

# WGA

WALLBRIDGE GILBERT  
AZTEC

ACP Mooringe Pty Ltd

## **Plympton Residential Development Plan Amendment**

### **STORMWATER REPORT**

Project No. WGA190190  
Doc No. 190190-RP-CV-0002  
Rev. B

01 May 2019

# WGA

---

### Revision History

Rev	Date	Issue	Originator	Checker	Approver
B	May 2019	Issue for Information	KV	RB	RB
A	April 2019	Draft Issue	KV	RB	RB

# CONTENTS

---

- 1 INTRODUCTION..... 1**
- 2 CATCHMENT HYDROLOGY ..... 2**
  - 2.1 EXISTING CATCHMENT ..... 2
  - 2.2 RE-ZONED CATCHMENT ..... 3
- 3 WATER SENSITIVE URBAN DESIGN ..... 5**
  - 3.1 GENERAL ..... 5
  - 3.2 WATER QUALITY TREATMENT REQUIREMENTS ..... 5
  - 3.3 SOIL EROSION AND DRAINAGE MANAGEMENT PLAN ..... 5

# 1 INTRODUCTION

Wallbridge Gilbert Aztec (WGA) were engaged by ACP Mooringe to complete a review of the proposed rezoning of industrial land to residential at the Former Boral Batching Plant at Plympton.

The site covers approximately 1.2 ha, and is bordered by Mooringe Avenue to the north, Gardner Street to the south and Streeters Road to the west. A locality sketch for the site can be seen in Figure 1.

The intent of this study is to identify the impact that the re-zoning of this land will have on the existing stormwater infrastructure. The study will also identify potential options/upgrades that may be required to ensure the network can cope with any increase in stormwater runoff. In addition, the study will consider potential opportunities to install water sensitive urban design (WSUD) devices.



Figure 1 - Site Locality Plan (Source: Location SA Map Viewer)

# 2

## CATCHMENT HYDROLOGY

### 2.1 EXISTING CATCHMENT

The site is currently an industrial site; the whole site appears to be paved and there were several large sheds adjacent Streeters Road/Mooringe Avenue which have now been demolished as part of the site works.

From the Locations SA Map Viewer, it can be seen that there is an existing stormwater pipe within Streeters Road and Gardner Street. This pipe originates in Gardener Street, to the east of the proposed re-zoned land, and drains towards Morphett Street. The pipe discharges to a swale running around the south of the Airport, which then discharges into the Patawalonga Creek. Refer Figure 2 for a plan showing the stormwater infrastructure around the site.



Figure 2 - Stormwater Network (Source: Location SA Map Viewer)

The existing site currently drains out to Gardner Street and Streeters Road, and the stormwater pipe network within the site that drains the existing sheds appears to connect directly underground into the Council stormwater network.

The site also falls within the broader Brownhill Keswick Creek catchment. The flood plain maps for the area; prepared as part of the BHKC Flood Study (2006); show that there is no flood risk for the site in a 1 in 100 year storm event. Refer Figure 3 for the flood plain map for the area from the Water Connect Flood Awareness Mapping Tool.

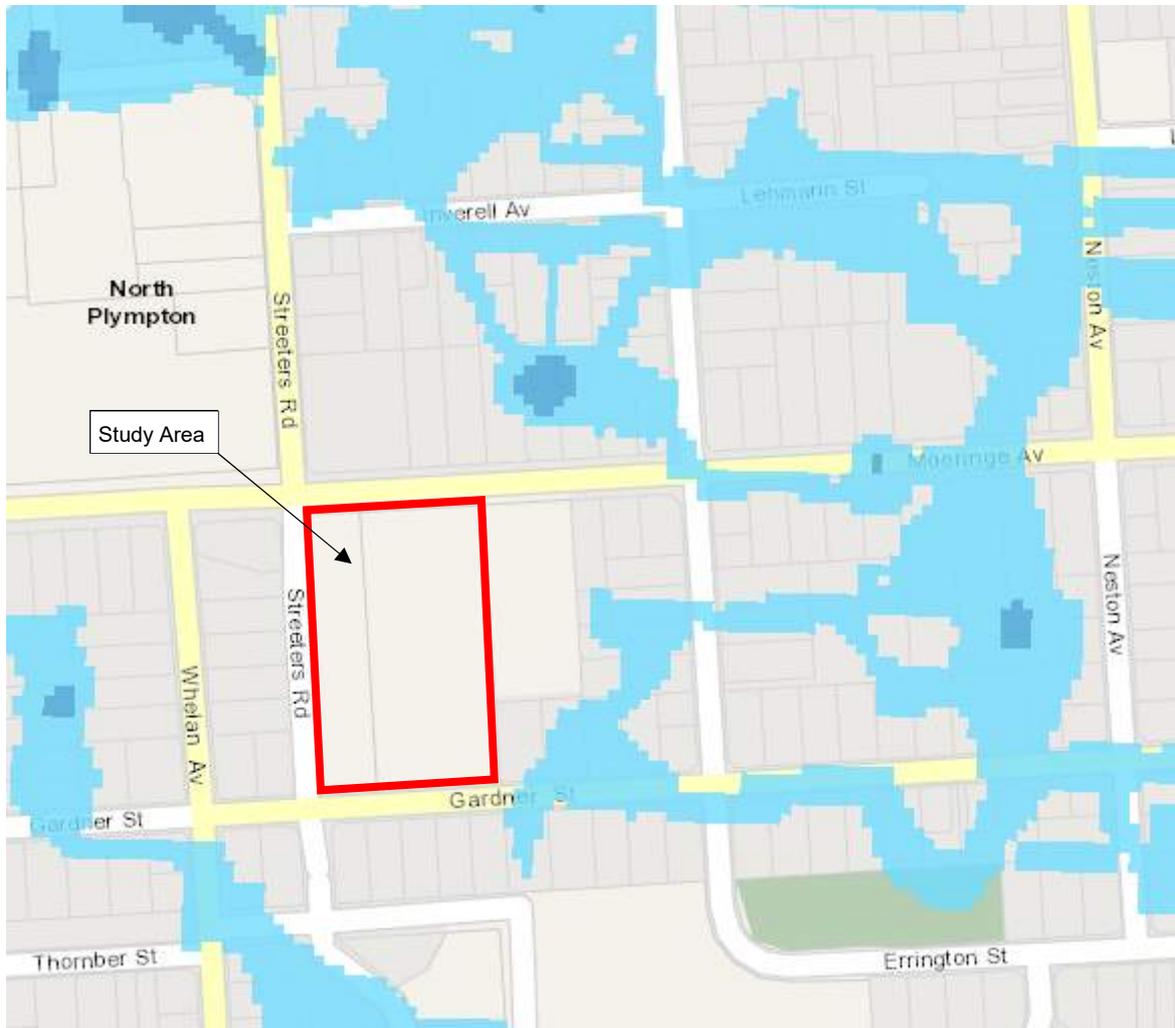


Figure 3 - Flood Awareness Map (Source: Water Connect)

## 2.2 RE-ZONED CATCHMENT

As part of the Development Plan Amendment, it is proposed for this site to be re-zoned and become residential land. Calculations were undertaken in the modelling program DRAINS to determine the expected runoff for the site.

For this model, ILSAX has been used to model catchment hydrology. The following runoff parameters were selected:

- Paved (impervious) area depression storage                    1 mm
- Supplementary area depression storage                         1 mm
- Grassed (pervious) area depression storage                    5 mm
- Soil Type     3
- Antecedent Moisture Condition                                        3

The site was assessed for area of paved, supplementary and impervious land use. A summary of the percentage breakdown assumed for the various land types can be seen in Table 1.

Table 1 - Land Use Characteristics

Land Use	% Impervious (DCP)	% Impervious (Supplementary)	% Grassed
<b>Industrial</b>	100 %	0 %	0 %
<b>Residential</b>	80 %	10 %	10 %

Rainfall data, storm losses and temporal patterns were obtained from the Australian Rainfall & Runoff (AR&R) Data Hub (Babister, M., Trim, A., Testoni, I. & Retallick, M. 2016. The Australian Rainfall & Runoff Datahub, 37th Hydrology and Water Resources Symposium Queenstown NZ).

The DRAINS model was run for both the minor storm (20 % AEP) and major storm (1% AEP) events, and results from the modelling can be seen in Table 2.

Table 2 - DRAINS Modelling Results

Land Use	Minor Storm Event (20% AEP)	Major Storm Event (1% AEP)
<b>Industrial</b>	179 L/s	402 L/s
<b>Residential</b>	183 L/s	447 L/s

From these results, it was found that detention storage would be required on site, to ensure that the runoff for the residential site does not exceed the runoff from the industrial site. For the minor storm event, approximately 25 m<sup>3</sup> of storage would be required so the site runoff does not exceed the pre-development runoff, and approximately 55 m<sup>3</sup> is required for the major storm event.

As part of the detailed design for the site, further consideration will need to be given to understand how this detention storage will be accommodated on site. Either a detention basin could be installed, or the storage could be provided underground within pipes/detention tanks. Given the low volume of storage required, it is likely than an underground system will be installed however this will be dependent on the inverts of the adjacent stormwater network.

# 3 WATER SENSITIVE URBAN DESIGN

## 3.1 GENERAL

The implementation of a WSUD strategy will facilitate opportunities for environmental enhancement within the re-zoned land. A treatment train approach will be adopted for the site, and it is currently proposed to install rain gardens or tree pits; or a similar treatment device; throughout the site to treat the stormwater runoff from the roads/road reserves.

## 3.2 WATER QUALITY TREATMENT REQUIREMENTS

The design of the site treatment systems should comply with the standards as defined by the South Australian EPA Water Quality Policy [EPP Water Quality (2003)], Council's Standards and Guidelines and the WSUD best management practice pollutant reduction targets as defined in the WSUD Guidelines for the Greater Adelaide Region.

Based on the EPP Water Quality (2003) for fresh water environments, the listed pollutant concentrations will be used as the limiting targets. These are based on the general water quality criteria in Schedule 2 Table 1 EPP (2003).

### *EPP Water Quality Criteria*

Total Phosphorous	=	0.5 mg/L
Total Nitrogen	=	5 mg/L
Suspended Sediment	=	20 mg/L

The results obtained will also be compared to the WSUD Guidelines for the Greater Adelaide Region, which are based on recognised Australian best practice.

### *WSUD Guidelines Water Quality Criteria*

Total Phosphorous	=	60% Removal
Total Nitrogen	=	45% Removal
Suspended Sediment	=	80% Removal
Gross Pollutants	=	90% Removal

## 3.3 SOIL EROSION AND DRAINAGE MANAGEMENT PLAN

During the construction phase of the site works, a Soil Erosion and Drainage Management Plan (SEDMP) shall be implemented in accordance with the Environment Protection Act 1993. A plan will be prepared to meet the requirements in accordance with the Code of Practice for the Construction and Building Industry (1999) during the final documentation phase.

The SEDMP will encompass surface stormwater management practices that shall be implemented during the construction phase. The SEDMP will provide a guide to the constructor to plan site management measures that should be implemented in order to prevent sediment and pollutant exports during the construction stages. Whilst the site's conditions will change as the construction progresses, it is the environmental duty of the constructor to ensure that the site SEDMP is progressively maintained and upgraded to suit.

The SEDMP shall include and not be limited to, sediment trap / basin, silt fences, diversion swales to control site flow, single site access point with shaker pad and other measures as deemed necessary. The design of the SEDMP will be undertaken as part of the detailed design phase.



Kate Vugts  
CIVIL ENGINEER

Telephone: 08 8223 7433  
Email: [kvugts@wga.com.au](mailto:kvugts@wga.com.au)

---

**ADELAIDE**

60 Wyatt St  
Adelaide SA 5000  
Telephone: 08 8223 7433  
Facsimile: 08 8232 0967

**MELBOURNE**

Level 2, 31 Market St  
South Melbourne VIC 3205  
Telephone: 03 9696 9522

**PERTH**

Level 1, 66 Kings Park Road  
West Perth WA 6005  
Telephone: 08 9336 6528

**DARWIN**

Suite 7/9 Keith Ln  
Fannie Bay NT 0820  
Telephone: 08 8941 1678  
Facsimile: 08 8941 5060

**WHYALLA**

1/15 Darling Tce  
Whyalla SA 5600  
Phone: 08 8644 0432

**WALLBRIDGE GILBERT AZTEC**

[www.wga.com.au](http://www.wga.com.au)  
[adelaide@wga.com.au](mailto:adelaide@wga.com.au)

---