



Baiada Poultry Pty Limited

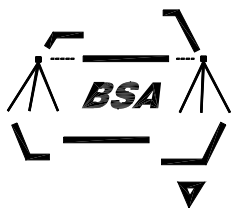
STATEMENT OF ENVIRONMENTAL EFFECTS

Section 96(2) Modification Application

APPENDIX G –

Integrated Soil, Water & Landscaping Concept Plan (Mead, I., 1997)

**Oakburn Processing Complex
Oxley Highway, Tamworth NSW**



Bath, Stewart Associates Pty Ltd

**Surveyors, Project Coordinators,
Development Consultants**

239 Marius Street, Tamworth NSW

P.O. Box 403 Tamworth NSW 2340

Ph. (02) 6766 5966 Fax. (02) 6766 5140

Email: office@bathstewart.com.au

**INTEGRATED SOIL, WATER AND
LANDSCAPING CONCEPT PLAN**

For

PROPOSED POULTRY PROCESSING COMPLEX

BAIADA PTY. LTD.

**I.J. Mead
Catchment Manager - Tamworth
25/7/97**

1.0 INTRODUCTION

Following a meeting with Terry Ellis (Environmental Consultant) Nigel Box (Baiada Pty. Ltd.) and Ian Mead Department of Land and Water Conservation (DLWC), Baiada Pty. Ltd. contracted DLWC to prepare an integrated soil, water and landscaping concept plan for a proposed development site for a Poultry Processing Complex at Tamworth.

The proposed development is to be staged over a ten year period. Therefore this plan has to be adaptable and have flexibility.

2.0 LOCATION

The site involves an area of 16.7 hectares and is located off the Oxley Highway approximately 10 kilometres from Tamworth City Centre. The site includes the old homestead (since demolished) of the property "Oakburn" and is opposite to the end of the Tamworth Airport runway. Terrain consists of sideslopes and footslopes with a slight ridge running south west to north east through the Lot. The slopes are gentle ranging from 1.3% to 2%. Soils are generally a Red Brown Earth that has suffered some surface erosion due to past usage and exhibits some minor scalding. The main feature of soil type is its poor infiltration rate which generates extra run-off in high rainfall events.

The site has been extensively cleared of vegetation with the only area of trees retained near the "Oakburn" homestead site with planting of shrubs and trees principally Kurrajongs in this area. The general features of the location are ideal for the proposed development.

3.0 OBJECTIVES

The objectives of this consultancy is to prepare a concept development plan that integrates soil and water (run-off) management with a landscaping and vegetation improvement plan for the development.

Specifically the objectives are:

- (1) Address the issue of increasing run-off the development will generate and seek solutions to restrict the peak discharge of this run-off to pre development conditions and usage. Design the structural soil conservation measures necessary.
- (2) The site run-off is in an overland flow condition and has no defined drainage pattern. The plan as much as possible should ensure run-off leaves the property in a broad sheet or overland flow and not become defined.
- (3) Identify on the plan the drainage pattern for the development and design the major drainage components.
- (4) Prepare a conceptional landscaping plan for the development site that:
 - a) retain as much of the existing desirable tree vegetation as possible and enhances it;
 - b) provide screening from the Oxley Highway for the development and improvement to the general landscape appearance of the development site;

- c) prepare some feature revegetation proposals to enhance the landscape appearance.
- (5) Provide a written report with plan describing recommendations and detail design of soil conservation structures to assist Baiada Pty. Ltd. to obtain approval for the development and its timely implementation.

4.0 METHODOLOGY

Structural soil conservation works were designed using appropriate methods as defined in Australian Rainfall and Run-off 1987.

In the design of run-off volumes a 1 in 20 year, 24 hour rainfall event has been used with run-off co-efficient of 60% for non development areas and 100% for proposed developments and hard surface areas used. This method was preferred as it gives a greater run-off volume per hectare compared to other methods and enables the recommended design run-off control measures to be on the conservative side.

Channel capacities and grades were designed using the appropriate average recurrence interval, Mannings Equation and the following maximum non-scouring velocities:

Vegetated Channels	-	1.5 metres/second
Bare Earthed Channels	-	0.6 metres/second

Average recurrence intervals for the design of proposed structural earthworks as:

Vegetated Channels	-	1:20 years
Level Banks Spillways	-	1:20 years

5.0 CALCULATIONS

All calculations for the concept plan have been done. Once a final layout plan for the development is settled the calculations should be re-asserted and final design information provided.

6.0 GENERAL COMMENTS AND RECOMMENDATIONS

a) Run-off Water Management

Using the design methodology each hectare of the development will generate a volume of 476 cubic metres of extra run-off. It is this portion of run-off that needs to be retained and slowly released (through pipe outlets) to prevent increasing peak discharges leaving the development site. The retaining and slow release of this portion of run-off will of course increase the duration time that run-off will occur. However it is the peak discharge of a rainfall and run-off event that has the most impact (erosion, flooding etc) to downstream lands and needs to be managed in such developments like this proposal.

The development site is adjacent to the Tamworth Airport, slopes are gentle and no defined drainage pattern occurs on the site. Traditional methods of run-off management using flush storage dams were not favoured primarily due to the effect such dams would have on increasing attraction of bird life near the Airport, needing increasing management to control by Baiada Pty. Ltd.

The low slopes and lack of defined drainage favours the use of level banks fitted with 100mm P.V.C. pipes and P.V.C. sumps to manage the increased run-off the development will generate. These banks as shown on attached plan should be constructed from the "back" forming a channel to a minimum of 4 metres below the bank structure. A concrete lip should be constructed along the contour of each channel extremity to allow run-off to spread out and leave the site in a broad sheet flow and prevent concentration of run-off flows. The pipe outlets should drain in the channel formed at the back of the bank and be dissipated by the use of P.V.C. sumps.

The channel at the back of the bank will hold approximately 0.20 metres (depth of cut to form bank) of water which will slowly infiltrate and evaporate after rainfall and run-off events. This ponding cannot be overcome except by construction of a larger sump and pumping due to the low slope of the development site.

The constructed bank should have a minimum height of 0.50 metres with outlets (overshot or bypass spillways) set at 0.30 metres. Overshot outlets in banks should be turfed with Kikuyu to ensure their stability.

Such a bank design on 1.3% slope will create a cross-sectional area of 3.5m² necessitating a length of 136 metres for each contribution hectare of hard surface area on the development. At 0.30 metres outlet height the run-off water will temporarily back up 23 metres from the bank.

The plan shows the favoured direction of drainage for the development, splitting the catchments on the development site into smaller areas. This will enable run-off water management works to be designed within the development site.

b) Internal Roads and Drainage

Perimeter site roads (for traffic movement) shown on the plan should be constructed as much as possible to 0.30 metres above existing ground surface due to the low slope of the site. The plan shows road surface drainage patterns preferred and it is recommended that roads be constructed so drainage sheds naturally from roads and not be defined and concentrated by kerb and guttering. With good revegetation of disturbed road verges this will enable as much infiltration of road run-off to occur and assist in reducing site run-off.

Pipe drainage points shown on the plan where drainage patterns need to cross roads should as far as possible be constructed at existing ground surface, due to site slopes, to enable desirable grades to be maintained for pipe or open channel drainage within site.

Internal open channel drainage should be formed as slight depressions with low slope batters to maintain desired grades and enable easy management (slashing and mowing). A rock filter can be established across drains near road crossings to enable any rubbish being moved in run-off events to be trapped in convenient locations to be recovered and disposed of.

c) **Erosion Control Management**

During site construction phases all topsoil material should be stripped and stockpiled at convenient locations for later re-use to enhance revegetation, garden mounds, and turn up section of recommended banks.

Prevention of soil movement from stockpile can be achieved by erection of sediment fencing below the stockpiles.

Temporary erosion control during site construction is recommended to be implemented using sediment fences or hay bales to intercept any silt movement that may occur from rainfall events during disturbance construction phases.

d) **Implementation and Maintenance**

Water run-off management structures (1,2 & 3) should be implemented during the construction of phase one (Protein Recovery Plant) of the development and initial access road construction.

Structures 4/5 implemented during construction of processing plant phases and associated access and parking areas.

All works (banks) shown on the sketch plan are diagrammatic and any implementation requires accurate survey and layout.

Prior to the construction of Bank 4 it will be necessary to obtain approval from NorthPower to construct the bank below existing power line.

It is recommended on completion of these works they be seeded and fertilised to establish vegetative cover.

Low growing type revegetation pasture species such as Couch grass, Wallaby grass, Perennial ryegrass, and Sub clover and Haifa White clover should be used as they will require less maintenance.

These pasture species are also recommended for revegetation on all disturbed areas requiring grass cover revegetation.

The use of temporary cover crop varieties, Ryecorn (Autumn/Winter) and Japanese millet (Spring/Summer) should be added in pasture mixture to enable quick cover establishment for rehabilitation and stability.

Water management structures should be inspected after high rainfall events and any maintenance required carried out. The control of rabbits on-site and the prevention of them forming burrows in the banks is essential for these structures to perform their designed function.

7.0 LANDSCAPE PLAN

One of the principles in preparing a landscape concept plan for the development was to arrange the developments location so as to retain as far as possible as much of the existing vegetation on the site.

This plan involves improvement in areas where existing tree vegetation exists, feature plantings, major screen plants to soften the development complex especially when viewed from Oxley Highway and to achieve an overall enhanced visual appearance of the development site.

As the development is proposed to be staged over a ten year period it is recommended that much of the vegetation plantings, especially perimeter screen plantings be established in early years of the development so these plantings can be well established and effective by the time the whole processing plant is constructed and in operation.

The following notes should be read in conjunction with the plan and describe the suggested planting proposals for each area of the plan.

Note 1: This area is a feature planting at the entrance from Oxley Highway to the site. Tamworth is well known for the simultaneous flowering in November of Silky Oaks (*Grevillea robusta*) and Jacaranda (*Jacaranda mimosifolia*). The tree flowering colours also represent Baiada Pty. Ltd. corporate colours and a feature mass planting of these species would be most visually appealing. Both Silky Oaks and Jacarandas can be frost susceptible when young and need protection in early stages, however, once established they are frost hardy.

Note 2: This area west of the main site entry road contains an area of original vegetation dominated by Blakley's red gum (*Eucalyptus blakelyi*). Increased planting of Blakely's red gum is recommended to develop an open woodland appearance of this species.

Note 3: This area east of the main site entry road contains the original "Oakburn" homestead area and is dominated by planted species associated with the homestead, particularly Kurrajong (*Brachychiton populneum*). In this area it is recommended to increase plantings of Kurrajong with Wilga (*Geijera parviflora*).

As a feature in this area there be fitted with a working windmill and painted in Baiada corporate colours.

Note 4: Screen planting area on southern side of the main car park area and heavy vehicle parking area, and adjacent to the internal road. A 5 metre wide mounded garden planted with screening varieties is recommended for this area. This will add to the screen effect of car and vehicle parking when viewed from Oxley Highway.

Recommended species for use in this area are:

Hakea laurina, Hakea petiolaris, Prickly melaleuca (*Melaleuca styphelioides*), *Callistemon* sp. Bottlebrushes especially the taller growing species, and two non-native species *Photinia robusta* and *Viburnum tinus*.

Note 5: The main car park area - 3 metre moulded gardens between each parking sections.

Central to the garden from access road in each bed a Swanes Golden pencil pine be planted as the feature tree with flowering Plumbago (blue) (*Plumbago auriculata*) planted adjacent to them is recommended.

Between each parking bay sections, smaller shrubs intermixed with taller columnar type shrubs be planted e.g.

Smaller Shrubs

Grevillea - Robyn gordon
Nandina *domestica*
Callistemon - Little John, Captain Cook
Buxus
Diosma

Taller Shrubs

Hakea *laurina*
Orange-berried pittosporum (*Pittosporum rhombifolium*)
Native Frangipani (*Hymenosporum flavum*)
Golden Melaleuca
Flowering Quince (*Chaenomeles*)
Dwarf She-oak (*Casuarina nana*)
Grevillea *banksii*

Note 6: Landscaped area adjacent to the car park access road, beside processing plant building to office area a feature garden area using:

West of Processing Plant - clumped planting of River She-oak (*Casuarina cunninghamiana*) or Silver birch (*Betula pendula*) with Nandina *domestica* and Golden diosma planted in the foreground.

Adjacent to the Processing Plant wall, screening using Camellia *sasanqua*.

Processing Plant wall to office - Feature trees clump of Silver birch (*Betula pendula*) with Golden diosma, Nandina *domestica* and Flowering Plumbago planted in the foreground.

Note 7: Landscaped area adjacent to Protein Recovery Plant - Depending on final design of this building, high screening will be a necessity where trucks enter building to tip waste material.

The screening plant recommended for this area is Port Jackson Cypress pine (*Callitris rhomboidea*) which should be planted as a row to afford necessary screen. Smaller native shrubs (as for Note 5) can be planted in the foreground.

Note 8: This area is a proposed staff garden/lawn area with seating and other staff facilities. The area tends to face due south and plantings should be of deciduous trees and shrubs to afford maximum shade in summer and sunlight in winter.

Trees such as Claret ash (*Fraxinus oxycarpa*), Pin oak (*Quercus palustris*), Chinese tallowwood (*Sapium sebiferum*) and Golden elm (*Ulmus procera*) are all suitable for this district and purpose.

It is recommended the lawn area be established in Buffalo grass as this species of grass is low maintenance and withstands shaded areas best. A soft leaf form of Buffalo grass is now available.

Note 9 & 10: These areas are perimeter native screen plantings with Eucalyptus trees which will allow the taller trees to become a feature with shrubs providing effective screening.

Screening Shrubs

Acacia species	-	Wattles especially <i>A. baileyana</i>
Callistemon species	-	Bottlebrushes
Grevillea	-	<i>hookerana</i> , 'Ivanhoe'
Hakea <i>laurina</i>		
Melaleuca <i>styphelioides</i>		(Prickly melaleuca)
Wilga (<i>Geijera parviflora</i>)		
Myall (<i>Acacia pendula</i>)		

Taller Trees

<i>Eucalyptus albens</i>	-	White box
<i>Eucalyptus melliodora</i>	-	Yellow box
<i>Eucalyptus blakelyi</i>	-	Blakely's red gum
<i>Eucalyptus sideroxylon</i>	-	Pink flowering ironbark

Note 11: This area is recommended to be planted to a feature of various flowering Eucalyptus tree species. Most are smaller growing eucalypts to 20 metres. These species include:

<i>Eucalyptus</i>	-	<i>caesia</i>
"	-	<i>erythrocorys</i>
"	-	<i>ficifolia</i>
"	-	<i>leucoxydon</i> 'Pink'
"	-	<i>macrocarpa</i>
"	-	<i>stellulata</i>
"	-	<i>cladocalyx</i> 'Dwarf'
"	-	<i>woodwardii</i>
"	-	<i>lehmannii</i>
"	-	<i>erythronema</i>

Note 12: Areas of tall Eucalypt plantings, height is important to balance development and offering tall screening. Species include:

<i>Eucalyptus albens</i>	-	White box
<i>Eucalyptus albens</i>	-	'Pink' flowering
<i>Eucalyptus melliodora</i>	-	Yellow box
<i>Eucalyptus sideroxylon</i> 'Pink'	-	Pink flowering ironbark


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I.J. Mead
Catchment Manager
Tamworth.
24/7/97

3 ORIGINAL SITE DOMINATED BY KURRAJONG TREES INCREASED PLANTING OF KURRAJONG & WILGA TREES IN THIS AREA

2 AREA OF ORIGINAL VEGETATION DOMINATED BY BLAKELY'S RED GUM FOR WOODLAND EFFECT

1 FEATURE AREA OF PLANTING WITH BOTH SILKY OAK & JACARANDA THE TREE FLOWERING COLORS ALSO REPRESENT BAIADA PTY LTD CORPORATE COLORS

4 SCREEN PLANTING TO CAR & TRUCK PARKING AREAS USING MIXED HAKEAS, MELALEUCAS & BOTTLEBRUSHES IN ADDITION TO TWO NON-NATIVES

5 MOULDED GARDENS BETWEEN EACH PARKING AREA USING A MIXTURE OF SMALL TO MEDIUM SIZE SHRUBS & GROUND COVERS

6 CLUMPED PLANTING OF RIVER SHE OAK OR SILVER BIRCH WITH NANDINA DOMESTICA & GOLDEN DIOSMA IN FOREGROUND

7 SCREEN PLANTINGS OF PORT JACKSON PINE & A MIXTURE OF SMALLER NATIVE SHRUBS

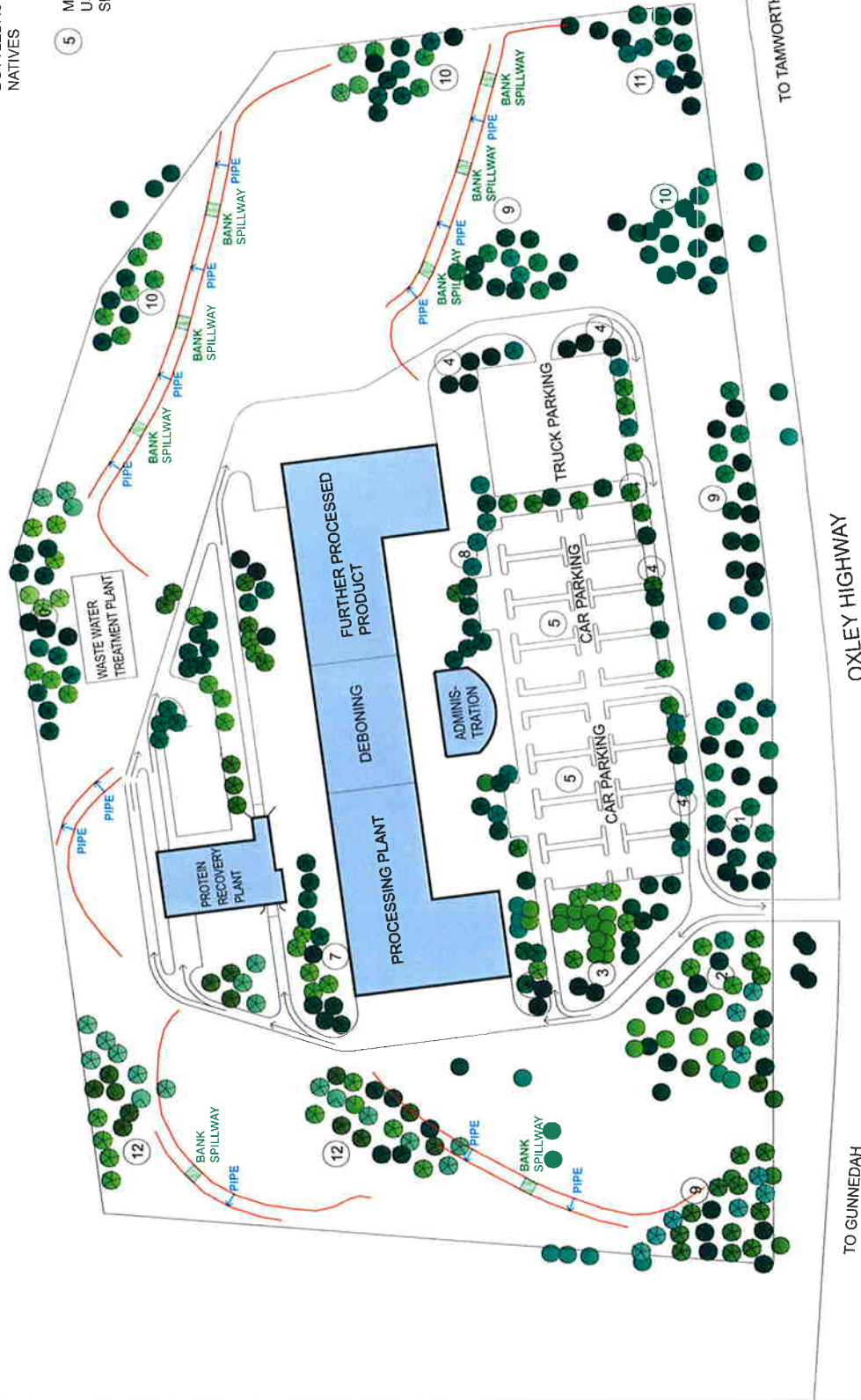
8 STAFF AREA WITH PLANTINGS OF DECIDUOUS TREES & SHRUBS FOR SUMMER SHADE & WINTER SUN LIGHT

9 NATIVE SCREEN PLANTINGS USING A MIXTURE OF WATTLE BOTTLEBRUSHES GREVILLEAS HAKEN MELALEUCAS WILGAS & MYALL SHRUBS & TALL TREES OF MIXED EUCALYPTUS WHITE BOX YELLOW BOX BLAKELY'S RED GUM & PINK FLOWERING IRONBARK

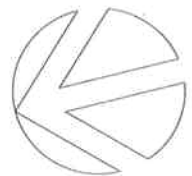
10 NATIVE SCREEN PLANTINGS USING A MIXTURE OF WATTLE BOTTLEBRUSHES GREVILLEAS HAKEN MELALEUCAS WILGAS & MYALL SHRUBS & TALL TREES OF MIXED EUCALYPTUS WHITE BOX YELLOW BOX BLAKELY'S RED GUM & PINK FLOWERING IRONBARK

11 PLANTED TO FEATURE A MIXTURE OF FLOWERING EUCALYPTUS TREES UP TO 20m HIGH

12 TALL EUCALYPT TREE PLANTINGS



RUNOFF, SEDIMENT CONTROL & LANDSCAPE PLAN FOR PROPOSED POULTRY PROCESSING COMPLEX AT OAKBURN OXLEY HIGHWAY TAMWORTH



Baiada
select poultry

LANDSCAPE & RUNOFF CONTROL PLAN BY:
IAN MEAD
DEPT. LAND & WATER CONSERVATION.
TAMWORTH. N.S.W.

BLEKTON PTY LTD
ACN 003 057 752

REF No:

Architectural Drafting & Design Service
20 Murray St., TAMWORTH 2340. PO Box 845. TEL (02) 6766 5412 - FAX (02) 6766 5944
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