ATTACHMENTS

Under Separate Cover
Ordinary Council Meeting

6.00pm Tuesday 25 February 2020

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SUBMISSION / OBJECTION TO GRANTING A PLANNING PERMIT

Planning and Environment Act 1987

Before completing this form, it is recommended you inspect the planning permit application online or at a Customer Service Centre.

GOLDEN PLAINS SHIRE
Golden Plains Shire Council
Bannockburn -
2 Pope Street, Bannockburn
Linton -
68 Sussex Street, Linton
M: PO Box 111
Bannockburn, Victoria 3331
P: (03) 5220 7111
F: (03) 5220 7100
E: enquiries@gplains.vic.gov.au
W: www.goldenplains.vic.gov.au

YOUR DETAILS:

Name: *(block le*

Postal Addres

Contact No:

DETAILS OF THE PERMIT APPLICATION YOU ARE RESPONDING TO:

Application Number: P18 - 005

Address of Subject Land: ~~PAUL~~ LOMANDRA DRIVE TEESDALE

Description of Proposal: MULTI - LOT SUBDIVISION

Name of Applicant: MICHAEL COSGRIFF (GOLDEN PLAINS SHIRE)

DETAILS OF SUBMISSION / OBJECTION:

(State reasons for objection and how you would be affected by the granting of a planning permit)

The proposed subdivision is far too crowded - and out of keeping with the surrounding estate. It appears that Golden Plains Shire are trying to maximise profits by sub-dividing the land to the smallest size currently allowed, therefore ruining the ambience and country-feel that draws people to Teesdale in the first place.

This will affect us by - increasing traffic within our local area and Teesdale as a whole. Increased domestic noise.

- Put increased pressure on the local primary school which

Continued – see over

OBJ (1)

PLANNING 10/10/2019

DETAILS OF SUBMISSION / OBJECTION: Continued

is already at capacity - therefore compromising my childrens quality of education. The school has little space to expand without building on the outdoor recreational space. Parking at the school has also become an huge issue, and the rate of subdivisions in Keesdale means that parking at the schools and the shops will ~~only~~ ~~otherwise~~ be increasingly difficult.

Attach additional pages if required

Are there any changes that could be made to the proposal to address your concerns? Yes ☑ No ☐

If yes, what changes would you suggest that would meet your concerns:

Reduce the number of lots in the subdivision from 36 to 24. Allow for a variety of lots sizes 1 - 2 acres.

[redacted]

Date: 7/10/2019

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PLANNING 10/10/2019

02.10.19
Objection to the application of planning permit P18-005

To whom it may concern,

My name is [redacted]
Teesdale. I'm writing to formally object to the planning permit P18-005.

My young family moved out to Teesdale and Bakers Lane just over 12 months ago in an attempt to raise our children with a deeper appreciation for the land, the environment, the ecosystem and it's natural resources.

Since moving out to Teesdale we have enjoyed the natural bounty of this beautiful area has provided. One such area is now in danger of being completely destroyed and it's wildlife disrupted by the proposed planning permit P18-005.

The development proposed in planning permit P18-005 represents an area that has a wealth of natural resources, being home to many native animal species and trees that will be destroyed if the development is to proceed.

- The area is populated with native plants and wattle trees used by local bees to pollinate local gardens and develop rich local honey consumed by residents.
- The area is regularly grazed by indigenous kangaroo and wallaby populations.
- The area and its trees are home to many local bird species.
- The area is home to reptile species.
- The area contains a number of natural pathways and tracks regularly used by locals for walks and bike rides.
- The area serves as a natural playground regularly frequented and played in by local children.
- The area contains a number of significant trees, the destruction of which will damage the local ecosystem and represent a significant (and irreparable) loss to the heritage of our area.

Not only will the development of this area damage the local wildlife, but it will also negatively affect the culture of the Teesdale community.

Teesdale represents a close-knit community of like-minded individuals. People who respect the land and want to live in harmony with it. Whether it's raising chickens, growing an orchard or raising bees, all of these things require sizeable allotments to be accommodated and maintained.

The lot's of land proposed in the planning permit P18-005 will simply not afford residents with this opportunity to engage in these types of activities. Rather, lots of this size will, in fact, attract individuals who do share the community values, nor care for the environment, but simply want a cheap lot of land with a nice view.

OBJ 2

The average lot' size listed in the planning proposal is just over 1 acre. With 29.7% of lots falling below this number.

I believe I speak for a large number of my fellow residents when I strongly object to this development. If it were to proceed it would not only damage the local wildlife populations but also disrupt the local Teesdale community.

Sincerely,

[redacted]

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YOUR DETAILS:

Name: [redacted]

Postal A

Contact

DETAILS OF THE PERMIT APPLICATION YOU ARE RESPONDING TO:

02 OCT 2019
Records Management
Golden Plains Shire Council

Application Number: P18 - 005

Address of Subject Land: LOT A ON PLAN OF SUBDIVISION 529738

Description of Proposal: MULTI LOT SUBDIVISION - BANNOCKBURN - SHELFORD Rd. TEESDALE

Name of Applicant: GOLD PLAINS SHIRE - MR. MICHAEL COSGRIFF

DETAILS OF SUBMISSION / OBJECTION:

(State reasons for objection and how you would be affected by the granting of a planning permit)

HOUSE WATER PRESSURE WOULD BE AFFECTED WITH ALL THESE NEW HOUSES, NOT THAT GOOD NOW.

PROCESSED

STORM WATER DRAINAGE IS FAR FROM ADEQUATE AT END OF TULLA DR NOW, WILL BECOME A MAJOR PROBLEM CAUSING FLOODING OF PROPERTIES WITH THESE NEW HOUSES. THE AREA HAS VERY SHALLOW TOP SOIL, THEN CLAY (AS THE SHIRE WOULD BE AWARE). DURING RAIN PERIODS THE SOIL BECOMES SATURATED WHICH CREATES ISSUES WITH

Continued – see over

OBJ 3

DETAILS OF SUBMISSION / OBJECTION: Continued

SEPTIC SYSTEMS AND STORMWATER DRAINAGE, BOTH ENDING UP IN OPEN DRAINAGE GUTTERS WITH POSSIBLE HEALTH ISSUES. I MOVED FROM ACREAGE TO MY LITTLE BLOCK SO THAT I WOULD NOT BE HEMMED IN BY HOUSES. PEACE & QUITE WILL NOT EXIST WITH SO MANY HOUSES LOTS. **Attach additional pages if required**

Are there any changes that could be made to the proposal to address your concerns? Yes ☑ No ☐

If yes, what changes would you suggest that would meet your concerns:

REDUCE THE NUMBER OF LOTS TO 2-3 ACRES, SIMILAR TO BOTH SIDES OF THE PROPOSED SUBDIVISION. (KEEPING AREA FEELING COUNTRY, RURAL)

Signed: [redacted] **Date:** 29/9/2019

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YOUR DETAILS:

Name [redacted]

Posta

Conta

DETAILS OF THE PERMIT APPLICATION YOU ARE RESPONDING TO:

Application Number: P18-005

Address of Subject Land: lot A on plan of subdivision 529738 Bannockburn Shelford rd Teesdale

Description of Proposal: multi lot sub division

Name of Applicant: Golden plains shire - Mr Michael Cosgriff

DETAILS OF SUBMISSION / OBJECTION:

(State reasons for objection and how you would be affected by the granting of a planning permit)

We currently have only one direct neighbor. which made the move out here more appealing 7 years ago we have no noise and no trafic which would dramatically change if the proposed sub division were to go ahead.

We did not move to the country to be next door to 37 new houses

Our infrastructure barely copes with the amount of houses now - no water pressure - no internet

Continued – see over

OBJ 1

DETAILS OF SUBMISSION / OBJECTION: Continued

- 1 primary school to cater for all these children as well as the exsisting ones - 1 post office to hold everyones mail

I would hate to see our quiet country life and everyone around us be affected by the proposed subdivision

Attach additional pages if required

Are there any changes that could be made to the proposal to address your concerns? Yes ☑ No ☐

If yes, what changes would you suggest that would meet your concerns:

Reduce the number of lots - one road down the middle and 2.5 - 3 acre lots each side - like the surrounding areas

Signed: [redacted] **Date:** 26 Sept 2019

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File Number:	**P18-005**
Author:	**Peter O'Brien, Town Planner**
Authoriser:	**Steven Sagona, Acting Director Infrastructure and Development**
Applicant:	**Golden Plains Shire Council**
Owner:	**Golden Plains Shire Council**
Proposal:	**Multi-lot subdivision**
Location:	**Lot A on Plan of Subdivision 529738U, Lomandra Drive, Teesdale**
Attachments:	**Nil**

RECOMMENDATION

That Council resolves to issue a Notice of Decision to Grant a Planning Permit for the development of land for the purposes of a multi-lot subdivision at Lot A on Plan of Subdivision 529738U, Lomandra Drive, Teesdale subject to the conditions attached to this report.

EXECUTIVE SUMMARY

This report relates to a planning permit application for the development of land for the purposes of a multi-lot subdivision at Lot A on Plan of Subdivision 529738U, Lomandra Drive, Teesdale. This report provides a background to the application and a summary of the relevant planning considerations.

PURPOSE

The application has been referred to the Council Meeting for determination because there are objections to the application.

CONFLICT OF INTEREST

In accordance with Section 80B of the *Local Government Act* 1989, the Officers preparing this report declare no conflict of interest in regard to this matter.

COUNCIL PLAN

Managing natural and built environments.

BACKGROUND INFORMATION

Site description

The subject land is situated at Lomandra Drive, Teesdale and is formally known as Lot A on Plan of Subdivision 529738U. The site is located in a low density residential area of Teesdale. The site is an un-developed parcel of land with a total area of 20.85 hectares. The land is flat and mostly cleared except for native vegetation adjacent to the western boundary. The site has access from Lomandra Drive & Caladenia Street which are both sealed roads managed by Council. The land is not affected by any restrictive covenants.

Site map

★ = Objectors

The proposal

The application proposes the development of the land for a multi-lot subdivision. A copy of the application and plans is attached. The proposed subdivision will create a total of 37 lots. The proposed lots range in size from 4000m² to 6500m² with the majority of the lots (27) in the range of 4000-4500m². The subdivision includes the construction of an internal road network from Lomandra Drive and Caladenia Street. A reserve along the southern boundary will serve a number of purposes including drainage, fire access and pedestrian access. The reserve will also provide a buffer to the farming land to the south. The lot layout has been designed to avoid the removal of existing native vegetation adjacent to the western boundary.

CONSULTATION

Notice of the application was given in accordance with Section 52 (1) (a) of the *Planning and Environment Act* 1987. Notice was provided by mail to 21 adjoining owners and occupiers. Notice was also carried out by placing a sign on the site.

As a result of the public notice, 4 objections were received. A copy of the objections is attached. The main concern of the objectors is that the proposed subdivision will have an adverse effect on the character of the area because the proposed lot sizes are smaller than those in the surrounding area. Other concerns have been raised regarding increased traffic, native vegetation impacts and drainage.

The objectors were invited to a consultation meeting held on 16 December 2019. Two objectors attended the meeting. There was no resolution or agreement reached at the meeting.

ASSESSMENT

Processing of the application

The application was originally submitted on 11 January 2018 but was placed on hold while amended plans and further information was prepared. An amended subdivision design and further information in the form of native vegetation and land capability assessment reports were submitted on 19 July 2019.

The application was referred under Section 55 of the Act to Barwon Water and Powercor in accordance with Clause 66.01 of the planning scheme. The application was also internally referred to Council's Works, Environmental Health and Natural Resources departments. These parties had no objection to the issue of a permit subject to conditions being placed on the permit.

Golden Plains Planning Scheme

Planning Policy Framework (PPF)

Clause 11.02 Managing Growth

The objective of the policy for the supply of urban land (Clause 11.02-1S) is to ensure a sufficient supply of land is available for residential and other uses. Planning for urban growth should consider:

- Opportunities for the consolidation, redevelopment and intensification of existing urban areas.
- Neighbourhood character and landscape considerations.
- The limits of land capability and natural hazards and environmental quality.
- Service limitations and the costs of providing infrastructure.

Clause 15.01 Urban Environment

The objective of the policy for subdivision design (Clause 15.01-3S) is to ensure the design of subdivisions achieves attractive, safe, accessible, diverse and sustainable neighbourhoods. In the development of new residential areas and in the redevelopment of existing areas, subdivision should be designed to create liveable and sustainable communities by, among other things, providing a range of lot sizes to suit a variety of dwelling and household types to meet the needs and aspirations of different groups of people.

Clause 16.01 Residential Development

The objective of the policy for the location of residential development (Clause 16.01-2S) is to locate new housing in designated locations that offer good access to jobs, services and transport. The policy seeks to increase the proportion of new housing in designated locations within established urban areas, ensure an adequate supply of redevelopment opportunities within the established urban area

to reduce the pressure for fringe development and to identify opportunities for increased residential densities to help consolidate urban areas.

Local Planning Policy Framework (LPPF)

Clause 21.02 Settlement

The local policy for settlement patterns (Clause 21.02-1) includes objectives to make efficient use of land and encourage the consolidation of existing township areas. The policy seeks to direct residential development to township areas that have reticulated water, sewerage and stormwater drainage and community services and facilities. Infill development in towns lacking sewerage treatment will be required to provide onsite effluent treatment.

The policy for rural areas (Clause 21.02-3) applies to the subdivision of land in low density residential areas. The policy seeks to control the density and overall lot sizes of land according to environmental conditions and established character and to avoid indiscriminate subdivision of land. To satisfy this policy new subdivision should recognise and maintain the surrounding lot configurations and lot size, provide appropriate infrastructure, including drainage and roads, and provide for on-site effluent disposal.

Clause 21.08 Local areas – Small towns

Town structure plans have been prepared for most settlements and establish a basis for future strategic planning decisions in each town. The Teesdale Structure Plan (Figure 21.08-14) seeks to consolidate low density residential development within the town by taking advantage of existing vacant land. The current structure plan which was adopted in 1997 shows the land located in an area for future residential development. The Teesdale Structure Plan is in the process of being reviewed by Council. While the review is only at an early stage it is not envisaged that the review will result in any policy changes related to the land or the proposal.

Clause 22.09 Low Density Residential Subdivision Policy

This policy seeks to ensure the elements of land capability and character are addressed when considering subdivision applications. The objectives of the policy are to ensure that new lots are of sufficient size for on-site effluent disposal and to maintain an open and spacious character through:

- Design that provides for open space and landscaping.
- Retention of existing vegetation.
- Avoiding creation of lots with battle-axe access in greenfield development.
- The provision of wide driveways with sufficient areas available for landscaping.
- Lot sizes with sufficient area to accommodate setbacks required by the Design and Development Overlay Schedule 5.

It is policy that support for subdivision in the Low Density Residential Zone will be considered only where rigorous testing of soil capacity has been undertaken by suitably qualified practitioners to demonstrate that the lot can contain on site effluent disposal and that subdivision within established low density residential areas respects and positively contributes to the lot configuration and character elements of the surrounding area.

Zone and overlay provisions

Clause 32.03 Low Density Residential Zone (LDRZ)

The site and surrounding land is in a Low Density Residential Zone (LDRZ). The purpose of the LDRZ is 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 under the provisions of the LDRZ. The LDRZ sets a minimum lot size of 0.4 hectares. The decision guidelines of the LDRZ require Council to consider, as appropriate:

- The protection and enhancement of the natural environment and character of the area including the retention of vegetation and faunal habitat and the need to plant vegetation along waterways, gullies, ridgelines and property boundaries.
- The availability and provision of utility services, including sewerage, water, drainage, electricity, gas and telecommunications.
- In the absence of reticulated sewerage, the capability of the lot to treat and retain all wastewater in accordance with the State Environment Protection Policy (Waters of Victoria) under the Environment Protection Act 1970.

Clause 43.02 Design & Development Overlay Schedule 5 (DDO5)

The land is affected by the Design & Development Overlay Schedule 5 (DDO5) which relates to setbacks for the construction of buildings. The DDO5 does not contain any specific requirements related to subdivision.

Clause 43.04 Development Plan Overlay – Schedule 2 (DPO2)

The Development Plan Overlay – Schedule 2 (DPO2) applies to the land however the DPO2 is not a permit trigger. Under the provisions of the DPO2 a planning permit must not be granted until a development plan has been prepared to the satisfaction of the responsible authority and any permit granted must be generally in accordance with the development plan. A development plan (subdivision plan) has been prepared meeting the requirements of the DPO2. A permit granted must include the following conditions and requirements specified in the schedule to the overlay:

- All residential development must be serviced with reticulated water and sewerage (when available).
- Where sewerage infrastructure cannot be provided soil and water reports must be submitted demonstrating compliance with State and Local Policies on effluent and stormwater disposal.
- All residential development must be serviced with sealed roads.

General provisions

The decision guidelines contained in Clause 65.01 of the planning scheme require Council to consider the following matters, as appropriate:

- The matters set out in section 60 of the Act.
- The Municipal Planning Strategy and the Planning Policy Framework.
- The purpose of the zone, overlay or other provision.
- Any matter required to be considered in the zone, overlay or other provision.
- The orderly planning of the area.
- The effect on the amenity of the area.
- The proximity of the land to any public land.

- Factors likely to cause or contribute to land degradation, salinity or reduce water quality.
- Whether the proposed development is designed to maintain or improve the quality of stormwater within and exiting the site.
- The extent and character of native vegetation and the likelihood of its destruction.
- Whether native vegetation is to be or can be protected, planted or allowed to regenerate.
- The degree of flood, erosion or fire hazard associated with the location of the land and the use, development or management of the land so as to minimise any such hazard.
- The adequacy of loading and unloading facilities and any associated amenity, traffic flow and road safety impacts.

In addition, before deciding on an application to subdivide land, the decision guidelines contained in Clause 65.02 must be considered, as appropriate:

- The suitability of the land for subdivision.
- The existing use and possible future development of the land and nearby land.
- The availability of subdivided land in the locality, and the need for the creation of further lots.
- The effect of development on the use or development of other land which has a common means of drainage.
- The subdivision pattern having regard to the physical characteristics of the land including existing vegetation.
- The density of the proposed development.
- The area and dimensions of each lot in the subdivision.
- The layout of roads having regard to their function and relationship to existing roads.
- The movement of pedestrians and vehicles throughout the subdivision and the ease of access to all lots.
- The provision and location of reserves for public open space and other community facilities.
- The staging of the subdivision.
- The design and siting of buildings having regard to safety and the risk of spread of fire.
- The provision of off-street parking.
- The provision and location of common property.
- The functions of any body corporate.
- The availability and provision of utility services, including water, sewerage, drainage, electricity and gas.
- If the land is not sewered and no provision has been made for the land to be sewered, the capacity of the land to treat and retain all sewage and sullage within the boundaries of each lot.
- Whether, in relation to subdivision plans, native vegetation can be protected through subdivision and siting of open space areas.

DISCUSSION

Planning scheme

The proposed subdivision is considered to satisfy the relevant provisions of the planning scheme including State and Local planning policies, the Low Density Residential Zone, Design & Development Overlay Schedule 5, Development Plan Overlay Schedule 2 and Clause 65 of the Victoria Planning Provisions. The Low Density Residential Zone and local policy for Low Density Residential Development (Clause 22.09) supports subdivision of land down to 0.4 hectares where lots are of sufficient size to contain on site effluent disposal and the open and spacious character of low density residential areas is maintained. A land capability assessment submitted with the application demonstrates that the proposed lots are capable of accommodating on-site effluent disposal. The

proposed subdivision design will maintain the character of the area by providing open space and landscaping, retaining existing native vegetation, providing lots with wide street frontages and avoiding battle-axe access and creating lots of sufficient size to provide setbacks in accordance with the DDO5.

Objectors' concerns

The main concern of the objectors is that the proposed subdivision will have an adverse effect on the character of the area because the proposed lot sizes are smaller than those in the surrounding area. As discussed the planning scheme supports subdivision down to 0.4 hectares in Low Density Residential areas where lots are capable of accommodating on-site effluent disposal and maintain the character of the area. While the proposed lot sizes are smaller than those in the surrounding area the proposed subdivision has been designed to maintain the character of the surrounding area. The proposed subdivision design will ensure there is no adverse effect on the character of the area by providing open space and landscaping, retaining existing native vegetation, providing lots with wide street frontages and avoiding battle-axe access and creating lots of sufficient size to provide setbacks in accordance with the DDO5.

Concerns were also raised about increased traffic, native vegetation impacts and drainage. In respect to traffic the existing road network is of an appropriate standard to accommodate additional traffic from the proposed subdivision and the proposed roads within the subdivision will be constructed in accordance with the requirements of Council's Infrastructure Design Manual. The objectors are unlikely to be impacted by increased traffic because none of the objectors' properties are located on Lomandra Drive which is the primary access to the subdivision.

Concerns regarding native vegetation impacts have been addressed because the proposed subdivision has been designed in order to avoid the removal of existing native vegetation on the western boundary. A condition will also be placed on the permit for tree protection envelopes in order to protect existing native vegetation. Permit conditions will also address concerns regarding drainage by requiring the preparation and implementation of a full drainage design which will include cut off drains along the boundaries of the subdivision that intercept and direct stormwater into the drainage network and provide appropriate stormwater detention.

CULTURAL HERITAGE IMPLICATIONS

This proposal does not require the preparation of a Cultural Heritage Management Plan under the *Aboriginal Heritage Regulations* 2007.

CONCLUSION

The application satisfies the provisions of the Planning Scheme, including State and Local planning policies, particularly the Local Policy for Low Density Residential Development (Clause 22.09), the provisions of the Low Density Residential Zone, and the decision guidelines of the Planning Scheme (Clause 65). The proposed subdivision has been designed to maintain the character of the area and the proposed lots are considered to be capable of on-site effluent disposal. Permit conditions requiring the provision of infrastructure including sealed roads and drainage, landscaping and the protection of native vegetation will ensure that the issue of a permit does not cause material detriment to any person.

GOLDEN PLAINS SHIRE

Office Use Only

VicSmart? ☐ YES ☐ NO

Specify class of VicSmart application:

Application No.: Date Lodged: / /

Planning Enquiries
Phone: (03) 5220 7111
Email: enquiries@gplains.vic.gov.au
Web: www.goldenplains.vic.gov.au

Application for a **Planning Permit**

If you need help to complete this form, read MORE INFORMATION at the back of this form.

⚠ Any material submitted with this application, including plans and personal information, will be made available for public viewing, including electronically, and copies may be made for interested parties for the purpose of enabling consideration and review as part of a planning process under the *Planning and Environment Act 1987*. If you have any concerns, please contact Council's planning department.

⚠ **Questions marked with an asterisk (*) must be completed.**

⚠ **If the space provided on the form is insufficient, attach a separate sheet.**

ℹ Click for further information.

Clear Form

Application Type

this a VicSmart application?*

○ No ○ Yes

If yes, please specify which VicSmart class or classes:.....

⚠ If the application falls into one of the classes listed under Clause 92 or the schedule to Clause 94, it is a VicSmart application.

Pre-application Meeting

Has there been a pre-application meeting with a Council planning officer?

○ No ○ Yes If 'Yes', with whom?: Peter O'Brien

Date: day / month / year

The Land ℹ

Address of the land. Complete the Street Address and one of the Formal Land Descriptions.

Street Address *

Unit No.: St. No.: St. Name: Bakers Lane

Suburb/Locality: Teesdale Postcode: 3328

. ormal Land Description *
Complete either A or B.

⚠ This information can be found on the certificate of title.

If this application relates to more than one address, attach a separate sheet setting out any additional property details.

A Lot No.: A ○ Lodged Plan ○ Title Plan ◉ Plan of Subdivision No.: 529738

OR

B Crown Allotment No.: Section No.:

Parish/Township Name: Carrah

PLANNING
29 AUG 2019

The Proposal

PLANNING
29 AUG 2019

⚠ You must give full details of your proposal and attach the information required to assess the application. Insufficient or unclear information will delay your application.

For what use, development or other matter do you require a permit? *

Development of the land for a multi-lot subdivision in accordance with the accompanying plans.

☑ Provide additional information about the proposal, including: plans and elevations; any information required by the planning scheme, requested by Council or outlined in a Council planning permit checklist; and if required, a description of the likely effect of the proposal.

Estimated cost of any development for which the permit is required *

Cost $ N/A

⚠ You may be required to verify this estimate. Insert '0' if no development is proposed.

If the application is for land within **metropolitan Melbourne** (as defined in section 3 of the *Planning and Environment Act 1987*) and the estimated cost of the development exceeds $1 million (adjusted annually by CPI) the Metropolitan Planning Levy **must** be paid to the State Revenue Office and a current levy certificate **must** be submitted with the application. Visit www.sro.vic.gov.au for information.

Existing Conditions

Describe how the land is used and developed now *

For example, vacant, three dwellings, medical centre with two practitioners, licensed restaurant with 80 seats, grazing.

Currenlty 20.8ha of vacant land (Zoned LDRZ) remaining from the larger 'Bakers Lane Subdivision'. Some scattered vegetation onsite.

☑ Provide a plan of the existing conditions. Photos are also helpful.

Title Information

Encumbrances on title *

Does the proposal breach, in any way, an encumbrance on title such as a restrictrive covenant, section 173 agreement or other obligation such as an easement or building envelope?

- ○ Yes (If 'yes' contact Council for advice on how to proceed before continuing with this application.)
- ○ No
- ○ Not applicable (no such encumbrance applies).

☑ Provide a full, current copy of the title for each individual parcel of land forming the subject site. The title includes: the covering 'register search statement', the title diagram and the associated title documents, known as 'instruments', for example, restrictive covenants.

Applicant and Owner Details

Provide details of the applicant and the owner of the land.

Applicant *

The person who wants the permit.

Name:
Title: Mr | First Name: Michael | Surname: Cosgriff
Organisation (if applicable): Golden Plains Shire Council
Postal Address: | If it is a P.O. Box, enter the details here:
Unit No.: | St. No.: 2 | St. Name: Pope Street
Suburb/Locality: Bannockburn | State: Vic | Postcode: 3331

*Please provide at least one contact phone number **

Contact information for applicant OR contact person below
Business phone: 03 5220 7201 | Email: michael.cosgriff@gplains.vic.gov.au
Mobile phone: 0407 890 565 | Fax:

Where the preferred contact person for the application is different from the applicant, provide the details of that person.

Contact person's details*
Same as applicant ✔
Name:
Title: | First Name: | Surname:
Organisation (if applicable):
Postal Address: | If it is a P.O. Box, enter the details here:
Unit No.: | St. No.: | St. Name:
Suburb/Locality: | State: | Postcode:

Owner *

The person or organisation who owns the land

Where the owner is different from the applicant, provide the details of that person or organisation.

Same as applicant ☐
Name:
Title: | First Name: | Surname:
Organisation (if applicable): Golden Plains Shire Council
Postal Address: | If it is a P.O. Box, enter the details here:
Unit No.: | St. No.: 2 | St. Name: Pope Street
Suburb/Locality: Bannockburn | State: Vic | Postcode: 3331
Owner's Signature (Optional): | Date: day / month / year

nformation requirements

Contact Council's planning department to discuss the specific requirements for this application and obtain a planning permit checklist.

Is the required information provided? ◉ Yes ○ No

Declaration

This form must be signed by the applicant *

⚠ Remember it is against the law to provide false or misleading information, which could result in a heavy fine and cancellation of the permit.

I declare that I am the applicant; and that all the information in this application is true and correct; and the owner (if not myself) has been notified of the permit application.

Signature: | Date: 29 / 08 / 2019 day / month / year

PLANNING
29 AUG 2019

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

VOLUME 11439 FOLIO 173 Security no : 124079425092G
Produced 23/09/2019 03:56 PM

LAND DESCRIPTION

Lot A on Plan of Subdivision 529738U.
PARENT TITLE Volume 11291 Folio 914
Created by instrument AK522060M 13/08/2013

REGISTERED PROPRIETOR

Estate Fee Simple
Sole Proprietor
GOLDEN PLAINS SHIRE COUNCIL of 2 POPE STREET BANNOCKBURN VIC 3331
PS529738U Stage 3 23/08/2011

ENCUMBRANCES, CAVEATS AND NOTICES

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

DIAGRAM LOCATION

SEE PS529738U 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)

ADMINISTRATIVE NOTICES

NIL

eCT Control 09864M GOLDEN PLAINS SHIRE COUNCIL
Effective from 18/05/2015

DOCUMENT END

PLAN OF SUBDIVISION	STAGE No	LRS EDITION 4	PLAN NUMBER PS529738U

LOCATION OF LAND

PARISH: CARRAH

TOWNSHIP: -

SECTION: -

CROWN ALLOTMENT:

CROWN PORTION: 54 (PART)

TITLE REFERENCES: VOL.9539 FOL.961

LAST PLAN REFERENCE/S: LP.144394 (LOT 2)(PT.)

POSTAL ADDRESS: BANNOCKBURN-SHELFORD ROAD TEESDALE 3328 (At time of subdivision)

MGA Co-ordinates (of approx centre of land in plan) E 238 880 N 5 786 330 ZONE: 55

COUNCIL CERTIFICATION AND ENDORSEMENT

COUNCIL NAME: GOLDEN PLAINS SHIRE REF: ~~SUB - 330~~

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~~ .....

Council Delegate

~~Council Seal~~

Date 4 / 5 / 2005

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

~~Council Delegate~~

~~Council Seal~~

~~Date / /~~

APPROVED TO MASTER PLAN (STAGE) ONLY

VESTING OF ROADS AND/OR RESERVES

IDENTIFIER	COUNCIL/BODY/PERSON
RESERVE No. 1	GOLDEN PLAINS SHIRE
RESERVE No. 2	GOLDEN PLAINS SHIRE
RESERVE No. 3	BARWON REGION WATER AUTHORITY
RESERVE No. 4	GOLDEN PLAINS SHIRE
RESERVE No.5	BARWON REGION WATER CORPORATION
RESERVE No.6	POWERCOR AUSTRALIA LIMITED
ROAD R1	GOLDEN PLAINS SHIRE
ROAD R2	GOLDEN PLAINS SHIRE
ROAD R3	GOLDEN PLAINS SHIRE

NOTATIONS

STAGING This is/ is not a staged subdivision
Planning permit No.

DEPTH LIMITATION DOES NOT APPLY

THE LAND BEING SUBDIVIDED IS ENCLOSED WITHIN THICK CONTINUOUS LINES.

SURVEY THIS PLAN IS / ~~IS NOT~~ BASED ON SURVEY
THIS SURVEY HAS BEEN CONNECTED TO PERMANENT MARKS No(s)
IN PROCLAIMED SURVEY AREA No

EASEMENT INFORMATION

Legend: E - Encumbering Easement, Condition in Crown Grant in the Nature of an Easement or Other Encumbrance
A - Appurtenant Easement R - Encumbering Easement (Road)

Subject Land	Purpose	Width (Metres)	Origin	Land Benefited/In Favour Of
E-1	DRAINAGE	10	THIS PLAN	GOLDEN PLAINS SHIRE
E-2	DRAINAGE	5	THIS PLAN	GOLDEN PLAINS SHIRE
E-3	POWER SUPPLY	SEE PLAN	THIS PLAN	POWERCOR AUSTRALIA LTD
E-4	ELECTRICITY SUPPLY	SEE PLAN	THIS PLAN SECTION 88 ELECTRICITY INDUSTRY ACT 2000	POWERCOR AUSTRLIA LIMITED

LRS
STATEMENT OF COMPLIANCE
EXEMPTION STATEMENT
RECEIVED ☑
DATE 25/ 8 / 05

THIS IS AN LR COMPILED PLAN

FOR DETAILS SEE MODIFICATION TABLE HEREIN

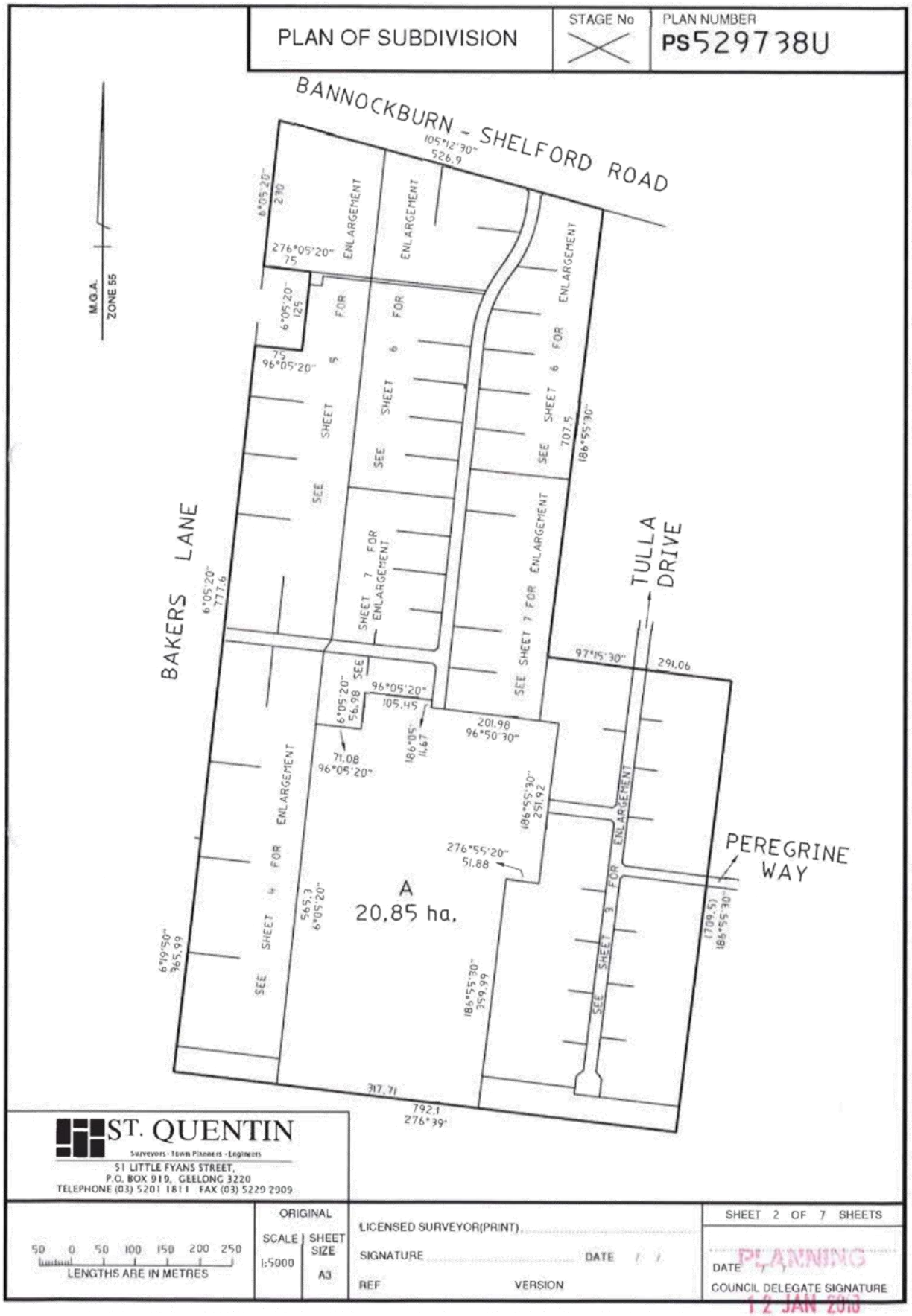
SHEET 1 OF 8 SHEETS

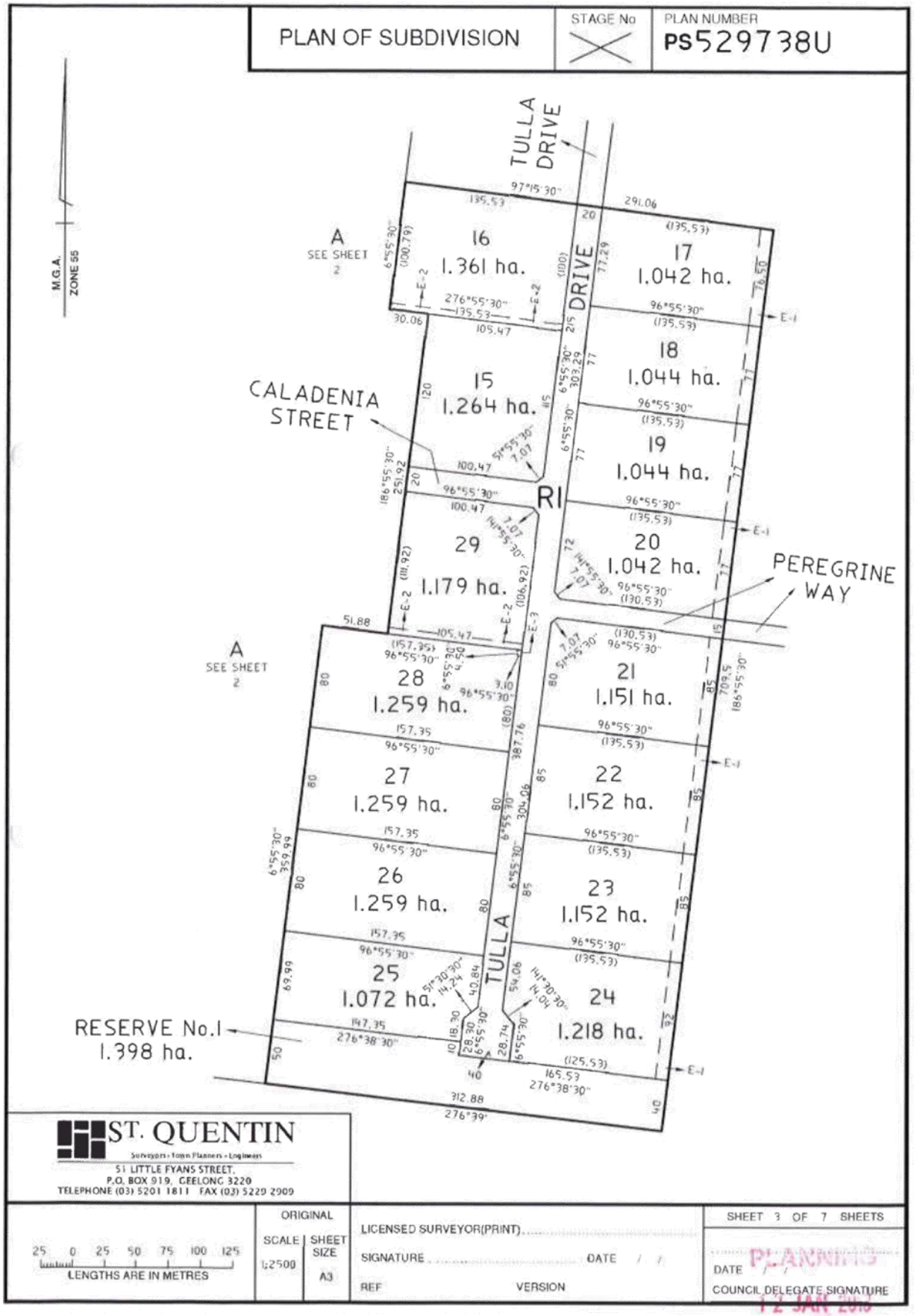
ST QUENTIN CONSULTING PTY LTD
SURVEYORS · TOWN PLANNERS · DEVELOPMENT CONSULTANTS
54 CORIO STREET, GEELONG 3220
PO BOX 919 GEELONG 3220
PH (03) 52292011 FAX (03) 52292909

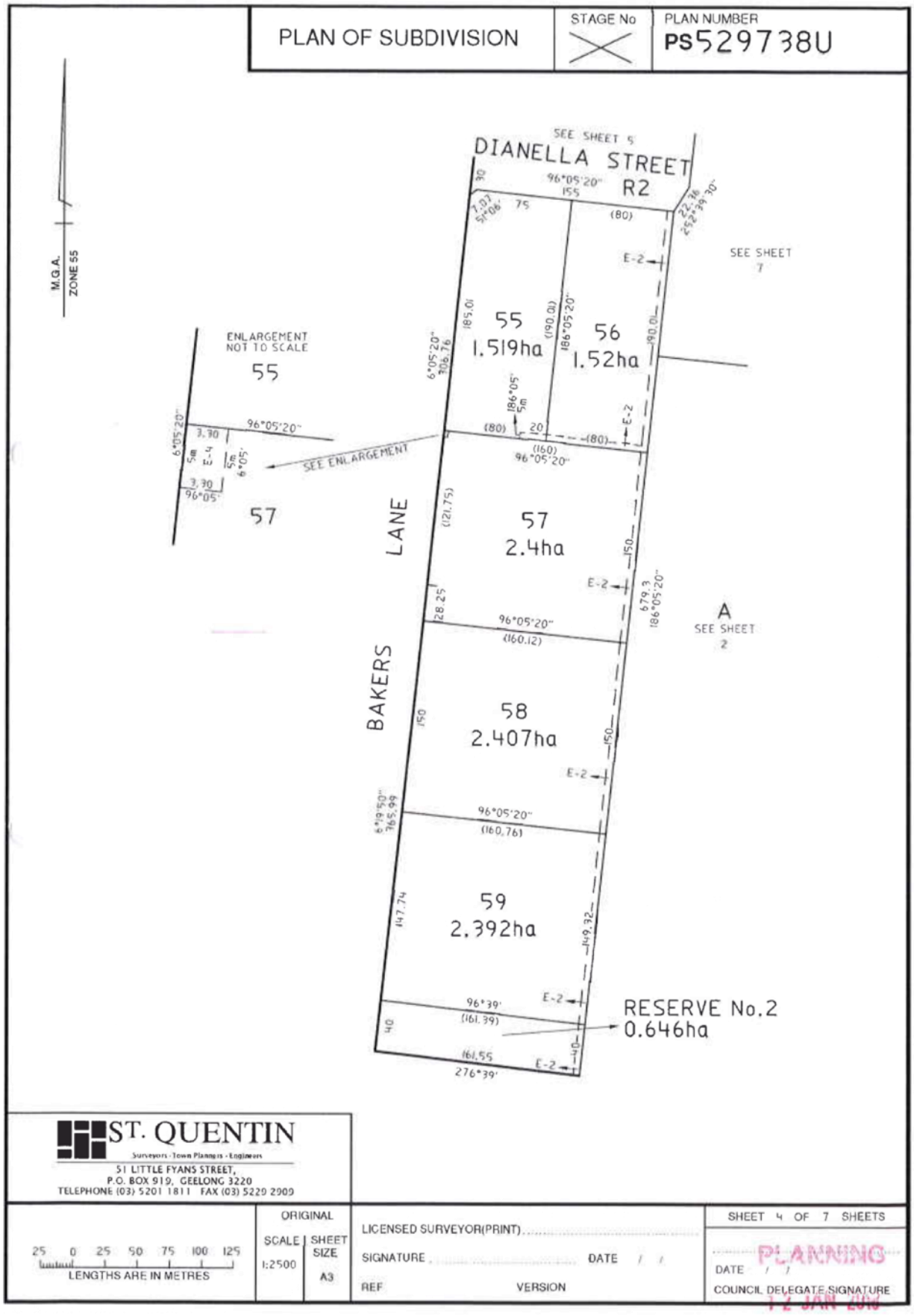
LICENSED SURVEYOR (PRINT) GRANT ST QUENTIN
SIGNATURE ..... DATE 3 / 9 / 04
REF 6402_SI/04 VERSION 04

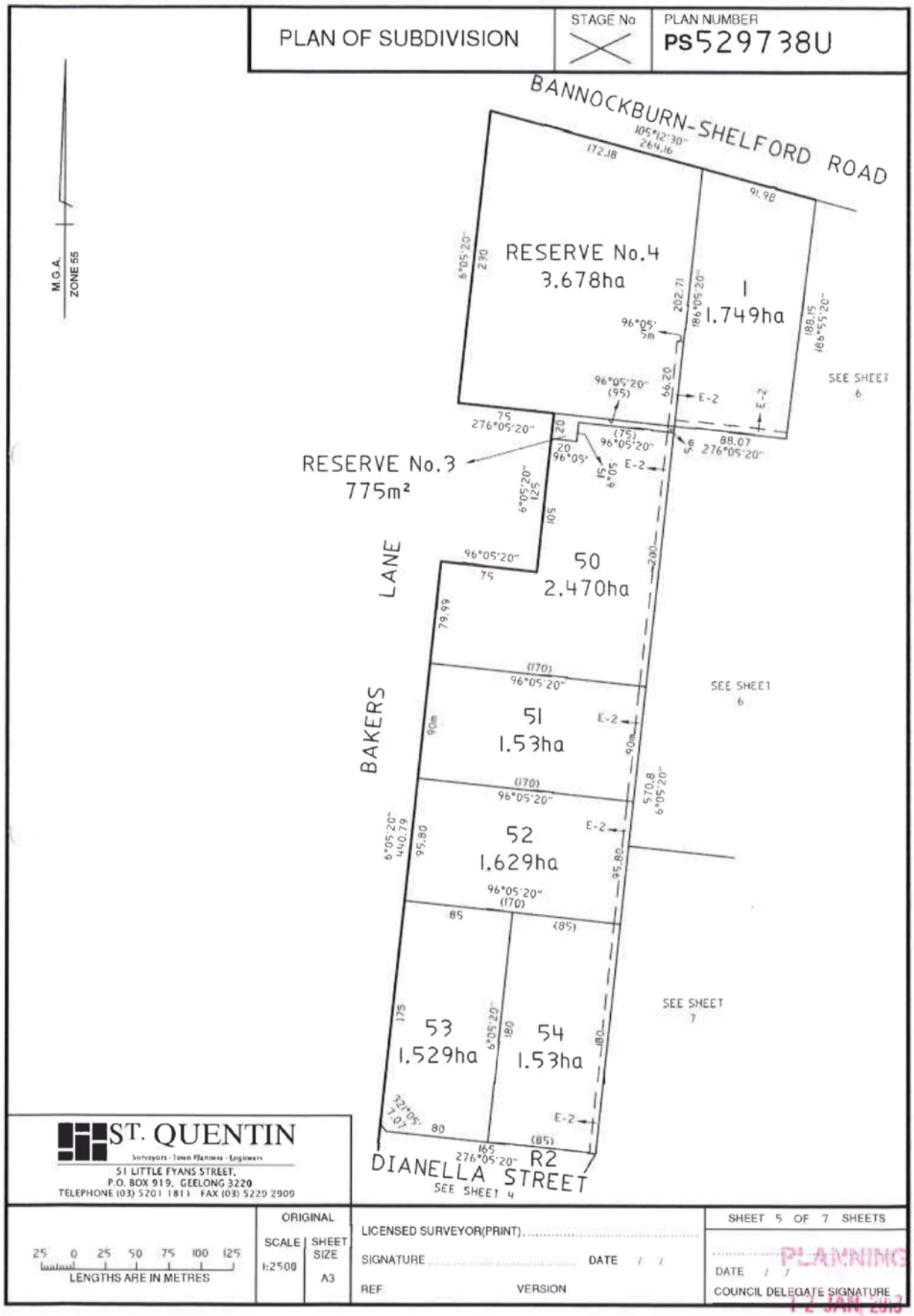
DATE 4 / 5 / 2005
COUNCIL DELEGATE SIGNATURE
ORIGINAL SHEET SIZE A3

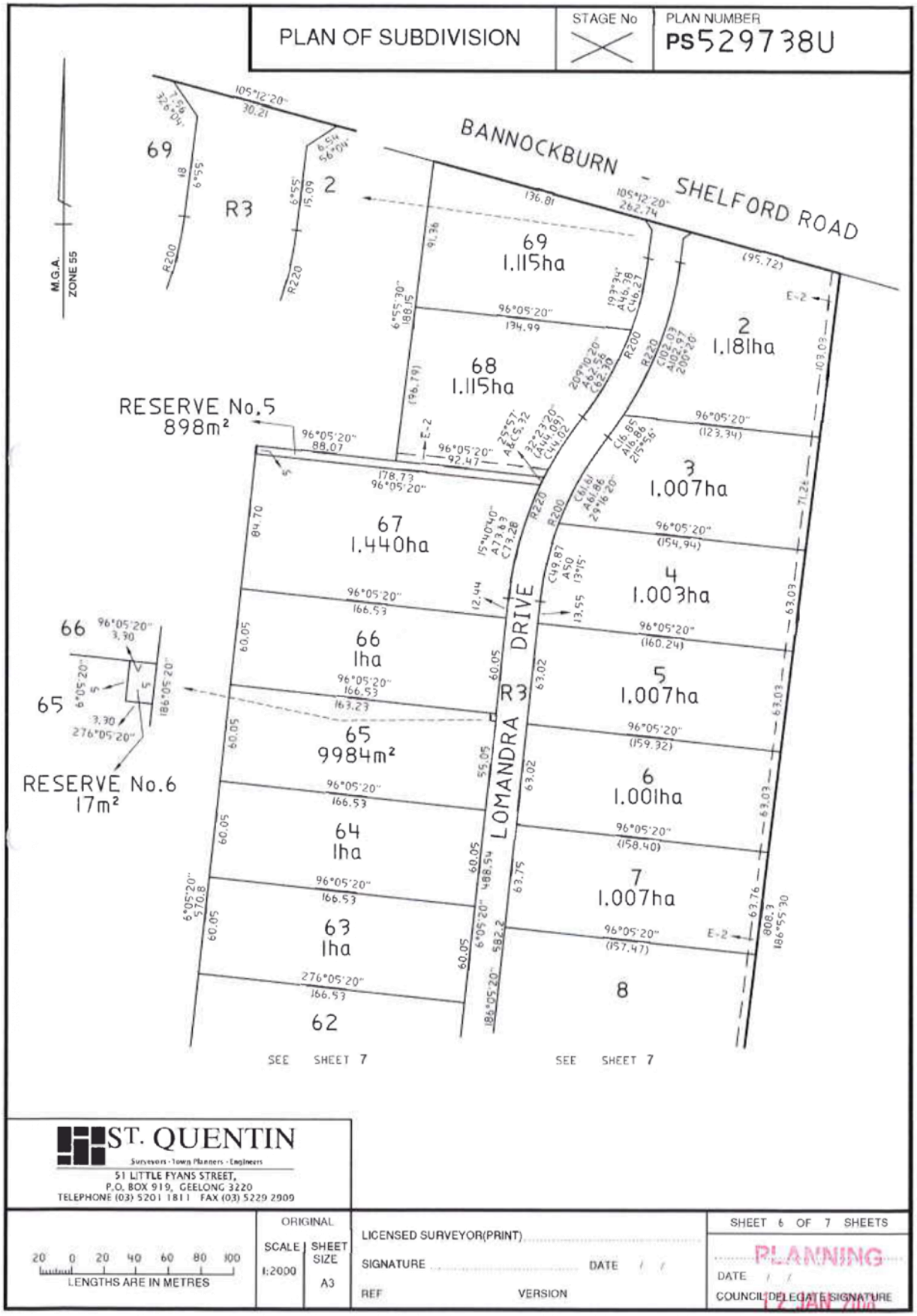
PLANNING
12 JAN 2018

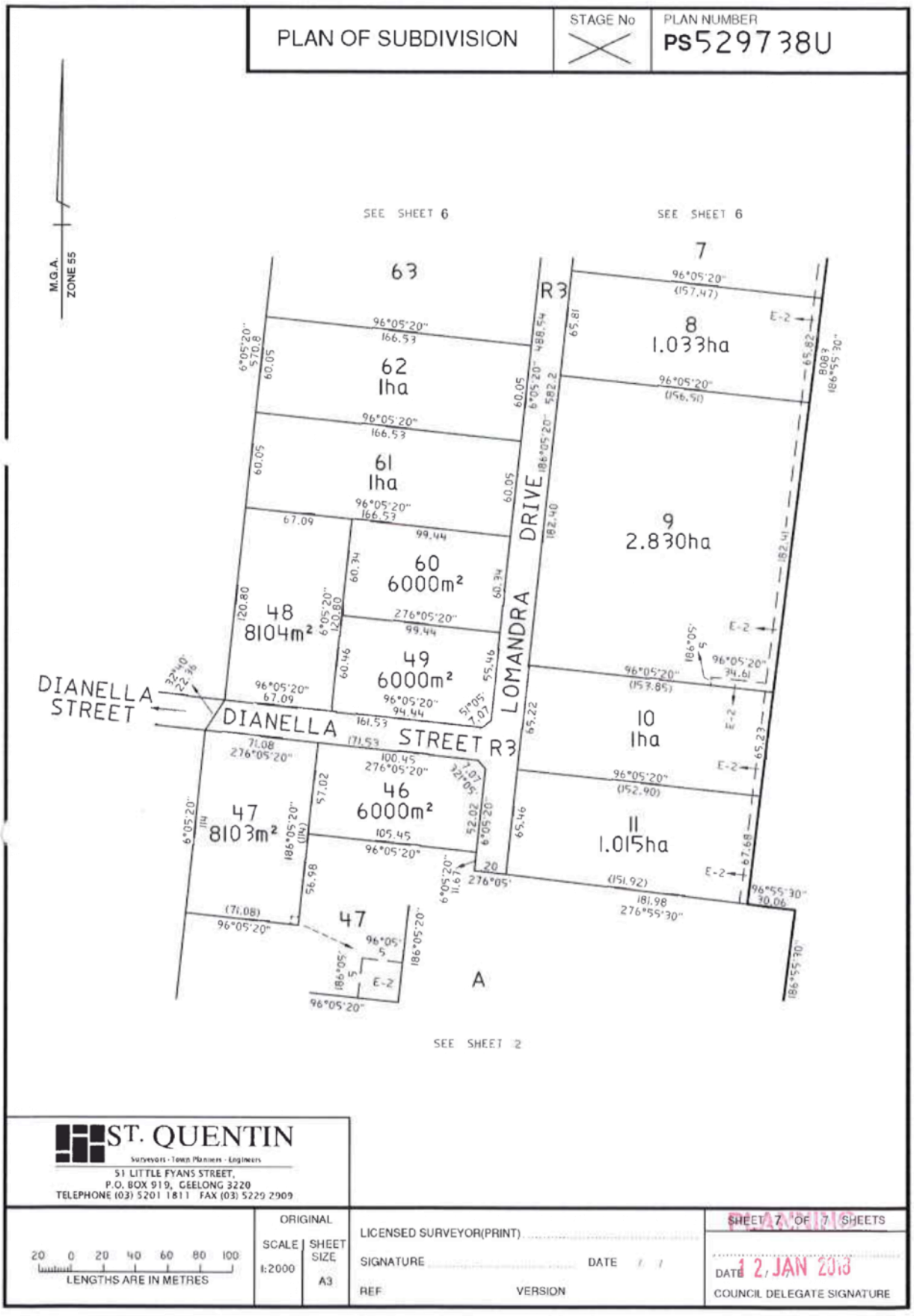


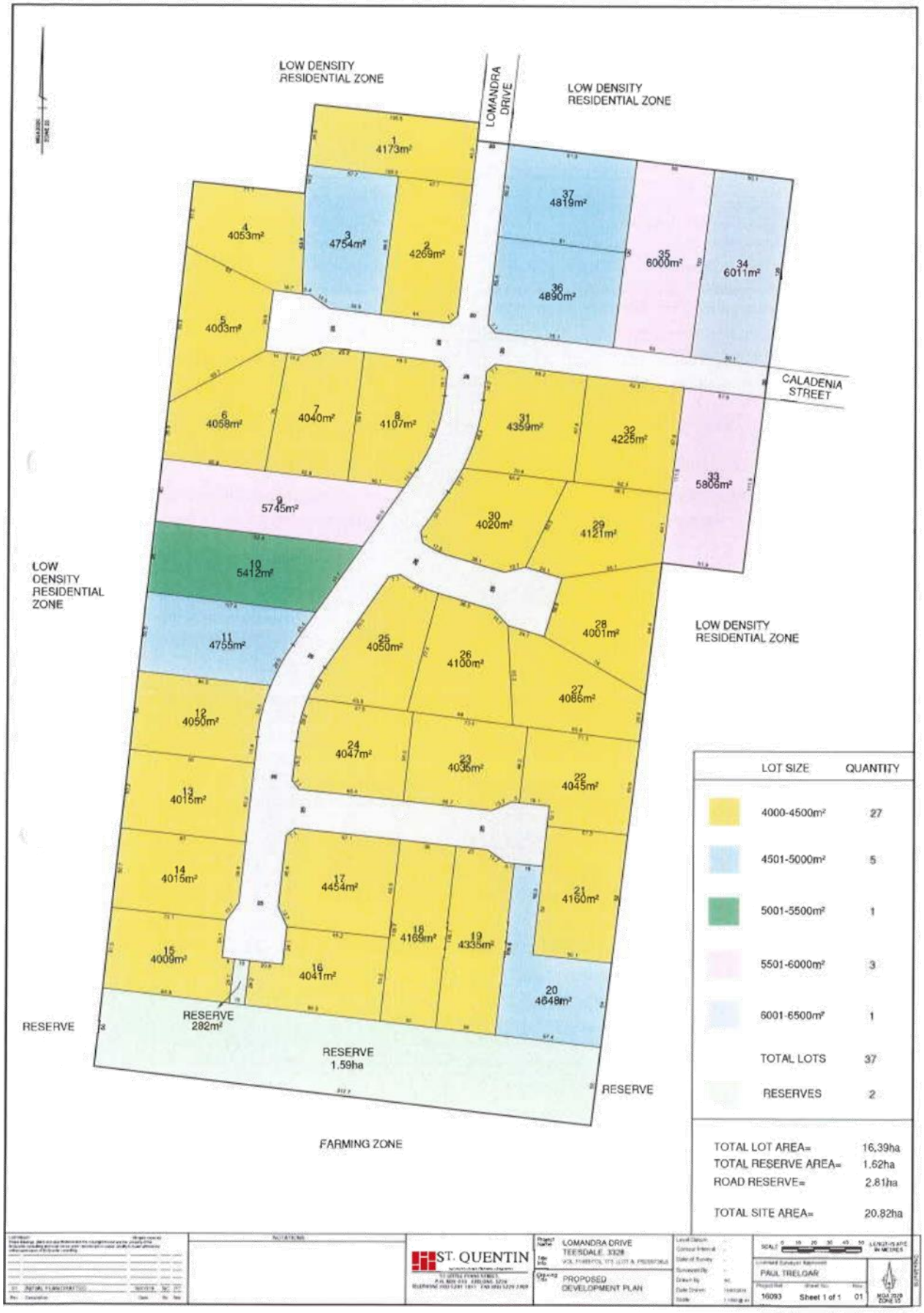











LOW DENSITY RESIDENTIAL ZONE
LOMANDRA DRIVE
LOW DENSITY RESIDENTIAL ZONE
CALADENIA STREET
LOW DENSITY RESIDENTIAL ZONE
LOW DENSITY RESIDENTIAL ZONE
RESERVE
RESERVE 282m²
RESERVE 1.59ha
RESERVE
FARMING ZONE
LOT SIZE QUANTITY
4000-4500m² 27
4501-5000m² 5
5001-5500m² 1
5501-6000m² 3
6001-6500m² 1
TOTAL LOTS 37
RESERVES 2
TOTAL LOT AREA= 16.39ha
TOTAL RESERVE AREA= 1.62ha
ROAD RESERVE= 2.81ha
TOTAL SITE AREA= 20.82ha
ST. QUENTIN
LOMANDRA DRIVE
TEESDALE 3328
PROPOSED DEVELOPMENT PLAN
PAUL TRELOAR
16093
Sheet 1 of 1
01

GOLDEN PLAINS SHIRE COUNCIL

LAND CAPABILITY ASSESSMENT
FOR
ON-SITE WASTEWATER MANAGEMENT
AT
LOT A PS529738, BAKERS LANE ESTATE, BANNOCKBURN-SHELFORD ROAD, TEESDALE

REPORT No. A180806 JUNE 2019

By

Paul Williams, B.App.Sc.
Paul Williams & Associates Pty Ltd
CONSULTANTS IN THE EARTH SCIENCES

IMPORTANT NOTE

The land capability assessment report consists of this cover sheet, two written sections, two drawings and four appendices.
The report elements are not to be read or interpreted in isolation.

TABLE OF CONTENTS

SECTION 2 RECOMMENDATIONS

(iii)

ASSESSOR'S ACADEMIC & PROFESSIONAL QUALIFICATIONS

Paul Williams is the Director and principal earth scientist at Paul Williams & Associates Pty Ltd. He has a Bachelors Degree in Applied Science (Geology and Land Use) (awarded in 1978) and has since specialised in vadose zone hydrology, soil science and engineering geology.

He is a member of the Foundation and Footings Society (Vic) Inc. and is a Registered Building Practitioner (EC1486)

All fieldwork and analyses are undertaken by, or directly supervised by Paul Williams.

ASSESSOR'S PROFESSIONAL INDEMNITY INSURANCE

Policy Number:	RSM0000001
Period of Cover:	14/2/2019 – 14/2/2020
Geographical Coverage:	Worldwide (excluding U.S.A. & Canada)
Retro-active Date:	Unlimited
Limit of Indemnity:	$4,000,000
Underwriting Company:	Lloyds of London (About Underwriting)

EXECUTIVE SUMMARY

The proposed development at Lot A PS529738, Bakers Lane Estate, Bannockburn-Shelford Road, Teesdale, is suitable for sustainable on-site effluent disposal.

It is proposed to subdivide an allotment of approximately 19 hectares (excluding the reserve on the southern boundary) into allotments of at least 4,000m^2.

Each allotment must be able to support a residence and associated onsite wastewater system.

The site is in the Low Density Residential zone and is not a Special Water Supply Catchment.

The site is not sewered. For design purposes, mains water (equivalent) is assumed.

Table One
Description of Development

Parameter	Site specific element
SPI Number	A\PS529738
Property Address	Lot A PS529738, Bakers Lane Estate, Bannockburn-Shelford Road, Teesdale.
Owner	Golden Plains Shire.
Contact	Michael Cosgriff 03 5220 7201 Michael.cosgriff@gplains.vic.gov.au
Locality	Teesdale
Zoning and Overlays	Low Density Residential.
Area	19 hectares (approximately).
Usable Lot Area	At least double proposed land application areas (for 4,000m^2 minimum lot size).
Soil Texture	Category 6 (loam) over Category 6 (sodic/magnesic medium clay).
Soil Depth	2+m.
Soil Structure	Weakly structured.
Soil Constraints	Low ksat, sodic/magnesic clays (Category 6 soils).
Permeability	0.03m/day after renovation.
Slope	Less than 1%.
Distance to Surface Waters	30m (minimum) to drain.
Water Supply	Mains equivalent (assumed for design purposes).
Wastewater Load	750 litres (4-bedroom dwellings).
Availability of Sewer	Not available

The assessment has been made in the context of prioritising public and environmental health with a design compromise between rational wastewater reuse and sustainable wastewater disposal.

Our field testing which included soil profile logging and sampling, laboratory testing and subsequent reporting including water and nutrient balance modelling and risk assessment has revealed that on-site effluent disposal is rational and sustainable.

Effluent shall be treated to at least the 20/30 standard and distributed by subsurface irrigation utilising the processes of evapotranspiration and deep seepage.

The irrigation area has been determined for the mean wet year and satisfies the requirements of *SEPPs (Waters of Victoria)* in that all wastewater can be contained onsite and the effluent irrigation system cannot have any detrimental impact on the beneficial use of surface waters or groundwater.

For the proposed development increases in effluent volume above 750 litres/day may be possible.

With regard to density of development and cumulative risk the assessment has considered risk associated with subsurface flows and surface flows.

In regard to subsurface flows, it is clear that provided the on-site system is adequately designed, constructed, operated and maintained the risk to surface and ground waters is negligible. Once the effluent is placed underground, the extraordinary long travel times via ground water to surface waters ensures adequate nutrient attenuation.

In regard to surface flows, it is clear that provided the on-site system is adequately designed, constructed, operated and maintained, the risk to surface and ground waters is no greater than for a sewered development.

The results of the land capability assessment and risk analysis indicate that primary effluent and trench systems are not appropriate for this site.

Where risk is defined as the product of consequences and frequency, the risk to public health and the environment can be reduced to negligible levels if effluent is treated to a secondary level and disposed via pressure compensated subsurface irrigation, as described in Section 2, below.

Residential use requires AWTS or sand filter with pressure compensated subsurface irrigation and load balancing facility/function.

Intermittent (e.g. holiday) use requires sand filter with pressure compensated subsurface irrigation and load balancing facility/function.

The LCA supports a conservative, scientifically based, well founded wastewater management system with inherent multiple barriers of safety.

Cumulative risk from the development is extremely low. The risk of serious or irreversible damage is extremely low.

All requirements of *SEPP (Waters of Victoria)* can be met.

Paul Williams & Associates Pty. Ltd.
ABN 80 006 412 862
CONSULTANTS IN THE EARTH SCIENCES

P. O. Box 277, Sunbury, Victoria, 3429
2 Argyle Place, Sunbury, Victoria, 3429
Telephone: 03 9744 6426
Mobile: 0418 171 796
Email: paul@rockdr.com.au

LAND CAPABILITY ASSESSMENT LAND USE MAPPING TERRAIN MODELLING HYDROGEOLOGY GEOLOGY HYDROLOGY SOIL SCIENCE LAND-SOIL RISK ASSESSMENT

A180806 – JUNE 2019

GOLDEN PLAINS SHIRE COUNCIL

LAND CAPABILITY ASSESSMENT
FOR
ON-SITE WASTEWATER MANAGEMENT
AT
LOT A PS529738, BAKERS LANE ESTATE, BANNOCKBURN-SHELFORD ROAD, TEESDALE

SECTION 1. SITE INVESTIGATION

1.1 INTRODUCTION

On instruction from the land owner, an investigation was undertaken to assess land capability for on-site effluent disposal at Lot A PS529738, Bakers Lane Estate, Bannockburn-Shelford Road, Teesdale.

It is proposed to subdivide an allotment of approximately 19 hectares (excluding the reserve on the southern boundary) into allotments of at least 4,000m^2.

Each allotment must be able to support a residence and associated onsite wastewater system.

The site is in the Low Density Residential zone and is not a Special Water Supply Catchment.

The site is not sewered. For design purposes, mains water (equivalent) is assumed.

The assessment has been made in the context of prioritising public and environmental health with a design compromise between rational wastewater reuse and sustainable wastewater disposal.

1.2 INVESTIGATION METHOD

The reconnaissance site investigation was carried out in accordance with *SEPPs (Waters of Victoria) and related documents. This report is in accordance with* current *SEPPs (Waters of Victoria), Code of Practice - Onsite Wastewater Management, E.P.A.* Publication 891.4, July 2016 and *Golden Plains Shire Domestic Wastewater Management Plan.* Guidance has been sought from *Approaches for Risk Analysis of Development with On-site Wastewater Disposal in Open, Potable Water Catchments,* Dr Robert Edis, April 2014. *AS/NZS 1547:2012, Guidelines for Wastewater Irrigation*, E.P.A. Publication 168, April 1991, *Wastewater Subsurface Drip Distribution*, Tennessee Valley Authority, March, 2004, *AS 2223, AS 1726, AS 1289, AS 2870* and *Australian Laboratory Handbook of Soil and Water Chemical Methods.*

Our capability assessment involved the mapping of unique land-soil unit(s) which were defined in terms of significant attributes including; climate, slope, aspect, vegetation, soil profile characteristics (including colloid stability, soil reaction trend and electrical conductivity), depth to rock, proximity to surface waters and escarpments, transient soil moisture characteristics and hydraulic conductivity.

Exploratory boreholes were augered and existing exposures were viewed. The soil profile was logged and representative soil samples were taken for laboratory testing.

Water and nutrient balance analyses were based on the mean wet year for Bannockburn and mean evaporation data for Durdidwarrah and were undertaken in accordance with *Guidelines for Wastewater Irrigation, E.P.A.* Publication 168, April 1991 (Part), *AS/NZS 1547:2012* and in-house methods.

1.3 CAPABILITY ASSESSMENT

We have used the attributes determined by the investigation to define one (1) land-soil unit, as follows:-

1.3.1 Land-Soil Unit A. This land-soil unit consists of gently sloping terrain, as shown in Drawings 1 and 2 and Figure 1.

1.3.1.1 Climate. The general area receives a mean annual rainfall of 509mm and a mean annual evaporation of 1026mm. Mean evaporation matches or exceeds the mean rainfall in August through April.

Rainfall and evaporation data are presented in Appendix B, to this report.

1.3.1.2 Slope and Aspect. The site occupies a very gently sloping plain. Ground slope is to the south-east at 0.7% to 1.1%, as shown in Drawings 1 and 2.

The unit is exposed to the prevailing winds and is subject to full winter sunshine.

1.3.1.3 Vegetation and Land Use. The unit is vegetated with sparse to dense pasture grasses, weeds and occasional thistles and remnant *native spp* and regrowth, as shown in Drawing 2.

1.3.1.4. Slope Stability. For the encountered subsurface conditions, slope degree and geometry and for the proposed range of hydraulic loadings, the stability of the ground slopes within the disposal areas are unlikely to be compromised.

1.3.1.5 Subsurface Profile. The unit is underlain by sedimentary materials of Tertiary Age.

The general subsurface profile consists of:-

- A topsoil (A-horizon) layer of grey-brown, yellow-grey and red-brown, moist, medium dense, non-dispersive and dispersive silty sand, clayey sand and sand (loam and sandy loam), with a soil reaction trend of 5.9 to 6.1 pH, electrical conductivity of 0.29 to 0.34 dS/m, to depths of 0.1 to 0.3m, overlying,

- An alluvial (A_L-horizon) layer of orange and orange-brown, moist, medium dense, non-dispersive and dispersive clayey sand (sandy loam), with a soil reaction trend of 7.4 to 7.8 pH, electrical conductivity of 0.56 to 1.02 dS/m and clay fraction free swell of 30% to 45%, containing indurated layers, to depths of 0.3 to 0.7m, overlying,

- An alluvial (A_L-horizon) layer of orange, red-brown, moist, very stiff, dispersive sandy clay of low plasticity (medium clay), and white, orange-grey, medium dense sand, with a soil reaction trend of 5.9 to 7.7 pH, electrical conductivity of 0.41 to 0.59 dS/m and free swell of 5% to 45%, to depths of 1.3 to at least 2m, overlying,

- An alluvial (A_L-horizon) layer of yellow-brown and orange-brown, moist, very stiff, dispersive sandy clay of low plasticity (medium clay), with interbeds of clayey sand (clay loam), with a soil reaction trend of 6.9 to 7.6 pH, electrical conductivity of 0.40 to 0.62 dS/m and free swell of 15% to 45%, to a depth of at least 2m.

1.3.1.6 Soil Permeability. The *in-situ* permeability tests were attempted on 4th March and 10th April 2019.

The field testing was abandoned due to spontaneous dispersion of the soil clay fraction.

Where the soils are dispersive *insitu* permeability testing realises inaccurate, low or nil results.

The hydraulic conductivity can be estimated by using test waters containing calcium chloride and/or by laboratory assessment of colloid stability and determination of ameliorant quantities (e.g. gypsum/lime requirement) and swell potential.

A conservative estimate of permeability has been deduced as follows (see Code 3.6.1):-

Profile analysis in accordance with AS/NZS 1547:2012 and our laboratory determined dispersion and swell potential shows the alluvial clay soils (and clay fractions) to be dispersive. They are therefore by definition Category 6 soils with saturated hydraulic conductivity less than 0.06m/day.

Similar dispersive soils have responded positively (with sufficiently improved hydraulic capability) following applications of gypsum.

For the limiting poorly-structured clay and clayey soils and assuming renovation by gypsum application we have adopted an estimated and conservative design saturated hydraulic conductivity of 0.030m/day.

Peak deep seepage is conservatively estimated at 3mm/day (<10% k_{sat}). Average daily deep seepage is 1.6mm.

1.3.1.7 Basement Material Permeability. From the literature and from examination of creek bed and bank materials in the vicinity, the hydraulic conductivity of the basement material could be up to 1m/day (adopt 1m/day for buffer design).

1.3.1.8 Colloid Stability. The results of the Emerson Crumb Tests, Dispersion Index tests and observations of any discolouration of water in the boreholes indicate that all encountered materials are non-dispersive and dispersive.

The Emerson Class was 5 to 2 and the Dispersion Index was zero to 13.

The electrical conductivity was determined for all horizons using a 1:5 soil/water extract and converted to EC (saturation extract).

The determined electrical conductivity (EC_{se}) ranged from 0.29 dS/m 1.02 dS/m.

Soil reaction trend ranged from 5.9 pH to 7.8 pH which is within a tolerable range.

Exchangeable Sodium was 11.9% to 23.6% (desirable range is <5%).

Exchangeable Magnesium was 42.2 to 47.5% (desirable range is 12% to 15%).

Exchangeable Calcium was 9.3% to 17% (desirable range is 65% to 70%).

The adjusted CEC was 1.82 to 16.29 (desirable range is 15+).

The Calcium/Magnesium ratio was 0.2 to 0.4 (desirable range is 2 to 4).

To improve the subsoil permeability and to maintain stable soil peds, the exchangeable Calcium needs to be increased while the exchangeable Sodium and Magnesium need to be decreased.

To achieve a suitable cation balance, gypsum needs to be added to the soil – see Section 2.2.8, below.

Assuming design, construction, operation and maintenance of the on-site effluent systems are in accordance with the recommendations contained in this report, we can conclude that there is a low salting potential.

1.3.1.9 AS1547:2012 Soil Classification. In accordance with *AS/NZS1547:2012* the alluvial materials can be classified as Category 6 soils (sodic and magnesic medium clays).

1.3.1.10 Surface Drainage. The site slopes to the south-east at 0.7% to 1.1%, as shown in Drawing 2. Any surface flows from the site would be intercepted by an existing drain (adjacent to the northern reserve boundary) to collect in a retarding basin, located at the southern end of Tulla Drive, as shown in Drawing 2.

A drainage trace running north-west to south-east is located, as shown in Drawing 2. It is described as a watercourse in the land database. This characterisation is not supported by the field evidence and we would describe it as a vague/diffuse linear depression.

The land to the south-west of the drainage trace has been furrowed normal to the contours, probably to facilitate drainage in the subdued terrain.

An artificial drain is located as shown in Drawing 2. This drain collects water from road run-off in the north (Lomandra Drive)

It is assumed that this drain will be decommissioned and that all road and allotment run-off will be collected in the estate's internal road-drain network.

Any remaining surface depressions on allotments can be infilled by the redistribution of existing topsoil with resultant minimal impact on the location of buildings and land application areas (which will have mandatory cut-off drains on all high sides).

1.3.1.11 Groundwater. No ground water was encountered in any of the boreholes.

Subsurface flow direction will generally reflect natural surface flow direction (i.e. a south-easterly direction).

There are no groundwater bores within a significant distance of the site.

The Victorian groundwater data base and our bore logs indicate groundwater is deeper than 2 metres of the surface.

Regionally the groundwater is contained in sedimentary sands and clays. The yield is moderate and quality is poor (3,500 to 7,000 mg/litre TDS) with beneficial use including some stock.

1.3.1.12 Nutrient Attenuation. Clayey soils (as found on this site) can fix large amounts of phosphorous. Phosphate-rich effluent seeping through these soils will lose most of the phosphorous within a few metres.

The limiting nutrient for this site is nitrogen. No phosphorous balance is required.

Nitrogen, contained in organic compounds and ammonia, forms nitrate-N and small amounts of nitrite-N when processed in an aerated treatment plant. Several processes affect nitrogen levels within soil after irrigation. Alternate periods of wetting and drying with the presence of organic matter promote reduction to nitrogen gas (denitrification). Plant roots absorb nitrates at varying rates depending on the plant species (see Appendix B), however nitrate is highly mobile, readily leached, and can enter groundwater via deep seepage and surface waters via overland flow and near-surface lateral flow.

Based on the water and nutrient balance (see Appendix B), and assuming 30mg/litre N in the effluent (general case) and 20mg/litre P, a denitrification rate of 20%, with N uptake of 220 kg/ha/year for the an appropriate grass cover equivalent to a rye/clover mix) and sequential zoned dosing of the irrigation area, a conservative estimate can be made of the nitrogen content in the deep seepage and lateral flow.

For the general case, and without considering further expected denitrification below the root zone and in the groundwater (reported to be in the vicinity of 80%), denitrification in the lateral flow (external to the irrigation areas but within the curtilage of the allotment) and plant uptake in the lateral flow, the irrigation area would need to be 300m² for 750 litres/day of effluent for complete attenuation.

The hydraulic component of the water and nutrient balance have shown that an irrigation area of 390m² (4-bedroom dwelling) would be required to limit surface rainwater flows to episodic rain events.

For the development and to satisfactorily attenuate nitrogen on-site and to accommodate the design hydraulic loading, the application rate should not exceed **1.9mm/day**.

1.4 RISK MANAGEMENT & MITIGATION

SEPP (Waters of Victoria) requires that the proposal be assessed on a risk-weighted basis and cumulative effects[a] be considered.

A multiple risk-reduction approach is used in assessing this development, with components listed below:

[a] We would contend that there can be no significant cumulative effect if the provisions of *SEPP (Waters of Victoria)* are met (i.e. all wastes contained onsite).

1.4.1 Water Usage. With respect to daily effluent production, the systems are overdesigned. Current best practice allows for a (continuous) daily effluent flows of 750 litres as per *Code of Practice - Onsite Wastewater Management, E.P.A.* Publication 891.4, July 2016.

The design flow is unlikely to be continuous and (at least) standard water reduction fixtures are a mandatory requirement under local building codes.

1.4.2 Secondary Treatment. The LCA recommends AWTS and sand filters. These systems generate a much higher quality of effluent than septic systems.

1.4.3 Large Block Size. Many under-performing effluent fields are placed on blocks where area is limited. Limited area can lead to inadequately sized or inappropriately placed effluent fields and a lack of options should the daily effluent volumes increase.

For minimum allotment areas of 4,000m^2, size is not a constraining factor.

1.4.4 Management Plan. Historically, inadequate maintenance has played a major part in the failure of onsite effluent disposal systems. There is a management plan within the LCA (see Appendix D). This plan gives guidance on the implementation of mandatory operation, maintenance and inspection procedures.

1.4.5 Sizing of Treatment Systems. No specific proprietary treatment plant is recommended, however treatment plants or sand filters must have current JAS/NZS accreditation, which match effluent volumes with plant capacity.

1.4.6 Load Balancing. Surge flows are possible due to parties, gatherings, etc. Under these conditions the systems may become overwhelmed for a period. This potential problem can be eliminated by installing a plant with a load balancing facility (or equivalent function) which enables short-term storage and sustainable flows to the distribution area over extended time. The load balancing facility also provides temporary storage should the plant fail or if there is a power outage.

1.4.7 Zoned Dosing. The LCA stipulates that the effluent area is (automatically) irrigated sequentially by zones or time to promote the creation of transient aerobic and anaerobic soil conditions.

The effluent field is sized conservatively for nitrogen attenuation, using pasture grass (rye/clover eq mix), which has a nitrogen uptake of 220 kg/ha/year. Zoned dosing will increase the efficiency of the field for removing nitrogen from the soil.

Undersized effluent fields are at risk of becoming anaerobic for long periods, with the risk of microbial build-up. This leads to secretion of microbial polysaccharides, which coat soil particles and restrict the ability of the soil to adsorb nutrients and attenuate pathogens. Polysaccharides can also coat the interior of pipes and block drainage holes if drainage is slow due to the field being overloaded with effluent. This can lead to effluent surcharge from the ends of the drainage pipes, forming preferential flow paths through overlying soil and draining overland to nearby surface waters.

The alternating aerobic and anaerobic conditions created by zoned dosing prevent the build-up of microbial polysaccharides, and ensures efficient renovation of effluent.

1.4.8 Pressure Compensated Subsurface Disposal. Conservatively sized irrigation areas with pressure compensated subsurface disposal and zoned dosing deliver effluent directly into the soil. Under saturated conditions, water flow is downwards in the direction of maximum hydraulic gradient. For a surface flow containing effluent to occur, the effluent would have to rise, *against gravity*, through at least 150mm of soil. Under unsaturated conditions, water flow is multi-directional due to capillary forces and matrix suction. The atmosphere provides a capillary break with capillary forces and matrix suction reducing to zero at the air/soil interface. Gravitational forces outweigh the capillary forces and matrix suction long before the surface is reached. Hence, any surface flow from the effluent area cannot contain any effluent, regardless of the intensity and duration of rain events. Surface flow can only consist of **rainfall** in excess of soil storage capacity and hydraulic conductivity.

Note: For a pressure compensated distribution network to function properly, lines must be placed parallel to contours and/or horizontal for even effluent distribution. This requirement, alone, requires a high level of quality assurance at the design and construction phases.

1.4.9 Oversized Effluent Areas. Design effluent areas are oversized and are based on conservative estimates of renovation and complete attenuation of nitrogen. The deep seepage rate is lower than the hydraulic conductivity of the limiting layer (<10%).

1.4.10 Reserve Areas. Although reserve areas are not required for subsurface irrigation (*Code of Practice*, 2016), they have been stipulated in the recommendations and constitute an additional barrier of safety. The reserve area is a spare effluent field, which is left undeveloped, but can be readily constructed and commissioned in the case of contingencies through the chain of ownership.

1.4.11 Buffer Distances. Buffer distances are set out in the *Code of Practice* to allow for attenuation of pathogens and nutrients, should an effluent surcharge occur, either overland or subsurface.

All land application areas are located at least 30m from surface waters (drain to the south of the site).

The time taken for groundwater to reach the nearest potable surface waters can be estimated by using the Darcy equation (which states that velocity is the product of the hydraulic conductivity and the hydraulic gradient). From the literature, the regional gradient is about 0.002.

Flow times can be estimated for groundwater to flow the 30m (minimum) to the nearest surface waters at this site.

For a conservative basement hydraulic conductivity of 0.5m/day[b] (clayey sands) with a hydraulic gradient of 0.002, the time taken for groundwater to flow a distance of 30m is over 80 years.

For perched groundwater flows in the topsoil materials (hydraulic conductivity of 0.6m/day) and a hydraulic gradient equivalent to the average ground slope (1%), the time taken for perched groundwater to flow a distance of 30m is about 13 years and assumes no evapotranspiration during this time.

For a surface effluent discharge on a 1% slope and for the prevailing soil hydraulic characteristics, the estimated maximum travel distance of effluent before reabsorption is less than 1m[c].

1.4.12 System Failure. A properly designed and constructed onsite effluent system consisting of the treatment plant and the irrigation area can suffer degrees of failure. Failure can take the form of mechanical (plant), accidental (toilet blockages, damaged irrigation lines, high BOD influent), operational (power outage, overloading) and maintenance (failure to check filters, failure to participate in maintenance programme).

1.4.12.1 Mechanical Breakdown. Mechanical plant breakdown typically involves compressor and pump malfunction causing no aeration and high-water levels, respectively. Both of these situations are alarmed (both audible and visual). The proposed plants will benefit from a service contract providing 24-hour repair cycles. If the alarms were ignored (or malfunctioned) and the household continued to produce waste until the load balancing tank and plant capacities were exceeded (at least 3 days), a mixture of septic and raw effluent would back up to the interior of the units and/or surcharge through the plant hatches. It is difficult to imagine how this outcome could be allowed to manifest. In addition, a plant malfunction with the residents absent could not cause an effluent surcharge because no influent would be produced during this period.

1.4.12.2 Accidents. Toilet blockages and accidentally damaged irrigation lines could allow localised surface surcharge of treated effluent. This is why minimum buffers to surface waters have been maintained. High BOD influent (e.g. dairy or orange juice) can realise a lesser quality than 20/30 standard for some weeks. Provided the high BOD influent is not continuous, the soils will continue to satisfactorily renovate the effluent.

1.4.12.3 Operational Breakdown. Operational failures including power outages and transient hydraulic overloading are accommodated by the load balancing facility, as described in Section 1.4.6, above.

[b] This is a conservatively high figure to demonstrate maximum possible flow rates. A conservatively low figure was used for calculation of effluent application rates (see recommendations) to demonstrate irrigation sustainability.

[c] Source: *Approaches for Risk Analysis of Development with On-site Wastewater Disposal in Open, Potable Water Catchments* (Dr Robert Edis April 2014).

1.4.12.4 Maintenance Breakdown. Maintenance breakdowns such as failure to clean line filters can lead to expensive pump repairs and in extreme cases leakage (of 20/30 standard effluent) from the outlet pipe. This leakage would occur in proximity to the dwelling and would be noticed and acted on.

Refusal to participate in the management programme would be acted on by the responsible authority within one maintenance cycle.

AWTS and pumped systems have mechanical components which can malfunction and will age. The management plan including the maintenance and monitoring programmes are essential to ensure safe onsite effluent disposal.

A prepaid maintenance, monitoring and reporting programme involving a certified and insured entity (i.e. external audit) would ensure safe onsite effluent disposal and reduce the responsible authority's burden of responsibility.

1.4.13 Risk Summary. With regard to density of development and cumulative risk the assessment has considered risk associated with subsurface flows and surface flows.

In regard to subsurface flows, it is clear that provided the on-site system is adequately designed, constructed, operated and maintained (see items 1.4.1 through 1.4.12.4), the risk to surface and ground waters is negligible. Once the effluent is placed underground, the extraordinary long travel times via ground water to surface waters ensures adequate nutrient attenuation.

In regard to surface flows, it is clear that provided the on-site system is adequately designed, constructed, operated and maintained (see items 1.4.1 through 1.4.12.4), the risk to surface and ground waters is no greater than for a sewered development. Indeed, it could be considered that the risk is less than for a sewered development because there can be no mains failure (because there is no mains).

The LCA recommends a conservative, scientifically based, well founded wastewater management system with inherent multiple barriers of safety. Cumulative risk from the development is also extremely low. The risk of serious or irreversible damage is extremely low.

All requirements of *SEPP (Waters of Victoria)* have been met.

Figure 1: Land-soil unit A (typical) viewed from north to south.