction industry in Christchurch is not taking erosion and sediment control issues seriously and is contributing sediment to the stormwater network and waterways on a regular basis. Many building consent approved erosion and sediment plans were found to be unfit for purpose. In practice they were found to be unsuitable due to factors such as existing structures, vegetation, slope and contours of sites. Erosion and sediment controls on hill sites are typically limited to silt fences and silt socks. In most cases these measures are not adequate and discharges of construction phase stormwater with a total suspended solid concentration in excess of 50 milligrams per litre will occur.
- 73 Industry knowledge and willingness to comply, site topography, sediment characteristics and lack of enforcement are all contributors to non-compliant discharges from building sites on the Port Hills.
- 74 It is not possible for me to quantify the effects on sedimentation that the intensification will result in as; the actual development scale and rate is

unknown, and there are many variables associated with the mobilisation and discharge of sediment.

- 75 Whilst the impact cannot be accurately quantified, any intensification and associated disturbance of hillside properties will result in an increase in the mobilisation of fine grained highly dispersive sediment, which will in turn have an adverse effect on stormwater infrastructure and receiving waterbodies.

Practical constraints on stormwater quantity management on the Port Hills

- 76 Whilst all hill sites are required to provide stormwater storage, the design developed for the Onsite Stormwater Mitigation Guide is based on short intense storms (up to 6 hours duration). The designs are not likely to effectively attenuate discharges for storms with longer durations, and lesser intensities. In addition, there are physical limitations to the positioning of these systems on hills sites. In some situations, it is too difficult to capture all impervious areas, and to direct it to a stormwater storage device (e.g. a rain tank).
- 77 The installation of these devices also assumes that maintenance will be undertaken by the homeowner to remove leaves and debris that may build up in the system and reduce the attenuation capacity available. In my experience, these systems are not always maintained adequately.
- 78 Whilst the onsite stormwater mitigation required by City Council attenuates stormwater runoff peaks (for certain storms), it does not mitigate the total volume of stormwater discharged from a site. The intensification of Residential Hills Zones will result in an increase in impervious areas, and an increase in stormwater entering the two receiving river catchments.
- 79 Intensification will adversely impact City Council's ability to comply with Schedule 10 of the CSNDC (refer to paragraph 57 above), unless the City Council provides mitigation through other means such as more centralised stormwater facilities.
- 80 It is not possible for me to quantify the effects on flooding that the intensification will result in because the actual development scale and rate is unknown, and City Council is yet to complete the model updates

for the Ōpāwaho/Heathcote River and Huritini/Halswell hydraulic models.

- 81 Whilst the impact cannot be accurately quantified with the use of updated hydraulic models, it is known now that an increase in impervious surface area will increase the discharge of stormwater and result in an increase in flooding as the quantity of water entering the river catchments (which are already prone to flooding) will increase.

Enforcement constraints

- 82 According to Section 15(1)(b) of the RMA no person may discharge a contaminant onto or into land in circumstances which may result in contaminants entering water unless the discharge is expressly allowed by a national environmental standard or other regulations, a rule in a regional plan as well as a rule in a proposed regional plan for the same region (if there is one), or a resource consent.
- 83 Penalties for breaching the RMA can range from infringement notices to prosecution. Resource management officers can issue on the spot infringement notices for discharges of construction phase stormwater to land where it may enter water.
- 84 Most discharges of construction phase stormwater from development or redevelopment sites (with some exclusions) within Christchurch District are expressly allowed by the CSNDC. This means that the discharge is not considered a contravention of Section 15 of the RMA and Regional Council officers are unable to take enforcement action.
- 85 If the proposed re-development can occur as a permitted activity under the District Plan, then the only form of compliance and inspection will be at the building consent stage. The Building Control Officers can issue a Notice to Fix if an issue is found during inspections. According to the Survey discussed above at paragraph 68, although 100% of sites failed to meet one or more of the conditions of the site-specific erosion and sediment control plans, all sites passed their building inspections. I understand that no enforcement action was taken.
- 86 The Council can take enforcement action with respect to the Bylaw. Every person who breaches the bylaw commits an offence and is liable on conviction to a fine not exceeding \$20,000, as set out in the Local Government Act 2002. However, the discharge of sediment is only an

offence under the Bylaw if it hasn't been expressly authorised by the Council. The Regional Council does not have information regarding whether the Council is actively taking enforcement action against persons responsible for discharges of sediment from sites that have not obtained a building consent or written approval to discharge stormwater.

- 87 If enforcement action is not taken against person(s) who are responsible for the discharge of construction phase stormwater during development or redevelopment of sites on the Port Hills, then there is less of an incentive for those person(s) to ensure that adequate erosion and sediment control measures are in place.

RESPONSE TO S42A EVIDENCE

- 88 I have reviewed the s42A evidence submitted by Mr Norton and Ms Ratka.

- 89 Mr Norton's statement of evidence discusses the expected impact of PC14 on flooding, water quality and the planning for future stormwater infrastructure to support growth. He considers that the intensification of housing enabled by PC14 will increase imperviousness of affected land throughout the City, which will in turn generate higher stormwater flows and increased stormwater runoff volumes. He also considers that if not mitigated, these higher stormwater flows and increased volumes will exacerbate flood hazards in many parts of the City and contribute to an ecological decline of natural waterway and wetland systems. I agree with Mr Norton's assessment of the expected impacts of PC14 on flooding and water quality.

- 90 In answering the question of why PC14 does not include a stormwater network constraint qualifying matter, Mr Norton says that:

55. There are two primary reasons why a stormwater network constraint Qualifying Matter was not proposed as part of PC14, in addition to the Qualifying Matters discussed above:

(a) The existing tools and powers (see below) that Council has in place are sufficient to manage some of the impacts; and

(b) The extent of hydraulic modelling that would be required to support the evidential threshold for a Qualifying Matter across the whole network could not be prepared in time for the plan change (see below).

- 91 Regarding Mr Norton's statement at paragraph 55(a), I consider that the existing tools and powers (see below) that Council has in place are sufficient to manage some of the impacts, but not all.
- 92 Whilst the onsite stormwater mitigation required by City Council attenuates stormwater runoff peaks (for certain storms), it does not mitigate the total volume of stormwater discharged from a site. It is difficult to manage the cumulative stormwater quantity effects of infill sites. The Residential Hills Zones to be affected by PC14 are in general downstream of Council owned stormwater facilities. The intensification of Residential Hills Zones will result in an increase in impervious areas, and an increase in stormwater entering the two receiving river catchments.
- 93 Disturbance of sites on the Port Hills will result in the generation of construction phase stormwater. Loess is particularly hard to manage and to remove from water once it has become entrained. The Survey found that there is inadequate attention and remedial action being undertaken by building contractors to ensure erosion and sediment control meets best practice. If the proposed re-development can occur as a permitted activity under the District Plan and the CLWRP, then the only form of compliance and inspection will be at the building consent stage. The risk of a discharge of construction phase stormwater from the site is therefore greatly increased.
- 94 Regarding Mr Norton's assertion at paragraph 55(b), I disagree that intensification should be allowed to proceed in the absence of updated flood modelling, knowing the likely adverse effects. Mr Norton states that: "[t]he Council is actively considering future controls on development for stormwater purposes once a complete and high-quality set of modelling data is available".
- 95 Intensification will be able to occur until such time as the Council is in a position to insert a stormwater network constraint Qualifying Matter into the District Plan. The Council has not given a timeframe for this, however I consider that it could be several years away, if ever. The effects of intensification of some of the areas not covered by a Qualifying Matter could therefore be realised at least in part. I consider that, even in the absence of completed hydraulic modelling, there is sufficient information to show that the kind of intensification proposed by PC14 on the Port Hills suburbs is inappropriate.

96 I consider that the Council experts have acknowledged that allowing intensification on the Port Hills will result in adverse effects. For example, Mr Norton says at paragraph 78 of his evidence that “[a]ny qualifying matter that reduces intensification (and disturbance) of hill land will be beneficial in terms of both water quality (flooding) and water quantity (sediment discharges, particularly during construction works).” I agree with this statement from Mr Norton.

CONCLUSION

97 I support renaming the “Low Public Transport Accessibility Area” Overlay over the majority of the Port Hills suburbs to “Suburban Hill Density Precinct” as recommended in the City Council s42A report. This qualifying matter should be extended to cover the parts of the Port Hills (Cashmere and Huntsbury) that are not covered by a qualifying matter as it is likely that intensification on the Port Hills will result in increased sedimentation of stormwater networks and receiving waterways, as well as increased flooding effects.

98 I support the qualifying matter for smaller, isolated Slope Instability Areas – which are the Cliff Collapse Management Area 1, Cliff Collapse Management Area 2 and Rockfall Management Area 1 carried over from the operative District Plan.

Jessica Newlands
20 September 2023