

NOVEMBER 2022

PLANNING PROPOSAL - 12-20 SHIRALEE ROAD, ORANGE NSW

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PLANNING, PROPERTY + PROJECT MANAGEMENT

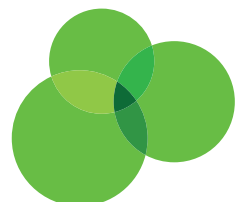
Appendix F

Flood Impact Assessment

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Dear Oliver,

Re: Flood Impacts Assessment for 12 & 20 Shiralee Road, Orange

INTRODUCTION

This report assesses the flood impact of proposed works at the subject site (12 & 20 Shiralee Road on the southern outskirts of Orange). The proposed development is for subdivision of the site. Design flood liability has previously been assessed by Orange City Council, which establishes that the site is flood-affected, albeit not by mainstream flooding but rather relatively minor overland flows. The relevant Council study is Blackmans Swamp Creek and Ploughmans Creek Floodplain Risk Management Study and Plan (Lyll & Associates 2020). Council's model has been obtained and used for assessing the impact of the proposed subdivision on flood behaviour.

This report describes existing flood behaviour below, then talks about proposed development and impacts of same. Finally, this report looks at how the proposed works meet DCP requirements.

EXISTING FLOOD BEHAVIOUR and CONSTRAINTS

The subject site consists of a 20-ha lot on the south side of Shiralee Road and bounded along its western boundary by Pinnacle Road and to the south by Hawke Lane. The site has ground elevations of around 910 to 930 m AHD. It consists of a large rural-residential lot with a house near Shiralee Road and minimal vegetation. The site contains a farm dam near Pinnacle Road. The surrounding area consists of similar large rural-residential lots, with some higher density residential areas where subdivision has been carried out.

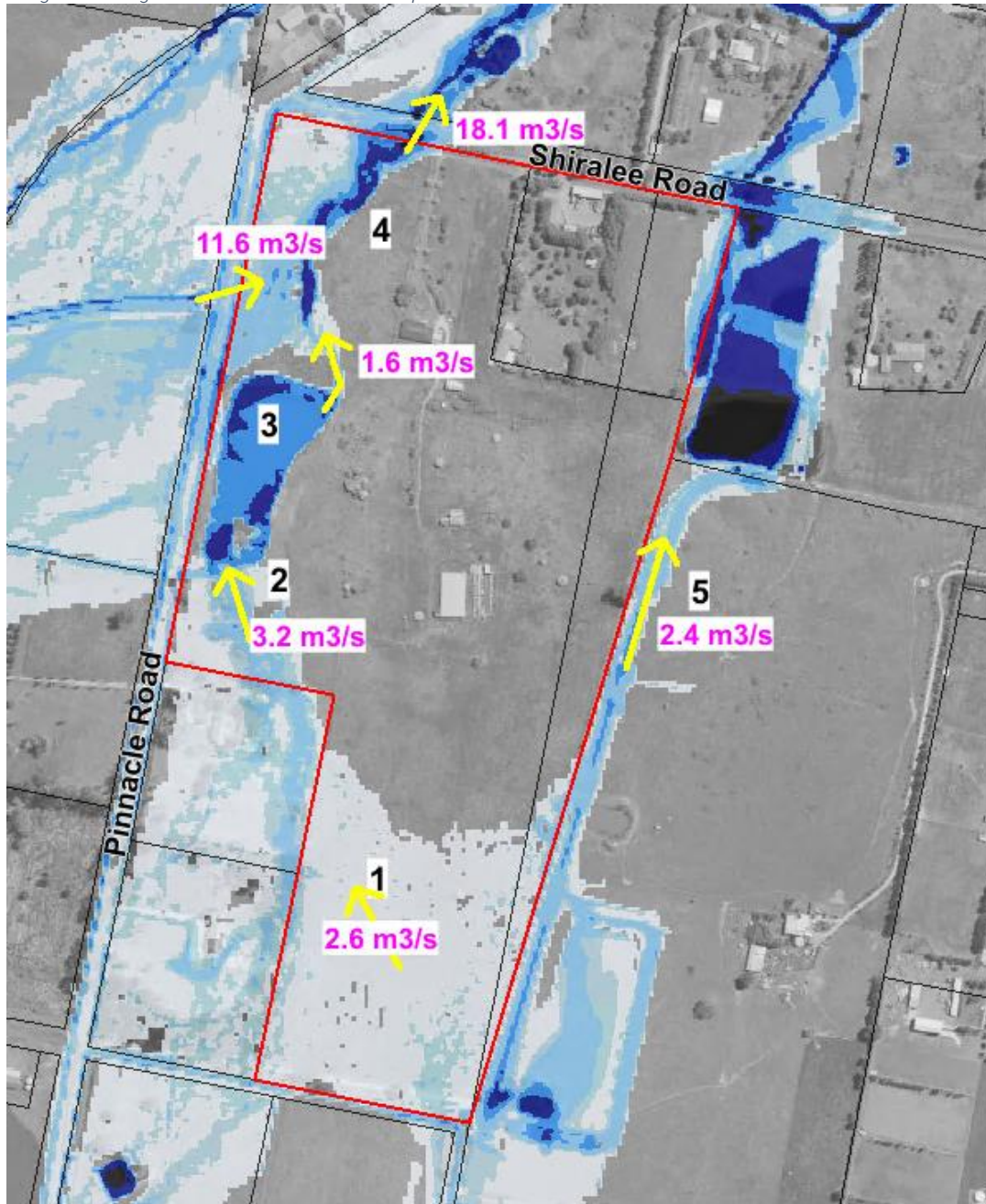
The subject site located within the Blackmans Swamp Creek catchment. The catchment at the site is 437 hectares. Blackmans Swamp Creek is located approximately 100 m to the west, and flows generally south to north, eventually passing through the Orange town centre. There is a second smaller flow path through the site, also flowing south to north and which meets Blackmans Swamp Creek 1.4 km downstream of the site. This second flow path splits into two flows near the site's southern boundary and these then flow generally along the eastern and western sides of the site.

Council's model has been revised with the eastern neighbour's approved development (Subdivision of lot 100 DP 1204145 Sweetheart Drive Orange DA 218/2015(2)).

Figure 01 shows the 1% AEP metrics for the existing case. This is taken from Council's model results. A summary of the three areas of flow is provided below with more detail in Image 1 below:

- Blackmans Swamp Creek, 11.6 m³/s peak flow in 1% AEP. The creek overtops Pinnacle Road with depths of up to 0.3 m on the subject site.
- Western flow path, 3.2 m³/s peak flow in 1% AEP. The flow path has depths of around 0.1 to 0.3 m on the subject site.
- Eastern flow path, 2.4 m³/s peak flow in 1% AEP. The flow path has depths of around 0.05 to 0.3 m on the subject site.

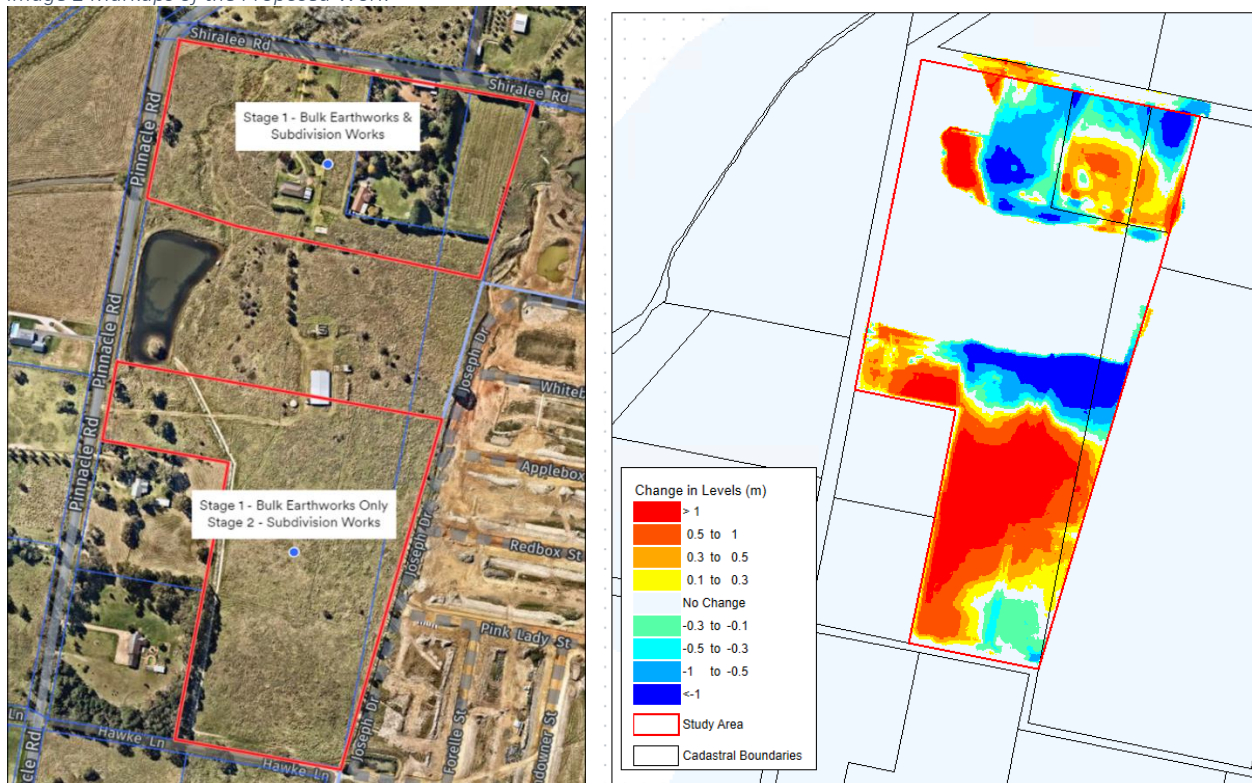
Image 1 Existing Flood Behaviours with Markups



PROPOSED DEVELOPMENT

The proposed development consists of two stages: bulk earthworks in the northern & southern portions of the site with subdivision works to the north of the site only. Subdivision works to the southern portion of the site are the subject of a future development application. The location of the works is shown in Image 22 below, which also shows the proposed cut and fill changes. In general, the southern site will be mostly raised by around 1 m except for some portions that will be lowered by 1 to 2 metres, and the northern portion will be mostly lowered by around 1 m except for a portion at the north-west, to be raised by up to 2 m. This north-west area involves a slight deviation of the existing flow path channel in that area.

Image 2 Markups of the Proposed Work



FLOOD IMPACT ASSESSMENT

The effect of the proposed changes has been assessed using the Council flood model (TUFLOW). Only earthworks have been assessed.

Stage 1 earthworks have been read into the model as a 'proposed' scenario. The model has then been run and peak flood depths and levels for the 1% AEP extracted and compared to the existing case. Any increases to the peak flood level are identified as flood impacts.

Figure 02 shows the 1% AEP design flood extent, levels and depths given the inclusion of proposed filling works.

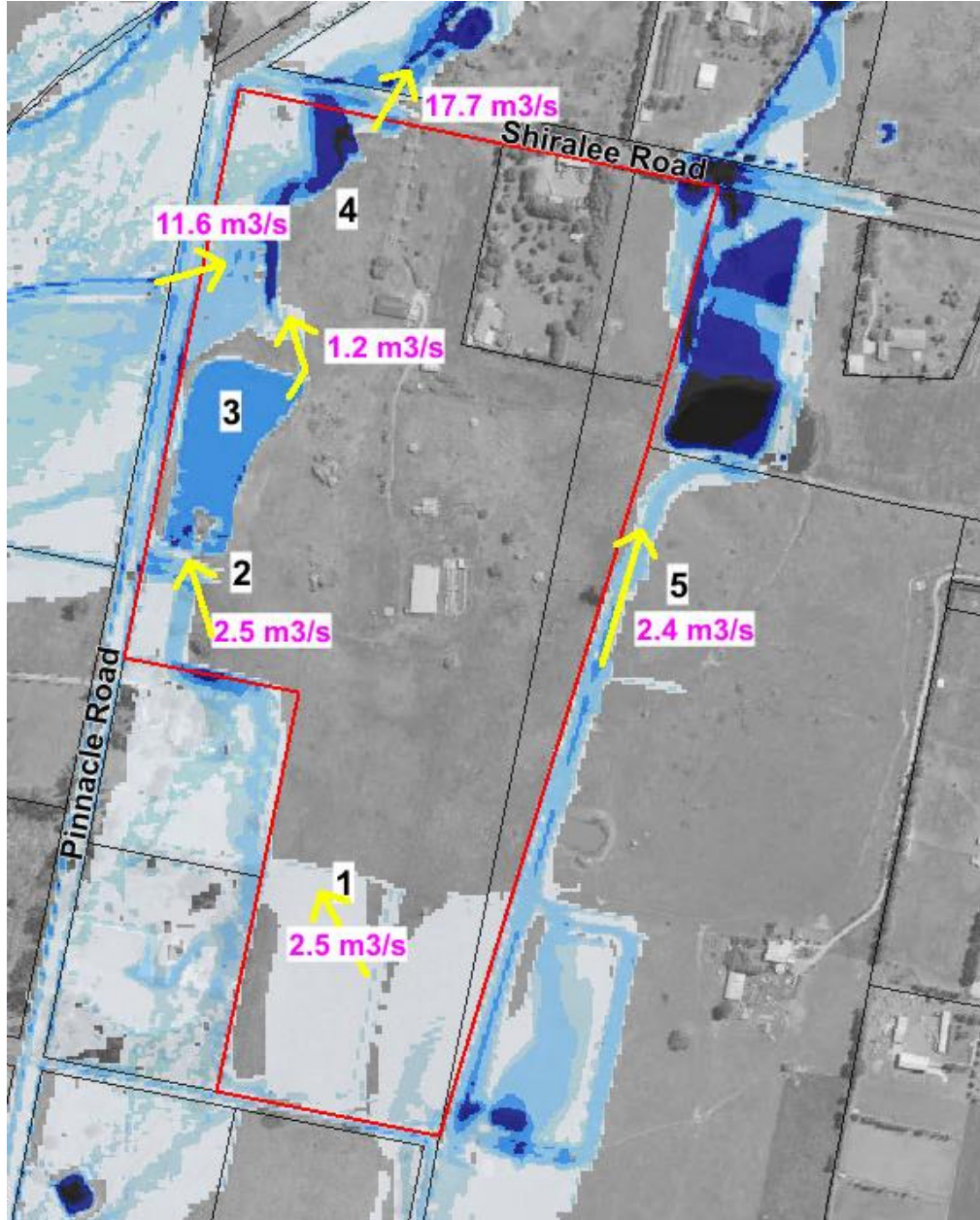
A summary of the three flow paths is provided below with more detail in Image 3 below:

- Flows from Blackmans Swamp Creek remains the same, 11.6 m³/s peak flow in 1% AEP.
- Flow at Western flow path has been reduced from 3.2 m³/s to 2.5 m³/s peak flow in 1% AEP.
- Flow at Shiralee Road is all but unchanged being 17.7 m³/s where it was previously 18.1 m³/s; and

- Flows at Eastern flow path do not change.

Overall then examining flows it is clear that the proposed earthworks do not alter the distribution of flow between the various flow paths impacting the site.

Image 3 Proposed Flood Behaviours with Markups



The flood level impacts of the proposed Stage 1 earthworks on 1% AEP flood levels and extent are shown in Figure 03.

Summarising Figure 03 we can say the following:

- Eastern flow path: minimal impacts on neighbouring lot.
- Western flow path, south-west corner of site: minor impacts but then increasing up to 0.3 m south of the dam. The areal extent of impacts is very limited and adjacent to property boundary
- Western flow path, north-west corner of site: impacts of up to 0.4 m on Shiralee Road and the neighbouring lot to the north.

Overall as per Image 3 and the discussion regarding the impact of proposed works on flows in the page above, Figure 03 further indicates the lack of impact on creek flooding. Overall, the cut and fill results in localised changes to overland flow as discussed above (mainly pertaining to the western flow path) which results in flood impacts in the vicinity of the site, with no large-scale change to flow behaviour.

With regards to on-site detention (OSD), the site lies in the floodplain of Blackmans Swamp Creek and adjacent flow paths. OSD has therefore not been included in the site layout as being proximate to the creek, lower peak flows downstream will be achieved by direct release (thus moving intralot drainage off-site before the upper catchment peak flow occurs at site (or adjacent), rather than sustained steady state discharges from OSD which add to flow peak).

DCP POLICY

DCP from 4a.7 Annexure 3 - Prescriptive Development Controls – Flood Response Levels in Orange Development Control Plan 2004 for Subdivision and filling.

Table 1: Proposed Development DCP Compliance Summary

Design Element	Applied Flood Response Level	Flood Response Controls	GRC Comment
Evacuation	1	The development is to be consistent with any relevant flood evacuation strategy	Comply – Council’s flood study indicates shallow depths over the site due to what is for all intents and purposes flash flooding due to overland flow and overbank spillage from the creek. As such evacuation in place is the default response and the proposed works are consistent with that strategy.
Flood Affection	1	Engineers report required to certify that the development will not increase flood affection elsewhere	Our work indicates some flood level impacts associated with the landform changes but as per the analysis herein, flows are relatively unchanged overall and impacts where they occur on property are limited in extent and at property boundaries.
	2	Development shall not block the conveyance of flood waters across the floodway or overland flow	Comply – Image 3 demonstrates that overland flow paths and creek floodplain flows are not materially impacted by the proposed works.
	4	Filling of a maximum of 1/3 of allotment up to 0.3m above the 1% AEP Flood level permitted provided this does not result in any significant effect on the conveyance of flood waters or flood levels	Cut and fill proposed is shown in Image 2 herein. As per that Plan approximately one third only of the site is subject to fill, however compensatory cut is also proposed as per Image 2. In regards to the impact of this work on conveyance that issue is addressed in Image 3 and as per above.
Management and Design	2	No external storage of materials below the design floor level which may cause pollution or be potentially hazardous during any flood	Comply
	3	Applicant to demonstrate the at the time of Development Application lodgement that the potential development complies with this DCP as a consequence of a subdivision proposal and any potential dwelling construction can be undertaken in accordance with this Plan	See responses above.

CONCLUSION

This report assesses the flood impact of proposed works at the subject site (12 & 20 Shiralee Road on the southern outskirts of Orange). The proposed development is for subdivision of the site. Design flood liability has previously been assessed by Orange City Council, which establishes that the site is flood-affected, albeit not by mainstream flooding but rather relatively minor overland flows. The relevant Council study is Blackmans Swamp Creek and Ploughmans Creek Floodplain Risk Management Study and Plan (Lyll & Associates 2020). Council's model has been obtained and used for assessing the impact of the proposed subdivision on flood behaviour.

Flood impact analysis using Council's model incorporating proposed works indicates (see Figure 03 and Image 3) that whilst there are some impacts associated with the works, these pertain to the western overland flow path only, and are minor. As per the DCP compliance summary in Table 1, GRC Hydro indicate that the proposed works meet the objectives of Council's DCP.

Yours Sincerely



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FIGURES

