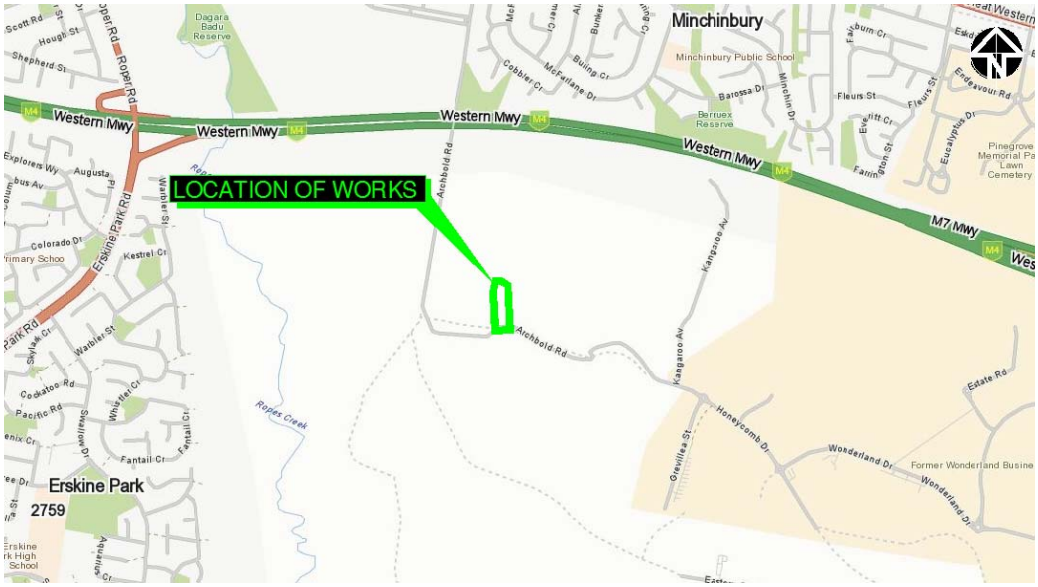
Pre-Sorting Centre, Eastern Creek



Section 75W Approval - Stormwater Management

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Finalisation signatures

The design described in this report is considered to have been finalised.

Signature	**Date**
Frank Xie Civil Engineer (Author)	15/12/14
Anthony McLandsborough Director	15/12/14

Notes: The finalisation signatures shown above do not provide evidence of approval to the design. Approval signatures are shown on the title sheet of the design plans.

Contents

LIST OF FIGURES AND TABLES

APPENDIX

1 Introduction

1.1 Project Description

The proposed development involves the construction of a Pre-Sorting Centre for Dial a Dump Industries Pty Ltd (DADI) in Eastern Creek approximately 36km west of the Sydney CBD.

The development involves the construction and operation of a Pre-Sorting Centre north of the Energy from Waste Plant (EWP).

Figure 1 - Site Location Plan

2 INTRODUCTION

At&L have been engaged by DADI to under the Civil Design and Documentation for a Section 75W Application for the above mentioned Pre-Sorting Centre.

The purpose of this report is the reassess the existing drainage infrastructure capacity and determine of upgrade is required.

This report should be read in conjunction with the following AT&L Development Applications 14-187 drawings dated December 2014 (Appendix E):

DAC000	COVER SHEET AND LOCALITY PLAN
DAC001	NOTES AND LEGENDS
DAC003	BULK EARTHWORKS CUT AND FILL PLAN
DAC004	TYPICAL SECTIONS SHEET 1
DAC005	TYPICAL SECTIONS SHEET 2
DAC010	GENERAL ARRANGEMENT PLAN
DAC011	SITEWORKS AND STORMWATER DRAINAGE PLAN SHEET 1
DAC012	SITEWORKS AND STORMWATER DRAINAGE PLAN SHEET 2
DAC013	SITEWORKS AND STORMWATER DRAINAGE PLAN SHEET 3
DAC020	PAVEMENT PLAN
DAC021	EROSION AND SEDIMENTATION CONTROL
DAC030	SITEWORKS DETAILS
DAC031	DRAINAGE DETAILS

2.1 SCOPE

This report generally covers the following items:

- Assess existing Southern On-Site Detention (OSD) Basin Capacity.
- Assess existing Water Sensitive Urban Design (WSUD).
- Review and compare previous documentations to determine if proposed design was incorporated.
- Document the proposed onsite stormwater drainage design.

2.2 Previous Documents

Site Surface Water Management Plan
Prepare by Storm Consulting Pty Ltd, November 2008 - Appendix A

Volume Capacity Southern Basin
Prepared by G R Hawkes and Associates, 2010 – Appendix B

Consolidated Stormwater Management Plan
Prepared by Martens and Associates Pty Ltd, October 2011 - Appendix B

Updated Basin Survey consolidated with overall existing site model.

3 STORMWATER MANAGEMENT

3.1 The Site

The subject site is located south west of the existing Genesis MPC facility. The development has a total operational area of approximately 1.64 Ha which includes the warehouse and hardstand areas, with a landscaped batters approximately 1.1 Ha. The site is located within the Blacktown City Council Local Government area (LGA).

The site is currently undeveloped and is located north of the proposed EFW Plant. The site is located adjacent to a car park to the east and an access road to the north. The site is located within an earth mound which generally falls to the east towards the car parking. This is then drained into a swale to the south and flows to the west into the southern On-Site Detention Basin.

3.2 Council Requirements

As the site falls within the Blacktown City Council LGA the civil and stormwater design principles have been designed to comply with the BCC Engineering Guide for Development. The proposed site falls within Catchment 4 in the all other areas of the Hawkesbury river catchment.

A summary of Council requirements adopted is listed below:

Catchments 4 (All Other Hawkesbury River Sub-Catchments	% impervious surface	
	100%	80%
Max. Permissible Site Discharge(l/s/ha)	147	56
Site Storage Requirements (m^3/ha)	264	473

Table 1 - On Site Detention Requirements

- WSUD to achieve target reductions:
  - 85% Total Suspended Solids (TSS)
  - 65% Total Phosphorus (TP)
  - 45% Total Nitrogen (TN)
  - 90% Total Hydrocarbons
  - 90% Gross Pollutants (GP)
- Finished Floor Levels (FFL) to have minimum 300mm freeboard to 100 year overland flows.

- In accordance with Blacktown City Council DCP Part R, rainwater tanks must be installed within the developed site with the aim to reduce the water demand for the development by a minimum of 80%. Rainwater tanks are an effective system to provide non-potable water for reuse for irrigation, toilets and other non-potable water uses. The rainwater tanks should be designed in accordance with *Rainwater Tank Design and Installation Handbook, Australian Rainwater Industry Development Group, November 2008*.

4 Existing OSD Basin Capacity

4.1 On-Site Detention (OSD)

There are two OSD basin (northern and southern) mentioned in previous reports; Site Surface Water Management Plan, prepare by Storm Consulting Pty Ltd, November 2008 (Appendix A) and Consolidated Stormwater Management Plan, prepared by Martens and Associates Pty Ltd, October 2011 (Appendix B). The focus of this report will be the southern basin, as the proposed development falls within this catchment.

The southern basin capacity table (derived from Land Partners Survey, April 2012).

Elevation (mAHD)	Description	Volume of Basin (m^3)	Volume of Storage (m^3)
58.48	Permanent Water Level	746	0
59.60	Top of Surcharge Pit	2369	1623
60.50	Top of Overflow Weir	3973	3227

Table 2 - On Site Detention Basin Capacity

Existing outlets details:
Orifice - 475 Diameter centre elevations of 59.337
Weir - Crest length of 10m at RL 60.5.

As mentioned within Section 3.2 it is a requirement of Blacktown City Council to have the OSD for this site be designed to comply with the Upper Parramatta River Catchment Trust (Catchment 4, others).

4.2 Results

As a result the following OSD parameter and conditions apply to this development as per Table 1:

- Maximum PSD (Permitted Site Discharge) = **147L/sec/Ha**
- SSR (Site Storage Requirement) = **264m^3/Ha**

Given the total developed site is 4.75 Ha the following rates would apply:

Maximum PSD = 147 x 4.75 = **698 L/sec (for 100 year ARI event)**

And SSR = 264 x 4.75 = **1254m^3**

Results

The existing basin has a maximum storage of 3227 m^3 results of the drains model also indicate the following targets are achieved:

	50 YR ARI (m^3/s)		100 YR ARI (m^3/s)	
Duration	**Existing**	**Developed**	**Existing**	**Developed**
Peak	1.39	0.644	1.60	0.689

Table 2- Pre-Post Developed Flows (With OSD)

These results are very similar to the Martens' report in appendix B, as the developed catchment areas are lower. This is due to the EWP development to the south, as a portion of the previously calculated areas (Martens report) is directed to EWP drainage catchment.

5 Existing Water Quality

5.1.1 Policy and Guidelines

Water Sensitive Urban Design encompasses all aspects of urban water cycle management, including water supply, wastewater and stormwater management. WSUD is intended to minimise the impacts of development upon the water cycle and achieve more sustainable forms of urban development.

The stormwater design considers the following guidelines:

- Australian Rainfall Quality (2006)
- Department of Environment and Climate Change NSW (DECC), Management Urban Stormwater: Urban Design (Consultation Draft, 2008)
- Blacktown City Council Stormwater Quality Control Policy (2001, reviewed 2009)
- Landcom Water Sensitive Urban Design Policy (2009)

5.1.2 MUSIC Analysis

The MUSIC Model for Urban Stormwater Improvement Conceptualisation (MUSIC, Version 5.00.10) was used to evaluate pollutant loads from the developed site for Post-development (treated) conditions based on the proposed site development.

A conceptual view of the MUSIC model used in this report can be found in Appendix B.

5.1.3 Catchment Areas and MUSIC Parameters

Catchments used for nodes are outlined below:

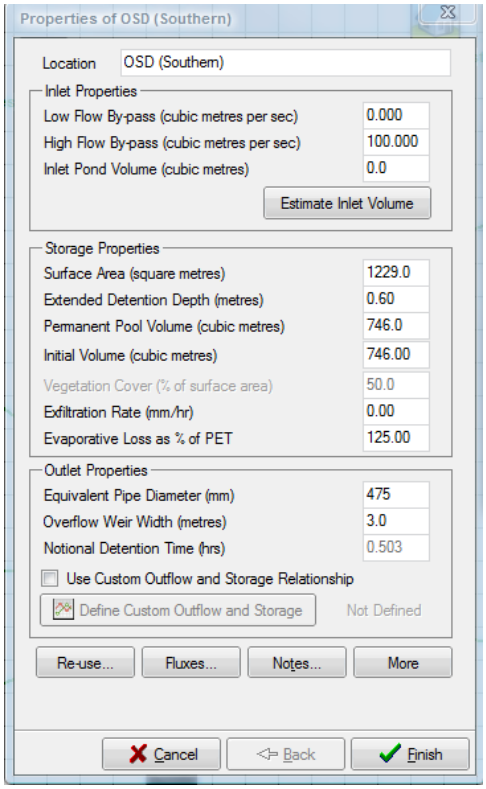
Node Name	Description	Impervious (ha)	Pervious (ha)
West Landscape	Landscaped areas and Batters	0	3.88
East Landscape	Landscaped areas and Batters	0	1.05
Road Area - Existing	Existing Access Road and Parking Area	1.496	0
Roof Areas - Existing	Existing Sheds	0.131	0
Estate Road	Portion of estate road in separate approval.	0.435	0

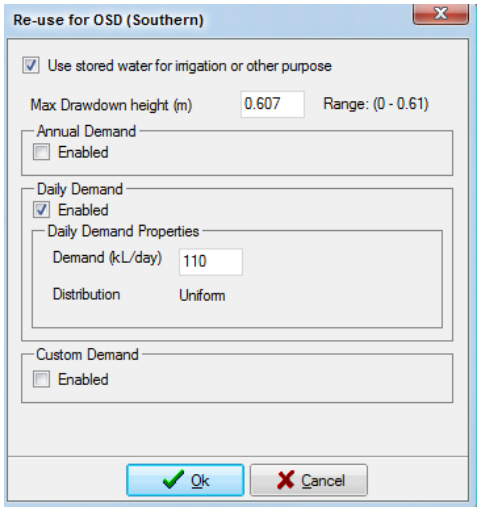
Hardstand - New	Proposed Hardstand	0.692	0
Roof - New	Proposed Warehouse Roof	0.945	0

Table 4- Music Model Catchments

Southern OSD Basin

The Basin parameters are modelled as below:





The extended detention depth provided an additional 500m^3 storage. This is for re-use during dry seasons. DADI confirmed average daily use as 110kL per day as noted in Martens stormwater report in Appendix B.

Rainwater Tank

Assumed size of 5kL tank are modelled, with minimal rainwater re-use for landscape.

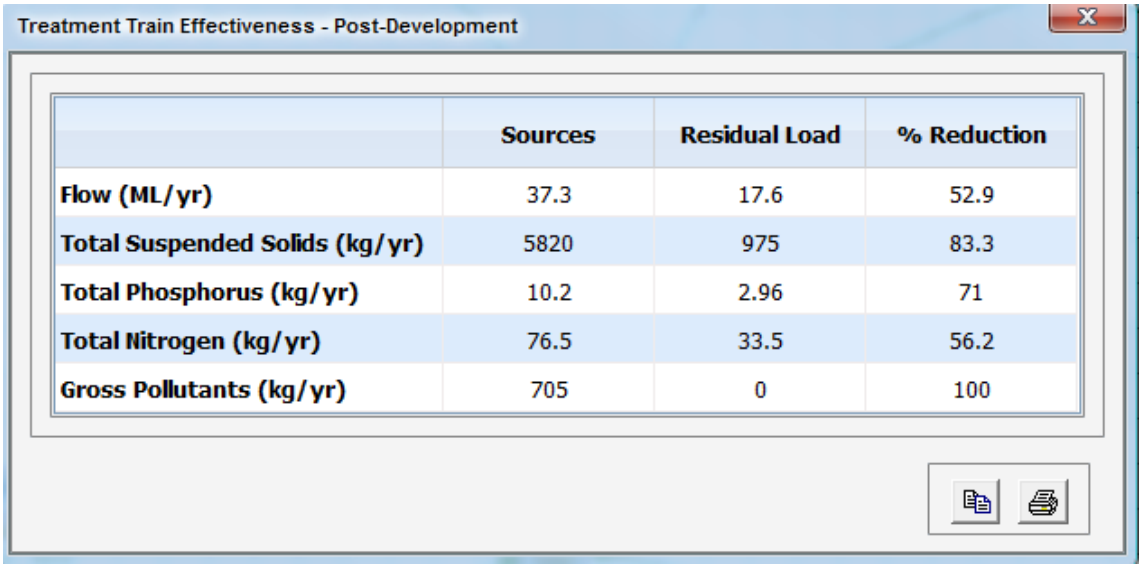
Gross Pollutant Trap

The assumed GPT used in the MUSIC model was adopted from parameters for a "CDS 1015" GPT unit.

5.2 Results

MUSIC modellings results presented as mean annual loads at the receiving node indicate that adopted target reductions are achieved. These results were similar to Martens' report in Appendix B.

The catchment sizes and reduction both differ to both "Storm Consultants" and "Martens". This is largely due to the Estate Road and the EWP proposal to the south. This is drained to a Bioretention swale/basin further south.
Refer to Appendix D for Music catchment plans.



	Sources	Residual Load	% Reduction
Flow (ML/yr)	37.3	17.6	52.9
Total Suspended Solids (kg/yr)	5820	975	83.3
Total Phosphorus (kg/yr)	10.2	2.96	71
Total Nitrogen (kg/yr)	76.5	33.5	56.2
Gross Pollutants (kg/yr)	705	0	100

Table 5- Music Model Results

6 Conclusion

The results presented in this report demonstrates the OSD basin with extended detention (permanent) has enough capacity to satisfy both the detention and the water quality requirements.

This report has demonstrated that a storm water system consistent with good management practices can be provided for the proposed development.

Appendix A

Site Surface Water Management Plan
Storm Consulting Pty Ltd

Appendix B

Consolidated Stormwater Management Plan
Martens

Appendix C

OSD Catchment Plan

Appendix D

Music Data and Catchment Plan

Appendix E

Civil Siteworks and Drainage Plans