

Our ref: DOC21/1022910-48 Your ref: SSD-16858710

Ms Jasmine Tranquille

Planning Officer Social and Other Infrastructure Assessments Planning and Assessment Division Department of Planning, Industry and Environment Jasmine.Tranquille@planning.nsw.gov.au

Dear Ms Tranquille

#### Pacific Brook Christian School (SSD 16858710) – Review of Environmental Impact Statement

I refer to your e-mail dated 17 November 2021 in which the Planning and Assessment Division (P&A) of the Department of Planning, Industry and Environment (the Department) invited Biodiversity and Conservation Division (BCD) to provide advice in relation to the Pacific Brook Christian School project (SSD 16858710) in Muswellbrook.

BCD have reviewed the Environmental Impact Statement, including relevant appendices, in relation to impacts on biodiversity and flood risk assessment.

BCD has no comment to provide on the biodiversity assessment. BCD's recommendations in relation to the flood risk assessment are provided in **Attachment A** and detailed comments are provided in **Attachment B**.

If you require any further information regarding this matter, please contact Brendan Mee, A/Senior Team Leader Planning, on 4904 2730 or via email at huntercentralcoast@environment.nsw.gov.au

Yours sincerely

Juline &

PAULINE DUNNE Acting Director Hunter Central Coast Branch Biodiversity and Conservation Division

Date: 14 December 2021

Enclosure: Attachments A and B

## **BCD's recommendations**

# Pacific Brook Christian School Project (SSD 16858710) – Review of EIS

# Flooding and flood risk

1. BCD advises that the proposal is inconsistent with the 4.3(8) Ministerial Directions on flooding.

BCD recommends that:

- the site should not be rezoned until the inconsistency with the management item MC2 of the Muswellbrook Flood Plain Risk Management Study and Plan is resolved.
- the proponent demonstrates that the school in its current form will not prevent the future construction of the MC2 flood mitigation works.
- flood planning levels applied to the development should be based on the levels with the MC2 flood mitigation works in place.
- 2. BCD recommends that an additional survey is required to determine if there is a secondary overland flow path through the site. If a flow path is identified, then the flood impact assessment will need to be updated to determine:
  - new flood planning level for the development.
  - impacts of filling the secondary flow path
  - impacts on emergency management.
- BCD advises that the proponent is required to develop a flood emergency response plan (FERP). The FERP must document how risk to life will be managed during the initial stages of the school development when there will be only portable buildings and for the final school development when permanent two-storey structures, designed to withstand PMF forces, will be available.
- 4. It is recommended that the bus storage and maintenance area be relocated to a less flood impacted area of the site and all stored chemicals and oils be required to be stored above the flood planning level. Hazardous materials if required to be kept on site should be stored-elsewhere on site in secure facilities.
- 5. BCD recommends that the proponent assess climate change impacts and updates the design floor levels for school facilities.
- 6. Split zoning consistent with flood risk post construction of proposed council flood mitigation works is considered to be a more resilient planning outcome and would be more likely to be supported by BCD.
- 7. BCD recommends that the maximum allowable off-site increase in 1% AEP flood levels for residential properties is 10mm. If achieving a maximum afflux of 10mm is not practical then affluxes up to 50mm can be considered for major projects, provided the impacts are well understood and appropriately justified.
- 8. BCD advises that proprietary stormwater quality inserts are not appropriate for this proposal, and that the design of pollution control should be changed to incorporate Water-sensitive Urban Design (WSUD) features instead of the proposed proprietary inserts. If the proponent

determines that proprietary inserts are the best solution, then the proponent must prepare a detailed maintenance plan and covenant that requires the inserts to be retained in a workable form for the life of the development.

9. The Structural certification report and the stormwater report Appendix 16 require amendments to ensure consistency with other provided documentation.

# **BCD's detailed comments**

# Pacific Brook Christian School Project (SSD 16858710) – Review of EIS

## Flooding and flood risk

1. The proposal is not consistent with Ministerial Direction No.4.3(8) Flooding

The rezoning proposal has not satisfactorily demonstrated consistency with the 4.3(8) Ministerial Directions on flooding.

Ministerial Direction No. 4.3(8) Flooding, issued in July 2021 under section 9.1(2), of the *Environmental Planning and Assessment Act 1979* states that the flood planning area must be consistent with a Floodplain Risk Management Study or Plan adopted by the relevant council.

The Flood Impact Assessment (FIA), prepared by Royal HaskoningDHV 2021 (Appendix 21 of the Environmental Impact Assessment) is not consistent with management item MC2 of Council's Muswellbrook Flood Plain Risk Management Study and Plan (FRMS&P) adopted 2019. Management item MC2 is a medium-high priority action in the FRMS&P. It is a construction of a flood bund on Muswellbrook Golf Course and significantly reduces flood downstream of Bell Street by:

- preventing an overland flow path forming downstream of the Bell Street bridge
- preventing above floor flooding of 31 homes in a 1% AEP flood event
- significantly reducing flood affectation and damages for all flood events
- provides 1% AEP flood immunity to the Bell Street bridge. The bridge is an important transport link, and improvement of level of service in flood events will improve the community's resilience to flooding.

The FRMS&P identified that MC2 will increase flood levels upstream of the Bell Street Bridge, including at the proposed school site. Construction of the proposed MC2 mitigation works will increase the 1% AEP flood extent and increase flood depths up to 500mm across the lower portion of the subject site.

The FIA has not included the MC2 golf course bund in its hydraulic modelling. Consequently, the FIA is underestimating the flood risk to the school, its future occupants and impacts on neighbouring properties.

#### Recommendation 1

BCD advises that the proposal is inconsistent with the 4.3(8) Ministerial Directions on flooding.

BCD recommends that:

- the site should not be rezoned until the inconsistency with the management item MC2 of the Muswellbrook Flood Plain Risk Management Study and Plan is resolved.
- the proponent demonstrates that the school in its current form will not prevent the future construction of the MC2 flood mitigation works.
- flood planning levels applied to the development should be based on the levels with the MC2 flood mitigation works in place.

### 2. An overland flow path through the site may not have been identified

BCD considers that the FIA may not have identified an overland flow path and may be underestimating flood planning levels, flood affectation and flood hazard across the site.

Figure 6 'Design Flood Levels (RHDHV, 2019) – Long Section' shows a local depression at chainage 200 m with an elevation of 148.5m. Figure 8 'Hazard Categorisation (1% AEP) 2019 from S&P' shows the elevation, immediately upstream on Muscle Creek is 148.92m AHD. This suggests that a breakout of Muscle Creek commences in floods with an AEP greater than 1%. This secondary flow path would originate near St Andrews Place (location 3) and flow through the subject site along the local depression, identified in Figure 8. However, no such flow path has been identified in the FIA.

The existence of a secondary flow path through the site would likely mean that the FIA is underestimating the flood planning levels and flood affectation across the site. It would also impact on emergency management.

More detailed topographical information is required to determine if a secondary flow path through the site exists.

#### Recommendation 2

BCD recommends that an additional survey is required to determine if there is a secondary overland flow path through the site. If a flow path is identified, then the flood impact assessment will need to be updated to determine:

- new flood planning level for the development.
- impacts of filling the secondary flow path
- impacts on emergency management.

#### 3. The proponent has not addressed risk to life during large flood events

It is proposed that the school will accommodate up to 656 students, including a special needs facility. A comprehensive evacuation plan will need to be developed to ensure safety of the students during large flood events.

A Flood Emergency Response Plan (FERP) is required to mitigate risk to life. The FIA shows that the school grounds will be flooded with depths up to 2m. This poses a large risk to life and a FERP is required to mitigate these risks. The FIA proposes that the school should evacuate to high ground on Thomas Street. The FIA has not assessed if there is time available to safely evacuate the school. The FIA also suggests that occupants could shelter in any of the two-storey buildings on site if required.

In the event that the FERP requires occupants to shelter in place then all building proposed to be used as refuge must use flood compatible materials and be constructed in accordance with the requirements of ABCB Construction of Buildings in Flood Hazard Areas.

The FERP must be developed in consultation with Muswellbrook Shire Council and the NSW SES.

The existing Operational Management Plan, EIS Appendix 27, mentions the need to develop a fire evacuation plan. However, flood evacuation/shelter in place arrangements are not included.

The initial stages of the school will accommodate students in modular portable single storey buildings, which are unlikely to be elevated or robust enough for shelter in place to be an

option. Evacuation will therefore be the only option for extreme flood events. Footings and tie downs for portable buildings should be designed to resist PMF forces to ensure that portable buildings do not become flood debris in an extreme event and impact the Bell Street bridge.

A flood warning system does not currently exist in Muscle Creek. Muswellbrook Council is currently designing a flash flood warning system for Muscle Creek. If this system is not operational prior to occupation of the school, then an interim evacuation plan will be required.

#### Recommendation 3

BCD advises that the proponent is required to develop a flood emergency response plan (FERP). The FERP must document how risk to life will be managed during the initial stages of the school development when there will be only portable buildings and for the final school development when permanent two-storey structures, designed to withstand PMF forces, will be available.

# 4. The proposed bus storage and maintenance area is located within the flood planning area

The bus storage and maintenance area is located in the lowest portion of the site and is noted as currently affected by up to 500mm of flooding in a 1% AEP event and will likely need to be filled. The bus shed site will be subject to an additional 500mm of flooding if the proposed flood mitigation works on the adjacent golf course are constructed. Relocation of the bus storage and maintenance area to a less impacted area of the site would be a better outcome and provide less potential for damage of the infrastructure or pollution of the environment should oils and chemicals be stored in this facility.

#### Recommendation 4

It is recommended that the bus storage and maintenance area be relocated to a less flood impacted area of the site and all stored chemicals and oils be required to be stored above the flood planning level. Hazardous materials if required to be kept on site should be stored elsewhere on site in secure facilities.

#### 5. Climate change has not been considered as required by SEARS.

The provided SEARS item 17 required the effects of climate change, including an increase in rainfall intensity, to be considered. BCD notes that the FIA has only considered the current 1% flood conditions. A development of this scale should consider climate change given the likely investment and lifespan for the built form.

#### Recommendation 5

BCD recommends that the proponent assess climate change impacts and updates the design floor levels for school facilities.

# 6. The extent of rezoning should be reduced to ensure buildings are not located on portions of the site within the flood planning area

The flood planning area on the site should be revised to include the impact of proposed flood mitigation works on the golf course (M2 noted in point 4 above). The remainder of the site could be rezoned from forestry use to a recreational use or other use compatible with the agricultural activities or sporting activities on the school which would still allow use as part of the school facility without increasing flood risk. Some changes to the proposed building layout and/or some fill may be required to ensure the school buildings can be constructed in a non-discriminatory accessible manner whilst complying with the revised flood planning levels.

## Recommendation 6

Split zoning consistent with flood risk post construction of proposed council flood mitigation works is considered to be a more resilient planning outcome and would be more likely to be supported by BCD.

## 7. Flood impacts may exceed acceptable levels for properties on St Andrews Close

The FIA estimates that the development will increase 1% AEP flood levels at point 6 by 77mm. Point 6 is within the subject site but is very close to the residential properties on St Andrews Close. BCD considers that the maximum tolerable afflux for a development of this type is 10mm. Consequently, further assessment is required to determine the flood afflux along St Andrews Close and how these impacts could be mitigated. If the proponent considers that achieving a maximum afflux of 10mm is not possible or practical then affluxes up to 50mm can be considered for major projects, provided the impacts are well understood and appropriately justified. Any justification will need to:

- Document the extent of the affluxes above 10mm.
- Identify all residential properties that transition from not flooded to flooded in a 1% AEP event.
- o Identify any sensitive receivers. These are land uses that:
  - Require ongoing functionality during and after a flood event such as hospitals and emergency services facilities.
  - Require high levels of assistance with evacuation, such as seniors housing, group homes, boarding houses, hostels, caravan parks, educational establishments, centre-based childcare facilities, and hospitals
  - Store hazardous materials that pose environmental and health risks if exposed to flood waters.
- Impacts on the frequency of flooding in smaller events than the 1% AEP event
- Demonstrate that there are no practical alternative design measures that could further mitigate impacts for that location.
- Demonstrate that the proposed afflux is not likely to result in unsustainable social and economic costs to the community as a consequence of flooding.

## Recommendation 7

BCD recommends that the maximum allowable off-site increase in 1% AEP flood levels for residential properties is 10mm. If achieving a maximum afflux of 10mm is not practical then affluxes up to 50mm can be considered for major projects, provided the impacts are well understood and appropriately justified.

#### 8. Pollution controls do not include Water sensitive urban design (WSUD) features

The stormwater quality treatment design should be changed to incorporate WSUD features instead of the proposed proprietary inserts. The proposed stormwater strategy, Appendix 36A to the EIS, includes modelling and plans to achieve the required pollution reduction targets consistent with development. This is achieved using proprietary pit inserts such as Oceanguard and Polysorb cartridges. Proprietary treatment is generally used in city developments where it is not possible to use water sensitive urban design pollution treatment due to significant site constraints. However, the school is in a rural township with ample land available.

BCD considers it likely that proprietary pit inserts will be removed as part of maintenance activities and the projected pollution reduction targets no longer achieved. Contractors in rural areas are not typically experienced in maintaining and replacing propriety provision pit insert cartridges, and are familiar with standard WSUD stormwater treatment devices, which also serve as landscaping features.

### Recommendation 8

BCD advises that proprietary stormwater quality inserts are not appropriate for this proposal. And the design of pollution control should be changed to incorporate WSUD features instead of the proposed proprietary inserts. If the proponent determines that proprietary inserts are the best solution, then the proponent must prepare a detailed maintenance plan and covenant that requires the inserts to be retained in a workable form for the life of the development.

#### 9. The report has minor inconsistencies

The structural certification by Birzulis Assoc dated 15 September 2021 does not specify requirements for the modular construction proposed initially for the school development. The certificate also needs to reference the ABCB Construction of Buildings in Flood Hazard Areas Standard to ensure that structural design includes analysis of potential flood loads up to the PMF event.

Appendix 16 - Stormwater report includes a section on page 8 which incorrectly refers to 374 cubic metres of absorption tank and Bayside City Council. It is likely that this is an editorial error from an earlier report.

#### Recommendation 9

The Structural certification report and the stormwater report Appendix 16 require amendments to ensure consistency with other provided documentation.