

Memo Template for GDC Hearing – Eastland Port – Twin Berth project.

Introduction

My full name is Hamish Leslie Jones. I have a Bachelor of Environmental Science from Macquarie University in Sydney. I am an environmental practitioner with 19 years' experience working in Industrial Trade and Stormwater Management in New Zealand, based in Auckland. I hold the title of Technical Director – Stormwater at Pattle Delamore Partners Limited (PDP).

My Experience includes working for Watercare Services Limited for circa 7 years where I monitored trade and industrial sites to be compliant with the local trade waste bylaws and supported these sites to become consented for their discharges (which included reviewing site management and treatment procedures/systems). I was also the project (Client) manager for developing the new Auckland Council Trade Waste bylaw and the new charging mechanism during the “super city” amalgamation. My experience also includes working for Hynds Pipes System for circa 4 years, where I designed stormwater and trade waste treatment systems, which included proprietary systems and more recently, working for PDP for circa 5 years developing site management plans for commercial/industrial clients and guidance documents and stormwater treatment for stormwater catchments for Auckland Council.

Code of Conduct statement

I have read and complied with the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2014 in preparing this report. I agree to comply with the Code of Conduct in presenting this report and any evidence at the hearing. The opinions and assessment within this report are within my area of expertise, except where I have stated my reliance on other identified evidence.

Executive Summary

The scope of work PDP was asked to undertake included to advise/confirm:

- That appropriate modelling/sampling has been completed to determine stormwater flows, discharge volumes and discharge quality;
- That the assessment and proposal for stormwater treatment is appropriate taking into account the nature of port activities and the discharge points into the Coastal Marine Area;
- Whether the proposed treatment process represents best practice; and
- Review and input into conditions.

Overall the reports reviewed are comprehensive with relevant supporting documentation provided in order to make a decision. Our review was generally supportive of the work reviewed. We suggested a few minor changes. We asked for a few clarifications and questions around sizing and potential considerations around the optimising of the treatment systems and rain events and flow rates that were to be managed.

Eastland Port Limited (EPL) asked Cheal to respond to our review which they did. In general their response outlined that some of our clarifications will be undertaken during the detailed design phase or that specific management will be/is employed.

With regards to any consent conditions, our key suggestion is at time of review is that the designs proposed need to be detailed and finalised before final signoff should be given by Gisborne District Council (GDC).

Review process

PDP was requested in September 2023 by Planning Works to undertake a desktop peer review of the Eastland Port Limited (EPL) Twin Berth reports in terms of the stormwater treatment process and discharge quality, on behalf of GDC.

In order to undertake this work the following documents were reviewed:

Appendix H: Cheal Stormwater Engineering report

Appendix M: 4sight Ecological and Water Quality Assessment Report.

Background

This section outlines current situation, the proposed solution and how it works, analytes sampled and main risks if the stormwater and its constituents being discharged into the treatment system is not well understood.

Currently the treatment of stormwater in the Southern Log Yard (SLY) is not performing, with Total Suspended Solids (TSS) concentration targets being exceeded for 84% of the monitoring surveys (2016 to 2021). As part of the Twin Berths Project, a stormwater management solution to address the non-compliance of TSS on this site was sought. Cheal was commissioned by EPL to propose a suitable stormwater management solution for the SLY. The SLY is made up of two sub-catchments (the north and south areas of the yard respectively). The northern sub-catchment is 5.25 ha but also accepts stormwater runoff from areas of Kaiti Beach Road and Kaiti Hill. This catchment discharges to the harbour area. The southern sub-catchment is 3.42ha and discharges to the bay. The bulk of residue is managed by sealed surface sweeping or by interception by the stormwater system but significant quantity of small particles tends to embed into the yard surface and are only mobilised during storm events. It was found that 30% of the TSS are Volatile Suspended Solids which are due to organic based particles from the wood stored on-site. This residue has lower density than water and is therefore resistant to traditional settling treatment methods.

The current treatment system consists of the following:

- ∴ Pre-treatment chamber (made up of a grate (20mm opening);
- ∴ A hydrodynamic vortex separator (Downstream Defender); and
- ∴ If bypass does occur, it flows to a modified storm shield.

In order to mitigate the non-compliance of TSS, a new treatment system is proposed which is to be placed downstream of the current treatment train and will include a detention and

pump chamber, chemical dosing, lamella clarifiers and a turbidity analyser before discharging to the outfall. This system is to be put in place in both the northern and southern sub-catchments of SLY (Figure 1).

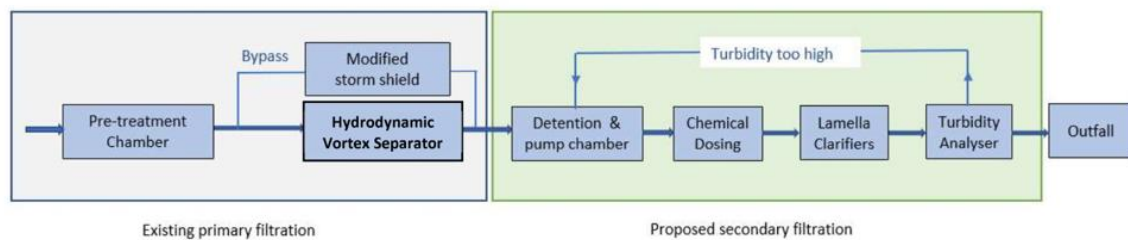


Figure 1: Proposed Treatment Train (Cheal Stormwater Engineering report)

The detention chamber will comprise of underground pipes (1600mm). Both the northern and southern sub-catchment Stormwater Treatment Plants (SWTP) will have two clarifiers (each with a flow rate of 110 m³/hr) with the pump pumping the correct flow through the lamella clarifiers to ensure optimal treatment.

Chemical dosing with Polyaluminium Chloride (coagulant) and Crystalfloc B400 (flocculant) is to be undertaken in order to accumulate fines into clumps which are larger and denser prior to settling within the Lamella clarifiers. Anti-foaming treatment is also to be included as a precaution (XIAMETER AFE-1520).

Ponding occurs in both the south and north sub-catchments. To mitigate ponding, additional treatment devices (hydrodynamic vortex separators) will be installed in the bypass flow paths in the north and south sub-catchments as outlined in Figure 2.

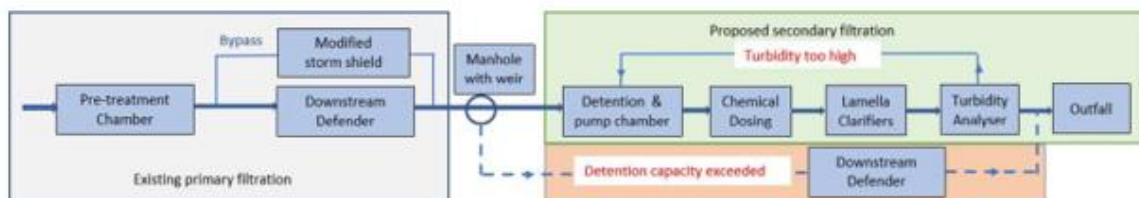


Figure 2: Proposed Treatment Train with bypass system (Cheal Stormwater Engineering report)

Quarterly consent stormwater sampling of the discharge from the port is undertaken with the following analytes pH, TSS, Volatile SS, COD, TOC, tannin, Total Petroleum Hydrocarbons (TPH), dissolved copper, dissolved lead and dissolved zinc. There are specific consent discharge limits for TSS, TPH and metals with only TSS being in non-compliance.

To be compliant with the TSS consent condition (median 300 g/m³ and 75 percentile of 450 g/m³), there are a number of characteristics that need to be assessed, these include understanding:

- the spectrum of the particle sizes being discharged into the vortex systems; and,
- flow rates of the stormwater entering the vortex systems; to,

understand what percentage of particles will be removed prior to discharge to the chemical dosing system or outfall (depending on if the discharge is going via the secondary filtration process or via the bypass).

Understanding the amount of TSS being chemically dosed is important as it will help to manage/limit the amount of non-reacted dosing chemicals from being discharged into the outfall and into the receiving environment where it can continue to further react in the harbour/bay.

Assessment

The key points from our review, that required further assessment included:

- Is the design using the appropriate rain event. PDP suggested that multiple rain events should be assessed in order to determine the most pragmatic solution.
- Detailed design (including particle size of sediments and particulates) should be completed, treatment system management and maintenance plans developed and submitted to GDC for approval prior to the treatment system being signed off and installed.
- The bypassed discharge is the main concern. With the type of contaminants/material discharged from the site, a hydrodynamic Vortex Separator, may not treat much of the stormwater that bypasses the main treatment system. Therefore, it is important to review and determine the rain events and flow rates that should be pragmatically treated.
- Further investigation into the design required into removing as much of the particles prior to detention and pumping chamber in order to reduce the maintenance period of the detention chamber due to build up of material as well as to reduce the load on the chemical dosing required.
- It was agreed that trials should be carried out in order to optimise dosing concentrations as concern was raised over the effect of excess coagulant and flocculant on the receiving environment.
- In general, implementing more monitoring to better understand the site would be appropriate. This will also allow the operator of the site to understand how the treatment system is operating in order to make informed decisions on any required changes (if necessary).

Conclusions

Overall, the Cheal Engineering and the 4sight Ecological and Water Quality Assessment reports are comprehensive with relevant supporting documentation provided in order for GDC to make a general decision. Our main suggestion is that before GDC sign off the design, that a detailed design is completed and peer reviewed prior to installation, which will provide GDC with confidence that the treatment systems are designed to treat the stormwater discharged for the appropriate rain events.