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City of Hume Planning Scheme Amendment C207

Statement of Expert Evidence Provided to Planning Panels Victoria

Stormwater Management Evidence for 65 Watsons Road

Prepared for Steven Galdes

Prepared by Nina Barich

1 Witness Details

1.1 Name and Address

Nina Barich

Principal Engineer

Incitus Pty Ltd

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1.2 Qualifications and Experience

I have almost 20 years' experience working in engineering related projects, focusing specifically on stormwater quantity and quality management. I have extensive experience in the development industry in relation to surface water management having worked for both the private and public sectors.

My related experience:

- I have 15 years' experience in strategic planning and design of stormwater management systems for greenfield and brownfield developments.
- In 2006 I achieved Chartered Professional Engineer status with Engineers Australia recognising skills and experience with respect to stormwater management.
- I formerly worked at Melbourne Water as Development Program Leader for the south-east region, which provided insight to the creation and implementation of Development Services Schemes for growth areas.
- I have undertaken stormwater strategies to inform Precinct Structure Plans and undertaken peer reviews of stormwater strategies undertaken for Precinct Structure Plans.
- I have participated in the creation of Development Services Schemes and Engineering Reviews of existing Development Services Schemes whilst employed by a consultant engaged by Melbourne Water.
- I have provided input to numerous industry guidelines and standards relating to drainage, including for Melbourne Water and the Victorian Planning Authority (formerly Growth Areas Authority)
- I have a sound understanding of the guidelines applicable to stormwater management for development and the role of government agencies in stormwater planning and management.
- I have attended and presented at various industry conferences and seminars.
- I lecture Civil and Environmental Engineering students at Royal Melbourne Institute of Technology in the subject of Stormwater Management and have done so for the past 8 years.

Therefore, my experience and expertise in stormwater management associated with civil engineering and development projects qualifies me to make this report.

2 Instructions

This statement has been prepared on the instruction of Urban Design and Management on behalf of Steven Galdes. I was instructed to:

- Determine if the waterway from Watsons Road could be serviced with pipe and road network to provide more developable land
- Confirm that the footprint allocated to the constructed wetland is appropriate
- Confirm if any of the landscape values area within 65 Watsons Road can be serviced by drainage

3 Information and Documentation

In preparing this statement, Nina Barich has had regard to:

- Sunbury South Precinct Structure Plan – November 2016 Exhibition – Victorian Planning Authority
- Melbourne Water's Fox Hollow Drive Development Services Scheme
- Riparian Vegetation and Geomorphology in the Sunbury Growth Area – Final Assessment – Alluvium and Biosis (October 2014)
- Stormwater Management Strategy Sunbury South and Lancefield Road – Alluvium (November 2014)
- Potentially Developable Land – Land not serviced by Development Services Scheme, Sunbury South Precinct Structure Plan – Victorian Planning Authority
- Australian Rainfall & Runoff (1997) – Engineers Australia
- Urban Stormwater Best Practice Environmental Management Guidelines (1999)
- Constructed Waterways in New Urban Developments Design Manual, Draft, Melbourne Water, 2014
- Constructed Wetlands Guidelines, Melbourne Water, July 2017
- Guidelines for the use of MUSIC, Melbourne Water, 2016
- Water Act 1989

4 The Site

The site at 65 Watsons Road Sunbury is illustrated in Figure 1. The rectangular-shaped site is bounded by Watsons Road to the south and future development to the west, north and east.

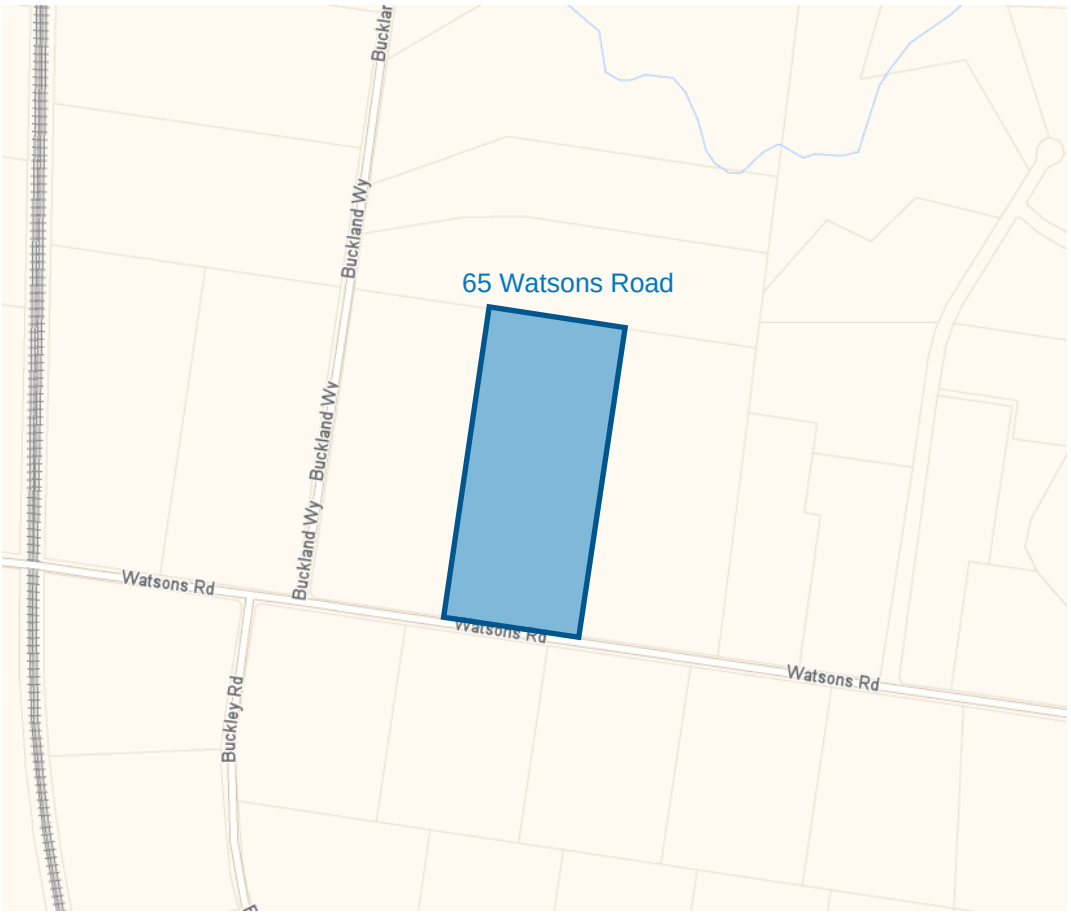

Figure 1 – 65 Watsons Road, Sunbury

The site is approximately 9 ha in area. The site generally grades from south to north, with slopes around 5%. The site has 2 existing drainage lines; a minor drainage line entering from Watsons Road and traversing the site to the north where it connects to a slightly more defined drainage line traversing the site from west to east. The site also has a tributary of Harpers Creek abutting the northern boundary. The drainage line from the west to the east of the site has a farm dam built on the watercourse. The minor drainage line from Watsons Road has a farm dam built on the south side of Watsons Road, upstream of an overgrown small pipe culvert crossing. The site is currently used for agricultural purposes and has had significant modification to the pre-European catchment form.

The site is located within the proposed Sunbury South Precinct Structure Plan and Melbourne Water's proposed Fox Hollow Drive Development Services Scheme. A Development Service Scheme plans stormwater infrastructure required for a growth area

to ensure new development meets appropriate standards for flood protection, water quality, waterway health and amenity.

The current draft Fox Hollow Drive Development Services Scheme (DSS) proposes numerous stormwater assets in the property at 65 Watsons Sunbury, including:

- A natural waterway traversing from Watsons Road to a proposed constructed wetland
- A constructed wetland built online of a natural watercourse
- Numerous pipelines connecting to the constructed wetland system and bypassing the constructed wetland system
- A constructed waterway connecting the south-west corner of the site with the natural waterway in the north-east, located along the alignment of the existing drainage line

Figure 2 illustrates an extract of Melbourne Water's Fox Hollow Drive Development Services Scheme illustrating the proposed assets within 65 Watsons Road.

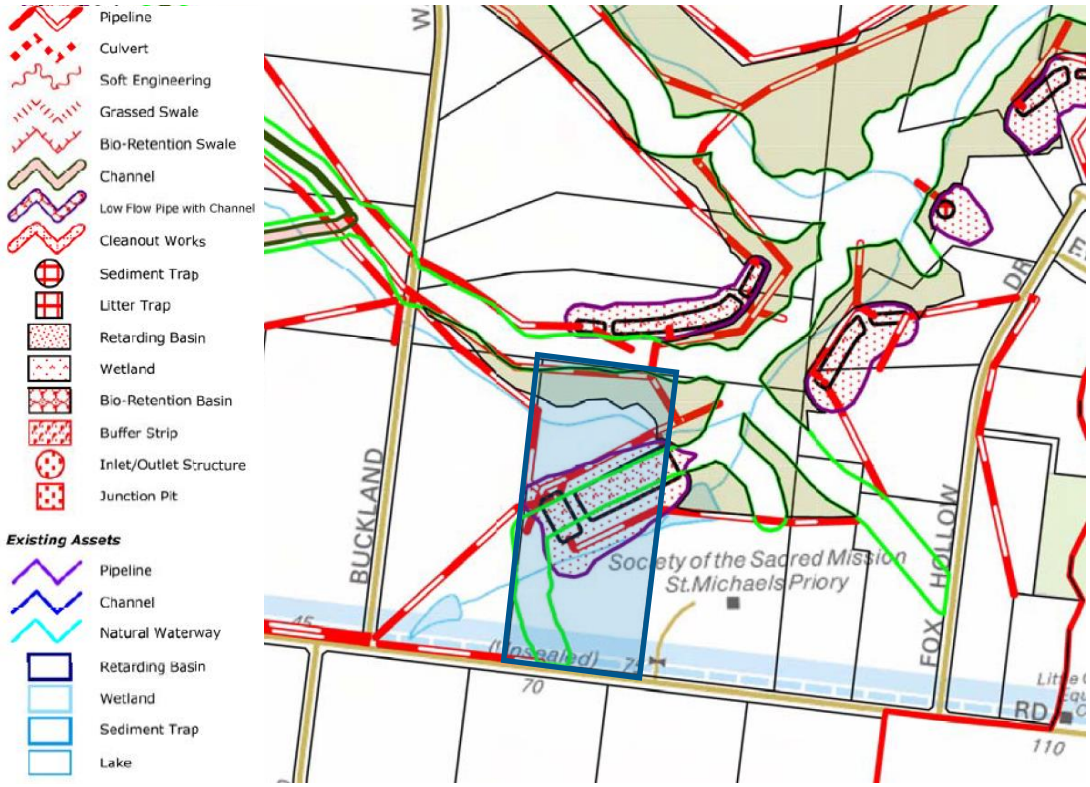

Figure 2 – Extract from Melbourne Water's Draft Fox Hollow Drive Development Services Scheme

Information provided by Victorian Planning Authority regarding the DSS waterways within 65 Watsons Road indicates that the natural waterway from Watsons Road has a 50 m wide corridor. The constructed wetland system has a footprint within the site of 3.06 ha including the online portion. The total land-take for allocated drainage reserve in 65 Watsons Road is approximately 4.1ha, or 46% of the site area. The draft Fox Hollow Drive DSS proposes approximately 22% of the site will be allocated as non-compensable drainage reserve.

The site also has approximately 1.55 ha of land that has been classified as potentially developable, but not serviced by the DSS. Together with the drainage reserve allocation, the site has only 37% land developable and serviced by the DSS.

5 Proposed Amendment to the Draft Fox Hollow Development Services Scheme

A balance is required between the protection of the natural environment and ecosystem with the viability of the development of the land and the stormwater management selected for the catchment to achieve the required level of service.

The Fox Hollow Drive Development Services Scheme (DSS) proposes the retention of a drainage line from Watsons Road and a constructed wetland system to be built on the drainage line which traverses the site from west to east.

It is proposed to replace the 50 m wide waterway from Watsons Road with a conventional pipe conveyance for minor flows and overland flow conveyance along road reserves within the development. It is also proposed to include most of the potentially developable land not serviced by the DSS within the DSS.

5.1 Waterway

The Fox Hollow Drive DSS has proposed a 50 m wide constructed waterway to convey flows from a localised undeveloped upstream catchment and a catchment piped to the waterway from west of the railway line.

The existing drainage line has an ill-defined upstream catchment of approximately 15 ha. The catchment is external to the precinct boundary. The peak 1% Annul Exceedance Probability (AEP) design flow for the catchment is estimated to be 1.7 m^3/s. A flow of this magnitude can be safely conveyed using the conventional pipe and road network. Despite this, Melbourne Water have proposed the retention of this drainage line as a natural waterway.

The drainage line traversing the site from west to east has a contributing catchment at the corner of Watsons Road and Buckland Way of approximately 82 ha. The peak 1% AEP design flow for the existing conditions (pre-developed) for this catchment is 6.3 m^3/s. This flow cannot be contained in a conventional pipe and road reserve system and would require either an increase in pipe drain sizes or conveyance with a constructed waterway. However, the draft Fox Hollow Drive DSS has not retained this drainage line upstream of 65 Watsons Road, opting to pipe the flows instead, diverting a catchment of approximately 40 ha to the retained drainage line from Watsons Road.

The existing drainage line from Watsons Road has been retained as it was identified in the Alluvium Riparian Vegetation and Geomorphology in the Sunbury Growth Area report as a waterway with high geomorphic values. It was also classified as having a high geomorphic sensitivity hydrologic change in the same report.

Diversion of the flows from the catchment that is currently contributing to the drainage line traversing the site from west to east will alter the hydrologic regime, which may in turn affect the geomorphic values from which it was proposed to be retained.

Diversion of the flows from the catchment that is currently contributing to the drainage line traversing the site from west to east will also result in a liability arising out of flow rate. Whilst the flow rate is still conveyed through the site at 65 Watsons Road; diverting the

flow to another drainage line reduces the developable land potential of the site. Approximately 0.95 ha of non-compensable land is allocated to the retention of the waterway from Watsons Road. The retention of the west to east drainage line is required due to the inability to convey flows with a conventional pipe and road network anyway. Transferring the water from that drainage line at the corner of Watsons Road and Buckland Way increases the developable land of 20 Buckland Way and reduces the potential developable land of 65 Watsons Road.

5.2 Constructed Wetland System

A high-level conceptual design has been undertaken to determine if the appropriate land-take footprint has been allocated for the proposed constructed wetland system located in 65 Watsons Road Sunbury.

To date, Melbourne Water have not released any models or specific information regarding proposed assets properties. Thus, a model was created to Melbourne Water guidelines to determine the treatment area proposed by the scheme.

It was difficult to ascertain the catchment area from the DSS map due to the high number of bypass pipes proposed in this strategy. It is estimated based on the deciphering of pipes shown on the scheme map that the catchment area for the PSP (excludes land outside of the precinct boundary) is approximately 52.3 ha. The treatment footprint required at the permanent water level is estimated to be 9,500 m^2. With a permanent water level set at approximately 185 m AHD, the asset will fit into the nominated land-take footprint with safe batters and allowance for access tracks into the asset and sediment dry-out areas.

5.3 Inclusion of the Potentially Developable Land in the DSS

The preliminary drainage contribution rates for the Fox Hollow Drive DSS effective as at 28 September 2017 is $ 356,829 per hectare of standard density residential development. These rates are based on the DSS achieving cost neutrality over the life of the scheme. They are based on estimated costs for the delivery of the stormwater assets indicated in the DSS, proportioned over the scheme area for the developable land only. The scheme can reduce the contribution rates through the reduction in the cost of the stormwater assets and an increase in developable land. At present, an area of approximately 1.55 ha of land not serviced by the DSS is located in 65 Watsons Road.

A high-level conceptual design indicated that land above a RL 186 m AHD will be able to drain into the proposed constructed wetland system located on 65 Watsons Road. The majority of the land located within 65 Watsons Road that is not currently serviced by the DSS, or approximately 1.3 ha is above this level. Therefore, this land should be included as serviced by the DSS.

It has been estimated that the treatment footprint at permanent water level would need to increase by 500 m^2 to service this additional 1.3 ha catchment and meet best practice pollutant reduction targets. The overall footprint will remain unchanged. The costs associated with the increased treatment footprint are approximately $20,000. The inclusion of the land above RL 186 m AHD in the DSS would result in an additional $603,000 in drainage contributions. Therefore, it is financially in the best interest of the DSS and the overall community to include this land for servicing in the DSS.

6 Recommendation and Summary of Opinion

The scheme should replace the waterway that enters the site from Watsons Road and routes north with a conventional pipe and road network system. The geomorphic values associated with this system are highly sensitive to changes in hydrologic regime, which the scheme is intending thus diminishing the values.

The scheme is also intending on transferring flows from the neighbouring property to the west to this waterway at 65 Watsons Road, increasing the developable land on the neighbouring property and reducing the developable land on 65 Watsons Road.

The existing 1% AEP flow contributing at this location on Watsons Road can be safely conveyed utilising a conventional pipe and road network. The conventional conveyance results in a lower overall cost to the community through the increased area of developable land which will contribute to the DSS.

The development potential for the site is increased through the removal of the constructed waterway.

The loss of the amenity associated with the waterway is negligible as the walkable catchment will contain other waterways.

The scheme should include the potentially developable land not serviced by the DSS at a level above RL 186 m AHD as it can be drained and serviced by the DSS with a positive net present value to the scheme.

7 Declaration

In preparing this statement I have made all the inquiries that I believe are expected and appropriate and no matters of significance which I regard as relevant have to my knowledge been withheld from the Panel.

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