



06 September 2010

Goodman International  
Level 10 60 Castlereagh Street  
Sydney NSW 2000

Our ref: 21/18115/162340  
Your ref:

Attn: Richard Seddon

Dear Richard,

## **Metcash Facility Stormwater Management Strategy**

### **1 Introduction**

This letter report has been prepared as an addendum to the Water Sensitive Urban Design (WSUD) Strategy report prepared by EDAW (EDAW, October 2009). This addendum specifically considers the works proposed under the Project Application for the Metcash Facility which involves the development of the Metcash site located within the south eastern corner of Bungarribee Industrial Estate. The Metcash stormwater management strategy has been developed with due consideration to the overall WSUD Strategy for the Bungarribee Industrial Estate.

The Metcash Facility is proposed to be developed while all lots within the Bungarribee Industrial Estate to the north of the Huntingwood Drive extension remain vacant (undisturbed). However, the bulk earthworks operations required to create the building pad for Metcash will also include the earthworks for the large residue lots 1 and 2 to the west of the Metcash site. As a result, the stormwater management strategy for the Metcash site will also have to give consideration to the adjoining residue lots.

Figures 1 and 2 provides a diagrammatic representation of the proposed stormwater management strategy for the Metcash site and the residual western lots referred to in the following sections.

### **2 Internal Site Drainage**

The Metcash site will be predominately impervious being made up of pavements, carparks, loading docks and buildings. The Metcash site is split into two main catchments (northern and southern) and the overland flow from these catchments will be directed either towards the proposed channel to the south of the site, or the proposed extension of Huntingwood Drive to the north of the site. A pit and pipe network will be designed to collect and convey stormwater runoff from the Metcash site including:

- ▶ Pipe network designed to cater for the 1 in 20 year ARI without surcharge collecting stormwater runoff from the site and rainwater tank overflows. The pipe network will direct stormwater to discharge points at the south and north western corners of site;
- ▶ Provision of GPT's at each site discharge point;
- ▶ Connection of southern catchment site stormwater system to the proposed southern channel via headwalls;

- ▶ Connect of northern catchment site stormwater system to the future pipe network along the proposed Huntingwood Drive extension; and
- ▶ Provision for overland flow paths from the site to ensure safe conveyance of major storm events (up to 100 year ARI).

Figure 2 shows a concept pit and pipe network with associated pipe sizes. A preliminary DRAINS model has been prepared associated with the concept site drainage network.

### 3 Stormwater Quantity

Stormwater detention for the whole of the Bungarrabee Industrial Estate is to be provided on a precinct level basis within the proposed constructed wetland and bio-retention basins, located to the west to the site adjacent to Eastern Creek (refer Figure 1). Detention will be provided for the 1.5 and 100 year ARI storm events. Stormwater detention will be provided for the Metcash site via the construction of a portion of the proposed wetland.

From the RORB hydrologic modelling performed as part of the WSUD Strategy report (EDAW, October 2009). It was found that a permissible site discharge (PSD) of 147L/s/ha for the 100-year Average Recurrence Interval (ARI) event was required to satisfy Blacktown City Council requirements for discharge to Eastern Creek. Given the PSD requirements, the storage volume required to attenuate the 100 year ARI flows from the Metcash site equates to a volume of 35,000m<sup>3</sup> (refer Table 1).

**Table 1 Detention Parameters (100-year ARI Event)**

Location	OSD (m <sup>3</sup> )	PSD (l/s)
Metcash Facility	35,000	2,650

### 4 Stormwater Quality

Stormwater quality treatment for the Metcash Facility will be predominately provided via the construction a portion of the precinct scale constructed wetlands (refer Figure 1), namely:

- ▶ Constructed wetland (portion);
- ▶ Southern inlet zone sediment basin;
- ▶ Southern channel;
- ▶ Northern inlet zone sediment basin; and
- ▶ Temporary wetland bypass channel.

From the MUSIC model prepared as part of the WSUD Strategy report (EDAW, October 2009) it was calculated that the required area of the wetlands to be constructed in order to treat stormwater flows from the Metcash site is 9,000m<sup>2</sup> of the proposed total of 16,600 m<sup>2</sup>.

Construction of 9,000m<sup>2</sup> of the wetland basin will provide a pollutant load reduction from the Metcash site of as least:

- ▶ 85 percent pollutant load reduction in TSS;
- ▶ 65 percent pollutant load reduction in TP; and

- ▶ 45 percent pollutant load reduction in TN.

Reductions in gross pollutant and total hydrocarbons loads will be achieved via the installation of GPT's at the discharge points from the Metcash site stormwater system to the estate trunk infrastructure.

The construction of the portion of wetlands required to service the Metcash site will be staged so that vegetation is not installed until the residue lots 1 and 2 have been stabilised (vegetated) so that sediment export from these vacant sites is minimal.

To further minimise impact on the constructed wetlands by potential sediment loads, a temporary bypass will be constructed so that Lot 1 of the western residue land area does not drain through the constructed wetlands. Instead, this lot will drain to the central inlet zone sediment basin and then around the wetlands via the temporary bypass (refer Figure 1). The bypass channel will be removed once Lot 1 is developed.

## **5 Flooding**

A flood study has been carried out as part of the Concept Plan application for the whole Bungarribee Industrial Estate by Bewsher Consulting. The Metcash facility does not lie within the 100 year or PMF flood extents of Eastern Creek.

## **6 Conclusion**

The proposed stormwater strategy adopted for the Metcash facility site is in accordance with the overall WSUD strategy developed by EDAW for the Bungarribee Industrial Estate. The proposed stormwater management strategy is summarised as follows:

- ▶ Internal site pit and pipe network designed to cater for the 1 in 20 year ARI will direct stormwater to discharge points at the south and north western corners of site;
- ▶ Provision of GPT's at each discharge point; and
- ▶ Runoff from the site will drain to precinct level stormwater infrastructure (constructed wetlands that incorporate stormwater detention) before runoff discharges to Eastern Creek

Yours faithfully  
GHD Pty Ltd

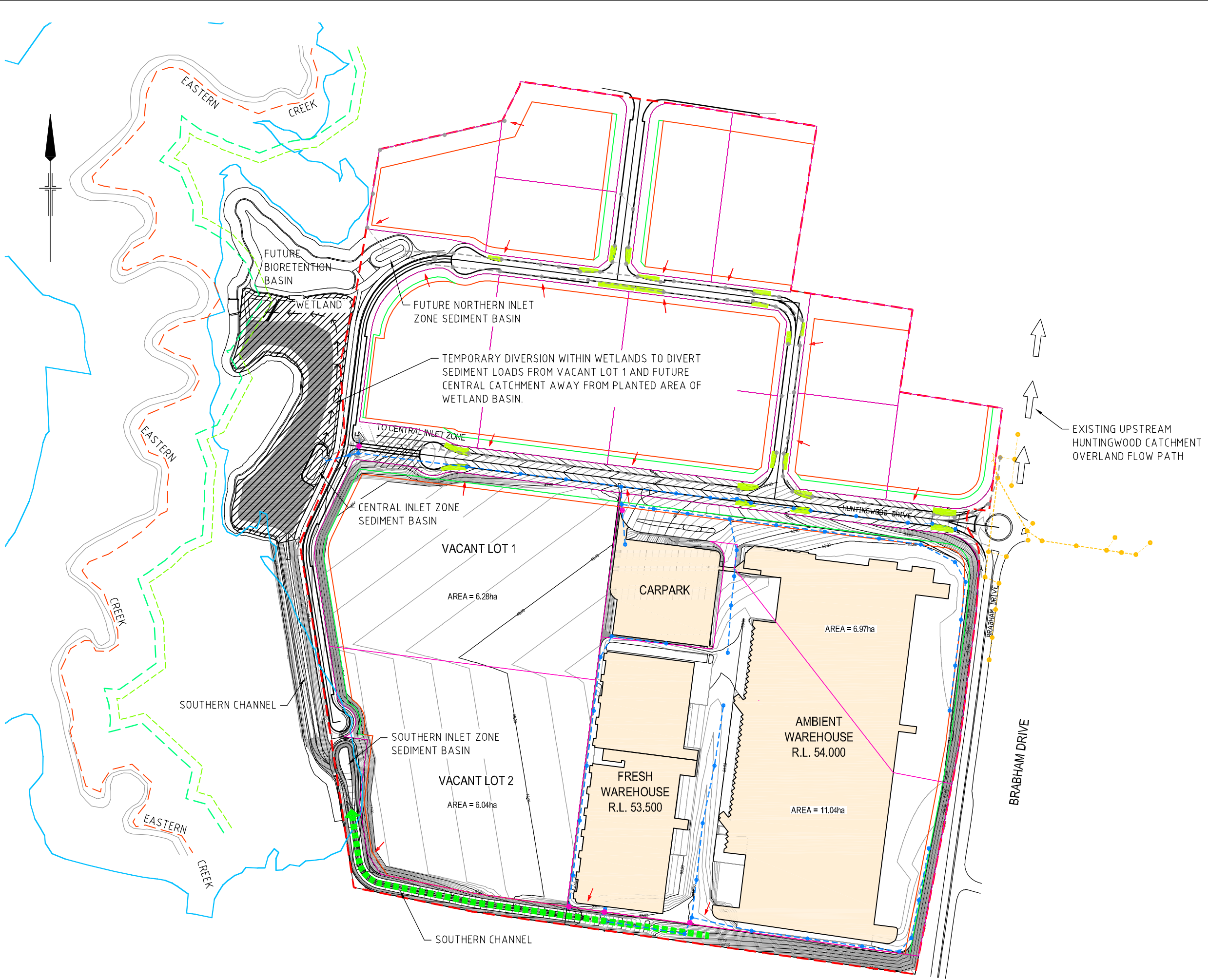


**Frank Carrozza**

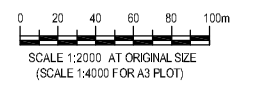
Senior Civil Engineer  
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Attachments

1. Figure 1 - Stormwater Management Strategy
2. Figure 2 - Concept Site Drainage System



- LEGEND**
- EXISTING STORMWATER PIPE / PIT / HEADWALL
  - PROPOSED STORMWATER PIPE / PIT / HEADWALL
  - FUTURE STORMWATER PIPE / PIT / HEADWALL
  - PROPOSED GROSS POLLUTANT TRAP
  - INDICATIVE CONNECTION POINT
  - ECO VERGE
  - ON SITE DETENTION Vol=35,000m<sup>3</sup> (APPROX 2m DEPTH)
  - WET LAND AREA A=9,000m<sup>2</sup>
  - CATCHMENT BOUNDARY
  - SITE BOUNDARY
  - EASTERN CREEK 1 IN 100 YEAR FLOOD EXTENT
  - EASTERN CREEK TOP OF BANK
  - EASTERN CREEK 40m WIDE RIPARIAN CORRIDOR
  - EASTERN CREEK 10m WIDE RIPARIAN BUFFER



**PRELIMINARY**

rev	description	app'd	date
C	MINOR AMENDMENTS	CM	06.09.10

Goodman  
Metcash Facility  
**Concept Stormwater Management Strategy**

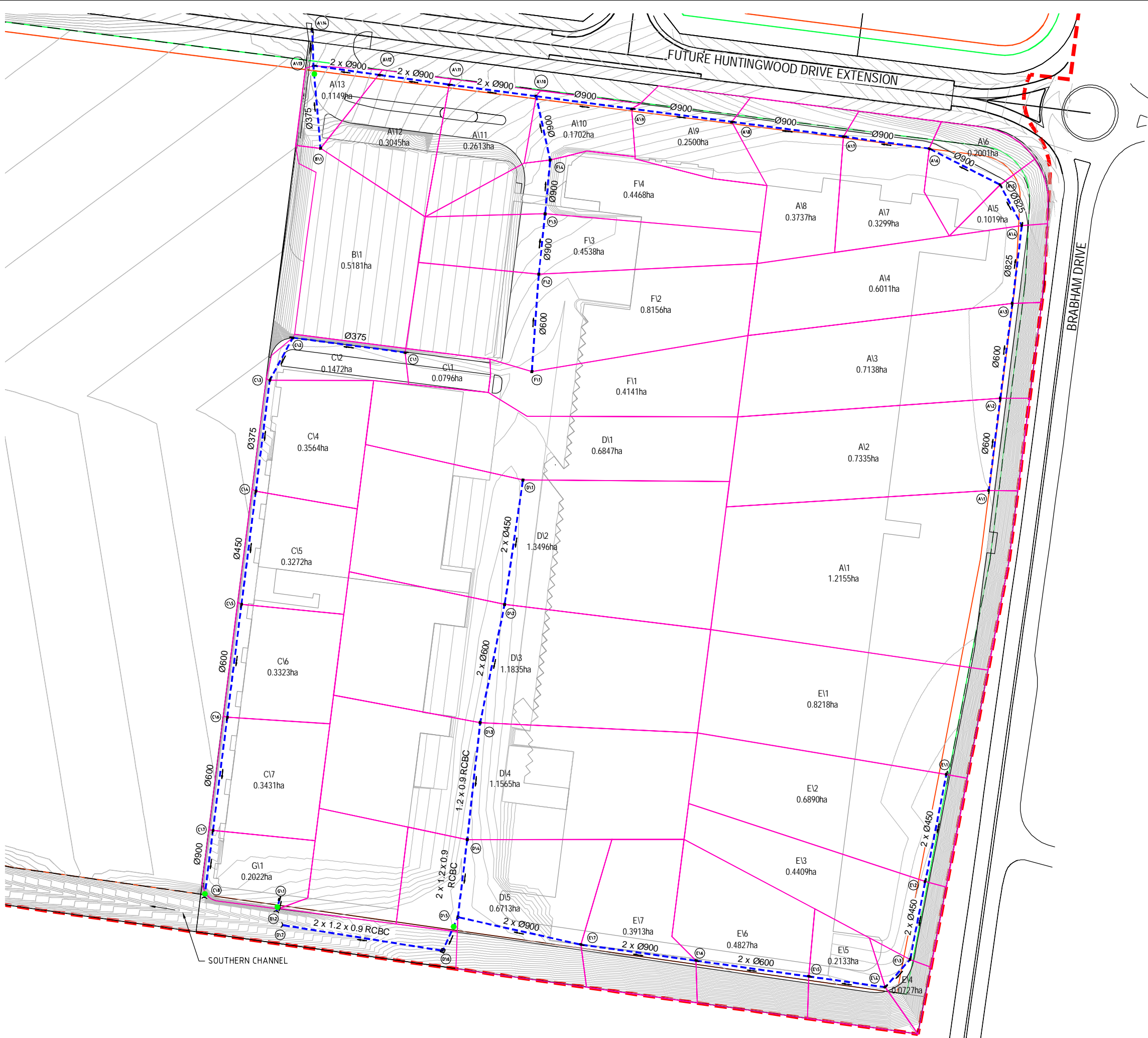


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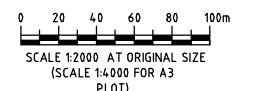
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approved ..... **SK066**



**LEGEND**

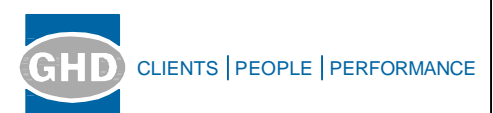
- PROPOSED STORMWATER PIPE / PIT / HEADWALL
- PROPOSED GROSS POLLUTANT TRAP
- CATCHMENT BOUNDARY



**PRELIMINARY**

rev	description	app'd	date
A	INITIAL ISSUE	CM*	06.09.10

Goodman  
Metcash Facility  
Concept Site  
Drainage System



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