

**BEFORE INDEPENDENT HEARING COMMISSIONERS
IN CHRISTCHURCH**

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

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of the hearing of submissions on Private Plan Change 19
Marshs Road Industrial to the Christchurch District Plan

**STATEMENT OF PRIMARY EVIDENCE OF ROBERT BRIAN NORTON ON
BEHALF OF CHRISTCHURCH CITY COUNCIL**

Dated: 24 September 2026

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EXECUTIVE SUMMARY

1. My full name is **Robert Brian Norton**. I am employed as a Senior Stormwater Planning Engineer at Christchurch City Council (the **Council**).
2. I have prepared this statement of evidence on behalf of the Christchurch City Council (the **Council**) in respect of matters arising from the submissions and further submissions on Private Plan Change 19 Marshs Road Industrial, Hornby to the Christchurch District Plan (the **District Plan**; **PC19**).
3. My evidence discusses stormwater quality, stormwater quantity and flooding matters relating to the proposed plan change enabling residential development of the land.
4. Residential development of the site will increase the rate of stormwater runoff and will increase the concentration of urban contaminants in stormwater discharges. If unmitigated, these higher stormwater flows and increased volumes will exacerbate existing flood hazards and contribute to an ecological decline of natural waterway and wetland systems.
5. Water quality and quantity effects of development can be mitigated by provision on onsite stormwater treatment and disposal systems (typically soil adsorption basins and rapid infiltration systems, where underlying soils are free-draining) to capture, treat and dispose of stormwater discharges from the development area into land.
6. The site contains an overland flow path for surface water from Main South Road, along with an existing rapid soakage system for disposal of collected stormwater into land, protected by easements in gross to Council. The development will need to protect those Council assets or otherwise incorporate them into the design of the onsite stormwater management system with an approved engineering plan.

INTRODUCTION

7. My full name is **Robert Brian Norton**. I am employed by the Council in the role of Senior Stormwater Planning Engineer in the Asset Planning – Stormwater and Waterways unit. I have held this position since 2010. I am responsible for implementation of the Council's Stormwater Management

Plans, delivery of the Council's capital programme for growth infrastructure, administration of the Council's Comprehensive Stormwater Network Discharge Consent and for providing technical review and advice on building, subdivision and land use consent applications.

8. As part of my role at the Council, I have been asked to provide technical advice on the Council's stormwater network planning, flooding and water quality in the context of proposed PC19.
9. In preparing this evidence I have reviewed the following documents:
 - (a) Request for a Change to the Christchurch City District Plan prepared for Calder Stewart Development Ltd (September 2025).
 - (b) Annexure D – PC19 – Infrastructure Report – Hornby Quadrant – Shands Road, Christchurch – Calder Stewart Industries Limited (December 2023).
 - (c) The summary of Submissions on the publicly notified plan change.
10. I am authorised to provide this evidence on behalf of the Council.

Qualifications and experience

11. I hold a Bachelor of Science degree in Civil Engineering from the University of Washington in Seattle, USA.
12. I have 26 years' experience as a civil engineer specialising in stormwater planning, flood management and site development. During this time, I have worked with local government in King County (Washington State, USA), with private consultancies, and presently with Christchurch City Council.
13. I have been involved in the development of various Council standards and guidelines relating to stormwater management. I have also been involved in several plan changes, Council and Environment Court hearings that relate to stormwater and flood management, consenting and development.

Code of conduct

14. While this is a Council hearing, I have read the Code of Conduct for Expert Witnesses (contained in the 2023 Practice Note) and agree to comply with it. Except where I state I rely on the evidence of another person, I confirm that the issues addressed in this statement of evidence are within my area

of expertise, and I have not omitted to consider material facts known to me that might alter or detract from my expressed opinions.

Scope of evidence

15. My statement of evidence addresses the following matters:
 - (a) Characteristics of the site;
 - (b) Mitigation of stormwater quality and flooding effects;
 - (c) Existing stormwater services;
 - (d) Response to submissions;
16. I address each of these points in my evidence below.

CHARACTERISTICS OF THE SITE

17. The PC19 site is zoned Rural Urban Fringe, and is bordered by small residential properties to the north end west boundaries. The bulk of the land is flat, gently sloping to the southeast with a combination of lifestyle blocks and pasture/agricultural uses. The site contains two topographic depressions which are likely to be historic Waimakariri River flood channels.
18. Greenfields development is often expected to provide onsite stormwater management systems to mitigate the effects of the development, or to connect to integrated stormwater management systems implemented by Council. New stormwater systems will vest to Council as stormwater assets. Council expects that these assets to be high quality, sustainable systems designed in accordance with current standards and guidelines, notably the Waterways, Wetlands and Drainage Guide (**WWDG**) and the Infrastructure Design Standard (**IDS**), and the Construction Standard Specifications (**CSS**). Greenfield stormwater mitigation systems are expected to provide multiple values¹ to the public (landscape, recreation, ecology, culture, heritage) and to use natural features and processes of soils and vegetation for treatment and storage of stormwater.
19. The PC19 development area is not currently serviced by any Council stormwater network, however a Selwyn District Council water race runs along Marshs Road to a point 60m upstream of Shands Road where it

¹ CCC Waterways and Wetlands Natural Asset Management Strategy 1999

enters a series of NZTA culvert and drain systems. The water race is not considered an acceptable outfall for urbanised stormwater discharges.

20. The site is not mapped within the District Plan as Flood Management Area (**FMA**) overlay, however Council's Halswell River flood model (Figure 1) predicts minor flooding within the onsite historic river channel depressions, potentially originating from Main South Road.

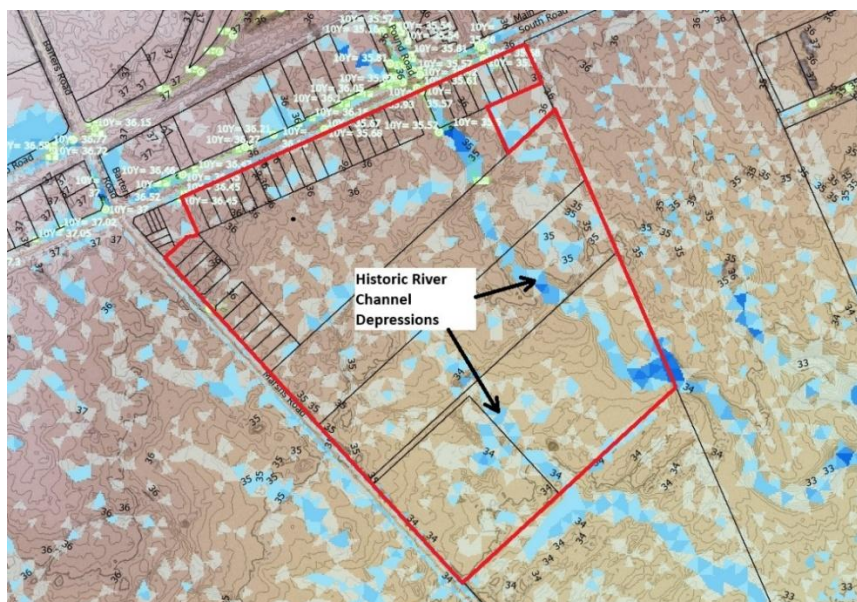


Figure 1: 1-in-10 year flood prediction

MITIGATION OF STORMWATER QUALITY AND FLOODING EFFECTS

21. Three primary Council documents provide the framework of expectations for mitigation of the stormwater quality and quantity (flooding) effects of development:
- (a) The Huritini-Halswell Stormwater Management Plan (CCC, 2025);
 - (b) Waterways, Wetlands and Drainage Guide (CCC, 2003); and
 - (c) Comprehensive Stormwater Network Discharge Consent (CSNDC) CRC252424.
22. In areas of the city where high seasonal groundwater is “deep” (greater than 1m below ground level) and free-draining soil textures (gravels and sands) are prevalent below shallow layers of topsoil and silts, the Council requires stormwater to be disposed of into land via infiltration. Doing so has two primary benefits: 1) It relieves stress on downstream surface water networks, and; 2) it recharges groundwater to compensate for reduced

natural infiltration caused by the new impervious surfaces of development. The Infrastructure Report notes (p.3) that sand and gravel layers exist at a depth of approximately 1.5m, which is within the feasible range to allow the use of infiltration devices for stormwater disposal.

23. The **first flush**² of stormwater generated from new development is required to pass through a treatment train consisting of a gross pollutant trap or other “pre-treatment” system to remove rubbish, debris and coarse sediment, followed by an infiltration basin lined with an engineered treatment media mix consisting of sand and quality topsoil. This type of treatment system is referred to as an **infiltration** or **soil adsorption** basin. Contaminated stormwater is held in the soil adsorption basin where it passes vertically through the sand/soil media, allowing particulates and dissolved metals to bond to charged media particles. Treated stormwater then discharges through free-draining gravels below and into the groundwater aquifer. Soil adsorption systems can be extremely efficient³ at removing sediment, metals, nutrients and E.coli from stormwater.
24. To mitigate the flooding effects of additional runoff caused by new sealed surfaces (roads, buildings and other hardstand areas) of development, stormwater in excess of the first flush is captured during a storm and held in a retention basin fitted with free draining gravel-filled soakpits or infiltration trenches. Iterative calculations considering inflows and infiltration rates for a series of storm events are used to derive the largest storage volume required for the system to function. The storm that generates the largest storage requirement is considered to be the “critical” storm duration. The stormwater management system must capture and dispose of the critical 2 percent annual exceedance probability (**AEP**) or “1-in-50 year” storm event.
25. Rare storm events that exceed the capacity of the stormwater management system are permitted to spill from the storage basin into the nearest ‘safe’ part of the downstream stormwater network or overland flow network. In this case, the stormwater system should be designed to spill into Marshs Road in an effort to avoid damage to other private property.
26. The applicant’s engineer confirms the fundamental requirements and expectations for stormwater treatment and disposal identified above will be

² The “first flush” represents the first portion of stormwater runoff that leaves a developed surface. This stormwater contains the highest concentration of contaminants. The first flush is defined in the CSNDC as the runoff generated from the first 25mm of rainfall OR the flow rate generated from 5mm/hr rainfall intensity.

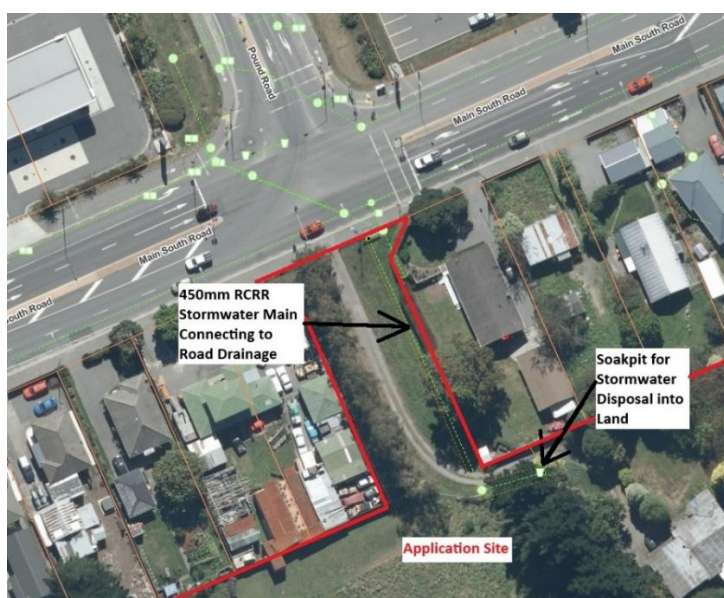
³ Testing the Performance of Infiltration Basins, Pattle Delamore Partners, February 2009

achieved through development on page 9 of the Infrastructure Report. I agree with this assessment.

27. To protect new buildings from flooding, I recommend that the minimum land levels for new development be based on the 1 in 200 year “max of max” (the highest predicted water level of all tested scenarios) flood prediction and that the finished floors of new buildings be set based on this peak water level plus 400mm of “vertical freeboard” as required by the District Plan.
28. Earthworks shaping of lots and roads will remove the historic river channel depressions within the site. Flow paths for surface water that exceeds the capacity of the piped network will be provided for within roading corridors, in accordance with the IDS⁴. Minimum finished floor levels for new buildings will then be set (at building consent phase) off of the modelled flood levels within internal roads as is typically required by resource consent conditions for subdivision.

EXISTING STORMWATER SERVICES

29. There is existing public stormwater services located within the application site, positioned in the narrow access point between 687 and 693 Main South Road. The services consist of a 450mm reinforced concrete pipeline and an infiltration soakpit. The pipeline conveys surface water from reticulation at the intersection of Main South Road and Pound Road to the soakpit where it discharges into land. The infrastructure within the application site is protected by an easement in gross.



⁴ Infrastructure Design Standard Part 5.6.4 *Design standards for new developments*

30. I consider it critical that the development of the site account for the stormwater conveyance and disposal system existing on the site. The existing system should either be left undisturbed or it shall be incorporated into the network and disposal system to be implemented for the development. The driveway access here should be formed to allow for overland flow to enter the site from Main South Road, so as to avoid exacerbating flooding of the road or private property. This requirement will form a condition of resource consent for subdivision.

RESPONSE TO SUBMISSIONS

31. One submitter (#2) raised concerns relating to stormwater and additional runoff created by development.
32. I consider that the development will be able to capture, control, treat and dispose of all stormwater runoff generated from the site (and upstream catchments) for all storms up to and including the critical 2 percent annual exceedance probability ("50-year") storm event. It is likely that flooding of other land currently attributable to the site will be reduced by the development.

CONCLUSION

33. I consider broadly that the development enabled by this plan change is capable of mitigating its effects on stormwater and flooding through standard conditions of resource consent for subdivision that are currently applied to similar industrial developments.

Date: 12 August 2026

Robert Brian Norton