

# CENTRAL INTERCEPTOR

## Memorandum

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Subject: Point Erin Extension – Assessment of Potential Flood Impacts

Doc. Ref: JNZ-WSL-CIP-TM-0000121

Date: 25 January 2023

Revision: C – Client Issue

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### Introduction

Watercare is proposing to extend the Central Interceptor Tunnel (CI) wastewater conveyance and storage tunnel from Tawariki Street in Grey Lynn to a new terminal shaft in Point Erin ("Project"). The tunnel extension will ensure combined overflows are picked up and conveyed to Māngere Wastewater Treatment Plant for safe treatment, reducing overflows to the environment and improving the quality of waterways and swimmable beaches by 2028.

The Project involves the construction, commissioning, operation and maintenance of a wastewater interceptor tunnel and associated activities in Point Erin Park in Herne Bay. Given that no surface works are required for the Point Erin Tunnel component of the Project, this assessment is focused only on the works proposed in Point Erin Park

The works at the Point Erin Shaft Site are proposed to occur in two discrete locations within the park:

- The terminal shaft and associated construction area is proposed to be located in the grassed area immediately to the south of the Point Erin Pools (referred to as the main construction area).
- The Control Chamber, Plant Room and associated construction area is proposed to be located towards the south-west corner of Point Erin Park near the intersection of Curran and Sarsfield Streets (referred to as the south-western construction area).

The proposed layout for these activities is shown in Figure 1.

The proposed Control Chamber and Plant Room are located adjacent to a **flood plain** and a **flood prone** area as identified on the Auckland Council GeoMaps site.

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As such, an assessment of the potential impact of the Project on the identified flood plain and flood prone areas within Point Erin Park has therefore been undertaken, to support the resource consent application being prepared for the Project.

## Basis of Assessment

The proposed Control Chamber and Plant Room will have different potential impacts on the flood plain and flood prone area within Point Erin Park during construction and operational phases. This is due to the different footprint extents associated with each phase. An assessment of the potential impact on the flood plain and flood prone area has therefore been undertaken for both the construction and operational phases.

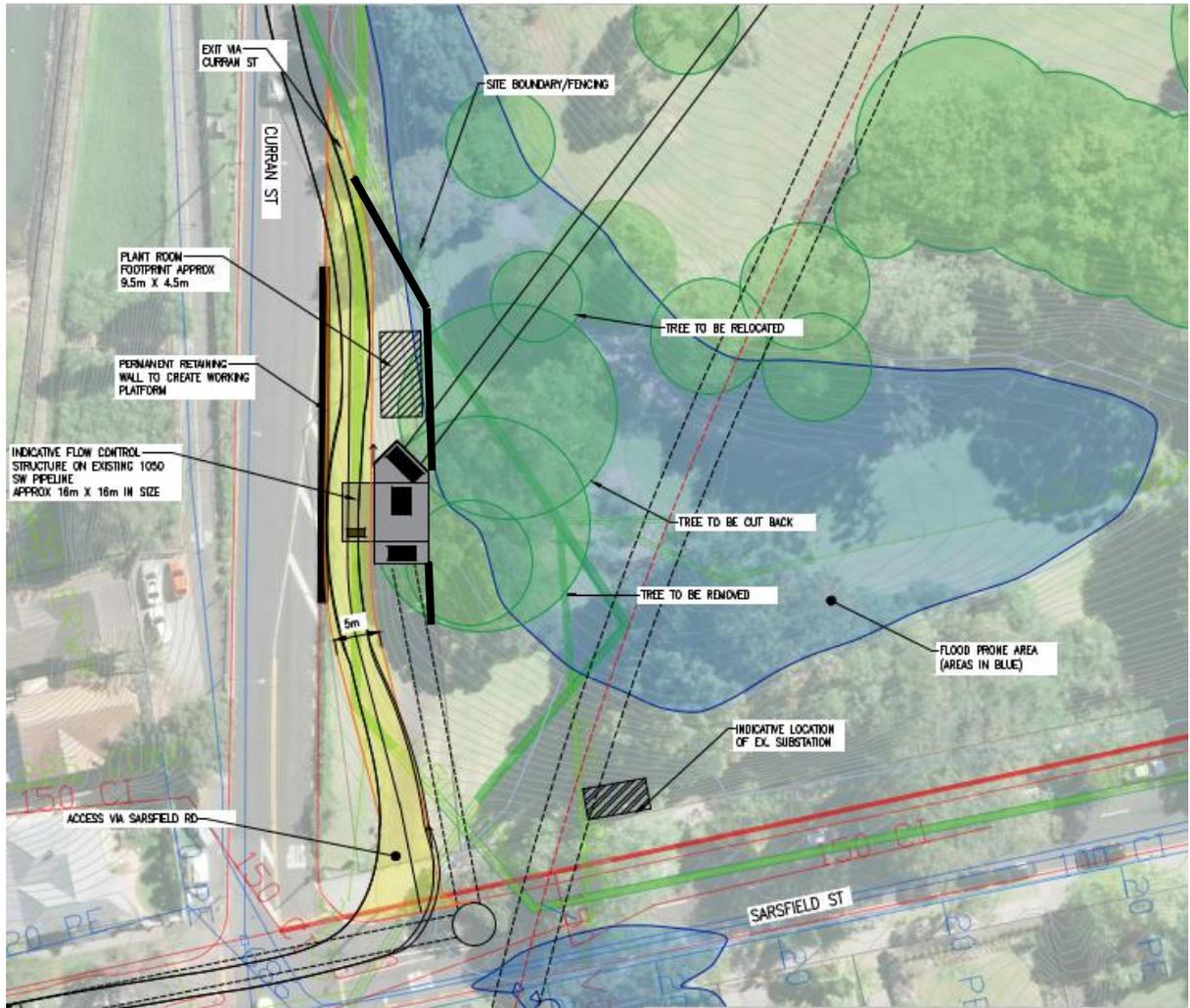
The Control Chamber and Plant Room is a permanent facility that once constructed, will remain operational for the foreseeable future. An assessment of the potential to impact on the flood plain and flood prone area has been undertaken against the **flood plain** extents predicted for a 1% AEP rainfall event, which are based upon hydraulic modelling as provided on the Auckland Council GeoMaps site. In this case, the flood plain and flood prone extents are the same for the 1% AEP rainfall event.

Construction of the Control Chamber and Plant Room is expected to take approximately two to three years, so an assessment of the potential to impact on the flood plain and flood prone area would normally be done against a more frequent return period rainfall event. However, Auckland Council has advised that they do not have a current stormwater model for this catchment, so modelling results from work undertaken by Auckland Council in 2005 has been used in lieu of more recent information. These results are sufficient to understand the potential impact that the construction of the Control Chamber and Plant Room will have on the flood plain and flood prone area.

## Operational Phase Assessment

The proposed Control Chamber and Plant Room's operational phase footprint and location in relation to the flood plain extents predicted for a 1% AEP rainfall event, as provided on the Auckland Council GeoMaps site, is shown in Figure 1.

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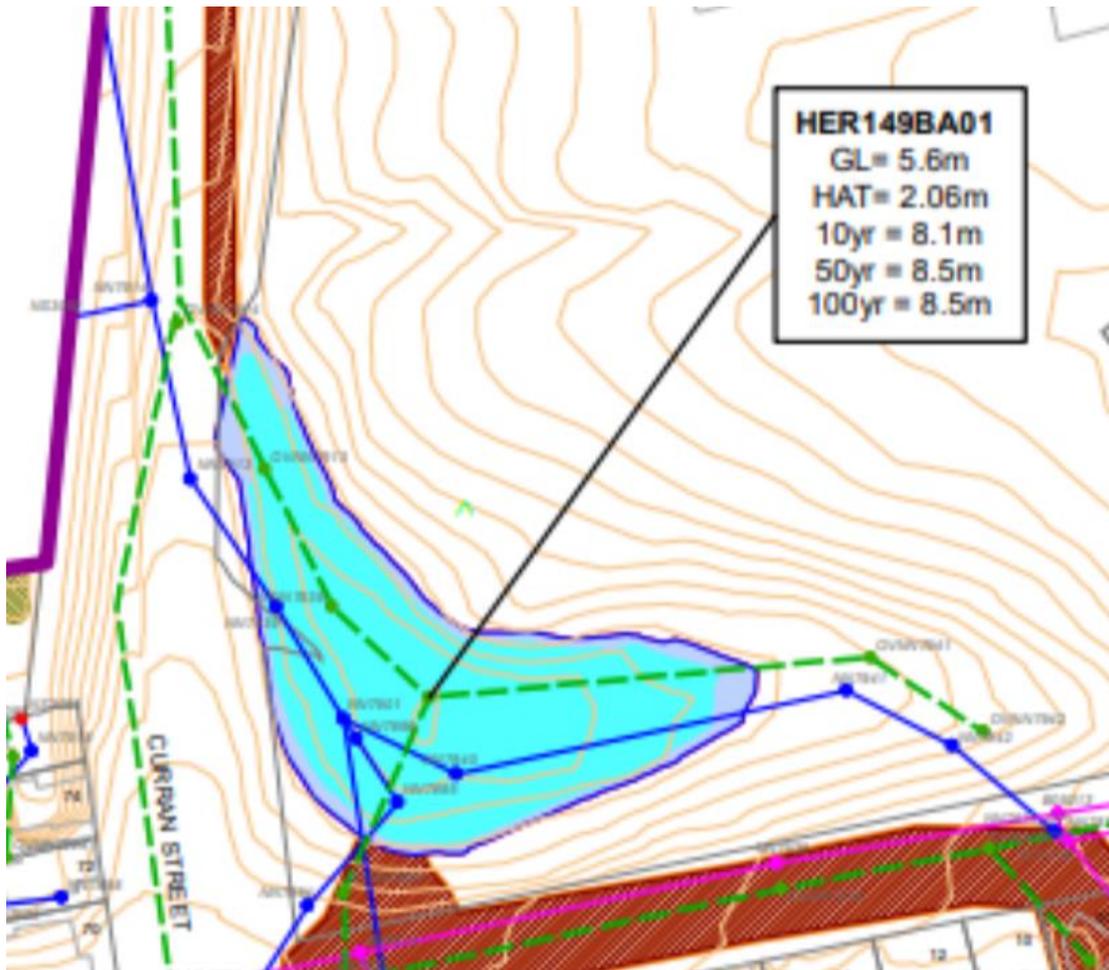
**Figure 1 Proposed Sarsfield Control Chamber operational phase footprint**

As can be seen in Figure 1, the Control Chamber Structure is outside of the flood plain area and the retaining wall beside the Plant Room extends into the flood plain area to a small extent. It is therefore determined that the operational phase of Project will have **no discernible impact** on the identified flood plain and flood prone areas within the Point Erin Park Shaft Site.

## Construction Phase Assessment

The modelling outputs sourced from Auckland Council's 2005 Integrated Catchment Modelling – Herne Bay Flood Hazard Mapping provide projected flood levels as shown in the extract in Figure 2.

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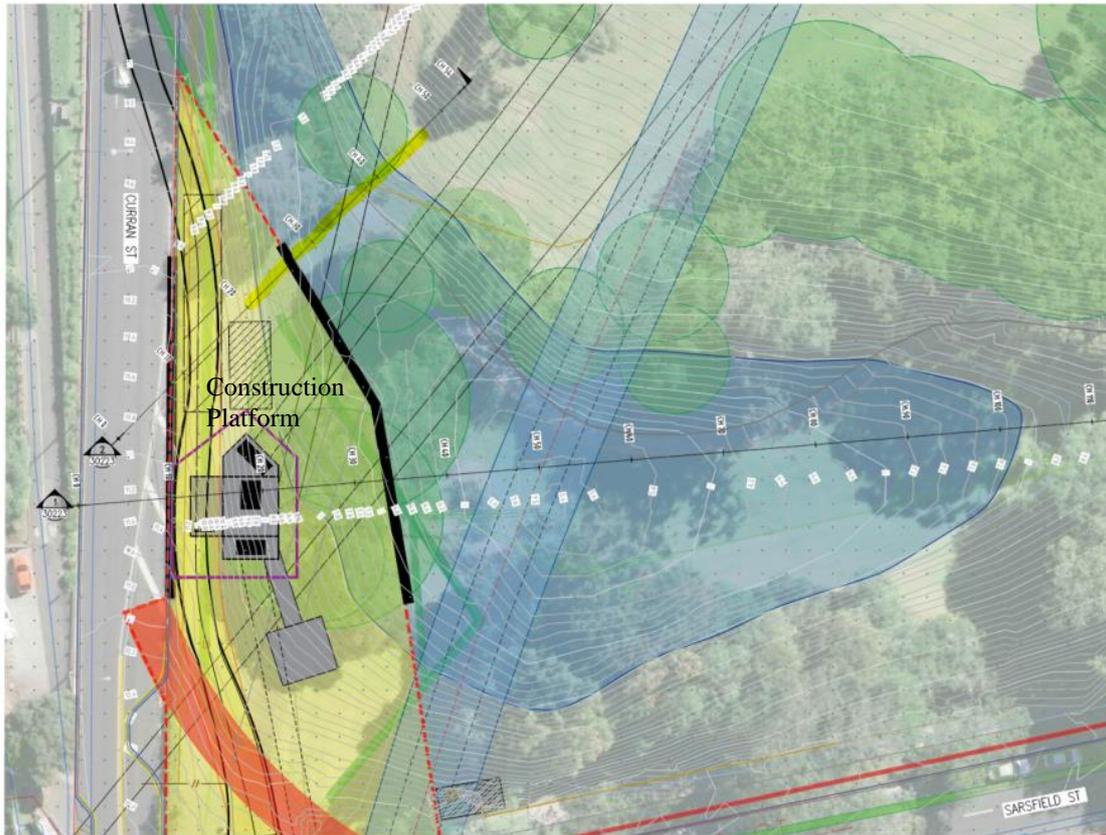
**Figure 2 Auckland Council flood hazard mapping**

The consistency between the 100-year flood levels and extents in Figure 2 and the 1% AEP rainfall event presented on Auckland Council's GeoMaps and the closeness of the 10-year and 100-year flood levels indicates that use of the 1% AEP rainfall event is a reasonable and conservative alternative for assessment of construction phase effects in the absence of a 10% AEP rainfall event data.

Auckland Council's GeoMaps does provide predicted peak flows (current) for the 10% AEP rainfall event for this catchment of 3.64 m<sup>3</sup>/s and this flow rate has been assumed for the overland flow rate for assessment of construction phase effects.

The construction phase footprint for the Control Chamber and Plant Room is shown in Figure 3.

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**Figure 3 Proposed Sarsfield Control Chamber construction phase footprint**

The proposed construction platform is temporary yet has the potential to impact on the flood plain area in several ways, including by restricting primary flow path, restricting secondary flow path, restricting passage to the secondary flow path or utilising storage and therefore affecting the timing or frequency of flooding effects, as discussed below.

### **Restricting primary flow path**

The primary flow path is within the drainage pipes, with the majority of the catchment located outside and upstream of Point Erin Park. Assuming that sediment and erosion controls are in place and effective then the construction platform is assessed as having **no effect** on the primary flow path.

### **Restricting secondary flow path**

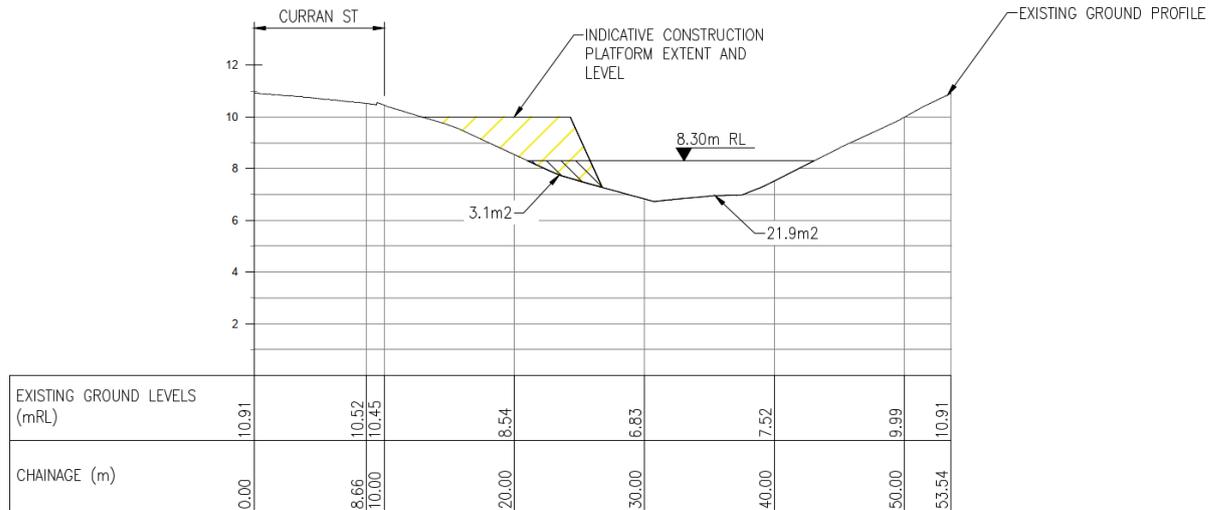
The proposed construction platform does not modify the entry and exit points of the overland flow path within Point Erin Park or where it traverses along Curran Street to discharge in to the Waitemata Harbour, and therefore has **no effect** on entry and exit points and the downstream path of the secondary flow path.

### **Restricting passage of the secondary flows**

The proposed construction platform encroaches into the overland flow path as shown in plan in Figure 3 and in cross-section in Figure 4.

The reduction in cross section at this narrowest location is approximately 14%, from 21.9m<sup>2</sup> to 18.8m<sup>2</sup>. Flow velocities would increase by a comparable amount, from 0.17m/s to 0.19m/s for the 3.64m<sup>3</sup>/s overland flow identified on Auckland Council's GeoMaps for the 10% AEP rainfall event.

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**Figure 4 Cross section showing construction platform and 10% AEP rainfall event flood plain**

These flow velocities are very slow and therefore the increase in velocity associated with the encroachment of the construction fill platform into the flood plain and flow path is expected to have **no discernible effect** on overland flows at this location and therefore will not raise the flood level within Point Erin Park. Consistent with this there would be no adverse effects on the upstream or downstream catchments.

## Storage volume

A preliminary assessment of the affected storage volume suggests the construction fill platform will occupy approximately 270m<sup>3</sup> or 6% of the estimated total storage volume available, approximately 4400m<sup>3</sup>.

This reduction in available storage volume will result in a very small decrease in time taken to fill the available storage, possibly in the order of several minutes, which is considered insignificant compared to the duration the secondary overflow path would be expected to be flowing, possibly in the order of several hours.

The minor reduction in available storage is therefore expected to have no more than a **minor effect** on the frequency or duration of secondary flow path overflow events.

## Summary

Based on the assessment documented above, the proposed construction of the Control Chamber and Plant Room in the southwestern corner of Point Erin Park will have no more than minor effects on flood extents, duration or frequency during construction and no effects in its operational state.