Watercare Services Limited

QUEEN STREET WASTEWATER DIVERSION PROGRAMME: MAYORAL DRIVE ALIGNMENT PROJECT

FLOOD HAZARD ASSESSMENT

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PUBLIC

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FLOOD HAZARD ASSESSMENT

Watercare Services Limited

WSP
Auckland
Level 3 The Westhaven
100 Beaumont St
Auckland 1010, New Zealand
+64 9 355 9500
wsp.com/nz

REV	DATE	DETAILS
3	10/06/2025	Flood Hazard Assessment for the latest Mayoral Drive Alignment

	NAME	DATE
Prepared by:	B. SUTTON	03/06/2025
Reviewed by:	W. BIRD	09/06/2025
Approved by:	P. MCFARLANE	04/06/2025

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ABBREVIATIONS

AEP	Annual Exceedance Probability
AUP	Auckland Unitary Plan (Operative in Part)
CSA	Construction Support Area
ESCP	Erosion and Sediment Control Plan
EOP	Engineered Overflow Points
OLFP	Overland Flow Path
The Project	The new wastewater pipeline between Part 3 – Part 4 Connector Tunnel within 329 Queen Street and P1MH1 within Vincent Street
Watercare	Watercare Services Limited
WSP	WSP New Zealand Limited

EXECUTIVE SUMMARY

Watercare Services Limited ('Watercare') proposes to construct a new wastewater line under Queen Street in Auckland's City Centre. As part of its design and consenting commission, WSP has been engaged by Watercare to assess the stormwater and natural hazards associated with the Mayoral Drive Alignment Project (the Project) of the Queen Street Wastewater Diversion Programme. The Project spreads across four connected sites; one Construction Support Area (CSA) at Greys Ave, followed by three Secondary Construction Compounds (Mayoral Drive, Mayoral-Cook and Vincent Street).

This Flood Hazard Assessment should be read in conjunction with the Erosion and Sediment Control Plan (ESCP) prepared for this Project (refer to Appendix L of this Application).

Stormwater and natural hazards have been assessed in accordance with Chapter E36 for Natural Hazards and Flooding of the Auckland Unitary Plan (AUP), including the relevant permitted standard E36.6.1.6. A desktop review of existing natural hazards within the Auckland City Centre catchment identified an overland flow path (OLFP) and a floodplain passing through the project area. Based on this assessment, the proposed works within the floodplain comply with the permitted standard, and resource consent is not required.

The proposed tunnelling of pipelines for the Mayoral Drive Alignment ensures that during the operational phase, pipe installation will not interfere with the existing overland flow paths and floodplains along or near the alignment, provided any excavations are reinstated to existing ground levels.

At Greys Ave, the CSA intersects an OLFP and floodplain. While an upstream detention basin at Myers Park mitigates some risk, overflow could still pass through the site due to the gully's topography. To manage this, the site will be split into one clean water corridor and two dirty water areas using concrete barriers and plywood bunds, allowing safe overflow without contamination.

Shaft P4MH3 is located near the clean water corridor boundary. It must remain within the dirty water area to avoid obstructing flow and to protect site safety during storms. Concrete barriers (1000 mm high) and plywood bunds (500 mm) will control stormwater between dirty and clean zones.

All sites included within this alignment will require a strict management regime to monitor weather forecasts. Specifically for the Greys Ave CSA, management will be required to limit activities within the clean water corridor when a storm is forecast. It is recommended that the Contractor's Construction Management Plan, once prepared, considers the recommendations of this assessment to ensure adverse effects are appropriately managed.

1 INTRODUCTION

Watercare is proposing to upgrade the existing wastewater network of the upper (southern) catchment of Auckland City Centre. The current network has insufficient capacity to meet future needs based on increased development in the area. The wider programme of works has been split into separate parts for the purpose of design, consenting and construction; the consenting and construction packages of the Queen Street programme are shown in Figure 1-1.

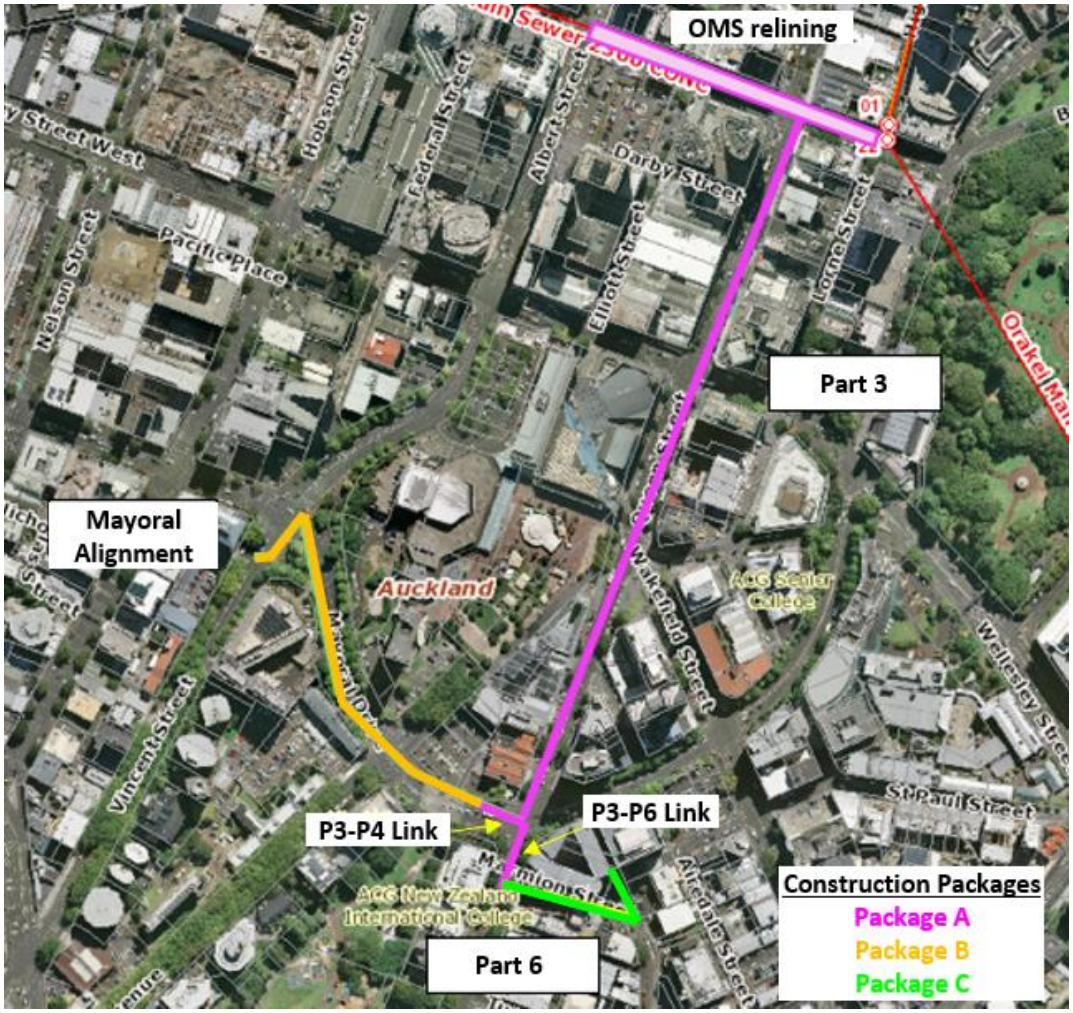

Figure 1-1: Queen Street Wastewater Diversion Programme

The Mayoral Drive alignment involves a new wastewater pipe within or adjacent to the road reserve of Mayoral Drive. The works proposed under this consent ('the Project') include a 375mm – 700mm diameter wastewater pipeline between the P4MH3 shaft within 329 Queen Street and the P1MH1 shaft within Vincent Street, along with connections to 'engineered overflow points' ('EOPs') and manholes.

1.1 PURPOSE OF THIS REPORT

The purpose of this report is to provide an assessment of flood hazards in relation to the proposed Mayoral Drive Alignment.

2 DESCRIPTION OF EXISTING ENVIRONMENT

The project is located within Auckland City Centre, on a section of Mayoral Drive between Queen Street and Vincent Street/Cook Street, along with a short extension within Vincent Street (see **Error! Reference source not found.** for approximate project area).

Figure 2-1: Mayoral Drive Alignment project area in orange

Currently, within the Greys Ave surface carpark, there exists an established CSA constructed under the 'Part 3' consent (refer Figure 3-2 within Section 3 for the existing CSA set up).

The Greys Ave carpark is directly intersected by an overland flow path (OLFP). This site also contains a 1% AEP flood plain within its boundary (refer Figure 2-2).

Upstream of the Greys Ave CSA is Myers Park, where the grassed area functions as a stormwater detention basin during large storm events (refer Figure 2-3). The presence of this basin suggests

that the flow directed towards the CSA will generally be minor and will not require significant mitigation to prevent clean water from entering the site.

Figure 2-2: The Greys Ave Carpark is intersected by an OLFP and a 1% AEP Flood Plain

Figure 2-3: Detention Basin at Myers Park

3 NATURE OF WORK (ACTIVITIES) SUBJECT TO ASSESSMENT

The following is a summary of the construction activities to which the resource consent relates. For more details on the nature of the works proposed, refer to the Construction Methodology (Appendix C of the Application). The Construction Methodology has been based on a likely scenario and has been developed to provide a baseline assessment.

This Project relates to the construction of a new wastewater sewer line within/adjacent to the road corridor of Mayoral Drive, including connections to the existing wastewater network.

The Project will be constructed using a combination of trenchless pilot bore and open-cut trenching excavation, with shafts utilised along the alignment to launch and receive the pilot boring machine. An overview of the proposed construction activities is shown below as Figure 3-1.

To ensure flexibility in the consenting process, a consenting envelope approach has been adopted for all shaft dimensions and the construction compounds. The dimensions specified within the consent allow for changes through the detailed design phase.

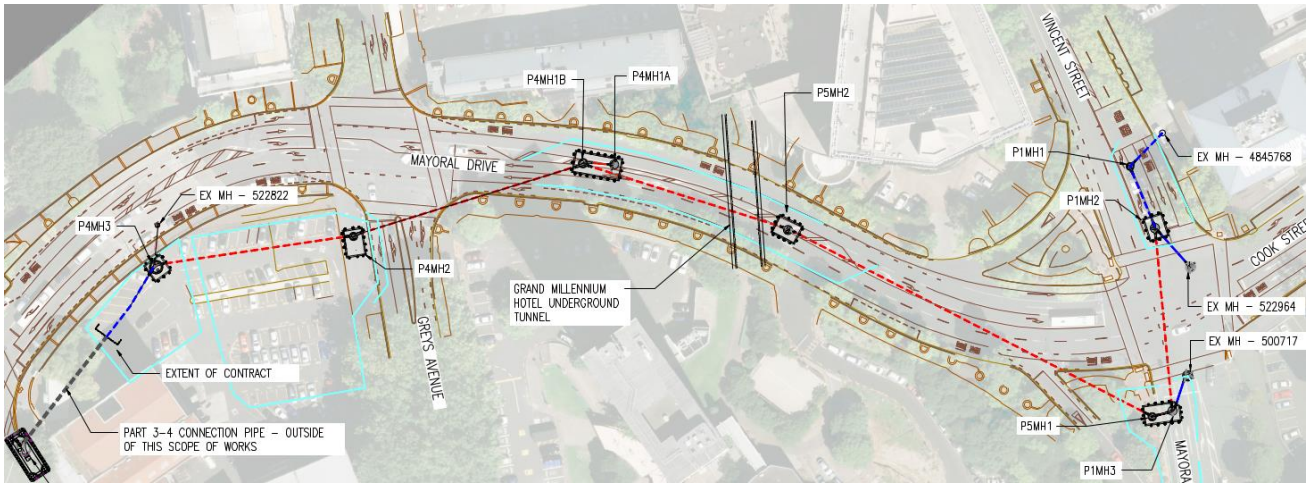

Figure 3-1: Overview of main indicative construction works (red lines are trenchless pipelines, blue are trenched pipelines)

Table 3-1 provides a high-level overview of the different construction activities and stages, which are provided in greater detail within the Construction Methodology.

Table 3-1: Overview of the different construction activities and stages

Network Utility Relocations	The existing network utilities within and around the proposed shafts will need to be relocated. The exact utilities to be diverted are yet to be confirmed, but will likely include potable water, electricity, wastewater, stormwater and communications. Open-cut progressive trenching will be utilised to relocate any utilities that are required to be relocated. New utilities will be constructed around the proposed shaft locations, and the existing utilities will be removed during shaft construction. Dewatering of the trenches may be required.

Temporary Construction Shafts	Most manhole locations on this alignment will be used as launch/reception pits for the trenchless construction method (axis/pilot bore). Six construction shafts are proposed along the Mayoral Drive alignment. The trenchless method requires shafts with maximum internal dimensions of 5.5 m x 12 m and a maximum depth of 9 m. The shafts are expected to be constructed using a 'post and panel' type methodology (subject to geotechnical investigations and shaft temporary works design). Refer to Section 3.1 of the Construction Methodology (Appendix C of the Application) for the steps to construct the temporary shafts.
Trenchless Tunnelling Works	It is proposed to construct the tunnelled sections between manholes P4MH3 (within Greys Avenue Carpark) and P1MH2 (within Vincent Street, opposite the intersection with Mayoral Drive) of the wastewater pipeline using a trenchless pilot-guided boring methodology. Refer to Section 3.2 of the Construction Methodology (Appendix C of the Application) for more detail of the trenchless tunnelling methodology.
Open Cut Construction Works	Open-cut construction is proposed for two short sections of the proposed pipeline between the shafts for P4MH3 and the P3-P4 Connector Tunnel within 329 Queen Street, and between P1MH1 and the shaft within Vincent Street. Open-cut construction is also proposed for network tie-ins and connections to existing EOPs. Refer to Section 4 of the Construction Methodology (Appendix C of the Application) for more detail of the trenchless tunnelling methodology.
Construction Support Areas	To support the proposed construction activities, a primary CSA will be used within the public carpark at 38 Greys Avenue and 329 Queen Street. This CSA is already set up as part of the approved Part 3 Alignment and will also be utilised for the Part 3 – Part 4 Connector Tunnel consents. The CSA may be reconfigured to respond to the works proposed for the Project. The CSA contains site offices and welfare facilities, along with some limited site laydown and materials storage areas. The indicative site layout for the Greys Avenue CSA is shown below in Figure 3-2 which reflects the set up for Part 3 construction. Three Secondary Construction Compounds (compounds) will be established within the road corridor of Mayoral Drive and Vincent Street to allow for the construction of shafts and to undertake tunnelling works. In addition, the Greys Avenue CSA will be extended into the footpath at Greys Avenue to accommodate the construction of P4MH2. These compounds are expected to be in place for 6 to 8 months. Temporary concrete or steel barriers with hoardings will be constructed around the perimeter of each, with access gates one or both ends. The indicative compound boundaries around the possible shaft envelopes are shown in Figures 3-3 to 3-5 below.

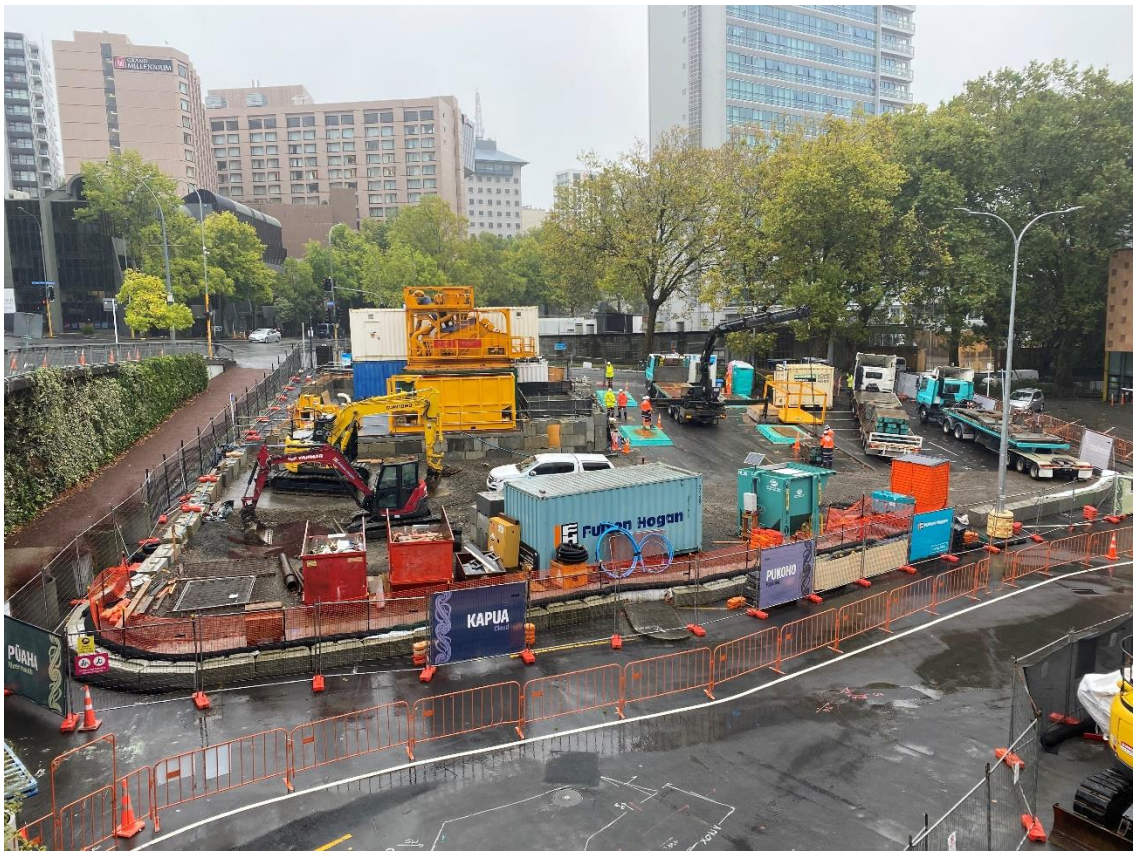

Figure 3-2: Indicative Greys Ave CSA layout (looking north-west towards Greys Ave)

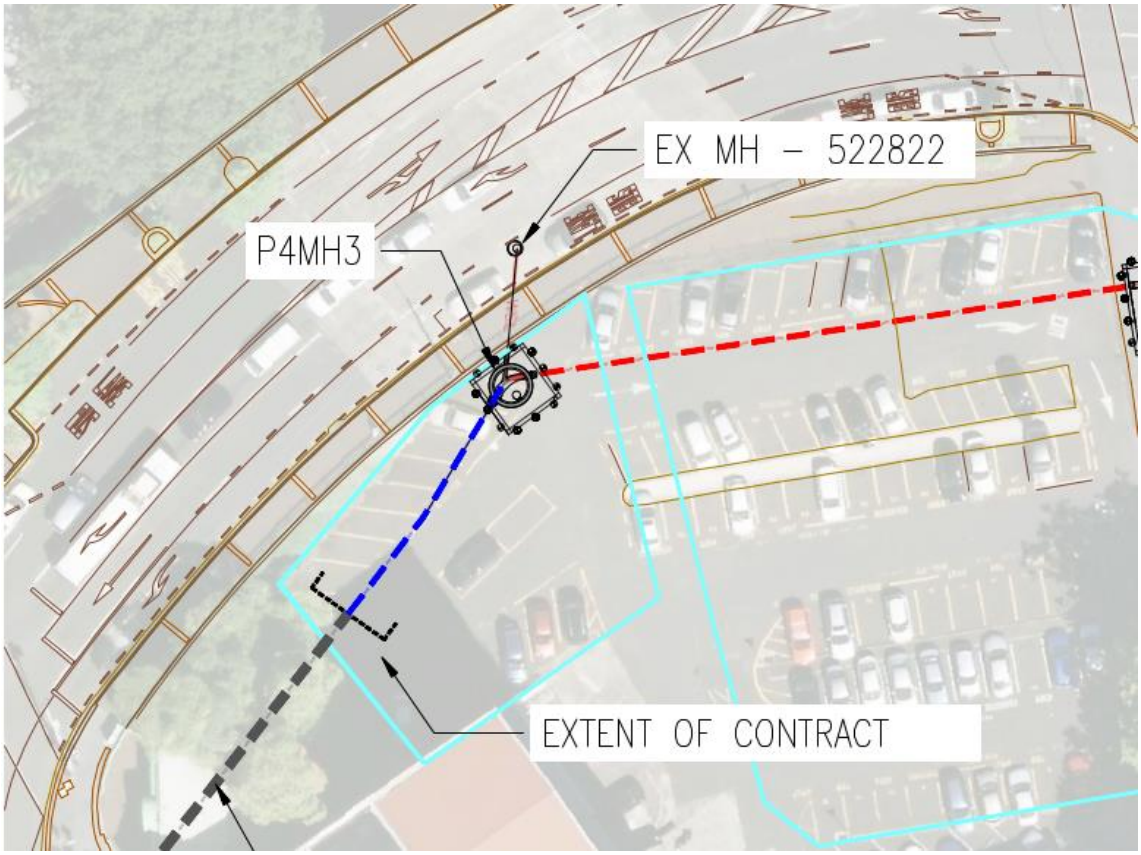

Figure 3-3: Indicative compound around P4MH3 within Greys Ave Carpark (indicative compound extents shown in light blue)

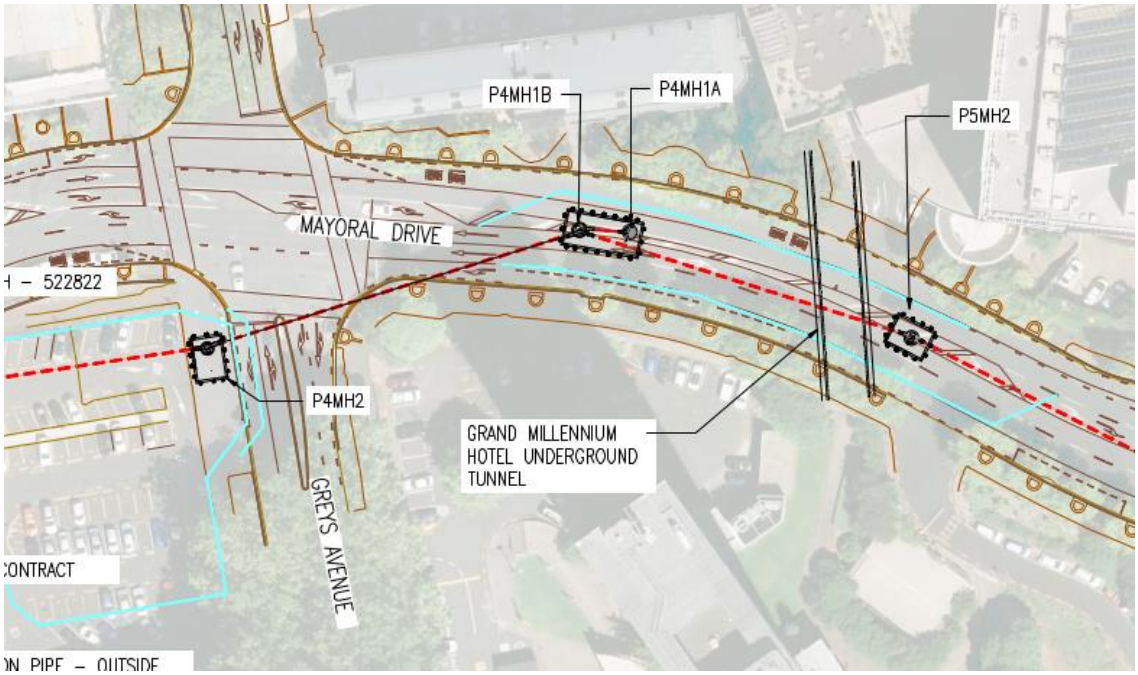

Figure 3-4: Two compounds on Mayoral Drive/Greys Ave outside 299 Queen Street, G05/1 Greys Ave and the CSA in the Greys Ave carpark

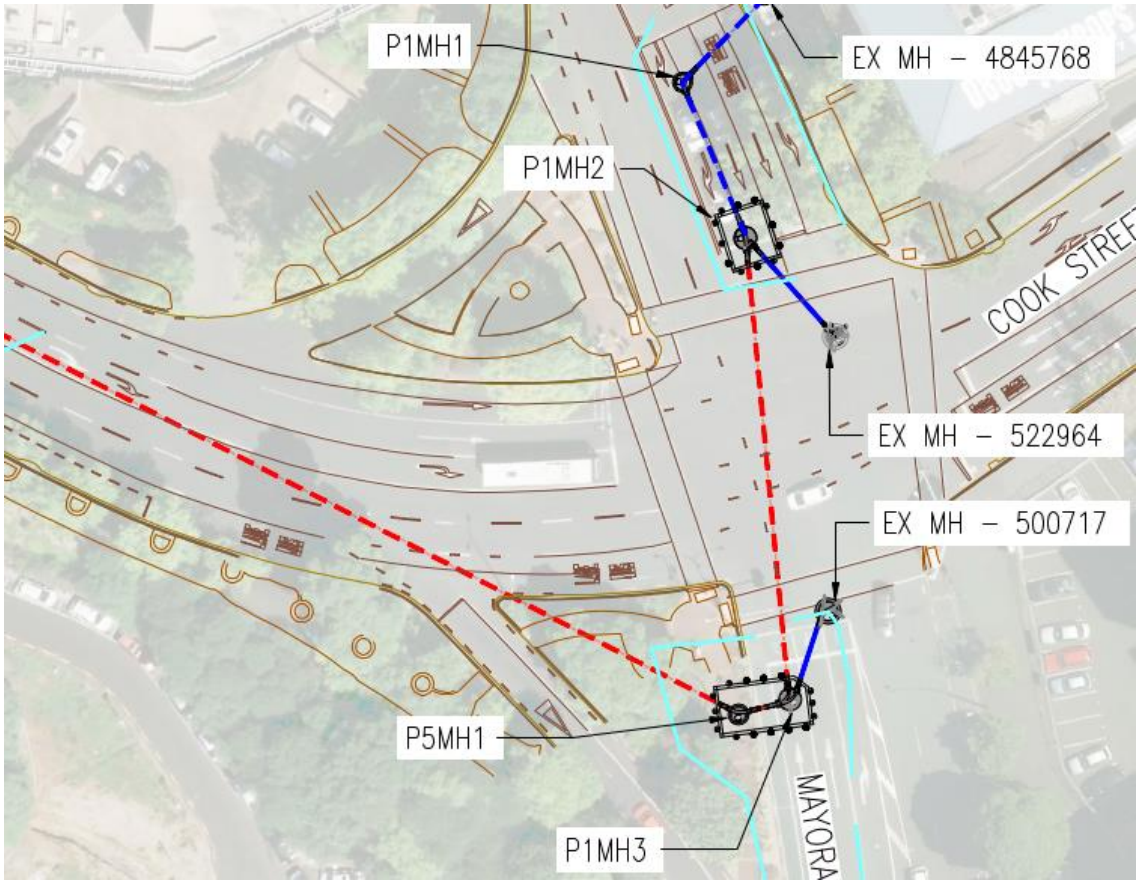

Figure 3-5: Two compounds at Cook St/Mayoral Drive/Vincent St intersection

4 ACTIVITY RULE AND PERMITTED STANDARDS

Chapter E36 of the AUP outlines the requirements for assessing development impacts on existing natural hazards. As identified in Section 2, an OLFP and a 1% AEP floodplain intersect within the Greys Ave carpark. While there is an existing CSA established in the car park, the layout of this and the works to occur in the car park will change due to the proposed tunnelling and shaft works for the Mayoral Drive Alignment.

Based on the description of the existing environment and the nature of the work proposed, the following permitted standard is considered relevant and is assessed in Table 4-1.

Table 4-1: Assessment of relevant permitted standard E36.6.1.6

Standard	Assessment
36.6.1.6. Storage of goods and materials in the 1 per cent annual exceedance probability (AEP) floodplain: *(1) Goods and materials stored in the 1 per cent annual exceedance probability (AEP) floodplain for longer than 28 consecutive days must:*	
(a) not impede flood flows; and	Using a combination of concrete barriers and plywood diversion bunds, the site will be divided into three areas; one “clean water” corridor, and two “dirty water areas” either side, allowing overflow from the upstream basin to pass through the site without contamination or alteration to the existing floodplain.
(b) where capable of creating a safety hazard by being shifted by floodwaters, be contained and secured in order to minimise movement in times of floods; and	An existing detention basin is located just upstream of the site at Myers Park. In the event that this basin is overtopped, overflow will be safely conveyed through the site via the 'clean water corridor' mentioned above.
(c) be stored in watertight containers if they are hazardous substances.	Hazardous substances will not be stored within the floodplain. It is recommended that the Construction Management Plan prepared by the Contractor considers the mitigative measures listed above and thereby reduce the risk of experiencing adverse flood effects on site.

Due to the above assessment, the storage of goods and materials within the 1% AEP is considered a permitted activity as per Rule Table E36.4.1 (A28) of the AUP.

5 CONCLUSION

Based on this assessment in Section 4, the proposed works within the floodplain comply with the permitted standard, and resource consent is not required.

Once constructed and operational, the proposed works for the Queen Street-Mayoral Drive Alignment Project will not affect existing floodplains or flow paths. Moreover, the pipeline will not create or worsen flood effects at adjacent properties.

During construction, flow diversion devices proposed in the Erosion and Sediment Control Plan (ESCP) will direct runoff safely around or through the sites, while bunds will contain dirty runoff generated within the work areas. These measures will also prevent the ingress of clean runoff into contaminated zones. At the Greys Ave Construction Support Area (CSA), activities within the proposed 3 m minimum width 'clean water corridor' must be tightly controlled to prevent sediment discharge and reduce risk during overland flow events. The upstream detention basin at Myers Park is expected to manage most low-flow events. In case of overflow, water will pass through the clean water corridor, which must be maintained throughout construction. An assessment of these mitigation measures confirms that the storage of goods and materials within the 1% AEP floodplain qualifies as a permitted activity under Rule Table E36.4.1 (A28) of the Auckland Unitary Plan (AUP).

It is recommended that the Contractor's Construction Management Plan, when prepared, takes into account the recommendations of this assessment to ensure that adverse effects are adequately managed.

6 LIMITATIONS

This report ('Report') has been prepared by WSP exclusively for Watercare Services Limited ('Client') in relation to the assessment of flood hazard effects for the Mayoral Drive Alignment of the Queen Street Wastewater Diversion Programme of Works, for consenting purposes ('Purpose') and in accordance with the task order number TO-WSP-65 task name Queen Street Wastewater Diversions – Rescoping, dated 03.12.2025. The findings in this Report are based on and are subject to the assumptions specified in the Report. WSP accepts no liability whatsoever for any reliance on or use of this Report, in whole or in part, for any use or purpose other than the Purpose or any use or reliance on the Report by any third party.

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