## APPROVED DEVELOPMENT PLAN SUMMARY

The following development plan has been approved by the Chief Executive Officer and signed by a Director of East Gippsland Shire Council. The development plan runs with the subject land into perpetuity however is able to be amended in part or in full, subject to Council approval. This document serves a summary and document control function.

Address	17 Blairs Road, Lakes Entrance	
Approval date	14 March 2017	

		<b>_</b>		
	Document	Date	Version	No of
				Pages
1	Development Plan Report	21/07/2016	1	28
2	Title	-	1	4
3	Development Plan 1 (DP1) – Site	21/07/2016	1	1
	Analysis			
4	Development Plan 2 (DP2) – Lot	21/07/2016	1	1
	Layout			
5	Development Plan 3 (DP3) – Road	21/07/2016	1	1
	Hierarchy			
6	Development Plan 5 (DP5) –	21/07/2016	1	1
	Easement Reserve			
7	Development Plan 6 (DP6) – Staging	21/07/2016	1	1
	Plan			
8	Development Plan 7 (DP7) – Cut & Fill	21/07/2016	1	1
	Plan			
9	Council Letter	18/12/2015	1	4
10	Geotechnical Report	21/05/2013	1	18
11	East Gippsland Catchment	14/04/2014	1	3
	Management Authority Letter			
12	East Gippsland Catchment	09/04/2014	1	1
	Management Authority Plan for			
	removal of north/south gully			
				Total :70

### This development plan is comprised of the following documents

This development plan has been amended as follows

Document	Date	Version	Date of approval	No of pages
Development Plan 5 (DP5a) – Easement Reserve	Sept 2016	5a	14/03/2017	1
Development Plan 4 (DP4) – Landscape Master Plan		1	14/03/2017	1

21 July 2016

Aaron Hollow Planning Department East Gippsland Shire Council PO Box 1618 Bairnsdale Victoria 3875

Dear Aaron,



Beacon Town Planning Pty Ltd ABN 68168162178

> jennie@beacontp.com.au www.beacontp.com.au M: 0409 412 141

Level 1, 61-63 Commercial Rd South Yarra 3141 (Entry off Hyland St)

# RE: Additional Further Information – Development Plan Application Number: 400/2014/P

Enclosed in a Development Plan for the site 17 Blairs Road, Lakes Entrance, as requested by Council. This Development Plan includes the following components:

- Development Plan 1: Site Analysis Plan
- Development Plan 2: Lot Layout
- Development Plan 3: Road Hierarchy Plan
- Development Plan 4: Landscape Master Plan
- Development Plan 5: Easement Reserve Plan
- Development Plan 6: Staging Plan for whole development
- Development Plan 7: Cut and Fill Plan for whole development

The Development Plan has been prepared in accordance with the Lakes Entrance Northern Growth Area Outline Development Plan.

Should you require any additional information, please do not hesitate to contact me.

Kind regards,

Jennie Jones







Martin Contraction Contraction

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Level 1, 61-63 Commercial Rd South Yarra 3141 (Entry off Hyland St)

Development Plan Application Report 17 Blairs Road, Lakes Entrance, 3909 21 July 2016



# **DOCUMENT / REPORT CONTROL FORM**

File Location	27.05.16/Devt Plan App Report/14-010 Murray Goff Lakes/BTP
Name:	Projects
Project Name:	Murray Goff Lakes
Project Number	14 Jan Contractor
Revision Number:	A Jacobas

# **Revision History**

Revision #	Date	Prepared by	Reviewed by	Approved for Issue by
А	27.05.16	Ursula van Dyk	Jennie Jones	-
В	17.06.16	Ursula van Dyk	Murray Goff	

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The information within this document is and shall remain the property of:

Beacon Town Planning Pty Ltd

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# **1 INTRODUCTION**

This development plan report has been prepared by Beacon Town Planning on behalf of the landowners Murray and Lyn Goff, as requested by East Gippsland Shire Council, for the site known as 17 Blair's Road, Lakes Entrance.

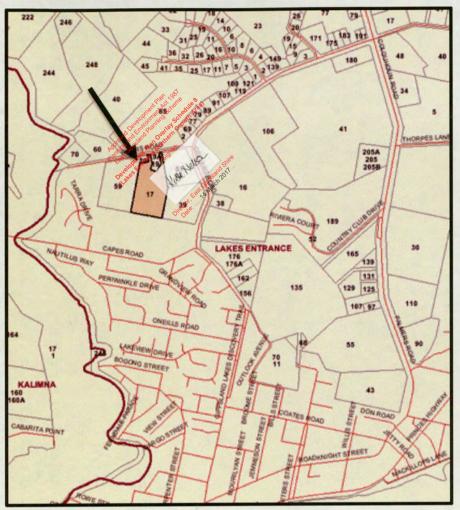
The subject site is within the General Residential Zone (Schedule 1) and is affected by the following overlays:

- Design and Development Overlay Schedule 13 (DDO13)
- Development Contributions Plan Overlay Schedule 1 (DCPO1)
- Development Plan Overlay Schedule 8 (DPO8)
- Environmental Significance Overlay Schedule 53 (ESO53)
- Erosion Management Overlay (EMO)

The subject site is located within the western part of the Lakes Entrance Northern Growth Area Outline Development Plan (LENGA ODP). The LENGA, approximately 245.06 hectares, provides for long-term future growth of the Lakes Entrance township and comprises urban areas, commercial and community area, open space areas with both interconnected pedestrian pathways and interconnected road linkages. The Plan also incorporates an interconnected drainage system through the whole growth area, facilitating drainage basins designed to retain and detain storm water to flows to not adversely affect the drainage system in the existing downstream Lakes Entrance township. The LENGA area is elevated and located out of the central low-lying Lakes Entrance township area.

The subject land for this Development Plan (DP) is 5.57 hectares in size, fronting Blair's Road, and is situated to the northwest of the LENGA ODP area, abutting the south side of Blair's Road. The site has been identified on the location plan below. See Appendix 1 - Title.

#### **Figure 1 Location Plan**



(Source: services.land.vic.gov.au)

This report provides background information and an explanation of the proposed development plan. It includes an assessment of the proposal against relevant planning policy and the detailed provisions of the East Gippsland Planning Scheme, the Lakes Entrance Northern Growth Area Outline Development Plan (LENGA ODP) and the Lakes Entrance Northern Growth Area Native Vegetation Precinct Plan (LENGA NVPP).

# **2 LAKES ENTRANCE NGA ODP**

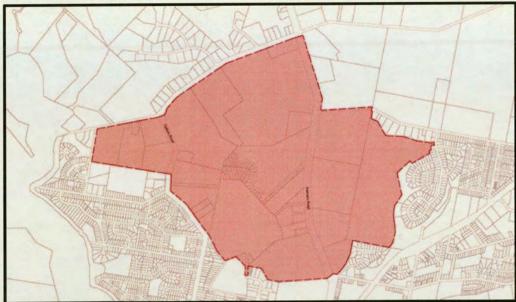
# 2.1 Lakes Entrance Northern Growth Area Outline Development Plan

The LENGA ODP was incorporated into the East Gippsland Planning Scheme in August 2014. The LENGA ODP incorporates and builds upon the background assessment work including hydrological assessment; slope analysis, social impact assessment, vegetation and ecological biodiversity assessment, one space and connectivity analysis, road and intersection connectivity analysis. The ODP envisages the creation of an attractive and liveable new community centred on its key green asset of the Eastern Creek and its drainage line connects the topographical feature and significant existing natural vegetation of the area. It incorporates an inter-linked public open space and path network, a neighbourhood activity centre, and a range of other planned and co-located community facilities that are accessible safely by all means of transport from and throughout Lakes Entrance Northern Growth Area.

The LENGAODP contains the objectives and design and planning guidelines that must be implemented to achieve this vision for the LENGA. These objectives and guidelines have been considered in the context of five key elements:

- Community design;
- Housing diversity;
- Movement network;
- Open space; and
- Environment.

The following image shows the LENGA Outline Development Plan subject area.



## Figure 2: LENGA Outline Development Plan Subject Areas

<sup>(</sup>Source: LENGA ODP - Plan 1)

# **3 DEVELOPMENT PLAN**

# 3.1 Site Analysis

A site analysis of the subject site shows the opportunities and constraints of the land, giving consideration to the following features. Refer to Appendix 2 for Development Plan 1- Site Analysis Plan)

# 3.1.1 Topography and other natural features

The site is undulating with a major gully, planted vegetation and no buildings. The site has a stand of planted vegetation, some existing stands of planted vegetation, which is planned to be retained where possible. There is also planted vegetation along the sides of the gully to assist with land stability on the site. The site entry is from Blair's Road.

The site presents a sloping and hilly landform across the area. The LENGA ODP concludes that there is a:

"general slope towards the south west on Blairs Road, with gullies existing along waterways, and it is not subject to inundation and falls above the Q100."

There is a watercourse in a major gully in the south portion of the site which runs west to east, from Ostlers Road to North Arm waterway. There are two additional minor watercourses running off this major water course: one runs from the west side, down towards the south eastern portion of the site, and the other being minor begins roughly in the middle of the site, running up towards the north eastern portion of the site. (Note this is located inaccurately in the ODP plans)

The LENGA ODP outlines the topography and landform of the area:

"The LENGA comprises valleys, slopes and waterways throughout the area. These areas naturally generate a sloping and hilly landform across the area. Land situated to the east of the LENGA, along Blairs Road has a general slope toward the south west with gullies existing along waterways. Similarly, the central area of the LENGA, bound by Ostlers Road and Palmers Road undulates to the south of the LENGA and is defined largely by the waterway and gully located on land to the west of Ostlers Road. Land within the LENGA situated to the east of Palmers Road has a slighter slope which undulates south of the LENGA. Again, a waterway and gully running north to south through this area, characterises the land form in this area. The land is not subject to inundation and falls above the Q100. " Below is a slope analysis showing the topography of the LENGA. Figure 3 LENGA ODP Topography



#### (Source: LENGA ODP 2013)

#### 3.1.2 Existing and new contours and levels

#### Existing contour levels:

The contour levels on the Site Analysis Plan show that there is a steep slope towards the north and south arising from the major gully, which runs from west to east in the southern portion of the site. The contour levels show an approximate 25 metre elevation over ten metres. As the slopes rise towards the north, east and south portions of the property, the steepness of these hills slowly plateaus to a uniform slope, which is indicated by the equal contour lines, then becoming a general slope as it reaches these boundaries of the site. See Appendix 2 Development Plan 1 -Site Analysis Plan.

Below is an image of the contour lines that cover the subject site.

#### **Figure 4 Subject Land Contour levels**



(Source: services.land.vic.gov.au)

#### New Contour levels:

The proposed contour levels are identified at Appendix 2 – Development Plan 7 – Cut and Fill Plan. Cut and Fill is only proposed to enable road construction.

### 3.1.3 Existing easements including the overhead electricity transmission lines

## Encumbering Easements

An overhead electricity transmission line runs across the north eastern corner of the property. The 16-metre-wide transmission we overheads the property on the northern boundary, towards the west, from the 6.13 metre mark to the 24.79 mark. It runs in a south eastern direction, exiting the property on a 128 degree angle, as shown on the plan in the Title at Appendix 1 As shown on this plan, the powerline only covers a small portion of the subject site.

The title states that the land is in favour of TXU Electricity Ltd., and the origin of the encumbering easement is *"this plan – section 88 of the Electricity Industry Act 2000"*.

### 3.1.4 Existing overlays:

- Design and Development Overlay Schedule 13 (DDO13)
- Development Contributions Plan Overlay Schedule 1 (DCPO1)
- Development Plan Overlay Schedule 8 (DPO8)
- Environmental Significance Overlay Schedule 53 (ESO53)
- Erosion Management Overlay (EMO)

#### Design and Development Overlay – Schedule 13 (DDO13)

The subject site is affected by the Design and Development Plan Overlay Schedule 13, RESIDENTIAL DEVELOPMENT IN COASTAL SETTLEMENTS: LAKES ENTRANCE. The design objectives are:

- To protect and manage the township character of coastal settlements.
- To ensure that the height and visual bulk of new development is compatible with the coastal neighbourhood setting.
- To ensure that new development is designed to minimise visual impacts on the natural landscape.
- To ensure that new development is visually and physically integrated with the site and surrounding landscape.
- To ensure that new development is sited and designed to be visually unobtrusive through and above the surrounding tree canopy when viewed from the public realm, lakes, coastal areas, or other distant viewpoints.
- To protect the vegetated character of the landscape, particularly where it is a dominant visual and environmental feature.
- To maintain the generally small mass of buildings in the landscape.

The design objectives specific to the subject area known as Future residential (area 14):

- Whether development minimises visual and environmental impacts and is well integrated with the natural landscape.
- Whether the proposal facilitates the development of the precinct in discreet stages.

- Whether revegetation along drainage lines and on steep slopes is included in the proposal.
- Whether shared path connections to town are included in the proposal.

Development Contributions Plan Overlay – Schedule 1 (DCPO1)

The subject site is affected by the Development Contributions Plan Overlay- Schedule 1. The Lakes Entrance Northern Growth Area Development Contributions Plan (LENGADCP) was approved and incorporated into the East Gipps and Planning Scheme in August 2014.

The subject land being Property 3 in the DCP has been allocated an overall net developable area of 2.69ha. This has been calculated based on removal of encumbered land, being the land along the gully deemed too steep to develop as well as removal of areas of vegetation to be protected with an indicative dwelling number of for the subject land of 26 dwellings.

# Development Plan Overlay - Schedule 8 (DPO8)

The purpose of the DPO is to detail design and building form controls for specified areas for new development.

The subject land falls within Future Residential (area 14) of the ODP. A Development Plan is required and must be in accordance with the LENGA ODP.

Environmental Significance Overlay – Schedule 53 (ESO53)

The purpose of the ESO is to identify areas where land may be affected by environmental constraints and to ensure development is compatible with the identified environmental value.

PS Map Ref	Site of Biological Significanc e Ref No.	Site Name	Statement of Ecological Significance	Management Practices
ESO53	16A01166	COLQUHOUN and KALIMNA	White-bellied Sea-eagle (Haliaeetus leucogaster) Masked Owl (Tyto novaehollandiae) Limestone Pomaderris (Pomaderris oraria sp calcicola) Spicy Everlasting (Ozothamnus argophyllus) Star Cucumber (Sicyos australis) Viscid Daisy-bush (Olearia viscosa) Yellow Milk Vine (Marsdenia flavescens) Limestone Blue Wattle (Acacia caerulescens) Warm Temperate Rainforest Limestone Box Forest	Encourage landholders to exclude stock by fencing vegetation remnants. Develop and encourage application of an appropriate weed control program. Encourage control of introduced predators. Exclude fire from rainforest areas. Location of White-bellied Sea-eagle nests are to remain confidential.

With regard to this matter the site has been thoroughly assessed through the Native Vegetation Precinct Plan (NVPP), which reviewed all the ESO matters to be considered, and ensure appropriate habitat is protected. Refer to Section 3.10 of this report for NVPP assessment for the subject land.

## Erosion Management Overlay (EMO)

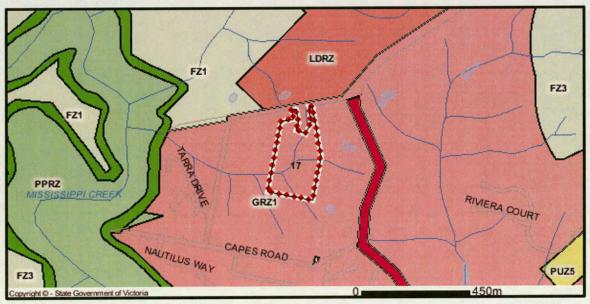
The purpose of the EMO is to identify land prone to erosion, landslip or other land degradation processes. Essentially the important consideration applicable for this application relate to proposed cut + fill, and vegetation retention as well as revegetation.

In regards to vegetation the current owner has been extremely proactive in this regard and has undertaken considerable re-vegetation of the gully within the subject land over the last 28 years with native vegetation. This is why the site is such a good condition currently. We therefore suggest that apart from stabilising proposed new batters on site with appropriate methods no further revegetation works are warranted as part of Stage 1 Development. Stage 2 and subsequent stages will need to incorporate revegetation works within the gully areas.

### 3.1.5 Adjacent land use and development patterns:

The subject site is the first development that has been proposed to the west of Ostlers Road. The land has recently (in 2014) been rezoned from Farming Zone to the General Residential Zone. The adjacent land uses are currently hobby farms, which are generally used for animal grazing. The surrounding zones are currently: Residential 1 Zone to the south and east, and Low Density Residential Zone to the north.

Below is an image of the Zones that surround and cover the subject site.

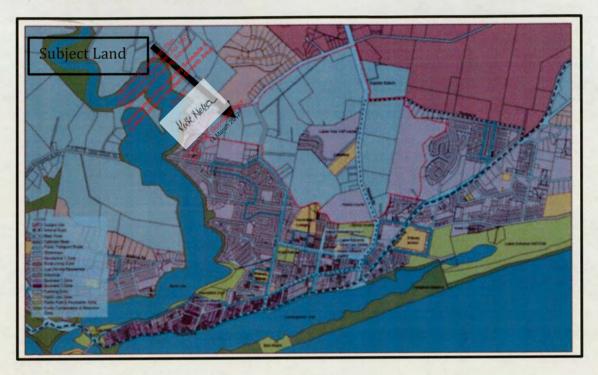


#### Figure 5 Subject Land Zone Plan

(Source: services.land.vic.gov.au)

The image below shows the site context plan extracted from the LENGA ODP (2013), which shows the adjacent land use and development patterns.

#### Figure 6 LENGA ODP Site Context Plan



(Source: LENGA ODP 2013)

#### 3.1.6 Views to and from the land

The views to and from the land, and the view lines towards Tara landing and North Arm to the west. Views are identified on the Development Plan 1- Site Analysis Plan at Appendix 2.

## 3.1.7 Existing open space, road, bicycle and pedestrian networks

#### Open Space Network:

There is currently no open space on the subject site, as it currently operates as a hobby farm. The portion of land that is south of the major gully is currently land-locked, which is why development is proposed to occur on the north-eastern portion of the site in the first stage. The Development Plan proposes an Open Space network within the gullies in accordance with the LENGA ODP. There has been some modification to the proposed reserve areas agreed to with East Gippsland Catchment Management Authority (EG CMA) and Council. See Appendix 2 – Development Plan 5 – Easement Reserve Plan- for a detailed plan showing proposed reservation areas and walking trails.

#### Road Network:

The subject site is currently used for farming, there are no existing road, bicycle or pedestrian networks. Refer to Section 2.2 Proposed Lot and Layout Patten for the proposed movement networks.

The site is serviced by various roads within the LENGA: the ODP Transport and Traffic Impact Assessment Report states that:

"The NGA is currently serviced by Palmers Road and Ostlers Road which run south to north through the precinct from the Lakes Entrance township. Palmers Road is situated to the east of the NGA and is an Urban Collector Road. The existing Palmers' Boad reserve can accommodate increased traffic flow generated by the NGA. Intersections along Palmers Road need to be established in appropriate locations to provide access to the NGA. As Lakes Entrance continues to develop and respond to changing environmental issues, Palmers Road may be upged at the form a secondary northern access between Lakes Entrance township and the Princes. Ostlers Road is located in the western portion of the NGA and is an Urban Collector Road. The existing road reserve is capable of accommodating increased traffic generated by development of the NGA. Intersections along Ostlers Road need to be established to provide internal access to the NGA."

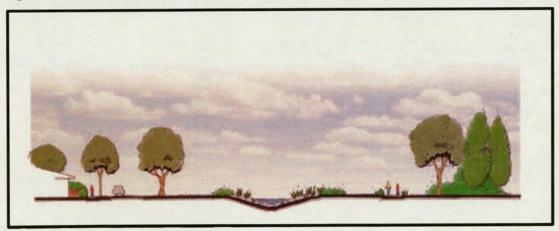
#### Bicycle/Pedestrian Network:

#### Within the LENGA,

"there is, currently, little in way off walking and cycling infrastructure within the NGA. East Gippsland Shire Council, the landowners and existing community are very eager for provision of a shared path to be provided through the NGA to provide connections with the existing and future community of Lakes Entrance, and for recreational purposes. The Outline Development Plan provides an extensive shared path network principally along the watercourse corridors, connecting with existing residential areas and off-road trails in the forested areas north of Lakes Entrance. This path network will partly act as an uninterrupted loop, thus providing an excellent option for residents to pursue active recreation."

Refer to Section 2.3 Open Space Network for the proposed shared bicycle/pedestrian network within the subject site. Refer to Figure 6 below for the Indicative Shared Pathway Cross Section set in the LENGA ODP.

## Figure 7 LENGA ODP Shared Pathway Cross Section



(Source: LENGA ODP - Figure 5)

# 3.2 Proposed lot and layout pattern

Refer to Appendix 2 for the Development Plan 2 - Proposed Lot and Layout Pattern, which demonstrates the following features:

The provision of a safe and practical road hierarchy showing connections to the local and arterial roads, which are generally in accordance with the LENGAODP:

"The Outline Development Plan has been designed to provide an arterial road network which will underpin a clear and legible street network in the NGA. The ODP utilises existing roads and road reserves to build the basis for a logical east-west and north-south street grid. Intersection locations along Palmers Road and Ostlers Road will create logical connections between residential areas, open space and the neighbourhood centre.

A new east west collector road will be constructed from Ostlers Road to Palmers Road and will run through the southern region of the development site. This road will provide the primary access for land within the Precinct and service the majority of future residents. A bus route has also been proposed for this collector road.

Whilst it is recognised that a future northern access from Lakes Entrance to the Princes Highway is likely to be facilitated via Palmers Road, no upgrade to Palmers Road required due to development of the NGA."

Movement Network Objectives set out in the LENGA ODP, which the development plan of the subject site is designed to address, include:

- "To provide better transport choices and options:
  - Provide safe and efficient walking, cycling, public transport and vehicle access to connect residents directly to the convenience centre, open space and community facilities within and adjoining the growth area and to wider regional networks.
  - Ensure that all areas be adequately serviced by buses
  - Design streets to cater for shred paths and bus movements
  - Locate higher density housing along the bus route
- To create well connected streets
  - Ensure streets and urban form are designed to cater for people's choice in movement- walking, cycling, public transport, car and other motorised vehicles
  - Encourage a mix of land uses within and around the convenience centre that can be easily accessed
  - Distribute traffic evenly through the local street network, and avoid opportunities for 'rat running'
  - Create permeable street networks, avoiding use of cul-de-sacs."

Ostlers Road is an Urban Collector Road, which Blairs Road comes off. Ostlers Road connects the LENGA to the Lakes Entrance township. Local road networking within the subject site will connect to

Blairs Road, and will provide individual access to each lot. Stage 2 road also provides a linkage connection to the adjacent western land parcel. The integrated road network provides road linkages in accordance with the LENGA road network objectives. Below is the Road Hierarchy Plan for the LENGA ODP area. See Appendix 2 for Development Plan 3 - Road Hierarchy Plan of the subject site.

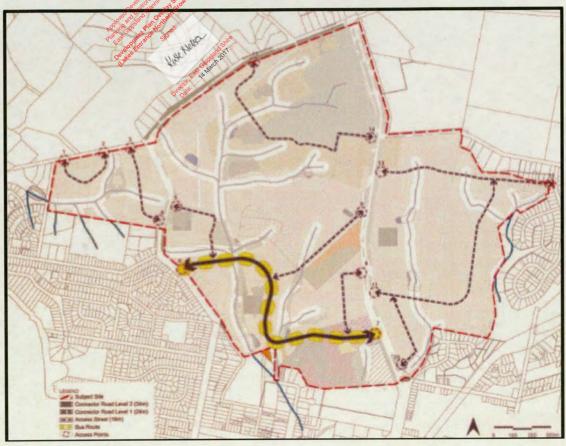


Figure 8 LENGA Road Hierarchy Plan

(Source: LENGA ODP - Plan 10)

A variety of lot sizes to cater for a diversity of housing type and design opportunities are generally in accordance with the LENGAODP:

Each lot within the subject site varies in size, ranging from 650sqm to approximately 1610sqm, allowing for a variety in housing design and size, in accordance with the LENGAODP.

Below is a table representing density and lot sizes within the LENGA. The proposed lot sizes respond to Council's intention for this area to predominantly accommodate conventional density housing.

#### Figure 9 LENGA Lot Density & Lot Size

Lot Type	Density	Average Lot Size	Potential Lot Yield
Conventional density housing (including existing R1Z land)	9.5 dwellings/ha	880m2	918
Low density housing	6 dwellings/ha	1,250m2	136
Medium density housing	16 dwellings/ha	450m2	68

(Source: LENGA ODP 2013 - Table 3)

As shown in the map below, the subject site is located in the 'Conventional density housing' area. "Conventional density housing will be the primary housing typology throughout the NGA and will comprise lot sizes of around 880m<sup>2</sup>, and will reflect the existing urban character of Lakes Entrance whilst also being well integrated with adjoining medium and low density residential areas...Conventional density residential should achieve an average of 9.5 dwellings per hectare."



**Figure 10 LENGA Housing Density** 

#### (Source: LENGA ODP 2013 - Plan 9)

The subject land being Property 3 in the DCP has been allocated an overall net developable area of 2.69 hectares. This has been calculated based on removal of encumbered land, being the land along the gully deemed too steep to develop, as well as removal of areas of vegetation to be protected with an indicative dwelling number of for the subject land of 26 dwellings.

#### (2.69Ha x 9.5 dwellings= 26 lots)

The Development Plan has been prepared to accord with the overall intent of the LENGA ODP. The Development Plan addresses the matters relevant to the site including: Lot yield 26 lots and variety of lot sizes addressing site topography considerations. Refer to Appendix 2 – Development Plan 4 Stage 1 Landscape Master Plan.

# 3.3 Proposed Open Space Network

The following map identifies the open space provision set out by the LENGA ODP.



### Figure 11 LENGA ODP Open Space

#### (Source: LENGA ODP 2013 - Plan 12)

As identified on the above map, active open space is proposed along the waterways within the subject site. The subject site shows that reserves along the watercourses have been planned for, alongside which shared pedestrian/bicycle paths will be located. This is in compliance with the following Open Space objectives set out by the LENGA ODP:

"To provide easily accessible open-space for passive recreation

Provide local parks within at least 400m safe walking distance of at least 95% of all dwellings

Provide active open space within 1km of 95% of all dwellings

Provide linear parks and trails, most often along waterways, but also linked to vegetation corridors and road reserves within 1km of 95% of all dwellings

Create clear links to active recreation opportunities at the existing Lakes Aquadome

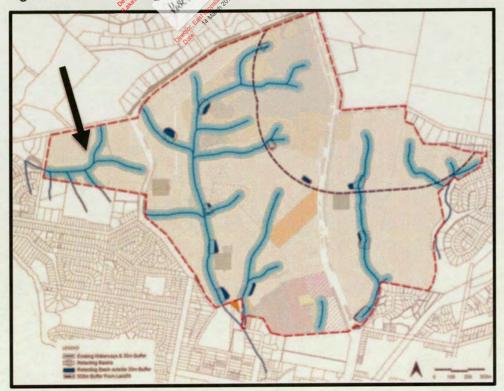
Use encumbered land productively for open space where possible."

Walking trails are provided within the waterway reservations, in accordance with LENGA ODP. See Appendix 2 – Development Plan 5 – Easement Reserve Plan.

# 3.4 Drainage/Hydrology Report

It has been confirmed with and by Council that this step is not required for this application until Stage 2 application commences. Refer to Appendix 3 for Council Letter dated 18.12.15.

Drainage will be in accordance with the drainage plan and design prepared for LENGA ODP by Water Technology. Water Technology has identified the subject site to be in Catchment 2: land bound by Palmers Road to the west and Ostlers Road to the east. The following image shows the catchment areas within the LENGA





(Source: LENGA ODP 2013 - Plan 11)

# **3.5 Community Services**

Community facilities are accommodated for in the ODP and are designed to support a strong and viable Lakes Entrance community which is to grow as the result of the cumulative effects of the proposed residential developments. The ODP outlines that the recommended location of future community facilities will occur in the east side of the LENGA study area, at 55 Palmers Road.

# The LENGA ODP outlines that:

"Most of the infrastructure in Lakes Entrance is either ageing, unable to expand to service increased demand or in physically disparate and poorly integrated across the community. As a response (due to flooding concerns), future development of the NGA will be required to contribute towards new and upgrades to existing community facilities." The proposed development of the subject site will accommodate residential growth in the LENGA ODP, located in close proximity to the proposed community facilities location.

The DCP requires a contribution at \$900/dwelling triggered by the issue of a building permit as Community Infrastructure Levy to go towards funding community facility provisions and upgrade required with the proposed population increase.

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## **3.6 Traffic**

It has been discussed with and confirmed by Council that a traffic impact assessment is not required until Stage 2 proceeds; however, this assessment will generally be in accordance with the access outcomes sought by the ODP and the LENGA Traffic Assessment. See Appendix 3 for Council Letter dated 18.12.15.

# 3.7 Geotechnical Assessment

A Geotechnical Risk Assessment (refer to Appendix 4) has been undertaken by Simon Anderson Consultants to demonstrate the level of geotechnical risk involved in relation to the proposed development plan. The Assessment concluded that there is a low risk for landslide, sheet/rill erosion and tunnel erosion. A summary of risk is as follows:

"Moderate grades over the majority of the allotment, ranging from approximately 1 in 5 to 1 in 10.

Excellent grass coverage, preventing topsoils from being washed away (even in the heaviest torrential downpours).

The well contoured landscape (Waxing Divergent) provides excellent surface water drainage and spreads run-off.

Natural soils of the site (Dense Sandy Silts, overlying Stiff Sandy Clays) will have adequate strength and stability for residential slabs, footings and retaining walls.

There is no evidence of soil erosion or landslip on the subject site or adjoining properties and I would consider the geotechnical risks to be low.

Any future building envelope should be located outside of ground sloped at 1 in 4 or greater (i.e. areas of Ephemeral Watercourses/shallow drainage lines).

Dependent on location of future dwellings, an Erosion Management Plan may need to be implemented during and after construction if slab on ground design with cut/fill batters and retaining walls were adopted.

Any construction works associated with the future dwellings would be protected by Building Code of Australia, Australian Standards, Building and Planning Permit requirements, and normal construction practice."

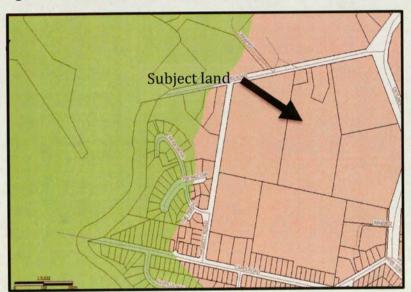
Based on these findings derived from both the Desktop and Site investigations, Simon Anderson Consultants finds that the "site is suitable for development as proposed and further intensive investigation would not be necessary to confirm...[these] findings".

# 3.8 Heritage

It has been confirmed with and by Council that this section is not required until Stage 2 proceeds- as the subject site is not within a heritage sensitive area. The LENGA ODP states that:

"There are four areas of Cultural Heritage Sensitivity identified within the NGA. Three of these areas are located on land holdings located along the east of Ostlers Road. The remaining area of Cultural Heritage Sensitivity site is located in the western most land holding in the NGA. An Aboriginal Cultural Heritage Place Survey and Cultural Heritage Management Plan has been completed for this area. "

The image below shows the cultural heritage sensitive areas within the LENGA area- Note that the subject site is not affected.



### Figure 13 Cultural Heritage Sensitivity Areas

(Source: Geo Vic mapping)

# 3.9 Landscape Master Plan

It has been confirmed with and by Council that the Landscape Master Plan is not required until Stage 2 proceeds. (See Appendix 3 Council Letter dated 18.12.15). However, as outlined in the LENGA ODP:

- "A landscape master plan is required for any future subdivision. The master plan must include any
  open space, reserves, pathways and streetscapes, entrance features and any other key attribute
  within the subdivision.
- A landscape master plan is required for any future medium density development. The master plan must include provision of vegetation along the front boundary to screen interface uses."

Development Plan 4- Landscape Master Plan for Stage 1 is included at Appendix 2.

# 3.10 Flora and Fauna Assessment

## Clause 52.16 Native Vegetation Precinct Plan (NVPP)

The purpose of Clause 52.16 is:

• To provide for the protection, management and removal of native vegetation in accordance with a native vegetation precinct plan.

- To ensure permitted clearing of native vegetation results in no net loss in the contribution made by native vegetation to Victoria's biodiversity. This is achieved through the following approach:
  - Avoid the removal of native vegetation that makes a significant contribution to Victoria's biodiversity.
  - Minimise impacts on Victoria's biodiversity from the removal of native vegetation.
  - Where native vegetation is permitted to be removed, ensure that an offset is provided in a manner that makes a contribution to Victoria's biodiversity that is equivalent to the contribution made by the native vegetation to be removed.
- To manage native vegetation to minimise land and water degradation.
- To managenative vertexion near buildings to reduce the threat to life and property from bushfire.

This Development Plan (DP) does not propose to remove any native vegetation or to create adverse effects thereupon, this DP is in accordance with the LENGA NVPP and no further assessments are required. It should be noted that there is a tree of significance on site, planted vegetation, a gully and watercourse and vegetation that can be removed as outlined within the LENGA NVPP.

The image below shows the native vegetation protection and removal map from LENGA's NVPP.

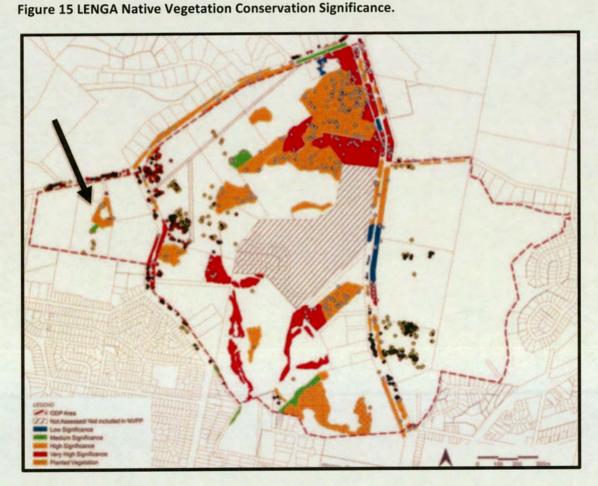
#### Figure 14 LENGA NVPP



(Source: Extract LENGA NVPP - Map 2)

The Development Plan 1- Site Analysis Plan at Appendix 2, labels the following trees to be retained (according to the EG NVPP 2013):

Blue box - Very Large Old Tree (identified on map as no. 233) Blue box – Medium Old Tree (identified on map as no. 236) Blue Box – Very Large Old Tree (identified on map as no. 237) Coast Grey Box – Large Old Tree (identified on map as no. 235) Coast Grey Box – Medium Old Tree (identified on map as no. 234) Below is a map of the LENGA's Native Vegetation Conservation Significance.



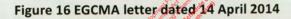
(Source: LENGA ODP 2013)

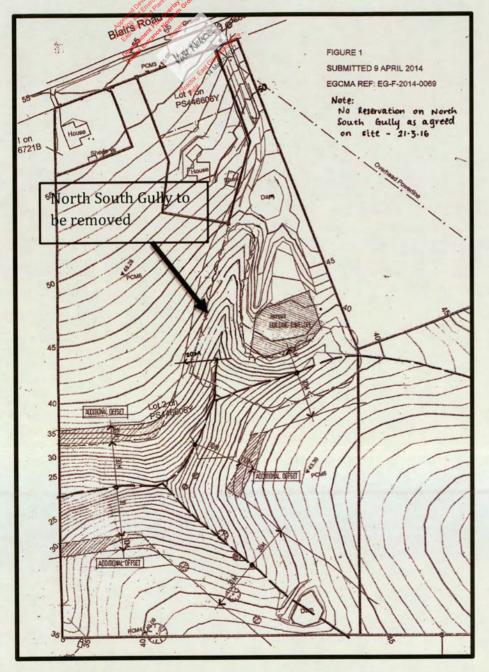
## 3.11 Waterway Buffers

The LENGA ODP sets out that:

"in accordance with the Water Act 1999, an ecological 30 metre buffer is to be provided either side of identified waterways...[to be] used to facilitate necessary drainage infrastructure to serve the precinct". However, the setback to the water course within the major gully has been reduced to between 15 & 40 metre offsets. East Gippsland Catchment Management Authority (EG CMA) has consented to this and has suggested an appropriate offset area accordingly, which includes the removal of the north south gully (this has been labelled on the map below – Refer to Appendix 6 for a copy of this map). Refer to Appendix 5 – EGCMA letter dated 14 April 2014.

The plan below shows the buffers that range between 15 and 40 metres.

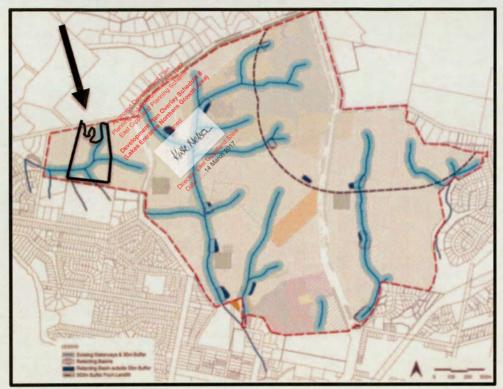




(Source: EGCMA)

The following image shows the drainage features within the LENGA

#### Figure 17 LENGA Drainage Catchments



#### (Source: LENGA ODP 2013 - Plan 11)

There is no vegetation removal proposed and therefore no offset revegetation required. The only matter triggering revegetation offset is the matter of setback from the streamline. In accordance with East Gippsland Catchment Management Authority (EG CMA) the setback to this watercourse has been reduced to 15 – 40 metres rather than 30 metres as specified in the ODP, however EG CMA have consented to this matter and suggested the areas as appropriate offset areas accordingly.

The Development Plan 5 - Easement Reserve Plan (refer to Appendix 2) shows the above-amended waterway buffers as approved and drawn by EG CMA. This area is to be provided as an easement remaining in ownership of land holder.

# 3.12 Neighbourhood Activity Centres

#### The LENGA ODP sets out that:

"A neighbourhood activity centre (NAC) is proposed within the land holding in the southern portion of the NGA, nearest to the Lakes Entrance township. The NAC is located adjacent to Palmers Road and is ideally located next to existing community facilities.

The NAC will perform a daily needs function for the residents within the precinct and may also capture a wider range of users subject to demand. An area of 3.5 hectares has been identified for the NAC, which reflects its intended role as a secondary retail precinct within Lakes Entrance. The NAC will serve the future community of the NGA, providing for their main shopping needs.

The NAC will form an important community focal point and have a mix of uses to meet local needs. Accessible to a viable user population by walking, cycling and by local bus services to Lakes Entrance township. Community facilities and emergency services are to be co-located with the NAC to reinforce its status as activity centre and community focal node. "

The subject site development plan is in accordance with the proposed NAC within the LENGA ODP as it provides conventional housing density close to the future NAC, which will be connected and accessed via road networks, alongside shared pedestrian and bicycles paths. The site does not fall within the proposed NAC location.

# 3.13 Staging Plan

Refer to Appendix 2 – Development Plan 6 – Staging Plan for Whole Development.

Stage 1: Lot 1

Stage 2: Lots 2 – 15.

Note: Stages 1 & 2 are staged first as they are accessible from Blairs Road.

Stage 3: Lots 16 - 22.

Stage 4: Lots 23 - 26.

Note: Stage 3 & 4 are subject to development of adjoining land, as they require access roads from eastern lot.

Reserves to be staged to areas abutting each development stage.

# **4 CONCLUSION**

The proposed development plan is in accordance with all of the relative requirements of the LENGA ODP for the following reasons:

- The proposed development plan provides the best possible design outcomes and orientation based on the existing site conditions and location constraints.
- The proposed development plan enables site permeability to be developed with the future stages of development.
- development.
   The proposed development planaccords with the LENGA ODP's 'conventional housing density' of 9.5 dwellings per hectare.

Based on the above, the Development Plan is appropriate for the subject site and should be supported for the following reasons:

- The proposal provides an appropriate response to the relevant objectives of the LENGA ODP and policy directions for open space provision, development plan design, native vegetation retention and protection of steep land.
- The proposal is consistent with, and provides an appropriate response to, the provisions of the Lakes Entrance Northern Growth Area Outline Development Plan.
- The proposal is consistent with the purpose and provisions of GRZ and specifically Clause 43.04 DPO -Schedule 8.
- The proposal has been discussed and agreed to as submitted by Council Officers over the last 18 months.

# **APPENDIX 1: TITLE**

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Transport, Planning and Local Infrastructure

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#### REGISTER SEARCH STATEMENT (Title Search) Transfer of

Page 1 of 1

Land Act 1958

VOLUME 10766 FOLIO 245

Security no : 124053047742P Produced 19/11/2014 06:07 pm

# LAND DESCRIPTION

Lot 2 on Plan of Subdivision 446606Y. PARENT TITLE VOlume 10101 Folio 797 Created by instrument PSA 6606Y 24/11/2003

#### REGISTERED PROPRIETOR

Estate Fee Simple TENANTS IN COMMON As to 1 of a total of 2 equal undivided shares Joint Proprietors MURRAY STUART GOFF LYNETTE ROBYN GOFF both of BLAIRS ROAD LAKES ENTRANCE VIC 3909 As to 1 of a total of 2 equal undivided shares Joint Proprietors PHILIP GRAEME LOUKES MARION LOUISE LOUKES both of BLAIRS ROAD LAKES ENTRANCE 3909 PS446606Y 24/11/2003

#### ENCUMBRANCES, CAVEATS AND NOTICES

Any encumbrances created by Section 98 Transfer of Land Act 1958 or Section 24 Subdivision Act 1988 and any other encumbrances shown or entered on the plan set out under DIAGRAM LOCATION below.

#### DIAGRAM LOCATION

SEE PS446606Y FOR FURTHER DETAILS AND BOUNDARIES

#### ACTIVITY IN THE LAST 125 DAYS

NIL

-----END OF REGISTER SEARCH STATEMENT-----

Additional information: (not part of the Register Search Statement)

Street Address: 17 BLAIRS ROAD LAKES ENTRANCE VIC 3909

DOCUMENT END



1

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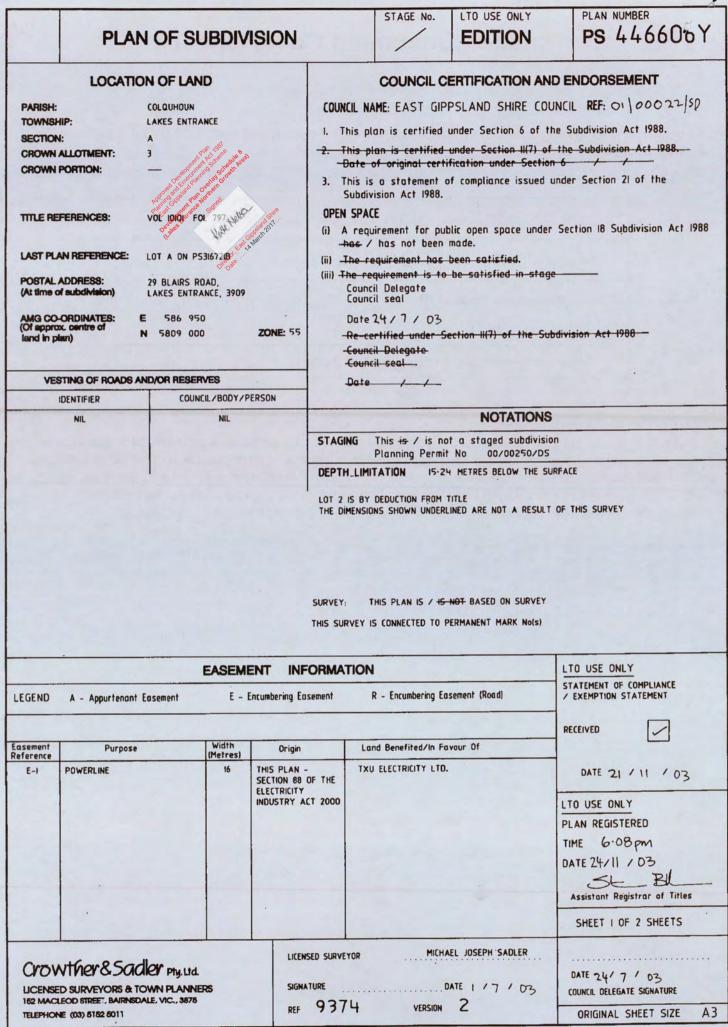
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Document Identification	PS446606Y
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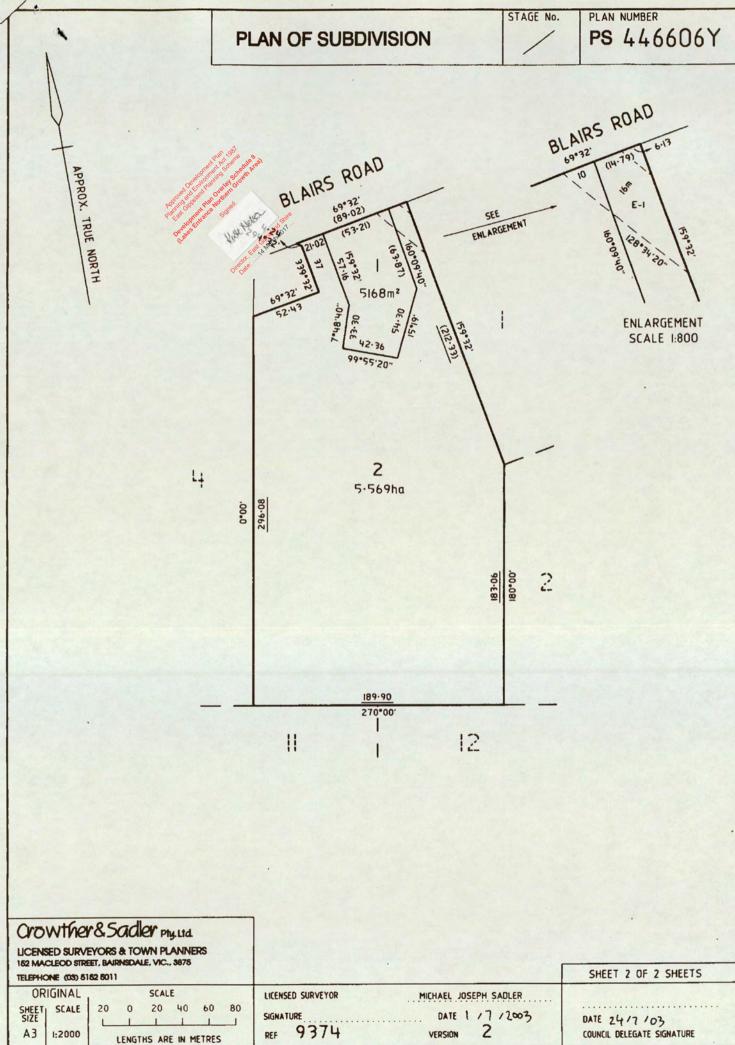
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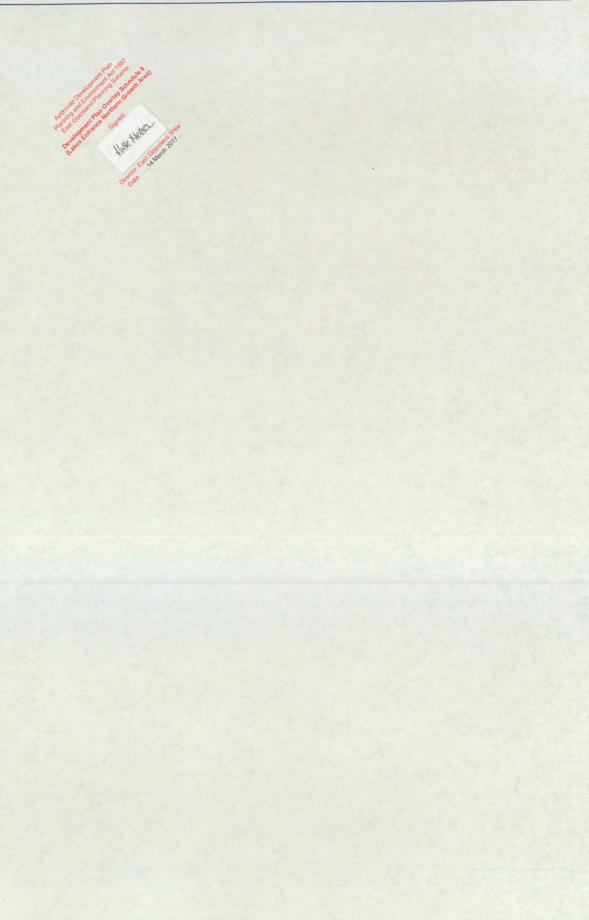


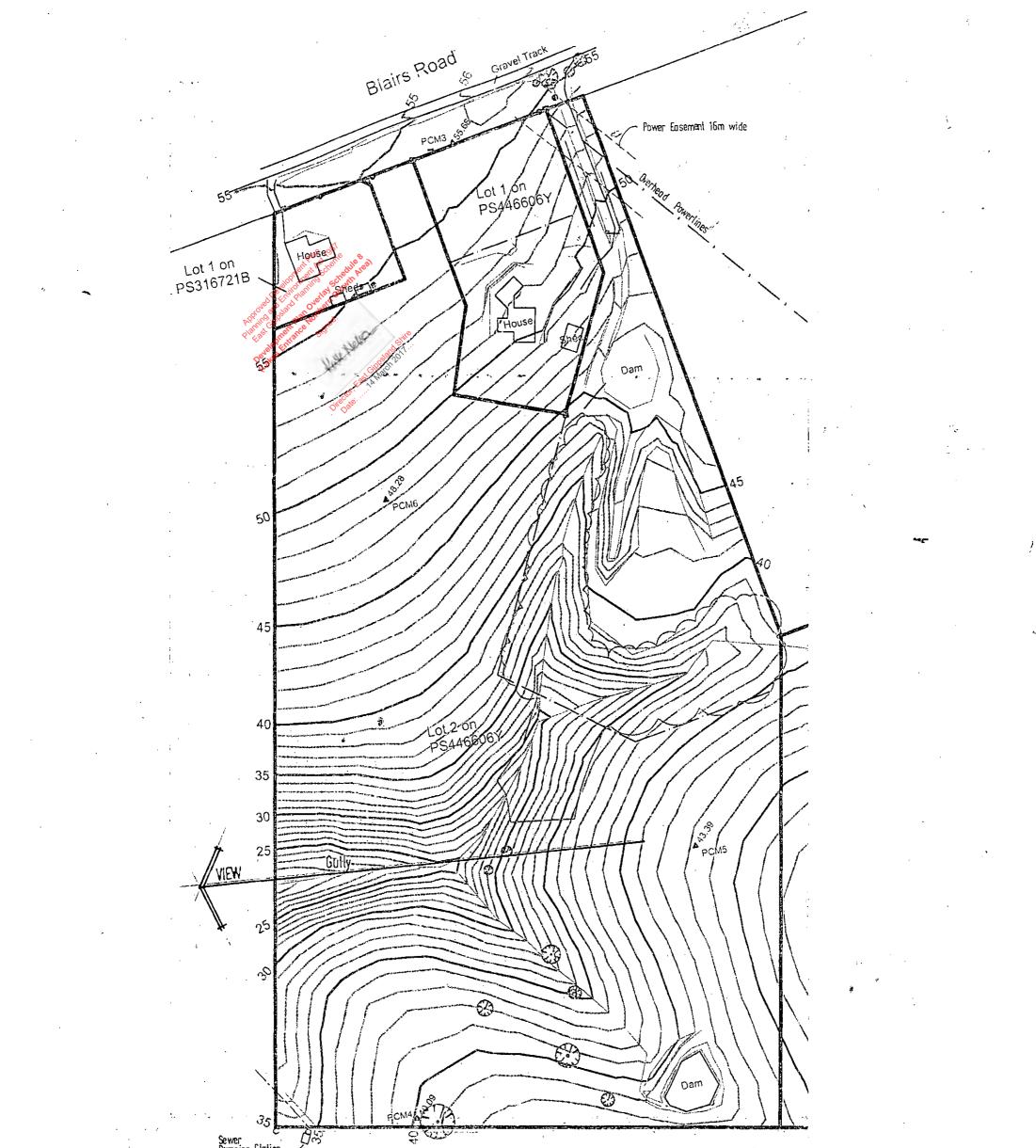
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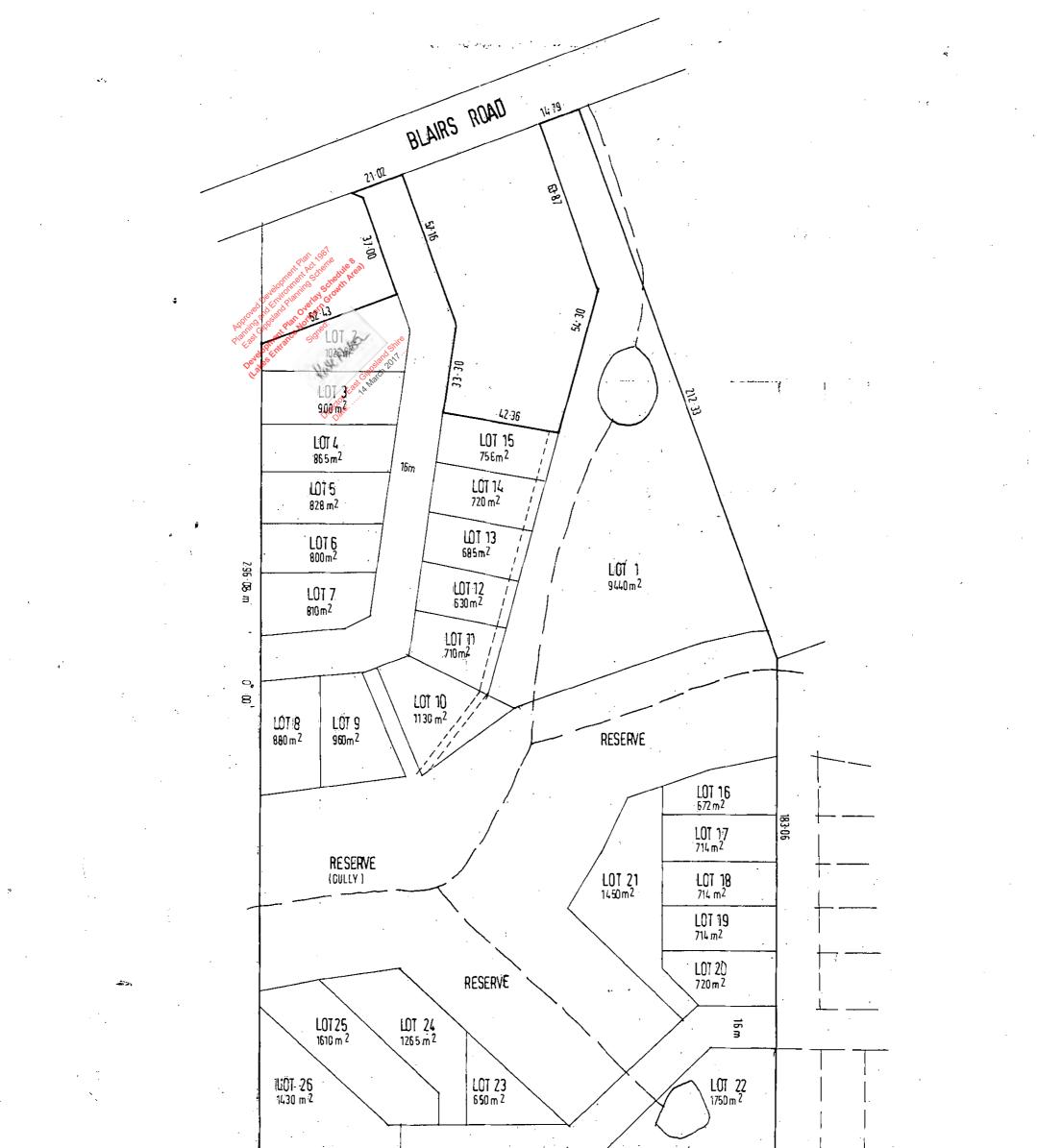
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# **APPENDIX 2: DEVELOPMENT PLANS 1 - 7**





	DEVELOPMENT PLAN 1 SITE ANALYSIS 0 10 20 30 40 50 50 70 80 90 00 SCALE OF METRES	PLANNING OVERLAYS APPLICABLE         • Design and Development Overlay       (DDO) whole site         • Development Contributions Plan Overlay       (DCPO) whole site         • Development Plan Overlay       (DPO) whole site         • Environmental Significance Overlay       (ESO) whole site         • Erosion Management Overlay       (ESO) whole site         • Vegetation Protection Overlay       (VPO) whole site         • ADJACENT LANDUSE       All surrounding properties are used as hobby farms
<b>*</b>	LAKES DRAFTING -PTY LTD BUILDING DESIGN CONSULTANTS DP-AD 1809	LAKES ENTRANCE <b>DP 1</b> TEL (03) 5155 2144



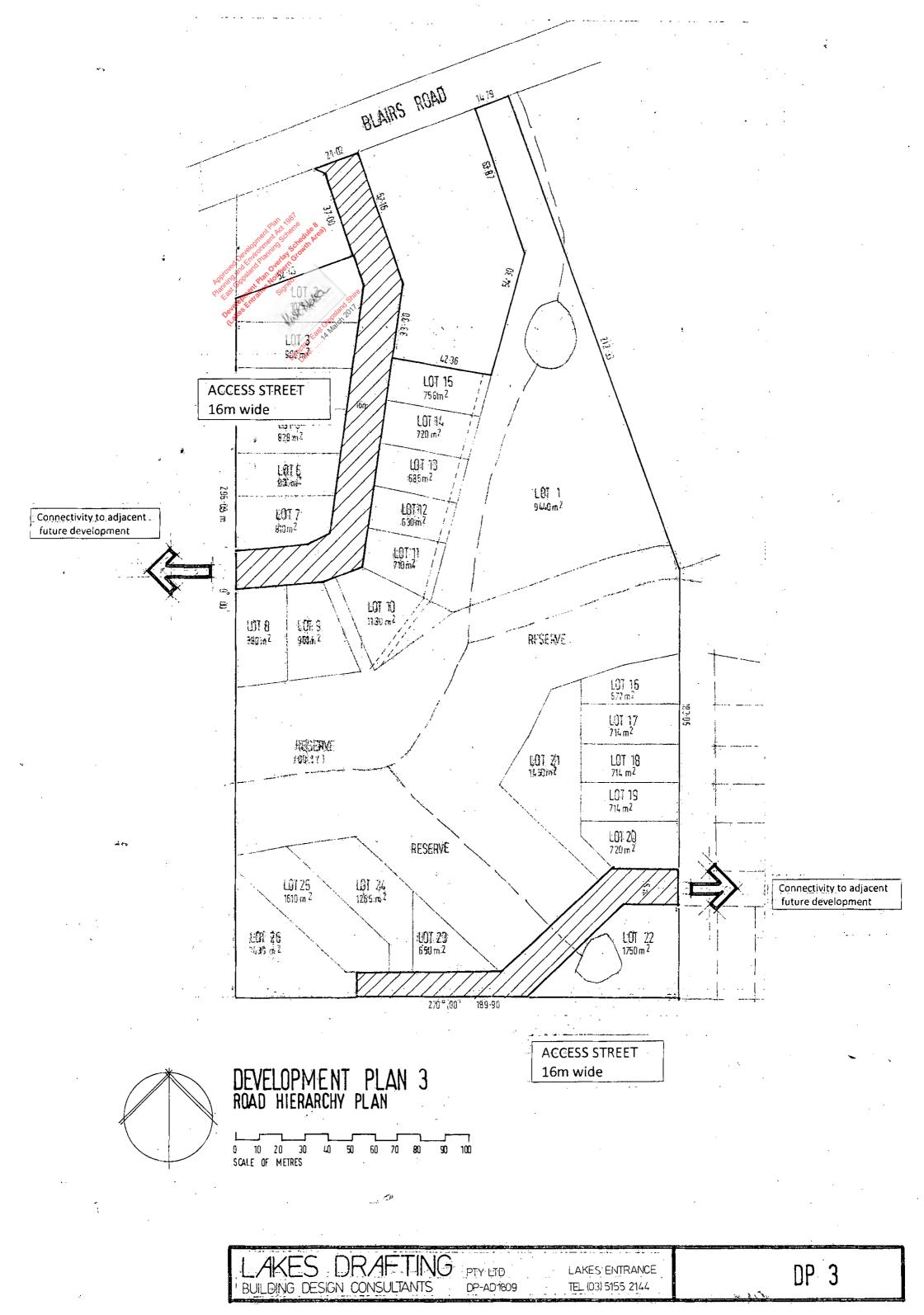
270°00' 189-90 DEVELOPMENT PLAN 2 LOT LAYOUT

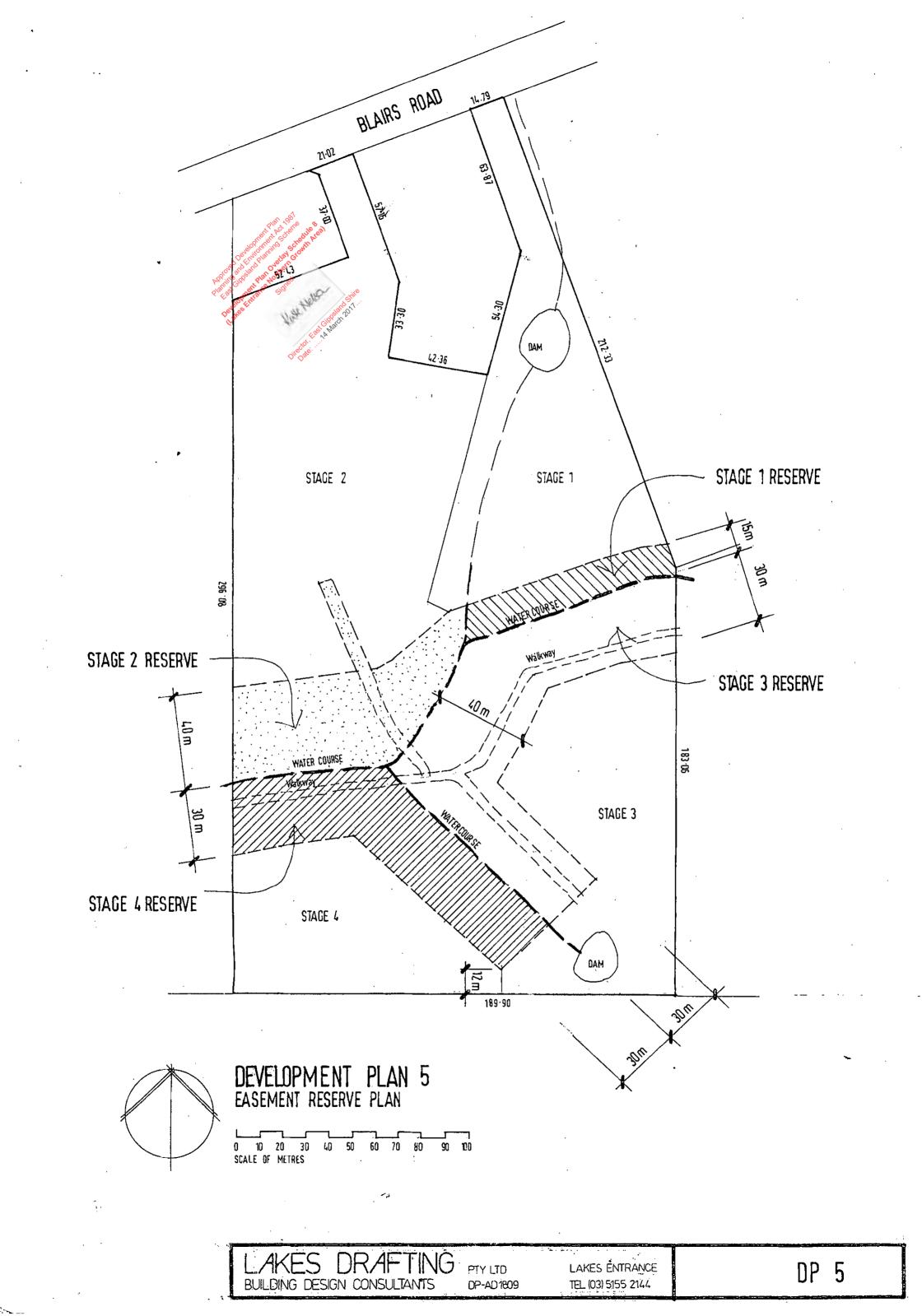
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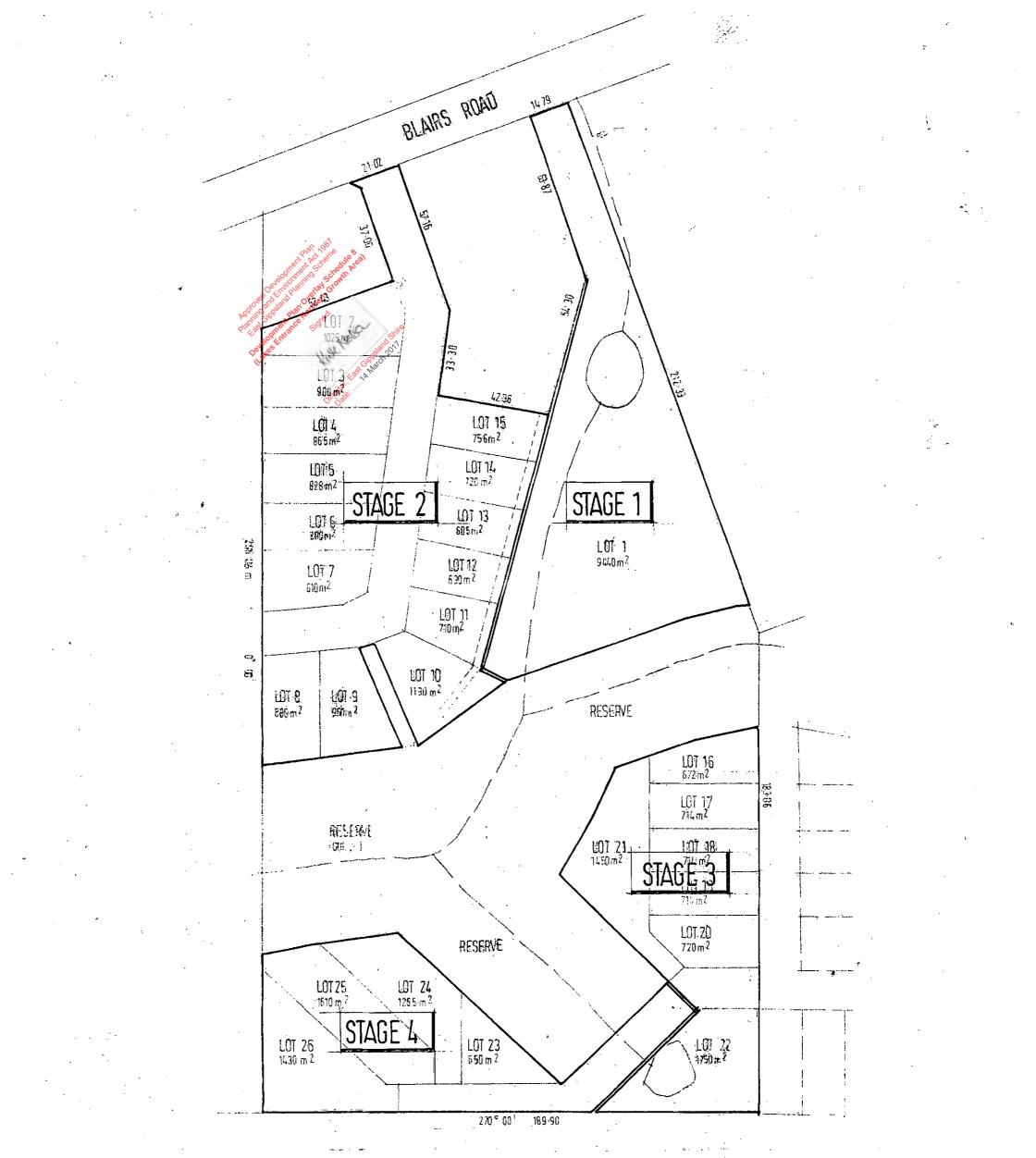
50 60 .70 80

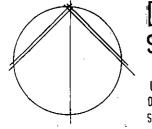
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NG PTY LTD DP 2 LAKES ENTRANCE BUILDING DESIGN CONSULTANTS DR-AD1809 TE (03) 5155 2144

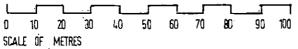








# DEVELOPMENT PLAN 6 STAGING PLAN FOR WHOLE DEVELOPMENT



BUILDING DESIGN CONSULTANTS

17

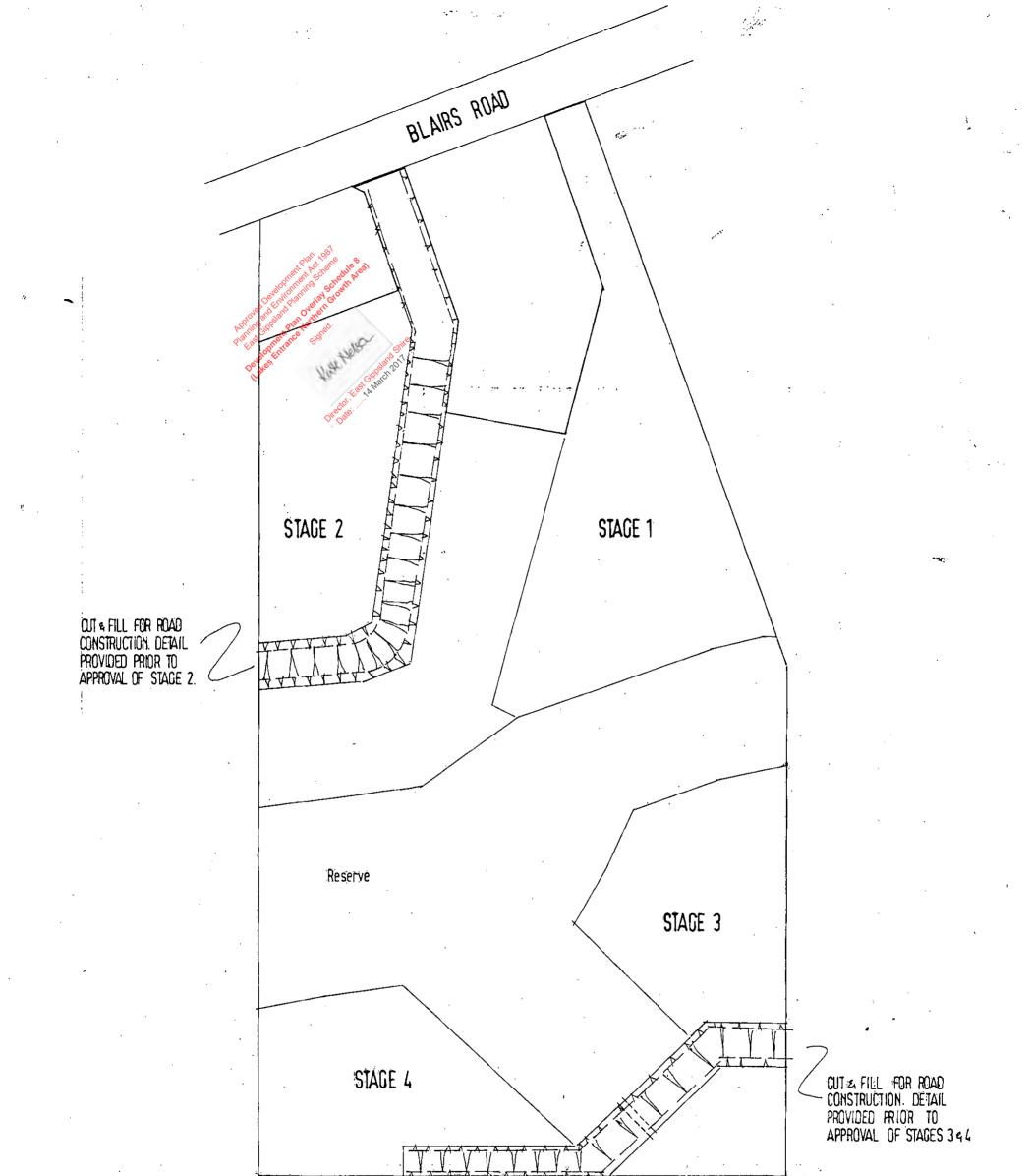
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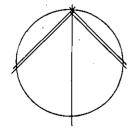
DP-AD 1809

DP 6

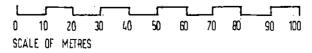
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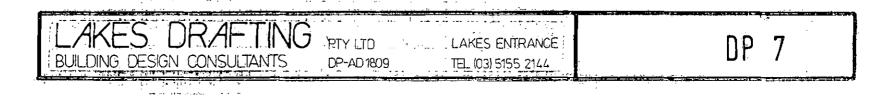
TEL (03) 5155 2144





# DEVELOPMENT PLAN 7 CUT & FILL PLAN





Page 27 of 30 Paring Column to a start to a sta State State State **APPENDIX 3: COUNCIL LETTER DATED 18.12.15** 

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Contact: Telephone No: Email: Nicole Reynolds (03) 5153 9500 feedback@egipps.vic.gov.au

18 December 2015

Attention: Principal Planning Director Beacon Town Planning Pty 100 Email: jennie@beacontp.com.au

Mr Murray & Mrs Lyn Goff PO Box 639 LAKES ENTRANCE 3909

email: lakesdrafting@westnet.com.au

Dear Jennie

### RE: Planning Permit Application 400/2014/P- 17 Blairs Road Lakes Entrance

Thank you for the receipt of your meeting notes by email on 10 December 2015 outlining actions and discussion of our meeting on 2 December 2015.

The purpose of this letter is to briefly outline agreed actions, next steps, to identify information gaps and nominate timelines for future actions.

### 1. EGCMA Buffers and Allotment boundaries proposed Lot 1

Officers have proposed a solution to distinguish between the north/south and east/west gullies.

Officers have proposed an outcome which proposes the retention of the north/south gully and waterway in private ownership with easements to benefit servicing authorities and Council for servicing. We agreed that provision for access purposes for the general public was not required. The width and easement requirements have not been described in detail to date.

We understand from you that East Gippsland Catchment Management Authority (EGCMA) advice is that this arrangement is suitable subject to the preparation of an Environmental Management Plan.

We note EGCMA response dated 1 September 2015 which confirms the Authority's consent for buffer modifications; however the Authority does not support the retention of the buffers and gullies in private ownership. We are seeking EGCMA clarification on this matter.

This presents as a significant issue.

With respect to the east/west gully and buffer, we agreed to the modifications for buffers as requested at the southern boundary of proposed Lot 1 to facilitate the proposed building envelope. This section of waterway and buffer will be required to be created as Reserve as part of the Stage 1 of a staged subdivision.



**Corporate Centre** 

273 Main Street (PO Box 1618) Bairnsdale Victoria 3875 **Telephone:** (03) 5153 9500 **National Relay Service:** 133 677 **Residents' Information Line:** 1300 555 886 **Facsimile:** (03) 5153 9576 **Email:** feedback@egipps.vic.gov.au **ABN:** 81 957 967 765 The accurate determination of the proposed southern boundary of Lot 1 still requires further consideration.

East Gippsland Water (EGW) advice has been sought with respect to the future provision of reticulated sewer and water to the precinct. This information will then be utilised to discuss the final southern boundary location for proposed Lot 1, the provision of foreshadowed sewer and water will also promote advancement in discussion concerning the provision of a walking track as part of future stages.

Officers have proposed an interim arrangement to allow 'lease back' of the section of reserve to the current land outpers. Given EGCMA current position this may also need to apply to the north south waterway and buffer.

The time, conditions of management, obligations, financial implications and property Department requests will all require further consideration.

Officers undertook to seek some preliminary advice from Maddocks Lawyers with respect to proposing a framework of general times, obligations and conditions to be detailed in a lease.

The principles agreed were as follows:

- To keep the terms and obligations simple.
- To obligate the current owners to manage the reserve in the current conditions with respect to weed management and existing conditions.
- The lease to refer to an Environmental Management Plan to be prepared by the landowner as part of DPO Schedule requirements, pertaining to both sections of the gully.
- The timing of the term of the lease to be generally with the current landowners and to be extinguished at transfer of land to a third party or at a time when Council requires the Reserve to facilitate pedestrian walkway for access purposes or for servicing drainage infrastructure.
- Period of review to be 5 yearly if possible for up to 20 years.
- The ongoing requirement for landowners to be able to maintain vehicular access across the proposed reserve for access to balance stages for maintenance management, and eventual construction of stages.
- All the above were and are subject to advice from Council officers relating to Assets, Property and Governance.

It is noted that there is disagreement between Parties with respect to the development principles contained within the outlined Development Plan in reference to public versus private ownership.

2. Development Plan Overlay Schedule Approval

We understand that the land owner has agreed to prepare a DPO request in conjunction with an amended Planning Permit Application with reference to the subject land.

General discussion in relation to the DPO Schedule 8 occurred with the following consequences and other matters requiring further discussion.

The DPO plan set will include the following:

1. Site Analysis Plan showing constraints and opportunities.

- 2. The preparation of a lot layout plan that contains the following details:
  - 2.1 Road hierarchy.

0

- 2.2 Variety of lot sizes.
- 2.3 Provision of Open Space.
- 2.4 Provision of pedestrian and cycling tracks.
- 2.5 Drainage Reserves/easements.
- 3. The deferment of the preparation of a Traffic Management Assessment to balance stages, commencing stage 2.

(A road hierarchy plac will be furnished as part of the DPO Plan set).

- 4. The preparation of a Hydrology Report will be required to balance stages, commencing stage 2.
- 5. A Geotechnical Assessment will be furnished as part of the DPO Plan set.
- 6. An assessment of heritage values will be furnished as part of the DPO plan set.
- 7. The preparation of a Landscape Master Plan will be deferred to balance stages, commencing stage 2.

An Environmental Management Plan will be prepared with respect to management, maintenance and any works proposed within the gullies and buffers to ECGMA and responsible authority satisfaction. This is to include any relevant flora and fauna assessment which may arise.

- 8. The creation of buffer zones for waterways with agreed modifications, ownership arrangement and management as per above.
- 9. A staging Plan (in line with plan received on 2 December 2015).

Officers indicated that the landowner is considering an Amended Planning Permit Application to request a 26 lot subdivision to be completed in stages and with concurrent consideration of DPO request for approval.

3. East Gippsland Water requirements

A preliminary meeting with officers and EGW in respect to the staged planning permit has been undertaken on 9 December 2015.

EGW has requested the provision of further background documentation on Lakes Entrance Northern Growth Area. This information has been furnished.

EGW will consider a request as follows:

- 3.1 To facilitate an 'interim' septic tank approval for one dwelling on Lot 1.
- 3.2. To consider conditions and agreement requests for doing so at 3.1.
- 3.3. To contain the provision of reticulated sewer and water to the sub precinct to watershed the 'best' and 'optimal' location of sewer and water for determination of the southern boundary of proposed Lot 1 and Reserve alignments/ boundary dimensions.
- 3.4. To consider access requests and pathway construction in the longer term.

A formal request has been made by Officers.

### 4. Development Contribution Plan Overlay - Schedule 1 requirements

There is disagreement with respect to the calculation and methodology of calculations for the Development Contribution Plan Overlay (DCPO) levy liabilities relating to the subject application.

Officers undertook to seek formal advice of Urban Enterprises Pty Ltd as follows:

- 1. Calculations and levies applicable with respect to property 3.
- 2. The implications of Lot 1 containing one dwelling which does not accurately reflect the total net develops to bectare calculations.
- 3. The ability to deter balance development contributions to balance subdivision as part of the staged subdivision.
- 4. Potential drafts of the planning permit conditions confirming that Section 173 Legal Agreement is the correct planning mechanism.
- 5. Environmental Significance Overlay Schedule 53

Officers undertook to investigate the planning implications associated with the construction of a dwelling on Proposed Lot 1.

There is a need to understand the interplay between the Environmental Significance Overlay (ESO) Schedule requests and the Native Vegetation Precinct Plan at 52.16.

The question relates to whether a planning permit application is required to use and develop the land for the purposes of a dwelling or approval of a DPO Plan request.

The multiple actions and tasks as outlined are currently in progress and we will keep you informed of the progress.

I advise that I am on leave from Friday 18 December 2015, to return on Monday 11 January 2016.

During my absence there will be no further action taken with respect to this matter.

As always, please do not hesitate to contact me should you wish to discuss further on 51 539500.

Yours sincerely

Other & fynance

NICOLE REYNOLDS Strategic Planning Coordinator

## **APPENDIX 4: GEOTECHNICAL RISK ASSESSMENT**

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SIMON ANDERSON C O N S U L T A N T S Structural, Civil & Project Engineers P.O. Box 1700 P.O. Box 566 111 Main St Bairnsdale, Vic, 3875 ACN 073 392 266 NCN 073 392 266 ACN 145 437 065	Job: Proposed Dwelling 17 Blairs Rd Lakes Entrance Client: M & L Goff Checked:	Date: 21 May 2013           Designed: SJA           Job No.: 334947           Page No.: 1 of 13
at the second se	CAPABILITY ASSESS DOMESTIC WASTE	
* B2	* B1	

### **1.0 INTRODUCTION**

Simon Anderson Consultants were engaged to undertake a land capability assessment for the purpose of on-site domestic wastewater management of the Proposed Dwelling at 17 Blairs Rd, Lakes Entrance. The field investigation and report have been undertaken by suitable experienced staff.

17 Blairs Rd, Lakes Entrance

The assessment was completed in accordance with the Environment Protection Authority's Draft Code of Practice – Onsite Wastewater Management (EPA Publication No. 1364, Dec 2010), guidelines for Land Capability Assessment For On-Site Wastewater Management (EPA Publication No. 746.1, March 2003), On-Site Domestic Wastewater Management (AS/NZS 1547:2012) and East Gippsland and Wellington Shires Domestic Wastewater Management Plan.

Information and results are presented in table form for clear data presentation and ease of identification of key points. Detailed recommendations presented on page 7 of the report. LCA is to be read in conjunction with Site Features Plan 334947-LC1.

Subject Land	17 Blairs Rd, Lakes Entrance
Client	M & L Goff
Postal Address	PO Box 639, Lakes Entrance VIC 3909
Contact	Ph: (03) 5155 2144
Map Reference	Vicroads 686 G1
Municipality	East Gippsland Shire Council
Proposed Development	Assume a 3 Bedroom Residence (Potential Occupancy = No. of Bedrooms $+ 1$ ) <sup>1</sup>
Design Flow	120 L/person/day <sup>2</sup> (for On-site roof water tank supply)
Anticipated Wastewater Load	480 L/day
Treatment System Required	Secondary treated effluent to minimum 20/30 standard (ie. AWTS <sup>3</sup> or sand filter)
Disposal System Required Sub-surface irrigation – Area of 150m <sup>2</sup>	

<sup>&</sup>lt;sup>1</sup> As identified in Victorian EPA Draft Code of Practice – Onsite Wastewater Management (publication 1364, Dec 2010) Section 4.3.1

<sup>3</sup> AWTS – Aerated Wastewater Treatment System (EPA approved) 334947 LCA.docx

<sup>&</sup>lt;sup>2</sup> As identified in AS/NZS 1547:2012 – Onsite Domestic Wastewater Management (Appendix H, Table H1)

SIMON ANDERSON	Job: Proposed Dwelling 17 Blairs Rd	Date: 21 May 2013
CONSULTANTS Structural, Civil & Project Engineers	Lakes Entrance	Designed: SJA
P.O. Box 1700 P.O. Box 566 111 Main St 191-193 Raymond St	Client: M & L Goff	Job No.: 334947
Bairnsdale, Vic, 3875         Sale, Vic, 3850           ACN 073 392 266         ACN 145 437 065	Checked:	Page No.: 2 of 13

### 2.0 PURPOSE/SCOPE OF ASSESSMENT

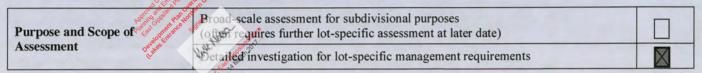




Figure 1: Locality Plan



Figure 2: Aerial view of subject site (approximate title boundaries shown)

334947 LCA.docx

SIMON ANDERSON Job: Proposed Dwelling 17 Blairs Rd	Date: 21 May 2013
CONSULTANTS Lakes Entrance	Designed: SJA
Structural, Civil & Project Engineers           P.O. Box 1700         P.O. Box 566           111 Main St         191-193 Raymond St	Job No.: 334947
Bairnsdale, Vic, 3875 Sale, Vic, 3850 ACN 073 392 266 ACN 145 437 065	Page No.: 3 of 13

## 3.0 SITE KEY FEATURES

•

Criteria / Feature	Description	Implications for Wastewater Management
Allotment/s	A CONTRACTOR A	
Title details	Lot 2, PS 446606, Council Property No: 88064	
No. of Lots Proposed	1 due to	
Lot size (EPA recommended minimum lot size = 1.0 ha)	5.57 ha	Large allotments, with ample capacity to locate dwelling and effluent fields in a number of sites within allotment boundaries and hence for effluent to be contained on-site.
Dwelling Usage	Likely to be permanent	
Adjoining Lot sizes	19 Blairs Rd – 0.5 ha 29 Blairs Rd – 1,800 m <sup>2</sup>	Overall volume of wastewater being disposed to land in the local district is low.
Current Land Use	Vacant	Current wastewater generation is negligible
Infrastructure		
Zoning & Overlays	Farming Zone – Schedule 3 (FZ3) Environ. Significance Overlay–Schedule 53 (ESO53) Erosion Management Overlay (EMO)	
Nearest Reticulated Sewer	Township of Lakes Entrance	Not feasible to currently connect to reticulated sewer. The area is likely to be sewered in the long term.
Reticulated Water	None available on existing allotment	On-site roof water collection – Occupants will rely solely on tank water for potable and non-potable supply
Power	Available on existing allotment	Allows ready use of wastewater treatment plant
Land Features		
Geology	Nl (Tm-p) – Marine, non-marine; gravel and sand deposits of the Tertiary derivation (from 1:250,000 Geological Map Series BAIRNSDALE)	Observed Soils dominated by Sandy Loam fill overlying natural coarse, sandy clays.
Elevation	Approx 40-50m AHD	
Landscape Elements	The site is situated mid slope (waxing congent) on a rolling low hill system, with a yellow duplex sedimentary landscape.	Contoured landscape providing good drainage, but may concentrate runoff; run-off is accelerated. Use of bunds required.
Fill	Some filling to a depth of 300mm was encountered over the proposed effluent disposal site.	Existing filling is to remain in the effluent management area.
Aspect	Area of investigation slopes to the South	Reduces both sun exposure and efficiency of effluent disposal fields
River/Stream Catchment	A number of Ephemeral watercourses run through the property and feed into the North Arm, approximately 650m west of the subject site.	Necessary setbacks can be achieved
Dams/Surface Water	Several small agricultural dams over both the subject site and adjoining allotments. Refer site features plan for locations.	Necessary setbacks are easily achieved
Rock Outcrop	None	Reduces limitations and maximises efficiency of effluent disposal fields
Erosion	No evidence of sheet or rill erosion.	The erosion hazard is low.
Vegetation	Predominantly grass/pasture. Some minor areas of Lowland Forest (EVC 16).	No vegetation clearing required for establishment of effluent disposal field or dwelling development
Climate	Temperate	Reduces variation in efficiency of effluent field
Solar Exposure	Low. Heavy shading from vegetation directly north of the proposed dwelling location.	Reduces efficiency of effluent disposal fields
Recommended Buffer Distances	All buffer distances recommended in Table 5 of EPA Publication 1364 (Dec 2010) while achievable, significantly limit siting of the LAA in this case	
Available Land Application Area (LAA)	Considering all site constraints and the buffers mentioned above, the site has adequate land that is suitable and available for land application of treated effluent. (Refer site features plan)	By using a system that provides secondary treatment and pressurized sub-surface irrigation, there will be adequate protection for surface and groundwater

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### 4.0 SOIL ASSESSMENT & CONSTRAINTS

The sites soils have been assessed for their suitability for onsite wastewater management by a combination of soil survey and desktop review of published soil survey information as outlined below.

### 4.1 Published Soils Information

Soils of the site have been mapped and described in Sustainable Soil Management "A reference manual to the major agricultural soils of the Bairnsdale and Dargo regions", and are described as belonging to the Stockdale, Sandy Profile (Sd,sp) map unit. This unit occurs on rolling low hills and is comprised of Tertiary sediments. The surface soils are sandy loam to loamy sand with a clear transition to the B1 horizon soils at a depth of 400 - 800mm. The B-horizon soils are sandy clay and cemented clay sands with ferruginous nodules or ironstone concretions, often occurring in the lower A2 (or B horizons).

### 4.2 Soil Survey and Analysis

A Soil survey was carried out at the site to determine suitability for application of treated effluent. Subsoil investigations were conducted at two locations in the vicinity of the proposed building, as shown on the Site Features Plan, using a hand auger (B1-2). This was sufficient to adequately characterise the soils, as only minor variation would be expected throughout the area of interest.

Samples of all discrete soil layers for test bore 1 were collected for subsequent laboratory analysis of pH<sup>4</sup>, electrical conductivity<sup>5</sup> and Emerson Aggregate Class<sup>6</sup>. The soil profile of bore 2 is detailed below.

Depth (m)	Description	Horizon	NORE 2
0.1 0.2 0.3	TOPSOIL: Brown, Moist, Loamy	FILL (F1)	
0.4 0.5 0.6	SILT: Orange/Brown, Moist, Dense, Sandy	B1	
0.7 0.8 0.9 1.0	CLAY: Orange/Brown, Moist, Stiff, Sandy Note: Bore 3 limiting horizon at 600mm depth		

<sup>&</sup>lt;sup>4</sup> The pH of 1:5 soil/water suspensions was measured using a Merck pH strip

 <sup>&</sup>lt;sup>5</sup> EC (dS m<sup>-1</sup>) was calculated by measuring the electrical conductivity of 1:5 soil water suspension.
 <sup>6</sup> Appendix C shows photographic results of Emerson Aggregate Test (Slaking/Dispersion)
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Soil Features: TEST PIT 1					
Soil Horizon	Fill Material	F2 – Fill Material	B1		
Depth (mm) Depth (mm)	Att Har Contract of the second	200 - 300	300 +		
Field Texture Grade <sup>7</sup>	S S	SL	CLS		
Structure	Single Grained	Weak	Moderate		
рН	6.0	6.0	5.0		
EC (dS m <sup>-1</sup> )	0.02	0.06	0.09		
Salinity Hazard	Non Saline	Non Saline	Non Saline		
Dominant Colour	Geyish Brown	Dark Brown	Yellowish Grey		
Mottles	ALCO-SALTA	NEW STREET			
Dispersion	2	5	1		
Coarse Fragments (% Volume)	< 10%	No. 19 - Alasa M	States - Pro		
Soil Category (AS/NZ1547:2012)	1	2	4		
Design Irrigation Rate <sup>8</sup> (DIR mm/day)	5	5	3.5		
Design Loading Rate <sup>9</sup> (DLR mm/day)	20	20	10		

NA: Not Applicable NR: Not Recommended F1 & F2: Denote fill layers

Depth (m)	Description	Horizon	A PARA LANG	BORE 1
0.1 0.2	FILL: Moist, Sand	F1	and the second	Carlo Sala
0.3	FILL: Moist, Sandy Loam	F2		See and the second
0.4	CLAY: Moist, Coarse Sandy	B1		
0.5			「「「「「「「「」」	A BARA
0.6				A CONTRACTOR
0.7				A AND AN
0.8				A HATTATA A
0.9			F LARA	A REAL
1.0				
1.1	An and a set			A Starting and
1.2			The second states and the	
1.5+				

Soil Bore Log Profile

 <sup>&</sup>lt;sup>7</sup> Refer Appendix D for description details
 <sup>8</sup> For drip irrigation (Refer Table M1 of AS/NZS 1547:2012)
 <sup>9</sup> For trenches and beds
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#### LAND CAPABILTY ASSESSMENT MATRIX 5.0

Land features	Land capability class rating						
State of the second	Very good	Good (2)	Fair (3)	Poor (4)	Very Poor (5)		
General characteristics	Hut some 20	A STATE STATE		San States	ALCONTRACT		
Site drainage	No visible signs of dampness	Moist soil, but no water in pit		Visible signs of dampness	Water ponding on surface		
Runoff	None	Low	Moderate	High - diversionary structures req'd	Very High - diversion not practical		
Flood/inundation potential (yearly return exceedence)	Ne	ver	< 1 in 100	< 1 in 30	> 1 in 20		
Proximity to watercourses	> 6	Om			< 60m		
Slope (%)	0 - 2	2 - 8	8 - 12	12 - 20	> 20		
Landslip	None I	Evident	Low potential for failure	High potential for failure	Present or past failure		
Seasonal water table depth (m) (incl. purched water tables)	>5	5 - 2.5	2.5 - 2.0	2.0 - 1.5	< 1.5		
Rock Outcrop (% of land surface containing rocks > 200mm)	0	< 10%	10-20%	20-50%	>50%		
Vegetation Type	Turf or pasture				Dense forest with little understorey		
Average Rainfall (mm/yr)	< 450	450 - 650	650 - 750	750 - 1000	> 1000		
Pan Evaporation (mm/yr)	> 1500	1250 - 1500	1000 - 1250		< 1000		
Fill	No Fill		Fill present				
Soil profile characteristics*				and the second sec			
Structure	High	Moderate	Weak	Massive	Single Grained		
Profile depth (of limiting Horizon B1)	> 2.0m	1.5m - 2.0m	1.5m - 1.0m	1.0m - 0.5m	≪0.5m		
Soil permeability category <sup>10</sup>	2 and 3	4		5	1 and 6		
Presence of mottling	None				Extensive		
Coarse Fragments (% volume)	<10	10-20	20-40		>40		
рН	6 - 8		4.5 - 6		<4.5, >8		
Emerson Aggregate Test (dispersion/slaking)	4, 6, 8	5	7	2, 3	1		
Salinity (dS/m) (Electrical Conductivity)	<0.3	0.3 - 0.8	0.8 - 2	2 - 4	>4		
Overall Site Rating <sup>11</sup>	and the states	production of the second second	Poor		4		

\* relevant to soils most restrictive layer(s)

 <sup>&</sup>lt;sup>10</sup> Refer Table 5.1 (Determination of Soil Category) of AS/NZS 1547:2012
 <sup>11</sup> A description of each Land Capability Class Rating is provided in Appendix A. 334947 LCA.docx

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### 6.0 CONCLUSION

This LCA has been prepared to accompany a development application to East Gippsland Shire Council for a Proposed Dwelling and associated necessary wastewater management system. Assuch, this report provides recommendations for treatment and land application systems that are appropriate to the land capability of the system of the land capability of the system.

The following section provides an overview of a suitable system, with sizing and design considerations. Detailed design for the system is beyond the scope of this study, but should be undertaken at the time of building application and submitted to Council.

### 7.0 RECOMMENDATIONS

It is recommended based on this LCA, that if the development of a Proposed Dwelling on 17 Blairs Rd, at the location indicated on the Site Features Plan 334947 - LC1:

- Install a system that provides secondary treatment with disinfection to meet EPA requirements for irrigation. Indicative target effluent quality is a minimum EPA standard 20mg/L BOD and 30mg/L SS. Several suitable options are available, including aerated wastewater treatment systems (AWTS) and single pass sand filters. Either of these options is capable of achieving the desired level of performance and final selection is the responsibility of the property owner, who will forward details to Council for approval.
- On-site disposal of domestic wastewater should occur within the proposed Land Application Area (refer Site Features Plan 334947 -LC1). The client is allowed flexibility in selecting the final location and configuration of the irrigation system, provided it remains within this envelope and in accordance with the relevant codes/standards.
- Subsurface irrigation will provide beneficial reuse of wastewater and this will be especially desirable given that the site is not serviced by town water. It will ensure the risk of effluent being transported off this site will be negligible.
- Calculation of Irrigation Area based on AS/NZ 1547 equation A=Q/DIR

	2 Bedrooms	3 Bedrooms	4 Bedrooms	5 Bedrooms
Q (L/day)	360	480	600	720
DIR (mm/day)	3.5	3.5	3.5	3.5
Irrigation Area (m <sup>2</sup> )	105	140	170	210
Water Balance (m <sup>2</sup> )	115	150	185	225
Notes Maximum wat	month on atomaga donth	of loss than 100mm (not	for Appondix B for full	dataile)

Note: Maximum wet weather storage depth of less than 100mm (refer Appendix B for full details)

- To determine if the irrigation areas recommended above are adequate, a water balance<sup>12</sup> modelling has been undertaken to achieve a maximum wet weather storage depth of less than 100mm. Refer Appendix B for full details and calculations
- Alternative effluent disposal systems, such as trenches and/or above ground irrigation, are not to be utilised without prior consultation and approval from Simon Anderson Consultants.
- Minimum setbacks and buffer distances must be obtained when establishing effluent disposal envelopes, as per EPA Code of Practice
   – Onsite Wastewater Management, publication 1364, (Dec 2010).
- The owner shall consult an irrigation expert familiar with wastewater irrigation equipment, to help design and install the irrigation system. The irrigation plan must ensure good, even application of effluent.

<sup>&</sup>lt;sup>12</sup> Water Balance undertaken in accordance with EPA Publication 168 (1991), Guidelines for Wastewater Irrigation. 334947 LCA.docx

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### 8.0 MANAGEMENT PROGRAM

### 8.1 Installation Issues

To ensure the satisfactory installation and operation of the AWTS and sub-surface irrigation, the following measures are to be implemented:

- Construction of a shaflow table of cut off drain along the high sides of the effluent disposal area, extending to below the effluent disposal field;
  - Overflow from all water storage tanks to be directed into a table drain, or equivalent, to discharge below the effluent disposal field in a
    manner to avoid scouring or washing away downstream of the discharge point;
  - Stormwater runoff from paved surfaces and driveways must be directed away from the disposal site.
- Installation of the sub-surface irrigation system to be undertaken when the soils are dry or moist, not when the ground is saturated;
- Sub-surface irrigation system to be designed to minimise root intrusion from trees;
- Sub-surface irrigation system to utilise pressure dosing to ensure effluent is applied uniformly throughout the effluent disposal area.

### 8.2 Ongoing Management & Maintenance Issues

To ensure the satisfactory ongoing performance of the proposed AWTS and sub-surface irrigation, the owners/occupiers will need to ensure that:

- No buildings or impermeable surfaces are constructed on or over the effluent disposal areas;
- Heavy equipment is kept away from effluent disposal areas whilst the soil is saturated;
- The primary effluent disposal field is maintained as a grassed area, or planted out with shrubs that tolerate wet conditions, have high evapo-transpiration capacity and can tolerate phosphorus levels typically found in treated effluent;
- Trees and/or thick shrubs <u>are not</u> to be planted out along the northern or western edges of the effluent disposal areas to prevent exposure to both wind and sun.

The installer of the AWTS and sub-surface irrigation is to ensure that the owners/occupants are aware of and fully understand their responsibilities in relation to operating the treatment system, maintenance requirements and what should be done in the event of any problems. The satisfactory ongoing performance and longevity of the AWTS and sub-surface irrigation can be enhanced by:

- Ensuring that maintenance requirements are undertaken regularly in accordance with the systems' requirements and that both they and future owners/occupiers are aware of the systems capabilities, limitations and ongoing requirements;
- Using biodegradable soaps, low phosphorous detergents and detergents that have low salt, sodium and chlorine levels;
- Limiting the use of germicides (such as strong detergents, disinfectants, toilet cleaners, whiteners and bleaches);
- Not flushing disposable nappies, sanitary napkins or other hygiene products into the systems;
- Not flushing chemicals, paint or similar substances into the systems.

**NOTE:** This report and associated plan(s) does not constitute a Septic Tank Permit. Such a permit should be obtained separately from the Environmental Health Department of East Gippsland Shire Council after development approval is obtained and prior to plumbing works commencing.

### APPENDIX A

Capability Class	Degree of Limitation	General Description
Rating 1	None to Very Slight	The proposed subdivision is suitable for on-site disposal of septic tank discharge. The limitations or environmental hazard from long-term use are considered very slight. Standard performance measures for design, installation and management should prove satisfactory.
Rating 2	Slight	The site has been identified as generally suitable for on-site effluent disposal but there is a slight associated environmental hazard expected. One or more land limitations are present, which may not be compatible with 'straight forward' conventional on-site disposal. The wastewater management program will require careful planning, adherence to specifications and adequate supervision.
Rating 3	Moderate	The site has only a fair capability for on-site effluent disposal with a moderate associated environmental risk always present. Very careful site selection, preparation and specialized design will be required to address the identified land constraints. A management program should be delivered to the responsible authority with the development application and prior to earthworks commencing. It is recommended that, in order to achieve BPEM, wastewater-processing systems which can attain a higher level of treatment with basic monitoring should be considered as an alternative to standard conventional trench disposal.
Rating 4	High	Areas have a poor capability rating with a high associated environmental risk. Considerable difficulties are expected during siting and installation of the wastewater treatment system and during routine operation. A very high Engineering input and close supervision would be needed to minimize the environmental impact. Alternative wastewater processing systems capable of consistently producing a high quality secondary effluent (such as aerated wastewater treatment plants) together with a close monitoring program should be seriously investigated and adopted.
Rating 5	Severe	Areas have a very poor capability and there is severe associated environmental risk. The areas are not generally considered suitable for disposal of septic tank effluent by trench systems. The high levels of Engineering input and management needed at all stages are unlikely to adequately address the identified land constraints and achieve a sustainable outcome. Reticulated sewerage is usually the only acceptable option.

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		veoprent part 198	edule 8 al	AF	PENDIX	B					
Lakes	s Entranc	e.08408	3~~~~			Evap.data		Orbost (	084030		
Mean Source:	AS1547-1994	- Table (3)	the spear 2017.	(Prepared by	R.A. Patterso		erage Pan e abs. Armida		April 2006)		
1 Month			0° / 4	3 Et		5 Retained	6 LTAR*N	7 Disposal	8 Effluent	9 Size of	
Month	Days			+Cf*Eo				rate/month	applied	area	
	month					Re=(1-r)P	3.5	(Et-Re)+	per month	the second se	
		mm	mm	mm	mm	mm	mm	LTAR*N mm	360 L	m2	
Les.			155.0	100	55.0	20.4	108.5	201.1	11160	55	
Jan Feb	31		155.0	132		39.1 29.1	108.5	178.4	10080		
Mar	31	3.5	108.5	92	54	37.8	108.5	162.9	11160	68	
Apr	30		72.0	43		44.0 45.9	105	104.2 92.3	10800		
May	30		49.0	22		40.8	108.5	83.3	10800		
Jul	31		40.3	24		38.4	108.5	94.3	11160		
Aug	31	2.0	62.0	37		35.2	108.5	110.5	11160		
Sep	30	and the second se	78.0	47		41.4	105	110.4	10800		
Oct	31	the second se	105.4	90		44.1	108.5	154.0	11160		
Nov	30		123.0	105	71	49.7	105	159.9	10800		
Dec	31		142.6	121		49.6	108.5	180.2	11160	62	
		Totals	1101.2	852		497.6	1.8.1		11160	62	
		Totals	1101.2	852	710.9	497.6	1.8.1		11160	11	
	<b>G2 - Dept</b>	Totals h of store	1101.2 ed effluen	852 t First tri	710.9 al - choose 6	497.6 e from co	I.9 table a	bove	10 reset if	62 11 equivalent	
TABLE	G2 - Dept	Totals h of store 3 application rate	1101.2 ed effluen 4 Disposal rate	852 t First tri 5	710.9 al - choose 6 Increase depth of	497.6 e from col 7 Starting depth	I.9 table a 8 increase depth	9 computed depth	10 reset if Et deficit	11 equivalent storage	
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TABLE	G2 - Dept	Totals h of store application rate (8)*/(2)	1101.2 ed effluen 4 Disposal rate per month (above)'	852 t First tri 5 (3)-(4)	710.9 al - choose 6 Increase depth of stored effluent	497.6 e from col 7 Starting depth	8 increase depth effluent	9 computed depth	10 reset if Et deficit	11 equivalent storage	
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Estimated area of effluent drainfield = 115 square metres Maximum depth of stored effluent = 60 mm depth

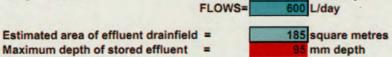
> Water Balance Model for 2 bedroom dwelling (prepared by R.A. Patterson, Lanfax Labs. Armidale April 2007)

ON AND	FRS	ON	Job: Prop	osed Dwel	ling				Date: 2'	1 May 2013
	Part Ren Cardona and		17 E	Blairs Rd					Deli	4. 0 14
NSUL ral, Civil & Pr				es Entrance	)		_		Designe	u: SJA
1700		Box 566	66 Job No.: 334947							
e, Vic, 3875 392 266		/ic, 3850	Checked:				-		Page No	o.: 10 of
	Developer	ent Plant 1981 Internet Scheme dute &	<sup>1</sup> 9)	APPEN	DIX B (c	cont'd)				
Lakes E Mean Source: AS	L. C. C.K.	N		Prepared by	R.A. Patterso		-	Orbost 0 avaporation ale updated		
1	Lat	Aug	Gipparch L 2	3	4	5	6	7	8	9
Month	Days	daily pan	Pan Eo	Et	Rainfall	Retained	LTAR*N	Disposal	Effluent	Size of
	per	Eo		+Cf*Eo	P	Rainfall		rate/month	applied	area
	month	(B.Met)				Re=(1-r)P	3.5	(Et-Re)+		(8)/(7)
					mm	mm	mm	LTAR*N mm	480	m2
		mm	mm	mm	trutt	1010	1111	Inth	-	
Jan	31	5.0	155.0	132	55.9	39.1	108.5	201.1	14880	74
Feb	28	4.6	128.8	109	41.5	29.1	98	178.4	13440	75
Mar	31	3.5	108.5	92	54	37.8	108.5	162.9	14880	91
Apr	30	2.4	72.0	43	62.8	44.0	105	104.2	14400	138
May	31	1.6	49.6	30	65.6	45.9 43.3	108.5	92.3 83.3	14880	161 173
Jun	30 31	1.2	36.0 40.3	22	61.9 54.9	38.4	108.5	94.3	14880	158
Jul Aug	31	2.0	62.0	37	50.3	35.2	108.5	110.5	14880	135
Sep	30	2.6	78.0	47	59.2	41.4	105	110.4	14400	130
Oct	31	3.4	105.4	90	63	44.1	108.5	154.0	14880	97
	30	4.1	123.0	105	71	49.7	105	159.9	14400	90
Nov	31	4.6	142.6	121	70.8	49.6	108.5	180.2	14880	83
Dec					710.9	497.6	the state		1	
TABLE G	2 - Depti	3	4	852 t First tria	6	7	8	9	10	11
Dec	2 first trial	3 application	4 Disposal	t First tria	6 Increase	7 Starting	8 increase	9 computed	reset if	equivalent
TABLE G	2 first trial area	3 application rate	4 Disposal rate	t First tria	6	7	8	9		
TABLE G	2 first trial	3 application rate	4 Disposal rate	t First tria	6 Increase depth of	7 Starting depth	8 increase depth	9 computed depth	reset if Et deficit	equivalent storage 10 x area
TABLE G	2 first trial area	3 application rate	4 Disposal rate per month	t First tria	6 Increase depth of stored	7 Starting depth effluent	8 increase depth	9 computed depth effluent	reset if Et deficit	equivalent storage
Dec TABLE G	2 first trial area	3 application rate (8)*/(2) (mm)	4 Disposal rate per month (above)' (mm)	5 (3)-(4) (mm)	6 Increase depth of stored effluent (5)/porosity	7 Starting depth effluent for month	8 increase depth effluent +(6)	9 computed depth effluent (X) (mm)	reset if Et deficit <0 (mm)	equivalent storage 10 x area (L)
Dec 1 month Dec Jan	2 first trial area	application rate (8)*/(2) (mm) 99	4 Disposal rate per month (above)' (mm) 201	t First tria	6 Increase depth of stored effluent (5)/porosity -340	7 Starting depth effluent for month	8 increase depth effluent +(6) -340	9 computed depth effluent (X) (mm) 00 -340	reset if Et deficit <0 (mm) 0	equivalent storage 10 x area (L) 0
Dec 1 month Dec Jan Feb	2 first trial area	3 application rate (8)*/(2) (mm) 99 90	4 Disposal rate per month (above)' (mm) 201 178	5 (3)-(4) (mm) -102 -89	6 Increase depth of stored effluent (5)/porosity -340 -296	7 Starting depth effluent for month 0 0	8 increase depth effluent +(6) -340 -296	9 computed depth effluent (X) (mm) -340 -296	reset if ( Et deficit <0 (mm) 0 0 0	equivalent storage 10 x area (L) 0 0
Dec 1 month Dec Jan Feb Mar	2 first trial area	3 application rate (8)*/(2) (mm) 99 90 99	4 Disposal rate per month (above)' (mm) 201 178 163	5 (3)-(4) (mm) -102 -89 -64	6 Increase depth of stored effluent (5)/porosity -340 -296 -212	7 Starting depth effluent for month 0 0 0	8 increase depth effluent +(6) -340 -296 -212	9 computed depth effluent (X) (mm) -340 -296 -212	reset if Et deficit <0 (mm) 0 0 0	equivalent storage 10 x area (L) 0 0 0
Dec 1 month Dec Jan Feb Mar Apr	2 first trial area	3 application rate (8)*/(2) (mm) 99 90 99 90	4 Disposal rate per month (above)' (mm) 201 178 163 104	5 (3)-(4) (mm) -102 -89	6 Increase depth of stored effluent (5)/porosity -340 -296 -212 -27	7 Starting depth effluent for month 0 0	8 increase depth effluent +(6) -340 -296	9 computed depth effluent (X) (mm) -340 -296 -212 -212 -27	reset if ( Et deficit <0 (mm) 0 0 0	equivalent storage 10 x area (L) 0 0
Dec 1 month Dec Jan Feb Mar	2 first trial area	3 application rate (8)*/(2) (mm) 99 90 99	4 Disposal rate per month (above)' (mm) 201 178 163	t First tria 5 (3)-(4) (mm) -102 -89 -64 -8	6 Increase depth of stored effluent (5)/porosity -340 -296 -212	7 Starting depth effluent for month 0 0 0 0	8 increase depth effluent +(6) -340 -296 -212 -27	9 computed depth effluent (X) (mm) -340 -296 -212	reset if Et deficit <0 (mm) 0 0 0 0 0 0	equivalent storage 10 x area (L) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Dec 1 month Dec Jan Feb Mar Apr May	2 first trial area	3           application           rate           (8)*/(2)           (mm)           99           90           99           96           99           99	4 Disposal rate per month (above)' (mm) 201 178 163 104 92	t First tria 5 (3)-(4) (mm) -102 -89 -64 -88 7 13 5	6 Increase depth of stored effluent (5)/porosity -340 -296 -212 -27 23 42 17	7 Starting depth effluent for month 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 5 5	8 increase depth effluent +(6) -340 -296 -212 -27 23 42 17	9 computed depth effluent (X) (mm) -340 -296 -212 -27 -23 65 82	reset if Et deficit <0 (mm) 0 0 0 0 0 0 23 65 82	equivalent storage 10 x area (L) 0 0 0 0 0 0 0 0 0 1029 2939 3681
Dec 1 month Dec Jan Feb Mar Apr May Jun Jun Jun Jun Aug	2 first trial area	h of store 3 application rate (8)*/(2) (mm) 99 90 99 96 99 96 99 96 99 96 99 96 99 99	4 Disposal rate per month (above)' (mm) 201 178 163 104 92 83 94 110	t First tria 5 (3)-(4) (mm) -102 -89 -64 -8 7 13 5 -11	6 Increase depth of stored effluent (5)/porosity -340 -296 -212 -27 23 42 17 -38	7 Starting depth effluent for month 0 0 0 0 0 0 0 0 0 0 23 65 82	8 increase depth effluent +(6) -340 -296 -212 -27 23 242 -27 23 42 17 -38	9 computed depth effluent (X) (mm) -340 -296 -212 -27 23 65 82 44	reset if Et deficit <0 (mm) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	equivalent storage 10 x area (L) 0 0 0 0 0 0 1029 2939 3681 1988
Dec 1 month Dec Jan Feb Mar Apr May Jun Jun Jul Aug Sep	2 first trial area	A of store 3 application rate (8)*/(2) (mm) 99 90 99 96 99 96 99 96 99 96 99 96 99 96 99 96	4 Disposal rate per month (above)' (mm) 201 178 163 104 92 83 94 110 110	t First tria 5 (3)-(4) (mm) -102 -89 -64 -8 7 13 5 -11 -14	6 Increase depth of stored effluent (5)/porosity -340 -296 -212 -27 23 42 -27 23 42 17 -38 -48	7 Starting depth effluent for month 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	8 increase depth effluent +(6) -340 -296 -212 -27 23 42 -27 23 42 -27 -38 42 -48	9 computed depth effluent (X) (mm) -340 -296 -212 -27 23 65 65 82 44 -4	reset if Et deficit <0 (mm) 0 0 0 0 0 0 0 0 0 0 0 0 0	equivalent storage 10 x area (L) 0 0 0 0 0 1029 2939 3681 1988 0
Dec 1 month Dec Jan Feb Mar Apr May Jun Jun Jun Jun Aug	2 first trial area	h of store 3 application rate (8)*/(2) (mm) 99 90 99 96 99 96 99 96 99 96 99 96 99 99	4 Disposal rate per month (above)' (mm) 201 178 163 104 92 83 94 110	t First tria 5 (3)-(4) (mm) -102 -89 -64 -8 7 13 5 -11	6 Increase depth of stored effluent (5)/porosity -340 -296 -212 -27 23 42 17 -38	7 Starting depth effluent for month 0 0 0 0 0 0 0 0 0 0 23 65 82	8 increase depth effluent +(6) -340 -296 -212 -27 23 242 -27 23 42 17 -38	9 computed depth effluent (X) (mm) -340 -296 -212 -27 23 65 82 44	reset if Et deficit <0 (mm) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	equivalent storage 10 x area (L) 0 0 0 0 0 0 1029 2939 3681 1988

Apr	96	104	-8	-27	0	-27	-27	0	0
May	99	92	7	23	0	23	23	23	1029
Jun	96	83	13	42	23	42	65	65	2939
Jul	99	94	5	17	65	17	82	82	3681
Aug	99	110	-11	-38	82	-38	44	44	1988
Sep	96	110	-14	-48	44	-48	-4	0	0
Oct	99	154	-55	-183	0	-183	-183	0	0
Nov	96	160	-64	-213	0	-213	-213	0	0
Dec	99	180	-81	-270	0	-270	-270	0	0
Jan	99	201	-102	-340	0	-340	-340	0	0
Feb	90	178	-89	-296	0	-296	-296	0	0
Mar	99	163	-64	-212	0	-212	-212	0	0
Apr	96	104	-8	-27	0	-27	-27	0	0
May	99	92	7	23	0	23	23	23	1029
From calculations in t	Porosity in	disposa		30%	ercentage				
Change as required		er Crop F inter Crop		0.6 cr			ate Oct-M ate -Apr-S		
Durange as requires		F	LOWS=	480 L/	day				
Estimated area					uare me				

Water Balance Model for 3 bedroom dwelling (prepared by R.A. Patterson, Lanfax Labs. Armidale April 2007)

ONSU			17 8	posed Dwe Blairs Rd es Entranc				-		21 May 2013 ned: SJA	
ructural, Civil & O. Box 1700 1 Main St		. Box 566	Client: M	& L Goff					Job No	o.: 334947	-
irnsdale, Vic, 3875 N 073 392 266	Sale,	Vic, 3850 5 437 065	Checked:						Page N	lo.: 11 of	1:
		onentplant 1981	due seal	APPEN	DIX B (	cont'd)					
Laka	s Entranc	Charlen of the start of	5				-	Orbost (	004020		-
Mear	AS1547-4894	- Table	Heldon stress Stress	(Prepared by	R.A. Patterso		erage Pan e	evaporation			
1	~		2	3		5	6	7	8	9	
Month	Days			Et		Retained	LTAR*N	Disposal	Effluent		
	month	Eo (B.Met)	the statement of the st	+Cf*Eo	P	Rainfall Re=(1-r)P	3.5	rate/month (Et-Re)+	applied per month	area (8)/(7)	
	month	(D.Met)		-		10-(1-1)-	3.0	LTAR*N	600	(0)(1)	
		mm	mm	mm	mm	mm	mm	mm	L	m2	
Jan	31	5.0	155.0	132	55.9	39.1	108.5	201.1	18600	92	
Feb	28			132		29.1	108.5	178.4	16800	94	
Mar	31		the second se	92	and the second division of the second divisio	37.8	108.5	162.9	18600	114	
Apr	30			43		44.0	105	104.2	18000	173	
May	31			30		45.9	108.5	92.3	18600	201	
Jun	30		36.0 40.3	22	a second s	43.3	105	83.3 94.3	18000	216	
Jul Aug	31		40.3	24	50.3	38.4	108.5	110.5	18600	168	
Sep	30		78.0	47				110.4	18000	163	
					38.2	41.4	105	110.4	10000	103	
Oct	31	and the second design of the s	the second se	90		41.4	105	154.0	18600	103	
Nov	30	3.4 4.1	105.4 123.0	90 105	63 71	44.1 49.7	108.5 105	154.0 159.9	18600 18000	121 113	
	the second se	3.4 4.1 4.6	105.4 123.0 142.6	90 105 121	63 71 70.8	44.1 49.7 49.6	108.5	154.0	18600	121	
Nov Dec	30 31	3.4 4.1 4.6 Totals	105.4 123.0 142.6 1101.2	90 105 121 <b>852</b>	63 71 70 8 <b>710.9</b>	44.1 49.7 49.6 <b>497.6</b>	108.5 105 108.5	154.0 159.9 180.2	18600 18000	121 113	
Nov Dec	30	3.4 4.1 4.6 Totals	105.4 123.0 142.6 1101.2	90 105 121 <b>852</b>	63 71 70 8 <b>710.9</b>	44.1 49.7 49.6 <b>497.6</b>	108.5 105 108.5	154.0 159.9 180.2	18600 18000	121 113	
Nov Dec	30 31	3.4 4.1 4.6 Totals	105.4 123.0 142.6 1101.2	90 105 121 <b>852</b>	63 71 70 8 <b>710.9</b>	44.1 49.7 49.6 <b>497.6</b>	108.5 105 108.5	154.0 159.9 180.2	18600 18000	121 113	
Nov Dec	30 31 E G2 - Dept	3.4 4.1 4.6 Totals h of store	105.4 123.0 142.6 1101.2 ed effluen	90 105 121 852 t First tri	63 71 70 8 710.9 al - choose	44.1 49.7 49.6 497.6 e from co	108.5 105 108.5 I.9 table a	154.0 159.9 180.2 above	18600 18000 18600 18600	121 113 103	
Nov Dec TABL	30 31 E G2 - Dept first trial area	3.4 4.1 4.6 Totals h of store 3 application rate	105.4 123.0 142.6 1101.2 ed effluen 4 Disposal rate	90 105 121 852 t First tri 5	63 71 70 8 710.9 al - choose 6 Increase depth of	44.1 49.7 49.6 497.6 e from co 7 Starting depth	108.5 105 108.5 108.5 I.9 table a 8 increase depth	154.0 159.9 180.2 above 9 computed depth	18600 18000 18600 18600 18600 18600 18600	121 113 103 11 equivalent storage	
Nov Dec TABL	30 31 E G2 - Dept 2 inth first trial	3.4 4.1 4.6 Totals h of store 3 application rate	105.4 123.0 142.6 1101.2 ed effluen 4 Disposal rate per month	90 105 121 852 t First tri 5	63 71 70 8 710.9 al - choose 6 Increase depth of stored	44.1 49.7 49.6 497.6 e from co 7 Starting depth effluent	108.5 105 108.5 I.9 table a 8 increase	154.0 159.9 180.2 above 9 computed depth effluent	18600 18000 18600 18600	121 113 103 11 equivalent	
Nov Dec TABL	30 31 E G2 - Dept first trial area	3.4 4.1 4.6 Totals h of store 3 application rate	105.4 123.0 142.6 1101.2 ed effluen 4 Disposal rate	90 105 121 852 t First tri 5	63 71 70 8 710.9 al - choose 6 Increase depth of	44.1 49.7 49.6 497.6 e from co 7 Starting depth	108.5 105 108.5 108.5 I.9 table a 8 increase depth	154.0 159.9 180.2 above 9 computed depth	18600 18000 18600 18600 18600 18600 18600	121 113 103 11 equivalent storage	
Nov Dec TABL	30 31 E G2 - Dept first trial area	3.4 4.1 4.6 Totals h of store 3 application rate (8)*/(2)	105.4 123.0 142.6 1101.2 ed effluen 4 Disposal rate per month (above)'	90 105 121 852 t First tri 5 (3)-(4)	63 71 70.8 710.9 al - choose 6 Increase depth of stored effluent	44.1 49.7 49.6 497.6 e from co 7 Starting depth effluent for	108.5 105 108.5 108.5 1.9 table a 8 increase depth effluent	154.0 159.9 180.2 above 9 computed depth effluent (X)	18600 18000 18600 18600 18600 18600 18600 18600 18600 18600 18600 18600 18600 18600	121 113 103 103 103 equivalent storage 10 x area	
TABL 1 Dec Jan	30 31 E G2 - Dept first trial area	3.4 4.1 4.6 Totals h of store 3 application rate (8)*/(2) (mm) 101	105.4 123.0 142.6 1101.2 ed effluen 4 Disposal rate per month (above)' (mm) 201	90 105 121 852 t First tri 5 (3)-(4) (mm) -101	63 71 70 8 710.9 al - choose 6 Increase depth of stored effluent (5)/porosity -335	44.1 49.7 49.6 497.6 e from co 7 Starting depth effluent for month 0	108.5 105 108.5 108.5 1.9 table a 8 increase depth effluent +(6) -335	154.0 159.9 180.2 above 9 computed depth effluent (X) (mm) 00 -335	18600 18000 18600 18600 reset if Et deficit <0 (mm)	121 113 103 103 103 103 103 103 103 10 x area (L) 0	
TABL 1 mo Dec Jan Feb	30 31 E G2 - Dept first trial area	3.4 4.1 4.6 Totals h of store 3 application rate (8)*/(2) (mm) 101 91	105.4 123.0 142.6 1101.2 ed effluen 4 Disposal rate per month (above)' (mm) 201 178	90 105 121 852 t First tri 5 (3)-(4) (mm) -101 -88	63 71 70 8 710.9 al - choose 6 Increase depth of stored effluent (5)/porosity -335 -292	44.1 49.7 49.6 497.6 e from co 7 Starting depth effluent for month 0 0	108.5 105 108.5 108.5 1.9 table a 8 increase depth effluent +(6) -335 -292	154.0 159.9 180.2 above 9 computed depth effluent (X) (mm) 0 0 -335 -292	18600 18000 18600 18600 reset if Et deficit <0 (mm) 0 0 0	121 113 103 103 103 103 103 103 103 10 x area (L) 0 0	
Nov Dec TABL	30 31 E G2 - Dept first trial area	3.4 4.1 4.6 Totals h of store 3 application rate (8)*/(2) (mm) 101 91	105.4 123.0 142.6 1101.2 ed effluen 4 Disposal rate per month (above)' (mm) 201 178 163	90 105 121 852 t First tri 5 (3)-(4) (mm) -101 -88 -62	63 71 70 8 710.9 al - choose 6 Increase depth of stored effluent (5)/porosity -335 -292 -208	44.1 49.7 49.6 497.6 e from co 7 Starting depth effluent for month 0 0	108.5 105 108.5 108.5 108.5 8 increase depth effluent +(6) -335 -292 -208	154.0 159.9 180.2 above 9 computed depth effluent (X) (mm) 0 335 -335 -292 -208	18600 18000 18600 18600 reset if Et deficit <0 (mm) 0 0 0 0	121 113 103 103 103 103 103 103 103 103 10	
Nov Dec TABL	30 31 E G2 - Dept first trial area	3.4 4.1 4.6 Totals h of store 3 application rate (8)*/(2) (mm) 101 91 101 97	105.4 123.0 142.6 1101.2 ed effluen 4 Disposal rate per month (above)' (mm) 201 178 163 104	90 105 121 852 t First tri 5 (3)-(4) (mm) -101 -88	63 71 70.8 710.9 al - choose 6 Increase depth of stored effluent (5)/porosity -335 -292 -208 -23	44.1 49.7 49.6 497.6 e from co 7 Starting depth effluent for month 0 0	108.5 105 108.5 108.5 1.9 table a increase depth effluent +(6) -335 -292 -208 -23	154.0 159.9 180.2 above 9 computed depth effluent (X) (mm) 0.0 -335 -292 -292 -208 -23	18600 18000 18600 18000 18600 18000 18000 18000 18000 18000 18000 18000 18000 18000 18000 18000 18000 18000 18000 18000 18000 18000 1000 18000 1000 18000 18000 18000 1000000	121 113 103 103 103 equivalent storage 10 x area (L) 0 0 0 0	
Nov Dec TABL	30 31 E G2 - Dept first trial area	3.4 4.1 4.6 Totals h of store 3 application rate (8)*/(2) (mm) 101 91	105.4 123.0 142.6 1101.2 ed effluen 4 Disposal rate per month (above)' (mm) 201 178 183 104 92	90 105 121 852 t First tri 5 (3)-(4) (mm) -101 -88 -62 -7	63 71 70.8 710.9 al - choose 6 Increase depth of stored effluent (5)/porosity -335 -292 -208 -208 -23 27	44.1 49.7 49.6 497.6 e from co 7 Starting depth effuent for month 0 0 0 0	108.5 105 108.5 108.5 108.5 8 increase depth effluent +(6) -335 -292 -208	154.0 159.9 180.2 above 9 computed depth effluent (X) (mm) 0 335 -335 -292 -208	18600 18000 18600 18600 reset if Et deficit <0 (mm) 0 0 0 0	121 113 103 103 103 103 103 103 103 103 10	
Nov Dec TABL 1 mo Dec Jan Feb Mar Apr May Jun Jul	30 31 E G2 - Dept first trial area	3.4 4.1 4.6 Totals h of store 3 application rate (8)*/(2) (mm) 101 91 101 97 101 97 101	105.4 123.0 142.6 1101.2 ed effluen 4 Disposal rate per month (above)' (mm) 201 178 163 104 92 83 94	90 105 121 <b>852</b> t First tri 5 (3)-(4) (mm) -101 -88 -62 -7 8 8 14 6	63 71 70.8 710.9 al - choose 6 Increase depth of stored effluent (5)/porosity -335 -292 -208 -238 -23 27 47 21	44.1 49.7 49.6 497.6 e from co 7 Starting depth effluent for month 0 0 0 0 0 0 0 7 7 74	108.5 105 108.5 108.5 108.5 8 increase depth effluent +(6) -335 -292 -208 -233 27 47 21	154.0 159.9 180.2 above 9 computed depth effluent (X) (mm) -335 -292 -208 -235 -292 -208 -23 -208 -23 -27 74 95	18600 18000 18600 18600 reset if Et deficit <0 (mm) 0 0 0 0 0 0 0 77 74 95	121 113 103 103 103 103 103 103 103 103 10	
Nov Dec TABL 1 mo Dec Jan Feb Mar Apr May Jul Jul Aug	30 31 E G2 - Dept 2 onth first trial area	3.4 4.1 4.6 Totals h of store 3 application rate (8)*/(2) (mm) 101 91 101 97 101 97 101 101	105.4 123.0 142.6 1101.2 ed effluen 4 Disposal rate per month (above)' (mm) 201 178 163 104 92 83 94 110	90 105 121 852 t First tri 5 (3)-(4) (mm) -101 -88 -62 -7 8 8 44 -62 -7 -7 8 14 -62 -7	63 71 70 8 710.9 al - choose 6 Increase depth of stored effluent (5)/porosity -335 -292 -208 -23 27 47 47 21 -33	44.1 49.7 49.6 497.6 e from co 7 Starting depth effluent for month 0 0 0 0 0 0 0 0 7 7 4 95	108.5 105 108.5 108.5 108.5 8 increase depth effluent +(6) -335 -292 -208 -23 -23 -27 47 27 47 21 -33	154.0 159.9 180.2 above 9 computed depth effluent (X) (mm) -335 -292 -208 -238 -232 -208 -237 74 95 62	18600 18000 18600 18600 reset if Et deficit <0 (mm) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	121 113 103 103 103 103 103 103 103 103 10	
Nov Dec TABL 1 mo Dec Jan Feb Mar Apr May Jul Jul Aug Sep	30 31 E G2 - Dept 2 onth first trial area	3.4 4.1 4.6 Totals h of store 3 application rate (8)*/(2) (mm) 101 91 101 97 101 101 97 101 101 97	105.4 123.0 142.6 1101.2 ed effluen 4 Disposal rate per month (above)' (mm) 201 178 163 104 92 83 94 110 110	90 105 121 852 t First tri 5 (3)-(4) (mm) -101 -88 -62 -7 8 -101 -88 -62 -7 -7 -8 -101 -101 -101 -101 -101 -105 -105 -105	63 71 70 8 710.9 al - choose 6 Increase depth of stored effluent (5)/porosity -335 -292 -208 -23 27 47 47 21 -33 -23 -23 -23 -23 -23 -23 -23 -23 -23	44.1 49.7 49.6 497.6 e from co 7 Starting depth effluent for month 0 0 0 0 0 0 0 0 0 7 7 4 95 62	108.5 105 108.5 108.5 108.5 108.5 108.5 108.5 4epth effluent +(6) -335 -292 -208 -23 27 47 21 -33 -44	154.0 159.9 180.2 above 9 computed depth effluent (X) (mm) 0.0 -335 -292 -208 -233 -292 -208 -23 -274 74 95 62 18	18600 18000 18600 18600 reset if Et deficit <0 (mm) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	121 113 103 103 103 103 103 103 103 103 10	
Nov Dec TABL 1 mo Dec Jan Feb Mar Apr May Jun Jun Jun Jun Sep Oct	30 31 E G2 - Dept 2 onth first trial area	3.4 4.1 4.6 Totals h of store application rate (8)*/(2) (mm) 101 91 101 97 101 97 101 101 97 101	105.4 123.0 142.6 1101.2 ed effluen 4 Disposal rate per month (above)' (mm) 201 178 163 104 92 83 94 110 110	90 105 121 852 t First tri 5 (3)-(4) (mm) -101 -88 -62 -7 8 14 6 6 2 -7 -8 8 -10 -13 -13 -53	63 71 70.8 710.9 al - choose 6 Increase depth of stored effluent (5)/porosity -335 -292 -208 -23 27 47 21 -33 -33 -44 -178	44.1 49.7 49.6 497.6 e from co 7 Starting depth effluent for month 0 0 0 0 0 0 0 0 0 7 7 4 74 95 62 18	108.5 105 108.5 108.5 1.9 table a increase depth effluent +(6) -335 -292 -208 -23 27 47 21 -33 -44 -178	154.0 159.9 180.2 above 9 computed depth effluent (X) (mm) 0 -335 -329 -208 -233 277 74 95 62 18 -180	18600 18000 18600 18600 18600 18600 10 reset if et deficit <0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	121 113 103 103 103 103 103 103 103 103 10	
Nov Dec TABL 1 mo Dec Jan Feb Mar Apr May Jul Jul Aug Sep	30 31 E G2 - Dept 2 onth first trial area	3.4 4.1 4.6 Totals h of store 3 application rate (8)*/(2) (mm) 101 91 101 97 101 101 97 101 101 97	105.4 123.0 142.6 1101.2 ed effluen 4 Disposal rate per month (above)' (mm) 201 178 163 104 92 83 94 110 110	90 105 121 852 t First tri 5 (3)-(4) (mm) -101 -88 -62 -7 8 -101 -88 -62 -7 -7 -8 -101 -101 -101 -101 -101 -105 -105 -105	63 71 70 8 710.9 al - choose 6 Increase depth of stored effluent (5)/porosity -335 -292 -208 -23 27 47 47 21 -33 -23 -23 -23 -23 -23 -23 -23 -23 -23	44.1 49.7 49.6 497.6 e from co 7 Starting depth effluent for month 0 0 0 0 0 0 0 0 0 7 7 4 95 62	108.5 105 108.5 108.5 108.5 108.5 108.5 108.5 4epth effluent +(6) -335 -292 -208 -23 27 47 21 -33 -44	154.0 159.9 180.2 above 9 computed depth effluent (X) (mm) 0.0 -335 -292 -208 -233 -292 -208 -23 -274 74 95 62 18	18600 18000 18600 18600 reset if Et deficit <0 (mm) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	121 113 103 103 103 103 103 103 103 103 10	
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Nov Dec TABL	30 31 E G2 - Dept inth first trial area (m2) 185	3.4 4.1 4.6 Totals h of store application rate (8)*/(2) (mm) 101 97 101 101 97 101 101 97 101 101 97 101 101 97 101 101 97 101 101 97 100 100 100 100 100 100 100 100 100 10	105.4 123.0 142.6 1101.2 ed effluen 4 Disposal rate per month (above)' (mm) 201 178 163 104 92 83 94 110 110 154 160 180 201 178 163 104 92 501 178 163 104 92 501 178 163 104 92 501 178 163 104 105 105 105 105 105 105 105 105	90 105 121 852 t First tri 5 (3)-(4) (mm) -101 -88 -62 -7 8 14 6 -10 -13 -53 -63 -80 -101 -88 -62 -7 8 -101 -88 -62 -7 8 -101 -88 -62 -7 8 -101 -88 -62 -7 8 -101 -88 -62 -7 8 -101 -88 -62 -7 8 -101 -88 -62 -7 8 -101 -88 -62 -7 8 -101 -88 -62 -7 8 -101 -88 -62 -7 8 -101 -88 -62 -7 8 -101 -103 -63 -63 -63 -63 -63 -63 -63 -6	63 71 70.8 710.9 al - choose 6 Increase depth of stored effluent (5)/porosity -335 -292 -208 -23 27 47 27 47 21 -33 -292 -208 -23 27 44 -33 -292 -208 -23 27 7 47 1 -33 -292 -208 -23 27 7 9 -205 -335 -292 -208 -23 -209 -285 -335 -292 -208 -208 -208 -208 -205 -208 -208 -208 -208 -208 -208 -208 -208	44.1 49.7 49.6 497.6 e from co 7 Starting depth effluent for month 0 0 0 0 0 0 0 0 0 0 0 0 0	108.5 105 108.5 10.5 10.5 10.5 10.5 10.5 10.5 10.5 10	154.0 159.9 180.2 above 9 computed depth effluent (X) (mm) 50 -335 -292 -208 -23 27 74 95 -202 -208 -23 -209 -205 -335 -335 -335 -322 -209 -209 -205 -335 -335 -335 -335 -292 -208 -209 -209 -209 -209 -209 -209 -209 -209	18600 18000 18600 18600 18600 18600 18600 0 0 0 0 0 0 0 0 0 0 0 0	121 113 103 103 103 103 103 103 103 103 10	



mm depth Water Balance Model for 4 bedroom dwelling

(prepared by R.A. Patterson, Lanfax Labs. Armidale April 2007)

Structural, Civil & Project Engineers	T S Lakes Entrance Designed: SJA	ructural, Civil & Project Engineers Client: M & L Goff			
P.O. Box 1700 P.O. Box 566 111 Main St 191-193 Raymond St Bairnsdale, Vic. 3875 Sale, Vic. 3850 Checked:	Sox 566         Cherked:         Job No.: 334947	P.O. Box 1700 P.O. Box 566 111 Main St 191-193 Raymond St Bairnsdale, Vic, 3875 Sale, Vic, 3850 Checked:			

1			1A 10 2	3	4	5	6	7	8	9
Month	Days	daily pan	Pan Eo	Et	Rainfall	Retained	LTAR*N	Disposal	Effluent	Size of
	per	Eo		+Cf*Eo	P	Rainfall		rate/month	applied	area
	month	(B.Met)				Re=(1-r)P	3.5	(Et-Re)+	per month	(8)/(7)
								LTAR*N	720	
March 1		mm	mm	mm	mm	mm	mm	mm	L	m2
			455.0	120	55.9	39.1	108.5	201,1	22320	111
Jan	31	5.0	155.0	132		29.1		178.4		113
Feb	28	4.6	128.8	109	41.5		98			
Mar	31	3.5	108.5	92	54	37.8	108.5	162.9	the second day is not the se	137
Apr	30	2.4	72.0	43	62.8	44.0	105	104.2	21600	207
May	31	1.6	49.6	30	65.6	45.9	108.5	92.3		242
Jun	30	1.2	36.0	22	61.9	43.3	105	83.3	21600	259
Jul	31	1.3	40.3	24	54.9	38.4	108.5	94.3	22320	237
Aug	31	2.0	62.0	37	50.3	35.2	108.5	110.5	22320	202
Sep	30	2.6	78.0	47	59.2	41.4	105	110.4	21600	196
Oct	31	3.4	105.4	90	63	44.1	108.5	154.0	22320	145
Nov	30	4.1	123.0	105	71	49.7	105	159.9		135
Dec	31	4.6	142.6	121	70.8	49.6	108.5	180.2	22320	124
		Totals	1101.2	852	710.9	497.6				

abiot theles

Mean

Source: AS1547-1994 -

710.9

average Pan evaporation

(Prepared by R.A. Patterson, Lanfax Labs. Armidale updated April 2006)

TABLE G2 - Depth of stored effluent First trial - choose from col.9 table above

1	2	3	4	5	6	7	8	9	10	11
month	first trial	application	Disposal	(3)-(4)	Increase	Starting	increase	computed	reset if	equivalen
	erea	rate	rate		depth of	depth	depth	depth	Et deficit	storage
	(m2)	(8)*/(2)	per month		stored	effluent	effluent	effluent	<0	10 x area
	-		(above)'		effluent	for		(X)		
		(mm)	(mm)	(mm)	(5)/porosity	month	+(6)	(mm)	(mm)	(L)
Dec								0.0	0	
Jan	225	99	201	-102	-340	0	-340	-340	0	(
Feb		90	178	-89	-296	0	-296	-296	0	(
Mar		99	163	-64	-212	0	-212	-212	0	
Apr		96	104	-8	-27	0	-27	-27	0	(
May	-	99	92	7	23	0	23	23	23	1544
Jun		96	83	13	42	23	42	65	65	4408
Jul		99	94	5	17	65	17	82	82	5522
Aug		99	110	-11	-38	82	-38	44	44	2981
Sep		96	110	-14	-48	44	-48	-4	0	(
Oct		99	154	-55	-183	0	-183	-183	0	(
Nov		96	160	-64	-213	0	-213	-213	0	(
Dec		99	180	-81	-270	0	-270	-270	0	(
Jan		99	201	-102	-340	0	-340	-340	0	(
Feb		90	178	-89	-296	0	-296	-296	0	
Mar		99	163	-64	-212	0	-212	-212	0	(
Apr		96	104	-8	-27	0	-27	-27	0	(
May		99	92	7	23	0	23	23	23	1544
Variables	Table	Porosity	in dispos	al area ff Coeff = Factor =	0.85	percenta crop tran crop tran L/m2/day	ge runof spiration spiration	f n rate Oct		

Estimated area of effluent drainfield = Maximum depth of stored effluent =

225 square metres mm depth

Water Balance Model for 5 bedroom dwelling (prepared by R.A. Patterson, Lanfax Labs. Armidale April 2007)

SIMON ANDERSON	Date: 21 May 2013	
ONSULTANTS Lakes Entrance		Designed: SJA
Structural, Civil & Project Engineers           P.O. Box 1700         P.O. Box 566           111 Main St         191-193 Raymond St	Client: M & L Goff	Job No.: 334947
Bairnsdale, Vic, 3875         Sale, Vic, 3850           ACN 073 392 266         ACN 145 437 065	Checked:	Page No.: 13 of 13

### APPENDIX C

	RECOR	RD OF FIEL	DTEXTUR	DETERM	INATION			TEST PIT TR	21
Soil	Grittiness	Stickiness	Plasticity	Stain	Ribbon (mm)	Grade	e		60
F1	Extremely	None	None	None	-	S	2	-	
F2	Extremely	Slight	Slight	Moderate	15	SL	F1	<b>F2</b>	BI
B1	Extremely	Slight	Slight	Very	50	CLS		****	

Emerson's Aggregate Testing & Ph Testing

NONE

SLIGHT MODI

elophoninent as schert

MODERATE VERY

EXTREMELY

Soil Category	Field	Texture Grade	Behaviour of moist blobs	Ribbon length (mm)	Approx clay content %
1	S	Sand	coherence nil to very slight, cannot be moulded; sand grains of medium size; single sand grains stick to fingers	nil	< 5%
	LS	Loamy sand	slight coherence; sand grains of medium size; can be sheared between thumb and forefinger to give minimal ribbon of about 5mm	about 5	about 5%
2	CS	Clayey sand	slight coherence; sand grains of medium size; sticky when wet; many sand grains stick to fingers; discolours fingers with clay stain	5 - 15	5% to 10%
	SL	Sandy loam	bolus coherent but very sandy to touch; will form ribbon; dominant sand grains of medium size and readily visible	15 - 25	10% to 20%
3	L	Loam	bolus coherent and rather spongy; smooth feel when manipulated but with no obvious sandiness or "silkiness"; may be somewhat greasy to touch if much organic material present	25	about 25%
	SCL	Sandy clay loam	strongly coherent bolus, sandy to touch; medium size sand grains visible in finer matrix	25 - 40	20% to 30%
4	CL	Clay loam	coherent plastic bolus, smooth to manipulate	40 - 50	30% to 35%
	CLS	Clay loam, sandy	coherent plastic bolus, medium sand grains visible in finer matrix	40 - 50	30% to 35%
	LC	Light clay	plastic bolus; smooth to touch; slight resistance to shearing between thumb and forefinger	50 - 75	35% to 40%
5	LMC	Light medium clay	plastic bolus; handles like plasticine and can be moulded into rods without fracture; has moderate resistance to ribboning shear	75	40% to 45%
c	MC	Medium clay	smooth plastic bolus; handles like plasticine and can be moulded into rods without fracture; has moderate resistance to ribboning shear	> 75	45% to 55%
6	HC	Heavy clay	smooth plastic bolus; handles like stiff plasticine; can be moulded into rods without fracture; has firm resistance to ribboning shear	> 75	50% +

Table E1 (Assessment of Soil Textures) pg 106 of AS/NZS 1547:2012

### APPENDIX D

SIMON ANDERSON CONSULTANTS	Job: Proposed Subdivision 17 Blairs Rd Lakes Entrance	Date: 6 Feb 2015 Designed: SJA
Structural, Civil & Project Engineers           P.O. Box 1700         P.O. Box 566           111 Main St         191-193 Raymond St	Client: Murray Goff	Job No.: 355460
Bairnsdale, Vic, 3875         Sale, Vic, 3850           ACN 073 392 266         ACN 145 437 065	Checked:	Page No.: 1 of 6
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### **INTRODUCTION**

This report is designed to demonstrate the level of geotechnical risk involved in relation to the proposed two (2) Lot residential subdivision at 17 Blairs Road, Lakes Entrance, during and after construction of associated works.

17 Blairs Rd, Lakes Entrance

### SITE DESCRIPTION

This large general residential zoned site (approximately 5.57 ha) on the south side of Blairs Road is currently vacant land. The subject site is situated on a rolling low hill landform, with a yellow duplex sedimentary landscape. The site has been predominantly cleared and displays excellent grass coverage throughout. Some areas of Lowland Forest (EVC 16) occur within the gullies of the Ephemeral Watercourses.

The majority of the sites surface water run-on is concentrated to the Ephemeral Watercourses at the south end of the property. The drainage lines then feed down into North Arm, approximately 650m west of the Subject Site. Drainage is considered good.

Currently the only vehicle access to the site is by gravel access track at the east end of the site. This will allow suitable access to proposed Lot 1.

Adjoining properties to the subject site (No.19 & No.29 Blairs Rd) have been fully developed, with landscaped gardens and manicured lawns. The sites show no sign of soil erosion or landslip.

### **PROJECT DETAILS**

A Two (2) Lot residential subdivision is proposed for the site. Proposed construction details will be as follows;

- Blocks to be sized Lot 1 1.19ha, Lot 2 4.38ha.
- Stable vehicle access point to be provided off Blairs Road for Lot 2.
- Existing drainage patterns to remain (during subdivision stage of development)

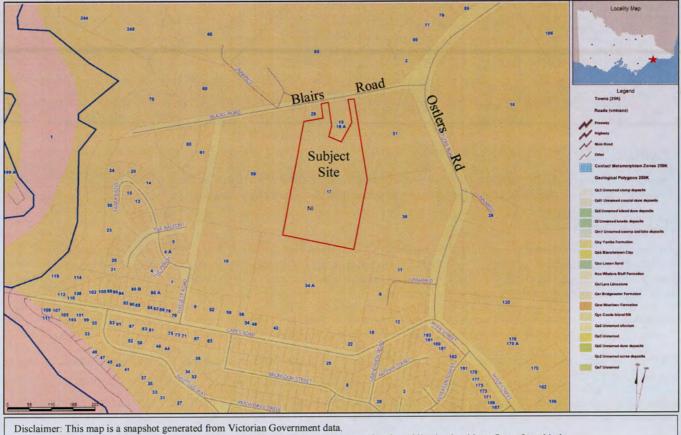
CONSULTANTS	Job: Proposed Subdivision 17 Blairs Rd Lakes Entrance	Date: 6 Feb 2015 Designed: SJA
Structural, Civil & Project Engineers           P.O. Box 1700         P.O. Box 566           111 Main St         191-193 Raymond St	Client: Murray Goff	Job No.: 355460
Bairnsdale, Vic, 3875         Sale, Vic, 3850           ACN 073 392 266         ACN 145 437 065	Checked:	Page No.: 2 of 6

### METHODOLOGY

#### 1.DESKTOP INVESTIGATION

A desktop investigation of the subject site was carried out using DSE and GeoVIC mapping of published soil survey information and noted watercourse locations.

Soils of the site have been mapped and described in Sustainable Soil Management "A reference manual to the major agricultural soils of the Bairnsdale and Dargo regions", and are described as belonging to the Stockdale (Sd) map unit with Munro (Mu). This unit occurs on rolling low hills and is comprised of Tertiary sediments and sands. Most of the land has been cleared of native vegetation and used for grazing. The surface soils are mostly fine textured soils, with a sandy loam to fine sandy loam sharply separated from a medium clay subsoil occurring at around 20-40cm, although some subsoils are clayey sands and sandy clays. Some of the more sandier surface soils have developed a "coffee rock" layer at the base of the A2 horizon.



This material may be of assistance to you but the State of Victoria does not guarantee that the publication is without flaw of any kind

### REF: VANDENBERG, A.H.M., 1997. BAIRNSDALE SJ 55-7 Edition 2, 1:250 000 Geological Map

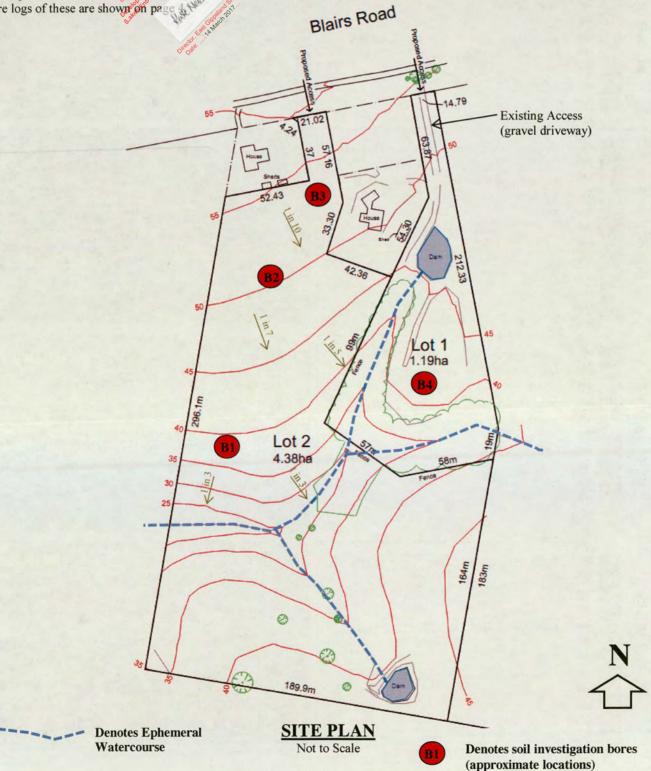
### (Series 1:250,000 geological maps. Geological Survey of Victoria.)

Geological Unit	Geological Description	Mapping Unit
NI (Tmp)	Tertiary Marine, Non-marine deposits consisting of gravel, sand.	Stockdale with Munro (Sd/Mu)

SIMON ANDERSON	Job: Proposed Subdivision 17 Blairs Rd	Date: 6 Feb 2015
CONSULTANTS	Lakes Entrance	Designed: SJA
Structural, Civil & Project Engineers           P.O. Box 1700         P.O. Box 566           111 Main St         191-193 Raymond St	Client: Murray Goff	Job No.: 355460
Bairnsdale, Vic, 3875         Sale, Vic, 3850           ACN 073 392 266         ACN 145 437 065	Checked:	Page No.: 3 of 6

### 2. FIELD INVESTIGATION

A site visit was carried out with an inspection of the area of Proposed Subdivision and of nearby landforms, features and developments. A series of soil investigation bores were taken throughout the site (B1-B4) as shown on the site plan below. The bore logs of these are shown on page 4. Proposed and provide the set of the set o



355460 GRA (Goff)

SIMON ANDERSON C O N S U L T A N T S Structural, Civil & Project Engineers P.O. Box 1700 P.O. Box 566 111 Main St Bairnsdale, Vic, 3875 ACN 073 392 266 ACN 145 437 065			17 B	osed Subdivisio lairs Rd s Entrance rray Goff	Designed: \$	Date:         6 Feb 2015           Designed:         SJA           Job No.:         355460           Page No.:         4 of 6		
BORE LOG B1	00 100 200 300 400 500 600 700 800 900 1000 1200	Dark Grey, Moist, Sand Grey Moist, Dense paler with depth Yellow-Brown, Moist, S veins of grey sand throu	alfor and and	TOPSOIL SAND CLAY			BORE 1	
BORE LOG B2	00 100 200 300 400 500 600 700 800 900 1000 1200	Dark Grey-Brown, Sand Lt Grey/Brown, Moist, I Yellow/Brown, Moist, S Gravely	Dense, Sandy	TOPSOIL SILT CLAY			BORE 2	
BORE LOG B3	00 100 200 300 400 500 600 700 800 900 1000 1200	Grey-Brown, Dry, Dens Lt Grey-Brown, Moist, I Gravely Yellow-Brown, Moist, S Gravely	Dense, Sandy	TOPSOIL SILT CLAY			BORE 3	
BORE LOG B4	00 100 200 300 400 500 600 700 800 900 1000 1200	Dark Grey-Brown, Mois Orange/Brown, Moist, E Yellow-Brown, Moist, S	Dense, Sandy	TOPSOIL SILT CLAY			BORE 4	

355460 GRA (Goff)

SIMON ANDERSON	Date: 6 Feb 2015			
CONSULTANTS	17 Blairs Rd Lakes Entrance	Designed: SJA		
Structural, Civil & Project Engineers           P.O. Box 1700         P.O. Box 566           111 Main St         191-193 Raymond St	Client: Murray Goff	Job No.: 355460		
Bairnsdale, Vic, 3875         Sale, Vic, 3850           ACN 073 392 266         ACN 145 437 065	Checked:	Page No.: 5 of 6		
SUMMARY OF RISK	use head	and the second second		

LANDSLIDE SHEET/RILL EROSION LOW LOW LOW

- Moderate grades over the majority of the allotment, ranging from approximately 1 in 5 to 1 in 10.
- Excellent grass coverage, preventing topsoils from being washed away (even in the heaviest torrential downpours).
- The well contoured landscape (Waxing Divergent) provides excellent surface water drainage and spreads run-off.
- Natural soils of the site (Dense Sandy Silts, overlying Stiff Sandy Clays) will have adequate strength and stability for residential slabs, footings and retaining walls.
- There is no evidence of soil erosion or landslip on the subject site or adjoining properties and I would consider the
  geotechnical risks to be low.
- Any future building envelope should be located outside of ground sloped at 1 in 4 or greater (i.e. areas of Ephemeral Watercourses/shallow drainage lines).
- Dependent on location of future dwellings, an Erosion Management Plan may need to be implemented during and after construction if slab on ground design with cut/fill batters and retaining walls were adopted.
- Any construction works associated with the future dwellings would be protected by Building Code of Australia, Australian Standards, Building and Planning Permit requirements, and normal construction practice.

Based on findings from both the Desktop and Site investigations the site is suitable for development as proposed and further intensive investigation would not be necessary to confirm the above findings.

### VERIFICATION

I, the author of this document, declare that I am suitably qualified and experienced to carry out this site assessment.



Simon Anderson BE (Civil)CPEng MIEAust No 930355 BCC Registration No EC-1711 Date 6 Feb 2015

## APPENDIX 5: EG CMA LETTER DATED 14 APRIL 2014

Toren of the the constant

EAST GIPPSLAND	
CATCHMENT	
MANAGEMENT	
AUTHORITY	



574 Main Street (PO Box 1012) Bairnsdale Vic 3875 PHONE: (03) 5152 0600 FAX: (03) 5150 3555 EMAIL: <u>egcma@egcma.com.au</u> ABN 72 411 984 201

CMA Application No: EG-F-2014-0069 Document No: 1 Date: 14 April 2014

Murray Goff PO Box 639 Lakes Entrance, Victoria 390

Dear Murray, Application Number (CMA Ref): EG-F-2014-0069 Location Street: Blairs Road, Lakes Entrance, Victoria 3909 Cadastral: Lot 2, PS446606, Parish of Colquhoun Regarding: Variation of waterway buffers for proposed subdivision as part of Lakes Entrance Northern Growth Area

Thank you for your submission relating to the variation of waterway buffers for the proposed subdivision of the land as part of the Lakes Entrance Northern Growth Area. This information was received at the East Gippsland Catchment Management Authority ('the Authority') on 9 April 2014.

The Authority has reviewed the information submitted in relation to the designated waterways within the property and in the context of your site meeting with Adam Dunn on 2 April 2014.

In light of this, the Authority advises that the proposal to vary the waterway buffers as per the plan submitted (annotated as 'Figure 1', attached) is satisfactory.

Should you have any queries, please do not hesitate to contact me on 1300 094 262. To assist the Authority in handling any enquiries please quote **EG-F-2014-0069** in your correspondence with us.

Yours sincerely,

Adam Dunn Gippsland Floodplain Officer

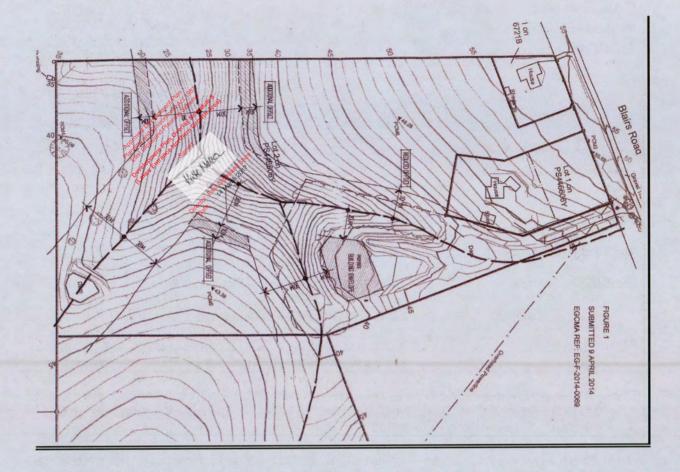
The information contained in this correspondence is subject to the disclaimers and definitions attached.

EG-F-2014-0069-01.docx

Pg 1 of 3

ABN 88 062 514 481 Correspondence PO Box 1374, Traralgon VIC 3844

Telephone 1300 094 262 • Facsimile (03) 5175 7899 • Email westgippy@wgcma.vic.gov.au • Website www.wgcma.vic.gov.au Traralgon Office 16 Hotham Street, Traralgon VIC 3844 • Leongatha Office Corner Young & Bair Streets, Leongatha VIC 3953



NOTE: Plan updated at site Meeting 21.03.2016. See Appendix 6.

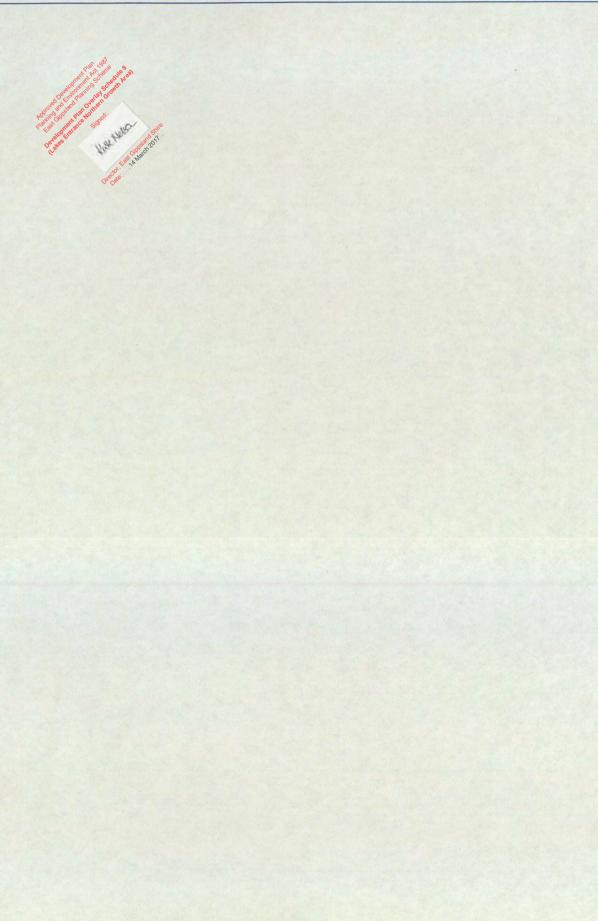
#### **Definitions and Disclaimers**

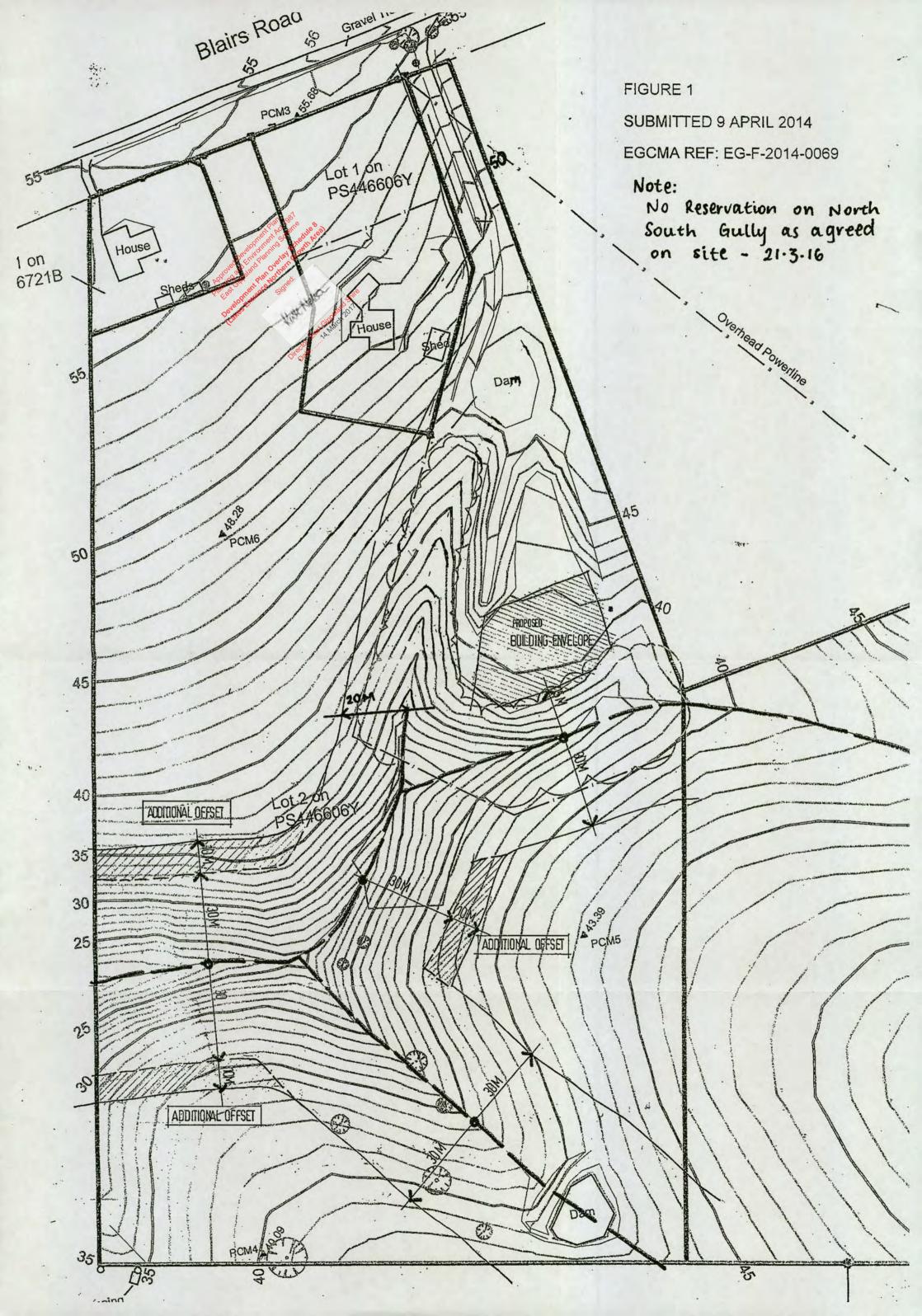
- The area referred to in this letter as the 'proposed development location' is the land parcel(s) that, according to the Authority's assessment, most closely represent(s) the location identified by the applicant. The identification of the 'proposed develop ment location' on the Authority's GIS has been done in good faith and in accordance with the information given to the Authority by the applicant(s) and/or the local government authority.
- While every endeavour has been made by the Authority to identify the proposed development location on its GIS using VicMap Parcel and Address data, the Authority accepts no responsibility for or makes no warranty with regard to the accuracy or naming of this proposed development location according to its official land title description.
- 3. AEP as Annual Exceedance Probability is the likelihood of occurrence of a flood of given size or larger occurring in any one year. AEP is expressed as a percentage (%) risk and may be expressed as the reciprocal of ARI (Average Recurrence Interval).

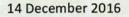
Please note that the 1% probability flood is not the probable maximum flood (PMF). There is always a possibility that a flood larger in height and extent than the 1% probability flood may occur in the future.

- 4. AHD as Australian Height Datum is the adopted national height datum that generally relates to height above mean sea level. Elevation is in metres.
- 5. ARI as Average Recurrence Interval is the likelihood of occurrence, expressed in terms of the long-term average number of years, between flood events as large as or larger than the design flood event. For example, floods with a discharge as large as or larger than the 100 year ARI flood will occur on average once every 100 years.
- 6. No warranty is made as to the accuracy or liability of any studies, estimates, calculations, opinions, conclusions, recommendations (which may change without notice) or other information contained in this letter and, to the maximum extent permitted by law, the Authority disclaims all liability and responsibility for any direct or indirect loss or damage which may be suffered by any recipient or other person through relying on anything contained in or omitted from this letter.
- 7. This letter has been prepared for the sole use by the party to whom it is addressed and no responsibility is accepted by the Authority with regard to any third party use of the whole or of any part of its contents. Neither the whole nor any part of this letter or any reference thereto may be included in any document, circular or statement without the Authority's written approval of the form and context in which it would appear.
- 8. The flood information provided represents the best estimates based on currently available information. This information is subject to change as new information becomes available and as further studies are carried out.

## **APPENDIX 6: EGCMA PLAN FOR REMOVAL OF NORTH SOUTH GULLY**







East Gippsland Shire Council 273 Main Street Bairnsdale VIC 3875

**ATTN: Nicole Reynolds** West tops

> Erist, RECORDS 1 5 DEC 2016

Dear Nicole,

**RE: DEVELOPMENT PLAN, 17 BLAIRS ROAD LAKES ENTRANCE** 

BEACON TOWN PLANNING

**Beacon Town Planning Pty Ltd** ABN 68168162178

> jennie@beacontp.com.au www.beacontp.com.au M: 0409 412 141

> > 15 Nott St Port Melbourne **VIC 3207**

Following the recent approval of the Development Plan (Tuesday 13th December 2016) at 17 Blairs Road in Lakes Entrance, as discussed we apply on behalf of the landowners, Murray and Lyn Goff, to amend the Development Plan 17 Blairs Road Lakes Entrance, which forms part of the Lakes Entrance Northern Growth Area Outline Development Plan, to restructure the staging and provision of reserve areas.

We apply to amend the Development Plan for 17 Blairs Road Lakes Entrance as follows: (Original Approved DP.5 plan + Amended DP.5A to detail the proposed amendment attached at Appendix 1 & 2 respectively):

- Remove Reserve from Stage 1 •
- Re-locate Stage 1 Reserve into Stage 3 Reserve
- No Reserve located within Stage 1



**BEACON TOWN PLANNING** jennie@beacontp.com.au | www.beacontp.com.au | M: 0409 412 141 15 Nott St., Port Melbourne VIC 3207

The rationale to this alteration in staging is as follows:

- Stage 1 can be subdivided without the issues attached to the reserve, transfer, lease back or maintenance
- This reserve stagin reallocation has no impact on lot size, bike path or utility service provision
- Restaging the reserve provision simplifies Stage 1 subdivision component and dwelling construction
- Enables efficienct title registration process

Please do not hesitate to contact me, Jennie Jones, should you have any further enquiries.

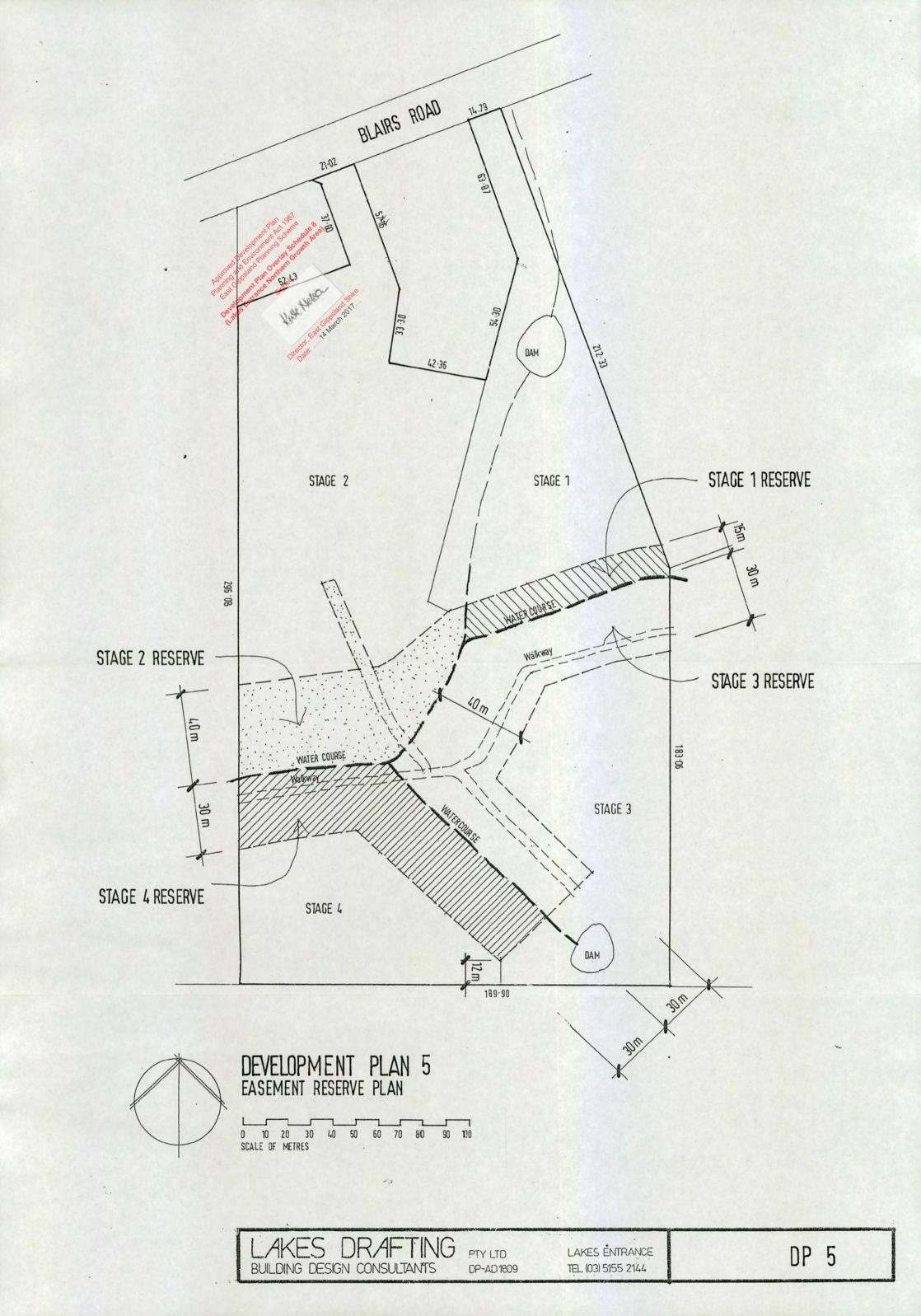
Kind Regards,

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Jennie Jones Beacon Town Planning Pty Ltd

## Appendix 1: Original Approved DP.5

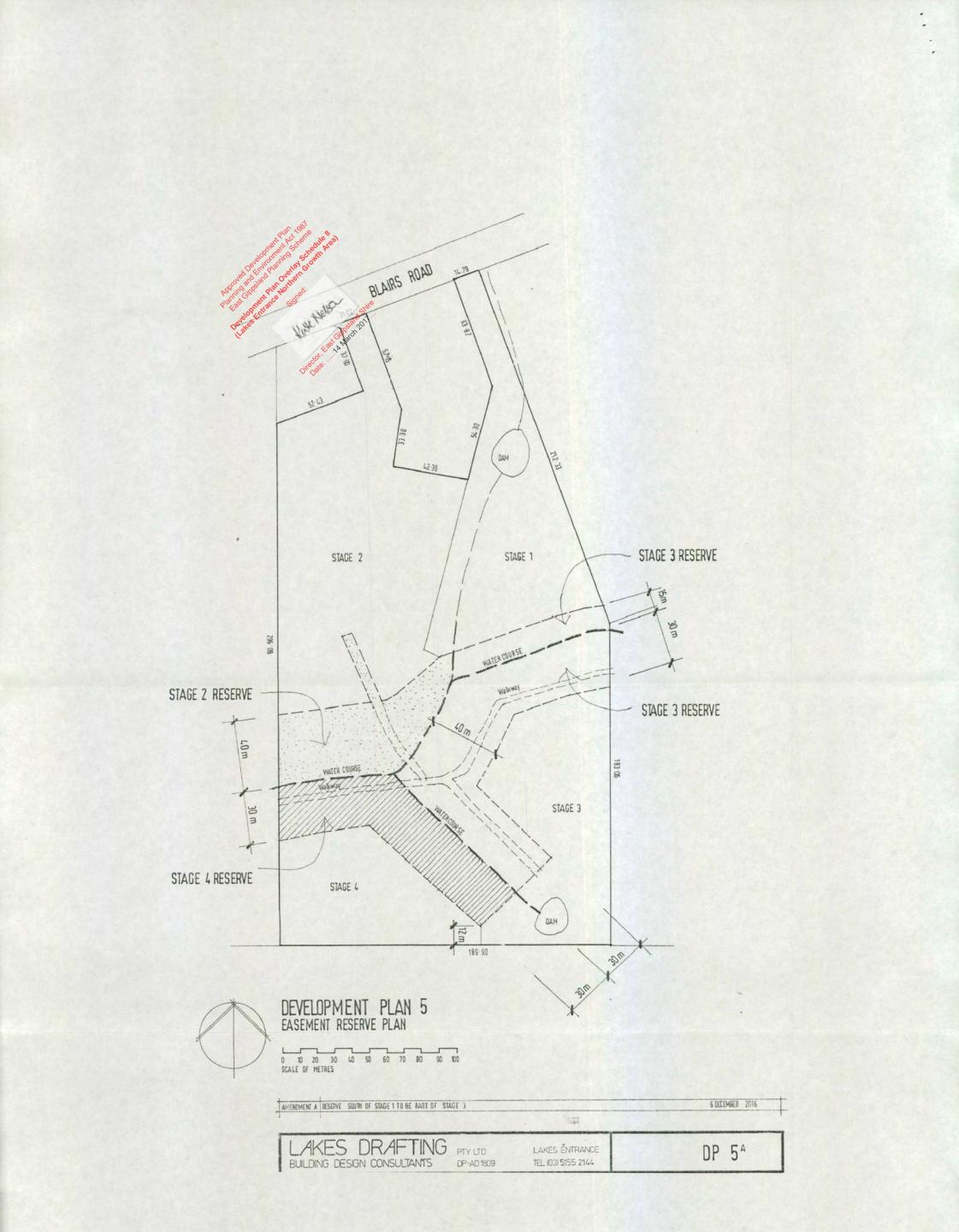


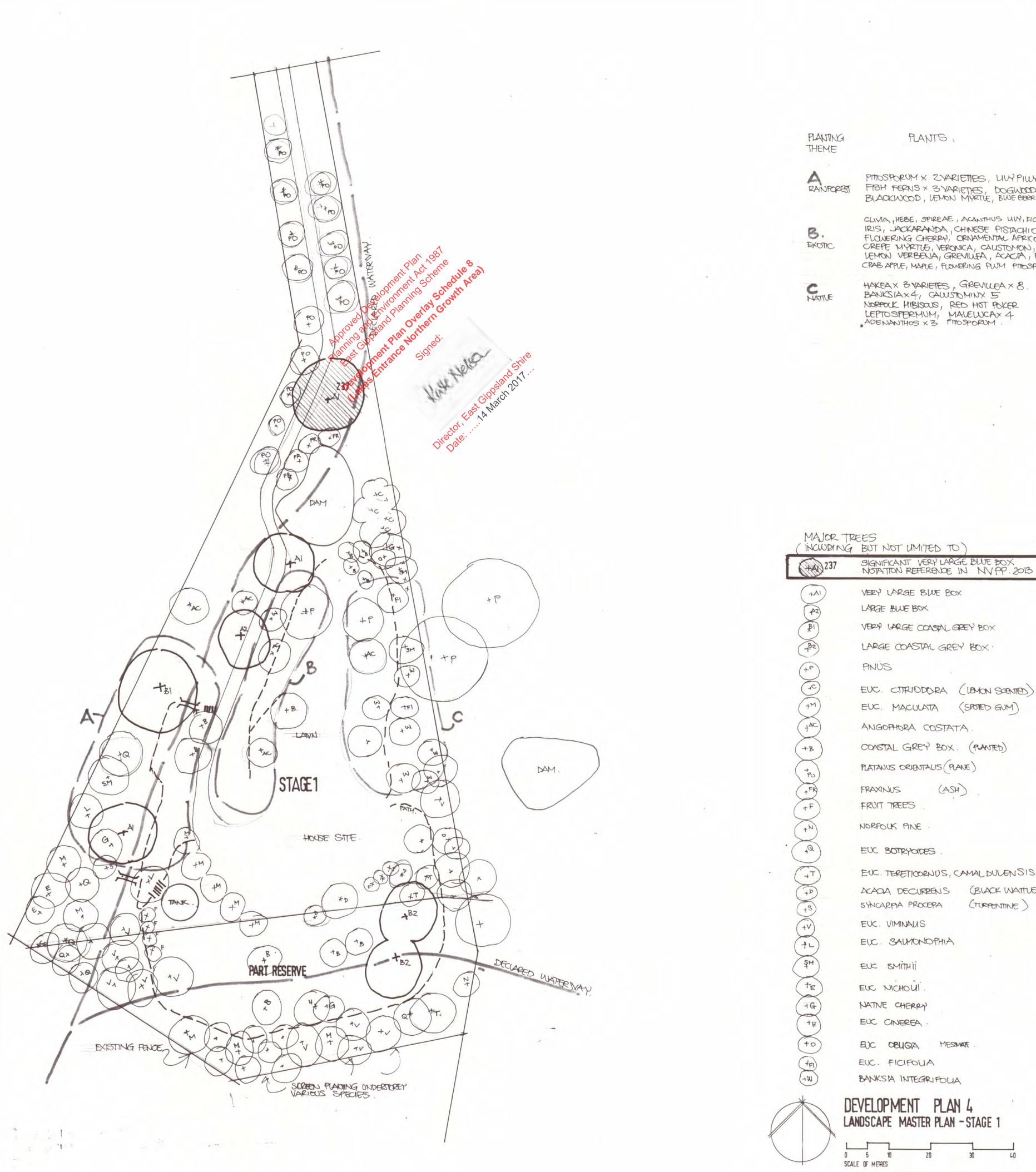


## Appendix 2: Proposed Amended DP.5A



BEACON TOWN PLANNING jennie@beacontp.com.au | M: 0409 412 141 15 Nott St., Port Melbourne VIC 3207





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## PLANTS :

A PHILOSPORUM X CHARICIES, DOGWOOD RAINFOREST FIBH FERNS X 3 VARIETIES, DOGWOOD BLACKWOOD, LEMON MYRTLE, BWE BERRY ASH.

CLIVIA, HEBE, SPIREAE, ACANTHUS UN, HOUS DNARFV. IRIS, JACKARANDA, CHINESE PISTACHIO, FLOWERING CHERPY, ORNAMENTAL APPICOT, CREPE MYRTUE, VERONICA, CAUSTOMON, LEMON VERBENA, GREVILLEA, ACACIA, BOX CRAB APPLE, MAPLE, FLOWERING PWM PMOSPORUM

HAKEAX 3 VARIETES, GREVILLEA × 8. BANKSIAX4, GAWSTOMINX 5 NORPOLK HIBISOUS, RED HOT POKER LEPTOSPERMUM, MALEWCAX 4 ADENANTHOS X3 PHOSPORUM

VERY LARGE BLUE BOX LARGE BWE BOX VBRY LARGE COASTAL GREY BOX LARGE COASTAL GREY BOX. PNUS EUC. CTTRIODORA (LEMON SORVIED) EUC. MACULATA (SPOTED GUM) ANGOPHORA COSTATA. COASTAL GREY BOX. (PLANTED) PLATANUS ORIBUTALIS (PLANE) FRAXINUS (ASH) FRUIT TREES NORFOLK PINE EUC BOTRYODES . EUC. TERETICORNUS, CAMAL DULENSIS (RED GUM) AKACIA DECURRENS (BLACK WATTLE). SYNCARPIA PROCERA (TURPENTINE) EUC. VIMINAUS EUC. SALMONOPHIA EUC SMITHI EUC NICHOUI. NATIVE CHERRY EUC CINEREA. EUC OBLIGIA MESMARE EUC. FICIFOUA BANKSIA INTEGRIFOLIA DEVELOPMENT PLAN 4

0 5 10 SCALE OF METRES	20	30	40					
LAKES BUILDING DES	DRA IGN CONSU		PTY LTD DP-AD 1809	KES ENTRA . (03) 5155 21		D	P4	