Worley Consulting
Level 19, 420 George St
Sydney NSW 2000
Australia
P: +61 2 9495 0500
D: +61 2 8456 7230
M: +61 407 063 711

Worley Services Pty Ltd
(trading as Worley Consulting)
ABN 61 001 279 812

www.worley.com

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Penrith Lakes Development Corporation Pty Ltd
Triniti 2,
Level 3, 39 Delhi Road
NORTH RYDE NSW 2113

26 September 2025

Attention: Mr Mitchell Corn

Dear Mitchell,

WESTERN SYDNEY LAKES – REVIEW OF FLOODING RELATED COMPONENTS OF THE CONCEPT DEVELOPMENT APPLICATION DA25/7071

I refer to your recent request for Worley Consulting to review the flood assessment documentation that was submitted to support the concept development application for a staged, mixed-use tourism and recreation development at 39-65 Old Castlereagh Road, Castlereagh (DA25/7071). The flood assessment related reports submitted with the development application include the following which have all been prepared by consulting engineers, Water Technology:

- *'Flooding Assessment – 39-65 Old Castlereagh Road, Castlereagh'*, dated 25 June 2025.
- *'Flood Emergency Response Plan - 39-65 Old Castlereagh Road, Castlereagh'*, dated 27 June 2025.

Accordingly, I am pleased to outline the findings from our review of these documents in the following.

1. Introduction

In undertaking the review, we have focused on assessing whether the development application adequately addresses the flood related assessment criteria outlined in the following planning instruments:

- the *State Environmental Planning Policy (Precincts – Western Sydney Parkland City) 2021* (Western Parklands SEPP); and,
- the *Penrith Lakes Development Control Plan – Stage 1 (*June 2022) (PLDCP).

2. Review Findings

The flooding assessment report prepared by Water Technology does not satisfy the following flood related controls outlined in *Section 3.1 – Flood Planning and Evacuation* of the PLDCP which are as follows.

5) Development must not adversely impact flood behaviour for the full range of floods (up to and including the PMF) and is to consider cumulative impacts of development on surrounding land, including:
   a) loss of flood storage;
   b) loss of or changes to flood flow paths;
   c) acceleration or obstruction of flood flows;
   d) increase in the depth, duration or velocity of floodwaters; and
   e) any reduction in flood warning times elsewhere on the floodplain.
6) The applicant must demonstrate that:
   a) the development will not increase the flood hazard or risk to other properties;
   b) all structures are designed and constructed to ensure structural integrity up to the 0.2% AEP, taking into account the forces of floodwater, wave action, flowing water with debris, buoyancy and immersion. Structural certification must be provided confirming the above;

The flood assessment report includes separate sections that address flood behaviour at the site for regional Hawkesbury-Nepean River flooding and local overland flooding as defined by the *Cranebrook Overland Flow Flood Study* (2023). The following comments outline our contentions with the flooding assessment report with reference to the PLDCP.

A. Local overland flow flood assessment

(i) The modelling appears to show that the duplicate 0.3 metre diameter pipe culvert that is proposed at location RHCO_5 in the flooding assessment report (*refer Figure 3-2*) is an important mitigation measure required to alleviate upstream impacts during local overland flow flood events. It is unclear from the report what, if any, blockage factors were adopted for this proposed pipe culvert. Due to the small size of this pipe, it is recommended that a blockage factor be adopted in accordance with Penrith City Council's engineering guidelines or ARR 2019, or at minimum, one that matches the blockage adopted for the adjacent existing pipe as part of the *Cranebrook Overland Flow Flood Study* (2023).

(ii) 'Section 4.2.2 – Developed Case Flood Impacts' of Water Technology's flooding assessment report does not provide any commentary on whether the development would result in any changes to the duration or velocity of floodwaters, and loss of or changes to flood flow paths in accordance with the controls outlined in the PLDCP. It is recommended that the flooding assessment report be expanded to address these requirements. This should include preparation of flow velocity and flood hazard difference mapping.

A visual inspection of figures prepared to show peak flow velocities for pre- and post-development conditions suggests that the development is predicted to cause localised flow velocity increases on the adjacent property to the east. The significance of these increases should be addressed in the commentary referred to above.

(iii) It is unclear from the reporting and associated figures whether the adjacent Nepean Business Park development (DA9876) has been included in the modelling for pre- and post-development conditions.

(iv) There is no commentary in the report to show that the 'cumulative impacts of development on surrounding land' has been assessed for the local overland flow flooding scenario in accordance with Control 5 of Section 3.1 Flood Planning and Evacuation of the Penrith Lakes DCP.

B. Regional Hawkesbury-Nepean River flood assessment

(i) Section 5.1 of the flooding assessment report states that *'the site is only impacted by riverine flooding in events of a 1% AEP and larger and regional flooding behaviour at the site is dominated by slow moving backflow as the lake system to the north equalises'*.

This statement is not an accurate representation of flood behaviour at the site which based on our independent review of the flood modelling results documented in the *Hawkesbury-Nepean River Flood Study* (2024) (2024 HNRFS), is characterised by a floodwater gradient between the site and Regatta Lake which is located 280 metres north and downstream of the site. The flood modelling results indicate that peak 1% Annual Exceedance Probability (AEP) flood levels and 1 in 1000 AEP flood levels at Regatta Lake are at least 0.3 metres lower. This indicates that flooding at the site would not be dominated by "backflow" at any stage during a flood up to the 1 in 1000 AEP event.

(ii) Section 5 'Regional Flooding Behaviour' states that the flood maps included in Appendix D are based on the modelling results obtained from the NSW Reconstruction Authority for the 2024 HNRFS. There is no indication that the model was modified as part of these site specific investigations. Comparison of the mapping in Appendix D to the mapping documented in the

2024 HNRFS shows an inconsistency in the 1 in 500 AEP flood map in terms of the predicted peak flood levels and flood extents. The figure should be reviewed to confirm its accuracy, or commentary included to explain the observed difference.

(iii) As discussed above, we do not believe it to be an accurate statement that the riverine flooding at the site *'is dominated by slow moving backflow as the lake system to the north equalises'*. Although not clearly stated, it appears this claim was used as justification for why post-development flood modelling was not undertaken as part of the assessment. As stated above, it is our assessment that there is a floodwater gradient across the site during floods that range between a 1% AEP and 1 in 1000 AEP event and as such, the development which involves filling of the floodplain, will have the potential to generate off-site increase in peak flood levels and flow velocities.

Accordingly, the flooding assessment does not address the flood related controls of the Penrith Lakes DCP with regard to regional riverine flooding, including the potential for the development to result in a change to peak flood levels, flow velocities and flood hazards during the full range of design flood events.

(iv) 'Section 5 – Regional Flooding Behaviour' of the flooding assessment report does not provide any commentary regarding the potential for the development to result in changes to the duration or velocity of floodwaters, and loss of or changes to flood flow paths in accordance with the controls outlined in the Penrith Lakes DCP. It is recommended that the flooding assessment report be expanded to address these requirements and that this additional work include preparation of flood level, flow velocity and flood hazard difference mapping.

(v) Any modelling of regional flooding should include the approved and currently under construction Nepean Business Park development (DA9876) that is located directly south of the proposed development.

(vi) There is no commentary in the report to show that the 'cumulative impacts of development on surrounding land' has been assessed for the regional flooding scenario in accordance with Control 5 of Section 3.1 Flood Planning and Evacuation of the Penrith Lakes DCP.

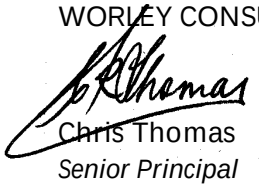
The following additional comments are made with regard to the Western Parklands SEPP and the flooding assessment report.

(i) The report does not address the following clauses of Section 3.26 'Development on flood prone and major creeks land – additional heads of consideration':

- *3.26 (b) whether or not the development will alter flow distributions and velocities to the detriment of other properties or the environment of the floodplain.*
- *3.26 (f) whether or not the development is compatible with the flow conveyance function of the floodway.*

I trust that these comments are sufficient for your purposes. Please do not hesitate to contact Roy Golaszewski of myself should you have any questions or require further advice.

Yours faithfully
WORLEY CONSULTING



Chris Thomas
Senior Principal
NSW & VIC Practice Lead – Water Resources