

MEMORANDUM

Project: Lot 3 - 35 University Drive, Meadowbrook

DCF Reference: 26117_M01_V01

To: Economic Development Queensland (EDQ) – c/- Steph Jensen, Azure Project 48 Pty Ltd

From: Donnie Carroll, Director / Principal Engineer, DC Flood Engineering Pty Ltd

Date: 31st July 2026

Re: Justification for a No-Detention Stormwater Quantity Management Strategy

1. Purpose

This memorandum has been prepared by DC Flood Engineering Pty Ltd (DCF) on behalf of Azure Project 48 Pty Ltd (AZ) to provide the hydrologic justification for adopting a *no-detention* stormwater quantity management strategy for the proposed 145-dwelling townhouse development at Lot 3, 35 University Drive, Meadowbrook (“the Site”).

This memorandum presents the results of conceptual ARR2019-compliant hydrologic modelling undertaken to quantify the change in peak discharge from the Site as a result of the proposed development, and to demonstrate that the adopted no-detention strategy does not result in an unacceptable increase in flood risk downstream.

This memorandum is issued for inclusion in AZ’s development application package to EDQ, and should be read in conjunction with the Stormwater Management Plan (DesignFlow, August 2025) and the Flood Impact Assessment (Water Engineering Partners, Issue 4, April 2026) previously lodged for the broader precinct, key points of which are summarised in Section 3.

2. The Site and Proposed Development

Lot 3 forms part of the broader 35 University Drive, Meadowbrook precinct, located on the south side of University Drive opposite the Griffith University Logan Campus. The Site is bounded by University Drive to the north, the Logan Motorway to the south, an existing lake (Griffith University land) to the east, and Lots 1 and 2 of the same precinct – proposed for separate medium-density residential development – to the west. The Site lies within the broader Logan River catchment, draining via the lake to Slacks Creek, which in turn joins the Logan River at their confluence to the south-east. Figure 1 shows the site locality.

AZ proposes to develop Lot 3 for 145 attached dwellings in a two-storey townhouse configuration, together with communal facilities including a pool, spa and communal open space, resident and visitor vehicle/bicycle parking, and a single vehicle entry from University Drive.

The proposed site layout is shown in Figure 2. Stormwater runoff from the Site is collected via the internal drainage network and discharged undetained via a single outlet to the south into the existing stormwater easement, in accordance with the current civil design prepared by DEQ Consulting (refer Section 3.3).

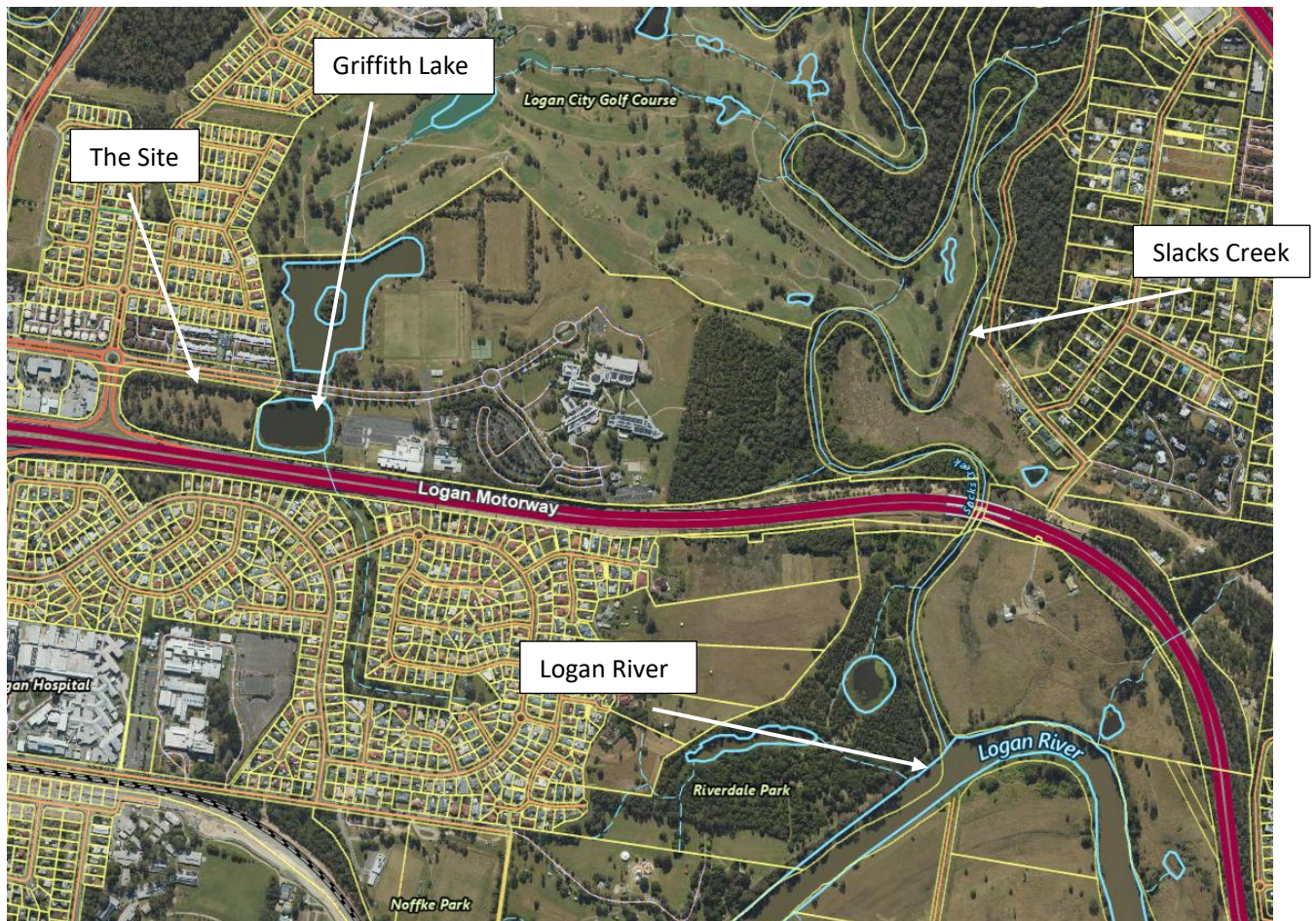


Figure 1: Site Locality Plan (Source: Queensland Globe)

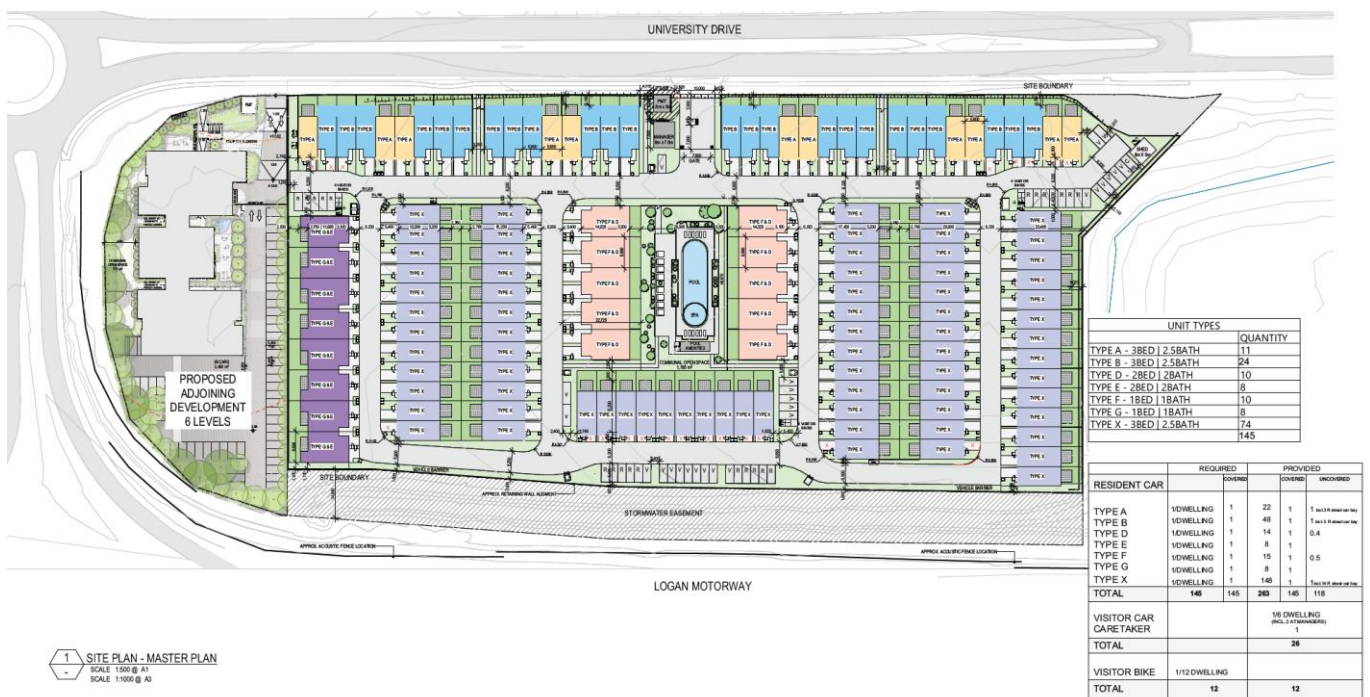


Figure 2: Proposed Site Layout Plan (Source: Cottey Parker Architects, Issue 17)

3. Background

The Site was recently acquired by AZ from EDQ. Prior to acquisition, EDQ commissioned a Stormwater Management Plan and a Flood Impact Assessment covering the broader precinct, both of which remain relevant to the current assessment and are summarised below.

3.1 Stormwater Management Plan (DesignFlow, August 2025)

DesignFlow prepared a Stormwater Management Plan (SMP) for EDQ to support Development Applications for a preliminary approval and development permits over the broader precinct (three master lots, facilitating residential development of up to 480 dwellings).

The SMP describes the precinct as having flat grades (generally RL10.5–11.0, <1%). There is an existing vegetated drain along the southern boundary conveying a 21.5 ha external catchment and a turf swale along the northern boundary both draining to the existing lake to the east (Griffith University land). The lake also receives runoff from an additional 55 ha external catchment entering the lake from the south beneath the Logan Motorway.

No-detention rationale (SMP Section 3.3): the SMP concluded that stormwater quantity management is not required for the precinct, for the following reasons:

- Regional flood behaviour is dominated by backwatering from Logan River and Slacks Creek; stormwater quantity management of local flow from the development has no material influence on regional flood levels.
- The Site is located at the downstream end of the local catchments (>75 ha upstream), meaning any attenuation of development flows would have little to no influence on peak flows and levels downstream during local storm events, due to hydrograph timing (i.e. the local catchment peak arrives well ahead of the much larger upstream catchment's peak).
- The lake to the east is to be lowered via a 900 mm pipe under University Drive, preserving flood storage and likely reducing peak flows downstream in local storm events.

It is noted, the no-detention rationale in Section 3.3 was presented qualitatively, without accompanying hydrologic modelling to quantify the change in peak flows associated with the change in land use.

3.2 Flood Impact Assessment (Water Engineering Partners, Issue 4, 1 April 2026)

Water Engineering Partners (WEP) prepared a Flood Impact Assessment (FIA, Ref. R.30252.002.04) for EDQ to support the RoL and Operational Works Application for the precinct (total site area 3.55 ha, facilitating up to 480 dwellings). The FIA assesses two flood sources potentially affecting the Site – regional flooding from the Logan River, and local/creek flooding from the Slacks Creek/Scrubby Creek system – using Logan City Council's 2023 TUFLOW flood models for each system.

Flood immunity: the FIA found the Site to have a relatively high level of immunity to Logan River flooding, being largely immune in the 2% AEP event and only shallowly inundated in the 1% AEP (defined flood) event. The Site was found to be generally immune to Slacks Creek/Scrubby Creek flooding, other than at the eastern edge and the southern boundary channel. Adopted design flood levels are summarised in Table 1.

Table 1: Flood Levels on the Site

Design Event	Logan River (mAHD)	Slacks Ck / Scrubby Ck (mAHD)
1% AEP (defined flood event)	10.9	9.4
Probable Maximum Flood (PMF)	17.4	10.9

Earthworks and floodplain storage: the proposed earthworks fill the developable area above the defined flood level. To offset the resulting loss of flood storage, the standing water level in the adjoining lake is to be lowered from 7.5 mAHD to 6.75 mAHD via a new 1,200 mm diameter pipe beneath University Drive. WEP calculated that this increases available flood storage by approximately 8,610 m³, more than offsetting the approximately 7,825 m³ of fill required – a net gain in floodplain storage. On this basis, the FIA concluded that the earthworks and lake works do not result in an adverse off-site flood level impact for either river or creek flooding, up to and including the PMF event.

Relevance to this assessment: the FIA assessed the proposal's compliance with the Flood Hazard Overlay Code of the *Logan Planning Scheme* and found it compliant. However, the stormwater quantity management provisions of that code (Performance Outcome PO28) were assessed by WEP as *not applicable*, on the basis that the application before WEP was for operational works (earthworks) only and, as it did not itself include impervious areas, did not require stormwater quantity management devices to be assessed at that stage. In other words, the FIA addressed flood *levels and storage* arising from the earthworks and lake modifications but explicitly did not assess the *peak flow / stormwater quantity* implications of the change in land use to residential development.

3.3 Current Civil Design (DEQ Consulting)

The current civil design, prepared by DEQ Consulting, discharges the Site via a single outlet to the south into the existing stormwater easement, which conveys flows to the adjoining lake waterbody. No on-site detention is proposed.

DCF was engaged to provide the additional engineering assessment required to support this approach for submission to EDQ and to satisfy the stormwater quantity assessment provisions of the LCC Planning Scheme.

4. Planning and Design Framework

The assessment has had regard to the stormwater management provisions of the *Logan Planning Scheme* (Logan City Council) and to the design guidance set out in the *Queensland Urban Drainage Manual (QUDM)*, specifically the provisions relating to stormwater quantity management and the circumstances under which on-site detention may be waived where a development can demonstrate no net worsening of downstream flooding.

Consistent with QUDM and the *Logan Planning Scheme*, the technical basis for waiving a detention requirement rests on demonstrating that: (i) the timing of the site's peak discharge relative to the main flood wave in the receiving system means detention provides negligible benefit, and/or (ii) any increase in peak flow does not materially increase flood levels or hazard downstream. Both lines of evidence are addressed in Sections 6 and 7 below.

5. Hydrologic Assessment Methodology

5.1 Modelling Approach

A hydrologic model of the Site and relevant external catchments was developed in URBS in accordance with Australian Rainfall and Runoff 2019 (ARR2019) procedures. The model extent includes the Site, external catchments draining through the Site, and the downstream lake, which has been represented as a storage-routing node to capture its attenuating effect on peak flows leaving the precinct. The total catchment area of the model is 115 hectares.

The URBS model has been simulated using ARR2019 procedures, incorporating preburst and loss parameters derived from the ARR Datahub. Model parameters were set as $\alpha = 0.2$, $\beta = 3.0$, and $m = 0.8$, which are within the standard industry-accepted range. Urbanisation has been represented in the model as “High Density” (UH) with the urbanisation factor set to twice the effective impervious area percentage. An assumed impervious percentage of 70% for the development has been applied. Figure 3 presents the URBS model layout.

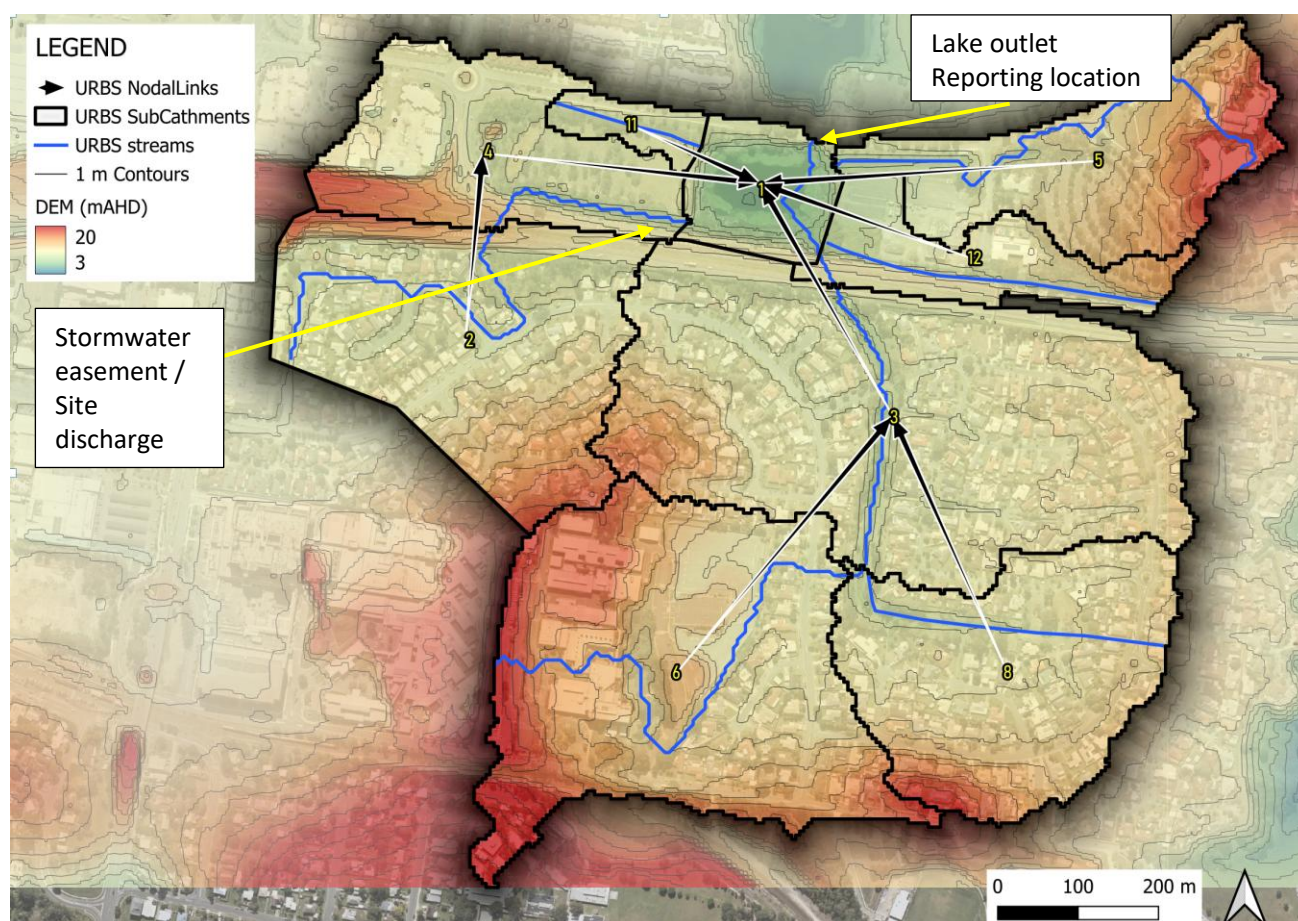


Figure 3: URBS Model Layout

Scenarios simulated:

- Existing Case – pre-development land use, and the existing lake outlet arrangement/SQ relationship (refer Section 5.2).
- Developed Case – post-development impervious fraction and catchment layout reflecting the proposed 145-dwelling design (increased imperviousness and urbanisation on Subcatchments #4 and #11), incorporating the proposed lake works (lowered operating level and revised SQ relationship).
- All AEPs from 50% to 1% with current climate conditions.

5.2 Representation of the Lake and Proposed Lake Works

The existing lake outlet arrangement comprises 3/2,100 mm diameter RCPs beneath University Drive, which commence operating from a normal lake water level of approximately 7.5 mAHD.

The proposed lake works, as described in the approved civil design and adopted in the Flood Impact Assessment (WEP, 2026; refer Section 3.2), include a new 1,200 mm diameter low-flow outlet pipe with an invert below that of the existing 3/2,100 mm diameter RCPs. With this lower pipe, the works also lower the normal standing water level in the lake to approximately 6.75 mAHD, as shown in Figure 4.

This creates a two-stage outlet arrangement. The smaller 1,200 mm diameter pipe controls lake outflows during low-to-moderate events, while the larger existing pipes engage as lake levels rise above approximately 7.5 mAHD. Lowering the normal operating level provides additional available storage below the existing outlet level, while the staged outlet configuration regulates the release of this storage during local flood events.

WEP's flood-storage calculations indicate that lowering the operating water level provides approximately 8,610 m³ of additional storage up to the Logan River Defined Flood Level (DFL). The storage–discharge (S–Q) curves applied in the URBS model for the respective scenarios are presented in Figure 5.

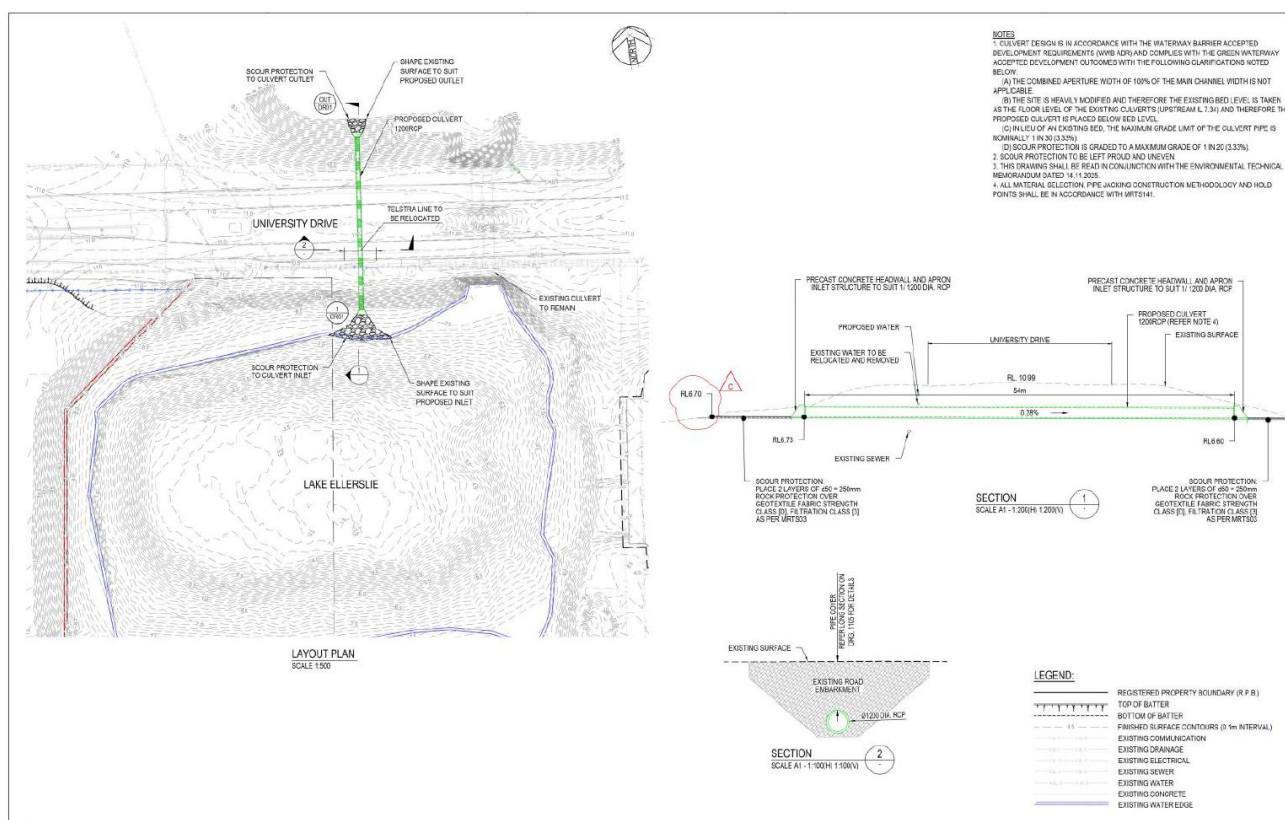


Figure 4: Griffith Lake upgrade works

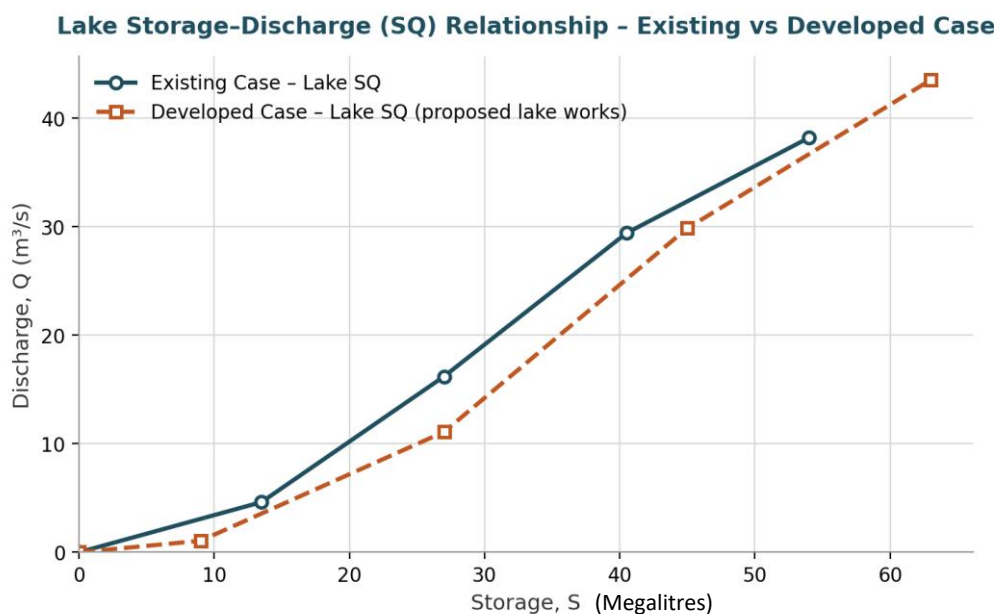


Figure 5: Lake Storage–Discharge (SQ) Curve Comparison – Existing vs Developed Case

6. Hydrologic Results

Table 2 summarises the Existing and Developed Case peak flows at the Site discharge point, the drainage easement along the Site’s southern boundary. This flow includes the Site’s own discharge together with the western and southern external catchments draining to the same easement.

Table 2: Existing vs Developed Case Drainage Easement flows (no mitigation)

Design Event (AEP)	Existing Case (m³/s)	Developed Case (m³/s)	Increase
50%	3.05	3.67	+20%
20%	4.08	4.79	+17%
10%	4.64	5.33	+15%
5%	5.35	6.10	+14%
2%	6.21	7.42	+19%
1%	6.90	8.16	+18%

As expected, the increase in impervious area associated with the development produces an increase in peak discharge at the Site discharge point across all modelled events (up to 20%). A Manning's equation assessment of the receiving stormwater easement indicates a flow capacity of approximately 20 m³/s, demonstrating that the easement has sufficient hydraulic capacity to convey the increased discharge to the downstream lake without surcharge. Table 3 then presents the effect of this increased inflow once combined with the remaining external catchments and routed through the lake incorporating the proposed additional flood storage.

Table 3: Existing vs Developed Case Lake inflows and outflows

Design Event (AEP)	Lake Outflow – Existing	Lake Outflow – Developed	Net Change in Outflow
50%	7.54	7.23	-4%
20%	10.81	10.07	-7%
10%	12.54	11.96	-5%
5%	15.10	14.96	-1%
2%	17.91	17.71	-1%
1%	20.16	20.15	0%

The results in Table 3 demonstrate that the proposed lake works offset the increase in inflow generated by the development for every modelled event up to and including 1% AEP event. It is noted that the DFE levels for this Site are governed by Logan River backwater and any change to local flows would have no impact to wider flood risk.

7. Discussion – Downstream Flood Risk Profile and Catchment Response Mechanism

The Site is located near the downstream extent of both the Logan River and Slacks Creek/Scrubby Creek catchments, each of which is very substantially larger than the local area draining through the Site (refer Section 2). Consistent with the findings of both the SMP (Section 3.1) and the FIA (Section 3.2), flood levels immediately downstream of the Site are governed primarily by these much larger regional and creek flood waves, with local inflows, including runoff from the Site, representing a comparatively minor contribution to peak flood levels within the backwater-affected floodplain.

Because the Logan River and Slacks Creek/Scrubby Creek catchments are so much larger than the Site's own local catchment, their flood waves take considerably longer to form and translate downstream than the Site's short-duration hydrograph response to a local rainfall burst. Therefore, the local runoff hydrograph from the Site is not expected to coincide with the controlling regional flood peak. For context, the critical duration for the local catchment is approximately 60 minutes, compared with the 72-hour storm duration that is critical for the Logan River at this location. Figure 6 presents the Logan River backwater peak flood depths across the Site, and Figure 7 shows the Site's location within the broader Logan River catchment, where it sits within the lower third.

Consequently, reducing the local hydrograph through conventional on-site detention would not materially reduce flood levels in the receiving system because the controlling flood levels are governed by the arrival of the regional backwater rather than the local catchment response.

This is consistent with the rationale originally adopted in the EDQ Stormwater Management Plan and confirms that a no-detention approach remains appropriate.



Figure 6: 1% AEP Logan River backwater flood extent (Source: Logan City Council Flood Portal)

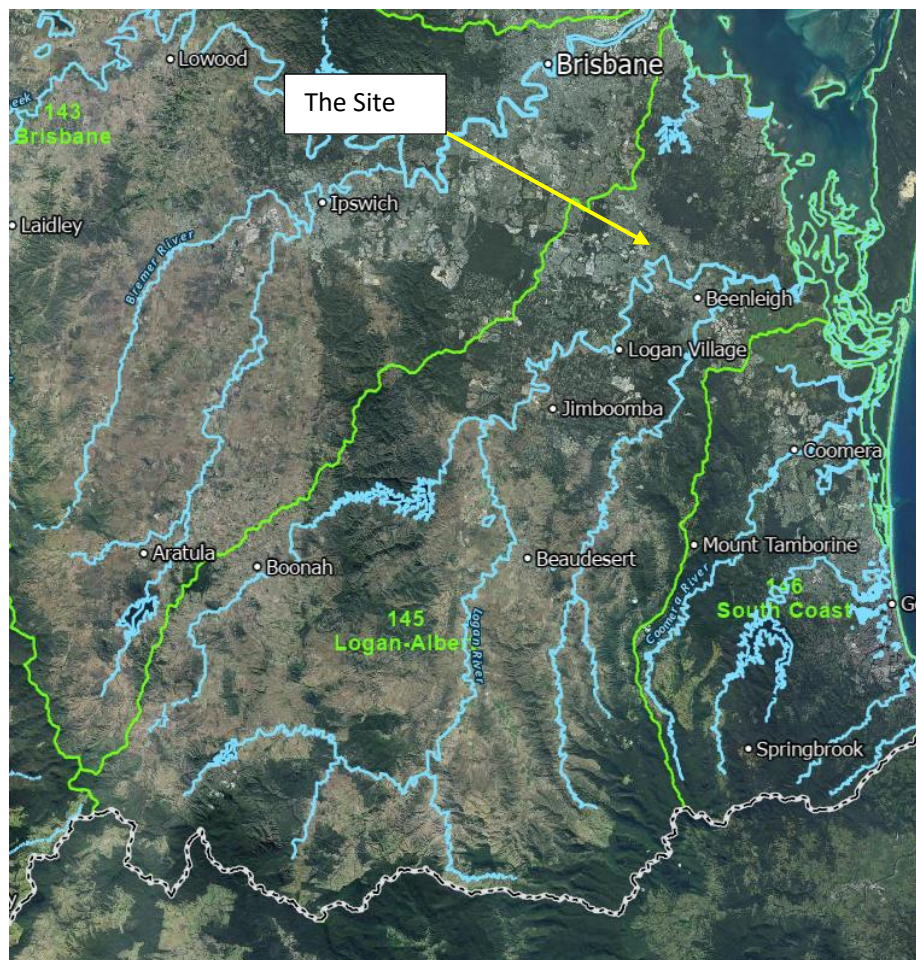


Figure 7: The Site in context of broader Logan River catchment (Source: Queensland Globe)

8. Conclusion

Based on the conceptual ARR2019 hydrologic assessment and catchment analysis presented in this memorandum, DCF concludes that the proposed no-detention stormwater quantity management strategy for Lot 3, 35 University Drive, Meadowbrook is appropriate. The proposed lake works provide sufficient additional flood storage and attenuation to offset the increase in runoff associated with the development. Furthermore, the Site's location within a backwater-dominated portion of the Logan River catchment means that conventional on-site detention would provide negligible additional benefit in reducing downstream flood risk.

This conclusion is consistent with, and completes, the no-detention rationale originally advanced in the EDQ Stormwater Management Plan (DesignFlow, 2025) and is compatible with the flood level and floodplain storage outcomes demonstrated in the Flood Impact Assessment (WEP, 2026).

A handwritten signature in black ink, appearing to read 'Donnie Carroll'.

Donnie Carroll, Director / Principal Engineer, RPEQ #29980

DC Flood Engineering Pty Ltd – ABN 43 686 359 679