



Evidence pursuant to s42A Resource Management Act 1991

In the matter of:	A Notice of Requirement to construct and operate a new intermodal rail and freight hub on land between Palmerston North and Bunnythorpe
And:	A hearing by Palmerston North City Council pursuant to s100A
Requiring Authority:	KiwiRail Holdings Ltd
Hearing date:	Commencing August 9, 2021

Section 42A technical evidence summary statement for hearing: Stormwater

By: David Arseneau and Reiko Baugham

1. We are the authors of the Section 42A Stormwater Report. We will focus on highlighting to the Panel any points of disagreement or outstanding matters that remain between ourselves and KiwiRail's experts. In particular, this will include justification for the Council-proposed NoR conditions related to the Stormwater Management Framework, as well as interfaces between the stormwater evidence and those of ecology and landscape.
2. As stated in our report, and as identified in Mr Leahy's presentation, we are generally in agreement with KiwiRail's assumptions and approach to sizing the stormwater detention ponds and treatment wetlands. We reached this agreement through an in-person meeting at Council offices in June 2020, with KiwiRail, Stantec, GHD, PNCC and Horizons Regional Council in attendance (flood management staff only), along with follow-up emails and phone discussions between Mr Leahy and ourselves (representing PNCC). The outcome of this process was the Stormwater Management Framework that was included in KiwiRail's NoR submission. Our expectation at the time was that the Stormwater Management Framework would play a fundamental role in all future consents and engineering reviews for the Freight Hub, for both City and Regional Councils, serving as a central document that would contain the sum total of stormwater information for the site.
3. In our opinion, a comprehensive document such as the proposed Stormwater Management Framework is the most effective and efficient way of navigating stormwater approvals for a site like the Freight Hub, and would avoid issues of having multiple documents for different stakeholders that address the same topic. The Stormwater Management Report and Stormwater Management and Monitoring Plan proposed by KiwiRail in the NoR conditions needlessly and confusingly fragment stormwater information related to the Freight Hub.
4. PNCC has an interest in stormwater management as it relates to the council-owned network, but also to other elements that may be affected by stormwater. That includes water quality, avoidance of natural hazards and damage to property, both public and private. This is evident in the various provisions set forth in the District Plan, Eco City Strategy, Asset Management Plans and engineering standards.
5. We acknowledge there is some jurisdictional overlap with regards to stormwater management between regional and territorial authorities, and, here, the unique geographic location of the Freight Hub which sees stormwater discharged almost directly to the Mangaone Stream (a system that is managed by Horizons Regional Council) without passing through PNCC infrastructure. As such, I consider that

KiwiRail's proposed Stormwater Conditions will be generally appropriate, subject to the following qualification.

6. With that said, as KiwiRail is proposing to deal with the detailed stormwater management design as part of the Horizons One Plan consenting process, I consider it appropriate to be clear that those assets that are necessary to service the Freight Hub or to address its affects are constructed operated and maintained in perpetuity by KiwiRail. Accordingly, I support the following addition:

The Requiring Authority must design, construct, operate and maintain all devices that accept, convey, detain and treat stormwater to and from the Freight Hub site, including for:

- i. *stormwater generated from within the Freight Hub site,*
 - ii. *stormwater redirected through or around the site, and*
 - iii. *stormwater from roading and other structures constructed as part of the Freight Hub and in Palmerston North City Council ownership.*
7. There are two important interfaces between the ecological, landscape and stormwater disciplines that need to be clarified and which inform the statements of Ms Quinn and Ms Whitby.
8. The first interface relates to the function of stormwater treatment wetlands and their suitability as mitigation for ecological and landscape effects. This interface was discussed in our evidence report but is important to reiterate here considering the statements from KiwiRail's experts. Stormwater treatment wetlands do not provide the same suite of functions and benefits that natural wetlands provide; key differences can be found in the hydrology and water quality of both types of wetlands:
 - a. Treatment wetlands by design receive runoff from urban areas. This type of runoff arrives quickly and intensely from their serviced areas, resulting in frequent rapid fluctuations in water levels. As well, the proposed wetlands will be co-located with the detention facilities, which are typically designed to accommodate water levels of up to several metres in depth. These water levels will also be present in the treatment wetlands and will require careful selection of vegetation to ensure they are resilient to this extreme inundation. An improved configuration to provide added ecological benefits would be to have the treatment wetland separated from the detention facility to

moderate water levels in the wetlands. However even if separated, aquatic organisms present in the treatment wetland would still be frequently disturbed by the water level fluctuations, and the ecological value would remain limited.

- b. Treatment wetlands are purpose-built to clean contaminated runoff from developed areas before discharging into the natural environment, essentially serving as a large filter to trap urban stormwater contaminants. These contaminants remain in the wetland and accumulate over time in the wetland soils and plants. Eventually, the sediment and contaminants “fill up” the wetland and removal is required. Typically these sediments need to be disposed of at landfills due to the composition of the accumulated contaminants. This requires extensive disturbance to the wetland soils and plants, essentially resetting it to its' original condition.
9. It is therefore important to understand the dual purpose that KiwiRail are trying to meet with the proposed wetlands, and this explanation is intended to provide useful context as to the ecological potential of the proposed stormwater treatment wetlands.
10. The second interface is the practicality of constructing and maintaining the proposed culverts in a manner that will allow fish passage. For context, I (David Arseneau) have a professional engineering background in stream restoration, aquatic habitat restoration, and fish passage assessment through my previous work in Canada, in addition to my experience in stormwater management.
11. As discussed in our evidence report, there are practical limitations to providing fish passage on the scale of the proposed culverts, including the following:
 - a. The interior of the culvert will be permanently dark without appropriate design or mitigation (which can be challenging and impractical to achieve), which may impact the behaviour of fish species and their willingness to pass through the entire length of the culvert. This may, in turn, limit the effectiveness of the culvert in terms of the overall proportion of fish which succeed at passing through the culvert relative to the total amount making the attempt. It suggests that the current level of connectivity may not be entirely maintained post-construction and that some amount of off-site compensation could be required as a result of the proposed activity; this is covered in more detail in the evidence of Ms Quinn.
 - b. The ability of any authority to effectively maintain fish passage conditions within a culvert of these lengths will be limited. Provisions for maintenance

access should be included when these culverts are designed, such that inspections and maintenance can be carried out in a manner that is safe and cost-effective.

12. We made a recommendation in our evidence report for a robust assessment of the erosion effects of the Freight Hub (paragraph 112). In Mr Leahy's statement to the Commissioners he indicated that since no established methodology for such an assessment has been formalised in New Zealand, that it should not form a condition of the NoR. We disagree and suggest that rather than simply not requiring the work, that KiwiRail and the relevant approving authorities should agree on a suitable methodology that will be carried out, drawing on established international standards as needed. We believe that in general the potential erosion effects have been understated in KiwiRail's assessment of effects, including potential effects during the construction period. However, we also acknowledge the potential jurisdictional overlap on this issue and will trust that this matter will be resolved through regional consents.

13. Finally, some of the submissions, including the evidence presented by Mr. Gore and Mr. O'Reilly, discuss the existing flooding concerns and KiwiRail not directly acknowledging (as far as we are aware) the existing environment in terms of flood risk. This was further reinforced during the Hearing through presentation of photos of recent flooding in the NoR area from several submitters. The proposed stormwater mitigation will need to consider the downstream hydraulic conditions and an appropriate return event, as well as the impacts of the loss of floodplain storage volume resulting from the construction of the Freight Hub, so as not to create or worsen flooding to other properties. The results of this assessment would not be expected to impact the NoR area, but may indicate the requirement for off-site mitigation or protection of properties made vulnerable to flooding by construction of the Freight Hub (if any). Again, we acknowledge the jurisdictional overlap and trust that this issue will be resolved through Regional consents.

We are happy to take your questions.

David Arseneau

Reiko Baugham

24 September 2021