Additional Stormwater Strategy Comments - Proposed Planning Scheme Amendment C193 to the Yarra Ranges Planning Scheme

General comments

Council has the following general comments on the submitted Stormwater Strategy:

- Typically Melbourne Water requires that flows are retarded to existing conditions at the outlet of the development site. If Melbourne Water does not support the approach proposed by the Stormwater Strategy it is not clear where attenuation would occur and if there is sufficient space within the development to do so.
- The strategy does not quantify by how much peak flows are increasing off the site for either the Lilydale Lake or Melba Drain Catchments. Council cannot assess the strategy without understanding the increase in peak flow off the site for a range of Annual Exceedance Probabilities (AEPs).
- The strategy only focuses on the 1% AEP event for both the Lilydale Lake and Melba Drain catchments. The planning provisions require all events up to and including the 1% AEP to be investigated and retarded back to existing conditions.
- Council needs to be assured that the strategy will not increase the potential of flooding on any land as a result of this development.
- The impact of climate change has not been considered in the strategy. Typically, climate change should be considered in the design in accordance with methods described in Australian Rainfall and Runoff 2019

Melba Drain Catchment

The applicant proposes to discharge post development flows into Melba Drain and eventually Olinda Creek without attenuation (retarding back to existing condition flow rates). The drainage strategy states that an option assessment has been undertaken on various scenarios. The assessment found that providing no attenuation in the development site (e.g. a retarding basin), results in the peak flow rate for the 1% AEP event being maintained at existing conditions in Olinda Creek. The strategy explains that this is possible as flows from the development will runoff before the larger flood wave coming down Olinda Creek at the outlet of Lillydale Lake. The strategy then goes on to imply that the increase in peak flows within Melba Drain due to the development will be managed by a pipe diversion to Olinda Creek.

Council has the following concerns:

- The strategy provides no analysis on the size and alignment of the diversion pipe to Olinda Creek to prevent an increase in peak flows in Melba Drain. The pipe connection will have to traverse through public open space and Council will need to understand the proposed alignment to assess potential impacts (e.g. impacts on native vegetation).
- The strategy provides no modelling outputs from the option assessment showing that peak flows in Olinda Creek are maintained at existing conditions as stated.
- There is no analysis presented as to the potential impact to private property downstream of the site along Melba Drain. The diversion pipe to Olinda Creek should be sized to prevent an increase in flood flows and flood levels downstream of the site along Melba Drain for a

range of AEPs. Without analysis, Council cannot be sure the proposed diversion pipe to protect Melba Drain from an increase in peak flows is feasible. An assessment should focus on showing minimal impact to private property with modelling outputs showing existing and proposed flood extents and afflux (change in flood level) plots for a range of AEPs.

- The applicant has provided no analysis as to how flows will be captured in the diversion pipe connecting to Olinda Creek. It is not clear where flows will be captured and how this may impact the development site (e.g. flooding of ovals).
- There has been no analysis on potential flood hazards cause by the proposal. It is not clear how the proposed diversion pipe may change velocities, depth of flooding and depth x velocity (flood hazard) along Melba Drain and through the Lillydale Lake Reserve downstream of the site. The reserve is regularly used by the community with a number of low crossings of Melba Drain.
- There is little analysis presented on the potential environmental impacts of the proposed strategy. Council is concerned that the proposal may increase flood velocities and erosion in Melba Drain. Moreover, the proposed wetland has had little feasibility work undertaken. Given the proposed location, there are potential constraints to the wetland site that need to be investigated further before the location can be confirmed; flora and fauna impacts, cultural heritage impacts, geotechnical impacts (Lillydale Lake embankment and spillway), potential for contaminated land and conceptual hydrological and hydraulic analysis. The strategy does not address any of these constraints. Moreover, the ownership of the wetland has not been confirmed. An alternative strategy may be possible to provide distributed treatment throughout the development (e.g. tree pits, swales) rather than the reliance on an end of line solution that may become a liability.

Lillydale Lake Catchment

The applicant proposes to discharge post development flows into Lillydale Lake without attenuation (retarding back to existing condition flow rates). A wetland is proposed at the outlet of the site with a low flow pipe outlet connecting to Lillydale Lake. The pipe will have capacity for the three month flow. It is proposed that flow greater than the three month flow will overflow from the wetland into a high flow channel through public open space into Lillydale Lake.

Council has the following concerns:

- Melbourne water has not confirmed if Lillydale Lake can receive un-attenuated flows from the development.
- The proposed form of the overflow channel from the wetland is a simple trapezoidal shape. The proposed outfall should enhance the amenity of the public space. A more naturalised arrangement with variable stream form (i.e. base width, bank slopes) and riparian vegetation and cluster plantings should be investigated. Given the channel will be engaged in events greater than a 3-month recurrence interval, Council would support the potential to remove the low flow pipe altogether.
- There has been some hydraulic modelling of the channel presented in the strategy which shows flows contained within the channel. To prevent the flooding of the existing Shared User Park in the reserve, a bridge will be required over the channel set at the 10% AEP flood level. It is not clear if the impact of the bridge has been included in the hydraulic modelling and Council are concerned that the bridge may cause impacts to private property in the 1% AEP event. An assessment should focus on showing minimal impact to private property

with modelling outputs showing existing and proposed flood extents and afflux (change in flood level) plots for a range of AEPs.

- An analysis of flood hazards along the channel is required and this has not been addressed in the strategy. Depths of flow in the channel are 600 mm, which is beyond safety limits outlined in Melbourne Water flood hazard guidance and Australian Rainfall and Runoff Book 6 Chapter 7. Moreover, velocities and velocities x depth have not been considered in the design. Council will not support a channel that creates a flood hazard through the park.
- Analysis is required into flow velocities through the channel and inclusion of erosion controls where required.