Appendix 3 - Memo from WSP on Stormwater Management

Memorandum

To	Kevin Kemp, Stormwater Team Leader (Timaru District Council)
Copy	
From	Sarah Dudson, Principal Engineer – Stormwater (WSP) Joao Machado, Work Group Manager – Planning, Engagement and Policy (WSP)
Office	Dunedin
Date	25 November 2024
File/Ref	3-C2006.91_GA006 PDP SW Technical Advice
Subject	Technical Advice for Stormwater Chapter: Timaru Proposed District Plan submissions and hearing report

1 Introduction

This memo has been prepared in response to Timaru District Council's ('TDC') request for technical advice to support their consultant planner (Andrew Willis) with his 42a report in response to submissions on the Stormwater Management chapter of the Proposed Timaru District Plan. We have reviewed key relevant submission points and provided suggested possible responses to these points. We have also identified on a preliminary basis some minor potential improvements to the policy provisions. These are a preliminary overview of what possible changes could be considered, and further work in collaboration with council subject matter experts and planning teams would be needed to refine these into planning policy for district plan document purposes.

We have structured this memo as follows –

- In Section 3, we provide technical advice and responses to the specific submission points requested by TDC.
- In Section 4, we provide a review of the stormwater chapter provisions, including the following topics or provisions of the stormwater chapter:
    - Stormwater management objectives and policies framework
    - Connection to reticulated networks
    - Stormwater discharge certificate
    - Impact of impervious surfaces
    - Stormwater neutrality; and
    - Stormwater quality.
- In Section 5, we identify possible amendments to the stormwater management chapter, noting ones for which we can clearly link back to submission points and those for which that link is not as clear and may, therefore, be considered to be 'out of scope'. We elaborate further with 'general advice' on two points for TDC's consideration — namely, 'water sensitive design' and the definition of 'reticulated stormwater network'.

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2 Qualification and Experience

2.1 Sarah Dudson

My name is Sarah Dudson.

I hold a BE Natural Resources (Hons) and I am a Chartered Professional Engineer with Engineering New Zealand (membership number: 247972).

I am a Principal Engineer with 18 years' experience, specialising in stormwater and flood risk management. My expertise includes the design of treatment, attenuation, and conveyance systems, as well as the development of stormwater and catchment management plans and strategies. Along with technical advice on the implications and consequences of implementing regional and district planning provisions.

I confirm I have read the Code of Conduct for expert witnesses contained in the Environment Court of New Zealand Practice Note 2023 and that I have complied with it when preparing my evidence. Other than when I state I am relying on the advice of another person, this 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.

My responses have been reviewed by Mark Groves, a chartered engineer at WSP with 26 years of experience in the management of stormwater and flood risk.

2.2 Joao Machado

My name is Joao Machado.

I hold Bachelor of Resource Studies degree from Lincoln University (2000), certificate of public participation (International Association of Public Participation – IAP2), and I'm a member of New Zealand Planning Institute and the Resource Management Law Association, and in the past also an active member of the Urban Design Forum.

I have practised as a resource management planner / urban planner for over 23 years in New Zealand, with experience in technical dive industry, land development and environmental law in Brazil prior to moving to New Zealand for university studies in 1998. I worked for 17 years in local government in the Auckland Region, working on planning policy, strategy and major infrastructure projects in Rodney District (2001-2009), Auckland City (2009-2010), and the Auckland Council (2010-2018). In have been in the private sector for the past 6 years joining WSP in Dunedin in 2021. I have worked on stormwater management policy and stormwater catchment management, land-development and in planning policy capacities (including sections of the Draft and Proposed Auckland Unitary Plan provisions through to hearings and the operative AUP between 2011 and 2018). I've provided policy advice to councils on stormwater management policy, including Tasman District Council and Dunedin City Council; with the latte including advice on 2GP district plan appeals in particular relating to the stormwater management planning framework adopted in the district plan. My work focuses primarily on RMA planning, resource consent and notices of requirement, infrastructure consenting, business case, and climate adaptation.

I confirm I have read the Code of Conduct for expert witnesses contained in the Environment Court of New Zealand Practice Note 2023 and that I have complied with it when preparing my evidence. Other than when I state I am relying on the advice of another person, this 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.

3 Technical advice on submissions

3.1 Kainga Ora

Topic/Point	*Submitter*	*Submission Summary*
Stormwater Management – General	*Kainga Ora*	*Concerns around the proposed plans approach to stormwater management. The proposed provisions discourage intensification in accordance with plan zoning. The s32 does not provide sufficient justification or reasoning to support this onsite management approach across the whole district.* *Additionally, the relationship between these stormwater provisions and the Financial Contributions Chapter and Appendix 7 is unclear.* *The following relief is sought:* 1. *Delete* ***SW-Stormwater Chapter****. AND* 2. *The Council provide further information and evidence around the effectiveness and efficiency of the proposed provisions, and whether this approach is reasonable; AND* 3. *Develop new provisions relating to stormwater which are:* a. *based on complete and accessible technical advice* b. *provide clarity about the relationship of on-site stormwater management and the payment of financial contributions.* c. *seek a simpler regime for managing stormwater onsite.* d. *provide alternative options to storage tanks as stormwater management options.* e. *provide more clarity around the relationship of on-site stormwater management and the payment of financial contributions.*

Recommendations for response to submission

Deleting the stormwater chapter – The stormwater chapter plays a key role in the management of stormwater across the district, ensuring that subdivision, land-use and development do not result in adverse downstream effects, and overall protecting the public stormwater infrastructure network. Removing these provisions would result in there being insufficient control on stormwater management which would inevitably result gradually over time in detrimental outcomes for receiving environments (discharge points) and the lower parts of a catchment where upstream flows have not been properly managed. This could result in adverse degradation of the receiving environment.

A key relevant resource management issue includes the appropriate provision of resilient infrastructure. If stormwater is not adequately managed through design (at the time of considering a land-use, development and/or subdivision), the public infrastructure could be inadvertently overloaded resulting in the public having to fund fixing post-development issues. Upstream and downstream network effects need to be clearly understood also.

Technical advice and onsite stormwater management – we have identified some possible improvements that could assist in simplifying the requirements for onsite stormwater management, including removing SW-S1 requirements. Please refer to sections 4 and 5 of this memo which provide further information and evidence about the proposed provisions and suggested possible improvements.

Financial contributions – the council does not use development contributions at the moment. The practice for off-setting stormwater mitigation on-site in lieu of paying financial contributions is an approach most territorial authorities have moved away from. The cost of infrastructure does not generally get recovered through financial contributions and these costs should be covered by the land-use activity, development or subdivision.

Topic/Point	*Submitter*	*Submission Summary*
#229.4 and 229.5 ***Definition of stormwater neutrality and stormwater neutrality device***	*Kainga Ora*	*The definition of 'Stormwater neutrality' and its associated provisions are opposed. Reasoning is discussed further in the submission points relating to stormwater management in the General District wide rules section.* *Concerns over the stormwater neutrality approach taken in the proposed plan. While the definition is appropriate, amendments sought for a number of provisions which use the definition of 'Stormwater Neutrality Device'. Reasoning is discussed further in the submission points relating to stormwater management in the General District wide rules section.* *The following relief is sought:* *1. Delete the definition of stormwater neutrality* *2. Delete the definition of stormwater neutrality device*
Recommendations for response to submission		
Stormwater neutrality provisions are important to include in the plan so that development doesn't cause the reticulated stormwater network to function beyond its capacity and cause or exacerbate flooding. We recommend the definitions of 'stormwater neutrality' and 'stormwater neutrality device' are retained, as these provide clarity when interpreting the district plan provisions. Stormwater neutrality is usually measured as "*no increase in the pre-development offsite discharge during rainfall events with an AEP of 50% or rarer across a range of rainfall durations and temporal patterns.*" In practice, written permission from the owner of the reticulated stormwater network to allow entry of the stormwater [e.g. resulting from an increase in impervious surface] into the reticulated stormwater network is currently managed through the Stormwater Discharge Certification process: https://www.timaru.govt.nz/services/environment/storm-water/stormwater-discharge-certification. The application for Stormwater Discharge can be made either via a TDC Acceptable Solution or hydraulic and/or engineering calculations from a qualified person that demonstrates compliance of the proposed design with the hydraulic neutrality and stormwater treatment requirements. If hydraulic/engineering calculations or modelling demonstrate no impact on network capacity or flooding upstream or downstream, this would be considered as meeting the hydraulic neutrality requirements. TDC is in the process of developing hydraulic models of the stormwater network. Where these are available, they can be used to analyse/assess the reticulated stormwater network and		

determine if development activities will impact network capacity and flood risk (typically requested as part of a Flood Risk Certificate https://www.timaru.govt.nz/services/environment/storm-water/flood-risk-certificates) e.g. as was completed for the Kainga Ora site at 29 Grey Road in Timaru.

We have made some recommendations on possible improvements to the stormwater management chapter which are presented in sections 4 and 5 of this memo, and provide further information and evidence about the proposed provisions.

3.2 Prime Port Limited

Topic/Point	*Submitter*	*Submission Summary*
Stormwater Management – Standards *SW-S2 Stormwater neutrality devices or systems*	*Prime Port*	*Considers stormwater neutrality is onerous and impractical for the Port Zone, which been densely developed and has little space for the size of stormwater neutrality devices for large warehouse buildings and extensive sealed areas.* *Under SW-S4, a new roof would require reduction of suspended solids by more than 80%, even though a nil reduction would likely still result in a significantly less suspended solids discharge than, for example, a new road* *The following relief is sought:* *1. Delete SW-S2; OR* *2. Amend SW-S2 so that Port Zone is excluded.* *3. Delete SW-S3.2; OR* *4. Amend SW-S3.2 so that Port Zone is excluded.* *5. Delete SW-S4; OR* *6. Amend SW-S4 so that Port Zone is excluded*
SW- S3 Stormwater quantity permission requirements		
SW- S4 Stormwater quantity permission requirements		
Recommendations for response to submission		

The Port Zone applies mostly to land adjacent to the sea which is an end point discharge for stormwater. Achieving stormwater neutrality isn't a key consideration / constraint for the Port, as downstream flood effects usually do not need to be considered. However, it is possible that activities in the Port Zone could impact the capacity of the stormwater network upstream (e.g. a significant increase in impervious area directly connected to the network could create a tailwater condition that reduces upstream network capacity).

Additional untreated impervious areas connected to the reticulated stormwater network within the Port Zone could also contribute to reduced water quality in the reticulated stormwater network and increase the contaminant load discharged.

As stated previously in this memo - in practice, written permission from the owner of the reticulated stormwater network to allow entry of the stormwater [e.g. resulting from an increase in impervious surface] into the reticulated stormwater network is currently managed through the Stormwater Discharge Certification process: https://www.timaru.govt.nz/services/environment/storm-water/stormwater-discharge-certification.

The application for Stormwater Discharge can be made either via a TDC Acceptable Solution or hydraulic and/or engineering calculations from a qualified person that demonstrates compliance of the proposed design with the hydraulic neutrality and stormwater treatment requirements. If hydraulic/engineering calculations demonstrate no impact on network capacity or flooding upstream, this would be considered as meeting the hydraulic neutrality requirements. TDC is also in the process of developing hydraulic models of the stormwater network. Where these are available, they can be used to analyse/assess the reticulated stormwater network and determine if activities within the Port Zone could impact the network capacity upstream (typically requested as part of a Flood Risk Certificate https://www.timaru.govt.nz/services/environment/storm-water/flood-risk-certificates).

Stormwater neutrality and water quality provisions are important to include in the plan so that development doesn't cause the reticulated stormwater network to function beyond its capacity and cause or exacerbate flooding or reduce water quality in the reticulated stormwater network. We recommend the submitter's suggested relief be declined.

However, some improvements have been recommended to the Stormwater Management chapter that may help to appease the submitter's concerns, particularly around SW-S4:

- Changing the requirement to only apply to roads, trafficked hardstand or areas where potential contaminants are handled and may be spilt or deposited.
- The impact of contaminants from high-risk building materials on stormwater quality in the network is already mitigated through SW-R7.
- SW-R7 is amended to apply to sheet cladding and excludes fixings and flashings.
- Amending the requirements for 30m^2-500m^2 increase in impervious surfaces to require a lesser standard of treatment.
- Increasing the threshold for Table 7 to apply only where the increase in impervious surface is greater than 500m^2.
- Clarifying that for hydraulic neutrality, an increase in imperviousness only applies where it replaces un-sealed surface area. New impervious surface in place of existing hardstand does not require mitigation.

The above changes could also warrant an amendment to SW-P2 as follows:

Maintain and enhance stormwater quality by requiring:

1. *restrictions on specified cladding materials that contribute to stormwater contamination; and*
2. *the treatment of stormwater quality for new trafficked hardstand areas created by subdivision, use or development or intensification of vehicular movements / use such that the contaminant yield is increased.*

3.3 Other submissions

Topic/Point	*Submitter*	*Submission Summary*
Stormwater Management – General	*BP Oil, Mobil Oil New Zealand Limited, Z Energy*	*Supports the introduction and the intent to provide clarity regarding the interaction of these provisions with regional rules and Council's reticulated stormwater network. Where sanctioned by regional resource consent, the Submitter seek to clarify that Council's input will be under the bylaw and specific to the capacity of the network.*
Stormwater Management - Policies *SW-P2 Water Quality*		*Support the policy in that it explicitly relates to new or increased impervious areas, however the degree of maintenance or, in particular, enhancement of stormwater quality, including point of compliance to meet the policy, is questioned and the requirement for treatment may not be necessary in all circumstances, especially where the network already has capacity and the proposed increase of impervious surfaces is nominal.* *The following relief is sought to amend SW-P2 as follows:* *Maintain and enhance stormwater quality by requiring:* *1. restrictions on specified cladding materials that contribute to stormwater contamination; and* *2. consider the need for the treatment of stormwater quality for new or increased impervious surfaces created by subdivision, use or development.*
Section A: Activities in the Residential Zones, Rural Lifestyle Zone, Settlement Zone and Māori Purpose Zone		*In regards to SW-R3, submitter supports this rule providing it relates to new car parks as opposed to alterations to existing or redevelopment of existing car parking / impervious areas. If this assumption is not correct, management of stormwater from higher contaminant generating car parking areas would be better reflected by a car parking number threshold.* *The following relief is sought:* *1. Confirm that the rule relates to new car parking areas and not redevelopment or enlargement (by less than the 500m² threshold) of existing car parks; OR* *2. Amend Rule SW-R3 so that the threshold for applicability of the rule is based on the number of car parks.*
Section B: Activities in the General Industrial Zone, Port Zone and Open Space and	*BP Oil, Mobil Oil New Zealand Limited, Z Energy*	The submitter assumes that the rule means: 1. If a resource consent is obtained from the regional council for a stormwater discharge, then focus and interest of TDC's acceptance of the stormwater discharge to the network is narrowed to matters of carrying capacity and quantity. In particular, that the requirements of this rule (specifically SW-S4) are not

Recreation Zone *Section C: Activities n the Commercial and mixed use zones*		considered (or relevant) in the network operator's consideration of the SWD approval application to council; and 2. If the stormwater discharge is a permitted activity in the relevant regional plan, SW-R4 is applicable. If the above assumption is correct, the submitter supports PER-1. Regarding PER-2, the Submitter have experienced instances where network operators have not been accepting of discharges of stormwater from industrial or trade premises to the reticulated stormwater network despite them being in accordance with good practice and permitted under the relevant regional plan. The Submitter seek to ensure that the role of industry good practice is recognised (in the case of the Submitter that is provided by the Environmental Guidelines for Water Discharges from Petroleum Industry Sites in NZ (MFE, 1998)). The following relief is sought: Retain SW-R4 as notified subject to clarification that the submitter's assumption is correct and amend the Matters of Discretion as follows: *Matters of discretion are restricted to:* *1. [...]* 2. *the extent of any potential flood risk from additional stormwater exceeding the capacity of the Council's reticulated stormwater network; and* 3. *the effectiveness of the maintenance plan that is in place for the consequences of a lack of maintenance of the stormwater neutrality device; and* 4. *the adverse effects of stormwater on a neighbouring property, waterway or road; and* In regards to SW-R5, the submitter requests that that this rule be retained as notified, subject to the clarification that the submitter's assumption is correct AND Amend the Matters of Discretion as follows: 1. *[...]* 2. *the extent of any potential flood risk from additional stormwater exceeding the capacity of the Council's reticulated stormwater network; and* 3. *the effectiveness of the maintenance plan that is in place for ~~the consequences of a lack of maintenance of~~ the stormwater neutrality device; and*

		4. *the adverse effects of stormwater on a neighbouring property, waterway or road; and*
Stormwater Management - Standards *SW -S4 Stormwater quality permission requirements*	*BP Oil, Mobil Oil New Zealand Limited, Z Energy*	The submitter considers the required percentage reductions of contaminants in Standard SW-S4 will not be achievable where stormwater is low in particular contaminants to begin with. An approach, recognised the MfE Guidelines as good practice, would be supported as an alternative. The following relief is sought: 1. Delete SW-S4 and 2. Replace with an appropriate risk-based standard that requires treatment where appropriate to manage particular contaminants of concern.

Recommendations for response to submission

Stormwater quality provisions are important to include in the plan so that development doesn't reduce water quality in the reticulated stormwater network. A risk-based approach does not provide enough certainty about requirements for permitted status. We recommend SW-S4 be retained with modification as outlined below.

The minimum treatment contaminant removal rates in Table 7 in SW-S4 imply that treatment focusing on gross pollutant removal (GPT, sump filter, etc) is not enough and that a higher standard of treatment is expected. In practice, literature and/or supplier documentation will be relied on to show a particular stormwater treatment device/system can achieve the required contaminant removal rates. However, in some cases, it will be very difficult to achieve minimum treatment contaminant removal rates e.g. at the lower end of the impervious surface threshold (it is difficult to design an effective stormwater treatment device for such small catchment areas) and areas with low traffic volumes and low contaminant generating ('inert') building materials (stormwater treatment devices are less effective when contaminant loading rates are much lower than 'typical').

Some improvements have been recommended to the Stormwater Management chapter that may help to appease the submitter's concerns, particularly around SW-S4:

- Changing the requirement to only apply to roads, trafficked hardstand or areas where potential contaminants are handled and may be spilt or deposited. The impact of contaminants from high contaminant generating building materials on stormwater quality in the network is already mitigated through SW-R7.
- SW-R7 is amended to apply to sheet cladding and excludes fixings and flashings.
- Amending the requirements for 30m^2-500m^2 increase in impervious surfaces to require a lesser standard of treatment.
- Increasing the threshold for Table 7 to apply only where the increase in impervious surface is greater than 500m^2.
- Clarifying that for hydraulic neutrality, an increase in imperviousness only applies where it replaces un-sealed surface area. New impervious surface in place of existing hardstand does not require mitigation.

The above changes could also warrant an amendment to SW-P2 as follows:

Maintain and enhance stormwater quality by requiring:

1. *restrictions on specified cladding materials that contribute to stormwater contamination; and*
2. *the treatment of stormwater quality for new or increased trafficked hardstand areas created by subdivision, use or development or intensification of vehicular movements / use such that the contaminant yield is increased.*

We support the submitter's suggested amendments to the matters of discretion items relating to the consequences of a lack of maintenance.

Concerning instances where resource consent is obtained from the regional council for a stormwater discharge, the requirements for connection to the network will depend on the stormwater management measures that have been consented and whether they are sufficient so that development doesn't cause the reticulated stormwater network to function beyond its capacity and cause or exacerbate flooding or reduce water quality in the reticulated stormwater network.

Topic/Point	*Submitter*	*Submission Summary*
Stormwater Management – Policies *SW-P3 Connection to reticulated stormwater networks*	*Transpower New Zealand Limited*	Does not support the absolute requirement to connect to the Council's stormwater network. The submitter is concerned that alternative stormwater disposal options are not provided for that may be more appropriate in some circumstances. These circumstances include stormwater discharges from substation sites. The following relief is sought: Amend SW-P3 Connection to reticulated stormwater networks as follows: *<u>Except where Policy SW-P4 applies or where stormwater is able to be managed within a site that</u> <u>accommodates Regionally Significant Infrastructure,</u> Require all subdivision, use and development to connect to the Council's reticulated stormwater network within reticulated infrastructure boundaries, to:* 1. *ensure that stormwater does not create increased flood risk on other properties; and* 2. *manage stormwater quality impacts through an integrated management approach.*
Recommendations for response to submission		
We have provided our views in relation to the need to connect to the public reticulated infrastructure (section 4.2 below). In some circumstances, other forms of discharge, such as soak pits, may be suitable – subject to ground and site conditions being suitable.		

Notably, regionally significant infrastructure can be located in rural / semi-rural areas where there is (or may not be) any reticulated infrastructure to connect to. The requirement to connect to the public stormwater network applies only where the infrastructure is available. Exemptions for regionally significant infrastructure sites can be reasonably obtained through the resource consent process.

The changes sought by the submitter are acceptable and consistent with providing greater flexibility for regionally significant infrastructure.

Topic/Point	*Submitter*	*Submission Summary*
Stormwater Management – Rules and Standards	*Milward Finlay Lobb*	Submission is in regard to SW-R2 where concern is raised around the reference to no stormwater entering neighbouring properties and questions why a 24 hour event is referred to when TDC system has a peak at 1 hour. The following relief is sought: Amend **SW-R2** as follows: *Activity status: Permitted Where:* *PER-1* *All stormwater is captured and directed to the Council's reticulated stormwater network and does not flow onto neighbouring ~~properties~~ dwellings or buildings; and* *[...]* In regards to SW-R3, SW-R4, and SW-R5 , the submitter raises the same concern above. The relief sought for each rule is similar to the above. In regard to SW-S3 - Stormwater quantity permission requirements, the submitter requests to amend event duration in **SW-S3 Stormwater quantity permission requirements** from 24-hour event to 1-hour event in Table 4, Table 5 and Table 6.
Recommendations for response to submission		
The submitter is correct in that the reticulated network typically has a critical duration of 1- 2hrs. However, that doesn't mean that this should be the target for stormwater neutrality. In some cases, it is the critical duration of the waterway the network discharges into that sets the critical duration. Larger sites have a greater potential risk of impacting the network and downstream receiving environment. A 24hr duration neutrality requirement means the network will be protected over a wider range of events, even if in some cases, 24hrs may be longer than what is required. This assumes the maximum permissible discharge for all		

duration events is the pre-development discharge rate calculated using a rainfall intensity of no more than 2x the average 24hr rainfall intensity.

Stormwater neutrality provisions are important to include in the plan so that development doesn't cause the reticulated stormwater network to function beyond its capacity and cause or exacerbate flooding. We recommend the submitter's suggested relief is rejected.

In practice, written permission from the owner of the reticulated stormwater network to allow entry of the stormwater [from an increase in impervious surface] into the reticulated stormwater network will be through the Stormwater Discharge Certification process: https://www.timaru.govt.nz/services/environment/storm-water/stormwater-discharge-certification. The application for Stormwater Discharge can either be via a TDC Acceptable Solution or hydraulic and/or engineering calculations from a qualified person that demonstrates compliance of the proposed design with the hydraulic neutrality and stormwater treatment requirements. If hydraulic/engineering calculations/modelling demonstrate no impact on network capacity or flooding upstream or downstream, this would be considered as meeting the hydraulic neutrality requirements. TDC is in the process of developing hydraulic models of the stormwater network. Where these are available, they can be used to analyse/assess the reticulated stormwater network and determine if development activities network capacity and flooding (typically requested as part of a Flood Risk Certificate https://www.timaru.govt.nz/services/environment/storm-water/flood-risk-certificates).

We also support the suggestion by Andrew Willis to remove references in the rules to stormwater not flowing into neighbouring properties as this is already adequately covered by the New Zealand Building Act 2004 and E1 of the New Zealand Building Code.

Topic/Point	*Submitter*	*Submission Summary*
Definitions *Policies* *Rules*	*Waka Kotahi*	Supports the definition of Available Reticulated Stormwater Network as it outlines that reticulated stormwater networks must have acceptance of the stormwater from the network operator. In regards to SW-P2 Water Quality, submitter considers it is not always possible to enhance the quality of stormwater. It is recommended that the policy be amended to state either maintain or enhance. The following relief is sought to amend SW-P2 as follows: *SW-P2 Water quality Maintain and enhance stormwater quality* *Maintain or ~~and~~ enhance stormwater quality by requiring:* 1. *restrictions on specified cladding materials that contribute to stormwater contamination; and*

		2. *the treatment of stormwater quality for new or increased impervious surfaces created by subdivision, use or development.* Supports SW-R1 as it requires all developments, other than a road, with specified areas of impervious surfaces to be captured and directed into the Council's reticulated stormwater network, which does not include the state highway stormwater network. The associated matters of discretion also allow for consideration of adverse effects of stormwater on a neighbouring road. The rule will ensure that runoff from adjoining development is appropriately managed and will not undermine regional consents for stormwater. Supports SW-R2 as it requires all developments, other than a road, with specified areas of impervious surfaces to be captured and directed into the Council's reticulated stormwater network, which does not include the state highway stormwater network. The associated matters of discretion also allow for consideration of adverse effects of stormwater on a neighbouring road. Supports SW-R3 as it requires all stormwater for non-residential activities that include impervious surfaces of 500m2 or more for car parking to be captured and directed into the Council's reticulated stormwater network, which does not include the state highway stormwater network. The associated matters of discretion also allow for consideration of adverse effects of stormwater on a neighbouring road. Requests that SWR1 – SW-R3 are retained as notified.
Recommendations for response to submission		
The policy issue relating to 'enhance or maintain' has been widely debated in other planning policy proceedings. The position put forward by Waka Kotahi is generally accepted overall, as in practice it's not always possible (and some argue that it's not 'fair') to require that a development is responsible for 'enhancing' the quality of stormwater. Where possible, water quality should be enhanced, but the bottom-line test as 'maintaining' is an accepted practice.		

Topic/Point	*Submitter*	*Submission Summary*
Introduction *Policies* *Rules* *Standards*	*Timaru District Council*	Considers that more consistent use of terminology is required in the Stormwater Introduction. The Introduction refers to "the Council's reticulated stormwater network". To future proof the PDP, recognising expected changes under Three Waters legislation to the way in which Council's infrastructure will be owned, this term should be replaced with "a public reticulated stormwater network". As notified, Policies SW-P1, SW-P3 and SW-P5, refer to "the Council's reticulated stormwater network". To future proof the PDP, recognising expected changes under Three Waters legislation to the way in which Council's infrastructure will be owned, this term should be replaced with "a public reticulated stormwater network". The following relief is sought: Replace all references to "the Council's reticulated stormwater network" in the Policies SW-P1, SW-P3 and SW-P5, to "a public reticulated stormwater network". OR in the alternative, include a statement within Part 1 of the Plan or new definition that the term 'Council' includes successors for infrastructure management. As notified, Rules SW-R1 to R7 (inclusive) refer to "the Council's reticulated stormwater network". To future proof the PDP, recognising expected changes under Three Waters legislation to the way in which Council's infrastructure will be owned, this term should be replaced with "a public reticulated stormwater network". The following relief is sought: Replace all references to "the Council's reticulated stormwater network" in the Rules SW-R1 -R7 (inclusive), to "a public reticulated stormwater network". OR in the alternative, include a statement within Part 1 of the Plan or new definition that the term 'Council' includes successors for infrastructure management. As notified, Standards SW-S3 and SW-S4 (inclusive) refer to "the Council's reticulated stormwater network". To future proof the PDP, recognising expected changes under Three Waters legislation to the way in which Council's

		infrastructure will be owned, this term should be replaced with "a public reticulated stormwater network". The following relief is sought: Replace all references to "the Council's reticulated stormwater network" in the Standards SW-S3 and SW-S4 to "a public reticulated stormwater network". OR in the alternative, include a statement within Part 1 of the Plan or new definition that the term 'Council' includes successors for infrastructure management.
Recommendations for response to submission		
Support the approach to reference 'council's reticulated infrastructure' as 'public reticulated stormwater network'; noting that the word 'reticulated' may cause confusion as 'reticulated' usually defaults to mean 'piped infrastructure'. The public stormwater infrastructure network includes above ground infrastructure such as swales, drains, raingardens, and ponds.		

4 Review of Stormwater Provisions

4.1 Stormwater Management Objectives and Policies Framework

The stormwater management chapter has one objective SW-01: "Subdivision, use and development within areas serviced by the Council's reticulated stormwater network do not increase peak demand on stormwater management systems or reduce water quality in the reticulated stormwater network."

This objective is supported by four policies which identify particular requirements and methods. These policies, working together with the rules in this chapter, are intended to give effect to the overarching objective. The policies relate to –

- SW-P1 – Stormwater quantity neutrality
- SW-P2 – Water quality
- SW-P3 – Connection to reticulated stormwater networks
- SW-P4 – Stormwater from roads.

The rules are structured in four groups –

- Section A: activities in the Residential Zones, Rural Lifestyle Zone, Settlement Zone and Māori Purpose Zone.
- Section B: activities in the General Industrial Zone, Port Zone, and Open Space and Recreation Zones
- Section C: activities in the Commercial and Mixed-Use Zones
- Section D: Activities in all zones.

4.2 Connection to reticulated stormwater networks

The stormwater provisions require all subdivision, use and development to connect to the Council's reticulated stormwater network, where there is an available reticulated stormwater network[1].

In general, it is better to have properties connected to the reticulated stormwater network as it gives the network operator more control and means that the network can be managed in an integrated and holistic way to address risks and natural hazards such as flooding, water contamination, groundwater issues, and climate change impacts, as well as to enable Council's ability to obtain and comply with a discharge consent(s) for the reticulated network.

In practice, there are situations where it can be preferable to manage stormwater through private discharge, as in through alternative means other than the reticulated stormwater network. These alternative methods include soakage to land, direct discharges to a waterway, the coastline, or overland flowpaths – where direct connection to the public network isn't possible or the best practicable option.

For example in Temuka, many properties discharge to an on-site soak pit where there is kerb and channel (discharging road runoff to a Council soak pit) but no piped network available. This method of discharging via soakage can be used with an appropriate factor of safety in situations where the ground conditions allow – as in good drainage such as sandy soils and gravels and/or absence of any groundwater issues. In doing so, 'downstream network effects' need to be carefully evaluated which circles back to the need for achieving 'stormwater neutrality' based on pre- and post-development flows.

4.3 Stormwater Discharge Certificate

The process for connecting to the reticulated stormwater network is via the stormwater certification process, which will be triggered by resource consent, building consent or service consent. The certification application requires a completed 'Application for Stormwater Discharge' which includes:

- Drainage plan and floor plan
- Change in the impervious/pervious area relative to existing
- Demonstration of the stormwater management solution (attenuation/treatment design) complies with the requirements
- Type of the stormwater device
- O&M requirement for the device.

Application for stormwater discharge is either via a TDC Acceptable Solution or Engineered Solution. The Engineered Solution includes hydraulic and/or engineering calculations from a qualified person that demonstrates compliance of the proposed design with the hydraulic neutrality and stormwater treatment requirements or demonstrates why it is not practical to do so.

[1] An available reticulated stormwater means a reticulated stormwater network where:

(a) a conveyance structure that forms part of the reticulated stormwater network passes within 50m of the property boundary; and
(b) stormwater is able to be conveyed into the reticulated network under gravity; and
(c) the network operator will accept the stormwater from the property; and
(d) the distance between the conveyance structure and the source of the stormwater is less than 100m.

4.4 Impact of Impervious Surfaces

Increased impervious surfaces, such as roads, parking lots, and buildings, have a significant impact on stormwater management:

1. Reduced Infiltration: Impervious surfaces prevent water from soaking into the ground. This reduction in infiltration leads to higher volumes of surface runoff and reduced groundwater / aquifer recharge.
2. Increased Runoff: With more water running off surfaces, the volume and speed of stormwater entering the drainage systems increase. This can overwhelm the capacity of the reticulated stormwater networks, in particular, where reticulated infrastructure may be 'under-sized' and where there is no adequate secondary overland flow path designed in an integrated manner with the stormwater network.
3. Flooding: When the reticulated stormwater network reaches its design capacity and becomes overwhelmed, it can lead to localised flooding, and possibly cumulatively wider flooding at street block or neighbourhood scale. This is particularly problematic in urban areas where the infrastructure may not be designed to handle such high volumes of water (e.g. where infrastructure has not kept up with the rate of development) which is certainly true in parts of the Timaru district. Similarly, discharges from the reticulated stormwater network contribute to flooding of urban waterways, that can lead to flooding of roads and property.
4. Erosion: Increased runoff can increase erosion in natural waterways and landscapes. More frequent flows and increased flow rates increase erosion, leading to increased sedimentation and habitat change.
5. Water Pollution: Runoff from impervious surfaces often carries pollutants like oil, heavy metals, and litter into water bodies, degrading water quality and harming aquatic life. Impervious surfaces can be a contaminant source (e.g. zinc leaching from unpainted/poorly painted galvanised roofs) as well as allowing pollutants to accumulate (e.g. vehicle tyre rubber, brake linings, and wind-blown sediment). The higher volumes and speed of runoff on impervious surfaces means any contaminant build-up is readily transported to the reticulated stormwater network (and associated downstream waterbody).

4.5 Stormwater Neutrality

Stormwater Neutrality means that post-development stormwater runoff rates and volumes do not exceed the pre-development stormwater runoff rates and volumes. This requires an understanding of upstream and downstream flows within a particular catchment.

The stormwater neutrality rules and standards are applied to development activities that increase impervious surfaces so that the impacts as outlined in the previous section can be avoided/mitigated.

The Stormwater Management chapter policy SW-P1 directs that subdivision, use and development achieve stormwater neutrality so that the reticulated stormwater network does not function beyond its capacity and cause or exacerbate flooding. The rules are intended to be permissible across as wide a spectrum of activities as possible. The Stormwater Standards (SW-S1, SW-S2 and SW-S3) have been included to provide certainty in what is required to operate under permitted status. However, additional clarity is required on how the stormwater standards should be used e.g. a 1 in 50-year stormwater neutrality requirement with a 24hr duration means the maximum permissible discharge for all duration events is the pre-development discharge rate calculated using a rainfall intensity of no more than 2x the average rainfall intensity for a 1 in 50-year annual exceedance probability, 24-hour duration event and without climate change.

SW-S1 Rainwater storage systems

The rainwater storage systems in the rules and standards are intended to provide stormwater retention to mitigate the additional runoff volume generated from additional impervious surfaces. The storage sizes given in SW-S1 have been sized so that the equivalent of at least 5 mm of runoff volume from the additional impervious surface is retained and used on site (e.g., for gardening or other reuse activity). This is designed to mimic the rainfall that would have naturally been retained on site, e.g., through surface depressions, infiltration, plant uptake or evaporation. Rainwater storage could be provided in a number of ways including rain tanks, a raingarden or an intentional ponding area in the garden.

This standard only applies to developments that result in an increase in impervious surfaces of between 30m^2 and 500m^2 (i.e. rule SW-S1). There are no specific requirements for retention in any of the other Stormwater Management rules. However, by definition, achieving stormwater neutrality would require some stormwater retention (i.e. captured and used on site) so that the volume of runoff discharged does not increase.

We note that this approach has limitations in its efficacy overall in mitigating stormwater. The provisions currently lack clarity about its purpose, functional need and whether / how stored water can be used on site.

Based on our preliminary assessment, we would recommend that this rule can be deleted from the plan. There isn't sufficiently clear benefits to justify this requirement, though it could be provided for voluntarily as a suitable method.

SW-S2 and SW-S3 Stormwater neutrality and quantity permission requirements

SW-S3 attempts to simplify the stormwater neutrality requirements for permitted activities i.e. specifying a single rain event duration and event return period for which stormwater neutrality needs to be met (varies depending on the increase in impervious surface area and the land use zone). The Annual Exceedance Probability plus the event duration are used with a design rainfall table to select the rainfall depth/intensity which is then used in calculations to determine predevelopment runoff rates/volumes. This is what development must meet to demonstrate stormwater neutrality.

The event duration requirement is either a 1-hour (for impervious surfaces less than 500 m^2) or a 24-hour event (for impervious surfaces greater than 500 m^2). For small-scale increases in impervious areas, a 1-hour event duration is reasonable as this is typically the critical duration for peak flow in much of the reticulated network. Meeting stormwater neutrality for this event would mean not exceeding the 1-hour duration predevelopment runoff flows (and volumes) for the specified Annual Exceedance Probability. However, it may be that longer duration events need to be considered to make sure the higher runoff volume does not overwhelm the system e.g. limiting the discharge from a site to the predevelopment 1-hour event duration may need to be larger to accommodate the additional runoff volumes (relative to the limiting flow rate) of a 2-hour or 6-hour event. In this regard, SW-S3 has room for interpretation of how the standard is applied.

For larger scale increases in impervious areas, a longer event duration is more appropriate as larger areas generate more runoff which has the potential for a greater impact on stormwater management systems. Meeting the requirement for stormwater neutrality in a 24-hour event means that the system can also cope with sustained rainfall over a range of shorter event durations, reducing the risk of overflow and flooding.

The Annual Exceedance Probabilities used in SW-S3 are for bigger events than the stormwater levels of service. Requiring stormwater neutrality for events greater than the reticulated network capacity is sensible as Council is interested in the overall stormwater management system, which includes how stormwater is managed when the capacity of the reticulated network is exceeded. However, using a single Annual Exceedance Probability event greater than that of the network capacity means that during a smaller event similar to the capacity of the network, the stormwater runoff would likely exceed pre-development rates

and could impact network capacity and flooding (which is inconsistent with the chapter objective SW-O1). The limiting pre-development discharge rate would need to be calculated for an Annual Exceedance Probability similar to the capacity of the reticulated network (i.e. 1 in 5-year for residential areas and 1 in 10-year for commercial/industrial areas) to avoid impacting network capacity and flooding. Though sizing of the stormwater neutrality device could still be required for a larger 1 in 50-year annual exceedance probability event.

4.6 Stormwater Quality

The minimum treatment contaminant removal rates in SW-S4 imply that treatment focusing on gross pollutant removal (GPT, sump filter, etc) is not enough and that a high standard of treatment is expected. In practice, literature and/or supplier documentation will be relied on to show a particular stormwater treatment device/system can achieve the required contaminant removal rates. In some cases, it will be very difficult to achieve minimum treatment contaminant removal rates e.g. at the lower end of the impervious surface threshold (it is difficult to design an effective stormwater treatment device for such small catchment areas) and areas with low traffic volumes and 'inert' building materials (stormwater treatment devices are less effective when contaminant loading rates are much lower than 'typical'. As such, amendments to SW-S4 are proposed to make the standard more effective and practical to comply with. Another alternative could be to refer to an acceptable design standard similar to the approach taken in the Auckland Unitary Plan which requires that the device or system must be sized and designed in accordance with 'Guidance Document 2017/001 Stormwater Management Devices in the Auckland Region (GD01)' or demonstrate that an alternative device is designed to achieve an equivalent level of contaminant or sediment removal performance.

5 Possible Amendments to the Stormwater Management Chapter

5.1 Possible changes for consideration within scope and with clear links to submission points

In the table below, we have identified some potential changes for consideration noting these in our opinion appear to fall within scope of submission points. These are for consideration and would require more work to progress into actual substantive changes – if any.

Item	Suggested amendments	Relevant submission
Clear link to submissions considered to be within scope – for consideration		
a.	Suggest SW-S1 is deleted – or alternatively, if retained, the wording should move away from the 'retention' requirements and be written to align with the TDC Stormwater Management Acceptable Solution No. 1. We note that the current SW-S1 approach has limitations in its efficacy overall in mitigating stormwater. The provisions currently lack clarity about its purpose, functional need and whether / how stored water can be used on site. There aren't sufficiently clear benefits to justify this requirement, though it could be provided for voluntarily as a suitable method. None of the rules in other zones have a specific retention requirement and under SW-R1, the stormwater neutrality requirement still applies in addition to retention.	Kainga Ora
b.	Suggest amending SW-R7 to apply to sheet cladding and exclude fixings and flashings.	Kainga Ora
c.	Adding additional clarity to how to apply the stormwater neutrality requirements in SW-S3 e.g. a 1 in 50-year stormwater neutrality requirement with a 24hr duration means the maximum permissible discharge for all duration events is the pre-development discharge rate calculated using a rainfall intensity of no more than 2x the average rainfall intensity for a 1 in 50-year annual exceedance probability, 24-hour duration event and without climate change. The stormwater neutrality device is sized for the maximum permissible discharge but using post-development conditions and rainfall that includes an allowance for climate change. Consider adapting the 1 in 50-year, 1-hour duration stormwater neutrality requirement so that the network is protected i.e. requiring the maximum permissible discharge to be no more than the pre-development 1 in 10-year, 1-hour discharge rate.	Kainga Ora
d.	Suggested amendments to SW-S4 • Changing the requirement to only apply to roads, trafficked hardstand or areas where potential contaminants are handled and may be spilt or deposited. The impact of contaminants from high contaminant generating building materials on stormwater quality in the network is already mitigated through SW-	Kainga Ora Prime Port BP Oil, Mobil Oil New Zealand

	R7.Amending the requirements for 30m²-500m² increase in impervious surfaces to require a lesser standard of treatment. • Increasing the threshold for Table 7 to apply only where the increase in impervious surface is greater than 500m².	Limited, Z Energy
e.	The above changes could also warrant an amendment to SW-P2 as follows: *Maintain and enhance stormwater quality by requiring:* *3. restrictions on specified cladding materials that contribute to stormwater contamination; and* *the treatment of stormwater quality for new or increased* roads and trafficked hardstand areas *created by subdivision, use or development.*	Kainga Ora Prime Port BP Oil, Mobil Oil New Zealand Limited, Z Energy

5.2 Possible changes for consideration 'out of scope of submissions'

In the table below, we have identified some potential changes for consideration noting these may be out of scope of submission points, and as such may need to be considered as general advice rather than direct responses to submission points.

Potentially 'out of scope of submissions' considerations where links to submissions are not clear		
f.	Reconsider how sites that hold consent with the regional council are excluded from certain requirements. We assume this exclusion is intended to apply where there is a specific consent for a particular site/activity, not that everywhere covered by the network discharge consents (one granted for Geraldine, four more in process for the other main urban centres) will be excluded. The rules need to consider whether the stormwater management measures that are consented are sufficient so that development doesn't cause the reticulated stormwater network to function beyond its capacity and cause or exacerbate flooding or reduce water quality in the reticulated stormwater network.	BP Oil, Mobil Oil New Zealand Limited, Z Energy
g.	Could we have a different approach to settlement / rural lifestyle zones. Separate out urban residential (where reticulated infrastructure exists and/or is planned for) vs semi-rural lifestyle areas and settlements where reticulated infrastructure is less likely to exist and/or is not planned for (as it's not economically sustainable over time).	Kainga Ora
h.	It would be useful for the rules to permit development if part of a wider scheme (e.g. subdivision development) that has constructed a communal stormwater treatment or attenuation system (to council approved standards / systems), designed such that stormwater neutrality is achieved overall for the development without any so onsite attenuation. Also, as TDC complete the various detailed hydraulic model builds, there may be areas that don't need attenuation at all e.g. connecting to stormwater pipe network with lots of capacity, at the bottom of a catchment, close to a coastal outfall.	Kainga Ora BP Oil, Mobil Oil New Zealand Limited, Z Energy

5.3 General Advice

(a) The rules have some components of 'water sensitive design' but don't have specific references or guidance around this methodology or approach – e.g. attenuation on-site combined with overland flow paths conveying the stormwater to a suitable receiving environment and managing secondary overland flow paths in an integrated manner. These methods can be identified through catchment management plans and through the design of subdivision (and development) where the management of stormwater influences the overall design.

(b) The definition of 'reticulated stormwater network' does not facilitate 'water sensitive design' approaches to managing stormwater. The intent should be a preference for sites to be part of a holistic and integrated public stormwater system which may or may not be 'reticulated'. Expanding and relying on the existing 'certification process' in practice by the council, consideration could be given to adding a clearer 'stormwater management plan framework' setting out key steps to be taken when designing subdivision / development in particular where the stormwater management plan/solutions would influence the overall subdivision/development design.

6 Disclaimer

This memo ('Memo') has been prepared by WSP exclusively for Timaru District Council ('Client') in relation to providing technical advice to support the Client's response to submissions on the Stormwater Management chapter of the Proposed Timaru District Plan('Purpose') and in accordance with the ACENZ and ENZ Short Form Agreement for Consultant Engagement between TDC and WSP, signed 18 January 2024. The findings in this Memo are based on and are subject to the assumptions specified in the Memo. WSP accepts no liability whatsoever for any reliance on or use of this Memo, in whole or in part, for any use or purpose other than the Purpose or any use or reliance on the Memo by any third party.

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