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# Statement of Environmental Effects

## Griffith Hatchery Snaidero Road, Griffith

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## Document Control

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Statement of Environmental Effects  
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**This document has been prepared for:**

Bartter Enterprises Pty Limited


**Contact:** Mr Dean Kent  
Group Engineer  
Baiada Poultry Pty Limited  
PO Box 21  
Pendle Hill NSW 2145

**This document has been prepared by:**



**Contact:** David Ireland  
PSA Consulting (Australia) Pty Ltd  
PO Box 15339 City East QLD 4002  
Telephone +61 7 3220 0288  
[david@psaconsult.com.au](mailto:david@psaconsult.com.au)  
[www.psaconsult.com.au](http://www.psaconsult.com.au)

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1	20 December 2013	DRAFT	Sarah Stirling	David Ireland 

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# 1 INTRODUCTION

PSA Consulting has been engaged by Bartter Enterprises Pty Ltd to prepare this Statement of Environmental Effects (SEE) to accompany a Development Application seeking Development Consent for a proposed new, purpose built chicken hatchery on the site of the existing hatchery at 1311 Snaidero Road, Griffith. The proposed new hatchery will be constructed in 2 stages and provide for a staged increase hatching capacity at the site from 750,000 to a maximum capacity of 3 million chicks per week.

The proposed increase in capacity is required to meet the projected growth of poultry production in the region and supplier consumer demand for chicken meat products in Australia.

This Statement of Environmental Effects is set out as follows:

<b>SECTION 1</b>	Introduction.
<b>SECTION 2</b>	Details of the site and its surrounds.
<b>SECTION 3</b>	Describes the proposed development.
<b>SECTION 4</b>	Provides an assessment against the relevant environmental planning controls.
<b>SECTION 5</b>	Provides an assessment of potential environmental impacts.
<b>SECTION 6</b>	Provides conclusions and recommendations.

## 1.1 JOINT REGIONAL PLANNING PANEL

Under Division 3, Section 23G, and Schedule 4a of the *Environmental Planning and Assessment Act 1979*, Joint Regional Planning Panels (JRPP) may be authorised to exercise consent authority functions of councils where the proposed development has a capital investment value of more than \$20 million.

As the proposed development will have a capital investment value of \$38 million, the JRPP will have any of Council's functions as Consent Authority in accordance with Section 23G (2) of the *Environmental Planning and Assessment Act 1979*. The Consent Authority for this Development Application is therefore the Western Joint Regional Planning Panel.

## 1.2 SITE DETAILS

<b>Address:</b>	1311 Snaidero Road, Griffith, NSW, 2680
<b>Property Description:</b>	Lot 2 on DP 1044004
<b>Registered Owner:</b>	Bartter Enterprises Pty Limited
<b>Applicant:</b>	Bartter Enterprises Pty Limited
<b>Local Authority:</b>	Griffith City Council
<b>TLEP Zoning:</b>	Zone 1(e) Rural Industry Griffith Local Environmental Plan 2002
<b>Total Site Area:</b>	31.47 Ha
<b>Existing Use:</b>	Hatchery producing 750,000 chicks per week
<b>Proposal:</b>	New Hatchery producing 3 Million chicks per week

## 1.3 SITE OWNER & OPERATOR

Bartter Enterprises Pty Limited (including the Steggles Business) is part of the Baiada Group of Companies (Baiada). Baiada is a privately owned Australian company which provides premium quality poultry products throughout Australia. The Baiada business is a fully integrated poultry operation encompassing Broiler & Breeder Farms, Hatcheries, Processing Plants, Feed Milling and Protein Recovery. Baiada's products include the sale of live poultry (including breeding stock), poultry feed, fertile eggs, day old chickens, primary processed chicken (raw), processed chicken products, and pet food.

Baiada is Australia's largest poultry producer and currently provides approximately 35% of the domestic poultry meat per annum.

The company has its head office at Pendle Hill, 30km west of Sydney CBD, with major operating centres located across Australia. Baiada have a current employee base of approximately 6,000 people and remains privately owned by the Baiada family.

## 1.4 AUSTRALIAN POULTRY INDUSTRY CONTEXT

Research undertaken by the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) indicates that the production of poultry meat in Australia has increased by 55% over the past ten years. Based on current projections, production is expected to grow by another 8% in the next three years. ABARES estimates that Australian poultry production in 2012 - 2013 will be in the order of 1,070,527 tonnes, equating to 580 million birds.

This increase is projected to continue over the medium term with a forecast growth rate of 3% a year, reaching 1,159,602 tonnes (628.3 million birds) by 2015 - 2016. The existing and projected growth of chicken meat production in Australia is outlined in Figure 1 below.

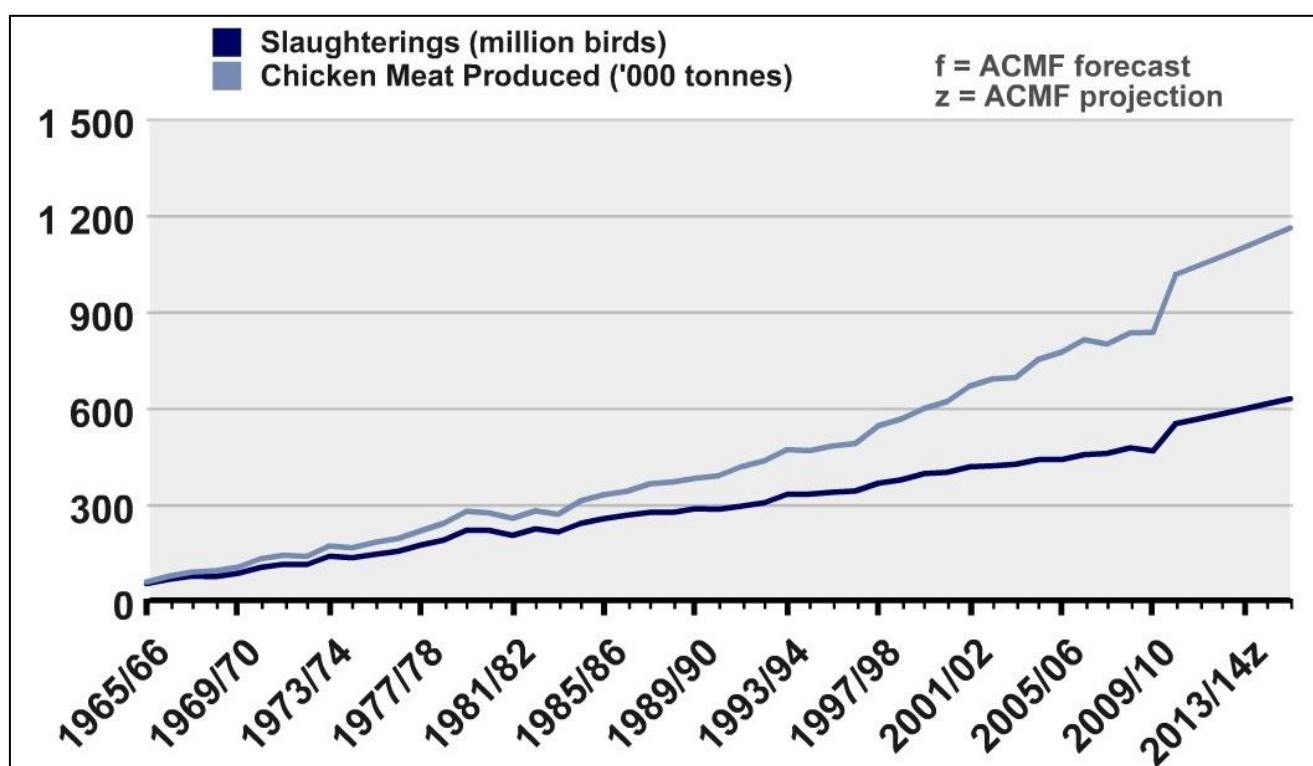


Figure 1: Chicken Meat Production in Australia (ABARE, 2011)

The ABARES commodities report on Poultry for the March Quarter (2011) indicates that poultry is currently Australian consumers' most preferred meat (surpassing beef in 2006) and is forecasted to maintain this position into at least 2015. Per capita poultry consumption is forecast to rise by 2% from 46.1kgs in 2012-2013 to reach around 47kgs by 2015-2016. Figure 2 identifies the projected increase in the consumption of chicken meat in Australia.



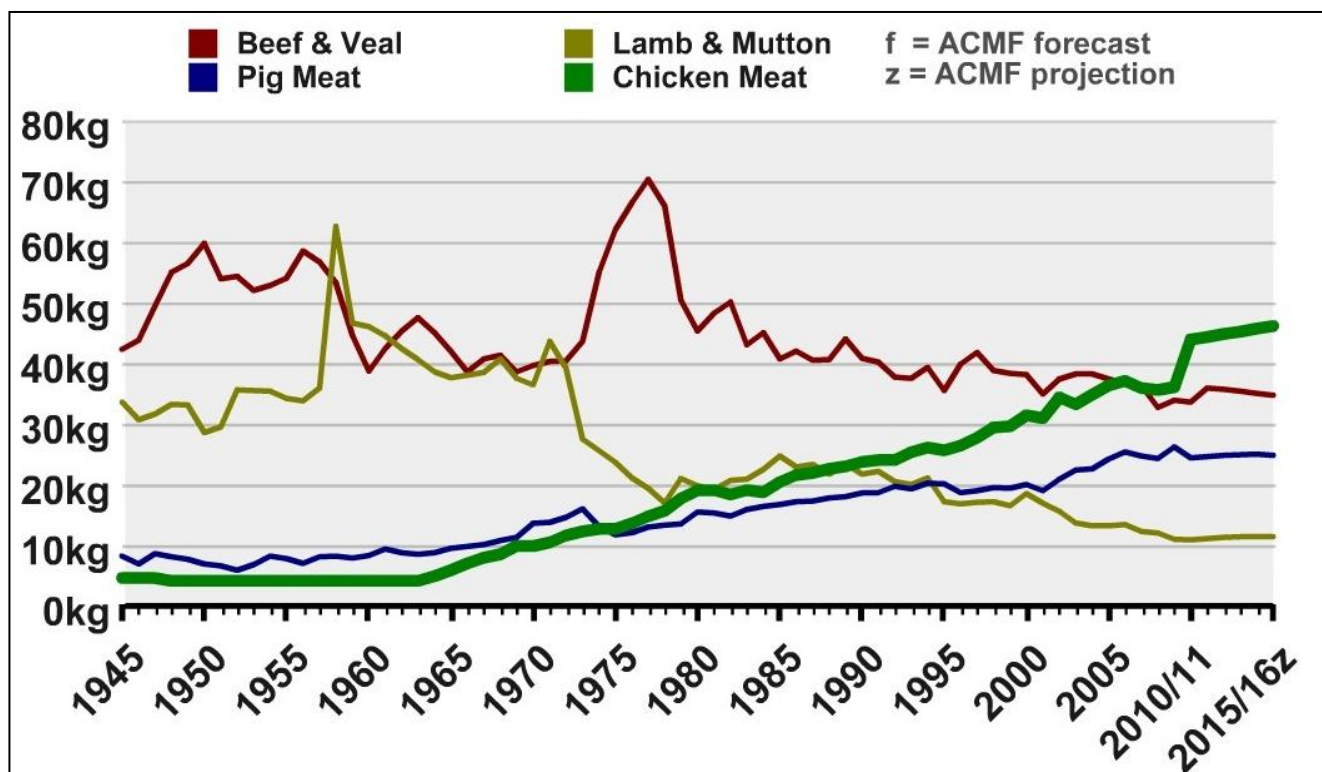


Figure 2: Consumption of Various Meats in Australia (ABARES, 2011)

## 1.5 GRIFFITH REGIONAL CONTEXT

Griffith is a key poultry growing and processing centre for Baiada. The company's Griffith operations directly employ 669 people as well as several hundred contract workers across the following facets of the vertically integrated business:

- grain farms;
- feed mill;
- poultry hatchery;
- breeder farms;
- broiler farms;
- poultry processing plant (abattoir); and
- by-product rendering plant.

Griffith is strategically located in a major grain growing region and is within a seven hour trip to Sydney, Adelaide or Melbourne making the area a focus for Baiada's expansion. In this regard, Baiada currently plans to increase the processing capacity of Griffith from 600,000 birds to approximately 1.5 million birds within 5 years.

This projected growth of Baiada's Griffith operation will involve the construction of an additional 120 broiler sheds, expansion to the hatchery, processing plant, rendering plant and feed mill as well as the subsequent growth of local supporting industries including transport, logistics and grain production. The upgrade and development of new capital infrastructure will result in the \$150 Million in direct investment and is anticipated to generate an additional 500 local jobs.

The new hatchery is a critical component of Baiada's operation and is required to provide additional birds to the broiler, breeder and layer farms in the region.

## 2 SITE AND SURROUNDS

### 2.1 SITE LOCATION

The subject site is identified as 1311 Snaidero Road, Griffith (described as Lot 2 on DP 1044004). A Certificate of Title is attached as *Appendix 1*. The lot has a total area of 31.47 ha and is located on the south-west corner of the Snaidero Road - Kidman Way intersection approximately 3km west of the city centre. The proposed hatchery will be located adjacent to the existing hatchery which includes the following physical components:

- An existing hatchery facility (currently processing 750,000 chicks per week);
- Maintenance shed;
- Two caretakers' residences;
- Water storage dam; and
- Open paddocks (currently utilised for the disposal of treated effluent by irrigation).

The location of the site is shown in Figure 3 below.

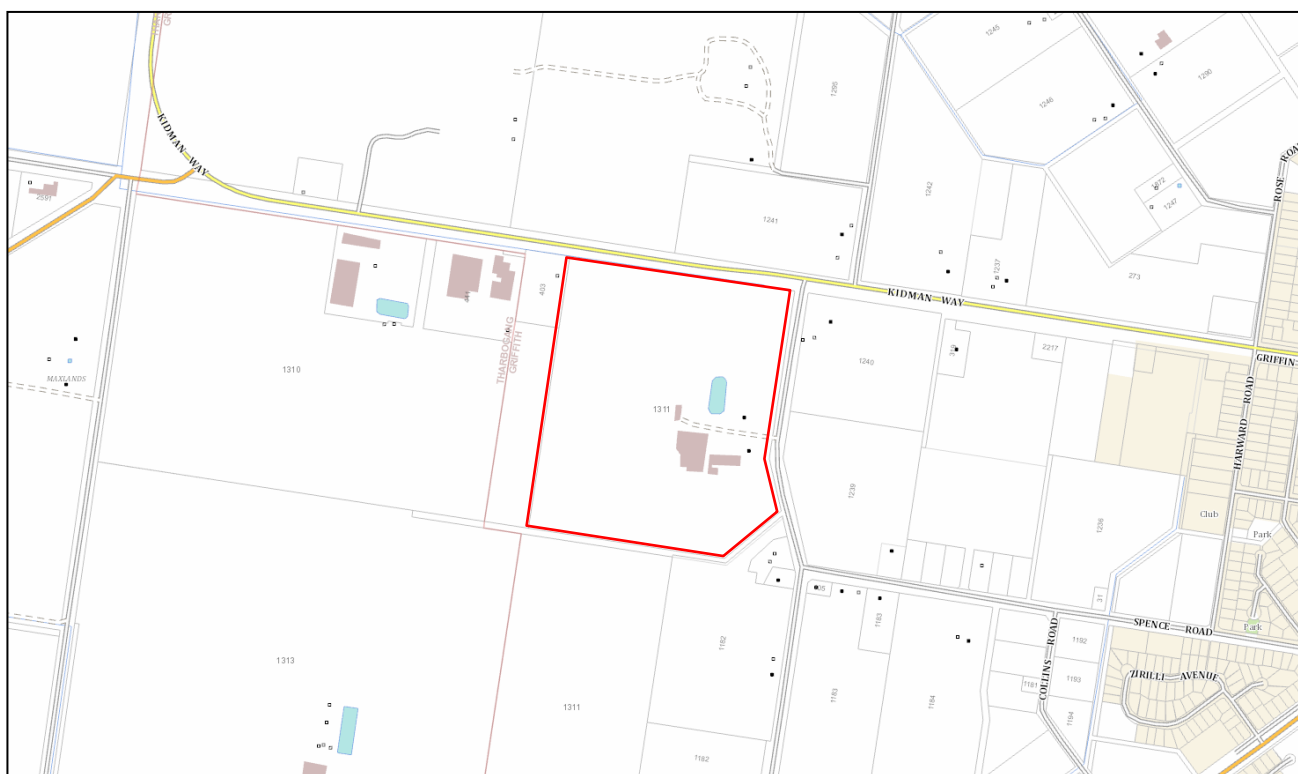


Figure 3: Site Location Plan (SixMaps, 2013)

### 2.2 SURROUNDING DEVELOPMENT

The site is located in an active rural production area which is used for a range of agricultural, horticultural and rural industrial pursuits located to the west of the Griffith City centre. The site is surrounded by citrus orchards to the east, north and south, and rural industries (i.e. Summertime Juicing) and warehousing to the west. Figure 4 is an aerial illustrating the site and its immediate surrounds.



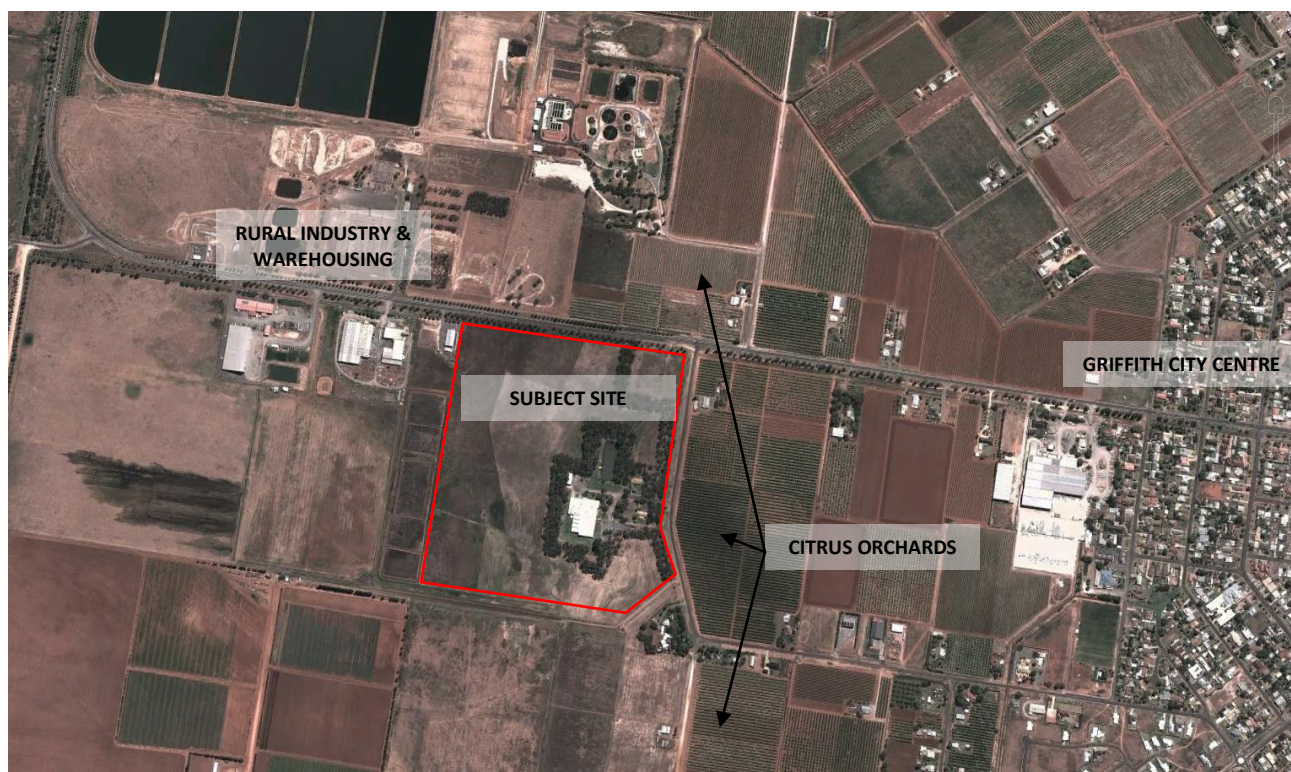


Figure 4: Aerial Local Site Context (Google, 2013)

## 2.3 SURROUNDING ROAD NETWORK

The site has frontage to Kidman Way to the North and Snaidero Road to the East. Kidman Way is a State Highway (87) under the control of the Department of Roads and Maritime Services (RMS). Kidman Way runs east-west and connects Griffith to the Mid-west Highway at Goolgowi 50km to the north-west. In the vicinity of the subject site, Kidman Way is a 2 lane two-way rural highway with a speed limit of 80km/h. Kidman Way is considered to be in good condition along the section adjacent to the site.

Snaidero Road is a local road with a length of approximately 1.4km. Snaidero Road runs south then east from Kidman Way towards Butler Road and has a speed limit of 50 km/h. The pavement width of Snaidero Road is approximately 5.0m. The road is generally in good condition.

## 2.4 SITE ACCESS

Access to the site is currently achieved via an existing access driveway that connects to Snaidero Road. The majority of hatchery traffic (both heavy vehicles and private staff vehicles) approach east and west along Kidman Way, and turn left or right (respectively) into Snaidero Road, before turning right onto the access driveway onto the site.

## 2.5 PHYSICAL INFRASTRUCTURE

The site is supplied with all necessary infrastructure including telecommunications, water, electricity, and sewerage (for staff amenities). The site's connection to reticulated water currently services both the processing activities and caretaker residences. The dam on site is used for irrigation of landscaping, grounds maintenance and fire fighting supply.

Waste water from the facility (generally limited to wash down water) is currently collected via internal drains which discharge into a centralised catch pit for disposal on the adjoining paddock via irrigation in accordance with the *Protection of the Environment Operations (Waste) Regulation 2005 – The Effluent Exemption 2008*.

Screens are attached to all drains to remove solid waste (e.g. fluff and egg shell) prior to disposal. These solids are collected on site along with other waste products from the hatching process and transported to a rendering plant for processing.

The waste generated by the two on-site caretaker residences is treated via individual separate septic systems, as are the staff amenities.

## 2.6 STORMWATER

Stormwater is currently collected on site in open grass swales, and directed onto grassed areas and the onsite water storage dam. Overland flow from the adjoining paddocks currently sheet flows to the lowest point of the site located in the north-west corner of the property.

## 2.7 SITE HISTORY

The site was originally development by Bartter Enterprises, prior to Acquisition of the Company by Baiada in 2009. As part of Baiada's expansion plans for the region, in December 2010 a Development Application for and extension to the hatchery, was lodged and subsequently approved by the Joint Regional Planning Panel (DA262/2010). This approval allowed for a 4,160m<sup>2</sup> increases to the existing hatchery (to a total GA of 11,350m<sup>2</sup>) and an increase in production from 750,000 to 1,800,000 chicks per week.

Subsequent to Approval, it has been determined that the level of investment, refurbishment cost and potential limitations on operations has led Baiada to review the proposal and determine that a new purpose built facility presents the best value for money and operational benefits for the company. As such, the Development Application will effectively replace the Development Consent (DA262/2010).

## 2.8 EXISTING OPERATIONS

### 2.8.1 Existing Development

The existing hatchery and ancillary infrastructure is shown in Figure 5. The hatchery currently employs approximately fifty (50) people and operates from 6am – 7pm, seven days per week. However, due to the variances in delivery, processing and dispatch, some activities may extend beyond these hours. The main hatchery building has a Gross Floor Area (GFA) of 7,190m<sup>2</sup> and is supported by an external maintenance shed and two caretaker residences utilised by the hatchery management team located to the east of the hatchery, off the access driveway.



Figure 5: Griffith Hatchery Site Aerial (Google Earth, 2013)



## 2.8.2 Current Operations

The current operation produces a maximum output of 750,000 chicks per week. An overview of the existing hatchery operations on site are outlined below.

Fertile eggs are received from the local breeder farms in vehicles that have tri-axle trailers with controlled environment capabilities to retain the egg temperature at optimum levels. This facilitates fewer vehicle movements to and from the site. The fertile eggs are held on trolleys each containing 3,520 eggs. The trolleys are wheeled off the tailgate of the truck, fumigated to kill pests and bacteria and finally placed into a holding area where they are stored at between 12°C and 18°C with provision of optimum levels of relative humidity. This control of temperature suspends embryo development allowing the eggs to be held in this condition for a period of up to 12 days, with minimal reduction in the hatching potential of the eggs.

From this storage area, the eggs are loaded into trays and placed in incubator trolleys (setting), each capable of holding 84,480 eggs. The trolleys are then wheeled into the incubators and held at a temperature of 37.2°C and a wet bulb humidity of 30°C. These control parameters are fitted with alarms on each incubator that will activate if the levels rise or fall away from defined points.

The eggs are held in this environment for a period of 17 days. During this time, the eggs are routinely turned by mechanical means to ensure the developing embryo remains in the centre of the egg and that it does not become adhered to the shell. At 17 days, the eggs are removed from the incubators and the trays holding them. The embryos may be vaccinated at this stage with specialised equipment which allows the embryo to be vaccinated when still in the egg, as is presently the case at some of Baiada's other hatcheries.

The eggs are then placed into special trays (called baskets) and these are placed into the hatchers which are also finely controlled with temperature and relative humidity, but do not require turning. After 3 days, the chicks hatch into these hatcher baskets (each holding 42,240 eggs).

The chicks are then graded and counted, and in some instances, feather-sexed. They are then finally placed into boxes, each containing 100 one day old chicks that are spray vaccinated and held ready for dispatch to the farms. The day old chicks are loaded into special controlled environment trucks on trolleys of 1,000 chickens, ready for delivery to the farms. Chicks are dispatched between the hours 10 am – 6pm.

Movements of eggs onto and chicks off the site can occur any time over a twenty-four (24) hour period and on any day of the week, but primarily occur Monday to Friday.

Hygiene and cleanliness within the hatchery is of paramount importance. To ensure that the embryos and chicks are not subject to risk of infection, a rigorous program of cleaning, disinfection and sanitation of buildings and equipment are maintained and backed up with a monitoring schedule to verify the program's effectiveness. All staff and visitors are required to declare their quarantine status and to shower and change clothing provided on site prior to entering the hatchery.

The primary concern at all times is that all equipment is cleaned and sanitised to prevent potential cross-contamination between the batch just hatched, and the next batch to be hatched. Waste water from the facility (generally limited to wash down water) is currently collected via internal drains which discharge into a centralised catch pit for disposal on the adjoining paddock via irrigation. Screens are attached to all drains to remove solid waste (e.g. fluff and egg shell) prior to disposal. These solids are collected on site along with other wastes products from the hatching process and transported to a rendering plant for processing.

Hard waste produced from the hatchery including egg shell, egg waste, fluff and mortalities is collected via a vacuum pump and held in a sealed waste bin for transfer to the rendering plant (approximately 3 truck loads per day). Waste water from cleaning of equipment is collected and discharged onto the adjoining paddock via surface irrigation. The irrigator location is rotated between three different disposal areas.

Chemicals located on site include formaldehyde, used for killing bacteria and pests on eggs placed in setters, and general cleaning agents.

## 3 PROPOSED DEVELOPMENT

The proposed development involves the construction of a new, purpose built hatchery to replace the existing hatchery on site. Detailed Development Plans are provided as *Appendix 2*. The proposed hatchery will facilitate a staged increase in production to a maximum of 3 Million chicks per week. The increase in supply of day old chicks in the region, to be produced on the site, will assist Baiada in meeting the projected growth in demand for poultry products in the Australian market, and will secure the viability of the integrated poultry production processes that are currently established in the region.

The existing hatchery will be retained as an emergency facility, to be used in times when the proposed hatchery facility is offline (e.g. for significant equipment maintenance or identified bio-security risk). The existing hatchery will process one or two batches of eggs per year to ensure that all systems remain intact and are maintained in working order for use when required.

### 3.1 BUILDING WORKS

The proposed development will involve the construction of a new facility with a total GFA of 19,942m<sup>2</sup> consisting of the following components:

- 896m<sup>2</sup> of office and amenities;
- 15,839m<sup>2</sup> for the main hatchery facility;
- 832m<sup>2</sup> of enclosed plant areas; and
- 2,375m<sup>2</sup> of open plant areas.

In addition to this, the proposed development a new access and loop roads and a staff car park providing 50 staff parking spaces. The proposed development is shown in and Detailed Development Plans (*Appendix 2*).

The height of the new facility will be 7.65m above finished ground level and will present as a modern industrial building. The new hatchery will be internally partitioned into a number of discreet spaces providing for specialised hatching processes including Egg Processing, Setting, Hatching, Chick Dispatch, Wash down and Storage.

The new hatchery facility will be constructed with steel frame, insulated panels, colorbond roofing and concrete floors. The internal and external design of the proposed hatchery facility will be similar to that of Baiada's Country Road hatchery located in Tamworth (See Figure 6).



Figure 6: Baiada's Country Road Hatchery



Figure 7: Baiada's Country Road Hatchery

### 3.2 STAGING

The proposed hatchery will be delivered in 2 separate stages (as shown in Figure 8) which will provide for a staged increase in production from 750,000 to approximately 2.2 Million chicks per week following completion of Stage 1, and 3 Million Chicks per week at ultimate development (Stage 2). The Gross Floor Area and the components of each Stage are outlined in Table 1.

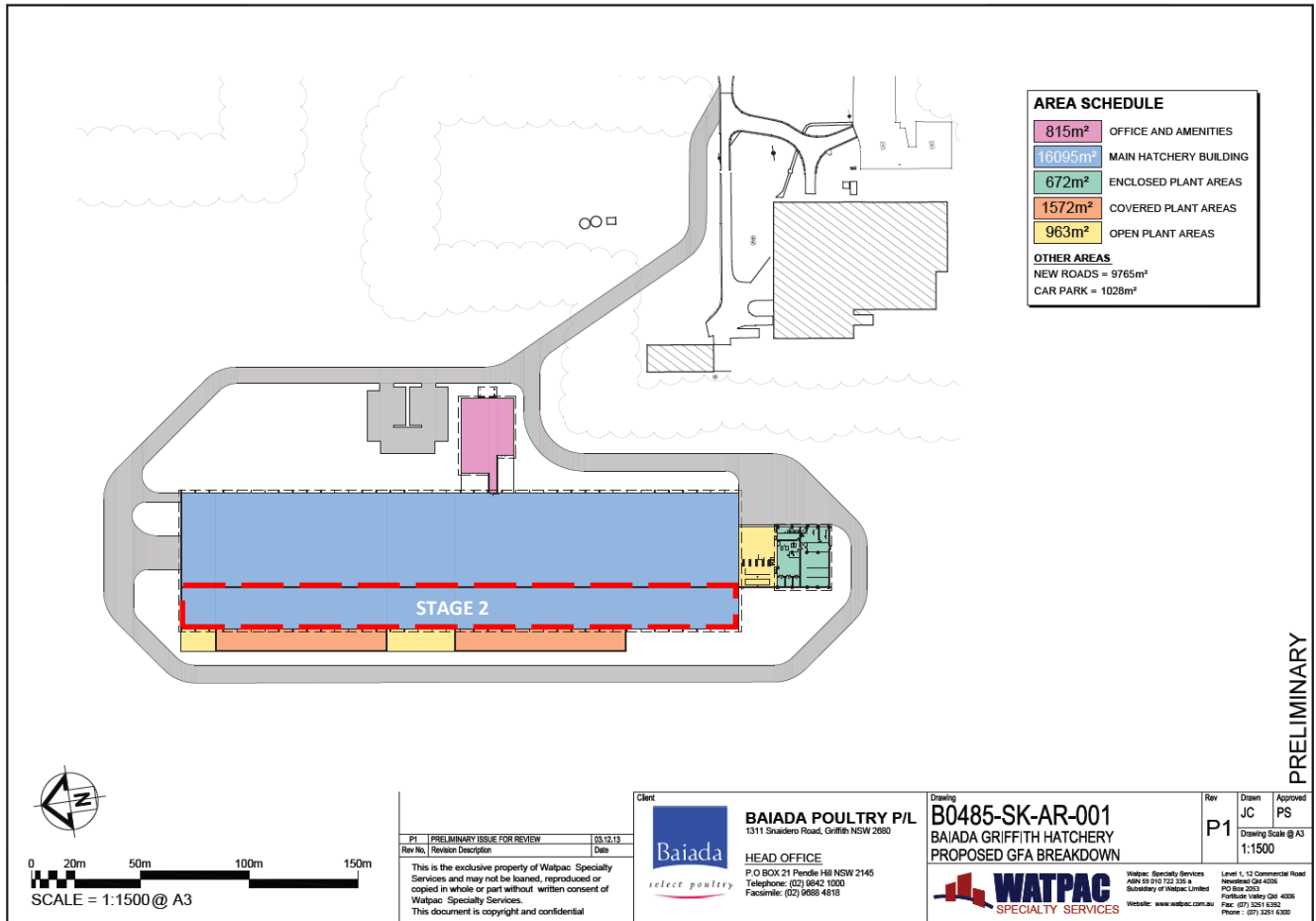


Figure 8: Staging Plan

**Table 1: Development Stages**

STAGES	COMPONENTS	GROSS FLOOR AREA
STAGE 1	• Main Hatchery Facility	15,005m <sup>2</sup>
	• Office and Amenities	815m <sup>2</sup>
	• Enclosed Plant	672m <sup>2</sup>
	• Open Plant	963m <sup>2</sup>
	• Internal Loop Road & Staff Car Park	
STAGE 2	• Extension to Hatchery Facility	4,937m <sup>2</sup>
<b>TOTAL</b>		<b>20,117m<sup>2</sup></b>

Construction of Stage 1 will commence as soon as possible following Development Consent, while Stage 2 will be developed as required based on the increase in demand for poultry products from the region over the longer term. It is important to note that any Conditions of Consent and payment of contributions need to reflect the 2 development stages.

### 3.3 PROPOSED HATCHERY PROCESS

The hatchery operations and processes within the proposed new hatchery building will be generally consistent with the operation as outlined in Section 2.8.2 of this report.

### 3.4 TRAFFIC, ACCESS AND PARKING

As outlined earlier, delivery of eggs to the hatchery and the dispatch of day old chicks can occur at any time over a 24 hour period. Additional heavy vehicle trips for; the removal of general waste to landfill, hatchery waste removal for rendering, and the removal of any recycled materials will also be generated by the proposed development.

Approximately 30 small vehicles comprised of staff vehicles, services and deliveries are expected to enter and exit the site per day when the hatchery is at full production capacity. The number of proposed vehicle movements as a result of the proposed development is identified in Table 2.

**Table 2: Proposed Vehicle Movements (Weekly)**

PURPOSE	VEHICLE TYPE	TRIPS / WEEK
Delivery of eggs and removal of day old chicks	Heavy vehicle	50
Waste removal services	Heavy vehicle	10
Staff and Contractor Vehicles	Private vehicles	210
<b>Totals</b>	<b>Heavy vehicles</b>	<b>60</b>
	<b>Private vehicles</b>	<b>210</b>

#### 3.4.1 Vehicle Access

Access to the site for both heavy vehicles and light vehicles will be via the existing driveway off Snaidero Road. No changes to the access driveway, or Snaidero Road / Kidman Way Intersection are proposed as part of this Development Application. The expected increase in the number of vehicles entering or exiting the site can be accommodated by the existing road network without any alterations or upgrades (See Section 4.1).

#### 3.4.2 Internal Access

As identified on the proposed development plans (see Appendix 1), the internal access to the new hatchery will be achieved via a new 8m wide loop road that will extend from the current internal access road on the site, and encircle the new hatchery building. This internal loop road will be designed to cater for all necessary vehicle types required to service the operations on site, and will be one-way to allow for safe and efficient operation.







## 3.8 WASTE MANAGEMENT

Baiada is also a signatory to Australian Packaging Covenant (APC) The APC is a sustainable packaging initiative which aims to change the culture of business to design more sustainable packaging, increase recycling rates and reduce packaging litter. As a signatory to the APC, Baiada has committed to find and fund solutions to address packaging sustainability issues throughout all components of the business.

### 3.8.1 Solid Waste

Other solid wastes that are expected to be generated by the proposed development are mainly limited to general waste from staff amenities, personal protection and bio-security equipment. This waste is proposed to be disposed of by licensed contractors to landfill, and is expected to be of a negligible amount.

### 3.8.2 Organic Waste

As with any livestock enterprise, it can be expected that mortalities will occur with the hatching of eggs. Normally, it is anticipated that of the total eggs received by the hatchery, 85% will hatch into day old chicks. The balances are lost due to mortality after hatching or during the incubation process.

A system of vacuum removal to storage will be in place for this chick and egg waste, thus sealing it completely during storage in order to minimise the possibility of odour and biosecurity impacts. The entire system is held under vacuum and the bins are removed onto a transport vehicle. The vacuumed wastes are rendered into pet food at the Hanwood Rendering Plant.

### 3.8.3 Disposal of Diseased Birds

Although every care and precaution will be undertaken to minimise the risk of disease and related mortalities, the hatchery has the potential for an outbreak of disease. The contingency for such events, where large scale destruction of chickens and eggs are required, disposal methods are to be identified and carried out with the consultation of the NSW Department of Primary Industries, and any other relevant authorities.

The preferred method of disposal for such an event is using carbon dioxide gas, and then sealed transport to the Hanwood Rendering Plant. In all cases, the disposal method for disposal of diseased birds will be at the discretion of the relevant government authority.

## 3.9 QUARANTINE MEASURES

The quarantine objectives for the hatchery are:

- To minimise the opportunities for serious disease causing organisms to be introduced into previously uninfected flocks;
- To decrease the access of non-specific contamination onto farms;
- To isolate farms known to be infected with specific controllable diseases to reduce further spread through the operation; and
- To minimise the spread of infective or contaminated material between areas within a unit (including areas of a hatchery).

Due to the vulnerability of young flocks to disease, the proposed hatchery will enforce strict quarantine measures to minimise the risk of disease and enhance animal welfare.

### 3.9.1 Movement of Persons

Baiada has a Quarantine Order for its national poultry operations. Staff, contractors and visitors moving between sites, is required to adhere to the Quarantine Order. Access to the site can be denied to any person the manager deems to be a biosecurity risk due to the persons contact with outside sites or if the person is not willing to adhere to the quarantine regulations.

Visitors and staff are to fully adhere to the quarantine declaration (LVS243) and have a full head to toe shower before entering processing areas. All clothing site is retained within the building and cleaned at the on-site laundry. When staff and visitors leave the sites, the following actions must be undertaken:

- All persons must leave the hatchery via the shower block;
- Clothing and footwear provided must be removed and left in baskets provided;

- All persons must shower for 2 minutes using soap and shampoo provided; and
- All persons are to move directly to the car park and leave only on designate access roads.

### **3.9.2 Equipment**

Egg fillers and trolleys are colour coded to each farm to prevent farm to farm contamination. These are cleaned and disinfected at the hatchery prior to delivery to farms. Eggs are collected for the hatchery a minimum of once each week and the egg truck and driver are to follow the quarantine order. Any trolleys or egg fillers which are visibly dirty and left at the farm will not be allowed entry to the farm and are to be returned to the hatchery for cleaning. Incorrect filler colours will not be accepted by the farm and will be returned to the hatchery. A corrective Action Request must be raised on the return of dirty fillers, trolleys, or incorrect filler colours.

Any equipment entering a hatchery is disinfected by the most practical means (in order of preference: washed and immersed in disinfectant, fumigated, or wiped over thoroughly with a disinfectant solution).

### **3.9.3 Vehicles**

Staff and visitors are to park vehicles in the designated parking area only and are not to be brought onsite unless approved by the hatchery manager.

## 4 EVALUATION

### 4.1 TRAFFIC IMPACT ASSESSMENT

As outlined above, the nature of this operation dictates that movements of eggs to the hatchery and day old chicks from the hatchery can occur at any time over a 24 hour period. The number of truck movements for eggs into and day out chicks out of this site can be expected to increase in a manner commensurate with the increase in production volumes to approximately 62 per week.

There will also be waste removal services (to take the general waste to landfill, hatchery waste for rendering and any recycled materials) comprising approximately of 6 extra truck movements per week. As well as the truck movements, it can be estimated that 30 small vehicles per day will enter and leave the site when it is full production, these being for staff and miscellaneous services and deliveries.

In relation to 'T'-intersections where the volumes of through traffic and turning traffic are relatively low, both 'without' and 'with' the project generated traffic; an analysis of the capacity of the intersection is considered unnecessary. If an intersection carries through volumes and cross volumes as shown in Table 3, the impact on the intersection is considered insignificant and high levels of service are expected to be maintained.

**Table 3: Intersection Volumes below Which Capacity Analysis Is Unnecessary**

TYPE OF ROAD	LIGHT CROSS AND TURNING VOLUMES MAXIMUM DESIGN HOUR VOLUMES (TWO-WAY VEHICLES PER HOUR)		
Two-lane major road	400	500	650
Cross Road	250	200	100
Four Lane Major Road	1000	1500	2000
Cross Road	100	50	25

Source: Adapted from the Austroads Guide to Traffic Management Part 3: Traffic Studies and Analysis Table 6.1

Traffic counts were undertaken by Griffith City Council in 2009 on Snaidero Road, between Kidman Way and Spence St, and on Kidman Way, between Harward Rd and Duchatel Rd. These counts demonstrated that Snaidero Road (the minor road) had a two way volume of 270 vehicles per day and a peak hour volume of 30 vehicles per hour, while Kidman Way (the two-lane major road) had a two way volume of 3,000 vehicles per day and a peak hour volume of 310 vehicles per hour. These existing traffic volumes are well below those specified in Table 5 as the maximum design hour volumes for both the major road and the minor road, indicating that the Kidman Way / Snaidero Road intersection is currently operating within its capacity as a priority controlled intersection.

The following table provides a summary of the typical weekly vehicles movements for the existing and proposed hatchery. Please note that as a result of the cycles, daily movements to and from the site can depending on the current progress. The additional traffic generated by the proposed development, compared to the current operation and previous approval is shown in Table 4.

**Table 4: Proposed Traffic Counts for Type of Vehicles and Frequency**

MOVEMENT	VEHICLE	EXISTING MOVEMENTS (750,000 Chicks/Week)	APPROVED MOVEMENTS (1,8 Million Chicks/Week)	STAGE 1 MOVEMENTS (2,2 Million Chicks/Week)	STAGE 2 MOVEMENTS (3 Million Chicks / Week)
Delivery of Eggs	Truck	3 per day (Daily)	7 per day (Daily)	9 per day (Daily)	12 per day (Daily)
Chick Dispatch (Regional)	Truck	1 per day (Mon, Tue)	3 per day (Mon, Tue)	4 per day 2 Days / Week	5 per day 2 Days / Week
Chick Dispatch	Truck	10 per day	10 per day	10 per day (4 Days /	10 per day

MOVEMENT	VEHICLE	EXISTING MOVEMENTS (750,000 Chicks/Week)	APPROVED MOVEMENTS (1,8 Million Chicks/Week)	STAGE 1 MOVEMENTS (2,2 Million Chicks/Week)	STAGE 2 MOVEMENTS (3 Million Chicks / Week)
(Local)		(Mon, Tue, Thur, Fri)	(Mon, Tue, Thur, Fri)	Week)	(4 Days / Week)
Waste Collection	Truck	3 per day (Mon, Tue, Thurs, Fri)	7 per day (Mon, Tue, Thur, Fri)	9 per day (4 Days / Week)	12 per day (4 Days / Week)
Staff Vehicles	Car	30 per day (Daily)	30 per day (Daily)	30 per day (Daily)	30 per day (Daily)
<b>TOTAL</b>		<b>47</b>	<b>57</b>	<b>62</b>	<b>69</b>

\* 1 Movement = Incoming + Outgoing

The location of the facility provides connection to the surrounding rural road network and allows trucks to access the site and the surrounding farms via the rural collector roads. No upgrade to the surrounding road network is required to facilitate the development. The addition of a total of 29 vehicles per day in Stage 1 or 44 vehicles per day in Stage 2 to the existing traffic volumes on Snaidero Road is not expected to result in any adverse impacts at the Kidman Way / Snaidero Road intersection.

## 4.2 STAFF PARKING

The proposed development will include the provision of an additional 50 car parking spaces in a new car park to be located adjacent to the proposed staff and amenities building at the front of the proposed new hatchery facility. These 50 spaces are in addition the 58 car parking spaces that are already provided at the existing facility.

The nature of the proposed operations generates parking requirements generally for employees only with limited demand for visitor parking required. Due to the proposed number of staff remaining at 50 for Stage 1 and increasing to 60 at Stage 2, the fact that some maintenance and administrative staff will work from the existing buildings (and use the current car park), and the provisions of 50 new parking spaces above the existing 58 on site, it is considered that sufficient parking is provided on site.

## 4.3 WATER DEMAND

Water to the facility is to be supplied from Council's reticulated water network. Demand for the existing and proposed hatchery is identified in Table 5. The projected water usage rates are sourced from the Baiada's Country Road Hatchery which is similar to operation to that which is proposed.

**Table 5: Water Use**

STAGE	WATER DEMAND (ML / Year)
Existing Hatchery (750,00 Birds / Week)	18.5 ML
Stage 1 (2.2 Million Birds / Week)	23.7 ML
Stage 2 (3 Million Birds / Week)	32.3 ML

It is noted that as the new hatchery will be purpose and installed with modern, hatching, sanitisation and wash down equipment, there will be a significant reduction in water use per egg compared to the current operation.

## 4.4 WASTE WATER TREATMENT AND DISPOSAL

No liquid wastes will generated from the actual hatching process however, waste water is generated as a result of sanitation and wash down procedures carried out to maintain hygiene standards.

As per the current situation, waste water will be collected via internal drains which discharge into a centralised catch pit for disposal on the adjoining paddock via irrigation in accordance with the *Protection of the Environment Operations (Waste) Regulation 2005 – The Effluent Exemption 2008*.

The irrigation of the waste water is consistent with the conditions and requirements of *The Effluent Exemption 2008* in that the waste water is:

- from a collection system which is ancillary to processing industries involving livestock;
- applied to land for irrigation purposes; and
- Applied within a reasonable period of time.

Within the hatchery facility, all floor drains will be equipped with removable basket sieves to remove solid waste (e.g. fluff and egg shell) prior to disposal. These solids are collected on site along with other wastes products from the hatching process and transported to a rendering plant for processing.

Screens are cleaned on a daily basis. The final collection point for the liquid wastes will also be equipped with a basket sieve prior to disposal via irrigation. This approach will enable as much of the solid and particulate matter to be removed as possible from the waste stream prior to irrigation. The removed material will be disposed of through the solid waste collection system, and sent to the rendering plant for processing.

The projected discharge rates are sourced from the Baiada's Country Road Hatchery which is a similar operation to that which is proposed. It is anticipated that approximately 70% of the water used will be discharged via irrigation.

**Table 6: Waste Water Generation**

STAGE	WATER DEMAND (ML / Year)
Existing Hatchery (750,00 Birds / Week)	~ 10 ML
Stage 1 (2.2 Million Birds / Week)	16.6 ML
Stage 2 (3.0 Million Birds / Week)	22.6 ML

As per the current situation, the irrigation discharge point will be moved regularly and regular soil testing undertaken to ensure application rates are not exceeding the carrying capacity of the fields.

Waste water flows generated from the staff amenities (toilets) and caretakers' residences will be treated by on-site septic systems as per the current situation.

## 4.5 STORMWATER MANAGEMENT

A Stormwater Management Strategy has been prepared by JWP Consulting Engineers and is attached as Appendix 3. This Strategy details the procedure and documents the design of the site stormwater detention and discharge control elements required by Griffith City Council. The strategy provides the necessary documentation to allow an approval of the development from a stormwater management perspective with provision of detailed design drawings to be provided as part of the Construction Certificate Stage.

### 4.5.1 Treatment Train Approach

The Strategy outlines a treatment train approach that includes a swale as the treatment measure. The subject site has minimal grade and as such, formal piped road drainage is not possible. Therefore, flows from the site will be collected via grassed swales located adjacent to the internal roads, which will treat and convey runoff to the proposed detention basin.

The structural elements proposed for the development consists of:

- Grassed swales around the development; and
- Detention basin with a total detention storage volume 1,450 m<sup>3</sup>.

The water quality arrangement will ensure that the pollution discharges are managed to industry accepted levels. Similarly, provision of the proposed detention basin will ensure that peak post development discharges are restricted to less than the pre development levels.

Due to the extremely flat site, a flat basin with maximum depth of 0.15m has been provided. A minimum freeboard of 0.5m has also been provided to the proposed finished floor level the proposed new hatchery (i.e. FFL 121.31 m).

#### **4.5.2 Stormwater Quantity**

A multi-staged weir is proposed as the outlet structure for the detention basin as part of the developed scenario. This device will restrict post development flows back to existing levels for the 1%, 5% and 50% AEP storm events. The results of the hydrological modelling for the various development scenarios show that the proposed water quantity basin is adequate to manage the increase in stormwater runoff and ensure that development condition flows are restricted to at or below existing conditions.

#### **4.5.3 Stormwater Quality**

The water quality analysis for this study was undertaken using the model MUSIC (Model for Urban Stormwater Improvement Conceptualisation) version 5 (CRCCH - 2005). The model provides a number of features relevant for the development:

- It is able to model the potential nutrient reduction benefits of gross pollutant traps, constructed wetlands, grass swales, bio-retention systems, sedimentation basins, infiltration systems and it incorporates mechanisms to model stormwater re-use as a treatment technique; and
- It provides mechanisms to evaluate the attainment of water quality objectives.

In absence of specific modelling guidelines available from Council, the following industry standard pollution reduction targets have been adopted:

- Total Phosphorous 65% reduction of average annual load;
- Total Nitrogen 45% reduction of average annual load;
- Suspended Solids 85% reduction of average annual load for particles 0.5 mm or less; and
- Gross Pollutants 90% retention of material greater than 5mm.

The MUSIC modelling was undertaken to demonstrate that the stormwater management system proposed for the development will result in reductions in overall post-development pollutant loads and concentrations being discharged from the proposed development and that these discharges comply with the above target objectives. To achieve the required pollutant reduction at the receiving node, the development should include grass lined swales and buffer strips in various forms to achieve the required water quality outcomes.

It is proposed to utilise swales around the perimeter road to collect runoff from the site and convey the flows to the detention basin. The swales provide the necessary water quality treatment for the development and upstream catchment flows collected by these swales. The performance of the proposed water quality management strategy for the site shows that the treatment train proposed will meet standard industry reduction targets for TSS, TP, TN and Gross Pollutants.

## **4.6 WASTE MANAGEMENT**

### **4.6.1 Volume of Waste and Collection Period**

The expanded facility will have an ultimate production capacity of 3,000,000 day old chicks per week. Considering infertile eggs and mortalities, this translates to placement of some 3,450,000 eggs per week. The eggs are transferred and hatched four days per week (Monday, Tuesday, Thursday, Friday) and thus the hatchery generates its waste over four days. The process waste streams from this include infertile eggs, egg shell and mortalities.



**Table 7: Waste Water Generation**

STAGE	INFERTILE EGGS (Kg)	MORTALITIES (Kg)	SHELL (Kg)	TOTAL (Kg)
Existing Hatchery (750,00 Birds / Week)	2243	172	1466	<b>3881</b>
Stage 1 (2.2 Million Birds / Week)	5382	414	3519	<b>9315</b>
Stage 2 (3.0 Million Birds / Week)	6578	506	4301	<b>11385</b>

#### 4.6.2 Waste Collection and Storage

It is proposed that the waste would be collected from within the hatchery and transported to closed collection tanks via a vacuum transport system. The transport system consists of stainless steel collection funnels located at the production point from within the facility, stainless steel transport pipes, approximately 12,000ltrs collection tanks and two vacuum pumps (an active pump and stand-by). The collection tanks (Figure 10) are closed vessels, having inlet connection coupling, connected to the waste transport system, and a discharge connection coupling which is connected to the vacuum pump. The tanks are mounted on a skid base with a front mounted hook-lift assembly. As a part of the proposed hatchery expansion, the tanks, connection points and the vacuum pumps would be located on the western face of the building, under a roof and within a bunded area.



**Figure 10: Waste Collection Tank**



Once one tank is filled, the connection points are released and reconnected to the adjoining tank. The full tank is collected by a standard hook-lift truck and transported the 9kms to Baiada Poultry's rendering facility at Hanwood. The tanks are fitted with a swinging rear door allowing for the tank to be emptied and washed. This door is fitted with a hydraulic mechanism which locks door closed to ensure secured closure during filling and transport.

The waste collection and storage system is designed and constructed by Viscon, a Dutch company which specialises the manufacture of hatchery processing and automation equipment. This system is used widely throughout Europe and the world, including Baiada's Country Road hatchery.

## 4.7 ODOUR IMPACTS

The new Griffith Hatchery will not affect the air quality or produce any odour impacts within the locality. Most of the air emissions from the hatchery consist of water vapour and carbon dioxide that are sourced from the incubators and hatchers which are not odorous emissions.

Once the day old chicks have hatched, a small amount of fluff (down) is generated. At the rear of the hatchers are 'fluff chambers', which have a water mist operating in them which serves to trap the fluff and this is collected in floor drain basket sieves that are manually cleaned, rather than being emitted through air vents.

Potential odour sources on site including egg waste and mortalities will be collected within the building via a vacuum pump and held within a sealed container for daily collection and transfer to the rendering plant. This material is collected, held and stored in a manner which does not emit odours.

As the site is located a suitable distance from any sensitive receptors and is surrounded by agricultural uses and rural industries. Accordingly, offsite odour impacts are not predicted or anticipated.

## 4.8 CHEMICAL USE AND STORAGE

The chemicals stored and used within the facility are predominantly associated with cleaning of processing areas and equipment and fumigation of eggs. Chemicals range from non-hazardous to various classes of Dangerous Goods. A full list of the chemicals used and stored on the Country Road Site is provided in the Master Chemical Register attached as *Appendix 4*. A similar range and quantity of chemicals will be utilised in the new hatchery, noting that some chemicals may differ based on supplier arrangements.

Where chemicals are held in sufficient quantities to require notification under the Dangerous Goods Act 1975, or exceed minor quantity storage volumes described in AS/NZS for the relevant class of dangerous goods, bunding and warning signs are in place.

An Environmental Operational Control Manual will be prepared for the site which outlines procedures for the use of chemicals and other liquids. It acknowledges that the proper storage of chemicals is an essential criterion to minimise risks to the environment, health and safety of personnel. These procedures include:

- All chemicals need to be stored as per Material Safety Data Sheets (MSDS) and in a bunded area.
- Those chemicals that are contained with portable bunds must have the bund plugs intact otherwise spills could leak out of the unprotected bund and be stored under cover.
- Chemicals or liquids that do leak need to be cleaned up immediately. Spill kits are available for employees who are trained in their use.
- Chemical or liquid spills that are able to leave site will be captured in the onsite open drainage system or in the constructed wetland. These should be reported for immediate action via the manager and site OHS/Environmental coordinator as contamination of soil could occur.
- All chemical storage areas need to have the correct signage displayed and that the Material Safety Data Sheets (MSDS) are no more than five years old, readily available in event of accidents or spills.
- The use of chemicals and other liquids are monitored through weekly environment site audit and through the following documentation:
  - MSDS for all chemicals on site;
  - Dangerous Goods / Chemical Manifest for all chemicals and liquids on site; and
  - Site weekly audit checklist;
  - Dockets from licensed waste carriers for removal of waste from site; and
  - Dangerous Goods Notification issued by Work Cover.

## 4.9 STATUTORY PLANNING

The development proposal is assessed below against the relevant matters for consideration pursuant to Section 79c of the *Environmental Planning & Assessment Act 1979*.

### 4.10 GRIFFITH LOCAL ENVIRONMENTAL PLAN 2002

The subject site is zoned Rural 1(e) Rural Industry and Employment Zone under the Griffith Local Environmental Plan 2002 (GLEP). The proposed development, as a replication of the existing use, falls under the GLEP definition of "Rural Industry" and is identified as "Permitted with Consent."

The objectives of the Rural 1(e) Zone are as follows:

- a) *To provide areas for a range of rural industries and employment-generating uses, and permit commercial development where it is ancillary to and associated with a rural industrial or employment-generating use of land within the zone, or it serves the convenience needs of the workforce in the area, if any such commercial development does not have an adverse impact on the continued viability of land within business zones in Griffith, and*
- b) *To provide land primarily for rural industries so as to protect existing and potential rural industries, and*
- c) *To allow accommodation that is ancillary to rural industries.*

The proposed development will replace and intensify an existing rural industry activity that currently exists on the site. An increase of employment at the site from 50 to approximately 60 (at ultimate development), is expected and will involve a substantial financial investment into the region, strengthening the poultry sector and the local economy. The proposed development is not anticipated to detrimentally affect, or be affected by, surrounding sensitive land use activities and accordingly is considered to comply with the objectives sought for the Rural 1(e) Zone under the Griffith LEP.

### 4.11 DRAFT GRIFFITH LOCAL ENVIRONMENTAL PLAN 2013

Griffith City Council has finalised a draft version of the "Griffith Local Environmental Plan (2013)" for the purposes of public exhibition. Council endorsed the Draft LEP (2013) at its ordinary meeting held on Tuesday 11 June 2013.

In the Draft LEP (2013) the site is included in the IN1 General Industry zone, the objectives of which are as follows:

- *To provide a wide range of industrial and warehouse land uses.*
- *To encourage employment opportunities.*
- *To minimise any adverse effect of industry on other land uses.*
- *To support and protect industrial land for industrial uses.*
- *To enable other land uses that provide facilities or services to meet the day to day needs of workers in the area.*

Under the Draft LEP (2013) the use falls under the definition of "Rural Industry" and is identified as "Permitted with Consent" in the IN1 General Industry zone. The proposed development is considered to comply with the objectives sought for the IN1 General Industry zone under the Draft LEP (2013).

### 4.12 DEVELOPMENT CONTROL PLANS

The following Development Control Plans (DCPs) are considered to be applicable to the proposed development:

- DCP 1: Non-Urban Development (Part 5 Rural Mixed and Rural Industry);
- DCP 3: Industrial Development; and
- DCP 20: Parking.

An assessment of the proposed development against the applicable DCP provisions is provided below.

#### 4.12.1 DCP1 Non-Urban Development

Table 8: DCP 1 Non-Urban Development Table 2

DESIGN ELEMENTS	APPLICANT RESPONSE
<b>Bulk, Scale, Setbacks and General Amenity Issues</b>	
<ul style="list-style-type: none"> <li>Zone 1(e): For allotments exceeding 0.3 hectares – a ten (10) metre setback shall apply to all boundaries.</li> <li>The establishment of a dwelling ancillary to a lawfully established development in Zone 1(e) must be <i>bona fide</i> ancillary to, or associated with, another existing or proposed approved development on the same site. <i>Note: With the exception of a nursery, 'agriculture' is not defined as 'another existing or proposed approved development' in this case.</i></li> </ul>	<p><b>Complies.</b> The proposed hatchery will be located 80m from The Kidman Way and 230m from Snaidero Road.</p>
<b>Open Space Additional Buffer Areas</b>	
<ul style="list-style-type: none"> <li>A minimum buffer distance (by way of an easement) of fifty (50) metres shall apply from natural watercourses.</li> <li>A minimum buffer distance (by way of an easement) of twenty (20) metres shall apply over drainage lines and canals.</li> <li>A minimum buffer distance (by way of an easement) of forty (40) metres shall apply from adjoining agricultural lands (Refer to DCP 28 - Land Use Buffer Controls).</li> <li>All buffer areas are to be planted out using tree species and shrubs that are suitable to the area.</li> <li>The above information shall be incorporated in the Management Plan to be submitted to Council. (See Table 1, Row h)</li> </ul>	<p><b>Complies.</b> The proposed development adjoins other agricultural uses and rural industries.</p> <p>The proposed development complies with the minimum buffer distance to the nearest agricultural lands and is not located in proximity to natural watercourses, water bodies or drainage lines.</p>
<b>Landscaping</b>	
<ul style="list-style-type: none"> <li>The required setback area in sub clause (a) to all boundaries is to be soft landscaped to a minimum of 90% of that part of the lot.</li> <li>No more than 10% of the front yard is to be paved or sealed.</li> </ul> <p><b>Note:</b> Soft landscaping can be trees, gardens, lawns and the like of the applicant/owners choice but does not include improvements such as driveways, parking areas, swimming pools (including coping decking and development ancillary to the pool) and ancillary dwelling structures/sheds/garages and the like.</p>	<p><b>Complies.</b> The proposed development will not alter the existing landscaping buffers to Snaidero Road. The new hatchery will include additional landscape planting around the facility, particular the car park and office area.</p>
<b>Site Access</b>	

DESIGN ELEMENTS	APPLICANT RESPONSE
<ul style="list-style-type: none"> <li>Where the access way connects to a sealed road, the access way and suitable tapers are to be bitumen sealed or equivalent hard surface between the property boundary and the road carriageway.</li> <li>Where the access connects to a gravel road, the access way and suitable tapers are to be constructed to gravel road standard, between the property boundary and the road carriageway.</li> <li>Concrete pipe culvert with standard headwalls is to be constructed at a suitable location relative to the table drain and clear of the edge of the road carriageway. Design and construction is to be to Council's standard.</li> <li>Existing channel crossings are to be used to service all existing and proposed structures on the allotment. Only one channel crossing per road frontage shall be permitted to be used to access allotments. Where additional channel crossings are proposed consent shall be obtained from Murrumbidgee Irrigation and Council prior to construction.</li> </ul> <p>Driveways shall be a minimum of six (6) metres wide between the edge of the road carriageway and the property boundary. Internal driveways shall be a minimum of three (3) metres wide.</p>	<p><b>Complies.</b> No changes are the existing site access is proposed. The new internal access road (8m wide) is designed to accommodate the largest design vehicle (articulated vehicle) and enable access to all service areas.</p>
<b>Stormwater Management</b>	
Refer to DCP 23 - <i>Engineering Requirements for Development for requirements.</i>	<p><b>Complies.</b> A Stormwater Management Plan (SWMP) has been prepared that proposes a new swale and detention basin to treat storm runoff from the site. Further details in relation to stormwater management are provided in <i>Appendix 3</i>.</p>
<b>Fire Management</b>	
<p>Fire access trails and firebreaks are to be sensitively sited within the landscape, especially in steep terrain</p> <p>Mowing and slashing is the preferred method of construction of firebreaks.</p> <p>Recommendations for this include:</p> <ul style="list-style-type: none"> <li>Mowing a strip up the back of the table drain will help to prevent fires.</li> <li>Avoiding any rare or significant plants during firebreak construction.</li> <li>Avoid construction of unnecessary firebreaks.</li> <li>Avoiding areas where there are native shrubs and trees or revegetated zones</li> </ul>	<p><b>Complies.</b> The internal access layout of the site ensures adequate access for fire fighting and emergency services vehicles to all areas. Adequate water supply, including the water storage dam, is available on site for fire fighting.</p> <p>The new hatchery has been designed to minimise risk of fire hazard through setbacks from the existing hatchery and the inclusion of fire resistant building materials. In addition to this, the internal plant equipment within the facility will be of high quality and reflect modern best practice design standards to reduce fire hazard.</p> <p>All relevant requirement of the BCA concerning fire management will be documented as part of the Construction Certificate.</p> <p>The site has been historically cleared of vegetation and is located in a low risk bush fire area.</p>

DESIGN ELEMENTS	APPLICANT RESPONSE
<p>when constructing firebreaks.</p> <ul style="list-style-type: none"> <li>Minimisation of damage to native vegetation.</li> </ul> <p>Consultation is required with the Rural Fire Services.</p>	

**Table 9: DCP 1 Non-Urban Development – Rural Mixed Use and Rural Industry Provisions**

DESIGN ELEMENTS	APPLICANT RESPONSE
<b>Amenity/character</b>	
<p>The non-residential use does not result in a detrimental impact on surrounding amenity and character.</p>	<p><b>Complies.</b> The scale and character of the proposed new hatchery is consistent with the existing development on the site and neighbouring properties. The location of the new hatchery will not cause any overlooking, light spill, dust or odour impacts on neighbouring properties, or result in negative visual impacts from any public or private vantage points.</p> <p>The proposed development's operation will be similar in nature and impact to the existing hatchery operation and will not introduce activities which are significantly different to the current operation.</p>

#### 4.12.2 DCP03 Industrial Development

**Table 10: DCP 3 Industrial Development Standard Requirements**

DESIGN ELEMENTS	APPLICANT RESPONSE
<p>Buildings are setback a minimum of 10 metres from the front boundary, to cater for customer parking. A minimum of 25% of the area in front of buildings within the property is to be landscaped.</p>	<p><b>Complies.</b> The proposed hatchery will be located 80m from The Kidman Way and 230m from Snaidero Road.</p> <p>The proposed development will not alter the existing landscaping buffers to Snaidero Road and will new landscaping around the office and staff parking area.</p>
<p>Access, car parking, loading and unloading facilities, drainage and external construction works are to comply with Council's "Development Manual".</p>	<p><b>Complies.</b> All internal access roads have been designed to enable heavy vehicles to service and access the site and proposed development operations effectively and safely. All related works are designed and will be constructed in accordance with Council's Development Manual.</p>
<p>Vehicular access with a minimum of 3.5 metres for one way movement and 6.5 metres for two way movement is to be provided.</p>	<p><b>Complies.</b> The proposed loop road will encircle the new hatchery facility and is designed to be one-way. The loop road will have a minimum width of 8m. The extension of the existing access road to the loop road will be two-way and will have a minimum width of 6m.</p>
<p>Onsite parking is to be provided in the ratio of 1 space for each 100m<sup>2</sup> of building and 1 space per employee. A minimum of 2 spaces is to be provided at the front. Shade trees are to be provided to all external car parking areas.</p>	<p><b>Complies.</b> The proposed development will include the provision of an additional 50 car parking spaces in a new car park to be located adjacent to the proposed staff and amenities building at the front of the proposed new hatchery facility. These 50 spaces are in addition the 58 car parking spaces that are already provided at the existing facility.</p> <p>The nature of the proposed operations generates parking requirements generally for employees only with limited demand for visitor parking required. Due to the proposed number of staff remaining at 50 for Stage 1 and increasing to 60 at Stage 2, the fact that some maintenance and administrative staff will work from the existing buildings (and use the current car park), and the provisions of 50 new parking spaces above the existing 58 on site. It is considered that sufficient parking is provided on site.</p>

DESIGN ELEMENTS	APPLICANT RESPONSE
The design of the building is to be functional for its intended purpose.  The façade of the building when viewed from the street shall be stepped back or designed so as to provide architectural relief and reduce the impact of the building from the streetscape.	<b>Complies.</b> The proposed new hatchery will be a purpose designed and industry facility that will improve the operational capacity of the hatchery operations on site, and support growth of Baiada's capacity in the Griffith region. The new hatchery will present a high quality and attractive industrial façade and incorporate visual elements and landscaping to enhance amenity.
Side and rear walls, where not brick or the like, are to be of pre-coloured metal cladding and should provide a satisfactory appearance when viewed from the street.	<b>Complies.</b> The proposed new hatchery will be constructed of a mix of pre-coloured metal sheeting, prefabricated concrete walls and other cladding materials providing an attractive industrial façade. The new hatchery will provide an improved site aesthetic and add visual appeal when viewed from external vantage points through its architectural appearance and landscaping treatments.
Details in relation to pollution control are to be submitted with the building application.	<b>Complies.</b> Relevant pollution controls are identified within this statement of effects.
A concept landscaping plan complying with Council's "Development Manual" is to be submitted with the Development Application. For a combined Building Application and Development Application a detailed plan is required.	<b>To be provided with the Construction Certificate.</b> The new hatchery will present a high quality and attractive industrial façade and incorporate visual elements and landscaping to enhance amenity. Full details will be provided as part of the Construction Certificate.

#### 4.12.3 DCP 20 Parking

Griffith City Council requires that off-street car parking be provided to meet the needs of the proposed use and that car parking is designed to meet the relevant code and standards set at the Local, State and Federal levels.

The proposed development will include the provision of an additional 50 car parking spaces in a new car park to be located adjacent to the proposed staff and amenities building at the front of the proposed new hatchery facility. These 50 spaces are in addition the 58 car parking spaces that are already provided at the existing facility.

The nature of the proposed operations generates parking requirements generally for employees only with limited demand for visitor parking required. Due to the proposed number of staff remaining at 50 for Stage 1 and increasing to 60 at Stage 2, the fact that some maintenance and administrative staff will work from the existing buildings (and use the current car park), and the provisions of 50 new parking spaces above the existing 58 on site, it is considered that sufficient parking is provided on site.

### 4.13 STATE ENVIRONMENTAL PLANNING POLICIES

There are no State Environmental Planning Policies applicable to this application.

### 4.14 Natural Environmental Impacts

**Visual Amenity:** The new Griffith Hatchery will be of an attractive industrial façade and incorporate appropriate levels of landscaping to enhance the visual amenity of the site when viewed from external vantage points. The design of the buildings will be commensurate with the character and function of the surrounding rural / rural industrial area and provide an improved site aesthetic and visual appeal through its architectural appearance and landscaping treatments.

**Water Quality:** The water quality arrangement will ensure that the pollution discharges are managed to industry accepted levels. Similarly, provision of the proposed detention basin will ensure that peak post development discharges are restricted to less than the pre development levels.

As per the current situation, waste water will be collected via internal drains which discharge into a centralised catch pit for disposal on the adjoining paddock via irrigation in accordance with the *Protection of the Environment Operations (Waste) Regulation 2005 – The Effluent Exemption 2008*.



The irrigation of the waste water is consistent with the conditions and requirements of *The Effluent Exemption 2008* in that the waste water is:

- from a collection system which is ancillary to processing industries involving livestock;
- applied to land for irrigation purposes; and
- Applied within a reasonable period of time.

As per the current situation, the irrigation discharge point will be moved regularly and regular soil testing undertaken to ensure application rates are not exceeding the carrying capacity of the fields.

**Air Quality / Odour:** The new Griffith Hatchery will not affect the air quality or produce any odour impacts within the locality. Most of the air emissions from the hatchery consist of water vapour and carbon dioxide that are sourced from the incubators and hatchers which is not an odorous emission.

Once the day old chicks have hatched, a small amount of fluff (down) is generated. At the rear of the hatchers are 'fluff chambers', which have a water mist operating in them which serves to trap the fluff and this is collected in floor drain basket sieves that are manually cleaned, rather than being emitted through air vents.

Potential odour sources on site including egg waste and mortalities will be collected within the building via a vacuum pump and held within a sealed container for daily collection and transfer to the rendering plant. This material is collected, held and stored in a manner which does not emit odours.

As the site is located a suitable distance from any sensitive receptors and is surrounded by agricultural uses and rural industries. Accordingly, offsite odour impacts accordingly are not predicted or anticipated.

**Flora and Fauna:** The new Griffith Hatchery does not require clearing of any vegetation.

**Waste Management:** Hard waste production is anticipated to increase as a result of the increased capacity of the hatchery. Waste material associated with the new Hatchery includes egg waste and bird mortalities. These waste materials will be collected daily via a vacuum pump and stored on site in sealed bins for transfer to an offsite rendering plant.

Baiada is also a signatory to Australian Packaging Covenant (APC) The APC is a sustainable packaging initiative which aims to change the culture of business to design more sustainable packaging, increase recycling rates and reduce packaging litter. As a signatory to the APC, Baiada has committed to find and fund solutions to address packaging sustainability issues throughout all components of the business.

## 4.15 Built Environmental Impacts

**Streetscape and Desired Future Character:** The new Griffith Hatchery will be of an attractive industrial façade and incorporate appropriate levels of landscaping to enhance the visual amenity of the site when viewed from external vantage points.

**Noise and Privacy:** The hatchery produces minimum noise emissions beyond what is common and expected for an industrial building. The nearest sensitive receptor is located approximately 310m away and adjacent to The Kidman Way. As such it is considered that there is limited potential for the facility to impact on the surrounding residents in terms of adverse noise, overlooking or privacy concerns.

### 4.15.1 Social and Economic Impacts

The proposed development is anticipated to directly generate an additional 10 positions at full development (Stage 2). Additional local employment opportunities will also be generated through the construction phase where a range of trade skills will be required to construct the new hatchery complex. This has the potential to inject additional income to the local economy.

The new hatchery is a critical component of Baiada's operation and is required to provide additional birds to the broiler, breeder and layer farms in the region. This projected growth of Baiada's Griffith operation will involve the construction of an additional 120 broiler sheds, expansion to the hatchery, processing plant, rendering plant and feed mill as well as the subsequent growth of local supporting industries including transport, logistics and grain production. The upgrade and development of new capital infrastructure will result in the \$150 Million in direct investment and is anticipated to generate an additional 500 local jobs.



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## 4.16 SITE SUITABILITY

The development as a Rural Industry is “Allowed with Consent” in the Rural 1(e) Zone, consistent with the Zone Objectives, and compliant with the applicable Development Control Plans. Recognising that the site contains the existing hatchery which current functions well, with minimal negative impacts, the proposed development is considered to be inherently suitable for the development.

## 4.17 THE PUBLIC INTEREST

The proposed development is not considered to result in any adverse environmental impacts on the natural environment or upon surrounding properties in terms of odour, noise, visual impacts, traffic generation, or privacy. The proposed development is consistent with the nature of the rural locality and various rural industries located in proximity to the site, and will be operated in accordance with all relevant standards.

As outlined above, the new hatchery is a critical component of Baiada’s operation and is required to provide additional birds to the broiler, breeder and layer farms in the region. This projected growth of Baiada’s Griffith operation will involve the construction of an additional 120 broiler sheds, expansion to the hatchery, processing plant, rendering plant and feed mill as well as the subsequent growth of local supporting industries including transport, logistics and grain production. The upgrade and development of new capital infrastructure will result in the \$150 Million in direct investment and is anticipated to generate an additional 500 local jobs. The proposal is therefore considered to be in the public interest.

## 5 CONCLUSION

PSA Consulting has been engaged by Bartter Enterprises Pty Ltd to prepare this Statement of Environmental Effects (SEE) to accompany a Development Application seeking Development Consent for a proposed new, purpose built chicken hatchery on the site of the existing hatchery at 1311 Snaidero Road, Griffith. The proposed new hatchery will be constructed in 2 stages and provide for a staged increase to the hatching capacity at the site from 750,000 to a maximum capacity of 3 Million chicks per week.

The proposed increase in capacity is required to meet the projected growth of poultry production in the region and supplier consumer demand for chicken meat products in Australia.

The new hatchery is a critical component of Baiada's operation and is required to provide additional birds to the broiler, breeder and layer farms in the region. This projected growth of Baiada's Griffith operation will involve the construction of an additional 120 broiler sheds, expansion to the hatchery, processing plant, rendering plant and feed mill as well as the subsequent growth of local supporting industries including transport, logistics and grain production. The upgrade and development of new capital infrastructure will result in the \$150 Million in direct investment and is anticipated to generate an additional 500 local jobs.

The proposed development is "Permitted with Consent" within the Rural 1(e) Rural Industry and Employment Zone, consistent with the Zone Objectives, and compliant with all applicable Development Control Plans. In addition, the development is consistent with the nature of the rural locality and various Rural Industries located in proximity to the site.

The development as proposed does not have any environmental impacts which would preclude it from going ahead at the proposed site. It is concluded therefore, that the proposal should be approved by Council, subject to relevant and reasonable conditions.

# **APPENDIX 1**

## **CERTIFICATES OF TITLE**

# Land and Property Information Division

ABN: 84 104 377 806

GPO BOX 15

Sydney NSW 2001

DX 17 SYDNEY

Telephone: 1300 052 637



## Land & Property Information

A division of the Department of Finance & Services

# TITLE SEARCH

Title Reference: 2/1044004

## LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 2/1044004

SEARCH DATE	TIME	EDITION NO	DATE
20/12/2013	12:12 PM	7	7/1/2010

### LAND

LOT 2 IN DEPOSITED PLAN 1044004  
AT WEST GRIFFITH  
LOCAL GOVERNMENT AREA GRIFFITH  
PARISH OF JONDARYAN COUNTY OF COOPER  
TITLE DIAGRAM DP1044004

### FIRST SCHEDULE

BARTTER ENTERPRISES PTY LTD (T AE886145)

### SECOND SCHEDULE (7 NOTIFICATIONS)

- 1 LAND EXCLUDES MINERALS AND IS SUBJECT TO RESERVATIONS AND CONDITIONS IN FAVOUR OF THE CROWN - SEE MEMORANDUM S700000A
- 2 SUBJECT TO PAYMENT OF RATES AND CHARGES FOR WATER UNDER THE IRRIGATION ACT, 1912
- 3 SUBJECT TO THE PROVISIONS OF THE CROWN LANDS CONSOLIDATION ACT 1913 PARTICULARLY AS REGARDS FORFEITURE PROVISIONS AND RESTRICTIONS ON LAND USE - SEE SECTIONS 147 AND 142.
- 4 IRRIGATION FARM PURCHASE NO. 1311 (MIRROOL NO. 1 IRRIGATION AREA)
- 5 DP1044004 EASEMENT TO DRAIN WATER 7 METRE(S) WIDE APPURTENANT TO THE LAND ABOVE DESCRIBED
- 6 AF107219 MORTGAGE TO WESTPAC BANKING CORPORATION
- 7 AF179368 MORTGAGE TO BK INVESTMENTS PTY LTD, PEJEN INVESTMENTS PTY LTD & TALISMAN INVESTMENTS PTY LTD
- \* AH153340 TRANSFER OF MORTGAGE AF179368 MORTGAGEE NOW BERNARD BARTTER TRACK PTY LTD, PETER BARTTER TRACK PTY LIMITED & HARZAN PTY LIMITED

### NOTATIONS

UNREGISTERED DEALINGS: NIL

\*\*\* END OF SEARCH \*\*\*

PRINTED ON 20/12/2013

\* ANY ENTRIES PRECEDED BY AN ASTERISK DO NOT APPEAR ON THE CURRENT EDITION OF THE CERTIFICATE OF TITLE.  
WARNING: THE INFORMATION APPEARING UNDER NOTATIONS HAS NOT BEEN FORMALLY RECORDED IN THE REGISTER.

## **APPENDIX 2**

# **DEVELOPMENT PLANS**



# BAIADA POULTRY

GRIFFITH, NSW



*select poultry*

## NEW HATCHERY



### LOCATION PLAN

SCALE = 1:2500 (APPROX)

Drawing Schedule		
DWG No.	Sheet Title	Rev
DA-01	Location Plan & Drawing Schedule	A
DA-02	Proposed Site Plan	A
DA-03	Proposed General Arrangement Plan	A
DA-04	Proposed Elevations	A

REAL PROPERTY DESCRIPTION
SNAIDERO ROAD GRIFFITH NSW
LOT 2 ON DP 1044004 (TOTAL LAND PARCEL 31.47ha)
PARISH: JONDARYAN COUNTY: COOPER LAND DISTRICT: NARRANDERA LOCAL GOVNT: CITY OF GRIFFITH

				CONSULTANT				CLIENT				PROJECT				DRAWING TITLE				SCALE				PROJECT NUMBER		BLDG NUMBER							
								 <b>BAIADA POULTRY P/L</b> 1311 Snaidero Road, Griffith NSW 2680				 <b>WATPAC</b> SPECIALTY SERVICES				BAIADA GRIFFITH HATCHERY				TITLE SHEET, LOCATION PLAN & DRAWING SCHEDULE				@ A1 = NTS @ A3 = NTS Do Not Scale from Drawings. Verify all Dimensions and Levels on Site				B0485		-			
								 <b>select poultry</b>								GRIFFITH NSW								DRAWN JC		CHECKED PS		DRAWING NUMBER		ISSUE			
								P.O BOX 21 Pendle Hill NSW 2145 Telephone: (02) 9842 1000 Facsimile: (02) 9688 4818				Watpac Specialty Services ABN 59 010 722 335 a Subsidiary of Watpac Limited Level 1, 12 Commercial Road Newstead Qld 4006 PO Box 2053 Fortitude Valley Qld 4006 Fax: (07) 3251 6392 Phone : (07) 3251 6300 Website: www.watpac.com.au												DATE NOV 2013				APPROVED -		DA-01		A	

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DEVELOPMENT APPLICATION

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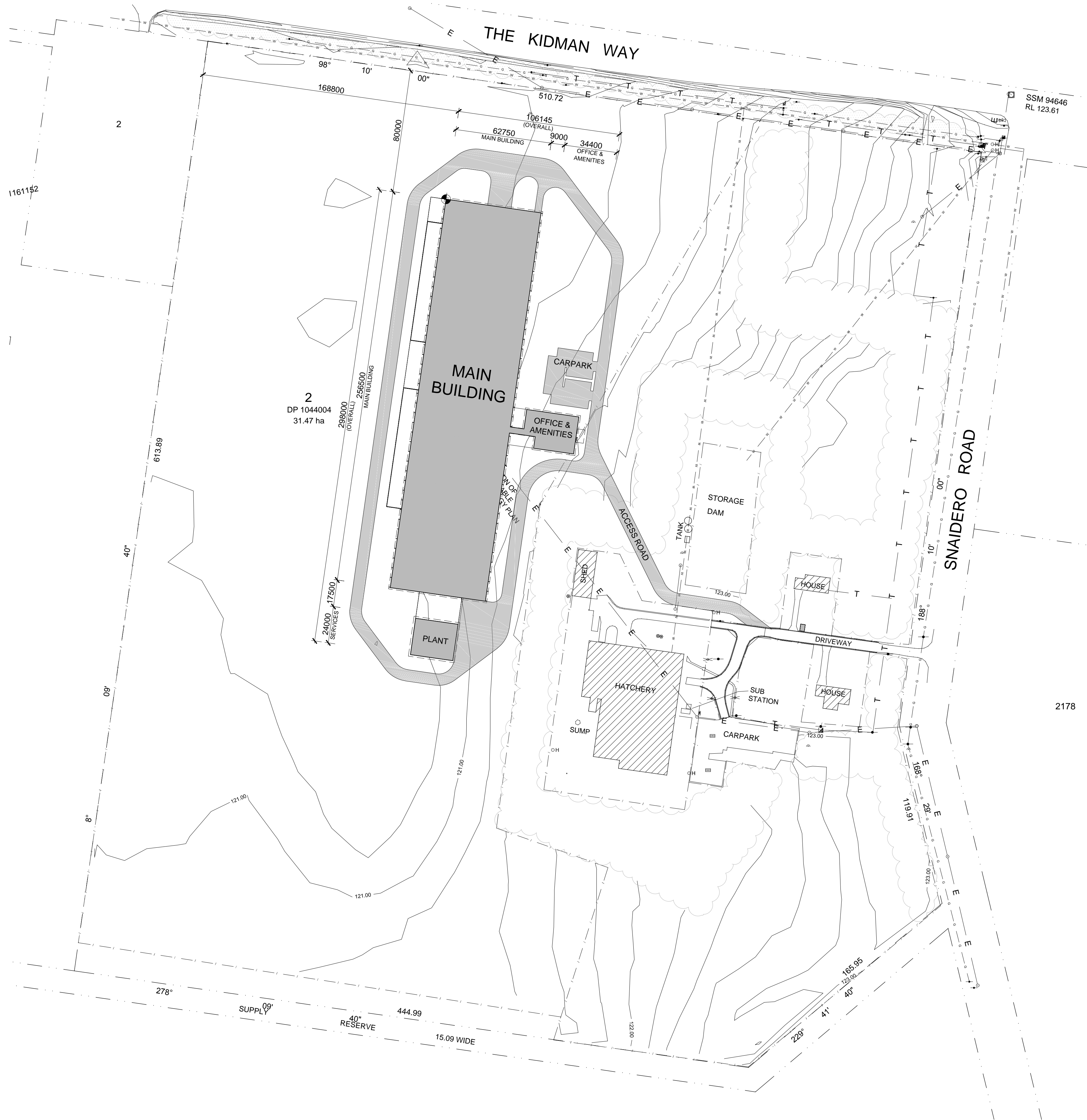


REAL PROPERTY  
DESCRIPTION

SNAIDERO ROAD  
GRIFFITH NSW

LOT 2 ON DP 1044004  
(TOTAL LAND PARCEL 31.47ha)

PARISH: JONDARYAN  
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LAND DISTRICT: NARRANDERA  
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DEVELOPMENT APPLICATION

AMENDMENTS				AMENDMENTS			
DATE	ISSUE	AMENDMENT	INITIAL	DATE	ISSUE	AMENDMENT	INITIAL
03.12.13	P1	ISSUED FOR DA	JC				

CONSULTANT

CLIENT
<b>BAIADA POULTRY P/L</b> 1311 Snaidero Road, Griffith NSW 2680
<b>HEAD OFFICE</b> P.O. BOX 21 Pindile Hill NSW 2145 Telephone: (02) 9842 1000 Facsimile: (02) 9688 4818

PROJECT
<b>BAIADA GRIFFITH HATCHERY</b> <b>GRIFFITH NSW</b>

DRAWING TITLE
<b>PROPOSED SITE PLAN</b>

DRAWING TITLE
PROPOSED SITE PLAN

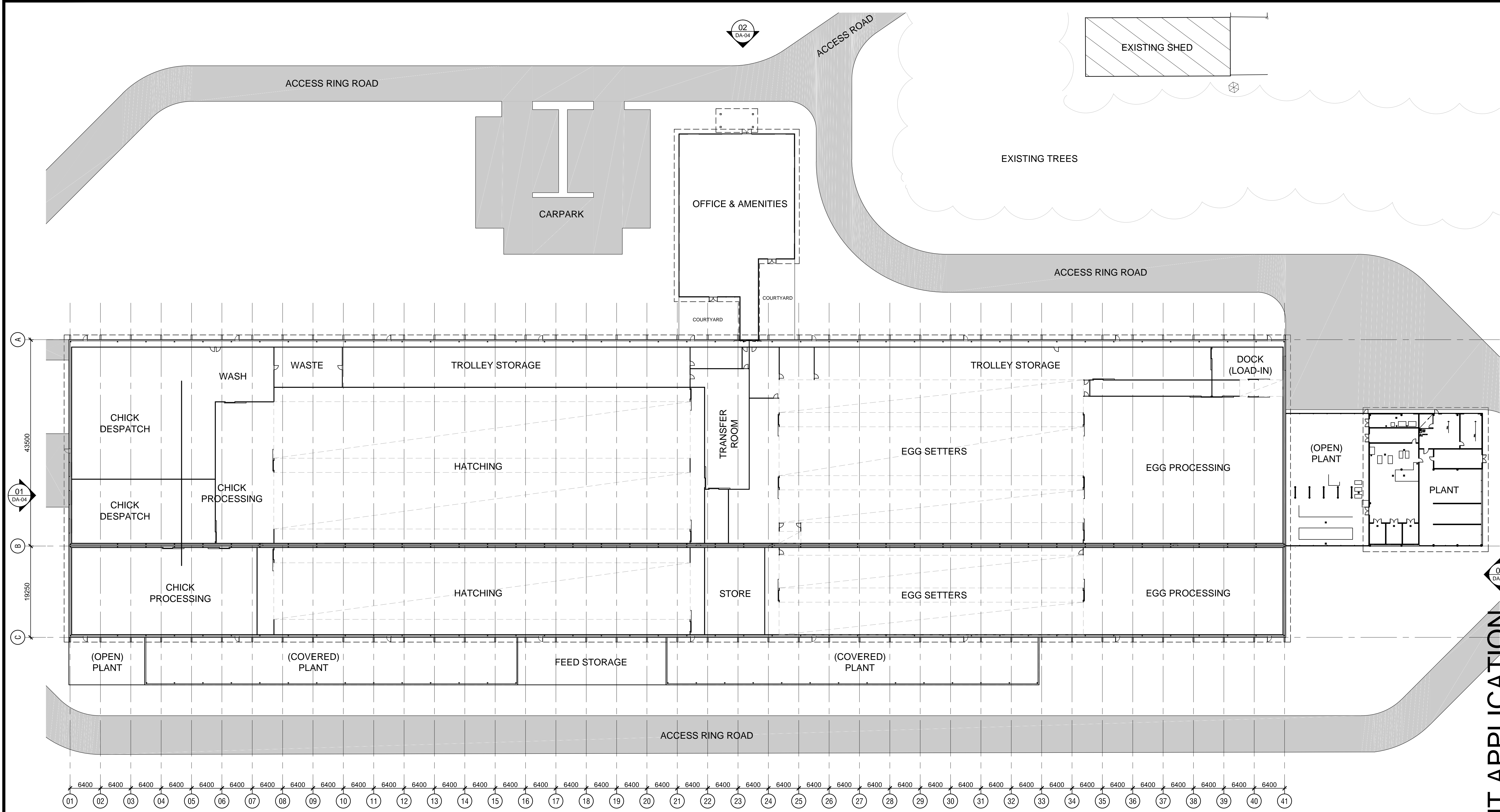
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DRAWING NUMBER
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BLDG NUMBER
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ISSUE
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FINISHES NOTES

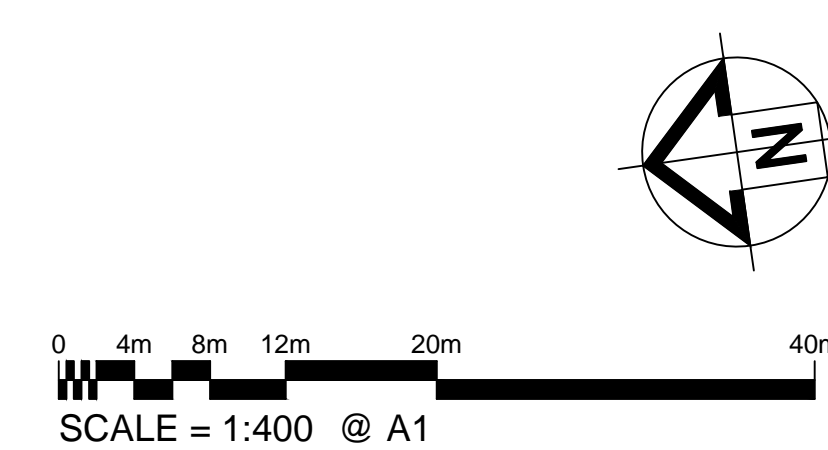
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INTERNAL WALLS: 75mm THICK (PIR) INSULATED WALL PANELS, COLORBOND FINISH (COLOUR TBC).  
CEILING: TYPICAL 2700mm CEILING HEIGHT. 75mm THICK (PIR) INSULATED CEILING PANELS, COLORBOND FINISH (COLOUR TBC).  
ROOFING: 'SPANDEK' PROFILE 0.48 BMT SPRING-CURVE INSTALLATION, COLORBOND FINISH, (COLOUR TBC).  
EAVES LINING: 'MINI-ORB' PROFILE 0.42 BMT, COLORBOND FINISH, (COLOUR TBC).  
EXTERNAL BLADES: 'AZURE' CLADDING PANELS, COLORBOND FINISH, (COLOUR TBC).  
GUTTERS & DOWNPIPES: 300Ø HALF-ROUND GUTTER WITH 150Ø DOWNPIPE (SIZES TBC).  
LOUVRES: WEATHERPROOF VENTILATION LOUVRES, COLOURBOND FINISH, (COLOUR TBC).  
STRUCTURAL STEEL: 3-COAT PAINT SYSTEM, (COLOUR TBC).  
OFFICE CLADDING: 'ALUCOBOND' ALUMINIUM COMPOSITE PANEL OR APPROVED SIMILAR, (COLOUR TBC).  
WINDOWS: ALUMINIUM FRAMED GLAZING SUITES, POWDERCOAT FINISH, (COLOUR TBC).  
SERVICES BUILDING: CORE FILLED BLOCKWORK WALLS, RENDER & PAINT FINISH, (COLOUR TBC).

**REAL PROPERTY DESCRIPTION**

SNAIDERO ROAD  
GRIFFITH NSW

LOT 2 ON DP 1044004  
(TOTAL LAND PARCEL 31.47ha)

PARISH: JONDARYAN  
COUNTY: COOPER  
LAND DISTRICT: NARRANDERA  
LOCAL GOVNT: CITY OF GRIFFITH



AMENDMENTS				AMENDMENTS			
DATE	ISSUE	AMENDMENT	INITIAL	DATE	ISSUE	AMENDMENT	INITIAL
				03.12.13	P1	ISSUED FOR DA	JC

CONSULTANT

CLIENT

**Baiada**  
select poultry

**BAIADA POULTRY P/L**  
1311 Snaidero Road, Griffith NSW 2680

HEAD OFFICE  
P O BOX 21 Pindile Hill NSW 2145  
Telephone: (02) 9842 1000  
Facsimile: (02) 9688 4818

**WATPAC**  
SPECIALTY SERVICES

Watpac Specialty Services  
ABN 59 010 722 335  
a Subsidiary of Watpac Limited

Level 1, 12 Commercial Road  
Newstead Qld 4006  
PO Box 2053  
Fortitude Valley Qld 4006  
Fax: (07) 3251 6392  
Phone: (07) 3251 6300

Website: www.watpac.com.au

PROJECT

**BAIADA GRIFFITH HATCHERY**  
**GRIFFITH NSW**

DRAWING TITLE

**PROPOSED GA PLAN**

SCALE	@ A1 = 1:400	@ A3 = NTS
Do Not Scale from Drawings. Verify all Dimensions and Levels on Site		
DRAWN	JC	CHECKED PS
DATE	NOV 2013	APPROVED -

PROJECT NUMBER	B0485	BLDG NUMBER	-
DRAWING NUMBER	DA-03	ISSUE	A

DEVELOPMENT APPLICATION

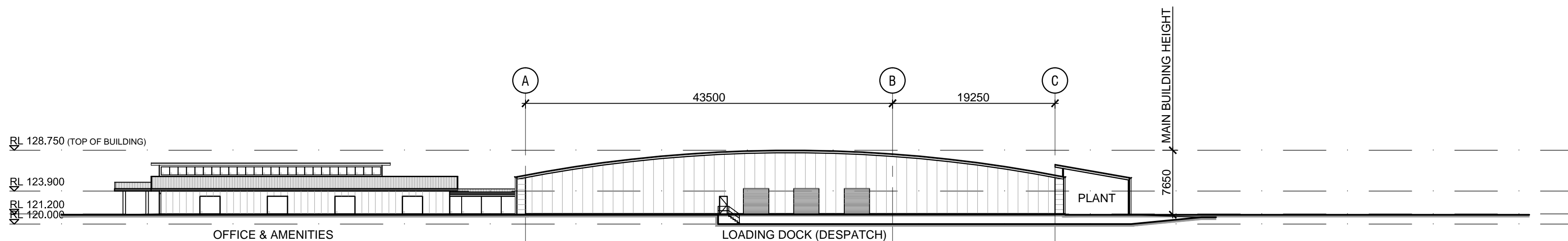
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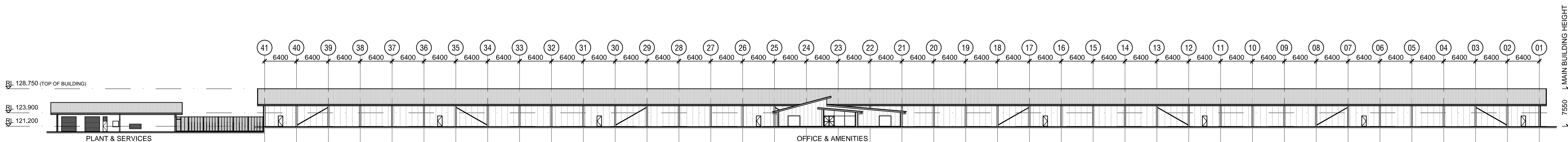
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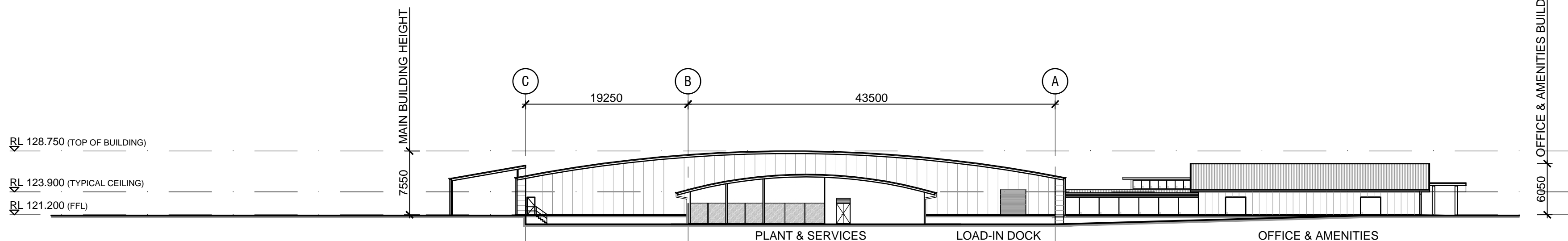
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COUNTY: COOPER  
LAND DISTRICT: NARRANDERA  
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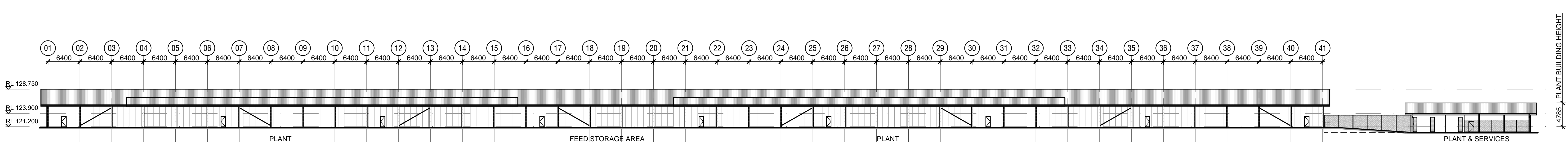
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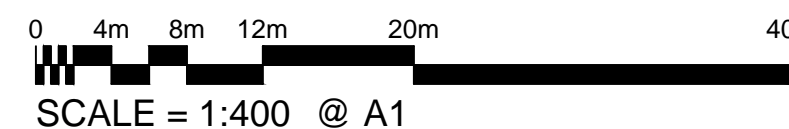
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04 WEST ELEVATION  
1:400

FINISHES NOTES


**EXTERNAL WALLS:** 100mm THICK (PIR) INSULATED WALL PANELS, COLORBOND FINISH (COLOUR TBC).  
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				03.12.13				P1	ISSUED FOR DA				JC
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CONSULTANT

CLIENT
 <b>BAIADA POULTRY P/L</b> 1311 Snaidero Road, Griffith NSW 2680
<b>HEAD OFFICE</b> P.O. BOX 21 Perle Hill NSW 2145 Telephone: (02) 9842 1000 Facsimile: (02) 9688 4818

 <b>WATPAC</b> SPECIALTY SERVICES
Watpac Specialty Services ABN 59 010 722 335 a Subsidiary of Watpac Limited
Level 1, 12 Commercial Road Newstead Qld 4006 PO Box 2053 Fortitude Valley Qld 4006 Fax: (07) 3251 6392 Phone: (07) 3251 6300
Website: www.watpac.com.au

PROJECT
<b>BAIADA GRIFFITH HATCHERY</b>
<b>GRIFFITH NSW</b>

DRAWING TITLE
<b>PROPOSED ELEVATIONS</b>

SCALE
@ A1 = 1:400 @ A3 = NTS
Do Not Scale from Drawings. Verify all Dimensions and Levels on Site
DRAWN
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DATE
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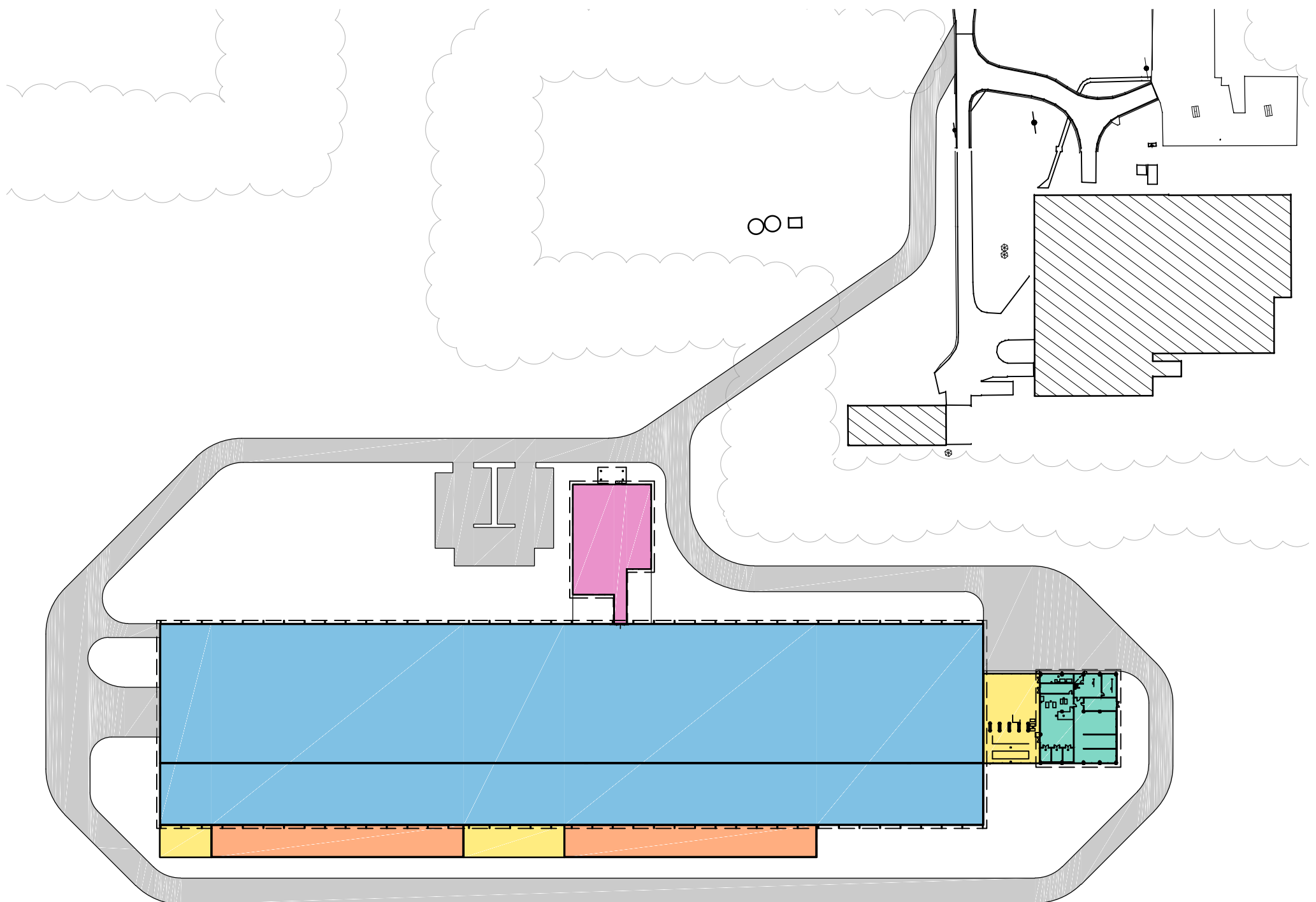
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DRAWING NUMBER
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BLDG NUMBER
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ISSUE
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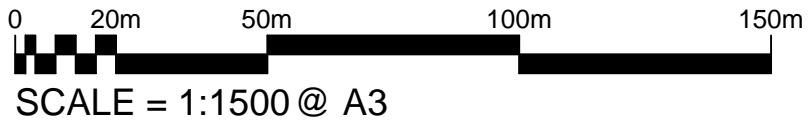
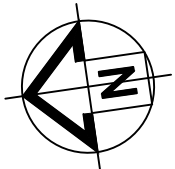
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APPLICATION

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AREA SCHEDULE	
815m <sup>2</sup>	OFFICE AND AMENITIES
16095m <sup>2</sup>	MAIN HATCHERY BUILDING
672m <sup>2</sup>	ENCLOSED PLANT AREAS
1572m <sup>2</sup>	COVERED PLANT AREAS
963m <sup>2</sup>	OPEN PLANT AREAS
OTHER AREAS	
NEW ROADS = 9765m <sup>2</sup>	
CAR PARK = 1028m <sup>2</sup>	



P1	PRELIMINARY ISSUE FOR REVIEW	03.12.13
Rev No.	Revision Description	Date
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**BAIADA POULTRY P/L**  
1311 Snaidero Road, Griffith NSW 2680  
  
**HEAD OFFICE**  
P.O BOX 21 Pendle Hill NSW 2145  
Telephone: (02) 9842 1000  
Facsimile: (02) 9688 4818

**B0485-SK-AR-001**  
BAIADA GRIFFITH HATCHERY  
PROPOSED GFA BREAKDOWN

Watpac Specialty Services  
ABN 59 010 722 335 a  
Subsidiary of Watpac Limited  
Website: [www.watpac.com.au](http://www.watpac.com.au)

Level 1, 12 Commercial Road  
Newstead Qld 4006  
PO Box 2053  
Fortitude Valley Qld 4006  
Fax: (07) 3251 6392  
Phone : (07) 3251 6300

Rev	Drawn	Approved
P1	JC	PS
Drawing Scale @ A3 1:1500		

## **APPENDIX 3**

# **STORMWATER MANAGEMENT STRATEGY**

# Griffith Hatchery Stormwater Management Strategy Report




**PSA Consulting**  
December, 2013



**J. WYNDHAM PRINCE**  
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS  
& PROJECT MANAGERS

## Griffith Hatchery Stormwater Management Plan

### - DOCUMENT CONTROL SHEET -

Issue	Amendment	Author	Reviewer	Certifier
A	Draft	FL (26/11/2013)	DC (16/12/2013)	
B	First Issue	FL (16/12/2013)	DC (16/12/2013)	DC (16/12/2013) 
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PO Box 4366  
PENRITH WESTFIELD NSW 2750  
P 02 4720 3300  
F 02 4721 7638  
W [www.jwprince.com.au](http://www.jwprince.com.au)  
E [jwp@jwp.com.au](mailto:jwp@jwp.com.au)

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## 1 INTRODUCTION

J. Wyndham Prince Pty Ltd (JWP) have been engaged by PSA Consulting to prepare a Stormwater Management Plan (SWMP) to support the development application (DA) for a new hatchery, to augment Baiada Poultry's existing hatchery which is located at 1311 Snaidero Road, Griffith NSW.

This report details the procedure and documents the design of the site stormwater detention and discharge control elements required by Griffith City Council. The strategy provides the basis for detailed design of this development moving forward.

## 2 THE EXISTING SITE

The subject site is identified as Lot 2 of DP 1044004, located on the corner of Kidman Way and Snaidero Road, Griffith NSW, and is located wholly within the Griffith Local Government Area.

The existing property is approximately 31.4 ha and houses an existing caretaker residence, hatchery, and associated staff carpark and water treatment pond. The site is generally undeveloped rural farmland. Plate 2-1 provides an overview of the main property features.

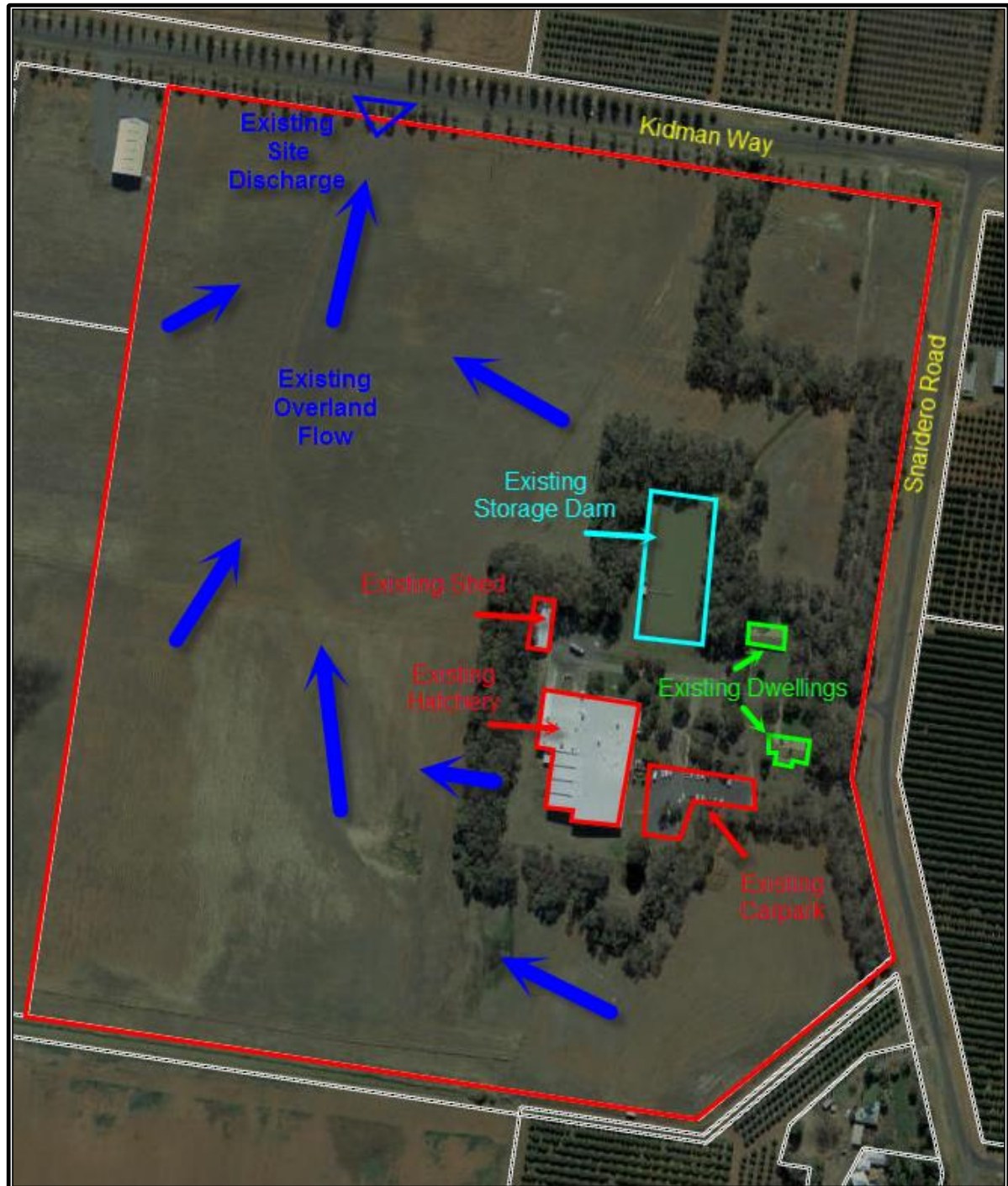


PLATE 2-1 - EXISTING SITE

## 3 PROPOSED DEVELOPMENT

A new hatchery is to be built to the north west of the existing hatchery on the site. Details of the preliminary layout are provided in Appendix E.

The new plant will consist of 896 m<sup>2</sup> office and amenities, 15839 m<sup>2</sup> main hatchery building, 832 m<sup>2</sup> enclosed plant areas, 2375 m<sup>2</sup> open plant areas, 9783 m<sup>2</sup> new roads and 1028 m<sup>2</sup> new car park.

Plate 3-1 below provides an overview of the proposed development.



PLATE 3-1 PROPOSED DEVELOPMENT



## 4 DEVELOPMENT CONTROLS AND GUIDELINES

### 4.1 Griffith City Council Development Control Plan No. 3 – Industrial Development (1995)

Controls relating to the management of stormwater from the development are not specified in DCP No. 3.

### 4.2 Engineering Guidelines - Subdivisions and Development Standards (2008)

Council's *Engineering Guidelines - Subdivisions and Development Standards (2008)* provides design guidelines for stormwater management in developments.

Generally, this document utilises the Rational Method to calculate stormwater flows due to development. It requires that post development discharge be less than pre-development discharge for the 1% AEP storm event.

This document requires that Water Sensitive Urban Design is to be undertaken in accordance with the general principles outlined in the following documents:

- *Water Sensitive Urban Design*, Melbourne Water (2005) WSUD Engineering Procedures, CSIRO Publishing.
- *Urban Stormwater Best Practice Environmental Management guidelines*, Victorian Stormwater Committee 1999.
- *Managing Urban Stormwater* – Series of documents (final and drafts), Department of Environment and Conservation NSW 2006-2008.
- *Australian Runoff Quality*, A guide to water sensitive urban design.

Council have advised that they will accept XP-RAFTS modelling for the Water Quantity calculations (GCC 2013). Email correspondence detailing the agreed XP-RAFTS modelling parameters is provided in Appendix D.

MUSIC modelling has been provided to assess the water quality treatment for this development. Many of the water quality treatment strategies found in the reference documents above are integrated into the MUSIC software package to allow treatment analysis of pollutant loads from development through various treatment elements such as swales, bio-retention gardens and wetlands. The NSW MUSIC modelling guidelines have been referenced to determine appropriate input parameters for this project.

## 5 PROPOSED STORMWATER MANAGEMENT

The subject site has minimal grade, and as such formal piped road drainage is not possible. Flows from the site will be collected via grassed swales adjacent to the internal roads, which will treat and convey runoff to the proposed detention basin.

Summarised below is a detailed methodology used to ensure compliance with Council DCP requirements and email correspondence.

### 5.1 Water Quantity Management

The hydrologic analyses for this study were undertaken using the rainfall - runoff flood routing model XP-RAFTS (Runoff and Flow Training Simulation with XP Graphical Interface) (Willing, 1996 & 1994). The hydrologic analysis for the new hatchery was undertaken to determine the requirement and size of the detention basin needed to restrict peak post development to pre development flows.

#### 5.1.1 Modelling Parameters

As part of the *XP-RAFTS* modelling for site, the following parameters were adopted:

**Design rainfall intensity-frequency-duration (IFD)** data adopted for the site has been obtained from Council's *Engineering Guidelines for Subdivisions & Developments (December 2008)*.

**Rainfall Loss Parameters** - The initial and continuing loss method was applied in accordance with Australian Rainfall and Runoff (IE Aust, 1987). Rainfall loss parameters were adopted based on Council's advice (refer Appendix D). The adopted parameters are included in Appendix A.

**Slope** - Catchment slopes have been estimated from existing survey contours. It is assumed that the development will be designed to generally conform with the existing site gradient. A summary of catchment slopes adopted are provided in Appendix A.

**Area** - Catchment areas were measured digitally and are summarised in Appendix A.

**Fraction Impervious** – Fraction impervious parameters were calculated based on a detailed area breakdown and applied to various land uses across the overall catchment. Refer to Appendix A for details.

**Manning's PERN value** – The type of land use has an effect on the runoff by providing some "resistance" to the flow. The "resistance" effect in XP-RAFTS is simulated by a storage delay coefficient called "PERN". Appendix A lists the PERN (n) values used in the model, as adopted from Council's *Engineering Guidelines for Subdivisions & Developments (December 2008)*.



## 5.1.2 Basin Outlet Control

A multi-staged weir is proposed as the outlet structure for the detention basin as part of the developed scenario. This device will restrict post development flows back to existing levels for the 1%, 5% and 50% AEP storm events. The proposed basin volume and outlet configuration is shown in Table 5-1 below.

**TABLE 5-1 BASIN CONFIGURATION**

Detention Basin	
Storage	1450 m <sup>3</sup>
Weir 1	4.6 m wide @ RL 120.66
Weir 2	15.0 m wide @ RL 120.76
Invert Level	RL 120.66
Top Water Level	RL 120.81
Crest	RL 121.31
FFL	RL 121.31
Freeboard	0.5 m

Detailed output files for the critical storm duration/s associated with the modelling are provided in Appendix A.

## 5.1.3 Discharge Estimates

Discharge estimates were derived for both the existing and developed catchments for the 1%, 5% and 50% AEP events. A range of storm durations from 10 minutes to 72 hours were analysed to determine the critical storm duration. Table 5-2 shows a comparison between pre and post development discharges.

**TABLE 5-2 PRE & POST DEVELOPMENT DISCHARGES**

AEP Storm Event	Existing Condition	Developed	Post/Pre Development Ratio
	Peak Outflow	Peak Outflow	
	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	
50%	0.11	0.10	0.86
5%	0.34	0.34	1.00
1%	0.67	0.65	0.97

The performance of the detention basin is provided in Table 5-3 below.

**TABLE 5-3 BASIN PERFORMANCE**

AEP Storm Event	Peak Inflow	Peak Outflow	Storage used	Stage used	Depth
	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(m <sup>3</sup> )	RL (m)	(m)
50%	0.67	0.10	512	120.71	0.05
5%	1.30	0.34	1079	120.77	0.11
1%	1.70	0.65	1449	120.81	0.15

## 5.1.4 Discussion of Modelling Results

The results of the hydrological modelling for the various development scenarios show that the proposed water quantity basin is adequate to manage the increase in stormwater runoff and ensure that development condition flows are restricted to at or below existing conditions.

## 5.2 Water Quality Management

The water quality analysis for this study was undertaken using the model MUSIC (Model for Urban Stormwater Improvement Conceptualisation) version 5 (CRCCH - 2005). This water quality modelling software was developed by the Cooperative Research Centre (CRC) for Catchment Hydrology, which is based at Monash University and was first released in July 2002.

The model provides a number of features relevant for the development:

- It is able to model the potential nutrient reduction benefits of gross pollutant traps, constructed wetlands, grass swales, bio-retention systems, sedimentation basins, infiltration systems and it incorporates mechanisms to model stormwater re-use as a treatment technique;
- It provides mechanisms to evaluate the attainment of water quality objectives;

In absence of specific modelling guidelines available from Council, the following industry standard pollution reduction targets have been adopted:

Total Phosphorous	65% reduction of average annual load
Total Nitrogen	45% reduction of average annual load
Suspended Solids	85% reduction of average annual load for particles 0.5 mm or less
Gross Pollutants	90% retention of material greater than 5mm

The MUSIC modelling was undertaken to demonstrate that the stormwater management system proposed for the development will result in reductions in overall post-development pollutant loads and concentrations being discharged from the proposed development and that these discharges comply with the above target objectives.

### 5.2.1 MUSIC Modelling Philosophy and Parameters

To achieve the required pollutant reduction at the receiving node, the development should include grass lined swales and buffer strips in various forms to achieve the required water quality outcomes.

Details of modelling parameters used for the swales is provided in Appendix D.

### 5.2.2 Catchments

The MUSIC model was established for the site, representing the proposed stormwater management system. The proposed catchment has been split into various land uses to represent the post development condition. The general arrangement of the MUSIC model is shown in Appendix B.

## 5.2.3 Rainfall Data

The MUSIC model is able to utilise rainfall data based on 6 minute, hourly, 6 hourly and daily time steps. A 6 minute time step was used in the analysis which was chosen in accordance with the recommendations for selecting a time step within the MUSIC User's Manual.

The nearest rainfall station to the site with a reasonable period of 6 minute rainfall data for a suitably representative period of rainfall for the site was:

Station No	Location	Years of Record	Type of Data
75041	Griffith CSIRO	1950 - 1970	6 minute

The mean annual rainfall for this data set was 444 mm, which is slightly higher than the value of 406 mm given on the Bureau of Meteorology website for that station. This will lead to slightly more conservative results for the water quality assessment.

The potential evapo-transpiration data necessary to establish this model was taken from the Bureau of Meteorology Website.

## 5.2.4 Grassed Swales

It is proposed to utilise swales around the perimeter road to collect runoff from the site and convey the flows to the detention basin. The swales provide the necessary water quality treatment for the development and upstream catchment flows collected by these swales. A typical cross section of a swale is provided in Appendix E. The required swale length and configuration necessary to achieve the water quality outcome is provided in Table 5-4 below.

**TABLE 5-4 SWALE DETAILS**

Catchment	Required Swale Length (m)	Provided Swale Length (m)	Bed Slope (%)	Base Width (m)	Top Width (m)	Depth (m)	Vegetation Height (m)	Exfiltration Rate (mm/hr)
MU01	60	190	0.3	7.2	8.4	0.15	0.05	3.6
MU02	60	180		6.1	7.3	0.15		
MU03	40	220		19.1	20.3	0.15		
MU04	Share MU03							
MU05	15	25		24.4	25.6	0.15		
MU06	Share MU01							
MU07	140 Buffer			3	3	0.01		
MU08	20	35		12.2	13.4	0.15		

Refer to Appendix B for MUSIC model layout and catchment area diagram.

## 5.2.5 Pollutant Load Estimates

The total annual pollutant loads derived from the MUSIC model for the proposed development at the point of discharge (i.e. at the Basin Outlet) are shown in Table 5-5 below.

**TABLE 5-5 MEAN ANNUAL POLLUTANT LOADS/REDUCTIONS**

Pollutant	Total Developed Source Nodes	Minimum Reduction Required	Total Residual Load from Site	Total Reduction Achieved	Total Reduction Achieved
	(kg/yr)	(kg/yr)	(kg/yr)	(kg/yr)	(%)
TSS	2050	1743	265	1785	87.1%
TP	4.18	2.72	1.44	2.74	65.6%
TN	31.6	14.2	16.70	14.9	47.2%
Gross Pollutants	497	447	0.0	497	100.0%

## 5.2.6 Discussion of Modelling

The performance of the proposed water quality management strategy for the site shows that the treatment train proposed will meet standard industry reduction targets for TSS, TP, TN and Gross Pollutants.

This report details the investigations and presents the results of the stormwater detention and water quality design to support the proposed new Hatchery for Baiada Poultry at their Griffith Plant.

This report provides the necessary details required for development application, and is consistent with Council's *Engineering Guidelines - Subdivisions and Development Standards (2008)*. Additional construction details can be provided prior to Construction Certificate.

The Stormwater Management Strategy consists of a treatment train approach that includes a swale as the treatment measure. The structural elements proposed for the development consists of:

- Grassed swales around the development.
- Detention basin with a total detention storage volume 1450 m<sup>3</sup>

The water quality arrangement will ensure that the pollution discharges are managed to industry accepted levels.

Provision of the proposed detention basin will ensure that peak post development discharges are restricted to less than the pre development levels.

Due to the extremely flat site, a flat basin with maximum depth of 0.15m has been provided. A minimum freeboard of 0.5 m has also been provided to the proposed finished floor level the proposed new hatchery (i.e. FFL 121.31 m).

The proposed Stormwater Management Strategy for the developed site provides a basis for the detailed design and development of the construction drawings to ensure that the environmental, urban amenity, engineering and economic objectives for stormwater management and site discharge are achieved.

This report provides the necessary documentation to allow an approval of the development from a stormwater management perspective.



## 7 REFERENCES

CRC for Catchment Hydrology (2009). MUSIC Model for Urban Stormwater Improvement Conceptualisation – User Guide

GCC 2013 – email advice received 3 December 2013, *Griffith City Council*.

Sydney Metropolitan Catchment Management Authority (2010). Draft NSW MUSIC Modelling Guidelines

Willing & Partners Pty. Ltd. (1994). Runoff Analysis & Flow Training Simulation. Detailed Documentation and User Manual, Version 4.0

Willing & Partners Pty. Ltd. (1996). Runoff Analysis & Flow Training Simulation. Addendum, Version 5.0

APPENDIX A – XP RAFTS INPUT AND OUTPUT DETAILS

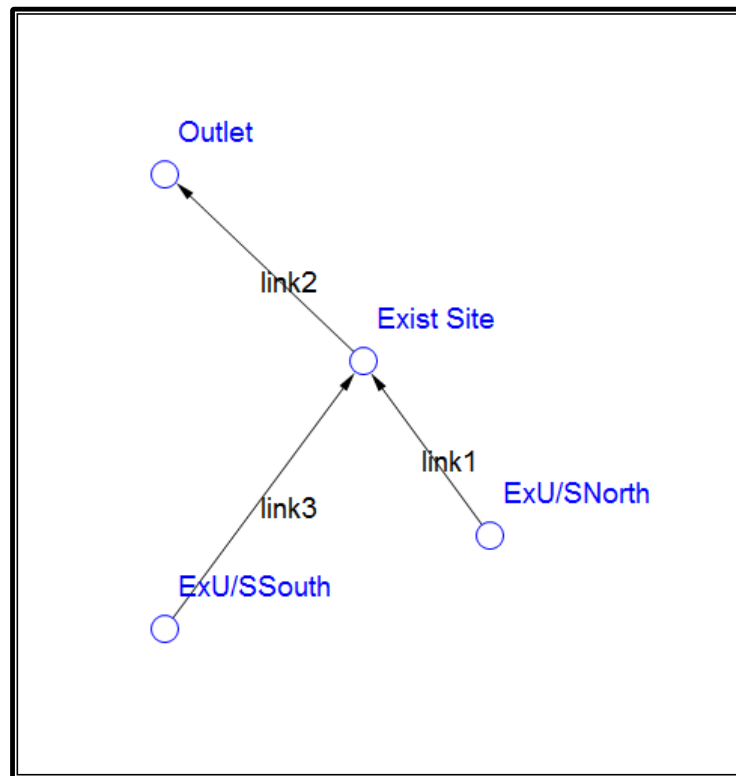


PLATE A 1 – EXISTING CONDITIONS RAFTS MODEL LAYOUT

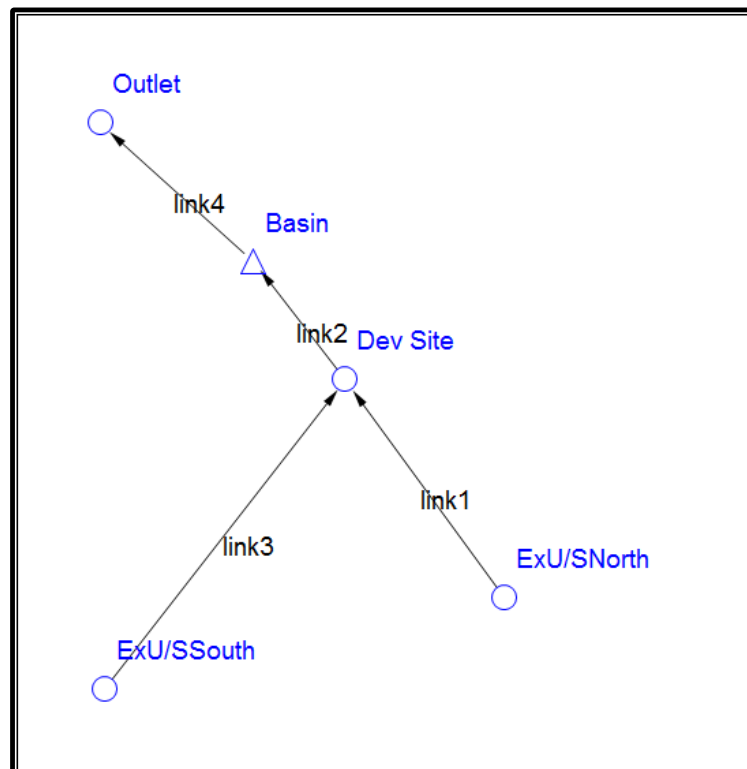


PLATE A 2 – DEVELOPED CONDITIONS RAFTS MODEL LAYOUT

## RAFTS INPUT PARAMETERS

**TABLE A 1 INITIAL / CONTINUING LOSS**

Initial/ Continuing Losses (mm/hr)		
Loss	Pervious Catchment	Impervious Catchment
Initial Loss	15.00	1.50
Continuing Loss	6.00	0.00

**TABLE A 2 - ADOPTED PERNS**

Catchment Condition	Adopted Manning's n
Pervious	0.025
Impervious	0.015

**Table A 3 – EXISTING CATCHMENT PARAMETERS**

Existing Catchment					
Node	Total Area	Percent Impervious	Pervious Area	Impervious Area	Slope
	(ha)	(%)	(ha)	(ha)	(%)
Existing Site	4.28	0.00	4.283	0.000	0.4
Ex. U/S North	4.08	9.72	3.679	0.3959	0.4
Ex. U/S South	1.29	16.93	1.075	0.2191	0.4

**TABLE A 4 – DEVELOPED CATCHMENT PARAMETERS**

Developed Catchment					
Node	Total Area	Percent Impervious	Pervious Area	Impervious Area	Slope
	(ha)	(%)	(ha)	(ha)	(%)
Dev Site	4.28	71.80	1.208	3.075	0.4
Ex. U/S North	4.08	9.72	3.679	0.3959	0.4
Ex. U/S South	1.29	16.93	1.075	0.2191	0.4

9848RA\_Ex\_Rpt1A.out.txt  
Run started at: 5th December 2013 11:22:32

#####  
RUNTIME RESULTS  
#####

LINK ExU/SNorth 1.000  
WARNING 8 - LOSSES POSS. EXCEED RAIN

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.5050E-01  
ESTIMATED PEAK FLOW (CUMEDS) = 0.74E-01  
ESTIMATED TIME TO PEAK (MINS) = 14.00

LINK ExU/SSouth 1.000  
WARNING 8 - LOSSES POSS. EXCEED RAIN

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.2794E-01  
ESTIMATED PEAK FLOW (CUMEDS) = 0.41E-01  
ESTIMATED TIME TO PEAK (MINS) = 14.00

LINK Exist Site 1.000  
WARNING 8 - LOSSES POSS. EXCEED RAIN

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.7844E-01  
ESTIMATED PEAK FLOW (CUMEDS) = 0.11  
ESTIMATED TIME TO PEAK (MINS) = 17.00

LINK Outlet 1.000  
WARNING 8 - LOSSES POSS. EXCEED RAIN

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.7844E-01  
ESTIMATED PEAK FLOW (CUMEDS) = 0.11  
ESTIMATED TIME TO PEAK (MINS) = 18.00

#####  
Existing Site

Results for period from 0: 0.0 1/ 1/1990  
to 4: 10.0 1/ 1/1990

#####

ROUTING INCREMENT (MINS) = 1.00  
STORM DURATION (MINS) = 25.  
RETURN PERIOD (YRS) = 2.  
BX = 1.0000  
TOTAL OF FIRST SUB-AREAS (ha) = 9.04  
TOTAL OF SECOND SUB-AREAS (ha) = 0.62  
TOTAL OF ALL SUB-AREAS (ha) = 9.65

# SUMMARY OF CATCHMENT AND RAINFALL DATA

Link	Catch. Area	Slope	% Impervious	Pern	B	Link
Label	#1 #2	#1 #2	#1 #2	#1 #2	#1 #2	No.
	(ha)	(%)	(%)			
ExU/SNorth	3.679 0.3959	.4000 .4000	0.000 100.0	.025 .015	.0808 .0015	1.000
ExU/SSouth	1.075 0.2191	.4000 .4000	0.000 100.0	.025 .015	.0426 .0011	2.000
Exist Site	4.283 .00001	.4000 .4000	0.000 100.0	.025 .015	.0875 0.000	1.001
Outlet	.00001 0.000	.0100 0.000	0.000 0.000	.025 0.00	.0006 0.000	1.002



9848RA\_Ex\_Rpt1A. out. txt

Link Label	Average Intensity (mm/h)	Init. #1 (mm)	Loss #2 (mm)	Cont. #1 (mm/h)	Loss #2 (mm/h)	Excess #1 (mm)	Rain #2	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Link Lag mins
ExU/SNorth	34.225	15.00	1.500	6.000	0.000	0.000	12.760	0.0739	14.00	1.900
ExU/SSouth	34.225	15.00	1.500	6.000	0.000	0.000	12.760	0.0409	14.00	5.300
Exist Site	34.225	15.00	1.500	6.000	0.000	0.000	12.760	0.1110	17.00	.8000
Outlet	34.225	15.00	0.000	6.000	0.000	0.000	0.000	0.1110	18.00	0.000

#####  
#####  
  
#####  
#####

LINK ExU/SNorth 6.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.467  
ESTIMATED PEAK FLOW (CUMECS) = 0.27  
ESTIMATED TIME TO PEAK (MINS) = 56.00

LINK ExU/SSouth 6.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.4839  
ESTIMATED PEAK FLOW (CUMECS) = 0.13  
ESTIMATED TIME TO PEAK (MINS) = 45.00

LINK Exist Site 6.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 3.429  
ESTIMATED PEAK FLOW (CUMECS) = 0.67  
ESTIMATED TIME TO PEAK (MINS) = 56.00

LINK Outlet 6.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 3.429  
ESTIMATED PEAK FLOW (CUMECS) = 0.67  
ESTIMATED TIME TO PEAK (MINS) = 57.00

#####  
Existing Site

Results for period from 0: 0.0 1/ 1/1990  
to 10: 0.0 1/ 1/1990

#####

ROUTING INCREMENT (MINS) = 1.00  
STORM DURATION (MINS) = 60.  
RETURN PERIOD (YRS) = 100.  
BX = 1.0000  
TOTAL OF FIRST SUB-AREAS (ha) = 9.04  
TOTAL OF SECOND SUB-AREAS (ha) = 0.62  
TOTAL OF ALL SUB-AREAS (ha) = 9.65

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area #1 (ha)	Area #2	Slope #1 (%)	% Impervious #2 (%)	Pern #1	#2	B #1	#2	Link No.
------------	---------------------	---------	--------------	---------------------	---------	----	------	----	----------

9848RA\_Ex\_Rpt1A.out.txt

	3.679	0.3959	.4000	.4000	0.000	100.0	.025	.015	.0808	.0015	1.000
ExU/SSouth	1.075	0.2191	.4000	.4000	0.000	100.0	.025	.015	.0426	.0011	2.000
Exist Site	4.283	.00001	.4000	.4000	0.000	100.0	.025	.015	.0875	0.000	1.001
Outlet	.00001	0.000	.0100	0.000	0.000	0.000	.025	0.00	.0006	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. #1 (mm)	Loss #2	Cont. #1 (mm/h)	Loss #2	Excess #1 (mm)	Rain #2	Peak Inflow (m^3/s)	Time to Peak	Link Lag mins
ExU/SSouth	53.679	15.00	1.500	6.000	0.000	34.179	52.179	0.2745	56.00	1.900
Exist Site	53.679	15.00	1.500	6.000	0.000	34.179	52.179	0.6731	56.00	.8000
Outlet	53.679	15.00	0.000	6.000	0.000	34.179	0.000	0.6731	57.00	0.000

#####

LINK ExU/SSouth 8.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.9866  
 ESTIMATED PEAK FLOW (CUMECS) = 0.14  
 ESTIMATED TIME TO PEAK (MINS) = 71.00

LINK Exist Site 8.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.3375  
 ESTIMATED PEAK FLOW (CUMECS) = 0.68E-01  
 ESTIMATED TIME TO PEAK (MINS) = 25.00

LINK Outlet 8.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.272  
 ESTIMATED PEAK FLOW (CUMECS) = 0.34  
 ESTIMATED TIME TO PEAK (MINS) = 73.00

LINK Outlet 8.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.272  
 ESTIMATED PEAK FLOW (CUMECS) = 0.34  
 ESTIMATED TIME TO PEAK (MINS) = 74.00

#####  
 Existing Site

Results for period from 0: 0.0 1/ 1/1990  
 to 20: 0.0 1/ 1/1990

#####

ROUTING INCREMENT (MINS) = 1.00  
 STORM DURATION (MINS) = 120.  
 RETURN PERIOD (YRS) = 20.  
 BX = 1.0000  
 TOTAL OF FIRST SUB-AREAS (ha) = 9.04  
 TOTAL OF SECOND SUB-AREAS (ha) = 0.62  
 TOTAL OF ALL SUB-AREAS (ha) = 9.65

9848RA\_Ex\_Rpt1A.out.txt

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. #1	Area #2	Slope #1	% Impervious #2	Pern #1	B #2	Link No.
	(ha)		(%)	(%)			
ExU/SSouth	3.679	0.3959	.4000	.4000	0.000	100.0	1.000
ExU/SSouth	1.075	0.2191	.4000	.4000	0.000	100.0	2.000
Exist Site	4.283	.00001	.4000	.4000	0.000	100.0	1.001
Outlet	.00001	0.000	.0100	0.000	0.000	0.000	1.002

Link Label	Average Intensity (mm/h)	Init. Loss #1 (mm)	Cont. Loss #2 (mm/h)	Excess Rain #1 (mm)	Peak Inflow (m <sup>3</sup> /s)	Time to Peak mins	Link Lag mins
ExU/SSouth	23.230	15.00	1.500	6.000	0.000	21.991	44.960
ExU/SSouth	23.230	15.00	1.500	6.000	0.000	21.991	44.960
Exist Site	23.230	15.00	1.500	6.000	0.000	21.991	44.960
Outlet	23.230	15.00	0.000	6.000	0.000	21.991	0.000

Run completed at: 5th December 2013 11:22:33

9848RA\_Dev\_Rpt1A.out.txt  
Run started at: 5th December 2013 11:15:12

#####  
RUNTIME RESULTS  
#####

LINK ExU/SSouth 1.000  
WARNING 8 - LOSSES POSS. EXCEED RAIN

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.1722  
ESTIMATED PEAK FLOW (CUMECs) = 0.64E-01  
ESTIMATED TIME TO PEAK (MINS) = 24.00

LINK ExU/SSouth 1.000  
WARNING 8 - LOSSES POSS. EXCEED RAIN

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.7140E-01  
ESTIMATED PEAK FLOW (CUMECs) = 0.36E-01  
ESTIMATED TIME TO PEAK (MINS) = 24.00

LINK Dev Site 1.000  
WARNING 8 - LOSSES POSS. EXCEED RAIN

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.8669  
ESTIMATED PEAK FLOW (CUMECs) = 0.57  
ESTIMATED TIME TO PEAK (MINS) = 25.00

LINK Basin 1.000  
WARNING 8 - LOSSES POSS. EXCEED RAIN

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.8669  
ESTIMATED PEAK FLOW (CUMECs) = 0.57  
ESTIMATED TIME TO PEAK (MINS) = 25.00

iosd Ilkta 0 5  
LINK Outlet 1.000  
WARNING 8 - LOSSES POSS. EXCEED RAIN

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.8607  
ESTIMATED PEAK FLOW (CUMECs) = 0.96E-01  
ESTIMATED TIME TO PEAK (MINS) = 51.00

#####  
Developed Site

Results for period from 0: 0.0 1/ 1/1990  
to 10: 0.0 1/ 1/1990

#####

ROUTING INCREMENT (MINS) = 1.00  
STORM DURATION (MINS) = 60.  
RETURN PERIOD (YRS) = 2.  
BX = 1.0000  
TOTAL OF FIRST SUB-AREAS (ha) = 5.96  
TOTAL OF SECOND SUB-AREAS (ha) = 3.69  
TOTAL OF ALL SUB-AREAS (ha) = 9.65

SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. Area	Slope	% Impervious	Pern	B	Link No.
	#1 #2	#1 #2	#1 #2	#1 #2	#1 #2	
	(ha)	(%)	(%)			

9848RA\_Dev\_Rpt1A.out.txt

ExU/SNorth	3.679	0.3959	.4000	.4000	0.000	100.0	.025	.015	.0808	.0015	1.000
ExU/SSouth	1.075	0.2191	.4000	.4000	0.000	100.0	.025	.015	.0426	.0011	2.000
Dev Site	1.208	3.075	.4000	.4000	0.000	100.0	.025	.015	.0453	.0042	1.001
Basin	.00001	.00001	.4000	.4000	0.000	0.000	.025	.015	.0001	0.000	1.002
Outlet	.00001	0.000	.0100	0.000	0.000	0.000	.025	0.00	.0006	0.000	1.003

Link Label	Average Intensity (mm/h)	Init. #1 (mm)	Loss #2	Cont. #1 (mm/h)	Loss #2	Excess #1 (mm)	Rain #2	Peak Inflow (m^3/s)	Time to Peak	Link Lag mins
ExU/SNorth	20.701	15.00	1.500	6.000	0.000	2.708	19.201	0.0641	24.00	1.900
ExU/SSouth	20.701	15.00	1.500	6.000	0.000	2.708	19.201	0.0356	24.00	5.300
Dev Site	20.701	15.00	1.500	6.000	0.000	2.708	19.201	0.5744	25.00	0.000
Basin	20.701	15.00	1.500	6.000	0.000	2.708	19.201	0.5744	25.00	0.000
Outlet	20.701	15.00	0.000	6.000	0.000	2.708	0.000	0.0964	51.00	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m^3/s)	Time to Peak	Peak Outflow (m^3/s)	Total Inflow (m^3)	----- Vol. Avail	Basin Vol. Used	----- Stage Used
Basin	25.00	.5744	51.00	.0964	866.95	0.0000	511.66	0.05293

#####  
#####

LINK ExU/SNorth 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 1.467  
ESTIMATED PEAK FLOW (CUMECS) = 0.27  
ESTIMATED TIME TO PEAK (MINS) = 56.00

LINK ExU/SSouth 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.4839  
ESTIMATED PEAK FLOW (CUMECS) = 0.13  
ESTIMATED TIME TO PEAK (MINS) = 45.00

LINK Dev Site 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 3.969  
ESTIMATED PEAK FLOW (CUMECS) = 1.5  
ESTIMATED TIME TO PEAK (MINS) = 25.00

LINK Basin 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 3.969  
ESTIMATED PEAK FLOW (CUMECS) = 1.5  
ESTIMATED TIME TO PEAK (MINS) = 25.00

iosd Iikta 0 5  
LINK Outlet 3.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 3.957  
ESTIMATED PEAK FLOW (CUMECS) = 0.65  
ESTIMATED TIME TO PEAK (MINS) = 56.00



#####  
 Developed Site

Results for period from 0: 0.0 1/ 1/1990  
 to 10: 0.0 1/ 1/1990

#####

ROUTING INCREMENT (MINS) = 1.00  
 STORM DURATION (MINS) = 60.  
 RETURN PERIOD (YRS) = 100.  
 BX = 1.0000  
 TOTAL OF FIRST SUB-AREAS (ha) = 5.96  
 TOTAL OF SECOND SUB-AREAS (ha) = 3.69  
 TOTAL OF ALL SUB-AREAS (ha) = 9.65

#### SUMMARY OF CATCHMENT AND RAINFALL DATA

Link Label	Catch. #1	Area #2	Slope #1	% Impervious #2	Pern #1	B #2	Link No.
	(ha)		(%)	(%)			
ExU/SNorth	3.679	0.3959	.4000	.4000	0.000	100.0	1.000
ExU/SSouth	1.075	0.2191	.4000	.4000	0.000	100.0	2.000
Dev Site	1.208	3.075	.4000	.4000	0.000	100.0	1.001
Basin	.00001	.00001	.4000	.4000	0.000	0.000	1.002
Outlet	.00001	0.000	.0100	0.000	0.000	0.000	1.003

Link Label	Average Intensity (mm/h)	Init. Loss #1 (mm)	Loss #2	Cont. Loss #1 (mm/h)	Loss #2	Excess Rain #1 (mm)	Rain #2	Peak Inflow (m^3/s)	Time to Peak mins	Link Lag mins
ExU/SNorth	53.679	15.00	1.500	6.000	0.000	34.179	52.179	0.2745	56.00	1.900
ExU/SSouth	53.679	15.00	1.500	6.000	0.000	34.179	52.179	0.1252	45.00	5.300
Dev Site	53.679	15.00	1.500	6.000	0.000	34.179	52.179	1.495	25.00	0.000
Basin	53.679	15.00	1.500	6.000	0.000	34.179	52.179	1.495	25.00	0.000
Outlet	53.679	15.00	0.000	6.000	0.000	34.179	0.000	0.6510	56.00	0.000

#### SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m^3/s)	Time to Peak	Peak Outflow (m^3/s)	Total Inflow (m^3)	----- Vol. Avail	Basin Vol. Used	----- Stage Used
Basin	25.00	1.495	56.00	.6510	3969.2	0.0000	1448.8	0.1499

#####  
 #####

LINK ExU/SNorth 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.9866  
 ESTIMATED PEAK FLOW (CUMECs) = 0.14

9848RA\_Dev\_Rpt1A. out. txt

ESTIMATED TIME TO PEAK (MINS) = 71.00

LINK ExU/SSouth 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 0.3375

ESTIMATED PEAK FLOW (CUMECs) = 0.68E-01

ESTIMATED TIME TO PEAK (MINS) = 25.00

LINK Dev Site 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.974

ESTIMATED PEAK FLOW (CUMECs) = 1.0

ESTIMATED TIME TO PEAK (MINS) = 25.00

LINK Basin 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.974

ESTIMATED PEAK FLOW (CUMECs) = 1.0

ESTIMATED TIME TO PEAK (MINS) = 25.00

iosd Ilkta 0 5

LINK Outlet 5.000

ESTIMATED VOLUME (CU METRES\*10\*\*3) = 2.974

ESTIMATED PEAK FLOW (CUMECs) = 0.34

ESTIMATED TIME TO PEAK (MINS) = 77.00

#####

Developed Site

Results for period from 0: 0.0 1/ 1/1990

to 20: 0.0 1/ 1/1990

#####

ROUTING INCREMENT (MINS) = 1.00

STORM DURATION (MINS) = 120.

RETURN PERIOD (YRS) = 20.

BX = 1.0000

TOTAL OF FIRST SUB-AREAS (ha) = 5.96

TOTAL OF SECOND SUB-AREAS (ha) = 3.69

TOTAL OF ALL SUB-AREAS (ha) = 9.65

#### SUMMARY OF CATCHMENT AND RAINFALL DATA

Link	Catch. Area	Slope	% Impervious	Pern	B	Link
Label	#1 #2	#1 #2	#1 #2	#1 #2	#1 #2	No.
	(ha)	(%)	(%)			
ExU/SNorth	3.679 0.3959	.4000 .4000	0.000 100.0	.025 .015	.0808 .0015	1.000
ExU/SSouth	1.075 0.2191	.4000 .4000	0.000 100.0	.025 .015	.0426 .0011	2.000
Dev Site	1.208 3.075	.4000 .4000	0.000 100.0	.025 .015	.0453 .0042	1.001
Basin	.00001 .00001	.4000 .4000	0.000 0.000	.025 .015	.0001 0.000	1.002
Outlet	.00001 0.000	.0100 0.000	0.000 0.000	.025 0.00	.0006 0.000	1.003

Link	Average	Init. Loss	Cont. Loss	Excess Rain	Peak	Time	Link
Label	Intensity	#1 #2	#1 #2	#1 #2	Inflow	to	Lag
	(mm/h)	(mm)	(mm/h)	(mm)	(m^3/s)	Peak	mins
ExU/SNorth	23.230	15.00 1.500	6.000 0.000	21.991 44.960	0.1436	71.00	1.900
ExU/SSouth	23.230	15.00 1.500	6.000 0.000	21.991 44.960	0.0677	25.00	5.300

9848RA\_Dev\_Rpt1A. out. txt

Dev Site	23.230	15.00	1.500	6.000	0.000	21.991	44.960	1.007	25.00	0.000
Basin	23.230	15.00	1.500	6.000	0.000	21.991	44.960	1.007	25.00	0.000
Outlet	23.230	15.00	0.000	6.000	0.000	21.991	0.000	0.3414	77.00	0.000

SUMMARY OF BASIN RESULTS

Link Label	Time to Peak	Peak Inflow (m <sup>3</sup> /s)	Time to Peak	Peak Outflow (m <sup>3</sup> /s)	Total Inflow (m <sup>3</sup> )	----- Vol. Avail	Basin ----- Vol. Used	Stage Used
Basin	25.00	1.006	77.00	.3414	2973.8	0.0000	1079.3	0.1117

Run completed at: 5th December 2013 11:15:14

**APPENDIX B – MUSIC MODELLING LAYOUT**

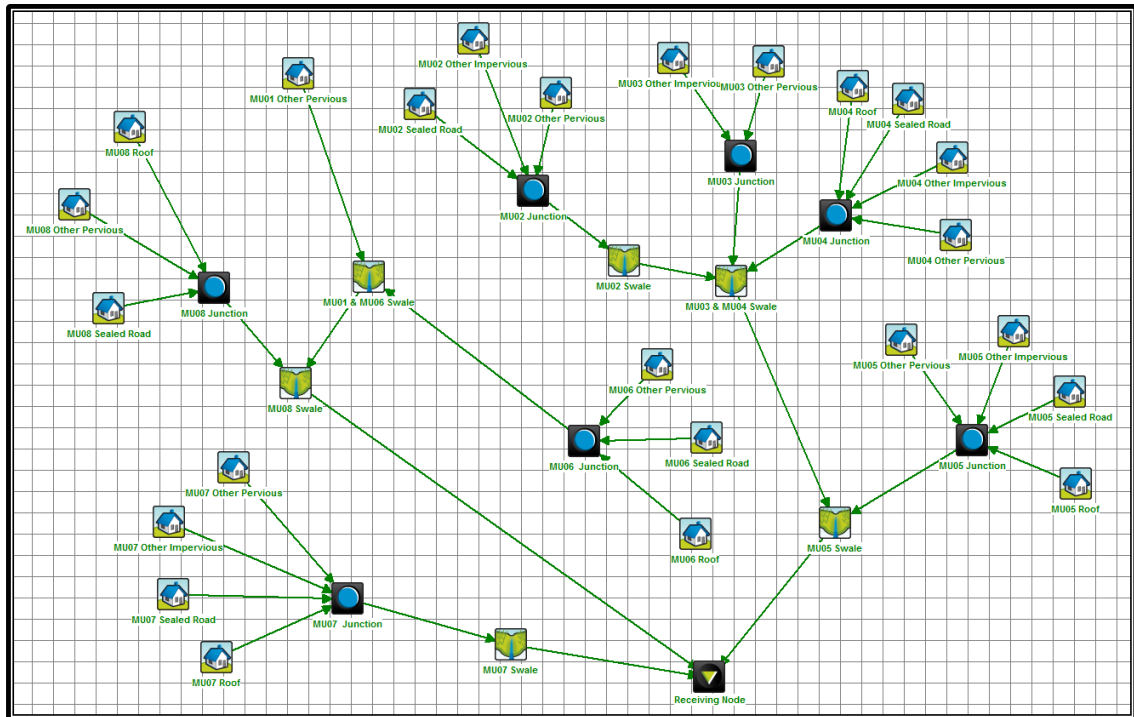


PLATE B 1 – MUSIC MODEL LAYOUT

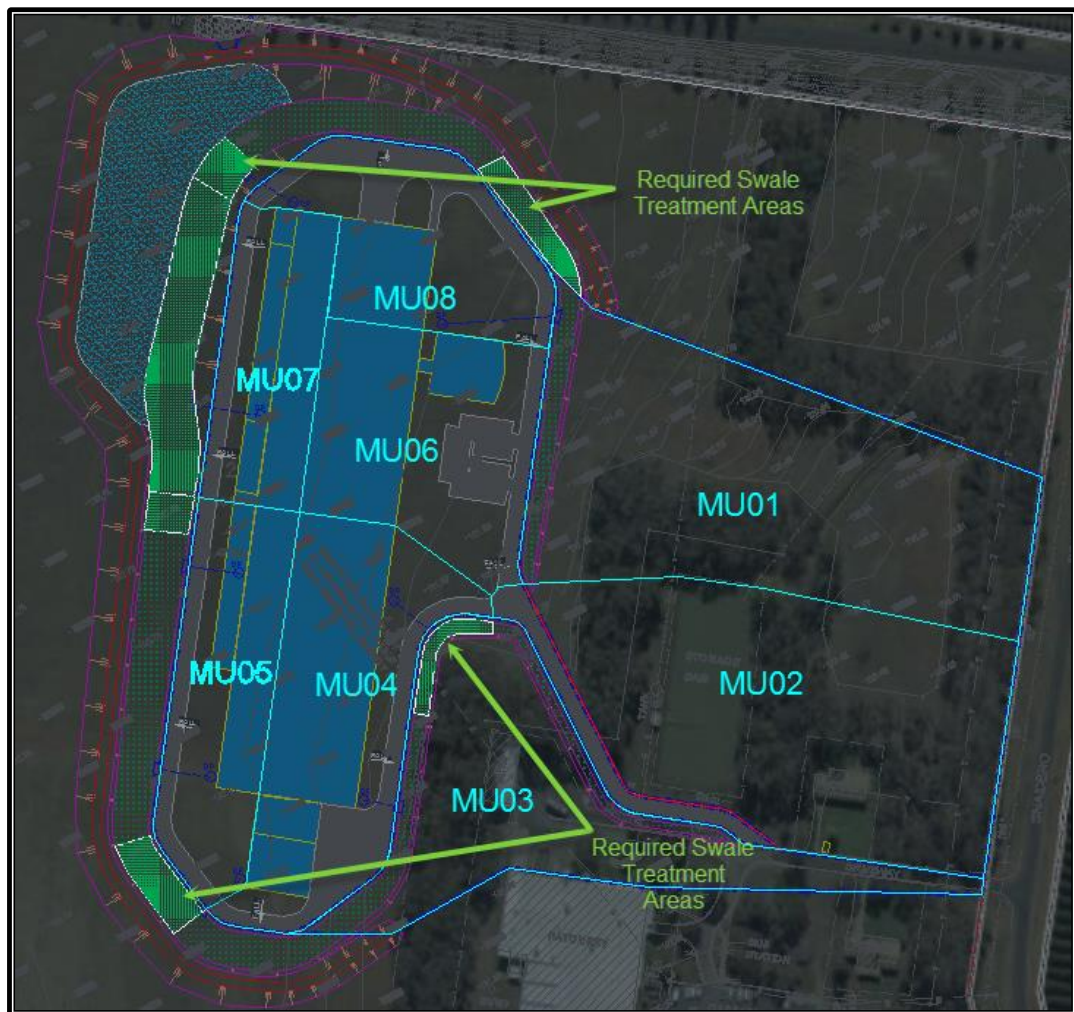


PLATE B 2 – MUSIC MODEL CATCHMENTS

**TABLE B1 MUSIC INPUTS**

MUSIC Inputs					
Catchment	Roof (ha)	Roads (ha)	Other Impervious Areas (ha)	Pervious Areas (ha)	Effective Swale length
MU01	0.000	0.000	0.000	2.110	80
MU02	0.000	0.151	0.396	1.569	80
MU03	0.000	0.000	0.219	1.075	125
MU04	0.604	0.256	0.049	0.211	Share MU03
MU05	0.238	0.147	0.074	0.282	95
MU06	0.460	0.184	0.000	0.288	Share MU01
MU07	0.265	0.105	0.115	0.097	None
MU08	0.190	0.237	0.000	0.329	108



**APPENDIX C – STANDARD MUSIC PARAMETERS & SOIL/GW ASSUMPTIONS**

**MUSIC MODELLING LANDUSE PARAMETERS**

Details of the soil / groundwater parameters adopted for the MUSIC modelling undertaken for this development are presented in Table C1 below. The adopted Annual Pollutant event mean concentrations are also presented in Table C2 below:

**Table C1 ADOPTED SOIL / GROUNDWATER PARAMETERS FOR THE SITE**

	Units	Roof	Road	Other
<b>Impervious Area Parameters</b>				
Rainfall threshold (Road 1, Roofs0.5)	mm/day	0.3	1.5	1.5
<b>Pervious Area Parameters</b>				
Soil storage capacity	mm	100	100	100
Initial storage	% of capacity	25	25	25
Field capacity	mm	87	87	87
Infiltration capacity coefficient - a		250	250	250
Infiltration capacity coefficient - b		1.3	1.3	1.3
<b>Groundwater Properties</b>				
Initial depth	mm	10	10	10
Daily recharge rate	%	60	60	60
Daily baseflow rate	%	45	45	45
Daily deep seepage rate	%	0	0	0

\* Roofed and Road catchments have been assumed to be 100% impervious

**Table C2 ADOPTED ANNUAL POLLUTANT EVENT MEAN CONCENTRATIONS**

	Roofed*		Road*		Other	
Pollutant	Base Flow	Storm Flow	Base Flow	Storm Flow	Base Flow	Storm Flow
	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
TSS	0	20	0	269	16	141.2
TP	0	0.13	0	0.5	0.14	0.25
TN	0	2	0	2.2	1.3	2

\* Roofed and Road catchments have been assumed to be 100% impervious

## GRASSED SWALE

A grassed swale is a graded and engineered landscape feature appearing as a linear, shallow, open channel with trapezoidal or parabolic shape. The swale is vegetated with flood tolerant, erosion resistant plants.



Within the grassed swales storm water is drained at a slow and controlled rate and the swale acts as a treatment device in removing pollutants and allowing stormwater infiltration.

A well-designed grassed swale results in a significant improvement over the traditional drainage ditch in both detaining the flows and cleaning of storm water. Collected stormwater is designed to drain out through the filter medium within several hours or days.

(<http://www.lakesuperiorstreams.org/stormwater/toolkit/swales.html>)

The general features of the grassed swale proposed for the site are indicated in Table 5.4 within the body of the report.

**Music Modelling Parameters**

The water quality reduction mechanisms in MUSIC are based on an exponential decay equation referred to as the  $k - C^*$  curve. The expected sediment and nutrient removal performance of the proposed devices were determined using the default equations and parameters provided in the MUSIC model. These values are summarised in **Table B5** below;

**Table B5      ADOPTED SWALE SYSTEM MUSIC  
MODELLING PARAMETERS**

Pollutant	Swale	
	k (m/yr)	C* (mg/L)
TSS	8000	20.000
TP	6000	0.130
TN	500	1.400

APPENDIX D – CORRESPONDENCE

## Francis Lane

---

**From:** Joe.Rizzo@griffith.nsw.gov.au  
**Sent:** Wednesday, 4 December 2013 9:12 AM  
**To:** Francis Lane  
**Cc:** Chris Randall; David Crompton  
**Subject:** RE: Additional Stormwater Design Data

Francis,

Sounds fine. Just wanted to make sure I led you on the right track now.

Thanks for asking the questions at this stage, saves allot of time once you submit the information.

Regards,

Joe Rizzo  
Development Engineer  
Griffith City Council  
PH: (02) 69628132  
Mobile: 0431 762 996

From: Francis Lane <flane@jwprince.com.au>  
To: "Joe.Rizzo@griffith.nsw.gov.au" <Joe.Rizzo@griffith.nsw.gov.au>,  
Cc: Chris Randall <CRandall@jwprince.com.au>, David Crompton <DCrompton@jwprince.com.au>  
Date: 03/12/2013 05:11 PM  
Subject: RE: Additional Stormwater Design Data

---

Thanks Joe,

Extract is fine. No need to send CD at this stage.

Interestingly, the values in the flood study are a lot closer to Sydney values than the values I had determined according to AR&R. We generally use 15 & 2.5 for pervious and 2.5 & 0 for impervious.

I will adopt initial and continuing loss values from the Griffith flood study as you requested.

Regards,

**Francis Lane** – Water Resources Engineer

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**J. WYNDHAM PRINCE**  
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS  
& PROJECT MANAGERS

P 02 4720 3385 F 02 4721 7638 W [www.jwprince.com.au](http://www.jwprince.com.au)  
580 High Street, Penrith NSW  
PO Box 4366 PENRITH WESTFIELD 2750

**From:** Joe.Rizzo@griffith.nsw.gov.au [<mailto:Joe.Rizzo@griffith.nsw.gov.au>]  
**Sent:** Tuesday, 3 December 2013 5:01 PM  
**To:** Francis Lane  
**Cc:** Chris Randall; David Crompton  
**Subject:** RE: Additional Stormwater Design Data

Francis,



Not too sure why the link isnt working from your end.  
The pdf of the document is 31Megs so I wont be able to email the document to you.  
I have provided an extract of the document below with contains some of the figures for your reference.

If you would like I can post you out a CD with the complete document if you like. Please advise and I will send a CD out to you in the post tomorrow.

Regards,

Joe Rizzo  
Development Engineer  
Griffith City Council  
PH: (02) 69628132  
Mobile: 0431 762 996

From: Francis Lane <[flane@jwprince.com.au](mailto:flane@jwprince.com.au)>  
To: "[Joe.Rizzo@griffith.nsw.gov.au](mailto:Joe.Rizzo@griffith.nsw.gov.au)" <[Joe.Rizzo@griffith.nsw.gov.au](mailto:Joe.Rizzo@griffith.nsw.gov.au)>,  
Cc: Chris Randall <[CRandall@jwprince.com.au](mailto:CRandall@jwprince.com.au)>, David Crompton <[DCrompton@jwprince.com.au](mailto:DCrompton@jwprince.com.au)>  
Date: 03/12/2013 04:28 PM  
Subject: RE: Additional Stormwater Design Data

---

Hi Joe,

I assume you are referring to the initial and continuing loss values. The values are taken from AR&R. According to AR&R Volume 1 Book 2 - Table 3.2, the western plains values are valid for mean annual rainfall < 300mm/yr. The BOM website indicates that Griffith mean annual rainfall is 403mm. The values adopted are the lower end of the range for the NSW values, and will give conservative results.

I did note that I had a typo in the mannings n values. Should have read 0.015 Impervious and 0.025 pervious – consistent with Griffith Council's Engineering guidelines.

Could you please send me a pdf of the Griffith flood study. I have tried accessing it on a couple of machines, and keep getting "error – link not found".

Kind regards,

**Francis Lane** – Water Resources Engineer

---

**J. WYNDHAM PRINCE**  
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS  
& PROJECT MANAGERS

P 02 4720 3385 F 02 4721 7638 W [www.jwprince.com.au](http://www.jwprince.com.au)  
580 High Street, Penrith NSW  
PO Box 4366 PENRITH WESTFIELD 2750

From: [Joe.Rizzo@griffith.nsw.gov.au](mailto:Joe.Rizzo@griffith.nsw.gov.au) [<mailto:Joe.Rizzo@griffith.nsw.gov.au>]  
Sent: Tuesday, 3 December 2013 4:14 PM  
To: Francis Lane  
Cc: Chris Randall; David Crompton  
Subject: RE: Additional Stormwater Design Data

Francis,

The values you are suggesting are more related to Sydney?

Council's Senior Engineering Coordinator has advised that the values from the Griffith Flood Study 2006 be used as a minimum.

Link below:

[http://www.griffith.nsw.gov.au/cp\\_themes/lifestyle/page.asp?p=DOC-VMK-34-88-21](http://www.griffith.nsw.gov.au/cp_themes/lifestyle/page.asp?p=DOC-VMK-34-88-21)

Regards,

Joe Rizzo  
Development Engineer  
Griffith City Council  
PH: (02) 69628132  
Mobile: 0431 762 996

From: Francis Lane <[flane@jwprince.com.au](mailto:flane@jwprince.com.au)>  
To: "Joe.Rizzo@griffith.nsw.gov.au" <[Joe.Rizzo@griffith.nsw.gov.au](mailto:Joe.Rizzo@griffith.nsw.gov.au)>,  
Cc: Chris Randall <[CRandall@jwprince.com.au](mailto:CRandall@jwprince.com.au)>, David Crompton <[DCrompton@jwprince.com.au](mailto:DCrompton@jwprince.com.au)>  
Date: 02/12/2013 04:06 PM  
Subject: RE: Additional Stormwater Design Data

---

Hi Joe,

Thank you for your response.

As discussed on the 28<sup>th</sup>, Council's Engineering Guidelines for Subdivisions and Development does not contain guidance on computer modelling parameters. We will adhere to Council's guidelines wherever possible, and adopt industry standard guidelines where additional information is required.

We will provide the following:

- An XP-RAFTS model for assessment of water quantity modelling.
  - Initial and continuing loss rates to be taken from AR&R.
    - pervious 10mm/hr initial, 2.5mm/h continuing.
    - Impervious 1.5mm/hr initial, 0mm/hr continuing.
  - Manning's n values to be adopted based on Council's Engineering Guidelines – suggest 0.015 and 0.025 for pervious and impervious areas respectively.
- A MUSIC model to assess the water quality treatment. Input parameters to be based on the NSW MUSIC modelling guidelines (2010).

Regards,

**Francis Lane** – Water Resources Engineer

---

**J. WYNDHAM PRINCE**

CONSULTING CIVIL INFRASTRUCTURE ENGINEERS  
& PROJECT MANAGERS

P 02 4720 3385 F 02 4721 7638 W [www.jwprince.com.au](http://www.jwprince.com.au)  
580 High Street, Penrith NSW  
PO Box 4366 PENRITH WESTFIELD 2750

From: [Joe.Rizzo@griffith.nsw.gov.au](mailto:Joe.Rizzo@griffith.nsw.gov.au) [<mailto:Joe.Rizzo@griffith.nsw.gov.au>]

Sent: Monday, 2 December 2013 3:24 PM

To: Francis Lane

Subject: Additional Stormwater Design Data

Francis,

As per our phone conversation on Thursday 28 November, data specific for Griffith for stormwater design and

calculations in available in *Council's Engineering Guidelines - Subdivision and Development Standards 2008* which is available from Council's website.

Any additional data required specific to Griffith is available on the Bureau of Meteorology's website and also AR&R Volume 1 Book 2 gives design loss rates and extrapolation methods of this data for NSW.

Regards,

Joe Rizzo  
Development Engineer  
Griffith City Council  
PH: (02) 69628132  
Mobile: 0431 762 996

---

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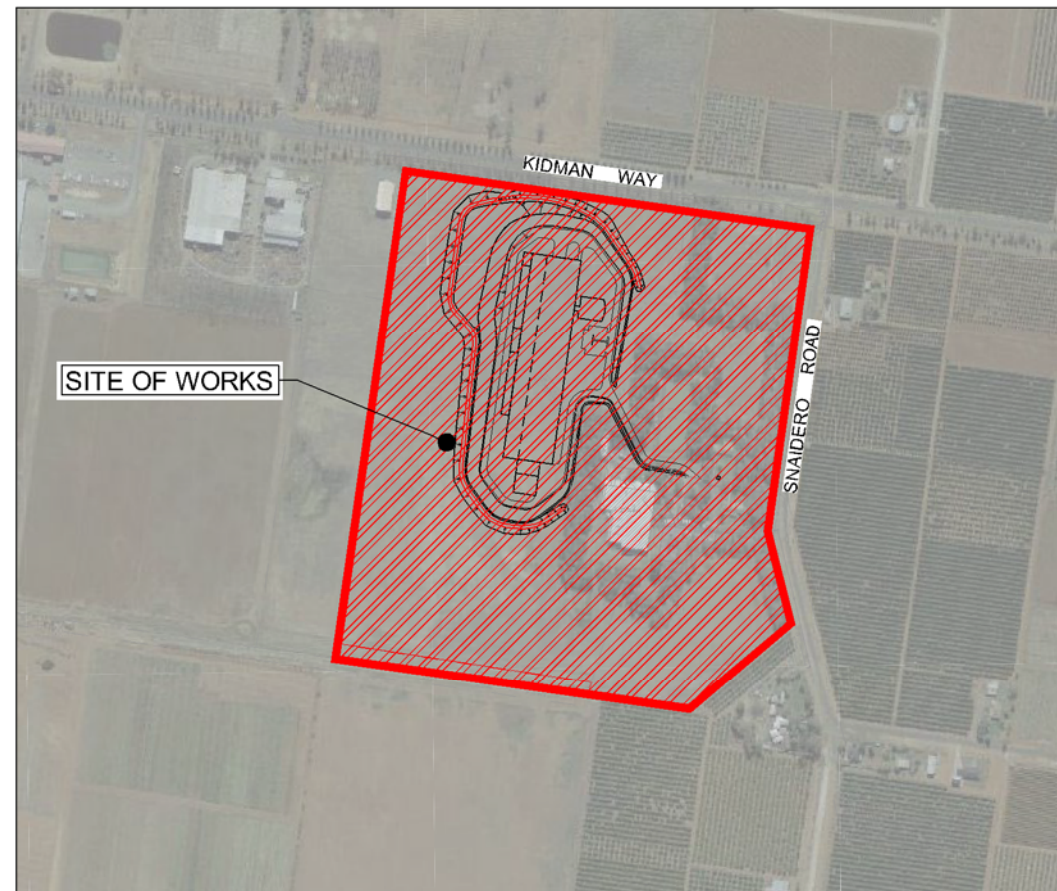
APPENDIX E – FIGURES

GRIFFITH CITY COUNCIL



PSA CONSULTING  
BAIADA HATCHERY GRIFFITH  
STORMWATER MANAGEMENT PLAN

COUNCIL REF:



LOCALITY SKETCH

Prepared By:

**J. WYNDHAM PRINCE**

CONSULTING CIVIL INFRASTRUCTURE ENGINEERS  
& PROJECT MANAGERS

PO Box 4366 PENRITH WESTFIELD NSW 2750

P 02 4720 3300 F 02 4720 3399

W [www.jwprince.com.au](http://www.jwprince.com.au)

E [jwp@jwprince.com.au](mailto:jwp@jwprince.com.au)



INDEX		
DWG NO.	DRAWING TITLE	REV NO.
9848/DA00	COVER SHEET, LEGEND & INDEX	B
9848/DA01	STORMWATER CONCEPT PLAN	B
9848/DA02	SEDIMENT & EROSION CONTROL PLAN	B

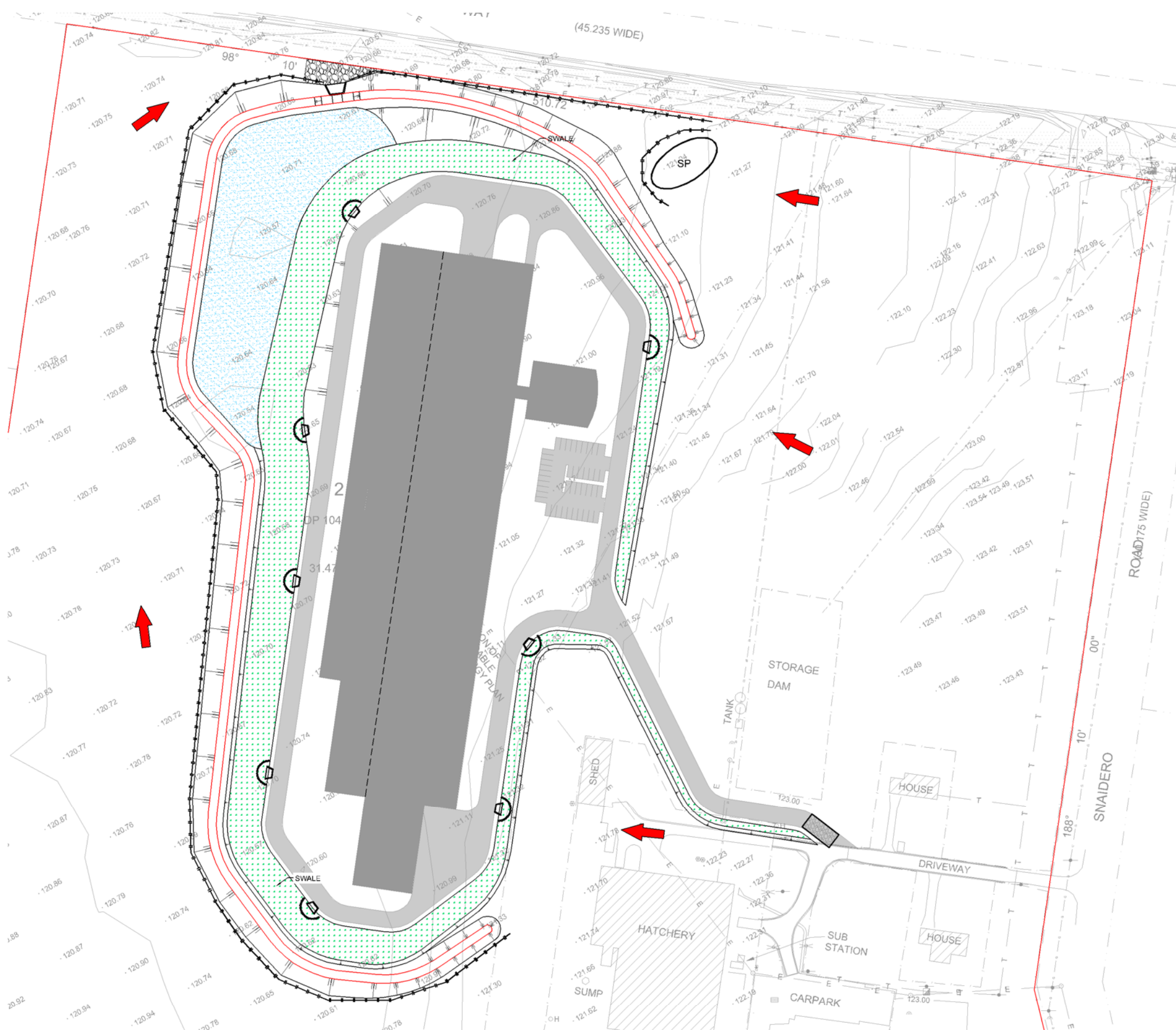
ISSUED FOR DA APPROVAL  
NOT FOR CONSTRUCTION

PLAN No.  
9848/DA00 B  
FILE No. 9848DA00





Plotted: 16 December, 2013 12:33:33 PM File Name: J:\9848\W\Drawings\DA - Development Application Approval\all Plans\9848DA02.dwg



LEGEND	
SYMBOL	DESCRIPTION
	SEDIMENT FENCE SD6-8
	STABILISED SITE ACCESS
	STOCK PILE
	FILTER ROLLS

1:1000 (AT A1)



AZIMUTH:

DATUM:

ORIGIN:

CLIENT:



THIS DRAWING MUST NOT BE USED FOR  
CONSTRUCTION UNLESS SIGNED AS PART OF AN  
APPROVED CONSTRUCTION CERTIFICATE.

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NOT FOR CONSTRUCTION

BAIADA HATCHERY GRIFFITH

SEDIMENT & EROSION CONTROL PLAN

PLAN No:  
9848/DA02

B

FILE No: 9848DA02

SHEET SIZE: A1 ORIGINAL

**J. WYNDHAM PRINCE** CONSULTING CIVIL INFRASTRUCTURE ENGINEERS  
& PROJECT MANAGERS

PO Box 4366 PENRITH WESTFIELD NSW 2750  
P 02 4720 3300 F 02 4720 3399 W [www.jwprince.com.au](http://www.jwprince.com.au) E [jwp@jwprince.com.au](mailto:jwp@jwprince.com.au)

REV	DESCRIPTION	FL	TG	DP	MS	DATE
B	ISSUE FOR DA APPROVAL	FL	TG	DP	MS	16/12/13
A	FIRST ISSUE	FL	TG	AM		09/12/13
AMENDMENT		DES	DRN	CKD	APR	DATE

## **APPENDIX 4**

# **CHEMICAL REGISTERS**



# Master Chemical Register

[Return to Main Page](#)

Product (trade) Name	Chemical Name	Total Quantity Held on Site	Location (s)	MSDS (Y/N)	MSDS Date	Hazardous Substance (Y/N)	Dangerous Good (Y/N)	Management Approval (Y/N)
Acetylene		2 x D type	Maintenance	<a href="#">Y</a>	17/Mar/10	Y	Y	Y
Aeroguard Tropical Strength		2 x 150g	Maintenance	<a href="#">Y</a>	7/May/09	Y	Y	Y
Alfaphos		1 x 20L	Main Chemical Store (Coolroom)/Maintenance	<a href="#">Y</a>	1/Apr/10	Y	Y	Y
Argon, compressed		3 x D type	Maintenance	<a href="#">Y</a>	5/Jul/10	N	Y	Y
Bel-Ray No-Tox Chain Lube 550		4 x 450g	Maintenance/Admin Store	<a href="#">Y</a>	11/Mar/09	N	N	Y
Blazer Clean		26 x 750ml	Main Chemical Store (Coolroom)/Production/Embrex	<a href="#">Y</a>	29/Jul/09	N	N	Y
Castrol HTB Grease 2		12 x 450g	Maintenance	<a href="#">Y</a>	31/Aug/10	N	N	Y
Chlor-Foam Cleaner		6 x 25L	Production	<a href="#">Y</a>	30/Dec/11	Y	Y	Y
Chlorbrite		2 x 25L	Main Chemical Store (Coolroom)	<a href="#">Y</a>	31/Dec/11	Y	Y	Y
Chlorcip		3 x 25L	Main Chemical Store (Coolroom)/Embrex	<a href="#">Y</a>	31/May/12	Y	Y	Y
Circhlor		24 x 25L	Production	<a href="#">Y</a>	31/Dec/11	Y	Y	Y
Citric Acid		3 x 20kg	Main Chemical Store (Coolroom)/Embrex	<a href="#">Y</a>	18/Jun/12	Y	N	Y
Clinafarm - smoke bombs		1200 x 5g	Admin Store/Production	<a href="#">Y</a>	4/May/12	Y	N	Y
Clawrite 6%		10 x 15L	Main Chemical Store (Coolroom)/Embrex	<a href="#">Y</a>	13/Jan/12	Y	Y	Y
CO2 Gass	Carbon Dioxide	4 x E type	Production	<a href="#">Y</a>	26/Mar/10	N	Y	Y
Contact Cleaner		8 x 400g	Maintenance	<a href="#">Y</a>	31/May/10	Y	Y	Y
Cooling Care		8 x 15L	Main Chemical Store (Coolroom)	<a href="#">Y</a>	16/Sep/12	Y	Y	Y
CRC 5-56		8 x 400g	Maintenance	<a href="#">Y</a>	1/Apr/10	Y	N	Y
CSA 70% ALCOHOL IPA		30 x 15L	Main Chemical Store (Coolroom)/Production/Embrex/Laundry	<a href="#">Y</a>	24/Nov/11	Y	Y	Y
Degreaser (Septone)		1 x 4L	Maintenance	<a href="#">Y</a>	30/Aug/10	Y	N	Y
Diesel Fuel		5,000 litre stored plus 2x 1,000L	Maintenance	<a href="#">Y</a>	19/Apr/13	Y	N	Y

# Master Chemical Register

[Return to Main Page](#)

Product (trade) Name	Chemical Name	Total Quantity Held on Site	Location (s)	MSDS (Y/N)	MSDS Date	Hazardous Substance (Y/N)	Dangerous Good (Y/N)	Management Approval (Y/N)
Dry Glide		8 x 150g	Laundry/ Maintenance	<a href="#">Y</a>	1/Apr/10	Y	Y	Y
Eco Wipes	propan-2-ol	18 x 100 wipes	Production/Admin Store	<a href="#">Y</a>	29/Mar/12	N	N	Y
Exit Mould		6 x 500ml	Laundry/Admin Store	<a href="#">Y</a>	3/Feb/12	Y	N	Y
Finish Dishwasher Cleaner		6 x 250ml	Admin Store	<a href="#">Y</a>	7/Oct/09	Y	N	Y
Finish Rinse Aid		6 x 500ml	Admin Store	<a href="#">Y</a>	9/Aug/12	N	N	Y
Floor Sweep		16 x 10kg	(Spill Kits) Main Chemical Store (Coolroom)/Production/Maintenance	<a href="#">Y</a>	30/Jun/10	N	N	Y
Foamclean S		3 x 25L	Main Chemical Store (Coolroom)/Laundry	<a href="#">Y</a>	30/Dec/11	Y	N	Y
Formaldehyde		5 x 20L	Main Chemical Store (Coolroom)/ Embrex	<a href="#">Y</a>	30/11/2012	Y	Y	Y
Galmet		6 x 300g	Maintenance	<a href="#">Y</a>	18/Jun/12	Y	Y	Y
Glen 20		6 x 250g	Laundry/Admin Store/Production	<a href="#">Y</a>	13/Sep/12	Y	Y	Y
Goof Off Graffiti Remover		2 x 400g	Laundry	<a href="#">Y</a>	7/Jul/09	Y	Y	Y
Hand Cleaner GP		9 x 5L	Main Chemical Store (Coolroom)/Laundry/Embrex/Production	<a href="#">Y</a>	30/Apr/11	N	N	Y
HFC-227ea (FM200)	Heptafluoropropane	30kg	Maintenance (roof also)	<a href="#">Y</a>	2/Jul/11	N	Y	Y
Inox		4 x 400g	Maintenance	<a href="#">Y</a>	20/Feb/10	N	N	Y
In Sync - dishwashing detergent		4 x 15L	Laundry/Admin Store	<a href="#">Y</a>	31/Jan/09	N	N	Y
Isowipes		18 x 75 wipes	Admin Store/Production	<a href="#">Y</a>	18/Jul/10	Y	N	Y
Liquid Nitrogen		2 x 40L	Embrex/Production	<a href="#">Y</a>	21/Jun/11	N	Y	Y
Loctite 243/243-SG		2 x 50ml	Maintenance	<a href="#">Y</a>	29/Jan/10	Y	N	Y
Loctite 262 Threadlocker		2 x 50ml	Maintenance	<a href="#">Y</a>	28/Jun/12	Y	N	Y
Loctite Silver Grade Anti-Seize		2 x 50ml	Maintenance	<a href="#">Y</a>	12/Apr/13	Y	N	Y
Mr Sheen Trigger		6 x 400g	Laundry/Admin Store	<a href="#">Y</a>	24/May/11	N	N	Y

# Master Chemical Register

[Return to Main Page](#)

Product (trade) Name	Chemical Name	Total Quantity Held on Site	Location (s)	MSDS (Y/N)	MSDS Date	Hazardous Substance (Y/N)	Dangerous Good (Y/N)	Management Approval (Y/N)
New Green		30 x 25L	Main Chemical Store (Coolroom)/Production/Embrex	<a href="#">Y</a>	30/Aug/12	N	N	Y
Oxygen Compressed		2 x D type	Maintenance	<a href="#">Y</a>	25/May/10	N	Y	Y
Palmolive Reg Anti-Bacterial Dish		6 x 750ml	Laundry/Admin/Embrex/Production	<a href="#">Y</a>	30/Jun/09	N	N	Y
Plug N' Dike		4 x 500g	(Spill Kits) Main Chemical Store (Coolroom)/Production/Maintenance	<a href="#">Y</a>	31/Jul/11	N	N	Y
Polyglaze Upholstery Cleaner		2 x 400g	Laundry	<a href="#">Y</a>	4/May/10	N	Y	Y
Safecirc		22 x 25L	Main Chemical Store (Coolroom)/Production/Embrex	<a href="#">Y</a>	28/Feb/12	Y	N	Y
Safedescale		1 x 25L	Main Chemical Store (Coolroom)	<a href="#">Y</a>	30/Sep/12	Y	Y	Y
Sanigard		24 x 25L	Main Chemical Store (Coolroom)/Production/Embrex	<a href="#">Y</a>	30/Dec/11	Y	N	Y
Sanispray		26 x 750ml	Main Chemical Store (Coolroom)/Production/Embrex	<a href="#">Y</a>	30/May/12	N	N	Y
Silicon Anti-Foam		2 x 25L	Main Chemical Store (Coolroom)	<a href="#">Y</a>	31/Jul/12	N	N	Y
Sikaflex 227		12 x 310ml	Maintenance	<a href="#">Y</a>	18/Jan/12	Y	N	Y
Topax 56	Phosphoric Acid ethonal phosphoric acid isotridecyl ester	7 x15L	Main Chemical Store (Coolroom)	<a href="#">Y</a>	7/May/12	Y	Y	Y
Ultramaxx Solvent QB43	Liquid Hydrocarbons	1 x 25L	Main Chemical Store (Coolroom)	<a href="#">Y</a>	30/Jun/10	Y	N	Y
Virkon S	Pentapotassium	3 x 5L	Admin Store	<a href="#">Y</a>	1/May/09	N	N	Y
Zinc It		2 x 400g	Maintenance	<a href="#">Y</a>	1/Apr/10	Y	Y	Y



## Dangerous Goods List

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Product Name	Location (s)	Class (Class and Sub Risk)	UN Number	Hazchem Code	RA Completed	Assessment Date
Acetylene	Maintenance	2.1	1001	2SE	31/10/2012	31/10/2014
Aeroguard Tropical Strength	Maintenance	2.1	1950	N/A	31/10/2012	31/10/2014
Alfaphos	Main Chemical Store (coolroom)	8	1805	2R	5/11/2012	5/11/2014
Argon, compressed	Maintenance	2.2	1006	2T	5/11/2012	5/11/2014
Chlorbrite	Production	8	1791	2X		
Chlor-Foam Cleaner	Production	8	1814	2R	21/11/2012	21/11/2014
Chlorcip	Main Chemical Store (Coolroom)/Embrex	8	1824	2R		
Circhlor	Production/Embrex	8	1814	2R	5/11/2012	5/11/2014
CO2 Gass	Production	2.2	1013	2RE	5/11/2012	5/11/2014
Clawrite 6%	Main store/Embrex	8	1791	2X	5/11/2012	5/11/2014
Contact Cleaner	Maintenance	2.1	1950	2Y		
Cooling Care 4600	Main Chemical Store (coolroom)	8	3287	2X	5/11/2012	5/11/2014
CSA 70% Alcohol IPA	Main Store/Production/Embrex/Laundry	3	1219	2YE	5/11/2012	5/11/2014
Dry Glide	Laundry/Office Store	2.1	1950	2Y		
Formaldehyde	Embrex	8	2209	2Z	5/11/2012	5/11/2014
Galmet	Maintenance	3	1263	3YE		
Glen 20	Laundry/Office Store	2.1	1950	N/A		
Goof Off Graffiti Remover	Laundry/Office Store					
HFC-227ea (FM200)	Maintenance (roof also)	2.2	3296	2RE	5/11/2012	5/11/2014
Liquid Nitrogen	Embrex/Production	2.2	1977	3A	5/11/2012	5/11/2014
Oxygen Compressed	Maintenance	2.2	1072	2S	5/11/2012	5/11/2014
Polyglaze Upholstery Cleaner	Laundry/Office Store	2.2	1950	2[Y]E		
Safedscale	Main Chemical Store (coolroom)	8	1760	2x	30/09/2012	30/09/2014
Topax 56	Main Chemical Store (coolroom)	8	1805	2R	5/11/2012	5/11/2014
Zinc It	Maintenance	2.1	1950	2Y		

# Hazardous Substances List

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Product Name	Quantity Held (L/Kg)	Location (s)	Risk Phrases and Safety Statements
Acetylene	2 X D Type	Maintenance	Risk Phrases: R12 - Extremely Flammable. R5 - Heating may cause explosion. R6 - Explosive with or without contact with air. Safety Phrases: S16 - Keep away from ignition - No smoking. S33 - Take precautionary measures against static discharges. S9 - Keep container in a well ventilated place.
Aeroguard Tropical Strength	300g	Maintenance	Risk Phrases: R12 - Extremely Flammable. R36 - Irritating to eyes. R52/53 - Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Safety Phrases: S2 - Keep out of the reach of children. S16 - Keep away from sources of ignition - No smoking. S23 - Do not breathe spray. S25 - Avoid contact with eyes.
Alfaphos	20L	Main Chemical Store(coolroom), Maintenance	Risk Phrases: R34 Causes burns. R41 Risk of serious eye damage. Safety Phrases: S24/25 Avoid contact with eyes, rinse immediately with plenty of water and seek medical advice. S27 Take off immediately all contaminated clothing. S28 After contact with skin, wash immediately with plenty of soap-suds. S37/39 Wear suitable gloves and eye/face protection. S46 If swallowed, seek medical advice immediately and show this container or label.
Chlorbrite	50L	Production	Risk Phrases: R31 - Contact with acids liberates toxic gas. R34 - Causes burns. Safety Phrases: S1/2 Keep locked up and out of reach of children, S24/25 - Avoid contact with skin and eyes, S28 - After contact with skin, wash immediately with plenty of water, S45 - In case of accident or if you feel unwell, contact a doctor or Poisons Information Centre immediately and show this container or label. S50 - Do not mix with any acidic material
Chlor-Foam Cleaner	275L	Production/Embrex	Risk Phrases: R35 - Causes severe burns. Safety Phrases: S26 - In case of contact with eyes, rinse immediately with plenty of water and contact a doctor or Poisons information Centre. S28 - After contact with skin, wash immediately with plenty of water. S37/39 - Wear suitable gloves and eye/face protection. S45 - in case of accident or if you feel unwell, contact a doctor or poisons Information Centre immediately and show this container label.
Chlorcip	75L	Main Chemical Store (Coolroom)/Embrex	Risk Phrases: R31 - Contact with acids liberates toxic gas. R35 - Causes severe burns. Safety Phrases: S1/2 - Keep locked up and out of reach of children. S26 - In case of contact with eyes, rinse immediately with plenty of water and contact a doctor or Poisons information Centre. S28 - After contact with skin, wash immediately with plenty of water. S37/39 - Wear suitable gloves and eye/face protection. S45 - in case of accident or if you feel unwell, contact a doctor or poisons Information Centre immediately and show this container label. S50 - Do not mix with any acidic material.

Circhlor	600L	Coolroom/Embrex	Risk Phrases: R35 Causes severe burns. Safety Phrases: S26 - In case of contact with eyes, rinse immediately with plenty of water and contact a doctor Poisons information Centre. S28 - After contact with skin, wash immediately with plenty of water. S37/39 - Wear suitable gloves and eye/face protection. S45 - In case of accident or if you feel unwell, contact a doctor or Poisons Information Centre immediately and show this container or label.
Citric Acid	60Kg	Coolroom/Embrex	Risk Phrases: Irritating to skin. Risk of serious damage to eyes. Ingestion may produce health damage. Cumulative effects may result following exposure. Safety Phrases: - Do not breathe gas/fumes/vapour/spray. - Avoid contact with eyes. - Avoid contact with skin. - Wear suitable gloves. - Wear eye/face protection. - To Clean the floor and all objects contaminated by this material, use water. - In case of contact with eyes, rinse with plenty of water and contact Doctor or Poisons Information Centre. - If swallowed, IMMEDIATELY contact Doctor or Poisons Information Centre (show this container or label).
Clinafarm - smoke bombs	60kg	Production	Risk Phrases: R11 - Highly Flammable. R20/22 - Harmful by inhalation and if swallowed. R41 - Risk of serious damage to eyes. R51/53 - Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Safety Phrases: S2 - Keep locked up and out of the reach of children. S13 - Keep away from food, drink and animal feeding stuffs. S24 - Avoid contact with skin. S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S35 - This material and its container must be disposed of in a safe way. S37/39 - Wear suitable gloves, eye/face protection. S42 - During fumigation/spraying wear suitable respiratory equipment. S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). S61 - Avoid release to the environment. Refer to special instructions/Safety data sheets.
Clawrite 6%	150L	Main Chemical Store (Coolroom),Embrex	Risk: -Contact with combustible material may cause fire. - Contact with acids liberates toxic gas. - Irritating to eyes, respiratory system and skin. - Toxic to aquatic organisms. - Ingestion may produce health damage. - Limited evidence of a carcinogenic effect. - Possible skin sensitizer. Safety: - Keep away from combustible material. - Do not breathe gas/fumes/vapour/spray. - Avoid contact with skin. - Wear suitable gloves. - Wear eye protection. - To clean the floor and all objects contaminated by this material, use water. - In case of contact with eyes, rinse with plenty of water and contact Doctor or Poisons Information Centre. - If swallowed, IMMEDIATELY contact Doctor or Poisons Information Centre. - This material and its container must be disposed of as a hazardous waste.

Contact Cleaner	3.2kg	Maintenance	Risk Phrases: R12 - Extremely Flammable. R67 - Vapours may cause drowsiness and dizziness. Safety Phrases: S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible) S53 - Avoid exposure, obtain special instructions before use.
Cooling Care 4600	120L	Coolroom	Risk Phrases: R25 - Toxic if swallowed. R36/38 - Irritating to eyes and skin. Safety Phrases - S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S28 - After contact with skin, wash immediately with plenty of water. S37/39 - Wear suitable gloves and eye/face protection. S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)
CRC 5-56	3.2kg	Maintenance	Risk Phrases: R20/22 - Harmful by inhalation and if swallowed. R33 - Danger of cumulative effects. R36/37/38 - Irritating to eyes, respiratory system and skin. R65 - Harmful: May cause lung damage if swallowed. Safety Phrases: S23 - Do not breathe gas/fumes/vapour/spray (where applicable). S36/39 Wear suitable protective clothing and eye/face protection. S51 Use only in well ventilated areas.
CSA 70% Alcohol IPA	450L	Production/Embrex/Laundry	Risk Phrases: Highly Flammable. Irritating to eyes. May cause lung damage if swallowed. Vapours may cause drowsiness and dizziness. Inhalation and/or ingestion may produce health damage. Cumulative effects may result following exposure. May produce discomfort of the respiratory system and skin. Repeated exposure potentially causes skin dryness and cracking. Safety Phrases: Keep away from sources of ignition. No smoking. Do not breathe gas/fumes/vapour/spray. Avoid contact with skin. Avoid contact with eyes. Wear suitable protective clothing. wear suitable gloves. Wear eye/face protection. Use only in well ventilated areas. Do not empty into drains. To clean the floor and all objects contaminated by this material, use water. Keep container tightly closed.
Degreaser (Septone)	4L	Maintenance	Risk Phrases: R36/38 - Irritating to the eyes and skin Safety Phrases: S1/2 - Keep locked up and out of reach of children. S26 - In case of contact with eyes rinse immediately with plenty of water and seek medical advice. S37/39 - Wear suitable gloves and eye/face protection. S45 - In case of accident or if you feel unwell seek medical advice immediately.

Diesel	5,000 litre stored plus 2x 1,000L	Maintenance	Risk Phrases: R40- Limited evidence of a carcinogenic effect. R20- Harmful by inhalation. R65 Harmful: may cause lung damage if swallowed. R38- Irritating to skin. R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Safety Phrases: S2- Keep out of the reach of children. S24- Avoid contact with skin. S29 do not empty into drains. S36/37 Wear suitable protective clothing and gloves. S43- In case of fire, use water, dry chemical powder or carbon dioxide. Do NOT use water jet. S62- If swallowed, do NOT induce vomiting: seek medical advice immediately and show container or label.
Dry Glide	1.2kg	Laundry	Risk Phrases: R11 - Highly flammable. R20 Harmful by inhalation. Safety Phrases: S2 - Keep out of the reach of children. S16 Keep away from sources of ignition - No Smoking. S25 - Avoid contact with eyes. S29 - Do not empty in drains. S33 - Take precautionary measures against static discharges.
Exit Mould	3L	Laundry/Office Store	Risk Phrases: R41 - Risk of serious damage to the eyes. R37/38 - Irritating to respiratory system and skin. Safety Phrases: S2 - Keep out of the reach of children. S24/25 - Avoid contact with eyes and skin. S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S28 After contact with skin, wash immediately with plenty of water. R37/38 - Irritating to respiratory system and skin. S46 - If swallowed, seek medical advice immediately and show this container or label. S50 - Do not mix with acids, bleach products or other household cleaners. S51 - Use only in well-ventilated areas.
Finish Dishwasher Cleaner	1.5L	Laundry/Office Store	Risk Phrases: R36 - Irritating to eyes. Safety Phrases: S2 - Keep out of the reach of children. S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S46 - If swallowed, seek medical advice immediately and show this container or label. S50 - Do not mix with acids, bleach products or other household cleaners. S35 - This material and its container must be disposed of in a safe way.
Foamclean S	75L	Main Chemical Store (coolroom)/laundry	Risk Phrases: R36/38 - irritating to eyes and skin. Safety Phrases: S2 - Keep out of reach of children. S26 - in case of contact with eyes, rinse immediately with plenty of water and contact a doctor or poisons Information Centre. S28 - After contact with skin, was immediately with plenty of water.

Formaldehyde	120L	Embrex	Risk Phrases: R11 - Highly flammable. R23/24/25 - Toxic by inhalation, in contact with and if swallowed. R34 - Causes burns. R40 - Limited evidence of a carcinogenic effect. R43 - May cause sensitisation by skin contact. Safety Phrases: S1/2 - Keep locked up and out of the reach of children. S7 - Keep container tightly closed. S16 - Keep away from sources of ignition - No Smoking. S24 - Avoid contact with skin. S26 - In case of contact with eyes, rinse immediately with plenty of water and contact a doctor or Poisons Information Centre. R36/37 - Wear suitable clothing and gloves. S45 - In case of accident or if you feel unwell, contact a doctor or Poisons Information Centre immediately and show this container or label. S51 - Use only in well-ventilated areas.
Galmet	1.8kg	Maintenance	Risk Phrases - R10- Flammable. R20- Harmful by Inhalation. R65- Harmful; May cause lung damage if swallowed. Safety Phrases - S2 Keep out of reach of children. S16- Keep away from sources of ignition - No Smoking. S23- Do not breath vapour/spray. S24/25- Avoid contact with skin & eyes. S62- If swallowed, do not induce vomiting; seek medical advice immediately and show this container or label
Goof Off Graffiti Remover	800g	Laundry/Office Store	Information not available at this time.
Isowipes	1350 wipes	Admin Store/ Production	Risk Phrases: R11 - Highly Flammable. R36 - Irritating to eyes. R67 - Vapours may cause drowsiness and dizziness. Safety Phrases: S16 - Keep away from sources of ignition - No smoking. S2 Keep out of the reach of children. S7 - Keep container tightly closed. S24/25 - Avoid contact with skin and eyes. S26 In case of contact with eyes, rinse immediately with plenty of water and contact a doctor or Poisons Information Centre.
Loctite 243/243-SG	100ml	Maintenance	Risk Phrases: R36 - Irritating to eyes. R37/38 - Irritating to respiratory system and skin. R43 - May cause sensitisation. Safety Phrases: S24/25 - Avoid contact with eyes and skin. S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S28 After contact with skin, wash immediately with plenty of water. S36/37/39 - Wear suitable protective clothing, gloves, eye/face protection. S46 - If swallowed, seek medical advice immediately and show this container or label.
Loctite 262 Threadlocker	100ml	Maintenance	Risk Phrases: R36 - Irritating to eyes. R37/38 - Irritating to respiratory system and skin. R43 - May cause sensitisation. Safety Phrases: S24/25 - Avoid contact with eyes and skin. S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S28 After contact with skin, wash immediately with plenty of water. S36/37/39 - Wear suitable protective clothing, gloves, eye/face protection. S46 - If swallowed, seek medical advice immediately and show this container or label.



Loctite Silver Grade Anti-Seize	100ml	Maintenance	Risk Phrases: R36 - Irritating to eyes. R37/38 - Irritating to respiratory system and skin. R43 - May cause sensitisation by skin contact. Safety Phrases: S24/25 - Avoid contact with eyes and skin. S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S28 After contact with skin, wash immediately with plenty of soap suds. S36/37/39 - Wear suitable protective clothing, gloves, eye/face protection. S46 If swallowed, seek medical advice immediately and show this container or label.
Safecirc	550L	Main Chemical Store (Coolroom)/Production/ Embrex	Risk Phrases: R36/37/38 - Irritating to eyes, respiratory system and skin. Safety Phrases: S2 - Keep out of reach of children. S24/25 - Avoid contact with skin and eyes. S26 - In case of contact with eyes, rinse immediately with plenty of water and contact a doctor or Poisons Information Centre.
Safedscale	25L	Main Chemical Store (Coolroom)	Risk Phrases : R 36 /37/38 Irritating to Eyes, respiratory system and skin if the concentrated is handled in such a way to create mist, this will irritate the respiratory system. This is not a likely route of exposure. Safety phrases : S24/25 Avoid contact with skin and eyes . S26 In case of contact with eyes, rinse immediately with plenty of water and contact a doctor or poisons Information Centre. S45 In case of accident or if you feel unwell, contact a doctor or poisons information centre and show this container or label.
Sanigard	600L	Main Chemical Store (Coolroom)/Production/Embrex	Risk Phrase: R36/38 - Irritating to eyes and skin. Safety Phrases: S24/25 - Avoid contact with skin and eyes. S26 - In case of contact with eyes, rinse immediately with plenty of water and contact a doctor or Poisons Information Centre. S28 - After contact with skin, wash immediately with plenty of water.
Sikaflex 227	37L	Maintenance	Risk Phrases: R36/38 - Irritating to eyes and skin. R43 - May cause sensitisation by skin contact. R52/53 - Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment. S Phrases: S24 Avoid contact with skin. S37 Wear suitable gloves.
Topax 56	120L	Production/ Embrex	Risk Phrases: R34- Causes burns. R37 - Irritating to respiratory system. Safety Phrases: S26- In case of contact with eyes, rinse immediately with plenty of water S28- After contact with skin, wash immediately with plenty of water S36/37/39- Wear suitable protective clothing, gloves and eye/face protection S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)
Ultramaxx Solvent QB43	25L	Main Chemical Store (Coolroom)	Risk Phrases: R22 - Harmful if swallowed. R38 - Irritating to skin. R65 - Harmful: may cause lung damage if swallowed. Safety phrases: S37 - Wear suitable gloves. S62 - If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

Zinc It	800g	Maintenance	Risk Phrases: R11 - Highly flammable. R20/21 - Harmful by inhalation and in contact with skin. R38 - Irritating to skin. S25 - Avoid contact with eyes. S29 - Do not empty into drains. S33 - Take precautionary measures against static discharges. Saftey Phrases: S16 - Keep away from sources of ignition - No Smoking.
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