



MEMO

STREAM WIDTH ASSESSMENT

TO	Classic Developments	DATE	20/02/2026
PROJECT NAME	Mt Welcome Development	ENVELOPE REF	1753-02
ATTENTION	Will Dorset	FROM	Erin Cameron
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1.0 EXECUTIVE SUMMARY

This memorandum assesses the stream widths within the proposed subdivision at Mt Welcome Development in Pukerua Bay, to determine whether they are classified as 'rivers' for the purpose of setting aside esplanade reserves or esplanade strips under the Resource Management Act 1991 (RMA). The report has been prepared in support of an application for the development under the Fast-track Approvals Act 2024.

Two streams have been identified for assessment on the development site in alignment with the Mt Welcome Station Ecology report prepared by Dr Vaughan Keesing dated 24 October 2025 (the ecology report) and are identified as the Kakaho-west main stem and the North-western draining catchment respectively.

Envelope have undertaken extensive hydraulic analysis of both watercourses using information collected from ground surveys (Survey completed on: 17 November 2025). The hydraulic analysis was undertaken using a 2.3 year Average Recurrence Interval (ARI) to determine the Annual Fullest Flow/Mean Annual Flood (MAF). The hydraulic modelling took into consideration the structures (culverts, dames, farm track... etc) which limit the flow of water into these two water courses.

The hydraulic analysis determined that the watercourse within the North-western draining catchment had an averaged width of 1.5m (2.3 Year ARI) and only the Kakaho-west main stem with an average width of 3.8m exceeded the minimum 3m width requirement, which would trigger the esplanade reserve requirement under s 230 RMA.

The proposed development, the streams assessed, along with many other watercourses outlined in the ecology report are to be fully contained within recreation or drainage reserves to be vested in Porirua City Council. The proposed reserves amount to a greater overall width than what would be set aside as an esplanade reserve or strip under the RMA..

2.0 INTRODUCTION

The purpose of this report is to identify which watercourses on the site trigger esplanade reserve requirements under ss 229-237 RMA and to recommend appropriate reserve or strip provisions for the proposed subdivision.

2.1 SITE DESCRIPTION

The site comprises approximately 205 ha of rural land south of Pukerua Bay within the Porirua Northern Growth Area. The land is currently used for farming and contains several natural and modified watercourses within shallow and steep gullies. The proposed development covers approximately 100ha of the site and includes 949 homes, a large commercial centre and a large network of green spaces, leaving a 105ha balance lot to remain.

ENVELOPE

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2.2 RELEVANT RMA DEFINITIONS & REQUIREMENTS

- **river** means a continually or intermittently flowing body of fresh water; and includes a stream and modified watercourse; but does not include any artificial watercourse (including an irrigation canal, water supply race, canal for the supply of water for electricity power generation, and farm drainage canal)
- **bed** means,—
 - (a) in relation to any river—
 - (i) for the purposes of esplanade reserves, esplanade strips, and subdivision, the space of land which the waters of the river cover at its annual fullest flow without overtopping its banks;(ii) in all other cases, the space of land which the waters of the river cover at its fullest flow without overtopping its banks;

s229 Purposes of esplanade reserves and esplanade strips

An esplanade reserve or an esplanade strip has 1 or more of the following purposes:

- (a) to contribute to the protection of conservation values by, in particular,—
 - (i) maintaining or enhancing the natural functioning of the adjacent sea, river, or lake; or
 - (ii) maintaining or enhancing water quality; or
 - (iii) maintaining or enhancing aquatic habitats; or
 - (iv) protecting the natural values associated with the esplanade reserve or esplanade strip; or
 - (v) mitigating natural hazards; or
- (b) to enable public access to or along any sea, river, or lake; or
- (c) to enable public recreational use of the esplanade reserve or esplanade strip and adjacent sea, river, or lake, where the use is compatible with conservation values.

s230 Requirement for esplanade reserves or esplanade strips

- (3) Except as provided by any rule in a district plan made under [section 77\(1\)](#), or a resource consent which waives, or reduces the width of, the esplanade reserve, where any allotment of less than 4 hectares is created when land is subdivided, an esplanade reserve 20 metres in width shall be set aside from that allotment along the mark of mean high water springs of the sea, and along the bank of any river or along the margin of any lake, as the case may be, and shall vest in accordance with [section 231](#).
- (4) For the purposes of subsection (3), a river means a river whose bed has an average width of 3 metres or more where the river flows through or adjoins an allotment; and a lake means a lake whose bed has an area of 8 hectares or more.



3.0 METHODOLOGY

3.1 DESKTOP REVIEW

A review of council GIS layers, aerial imagery, LiDAR and the ecology report was undertaken to identify existing perennial streams and these were overlaid on the proposed 100ha of land to be developed. As the balance lot remains outside the development and is greater than 4ha as per the trigger level in s230 of the RMA, streams in the balance lot were not assessed.

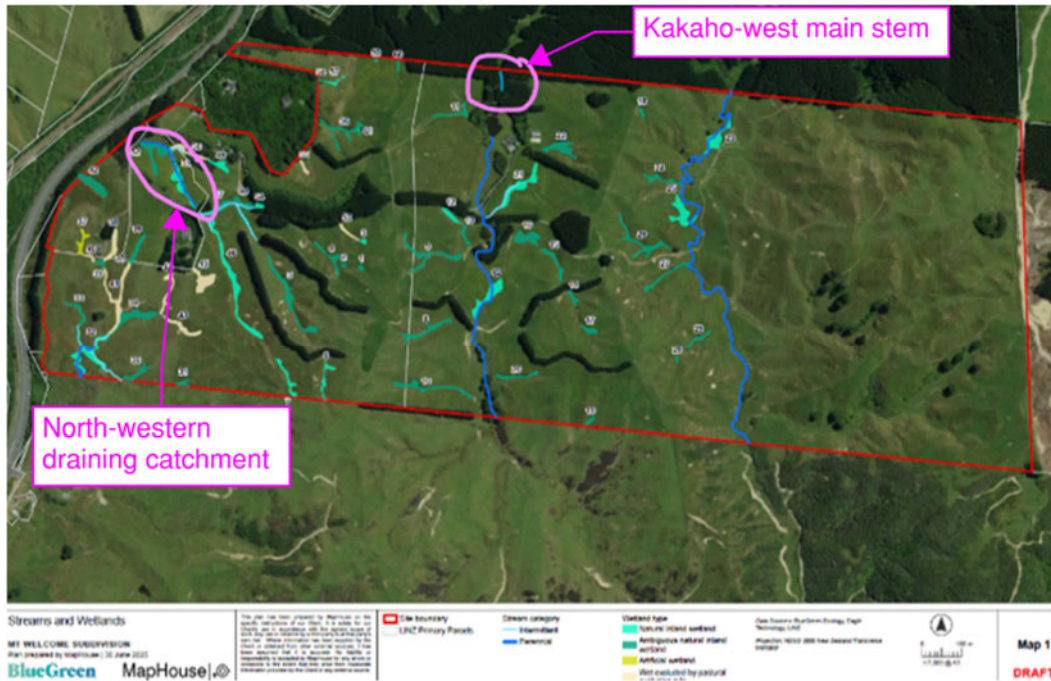


Figure 1: Streams (circled pink) to be assessed

3.2 FIELD SURVEY

Ground based field surveys were carried out on 14th and 17th November 2025 to position the regular channels and banks of the streams with survey grade GPS and Total Station equipment. Along with the topography, flow permanence, vegetation, moisture on the ground outside of the normal water level and erosion features were also considered. Outside of the small sub channel and normal water level the streams were assessed for where the fullest flow would overtop the banks. For the North-western draining catchment in particular, landslips made it difficult to determine banks on both sides in some places. Where banks were not clear on one side, top of bank was surveyed on the available side of the stream and the same level set out on the opposite side of the stream to determine the width.

The following equipment was used for the survey:

- Survey Method: RTK GNSS & Total Station
- Equipment Used:

Leica GS16 base station:	GS16 S.N. #3714214
Leica GNSS rover:	GS18i S.N. #3608870
	Controller "Two" CS20 S.N. #3273264
Leica Total Station:	TS16 P 3" R500 S.N. #3268484
	Controller "One" CS20 S.N. #3273349

3.3 HYDRAULIC ANALYSIS

A hydraulic assessment was undertaken on the stream extents based on controlling hydraulic conditions rather than observed low-flow features. The assessment considered upstream catchments and constraints that limit conveyance, such as tracks, dams, and culverts. In both cases, the assessment confirmed the surveyed lower stream banks are sufficient to contain the mean annual flood (2.3-year ARI) without overtopping.



4.0 DESCRIPTION OF WATERCOURSES

STREAM NAME	AVERAGE WIDTH (2.3 YEAR ARI)	RMA TRIGGER
Kakaho-west main stem	3.8m	Yes
North-western draining catchment	1.5m	No

4.1 KAKAHO-WEST MAIN STEM

- Located in vegetated gully, steeper on the west side that slopes up toward existing deer fence and farm paddock, less steep on the east side with a more defined bank toward established pine forest.
- Average width: **3.8m (2.3 Year ARI)**
- Intermittent flow, flowing out into an artificial pond considered to be excluded from the definition of a river in the RMA.

4.2 NORTH-WESTERN DRAINING CATCHMENT

- Located in deep gully containing numerous landslips, covered in pasture and tussock in the wetter areas.
- Average width: **1.5 m (2.3 Year ARI)**
- Continual flow in small sub channel leading to culvert under State Highway 59.

5.0 RECOMMENDED RESERVE PROVISIONS

Only the Kakaho-west main stem trigger the requirement for esplanade reserves or strips due to the average width being greater than 3m. Overall the development has been designed to accommodate this stream along with other wetlands and watercourses with suitable drainage and recreation reserves proposed. The proposed reserves completely contain the two streams assessed, the Kakaho-west main stem contained within proposed drainage reserve Lot 1315 & 1316 and the North-western draining catchment within proposed drainage reserve Lot 1308 and recreation reserve Lot 1204. The minimum width of reserve areas proposed measured perpendicular to the Kakaho-west main stem is 58m. The minimum width of reserve areas proposed measured perpendicular to the North-western draining catchment is 72m.

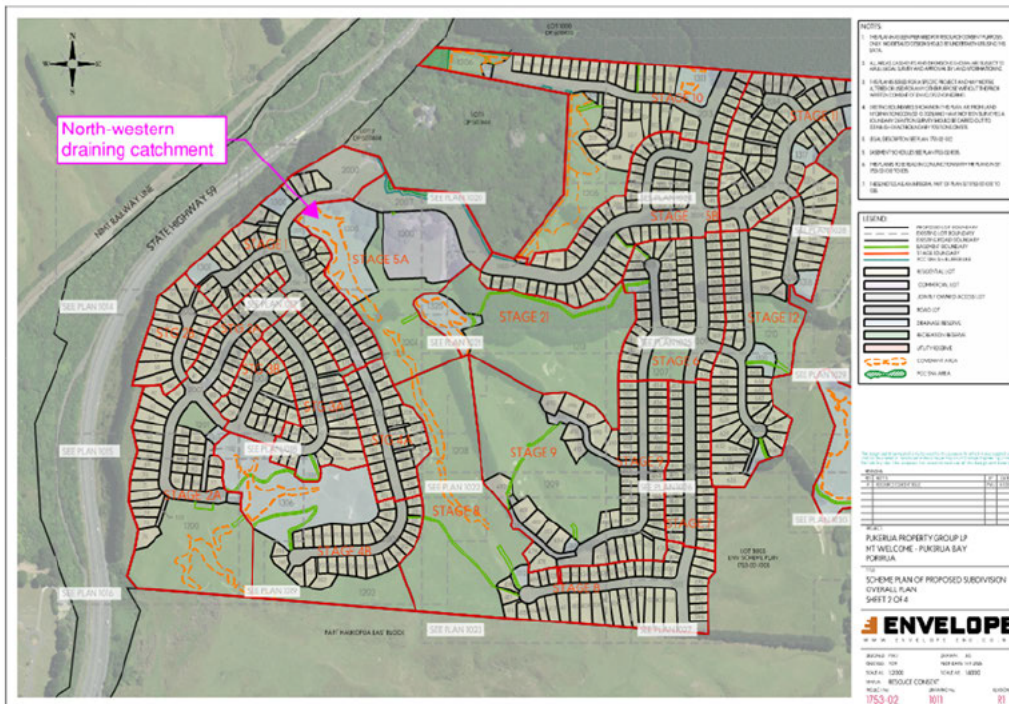


Figure 2: Location of North-western draining catchment in relation to proposed reserves



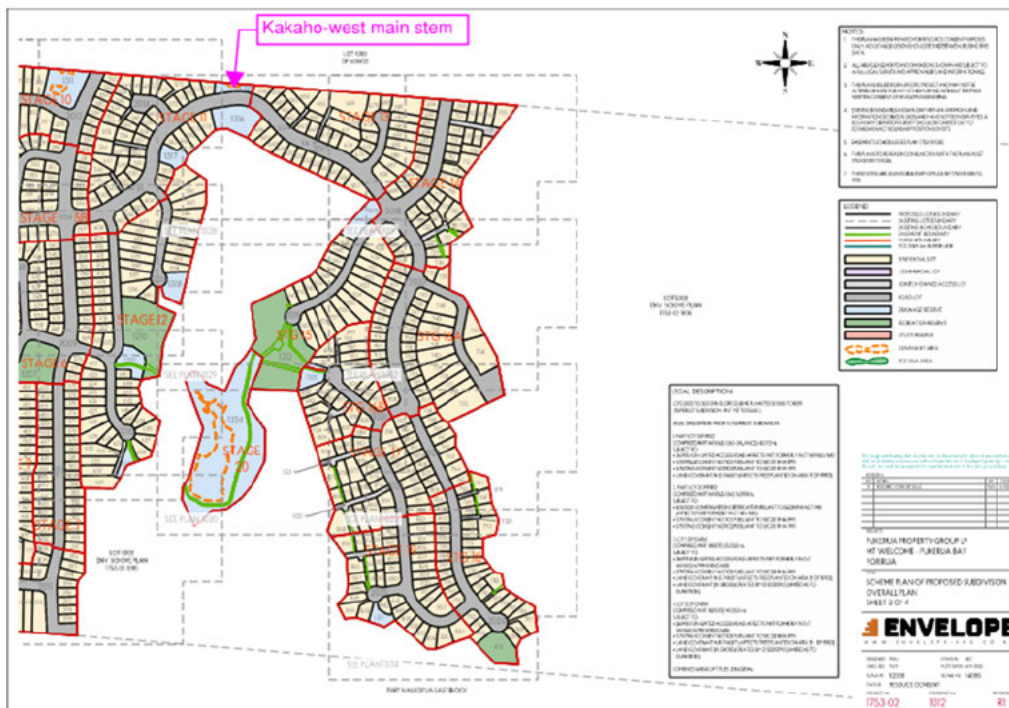


Figure 3: Location of Kakaho-west main stem in relation to proposed reserves

The reserves proposed around the streams protect conservation values, enable public access and enable public recreational use in alignment with s229 of the RMA and it is recommended that these reserves are created as proposed. If esplanade reserves or strips of 20m from each stream bank were imposed there would be minor infringements into the proposed residential lots, however, in most areas adjacent to the stream banks the proposed reserve width is greater than 20m. Therefore, creating 20m wide esplanade reserves would result in unnecessary fragmentation of parcels and two adjacent reserve parcels with similar purpose.

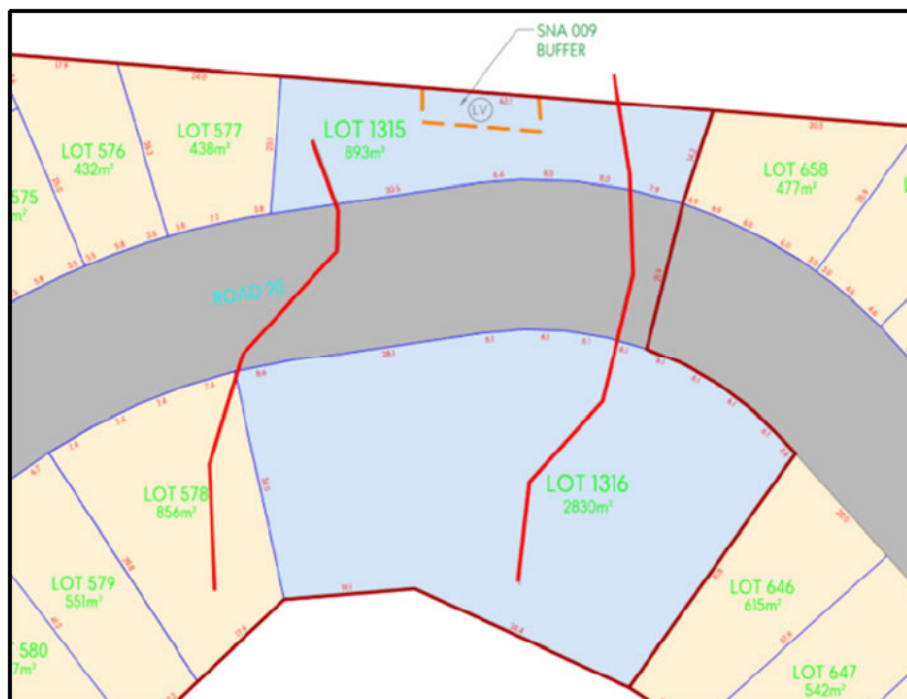


Figure 4: 20m offset lines (in red) based on surveyed Kakaho-west main stem stream banks



6.0 CONCLUSION

Hydraulic analysis based on ground-based field survey confirms that only the Kakaho-west main stem (north of the man-made pond) has an average bed width exceeding 3 metres (3.8 m at the 2.3-year ARI) and therefore meets the definition of a “river” for the purposes of s230(4) RMA. Accordingly, this watercourse triggers the requirement to set aside an esplanade reserve or esplanade strip. The North-western draining catchment, with an assessed average width of 1.5 m, does not trigger this requirement.

The proposed subdivision design incorporates both assessed streams within drainage and recreation reserves that exceed the minimum 20 m esplanade width and achieve the statutory purposes outlined in s229 RMA, including protection of conservation values, maintenance of natural functioning, and provision for public access and recreation. In our opinion, the proposed reserve framework provides an outcome that creates abundant accessible public access along streams (both those that are under and over 3m in width), while avoiding unnecessary parcel fragmentation that would arise from imposing additional esplanade reserves or strips.

7.0 LIMITATIONS

This memo is for the use of Classic Developments and their agents only and should not be used or relied upon by any other person or entity or for any other project.

This report has been prepared for the particular project described to us and its extent is limited to the scope of work agreed between the client and Envelope Surveying Limited. No responsibility is accepted by Envelope Surveying Limited or its directors, servants, agents, staff or employees for the accuracy of information provided by third parties and/or the use of any part of this report in any other context or for any other purposes.

