To

Welhom Developments Limited
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From

Woods
Mark Thomson – Associate Engineer

W-REF: P22-323
13 February 2025
Reviewer: Manu Miskell

Memorandum

Ratanui Plan Change – Updated Wastewater Capacity Assessment

Welhom Developments Limited (Welhom) commissioned a wastewater capacity assessment by Kāpiti Coast District Council (KCDC)'s nominated consultant to identify the scale and nature of any off-site infrastructure upgrades triggered by a potential residential development of the Site at part 65, and 73 Ratanui Road that is currently subject to a private plan change request to KCDC to rezone the site from rural lifestyle to residential. This wastewater capacity assessment was still being prepared at the time the private plan change request was lodged with KCDC but has now been completed.

Please refer to the wastewater capacity assessment (*'65 and 73 Ratanui Road Development Impact Assessment*', by HAL Consulting Limited dated February 2025) attached to this memorandum.

The wastewater capacity assessment concludes at section 7: "*…the downstream network is considered to have sufficient capacity to accommodate the increased flows from the proposed development*."

On the basis of this conclusion we consider that:

a) no off-site upgrades of the existing KCDC wastewater network are required to support development of the Site in accordance with the requested zoning; and,

b) no special or unusual on-site wastewater infrastructure would be required on-site to mitigate off-site issues in the KCDC wastewater network.

Yours sincerely

Mark Thomson

Associate Engineer

KAPITI COAST DISTRICT COUNCIL

65 and 73 Ratanui Road

Development Impact Assessment

FEBRUARY 2025

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Document Title	65 & 73 Ratanui Road Development Impact Assessment
HAL Job Reference	J0749

Revision Schedule

Rev	Date	Description	Prepared by	Checked by	Reviewed by	Approved by
1	29/01/2025	Draft for Client Review	BY	EE	EE	BR
2	04/02/2025	Final Report incorporating client comments	BY	EE	EE	BR

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1 Introduction

1.1 Objective

The objective of this study is to utilise the existing Hydraulic model of the Paraparaumu and Waikanae wastewater network to assess the impact of the proposed 65 & 73 Ratanui Road development. The existing modelled populations have been updated by HAL Consulting Ltd (HAL) to provide an estimated existing (2018) population scenario.

1.2 Background

The proposed development site is located in Paraparaumu, just north of the township. A previous development impact assessment has been undertaken in July 2024 for a proposed retirement village development at 65 & 73 Ratanui Road. For further information, please refer to "65 and 73 Ratanui Road Development Impact Assessment (HAL Consulting, 2024)".

This assessment has been prepared to assess the impact on the KCDC wastewater network from development of 65 & 73 Ratanui Road into 235 residential dwellings.

2 Scope

The following tasks were undertaken as part of this assessment:

- Calculation of design flows for the 65 & 73 Ratanui Road development.
- Assessment of the 65 & 73 Ratanui Road development impact on the existing wastewater network for the current development scenario.

Each of these tasks is discussed in more detail in the following sections.

3 65 & 73 Ratanui Road Design Flows

3.1 Overview

The 65 & 73 Ratanui Road proposal seeks to develop two lots into 235 residential dwellings. It is assumed that the connection point for the updated proposal remains the same as the previous development impact assessment. The development is proposing to discharge into a new manhole on Pipe ID KWWP001467. For the purposes of this assessment, it has been assumed that the development will connect to an existing manhole (Manhole ID KWWN004402) directly upstream of Pipe ID KWWP001467. The location of the proposed development and the discharge point is shown in Figure 1 below.

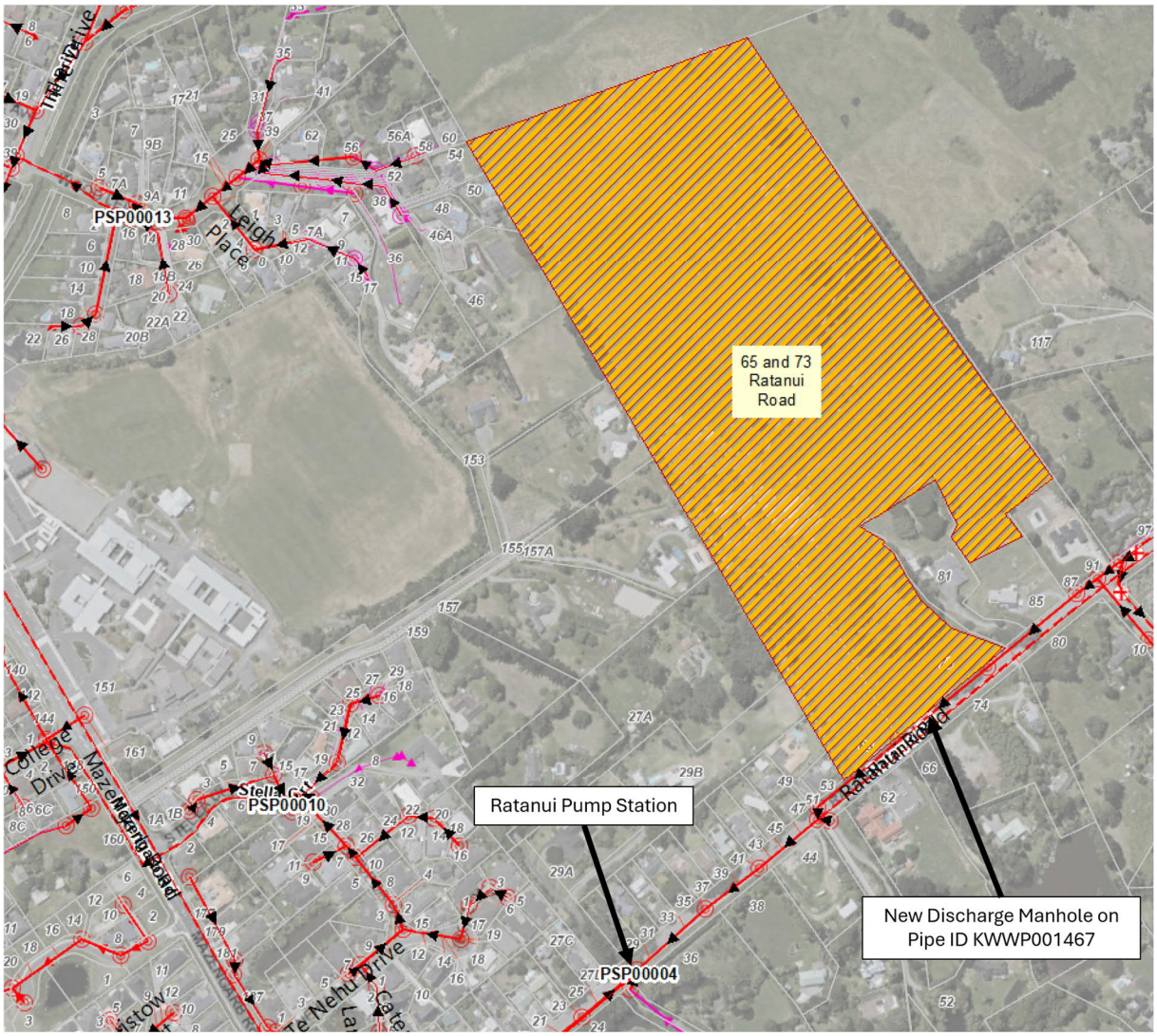

Figure 1: Proposed 65 & 73 Ratanui Road Development location and connection point

From the connection point, the network flows in a south-westerly direction through a section of 150mm gravity network, before flowing into ~200m of 225mm network prior to discharging to a Pump Station (PSP0004 - Ratanui PS), which then pumps to the Paraparaumu WWTP.

3.2 Development Design Flows

The Peak Wet Weather Flow (PWWF) generated by the proposed 235 residential dwellings has been calculated following the KCDC Land Development Minimum Requirements Code (2022) and NZS 4404:2010 Section 5, Wastewater. The design flow formulas, as shown below in Table 1, were used to calculate a proposed residential PWWF of 8.5 l/s for the development. The calculated PWWF agrees with estimated flowrates provided to HAL by the developer's Engineering Consultant, Wood & Partners Consultants Ltd. (Woods).

Table 1: 65 & 73 Ratanui Road Design Flows

No of units	Type of units	Occupancy	Population	ADWF (l/p/day)	ADWF (l/s)	DWF Peaking Factor	PDWF (l/s)	WWF Peaking Factor	PWWF (l/s)
235	Residential dwellings	2.5	587.5	250	1.70	2.5	4.25	5	8.5
	Total Flow								8.5

4 65 & 73 Ratanui Road Development Impact

4.1 Pre-Development Scenario

The Paraparaumu and Waikanae wastewater model was run under the pre-development scenario, without the proposed development adopting a standard design storm with a 5-year ARI being used as the level of service for this assessment.

Figure 2 shows a long section of the pipe network between the discharge point to PSP0004 in a pre-development scenario. As shown in the long section, the existing network shows some evidence of pipe surcharge in the downstream network prior to PSP0004, however there are no uncontrolled overflows and the risk of overflows is considered low.

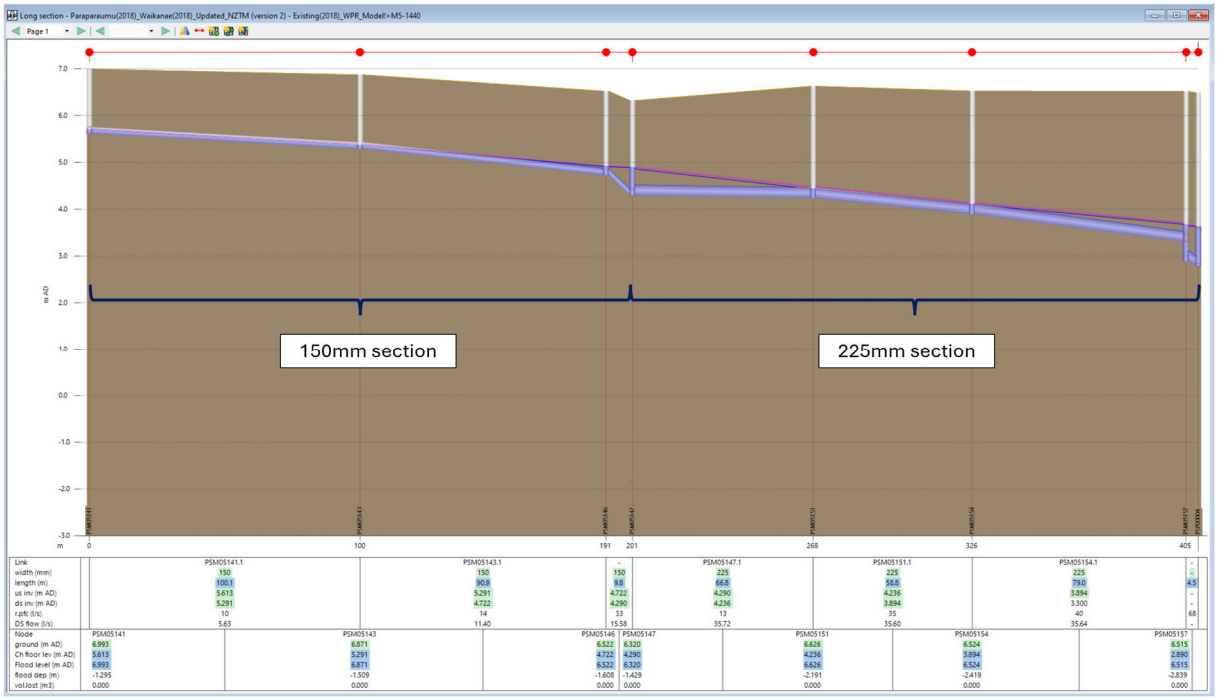

Figure 2: Pre-development flows from the proposed discharge point to PSP0004 - 5-year ARI design storm, long section

4.2 Post-Development Scenario

The Paraparaumu and Waikanae wastewater model was run for the 5-year ARI design storm to assess how the local network performs in storms of this magnitude, with the additional peak wet weather flows of 8.5 l/s from the proposed development.

Figure 3 shows a long section of the pipe network between the discharge point to PSP0004 in the post-development scenario. As shown in the figure, the post development scenario exacerbates the surcharging downstream of the development's connection point prior to PSP0004 that was seen in the pre-development scenario, however there are still no uncontrolled overflows, and the risk of overflows is considered low.

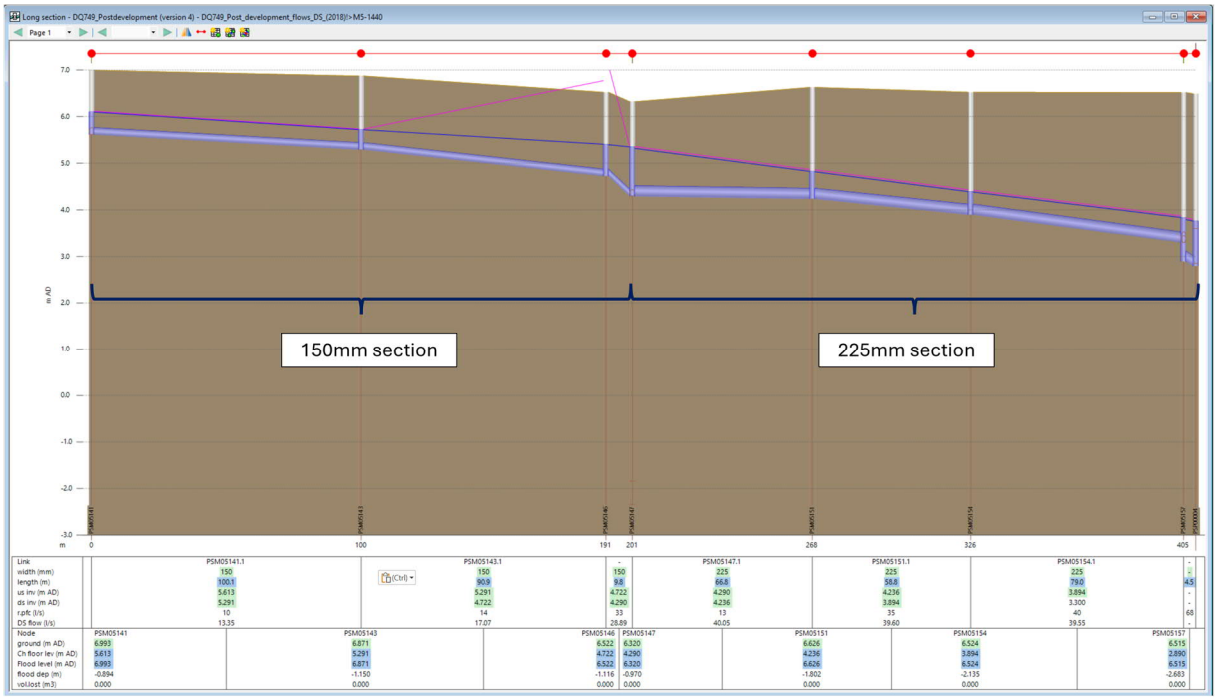

Figure 3: Post-development flows from the proposed discharge point to PSP0004 - 5-year ARI design storm, long section

4.3 Post-Development Scenario with Upgrades

KCDC is planning to upgrade the clouded section of the line running along Ratanui Rd, seen in Figure 4, in early 2025 which will likely alleviate the surcharging issues downstream of the development.

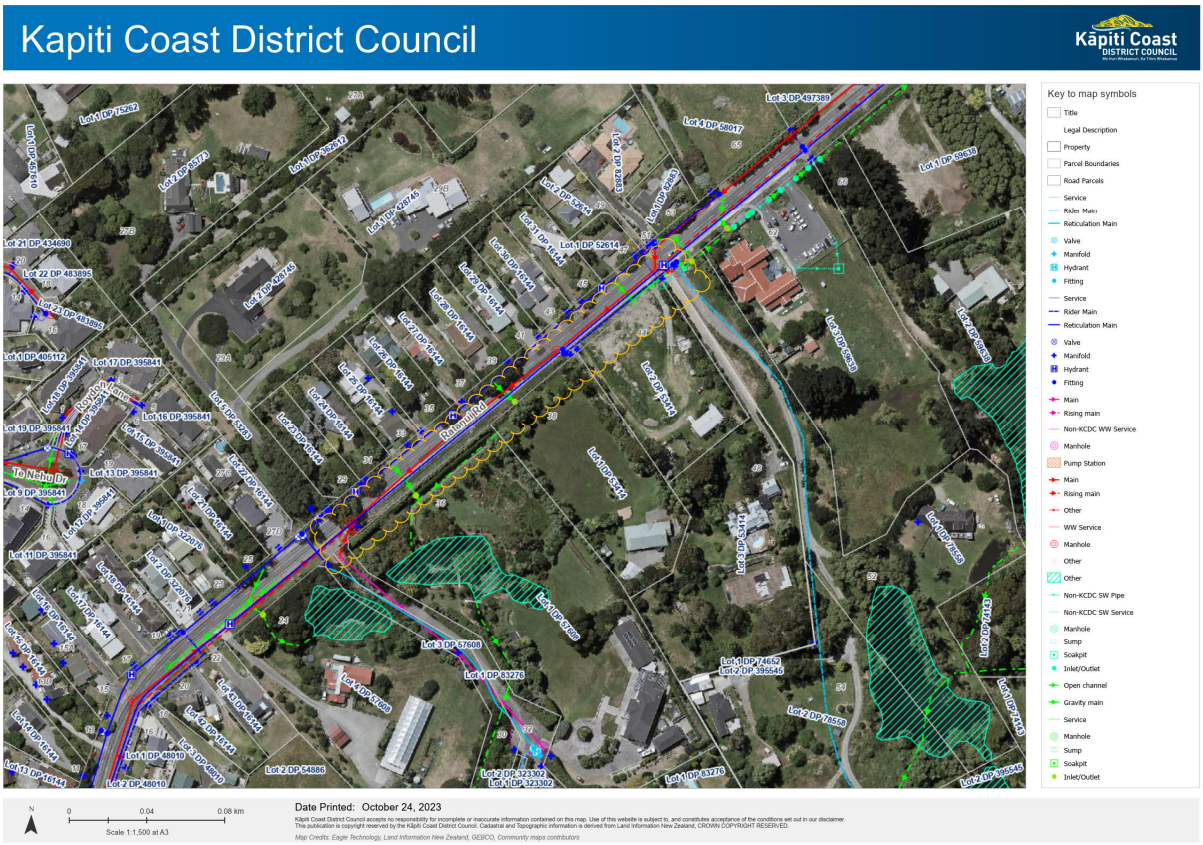

Figure 4: Upgrades to the local network (pipes within the clouded orange area upgraded from 225mm to 300mm

Therefore, the Paraparaumu and Waikanae wastewater model was run for the 5-year ARI design storm to assess how the local network performs, with the additional peak wet weather flows of 8.5 l/s from the proposed 65 & 73 Ratanui Road development and the pipe upgrades planned by KCDC shown in Figure 4.

Figure 5 below shows the post-development scenario long section with planned upgrades. As shown in the figure, the upgrades show some minor surcharging downstream of the development's connection point prior to PSP0004 but the surcharging in the gravity network is at a much lower level compared to the model run without upgrades and occurs primarily as a result of backup from PSP0004.

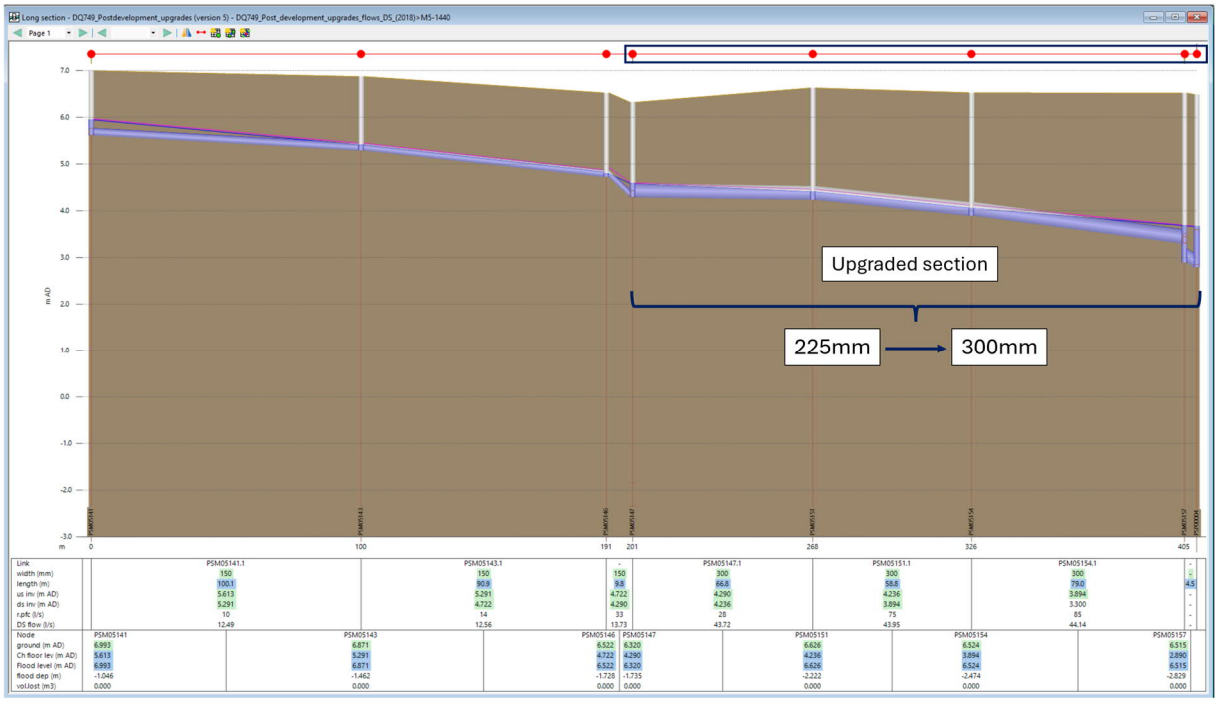

Figure 5: Post-development flows to PSP0004 with upgrades - 5-year ARI design storm, long section

5 Ratanui Pump Station (PSP0004) Assessment

Downstream of the proposed development sites, the 150 / 225mm wastewater network flows via gravity to Ratanui Pump Station (PSP0004), which has a modelled capacity of 35 l/s (based on KCDC records).

As shown in Figure 6 below, the pre-development scenario simulates a peak inflow rate of approximately 37 l/s in the 5-year design storm. With the addition of the development's peak flows (8.5 l/s), the peak inflow rate into the PS increases to around 42 l/s and, in the post-development scenario with upgrades, the inflow rate increases to 46 l/s, as the existing constraint attenuating peak flows is no longer present.

Hence, it is concluded that the inflow into PSP0004 Pump Station will exceed the PS's capacity during the post-development scenario (including upgrades), however the buffering provided by the storage at PSP0004 and the upstream gravity network is sufficient to attenuate peak flows during the design storm, mitigating the risk of overflows to an acceptable level.

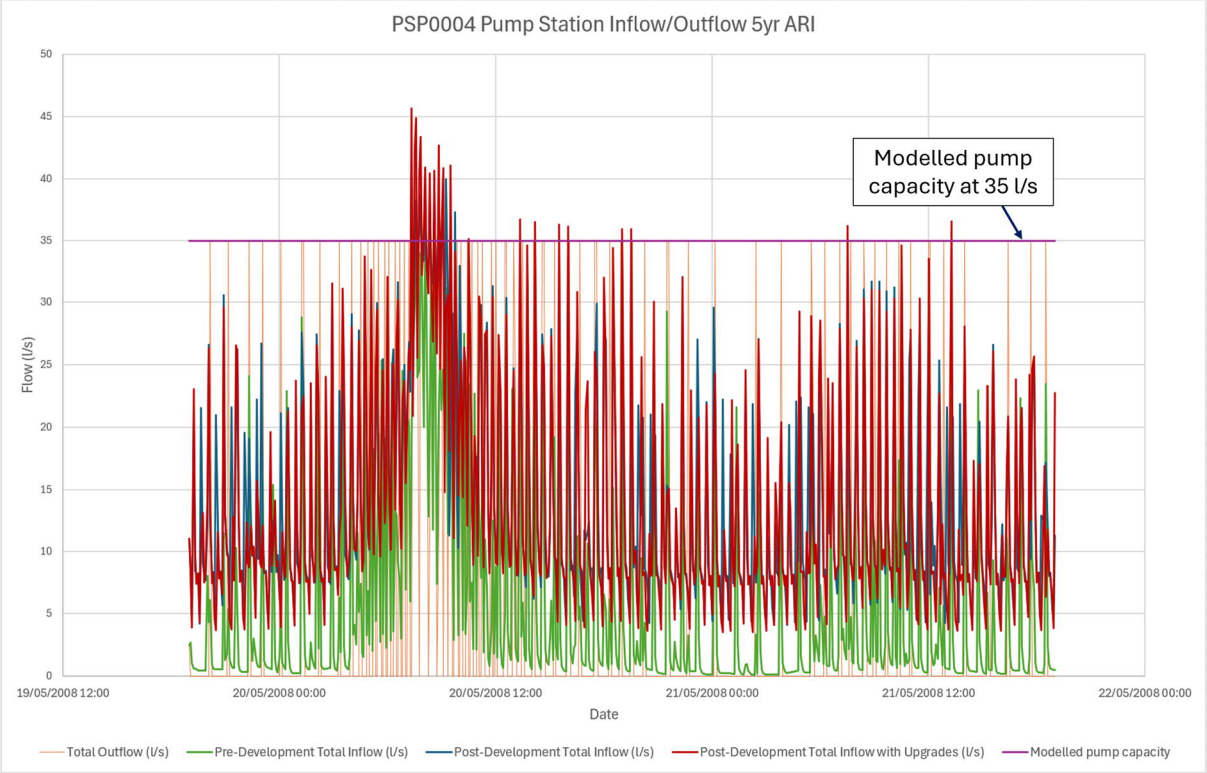

Figure 6: Existing Pre- and Post-Development PSP0004 Pump Station Flows – 5-year ARI Design Storm

6 Model Assumptions and Limitations

The following assumptions should be read in conjunction with the following reports.

- Aurecon's report 'Paraparaumu Wastewater System – Model Build and Calibration Report, June 2009)
- Watershed's Model Update Report (2016)
- Watershed's Model Recalibration and System Performance Report (2017)
- 65 and 73 Ratanui Road Development Impact Assessment (HAL Consulting, 2024)

The following limitations apply to the modelling undertaken as part of these studies:

- The model has been verified (and recalibrated) against flows developed from KCDC pump station SCADA data, and as such has an inherent limitation to the degree of accuracy able to be achieved.
- The distribution of the modelled population is an approximation based on the population increase between the 2006 and 2018 census. No allowance has been made for additional growth since 2018 which is considered to be minor.
- Future growth other than this development has not been considered as part of this assessment
- No allowance has been made for future increased inflow/infiltration in existing areas due to deterioration of existing sewers.
- Pump station model parameters are based on information provided by KCDC operations, and its accuracy has not been validated as part of this study.
- No assessment of the development's infrastructure has been completed as part of this report.

7 Conclusion

The objective of this study was to utilise the existing hydraulic model of the Paraparaumu and Waikanae wastewater network to assess the impact of the proposed 65 & 73 Ratanui Road, retirement home facility.

The model was run under the existing population scenario, with the additional flows from the proposed development at 65 & 73 Ratanui Road with a calculated design flow of 8.5 l/s added. The development impact was assessed against a 5-year ARI design storm to understand the performance of the downstream network, with the development assumed to connect into an existing manhole (Manhole ID KWWN004402) along Pipe ID: KWWP001467.

The model was run with the additional development flows connected to the 150 / 225mm local network. The model simulates some evidence of minor surcharging within the local network, however there are no signs of uncontrolled overflows and the risk of overflows is considered low. The level of surcharging will be decreased with planned upgrades of the network by KCDC in early 2025. Therefore, as the surcharging will be minor and there is a low risk of uncontrolled overflows, the downstream network is considered to have sufficient capacity to accommodate the increased flows from the proposed development.