PP31/2019-1

5 Tullamore Court ELLIMINYT

Lot: 21 PS: 322547 V/F: 10316/369

Three (3) Lot Subdivision of Land

Rod Bright & Associates Pty Ltd

Officer - Vikram Kumar

EXHIBITION FILE

This document is made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any Copyright.

Submissions to this planning application will be accepted until a decision is made on the application.

If you would like to make a submission relating to a planning permit application, you must do so in writing to the Planning Department

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Application for Planning Permit for a Subdivision

Supplied by	Brett Quickensted
Submitted Date	20/02/2019

Application Details

Application Type	Planning Permit for a Subdivision
	Version 1
Applicant Reference Number	18-51
Application name or Estate name	Harris
Responsible Authority Name	Colac Otway Shire
Responsible Authority Reference Number(s)	(Not Supplied)
SPEAR Reference Number	S136806A
Application Status	Lodged with Responsible Authority
Planning Permit Issue Date	NA
Planning Permit Expiry Date	NA

The Land

Primary Parcel

5 TULLAMORE COURT, ELLIMINYT VIC 3250
Lot 21/Plan PS322547
Volume 10316/Folio 369
SPI 21\PS322547
CPN 22110

Zone:	32.03 Low Density Residential
Overlay:	44.01 Erosion Management
	42.03 Significant Landscape
	42.02 Vegetation Protection

The Proposal

Plan Number	(Not Supplied)
Number of lots	3
Proposal Description	Three (3) Lot Subdivision
Estimated cost of the development for which a permit is required $	0

Existing Conditions

Existing Conditions Description	Existing dwelling, associated shedding and cleared grazing land.
Title Information - Does the proposal breach an encumbrance on Title?	The proposal does not breach an encumbrance on title, such as a restrictive covenant, section 173 agreement or other obligation such as an easement or building envelope.

Applicant Contact

Applicant Contact

Mr Anthony Bright
Rod Bright and Associates Pty Ltd
26 Murray Street, Colac, VIC, 3250
Business Phone: 03 5231 4883
Email: rodbright@iprimus.com.au

Applicant

Applicant

S.A. Harris
5 Tullamore Court, Elliminyt, VIC, 3250 Australia
Mobile Phone: 0488322105
Email: scott@spenceconstruction.com.au

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Owner

Owner

(Owner details as per Applicant)

Declaration

I, Brett Quickensted, declare that the owner (if not myself) has been notified about this application.

I, Brett Quickensted, declare that all the information supplied is true.

Authorised by

Brett Quickensted

Organisation

Rod Bright and Associates Pty Ltd

PLAN OF PROPOSED SUBDIVISION
PART OF CROWN ALLOTMENTS 51 & 52
PARISH OF ELLIMINYT
COUNTY OF POLWARTH
RE: S.A. HARRIS
SCALE 1:1250 (Original Sheet Size A3)

ROD BRIGHT & ASSOCIATES PTY LTD
LICENSED SURVEYORS & TOWN PLANNERS
26 MURRAY STREET COLAC 3250
TEL 5231 4883 ACN 007 206 975

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NOTE:
Certain dimensions shown hereon are subject to survey.
Certain areas shown hereon are subject to survey.
Land contained within C/T Vol. 10316 Fol. 369.
E-1 denotes electricity easement in favor of S.E.C.V
(see copy of title for full easement descriptions).

▨ denotes proposed effluent disposal envelope.

Existing Conditions Diagram

REF. 18-51

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REGISTER SEARCH STATEMENT (Title Search) Transfer of Land Act 1958

VOLUME 10316 FOLIO 369 Security no : 124076210266H
Produced 19/02/2019 12:48 PM

LAND DESCRIPTION

Lot 21 on Plan of Subdivision 322547F.
PARENT TITLE Volume 10218 Folio 996
Created by instrument PS322547F Stage 3 05/02/1997

REGISTERED PROPRIETOR

Estate Fee Simple
Sole Proprietor
SCOTT ANTHONY HARRIS of 5 TULLAMORE COURT ELLIMINYT VIC 3250
AR292436H 27/07/2018

ENCUMBRANCES, CAVEATS AND NOTICES

MORTGAGE AR292437F 27/07/2018
WESTPAC BANKING CORPORATION

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 PS322547F 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: 5 TULLAMORE COURT ELLIMINYT VIC 3250

ADMINISTRATIVE NOTICES

NIL

eCT Control 16320Q WESTPAC BANKING CORPORATION
Effective from 27/07/2018

DOCUMENT END

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PLAN OF SUBDIVISION

STAGE NO. | LTO use only | Plan Number

EDITION 8 | PS 322547F

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Location of Land

Parish: ELLIMINYT

Township: ———

Section: ———

Crown Allotment: 51, 52, 71 and 72

Crown Portion: ———

LTO Base Record: PARISH 1 (2586)

Title Reference: C\T. Vol. 5897 Fol. 357

Last Plan Reference: ———

Postal Address: Woodrow Vale Road
(at time of subdivision) ELLIMINYT 3249

AMG Co-ordinates (of approx. centre of land in plan) E 727 350 N 5748 900 Zone: 54

Council Certificate and Endorsement

Council Name: SHIRE OF COLAC Ref: 639/L1/92

1. This plan is certified under section 6 of the Subdivision Act 1988.
2. ~~This plan is certified under section 11(7) of the Subdivision Act 1988.~~
   ~~Date of original certification under section 6 / / /~~
3. ~~This is a statement of compliance issued under section 21 of the Subdivision Act 1988.~~

OPEN SPACE

(i) A requirement for public open space under section 18 of the Subdivision Act 1988 has/has not been made.

~~(ii) The requirement has been satisfied.~~

(iii) The requirement is to be satisfied in Stage 2

Council delegate

~~Council seal~~

Date 14 / 12 / 92

~~Re-certified under section 11(7) of the Subdivision Act 1988~~

~~Council Delegate~~

~~Council Seal~~

~~Date / /~~

APPLIES TO MASTER PLAN ONLY

Vesting of Roads and/or Reserves

Identifier	Council/Body/Person
ROAD R1	SHIRE OF COLAC
ROAD R2	COLAC OTWAY SHIRE
ROAD R3	" " "

Notations

Staging This is/[redacted] a staged subdivision
Planning Permit No. 0789

Depth Limitation
Does not apply

(both inclusive) have not been shown on this plan.

Land being subdivided is enclosed within thick continuous lines.

Lots 7 to 16, & 37 to 40 have been omitted from this plan.

Easement Variation: Variation of location of the easement created in dealing A844510 and shown on C/T. Vol. 5897 Fol. 357 to position shown by easement E-1 on this plan.

Grounds for Variation: Planning permit No. 0789

Tangent points shown thus ———

Survey This plan is/[redacted] based on survey

This survey has been connected to permanent marks no(s)
In Proclaimed Survey Area No.

Easement Information

Legend: A - Appurtenant Easement E - Encumbering Easement R - Encumbering Easement (Road)

Easement Reference	Purpose	Width (Metres)	Origin	Land Benefited/In Favour Of
E-1, E-7, E-8 & E-9	Transmission of Electricity	36·58	C/E A844510	S. E. C. V.
E-10	Drainage	5	This plan	Colac Otway Shire
E-2, E-8	Drainage	5	This plan	Shire of Colac
E-3 & E-9	Way and Water Supply	40	This plan	Land in this plan
E-4	Water Supply	See diag.	This plan	Colac Region Water Authority
E-11	**Powerline**	**See diag**	This plan-section 88 of the Electricity Industry Act 2000	**Powercor Australia Limited**
R-1 & R-2 & R-3	Water Supply, Way, Drainage, Electricity, Telephone & Data transmission	See diag	This plan	Land in this plan

LTO use only

Statement of Compliance/ Exemption Statement

Received ☑

Date 12 / 7 / 93

THIS IS AN L.T.O. COMPILED PLAN

CHECKED 24/1/00

Assistant Registrar of Titles

SHEET 1 OF 8 SHEETS

ROD BRIGHT & ASSOCIATES PTY. LTD.
LICENSED SURVEYORS
26 MURRAY STREET COLAC 3250
TEL. 052-31 4883 A.C.N. 007 206 975

LICENSED SURVEYOR (PRINT) RODNEY ARTHUR BRIGHT

SIGNATURE..... DATE 20 / 10 / '92

REF 84080 VERSION 2

DATE / /

COUNCIL DELEGATE SIGNATURE

Original sheet size A3

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PLAN OF SUBDIVISION

Stage No.

Plan Number **PS 322547F**

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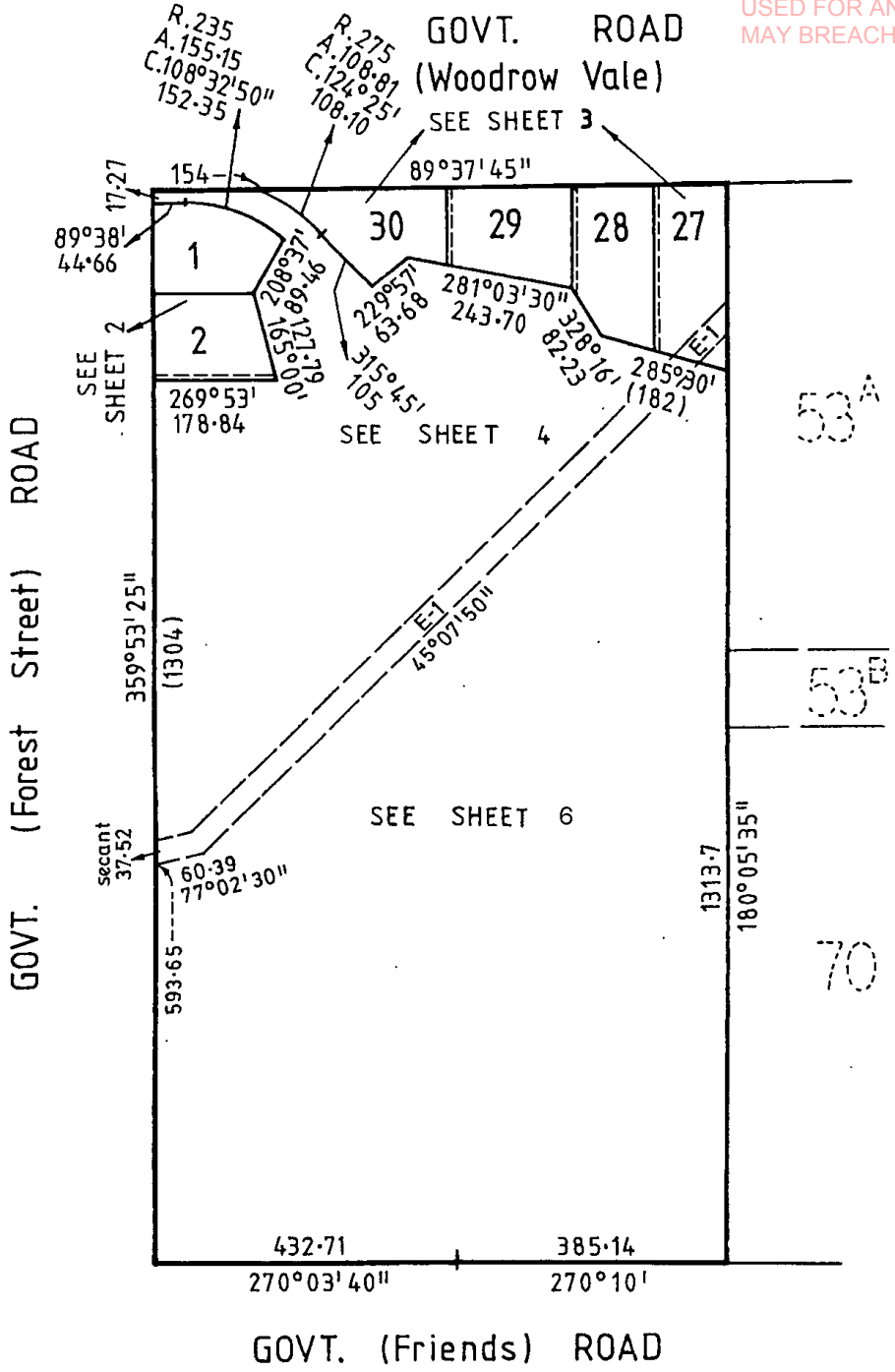

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ORIGINAL		SCALE	LICENSED SURVEYOR (PRINT) RODNEY ARTHUR BRIGHT	
SCALE 1:7500	SHEET SIZE A3	75 0 150 300 LENGTHS ARE IN METRES	SIGNATURE..... DATE 20 / 10 / 92	DATE / /
			REF 84080 VERSION 2	COUNCIL DELEGATE SIGNATURE
				Original sheet size A3

0 10 20 30 40 50 60 70 80 90 100 mm

T.O.2

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PLAN OF SUBDIVISION

Stage No.

Plan Number **PS 322547F**

T.O.3

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SCALE 30 0 60 120

LENGTHS ARE IN METRES

ORIGINAL SHEET SIZE A3

SCALE 1:3000

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GOVT. (Woodrow Vale) ROAD

GOVT. (Forest Street) ROAD

SEE SHEET 4

1	2·013ha	127	154	89°38'	44·66
2	2·006ha	123·50	146	89°53'	178·84
27	2·604ha	235·74	105	179°38"	(265)
28	2·399ha	145	115	179°38"	75·05
29	2·315ha	108	183	179°38"	186·70
30	2·105ha	266·45	57	89°37' 45"	63·68

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PLAN OF SUBDIVISION

Stage No.

Plan Number **PS 322547F**

SHEET 4 OF 8 SHEETS

T.O.3

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SIGNATURE ..... DATE 19 / 7 /94

REF 84080 VERSION 2

DATE / /

COUNCIL DELEGATE SIGNATURE

SCALE 25 0 50 100

LENGTHS ARE IN METRES

ORIGINAL SCALE 1:2500 SHEET SIZE A3

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SEE SHEET 3

SEE SHEET 5

SEE SHEET 6

GOVT. (Woodrow Vale) ROAD

ROAD (Forest Street)

GOVT ROAD

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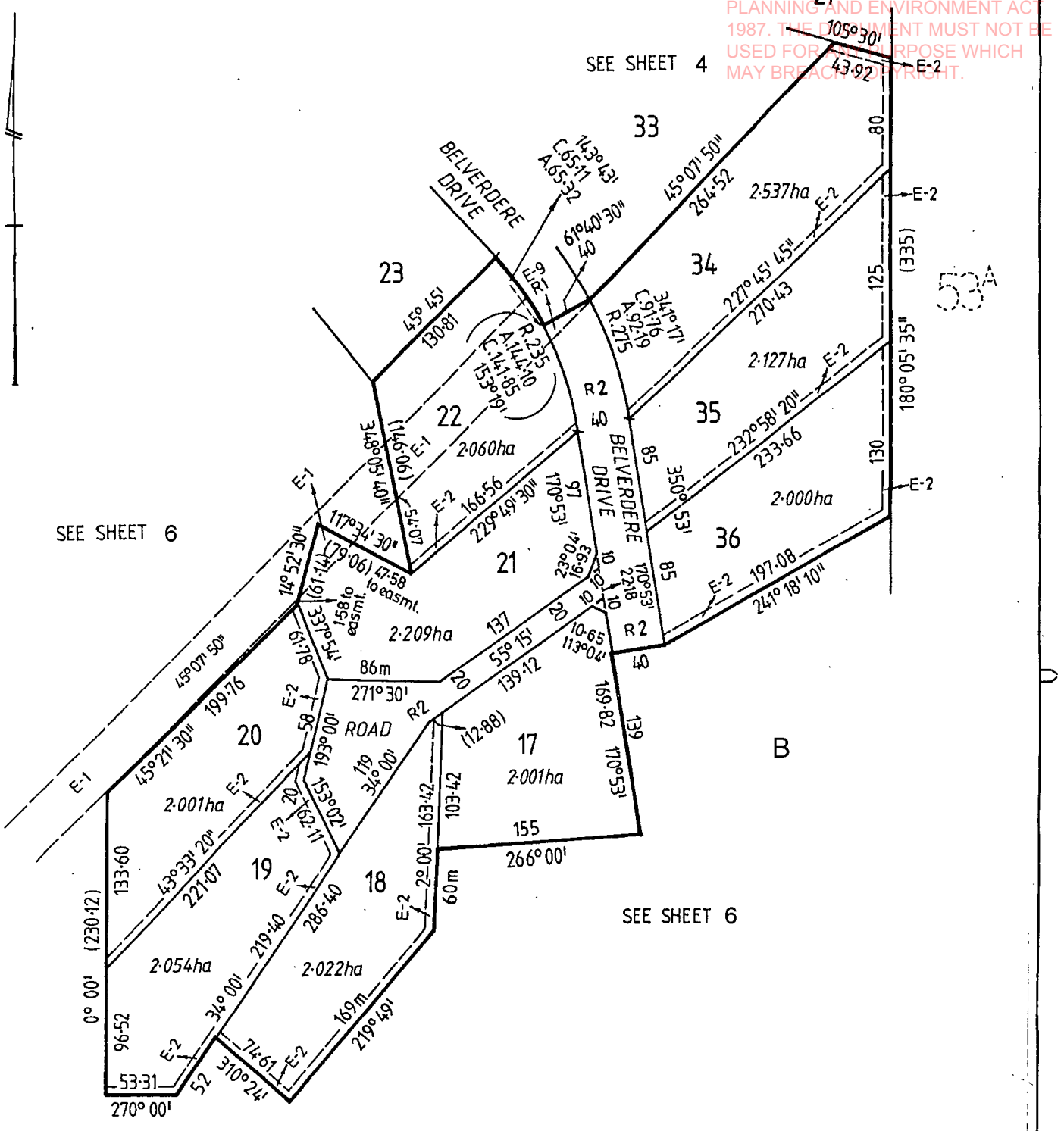

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26 MURRAY STREET COLAC 3250	
TEL. 052-314883 A.C.N. 007 206 975	
ORIGINAL SCALE 1:3000 / SHEET SIZE A3	SCALE 30 0 60 120 — LENGTHS ARE IN METRES
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DATE / /	
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PLAN OF SUBDIVISION

Stage No.

Plan Number PS322547F

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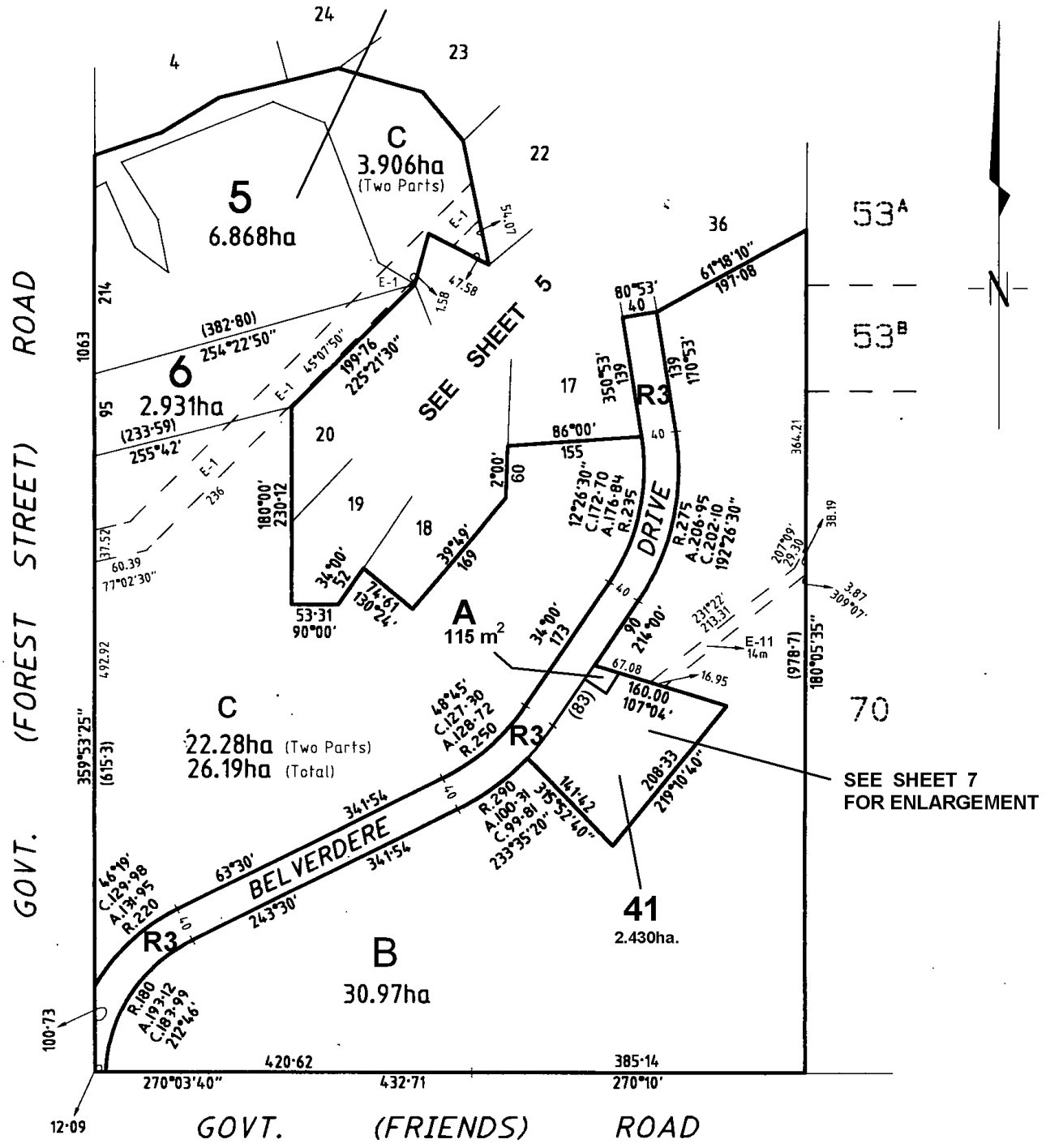

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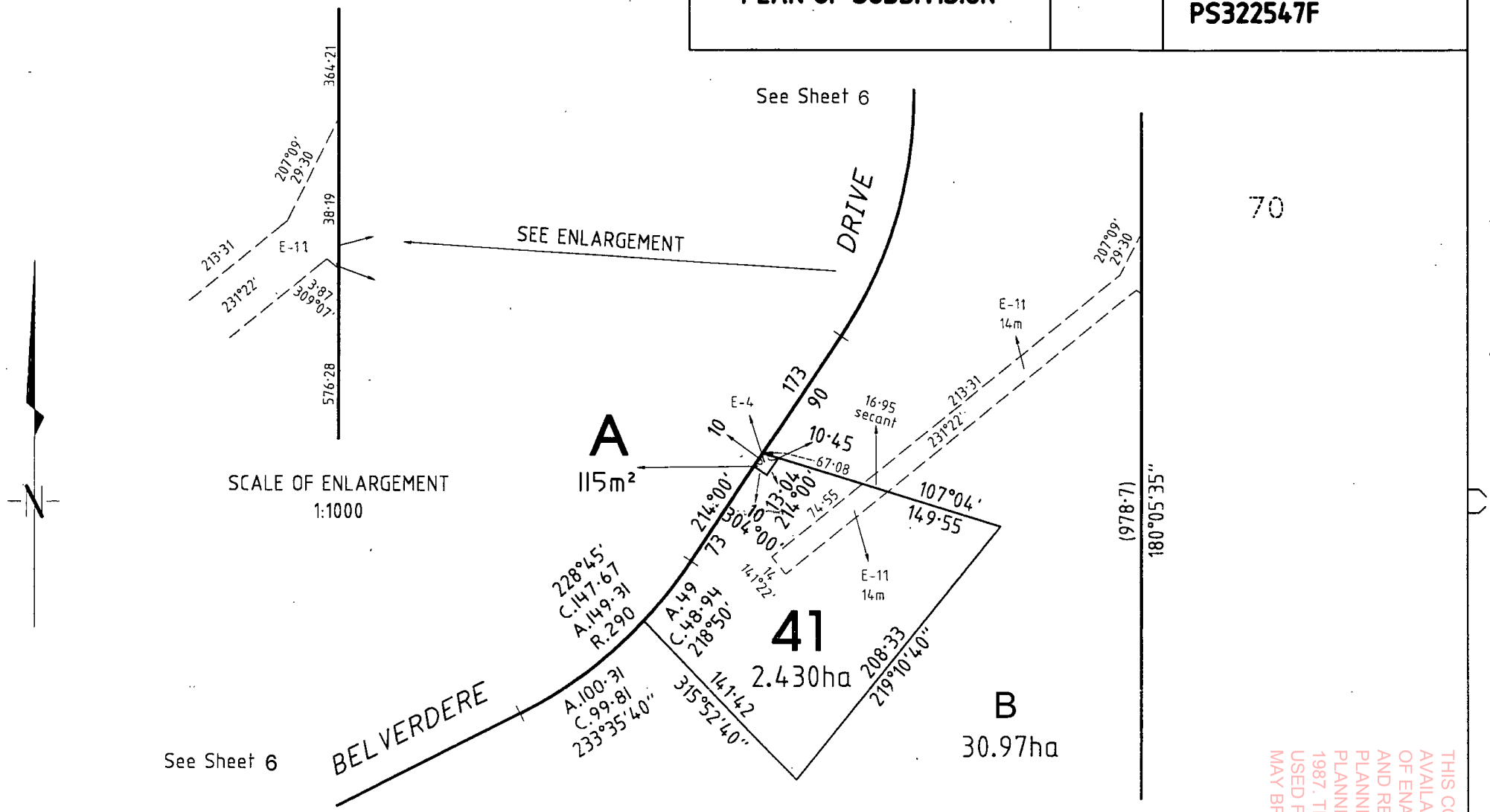
ORIGINAL SCALE 1:5000 SHEET SIZE A3	SCALE 50 0 50 100 150 200 LENGTHS ARE IN METRES
LICENSED SURVEYOR (PRINT) RODNEY ARTHUR BRIGHT	DATE / /
SIGNATURE . . . . . DATE 2 / 01 / 2003	COUNCIL DELEGATE SIGNATURE
REF 84080 VERSION	Original sheet size A3

PLAN OF SUBDIVISION

Stage No.

Plan Number

PS322547F



SHEET 7 OF 8 SHEETS

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ORIGINAL
SCALE 1:2500
SHEET SIZE A3

SCALE
25 0 25 50 75 100
LENGTHS ARE IN METRES

LICENSED SURVEYOR (PRINT) RODNEY ARTHUR BRIGHT
SIGNATURE . . . . . DATE 28 / 11 / 2001
REF 84080 VERSION 4

DATE 13 / 2 / 02
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0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150mm

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PLAN OF SUBDIVISION

Stage No.

Plan Number PS322547F

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CREATION OF RESTRICTION

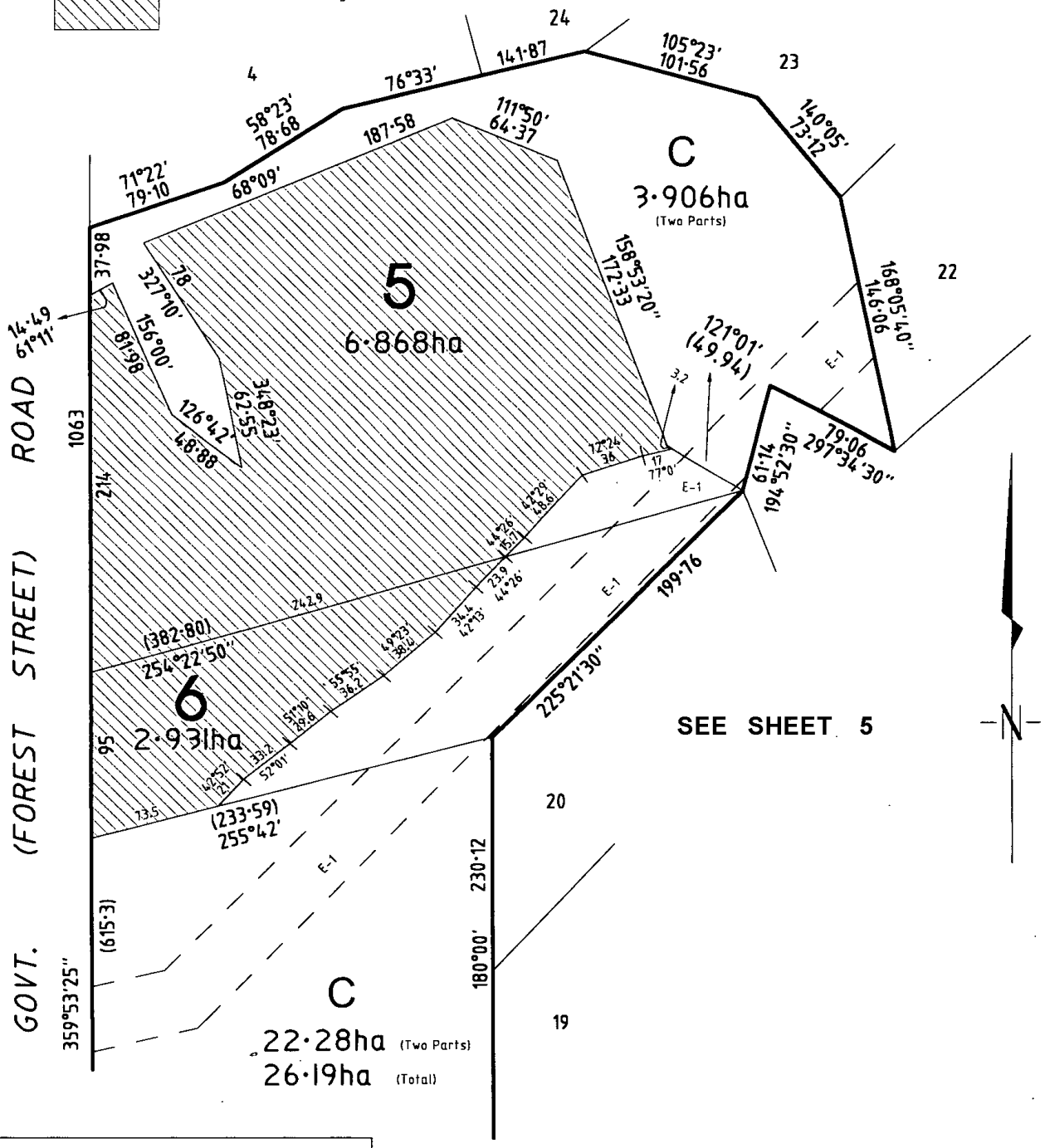
ON REGISTRATION OF THIS PLAN THE FOLLOWING RESTRICTION IS CREATED

LAND TO BE BURDENED - Lots 5 and 6 on this Plan.

LAND TO BE BENEFITTED - Lots 5 and 6 on this Plan.

DESCRIPTION OF RESTRICTION

No building shall be constructed on Lots 5 or 6 outside of the land shown thus ▨ as directed in Planning Permit No. 0789.



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SHEET 8 OF 8 SHEETS

ORIGINAL

SCALE 1:2500

SHEET SIZE A3

SCALE 25 0 25 50 75 100

LENGTHS ARE IN METRES

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DATE / /

COUNCIL DELEGATE SIGNATURE

Original sheet size A3

MODIFICATION TABLE

RECORD OF ALL ADDITIONS OR CHANGES TO THE PLAN

PLAN NUMBER

PS 322547F

MASTER PLAN REGISTERED DATE 22/7/93 TIME 8.15 am

LAND	MODIFICATION	DEALING REFERENCE	DATE AND TIME		NEW EDITION NUMBER	SIGNATURE OF ASSISTANT REGISTRAR OF TITLES
			DATE	TIME		
LOT S2	STAGE 2	T512524Q	27/2/95	2.45pm	2	AD
LOT S3	STAGE 3	U 373817Y	5/2/97	10.55am	3	
LOT S4	STAGE 4	U373818V	23/1/01	8 20am	4	
LOT 3	REMOVAL OF EASEMENT	PS441080P			5	pu.
LOT S5	STAGE 5	PS322547F / S5	13/5/02	6.32pm	6	GJN
	WARNING: THE IMAGE OF THIS PLAN/DOCUMENT HAS BEEN DIGITALLY AMENDED. NO FURTHER AMENDMENTS ARE TO BE MADE TO THE ORIGINAL PLAN/DOCUMENT.					
LOT S6	**STAGE 6**	**PS322547F/S6**	**30/10/03**		**7**	**GMR**
LOTS S7 AND S8	REMOVING LOTS FROM STAGING PROCESS VIDE 37(8) AND CREATING LOTS B AND C IN THEIR PLACE	PS626629J	20 / 5 / 2015		8	LC

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PLAN OF PROPOSED SUBDIVISION
PART OF CROWN ALLOTMENTS 51 & 52
PARISH OF ELLIMINYT
COUNTY OF POLWARTH
RE: S.A. HARRIS
SCALE 1:1250 (Original Sheet Size A3)

ROD BRIGHT & ASSOCIATES PTY LTD
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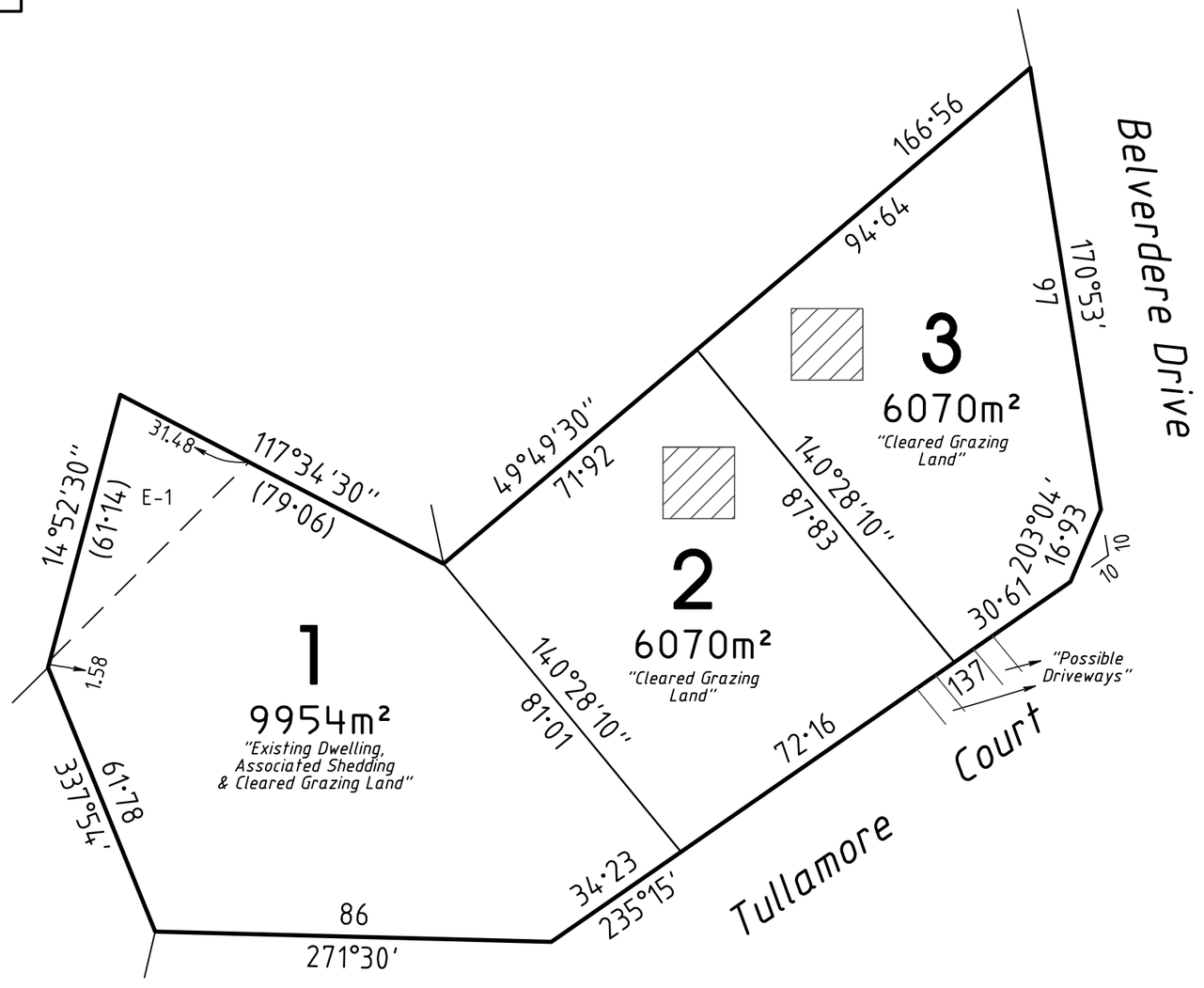
(see copy of title for full easement descriptions).

denotes proposed effluent disposal envelope.



N

REF. 18-51

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Site Description & Design Response

Proposed 3 Lot Subdivision

5 Tullamore Court, Elliminyt

S.A. Harris

February 2019

Rod Bright & Associates Pty Ltd

Licensed Land Surveyors and Planners

26 Murray St Colac 3250

Ph (03) 5231 4883

www.rodbrightlds.com.au

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Table of Contents

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1.0 Subdivision site and context description

The following information is provided in accordance with clause 56.01-1 Colac Otway Planning Scheme – Neighbourhood site and context description.

1.1 Title particulars and location

Address: 5 Tullamore Court, Elliminyt.

Comprising allotment: Lot 21 on PS322547F - Vol. 10316 Fol. 369.

The land comprises an area of 2.209ha.

There is an existing Transmission of Electricity easement on title.

The land fronts Tullamore Court and Belverdere Drive, Elliminyt.

Figure 1: Site context plan. Image source: LASSI.

1.2 Land use

The land currently contains an existing dwelling, shedding and cleared grazing land.

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1.3 Physical landform

Lot 1 comprises of the existing dwelling and shedding with existing shelter belts on the western, southern and eastern sides of the dwelling. Lots 2 & 3 comprise of open pasture. The site is located in an elevated area of Elliminyt and slopes towards the north west.

There are no identifiable contaminated soils on the site. There is a small portion of fill along the road reserve of proposed lots 2 & 3 that will be shown in the LCA.

There are views over Colac and of the surrounding farmland available from the site.

Refer to the attached plans for dimensions and relevant site information.

1.4 Surrounding land use

Surrounding land is used for low density residential and farming, with lots sizes varying from approximately 2ha to 6.9ha.

The land is located approximately 3.6km from the nearest primary school (Elliminyt Primary School), 3.4km to the nearest secondary school (Colac Secondary College, Library & Bluewater Fitness Centre) and 3.6km from the nearest shop (Hearn Street Milk Bar).

1.5 Services

Power, telecommunications and reticulated water are available to the site.

Reticulated sewer and gas are not available.

Refer to attached servicing information in Section 3.

1.6 Colac Otway Planning Scheme

1.6.1 Zone

The land is zoned Low Density Residential (LDRZ).

The zone's purposes are:

- To implement the Municipal Planning Strategy and the Planning Policy Framework.
  To provide for low-density residential development on lots which, in the absence of reticulated sewerage, can treat and retain all wastewater.

A permit is required to subdivide land.

Each lot must be at least the area specified for the land in a schedule to this zone. Any area specified must be at least:

- 0.4 hectare for each lot where reticulated sewerage is not connected. If no area is specified each lot must be at least 0.4 hectare.

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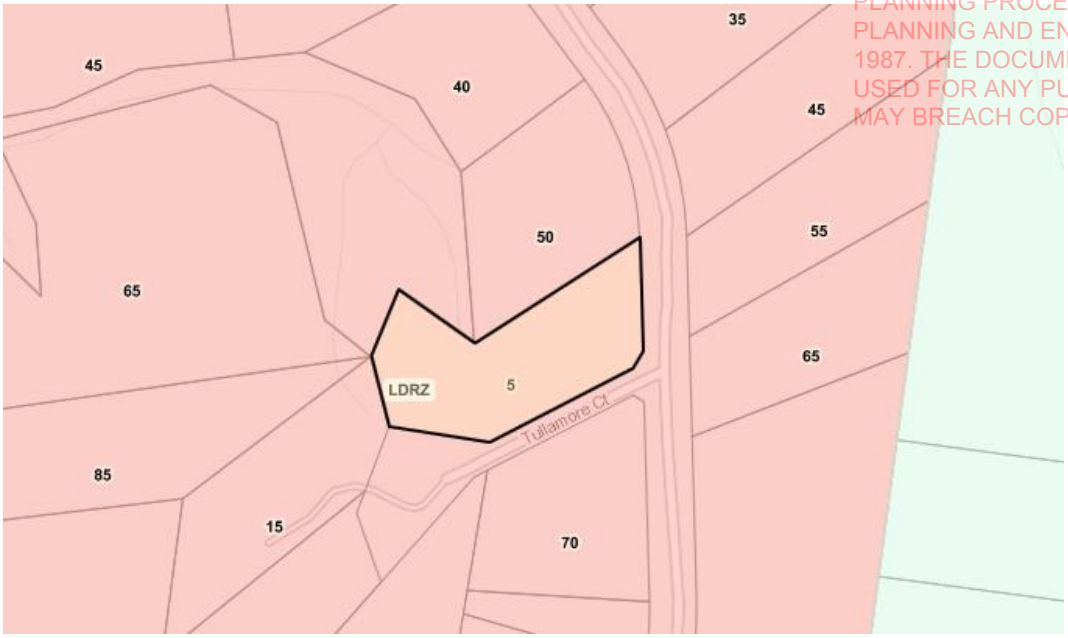

Figure 2: Planning Zone. (https://maps.land.vic.gov.au/lassi/SpearUI.jsp)

1.6.2 Overlays

Erosion Management Overlay (EMO1)

The overlay has the intention to protect areas prone to landslip or other soil degradation processes, by minimising land disturbance and inappropriate development. The overlay requires a permit for subdivision and Schedule 1 to the EMO requires the application to be accompanied by a Land Stability Assessment prepared by a professionally qualified consultant. Our client has engaged the services of a qualified consultant. A copy of the Land Capability Assessment will be supplied as soon as it is available.

Significant Landscape Overlay (SLO1)

The purpose of this overlay is to implement the State Planning Policy Framework and the Local Planning Policy Framework, including the Municipal Strategic Statement and local planning policies.

- To identify significant landscapes.
- To conserve and enhance the character of significant landscapes.

A landscaping plan should be submitted with an application for buildings and works, or to remove, destroy or lop vegetation, utilizing appropriate species and demonstrating how the affected area will be remediated after development.

As there is no development or works planned as part of this subdivision, this proposal in no way affects this overlay.

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Vegetation Protection Overlay (VPO1)

The site is affected by the Vegetation Protection Overlay (VPO1).

The purpose of this overlay is to implement the State Planning Policy Framework and the Local Planning Policy Framework, including the Municipal Strategic Statement and local planning policies.

- To protect areas of significant vegetation.
- To ensure that development minimises loss of vegetation.
- To preserve existing trees and other vegetation.
- To recognise vegetation protection areas as locations of special significance, natural beauty, interest and importance.
- To maintain and enhance habitat and habitat corridors for indigenous fauna.
- To encourage the regeneration of native vegetation.

A permit is required to remove, destroy or lop any vegetation specified in the schedule. As this application does not seek consent to remove, destroy or lop vegetation, a permit is not required under the provisions.

1.6.3 Planning Policy Framework

Relevant planning scheme policies are listed below and are referred to later within this document:

Clauses	
11	SETTLEMENT
11.01-1R	Settlement – Geelong G21
11.02	Managing Growth
11.02-1S	Supply of urban land
11.02-2S	Structure Planning
15	BUILT ENVIRONMENT AND HERITAGE
15.01	Built Environment
15.01-1S	Urban Design
15.01-3S	Subdivision Design
15.01-4S	Healthy neighbourhoods
15.01-5S	Neighbourhood character
15.03-2S	Aboriginal Cultural Heritage
19	INFRASTRUCTURE
19.03	Development Infrastructure
19.03-03S	Integrated Water Management
19.03-2S	Infrastructure design and provision
19.03-4S	Telecommunications
19.03-5S	Waste and Resource Recovery
20	LOCAL PLANNING POLICY FRAMEWORK
21	MUNICIPAL STRATEGIC STATEMENT

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21.01	Municipal Profile
21.02	Vision
21.03	Settlement
21.03-2	Colac

2.0 Residential Subdivision - Design Response (56.01-2)

2.1 Subdivision Design

The subdivision proposes the creation of 3 new allotments, Lot 1 having existing access from Tullamore Court, Lots 2 & 3 do not currently have existing access from either Tullamore Court or Belverdere Drive.

Lot 1 will contain the existing dwelling and associated shedding and comprise of approximately 9954m^2, Lot 2 will comprise of approximately 6070m^2 and is cleared grazing land. Lot 3 will comprise of approximately 6070m^2 and is also cleared grazing land.

2.2 Design Response

The design response responds to the site and context description by way of the following:

- The proposed 3 lot subdivision with allotment sizes of approximately 9954m^2 (Lot 1) 6070m^2 (Lot 2) and 6070m^2 (Lot 3) is an appropriate response to the surrounding pattern of development which comprises of a mix of medium and low-density development.
- The lot sizes will enable suitable area for compliance with the Residential Subdivision (clause 56) objectives of the planning scheme.
- There is no significant vegetation or site features within the allotments which require protection and consideration as part of the subdivision.
- There is an existing cross-over for the proposed Lot 1.
- There are no specific site and context features for the area identified in a local planning policy or a Neighbourhood Character Overlay.

All lots are designed to cater for traditional residential development with single dwellings on each allotment and adequate private open space and solar access.

Compliance with the relevant objectives of Clause 56 is demonstrated below.

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An application to subdivide land, other than an application to subdivide land into lots each containing an existing dwelling or car parking space, must meet the requirements of Clause 56 and:

- Must meet all of the objectives included in the clauses specified in the following table.
- Should meet all of the standards included in the clauses specified in the following table.

Class of subdivision	Objectives and standards to be met
60 or more lots	All except Clause 56.03-5.
16 – 59 lots	All except Clauses 56.03-1 to 56.03-3, 56.03-5, 56.06-1 and 56.06-3.
3 – 15 lots	All except Clauses 56.02-1, 56.03-1 to 56.03-4, 56.05-2, 56.06-1, 56.06-3 and 56.06-6.
2 lots	Clauses 56.03-5, 56.04-2, 56.04-3, 56.04-5, 56.06-8 to 56.09-2.

56.03 LIVABLE AND SUSTAINABLE COMMUNITIES

56.03-4 Built Environment Objective

To create urban places with identity and character

Standard C5

The built environment should:

Implement any relevant urban design strategy, plan or policy for the area set out in this scheme.

Provide living and working environments that are functional, safe and attractive.

Provide an integrated layout, built form and urban landscape,

Contribute to a sense of place and cultural identity.

An application should describe the identity and character to be achieved and the elements that contribute to that identity and character.

Response:

The proposed subdivision is consistent with the above objective by:

There is no urban design strategy, plan or policy for this area.

The identity and character of the area will evolve through the construction of new dwellings and with the wide frontages, will enable space for the planting of canopy trees and gardens.

56.03-5 Neighbourhood Character:

56.03-5 Neighbourhood Character Objective

To design subdivisions that respond to neighbourhood character

Standard C6

Subdivision should:

- Respect the existing neighbourhood character or achieve a preferred neighbourhood character consistent with any relevant neighbourhood character objective, policy or statement set out in this scheme.

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- Respond to and integrate with the surrounding urban environment.
- Protect significant vegetation and site features.

Response:

The proposed subdivision is consistent with the above objective by:

A preferred neighbourhood character is not identified for this area of Elliminyt. An absence of formal kerb & channel or footpath on Tullamore Court and Belverdere Drive, along with the use of the adjoining land for grazing or pasture creates a rural aesthetic. Houses within Tullamore Court are single modern dwellings, recently constructed.

Neighbourhood character in the area is developing and will evolve in response to this new development.

56.04 LOT DESIGN

56.04-1 Lot diversity and Distribution objectives:

To achieve housing densities that support compact and walkable neighbourhoods and the efficient provision of public transport services.

To provide higher housing densities within walking distance of activity centres.

To achieve increased housing densities in designated growth areas.

To provide a range of lot sizes to suit a variety of dwelling and household types.

Standard C7:

A subdivision should implement any relevant housing strategy, plan or policy for the area set out in this scheme.

Lot sizes and mix should achieve the average net residential density specified in any zone or overlay that applies to the land or in any relevant policy for the area set out in this scheme.

A range and mix of lot sizes should be provided including lots suitable for the development of: single dwellings, two dwellings or more, higher density housing, residential buildings and retirement villages.

Unless the site is constrained by topography or other site conditions, lot distribution should provide for 95% of dwellings to be located no more than 400m street walking distance from the nearest existing or proposed bus stop, 600m street walking distance from the nearest existing or proposed tram stop and 800 metres street walking distance from the nearest existing or proposed railway station.

Lots of 300 square metres or less in area, lots suitable for the development of 2 dwellings or more, lots suitable for higher density housing and lots suitable for residential buildings and retirement villages should be located in and within 400 metres street walking distance of an activity centre.

Response:

The proposed subdivision is consistent with the above objective by:

The site is approximately 5.5km from Colac's CBD.

The lots are designed for traditional single dwellings, catering for current demand for sizable dwellings on larger allotments.

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56.04-2 Lot area and building envelopes objective

To provide lots with dimensions and areas that enable the appropriate siting and construction of a dwelling, solar access, private open space, vehicle access and parking, water management, easement and the retention of significant vegetation and site features.

Standard C8

Lots greater than 500m^2 should be able to contain a rectangle measuring 10m by 15m and may contain a building envelope.

A building envelope may specify or incorporate any relevant siting and design requirement. Any requirement should meet the relevant standards of Clause 54, unless:

- The objectives of the relevant standard are met, and
- The building envelope is shown as a restriction on a PS registered under the Subdivision Act 1988 or is specified as a covenant in an agreement under Section 173 of the Act.

Where a lot with a building envelope adjoins a lot that is not on the same plan of subdivision or is not subject to the same agreement relating to the relevant building envelope:

- The building envelope must meet Standards A10 and A11 of Clause 54 in relation to the adjoining lot, and
- The building envelope must not regulate siting matters covered by Standards A12 to A15 (inclusive) of Clause 54 in relation to the adjoining lot. This should be specified in the relevant PS or agreement.

Lot dimensions and building envelopes should protect:

- Solar access for future dwellings and supports the siting and design of dwellings that achieve the energy rating requirement of the building regulations.
- Existing and proposed easement on lots.
- Significant vegetation and site features.

Response:

The proposed subdivision is consistent with the above objective by:

- The proposed Lot 1 has an existing dwelling and appropriate setbacks. The proposed Lots 2 & 3 are capable of containing a building envelope exceeding 10m by 15m.
- Building envelopes have not been designated on lots 2 & 3 to enable flexibility in dwelling design and placement.

56.04-3 Solar orientation of lots objective

To provide good solar orientation of lots and solar access for future dwellings.

Standard C9

Unless the site is constrained by topography or other site conditions, at least 70 percent of lots should have appropriate solar orientation.

Lots have appropriate solar orientation when:

- The long axis of lots are within the range north 20 degrees west to north 30 degrees east, or east 20 degrees north to east 30 degrees south.
- Dimensions of lots are adequate to protect solar access to the lot, taking into account likely dwelling size and the relationship of each lot to the street.

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Response:

The proposed subdivision is consistent with the above objective by:

- Lots will retain solar access due to their size and absence of large-scale development.

56.04-4 Street orientation objective

To provide a lot layout that contributes to community social interaction, personal safety and property security.

Standard C10

Subdivision should increase viability and surveillance by:

- Ensuring lots front all roads and streets and avoid the side or rear of lots being oriented to connector streets and arterial roads.
- Providing lots of 300m2 or less in area and lots for 2 or more dwellings around activity centres and public open space.
- Ensuring streets and houses look onto public open space and avoiding sides and rears of lots along public open space boundaries.
- Providing roads and streets along public open space boundaries.

Response:

All Lots facilitate observation of Tullamore Court.

There are no adjoining areas of open space.

56.04-5 Common area objectives

To identify common areas and the purpose for which the area is commonly held.

To ensure the provision for common area is appropriate and that necessary management arrangements are in place.

To maintain direct public access throughout the neighbourhood street network.

Standard C11

An application to subdivide land that creates common land must be accompanied by a plan and a report identifying:

- The common area to be owned by the body corporate, including any streets and open space.
- The reasons why the area should be commonly held.
- Lots participating in the body corporate.
- The proposed management arrangements including maintenance standards for streets and open spaces to be commonly held.

Response:

Common areas are not proposed as part of this subdivision.

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56.05 URBAN LANDSCAPE

56.05-1 Integrated urban landscape objective

To provide attractive and continuous landscaping in streets and public open spaces that contribute to the character and identity of new neighbourhoods and urban places or to existing or preferred neighbourhood character in existing urban areas.

To incorporate natural and cultural features in the design of streets and public open space where appropriate.

To protect and enhance native habitat and discourage the planting and spread of noxious weeds.

To provide for integrated water management systems and contribute to drinking water conservation.

Standards C12

An application for subdivision that creates streets or public open space should be accompanied by a landscape design……

Response:

As we are not creating any new streets or areas of public open space, a Landscape Plan is not required.

56.06 ACCESS & MOBILITY MANAGEMENT

56.06-2 Walking and cycling network objectives

To contribute to community health and wellbeing by encouraging walking and cycling as part of the daily lives of residents, employees and visitors.

To provide safe and direct movement through and between neighbourhoods by pedestrians and cyclists.

To reduce car use, greenhouse emissions and air pollution.

Standard C15

The walking and cycling network should be designed to:

- Implement any relevant regional and local walking and cycling strategy, plan or policy for the area set out in this scheme.
- Link to any existing pedestrian and cycling networks.
- Provide safe walkable distances to activity centres, community facilities, public transport stops and open spaces.
- Provide an interconnected and continuous network of safe, efficient and convenient footpaths, shared paths, cycle paths and cycle lanes based primarily on the network of arterial roads, neighbourhood streets and regional public open spaces,
- Provide direct cycling routes of regional journeys to major activity centre, community facilities, public transport and other regional activities and for regional recreational cycling.
- Ensure safe street and road crossings including the provision of traffic controls where required.
- Provide an appropriate level of priority or pedestrians and cyclists.
- Have natural surveillance along streets and from abutting dwellings and be designed for personal safety and security particularly at night.
- Be accessible to people with disabilities.

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Response:

A walking and cycling network has not been established in this part of Elliminyt, which has no footpaths. It is outside the scope of this subdivision to alter the current arrangements.

56.06-4 Neighbourhood street network objectives

56.06-5 Walking and cycling network detail objectives

56.06-6 Public transport network detail objectives

56.06-7 Neighbourhood street network objective.

Standards C17-C20

Response:

The cross overs and driveways will be designed and constructed in accordance with Council requirements and Australian Standards.

There is no public transport for this area of Elliminyt.

56.06-8 Lot access objective

To provide for safe vehicle access between roads and lots

Standard C21

Vehicle access to lots abutting arterial roads should be provided from service roads, side or rear access lanes, access places or access streets where appropriate and in accordance with the access management requirements of the relevant road's authority.

Vehicle access to lots of 300 square metres or less in area and lots with a frontage of 7.5 metres or less should be provided via rear or side access lanes, places or streets.

The design and construction of a crossover should meet the requirements of the relevant road authority.

Response:

The design and construction of new cross overs for the lots created will be in accordance with the requirements of Colac Otway Shire as specified by planning permit as conditions.

56.07 INTEGRATED WATER MANAGEMENT

56.07-1 Drinking Water Supply Objective

To reduce the use of drinking water.

To provide an adequate, cost-effective supply of drinking water.

Standard C22

The supply of drinking water must be:

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Designed and constructed in accordance with the requirements and to the satisfaction of the relevant water authority.

Provided to the boundary of all lots in the subdivision to the satisfaction for the relevant water authority.

Response:

The supply of drinking water will be provided to the boundary of all the lots in the development in accordance with the requirements of Barwon Water as specified by planning permit conditions.

56.07-2 Reused and recycled water objective

To provide for the substitution of drinking water for non-drinking purposes with reused and recycled water.

Standard C23

Reused and recycled water systems must be:

Designed, constructed and managed in accordance with the requirements and to the satisfaction of the relevant water authority, EPA and DHS.

Provided to the boundary of all lots in the subdivision where required by the relevant water authority.

Response:

Reused and recycled water systems will be provided and designed if required by Barwon Water as permit conditions.

56.07-3 Waste water management objective

To provide a waste water system that is adequate for the maintenance of public health and the management of effluent in an environmentally friendly manner.

Standard C24

Waste water systems must be:

Designed, constructed and managed in accordance with the requirements and to the satisfaction of the relevant water authority and the EPA.

Consistent with any relevant approved domestic waste water management plan.

Reticulated waste water systems must be provided to the boundary of all lots in the subdivision where required by the relevant water authority.

Response:

There is no reticulated waste water supply in this area of Elliminyt. The proposed allotments are large enough for all waste water to be retained and treated on site as will be shown in the LCA.

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56.07-4 Stormwater management objectives

To minimise damage to properties and inconvenience to residents from stormwater.

To ensure that the street operates adequately during major storm events and provides for public safety

To minimise increases in stormwater and protect the environmental values and physical characteristics of receiving waters from degradation by stormwater.

To encourage stormwater management that maximises the retention and reuse of stormwater.

To encourage stormwater management that contributes to cooling, local habitat improvements and provision of attractive and enjoyable spaces.

Standard C25

The stormwater management system must be designed and managed in accordance with the requirements and to the satisfaction of the relevant drainage authority……and in accordance with standards and specifications detailed under this clause.

Response:

Connection to the existing stormwater system will be provided to the new lots and in accordance with the requirements of the Colac Otway Shire Council.

Excess runoff will be directed into the appropriate legal point of discharge, as required by Colac Otway Shire Council, through planning permit conditions.

56.08 SITE MANAGEMENT

56.08 Site Management objectives

To protect drainage infrastructure and receiving waters from sedimentation and contamination.

To protect the site and surrounding area from environmental degradation ort nuisance prior to and during construction of subdivision works.

To encourage the re-use of materials from the site and recycled materials in the construction of subdivision where practicable….

Standard C26

A subdivision site must describe how the site will be managed prior to and during the construction period and may set out requirements from managing erosion and sediment, dust, run-off, litter concrete and other construction wastes, chemical contamination, vegetation and natural features planned for retention.

Response:

A site management plan (including erosion management) will be submitted to Colac Otway Shire prior to commencement of works.

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56.09 UTILITIES

56.09-1 Shared Trenching Objective

To maximise the opportunities for shared trenching

To minimise constrains on landscaping within street reserves……

Standard C27

Reticulated services for water, gas, electricity and telecommunications should be provided in shared trenching to minimise construction costs and land allocation for underground services

Response:

Shared trenching will be utilised where possible during any construction.

56.09-2 Electricity, communications and gas objectives

To provide public utilities to each lot in a timely, efficient and cost-effective manner.

To reduce greenhouse gas emissions by supporting generation and use of electricity from renewable sources.

Standard C28

The electricity supply system must be designed in accordance with the requirements of the relevant electricity supply agency and be provided to the boundary of all lots in the subdivision to the satisfaction of the relevant electricity authority.

The telecommunications system must be designed in accordance with the requirements of the relevant telecommunications servicing agency…….and be provided to the boundary of all lots in the subdivision to the satisfaction of the relevant telecommunications servicing authority.

Where available, the reticulated gas supply system must be designed in accordance with the requirements of the relevant gas supply agency and be provided to the boundary of all lots in the subdivision to the satisfaction of the relevant gas supply agency.

Response:

Electricity and telecommunications will be supplied to the lots in accordance with relevant permit requirements of the relevant infrastructure providers.

56.09-3 Fire hydrants objective

To provide fire hydrants and fire plugs in positions that enable fire fighters to access water safely, effectively and efficiently.

Standard C29

Fire hydrants should be provided:

- A maximum distance of 120 metres from the rear of each lot.
- No more than 200 metres apart.

Hydrants and fire plugs must be compatible with the relevant fire service equipment. Where the provision of fire hydrants and fire plugs does not comply with the requirements of standard C29, fire hydrants must be provided to the satisfaction of the relevant fire authority.

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Response:

Hydrants and fire plugs, if required, will be planned for and included as required to comply with this standard and the requirements of the CFA.

56.09-4 Public lighting objective

To provide public lighting to ensure the safety of pedestrians, cyclists and vehicles.

To provide pedestrians with a sense of personal safety at night.

To contribute to reducing greenhouse gas emissions and to saving energy.

Standard C30

Public lighting should be provided to streets, footpaths, public telephones, public transport stops and to major pedestrian and cycle paths including public open spaces that are likely to be well used at night to assist in providing safe passage for pedestrians, cyclists and vehicles.

Public lighting should be designed in accordance with the relevant Australian Standards.

Public lighting should be consistent with any strategy, policy or plan for the use of renewable energy and energy efficient fittings.

Response:

Not applicable as no new roads or common property is proposed as part of this subdivision.

2.3 General Policy and Decision Guidelines Assessment

The proposal is consistent with relevant planning scheme policies and strategies, the purpose and decision guidelines of the relevant zone and applicable overlays, as described below.

Planning Policy Framework

11) Settlement (11.01-1R, 11.02, 11.02-1S, 11.02-2S)

The subdivision of the site provides the following outcomes responding to the above planning policies and strategies:

- Enables sustainable growth at a location where utility, transport, commercial and social infrastructure and services are available.
- The subdivision builds on existing infrastructure, availability of services and the existing road network.

15) Built Environment & Heritage (15.01, 15.01-1S, 15.01-3S, 15.01-4S, 15.01-5S, 15.03-2S)

The subdivision of the site provides the following outcomes responding to the above planning policies and strategies:

- The subdivision responds to its surrounding landscape and character,
- The development considers the natural, cultural and strategic context of its location.

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- The design of the subdivision provides lot sizes to suit a variety of dwelling and household types to meet the needs and aspirations of different groups of people.
- Provides an opportunity for increased residential density to help consolidate urban areas.

19) Infrastructure (19.03, 19.03-03S, 19.03-2S, 19.03-4S, 19.03-5S)

- The subdivision enables infill development in an existing low-density residential area, thus contributing to efficiencies in infrastructure and service provision.
- Public open space contributions will be provided in accordance with the contributions scheme if required.

20) Local Planning Policy Framework including MSS, municipal profile and vision (21.03-2 Colac Framework Plan

The subdivision of the site provides the following outcomes responding to the above planning policies and strategies:

- The current MSS in relation to Elliminyt does not provide any relevant direction regarding residential infill development opportunities.

Clause 65.02 Colac Otway Planning Scheme
Subdivision Decision Guidelines

The design, development, subdivision and use of the site, as proposed, provide the following outcomes responding to the above decision guidelines, (if not referred to elsewhere in this document):

- The land is suitable for subdivision, with the development enabling infill development in an established area of Elliminyt.
- Engineering design will ensure that the stormwater drainage from the development will not detrimentally impact surrounding land or the existing stormwater system.
- The proposed subdivision pattern is consistent with traditional low-density residential development.
- The subdivision will not be staged. No common property areas are proposed.

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3.0 Service asset locations

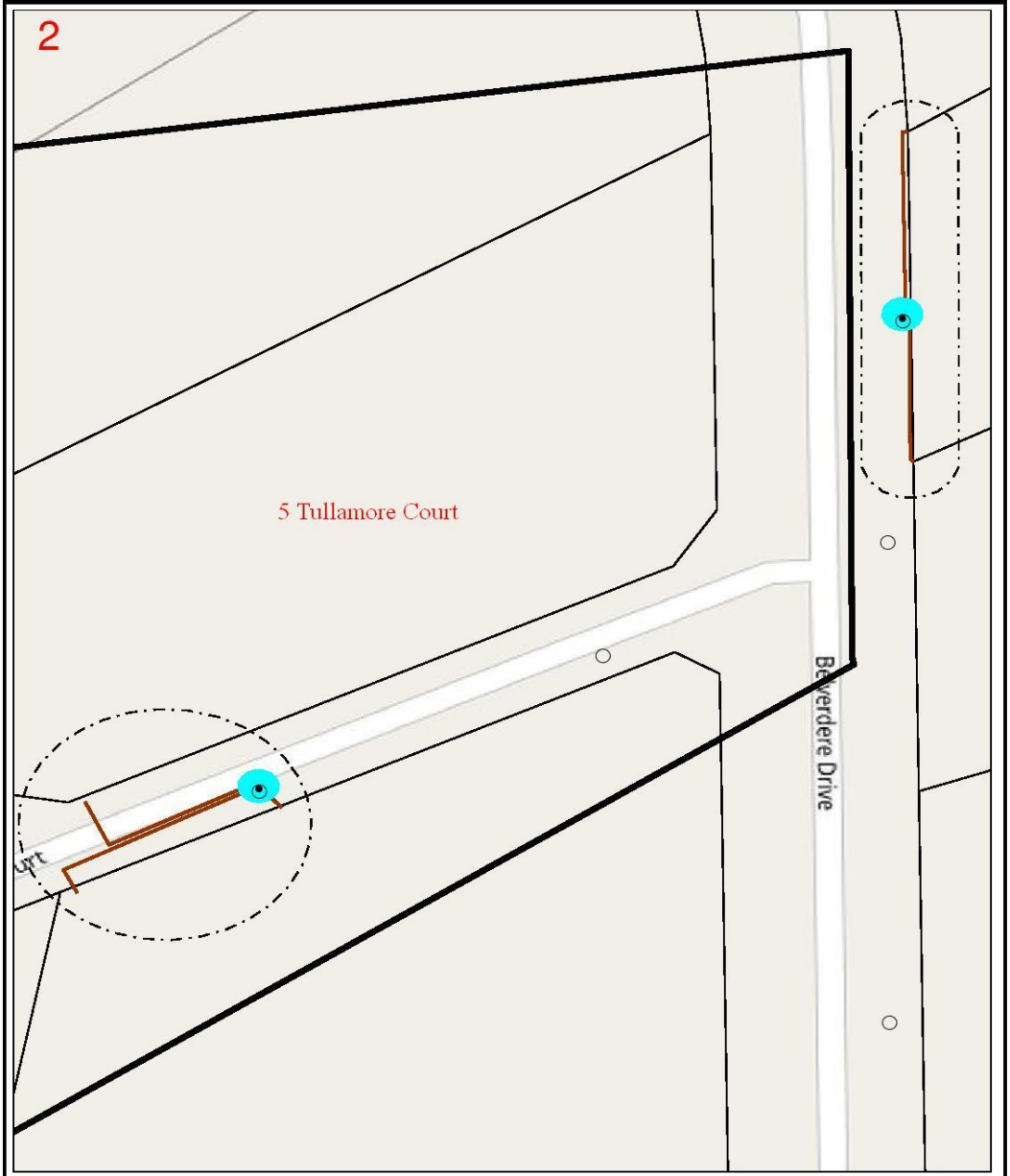
Date: 19/02/2019

CitiPower Powercor AUSTRALIA **Map 2**

Sequence No: 80368929

5 Tullamore Court Elliminyt

MAP IS A GUIDE ONLY- REFER TO CABLE PLANS FOR ACCURATE ASSET LOCATIONS



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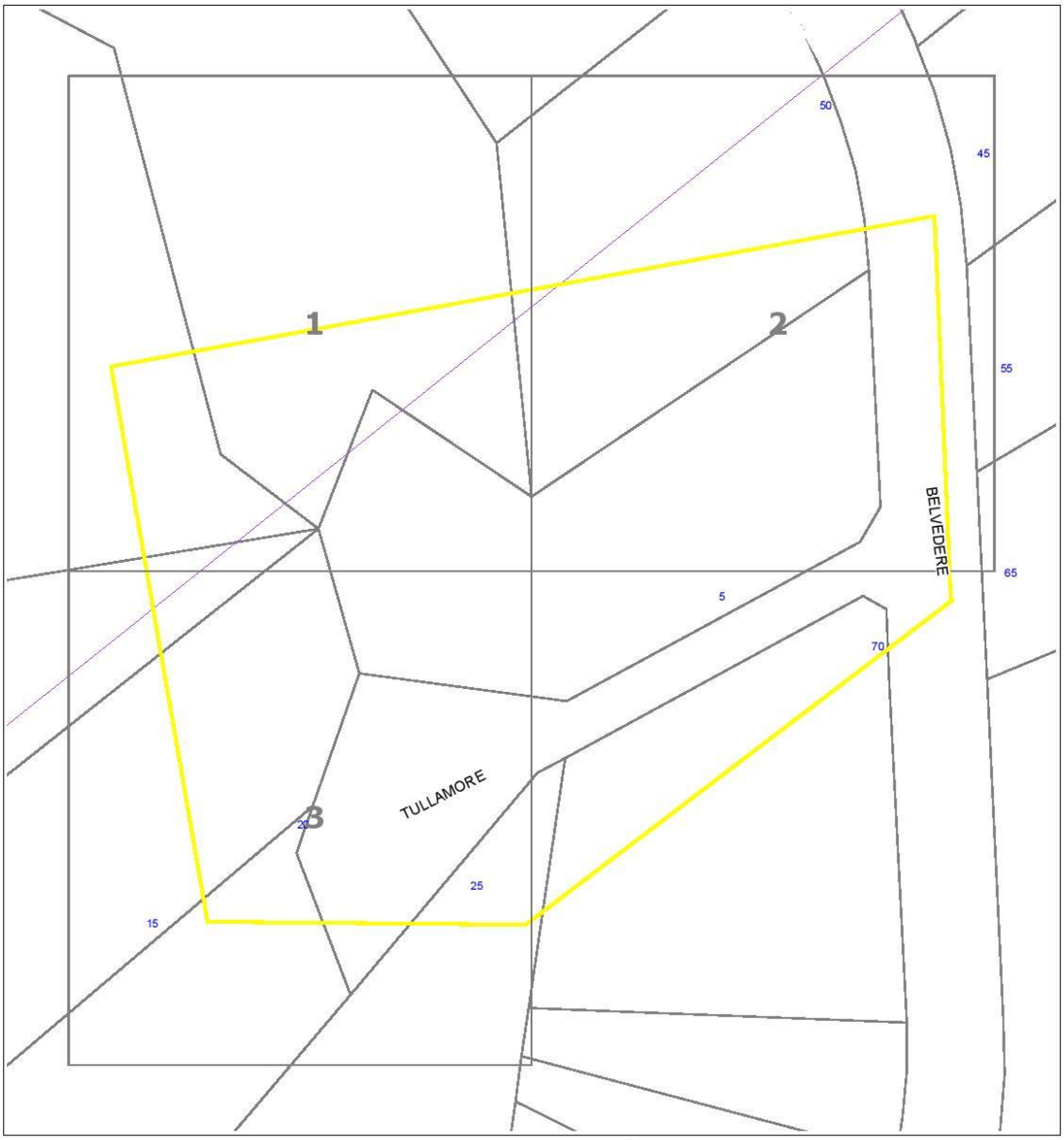
Transmission Lines

Sequence Number: 80368928

Address:5 Tullamore Court, Elliminyt, VIC, 3250



Create Date:
19/02/2019

Scale:
1:1000

AusNet services

220 kV Cable
Communication Cable
Transmission Line
Terminal Station

WORK REQUIREMENTS NEAR AUSNET TRANSMISSION GROUP CABLES
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Ausnet Transmission Group : Telephone 9695 6000
Email : lmg@ausnetservices.com.au

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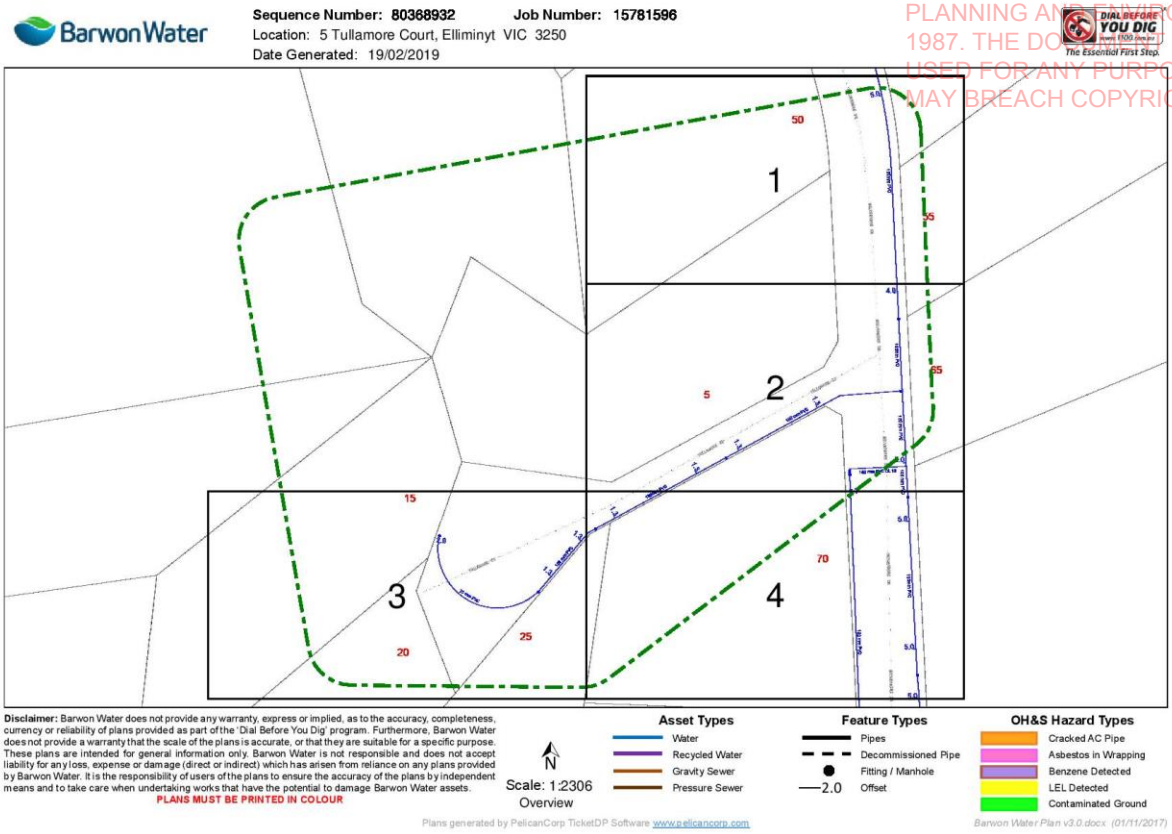

4.0 Summary

The proposal for a low-density residential subdivision is a positive outcome for this area of Elliminyt, which is currently evolving to meet increased growth demand for differing lot sizes.

Overall, the proposal is consistent with relevant planning policies.

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Department of Environment, Land, Water and Planning

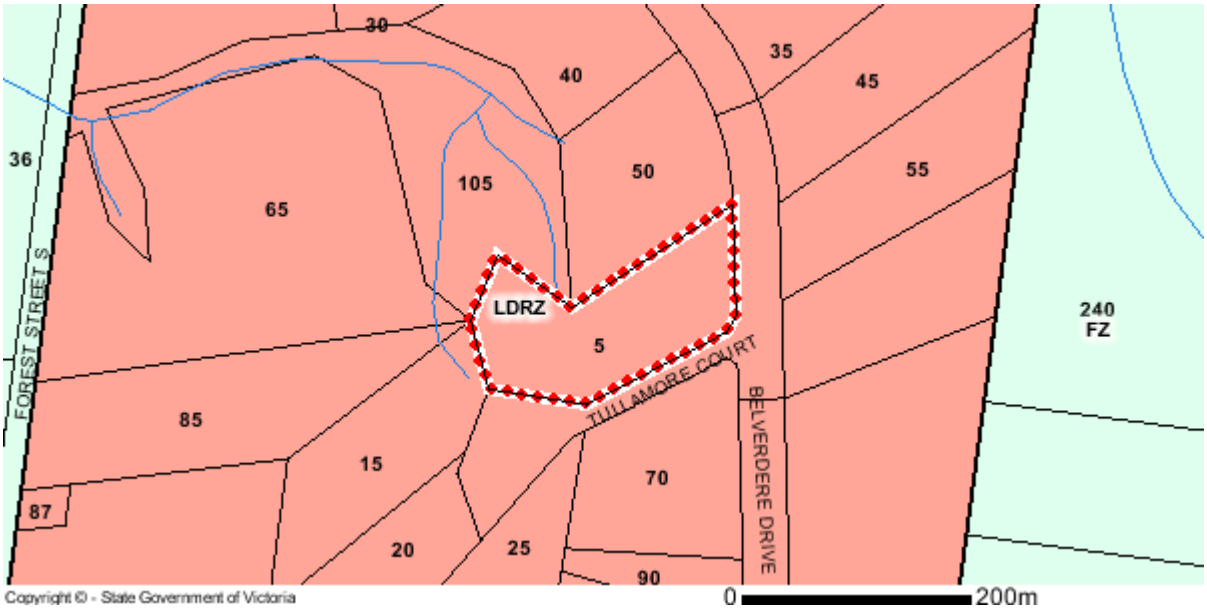
Planning Property Report

from www.planning.vic.gov.au on 20 February 2019 03:05 PM

Lot and Plan Number: Lot 21 PS322547
Address: 5 TULLAMORE COURT ELLIMINYT 3250
Local Government (Council): COLAC OTWAY **Council Property Number:** 22110
Directory Reference: VicRoads 92 B8

Planning Zone

LOW DENSITY RESIDENTIAL ZONE (LDRZ)
SCHEDULE TO THE LOW DENSITY RESIDENTIAL ZONE (LDRZ)



Note: labels for zones may appear outside the actual zone - please compare the labels with the legend.

Zones Legend

- ACZ - Activity Centre
- B1Z - Commercial 1
- B2Z - Commercial 1
- B3Z - Commercial 2
- B4Z - Commercial 2
- B5Z - Commercial 1
- C1Z - Commercial 1
- C2Z - Commercial 2
- CA - Commonwealth Land
- CCZ - Capital City
- CDZ - Comprehensive Development
- DZ - Dockland
- ERZ - Environmental Rural
- FZ - Farming
- GRZ - General Residential
- GWAZ - Green Wedge A
- GWZ - Green Wedge
- IN1Z - Industrial 1
- IN2Z - Industrial 2
- IN3Z - Industrial 3
- LDRZ - Low Density Residential
- MUZ - Mixed Use
- NRZ - Neighbourhood Residential
- PCRZ - Public Conservation & Resource
- PDZ - Priority Development
- PPRZ - Public Park & Recreation
- PUZ1 - Public Use - Service & Utility
- PUZ2 - Public Use - Education
- PUZ3 - Public Use - Health Community
- PUZ4 - Public Use - Transport
- PUZ5 - Public Use - Cemetery/Crematorium
- PUZ6 - Public Use - Local Government
- PUZ7 - Public Use - Other Public Use
- PZ - Port
- R1Z - General Residential
- R2Z - General Residential
- R3Z - General Residential
- RAZ - Rural Activity
- RCZ - Rural Conservation
- RDZ1 - Road - Category 1
- RDZ2 - Road - Category 2
- RGZ - Residential Growth
- RLZ - Rural Living
- RUZ - Rural
- SUZ - Special Use
- TZ - Township
- UFZ - Urban Floodway
- UGZ - Urban Growth
- Urban Growth Boundary

Railway | Tram | River, stream | Lake, waterbody

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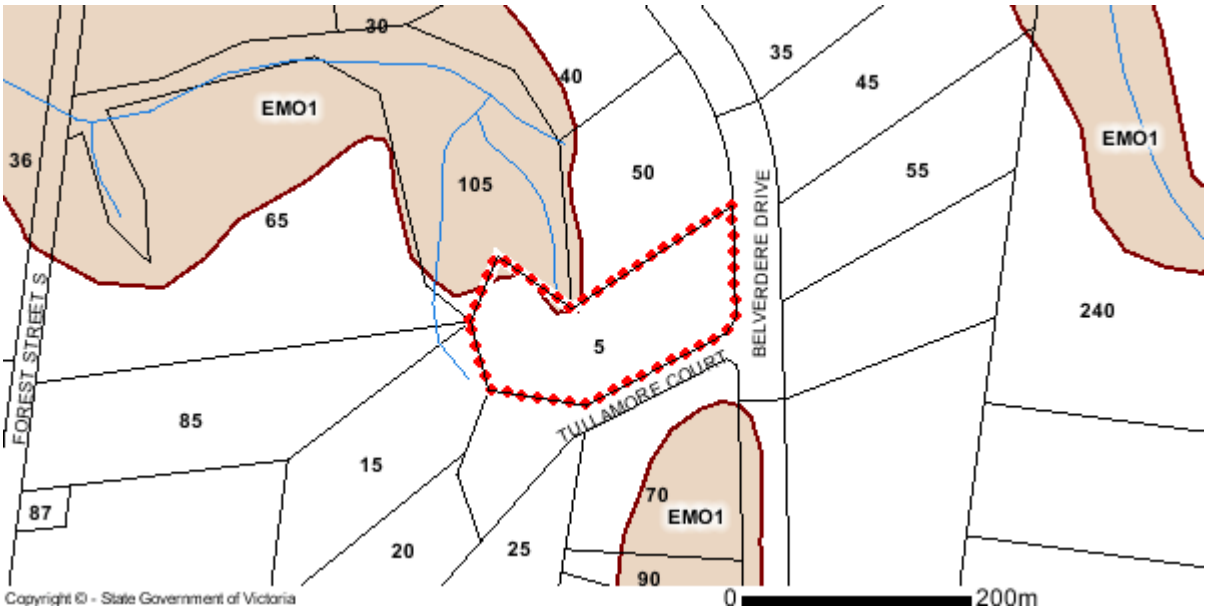
Department of Environment, Land, Water and Planning

Planning Overlays

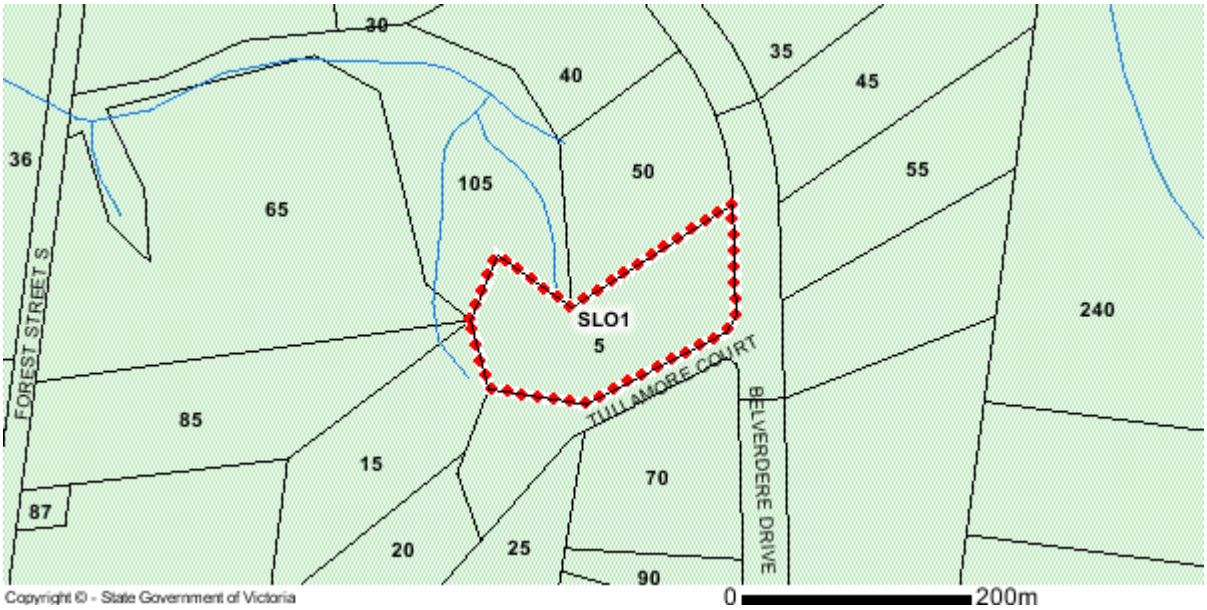
EROSION MANAGEMENT OVERLAY (EMO)

EROSION MANAGEMENT OVERLAY - SCHEDULE 1 (EMO1)



SIGNIFICANT LANDSCAPE OVERLAY (SLO)

SIGNIFICANT LANDSCAPE OVERLAY - SCHEDULE 1 (SLO1)



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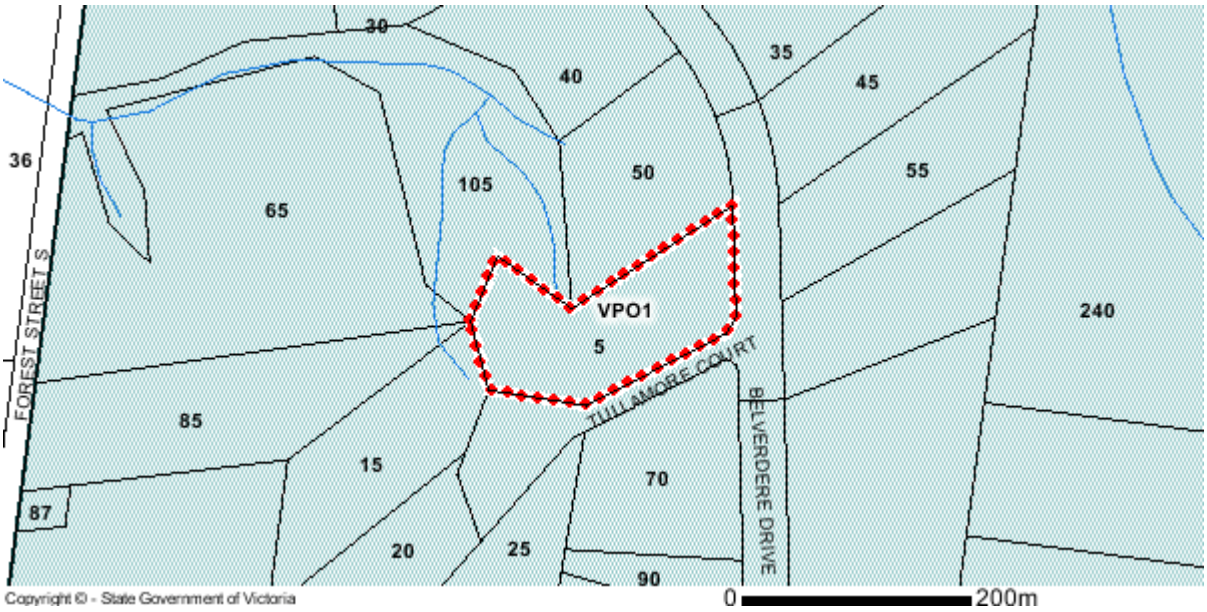
Planning Overlays

VEGETATION PROTECTION OVERLAY (VPO)

VEGETATION PROTECTION OVERLAY - SCHEDULE 1 (VPO1)



Overlays Legend

- AEO - Airport Environs
- BMO - Bushfire Management
- CLPO - City Link Project
- DCPO - Development Contributions Plan
- DDO - Design & Development
- DDOPT - Design & Development Part
- DPO - Development Plan
- EAO - Environmental Audit
- EMO - Erosion Management
- ESO - Environmental Significance
- FO - Floodway
- HO - Heritage
- ICPO - Infrastructure Contributions Plan
- IPO - Incorporated Plan
- LSIO - Land Subject to Inundation
- MAEO1 - Melbourne Airport Environs 1
- MAEO2 - Melbourne Airport Environs 2
- NCO - Neighbourhood Character
- PO - Parking
- PAO - Public Acquisition
- RO - Restructure
- RCO - Road Closure
- SBO - Special Building
- SLO - Significant Landscape
- SMO - Salinity Management
- SRO - State Resource
- VPO - Vegetation Protection

Railway Tram River, stream Lake, waterbody

Note: due to overlaps some colours on the maps may not match those in the legend.

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Further Planning Information

Planning scheme data last updated on 6 February 2019.

A **planning scheme** sets out policies and requirements for the use, development and protection of land.
This report provides information about the zone and overlay provisions that apply to the selected land.
Information about the State and local policy, particular, general and operational provisions of the local planning scheme that may affect the use of this land can be obtained by contacting the local council or by visiting Planning Schemes Online

This report is NOT a **Planning Certificate** issued pursuant to Section 199 of the *Planning and Environment Act 1987.*
It does not include information about exhibited planning scheme amendments, or zonings that may abut the land.
To obtain a Planning Certificate go to Titles and Property Certificates

For details of surrounding properties, use this service to get the Reports for properties of interest

To view planning zones, overlay and heritage information in an interactive format visit Planning Maps Online

For other information about planning in Victoria visit www.planning.vic.gov.au

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LAND CAPABILITY ASSESSMENT

Lot 3.
5 Tullamore Crt
Elliminyt, VICTORIA. 3250

2020Engineering Solutions
2/11/2019

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Welcome to our new format LCA.

Section 1.

Contains relevant information is presented in a concise, logical, trail following from regional perspective to site specific characteristics.

This section informs the size, location and exclusion zones for the LAA on Lot 3 of the proposed subdivision.

Section 2.

Contains the balance of information required under the DWMP, MAV, AS1547:2012and EPA 891.4 including additional information required for subdivisions.

Section 3.

Property Management Plan

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REPORT CONTENTS

REPORT SUMMARY/EXECUTIVE SUMMARY

REPORT SUMMARY/EXECUTIVE SUMMARY

This Report is to Lot 3 of three Lot sub-division and finds that each proposed allotment can sustainably manage wastewater within boundaries to EPA requirements based upon water balance calculations, soil type/s and suitably sized Land Application Area.

Lot One contains an existing dwelling and LAA wholly included within the proposed allotment.

The minimum allowed allotment in this zone is 0.40Ha,Lot 3 proposed is 0.607Ha thereby exceeding minimum requirement and providing adequate area for effluent disposal.

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SECTION ONE

INTRODUCTION & BACKGROUND

Property Details

Address

5 Tullamore Crt. Elliminyt, Victoria.

Lot and Plan Number

Part CA 51 & 52, Parish of Elliminyt, County of Polwarth.

SPI

21\ PS322547

LGA

Colac Otway Shire

Zoning

Low Density Residential Zone

Overlays

EMO(Part) SLOVPO

Property Size

Total 2.2091Ha

Proposed

Lot 1 9954m2(Contains existing development)

Lot 2 6070m2

Lot 3 6070m2

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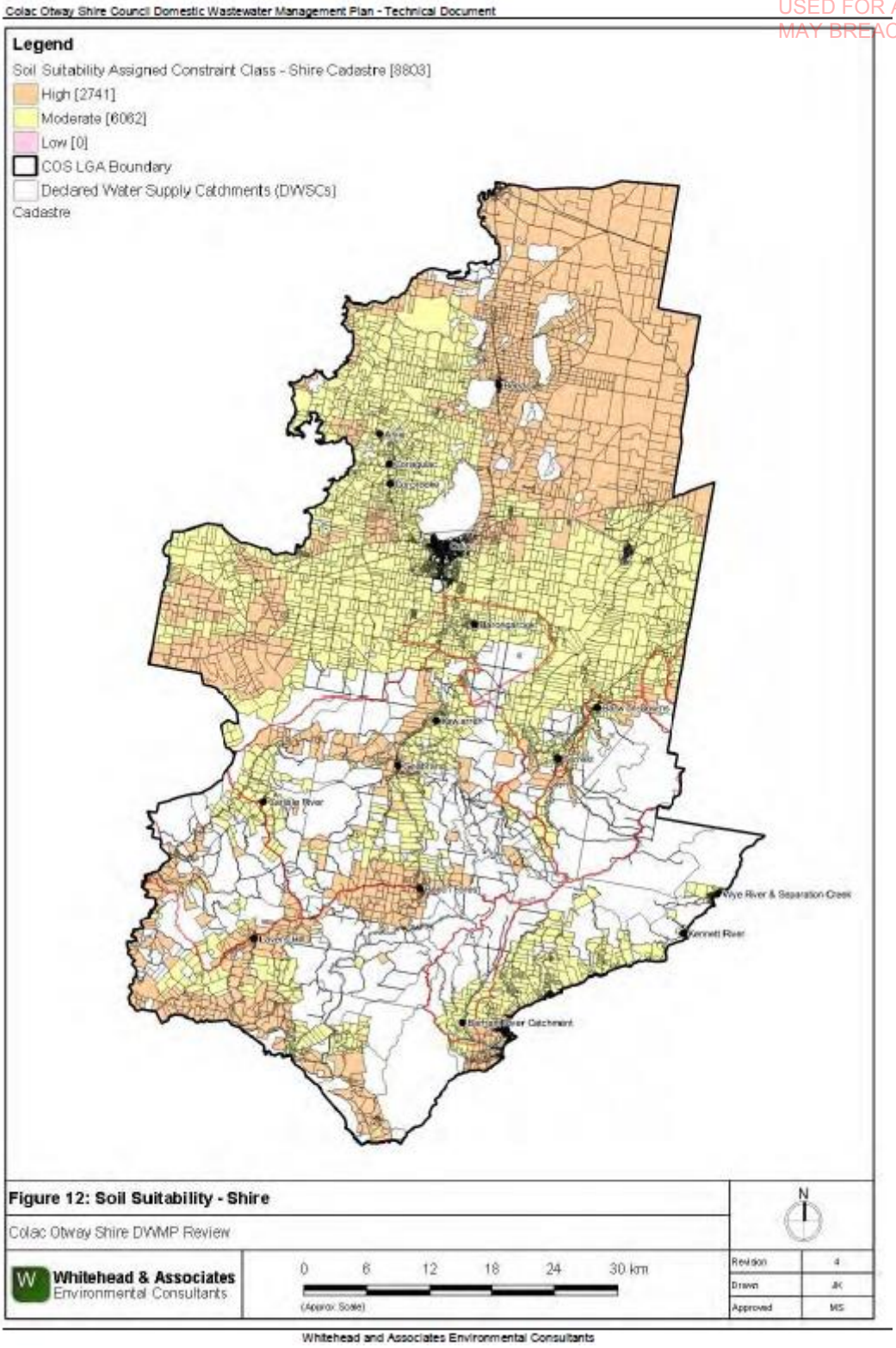
Property Sensitivity



Property size at this scale makes identification difficult however it would appear to be Moderate Sensitivity (DWMP) Standard Report.(DWMP)

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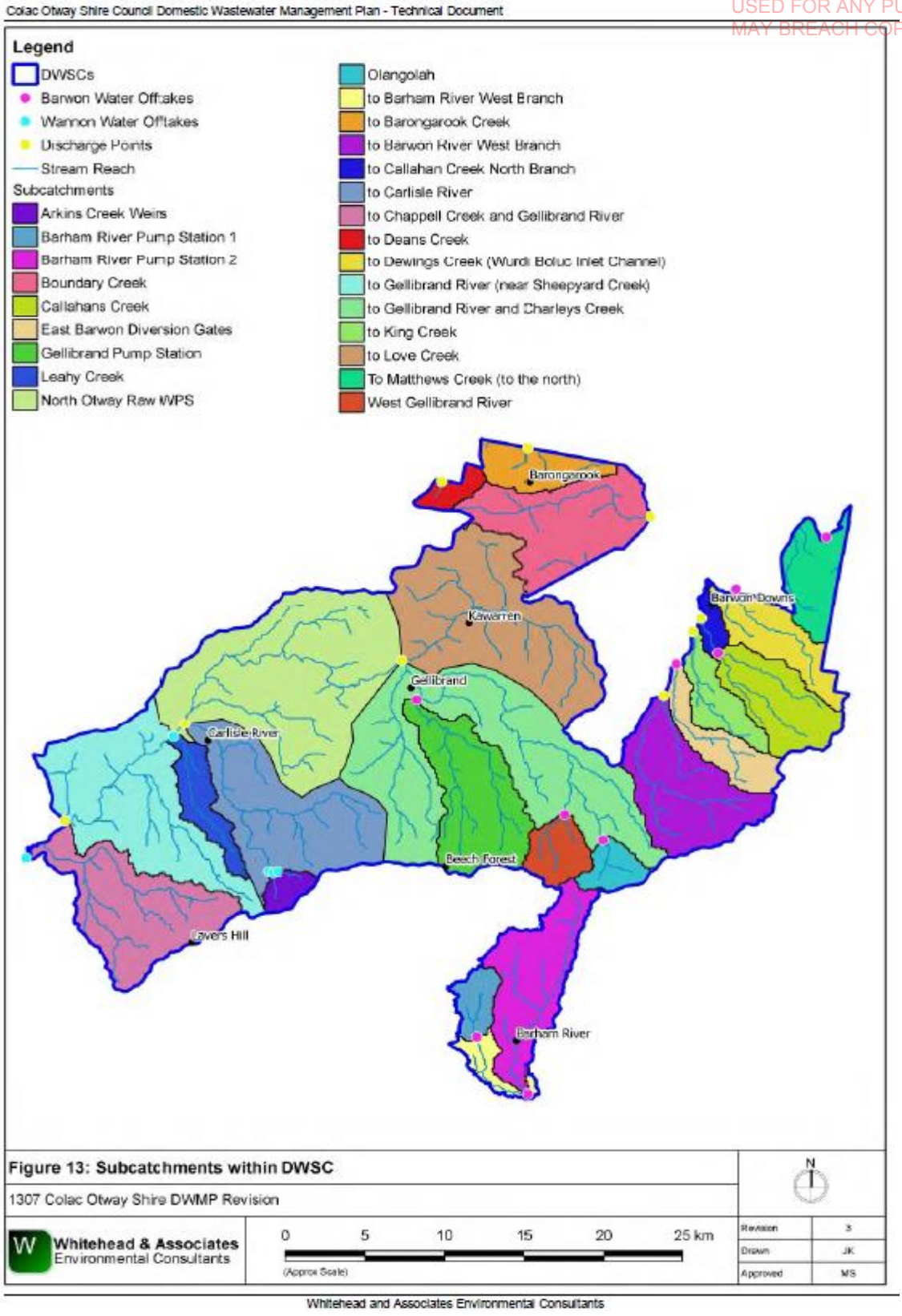
3.0 DECLARED WATER CATCHMENT AREA



Subject land <u>is not within</u> a DWSC

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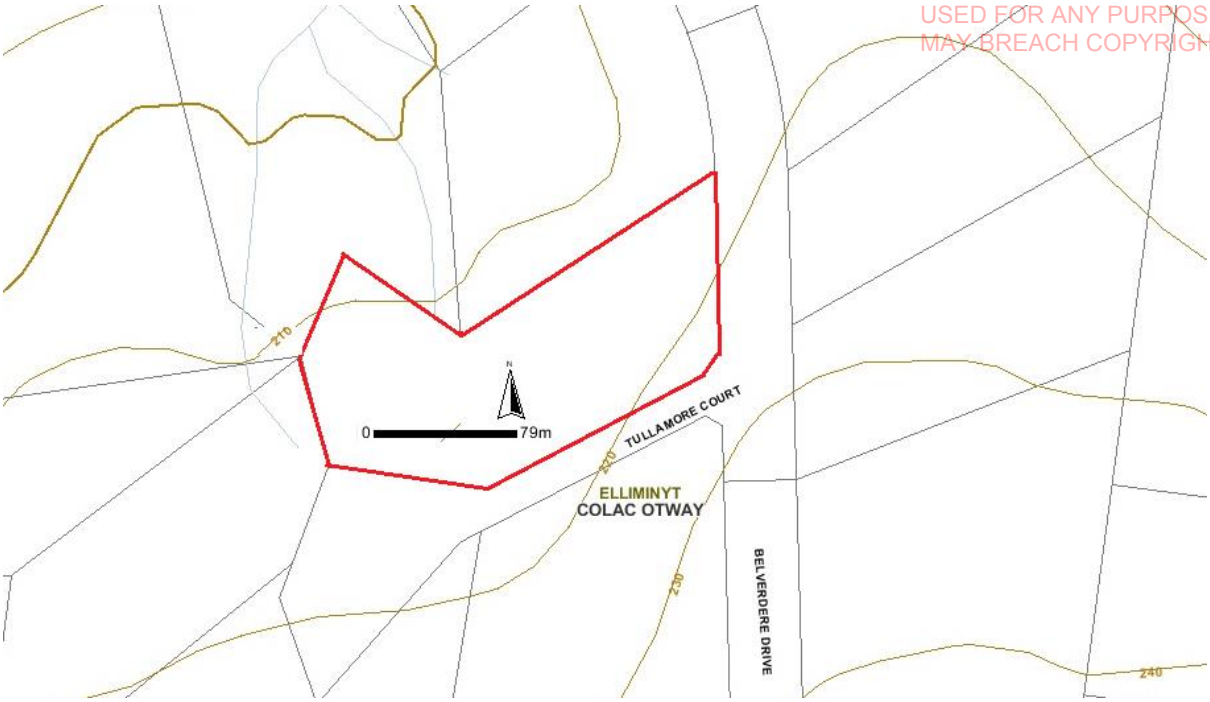
4.0 TOPOGRAPHY



Topography and surface water/s. (Planning Maps Online).

Comment.

Subject land displays a NW aspect with surface slopes <5% to the northwest with excellent solar and wind exposure.

The nearest surface water is indicated as starting almost at the northern junction of Lots 1 &2. This feature will generate a setback of 30m for secondary treatment or 60m for primary treated effluent, but only in Lot 2, all of Lot 3 is outside this buffer.

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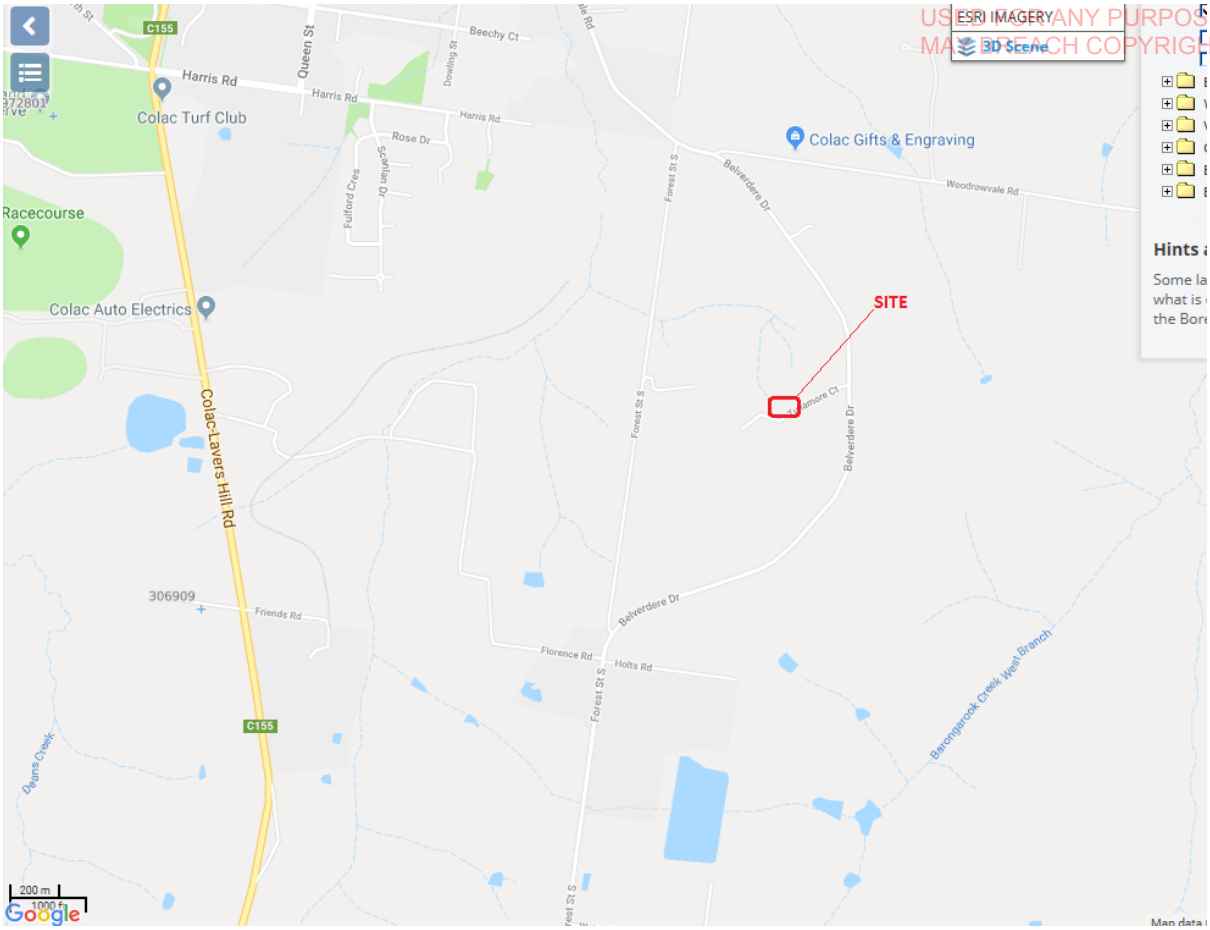
GROUNDWATER



Groundwater bores (VVG)

Comment

VVG data base indicates no mapped bores on or near the subject land.

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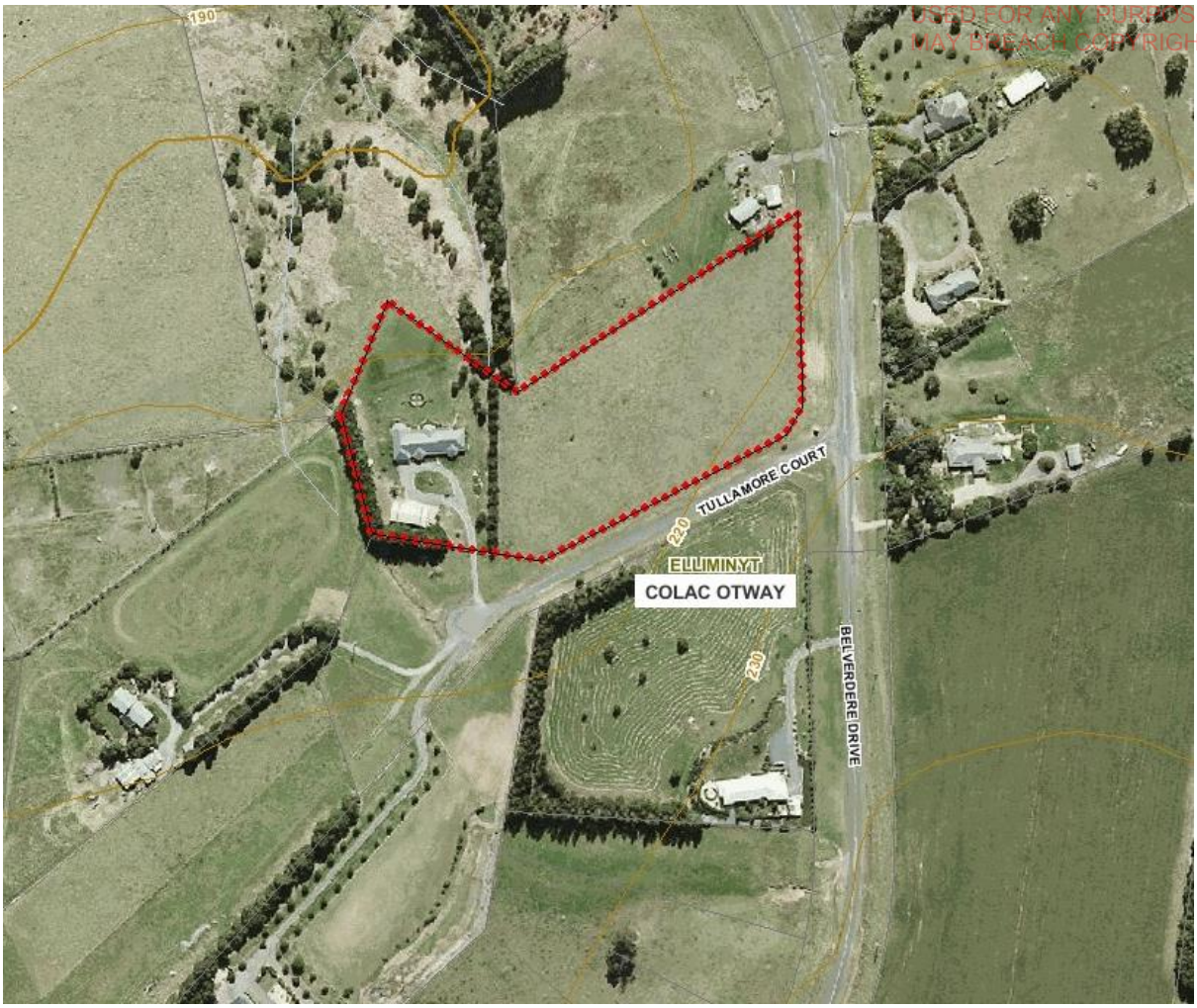
5.0. REGIONAL LAND USE



Aerial image indicates surrounding land use,cleared,open grassland, plantation and low density residential . (Planning Maps Online)

Above image shows existing LAA contained within proposed Lot 1, as a green strip.

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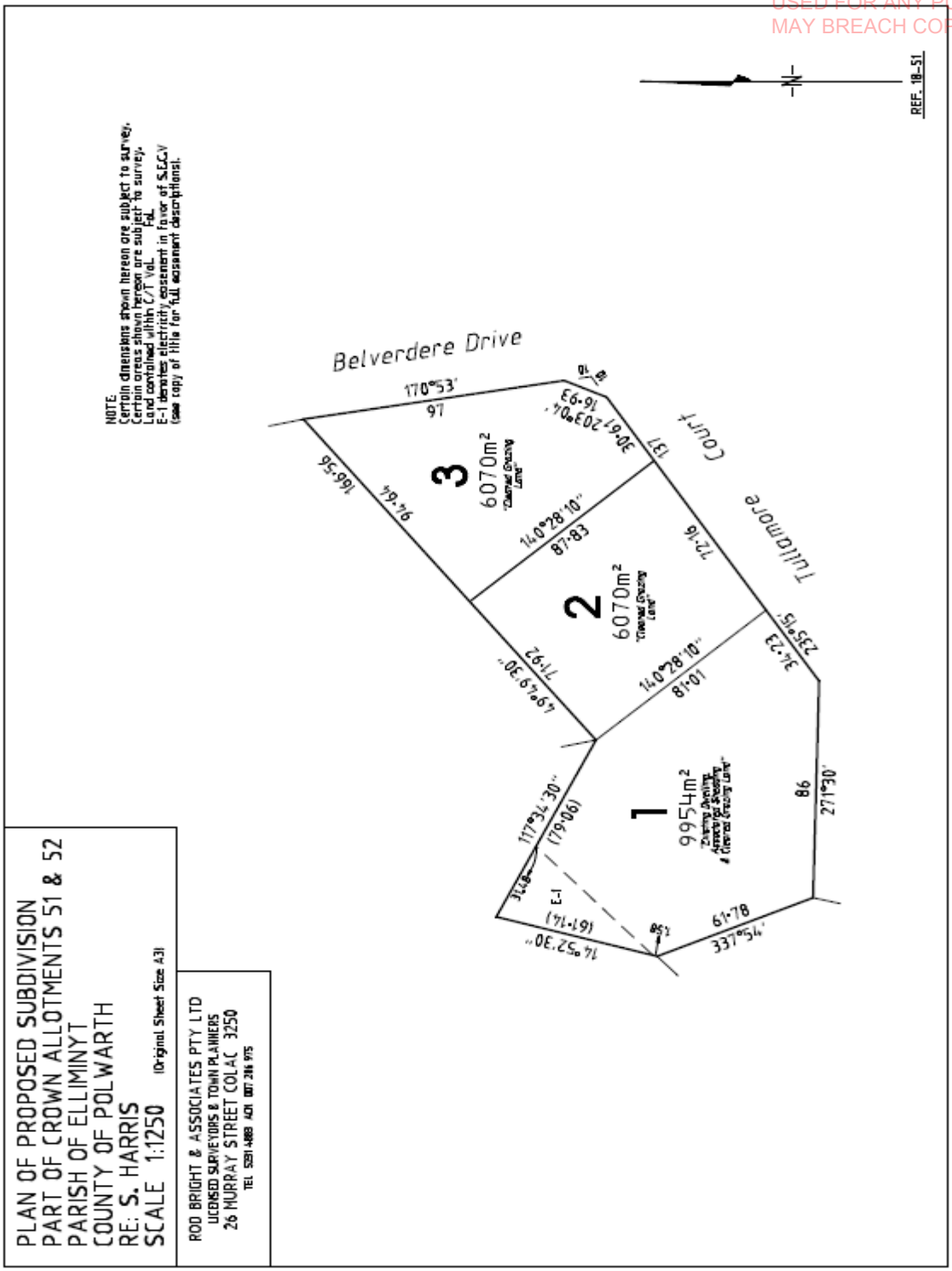
6.0 Proposal



Proposed sub-division.(Rod Bright & Ass.).

Comment;

While the proposal is for a subdivision, this Report will develop LAA based upon a 5 bedroom development with water reduction fittings, deemed to produce 900 l/d.

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7.0 Site Features

View to west across Lot 3 to Lot 2, Lot 1, behind plantation.(Author).

Comment

From the site inspection, the subject land does not exhibit land unsuitable for effluent disposal aside from the small portion of FILL adjoining the road reserve.

This area of FILL will be identified in developed site maps later in the Report.

A setback of 6.0m will be required from the property on the photo left and Lot 2.

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8.0 BORELOG

Soil profile typical of subject land (Author).

Comment

Based upon the site investigation and numerous LCA investigations across the larger subdivision, the subject land, including proposed Lot 3, can expect to contain a 3b type soil over a 4a subsoil.

From Appendix A, Table 9, a 4a soil can expect to display a DIR of 12.

Elliminyt climate data is not included in the DWMP, data from Barongarook is used. Elliminyt can be expected to have a higher rainfall and lower evaporation rate than Barongarook, introducing a margin of safety into the design.

The following water balance spread sheets indicate required areas based upon foregoing parameters.

Primary treatment systems are supported under the DWMP for the Barongarook area and as such also Elliminyt, especially if there are no constraints.

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9.0 SOIL ANALYSIS

Nutrient Advantage
Knowledge | Productivity | Responsibility

SOIL ANALYSIS REPORT

ASPAC

Report Number: 575209

2020 ENGINEERING SOLUTIONS L
DELAHUNTY
1745 COLAC FORREST RD
COLAC
VIC 3249

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

Report Authorised
Paul Kennelly
Laboratory Manager
NATA Accredited Laboratory
Number: 11958

Sample Number:	021908761	**Paddock Name:**	ES1916 1	**Date Sampled:**	12-Feb-2019
Test Code:	2014-022	**Sample Name:**	#2	**Date Received:**	19-Feb-2019
Purchase Order No:	AS1289	**Sample Depth:**	0 to 10 cm	**Date of Report:**	26-Feb-2019
Grower Name:	2020 ENGINEERING SOLUT				

Analyte	Result	Units	Method Code	Comments
Available Potassium ^	16	mg/kg	04-026-ICP8	Calculation
Emerson Class ^	7			Emerson, AS 1289.3.8.1
pH (1:5 CaCl2)	4.4		04-031-PH	1:5 soil/0.01M CaCl2
Potassium (Amm-acet.)	0.040	cmol(+)/kg	04-026-ICP8	
Calcium (Amm-acet.)	1.1	cmol(+)/kg	04-026-ICP8	
Magnesium (Amm-acet.)	0.40	cmol(+)/kg	04-026-ICP8	
Sodium (Amm-acet.)	0.16	cmol(+)/kg	04-026-ICP8	
Aluminium (KCl)	44	mg/kg	04-027-ICP9	
Aluminium (KCl)	0.48	cmol(+)/kg	04-027-ICP9	
Cation Exchange Capacity (Amm-acet.)	2.14	cmol(+)/kg	04-026-ICP8	Calculation
Sodium % of cations	7.3	%	04-026-ICP8	Calculation
Aluminium % of Cations	23	%	04-026-ICP8	Calculation
Calcium/Magnesium Ratio	2.8		04-026-ICP8	Calculation
pH (1:5 Water)	5.3		04-031-PH	1:5 soil/water
Electrical Conductivity (1:5 water)	0.07	dS/m	04-031-PH	1:5 soil/water

The results pertain only to the sample submitted.
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Analyses performed on soil dried at 40 °C and ground to 2mm or less.
^ NATA accreditation does not cover the performance of this service.

Accredited for compliance with ISO/IEC 17025 - Testing.
This results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national

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8 South Rd, Werribee Vic 3030
Toll-free: 1800 803 453 Fax: (61 3) 9974 0699

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Page 1 of 1

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10.0 SIZING TABLES

INPUT DATA					
Design Wastewater Flow	Q	900	L/day	Based on maximum potential occupancy and derived from Table 4 in the EPA Code of Practice (2013)	
Design Irrigation Rate	DIR	12.0	mm/day	Based on soil texture class/permeability and derived from Table 9 in the EPA Code of Practice (2013)	
Nominated Land Application Area	L	1200	m^2	[1]	
Crop Factor	C	0.6-0.8	unitless	Estimates evapotranspiration as a fraction of pan evaporation; varies with season and crop type[2]	
Rainfall Runoff Factor	RF	0.9	unitless	Proportion of rainfall that remains onsite and infiltrates, allowing for any runoff	
Mean Monthly Rainfall Data		DWMP		BoM Station and number	
Mean Monthly Pan Evaporation Data		DWMP		BoM Station and number	

Parameter	Symbol	Formula	Units	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Days in month	D		days	31	28	31	30	31	30	31	31	30	31	30	31	365
Rainfall	R		mm/month	44	44	55	77	90	110	109	117	101	92	69	59	967
Evaporation	E		mm/month	129	106	88	54	33	22	25	37	55	81	97	119	846
Crop Factor	C		unitless	0.80	0.80	0.70	0.70	0.60	0.60	0.60	0.60	0.70	0.80	0.80	0.80	
OUTPUTS																
Evapotranspiration	ET	ExC	mm/month	103	85	62	38	20	13	15	22	39	65	78	95	633.7
Percolation	B	DIRxD	mm/month	372.0	336	372.0	360.0	372.0	360.0	372.0	372.0	360.0	372.0	360.0	372.0	4380.0
Outputs		ET+B	mm/month	475.2	420.8	433.6	397.8	391.8	373.2	387.0	394.2	398.5	436.8	437.6	467.2	5013.7
INPUTS																
Retained Rainfall	RR	RxRF	mm/month	37.4	37.4	46.75	65.45	76.5	93.5	92.65	99.45	85.85	78.2	58.65	50.15	821.95
Applied Effluent	W	(QxD)/L	mm/month	23.3	21.0	23.3	22.5	23.3	22.5	23.3	23.3	22.5	23.3	22.5	23.3	273.8
Inputs		RR+W	mm/month	60.7	58.4	70.0	88.0	99.8	116.0	115.9	122.7	108.4	101.5	81.2	73.4	1095.7
STORAGE CALCULATION																
Storage remaining from previous month			mm/month	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Storage for the month	S	(RR+W)-(ET+B)	mm/month	-414.6	-362.4	-363.6	-309.9	-292.1	-257.2	-271.1	-271.5	-290.2	-335.4	-356.5	-393.8	
Cumulative Storage	M		mm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Maximum Storage for Nominated Area	N		mm	0.00												
	V	NxL	L	0												
LAND AREA REQUIRED FOR ZERO STORAGE			m^2	64	66	72	81	88	97	95	95	86	78	71	67	
MINIMUM AREA REQUIRED FOR ZERO STORAGE:				97.0	m^2											

CELLS

	Please enter data in blue cells
XX	Red cells are automatically populated by the spreadsheet
XX	Data in yellow cells is calculated by the spreadsheet, DO NOT ALTER THESE CELLS

NOTES

[1] This value should be the largest of the following: land application area required based on the most limiting nutrient balance or minimum area required for zero storage

[2] Values selected are suitable for pasture grass in Victoria

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Barongarook

Drip and Spray Irrigation Systems* - Secondary Treated Effluent only

	Soil Category	Gravels & Sands (1)	Sandy Loams (2)	Loams (3)	Clay Loams (4)	Light Clays (5)	Medium to Heavy Clays (6)	
	DIR (mm)	5	5	4	3.5	3	2	
Development Type	Daily (L/day)	Total min. irrigation area required for zero wet weather effluent storage (m²)†					N/A (Alternative Land Application System Required)	
5 + bedroom residence	1,080	386		600	831	1,350		
4 bedroom residence	900	322		500	693	1,125		
1-3 bedroom residence	720	258		400	554	900		

Note: * irrigation system sizes are based on the assumption that the land application area is less than 10% slope. Reductions in DIR apply for slopes above 10% according to Table M2 of AS1547:2012
† not including spacing and setbacks

Conventional Absorption Trenches and Beds - Primary Treated Effluent

	Soil Category	Gravels & Sands (1)	Sandy Loams (2)	Loams (3)	Weak Loams & High/Mod Clay Loams (3 & 4)	Weak Clay Loams (4)	Light Clays (5)	Massive Clay Loams (4)	Medium to Heavy Clays (6)
	DLR (mm)	Not supported (Alternative Land Application System Required)							
Development Type	Daily (L/day)								
5 + bedroom residence	1,080								
4 bedroom residence	900								
1-3 bedroom residence	720								

Evapotranspiration-Absorption Trenches and Beds - Primary Treated Effluent (Category 1 to 5) and Secondary Treated Effluent only (Category 6)

	Soil Category	Gravels & Sands (1)	Sandy Loams (2)	Loams (3a)	Weak/Massive Loams (3b)	High/Mod Clay Loams (4a)	Weak Clay Loams (4b) & Strong Light Clays (5a)	Massive Clay Loams (4c) and Mod & Weak Light Clays (5b, 5c)	Medium to Heavy Clays (6) - Secondary Effluent Only
	DLR (mm)	20*	20*	15	10	12	8	5	5
Development Type	Daily (L/day)	Total min. basal area required for zero wet weather storage (m²)†							
5 + bedroom residence	1,080	62		87	145	115	199	441	
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
1-3 bedroom residence	720	42		58	97	77	133	294	

Note: * Gravels, Sands and sandy loams are unsuitable for conventional absorption trenches and beds if there is a high waterable, including seasonal and perched waterables. Value based on average of conservative rate and maximum rate for Category 2b and 3a soils in AS1547:2012

LPED Irrigation Systems - Primary or Secondary Treated Effluent

	Soil Category	Gravels & Sands (1)	Sandy Loams (2)	Loams (3)	Clay Loams (4)	Light Clays (5)	Medium to Heavy Clays (6)	
	DIR (mm)	N/A	4	3.5	N/A	N/A	N/A	
Development Type	Daily (L/day)	(Alternative Land Application System Required)	Total min. basal or 'wetted area' (m²)†		(Alternative Land Application System Required)	(Alternative Land Application System Required)	(Alternative Land Application System Required)	
5 + bedroom residence	1,080		744	1,135				
4 bedroom residence	900		620	946				
1-3 bedroom residence	720		496	757				

† required for zero wet weather storage (m³) not including spacing & setbacks

Wick Trenches and Beds - Secondary Treated Effluent Only

	Soil Category	Gravels & Sands (1)	Sandy Loams (2) Loams (3) & High/Mod Clay Loams (4a,b)	Weak Clay Loams (4)	Massive Clay Loams (4)	Strong Light Clays (5a)	Moderate Light Clays (5b)	Weak Light Clays (5c)	Medium to Heavy Clays (6)
	DLR (mm)	25	30	20	10	12	8	5	5
Development Type	Daily (L/day)	Total min. basal or 'wetted area' required for zero wet weather storage (m²) not including spacing & setbacks							
5 + bedroom residence	1,080	49	40	62	145	115	199	441	
4 bedroom residence	900	41	33	52	121	96	166	368	
1-3 bedroom residence	720	33	27	42	97	77	133	294	

Whitehead and Associates Environmental Consultants

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Victorian Land Capability Assessment Framework

Trench & Bed Sizing

FORMULA FOR TRENCH AND BED SIZING			
L = Q/DLR x W			From AS/NZS 1547:2012
Where:	Units		
L = Trench or bed length	m		Total trench or bed length required
Q = Design Wastewater Flow	L/day		Based on maximum potential occupancy and derived from Table 4 in the EPA Code of Practice (2013)
DLR = Design Loading Rate	mm/day		Based on soil texture class/permeability and derived from Table 9 in the EPA Code of Practice (2013)
W = Trench or bed width	m		As selected by designer/installer

INPUT DATA				
Design Wastewater Flow	Q	900	L/day	Based on maximum potential occupancy and derived from Table 4 in the EPA Code of Practice (2013)
Design Loading Rate	DLR	12.0	mm/day	Based on soil texture class/permeability and derived from Table 9 in the EPA Code of Practice (2013)
Trench basal area required	B	75.0	m^2	
Selected trench or bed width	W	0.6	m	As selected by designer/installer

OUTPUT			
Required trench or bed length	L	125.0	m

CELLS	
	Please enter data in blue cells
XX	Red cells are automatically populated by the spreadsheet
XX	Data in yellow cells is calculated by the spreadsheet, DO NOT ALTER THESE CELLS

2020Engineering Solutions ACN 11 9460 865

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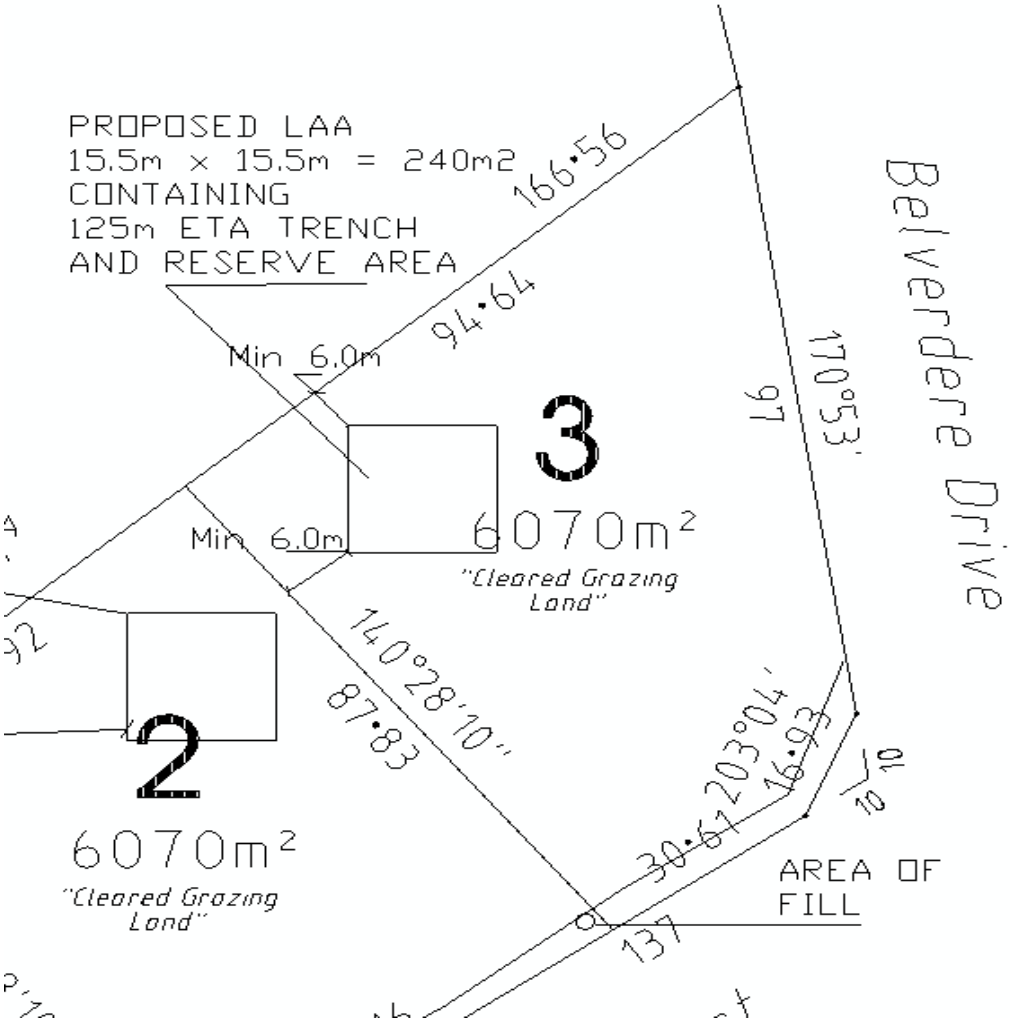
11.0 SIZING THE EFFLUENT DISPOSAL AREAS

Based upon the site inspection, the size of the allotment, the local environment and the guidelines within the controlling documents, this report recommends primary treatment system discharging to an ETA trench system.

The MAV calculations indicate 97m2 would be required, in general agreement with the DWMP recommendations of 115m2, again indicted as 125m of ETA trench.

Proposed Lot 2 has some restrictions on the location of the LAA due to the proximity of the streamline but no such restriction exists on Lot 3, see following site map and overall plan of subdivision.



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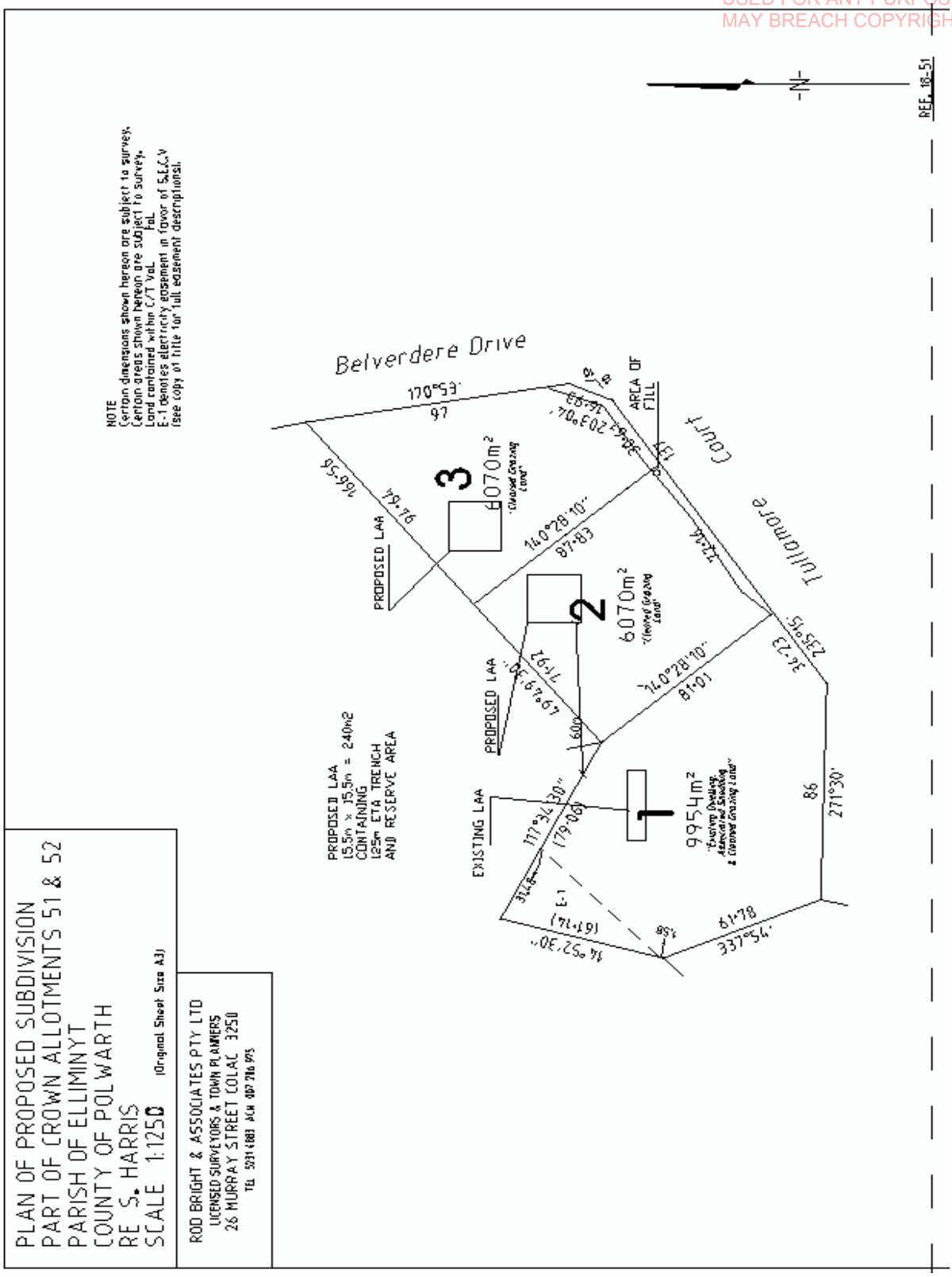
12. SITE PLAN



Scale drawing of proposed disposal area/s within subject land.(R.Bright&Ass/Author)

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12.1 Applicable Setback Distances (from AS1547:2012)

Landscape Feature / Structure	* Setback Distances (m)					
	Primary Treated Effluent		Secondary Sewage &Grey water Effluent		Advanced Secondary Grey water Effluent	
BUILDING						
Wastewater field up-slope of building	x	6		3		3
Wastewater field down-slope of building	x	3		1.5		1.5
Wastewater field up-slope of cutting/escarpment	x	15		15		15
ALLOTMENT BOUNDARY						
Wastewater field up-slope of adjacent lot	x	6		3		1
Wastewater field down-slope of adjacent lot	x	3		1.5		0.5
SERVICES						
Water supply pipe	x	3		1.5		1.5
Wastewater field up-slope of potable supply channel	x	300		150		150
Wastewater field down-slope of potable supply channel	x	20		10		10
Gas supply pipe	x	3		1.5		1.5
In-ground water tank	x	15		4		3
Stormwater drain	x	6		3		2
RECREATION AREAS						
Children's grassed playground	x	6		3		2
In-ground swimming pool	x	6		3		2
SURFACE WATERS UP-SLOPE OF						
Dam, lake or reservoir (potable water supply)	x	300		150		150
Waterways (potable water supply)	x	100		100		50
Waterways, wetlands (continuous or ephemeral, non-potable); estuaries, ocean beach at high-tide mark; dams, lakes or reservoirs (stock & domestic, non-potable)	x	60		30		30
GROUNDWATER BORES						
Category 1 & 2a soils		NA		50		20
Category 2b – 6 soils		20		20		20
WATERTABLE						
Vertical depth from base of trench to highest seasonal water table	x	1.5		1.5		1.5
	x					
Vertical depth from irrigation pipes to highest seasonal water table		NA		1.5		1.5

* X indicates compliance

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13 PLANNING AUTHORITY LAND CAPABILITY ASSESSMENT/CONFIRMATION

Date Received:

1. Forwarded to Referral Authority:	☐	Yes	☐	No
Authority Name:				
Date Forwarded:				
Response within Statutory Time Frame:	☐	Yes	☐	No
Referral Authority Advice Conforming:	☐	Yes	☐	No
Reason for Non-Conformance:				

2. Forwarded to Referral Authority:	☐	Yes	☐	No
Authority Name:				
Date Forwarded:				
Response within Statutory Time Frame:	☐	Yes	☐	No
Referral Authority Advice Conforming:	☐	Yes	☐	No
Reason for Non-Conformance:				

Planning Authority Advice Conforming:	☐	Yes	☐	No

Date Assessed:

Responsible Planning Officer:

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SECTION TWOMAV TABLES

Table 1: Key Site Features

Feature	Explanation	Assessment Process
Aspect	The aspect or the direction that a slope is facing influences solar exposure.	Slight W aspect, good wind solar exposure. No constraint
Climate	Seasonal rainfall, evaporation and temperature patterns influence potential evapotranspiration in land application areas.	Incorporated into water balance spread sheet/s and LAA sizing. Note 90th percentile used
Erosion and Landslip	Unstable areas (steep, unvegetated, dispersive soils etc.) are usually unsuitable for LAAs without mitigation.	No, outside EMO No constraint
Fill (imported)	Capacity to assimilate effluent depends on the physical and chemical characteristics of the imported fill material(s).	No fill in LAA No constraint
Flooding	Requirements for siting onsite wastewater infrastructure (including LAAs) away from areas subject to flooding can vary between Councils.	No. Elevated landform. No constraint
Ground-water	Adequate depth of soil to protect groundwater resources largely depends on soil type and climate.	Not noted in boreholes No constraint
LandSuitability	An LCA is used to determine which land is suitable and unsuitable for LAAs.	All land outside noted exclusion zones suitable for LAA. No constraint
Landform	Landform shape and the position of LAAs on slopes influence drainage and runoff characteristics both onto any potential LAAs as well as downslope of them (i.e. will runoff be evenly shed, or concentrated or dispersed flows?).	See contour map attached Broad even run-off from site. No constraint

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Feature	Explanation	Assessment Process
Rock Outcrops	Rock outcrops displace soil horizons and therefore can limit the assimilative capacity of LAAs for effluent. Outcrops can indicate shallow bedrock. Some rocks are strongly fissured and permeable and others are not.	Digging No Rock No constraint
Setback Distances	Determining the most appropriate position for LAAs should be prioritised over placement of building areas.	See included table from AS1547;2012 No constraint
Site Drainage	LAAs should be located in areas of good surface and subsurface (soil) drainage.	Good drainage, slight slope on land allowing slow run-off but no pooling. No constraint
Stormwater Run-on and Runoff	LAAs should not be located in areas with high run-on, without mitigation such as upslope diversion structures. Downslope runoff diversion may be useful.	Minimal run-off on to LAA No constraint
Slope	Land application of effluent becomes increasingly constrained with increasing slope gradient, increasing the chances of effluent runoff or subsurface seepage.	Slope of land generally <5.0% Down to west. No constraint
Surface Waters	Whether the setback distances specified in the Code can be achieved from LAAs.	Adequate setback from stream, 60m No constraint
Vegetation	Good vegetation cover is important to prevent erosion as well as for uptake of water and nutrients from effluent.	Grasses. Vigorous and extensive. No constraint

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Table 2: Description of Key Chemical and Physical Soil Features		
Feature	**Explanation**	**Assessment Process**
Cation Exchange Capacity	Influences the ability of the soil to hold and exchange cations; a major controlling agent for soil structural stability, nutrient availability for plants and the soil's reaction to fertilisers and other ameliorants (refer to Hazelton & Murphy, 2007).	2.14 Reasonable result skewed by the high result for aluminium.
Colour and Mottling	Gleyed soils indicate permanent saturation (permanent watertable), while orange, yellow and red mottles indicate seasonal saturation with intermittent periods of drying (perched or seasonal watertable).	No mottling noted No constraint
Electrical Conductivity **(EC)**	EC test result infers the salinity of the soil and its potential impact on plant growth on the LAA. Refer to Hazelton & Murphy (2007) for interpretation of EC test results. Application of effluent increases salt content of soils over time.	0.07dS/m <0.8 dS/m No Constraint

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Feature	Explanation	Assessment Process
Emerson Aggregate Class	EAC results infer dispersibility (as ped slaking, soil dispersion or both). LAAs should not be installed in soils with moderate or high dispersibility, without adequate mitigation (e.g. addition of gypsum, use of irrigation).	7 Moderate constraint. Mitigated by low overall slope preventing soil export.
Permeability and Design Loading Rate	The rate at which water moves through the soil reflects the soil's permeability and determines the rate at which effluent is applied to land in litres per square metre per day (mm per day). The application rate for each type of land dispersal and recycling system is listed in Table 9 in the Code. Whilst the loading rate for LAA design is based on the permeability, it is less than the true permeability.	DIR of 12.0
pH	Acid soils (pH <5) or alkaline soils (pH >8) may constrain plant growth and should be ameliorated by use of chemical additives (e.g. lime for acidity).	5.3 5.5-8.0 Optimum range 4.5-5.5 Acid loving plants suited
Rock Fragments	Coarse rock fragments displace soil volume and therefore can limit assimilative capacity of soils.	No rock <10% No constraint
Sodicity **[Exchangeable Sodium Percentage (ESP)]**	The percentage of sodium compounds on cation exchange sites on soil particles. ESP >6% may cause damage to the soil structure. Refer to Hazelton & Murphy (2007). Effluent and greywater contain sodium.	7.3 < 6% No constraint therefore generates minor constraint. See comment section
Sodium Absorption Ratio (SAR)	The ratio of sodium to calcium and magnesium (beneficial elements) in the soil solution, with higher ratios potentially damaging to plants and soils.	9.3 High ration of beneficial elements No constraint

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Feature	Explanation	Assessment Process
Soil Depth	Deeper soils generally have a greater assimilative capacity for effluent (depending on soil type).	>1.8m No constraint
Soil Texture	Soil textures are categorised as 1. Gravels and Sands 2. Sandy Loams 3. Loams 4. Clay Loams 5. Light Clays, or 6. Medium to Heavy Clays (AS/NZS1547:2012).	Loam over Light Clay Cat 2 over Cat 4. No constraint
Watertable (depth to)	The required soil depth to protect groundwater depends on soil type; high permeability soils generally require a greater separation distance (soil depth).	10.0m – 20.0m >2.0m No constraint

Comment

Of concern is the slightly elevated level of sodicity as expressed as a percentage. The identified level may be an anomaly as the associated indicators of salinity and dispersiveness are within 'normal' parameters indicating there is no systemic problem.

Salinity at 0.07 dS/m is very much lower than the MAV identified level generating concern of 0.8dS/m.

Likewise elevated levels of sodicity can be associated with high pH levels as sodium ions tie-up OH^- ions, however the site returned a low pH.

Aluminium was identified as the dominate cation. The addition of gypsum may improve soil structure and calcium content but must be applied and incorporated at the correct soil moisture content.

Plants for the area should be selected based upon tolerance to elevated aluminium levels.

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Table 3: Risk Assessment of Site Characteristics

Characteristic	Level of Constraint			Assessed Level of Constraint for Site
	Nil or Minor	Moderate	Major	
Aspect (affects solar radiation received)	North / North-East / North-West	East / West / South-East / South-West	South	NIL
Climate (difference between annual rainfall and pan evaporation)	Excess of evaporation over rainfall in the wettest months	Rainfall approximates to evaporation	Excess of rainfall over evaporation in the wettest months	MODERATE
Erosion [1] (or potential for erosion)	Nil or minor	Moderate	Severe	NIL
Exposure to sun and wind	Full sun and/or high wind or minimal shading	Dappled light	Limited patches of light and little wind to heavily shaded all day	NIL
Fill [2] (imported)	No fill or minimal fill, or fill is good quality topsoil	Moderate coverage and fill is good quality	Extensive poor quality fill and variable quality fill	NIL
Flood frequency (ARI) [3]	Less than 1 in 100 years	Between 100 and 20 years	More than 1 in 20 years	NIL
Groundwater bores [4]	No bores onsite or on neighbouring properties	Setback distance from bore complies with requirements in EPA Code of Practice 891.3 (as amended)	Setback distance from bore does not comply with requirements in EPA Code of Practice 891.3 (as amended)	MODERATE

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Characteristic	Level of Constraint			Assessed Level of Constraint for Site
	Nil or Minor	Moderate	Major	
Land area available for LAA	Exceeds LAA and duplicate LAA and buffer distance requirements	Meets LAA and duplicate LAA and buffer distance requirements	Insufficient area for LAA	NIL
Landslip (or landslip potential) [5]	Nil	Minor to moderate	High or Severe	NIL
Rock outcrops (% of surface)	<10%	10-20%	>20%	NIL
Slope Form (affects water shedding ability)	Convex or divergent side-slopes	Straight side-slopes	Concave or convergent side-slopes	MODERATE
Slope gradient [6] (%)				
(a) for absorption trenches and beds	<6%	6-15%	>15%	NIL
(b) for surface irrigation	<6%	6-10%	>10%	
(c) for subsurface irrigation	<10%	10-30%	>30%	
Soil Drainage [7] (qualitative)	No visible signs or likelihood of dampness, even in wet season	Some signs or likelihood of dampness	Wet soil, moisture-loving plants, standing water in pit, water ponding on surface, soil pit fills with water	MODERATE

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Characteristic	Level of Constraint			Assessed Level of Constraint for Site
	Nil or Minor	Moderate	Major	
Stormwater run-on	Low likelihood of stormwater run-on		High likelihood of inundation by stormwater run-on	MINOR
Surface waters - setback distance (m) [9]	Setback distance complies with requirements in EPA Code of Practice 891.3 (as amended)		Setback distance does not comply with requirements in EPA Code of Practice 891.3 (as amended)	MINOR
Vegetation coverage over the site	Plentiful vegetation with healthy growth and good potential for nutrient uptake	Limited variety of vegetation	Sparse vegetation or no vegetation	MINOR

Characteristic	Level of Constraint			Assessed Level of Constraint for Site
	Nil or Minor	Moderate	Major	
Soil Drainage [8] (Field Handbook definitions)	Rapidly drained. Water removed from soil rapidly in relation to supply, excess water flows downward rapidly. No horizon remains wet for more than a few hours after addition	Well drained. Water removed from the soil readily, excess flows downward. Some horizons may remain wet for several days after addition	Moderately well drained. Water removed somewhat slowly in relation to supply, some horizons may remain wet for a week or more after addition	Imperfectly drained. Water removed very slowly in relation to supply, seasonal ponding, all horizons wet for periods of several months, some mottling	Poorly/Very poorly drained. Water remains at or near the surface for most of the year, strong gleying. All horizons wet for several months	Moderate

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LCA Component	Additional Considerations for Multi-Lot LCAsMAV 2014
Characteristics of the development	Proposed lot size exceeds minimum for this zoning Cumulative impacts not anticipated due to the size of the proposed allotments and provision of reserve area/s.
Site assessment	With Lot 1 as a 'stand alone' allotment, lots 2 & 3 comprise a uniform hillside landscape. the use of trenches in this area appear to provide a suitable safe disposal method. Given the existing infrastructure, roads etc. subdivision layout is limited but some consideration of the nearby stream is to be taken into account for Lot 2 but Lot 3 is outside this buffer zone.
Soil assessment	Uniform soil profile across allotments, except for area of FIL, noted on site plan. Two soil samples taken and reported.
Land capability assessment	See site plan, all land suitable for effluent disposal except for FILL area, as identified in site plan.
Recommended management program (including system design)	Recommendations for treatment systems and disposal methods and areas in report and site plan. Proposed lots 2&3, sizes are 50% bigger than minimum required. Lot 3 has no major buffer or soil type restrictions

Comment

The foregoing MAV tables indicate five Moderate constraints, aspect, climate, slope andsoil drainage(2), all of which are possible to mitigate.

A west aspect produces a Moderate constraint but the proposed LAA site has very good solar and wind exposure enhancing evaporatranspiration and as such is not an insurmountable constraint.

Climate is difficult to mitigate however elevated rainfall figures are incorporated into the water balance equation to mitigate the potential of waterlogging.

Straight sided hillside landform produces a moderate constraint. This constraint is mitigated by placing the LAA along contours and directing excess roof and hardstand area/s to legal point of discharge.

From the site inspection and expert judgement, there is some evidence of winter waterlogging typical for the area, triggering the constraint. Once again, by careful location of the LAA, this constraint can be mitigated especially given the excellent depth of the soil.

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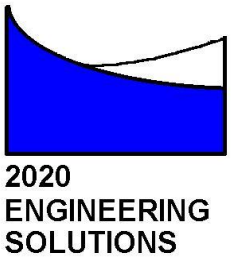
SECTION THREE

SITE MANAGEMENT PLAN



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www.2020es.com

PROPERTY MANAGEMENT PLAN

SITE: Tullimore Court

Elliminyt, VICTORIA

DEVELOPER: S. Harris

REPORT NUMBER: ES1934

DATE: Feb 2019

REPORTING TO: AS 1547:2012

On-site domestic wastewater management

EPA Publication 891.4 July 2016

Code of Practice Onsite Wastewater Management

Barwon Water / Wannon Water

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1 PREAMBLE

This Property Management Plan is intended for use by property owners in Barwon Water /Wannon Water drinking water supply catchments. It is written for occupancies with onsite wastewater treatment systems, but also applies to other developments where management of risk to downstream water quality is required.

This document must not be considered a definitive plan or control for all properties and wastewater systems. The landowner property management plan is drafted with consideration to planning permit requirements, EPA Publication 891.4 “Code of Practice Onsite Wastewater Management”, the Land Capability Assessment, and AS1547:2012 “On-site domestic wastewater management”.

The plan must be maintained by the landowner and amended when required. Any increased loading on the property or system failure requires the review of the existing Land Capability Assessment and Waste Water Management System. Any amendment to the plan must be submitted to Barwon Water/Wannon Water for endorsement.

The plan must be kept on site and be available for inspection by Council or other government agencies.

1.1 Property Owner Responsibilities

Property owners and occupiers are responsible for reducing risks to downstream water quality that originate from their property. This includes:

- ensuring pipework & wastewater systems don’t leak;
- keeping wastewater systems well maintained & in good repair;
- appropriately managing herbicides, pesticides & other chemicals;
- minimising erosion & sediment movement;
- maintaining buffers of native vegetation around watercourses;
- compliance with Council and EPA requirements; and
- implementing this Property Management Plan.

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2 EMERGENCY CONTACT NUMBERS

PROPERTY MANGEMENT PLAN	
EMERGENCY OR ONSITE WASTEWATER MAINTENANCE CONTACT NUMBERS	
POLICE, AMBULANCE, FIRE	000
PLUMBER	To be advised
ELECTRICIAN	To be advised
COUNCIL ENVIRONMENTAL HEALTH OFFICER	COLAC OTWAY SHIRE 03 5232 9400
EPA	1300 372 842
SYSTEM SUPPLIER	COLAC CEMENT PRODUCTS 03 5231 5231or other
SYSTEM SERVICE AGENT	COLAC CEMENT PRODUCTS 03 5231 5231 or other
SEPTIC PUMPOUT TANKER	RICHARDSON'S LIQUID WASTE 03 5234 6585 or other
BARWON WATER	1300 656 007

If any of the following incidents, which could impact on downstream water quality, occur on site they should be reported to Barwon Water immediately:

Chemical spill Fuel spill Bushfire Landslip

3 SITE PLAN

Site plans drawn to scale (attached) show dimensions and include the following details:

- the site address, including lot number & street number;
- title boundaries;
- direction of north;
- location of groundwater bores on the site & adjacent properties;
- contour lines (at 1 - 10 m intervals), or direction of slope & slope in percent;
- location of dams & waterways onsite & within 100m of the property;
- drainage lines & springs;
- stormwater cut-off drains adjacent to land application area & treatment system;
- location of actual & proposed buildings, sheds, driveways, paths & paddocks;
- location of actual & proposed infrastructure, especially drains;
- location& dimensions of the wastewater treatment plan; and
- location& dimensions of the land application area.

The site plan must be amended when any of the above details change (including on issue of as-constructed drawings), and the amended plan must be provided to Barwon Water.

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4 DETAILS OF THE WASTEWATER TREATMENT SYSTEM

The plan requires the following details of the wastewater treatment system:

- manufacturer's manuals & spare parts list;
- as-installed drawings;
- copy of EPA Certificate of Approval;
- copy of Council wastewater system permit;
- description of the maintenance regime, to meet manufacturer's recommendations & the maintenance, monitoring & reporting requirements of the Council permit & the EPA certificate of approval; and
- in the case of a secondary treatment system, a copy of a current service contract with an accredited or experienced trained service technician to implement the maintenance regime.

All details relevant to the above will be available and submitted after issue of the permit as they are post developmental.

Sewage Treatment Plants

Developer to select suitable secondary treatment plant with EPA approval.

NOTE: Developer can supply following information post construction as most documentation relies upon approval to construct development and install a system. Included as example only. 2020Eng is independent and does not recommend particular systems.

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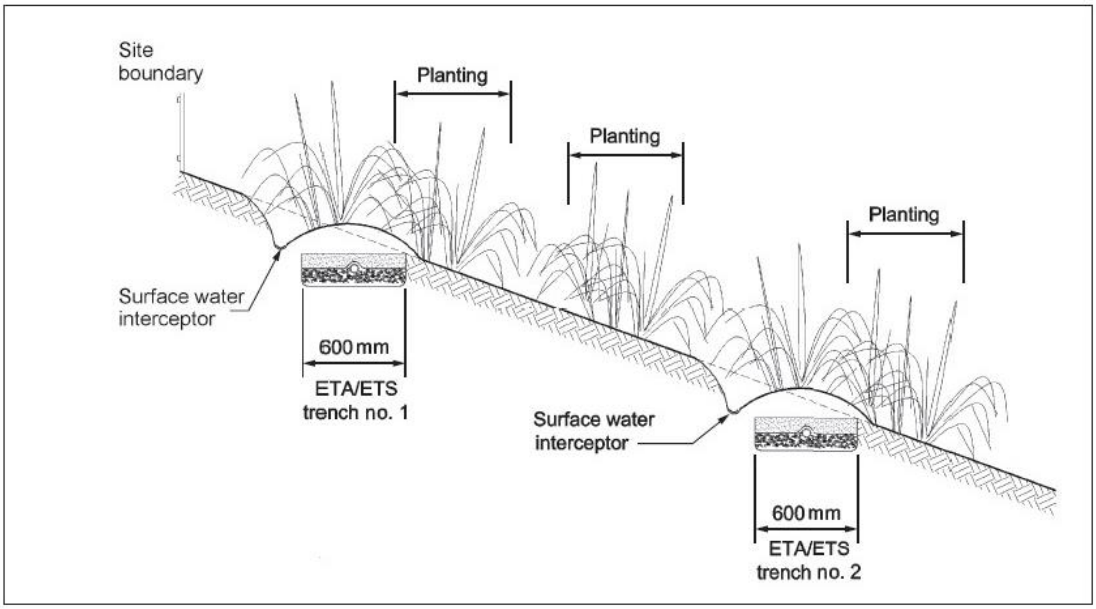
5 DETAILS OF THE EFFLUENT DISPOSAL SYSTEM(AS1547:2012)



NOTES:

1 An LPED line can be used to dose load the ETA/ETS trenches.

2 Each ETA/ETS trench is constructed to disperse effluent into downslope topsoil so that plantings can provide assistance by evapotranspiration.

FIGURE L7 ETA/ETS TRENCHES

The plan requires the following details of the effluent disposal system:

- manufacturer's manuals & spare parts list for components including pumps, valves, and filters;
- as-installed drawings; and
- description of the maintenance regime, to meet manufacturer's recommendations & the maintenance, monitoring & reporting requirements of Council & the EPA. At a minimum, visual inspection of the land application area is required whenever the treatment system is inspected.

All details relevant to the above will be available and submitted after issue of the permit as they are post developmental.

6 WASTEWATER TREATEMENT SYSTEM MAINTENANCE

The waste water treatment system, including its pipework shall:

- be inspected & maintained as per the maintenance regime;
- be protected from vehicle, farm machinery or livestock damage;

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- have any grease trap inspected at least quarterly & cleaned out regularly;
- have any vents kept clear & access covers in working order;
- be visually checked for damage especially after being pumped out - damage is to be repaired; and
- be replaced if not operating adequately.

Inspections of treatment units are to be recorded on the operation and maintenance log as well as any defects and repairs undertaken.

7 LAND APPLICATION AREA (Effluent Disposal) OPERATION & MAINTENANCE

The following measures shall be implemented:

- the land application area & disposal system shall be inspected & maintained as per the maintenance regime;
- any evapotranspiration areas shall be designed to exclude vehicle, farm machinery, or stock access;
- surface water diversion drains shall be maintained upslope of & around the land application area & kept clean; and
- roof water drainage / hard stand drainage must be diverted away from the land application area.

Evapotranspiration and irrigation areas shall:

- have their grass mown & plants maintained to ensure these areas take up nutrients with maximum efficiency;
- be checked for wet spots, uneven grass colour 7 symptoms of emitter blockage (evidenced by under-irrigated dry areas or over-irrigated wet areas); and
- have blocked or damaged irrigation lines replaced.

Equipment shall be checked in the following manner:

- the manufacturer's instructions for maintaining & cleaning pumps, siphons & septic tank & outlet filters shall be followed;
- disc filters or filter screens on irrigation-dosing equipment shall be cleaned at least annually by rinsing back into the primary wastewater treatment unit; and
- irrigation lines shall be flushed at least annually to scour out any accumulated sediment.

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Inspections are to be recorded on the Operations Log as well as any defects and repairs undertaken.

8 HOUSEHOLD MANAGEMENT OF WASTEWATER

The following measures should be implemented for optimum performance of system.

8.1 Sludge Build Up Reduction

- food waste including fats, grease & oils shall be disposed of in composting bin or worm farm
- no food waste disposal unit shall be installed
- sanitary napkins & hygiene products shall be disposed of in garbage

8.2 Encourage Bacteria

- use biodegradable soaps
- use low-phosphorus detergent
- use low-sodium detergent where soils are dispersive
- limit the use of cleaners such as bleaches, whiteners, nappy soakers & disinfectant, especially for toilet/shower cleaning
- do not put chemicals, thinners or paint down the drain or gulley trap

8.3 Reduce Effluent Volume Load

- install & use water conserving fittings ie. shower heads & appliances
- wash full loads only in dishwasher & washing machine
- avoid system overload ie. 1 washing machine load per day & run washing machine & dishwasher at different times
- do not install a spa bath

9 CONTINGENCY PLAN

The plan below shall be followed for a sudden failure of the wastewater system. A generalised flow chart of actions to be taken is:

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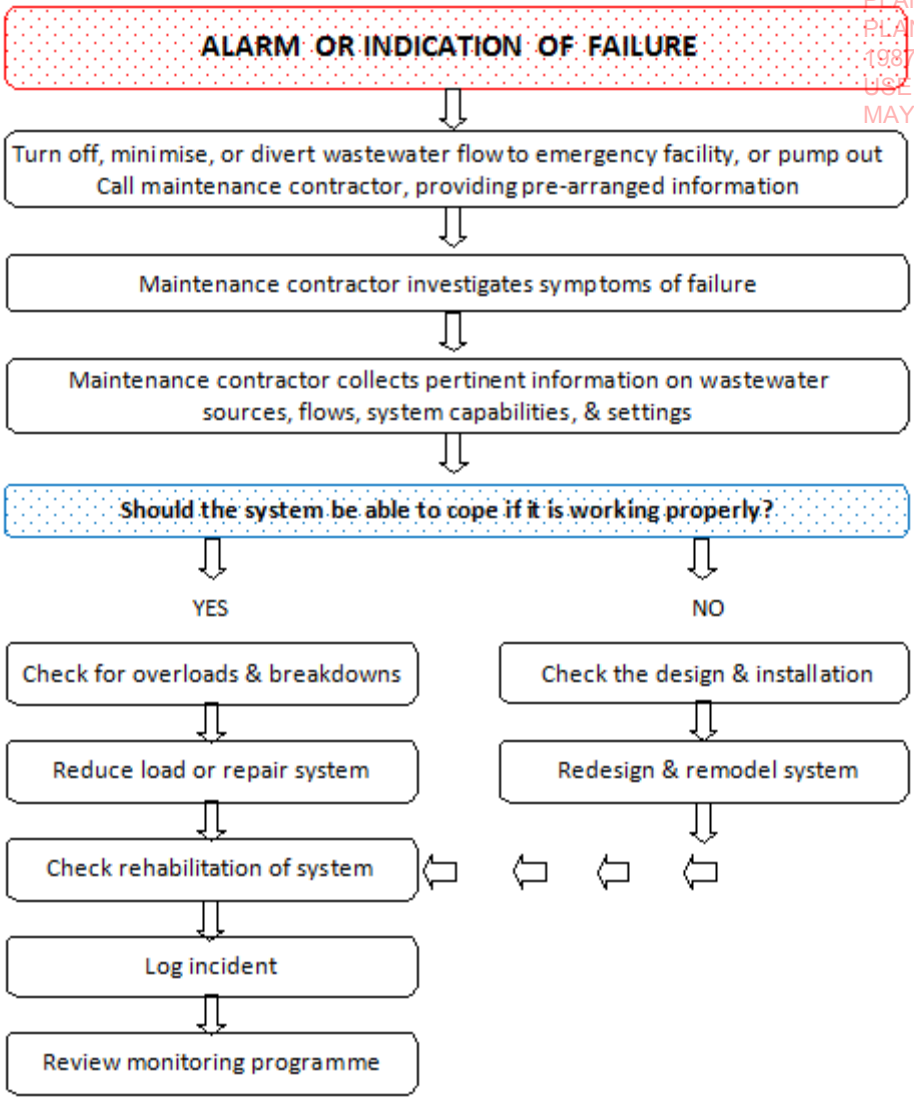

(Figure 6.3 from AS1547:2012)

10 SITE OPERATIONS & MAINTENANCE LOG

A site operation and maintenance log shall be kept for any wastewater system. This will assist in the determination of recurring problems/trends. The maintenance log is to show when scheduled maintenance is due. Matters to be recorded in the log include:

- pump out records;
- service records;
- inspections; and
- records of all irregular operation & response actions.

Copies of programmed maintenance and pump out (desludging) works performed by maintenance contractors, as required by the Council (septic tank) permit, are to be

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forwarded to the Council Environmental Health Officer. A copy of the latest maintenance certificate is to be retained with this property management plan and recorded on the maintenance log.

11 IDENTIFICATION, RISK ASSESSMENT & CONTROLS FOR OTHER POTENTIAL THREATS TO DOWNSTREAM WATER QUALITY

The landholder is required to identify and assess the risk of other potential threats to downstream water quality, resulting from the development and use of the property ie.

- erosion risks; and
- risks from storage & application of chemicals.

Construction methods should be carried out in a manner which will minimise soil, sediment and nutrient movement from the property to water courses during development and use of the property. Potential sources of sediment movement to consider are:

- tracks& driveways;
- high traffic areas (vehicular, human, animal); and
- construction areas (occupancy, roads, fencing).

The design of stormwater run-off from the site should be described. Activities to encourage native vegetation retention and re-establishment within a 30 metre buffer zone along waterways, and to exclude stock from waterways, should be described. Activities to prevent the spread of noxious weeds should be described.

Chemicals such as herbicides and pesticides can be a risk to downstream water quality. The landowner should follow manufacturer's instructions and be familiar with the advice available from: http://www.depi.vic.gov.au/agriculture-and-food/farm-management/chemical-use. Procedures for chemical application and storage should be described in the Property Management Plan.

Businesses should contact Barwon Water/Wannon Water to determine if a water quality monitoring program immediately up and down stream of works that pose a significant threat to water quality is required. This may include:

- analytical monitoring of turbidity following large-scale activities that could potentially result in sediment movement (e.g. cultivation, harvesting); and
- monitoring of the active ingredients within herbicides and pesticides following intensive and broad scale herbicide/pesticide applications.

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Appendix 1 Maintenance Log Template

Treatment System Inspections, Maintenance & Repairs			
Due Date (if scheduled)	Actual Date of Activity	Name of Inspector/ Contractor	Description of Work, Observations & Comments

Effluent Disposal Area Inspections, Maintenance & Repairs			
Due Date (if scheduled)	Actual Date of Activity	Name of Inspector/ Contractor	Description of Work, Observations & Comments

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12 INSURANCE CERTIFICATE OF CURRENCY

Integro Insurance Brokers Limited
1st Floor • 71 Fenchurch Street • London
EC3A 4BS
Telephone: (0)20 7444 6000
Fax: (0)20 7444 6001
Website: www.integrouk.com

MONDAY, 03 SEPTEMBER 2018

CERTIFICATE OF CURRENCY

POLICY NUMBER:	**IL1805880**
TYPE:	PROFESSIONAL INDEMNITY INSURANCE as may be more fully defined in the policy wording.
INSURED:	2020 Engineering Solutions
ADDRESS:	1745 Colac-Forrest Road Colac VIC 3249 Australia
PERIOD OF INSURANCE:	From: 31st August 2018 To: 31st August 2019 Both days at 16:00 Hours Local Standard Time at the Principal Address of the Insured
LIMIT OF INDEMNITY:	AUD 2,000,000 any one Claim and in the aggregate including Costs and Expenses plus one reinstatement
PLACED WITH:	100% Certain Underwriters at Lloyd's

For and on behalf of Integro Insurance Brokers Limited

This certificate is a summary of the policy and is not intended to amend, extend, replace or override the policy terms and conditions. In the event of any consistency between this certificate and the policy, the policy prevails.

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13 DISCLAIMER

2020 Engineering Solutions Pty Ltd ("2020")
Geotechnical Report Limitations

The report to which this document has been attached assesses risks arising from land slope instability and proposes risk minimisation solutions. Absolute risk avoidance cannot be assured, principally due to assessment cost factors. It is therefore necessary to rely on instructions and make assumptions.

Changed Conditions

The report may be invalidated by changed conditions including:-

1. topography.
2. soil moisture content.
3. above or below ground structures.
4. soil and substrate profiles.
5. location of site boundaries.

Causes of Changed Conditions

Changed conditions may occur due to:-

1. extreme conditions such as flood, drought, cold, heat or fire.
2. human activities.
3. natural processes.
4. planning or design requirements.

Client to inform 2020 of any changes

2020 will endeavour to identify any reasonably foreseeable risk factors on the site which may cause changed conditions. Samples are taken at reasonable intervals bearing in mind the cost to the client. In the absence of specific instructions or patent conditions it will be assumed that conditions observed in samples are consistent across the site.

This document is provided to inform the client that their responsibility for risk is shared with 2020. The client will be responsible for inaccurate instructions or failure to instruct in relation to changed conditions, events that may cause changed conditions or when it becomes evident that assumptions may be invalid. Failure to do so could result in substantial and costly damage and disputes.

Interpretation

The report must be considered in its entirety. Each part of the report may be dependent on other parts for meaningful interpretation. The report should also only be used by the client. It may not be relied upon by any other person without first conferring with 2020. The report should only be acted upon and interpreted by persons qualified and competent in the activities contemplated in the report.

130433 - 13 05 31 Geotechnical Report Limitation

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LAND CAPABILITY ASSESSMENT

Lot 2.
5 Tullamore Crt
Elliminyt, VICTORIA.3250

2020Engineering Solutions
2/11/2019

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Welcome to our new format LCA.

Section 1.

Contains relevant information is presented in a concise, logical, trail following from regional perspective to site specific characteristics.

This section informs the size, location and exclusion zones for the LAAs' on Lots 2 & 3.

Section 2.

Contains the balance of information required under the DWMP, MAV and EPA 891.4

Section 3.

Property Management Plan

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REPORT CONTENTS

REPORT SUMMARY/EXECUTIVE SUMMARY

REPORT SUMMARY/EXECUTIVE SUMMARY

This Report is to Lot 2 of a three Lot sub-division and finds that this and each proposed allotment can sustainably manage wastewater within boundaries to EPA requirements based upon water balance calculations, soil type/s and suitably sized Land Application Area.

Lot One contains an existing dwelling and LAA wholly included within the proposed allotment.

The minimum allowed allotment in this zone is 0.40Ha, Lot 2 proposed is 0.607Ha thereby exceeding minimum requirement.

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SECTION ONE

INTRODUCTION & BACKGROUND

Property Details

Address

5 Tullamore Crt. Elliminyt, Victoria.

Lot and Plan Number

Part CA 51 & 52, Parish of Elliminyt, County of Polwarth.

SPI

21\ PS322547

LGA

Colac Otway Shire

Zoning

Low Density Residential Zone

Overlays

EMO(Part) SLOVPO

Property Size

Total 2.2091Ha

Proposed

Lot 1 9954m2(Contains existing development)

Lot 2 6070m2

Lot 3 6070m2

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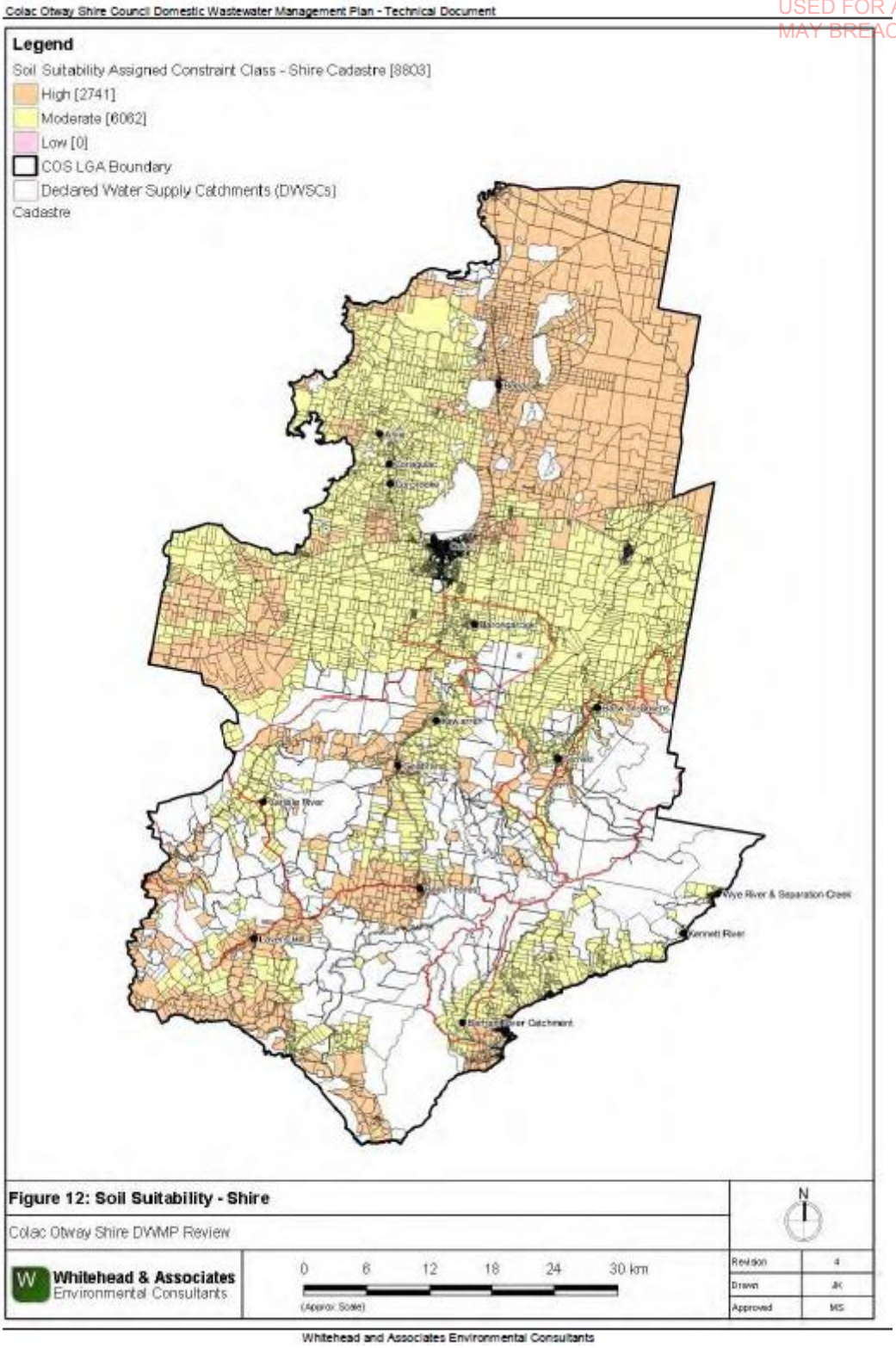
Property Sensitivity



Property size at this scale makes identification difficult however it would appear to be Moderate Sensitivity (DWMP) Standard Report.(DWMP)

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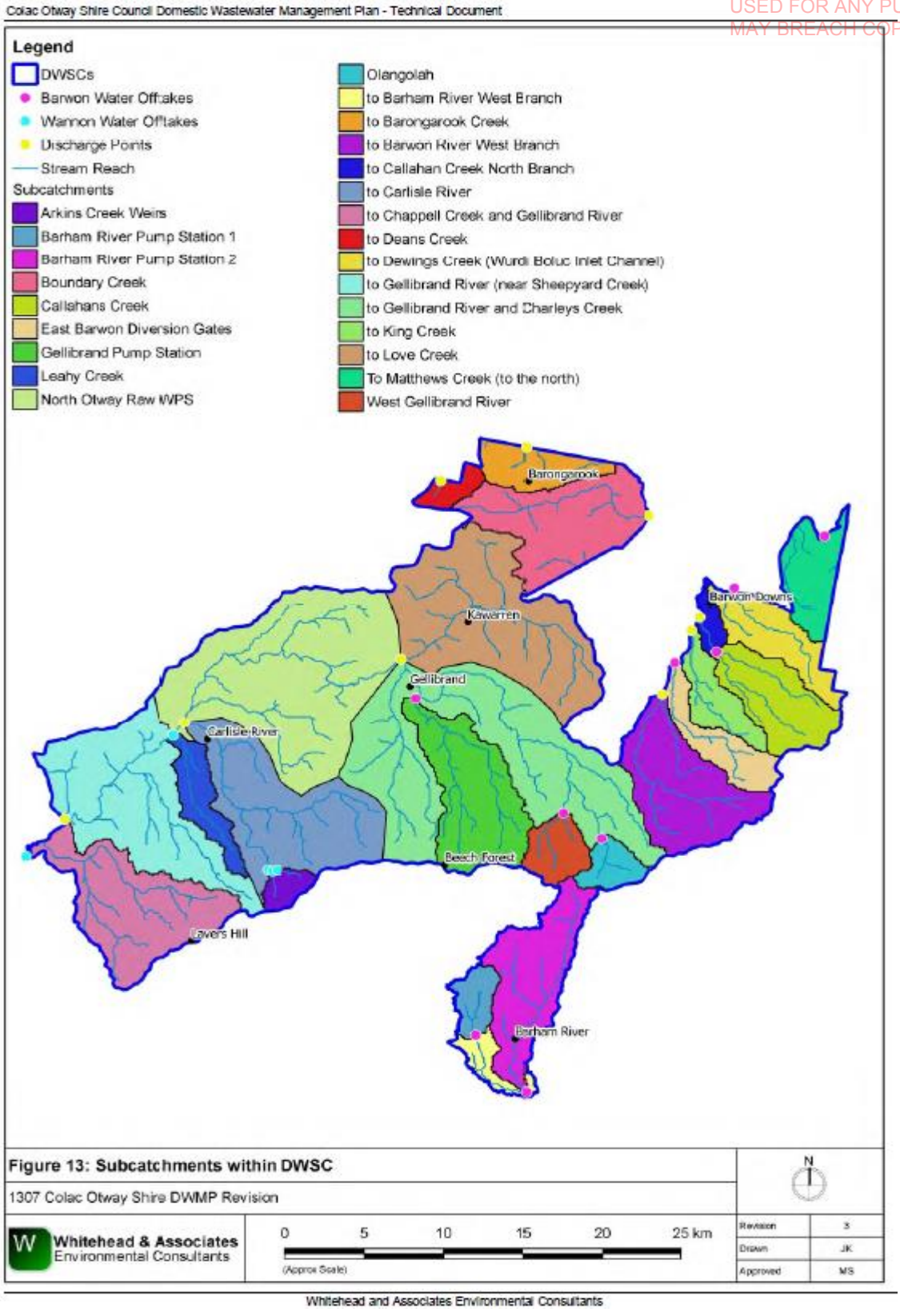
3.0 DECLARED WATER CATCHMENT AREA



Subject land <u>is not within</u> a DWSC

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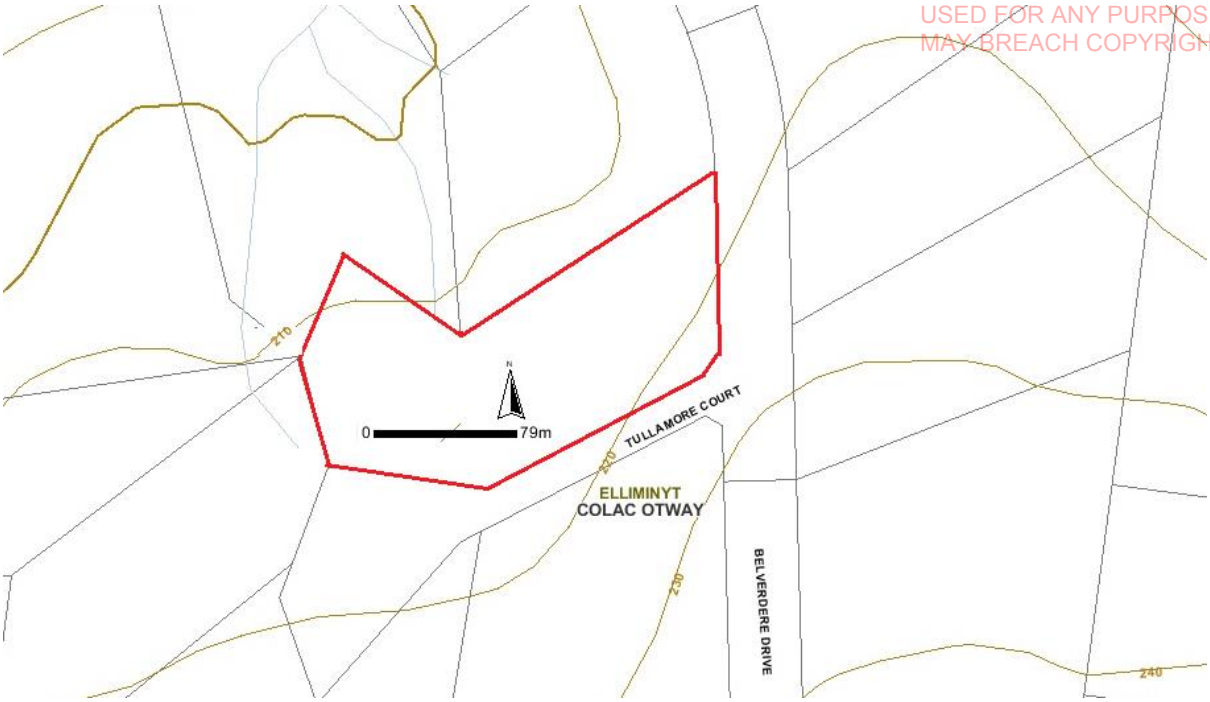
4.0 TOPOGRAPHY



Topography and surface water/s. (Planning Maps Online).

Comment.

Subject land displays a NW aspect with surface slopes around 5% to the northwest with excellent solar and wind exposure.

The nearest surface water is indicated as starting almost at the northern junction of Lots 1 &2. This feature will generate a setback of 30m for secondary treatment or 60m for primary treated effluent across Lot 2.

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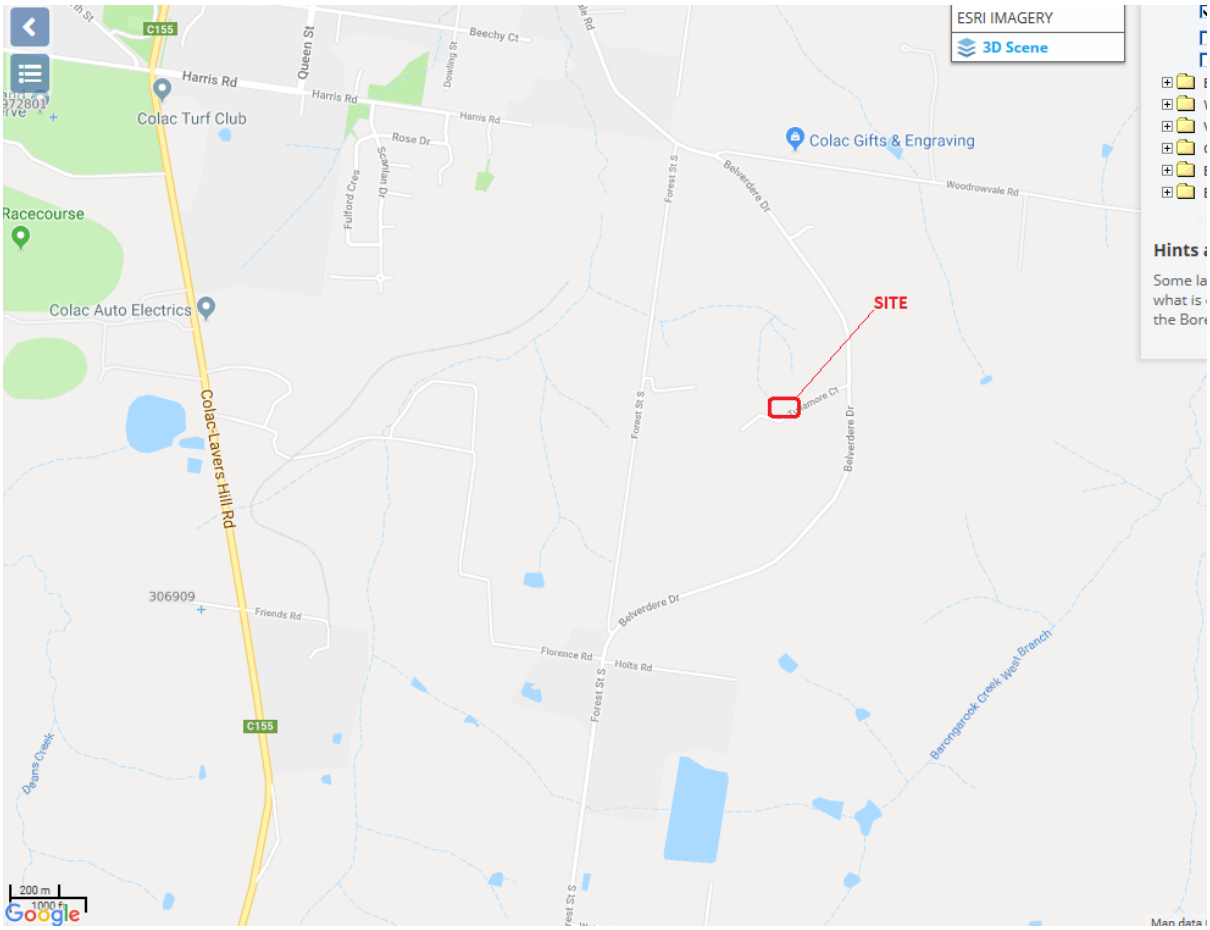
GROUNDWATER



Groundwater bores (VVG)

Comment

VVG data base indicates no mapped bores on or near the subject land.

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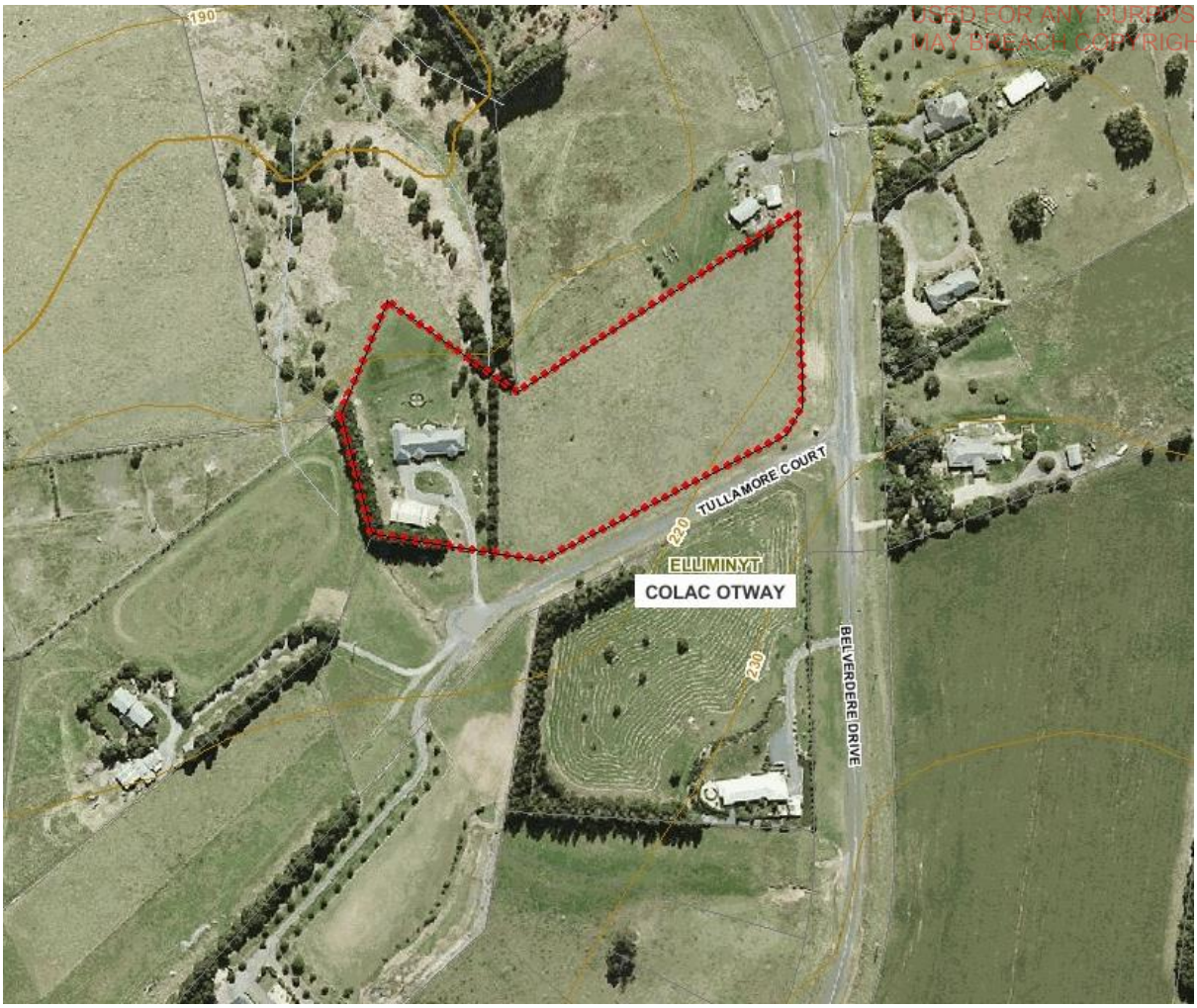
5.0. REGIONAL LAND USE



Aerial image indicates surrounding land use,cleared,open grassland, plantation and low density residential . (Planning Maps Online)

Above image shows existing LAA contained within proposed Lot 1.

Proposed Lot 2 contains open cleared grazing land.

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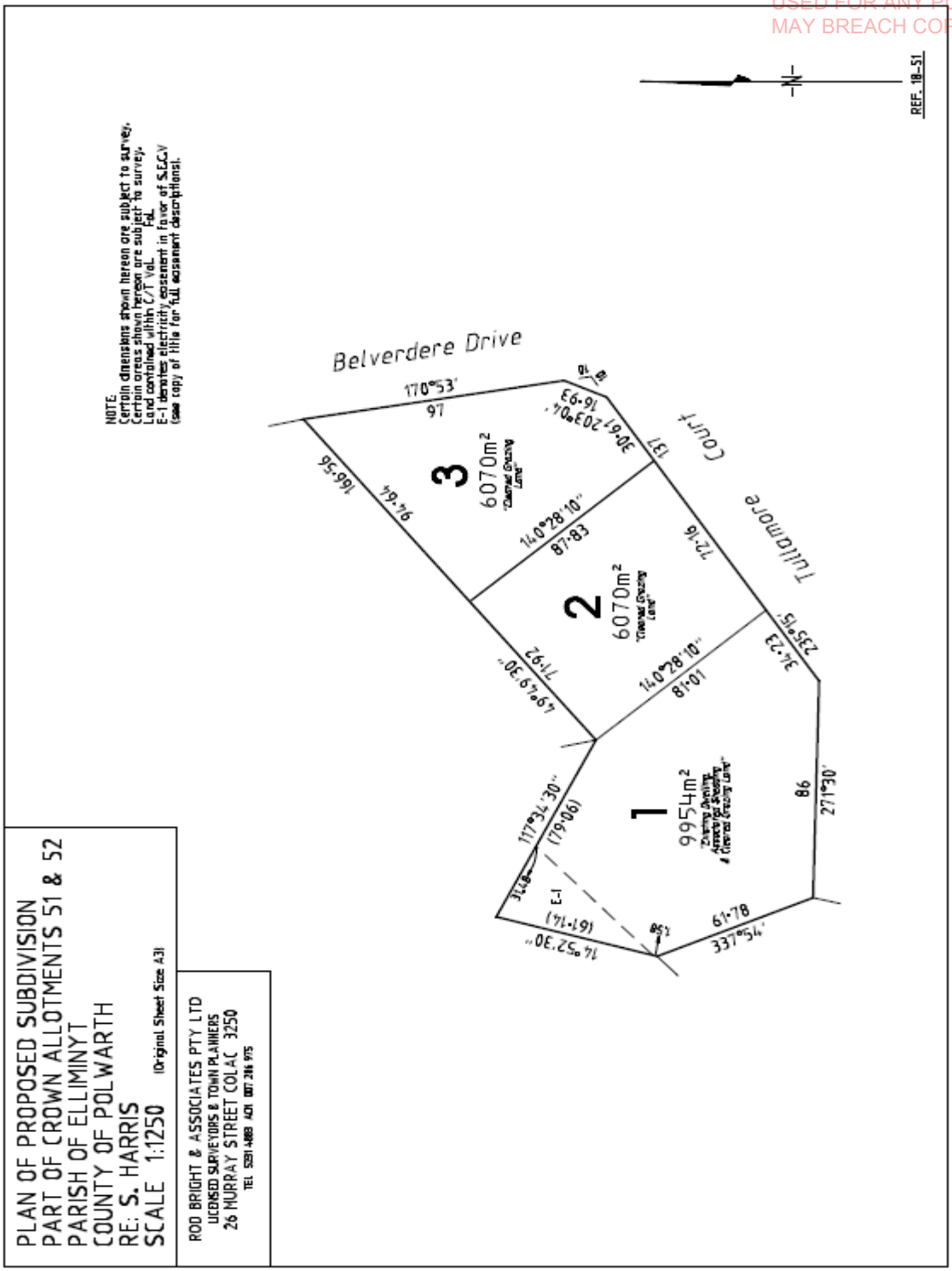
6.0 Proposal



Proposed sub-division.(Rod Bright & Ass.).

Comment;

While the proposal is for a subdivision, this Report will develop LAA based upon a 5 bedroom development with water reduction fittings, deemed to produce 900 l/d.

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7.0 Site Features

View to NW across Lot 2 to Lot 1, behind plantation.(Source).

Comment

From the site inspection, the subject land does not exhibit land unsuitable for effluent disposal aside from the small portion near the EMO coverage and an area of FILL adjoining the road reserve.

This area of FILL will be identified in developed site maps later in the Report.

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8.0 BORELOG

Soil profile typical of subject land (Author).

Comment

Based upon the site investigation and numerous LCA investigations across the larger subdivision, the subject land can expect to contain a 3b type soil over a 4a subsoil.

From Appendix A, Table 9, a 4a soil can expect to display a DIR of 12.

Elliminyt climate data is not included in the DWMP, data from Barongarook is used. Elliminyt can be expected to have a higher rainfall and lower evaporation rate than Barongarook, introducing a margin of safety into the design.

The following water balance spread sheets indicate required areas based upon foregoing parameters.

Primary treatment systems are supported under the DWMP for the Barongarook area and as such also Elliminyt, especially if there are no constraints.

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9.0 SOIL ANALYSIS

Nutrient Advantage®
Knowledge | Productivity | Responsibility

SOIL ANALYSIS REPORT

ASPAC

Report Number: 575059

2020 ENGINEERING SOLUTIONS L
DELAHUNTY
1745 COLAC FORREST RD
COLAC
VIC 3249

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

Report Authorised
Paul Kennelly
Laboratory Manager
NATA Accredited Laboratory Number: 11958

Sample Number:	021908762	**Paddock Name:**	ES1916	**Date Sampled:**	12-Feb-2019
Test Code:	2014-022	**Sample Name:**	#1	**Date Received:**	19-Feb-2019
Purchase Order No:	AS1289	**Sample Depth:**	0 to 10 cm	**Date of Report:**	25-Feb-2019
Grower Name:	2020 ENGINEERING SOLUT				

Analyte	Result	Units	Method Code	Comments
Available Potassium ^	42	mg/kg	04-026-ICP8	Calculation
Emerson Class ^	7			Emerson, AS 1289.3.8.1
pH (1:5 CaCl2)	4.5		04-031-PH	1:5 soil/0.01M CaCl2
Potassium (Amm-acet.)	0.11	cmol(+)/kg	04-026-ICP8	
Calcium (Amm-acet.)	1.6	cmol(+)/kg	04-026-ICP8	
Magnesium (Amm-acet.)	0.76	cmol(+)/kg	04-026-ICP8	
Sodium (Amm-acet.)	0.27	cmol(+)/kg	04-026-ICP8	
Aluminium (KCl)	34	mg/kg	04-027-ICP9	
Aluminium (KCl)	0.37	cmol(+)/kg	04-027-ICP9	
Cation Exchange Capacity (Amm-acet.)	3.07	cmol(+)/kg	04-026-ICP8	Calculation
Sodium % of cations	8.7	%	04-026-ICP8	Calculation
Aluminium % of Cations	12	%	04-026-ICP8	Calculation
Calcium/Magnesium Ratio	2.1		04-026-ICP8	Calculation
pH (1:5 Water)	5.3		04-031-PH	1:5 soil/water
Electrical Conductivity (1:5 water)	0.14	dS/m	04-031-PH	1:5 soil/water

The results pertain only to the sample submitted.
This document shall not be reproduced except in full.
Analyses performed on soil dried at 40 °C and ground to 2mm or less.
^ NATA accreditation does not cover the performance of this service.

Accredited for compliance with ISO/IEC 17025 - Testing.
This results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national

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8 South Rd, Werribee Vic 3030
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Page 1 of 1

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10.0 SIZING TABLES

INPUT DATA				
Design Wastewater Flow	Q	900	L/day	Based on maximum potential occupancy and derived from Table 4 in the EPA Code of Practice (2013)
Design Irrigation Rate	DIR	12.0	mm/day	Based on soil texture class/permeability and derived from Table 9 in the EPA Code of Practice (2013)
Nominated Land Application Area	L	1200	m^2	[1]
Crop Factor	C	0.6-0.8	unitless	Estimates evapotranspiration as a fraction of pan evaporation; varies with season and crop type[2]
Rainfall Runoff Factor	RF	0.9	unitless	Proportion of rainfall that remains onsite and infiltrates, allowing for any runoff
Mean Monthly Rainfall Data		DWMP		BoM Station and number
Mean Monthly Pan Evaporation Data		DWMP		BoM Station and number

Parameter	Symbol	Formula	Units	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Days in month	D		days	31	28	31	30	31	30	31	31	30	31	30	31	365
Rainfall	R		mm/month	44	44	55	77	90	110	109	117	101	92	69	59	967
Evaporation	E		mm/month	129	106	88	54	33	22	25	37	55	81	97	119	846
Crop Factor	C		unitless	0.80	0.80	0.70	0.70	0.60	0.60	0.60	0.60	0.70	0.80	0.80	0.80	
OUTPUTS																
Evapotranspiration	ET	ExC	mm/month	103	85	62	38	20	13	15	22	39	65	78	95	633.7
Percolation	B	DIRxD	mm/month	372.0	336	372.0	360.0	372.0	360.0	372.0	372.0	360.0	372.0	360.0	372.0	4380.0
Outputs		ET+B	mm/month	475.2	420.8	433.6	397.8	391.8	373.2	387.0	394.2	398.5	436.8	437.6	467.2	5013.7
INPUTS																
Retained Rainfall	RR	RxRF	mm/month	37.4	37.4	46.75	65.45	76.5	93.5	92.65	99.45	85.85	78.2	58.65	50.15	821.95
Applied Effluent	W	(QxD)/L	mm/month	23.3	21.0	23.3	22.5	23.3	22.5	23.3	23.3	22.5	23.3	22.5	23.3	273.8
Inputs		RR+W	mm/month	60.7	58.4	70.0	88.0	99.8	116.0	115.9	122.7	108.4	101.5	81.2	73.4	1095.7
STORAGE CALCULATION																
Storage remaining from previous month			mm/month	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Storage for the month	S	(RR+W)-(ET+B)	mm/month	-414.6	-362.4	-363.6	-309.9	-292.1	-257.2	-271.1	-271.5	-290.2	-335.4	-356.5	-393.8	
Cumulative Storage	M		mm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Maximum Storage for Nominated Area	N		mm	0.00												
	V	NxL	L	0												
LAND AREA REQUIRED FOR ZERO STORAGE			m^2	64	66	72	81	88	97	95	95	86	78	71	67	
MINIMUM AREA REQUIRED FOR ZERO STORAGE:			m^2	97.0												

CELLS

	Please enter data in blue cells
XX	Red cells are automatically populated by the spreadsheet
XX	Data in yellow cells is calculated by the spreadsheet, DO NOT ALTER THESE CELLS

NOTES

[1] This value should be the largest of the following: land application area required based on the most limiting nutrient balance or minimum area required for zero storage

[2] Values selected are suitable for pasture grass in Victoria

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Barongarook

Drip and Spray Irrigation Systems* - Secondary Treated Effluent only

	Soil Category	Gravels & Sands (1)	Sandy Loams (2)	Loams (3)	Clay Loams (4)	Light Clays (5)	Medium to Heavy Clays (6)		
	DIR (mm)	5	5	4	3.5	3	2		
Development Type	Daily (L/day)	Total min. irrigation area required for zero wet weather effluent storage (m²)†					N/A (Alternative Land Application System Required)		
5 + bedroom residence	1,080	386		600	831	1,350			
4 bedroom residence	900	322		500	693	1,125			
1-3 bedroom residence	720	258		400	554	900			

Note: * irrigation system sizes are based on the assumption that the land application area is less than 10% slope. Reductions in DIR apply for slopes above 10% according to Table M2 of AS1547:2012
† not including spacing and setbacks

Conventional Absorption Trenches and Beds - Primary Treated Effluent

	Soil Category	Gravels & Sands (1)	Sandy Loams (2)	Loams (3)	Weak Loams & High/Mod Clay Loams (3 & 4)	Weak Clay Loams (4)	Light Clays (5)	Massive Clay Loams (4)	Medium to Heavy Clays (6)
	DLR (mm)	Not supported (Alternative Land Application System Required)							
Development Type	Daily (L/day)								
5 + bedroom residence	1,080								
4 bedroom residence	900								
1-3 bedroom residence	720								

Evapotranspiration-Absorption Trenches and Beds - Primary Treated Effluent (Category 1 to 5) and Secondary Treated Effluent only (Category 6)

	Soil Category	Gravels & Sands (1)	Sandy Loams (2)	Loams (3a)	Weak/Massive Loams (3b)	High/Mod Clay Loams (4a)	Weak Clay Loams (4b) & Strong Light Clays (5a)	Massive Clay Loams (4c) and Mod & Weak Light Clays (5b, 5c)	Medium to Heavy Clays (6) - Secondary Effluent Only
	DLR (mm)	20*	20*	15	10	12	8	5	5
Development Type	Daily (L/day)	Total min. basal or 'wetted area' required for zero wet weather storage (m²) not including spacing & setbacks							
5 + bedroom residence	1,080	62		87	145	115	199	441	
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
1-3 bedroom residence	720	42		58	97	77	133	294	

Note: * Gravels, Sands and sandy loams are unsuitable for conventional absorption trenches and beds if there is a high watertable, including seasonal and perched watertables. Value based on average of conservative rate and maximum rate for Category 2b and 3a soils in AS1547:2012

LPED Irrigation Systems - Primary or Secondary Treated Effluent

	Soil Category	Gravels & Sands (1)	Sandy Loams (2)	Loams (3)	Clay Loams (4)	Light Clays (5)	Medium to Heavy Clays (6)		
	DIR (mm)	N/A (Alternative Land Application System Required)	4	3.5	N/A (Alternative Land Application System Required)	N/A (Alternative Land Application System Required)	N/A (Alternative Land Application System Required)		
Development Type	Daily (L/day)		Total min. basal or 'wetted area' (m²)†						
5 + bedroom residence	1,080		744	1,135					
4 bedroom residence	900		620	946					
1-3 bedroom residence	720		496	757					

† required for zero wet weather storage (m³) not including spacing & setbacks

Wick Trenches and Beds - Secondary Treated Effluent Only

	Soil Category	Gravels & Sands (1)	Sandy Loams (2) Loams (3) & High/Mod Clay Loams (4a,b)	Weak Clay Loams (4)	Massive Clay Loams (4)	Strong Light Clays (5a)	Moderate Light Clays (5b)	Weak Light Clays (5c)	Medium to Heavy Clays (6)
	DLR (mm)	25	30	20	10	12	8	5	5
Development Type	Daily (L/day)	Total min. basal or 'wetted area' required for zero wet weather storage (m²) not including spacing & setbacks							
5 + bedroom residence	1,080	49	40	62	145	115	199	441	
4 bedroom residence	900	41	33	52	121	96	166	368	
1-3 bedroom residence	720	33	27	42	97	77	133	294	

Whitehead and Associates Environmental Consultants

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Victorian Land Capability Assessment Framework

Trench & Bed Sizing

FORMULA FOR TRENCH AND BED SIZING				
L = Q/DLR x W			From AS/NZS 1547:2012	
Where:	Units			
L = Trench or bed length	m		Total trench or bed length required	
Q = Design Wastewater Flow	L/day		Based on maximum potential occupancy and derived from Table 4 in the EPA Code of Practice (2013)	
DLR = Design Loading Rate	mm/day		Based on soil texture class/permeability and derived from Table 9 in the EPA Code of Practice (2013)	
W = Trench or bed width	m		As selected by designer/installer	
INPUT DATA				
Design Wastewater Flow	Q	900	L/day	Based on maximum potential occupancy and derived from Table 4 in the EPA Code of Practice (2013)
Design Loading Rate	DLR	12.0	mm/day	Based on soil texture class/permeability and derived from Table 9 in the EPA Code of Practice (2013)
Trench basal area required	B	75.0	m^2	
Selected trench or bed width	W	0.6	m	As selected by designer/installer
OUTPUT				
Required trench or bed length	L	125.0	m	

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2020Engineering Solutions
ACN 11 9460 865

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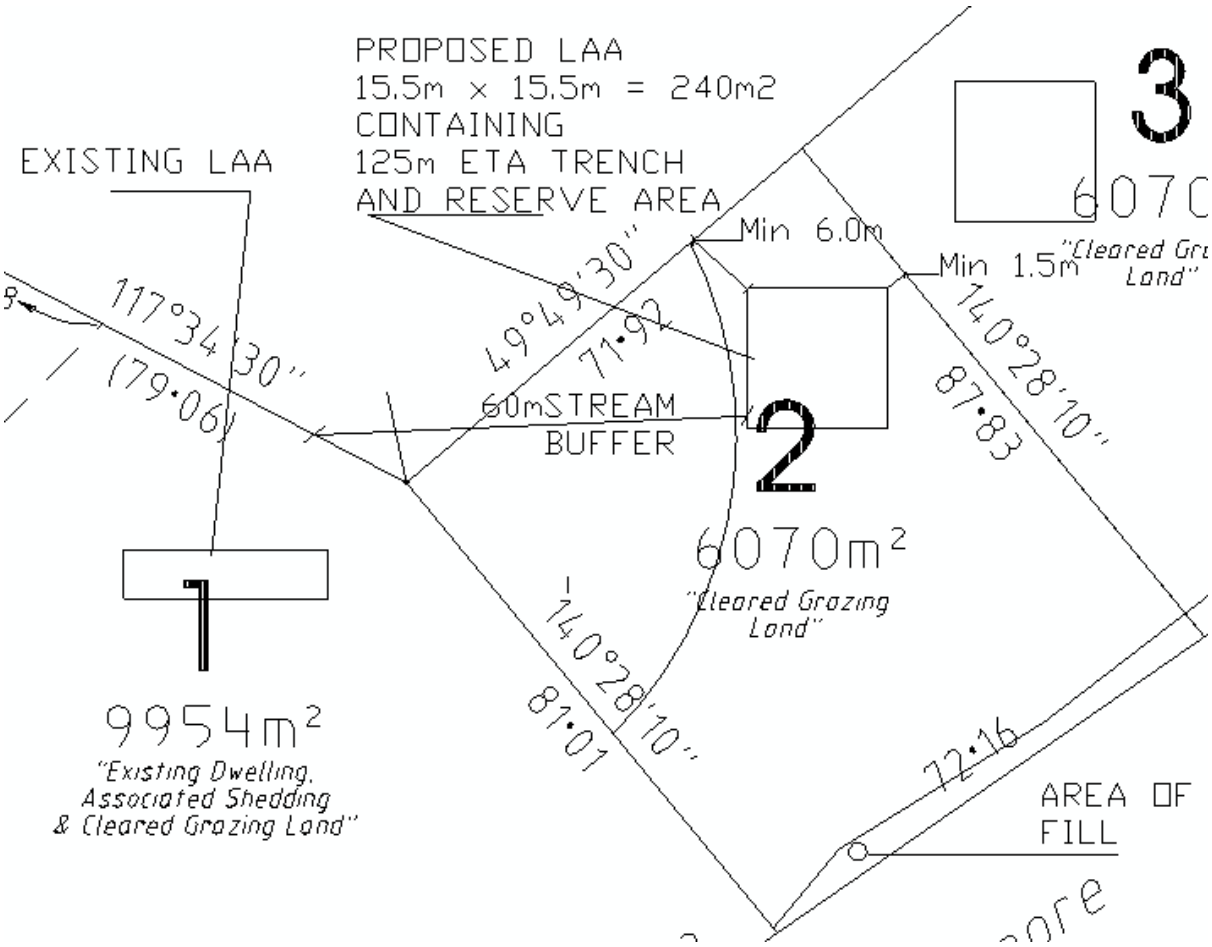
11.0 SIZING THE EFFLUENT DISPOSAL AREAS

Based upon the site inspection, the size of the allotment, the local environment and the guidelines within the controlling documents, this report recommends primary treatment system discharging to an ETA trench system.

The MAV calculations indicate 97m2 would be required, in general agreement with the DWMP recommendations of 115m2, again indicted as 125m of ETA trench.

Proposed Lot 2 LAA is detailed in the following site maps.



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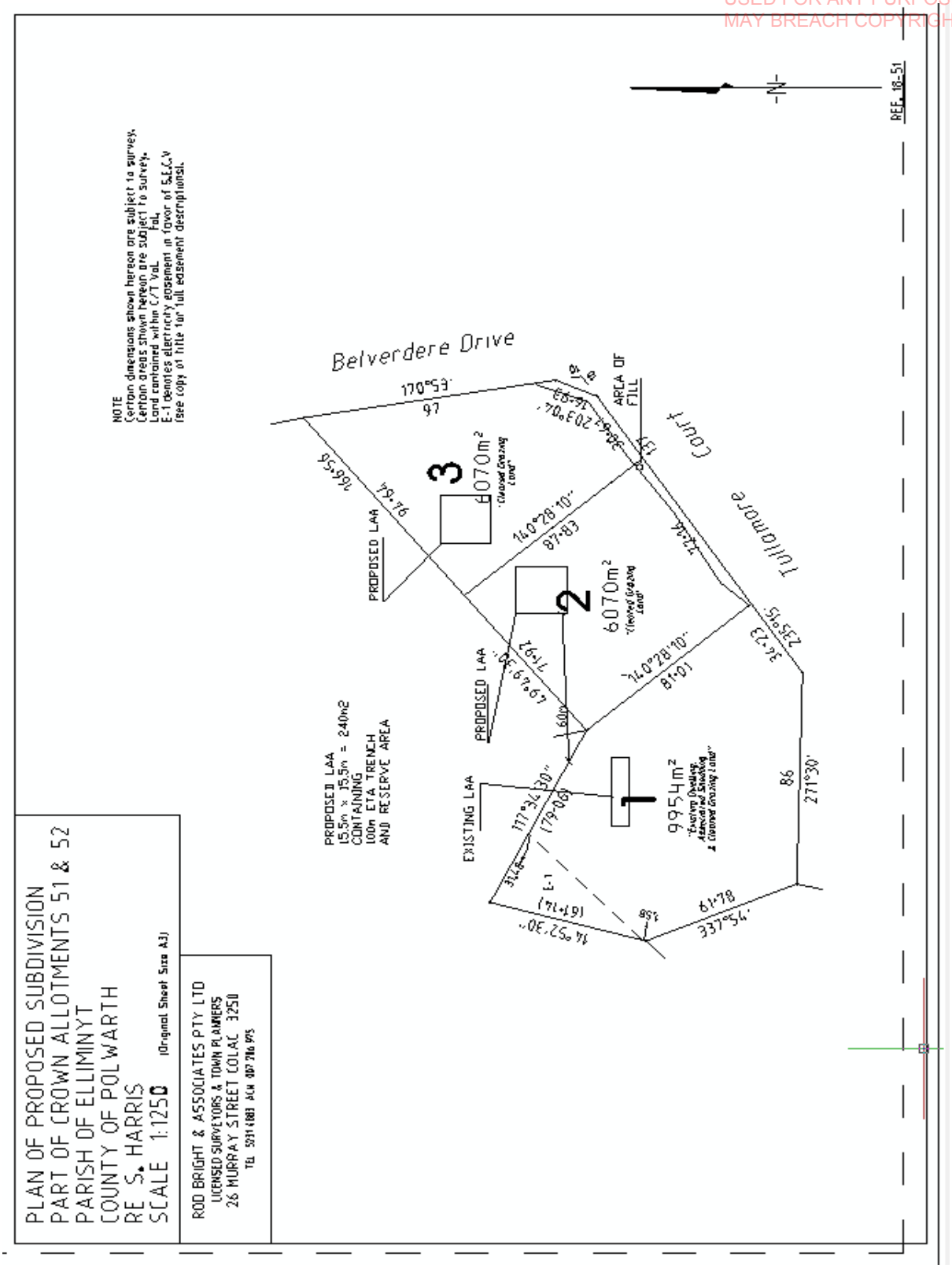
12. SITE PLAN



Scale drawing of proposed disposal area/s within subject land.(R.Bright&Ass/Author)

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12.1 Applicable Setback Distances (from AS1547:2012)

Landscape Feature / Structure	* Setback Distances (m)					
	Primary Treated Effluent		Secondary Sewage &Grey water Effluent		Advanced Secondary Grey water Effluent	
BUILDING						
Wastewater field up-slope of building	x	6		3		3
Wastewater field down-slope of building	x	3		1.5		1.5
Wastewater field up-slope of cutting/escarpment	x	15		15		15
ALLOTMENT BOUNDARY						
Wastewater field up-slope of adjacent lot	x	6		3		1
Wastewater field down-slope of adjacent lot	x	3		1.5		0.5
SERVICES						
Water supply pipe	x	3		1.5		1.5
Wastewater field up-slope of potable supply channel	x	300		150		150
Wastewater field down-slope of potable supply channel	x	20		10		10
Gas supply pipe	x	3		1.5		1.5
In-ground water tank	x	15		4		3
Stormwater drain	x	6		3		2
RECREATION AREAS						
Children's grassed playground	x	6		3		2
In-ground swimming pool	x	6		3		2
SURFACE WATERS UP-SLOPE OF						
Dam, lake or reservoir (potable water supply)	x	300		150		150
Waterways (potable water supply)	x	100		100		50
Waterways, wetlands (continuous or ephemeral, non-potable); estuaries, ocean beach at high-tide mark; dams, lakes or reservoirs (stock & domestic, non-potable)	x	60		30		30
GROUNDWATER BORES						
Category 1 & 2a soils		NA		50		20
Category 2b – 6 soils		20		20		20
WATERTABLE						
Vertical depth from base of trench to highest seasonal water table	x x	1.5		1.5		1.5
Vertical depth from irrigation pipes to highest seasonal water table		NA		1.5		1.5

* X indicates compliance

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13 PLANNING AUTHORITY LAND CAPABILITY ASSESSMENT/CONFIRMATION

Date Received:

1. Forwarded to Referral Authority:	☐	Yes	☐	No
Authority Name:				
Date Forwarded:				
Response within Statutory Time Frame:	☐	Yes	☐	No
Referral Authority Advice Conforming:	☐	Yes	☐	No
Reason for Non-Conformance:				

2. Forwarded to Referral Authority:	☐	Yes	☐	No
Authority Name:				
Date Forwarded:				
Response within Statutory Time Frame:	☐	Yes	☐	No
Referral Authority Advice Conforming:	☐	Yes	☐	No
Reason for Non-Conformance:				

Planning Authority Advice Conforming:	☐	Yes	☐	No

Date Assessed:

Responsible Planning Officer:

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SECTION TWOMAV TABLES

Table 1: Key Site Features

Feature	Explanation	Assessment Process
Aspect	The aspect or the direction that a slope is facing influences solar exposure.	Slight W aspect, good wind solar exposure. No constraint
Climate	Seasonal rainfall, evaporation and temperature patterns influence potential evapotranspiration in land application areas.	Incorporated into water balance spread sheet/s and LAA sizing. Note 90th percentile used
Erosion and Landslip	Unstable areas (steep, unvegetated, dispersive soils etc.) are usually unsuitable for LAAs without mitigation.	No, outside EMO No constraint
Fill (imported)	Capacity to assimilate effluent depends on the physical and chemical characteristics of the imported fill material(s).	No fill in LAA No constraint
Flooding	Requirements for siting onsite wastewater infrastructure (including LAAs) away from areas subject to flooding can vary between Councils.	No. Elevated allotment, setback from stream will provide buffer. No constraint
Ground-water	Adequate depth of soil to protect groundwater resources largely depends on soil type and climate.	Not noted in boreholes No constraint
LandSuitability	An LCA is used to determine which land is suitable and unsuitable for LAAs.	All land outside noted exclusion zones suitable for LAA. No constraint
Landform	Landform shape and the position of LAAs on slopes influence drainage and runoff characteristics both onto any potential LAAs as well as downslope of them (i.e. will runoff be evenly shed, or concentrated or dispersed flows?).	See contour map attached Broad even run-off from site. No constraint

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Feature	Explanation	Assessment Process
Rock Outcrops	Rock outcrops displace soil horizons and therefore can limit the assimilative capacity of LAAs for effluent. Outcrops can indicate shallow bedrock. Some rocks are strongly fissured and permeable and others are not.	Digging No Rock No constraint
Setback Distances	Determining the most appropriate position for LAAs should be prioritised over placement of building areas.	See included table from AS1547;2012 No constraint
Site Drainage	LAAs should be located in areas of good surface and subsurface (soil) drainage.	Good drainage, slight slope on land allowing slow run-off but no pooling. No constraint
Stormwater Run-on and Runoff	LAAs should not be located in areas with high run-on, without mitigation such as upslope diversion structures. Downslope runoff diversion may be useful.	Minimal run-off on to LAA No constraint
Slope	Land application of effluent becomes increasingly constrained with increasing slope gradient, increasing the chances of effluent runoff or subsurface seepage.	Slope of land generally <5.0% Down to west. No constraint
Surface Waters	Whether the setback distances specified in the Code can be achieved from LAAs.	Adequate setback from stream, 60m No constraint
Vegetation	Good vegetation cover is important to prevent erosion as well as for uptake of water and nutrients from effluent.	Grasses. Vigorous and extensive. No constraint

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Table 2: Description of Key Chemical and Physical Soil Features		
Feature	**Explanation**	**Assessment Process**
Cation Exchange Capacity	Influences the ability of the soil to hold and exchange cations; a major controlling agent for soil structural stability, nutrient availability for plants and the soil's reaction to fertilisers and other ameliorants (refer to Hazelton & Murphy, 2007).	3.07 cmol(+)/kg Nil constraint
Colour and Mottling	Gleyed soils indicate permanent saturation (permanent watertable), while orange, yellow and red mottles indicate seasonal saturation with intermittent periods of drying (perched or seasonal watertable).	No mottling noted No constraint
Electrical Conductivity **(EC)**	EC test result infers the salinity of the soil and its potential impact on plant growth on the LAA. Refer to Hazelton & Murphy (2007) for interpretation of EC test results. Application of effluent increases salt content of soils over time.	0.14 dS/m <0.8 dS/m No Constraint

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Feature	Explanation	Assessment Process
Emerson Aggregate Class	EAC results infer dispersibility (as ped slaking, soil dispersion or both). LAAs should not be installed in soils with moderate or high dispersibility, without adequate mitigation (e.g. addition of gypsum, use of irrigation).	7 Moderate constraint. Mitigated by low overall slope preventing soil export.
Permeability and Design Loading Rate	The rate at which water moves through the soil reflects the soil's permeability and determines the rate at which effluent is applied to land in litres per square metre per day (mm per day). The application rate for each type of land dispersal and recycling system is listed in Table 9 in the Code. Whilst the loading rate for LAA design is based on the permeability, it is less than the true permeability.	DIR of 12.0
pH	Acid soils (pH <5) or alkaline soils (pH >8) may constrain plant growth and should be ameliorated by use of chemical additives (e.g. lime for acidity).	5.3 5.5-8.0 Optimum range 4.5-5.5 Acid loving plants suited
Rock Fragments	Coarse rock fragments displace soil volume and therefore can limit assimilative capacity of soils.	No rock <10% No constraint
Sodicity **[Exchangeable Sodium Percentage (ESP)]**	The percentage of sodium compounds on cation exchange sites on soil particles. ESP >6% may cause damage to the soil structure. Refer to Hazelton & Murphy (2007). Effluent and greywater contain sodium.	8.7 < 6% No constraint as result above this level see comment section.
Sodium Absorption Ratio (SAR)	The ratio of sodium to calcium and magnesium (beneficial elements) in the soil solution, with higher ratios potentially damaging to plants and soils.	8.74 High ration of beneficial elements No constraint

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Feature	Explanation	Assessment Process
Soil Depth	Deeper soils generally have a greater assimilative capacity for effluent (depending on soil type).	>1.8m No constraint
Soil Texture	Soil textures are categorised as 1. Gravels and Sands 2. Sandy Loams 3. Loams 4. Clay Loams 5. Light Clays, or 6. Medium to Heavy Clays (AS/NZS1547:2012).	Loam over Light Clay Cat 2 over Cat 4. No constraint
Watertable (depth to)	The required soil depth to protect groundwater depends on soil type; high permeability soils generally require a greater separation distance (soil depth).	10.0m – 20.0m >2.0m No constraint

Comment

Of concern is the elevated level of sodicity as expressed as a percentage. The identified level may be an anomaly as the associated indicators of salinity and dispersiveness are within 'normal' parameters indicating there is no systemic problem.

Salinity at 0.14 dS/m is very much lower than the MAV identified level generating concern of 0.8dS/m.

Likewise elevated levels of sodicity can be associated with high pH levels as sodium ions tie-up OH^- ions, however the site returned a low pH.

Calcium was identified as the dominate ion, typical for a 'good' LAA (MAV). The addition of gypsum may improve soil structure but must be applied and incorporated at the correct soil moisture content.

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Table 3: Risk Assessment of Site Characteristics

Characteristic	Level of Constraint			Assessed Level of Constraint for Site
	Nil or Minor	Moderate	Major	
Aspect (affects solar radiation received)	North / North-East / North-West	East / West / South-East / South-West	South	NIL
Climate (difference between annual rainfall and pan evaporation)	Excess of evaporation over rainfall in the wettest months	Rainfall approximates to evaporation	Excess of rainfall over evaporation in the wettest months	MODERATE
Erosion [1] (or potential for erosion)	Nil or minor	Moderate	Severe	
Exposure to sun and wind	Full sun and/or high wind or minimal shading	Dappled light	Limited patches of light and little wind to heavily shaded all day	NIL
Fill [2] (imported)	No fill or minimal fill, or fill is good quality topsoil	Moderate coverage and fill is good quality	Extensive poor quality fill and variable quality fill	NIL
Flood frequency (ARI) [3]	Less than 1 in 100 years	Between 100 and 20 years	More than 1 in 20 years	NIL
Groundwater bores [4]	No bores onsite or on neighbouring properties	Setback distance from bore complies with requirements in EPA Code of Practice 891.3 (as amended)	Setback distance from bore does not comply with requirements in EPA Code of Practice 891.3 (as amended)	MODERATE

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Characteristic	Level of Constraint			Assessed Level of Constraint for Site
	Nil or Minor	Moderate	Major	
Land area available for LAA	Exceeds LAA and duplicate LAA and buffer distance requirements	Meets LAA and duplicate LAA and buffer distance requirements	Insufficient area for LAA	NIL
Landslip (or landslip potential) [5]	Nil	Minor to moderate	High or Severe	NIL
Rock outcrops (% of surface)	<10%	10-20%	>20%	NIL
Slope Form (affects water shedding ability)	Convex or divergent side-slopes	Straight side-slopes	Concave or convergent side-slopes	MODERATE
Slope gradient [6] (%)				
(a) for absorption trenches and beds	<6%	6-15%	>15%	NIL
(b) for surface irrigation	<6%	6-10%	>10%	
(c) for subsurface irrigation	<10%	10-30%	>30%	
Soil Drainage [7] (qualitative)	No visible signs or likelihood of dampness, even in wet season	Some signs or likelihood of dampness	Wet soil, moisture-loving plants, standing water in pit, water ponding on surface, soil pit fills with water	MODERATE

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Characteristic	Level of Constraint			Assessed Level of Constraint for Site
	Nil or Minor	Moderate	Major	
Stormwater run-on	Low likelihood of stormwater run-on		High likelihood of inundation by stormwater run-on	MINOR
Surface waters - setback distance (m) [9]	Setback distance complies with requirements in EPA Code of Practice 891.3 (as amended)		Setback distance does not comply with requirements in EPA Code of Practice 891.3 (as amended)	MINOR
Vegetation coverage over the site	Plentiful vegetation with healthy growth and good potential for nutrient uptake	Limited variety of vegetation	Sparse vegetation or no vegetation	MINOR

Characteristic	Level of Constraint			Assessed Level of Constraint for Site
	Nil or Minor	Moderate	Major	
Soil Drainage [8] (Field Handbook definitions)	Rapidly drained. Water removed from soil rapidly in relation to supply, excess water flows downward rapidly. No horizon remains wet for more than a few hours after addition	Well drained. Water removed from the soil readily, excess flows downward. Some horizons may remain wet for several days after addition	Moderately well drained. Water removed somewhat slowly in relation to supply, some horizons may remain wet for a week or more after addition	Imperfectly drained. Water removed very slowly in relation to supply, seasonal ponding, all horizons wet for periods of several months, some mottling	Poorly/Very poorly drained. Water remains at or near the surface for most of the year, strong gleying. All horizons wet for several months	Moderate

Comment

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Comment

The foregoing MAV tables indicate five Moderate constraints, aspect, climate, slope andsoil drainage(2), all of which are possible to mitigate.

Proposed allotment 2 LAA site has very good solar and wind exposure enhancing evaporatranspiration and as such is not an insurmountable constraint.

Climate is difficult to mitigate however elevated rainfall figures are incorporated into the water balance equation to mitigate the potential of waterlogging.

Straight sided hillside landform produces a moderate constraint. This constraint is mitigated by placing the LAA along and across the higher portion of the property, just, to minimise run-on during heavy storm/s.

From the site inspection and expert judgement, there is some evidence of winter waterlogging triggering the constraint. Once again, by careful location of the LAA, this constraint can be mitigated especially given the excellent depth of the soil.

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SECTION THREE

SITE MANAGEMENT PLAN

2020 ENGINEERING SOLUTIONS

2020 Engineering Solutions

1745 Colac–Forrest Road

COLAC VIC 3249

Ph: 0428 141 441 Fax: (03) 5233 4608

ABN 57 215 499 312 ACN 11 9460 865

www.2020es.com

PROPERTY MANAGEMENT PLAN

SITE: 5 Tulliamore Court

DEVELOPER: S. Harris

REPORT NUMBER: ES1934

DATE: Feb 2019

REPORTING TO: AS 1547:2012

On-site domestic wastewater management

EPA Publication 891.4 July 2016

Code of Practice Onsite Wastewater Management

Barwon Water / Wannon Water

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1 PREAMBLE

This Property Management Plan is intended for use by property owners in Barwon Water /Wannon Water drinking water supply catchments. It is written for occupancies with onsite wastewater treatment systems, but also applies to other developments where management of risk to downstream water quality is required.

This document must not be considered a definitive plan or control for all properties and wastewater systems. The landowner property management plan is drafted with consideration to planning permit requirements, EPA Publication 891.4 “Code of Practice Onsite Wastewater Management”, the Land Capability Assessment, and AS1547:2012 “On-site domestic wastewater management”.

The plan must be maintained by the landowner and amended when required. Any increased loading on the property or system failure requires the review of the existing Land Capability Assessment and Waste Water Management System. Any amendment to the plan must be submitted to Barwon Water/Wannon Water for endorsement.

The plan must be kept on site and be available for inspection by Council or other government agencies.

1.1 Property Owner Responsibilities

Property owners and occupiers are responsible for reducing risks to downstream water quality that originate from their property. This includes:

- ensuring pipework & wastewater systems don’t leak;
- keeping wastewater systems well maintained & in good repair;
- appropriately managing herbicides, pesticides & other chemicals;
- minimising erosion & sediment movement;
- maintaining buffers of native vegetation around watercourses;
- compliance with Council and EPA requirements; and
- implementing this Property Management Plan.

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2 EMERGENCY CONTACT NUMBERS

PROPERTY MANGEMENT PLAN	
EMERGENCY OR ONSITE WASTEWATER MAINTENANCE CONTACT NUMBERS	
POLICE, AMBULANCE, FIRE	000
PLUMBER	To be advised
ELECTRICIAN	To be advised
COUNCIL ENVIRONMENTAL HEALTH OFFICER	COLAC OTWAY SHIRE 03 5232 9400
EPA	1300 372 842
SYSTEM SUPPLIER	COLAC CEMENT PRODUCTS 03 5231 5231or other
SYSTEM SERVICE AGENT	COLAC CEMENT PRODUCTS 03 5231 5231 or other
SEPTIC PUMPOUT TANKER	RICHARDSON'S LIQUID WASTE 03 5234 6585 or other
BARWON WATER	1300 656 007

If any of the following incidents, which could impact on downstream water quality, occur on site they should be reported to Barwon Water immediately:

Chemical spill Fuel spill Bushfire Landslip

3 SITE PLAN

Site plans drawn to scale (attached) show dimensions and include the following details:

- the site address, including lot number & street number;
- title boundaries;
- direction of north;
- location of groundwater bores on the site & adjacent properties;
- contour lines (at 1 - 10 m intervals), or direction of slope & slope in percent;
- location of dams & waterways onsite & within 100m of the property;
- drainage lines & springs;
- stormwater cut-off drains adjacent to land application area & treatment system;
- location of actual & proposed buildings, sheds, driveways, paths & paddocks;
- location of actual & proposed infrastructure, especially drains;
- location& dimensions of the wastewater treatment plan; and
- location& dimensions of the land application area.

The site plan must be amended when any of the above details change (including on issue of as-constructed drawings), and the amended plan must be provided to Barwon Water.

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4 DETAILS OF THE WASTEWATER TREATMENT SYSTEM

The plan requires the following details of the wastewater treatment system:

- manufacturer's manuals & spare parts list;
- as-installed drawings;
- copy of EPA Certificate of Approval;
- copy of Council wastewater system permit;
- description of the maintenance regime, to meet manufacturer's recommendations & the maintenance, monitoring & reporting requirements of the Council permit & the EPA certificate of approval; and
- in the case of a secondary treatment system, a copy of a current service contract with an accredited or experienced trained service technician to implement the maintenance regime.

All details relevant to the above will be available and submitted after issue of the permit as they are post developmental.

Sewage Treatment Plants

Developer to select suitable secondary treatment plant with EPA approval.

NOTE: Developer can supply following information post construction as most documentation relies upon approval to construct development and install a system. Included as example only. 2020Eng is independent and does not recommend particular systems.

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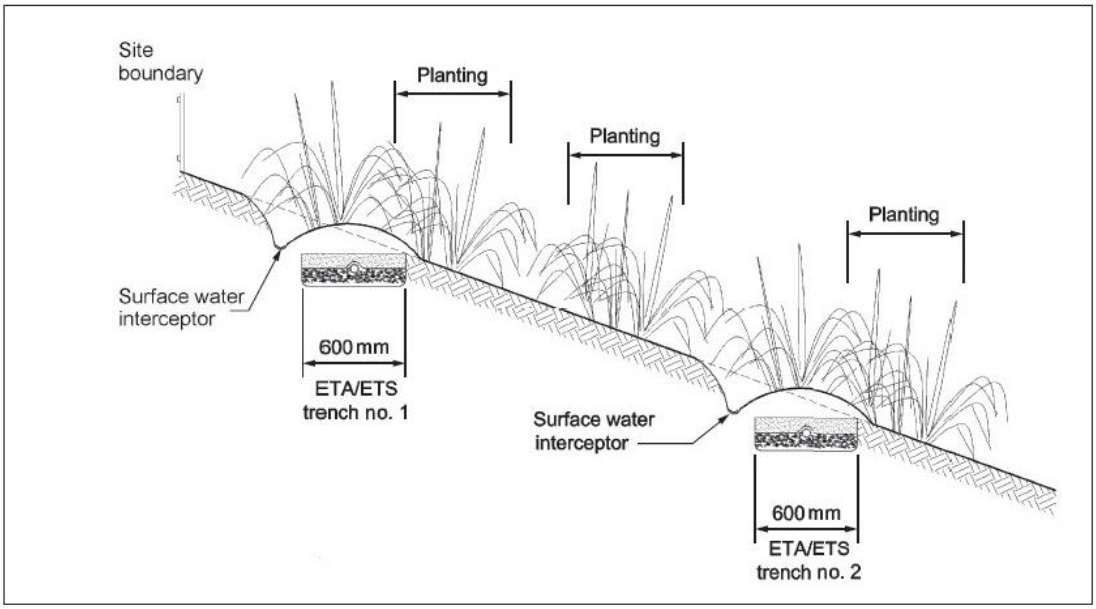
5 DETAILS OF THE EFFLUENT DISPOSAL SYSTEM(AS1547:2012)



NOTES:
1 An LPED line can be used to dose load the ETA/ETS trenches.
2 Each ETA/ETS trench is constructed to disperse effluent into downslope topsoil so that plantings can provide assistance by evapotranspiration.

FIGURE L7 ETA/ETS TRENCHES

The plan requires the following details of the effluent disposal system:

- manufacturer's manuals & spare parts list for components including pumps, valves, and filters;
- as-installed drawings; and
- description of the maintenance regime, to meet manufacturer's recommendations & the maintenance, monitoring & reporting requirements of Council & the EPA. At a minimum, visual inspection of the land application area is required whenever the treatment system is inspected.

All details relevant to the above will be available and submitted after issue of the permit as they are post developmental.

6 WASTEWATER TREATEMENT SYSTEM MAINTENANCE

The waste water treatment system, including its pipework shall:

- be inspected & maintained as per the maintenance regime;
- be protected from vehicle, farm machinery or livestock damage;

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- have any grease trap inspected at least quarterly & cleaned out regularly;
- have any vents kept clear & access covers in working order;
- be visually checked for damage especially after being pumped out - damage is to be repaired; and
- be replaced if not operating adequately.

Inspections of treatment units are to be recorded on the operation and maintenance log as well as any defects and repairs undertaken.

7 LAND APPLICATION AREA (Effluent Disposal) OPERATION & MAINTENANCE

The following measures shall be implemented:

- the land application area & disposal system shall be inspected & maintained as per the maintenance regime;
- any evapotranspiration areas shall be designed to exclude vehicle, farm machinery, or stock access;
- surface water diversion drains shall be maintained upslope of & around the land application area & kept clean; and
- roof water drainage / hard stand drainage must be diverted away from the land application area.

Evapotranspiration and irrigation areas shall:

- have their grass mown & plants maintained to ensure these areas take up nutrients with maximum efficiency;
- be checked for wet spots, uneven grass colour 7 symptoms of emitter blockage (evidenced by under-irrigated dry areas or over-irrigated wet areas); and
- have blocked or damaged irrigation lines replaced.

Equipment shall be checked in the following manner:

- the manufacturer's instructions for maintaining & cleaning pumps, siphons & septic tank & outlet filters shall be followed;
- disc filters or filter screens on irrigation-dosing equipment shall be cleaned at least annually by rinsing back into the primary wastewater treatment unit; and
- irrigation lines shall be flushed at least annually to scour out any accumulated sediment.

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Inspections are to be recorded on the Operations Log as well as any defects and repairs undertaken.

8 HOUSEHOLD MANAGEMENT OF WASTEWATER

The following measures should be implemented for optimum performance of system.

8.1 Sludge Build Up Reduction

- food waste including fats, grease & oils shall be disposed of in composting bin or worm farm
- no food waste disposal unit shall be installed
- sanitary napkins & hygiene products shall be disposed of in garbage

8.2 Encourage Bacteria

- use biodegradable soaps
- use low-phosphorus detergent
- use low-sodium detergent where soils are dispersive
- limit the use of cleaners such as bleaches, whiteners, nappy soakers & disinfectant, especially for toilet/shower cleaning
- do not put chemicals, thinners or paint down the drain or gulley trap

8.3 Reduce Effluent Volume Load

- install & use water conserving fittings ie. shower heads & appliances
- wash full loads only in dishwasher & washing machine
- avoid system overload ie. 1 washing machine load per day & run washing machine & dishwasher at different times
- do not install a spa bath

9 CONTINGENCY PLAN

The plan below shall be followed for a sudden failure of the wastewater system. A generalised flow chart of actions to be taken is:

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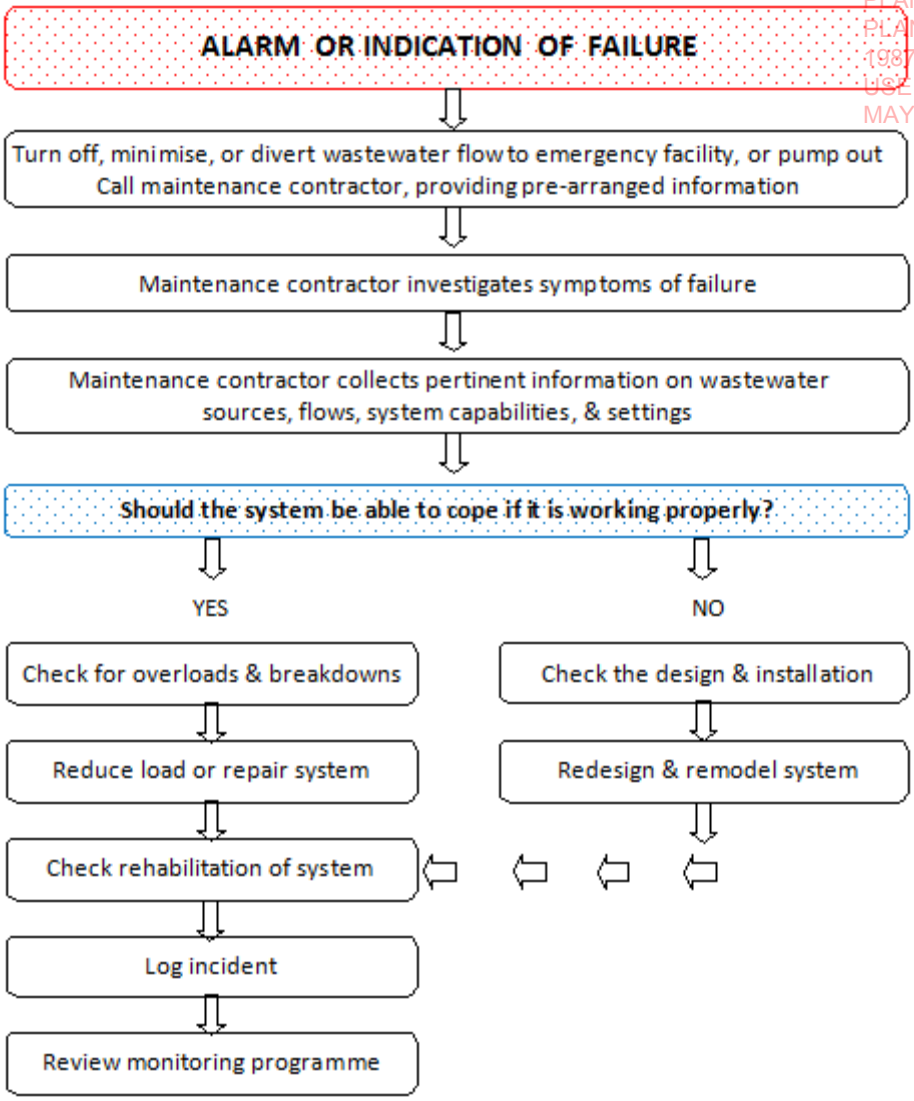

(Figure 6.3 from AS1547:2012)

10 SITE OPERATIONS & MAINTENANCE LOG

A site operation and maintenance log shall be kept for any wastewater system. This will assist in the determination of recurring problems/trends. The maintenance log is to show when scheduled maintenance is due. Matters to be recorded in the log include:

- pump out records;
- service records;
- inspections; and
- records of all irregular operation & response actions.

Copies of programmed maintenance and pump out (desludging) works performed by maintenance contractors, as required by the Council (septic tank) permit, are to be

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forwarded to the Council Environmental Health Officer. A copy of the latest maintenance certificate is to be retained with this property management plan and recorded on the maintenance log.

11 IDENTIFICATION, RISK ASSESSMENT & CONTROLS FOR OTHER POTENTIAL THREATS TO DOWNSTREAM WATER QUALITY

The landholder is required to identify and assess the risk of other potential threats to downstream water quality, resulting from the development and use of the property ie.

- erosion risks; and
- risks from storage & application of chemicals.

Construction methods should be carried out in a manner which will minimise soil, sediment and nutrient movement from the property to water courses during development and use of the property. Potential sources of sediment movement to consider are:

- tracks& driveways;
- high traffic areas (vehicular, human, animal); and
- construction areas (occupancy, roads, fencing).

The design of stormwater run-off from the site should be described. Activities to encourage native vegetation retention and re-establishment within a 30 metre buffer zone along waterways, and to exclude stock from waterways, should be described. Activities to prevent the spread of noxious weeds should be described.

Chemicals such as herbicides and pesticides can be a risk to downstream water quality. The landowner should follow manufacturer's instructions and be familiar with the advice available from: http://www.depi.vic.gov.au/agriculture-and-food/farm-management/chemical-use. Procedures for chemical application and storage should be described in the Property Management Plan.

Businesses should contact Barwon Water/Wannon Water to determine if a water quality monitoring program immediately up and down stream of works that pose a significant threat to water quality is required. This may include:

- analytical monitoring of turbidity following large-scale activities that could potentially result in sediment movement (e.g. cultivation, harvesting); and
- monitoring of the active ingredients within herbicides and pesticides following intensive and broad scale herbicide/pesticide applications.

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Appendix 1 Maintenance Log Template

Treatment System Inspections, Maintenance & Repairs			
Due Date (if scheduled)	Actual Date of Activity	Name of Inspector/ Contractor	Description of Work, Observations & Comments

Effluent Disposal Area Inspections, Maintenance & Repairs			
Due Date (if scheduled)	Actual Date of Activity	Name of Inspector/ Contractor	Description of Work, Observations & Comments

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12 INSURANCE CERTIFICATE OF CURRENCY

Integro Insurance Brokers Limited
1st Floor • 71 Fenchurch Street • London
EC3A 4BS
Telephone: (0)20 7444 6000
Fax: (0)20 7444 6001
Website: www.integrouk.com

MONDAY, 03 SEPTEMBER 2018

CERTIFICATE OF CURRENCY

POLICY NUMBER:	**IL1805880**
TYPE:	PROFESSIONAL INDEMNITY INSURANCE as may be more fully defined in the policy wording.
INSURED:	2020 Engineering Solutions
ADDRESS:	1745 Colac-Forrest Road Colac VIC 3249 Australia
PERIOD OF INSURANCE:	From: 31st August 2018 To: 31st August 2019 Both days at 16:00 Hours Local Standard Time at the Principal Address of the Insured
LIMIT OF INDEMNITY:	AUD 2,000,000 any one Claim and in the aggregate including Costs and Expenses plus one reinstatement
PLACED WITH:	100% Certain Underwriters at Lloyd's

For and on behalf of Integro Insurance Brokers Limited

This certificate is a summary of the policy and is not intended to amend, extend, replace or override the policy terms and conditions. In the event of any consistency between this certificate and the policy, the policy prevails.

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13 DISCLAIMER

2020 Engineering Solutions Pty Ltd ("2020")
Geotechnical Report Limitations

The report to which this document has been attached assesses risks arising from land slope instability and proposes risk minimisation solutions. Absolute risk avoidance cannot be assured, principally due to assessment cost factors. It is therefore necessary to rely on instructions and make assumptions.

Changed Conditions

The report may be invalidated by changed conditions including:-

1. topography.
2. soil moisture content.
3. above or below ground structures.
4. soil and substrate profiles.
5. location of site boundaries.

Causes of Changed Conditions

Changed conditions may occur due to:-

1. extreme conditions such as flood, drought, cold, heat or fire.
2. human activities.
3. natural processes.
4. planning or design requirements.

Client to inform 2020 of any changes

2020 will endeavour to identify any reasonably foreseeable risk factors on the site which may cause changed conditions. Samples are taken at reasonable intervals bearing in mind the cost to the client. In the absence of specific instructions or patent conditions it will be assumed that conditions observed in samples are consistent across the site.

This document is provided to inform the client that their responsibility for risk is shared with 2020. The client will be responsible for inaccurate instructions or failure to instruct in relation to changed conditions, events that may cause changed conditions or when it becomes evident that assumptions may be invalid. Failure to do so could result in substantial and costly damage and disputes.

Interpretation

The report must be considered in its entirety. Each part of the report may be dependent on other parts for meaningful interpretation. The report should also only be used by the client. It may not be relied upon by any other person without first conferring with 2020. The report should only be acted upon and interpreted by persons qualified and competent in the activities contemplated in the report.

130433 - 13 05 31 Geotechnical Report Limitation

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2020
ENGINEERING
SOLUTIONS

2020Engineering Solutions
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ABN 57 215 499 312ACN 11 9460 865
info@2020es.com

GEOTECHNICAL ASSESSMENT

SITE; 5 Tullamore Court
Elliminyt, Victoria. 3250

DEVELOPER; Mr. S. Harris

REPORT NUMBER; ES1916

DATE; 11/02/2019

REPORTING TO; COLAC OTWAY SHIRE
Planning Scheme, Erosion Management
Overlay Procedures (EMO), 2013. Amendment C68

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CONTENTS

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Executive Summary

Maximum Annual probability of loss of life, associated with the proposal is Barely Credible. This figure is below the advised acceptable limit
Likewise Property Risk would be Very Low, this is also below the advised acceptable limit.

Subsequent to the sub-division the new allotments will have safe building envelopes

Succinct Recommendations

a) The proposal be allowed as the calculated risk is within the acceptable ranges for Life and Property

b) Landslip Risk Assessment is not required

Preamble

Note; This document reports to Schedule One to the Erosion Management Overlay as in operation at the time of commissioning.

The Shire contains areas of land that are susceptible to landslip..... In areas susceptible to landslips, it is necessary to assess the potential impact of buildings, works and vegetation removal on the environment, in order to minimise risk to life and property. (EMO Policy Basis)

The proposal comprises a three (3) lot subdivision of the subject land. While the proposal is strictly for a sub-division, this Report will, where approcate, comment upon the suitability of the sub-divided land for residential development.

This report considers the geotechnical implications of the proposal.

*Cover View to NW across subject land. (Author).

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1.0 Consultant

Michael Daniel Delahunty
'Culliamurra'
1745 Colac – Forrest Road
Colac Victoria Australia.

1.1 Details of Qualifications, Experience and Expertise

Bachelor Degree in Mining Engineering University of Ballarat.

2001-2003 Civiltest, Geotechnical technologist

2006- to current 2020Engineering Solutions P/L
Managing Director, Principal Engineer

Member Institute of Engineers Australia Member # 2274072

1.2 Specific Expertise

Over the past eighteen years I have personally conducted several hundred site and soil investigations across SW Victoria. This work, along with academic qualifications, has equipped me with an understanding of typical and atypical sub-soil conditions.

The author has valid professional indemnity insurance at the time of inspection and reporting. As part of a commitment to on-going professional development the author is undertaking the process of accreditation and attainment of chartered status.

1.3 Equipment

Digital camera
Computer hardware and software

2.0 Date of Assessment

28th Jan, 2019

2.1 Reporting Date

12th Feb 2019

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3.0 Site Description

The subject property comprises a large semi-rural allotment in a Low Density Rural Zone with an existing dwelling on Lot 1.

The cover photo shows the site and vegetation.

3.1 Address

5 Tullamore Court
Elliminyt, Victoria.3250

3.2 Title Details (Planning Maps On line)

CA 51 & 52 (Parts) Parish of Elliminyt,
County of Polwarth

3.2.1 Overlays

VPO EMO(Part) SLO

3.2.2 Property Owner

S. Harris

3.3 Developer

S. Harris

3.4 Responsible Authority

Colac Otway Shire
Rae St, Colac. 3250

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3.4.1 Planning Details

PLANNING PROPERTY REPORT

From www.planning.vic.gov.au on 24 January 2019 12:34 PM

PROPERTY DETAILS

Address:	5 TULLAMORE COURT ELLIMINYT 3250
Lot and Plan Number:	Lot 21 PS322547
Standard Parcel Identifier (SPI):	21\PS322547
Local Government Area (Council):	COLAC OTWAY www.colacotway.vic.gov.au
Council Property Number:	22110
Planning Scheme:	Colac Otway planning-schemes.delwp.vic.gov.au/schemes/colacotway
Directory Reference:	VicRoads 92 B8

UTILITIES

Rural Water Corporation:	Southern Rural Water
Urban Water Corporation:	Barwon Water
Melbourne Water:	outside drainage boundary
Power Distributor:	POWERCOR

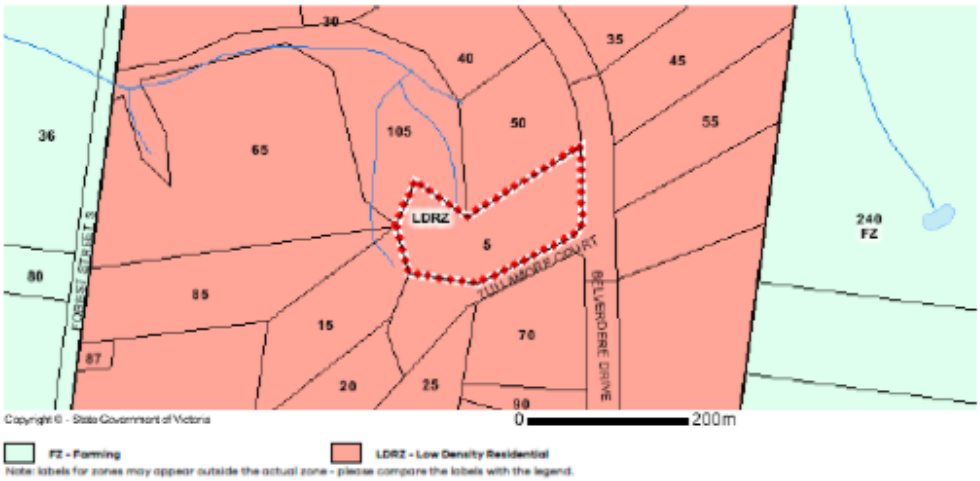
STATE ELECTORATES

Legislative Council:	WESTERN VICTORIA
Legislative Assembly:	POLWARTH

Planning Zones

LOW DENSITY RESIDENTIAL ZONE (LDRZ)

SCHEDULE TO THE LOW DENSITY RESIDENTIAL ZONE (LDRZ)



Copyright © - State Government of Victoria

FZ - Farming LDRZ - Low Density Residential

Note: labels for zones may appear outside the actual zone - please compare the labels with the legend.

Fig 1. Planning Controls. (Planning Maps Online)

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Planning Overlays

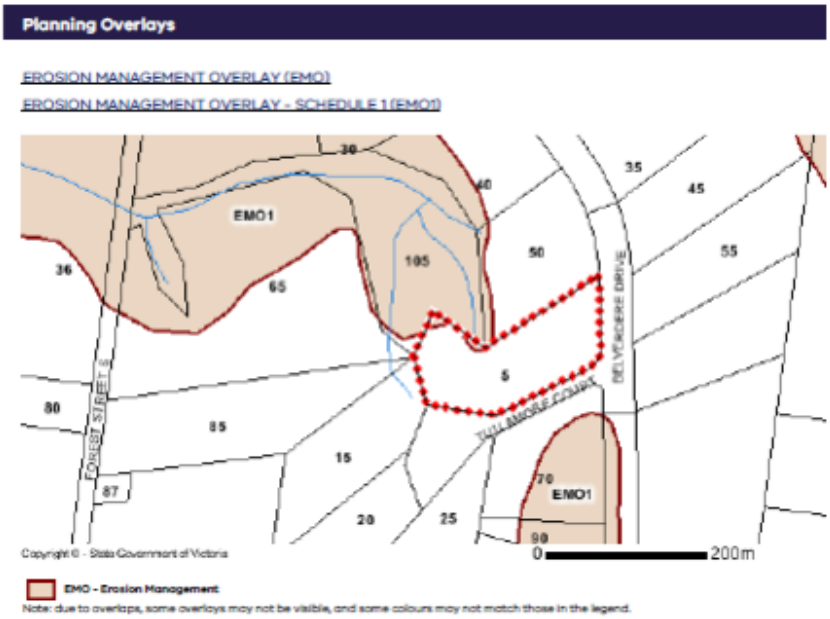

Fig 2 Extent of EMO with respect to subject land.

Comment

Only two small portions of land are covered by the Overlay, in the absence of more detailed mapping it appears the both these portions of land are within the proposed Allotment 1.

Allotment 1 contains an existing dwelling, constructed outside the areas identified as subject to the EMO.

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4.0 Site Assessment Plans

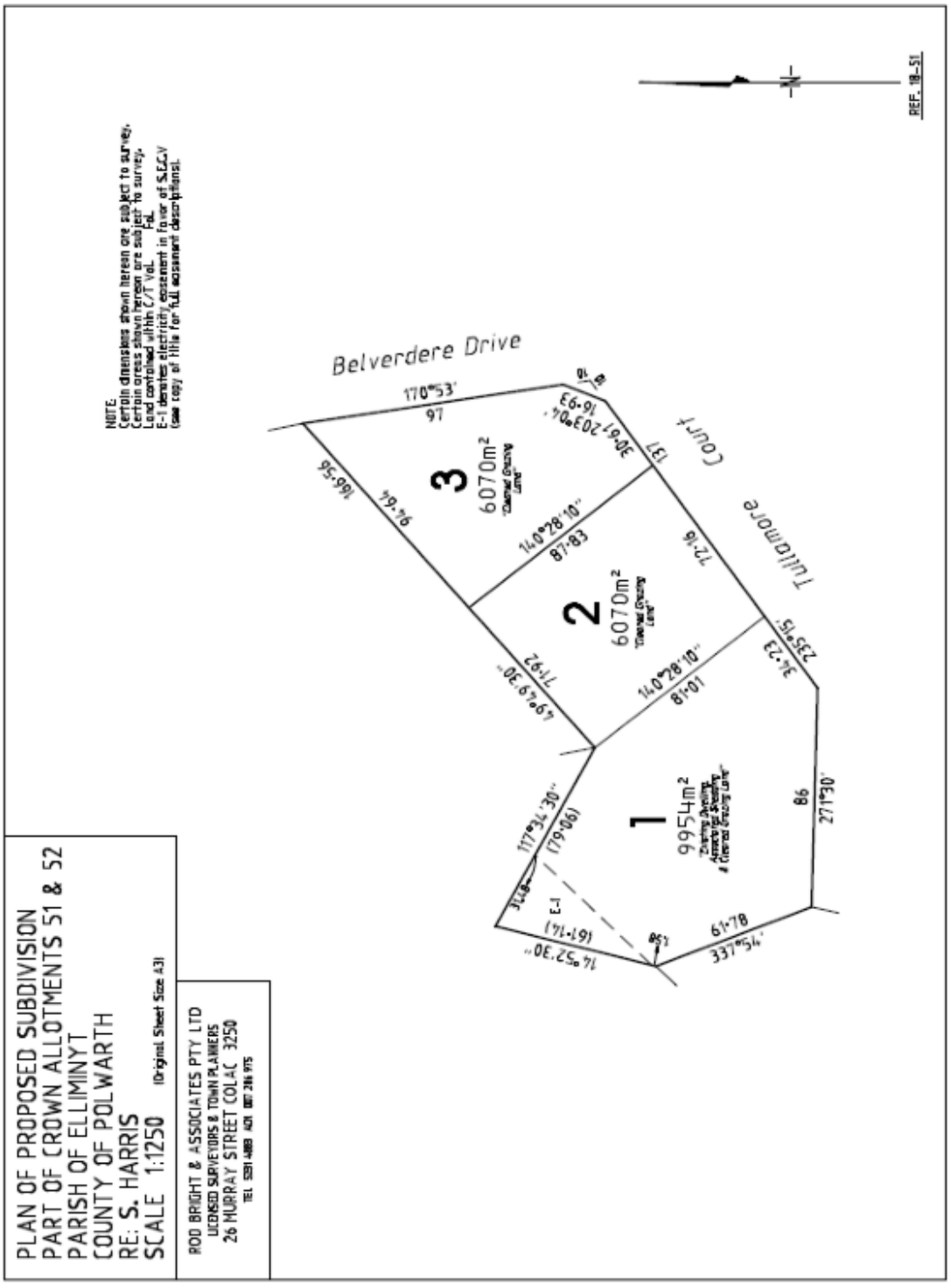

Fig 3. Proposed Plan Of Sub-division (Rod Bright &Ass)

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5.0 Geology

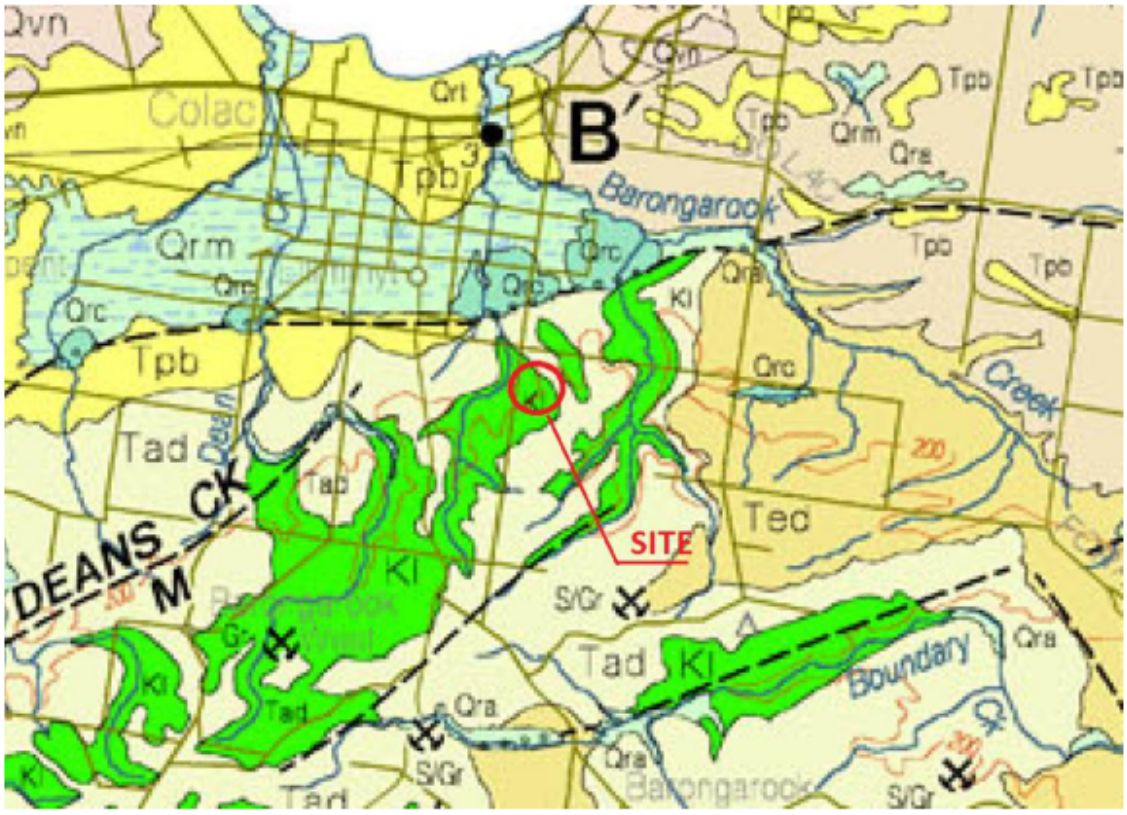

Fig 4. District geology showing subject land principally contains Cretaceous Age Eumerall Formation part of the Otway Group, but tends up to a ridge of Tertiary Age Dillwyn Formation material. (GeoVic, Author)

Of interest is the proximity of the Colac Anticline to the subject land, while a significant geological feature, it will have no impact on the proposal.

5.1 Surface Conditions

As per the site description and cover photo, the subject land contains a surface covering of grasses with some plantations. The vegetation appeared vigorous and healthy.

The surface soils appeared sandy, as typical for the region, while the extent of vegetation limited inspection, the surface soils did not appear susceptible to erosion.

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5.2 Subsurface Conditions

Based upon sub-surface investigations the subject land subsurface profile would comprise a Silty Sand over a deep Sandy Clay, with sandstone at a range of depths.

5.3 Groundwater

No discharge areas were noted on the subject land.

5.4 Geomorphic Process

Most of the basis of the understanding of the geology and geomprphology for the Otways comes from the Landslide Risk Management Final Report to the Colac Otway Shire from Dahlhaus Environmental Geology, 2001, with relevant sections and information presented below.

Regional development of the Otway Ranges began as Australia pulled away from Antarctica duringthe Late Jurassic to Early Cretaceous initiating rift valley volcanism and deposition whichultimately formed the Otway Ranges. Lower Cretaceous sediments of the regionally expansiveOtway Group make up most of the Otway Ranges in south-western Victoria. The Eumeralla Formation, by far the most expansive formation in Otway Group, comprises mostly of fluvialchannel deposited lithic sandstones, mudstones, siltstones and minor mud-clast conglomerate.

The sandstones and mudstones are characteristically quartz-poor volcanogenic sediments high in calcic feldspars derived from dacitic volcanic material which originated from contemporaneous rift valley volcanism to the north of the Otway Ranges. Post deposition the Otway Group has been gently folded, faulted and uplifted along a series of parallel faults trending north-east.

The composition of the Eumeralla Formation makes it highly susceptible to weathering producingclay rich soils typically 0.5-1m thick in sandstone dominant areas and up to and greater than 2mdeep in siltstone/mudstone dominant areas. A typical soil profile is generally well developed overlying and sometimes grading into extremely and highly weathered rock. The weathering profile continues to progressively grade into fresh rock.

5.5 Terrain Slope and Aspect

The steepness of the slope is a causal factor in landslides, since gravitational forces act on all slope materials.

Aspect also a causal factor as slopes exposed to prevailing weather, especially rainfall can display elevated levels of instability, both with rainfall as a trigger factor and the deeper degree of weathering again due to the higher rainfall and reduced vegetation.

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6.0 Regional Instability

6.1 Mapped

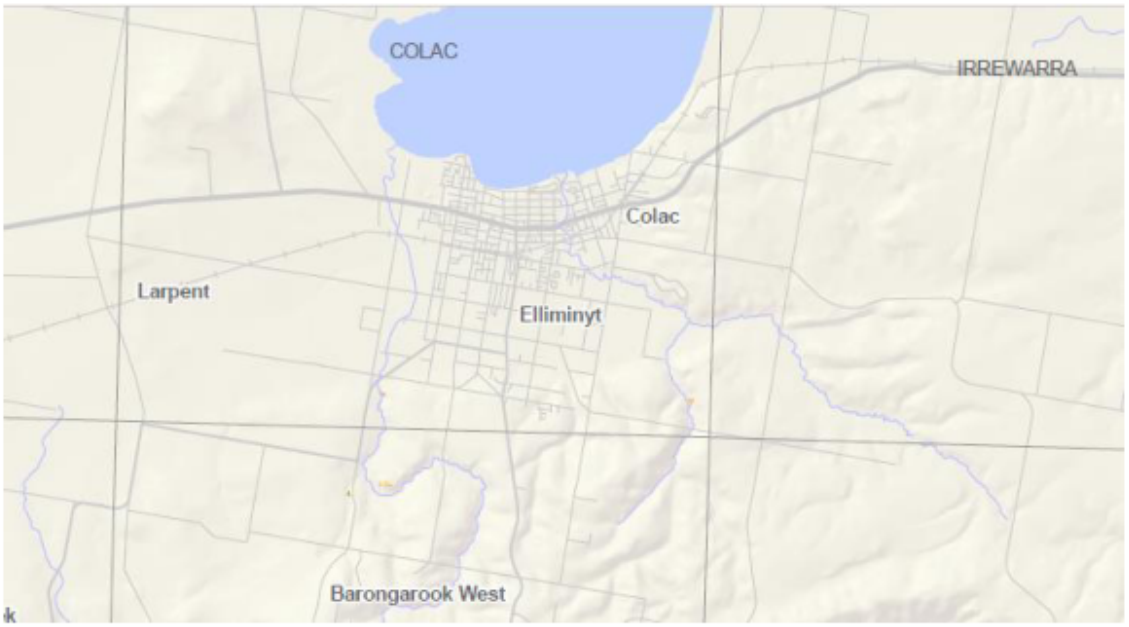

Fig 5.Mapped Slip Systems of Colac and Elliminyt. (Source; Colac Otway Shire)

Inventory of Landslides, Colac Otway Shire Map, shows no slip systems on or near the subject land.

6.2 Unmapped

No evidence of mass land instability was noted on or near the subject land.

7.0 Assessment Methodology

The principal assessment methodology of instability analysis for this development was visual, informing a considered opinion.

7.1 Slope Model

A slope model was not produces due to the extent of the landscape of the subject land, low slope angles and limited extent of EMO.