

ORDINARY COUNCIL MEETING

AGENDA

22 JULY 2015

at 4:00 PM

COPACC Meeting Rooms

Next Meeting:
26 August 2015 at 4.00pm
Birregurra Public Hall



Our Vision

Council will work together with our community to create a sustainable, vibrant future.

Our Mission

Council will work in partnership with our community and other organisations to provide:

- Effective leadership, governance and financial accountability
- Affordable and effective services
- An advocacy and engagement approach to sustainably grow our community

Our Values

Council will achieve its Vision and Mission by acting with:

- Respect
- Integrity
- Goodwill
- Honesty
- Trust

Our Strategic Direction

The four pillars of our Council Plan indicate our key strategic direction for 2013-2017.



Ordinary Meeting of Council

Welcome

Welcome to this Meeting of the Colac Otway Shire Council

Council Meetings are an important way to ensure that your democratically elected representatives are working for you in a fair and transparent way. They also allow the public to be involved in the decision making process of Council

About this meeting

There are a few things to know about tonight's meeting. The agenda itemizes all the different parts to the meeting. Some of the items are administrative and are required by law. In the agenda you will also find a list of all the items to be discussed this evening.

Each report is written by a Council officer outlining the purpose of the report, all relevant information and a recommendation. Council will consider the report and either accept the recommendation or make amendments to it. All decisions of Council are adopted if they receive a majority vote from the Councillors present at the meeting.

In accordance with Local Law 4, agenda items will be considered as follows:

- The item is introduced by the Mayor and Councillors are invited to ask questions of relevant officers
- A mover and a seconder of a motion is called for and if there is any Councillor who wishes to oppose the motion.
- The mover will then be invited to speak to the motion, followed by the seconder and then, if required, the Councillor who opposed the motion.
- Remaining Councillors will be given the opportunity to speak for or against the motion.
- If any Councillor speaks against the motion, the mover will be given the right of reply.
- There will be no further discussion of the item once the vote has been declared.

Public Question Time

Provision is made at the beginning of the meeting for general question time from members of the public. Matters relating to routine Council works should be taken up with Council's Customer Assist Staff.

Up to thirty minutes may be provided for Question Time. This is at the discretion of the Mayor.

Residents are encouraged to lodge questions in advance so that a more complete response can be given.

Questions can be submitted in writing up until 5.00pm on the Monday prior to each Council meeting. There is also provision for questions to be asked from the gallery. If you would like to ask a question during Question Time, it would be appreciated if you could please fill in the blue "Public Question Time – Council Meetings" form located in the meeting rooms and hand to the COPACC Duty Supervisor.

Questions relating to a topic on the agenda may be taken on notice and responded to after the meeting. Responses to questions taken on notice will be tabled at the following meeting and included in the minutes of that meeting.

Hearing of Submissions

Any person who has made a written submission on an item and requested that she or he be heard in support of that written submission pursuant to section 223 of the *Local Government Act 1989* will be entitled to address Council.

When the relevant item is listed for discussion, the Mayor/Chairperson will call your name and ask you to address the Council. The length of time available to each speaker is five minutes.

Recording of Meetings

All Council and Committee meetings are audio recorded, with the exception of matters identified as confidential items in the Agenda. This includes the public participation sections of the meetings. Audio recordings of meetings are taken to facilitate the preparation of the minutes of open Council and Committee meetings and to ensure their accuracy. In some circumstances a recording will be disclosed to a third party. Those circumstances include, but are not limited to, circumstances, such as where Council is compelled to disclose an audio recording because it is required by law, such as the Freedom of Information Act 1982, or by court order, warrant, or subpoena or to assist in an investigation undertaken by the Ombudsman or the Independent Broad-based Anti-corruption Commission.

Council will not use or disclose the recordings for any other purpose. It is an offence to make an unauthorised recording of the meeting.

COLAC-OTWAY SHIRE COUNCIL MEETING

22 JULY 2015

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COLAC OTWAY SHIRE COUNCIL ORDINARY MEETING OF COUNCIL

NOTICE is hereby given that the next **ORDINARY COUNCIL MEETING OF THE COLAC-OTWAY SHIRE COUNCIL** will be held in COPACC Meeting Rooms on 22 July 2015 at 4.00pm.

1. OPENING PRAYER

*Almighty God, we seek your
blessing and guidance in our
deliberations on behalf of the
people of the Colac Otway Shire.
Enable this Council's decisions to be
those that contribute to the true
welfare and betterment of our community.
AMEN*

2. APOLOGIES

3. DECLARATION OF INTEREST

Pursuant to Sections 77, 78 and 79 of the Local Government Act 1989, direct and indirect conflict of interest must be declared prior to debate on specific items within the agenda; or in writing to the Chief Executive Officer before the meeting. Declaration of indirect interests must also include the classification of the interest (in circumstances where a Councillor has made a Declaration in writing, the classification of the interest must still be declared at the meeting), ie:

- a) direct financial interest
- b) indirect interest by close association
- c) indirect interest that is an indirect financial interest
- d) indirect interest because of conflicting duties
- e) indirect interest because of receipt of an applicable gift
- f) indirect interest as a consequence of becoming an interested party
- g) indirect interest as a result of impact on residential amenity
- h) conflicting personal interest.

A Councillor who has declared a conflict of interest, must leave the meeting and remain outside the room while the matter is being considered, or any vote is taken.

Councillors are also encouraged to declare circumstances where there may be a perceived conflict of interest.

4. WELCOME & ACKNOWLEDGEMENT OF COUNTRY

Colac Otway Shire acknowledges the traditional custodians and law makers of this land, their elders past and present and welcomes any descendants here today.

Colac Otway Shire encourages community input and participation in Council decisions. Council meetings provide an opportunity for the community to ask Council questions, either verbally at the meeting or in writing.

Please note that Council may not be able to answer some questions at the meeting. These will be answered later.

Council meetings enable Councillors to debate matters prior to decisions being made. I ask that we all behave in a courteous manner.

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In some circumstances a recording will be disclosed to a third party. Those circumstances include, but are not limited to, circumstances, such as where Council is compelled to disclose an audio recording because it is required by law, such as the Freedom of Information Act 1982, or by court order, warrant, or subpoena or to assist in an investigation undertaken by the Ombudsman or the Independent Broad-based Anti-corruption Commission.

Council will not use or disclose the recordings for any other purpose. It is an offence to make an unauthorised recording of the meeting.

5. QUESTION TIME

Thank you. Now 30 minutes is allowed for question time. Please remember, you must ask a question. If you do not ask a question you will be asked to sit down and the next person will be invited to ask a question. This is not a forum for public debate or statements.

1. Questions received in writing prior to the meeting (subject to attendance and time),
2. Questions from the floor.

6. TABLING OF RESPONSES TO QUESTIONS TAKEN ON NOTICE AT PREVIOUS MEETINGS

These responses will not be read out but will be included in the minutes of this meeting.

7. PETITIONS/JOINT LETTERS (if required)

8. CONFIRMATION OF MINUTES

- **Ordinary Council Meeting held on the 24/06/15.**

Recommendation

That Council confirm the above minutes.

As per Governance Local Law No 4, clause 34:

34. Objection to Confirmation of Minutes

- (1) If a Councillor is dissatisfied with the accuracy of the minutes, then he or she must:
 - (a) state the item or items with which he or she is dissatisfied; and
 - (b) propose a motion clearly outlining the alternative wording to amend the minutes.
- (2) Except where sub-clause (1) applies, no vote shall be recorded against a motion to adopt the minutes.

OM152207-1 CEO'S PROGRESS REPORT TO COUNCIL

AUTHOR:	Rhonda Deigan	ENDORSED:	Sue Wilkinson
DEPARTMENT:	Executive	FILE REF:	F11/3291

EXECUTIVE

The CEO attending the following meetings and events during the past month:

- G21 Board meeting in Queenscliff
- Meeting with Kerry Presser, Senior Advisor Education and Training
- Regular meeting with Inspector Peter Seel, Surf Coast Policy Service Area
- Quarterly meeting with G21 CEO, Elaine Carbines
- Meeting with Colac Area Health CEO, Geoff Iles
- Tour of Trinity College, Colac
- G21 CEOs Delegation to Canberra
- Meeting with the Great South Coast Group CEO, Karen Foster.

Mobile Black Spot Funding Program

The Australian Government has announced that it will be committing \$100 million through Round 1 of the Mobile Black Spot Funding Program to invest in telecommunications infrastructure to address mobile black spots in outer metropolitan, regional and remote Australia. This announcement follows significant advocacy on this issue by the Colac Otway Shire Council. As a result of this funding, eight mobile base stations will be installed at:

- Apollo Bay
- Barongarook
- Barwon Downs
- Cape Otway
- Carlisle River
- Gellibrand
- Kewarren
- Yeodene

Given the significant fire risk faced by these communities each summer, the telecommunication demands of our burgeoning tourism industry and the influx of tourists into these parts of the region throughout the year, Council believes that this is a significant and much needed outcome for our residents, business owners and visitors alike.

2015 Community Satisfaction Survey Results

During February and March this year, the Colac Otway Shire Council Community Satisfaction Survey was conducted, with 400 people from across the Shire being interviewed by telephone on 7 core measures and 12 service measures.

While the ratings have improved across all core measures in comparison to last year, they are still below other similar sized councils and state-wide averages. The highest rating service areas in this year's survey were waste management, elderly support services and family support services.

The services most in need of improvement are unsealed roads (although up four points from 2014), sealed roads and town planning policy.

Processes put in place to address these areas include:

- An independent comprehensive review of our planning services, including processes and policy, to improve efficiencies.
- An exit survey offered to everyone using our planning services to provide feedback on their experience so we can identify specific areas for improvement
- A series of targeted consultation events will take place over the next six months to help Council understand people's specific concerns with respect to sealed and unsealed roads.

G21 Delegation to Canberra

As part of a G21 Delegation, the CEO travelled to Canberra to meet with Department Secretaries and senior department staff to discuss a range of issues relevant to this shire including:

- Improved access to high speed broadband
- National Stronger Region Fund applications
- National Disability Insurance Scheme
- Renewable Energy Targets
- Unconventional Gas
- Avalon
- GROW Business case
- Intensive agriculture.

CORPORATE & COMMUNITY SERVICES

HEALTH & COMMUNITY SERVICES

Family & Children's Services

"Let's Talk About Anxiety and Building Resilience in Children and Young People" Forum

The Lets Talk forum was held on Thursday 11 June 2015 at COPACC and was attended by approximately 120 people who registered for the event and an additional 10 people who walked in off the street after hearing about the forum on local radio. Council received very positive feedback from participants ranging from the quality of the speakers through to the value of having this kind of forum in our community with lots of encouragement to Council to hold forums such as this on a regular basis.

Maternal and Child Health (M&CH)

We have had slightly higher than average birth notifications numbers this month.

M&CH staff participated in the Colac Parenting Forum on Anxiety and Building Resilience in Children and it was great seeing so many of our families taking advantage of this wonderful day. Staff and parents have already put some of the new resources to good use.

Key Ages and Stages Consultations

Over the month Council has delivered 153 Key Ages and Stages consultations which focus on child development and health, maternal wellbeing and health promotion.

Statistics – June 2015

- 19 infants enrolled from birth notifications.

Other services provided included:

- M&CH sessions were held in Apollo Bay, Cororooke, Lavers Hill, Carlisle River and Birregurra.
- 106 additional consultations
- 24 phone consultations
- 3 opportunistic immunisations
- From 26 counselling sessions, 16 families were referred to additional services by M&CH staff. The main issues being nutrition, vision, domestic violence and maternal emotional health.
- New Parents Groups - 4 sessions from the Queen Street centre and other community venues.
- The 'Enhanced Maternal and Child Health Service' provides more intensive levels of support for vulnerable families. This month we commenced with 44 cases, we opened 9 new cases and closed 10.

RECREATION ARTS AND CULTURE

EVENTS

The next major event is the Amy's Gran Fondo on 13 September 2015. Community Information meetings will be held on Wednesday 29 July 2015 in Forrest and Wye River covering information about the road closures, AustCycle cycling education programs, Remembering Amy for a Reason classroom program and free exhibitor places for local businesses at the Expo on the Lorne foreshore.

RECREATION

Playground Maintenance Assessments

Council has received the bi-annual playground maintenance assessment audits of Colac Otway Shire's 26 combined playgrounds and skate parks.

Required and ongoing maintenance repairs will be carried out by Council's Services and Operations Department over the next three months.

Playground Developments – Wyuna Estate & Colac East

A community engagement plan has been developed for the development of two new playgrounds at Wyuna Estate Elliminyt and Colac East. Implementation of the two new playgrounds is expected to be completed late 2015/early 2016.

These two new playgrounds have been funded through the State Government's Community Facility Funding Program, Council funds and developer contributions.

COPACC

Programme update

In June 2015 COPACC hosted a sell-out show of the *Melbourne International Comedy Festival Roadshow* in the auditorium, and three sell-out performances of *Roald Dahls' Revolting Rhymes & Dirty Beasts* in the Civic Hall.

World Environment Day was also a popular success with more than 700 people boarding the SS Environment ship and maze, made completely out of recycled cardboard, in the Civic Hall. More than 500 primary school students attended workshops and performances.

COPACC has again partnered with Red Rock Regional Theatre and Gallery (RRRTAG) to present the third annual *CrossXpollination* – festival of textile and fibre art during July 2015. The busy programme includes exhibitions in the Civic Hall and at RRRTAG, a wearable art market and pop-up café, artist talks, workshops and two performances of *Head Full of Love*, a play about two women who forge an unlikely friendship at the Alice Springs Beanie Festival.

Business Events

June 2015 was an extremely strong month for business events with COPACC hosting the *Long Road Appeal Ball*, the *Let's Talk Forum*, and a week-long hire of the auditorium for Red Door Theatre Company's production of *The Little Mermaid*.

INFRASTRUCTURE & SERVICES

ASSETS AND PROPERTY SERVICES

ACTIONS	STATUS	% COMPLETION	PROGRESS COMMENTS
Completion of Stage 2 of the Authority Asset Management Module implementation	In Progress	50%	Civica visits to implement the Strategic Asset Management (SAM) module will occur in August/September 2015. This will complete the implementation of the Asset Management modules.
Monitor the performance and condition of Council's various asset types through programmed inspections and data collection.	In Progress	90%	Work has commenced on developing the quotation documentation for the next round of sealed road condition surveys. Data collected from the ongoing asset condition audits are used to develop long term maintenance and renewal programs.
Implement the asset renewal and maintenance programs.	Completed	100%	The reconstruction of Richmond Street, Colac has reached practical completion. The reconstruction of a short section of Costin Street between Seymour Crescent and Montrose Avenue has also been completed.
Complete specific incident inspections to identify and address safety/risk issues associated with elements of Council's road and footpath networks; including rail crossings and in response to reported incidents.	Completed	100%	Incident inspections are completed as required in line with Council's Road Management Plan.

Manage building maintenance programme to address programmed and reactive maintenance needs.	Completed	100%	Routine building maintenance activities have been completed over the past month to maintain functionality and ensure user safety. The ceiling in the Pennyroyal Public Hall has been demolished following its failure due to weather damage. An independent structural review of the building has been conducted, the findings of which are presently being reviewed by Council officers.
Footpath Renewal Program.	Completed	100%	The gravel footpath re-sheeting works in Beeac is now finished. This completes the Footpath renewal program for 2015.
Complete road and footpath network inspections to meet frequencies prescribed by Council's Road Management Plan (RMP).	Completed	100%	All inspections are conducted in accordance with Council's Road Management Plan. Routine inspections of Footpath in Colac Area 4 which is the south east quarter of Colac were completed.
Building Renewal Program.	Completed	100%	The following is a status summary of projects being completed under the 2014/15 Building Renewal Programme: <ul style="list-style-type: none"> - Works to replace the floor within the Beech Forest Public Hall are now complete - A draft report detailing conservation works for the Colac War Memorial has been received and is presently being reviewed by Council officers. Council's conservation consultant is currently preparing a staged scope of works and cost estimate for the proposed works - The works to install the new Apollo Bay bus shelter are now complete
Coordinate inspections and reporting of Essential Safety Measures (ESM's) relating to nominated Council buildings.	Completed	100%	Programmed inspections of essential safety measures in nominated Council buildings is ongoing and is in line with statutory requirements. Any non-compliance issues identified are addressed in accordance with priorities and available budgets.

Implement the 2013/14 Kerb & Channel Renewal Programme.	Completed	100%	Kerb and Channel works have now been completed in Farrington St, Stewart St, Churchill Square and Queen Street, Colac. This completes the program for 2014/15.
Asbestos Register Update.	Completed	100%	The review of Council's building asbestos register has been completed. This involved inspections and materials testing. An updated register has been provided which is a requirement of legislation relating to occupational health and safety.

CAPITAL WORKS

ACTIONS	STATUS	% COMPLETION	PROGRESS COMMENTS
Facilitate the construction of the public off street car park at Pascoe Street Apollo Bay.	Complete	100%	Civil works have been completed on the Pascoe Street Car Park.

Footpath extension program

Footpath extension works in both Colac and Apollo Bay are complete. The overall works consist of approximately 1,700m of new footpath linkages servicing school districts in Colac and Apollo Bay.

Strategic Road Network Review

The Colac Otway Shire Strategic Road Network Review was adopted at the June 2015 ordinary Council meeting. The development of this document involved consultation with heavy freight operators to identify strategically important roads combined with road inspections to provide a report and action plan including cost estimate for required road improvements to meet the needs of road users.

Gross Pollutant Trap maintenance

The tender has closed for maintenance of the Shire's 6 Gross Pollutant Traps (GPT) for the period 2015-2017. GPT maintenance includes regular monitoring of pollutant levels within the traps, and cleaning of the litter and organic matter from the traps every few months.

MAJOR PROJECTS

Tenders

The reporting period is from 9 June 2014 to 8 July 2015.

Tenders opened since the last reporting period:

1526 – Cape Otway Road Bridge Rehabilitation

Tenders awarded since the last reporting period:

1508 – Engineering Consultancy Services – to Panel of Consultants

1520 – External Plant Hire – to Panel of Suppliers

1521 – Crushed Rock, Sealing Aggregate and Pavement Material – to Panel of Suppliers

1522 – Recruitment Services – Casual Employees – to CQ Recruitment; Workforce Recruitment and Labour Services

Tenders advertised since the last reporting period:

1527 – Website Content Management System, closed 8 July 2015

1529 – Provision of Tree Services, closing 22 July 2015

Subdivision Works

The following table shows the current status of various subdivisional works which will be handed over to Council when completion is approved:

Subdivision	Status
Queen Street, Colac (Stage 1B & 2) 18 Lot Subdivision	Civil works have been completed. A CCTV record of underground drainage is to be provided before “approval of the works” and the <i>Statement of Compliance</i> can be issued.
Cants Road (Stage 6) 10 Lot Subdivision	Engineering plans have been approved to extend Imperial Drive and create another ten lots from the total development of 72 lots. Works are expected to commence in July 2015.

Ferrier Drive Reconstruction Stage 2

Bitumen sealing was completed by Deja Eight Pty Ltd on Ferrier Drive on 30 June 2015. All contract works are complete and Council has issued a certificate of practical completion.

This reconstruction project has proceeded very well with works completed over a five week period. The works were a continuation of the Ferrier Drive works completed in 2014, extending 180m from Great Ocean Road to Cemetery Road.

Richmond Street Reconstruction

The reconstruction of Richmond Street has reached practical completion. Asphalt works were completed on 3 July with linemarking of intersections occurring shortly after this. Final planting of street trees will be undertaken with appropriate weather conditions prevailing.



Richmond Street Reconstruction

SERVICES AND OPERATIONS

Works undertaken by Services and Operations during June are as follows:

Patching of Sealed Roads

Minor patching works are ongoing on sealed road repairs to keep up with potholes and edge breaks with granular materials across all areas of the shire. Nalangil Road and Red Johanna Road shoulders have been topped up with granular materials.

Road Regrading

Road regrading has continued in all areas of the Shire due to drier weather conditions.

Gravel Road Resheeting

Approximately 18 kilometres of resheeting works have been completed on:

- Sproules Road
- Illetts Road
- Bulleens Road
- Stones Road
- South Cundare Road
- South Dreeite Road
- Irrewillipe – Pirron Yallock Road
- Old Irrewillipe Road

Linemarking

Statutory Control (Statcon) line-marking is complete in in all areas.

Street Sweeping

Street Sweeping has been completed as per Council's monthly schedule. In addition, increased sweeps have been performed in Colac due to an increase in leaves dropping at this time of year.

Major Drainage Works

During June works were completed in the following areas and roads:

- Old Ocean Road
- Denherts Track
- Binns Road
- Lardeners Track
- Devondale Road
- Beauchamp Falls Road
- Aire Settlement Road
- Amiets Track

Routine Drainage Works

During June routine drainage works were completed in the following townships and areas:

- Apollo Bay
- Kennett River
- Skenes Creek
- Johanna
- Gellibrand
- Wye River
- Separation Creek
- Marengo
- Kawarren
- Forrest

Bridge Maintenance

During June works were carried out on Leggs bridge to replace timber decking, Raffertys bridge to repair cross heads and bracing, Deepdene bridge to repair damaged guard rails. Level 1 bridge inspections have commenced and general clean-up of bridge approaches, guard rail, posts, signage and vegetation is occurring in all areas.

Township Mowing

Township mowing has occurred as per the regular cycle in the following towns:

- Apollo Bay
- Beech Forest
- Forrest
- Beeac
- Birregurra
- Gellibrand
- Barwon Downs
- Carlisle
- Cressy
- Kawarren

Vegetation Control

Works have been completed on Wonga Road to trim vegetation.

Colac Township Parks

Trees are being trimmed and lifted to improve cleanliness and to improve/reduce rubbish and litter being thrown under low foliage. Broadleaf spraying for Capeweed has been completed.

Sports Ovals

Mowing of sporting ovals has continued during June 2015 as scheduled. The Central Reserve, Western Oval and South Colac ovals have been aerated by Contractors.

Storm Damage

During June there were an above average number of fallen, hanging and dangerous trees due to strong, gusty wind damage. This has been predominantly in the southern section of the shire.

Tree Maintenance

During June tree planting was completed in Apollo Bay, Marengo and Gellibrand townships. Tree maintenance works were carried out in:

- | | |
|------------------------|---------------------|
| • Station Street | • Blundy Street |
| • Fyans Street | • Cressy playground |
| • McPaddens Road | • Kennet River |
| • Lake Colac foreshore | • Colac streets |

Old Beechy Rail Trail

During June crews worked on cleaning up of fallen trees, repairing gates, fencing, bollards, cleaning culverts due to tree damage and completed mowing and weed spraying along various sections of the trail.

SUSTAINABLE PLANNING & DEVELOPMENT

Economic Development

Business events

The Victorian Government's Small Business Bus visited Colac on 25 June 2015 with the opportunity of free mentoring sessions for local business owners by a small business mentor. The bus received a great amount of interest from local businesses with six mentoring sessions booked and 18 people visiting the bus throughout the day. Business people had the opportunity to receive information on starting a new business, small business tips and hints, and potential grants available. The bus visits Colac and Apollo Bay annually due to the large amount of support from Council and local businesses.

Economic Development Strategy

Workshops were held in June 2015 in Apollo Bay to commence consultation on the Shire's next Economic Development Strategy, with further activity to follow in Colac and elsewhere, including a survey to all businesses in the Shire. A key focus for the Apollo Bay participants was growing the permanent population of the town without losing what makes the town special. A draft of the Strategy will be presented to Council late in 2015 after extensive community and business consultation across the Shire.

Great Ocean Road Regional Tourism (GORRT) - Great Ocean Road Strategic Master Plan

GORRT has been working with industry and the community on the development of a Master Plan for the region. The Project Committee presented a draft of the plan to the Great Ocean Road Regional Tourism (GORRT) Board in April. The draft Master Plan was subsequently released for stakeholder consultation throughout May/June, with submissions due on 22 June 2015. Council made a submission broadly supporting the plan, which it is anticipated will be finalised in July/August.

Closure of Marriners Falls

The Department of Environment, Land, Water and Planning (DELWP) has announced that Apollo Bay's Marriners Falls will be closed indefinitely. In December 2014 DELWP commissioned a report to examine the area's geological and geomorphic setting. The report concluded the site has unique features that significantly contribute to the potential for trees to fall and this represented an unacceptable risk to human safety. Parks Victoria has advised that having considered whether there is any way to manage these risks to keep the walk open, it is not possible to address these risks in a way that would enable this to occur.

Environment & Community Safety

Lake Colac Foreshore Master Plan

Council has started the process for developing a new Lake Colac Foreshore Master Plan. The last Master Plan was developed in 2002 so it is time to have a discussion with the community about what we would like the lake's foreshore to look like in the future. The aim is to have the new Master Plan developed by the end of the year so we can start seeking funding to implement actions on the ground in 2016. In August we will be giving the community the opportunity to tell us how they think we could improve the lake foreshore area. There will be a range of engagement opportunities provided to give everyone an opportunity to have their say.

Attachments

Nil

Recommendation(s)

That Council notes the CEO's Progress Report to Council.

~~~~~u ~~~~~

**OM152207-2**

**RE-ELECTION OF S86 COMMITTEES OF MANAGEMENT**

|             |                                |           |               |
|-------------|--------------------------------|-----------|---------------|
| AUTHOR:     | Colin Hayman                   | ENDORSED: | Sue Wilkinson |
| DEPARTMENT: | Corporate & Community Services | FILE REF: | F11/3291      |

**Purpose**

To consider the appointment of newly elected committee members to the Alvie Recreation Reserve, Irrewillipe Hall and Reserve, Municipal Aerodrome and Pirron Yallock Recreation Reserve S86 Committees of Management.

**Declaration of Interests**

No officer declared an interest under the *Local Government Act 1989* in the preparation of this report.

**Background**

Council appoints Committees of Management under section 86 of the *Local Government Act 1989* as Special Committees of Council to act in accordance with rules and conditions of appointment adopted by Council. The purpose of the Committees is to manage the operations of the facilities. Council policy is that Committee of Management members are appointed for a three year term.

Meetings to appoint new members to the following reserves have been conducted.

|                                   |              |
|-----------------------------------|--------------|
| Alvie Recreation Reserve          | 12 May 2015  |
| Irrewillipe Hall and Reserve      | 11 May 2015  |
| Municipal Aerodrome               | 15 June 2015 |
| Pirron Yallock Recreation Reserve | 6 July 2015  |

**Council Plan / Other Strategies / Policy**

**Good Governance**

Means we care about and are responsive to the community, encourage democratic participation and involve people in decisions that affect them. We strive for excellence in financial management and council services, and always look for better ways to do things.

*Our Goal:*

Ensure transparency of governance practices, the capability of our organisation and effective resource management.

**Issues / Options**

**Option 1**

To appoint the nominees as put forward by the Committees of Management.

Council's policy is that Committee of Management members are appointed for a 3 year term or less where applicable.

The current three year term for these Committees of Management has been completed and the nominations of community persons have been put forward to be on the committees for a period of three years for Council endorsement.

### **Option 2**

Not to appoint the community persons put forward. It is an important process that each 3 years the members of the particular community/facility consider the membership of the S86 committee. Council's policy is that Committees of Management members are appointed for a 3 year term or less where applicable.

### **Proposal**

It is proposed to appoint the following community persons to the committee named for a term of 3 years until 25 July 2018.

|                                   |                                                                                                                                                                       |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alvie Recreation Reserve          | Peter Delahunty, Damien Fleming, John Miller, Noel McKay, Barry Parker, Peter Holland, Neil Cook, Tony Pennock                                                        |
| Irrewillipe Hall & Reserve        | John Ladhams, Tim Ryan, Paul Theodore, Don Henderson, Tony Cirillo, Doug Phillips, Phil Riches, Kevin McNabb, Matthias Weis, Steve Theodore, Jim Carson, John Sherman |
| Municipal Aerodrome               | Brendan Reidy, Norm Tann, Ross Higgins, John Callahan, Brian Smith, David Fenn, Michael Murray                                                                        |
| Pirron Yallock Recreation Reserve | Kevin Boyd, Elaine Menzies, Fiona Castles, John Sherman, Jarrod Phillips, Mick Rafaniello, Ian Gill, Bead McGuane                                                     |

### **Financial and Other Resource Implications**

Each Committee holds their own bank account and administers budgets set by the Committee in accordance with funds within these accounts.

Each Committee is required to provide copies of annual financial statements/treasurer's report to Council.

### **Risk Management & Compliance Issues**

Each committee has been provided with a Risk Management and Insurance Manual developed for Council Committees of Management.

### **Environmental and Climate Change Considerations**

Nil

### **Community Engagement**

The community engagement strategy follows the recommendations of the Colac Otway Shire Council Community Engagement Policy of January 2010, which details five levels of engagement – inform, consult, involve, collaborate and empower.

The method selected has been to inform and consult. Advertisements were placed in the local media seeking nominations to the committee. Consultation also took place with Committee members as to the preferred time for the meetings to be held.

### **Implementation**

A letter will be forwarded to the Management Committees advising them of Council's endorsement of the appointments to the committee.

### **Conclusion**

The decision to appoint the Committees as Special Committees of Council is in keeping with Council's policy of working with its community in the management of halls, reserves and other facilities throughout the Shire.

**Attachments**

Nil

**Recommendation(s)**

***That Council:***

1. ***Pursuant to section 86 of the Local Government Act 1989, resolves to appoint the following nominated members to the Alvie Recreation Reserve, Irrewillipe Hall and Reserve, Municipal Aerodrome and the Pirron Yallock Recreation Reserve Committees of Management until 25 July 2018:***

|                                                 |                                                                                                                                                                                                |
|-------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b><i>Alvie Recreation Reserve</i></b>          | <b><i>Peter Delahunty, Damien Fleming, John Miller, Noel McKay, Barry Parker, Peter Holland, Neil Cook, Tony Pennock</i></b>                                                                   |
| <b><i>Irrewillipe Hall and Reserve</i></b>      | <b><i>John Ladhams, Tim Ryan, Paul Theodore, Don Henderson, Tony Cirillo, Doug Phillips, Phil Riches, Kevin McNabb, Matthias Weis, Steve Theodore, Jim Carson, John Sherman, H. Uwland</i></b> |
| <b><i>Municipal Aerodrome</i></b>               | <b><i>Brendan Reidy, Norm Tann, Ross Higgins, John Callahan, Brian Smith, David Fenn, Michael Murray</i></b>                                                                                   |
| <b><i>Pirron Yallock Recreation Reserve</i></b> | <b><i>Kevin Boyd, Elaine Menzies, Fiona Castles, John Sherman, Jarrod Phillips, Mick Rafaniello, Ian Gill, Bead McGuane</i></b>                                                                |

2. ***In accordance with section 81 sub-section(2) sub-section(a) of the Local Government Act 1989, resolves to exempt members of the Committee from being required to submit a primary or ordinary conflict of interest return in accordance with this section.***
3. ***Advises the Committee that a copy of minutes of meetings held be forwarded to Council for its record after each meeting and that a Treasurer's Report be provided on an annual basis.***

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OM152207-3

COROROOKE OPEN SPACE LANDSCAPE MASTER PLAN

| | | | |
|-------------|--------------------------------|-----------|--------------|
| AUTHOR: | Ian Seuren | ENDORSED: | Colin Hayman |
| DEPARTMENT: | Corporate & Community Services | FILE REF: | F14/821 |

Purpose

To seek Council endorsement of the Cororooke Open Space Landscape Master Plan.

Declaration of Interests

No officer declared an interest under the *Local Government Act 1989* in the preparation of this report.

Background

Following the closure of the Fonterra Cororooke factory site, Fonterra agreed to donate a 1ha parcel of land to Council for the purposes of public open space – Lot 1 on the map (boundaries are indicative only).



Since this time, Council has worked with the Red Rock District Progress Association (RRDPA), the Cororooke Tennis Club and the broader community to prepare a landscape master plan for the site. The purpose of the landscape master plan is to determine the best use of land in accordance with community requirements, expectations and aspirations. Geelong based landscape architects *Mexted Rimmer* were engaged to prepare the landscape master plan.

Council considered the draft Cororooke Open Space Landscape Master Plan at its April 2015 meeting, where it resolved:

That Council endorses the draft Cororooke Open Space Landscape Master Plan to be placed on public exhibition in accordance with Council's Community Engagement Policy 2010, from Monday 27 April 2015 until Wednesday 10 June 2015.

The draft Cororooke Open Space Landscape Master Plan was publicly exhibited from Monday 27 April 2015 to Wednesday 10 June 2015.

Council Plan / Other Strategies / Policy

A Planned Future

Creates an attractive shire with quality buildings and spaces, accessible travel and transport, and a community that has the services and facilities it needs now and in the future; supports a prosperous economy where trade, manufacturing and business activity flourishes.

Our Goal:

Facilitate the growth, liveability and development of the shire and encourage innovation and efficiency in the local economy.

A Place to Live and Grow

Is a community where people feel cared for and supported; where buildings and spaces facilitate creativity, social activity and enrichment of life, and people have access to gain the skills and education needed to reach their potential.

Our Goal:

Improve access to buildings, spaces, services and education to support and enable quality of life.

Related strategic justification

This report is supported by Council's Public Open Space Strategy (2011) and the Red Rock Region Community Infrastructure Plan.

Issues / Options

The draft Cororooke Open Space Landscape Master Plan was publicly exhibited from Monday 27 April 2015 to Wednesday 10 June 2015. To inform the community that the draft landscape master plan was on public exhibition and that Council was seeking feedback, Council officers undertook the following activities:

- Directly contacted organisations and individuals who had previously been involved in the project.
- Placed advertisements in the local media and information in local newsletters.
- Placed the draft landscape master plan on Council's website.
- Made copies of the draft landscape master plan available for viewing in the Colac Council Offices and the two local Cororooke shops – Café Rooke and the Cororooke General Store.
- Requested that the RRDPA and the Cororooke Tennis Club circulate the draft landscape master plan through their membership base and to the broader Cororooke and Coragulac communities.

Submissions

Two submissions to the draft landscape master plan were received from the community. An overview of the submissions and the officer response is detailed below:

| Submission No. | Details of submission | Proposed response |
|----------------|--|--|
| 1 | <ul style="list-style-type: none"> - Looks amazing and very excited about the proposal. - More community focus on the use of the tennis courts by having at least once court accessible to the public at all times. - Focus the playground on a Red Rock theme. | <ul style="list-style-type: none"> - Noted. - Agree. Council's informal policy is that public tennis courts are not locked and therefore available to the public at all times. Recommend no change to the plan as this is a management issue, not a master plan design issue. Council officers will work with the tennis club to resolve this issue. - Good suggestion however it is important to engage with the community when designing playground infrastructure so this proposal would be tested at that time. Recommend no change to the landscape master plan. |
| 2 | <ul style="list-style-type: none"> - Applaud Council for the master plan. - Parking has no provisions for a mini-bus. Extra space could be allocated to a mini-bus next to the car park along the entrance drive. | <ul style="list-style-type: none"> - Noted. - There is adequate parking available on site. Rather than proposing more parking, mini bus parking could be easily accommodated in the parking area adjacent to the tennis courts. The plan now indicates that there is sufficient room for a mini-bus (21 seat Toyota Coaster) to turn around. - Recommend no further change to the master plan. |

As detailed in the table above, it is recommended that no changes be made to the draft landscape master plan, other than indicating a turnaround area for a mini-bus. The preparation of the plan involved extensive consultation with the local community with great participation occurring through the development process.

Proposal

That Council endorses the Cororooke Open Space Landscape Master Plan.

Financial and Other Resource Implications

The landscape master plan includes a prioritised and costed action plan for implementation. The estimated total project cost to implement the full plan is approximately \$813,000 (excl. GST) which includes construction of the tennis courts.

It is important to note that once adopted, implementation of the landscape master plan would be subject to Council's annual budget process and/or seeking funding from other sources. Proposed projects or physical works would need to be considered in line with all other competing priorities across the organisation.

It is anticipated that a number of the infrastructure elements included in the landscape master plan would be eligible for State Government funding. Significant funding for the relocation of the tennis courts has already been sourced from a range of partners.

Risk Management & Compliance Issues

There are no risk management considerations in relation to this report.

Environmental and Climate Change Considerations

There are no environmental considerations relating to this report. Environmental considerations will be factored in if and when detailed design is undertaken for certain project components of the landscape master plan.

Community Engagement

The community engagement strategy follows the recommendations of the Colac Otway Shire Council Community Engagement Policy of January 2010, which details five levels of engagement – inform, consult, involve, collaborate and empower.

The method selected has been to collaborate.

The landscape master plan has been developed through an extensive community engagement process. Importantly, the local community through the RRDPA and the Cororooke Tennis Club guided Council on how best to consult and engage with their community. Based on the advice, a community engagement plan was developed which included the following activities:

- Meeting with the RRDPA and Cororooke Tennis Club.
- Community survey – circulated through networks such as the RRDPA, local schools, local sporting clubs etc. 96 responses received.
- Community 'Open House' on-site, approximately 30 people attended.
- Copy of initial draft landscape master plan sent to the RRDPA and Cororooke Tennis Club seeking feedback.
- Copy of initial draft landscape master plan sent to those that attended the 'Open House' seeking feedback.
- Copy of draft landscape master plan displayed at Café Rooke and the Cororooke General Store.
- Community meeting held to discuss draft landscape master plan, 16 community people attended with 9 formal apologies.

The draft landscape master plan was publicly exhibited from Monday 27 April 2015 to Wednesday 10 June 2015, in accordance with Council's Community Engagement Policy 2010.

A range of activities were undertaken to inform the community that the draft landscape master plan was on public exhibition and feedback was sought by Council. These activities have been detailed previously in this report.

Implementation

The landscape master plan will be implemented as funds become available, either through Council's annual budget process or external funding opportunities eg: other levels of government.

Significant funding has been sourced from a range of partners to construct new tennis courts at the site. This work is likely to commence later in 2015.

Conclusion

The acquisition of land from Fonterra for the purposes of public open space is a great outcome for the Cororooke/Coragulac communities. The Cororooke Open Space Landscape Master Plan has been prepared in partnership with the local communities that make up the Red Rock Region. The plan was prepared following a thorough community engagement process and reflects the needs and aspirations of the local community.

The development of a landscape master plan will guide the future development of the land based on clear direction from the community. The landscape master plan is a long term plan and its implementation will be subject to future budget considerations and the ability to access funding from other levels of government.

Attachments

1. Cororooke Open Space Landscape Master Plan

Recommendation(s)

That Council:

1. ***Endorses the Cororooke Open Space Landscape Master Plan.***
2. ***Notes that any works outlined in the Cororooke Open Space Landscape Master Plan would be subject to consideration via future budget processes and analysis of all Council priorities.***

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**OM152207-4                      REVIEW OF PROCUREMENT POLICY**

|             |                                |           |               |
|-------------|--------------------------------|-----------|---------------|
| AUTHOR:     | Colin Hayman                   | ENDORSED: | Sue Wilkinson |
| DEPARTMENT: | Corporate & Community Services | FILE REF: | 11/96037      |

The purpose of this report is to present for Council's consideration a revised Procurement Policy for adoption.

**Declaration of Interests**

No officer declared an interest under the *Local Government Act 1989* in the preparation of this report.

**Background**

Section 186A of the *Local Government Act 1989* (the Act) provides the details on a "Procurement Policy".

**186A Procurement Policy**

- (1) *A Council must prepare and approve a procurement policy.*
- (2) *A Council must within 12 months after the commencement of section 67 of the Local Government Amendment (Councillor Conduct and Other Matters) Act 2008 prepare and approve a procurement policy.*
- (3) *A procurement policy must include any matters, practices or procedures which are prescribed for the purposes of this section.*
- (4) *A Council must have regard to guidelines made under subsection (5) in preparing a procurement policy.*
- (5) *The Minister may make guidelines with respect to the form or content of a procurement policy.*
- (6) *Guidelines made under subsection (5) must be published in the Government Gazette.*
- (7) *At least once in each financial year a Council must review the current procurement policy and may, in accordance with this section, amend the procurement policy.*
- (8) *A copy of the current procurement policy must be available for inspection by the public –*
  - (a) *at the Council office; and*
  - (b) *on the Council's internet website.*
- (9) *A Council must comply with its procurement policy.*
- (10) *In this section procurement policy means the principles, processes and procedures that will apply to all purchases of goods, services and works by the Council.*

The Policy was last reviewed in April/May 2014 and adopted by Council on 28 May 2014.

The latest revised Policy has been reviewed by members of the Procurement Steering Committee and the Executive Management Team.

The Procurement Policy aims to be consistent with the Victorian Local Government Best Practice Procurement Guidelines which provides a set of principles and practices that represent the most efficient and prudent course of action for developing and maintaining best practice local government procurement processes, in order to:

1. achieve value for money and continuous improvement in the provision of services for the community
2. ensure resources are used efficiently and effectively to improve the overall quality of life of people in the local community
3. achieve compliance with relevant legislative requirements
4. achieve high standards of fairness, openness, probity, transparency, risk management and accountability
5. minimise the cost of bidding for potential suppliers.

### **Council Plan / Other Strategies / Policy**

#### **Good Governance**

Means we care about and are responsive to the community, encourage democratic participation and involve people in decisions that affect them. We strive for excellence in financial management and council services, and always look for better ways to do things.

#### *Our Goal:*

Ensure transparency of governance practices, the capability of our organisation and effective resource management.

### **Issues / Options**

#### Review of Policy

An extensive review of the Procurement Policy was undertaken in May 2013. The last review was undertaken in May 2014.

The previous reviews took into account:

- Relevant points from the updated Municipal Association of Victoria Model Procurement Policy
- Procurement policies of other Councils
- The 2013 Victorian Local Government Best Practice Procurement Guidelines.

#### Current Review

The current review has involved comparing our policy with those of other councils including:

- City of Greater Bendigo
- City of Greater Geelong
- Knox City
- Maribyrnong City
- City of Monash
- Moreland City Council
- Moyne Shire.

It should be noted that the Procurement policies of many councils are similar in content.

The aim of the current review is to ensure that we comply with the Local Government Act and to ensure that the Policy remains current.

### Tracked Changes

A tracked change version of the Procurement Policy is attached which indicates the more significant changes.

The latest review of the policy has had a number of additions and alterations made to it. The changes that have been made do not change the operations of the Policy. The changes are to ensure that the Policy reflects current practices and provide more appropriate wording for certain clauses in the Policy.

The primary changes include:

- Clause 1.2 – Revised clause. The changes are to ensure that the clause on Legislative Provisions is clearer as to what Legislation, Standards and Guidelines and Council Policies are applicable to the Policy.
- Definitions and Abbreviations – Changed wording to Procurement and Request for Quotation and new Request for Tender to make the definitions clearer.
- Clause 2.1.4 – Revised Clause. The changes on the Conflict of Interest clause provide more succinct guidelines.
- Clause 2.1.7 – Additional wording regarding the Gifts, Benefits and Hospitality Policy.
- Clause 2.2.3 – Additional wording re: Multi-stage tenders/EOI. The additional wording provides information on an Expression of Interest tender process.

A revised Policy document is also attached.

### Further Review

It is intended that a further review of the policy is undertaken early in 2016 following:

- the appointment of the Community Development Position that will further develop the Grow and Beyond the Bell projects. The review to further investigate “Social Procurement”; and
- the development of a new Economic Development Strategy which will examine Council’s support for the local economy.

### **Proposal**

That Council adopts the revised Procurement Policy.

### **Financial and Other Resource Implications**

Council spends millions of dollars in the procurement of goods and services each year and the significant procurement activity supports the delivery of services in the Council Plan. Procurement needs to be undertaken in a manner that ensures value for money and accountability to the community for the expenditure of public monies.

### **Risk Management & Compliance Issues**

The Background in this report provides details of section 186A of the *Local Government Act 1989* related to procurement.

Clause 3.6 of the Policy provides details on Risk Management considerations.

### **Environmental and Climate Change Considerations**

Section 4.3 – “Sustainability” of the policy provides details on the approach to environmental issues.

### **Community Engagement**

The community engagement strategy will follow the recommendations of the Colac Otway Shire Council Community Engagement Policy of January 2010, which details five levels of engagement – inform, consult, involve, collaborate and empower.

The method selected in the review of the policy has been to consult. The policy was considered by the Procurement Steering Committee and reviewed by the Executive Management Team. A copy of the Draft Policy was also forwarded to all staff for comment as many are involved in procurement activities.

This is an internal policy and does not require community engagement which is consistent with the current Procurement Policy.

### **Implementation**

It is proposed that once the policy is adopted Council's register and Council's website would be updated. The policy will also be available at the Council Offices.

It is intended that a further review of the policy is undertaken early in 2016 following:

- the appointment of the Community Development Position that will further develop the Grow and Beyond the Bell projects. The review to further investigate "Social Procurement"; and
- the development of a new Economic Development Strategy which will examine Council's support for the local economy.

### **Conclusion**

The Procurement Policy has been reviewed in accordance with the *Local Government Act 1989*. The policy was last reviewed in May 2014.

### **Attachments**

1. 3.2 Procurement Policy (tracked version)
2. 3.2 Procurement Policy

### **Recommendation(s)**

***That Council adopts the revised Procurement Policy No. 3.2.***

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**OM152207-5 JOINT LETTER RESPONSE - REQUEST TO UPGRADE
MURRAY STREET, COLAC**

| | | | |
|-------------|---------------------------|-----------|---------------|
| AUTHOR: | Paula Gardiner | ENDORSED: | Sue Wilkinson |
| DEPARTMENT: | Infrastructure & Services | FILE REF: | F11/1890 |

Purpose

The purpose of this report is to respond to a joint letter received relating to a request to upgrade the streetscape in Murray Street, Colac. The joint letter was tabled at the Ordinary Council Meeting on 24 June 2015.

Declaration of Interests

No officer declared an interest under the *Local Government Act 1989* in the preparation of this report.

Background

On 10 June 2015 Council received a joint letter requesting urgent improvements to the streetscape in Murray Street, Colac.

The joint letter was supported by 19 signatures made up of owners or employees of 17 businesses situated on Murray Street between Gellibrand & Corangamite Streets. A copy of the joint letter was tabled at the 24 June 2015 Ordinary Council Meeting.

The joint letter is requesting the urgent improvement of the garden beds and median strip located on Murray Street, Colac. The joint letter also requests:

- Removal of all existing vegetation in the garden beds
- Removal of the lower plantings in the median strip
- Installation of coloured rock toppings in the garden beds and the median strips.

The joint letter included photographs and examples of the reasons the joint letter writers believe an upgrade is warranted which are summarised, with officer's responses as appropriate, below:

- *Photograph of the current state of the Murray Street median strip* – Officers acknowledge that the look of the median strip could be improved. No stand-alone budget allocation to fund any improvements.
- *Photograph of a Ballarat median strip showing gravel and native plantings* – Officers have investigated this option and identified that the cost for implementing a similar topping is excessive. Indicative estimates for this work in the centre median between Corangamite & Gellibrand Streets would be in the order of \$30,000 with a significant portion of this costs relating to traffic management costs. There is also the issue of the gradient (relating to the centre median) of this section of Murray Street, which could mean that during heavy rainfall events small sized rock toppings, such as pictured in the photograph of Ballarat, would likely wash away, or to the bottom of the median strip, leading to increased maintenance costs to ensure that the garden beds retain their initial aesthetic appeal.
- *Photograph of a courier off-loading into a garden bed* – There is currently a paved pathway between the kerb and the garden bed to allow this area to be used for the

off-loading of goods by couriers and delivery drivers. Traders may wish to suggest that deliveries are made to their rear entrances for large items.

- *Photograph of the current state of the garden beds* – As the garden beds are planted with Dianella, a native Australian, which is pruned twice per year, at certain times of year this vegetation may appear untidy. Dianella was selected as it is a native species of plant and is particularly hardy, growing in both shade and sun, is frost and damp tolerant and does not require specialized care to remain in a healthy state. Due to its hardy nature it can also tolerate less than optimal treatment by passing pedestrians who may choose to cut through the garden bed.

Council acknowledges the concerns of the joint letter writers and the importance of an appealing entrance to Colac and the streetscape of the main thoroughfare. Council is also committed to improvements to this area and has commenced a CBD and Entrances project to improve this important part of Colac both for locals and visitors.

The CBD and Entrances Project proposes major revitalisation works along Murray Street from Corangamite Street to Gellibrand Street. Works in the median strip along this section include the removal of all unsightly ground plantings as well as removal of the existing chain fence, planting of new, more attractive and suitable ground cover and planting of tufting plants. The existing trees within the median will be retained, as will the existing kerb and newly renewed road pavement. In the pedestrian areas, the footpath and garden beds will be entirely replaced, and their layout revised to enhance focus on the pedestrian crossings.

Council is in the process of seeking federal government grant assistance through round two of the National Stronger Regions Fund (NSRF) Program. If successful, the scope of this work will include the redevelopment to the garden beds, centre median improvements and streetscape enhancements along Murray Street.

Council Plan / Other Strategies / Policy

Good Governance

Means we care about and are responsive to the community, encourage democratic participation and involve people in decisions that affect them. We strive for excellence in financial management and council services, and always look for better ways to do things.

Our Goal:

Ensure transparency of governance practices, the capability of our organisation and effective resource management.

Issues / Options

An investigation by officers of the upgrades being proposed by the joint letter writers has revealed that the approximate cost associated with implementing their upgrades are in the vicinity of \$30,000 for centre median treatments, and up to \$15,000 per garden revitalisation. These costs are not able to be absorbed in current budgets. While the visual improvement of the streetscape is of high value, it is considered other methods need to be further considered with traders that are more affordable.

Proposal

It is proposed that Council continue to investigate opportunities to improve the visual appearance of the garden beds within the capacity of Council's current operational budgets.

Council Officers will continue to liaise with the joint letter organiser regarding the scope and extent of proposed improvements.

Financial and Other Resource Implications

There are significant financial implications if the joint letter writers suggestions are implemented in full as works of this scale had not been allowed for within Council's approved 2015/16 Budget. It is therefore proposed to implement variations to those suggestions which can be carried out with other planned works to improve the appearance of the Murray Street streetscape within the capacity of Council's current budget. Improvements to the centre median will need to be deferred for consideration within the work to be done on the Colac CBD and Entrances project.

Risk Management & Compliance Issues

There are risk management and safety implications to be considered relating to carrying out works within or adjacent to the road reserve. Those risks will be assessed and managed as per Council's Services and Operation's unit business rules and safe operating procedures.

Environmental and Climate Change Considerations

There are expected to be minimal to no environmental impacts as a result of these proposed changes.

Community Engagement

The community engagement strategy follows the recommendations of the Colac Otway Shire Council Community Engagement Policy of January 2010, which details five levels of engagement – inform, consult, involve, collaborate and empower.

The method selected would be inform and include providing a written response to the joint letter writers detailing Council's decision.

Implementation

The necessary actions will be implemented following the resolution of Council

Conclusion

Council currently has no planned budget allocation for upgrading the streetscape of Murray Street, however we are able to implement some short term measures to improve the appearance of this location using existing budgets and programmed future works. Council will also consider the suggestions that we are unable to implement in the short term in the Colac CBD & Entrances project. Council officers will aim to provide an outcome which improves the aesthetics of Murray Street, while minimising the cost to ratepayers. The proposal which has been submitted by the joint letter writers are outside the scope of current budget allocations, are costly to implement and include inherent risks in both implementation and ongoing maintenance. Council officers will continue to investigate options which are able to be implemented within budget allocations and have lower ongoing maintenance costs and a report will be presented to the October Council meeting presenting these findings.

Attachments

Nil

Recommendation(s)

That Council:

- 1. Writes to the joint letter writers advising of those actions which Council will be undertaking in the short term.***
- 2. Includes the suggestions which are not able to be actioned in the planning for the Colac CBD and Entrances Project.***

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**OM152207-6 WASTE SERVICES CONTRACT EXTENSION**

|             |                           |           |                |
|-------------|---------------------------|-----------|----------------|
| AUTHOR:     | Janet Forbes              | ENDORSED: | Paula Gardiner |
| DEPARTMENT: | Infrastructure & Services | FILE REF: | F11/2286       |

**Purpose**

To consider extending waste management services contracts for a further five years.

**Declaration of Interests**

No officer declared an interest under the *Local Government Act 1989* in the preparation of this report.

**Background**

In 2009 Council undertook the tendering process for a waste contract for various services for commencement of the contract on 6 September 2010. The original contract term was for five (5) years, with an option to extend for up to an additional five (5) years at Council's discretion. The contract was made up of separable portions as shown in the following table;

| Reference | Description                                | Contract awarded to      | Original contract period | Current contract completion date | Maximum Extension available | Comments                                                                                     |
|-----------|--------------------------------------------|--------------------------|--------------------------|----------------------------------|-----------------------------|----------------------------------------------------------------------------------------------|
| Section B | Garbage, Organics & Recyclables Collection | Wheelie Waste            | 5 years                  | 5 September 2020                 | 0 years                     | Contract extension of 5 years approved in September 2012 to take effect from September 2015. |
| Section D | Litter Bin Collection                      | Wheelie Waste            | 5 years                  | 5 September 2020                 | 0 years                     | Contract extension of 5 years approved in September 2012 to take effect from September 2015. |
| Section E | Transfer Station and Landfill              | Wheelie Waste            | 5 years                  | 5 September 2020                 | 0 years                     | Contract extension of 5 years approved in September 2012 to take effect from September 2015. |
| Section F | Bulk Haulage                               | Wheelie Waste            | 5 years                  | 5 September 2020                 | 0 years                     | Contract extension of 5 years approved in September 2012 to take effect from September 2015. |
| Section G | Drop Off Facilities                        | R & J Spence             | 5 years                  | 5 September 2015.                | 5 years                     |                                                                                              |
| Section H | Mobile Bin Supply                          | Mastec Australia Pty Ltd | 5 years                  | 5 September 2015.                | 5 years                     | Any extension would only relate to supply of garbage and                                     |

|  |  |  |  |  |  |                                                                              |
|--|--|--|--|--|--|------------------------------------------------------------------------------|
|  |  |  |  |  |  | recycle bins.<br>Supply of organic<br>bins is through<br>different contract. |
|--|--|--|--|--|--|------------------------------------------------------------------------------|

Contract extensions were negotiated and subsequently approved by Council in September 2012 for Wheelie Waste to continue to provide services described in Section B, D, E and F until 5 September 2020. This contract extension provided for these services to be delivery by Wheelie Waste for the maximum period of time allowance under Contract 0912.

The remaining service contracts, being described in Section G and Section H are due to expire on 5 September 2015 unless approval from Council is given for the extension of these contract terms.

### **Council Plan / Other Strategies / Policy**

#### **Good Governance**

Means we care about and are responsive to the community, encourage democratic participation and involve people in decisions that affect them. We strive for excellence in financial management and council services, and always look for better ways to do things.

#### *Our Goal:*

Ensure transparency of governance practices, the capability of our organisation and effective resource management.

#### **A Healthy Community and Environment**

Actively connects and includes people of all ages and backgrounds and promotes a healthy and vibrant community life in a clean, safe and sustainable environment.

#### *Our Goal:*

Respect cultural differences, support a diverse range of healthy and creative activities, foster community safety and promote environmental sustainability.

#### **Issues / Options**

Sections B, D E & F were extended in September 2012 with the extension to be effective from 6 September 2015 to 5 September 2020. Council resolved to extend the waste contract associated with these Sections at the In-Committee Meeting of Council held on 19 September 2012.

Tender periods for the following are due to be either extended or retendered:

- Section G – Drop off Facilities – R & J Spence now trading as Spence Waste
- Section H – Mastec Australia Pty Ltd – Ongoing supply of kerbside (waste and recycle) bins and associated bin parts.

#### Sec G - Drop Off Facilities:

The drop off facilities currently operate at a fixed lump sum plus annual CPI contract value. The contractor has been reliable and meets the needs of the local communities. Any extension to the contract term would continue the contract value arrangement.

It should be noted, during the tender period undertaken in 2009, other tenderers for this service stated it was reliant on them winning other portions of the contract.

Section H – Mastec Australia Pty Ltd:

The service and product supplied by the contractor over the period of this contract to date has been of a high standard. Councils annual spend on new garbage and recycling bins supplies has been approximately \$20,000 to \$25,000 per annum.

Should Council retender for the supply of the garbage and recycling bins, Council could end up with a third supplier and thus three different brands of bins in the system. Different bins could pose a problem with:

- Consistent branding
- Compatibility of spare parts

**Proposal**

The current contracts that are in place for the provision of Drop Off Facility Waste Collection and Supply of Bins provides good value for money and the contractors are proven to provide reliable, good quality service.

It is considered appropriate to extend the contract terms for Section G – Drop Off Facilities, and Section H – Mastec Australia Pty Ltd for a period of five (5) years.

**Financial and Other Resource Implications**

The extension of contract terms would not expose Council to additional financial or resource risk. The contract values are known for the full period of the contract term, and the resource capability of the contractors are known and considered sound.

**Risk Management & Compliance Issues**

The provision for contract term extension is available within the current Contract arrangements, and can be enabled at the discretion of Council. The extension of sections G & H of Contract 0912 for waste management services is in line with Colac Otway Shire's Procurement policy.

**Environmental and Climate Change Considerations**

There are no environmental or climate change implications associated with the extension of contract terms.

**Community Engagement**

The community engagement strategy follows the recommendations of the Colac Otway Shire Council Community Engagement Policy of January 2010, which details five levels of engagement – inform, consult, involve, collaborate and empower.

As this relates to direct contract arrangements, no community consultation will be undertaken.

**Implementation**

Necessary contract arrangements will be implemented following the resolution of Council.

**Conclusion**

Both the drop off facilities and the supply of ongoing parts for mobile bins have worked successfully over the last five years. Both provide good value for money for Council. By extending the Mastec contract we will maintain consistency of bins in service for the Council at a competitive rate.

**Attachments**

Nil

**Recommendation(s)**

***That Council:***

- 1. Approves the contract extension to R & J Spence, up to 5 September 2020.***
- 2. Approves the contract extension to Mastec Australia Pty Ltd, up to 5 September 2020.***

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OM152207-7

**BROMFIELD STREET ROAD DISCONTINUANCE TO
FACILITATE PROPOSED SUPERMARKET AND RETAIL
DEVELOPMENT**

| | | | |
|-------------|---------------------------|-----------|----------------|
| AUTHOR: | Clive Brooker | ENDORSED: | Paula Gardiner |
| DEPARTMENT: | Infrastructure & Services | FILE REF: | F15/6023 |

Purpose

The purpose of this report is for Council to consider the possible closure of a portion of the eastern end of Bromfield Street Colac.

Declaration of Interests

No officer declared an interest under the *Local Government Act 1989* in the preparation of this report.

Background

An application has been received by Council to discontinue a portion of the road reserve at the eastern end of Bromfield Street.

Separately, a planning permit has been lodged with Council seeking to establish a supermarket and retail development on the former vacant Mobil and BP sites, at the eastern end of Bromfield Street, opposite the Crowe Horwath office. The proposal seeks to construct part of the development and car parking areas within the road reserve. The road discontinuance would be required to allow the extension of proposed buildings into the current road reserve.

The 180m long eastern most section of Bromfield Street is a local Council controlled road terminating at a dead end west of Barongarook Creek and forms part of the subject site for the purposes of the planning permit application.

The proponent is seeking approval for public access to continue to enable access to existing properties on the north side of Bromfield Street (i.e. Crowe Horwath), and the redesign of the road reserve to form part of the supermarket development. The proposal is that whilst most of the supermarket building would be within the private land, the northernmost section would extend into the current road reserve, with a rear loading bay and car parking accessed along a modified road pavement to the north of the building.

It is noted that the area of proposed road discontinuance would be limited to the land to be occupied by the proposed building. Under the proposal, the remainder of the road reserve would remain a public road, with changes to road pavement and kerb lines by the proponent to give effect to the supermarket parking, access and loading layout. These works would be subject to Council approval.

**Council Plan / Other Strategies / Policy
A Planned Future**

Creates an attractive shire with quality buildings and spaces, accessible travel and transport, and a community that has the services and facilities it needs now and in the future; supports a prosperous economy where trade, manufacturing and business activity flourishes.

Our Goal:

Facilitate the growth, liveability and development of the shire and encourage innovation and efficiency in the local economy.

This proposal has been considered against Council's *Closure of Unused Government Roads, Licencing of an Unused Road or Water Frontage Policy*.

Issues / Options

The proponent of the above planning application is currently in negotiation with the owner of land at 140–150 Bromfield Street, Colac (Certificate of Title Volume 9655 Folio 071 (land in Consolidation Plan 161552L) and Volume 9654 Folio 974 (Lot B on Plan of Subdivision 202154M) – this land forms the bulk of the development site, being the former fuel depots. The negotiations have concerned the discontinuation of a portion of Bromfield Street adjacent to these parcels (to be occupied by the building), and to subsequently purchase the parcel created by the discontinuation and to consolidate it with the land subject to the development.

Council officers have sought an indication of in principle agreement to the discontinuation from affected property owners. The current owners of the proposed development site have given this agreement subject to several conditions. These conditions are:

- That the sale of the subject land to the proponent is satisfactorily completed (ie the discontinuance would only occur if the land is sold & the development occurs – protecting the interests of the land owner if the sale was to fall through for some reason); and
- If required, that the current owner be granted access for the purpose of groundwater monitoring, sampling and remediation purposes to satisfy any requirements applicable by operation of the *Environment Protection Act 1970* (Vic).

An adjacent property owner, Crowe Horwath, who is not a party to the sale of land has indicated that it will reserve its right to make a submission as part of the road discontinuance process.

Clause 3 of Schedule 10 of the *Local Government Act 1989* provides the power to discontinue roads:

"A Council may, in addition to any power given to it by section 43 and 44 of the Planning and Environment Act 1987—

- a. *Discontinue a road, or part of a road, by a notice published in the Government Gazette; and*
- b. *Sell the land from that road (if it is not Crown Land), transfer the land to the Crown or itself or retain the land."*

Council must decide whether to discontinue the portion of road in question. This is done after public consultation which is prescribed by the *Local Government Act*. If Council resolves that the land is not reasonably required for road purposes, then it can discontinue the road via a notice published in the Victoria Government Gazette.

If Council chooses to discontinue the road, then consideration can be given to the sale of the resultant land. As this section of Bromfield Street is a Government Road, its discontinuance would result in the creation of a parcel of unalienated Crown Land. This means that the land could then be sold to the proponent by the Department of Environment, Land, Water & Planning (DELWP) which is responsible for the management of public land. Given Council has no ownership of the road reserve in question, it would receive no financial benefit from

the sale of this land. Neither would Council incur any direct costs related to the undertaking, apart from Council officer time, which is not expected to be significant.

Based on the information provided to date, there do not appear to be any significant practical impediments to Council considering the proposed road discontinuance, and formally exhibiting the proposal. The public exhibition phase would assist in identifying if there are any issues to arise from the proposed discontinuance that have not been previously considered. Should Council proceed to exhibit the proposal, a further detailed assessment of the proposal to discontinue and sell the identified portion of Bromfield Street would be undertaken following receipt of public submissions. Any submissions received need to be considered in accordance with section 223 of the *Local Government Act 1989*.

It is important to note that the proposed notice process for the discontinuance of the road and planning application would not prejudice Council's decision on either of the proposals, which would be the subject of later reports to Council addressing submissions. The proposals would each need to be considered on their relative merits.

Proposal

It is proposed that Council give public notice of an intention to discontinue part of the Bromfield Street road reserve adjoining the development site in accordance with the requirements of the *Local Government Act*.

Formal notice of the planning application will occur concurrently with any discontinuance notice period, to ensure there is clear communication with the public about why the discontinuance is being considered.

Financial and Other Resource Implications

This project will be cost neutral to Council and any funds from the sale of the road reserve will go to the Crown.

The administrative process of completing the road discontinuance will be undertaken using in-house resources without any significant impact to routine operations and activities. Any direct costs incurred in carrying out this statutory function will be recouped from the proponent in this matter.

As this is a Government Road, its discontinuance will result in the creation of a parcel of unalienated Crown land. This means that the land could then be sold to the proponent by the Department of Environment, Land, Water and Planning (DELWP), whom are responsible for the management of public land. Council would see no financial benefit in the sale of this land.

Risk Management & Compliance Issues

Council must ensure that it complies with its legislative requirements when exercising its powers to discontinue the subject length of road.

Environmental and Climate Change Considerations

There are no specific environmental or climate change issues which need to be considered as part of this proposal.

Community Engagement

The community engagement strategy follows the recommendations of the Colac Otway Shire Council Community Engagement Policy of January 2010, which details five levels of engagement – inform, consult, involve, collaborate and empower.

The method selected would be consult. A public notice would be placed in the Colac Herald on 31 July 2015 advising of the commencement of a six (6) weeks public consultation period regarding Council's intention to discontinue the identified section of road in accordance with the *Local Government Act 1989*. The consultation period would end at 4.00pm on 10

September 2015. In addition to this, all abutting property owners will be written to advising them of Council's intention and their right to make a submission.

All submissions received will be considered in accordance with section 223 of the *Local Government Act 1989*.

Applicable utility companies will also be advised of Council's intentions to ensure consideration is given to the potential impacts on the management of services which may exist in the vicinity of this road.

Implementation

Advertising of Council's intention to discontinue the road will be prepared upon resolution. This will also include the forwarding of required correspondence to all abutting property owners and utility agencies.

Conclusion

It is considered that the discontinuation of the portion of Government road abutting 140-150 Bromfield Street Colac will not adversely impact on service delivery and should Council seek to test support for this proposal, it can advertise its intention to make this declaration pursuant to the provisions of the *Land Act 1958*.

Attachments

1. Locality Plan - Road Discontinuance - Bromfield St - Colac
2. Plan of discontinuance - Bromfield St Colac
3. PP247/2013-1 Coles Supermarket Plans

Recommendation(s)

That Council:

- 1. Gives public notice of its intention to discontinue a portion of the Government road abutting the land at 140–150 Bromfield Street, Colac (Certificate of Title Volume 9655 Folio 071 (land in Consolidation Plan 161552L) and Volume 9654 Folio 974 (Lot B on Plan of Subdivision 202154M).***
- 2. If submissions are received, gives seven (7) days notice, by placement of a public notice in local media of its intention to consider any submissions received at the General Council Meeting on Wednesday 23 September 2015 at COPACC at 4.00pm. Formal advice of the time and place of the meeting will be provided to those parties wanting to be heard in support of their submissions.***
- 3. If required, makes a final decision following preparation of a report by the General Manager Infrastructure and Leisure after consideration of submissions received by Council at its meeting on Wednesday, 23 September 2015.***
- 4. In the event that no submissions are received, authorises the Chief Executive Officer, or her delegate, to do all things required to discontinue a portion of the Government road abutting the land at 140–150 Bromfield Street, Colac (Certificate of Title Volume 9655 Folio 071 (land in Consolidation Plan 161552L) and Volume 9654 Folio 974 (Lot B on Plan of Subdivision 202154M).***

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**OM152207-8**

**BLUEWATER FITNESS CENTRE REDEVELOPMENT  
PROJECT - PROGRESS REPORT**

|             |                           |           |                |
|-------------|---------------------------|-----------|----------------|
| AUTHOR:     | Adam Lehmann              | ENDORSED: | Paula Gardiner |
| DEPARTMENT: | Infrastructure & Services | FILE REF: | F13/7721       |

**Purpose**

The purpose of this report is to provide Council with an update on the progress of the delivery of the Bluewater Fitness Centre Redevelopment Project.

**Declaration of Interests**

No officer declared an interest under the *Local Government Act 1989* in the preparation of this report.

**Background**

The transformation of the Bluewater Fitness Centre is one of the most significant projects undertaken by Council. The Centre is a focus for sport and leisure within the Shire, and an enhanced facility will allow quality recreational activities to be delivered to the community for many years to come.

**Council Plan / Other Strategies / Policy**

**A Planned Future**

Creates an attractive shire with quality buildings and spaces, accessible travel and transport, and a community that has the services and facilities it needs now and in the future; supports a prosperous economy where trade, manufacturing and business activity flourishes.

*Our Goal:*

Facilitate the growth, liveability and development of the shire and encourage innovation and efficiency in the local economy.

**A Place to Live and Grow**

Is a community where people feel cared for and supported; where buildings and spaces facilitate creativity, social activity and enrichment of life, and people have access to gain the skills and education needed to reach their potential.

*Our Goal:*

Improve access to buildings, spaces, services and education to support and enable quality of life.

**A Healthy Community and Environment**

Actively connects and includes people of all ages and backgrounds and promotes a healthy and vibrant community life in a clean, safe and sustainable environment.

*Our Goal:*

Respect cultural differences, support a diverse range of healthy and creative activities, foster community safety and promote environmental sustainability.

### **Issues / Options**

This report is prepared to provide timely and accurate information specific to the delivery of the Bluewater Fitness Centre Redevelopment Project.

### **Proposal**

This report is for Council to note the progress of this project and provides details relating to performance and variance against schedule, budget, and quality parameters. The report also gives an indication of the key issues and risks which have the potential to affect project delivery outcomes.

### **Financial and Other Resource Implications**

The project budget is \$11.86M. The project is presently being managed within budget tolerances.

### **Risk Management & Compliance Issues**

All aspects of the project are being managed through an established risk register. There are a number of key risks which have the potential to deviate the project from schedule, budget, and quality objectives. The major known issues relate to latent conditions associated with the condition of the existing building structure.

### **Environmental and Climate Change Considerations**

Environmental risks posed by construction activities on site are being managed in accordance with the Contractor's Environmental Management Plan.

### **Community Engagement**

The community engagement strategy follows the recommendations of the Colac Otway Shire Council Community Engagement Policy of January 2010, which details five levels of engagement – inform, consult, involve, collaborate and empower.

The method used is to inform including ongoing community and stakeholder engagement activities which will be implemented throughout the course of the project. Information about the project will be disseminated to the community through traditional and social media outlets.

### **Implementation**

This report is provided as information for the benefit of Council and the community and gives a status update on the delivery of the Blue Water Fitness Centre Redevelopment Project.

### **Conclusion**

The intention of this report is to inform the community about the progress of the Blue Water Fitness Centre Redevelopment project. These ongoing reports focus on monitoring of budget and expenditure, progress of works and issues or variances which have the potential to impact on project delivery outcomes.

### **Attachments**

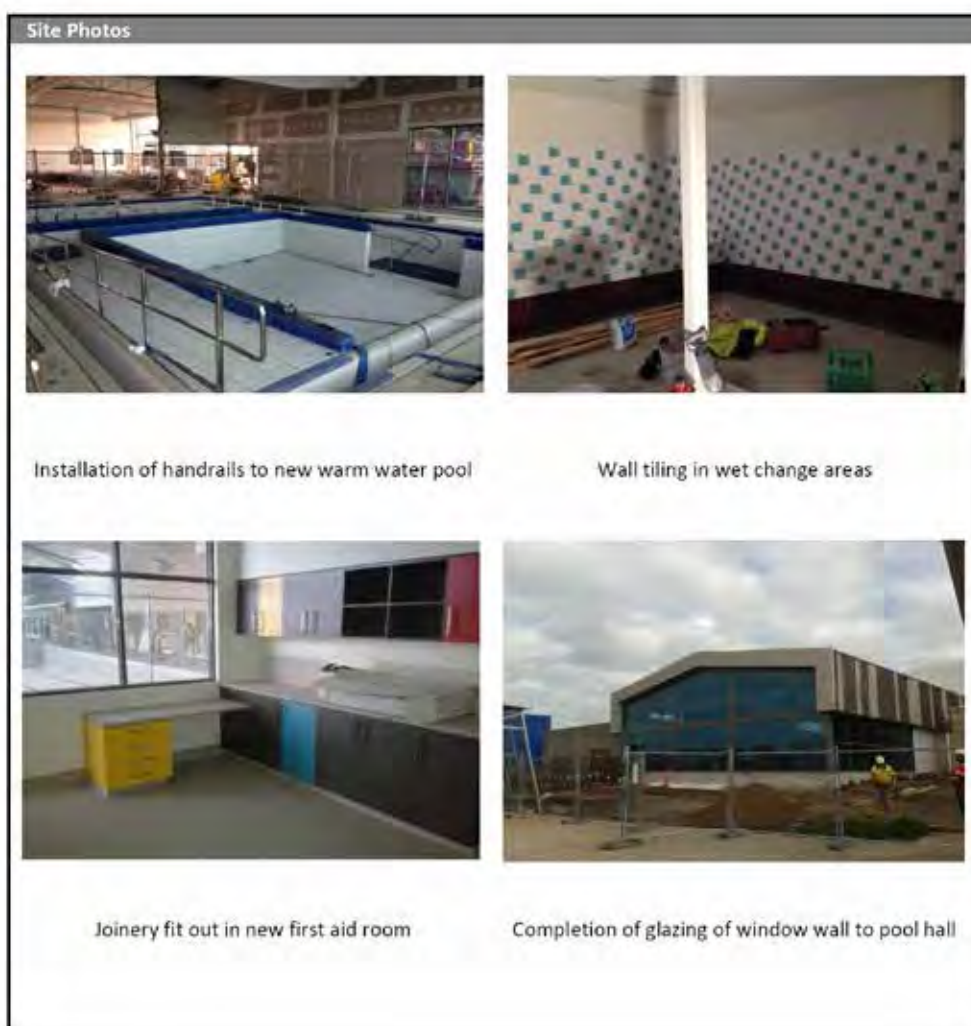
Nil

### **Recommendation(s)**

***That Council notes the monthly status report for the Bluewater Fitness Centre Redevelopment Project covering the period to 1 June 2015 to 30 June 2015.***

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| Schedule Performance | | | | | | |
|---|--|---|--------------|--|-------------|--------------------|
| Project Element | Design (Including Contract Administration) | Relocation of Dry Programmes | Construction | Equipment Purchases for Redeveloped Facility | Landscaping | Project Management |
| Percentage Complete | 103.9% | 100.0% | 87.3% | 0.0% | 0.0% | 145.1% |
| Construction Correspondence | | | | | | |
| No. of Requests For Information (RFI) to Date | 378 | No. Variation Quotations (VQ) Submitted | | 212 | | |
| No. Unresolved RFIs | 5 | | | | | |
| No. Site Instructions Issued (SI) | 850 | No. VQs Approved | | 173 | | |
| Accomplishments Since Last Report | | | | | | |
| Initial sanding and sealing of new sports floor completed | | | | | | |
| Installation of handrailing to warm water pool | | | | | | |
| Completion of tiling of warm water pool | | | | | | |
| Tiling in wet change areas commenced | | | | | | |
| Upcoming / Next Steps | | | | | | |
| Line marking and polishing of sports floor | | | | | | |
| External hard landscaping works to commence | | | | | | |
| Laying of floor finishes across multiple areas | | | | | | |
| Erection of structural steel for splash pad extension | | | | | | |
| Key Risks that May Affect the Project | | | | | | |
| RFI response times | | | | Current Status | | |
| Possible delays due to seasonal change and extent of works exposed to weather | | | | Controlled | | |
| Impacts to schedule due to additional works across aspects of the site | | | | Controlled | | |
| | | | | Caution | | |
| Key Issues that Currently Affect the Project: | | | | | | |
| RFIs pending response and current timeframes for finalisation | | | | Current Status | | |
| Project schedule impacted by redesign and documentation delivery | | | | Controlled | | |
| Progress of construction of splash pad area | | | | Controlled | | |
| | | | | Caution | | |
| Key Upcoming Milestones | | | | Target Completion Date | | |
| Completion of sports floor (line marking and polishing) | | | | 31-Jul-15 | | |
| External hard landscaping works | | | | 31-Jul-15 | | |
| Erection of structural steel for splash pad area | | | | 24-Jul-15 | | |
| Key | | | | | | |
| Controlled | | - Project or issue is within established milestones, scope, budget and is on schedule | | | | |
| Caution | | - Project has slightly deviated from the plan. | | | | |
| | | - Issue/risk has the potential to deviate project from defined time, cost, quality objectives. | | | | |
| | | - Project not tracking to established milestones, or has taken on tasks out of scope or budget. | | | | |
| Critical | | - Issue or risk likely to significantly impact on schedule and project costs. | | | | |



OM152207-9

AMENDMENT C78 - WYUNA ESTATE

| | | | |
|-------------|------------------------------------|-----------|--------------|
| AUTHOR: | Suzanne Barker | ENDORSED: | Doug McNeill |
| DEPARTMENT: | Sustainable Planning & Development | FILE REF: | F11/3291 |

Purpose

The purpose of this report is to seek Council's support to prepare and publicly exhibit Planning Scheme Amendment C78 which aims to rezone land at the Wyuna Estate to allow expansion of the existing residential area.

Declaration of Interests

No officer declared an interest under the *Local Government Act 1989* in the preparation of this report.

Background

At the request of the landowner (the Proponent), Council resolved at its 27 November 2013 meeting to exhibit an Amendment to the Planning Scheme to rezone to General Residential Zone Schedule 1 (GRZ1) the land known as Lot 1 on TP326494Q and part of Lot 2 PS529787 which contains the former Beechy Rail line reserve. This land has frontage to Harris Road, and has an approximate area of 14.03 hectares. The site adjoins the eastern boundary of the existing 'Wyuna' residential estate in Elliminyt, and the western boundary of the Beechy Railway line reserve which is included in the area to be rezoned, and is zoned Farming. Its location is shown in the map below.



Strategic support for the rezoning was established through Amendment C55 in 2009. Amendment C55 introduced the Colac Structure Plan, amongst other things, into the Colac Otway Planning Scheme. The Proponent made a submission to Amendment C55, and the Independent Panel which considered the submissions agreed with the Proponent that the rezoning had merit. The Panel made an explicit recommendation that a future Amendment should rezone the land without the need for any further strategic justification.

Whilst Amendment C55 introduced the Colac Structure Plan into the Planning Scheme through the settlement map at Clause 21.03, the Planning Scheme shows the subject land outside of the current settlement boundary. This will need to be addressed if the land is to be rezoned, and was not previously noted as part of Council's 2013 resolution.

At the time of Council's resolution in 2013, it was proposed to rezone the land to General Residential Zone, remove the Significant Landscape Overlay Schedule 1 (SLO1) which applies to the land, and apply a Development Plan Overlay. No amendment documentation was provided to Council for consideration as part of its resolution.

The Amendment did not proceed to exhibition because a number of technical issues needed to be resolved, particularly in relation to road layout, stormwater, and open space. It is requested that Council consider the Amendment proposal anew through this Agenda item, having regard to the attached draft Amendment documents, as Council officers are of the view that a slightly different approach should be taken.

Council Plan / Other Strategies / Policy

A Planned Future

Creates an attractive shire with quality buildings and spaces, accessible travel and transport, and a community that has the services and facilities it needs now and in the future; supports a prosperous economy where trade, manufacturing and business activity flourishes.

Our Goal:

Facilitate the growth, liveability and development of the shire and encourage innovation and efficiency in the local economy.

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Is a community where people feel cared for and supported; where buildings and spaces facilitate creativity, social activity and enrichment of life, and people have access to gain the skills and education needed to reach their potential.

Our Goal:

Improve access to buildings, spaces, services and education to support and enable quality of life.

Issues / Options

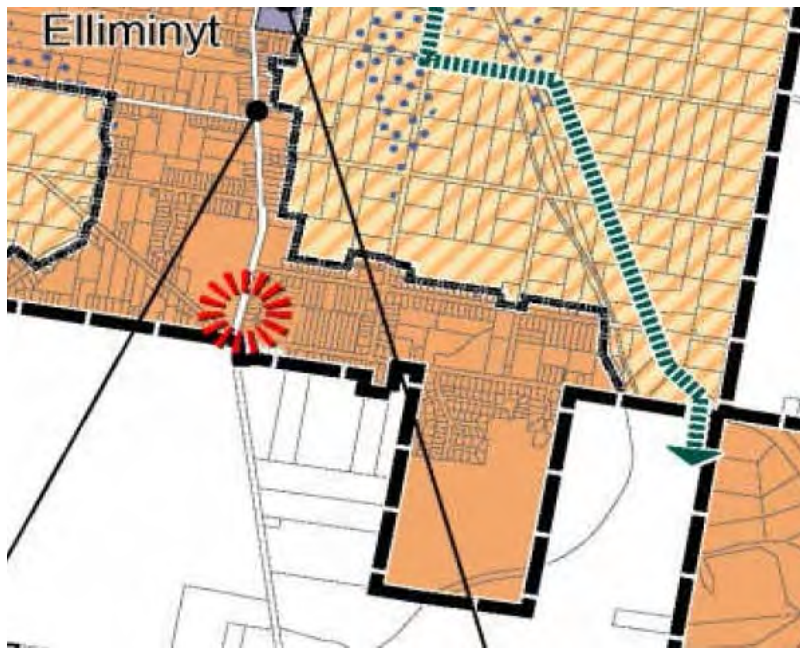
Strategic Justification and Settlement Boundary

The Independent Panel for Amendment C55 made an explicit recommendation that supported the rezoning of the subject land without the need for any further strategic justification. The Panel also recommended the preparation of a precinct structure plan for Elliminyt. It is considered that this latter exercise is no longer warranted given the Colac 2050 project, however, that the discrete rezoning of the subject land which has an explicit Panel recommendation should be pursued to resolve an outstanding item from the aforementioned Panel process. It is considered that this:

- Will not prejudice any future planning for the Elliminyt area;
- Will provide for a logical extension to the existing residential area to extend to the natural boundary of the former Colac-Beech Forest Railway line.
- Provide an opportunity to create a permanent public open space link using the former Railway land; and
- Will provide additional land supply in the Elliminyt area.

To provide for the strategic justification however, the Colac Framework Plan contained within Clause 21.03 of the Planning Scheme (extract shown below) will need to be amended as part of this process to include the subject land within the settlement boundary.

The subject site is currently located outside of the settlement boundary which is anomalous with the strategic intent for the land as expressed through the Panel recommendation.



Former Colac to Beech Forest Rail Reserve and Public Open Space

A section of the former Colac to Beech Forest Railway (Beechy Line Railway Trail) is contained within the eastern boundary of the subject land. This land is the subject of a current planning permit application to allow the consolidation of the former railway land by way of re-subdivision into the primary parcel. The permit is likely to have been issued by the time Council meet.

The Proponent has expressed a desire that the former Colac to Beech Forest Railway reserve form part of the land's future public open space contribution. Council has previously expressed support for this. The land would formally transfer to Council ownership at the time of subdivision.

The Railway reservation land is approximately 1.86 hectares and would exceed the 10% open space contribution required for any future subdivision of the land which the Proponent is supportive of. Given that the subdivision of the land may be a number of years away, it is recommended that Council enter into a Section 173 agreement with the land owner to ensure that any future owners of the land are aware that the Proponent and Council have a mutual understanding that this important open space link is to become a public asset in perpetuity at the time of subdivision.

Interface with the Former Colac to Beech Forest Railway Line and the DDO17

It is important that the future subdivision of the land has regard to the Beechy Line Railway trail open space link and be designed in a way that facilitates passive surveillance of this area. Public surveillance of open spaces is important because it has been demonstrated to facilitate: public safety; public use of the open space link; and avoid vandalism or the dumping of rubbish. The open space link has the potential to become a key public asset for Elliminyt and indeed Colac generally as it is a critical link in the Rail Trail corridor. Public surveillance is enhanced with lots which front onto open spaces so that houses direct their public activity (windows, garages, and front doors) to the public reserve. This allows for "eyes on the street and open space", and has the benefit of improving public safety.

The Proponent has provided Council with an indicative development plan which includes a road layout which shows lots which back onto the public reserve. They have argued that it is

not cost effective to have a road which runs along the public reserve due to the steep slope. Whilst ideally a road should form the interface with the public open space, this ultimately should be decided at the time of subdivision based on merit, the available information at the time, and the planning provisions which apply.

The risk with a subdivision response where lots directly abut a public open space is that high fencing will be constructed as a boundary treatment along the public reserve's edge. High fencing will hinder the passive surveillance of the open space corridor.

It is considered that the detail of the road layout does not need to be resolved at the time of the rezoning and may not need to be resolved for a number of years. It is a matter which can be assessed under the current provisions of the Planning Scheme through Clause 56 which deal with the subdivision of land. The important thing at the time of rezoning is to ensure that passive surveillance of the open space corridor is maintained when the estate is developed, whatever the road layout outcome.

It is proposed that boundary fencing be controlled through the Planning Scheme for any future lots which abut the public open space created by the Railway line corridor. Fencing controls through a Design and Development Overlay Schedule 17 (DDO17) would require a planning permit for a boundary fence within 5 metres of the public open space corridor if it exceeds 1.2 metres in height and is not constructed with materials which allow 50% permeability. This will ensure that fences along the boundary of the public open space corridor (and within its proximity ie high side fencing and fencing setback off the boundary) are low and allow for clear visual linkages and passive surveillance of the open space. The DDO17 has been worded so that it is only applicable to boundaries which abut the public open space, and would not apply to other fencing in the estate. The height of the fence at 1.2metres is considered reasonable to allow for internal security of pets and young children, whilst maintaining visibility over this height.

The extent of, or indeed the need for the control, could be reassessed at the time of subdivision when the ultimate road layout is finalised. The control should be refined to extend only to the lots which abut the public open space, or ideally, be removed, because the road layout has been designed so that no lots adjoin the public open space. This could be done as an Amendment which is undertaken in conjunction with another strategic project in the future to reduce administrative costs.

Significant Landscape Overlay (SLO1)

An existing SLO1 extends over the entire subject land and further south into surrounding farmland. It is proposed to remove this control from the land being rezoned as it is no longer relevant to the intended development of the area.

Erosion Management Overlay (EMO1)

The EMO1 extends over a small portion of the land and falls predominantly on the section of the former Railway line. It is not proposed to amend this control.

Technical support and Future Subdivision

The Proponent has provided Council with a number of technical assessments to support their application for rezoning. These include:

- Geotechnical Assessment
- Flora and Fauna Assessment
- Stormwater Management Report
- Engineering Services Report
- Traffic Impact Assessment.

There is no requirement under the Aboriginal Heritage Regulations 2007 for an Aboriginal Cultural Heritage Management Plan to be prepared and approved prior to the rezoning of the land or prior to seeking statutory approvals for subdivision. At this stage, a desktop level Cultural Heritage assessment has been prepared by Urban Colour Arts. The assessment

revealed that there are no areas of cultural heritage sensitivity within the study area and rezoning is not a high impact activity. Therefore a mandatory CHMP is not required for the application to rezone the land.

Council officers are satisfied that there is sufficient information to indicate that the land can be developed, is serviceable, and would not result in any significant environmental impact. Some issues remain in relation to the stormwater management response proposed for the future development of the land. However, it is considered that the ultimate stormwater management response can be resolved at the time of subdivision as it is agreed that a number of feasible technical solutions exist to appropriately manage stormwater within the subject land's boundaries as part of future development.

It is not considered necessary to apply a Development Plan Overlay (DPO) over the land. The DPO is normally applied when multiple land owners are involved to assist with the coordination of development or to guide the land's future development in specific ways. The subject land is an extension to an existing estate and is bounded by a deep creek line to the east, Harris Road to the north, and the settlement boundary to the south (and east). The ultimate design response for the subdivision is constrained within these existing parameters. It is considered that the provisions of the Planning Scheme predominantly through Clause 56 are sufficient to deal with the future subdivision of the land.

Proposal

It is proposed that Council endorse the preparation and exhibition of a planning scheme amendment (C78) that:

- Amends Clause 21.03 Settlement - Colac Settlement Framework to include Lot 1 on TP326494Q and part of Lot 2 PS529787 (the subject land) within the town's settlement boundary;
- Rezones the subject land from Farming Zone to General Residential Zone Schedule 1. The land is approximately 14.03 hectares, has frontage to Harris Road, Elliminyt; and is part of a larger land holding known as 215 Colac-Lavers Hills Road, Elliminyt which is not subject to this Amendment proposal;
- Removes the existing Significant Landscape Overlay Schedule 1 from the subject land; and
- Applies a Design and Development Overlay Schedule 17 over the subject land to control fencing which adjoins a public reserve.

Financial and Other Resource Implications

As a privately sponsored amendment, amendment costs including statutory fees and panel costs will be borne by the proponent.

Risk Management & Compliance Issues

The risk to Council of not proceeding with the Amendment is that it would not allow the final stages of the Wyuna Estate and associated infrastructure to be developed, which received support through Amendment C55.

Environmental and Climate Change Considerations

There are no direct environmental or climate change considerations associated with the Amendment. Detailed site specific environmental issues will be dealt with at the subdivision permit stage.

Community Engagement

The community engagement strategy follows the recommendations of the Colac Otway Shire Council Community Engagement Policy of January 2010, which details five levels of engagement – inform, consult, involve, collaborate and empower.

The method selected would be inform and include an opportunity for members of community to make written submissions to the Amendment. Should submissions be unable to be resolved, then submitters will have the opportunity of presenting directly before an independent panel that would be appointed by the State Government to advise Council on submissions.

Implementation

Planning Scheme Amendment C78 has been prepared in draft form. The explanatory report, Amendments maps, and proposed Design and Development Overlay 17 are attached. Officers will finalise the administrative components of the Amendment documentation and seek authorisation to prepare and exhibit the Amendment from the State Planning Minister.

Conclusion

Amendment C78 is a privately sponsored amendment proposal in response to the recommendations of the Amendment C55 Panel Report which supported a follow-on amendment to rezone land for the expansion of the Wyuna Estate. The Amendment represents the final parcel of land to be rezoned as part of Wyuna Estate. If supported by Council, officers will seek authorisation from the Planning Minister to exhibit the Amendment during late August 2015.

Attachments

1. C78 Explanatory Report for Council meeting for Exhibition
2. C78 Clause 21 MSS 03 Exhibition tracked for Council report
3. C78 DDO17 Exhibition version for Council meeting
4. C78 00 Deleted SLO Maps Exhibition
5. C78 001 Zone Maps 11 16 Exhibition
6. C78 004 DDO Maps 11 16 Exhibition

Recommendation(s)

That Council:

1. ***Seeks authorisation from the State Planning Minister to prepare Planning Scheme Amendment C78 which seeks to:***
 - ***Amend Clause 21.03 Settlement - Colac Settlement Framework to include Lot 1 on TP326494Q and part of Lot 2 PS529787 (the subject land) within the town's settlement boundary;***
 - ***Rezone the subject land from Farming Zone to General Residential Zone Schedule 1;***
 - ***Remove the existing Significant Landscape Overlay Schedule 1 from the subject land; and***
 - ***Apply a Design and Development Overlay Schedule 17 over the subject land to control fencing which adjoins a public reserve.***
2. ***Exhibits Amendment C78 for a minimum period of six weeks seeking written submissions.***

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**OM152207-10 DRAFT DOMESTIC WASTEWATER MANAGEMENT PLAN**

|             |                                    |           |              |
|-------------|------------------------------------|-----------|--------------|
| AUTHOR:     | Blaithin Butler                    | ENDORSED: | Doug McNeill |
| DEPARTMENT: | Sustainable Planning & Development | FILE REF: | F14/5663     |

**Purpose**

To seek Council support to place the draft Domestic Wastewater Management Plan (DWMP) on public exhibition for a period of eight weeks.

**Declaration of Interests**

No officer declared an interest under the *Local Government Act 1989* in the preparation of this report.

**Background**

Work has been ongoing on the preparation of a Domestic Wastewater Management Plan (DWMP) for areas within drinking water catchments and for unsewered properties in the municipality, especially those within settlements and townships. The draft 2015 Plan functions as a review and update of the 2007 DWMP.

The draft DWMP 2015 covers all unsewered parts of Colac Otway Shire, with a particular focus on the following areas:

- Water catchment areas (including Barham River, Barwon Downs, Beech Forest, Carlisle River, Forrest, Gellibrand, Kawarren and Lavers Hill).
- Unsewered townships outside water catchments: Alvie, Barongarook, Beeac, Coragulac, Cororooke, Kennett River, Wye River and Separation Creek.

The draft Plan comprises two separate documents – an Operational Plan, and a Technical Document that contains much of the supporting data and maps associated with the production of the DWMP. Council is now being asked to place these documents on public exhibition to seek community feedback.

Why are we preparing a DWMP?

In 2003, a document entitled '*The Variation to State Environment Protection Policy (Waters of Victoria (SEPP))*' required all relevant councils to ensure that domestic wastewater systems on unsewered properties in their municipality were managed to prevent wastewater containing nutrients, pathogens and other pollutants being discharged beyond allotment boundaries. This was to be done through the development and implementation of a DWMP.

A DWMP must provide for:

- the effective monitoring of the condition and management of onsite treatment systems, including but not limited to compliance by permit holders with permit conditions and the relevant EPA Code of Practice;
- the results of monitoring being provided to stakeholders as agreed by the relevant stakeholders;
- enforcement action where non-compliance is identified;
- a process of review and updating (if necessary) of the DWMP every 5 years;

- independent audit by an accredited auditor (water corporation approved) of implementation of the DWMP, including monitoring and enforcement, every 3 years;
- the results of audits being provided to stakeholders as soon as possible after the relevant assessment.

Councils are required to demonstrate that suitable resourcing for implementation, including monitoring, enforcement, review and audit, is in place.

#### Previous work

Council's first DWMP, in 2007, developed previous work undertaken by Council which had identified wastewater issues in a number of towns. This collection of information was instrumental in securing \$12,000,000 to sewer Birregurra and over \$800,000 to connect Skenes Creek to the Apollo Bay sewerage system at minimal cost to property owners. Unfortunately, sewerage was not an option for Wye River and Separation Creek due to potential landslip issues associated with treated effluent disposal from the sewerage system and the prohibitive cost.

As noted above, it is a requirement of the Victorian Government that a DWMP be reviewed and updated every 5 years, which meant that the 2007 DWMP should have been reviewed in 2012. This did not happen due to competing funding priorities. An updated DWMP is therefore well overdue.

Following the decision not to sewer Wye River and Separation Creek, the Victorian Government commissioned a report in 2013 to look at the risks of domestic wastewater systems within these two coastal hamlets. This report recommended the development and implementation of a DWMP to reduce the risk of on-site treatment and disposal system failure. The report also recommended system upgrades on a prioritised basis, and regular inspection, desludging and maintenance activities. This report has also been one of the drivers for the 2007 DWMP review and update.

#### Draft Domestic Wastewater Management Plan 2015

There are around 8,803 unsewered lots/properties in the municipality as a whole (ie all land excluding urban Colac, Apollo Bay and Birregurra), of which over half are in towns and their surrounds.

The draft 2015 DWMP, which is an update of the 2007 plan, does not look at all townships. It has prioritised the highest risk townships (such as Wye River, Separation Creek and Kennett River), those townships in water supply catchments, and unsewered townships identified for growth. Other townships will be considered in the next review and update of the DWMP.

#### Barwon Water and Wannon Water

In addition to addressing the broader municipal wide obligations for a DWMP, a particular focus for the draft DWMP has been to clarify the development potential of land within the drinking water catchments (DWSCs) given the constraints to development of land in the Otways arising from application of State policies relating to protection of water quality in declared catchments.

Water corporations are responsible under legislation for management of declared water catchments, with the aim of protecting the quality of water supply from the catchments. The catchment managed by Barwon Water supplies drinking water to Colac, Geelong and the surrounding region, whilst the Wannon Water catchment supplies water to towns in the west of the State such as Warrnambool. The onus of the legislation on these corporations to protect drinking water quality is significant.

In the declared water catchments of the Shire, an Environmental Significance Overlay – Schedule 3 (ESO3) has been applied through the Planning Scheme to ensure that a planning permit is required for any dwelling (or other similar type development). Whilst Council has introduced an overlay schedule aimed at exempting minor developments from permit requirements, the State standard overlay triggers a planning permit for most developments. The planning process, however, simply enables consideration of the impacts of the development on water quality by the water corporations.

In November 2012 the Minister for Water released guidelines on ‘*Planning permit applications in open, potable water supply catchment areas*’, which state in Guideline 1 that:

*“Where a planning permit is required to use land for a dwelling or to subdivide land or where a planning permit to develop land is required pursuant to a schedule to the Environmental Significance Overlay that has catchment or water quality protection as an objective:*

- the density of dwellings should be no greater than one dwelling per 40 hectares (1:40 ha); and*
- each lot created in the subdivision should be at least 40 hectares in area”.*

The guidelines also state that water corporations can consider allowing a higher density of development where all of the following conditions are met:

- the minimum lot size specified in the zone for subdivision is met in respect of each lot;
- the water corporation is satisfied that the relevant Council has prepared, adopted and is implementing a Domestic Wastewater Management Plan (DWMP) in accordance with the DWMP Requirements; and
- the proposal does not present an unacceptable risk to the catchment having regard to a number of criteria.

(Note: these criteria have been used in Council’s draft DWMP to define the risk and how, if possible, to overcome the risk, thereby, increasing the opportunity to develop a property in open, potable water supply catchment areas.)

Whilst the 2012 State Government guidelines superseded an earlier version that had been in place since 2009, they were applied by water corporations more strictly following the 2012 changes after VCAT began making determinations on permit applications which strongly criticised Councils and water corporations for not meeting their obligations to implement them. This resulted in permit applicants finding it significantly more difficult in the Shire’s water catchments to obtain approval than had previously been the case, with some applications refused, and others being delayed for significant periods whilst applicants sought to prepare extensive information to satisfy water corporation requirements. This continues to be the case.

In 2013 Council determined to commence work on the current draft DWMP, following an offer from Barwon Water and Wannon Water to financially contribute to developing a DWMP in order to overcome the planning issues within their water catchments. This was seen by Council as a win-win, as this jointly funded new DWMP would also satisfy the obligation of Council to review and update the 2007 DWMP.

#### What is the connection between a DWMP and obtaining a planning permit?

The SEPP (Waters of Victoria) requires Councils to develop and implement a DWMP. Whether a planning permit is required for a development or not, Council through its Health Protection Unit:

- must assess the suitability of land for on-site domestic wastewater systems prior to approving a development. To assist in this, the Environment Protection Authority provides guidance including that in '*Assessment for Onsite Domestic Wastewater Management (2001)*' as amended;
- ensure that permits are consistent with guidance provided by the Environment Protection Authority, including that provided in the *Code Of Practice - Septic Tanks On-Site Domestic Wastewater Management (2003)*, as amended; and
- apply conditions to the Permit to Use (the on-site treatment system).

This means that even in situations outside of the drinking water catchments where a planning permit is not required a dwelling, Council has a role in reviewing and approving the on-site treatment system to be used via the Health Department. This would occur when an application is made for a Building Permit.

As noted above, the preparation, adoption and implementation of a DWMP also allows water corporations, where planning permits are required, to consider a higher density of development than otherwise can be allowed within water catchment areas. Unless water corporations are satisfied that Council is implementing an adopted DWMP, there is no scope to relax the 1:40 hectare density guideline set by the Minister for Water. As Councillors are aware, this is a matter that has limited development potential in water supply catchments across the State in recent years.

A DWMP does not impose any new planning controls over land. Rather, it is a tool that, amongst other things, provides Council and water corporations more flexibility when considering planning applications in water supply catchments. The draft DWMP has the potential to provide for appropriate development, where measures can be put in place to ensure the development would not compromise the water supply. Rather than applying the current instrument of allowing the 1 dwelling per 40 hectares permissible under State Guidelines, decisions would be possible based on the specific circumstances of a property through the implementation of a DWMP.

Whilst the Plan does not guarantee a positive development outcome for every property owner in the water catchments, it does provide consistency in terms of application requirements and the way that applications are assessed, having regard to site specific considerations.

#### Implications of the DWMP for planning of townships

The revised DWMP provides the basis for future strategic planning of township areas by examining the implications for water quality. Past strategic studies such as the Shire's Rural Living Strategy 2011 had considered future expansion of Gellibrand, Beech Forest, Forrest, Alvie, Beeac, Cororooke and Coragulac, however the implications for infill development in the towns was unknown due to lack of information on land capability for on-site effluent treatment. It was also unknown to what degree the need to protect water quality in the declared water catchments would prevent outward growth of Gellibrand and Beech Forest (to the north). The 2015 plan also provides the basis for establishing recommended minimum subdivision lot sizes for each of the unsewered townships in the Study.

#### Who has prepared the draft 2015 DWMP & what was the process?

Council engaged a consultancy, Whitehead and Associates, that is highly experienced in developing DWMPs to prepare the draft DWMP for the municipality.

This consultancy has previously been involved in the preparation, review and updating of Domestic Wastewater Management Plans for a number of other councils in Victoria, New

South Wales and Tasmania, including reviews of the DWMPs for Corangamite Shire Council, Moorabool Shire Council, Macedon Ranges Shire Council and Baw Baw Shire.

Throughout the preparation of the draft DWMP, the consultancy reported to a Working Group comprising Council officers and representatives from Barwon Water, Wannon Water, Southern Rural Water (SRW), the Environment Protection Authority (EPA), the Corangamite Catchment Management Authority (CCMA) and the Department of Environment, Land, Water & Planning (DELWP).

Unsewered properties in the Shire were categorised by the consultant using the most reliable, up-to-date data available on matters such as climate, soil and topography. The criteria used included information about allotment size; zoning under the Planning Scheme; topography; geology; soil type, depth, permeability and structure; site gradient or slope; useable lot area; climate suitability; the property's proximity to water courses, groundwater bores, water storages and reservoirs, and land subject to inundation; average soil moisture levels; groundwater depth; and landslide risk.

The consultant also carried out ground truthing of data which included testing of soil conditions on over 40 properties across eight priority townships during a wet period of September last year. The results of this testing were used to cross reference against the more general soils information in existing data bases held by the different agencies.

The final result of the consultant's work is that all properties within the draft DWMP now have a sensitivity risk rating (for the purpose of considering on-site effluent treatment) of 'low', 'medium', 'high' or 'very high'. These ratings provide clarity to property owners about the information they will have to supply with any future planning application, or where no planning permit is required for a development, for any application to Council for a "Permit to Use" an on-site effluent treatment system.

In summary, the outcomes of the sensitivity analysis are:

- 2,113 unsewered allotments are within the declared water catchments.
- 204 allotments have been assigned a sensitivity rating of Very High (only 2.3% of unsewered allotments).
- 1,912 allotments have been assigned a sensitivity rating of High (21.7% of unsewered lots in the Shire).
- 4,696 allotments have been assigned a sensitivity rating of Medium (53.4% of unsewered lots in the Shire); and
- 1,991 allotments have been assigned a sensitivity rating of Low (22.6% of unsewered lots in the Shire).

The DWMP establishes the different information to be submitted with planning permit applications or applications to Council's Health Protection Unit for 'Permits to Use' an on-site effluent treatment system, depending on the sensitivity rating. For low rated properties, only very basic information would need to be submitted, compared to more comprehensive information for those rated Very High.

It is noted that there are concentrations of Very High rated lots in the areas within and around the townships of Lavers Hill and Beech Forest, reflecting the high rainfall and steep slopes within these towns.

What if a land owner considers the sensitivity rating to be inaccurate?

The sensitivity rating differentiates the level of information to be submitted with applications for development depending on the relative risk to water quality based on a broad analysis at a Shire wide level.

The draft DWMP makes it clear that the results of this analysis may not represent the actual conditions of properties throughout the entire Shire, due to the regional scale of the study. It may be possible that the information that does not reflect actual conditions on the ground will come to light when a landowner proposes to develop a site and/or install a septic system.

In such cases, a land owner could review the information in the DWMP and present additional information through a Land Capability Assessment (LCA) and, if necessary, the DWMP would be updated at its next review.

Council will base its decision on the most accurate information relating to the site arising from the site specific Land Capability Assessment (LCA) prepared for the development.

For land in the water catchments, the important implication of the sensitivity ratings is that it will enable water corporations to consider each planning permit application for a dwelling on its actual merits, instead of using the blunt instrument of the maximum development density of 1:40 hectares from the State Guidelines to refuse applications.

There would be no immediate implications for owners with existing systems unless those systems are defective or malfunctioning, or the property is being further developed. Substandard systems would be detected through audits or complaints. Over the longer term systems that do not comply with current standards would need to be improved.

A property is classified as 'Very High' - does this mean it cannot be developed?

The draft DWMP ensures that all properties can be assessed on their individual merits, rather than a blanket standard being applied. Even for land in the Very High risk category, there is no direct implication that applications would not be supported – it simply means that instead of being refused based simply on the density of development in the surrounding area (which is a particular issue in the townships in the water catchments), a proponent can supply detailed information seeking to demonstrate that a proposal can be suitable.

Whilst there is no guarantee that all proponents of development in water catchments would receive support from the water corporations for the issue of a planning permit (as some sites will be too challenging due to their specific site conditions to meet SEPP requirements), it is highly likely that the DWMP would facilitate more positive outcomes than under the present State Guidelines. The draft DWMP will not make it any harder for any site to get a planning permit than currently is the case.

Will it cost land owners more to lodge an application?

There may be some additional costs associated with the preparation of Land Capability Assessments (LCA), especially for 'high' and 'very high' risk properties. However, the adoption and implementation of a DWMP will result in more opportunity to obtain permits to carry out development, with less environmental risk. Without the required level of LCA being submitted for a property, it will not be possible to obtain a permit to develop.

Will the DWMP affect property values?

The DWMP should not materially affect property values, as it will increase the overall potential for environmentally responsible development in the Shire.

No property will have less development potential than it currently does, but the requirements it will need to meet to obtain a planning permit, or a permit for a septic system, will be clear and equitable.

What is the role of Council, and what is the role of the water corporations?

The following sets out the different roles of Council and the water corporations in using the DWMP to meet their legislative obligations:

Council

As noted earlier in the report, the State Environment Protection Policy (Waters of Victoria), together with the 2012 State Guidelines, define the role of relevant councils to develop, implement and review a DWMP, in conjunction with water authorities, EPA, communities, and other local governments with shared water catchments, that:

- reviews land capability assessments and available domestic wastewater management options to prevent the discharge of wastewater beyond allotment boundaries and prevent impacts on groundwater beneficial uses;
- identifies the preferred options, together with costs, funding needs, timelines and priorities;
- provides for the assessment of compliance of on-site domestic wastewater systems with permit conditions; and
- comprises a strategy, in compliance with all of the requirements in the 2012 Guidelines.

As shown in the attached diagram (Attachment 3), Council is responsible for monitoring all septic systems installed within the municipality, not just in drinking water supply catchments. Council, through its Health Protection Unit, is required to review applications for the installation of a septic system. If approved, the applicant is issued with a 'Permit to Install' in accordance with any conditions. Once the septic system is installed to the satisfaction of a Council officer, a 'Permit to Use' is issued. This procedure is required whether or not a planning permit is required.

The importance of the draft DWMP when considering proposed development in drinking water supply catchments is that it provides a risk based approach to facilitate a way of developing on properties with densities of dwellings in the locality greater than 1:40 hectares.

Water Corporations

Wannon Water and Barwon Water invested in the development of the draft DWMP and are on its Steering Committee, together with the Department of Environment, Land, Water and Planning (DELWP), EPA and other entities. Both water corporations are keen to ensure that an updated DWMP complies with all of the requirements on the 2012 Guidelines for open, potable water supply catchment areas, which have been outlined above.

Water corporations are a statutory referral authority on planning applications within drinking water supply catchments. Council must refer planning applications within those areas to the relevant water corporation(s) and is bound by the response received, i.e. an application must be refused if the water corporation recommends this, and any conditions required by the water corporation must be imposed if a permit is issued. Without the adoption and implementation of the draft DWMP, both water corporations are bound by the guidelines to refuse an application for a dwelling if the density of dwellings in the area around the property is greater than 1:40 hectares. (The 1:40 hectares benchmark is a non-negotiable requirement applied to all water corporations in Victoria.)

Will the water corporations endorse the plan and apply it when considering applications?

It is important that the DWMP has the support of Barwon Water and Wannon Water, and Council has worked closely with both water corporations on this project. Both authorities have been involved in a Working Group which has worked with Whitehead & Associates to develop the Plan. Support will also be sought from the EPA.

In order for Council to secure the support of water corporations for the DWMP if adopted, it will be necessary to resource it, which will involve increased monitoring of unsewered properties in the Shire to ensure wastewater systems are operating properly. The Operational Plan which forms part of the draft DWMP includes an Action Plan, which outlines the management strategies and actions to address priorities.

Draft Plan Ready for Exhibition

It is considered that the draft is now ready for public exhibition, and it is recommended that the two documents that comprise the draft DWMP (the Operational Plan and the Technical Document) be made available for viewing by interested parties.

It is recommended that the draft DWMP be exhibited for a period of eight weeks, as outlined in the 'Community Engagement' section below, with submissions invited from any interested persons/parties.

**Council Plan / Other Strategies / Policy**

**A Planned Future**

Creates an attractive Shire with quality buildings and spaces, accessible travel and transport, and a community that has the services and facilities it needs now and in the future; supports a prosperous economy where trade, manufacturing and business activity flourishes.

*Our Goal:*

Facilitate the growth, liveability and development of the shire and encourage innovation and efficiency in the local economy.

**A Healthy Community and Environment**

Actively connects and includes people of all ages and backgrounds and promotes a healthy and vibrant community life in a clean, safe and sustainable environment.

*Our Goal*

Respect cultural differences, support a diverse range of healthy and creative activities, foster community safety and promote environmental sustainability.

The Council Plan notes that Colac Otway Shire operates in a highly regulated environment, with complex planning and building control systems administered by the State Government. It notes that these have an important purpose but in some instances have an impact on development. The adoption and implementation of an updated DWMP should assist in providing greater flexibility for consideration of development in Council's declared water catchments.

**Issues / Options**

Adoption of an updated DWMP will ensure that Council meets its statutory requirement to prepare and implement a Domestic Wastewater Management Plan. In addition, it will provide certainty to the community about the information required when proposals for development include the installation of a septic system, regardless of whether planning permission is required.

The draft DWMP has been prepared by a consultancy that is a leader in this field, in consultation with the water corporations, the EPA and other interested bodies. There has been strong collaboration in its preparation, and it is important that the water corporations in particular are supportive of the draft that is being proposed for exhibition.

Whilst the DWMP will facilitate more effective management of on-site effluent treatment in unsewered areas, the greatest implication for our Shire is that (as noted above) the preparation, adoption and implementation of a DWMP allows water corporations, where planning permits are required, to consider a higher density of development than otherwise can be allowed within water catchment areas. Failure to adopt and implement an updated DWMP would mean that the water corporations would continue to apply the maximum 1:40ha density for dwellings in catchment areas, as there would be no information available to justify a relaxation of the Minister for Water's Guidelines. With the adoption and implementation of the draft DWMP, Council and water corporations would have more ability to consider planning applications in water supply catchments. A DWMP does not impose any new planning controls over land.

Whilst the Plan does not guarantee a positive development outcome for every property owner in the water catchments, it does provide consistency in terms of application requirements and the way that applications are assessed, having regard to site specific considerations. It would also offer the potential for development of sites which in the past have not met the 1:40 hectare density requirement.

From a planning perspective, the draft DWMP will also provide clear guidelines for future lot sizes in rural townships across the Shire, based on local conditions. This would be an important tool when looking at the growth potential of towns throughout the municipality such as Beeac, Cororooke, Forrest and Alvie.

In summary, the benefits of the draft DWMP to the Council and the community include:

*Council*

- It will provide greater certainty that the water corporations will approve development in drinking water supply catchments.
- It will ensure Council complies with its responsibilities, taking a consistent, risk-based approach.
- It will set out requirements for Land Capability Assessments (LCAs), which would provide both consistency and compliance with the necessary criteria considerations.
- It will provide a detailed set of property data for all developable unsewered properties in the municipality, and the processes and information to assist Council in making consistent and well informed decisions.
- As it would have a risk-based approach, the DWMP will provide controls commensurate with the potential risk of the proposed septic system. Therefore, there will be fewer requirements for low risk proposals, with the most requirements applied to very high risk proposals.
- As a last resort, Council could confidently and reasonably justify a refusal of a proposal if the risk could not be satisfactorily mitigated.
- It would have an action plan that would strategically inform Council over the next 5 years, with a list of priority towns such as Kennett River, Wye River and Separation Creek where efforts can be focussed.

- Council would be in breach of Victorian Government requirements if it does not prepare a new DWMP every five years.

### *Community*

- Developers will be able to access the criteria data for their property, to have a better understanding of the ratings that have been prescribed to it. This data will be verified on-site if it is disputed or an application to install a septic system is made to Council.
- The opportunity to develop on properties at a density greater than 1:40 hectares in drinking water supply catchments.
- If a proposal in a drinking water supply catchment satisfies the requirements of an adopted DWMP that is being implemented by Council, the developer should be confident that it will be approved by the water corporations. If, for whatever reason, it is not approved, the developer would have a better case to appeal the decision at VCAT.
- The auditing of properties would develop a database which could be used, when necessary, for Council to present a case to the local water corporations to construct a full, partial or modified sewerage system. (Note: the only way a sewerage system can be considered is through a compelling request from Council which satisfies State requirements. This is how Skenes Creek and Birregurra were considered appropriate and funded by the Victorian Government for sewerage.)
- The auditing of properties would develop a database which could be used, when necessary, to include townships in Victorian Government schemes that provide funding to support property owners to upgrade non-compliant septic systems. (Note: these schemes have been available periodically in the past. Although there is no such scheme at the moment, having the audit data would give Council the opportunity to apply for one or more townships if the opportunity arises in the future.)
- Many property owners are unaware of the capacity and condition of their septic tank system, especially if they were not responsible for its installation. Advice on correct maintenance to keep the system in working order, or the need to alter or install a new system (over a given timeframe), would reduce public health and environmental risk for the property occupier, neighbours and downstream water users.
- The draft DWMP recognises that many septic tank systems do not comply with the current Code of Practice and has outlined a risk-based approach that would see improvements to these systems within a reasonable timeframe.

It is considered that the draft DWMP is now at a stage where it would be appropriate to undertake public consultation, inviting feedback from interested parties. Any submissions received will be considered prior to finalising the DWMP for adoption.

### **Proposal**

The draft DWMP has been prepared by a highly respected consultant in accordance with the requirements of SEPP (Waters of Victoria) and the Minister for Water's *'Guidelines for Planning Permit Applications in Open, Potable Water Catchments'* (DSE, November 2012). It is now recommended that it be placed on public exhibition so that the views of the community and neighbouring Councils can be sought.

### **Financial and Other Resource Implications**

The DWMP has been partly funded by Council, with financial contributions from Barwon Water and Wannon Water. A small portion of these funds was carried forward into the 2015/16 budget to allow completion of the project.

The resource implications of implementing the DWMP must be noted. The effectiveness of a DWMP and the compliance monitoring program contained within it (i.e. the regime of auditing septic systems) will depend on the ability of Council to suitably resource the monitoring program. As noted above, under the Minister for Water's 2012 guidelines, water corporations must be satisfied that Councils are *implementing* an adopted DWMP in order to relax the 1:40 hectare density guideline.

The Action Plan included in the Operational Plan of the draft DWMP outlines key actions and timelines that will need to be met by Council, and associated resource implications.

Whilst this Plan highlights the need for greater monitoring and auditing of septic systems across the Shire than current staff arrangements could accommodate, there are many ways in which this could be addressed, whether this be funding further employee(s) through rate income or introduction of user charges in unsewered areas. There are also options for advocacy to State Government for funding which assists Council to offset the monitoring costs given the cost to Council of protecting the State's drinking water quality, or for alternative methods to be explored which do not add to employee numbers. A further element of the Action Plan is consideration of new IT software which would enhance the efficiency of data collection and management for on-site effluent disposal – this can be considered in future budget processes.

In any case, there will no net cost increase arising from this plan in the 2015/16 budget year. The initial property auditing anticipated by the Plan can be accommodated within the work plan of the new additional Environmental Health Officer which was funded in the current budget to address existing resource deficiencies in the Health Protection Unit.

The public exhibition process for the draft DWMP will require a significant amount of dedicated staff time. Direct costs associated with the mail out and consultant time will be met from within the project budget.

### **Risk Management & Compliance Issues**

Council is required to prepare, adopt and implement a Domestic Wastewater Management Plan. SEPP (Water of Victoria) also requires the preparation of the Plan to be in conjunction with the water authorities and the community. The water authorities have been involved throughout the entire process of the development of the draft DWMP, and it is now recommended that the draft DWMP be put on public exhibition, in accordance with Council's normal practice, to ensure the community and neighbouring Councils can have input into its development.

### **Environmental and Climate Change Considerations**

The development and implementation of a Domestic Wastewater Management Plan will enable Council to meet its requirements under *'The Variation to State Environment Protection Policy (Waters of Victoria) (SEPP)* to ensure that domestic wastewater systems on unsewered properties in the municipality are managed to prevent wastewater containing nutrients, pathogens and other pollutants being discharged beyond allotment boundaries. This is particularly important given the fact that nearly one third of the municipality is in drinking water supply catchments.

### **Community Engagement**

The community engagement strategy follows the recommendations of the Colac Otway Shire Council Community Engagement Policy of January 2010, which details five levels of engagement – inform, consult, involve, collaborate and empower.

This report seeks authorisation to put the draft DWMP (2015) on public exhibition. The method selected would be to inform and consult. It is proposed to exhibit the draft DWMP for

a period of eight weeks to reflect its complexity and ensure there is enough time for the community to fully consider its implications. The documentation will be made available on Council's website and in hard copy at Council's Customer Service areas.

A mail out to the owners of all unsewered properties is proposed, together with notices in the Colac Herald, in local news sheets, on public noticeboards in townships and on Council's website. A fact sheet outlining the purpose of the project and how people can make submissions will be prepared and will be made available in settlements covered by the draft DWMP (e.g. in local stores, hotels etc). A general media release will be prepared immediately prior to commencement of the public exhibition period, complemented by posts on the Shire Facebook page.

It is intended to hold drop-in information sessions across key towns similar to those held at the commencement of this project. These sessions will be attended by Council officers and a representative from the consultancy engaged by Council to prepare the draft DWMP (Whitehead and Associates).

### **Implementation**

Following public exhibition and consideration of submissions by Council, it is intended that a report be prepared for Council to consider the adoption of the strategy.

### **Conclusion**

A draft DWMP has been prepared as part of the process of ensuring Council meets its requirement to prepare, adopt and implement a DWMP. The Plan has significant potential to address current development constraints in the Shire's water catchments which arise from State Government requirements. It is now recommended that the draft DWMP be put on public exhibition for eight weeks to ensure that it is developed in conjunction with the community and neighbouring Councils.

### **Attachments**

1. Technical Document v7
2. Operational Document 007
3. Attachment 3 - DWMP Flowchart

### **Recommendation(s)**

***That Council authorises officers to publicly exhibit the draft Domestic Wastewater Management Plan for eight weeks from 3 August 2015 to 28 September 2015.***

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OM152207-11 PLANNING & BUILDING STATISTICAL REPORTS

| | | | |
|-------------|------------------------------------|-----------|--------------|
| AUTHOR: | Jane Preston-Smith | ENDORSED: | Doug McNeill |
| DEPARTMENT: | Sustainable Planning & Development | FILE REF: | F11/3291 |

Purpose

The report provides statistics relating to planning and building for the months of March, April, May and June 2015, which have not been reported to the Shire's Planning Committee as normally occurs given that a Committee meeting has not been required to be held for consideration of planning permit applications over that period.

Declaration of Interests

No officer declared an interest under the *Local Government Act 1989* in the preparation of this report.

Background

Planning Committee meetings are generally held once per month for decision making by Councilors on planning permit applications where officers do not have delegation to make determinations. Meetings are not held in the scheduled month if there are no applications due to be determined.

The agenda for Planning Committee meetings contains a monthly Planning and Building statistical report which highlights the level of activity on a month by month basis for planning permits and building permits, and lists all decisions made on planning permits for the previous month.

No Planning Committee meeting has been held since the meeting on 11 March 2015, with the April, May, June and July meetings cancelled due to the lack of items to be considered. The monthly statistical report for the months of March, April, May and June has therefore not been reported publicly. Given the next scheduled meeting is on 12 August 2015, it is desirable to report these statistics to this Council meeting, so that the information is made publicly available.

The following is a summary of statistics relating to planning permit applications over the months March to June 2015:

Planning Statistics

31 Planning Permit Applications were received for the period 1 March to 31 March 2015.

31 Planning Permit Applications were considered for the period 1 March to 31 March 2015.

29 Planning Permit Applications were received for the period of 1 April to 30 April 2015.

31 Planning Permit Applications were considered for the period of 1 April to 30 April 2015.

35 Planning Permit Applications were received for the period of 1 May to 31 May 2015.

24 Planning Permit Applications were considered for the period of 1 May to 31 May 2015.

28 Planning Permit Applications were received for period of 1 June to 30 June 2015.

28 Planning Permit Applications were considered for period of 1 June to 30 June 2015.

The attachments to this report detail further planning statistical information, as well as details of determinations made on all planning applications for the same period.

Building Statistics

The building statistics shown in the attachments to this report are updated to June 2015.

Council Plan / Other Strategies / Policy

Good Governance

Means we care about and are responsive to the community, encourage democratic participation and involve people in decisions that affect them. We strive for excellence in financial management and council services, and always look for better ways to do things.

Our Goal:

Ensure transparency of governance practices, the capability of our organisation and effective resource management.

Issues / Options

Whilst Councillors are provided a copy of the statistical reports at the end of each month regardless of whether they are reported to the Planning Committee, it is considered desirable to have the reports made public at this Council meeting, rather than this being delayed until the next Planning Committee meeting, which may be held in August or later, depending on the timing of applications due for decision.

Officers will be posting this information on the Shire's website at the end of each month when the current redevelopment of the web site is completed.

Proposal

It is proposed that Council notes the Planning and Building statistical reports for the months of March, April, May and June 2015.

Financial and Other Resource Implications

There are no financial or other resource considerations relevant to this report.

Risk Management & Compliance Issues

There are no risk management or compliance considerations relevant to this report.

Environmental and Climate Change Considerations

There are no environmental or climate change considerations relevant to this report.

Community Engagement

The community engagement strategy follows the recommendations of the Colac Otway Shire Council Community Engagement Policy of January 2010, which details five levels of engagement – inform, consult, involve, collaborate and empower. The method selected in this instance is Inform. The community is being made aware of the monthly statistical reports through the publication of this agenda.

Implementation

There are no further actions required as a result of this report.

Conclusion

Councillors are asked to note the statistical reports, which are being provided to ensure that information is made publicly available.

Attachments

1. Planning Statistical Report – March 2015
2. Planning Statistical Report – April 2015
3. Planning Statistical Report – May 2015
4. Planning Statistical Report - June 2015

Recommendation(s)

That Council notes the Planning and Building statistical reports for the months of March, April, May and June 2015.

~~~~~u ~~~~~



**OM152207-12**

**MINUTES OF THE OLD BEECHY RAIL TRAIL COMMITTEE**

|             |                                |           |              |
|-------------|--------------------------------|-----------|--------------|
| AUTHOR:     | Lucy Vesey                     | ENDORSED: | Colin Hayman |
| DEPARTMENT: | Corporate & Community Services | FILE REF: | 11/96660     |

It has been previously agreed to by Council that the minutes of the Old Beechy Rail Trail Committee should be included in the Council agenda once any confidential items have been identified and the minutes have been confirmed by the Committee.

Attached are the Minutes from the meeting held 30 March 2015.

Meetings are held every two months, commencing in February of each year.

**Attachments**

1. Meeting Minutes - Old Beechy Rail Trail - 20150330

**Recommendation(s)**

***That Council notes the Minutes of the Old Beechy Rail Trail Committee for 30 March 2015.***

~~~~~u ~~~~~


OM152207-13 ASSEMBLY OF COUNCILLORS

| | | | |
|-------------|---------------|-----------|---------------|
| AUTHOR: | Rhonda Deigan | ENDORSED: | Sue Wilkinson |
| DEPARTMENT: | Executive | FILE REF: | F14/6031 |

Introduction

The *Local Government Act 1989* (the Act) requires that records of meetings, which constitute an Assembly of Councillors, be tabled at the next practicable meeting of Council and incorporated in the minutes of the Council meeting.

Definition

An “assembly of Councillors” is a defined term under section 3(1) of the *Local Government Act 1989*.

It is a meeting at which matters are considered that are intended or likely to be the subject of a Council decision or the exercise of a delegated authority and which is either of the following:

- A meeting of an advisory committee where at least one Councillor is present or
- A planned or scheduled meeting that includes at least half the Councillors and at least one Council officer.

If a meeting fits either of these types, the procedures applying to an assembly of Councillors must be complied with, irrespective of any name or description given to the committee or meeting.

Advisory Committees

Section 3(1) of the Act defines an advisory committee to be any committee established by the Council, other than a special committee, that provides advice to:

- *the Council or*
- *a special committee or*
- *a member of Council staff who has been delegated a power, duty or function of the Council under section 98.*

Councillor briefings

One type of meeting that is clearly an assembly of Councillors is the type of regular meeting, commonly referred to as a “Councillor Briefing” or similar name where Councillors and staff meet to discuss issues that are likely to come before Council for decision.

As part of decision making processes at Colac Otway, it is essential that Councillors are briefed on a range of issues which come before Council for consideration. As a means of providing this information, Assembly of Councillor briefings are conducted.

Assemblies are also attended by Council Officers, and sometimes other specific advisors, to provide Councillors with a detailed knowledge and understanding of issues under consideration to a level of detail that would inhibit timely decision-making, that would not be possible in an open council meeting or where decision-making related debate is governed by strict meeting procedures.

While these meetings have no authority to make Council decisions, they are generally assemblies of Councillors and subject to conflict of interest disclosures.

What records are to be kept

Section 80A of the Act requires that a record must be kept of an Assembly of Councillors which lists:

- the names of all Councillors and members of Council staff attending;
- the matters considered;
- conflict of interest disclosures made by a Councillor (if any are made); and
- whether a Councillor who has disclosed a conflict of interest leaves the assembly.

It is a requirement that the record of an assembly is to be reported to the next practicable ordinary meeting of Council and be incorporated in the minutes of that Council meeting.

Assemblies of Councillors

The following Assemblies of Councillors have been held:

- | | |
|---|--------------|
| · Councillor Briefing | 17 June 2015 |
| · Saleyards Advisory Committee | 19 June 2015 |
| · Audit Committee Chairperson's Report to Council | 22 June 2015 |
| · Councillor Briefing | 24 June 2015 |
| · Councillor Briefing | 8 July 2015 |

Attachments

1. Councillor Briefing Session - 17 June 2015
2. Saleyards Advisory Committee - Assembly of Councillors - June 2015
3. Assembly - Audit Committee Chairperson Report to Council - 20150622
4. Assembly - Councillor Briefing Session - 20150624
5. Assembly - Councillor Briefing - 20150708

Recommendation(s)

That Council notes the Assembly of Councillors reports for:

- | | |
|---|----------------------------|
| · <i>Councillor Briefing</i> | <i>17 June 2015</i> |
| · <i>Saleyards Advisory Committee</i> | <i>19 June 2015</i> |
| · <i>Audit Committee Chairperson's Report to Council</i> | <i>22 June 2015</i> |
| · <i>Councillor Briefing</i> | <i>24 June 2015</i> |
| · <i>Councillor Briefing</i> | <i>8 July 2015</i> |

~~~~~u ~~~~~

**OM152207-14      ITEM FOR SIGNING AND SEALING - REVOCATION OF A LAND ACQUISITION NOTICE - 45 POUND ROAD BEECH FOREST**

|             |                           |           |                |
|-------------|---------------------------|-----------|----------------|
| AUTHOR:     | Clive Brooker             | ENDORSED: | Paula Gardiner |
| DEPARTMENT: | Infrastructure & Services | FILE REF: | F15/6022       |

In June 1991 the Shire of Otway gave notice of its intention to acquire a parcel of land under the *Land Acquisition and Compensation Act 1986*. The land being part of Crown allotments 14A and 14G, Parish of Olangolah, being part of the land described in Certificate of Title 9148/235. The purpose of the acquisition was to provide a legal point of access to the parcel described in title plan TP334754, shown on the attached locality plan.

The Shire of Otway indicated at the time that it intended to complete the acquisition by 30 June 1991. To date, neither the Shire of Otway nor its successor Colac Otway Shire has sought to complete the acquisition.

The *Land Acquisition and Compensation Act 1986* (Vic) s16 states that if the acquiring authority has not completed the acquisition within six months of the notice being served then the notice lapses. While the notice lapsed twenty four years ago it continues to affect the title of the above property. The property has recently been sold and the parties to the sale have requested that Council formally advise the Titles Office that the notice has lapsed and request that it be removed from the title.

It is believed that the need for a legal point of access from the acquired parcel was required due to the portion of Pound Road immediately to the north, identified in title plan TP 314918 and hatched in the attached locality plan, being discontinued by the Shire of Otway. It seems likely that the Shire of Otway planned to sell this parcel to the adjoining landowner. The sale did not proceed and title to this parcel is in the name of Council. A road is currently constructed over the parcel and it is recognised in Council's Road Register. Council has assumed responsibility for the inspection and maintenance of this road.

While the road has not been formally declared a public highway by Council under section 204(1) of the *Local Government Act 1989*, it would be deemed to be such through the Common Law doctrine of Dedication and Acceptance.

Council officers have reviewed the documentation relating to the original acquisition notice and have determined that the parcel is no longer required for the purpose of a road. A legal point of access is available to the affected land and no impairment to that right will result from the decision not to proceed with the acquisition.

No Public Acquisition Overlay was created at the time the Notice of Acquisition was lodged. The only cost involved in removing the notice from the title relates to officer time and is not significant.

**Attachments**

1. Locality Plan - Pound Road Beech Forest - Lapsed Acquisition Notice
2. Title Plan - 45 Pound Road Beech Forest - TP314918 - Lapsed Acquisition Notice
3. Title Plan - 45 Pound Road Beech Forest - TP334754 - Lapsed Acquisition Notice
4. Title Plan - 45 Pound Road Beech Forest - TP812454 - Lapsed Acquisition Notice

**Recommendation(s)**

***That Council resolves to authorise the CEO to sign and seal a letter to the Titles Office requesting that the land acquisition application, number R514719Y, be cancelled.***

~~~~~u ~~~~~

**OM152207-15 ALTERNATIVE HEAVY VEHICLE ROUTE FOR PRINCES
HIGHWAY (CR MICHAEL DELAHUNTY)**

TAKE NOTICE that it is my intention to move at the Ordinary Council Meeting of the Colac Otway Shire to be held on 22 July 2015:

That Council

1. Instructs our representative on the Colac 2050 Project Control Group to seek clarification, through the Group, from VicRoads, as to the long term location of an alternative heavy vehicle route for the Princes Highway.
2. Acknowledges that this request is in line with the Council Plan 2013-2017 Key Strategic Action, Transport Network, which states "The potential for significant road freight volumes will impact on the liveability and tourist values across the Shire. Response to this may need to include; Supporting VicRoads to develop alternative truck route for Colac".

Attachments

Nil

Recommendation

That Council consider the contents of this Notice of Motion.

~~~~~u ~~~~~



**OM152207-16      REPORT FROM DELEGATE TO OTHER BODIES - AUDIT  
COMMITTEE MINUTES**

Unconfirmed summary minutes of the Colac Otway Shire Audit Committee Meeting dated 22 June 2015.

**Attachments**

1. Audit Committee Minutes 22 June 2015

**Recommendation**

***That Council receives for information the unconfirmed summary minutes of the Colac Otway Shire Audit Committee Meeting dated 18 March 2015.***

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IN COMMITTEE

Recommendation

That pursuant to the provisions of Section 89(2) of the Local Government Act, the meeting be closed to the public and Council move “In-Committee” in order to deal with:

| <i>SUBJECT</i> | <i>REASON</i> | <i>SECTION OF ACT</i> |
|--|---|------------------------------|
| Minutes of the 24 June 2015 In-Committee Meeting | this matter deals with personnel matters; AND this matter deals with contractual matters; AND this matter may prejudice the Council or any person | Section 89 (2) (a) (d) (h) |
| COPACC Cinema Lease | this matter deals with contractual matters; AND this matter deals with legal advice | Section 89 (2) (d) (f) |
| Waste Services Contract Extension | this matter deals with contractual matters | Section 89 (2) (d) |



ORDINARY COUNCIL MEETING

WEDNESDAY, 22 JULY 2015

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No. Issue Date

PRELIMINARY

Colac Otway
SHIRE

Cororooke
Open Space
Reserve No. 1
Corangamite Lake Road

Landscape Concept Plan

MEXTER
LANDSCAPE ARCHITECTS
A. B. MEXTER & ASSOCIATES PTY LTD
A.B. MEXTER & ASSOCIATES PTY LTD
10/100 WILSON STREET, COLAC VIC 3260
TEL: 03 5261 1234
EMAIL: mail@mexterminter.com

project no: 2787
drawing no: LC1
sheet no: 1 of 1
designed by: GM
drawn by: JD & MM
date: 31.03.2015
scale: 1:600 @ A3





COUNCIL POLICY

| | |
|--------------------------|--------------------|
| Council Policy Title: | Procurement |
| Council Policy No: | 3.2 |
| Responsible Department: | Corporate Services |
| Date of adoption/review: | |

Deleted: 28 May 2014

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Date Adopted:

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Policy No: 3.2
Procurement Policy

1 PRINCIPLES

1.1 Background

Colac Otway Shire Council:

- Recognises that:
 - o Developing a procurement strategy and adopting appropriate best practice tendering and procurement principles, policies, processes and procedures for all goods, services and works by Council, which will enhance achievement of council objectives;
 - o The elements of best practice applicable to local government procurement incorporate:
 - broad principles covering ethics, value for money, responsibilities and accountabilities;
 - guidelines giving effect to those principles;
 - a system of delegations (i.e. the authorisation of officers to approve a range of functions in the procurement process);
 - procurement processes, with appropriate procedures covering minor simple procurement to high value complex procurement; and
 - a professional approach.
- Requires that Council's tendering, purchasing and contract management activities:
 - o support the Council's corporate strategies, aims and objectives including, but not limited to those related to sustainability, protection of the environment, and corporate social responsibility;
 - o achieve and demonstrate value for money and quality in the acquisition of goods, services and works by the Council;
 - o ~~are conducted, and are seen to be conducted, in an impartial, fair and ethical manner;~~
 - o ensure that risk is identified, assessed and managed at all stages of the procurement process;
 - o comply with legislation (including Risk Management, Occupational Health and Safety and Competition and Consumer Legislation), corporate policies or other requirements;

Deleted: can demonstrate that public money has been well spent.

Date Adopted:

31/08/2016

Policy No: 3.2
Procurement Policy

- seek continued improvement including embracing innovative and technological activities to reduce activity costs;
- generate and support business in the local community where possible; and
- ensure staff are adequately trained in procurement practices and procedures as it relates to tendering and control.

1.2 Legislative Provisions

This Procurement Policy is made under Section 186a of the Local Government Act 1989 (The Act).

The Act is the key legislative framework that regulates the process of local government procurement in Victoria. Section 186a of the Act requires the Council to prepare, approve and comply with a Procurement Policy encompassing the principles, processes and procedures applied to all purchases of goods, services and works by the Council.

As such the Council's procurement activities will be carried out to the professional standards required by best practice and in compliance with the following, including any changes or amendments made thereto:

Legislation

- Sections 186a and 208A of the Local Government Act 1989;
- Local Government (General) Regulations 2004; and
- Other relevant legislative requirements such as but not limited to the Trade Practices Act, Competition and Consumer Act 2010; and Victorian Charter of Human Rights and Responsibilities Act 2006.

Standards and Guidelines

- Department of Planning and Community Development (DPCD) Local Government Procurement Best Practice Guidelines 2013.

Council Policies

- Council's Councillor and Staff Codes of Conduct;
- Council's policies including Risk Management, Fraud/Prevention Control and Gifts, Benefits and Hospitality;
- Council Instrument of Delegation to CEO.

1.3 Scope and Application

This policy represents the principles, processes and procedures that will be applied to the purchase of all goods, services and works by Council. The scope of this policy commences from when Council has identified a need for procurement requirements. It continues through to the delivery of goods or completion of works or services.

Deleted: The key legislative requirements including:

- Section 186 of the Act (Power to enter into Contracts);
 - Section 186A of the Act (Procurement Policy);
 - Section 3C of the Act (Objectives of a Council);
 - Sections 208C of the Act (Applying Best Value Principles);
 - Sections 77A, 77B, 78, 78A to 78E, 79, 79B to D, 80, 80A to G and 95 of the Act (Conflict of Interest);
 - Section 98 of the Act (Delegations);
 - Section 140 of the Act (Accounts and Records);
 - The relevant provisions of the Competition and Consumer Act 2010.
- Council will adhere to all these provisions in all procurement matters consistent with the Victorian Local Government Best Practice Procurement Guidelines.

Date Adopted:

4/1/2020

Policy No: 3.2
Procurement Policy

This policy will apply to Councillors, Council staff and all persons undertaking procurement on Council's behalf and they are accountable for complying with all relevant procurement legislative and policy requirements.

1.4 Purpose

The purpose of this Policy is to:

- provide policy and guidance to Council to allow consistency and control over procurement activities;
- demonstrate accountability to rate payers;
- provide guidance on ethical behaviour in public sector purchasing;
- demonstrate the application of elements of best practice in purchasing; and
- increase the probability of obtaining the right outcome when purchasing goods and services.

1.5 Treatment of GST

All monetary values stated in this policy include GST, except where specifically stated otherwise.

Definitions and Abbreviations

| Term | Definition |
|--------------------------|--|
| Act | Local Government Act 1989 |
| Commercial in Confidence | Information that, if released, may prejudice the business dealings of a party eg prices, discounts, rebates, profits, methodologies and process information, etc.
Disclosure may occur where applicable under the <i>Freedom of Information Act 1982</i> or as required by the Victorian Auditor-General's Office or the Victorian Ombudsman. |
| Contract | An agreement between two or more authorised persons on behalf of their organisations to perform or not perform a specific act/s that is enforceable in law. A contract may be verbal or written or inferred by conduct. |
| Contract Management | The process that ensures both parties to a contract fully meet their respective obligations as efficiently and effectively as possible, in order to deliver the business and operational objectives required from the contract and in particular, to provide value for money. |
| Council Staff | Includes full time and part-time council officers, and temporary employees, contractors and consultants while engaged by the Council. |
| Delegation | A power handed down by the Council or Chief Executive Officer in an instrument to enable a delegate to act on Council's behalf. |
| Evaluation Criteria | The criteria used to evaluate the compliance and/or relative ranking of tender responses. All evaluation criteria must be clearly stated in the request documentation. |

Date Adopted:

51 Page 6

Policy No: 3.2
Procurement Policy

| | |
|-----------------------------------|---|
| Expression of Interest (EOI) | A request for Expression of Interest is generally sent to the supplier market, designed to capture commercial information and pricing. Allows Council to assess suitability and evaluate responses against a set of pre-defined requirements. This invitation is not an offer or a contract. |
| Probity | A Procurement process that conforms to the expected standards of probity is one in which clear procedures that are consistent with the Council's policies and legislation are established, understood and followed from the outset.
These procedures need to consider the legitimate interests of suppliers and ensure that all potential suppliers are treated equitably. |
| Procurement | Procurement is the whole process of acquisition of external goods, services and works. This process spans the whole life cycle from initial concept through to the end of the useful life of an asset (including disposal) or the end of a service contract. |
| Purchase Order | A form of contract, which is an official document used to authorise and record the purchase of goods or services by a buyer. It is the prime reference confirming the contractual situation between the buyer and supplier. |
| Request for Quotation (RFQ) | A written process of inviting offers to supply goods and/or services involving simple documentation, a limited number of potential suppliers and generally of relatively lower values. |
| Request for Tender (RFT) | A request for offer against a set of clearly defined and specified requirements. Tenderers are advised of all requirements involved, including the conditions of tendering and proposed contract conditions. |
| Standing Offer Arrangements (SOA) | A contract that sets out rates for goods and services which are available for the term of the agreement. However, no commitment is made under the agreement to purchase a specified value or quantity of goods or services. |
| Sustainability | Activities that meet the needs of the present without compromising the ability of future generations to meet their needs. |
| Tender Process | The process of inviting parties to submit a quotation or tender by public advertisement or selective tendering, followed by evaluation of submissions and selection of a successful bidder or tenderer. |
| Value for Money | Value for Money in Procurement is about selecting the supply of goods, services and works taking into account both cost and non-cost factors including: <ul style="list-style-type: none"> contribution to the advancement of the Council's priorities; non-cost factors such as fitness for purpose, quality, service and support; and cost-related factors including whole-of-life costs and transaction costs associated with acquiring, using, holding, maintaining and disposing of the goods, services or works. |

Deleted: Within Local Government, the word "probity" is often used in a general sense to mean "good process."

Deleted: It can include planning, design, standards determination, specification writing, preparation of quotation and tender documentation, selection of suppliers, financing, contract administration, disposals and other related functions. It also includes the organisational and governance frameworks that underpin the procurement function.

Deleted: A request for proposal is generally sent to the supplier market, designed to capture commercial information and pricing. Allows Council to assess suitability and evaluate responses against a set of pre defined requirements.

Deleted: Proposal

Deleted: Thresholds.

Deleted: The value above which a procurement, unless exempt is subject to the mandatory procurement procedures.

Date Adopted:

6/7/2020

2 EFFECTIVE LEGISLATIVE AND POLICY COMPLIANCE AND CONTROL

2.1 Ethics and Probity

2.1.1 Requirement

Council's procurement activities shall be performed with integrity and in a manner able to withstand the closest possible scrutiny.

2.1.2 Conduct of Councillors and Council Staff

2.1.2.1 General

Councillors and Council Staff shall at all times conduct themselves in ways that are, and are seen to be, ethical and of the highest integrity and will:

- treat potential and existing suppliers with equality and fairness;
- not seek or receive personal gain;
- maintain confidentiality of Commercial in Confidence such as Tender prices and other sensitive information;
- present the highest standards of professionalism and probity;
- deal with suppliers in an honest and impartial manner that does not allow conflicts of interest;
- report to the Chief Executive Officer or relevant General Manager any attempt by a supplier/prospective supplier (or their agent) to compromise the procurement process or to seek an unfair advantage;
- provide all suppliers and tenderers with the same information and equal opportunity; and
- be able to account for all decisions and provide feedback on them.

Council Staff who are responsible for managing or supervising contracts are prohibited from performing any works under the contract they are supervising.

2.1.2.2 Members of Professional Bodies

Councillors and Council Staff belonging to professional organisations shall, in addition to the obligations detailed in this policy, ensure that they adhere to any code of ethics or professional standards required by that body.

2.1.3 Tender and Quotation Processes

All tender and quotation processes shall be conducted in accordance with the requirements of this policy and any associated procedures, relevant legislation, relevant Australian Standards and the Act.

2.1.4 Conflict of Interest

Councillors, Council staff and independent tender evaluation panel members shall at all times avoid situations in which private interests conflict, or might reasonably be thought to conflict, or have the potential to conflict, with their Council duties.

Deleted: Councillors and members of staff (and all persons engaged in procurement on Council's behalf) must exercise the highest standards of integrity in a manner able to withstand the closest possible scrutiny.

All members of staff have an overriding responsibility to act impartially and with integrity, avoiding conflicts of interest (section 95 of the Act).

In procurement matters:

Members of staff must disclose a direct or indirect interest (and the type of interest) before providing advice or reports (or any other matter) (section 80C of the Act).

Council officers delegated Council powers or duties are prohibited from exercising those powers, duties or functions if they have conflicts of interest (section 80B of the Act).

A Councillor must comply with the Primary Principle of Councillor Conduct and avoid conflicts between his or her public duties as a Councillor and his or her personal interests and obligations (section 76BA, LGA). Councillors (and members of audit committees) must disclose a conflict of interest (section 79 of the Act).

Members of staff must also comply with the Code of Conduct for Council Staff (section 95AA of the Act).

All staff appointed to an Evaluation Panel for the purpose of assessing quotations or tenders must adhere to this policy and complete and lodge a Conflict of Interest Declaration and a Deed of Confidentiality.

All Councillors and staff must adhere to Council's gifts and hospitality policy in matters of procurement.

Councillors, Council staff and independent tender evaluation panel members shall not participate in any action or matter associated with the arrangement of a contract (ie. evaluation, negotiation, recommendation or approval) where that person or any member of their immediate family has a significant interest or holds a position of influence or power in a business undertaking tendering for the work.

The onus is on the Councillor, the member of Council staff and independent tender evaluation panel members involved being alert to and promptly declaring an actual or potential conflict of interest.

2.1.5 Fair and Honest Dealing

All prospective contractors and suppliers must be afforded an equal opportunity to tender or quote.

Impartiality must be maintained in selecting contractors and suppliers so that no action is taken that could evoke reasonable criticism of the Council or disadvantage a potential supplier.

Confidentiality of information provided by existing and prospective suppliers must be maintained at all times, particularly commercially sensitive material such as, but not limited to prices, discounts, rebates, profit, manufacturing and product information.

2.1.6 Accountability and Transparency

Accountability in procurement means being able to explain and provide evidence on the process followed. The test of accountability is that an independent third party must be able to see clearly that a process has been followed and that the process is fair and reasonable.

Therefore the processes by which all procurement activities are conducted will be in accordance with this Procurement Policy and related Council policies and procedures.

Additionally,

- all Council Staff must be able to account for all procurement decisions made over the life cycle of all goods, services and works purchased by the Council and provide feedback on them; and
- all procurement activities are to provide an audit trail for monitoring and reporting purposes.

2.1.7 Gifts and Hospitality

No Councillor or member of Council staff shall, either directly or indirectly solicit or accept gifts or presents from any member of the public involved, with any matter that is connected with the duties of the officer, or in which the Council is interested.

Councillors and Council Staff must exercise the utmost discretion in accepting hospitality from contractors or their representatives, or from organisations, firms or individuals with whom they have official dealings.

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Offers of bribes, commissions or other irregular approaches from organisations or individuals (no matter how flimsy the evidence available), must be promptly brought to the attention of the CEO and relevant General Manager.

All gifts, hospitality that fall within the definition of gift/hospitality as described in Council's Gifts, Benefits and Hospitality Policy are to be declared and recorded.

2.1.8 Disclosure of Information

Commercial in-confidence information received by the Council must not be disclosed and is to be stored in a secure location.

Councillors and Council staff are to protect, by refusing to release or discuss the following:

- information disclosed by organisations in tenders, quotation or during tender negotiations;
- all information that is Commercial in Confidence information; and
- pre-contract information including but not limited to information provided in quotes and tenders or subsequently provided in pre-contract negotiations.

Councillors, Council Staff and independent panel members are to avoid references to current or proposed contracts in discussion with acquaintances or outside interests.

Discussion with potential suppliers during tender evaluations should not go beyond the extent necessary to resolve doubt on what is being offered by that supplier.

At no stage should any discussion be entered into which could have potential contractual implications prior to the Tender approval process being finalised other than authorised pre-contract negotiations.

Disclosure may occur where applicable under the *Freedom of Information Act 1982* or as required by the Victorian Auditor-General's Office or the Victorian Ombudsman.

2.2 Governance

2.2.1 Structure

Council shall:

- establish a procurement management responsibility structure and delegations ensuring accountability, traceability and auditability of all procurement decisions;
- ensure that the Council's procurement structure:
 - is flexible enough to purchase in a timely manner the diverse range of materials, goods, works and services required by Council;
 - ensures that prospective contractors and suppliers are afforded an equal opportunity to tender/quote;
 - encourages competition; and
 - ensures that policies that impinge on the purchasing policies and practices are communicated and implemented.

Date Adopted:

9/1/2023

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2.2.2 Standards

Council's procurement activities shall be carried out to the professional standards required by best practice and in compliance with the:

- The Act;
- The Council's policies, guidelines and procedures;
- The Council's Code of Conduct and the Staff Code of Conduct;
- Local Government Procurement Best Practice Procurement Guidelines 2015 and
- Other relevant legislative requirements.

2.2.3 Methods

Council's standard methods for purchasing goods, services and works shall be by some or all of the following methods:

- petty cash;
- credit card, including fuel card;
- purchase order following a quotation process from suppliers for goods or services that represent best value for money under direct quotation thresholds;
- under contract following a tender or quotation process; or
- using aggregated purchasing arrangements with other Councils, MAV Procurement, Procurement Australia, Victorian Government, or other bodies;

unless other arrangements are authorised by the delegated authority on a needs basis as required by abnormal circumstances such as emergencies.

Council may, at its discretion and based on the complexity and cost of the project, conduct one stage or multi-stage tenders.

Typically a multi-stage tender process will commence with an Expression of Interest (EOI) stage followed by a tender process involving the organisations selected as a consequence of the registration of interest stage.

EOI may be appropriate where:

- the requirement is complex, difficult to define, unknown or unclear;
- limited knowledge of tenderers in the market place;
- the requirement is capable of several technical solutions;
- Council wants to consider ahead of formal tender processes such issues as whether those tendering possess the necessary technical, managerial and financial resources to successfully complete the project;
- Tendering costs are likely to be high and Council seeks to ensure that companies incapable of supplying the requirement do not incur unnecessary expense;

Deleted: such as but not limited to the *Competition and Consumer Act 2010*, *Charter of Human Rights and Responsibilities Act 1970* and the *Environmental Protection Act 1970*.

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- It is necessary to pre-qualify suppliers and goods to meet defined standards and
- The requirement is generally known but there is still considerable analysis, evaluation and clarification required (both of the objective and the solution)

2.2.4 Responsible Financial Management

The principle of responsible financial management shall be applied to all procurement activities.

Accordingly, to give effect to this principle, the availability of existing funds within an approved budget or source of funds, shall be established prior to the commencement of any procurement action for the supply of goods, services or works.

Council staff must not authorise the expenditure of funds in excess of their financial delegations.

Council funds must be used efficiently and effectively to procure goods, services and works and every attempt must be made to contain the costs of the procurement process without compromising any of the procurement principles set out in this Policy.

POLICY PROVISIONS

3. PROCUREMENT GUIDELINES

3.1 Minimum Spend Competition Thresholds

The value of all contracts for the purposes of compliance with section 186 of the Act includes:

- costs for the full term of the contract, including any options for either party to extend the contract;
- applicable goods and services tax (GST);
- anticipated contingency allowances or variations
- all other known, anticipated and reasonably foreseeable costs.

The thresholds do not apply to services which a Council elects to conduct using employed staff as these are not contracts for goods, services or works and are not subject to section 186 of the Act. The method for the delivery of all services and carrying out of works is reserved to the Council and the public tendering process only applies to those circumstances where external resources are sought and the thresholds are reached.

3.1.1 Tenders

Council's policy is that the value of all tenders estimated to be over the value of \$150,000 must be undertaken by public tender.

However, should the CEO, or their delegate consider that the nature of the requirement and the characteristics of the market are such that the public tender process would lead to a better result for the Council, public tenders may be called for purchase of goods, services and works for which the estimated expenditure is below the threshold.

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3.1.2 Quotations

For purchase of goods, services and works having a total valuation of \$150,000 or less, procurement by quotation method ~~may be undertaken~~ in accordance with the thresholds set ~~out~~ in the Procurement, Quotations/Tendering and Purchasing Procedure.

~~Deleted: the following processes may be undertaken using the~~

~~Deleted: To establish that the Council is receiving value for money, quotations should be obtained~~

3.2 Public Advertising

The public notice which Council is required to issue under the Act when calling ~~for~~ tenders or expressions of interest for procurement, above the legislated threshold, must be in the prescribed form and contain any prescribed details.

The requirement under the Act to give public notice has two elements. The notice must:

- ❑ give the purpose of the contract
- ❑ invite tenders (or expressions of interest) from persons wishing to undertake the contract.

Public notice is defined as a notice published in a newspaper generally circulating in the municipal district of the Council chosen by the Council for that purpose.

Council must also ensure that any public notice is published on its website.

Contracts for procurement below the legislated threshold may be advertised at Council's discretion with appropriate direction from Council's Procurement, Quotations, Tendering and Purchasing Procedure.

3.3 Delegation of Authority

3.3.1 Requirement

Delegations define the limitations within which Council Staff are permitted to work. Delegation of procurement authority allows specified Council Staff to approve certain purchases, quotation, tender and contractual processes without prior referral to the Council. This enables the Council to conduct procurement activities in an efficient and timely manner whilst maintaining transparency and integrity.

Procurement delegations ensure accountability and provide confidence to Council and the public that purchasing activities are dealt with at the appropriate level.

As such Council has delegated responsibilities as detailed below relating to the expenditure of funds for the purchase of goods, services and works, the acceptance of quotes and tenders and for Contract Management activities.

3.3.2 Delegations

3.3.2.1 Council Staff

Council maintains ~~a documented record of authorised~~ procurement delegations, identifying Council Staff authorised to make such procurement commitments in respect of goods, services and works on behalf of the Council, to include but not necessarily be limited to the following:

- ~~power to authorise and issue order forms for goods and services~~

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- power to enter into contracts within approved budget; and
- contract term extensions and contract variations.

3.3.2.2 Delegations Reserved for the Council

Commitments and processes which exceed the CEO's delegation and which must be approved by the Council are:

- Tender recommendations and contract approval for all expenditure over \$250,000 in value; and
- Signing and sealing of the subsequent contract documentation.

Deleted: The requisition and authorisation of purchases cannot be processed by the same officer.

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3.4 Internal Controls

Council will establish, document and maintain a framework of internal controls over procurement processes in order to ensure:

- a framework for supplier engagement is in place;
- more than one person is involved in, and responsible for, each transaction;
- transparency in the procurement process;
- a clearly documented audit trail exists for procurement functions;
- appropriate authorisations are obtained and documented;
- systems are in place for appropriate monitoring and performance measurement.

All persons engaged in procurement processes must diligently apply all internal controls.

3.5 Commercial Information

Procurement activities will be carried out in a way that supports Council staff in meeting their obligations to ensure information of a commercially sensitive or confidential nature is obtained, stored, processed, published (where applicable) in an appropriate manner in accordance with the relevant Council guidelines.

3.6 Risk Management

3.6.1 General

Risk Management is to be appropriately applied at all stages of procurement activities which will be properly planned and carried out in a manner that will protect and enhance Council's capability to prevent, withstand and recover from interruption to the supply of goods, services and works.

Risk Management will be carried out in accordance with the stated requirements in the Risk Management Policy and the Guidelines for Occupational Health and Safety Management of Contractors and any Federal or State regulatory requirements.

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3.6.2 Supply by Contract

The provision of goods, services and works by contract potentially exposes the Council to risk.

Council will minimise its risk exposure by measures such as:

- standardising contracts to include current, relevant clauses;
- requiring security deposits where appropriate;
- referring specifications to relevant experts;
- requiring contractual agreement before allowing the commencement of work;
- use of or reference to relevant Australian Standards (or equivalent);
- effectively managing the contract including monitoring and enforcing performance;
- undertaking relevant financial checks of companies to ensure they are viable to undertake the contract;
- developing a Probity Plan for tenders in excess of \$3 million or where a proposed contract is particularly complex, a high risk or controversial and requiring a high level of public confidence; and
- obtaining copies of certificates of currency for relevant insurances.

3.6.3 Probity Plan

A Probity Plan should cover the following matters:

- identification of the contract;
- objectives of the probity processes;
- statement on the proposed application of probity principles;
- roles and responsibilities of each participant in the evaluation process and probity auditing;
- specification of what probity auditing will occur;
- probity tasks, documents and timelines;
- measures for ensuring confidentiality and security;
- communication protocol with bidders (to ensure that no one bid obtains an unfair advantage over others) and
- record keeping requirements.

3.7 Contract Terms

All contractual relationships must be documented in writing based on standard terms and conditions.

Where this is not possible, approval must be obtained from the appropriate member of Council Staff as per Council delegations. A request for such an approval should be supported with procurement and legal advice as relevant.

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To protect the best interests of the Council, terms and conditions must be settled in advance of any commitment being made with a supplier. Any exceptions to doing this expose the Council to risk and thus must be authorised by the appropriate member of Council staff listed in the Council delegations.

3.8 Endorsement

Council Staff must not endorse any products or services. Individual requests received for endorsement must be referred to the CEO or relevant General Manager.

3.9 Dispute Resolution

All Council contracts shall incorporate dispute management and alternative dispute resolution provisions to minimise the chance of disputes getting out of hand and leading to legal action.

3.10 Contract Management

The purpose of contract management is to ensure that the Council, and where applicable its clients, receive the goods, services or works provided to the required standards of quality and quantity as intended by the contract by:

- establishing a system monitoring and achieving the responsibilities and obligations of both parties under the contract;
- providing a means for the early recognition of issues and performance problems and the identification of solutions; and
- adhering to Council's Risk Management Framework and adhering to relevant Occupational Health and Safety Contractor Compliance Procedures.

All Council contracts are to include contract management requirements. Furthermore, contracts are to be proactively managed by the member of Council staff responsible for the delivery of the contracted goods, services or works to ensure Council receives Value for Money.

3.11 e-Tendering

e-Tendering is integral to the overall development of procurement processes and involves the use of an electronic system/s to acquire goods services and works.

By utilising e-tendering the Council aims to:

- reduce transaction costs
- achieve greater leverage
- make processes more efficient
- improve management information and visibility of spend
- increasing control and consistency of processes, and
- improve spend compliance.

3.12 Charter of Human Rights

Council will ensure that all of its procurement operations are fully consistent with prescribed rights and responsibilities and that they respect the 20 fundamental rights within the *Victorian Charter of Human Rights and Responsibilities Act 2006*.

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4. DEMONSTRATE SUSTAINED VALUE

4.1 Integration with Council Strategy

Council's procurement strategy shall support Council's corporate strategy, aims and objectives as outlined in the Council Plan 2013-2017 relating to the four key themes or pillars of:

- Good Governance
- A Planned Future
- A Place to Live and Grow
- A Healthy Community and Environment

4.2 Best Practice Principles

The fundamental best practice principles that should be applied to every procurement, irrespective of the value and complexity of that procurement are:

- value for money
- open and fair competition
- accountability
- risk management
- probity and transparency

4.2.1 Value for Money

Obtaining value for money does not mean Council is obliged to accept the lowest price. Section 186(4) of the Act specifically provides Council does not have to accept the lowest tender.

The concept of 'value for money' involves taking into account both costs and non-cost factors including:

- advancing the Council's priorities
- fitness for purpose
- quality
- service and support
- whole-of-life costs and transaction costs associated with acquiring, using, holding, maintaining and disposing of goods, services or works.

4.2.2 Approach

This will be facilitated by:

- developing, implementing and managing procurement strategies that support the co-ordination and streamlining of activities throughout;
- effective use of competition;
- using aggregated contracts and panel contract arrangements where appropriate;
- identifying and rectifying inefficiencies in procurement processes;

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- developing a cost efficient tender process including appropriate use of e-solutions;
- Council staff responsible for providing procurement services or assistance within the Council providing competent advice in terms of available products and agreements; and
- working with suppliers to create relationships that are professional and productive, and are appropriate to the value and importance of the goods, services and works being acquired.

4.2.3 Role of Specifications

Specifications used in quotations, tenders and contracts are to support and contribute to the Council's Value for Money objectives through being written in a manner that:

- ensures impartiality and objectivity as reasonably practicable;
- clearly defines the Council's requirements;
- encourages the use of standard products;
- encourages sustainability; and
- eliminates unnecessarily stringent requirements.

4.3 Sustainability

4.3.1 General

Council is committed to **environmental** sustainability and ensuring it monitors and reports on Council activities and programs that have an impact on, or contribute to the environment including but not limited to the following:

- **Waste management**
- **Recycling**
- **Energy management**
- **Emission management**
- **Carbon footprint**
- **Water conservation**
- **Green building design**
- **Climate change**
- **Procurement**

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4.3.2 ~~Environmentally~~ Sustainable Procurement

Council is committed to adopting a Green Procurement approach by supporting the principles of sustainable Procurement within the context of purchasing on a Value for Money basis.

Value for Money purchasing decisions made by the Council are made on the basis of cost and non-financial cost factors including contribution to the Council's environmentally sustainability objectives.

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Council prefers to purchase environmentally preferred products whenever they achieve the same function and value for money outcomes.

Council will therefore consider the following environmental sustainability criteria:

- Reduce, Reuse, and Recycle:

The Council is committed to reduce resources, consumption and minimise waste during the procurement life cycle including:

- o Encouraging and preferring environmentally products which are more energy efficient;
- o Selecting energy, fuel and water efficient products (ideally Energy and Water Star Rating of 4 and above);
- o Preferring to purchase from a source which is less polluting or uses clean technology; and
- o Always considering the provision of re-use and recycling as part of the project planning process, including the consideration of whole-life costs and disposal considerations.

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- Buy Recycled:

Council is committed to buy recycled/part recycled products to optimise consumption and stimulate demand for recycled products, promoting the collection and reprocessing of waste and working towards zero discharge to the landfill.

- Green the Supply Chain:

Council shall encourage suppliers to adopt good environmental practices and will promote green procurement throughout its supply chain and ensure selection which has minimum environmental impact.

4.4 Diversity

Promoting equality through procurement can improve competition, value for money, the quality of public services, satisfaction among users, and community relations.

Diversity should be a consideration in every procurement project and reflect corporate commitment to diversity and equal opportunities wherever possible.

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4.5 Support of Local Business

4.5.1 Support of Local Business

Council is committed to supporting local businesses in procuring works, goods and services where such purchases may be justified on Value for Money grounds.

Wherever practicable Council will fully examine the benefits available through purchasing works, goods or services from suppliers/contractors that offer an economic contribution to the Colac Otway Shire.

In all contracts where there are more than 3 selection criteria a 5% weighting shall be included. The weighting shall be given to suppliers who demonstrate how they intend to support local suppliers, contractors and services.

(See 4.5.2 for Light Fleet Vehicle Purchases.)

Local is defined as within the Colac Otway Shire.

Council will also seek from prospective suppliers/contractors where applicable what economic contribution they will make to the Colac Otway Shire.

Such examples may include:

- (1) Engaging and contracting with local suppliers.
- (2) Engaging local sub-contractors.
- (3) Suppliers/contractors participation in any apprenticeship schemes or employment of apprentices.
- (4) Contributing to the financial, social and environmental well being of the Shire.
- (5) Enable the business expansion, growth and servicing of local business and contractors.
- (6) Existing local business.

4.5.2 Light Fleet Vehicle Purchases

All Council light vehicles purchased shall be subject to a competitive process managed by the Fleet Manager. This will involve obtaining competitive prices in writing in accordance with the Councils Procurement Policy. Prices shall be obtained from suppliers based on all suppliers quoting on specific vehicle details as advised in writing by Council.

When evaluating tenders a \$500 price allowance shall be applied to local suppliers in the municipality.

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5. APPLY A CONSISTENT AND STANDARD APPROACH

5.1 Standard Processes:

Council will provide effective commercial arrangements covering standard products and standard service provisions across the Council to enable employees to source requirements in an efficient manner.

This will be achieved via a combination of the following areas:

- pricing where relevant;
- processes, procedures and techniques;
- tools and business systems (e.g. implementing the e-tendering, e-evaluation, e-catalogue, or e-sourcing arrangements);
- reporting requirements; and
- application of standard contract terms and conditions.

5.2 Management Information

5.2.1 Performance Measures and Continuous Improvement

Appropriate performance measures are to be established and reporting systems will be used to monitor performance and compliance with procurement policies, procedures and controls.

5.2.2 Audits of Organisational Purchasing

An internal audit will be undertaken at least twice a year of organisational purchasing. Reports will include information:

- all purchasing for the period by supplier
- dollar value by supplier
- all approved procedural exemptions; and
- suppliers/areas for further review

5.2.3 Record Keeping

Council will ensure that a thorough and sound record keeping/archiving process is undertaken for each contract for a number of reasons, including to:

- substantiate the practices adopted during the procurement
- support any post-contract matters or disputes
- demonstrate OHS compliance and address any subsequent claims

The structure and extent of records kept will depend on the value and complexity of the procurement. Procurement records, including contract management records will be integrated with Council's recording management system - whether hardcopy or electronic.

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2017

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Records will be kept in accordance with the *Public Records Act 1973* Public Record Standard PROS 09/05 (Retention and Disposal Authority for Records of Local Government Functions).

6. BUILD AND MAINTAIN SUPPLY RELATIONSHIPS

Council recognises that in order to achieve sustainable value, appropriate relationships must be developed and maintained with suppliers.

6.1 Developing and Managing Suppliers

Council recognises the importance of effective and open working relationships with its suppliers, and is committed to the following:

- managing existing suppliers, via the appropriate development programmes and performance measurements to ensure the benefits are delivered;
- maintaining approved supplier lists; and
- developing new suppliers and improving the capability of existing suppliers where appropriate.

6.2 Supply Market Development

A wide range of suppliers will be encouraged to compete for Council work.

6.3 Relationship Management

Council is committed to developing constructive long-term relationships with suppliers. It is important that the Council identifies its key suppliers so that its efforts are focused to best effect.

Such areas may include:

- size of spend across the Council;
- criticality of goods / services supplier to the delivery of the Council's services;
- availability of substitutes; and
- market share and strategic share of suppliers.

6.4 Communication

External communication is very important in ensuring a healthy interest from potential suppliers and partners to the Council. Council will aim to ensure that the following information is available:

- information about Council and how to become an approved supplier;
- a list of existing and forthcoming Tender opportunities;
- guidelines for doing business with Council; and
- standard documentation used in the procurement process.

7. CONTINUAL IMPROVEMENT

Council is committed to continuous improvement and will review the procurement policy on an annual basis, to ensure that it continues to meet its wider strategic objectives.

Date Adopted:

21 Feb 2020

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8. REFERENCES

- Colac Otway Shire Operational Procedure – "Quotations/Tendering and Purchasing Procedure"
- Confidential Information Policy
- Council Plan 2013-2017
- Councillor Code of Conduct
- Fraud Prevention Policy
- Gifts, Benefits and Hospitality Policy
- Local Government Act 1989
- Occupational Health and Safety Policy
- Public Records Act 1973
- Risk Management Policy
- Staff Code of Conduct
- Tender Evaluation Panel Policy

ADOPTED/AMENDMENT OF POLICY

| Policy Review Date | Reason for Amendment |
|--------------------|----------------------|
| 23 June 2010 | Adopted by Council |
| 28 September 2011 | Review |
| 22 May 2013 | Review |
| 28 May 2014 | Review |

Date Adopted:

22/1/2014



COUNCIL POLICY

| | |
|---------------------------------|--------------------|
| Council Policy Title: | Procurement |
| Council Policy No: | 3.2 |
| Responsible Department: | Corporate Services |
| Date of adoption/review: | |

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1 PRINCIPLES

1.1 Background

Colac Otway Shire Council:

- Recognises that:
 - Developing a procurement strategy and adopting appropriate best practice tendering and procurement principles, policies, processes and procedures for all goods, services and works by Council, which will enhance achievement of council objectives.
 - The elements of best practice applicable to local government procurement incorporate:
 - broad principles covering ethics, value for money, responsibilities and accountabilities;
 - guidelines giving effect to those principles;
 - a system of delegations (i.e. the authorisation of officers to approve a range of functions in the procurement process);
 - procurement processes, with appropriate procedures covering minor simple procurement to high value complex procurement; and
 - a professional approach.
- Requires that Council's tendering, purchasing and contract management activities:
 - support the Council's corporate strategies, aims and objectives including, but not limited to those related to sustainability, protection of the environment, and corporate social responsibility;
 - achieve and demonstrate value for money and quality in the acquisition of goods, services and works by the Council;
 -
 - are conducted, and are seen to be conducted, in an impartial, fair and ethical manner;
 - ensure that risk is identified, assessed and managed at all stages of the procurement process;
 - comply with legislation (including Risk Management, Occupational Health and Safety and Competition and Consumer Legislation), corporate policies or other requirements;

- seek continued improvement including embracing innovative and technological activities to reduce activity costs;
- generate and support business in the local community where possible; and
- ensure staff are adequately trained in procurement practices and procedures as it relates to tendering and control.

1.2 Legislative Provisions

This Procurement Policy is made under Section 186a of the *Local Government Act* 1989 (The Act).

The Act is the key legislative framework that regulates the process of local government procurement in Victoria. Section 186a of the Act requires the Council to prepare, approve and comply with a Procurement Policy encompassing the principles, processes and procedures applied to all purchases of goods, services and works by the Council.

As such the Council's procurement activities will be carried out to the professional standards required by best practice and in compliance with the following, including any changes or amendments made thereto:

Legislation

- Sections 186a and 208A of the *Local Government Act* 1989;
- *Local Government (General) Regulations* 2004; and
- Other relevant legislative requirements such as but not limited to the *Trade Practices Act*, *Competition and Consumer Act* 2010; and *Victorian Charter of Human Rights and Responsibilities Act* 2006.

Standards and Guidelines

- Department of Planning and Community Development (DPCD) *Local Government Procurement Best Practice Guidelines* 2013.

Council Policies

- Council's Councillor and Staff Codes of Conduct;
- Council's policies including Risk Management, Fraud/Prevention Control and Gifts, Benefits and Hospitality.
- Council Instrument of Delegation to CEO.

1.3 Scope and Application

This policy represents the principles, processes and procedures that will be applied to the purchase of all goods, services and works by Council. The scope of this policy commences from when Council has identified a need for procurement requirements. It continues through to the delivery of goods or completion of works or services.

This policy will apply to Councillors, Council staff and all persons undertaking procurement on Council's behalf and they are accountable for complying with all relevant procurement legislative and policy requirements.

1.4 Purpose

The purpose of this Policy is to:

- provide policy and guidance to Council to allow consistency and control over procurement activities;
- demonstrate accountability to rate payers;
- provide guidance on ethical behaviour in public sector purchasing;
- demonstrate the application of elements of best practice in purchasing; and
- increase the probability of obtaining the right outcome when purchasing goods and services.

1.5 Treatment of GST

All monetary values stated in this policy include GST, except where specifically stated otherwise.

Definitions and Abbreviations

| Term | Definition |
|--------------------------|--|
| Act | Local Government Act 1989 |
| Commercial in Confidence | Information that, if released, may prejudice the business dealings of a party eg prices, discounts, rebates, profits, methodologies and process information, etc.
Disclosure may occur where applicable under the <i>Freedom of Information Act 1982</i> or as required by the Victorian Auditor-General's Office or the Victorian Ombudsman. |
| Contract | An agreement between two or more authorised persons on behalf of their organisations to perform or not perform a specific act/s that is enforceable in law. A contract may be verbal or written or inferred by conduct. |
| Contract Management | The process that ensures both parties to a contract fully meet their respective obligations as efficiently and effectively as possible, in order to deliver the business and operational objectives required from the contract and in particular, to provide value for money. |
| Council Staff | Includes full time and part-time council officers, and temporary employees, contractors and consultants while engaged by the Council. |
| Delegation | A power handed down by the Council or Chief Executive Officer in an instrument to enable a delegate to act on Council's behalf. |
| Evaluation Criteria | The criteria used to evaluate the compliance and/or relative ranking of tender responses. All evaluation criteria must be clearly stated in the request documentation. |

| | |
|-----------------------------------|---|
| Expression of Interest (EOI) | A request for Expression of Interest is generally sent to the supplier market, designed to capture commercial information and pricing. Allows Council to assess suitability and evaluate responses against a set of pre-defined requirements. This invitation is not an offer or a contract. |
| Probity | A Procurement process that conforms to the expected standards of probity is one in which clear procedures that are consistent with the Council's policies and legislation are established, understood and followed from the outset. These procedures need to consider the legitimate interests of suppliers and ensure that all potential suppliers are treated equitably. |
| Procurement | Procurement is the whole process of acquisition of external goods, services and works. This process spans the whole life cycle from initial concept through to the end of the useful life of an asset (including disposal) or the end of a service contract. |
| Purchase Order | A form of contract, which is an official document used to authorise and record the purchase of goods or services by a buyer. It is the prime reference confirming the contractual situation between the buyer and supplier. |
| Request for Quotation (RFQ) | A written process of inviting offers to supply goods and/or services involving simple documentation, a limited number of potential suppliers and generally of relatively lower values.. |
| Request for Tender (RFT) | A request for offer against a set of clearly defined and specified requirements. Tenderers are advised of all requirements involved, including the conditions of tendering and proposed contract conditions. |
| Standing Offer Arrangements (SOA) | A contract that sets out rates for goods and services which are available for the term of the agreement. However, no commitment is made under the agreement to purchase a specified value or quantity of goods or services. |
| Sustainability | Activities that meet the needs of the present without compromising the ability of future generations to meet their needs. |
| Tender Process | The process of inviting parties to submit a quotation or tender by public advertisement or selective tendering, followed by evaluation of submissions and selection of a successful bidder or tenderer. |
| Value for Money | Value for Money in Procurement is about selecting the supply of goods, services and works taking into account both cost and non-cost factors including: <ul style="list-style-type: none"> • contribution to the advancement of the Council's priorities; • non-cost factors such as fitness for purpose, quality, service and support; and • cost-related factors including whole-of-life costs and transaction costs associated with acquiring, using, holding, maintaining and disposing of the goods, services or works. |

2 EFFECTIVE LEGISLATIVE AND POLICY COMPLIANCE AND CONTROL

2.1 Ethics and Probity

2.1.1 Requirement

Council's procurement activities shall be performed with integrity and in a manner able to withstand the closest possible scrutiny.

2.1.2 Conduct of Councillors and Council Staff

2.1.2.1 General

Councillors and Council Staff shall at all times conduct themselves in ways that are, and are seen to be, ethical and of the highest integrity and will:

- treat potential and existing suppliers with equality and fairness;
- not seek or receive personal gain;
- maintain confidentiality of Commercial in Confidence such as Tender prices and other sensitive information;
- present the highest standards of professionalism and probity;
- deal with suppliers in an honest and impartial manner that does not allow conflicts of interest;
- report to the Chief Executive Officer or relevant General Manager any attempt by a supplier/prospective supplier (or their agent) to compromise the procurement process or to seek an unfair advantage;
- provide all suppliers and tenderers with the same information and equal opportunity; and
- be able to account for all decisions and provide feedback on them.

Council Staff who are responsible for managing or supervising contracts are prohibited from performing any works under the contract they are supervising.

2.1.2.2 Members of Professional Bodies

Councillors and Council Staff belonging to professional organisations shall, in addition to the obligations detailed in this policy, ensure that they adhere to any code of ethics or professional standards required by that body.

2.1.3 Tender and Quotation Processes

All tender and quotation processes shall be conducted in accordance with the requirements of this policy and any associated procedures, relevant legislation, relevant Australian Standards and the Act.

2.1.4 Conflict of Interest

Councillors, Council staff and independent tender evaluation panel members shall at all times avoid situations in which private interests conflict, or might reasonably be thought to conflict, or have the potential to conflict, with their Council duties.

Councillors, Council staff and independent tender evaluation panel members shall not participate in any action or matter associated with the arrangement of a contract (ie. evaluation, negotiation, recommendation or approval) where that person or any member of their immediate family has a significant interest, or holds a position of influence or power in a business undertaking tendering for the work.

The onus is on the Councillor, the member of Council staff and independent tender evaluation panel members involved being alert to and promptly declaring an actual or potential conflict of interest.

2.1.5 Fair and Honest Dealing

All prospective contractors and suppliers must be afforded an equal opportunity to tender or quote.

Impartiality must be maintained in selecting contractors and suppliers so that no action is taken that could evoke reasonable criticism of the Council or disadvantage a potential supplier.

Confidentiality of information provided by existing and prospective suppliers must be maintained at all times, particularly commercially sensitive material such as, but not limited to prices, discounts, rebates, profit, manufacturing and product information.

2.1.6 Accountability and Transparency

Accountability in procurement means being able to explain and provide evidence on the process followed. The test of accountability is that an independent third party must be able to see clearly that a process has been followed and that the process is fair and reasonable.

Therefore the processes by which all procurement activities are conducted will be in accordance with this Procurement Policy and related Council policies and procedures.

Additionally:

- all Council Staff must be able to account for all procurement decisions made over the life cycle of all goods, services and works purchased by the Council and provide feedback on them; and
- all procurement activities are to provide an audit trail for monitoring and reporting purposes.

2.1.7 Gifts and Hospitality

No Councillor or member of Council staff shall, either directly or indirectly solicit or accept gifts or presents from any member of the public involved, with any matter that is connected with the duties of the officer, or in which the Council is interested.

Councillors and Council Staff must exercise the utmost discretion in accepting hospitality from contractors or their representatives, or from organisations, firms or individuals with whom they have official dealings.

Offers of bribes, commissions or other irregular approaches from organisations or individuals (no matter how flimsy the evidence available), must be promptly brought to the attention of the CEO and relevant General Manager.

All gifts, hospitality that fall within the definition of gift/hospitality as described in Council's Gifts, Benefits and Hospitality Policy are to be declared and recorded.

2.1.8 Disclosure of Information

Commercial in-confidence information received by the Council must not be disclosed and is to be stored in a secure location.

Councillors and Council staff are to protect, by refusing to release or discuss the following:

- information disclosed by organisations in tenders, quotation or during tender negotiations;
- all information that is Commercial in Confidence information; and
- pre-contract information including but not limited to information provided in quotes and tenders or subsequently provided in pre-contract negotiations.

Councillors, Council Staff and independent panel members are to avoid references to current or proposed contracts in discussion with acquaintances or outside interests.

Discussion with potential suppliers during tender evaluations should not go beyond the extent necessary to resolve doubt on what is being offered by that supplier.

At no stage should any discussion be entered into which could have potential contractual implications prior to the Tender approval process being finalised other than authorised pre-contract negotiations.

Disclosure may occur where applicable under the *Freedom of Information Act 1982* or as required by the Victorian Auditor-General's Office or the Victorian Ombudsman.

2.2 Governance

2.2.1 Structure

Council shall:

- establish a procurement management responsibility structure and delegations ensuring accountability, traceability and auditability of all procurement decisions;
- ensure that the Council's procurement structure:
 - is flexible enough to purchase in a timely manner the diverse range of materials, goods, works and services required by Council;
 - ensures that prospective contractors and suppliers are afforded an equal opportunity to tender/quote;
 - encourages competition; and
 - ensures that policies that impinge on the purchasing policies and practices are communicated and implemented.

2.2.2 Standards

Council's procurement activities shall be carried out to the professional standards required by best practice and in compliance with the:

- The Act;
 - The Council's policies, guidelines and procedures;
 - The Council's Code of Conduct and the Staff Code of Conduct;
 - Local Government Procurement Best Practice Procurement Guidelines 2015; and
- Other relevant legislative requirements.

2.2.3 Methods

Council's standard methods for purchasing goods, services and works shall be by some or all of the following methods:

- petty cash;
- credit card, including fuel card;
- purchase order following a quotation process from suppliers for goods or services that represent best value for money under direct quotation thresholds;
- under contract following a tender or quotation process; or
- using aggregated purchasing arrangements with other Councils, MAV Procurement, Procurement Australia, Victorian Government, or other bodies;

unless other arrangements are authorised by the delegated authority on a needs basis as required by abnormal circumstances such as emergencies.

Council may, at its discretion and based on the complexity and cost of the project, conduct one stage or multi-stage tenders.

Typically a multi-stage tender process will commence with an Expression of Interest (EOI) stage followed by a tender process involving the organisations selected as a consequence of the registration of interest stage.

EOI may be appropriate where:

- the requirement is complex, difficult to define, unknown or unclear;
- limited knowledge of tenderers in the market place;
- the requirement is capable of several technical solutions;
- Council wants to consider ahead of formal tender processes such issues as whether those tendering possess the necessary technical, managerial and financial resources to successfully complete the project;
- Tendering costs are likely to be high and Council seeks to ensure that companies incapable of supplying the requirement do not incur unnecessary expense;

- It is necessary to pre-qualify suppliers and goods to meet defined standards; and
- The requirement is generally known but there is still considerable analysis, evaluation and clarification required (both of the objective and the solution).

2.2.4 Responsible Financial Management

The principle of responsible financial management shall be applied to all procurement activities.

Accordingly, to give effect to this principle: the availability of existing funds within an approved budget, or source of funds, shall be established prior to the commencement of any procurement action for the supply of goods, services or works.

Council staff must not authorise the expenditure of funds in excess of their financial delegations.

Council funds, must be used efficiently and effectively to procure goods, services and works and every attempt must be made to contain the costs of the procurement process without compromising any of the procurement principles set out in this Policy.

POLICY PROVISIONS

3. PROCUREMENT GUIDELINES

3.1 Minimum Spend Competition Thresholds

The value of all contracts for the purposes of compliance with section 186 of the Act includes:

- costs for the full term of the contract, including any options for either party to extend the contract.
- applicable goods and services tax (GST).
- anticipated contingency allowances or variations
- all other known, anticipated and reasonably foreseeable costs.

The thresholds do not apply to services which a Council elects to conduct using employed staff as these are not contracts for goods, services or works and are not subject to section 186 of the Act. The method for the delivery of all services and carrying out of works is reserved to the Council and the public tendering process only applies to those circumstances where external resources are sought and the thresholds are reached.

3.1.1 Tenders

Council's policy is that the value of all tenders estimated to be over the value of \$150,000 must be undertaken by public tender.

However, should the CEO, or their delegate consider that the nature of the requirement and the characteristics of the market are such that the public tender process would lead to a better result for the Council, public tenders may be called for purchase of goods, services and works for which the estimated expenditure is below the threshold.

3.1.2 Quotations

For purchase of goods, services and works having a total valuation of \$150,000 or less procurement by quotation method may be undertaken. in accordance with the thresholds set out in the Procurement, Quotations/Tendering and Purchasing Procedure.

3.2 Public Advertising

The public notice which Council is required to issue under the Act when calling for tenders or expressions of interest for procurement, above the legislated threshold, must be in the prescribed form and contain any prescribed details.

The requirement under the Act to give public notice has two elements. The notice must:

- o give the purpose of the contract
- o invite tenders (or expressions of interest) from persons wishing to undertake the contract.

Public notice is defined as a notice published in a newspaper generally circulating in the municipal district of the Council chosen by the Council for that purpose.

Council must also ensure that any public notice is published on its website.

Contracts for procurement below the legislated threshold may be advertised at Council's discretion with appropriate direction from Council's Procurement, Quotations, Tendering and Purchasing Procedure.

3.3 Delegation of Authority

3.3.1 Requirement

Delegations define the limitations within which Council Staff are permitted to work. Delegation of procurement authority allows specified Council Staff to approve certain purchases, quotation, tender and contractual processes without prior referral to the Council. This enables the Council to conduct procurement activities in an efficient and timely manner whilst maintaining transparency and integrity.

Procurement delegations ensure accountability and provide confidence to Council and the public that purchasing activities are dealt with at the appropriate level.

As such Council has delegated responsibilities as detailed below relating to the expenditure of funds for the purchase of goods, services and works, the acceptance of quotes and tenders and for Contract Management activities.

3.3.2 Delegations

3.3.2.1 Council Staff

Council maintains a documented record of authorised procurement delegations, identifying Council Staff authorised to make such procurement commitments in respect of goods, services and works on behalf of the Council, to include but not necessarily be limited to the following:

- power to authorise and issue order forms for goods and services;

- power to enter into contracts within approved budget; and
- contract term extensions and contract variations.

3.3.2.2 Delegations Reserved for the Council

Commitments and processes which exceed the CEO's delegation and which must be approved by the Council are:

- Tender recommendations and contract approval for all expenditure over \$250,000 in value; and
- Signing and sealing of the subsequent contract documentation.

3.4 Internal Controls

Council will establish, document and maintain a framework of internal controls over procurement processes in order to ensure:

- a framework for supplier engagement is in place;
- more than one person is involved in, and responsible for, each transaction;
- transparency in the procurement process;
- a clearly documented audit trail exists for procurement functions;
- appropriate authorisations are obtained and documented;
- systems are in place for appropriate monitoring and performance measurement;

All persons engaged in procurement processes must diligently apply all internal controls.

3.5 Commercial Information

Procurement activities will be carried out in a way that supports Council staff in meeting their obligations to ensure information of a commercially sensitive or confidential nature is obtained, stored, processed, published (where applicable) in an appropriate manner in accordance with the relevant Council guidelines.

3.6 Risk Management

3.6.1 General

Risk Management is to be appropriately applied at all stages of procurement activities which will be properly planned and carried out in a manner that will protect and enhance Council's capability to prevent, withstand and recover from interruption to the supply of goods, services and works.

Risk Management will be carried out in accordance with the stated requirements in the Risk Management Policy and the Guidelines for Occupational Health and Safety Management of Contractors and any Federal or State regulatory requirements.

3.6.2 Supply by Contract

The provision of goods, services and works by contract potentially exposes the Council to risk.

Council will minimise its risk exposure by measures such as:

- standardising contracts to include current, relevant clauses;
- requiring security deposits where appropriate;
- referring specifications to relevant experts;
- requiring contractual agreement before allowing the commencement of work;
- use of or reference to relevant Australian Standards (or equivalent);
- effectively managing the contract including monitoring and enforcing performance;
- undertaking relevant financial checks of companies to ensure they are viable to undertake the contract;
- developing a Probity Plan for tenders in excess of \$3 million or where a proposed contract is particularly complex, a high risk or controversial and requiring a high level of public confidence; and
- obtaining copies of certificates of currency for relevant insurances.

3.6.3 Probity Plan

A Probity Plan should cover the following matters:

- identification of the contract;
- objectives of the probity processes;
- statement on the proposed application of probity principles;
- roles and responsibilities of each participant in the evaluation process and probity auditing;
- specification of what probity auditing will occur;
- probity tasks, documents and timelines;
- measures for ensuring confidentiality and security;
- communication protocol with bidders (to ensure that no one bid obtains an unfair advantage over others); and
- record keeping requirements.

3.7 Contract Terms

All contractual relationships must be documented in writing based on standard terms and conditions.

Where this is not possible, approval must be obtained from the appropriate member of Council Staff as per Council delegations. A request for such an approval should be supported with procurement and legal advice as relevant.

To protect the best interests of the Council, terms and conditions must be settled in advance of any commitment being made with a supplier. Any exceptions to doing this expose the Council to risk and thus must be authorised by the appropriate member of Council staff listed in the Council delegations.

3.8 Endorsement

Council Staff must not endorse any products or services. Individual requests received for endorsement must be referred to the CEO or relevant General Manager.

3.9 Dispute Resolution

All Council contracts shall incorporate dispute management and alternative dispute resolution provisions to minimise the chance of disputes getting out of hand and leading to legal action.

3.10 Contract Management

The purpose of contract management is to ensure that the Council, and where applicable its clients, receive the goods, services or works provided to the required standards of quality and quantity as intended by the contract by:

- establishing a system monitoring and achieving the responsibilities and obligations of both parties under the contract;
- providing a means for the early recognition of issues and performance problems and the identification of solutions; and
- adhering to Council's Risk Management Framework and adhering to relevant Occupational Health and Safety Contractor Compliance Procedures.

All Council contracts are to include contract management requirements. Furthermore, contracts are to be proactively managed by the member of Council staff responsible for the delivery of the contracted goods, services or works to ensure Council receives Value for Money.

3.11 e-Tendering

e-Tendering is integral to the overall development of procurement processes and involves the use of an electronic system/s to acquire goods services and works.

By utilising e-tendering the Council aims to:

- reduce transaction costs
- achieve greater leverage
- make processes more efficient;
- improve management information and visibility of spend;
- increasing control and consistency of processes, and
- improve spend compliance.

3.12 Charter of Human Rights

Council will ensure that all of its procurement operations are fully consistent with prescribed rights and responsibilities and that they respect the 20 fundamental rights within the *Victorian Charter of Human Rights and Responsibilities Act 2006*.

4. DEMONSTRATE SUSTAINED VALUE

4.1 Integration with Council Strategy

Council's procurement strategy shall support Council's corporate strategy, aims and objectives as outlined in the Council Plan 2013-2017 relating to the four key themes or pillars of:

- Good Governance
- A Planned Future
- A Place to Live and Grow
- A Healthy Community and Environment

4.2 Best Practice Principles

The fundamental best practice principles that should be applied to every procurement, irrespective of the value and complexity of that procurement are:

- value for money
- open and fair competition
- accountability
- risk management
- probity and transparency

4.2.1 Value for Money

Obtaining value for money does not mean Council is obliged to accept the lowest price. Section 186(4) of the Act specifically provides Council does not have to accept the lowest tender.

The concept of 'value for money' involves taking into account both costs and non-cost factors including;

- advancing the Council's priorities
- fitness for purpose
- quality
- service and support
- whole-of-life costs and transaction costs associated with acquiring, using, holding, maintaining and disposing of goods, services or works.

4.2.2 Approach

This will be facilitated by:

- developing, implementing and managing procurement strategies that support the co-ordination and streamlining of activities throughout;
- effective use of competition;
- using aggregated contracts and panel contract arrangements where appropriate;
- identifying and rectifying inefficiencies in procurement processes;

- developing a cost efficient tender process including appropriate use of e-solutions;
- Council staff responsible for providing procurement services or assistance within the Council providing competent advice in terms of available products and agreements; and
- working with suppliers to create relationships that are professional and productive, and are appropriate to the value and importance of the goods, services and works being acquired.

4.2.3 Role of Specifications

Specifications used in quotations, tenders and contracts are to support and contribute to the Council's Value for Money objectives through being written in a manner that:

- ensures impartiality and objectivity as reasonably practicable;
- clearly defines the Council's requirements;
- encourages the use of standard products;
- encourages sustainability; and
- eliminates unnecessarily stringent requirements.

4.3 Sustainability

4.3.1 General

Council is committed to environmental sustainability and ensuring it monitors and reports on Council activities and programs that have an impact on, or contribute to the environment including but not limited to the following:

- Waste management
- Recycling
- Energy management
- Emission management
- Carbon footprint
- Water conservation
- Green building design
- Climate change
- Procurement

4.3.2 Environmentally Sustainable Procurement

Council is committed to adopting a Green Procurement approach by supporting the principles of sustainable Procurement within the context of purchasing on a Value for Money basis.

Value for Money purchasing decisions made by the Council are made on the basis of cost and non-financial cost factors including contribution to the Council's environmentally sustainability objectives.

Council prefers to purchase environmentally preferred products whenever they achieve the same function and value for money outcomes.

Council will therefore consider the following environmental sustainability criteria:

- Reduce, Reuse, and Recycle:

The Council is committed to reduce resources, consumption and minimise waste during the procurement life cycle including:

- Encouraging and preferring environmentally products which are more energy efficient;
- Selecting energy, fuel and water efficient products (ideally Energy and Water Star Rating of 4 and above);
- Preferring to purchase from a source which is less polluting or uses clean technology; and
- Always considering the provision of re-use and recycling as part of the project planning process, including the consideration of whole-life costs and disposal considerations.

- Buy Recycled:

Council is committed to buy recycled/part recycled products to optimise consumption and stimulate demand for recycled products, promoting the collection and reprocessing of waste and working towards zero discharge to the landfill.

- Green the Supply Chain:

Council shall encourage suppliers to adopt good environmental practices and will promote green procurement throughout its supply chain and ensure selection which has minimum environmental impact.

4.4 Diversity

Promoting equality through procurement can improve competition, value for money, the quality of public services, satisfaction among users, and community relations.

Diversity should be a consideration in every procurement project and reflect corporate commitment to diversity and equal opportunities wherever possible.

4.5 Support of Local Business

4.5.1 Support of Local Business

Council is committed to supporting local businesses in procuring works, goods and services where such purchases may be justified on Value for Money grounds.

Wherever practicable Council will fully examine the benefits available through purchasing works, goods or services from suppliers/contractors that offer an economic contribution to the Colac Otway Shire.

In all contracts where there are more than 3 selection criteria a 5% weighting shall be included. The weighting shall be given to suppliers who demonstrate how they intend to support local suppliers, contractors and services.

(See 4.5.2 for Light Fleet Vehicle Purchases.)

Local is defined as within the Colac Otway Shire.

Council will also seek from prospective suppliers/contractors where applicable what economic contribution they will make to the Colac Otway Shire.

Such examples may include:

- (1) Engaging and contracting with local suppliers.
- (2) Engaging local sub contractors.
- (3) Suppliers/contractors participation in any apprenticeship schemes or employment of apprentices.
- (4) Contributing to the financial, social and environmental well being of the Shire.
- (5) Enable the business expansion, growth and servicing of local business and contractors.
- (6) Existing local business.

4.5.2 Light Fleet Vehicle Purchases

All Council light vehicles purchased shall be subject to a competitive process managed by the Fleet Manager. This will involve obtaining competitive prices in writing in accordance with the Councils Procurement Policy. Prices shall be obtained from suppliers based on all suppliers quoting on specific vehicle details as advised in writing by Council.

When evaluating tenders a \$500 price allowance shall be applied to local suppliers in the municipality.

5. APPLY A CONSISTENT AND STANDARD APPROACH

5.1 Standard Processes

Council will provide effective commercial arrangements covering standard products and standard service provisions across the Council to enable employees to source requirements in an efficient manner.

This will be achieved via a combination of the following areas:

- pricing where relevant;
- processes, procedures and techniques;
- tools and business systems (e.g. implementing the e-tendering, e-evaluation, e-catalogue, or e-sourcing arrangements);
- reporting requirements; and
- application of standard contract terms and conditions.

5.2 Management Information

5.2.1 Performance Measures and Continuous Improvement

Appropriate performance measures are to be established and reporting systems will be used to monitor performance and compliance with procurement policies, procedures and controls.

5.2.2 Audits of Organisational Purchasing

An internal audit will be undertaken at least twice a year of organisational purchasing. Reports will include information:

- all purchasing for the period by supplier
- dollar value by supplier
- all approved procedural exemptions; and
- suppliers/areas for further review

5.2.3 Record Keeping

Council will ensure that a thorough and sound record keeping/archiving process is undertaken for each contract for a number of reasons, including to:

- substantiate the practices adopted during the procurement
- support any post-contract matters or disputes
- demonstrate OHS compliance and address any subsequent claims.

The structure and extent of records kept will depend on the value and complexity of the procurement. Procurement records, including contract management records will be integrated with Council's recording management system - whether hardcopy or electronic.

Records will be kept in accordance with the *Public Records Act 1973* Public Record Standard PROS 09/05 (Retention and Disposal Authority for Records of Local Government Functions).

6. BUILD AND MAINTAIN SUPPLY RELATIONSHIPS

Council recognises that in order to achieve sustainable value, appropriate relationships must be developed and maintained with suppliers.

6.1 Developing and Managing Suppliers

Council recognises the importance of effective and open working relationships with its suppliers, and is committed to the following:

- managing existing suppliers, via the appropriate development programmes and performance measurements to ensure the benefits are delivered;
- maintaining approved supplier lists; and
- developing new suppliers and improving the capability of existing suppliers where appropriate.

6.2 Supply Market Development

A wide range of suppliers will be encouraged to compete for Council work.

6.3 Relationship Management

Council is committed to developing constructive long-term relationships with suppliers. It is important that the Council identifies its key suppliers so that its efforts are focused to best effect.

Such areas may include:

- size of spend across the Council;
- criticality of goods / services supplier, to the delivery of the Council's services;
- availability of substitutes; and
- market share and strategic share of suppliers.

6.4 Communication

External communication is very important in ensuring a healthy interest from potential suppliers and partners to the Council. Council will aim to ensure that the following information is available.

- information about Council and how to become an approved supplier;
- a list of existing and forthcoming Tender opportunities;
- guidelines for doing business with Council; and
- standard documentation used in the procurement process

7. CONTINUAL IMPROVEMENT

Council is committed to continuous improvement and will review the procurement policy on an annual basis, to ensure that it continues to meet its wider strategic objectives.

8. REFERENCES

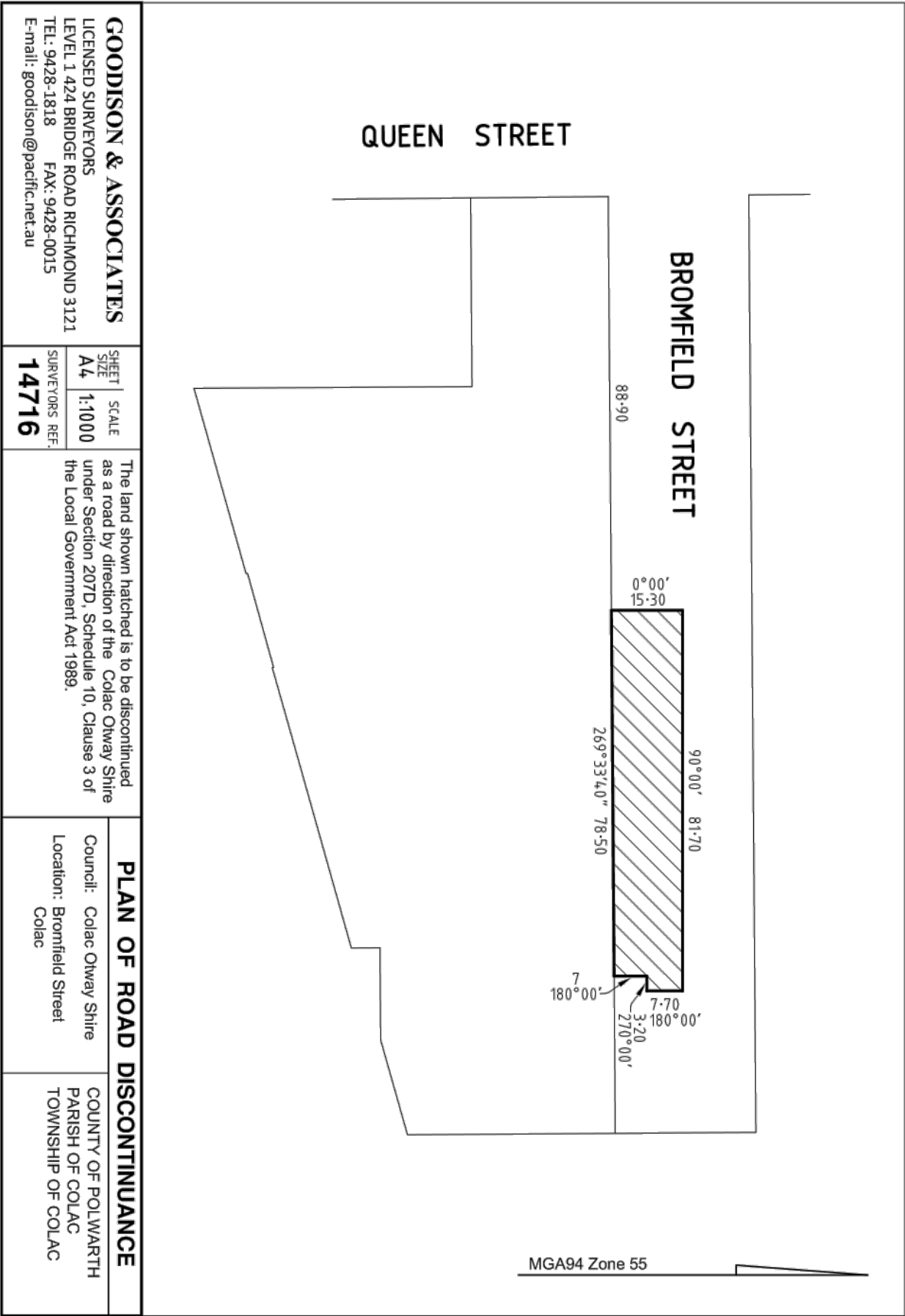
- Colac Otway Shire Operational Procedure – "Quotations/Tendering and Purchasing Procedure"
- Confidential Information Policy
- Council Plan 2013- 2017
- Councillor Code of Conduct
- Fraud Prevention Policy
- Gifts, Benefits and Hospitality Policy
- *Local Government Act 1989*
- Occupational Health and Safety Policy
- *Public Records Act 1973*
- Risk Management Policy
- Staff Code of Conduct;
- Tender Evaluation Panel Policy

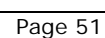
ADOPTED/AMENDMENT OF POLICY

| Policy Review Date | Reason for Amendment |
|--------------------|----------------------|
| 23 June 2010 | Adopted by Council |
| 28 September 2011 | Review |
| 22 May 2013 | Review |
| 28 May 2014 | Review |
| 22 July 2015 | Review |

Locality Plan - Proposed Discontinuance of Bromfield Street







Planning and Environment Act 1987

COLAC OTWAY PLANNING SCHEME

AMENDMENT C78

EXPLANATORY REPORT

Who is the planning authority?

This amendment has been prepared by the Colac Otway Shire Council, which is the planning authority for this amendment.

The Amendment has been made at the request of Brian Consulting and Rod Bright & Associates P/L on behalf of Mr Brendan Scanlan and Mrs Roslyn Scanlan, the owners of the land.

Land affected by the Amendment

The Amendment applies to land known as Lot 1 on Title Plan 326494Q (C/T8148/725), and part of Lot 2 PS529787 which contains the former Beechy Line railway reserve. The land fronts Harris Road, Elliminyt, and extends to the south and east with the former Beechy Line railway trail as the boundary. The title is contained within a larger property which extends to the Colac-Lavers Hill Rd, which is not affected by this Amendment.



What the amendment does

The Amendment seeks to enable an extension of the existing "Wyuna" residential estate to facilitate development for residential purposes within an expanding residential community.

Specifically, the amendment proposes to:

- Amend Clause 21.03 Settlement to include Lot 1 on TP326494Q (the subject land) within the town's settlement boundary in the Colac Settlement Framework;
- Rezone the land from Farming Zone (FZ) to General Residential 1 Zone (GRZ1);
- Remove the Significant Landscape Overlay Schedule 1 (SLO1) from the subject land.
- Apply a Design and Development Overlay Schedule 17 (DDO17) to the land to require a permit for fences above 1.2 metre in height on lots which abut a public open space.

Strategic assessment of the Amendment

Why is the Amendment required?

The Amendment is required to allow the land to be set aside for residential purposes generally in accordance with the principles for growth and development of Elliminyt in the Colac Structure Plan (2007). The Amendment also implements a specific recommendation made by the Independent Panel for Amendment C55 to the Colac Otway Planning Scheme that the land should be rezoned without the need for further strategic work.

In support of this recommendation, the Panel considered that the subject land is suitable to accommodate future residential development as it adjoins existing residential zoned land within the Wyuna Residential Estate. The Panel also considered that the rezoning has merit to enable improved access to Harris Road and to provide an urban edge to the Beechy rail trail located to the east and south.

Council and the Proponent are in the process of entering into a Section 173 to formally recognise that the Beechy rail trail will form the open space contribution required for the future subdivision of the land, and become a public open space reserve at that time. The former Beechy rail reserve land comprises approximately 1.86 hectares, and exceeds the 10% public open space contribution required under the Planning Scheme. This link will ultimately provide an important off-road connection as part of the broader Beechy rail trail corridor for pedestrians and cyclists.

The Amendment considers the future interface with the Beechy rail trail as a public open space link through the application of the Design and Development Overlay Schedule 17 (DDO17). DDO17 will require a planning permit for fences which exceed 1.2meters in height on land which abuts the public reserve, for fences which are within 6metres of this property boundary, and are not at least 50% permeable in their construction materials. This will ensure that no high or solid front fences are constructed along the Beechy rail trail interface and facilitate the passive surveillance of this recreational reserve. Should the eventual road layout indicate that a road is provided as an interface to the reserve, then a future Amendment can remove this control as it will not be required. A future Amendment can also reduce the area to which the control applies after the subdivision layout has been approved.

The Amendment seeks to rezone 14.03 hectares of land from Farming Zone to General Residential Zone Schedule 1 (GRZ1). Of this area, the former Beechy Line land comprises approximately 1.86 hectares. The Amendment proposes to include the land within the settlement boundary Clause 21.03 Settlement by amending the Colac Framework Plan map.

A number of technical assessments have been prepared which demonstrate that the land is serviceable and that no environmental impacts will occur. These include:

- Geotechnical Assessment
- Flora and Fauna Assessment
- Stormwater Management Report
- Engineering Services Report
- Traffic Impact Assessment.

Further technical investigations will occur at the time of subdivision.

How does the Amendment implement the objectives of planning in Victoria?

The Amendment implements the relevant objectives of planning in Victoria at stated in section 4 of the Planning and Environment Act 1987.

- The Amendment provides for the fair, orderly, economic and sustainable use and development of the land by facilitating residential use of the land which provides a logical extension of an existing residential estate.
- The Amendment does not impact on any identified place of historic or ecological significance.

- The Amendment facilitates the future development of the land for residential purposes to provide a safe working, living and recreational environment for future residents.

How does the Amendment address any environmental, social and economic effects?

Environmental Effects

A detailed flora and fauna assessment and Aboriginal cultural heritage initial assessment have been undertaken. These assessments have identified that the proposed amendment would have no significant adverse environmental effects or Aboriginal cultural heritage and archaeological impacts.

The Flora and Fauna assessment prepared by Ecology and Heritage Partners revealed that the site has been cleared for grazing with the exception of one remnant swamp gum tree. Historically, the site has been used for rural purposes for over 100 years. The report concluded that there were no conservation values on site.

There is no requirement under the Aboriginal Heritage Regulations 2007 for an Aboriginal Cultural Heritage Management Plan to be prepared and approved prior to the rezoning of the land or prior to seeking statutory approvals for subdivision. At this stage, a desktop level Cultural Heritage assessment has been prepared by Urban Colour Arts. The assessment revealed that there are no areas of cultural heritage sensitivity within the study area and rezoning is not a high impact activity. Therefore a mandatory CHMP is not required for the application to rezone the land.

The amendment will have positive environmental effects in terms of its abuttal and linkage with the former Beechy Rail Trail to the east and south and this presents future opportunities for public open space in the immediate area.

Social and Economic Effects

The Amendment is anticipated to result in positive social and economic effects by:

- Delivering residential zoned land within 4kms of the Colac CBD to accommodate forecast demand for population growth and residential development as identified by the G21 Regional Growth Plan 2013.
- Delivering opportunities for future residential development as a logical extension of an existing residential estate.

Does the Amendment address relevant bushfire risk?

The land is not within a Bushfire Management Overlay however is within a designated Bushfire prone area. It is cleared of vegetation, and no development is proposed as part of the Amendment.

Does the Amendment comply with the requirements of any Minister's Direction applicable to the amendment?

This Amendment has been prepared in accordance with the requirements of Minister's Direction 11: Strategic Assessment of Amendments.

How does the Amendment support or implement the State Planning Policy Framework and any adopted State policy?

The amendment supports and implements the following elements of State planning policy, notably:

- Clause 11.02: (Urban Growth) by providing sufficient land supply to meet future housing demand
- Clause 11.05-4 (Regional planning strategies and principles) by creating and opportunity to enhance Elliminyt's open space networks with the future use of the Beechy Rail trail for public open space purposes.

- Clause 15.01-1 (Urban design) and 15.01-4 (Design for safety) by ensuring that the design of fencing maintains passive surveillance of a future public open space reserve and is designed in a way which is open and transparent.
- 16.01-1 (Integrated housing) by allowing for the future increase in housing supply which adjoins an existing residential area.

How does the Amendment support or implement the Local Planning Policy Framework, and specifically the Municipal Strategic Statement?

The amendment supports and implements the following elements of Local planning policy, notably:

- Clause 21.03 (Settlement) by ensuring that there is sufficient fully serviced residential land to meet the needs of the existing and future population.

Does the Amendment make proper use of the Victoria Planning Provisions?

The Amendment makes proper use of the Victoria Planning Provisions by zoning the land to an appropriate residential zone, consistent with the adjoining residential land. The removes the Significant Landscape Overlay Schedule 1 in recognition of the changing land use, and applies the Design and Development Overlay Schedule 17 to ensure that low fencing is maintained along boundaries which abut public open space.

How does the Amendment address the views of any relevant agency?

Preliminary discussions with servicing authorities indicate no objection to the use of the land for residential purposes. Barwon Water has indicated that the land can be serviced by both reticulated water and sewerage.

Does the Amendment address relevant requirements of the Transport Integration Act 2010?

The rezoning will facilitate residential development in accord with the requirements of the Transport Integration Act 2010. No state owned transport system is impacted by the amendment.

Resource and administrative costs

- **What impact will the new planning provisions have on the resource and administrative costs of the responsible authority?**

It is anticipated that the amendment will have a minimal impact upon the resource and administrative costs of the responsible authority.

Where you may inspect this Amendment

The Amendment is available for public inspection, free of charge, during office hours at the following places:

| | |
|--|--|
| Colac Otway Shire Council
Colac Service Centre
2-6 Rae Street
COLAC VIC 3250 | Colac Otway Shire Council
Apollo Bay Customer Service Centre
69-71 Nelson Street
APOLLO BAY VIC 3233 |
| Colac Otway Shire Council
Sustainable Planning and Development Service Centre
101-105 Gellibrand Street | Colac Community Library & Learning Centre
173 Queen Street
COLAC VIC 3250 |

| | |
|----------------|--|
| COLAC VIC 3250 | |
|----------------|--|

Website: www.colacotway.vic.gov.au

The Amendment can also be inspected free of charge at the Department of Environment, Land, Water and Planning website at www.dtpli.vic.gov.au/publicinspection.

Submissions

Any person who may be affected by the Amendment may make a submission to the planning authority. Submissions about the Amendment must be received by **[insert submissions due date]**.

A submission must be sent to: **[insert Council's address]**

Panel hearing dates

In accordance with clause 4(2) of Ministerial Direction No.15 the following panel hearing dates have been set for this amendment:

- directions hearing: **[insert directions hearing date]**
- panel hearing: **[insert panel hearing date]**]

COLAC OTWAY PLANNING SCHEME

21.03 SETTLEMENT

19/02/2015
C74

21.03-1 General

11/09/2014
C75

Overview

- Colac is the major regional centre in the Shire for residential, service and manufacturing industry, retail, office services, recreation and education facilities.
- Apollo Bay is the major coastal urban centre in the Shire. It is experiencing high rates of development for both permanent and short-term (tourist) accommodation. It also provides a range of entertainment and recreational related facilities, including swimming, fishing, golf, cafes and restaurants.
- Colac and the coastal townships are experiencing increased rates of development.
- The management of residential, tourism and infrastructure development pressures is required, particularly in coastal areas.
- The development of the major towns in the Shire should take place in accordance with the recently completed Structure Plans for Colac and Apollo Bay.
- Smaller coastal settlements occur at Kennett River, Marengo, Separation Creek, Skenes Creek and Wye River, where development is expected to occur within current settlement boundaries due to various environmental constraints to growth.
- Other townships are located at Alvie, Barwon Downs, Beeac, Beech Forest, Birregurra, Carlisle River, Coragulac, Cororooke, Cressy, Forrest, Gellibrand, Lavers Hill, Pirron Yallock, Swan Marsh and Warriorn.
- The future development of other townships in the Shire should proceed in a manner that contributes to the economic development of these townships, acknowledges and responds to environmental constraints and protects the broader landscapes within which these townships are located.
- Effluent disposal is a major problem in the smaller settlements, particularly in the peak periods with high tourist numbers.
- Rural residential living provides a desirable lifestyle for a number of residents and if appropriately located can reduce land use conflict in farming areas and contribute toward the economic development of small townships.
- The Rural Living Strategy 2011 has identified and designated suitable locations for rural living areas which do not take up high quality agricultural land and where an adequate level of services can be provided.
- The Rural Living Strategy highlights the role of small townships in accessing rural living land.
- A number of settlements have been identified with potentially suitable locations for additional rural living and township development subject to further investigation including Beech Forest, Gellibrand, Forrest, Alvie, Cororooke and Beeac.
- A number of de facto rural living areas have developed over a number of years on old subdivisions within the localities of Barongarook – Bushby's Road, Barongarook – Robinson Road, Barongarook – Everett Crescent, Barramunga, Bungador, Cororooke – Langdons Lane, Grey River, Irrewarra – Pyles Road, Johanna, Kawarren, Marengo – Alice Court, Petticoat Creek, Warncoort and Weeaprounah.
- A number of largely undeveloped, old and inappropriate subdivisions unsuitable for development are found within the Shire abutting the township boundaries of Cressy and

COLAC OTWAY PLANNING SCHEME

Pirron Yallock and in the localities of Gerangamete and Irrewillipe – Swan Marsh-Irrewillipe Road.

- There is a need to encourage excellence in the design of new development, including the layout of subdivisions and the recognition of cultural heritage.
- New urban development should be supported by the provision of or upgrade of public open space to meet the needs of the community it is to serve.

Objectives

- To facilitate the development of the various settlements in the Shire in accordance with the needs of each local community.
- To facilitate a range of developments in an environmentally sensitive way to provide greater residential choice.
- To direct rural residential and small town development to preferred locations.
- To provide limited opportunities for rural living development where these do not detract from the key environmental qualities of the region and do not cause land use conflict in farming areas.
- To minimise ad hoc development of unserviced old and inappropriate subdivision in the Farming Zone.
- To provide for and improve public open space to meet the needs of the community.

Strategies

- Ensure that there is sufficient fully serviced residential land to meet the needs of the existing and future population.
- Encourage future residential development into existing zoned and serviced areas to avoid an oversupply of residential zoned land and to make the most effective use of infrastructure services.
- Provide opportunities for the provision of a wide range of housing choices for residents, short-term holiday residents and tourists.
- Development within rural living areas should be contained within the existing Rural Living Zone land and further subdivision, other than in Elliminyt, should be discouraged.
- Restructure existing lots in old and inappropriate subdivisions in Cressy, Gerangamete, Pirron Yallock and Irrewillipe in order to minimise development, retain the land in agriculture, prevent further servicing problems and avoid ad hoc development outside designated settlement boundaries.
- Ensure that development incorporates Environmentally Sustainable Development (ESD) practises.
- Promote a pattern of settlements in the coastal strip that balances between opportunity for growth and retention of environmental and cultural qualities.
- Restrict the expansion of other coastal settlements in accordance with environmental constraints.
- Ensure that development of the Colac and Apollo Bay airfields is not prejudiced by encroaching urban development.
- Ensure the provision of public open space meets the needs of the communities it is to serve by improving access, facilities and presentation.

COLAC OTWAY PLANNING SCHEME

21.03-2 Colac

--/20--
C78

Overview

A Structure Plan for Colac was adopted by Council (February 2007) and articulates the preferred development future for this key centre of the municipality and broader region. Key issues to emerge from the Structure Plan include the need for:

- A township boundary to clearly identify the extent of future development and enable the protection of valuable farming land that surrounds the township.
- Consolidation around the town centre and activity nodes taking into account heritage constraints.
- Provision of a secondary commercial node to cater for the growing area of Elliminyt.
- Retention and enhancement of Colac's heritage assets.
- Protection of Lake Colac from inappropriate industrial development.
- Provision of an adequate supply of industrial land consolidated in east Colac.
- An increase in the amount of public open space (both linear and non-linear) and development of policy direction supporting future open space provision for residential development.
- Better integration between Colac and Lake Colac through design features and foreshore development.
- Increased opportunity for recreational linkages between key activity areas including Lake Colac.
- Urban design improvements for the enhancement of the Colac Town Centre and main street.
- Improved traffic management in Colac.
- Strategies to create a precinct to focus community learning through a multi-purpose education, recreation and community precinct.
- There is a need to identify a heavy vehicle by-pass of the Murray Street retail centre.

The *Colac CBD and Entrances Project (2012)* outlines proposals for the enhancement of Colac's CBD and its eastern and western entrances which focus on the design of buildings and spaces.

The Plan's key recommendations are to:

- Develop Colac as a 'Botanic Garden City' with thematic tree planting throughout the CBD, linking the Botanic Gardens, Beechy Precinct and Barongarook Creek corridor.
- Improve the eastern entrance to the CBD with enhanced landscaping and views to heritage buildings, widened pedestrian pathways over the Barongarook Creek bridge and improved visibility to the Visitor Information Centre.
- Enhance priority streetscapes: Improve Murray Street West's streetscape with tree planting and other works, continuing the design theme of the central part of Murray Street. Improve Bromfield Street's streetscape with new tree planting, improved pedestrian access, bicycle lanes and the redevelopment of underused land at the rear of Murray Street shops with improved pedestrian links through to Murray Street. Upgrade Memorial Square's western edge with refurbished amenities and a shared space where pedestrians have priority which could ultimately be extended around the park and south along Gellibrand Street to the Station. Improve Murray Street East's streetscape with road side tree planting, upgraded footpath pavement, pedestrian crossings and street furniture, and infill planting where gaps exist.

COLAC OTWAY PLANNING SCHEME

- Improve the outer approaches to Colac with new landscaping, framing views to the Lake and emphasis on reducing the visual clutter of advertising signage.
- Improve the laneway network.
- Provide new and improved bicycle lanes.
- Apply built form guidelines to the CBD with emphasis on the inner retail areas to maintain the 'fine grain' character of these areas and to ensure a high quality of new architecture and the protection of heritage buildings.

Objectives

- To manage the growth of Colac consistent with its role as the major urban centre of the Shire.
- To enhance the built and natural environment of Colac.
- To develop a unifying design theme for Colac – 'Colac Botanic Garden City' – as a memorable and identifying feature of the town.
- To create landscape links between the main activity areas of the CBD and its principal open spaces.
- To improve the amenity and appearance of Colac's main pedestrian streets and town entrances.
- To create a pedestrian-focussed, accessible and well-connected public realm, particularly for those with limited mobility.
- To promote sustainable methods of transport, supporting walking and cycling as viable alternatives to car travel.
- To manage the road network to optimise its safety, efficiency and amenity for all road users.

Strategies

- Ensure that the development of Colac occurs generally in accordance with the strategic directions outlined in the Colac Framework Plan and the Colac CBD Framework Plan attached to this Clause.
- Encourage medium density development in the existing Colac town centre and ensure that infill housing proposals demonstrate that they are designed in a manner that is compatible and appropriate for the prevailing character and heritage values of the precinct.
- Create additional residential opportunities close to the Colac town centre.
- Provide adequate car parking to cater for commercial development consistent with the Colac Commercial Centre Parking Precinct Plan 2011, recognising that opportunity exists to take advantage of underutilised street parking and shared off street parking.
- Ensure new development in the hospital precinct of the CBD provides on site parking to meet projected demand and does not contribute further to on street parking pressures.
- Retain heritage places and areas as significant components of Colac's character and attractiveness and encourage their adaptive re-use and restoration including by supporting innovative uses that attract visitors and customers into disused retail areas.
- Designate areas of rural land between Elliminyt and Colac (east and west of Colac - Lavers Hill Road) as rural lifestyle opportunities.
- Support an increase in the amount of usable public open space (both linear and non-linear) to support recreational land uses and linkages between activities.

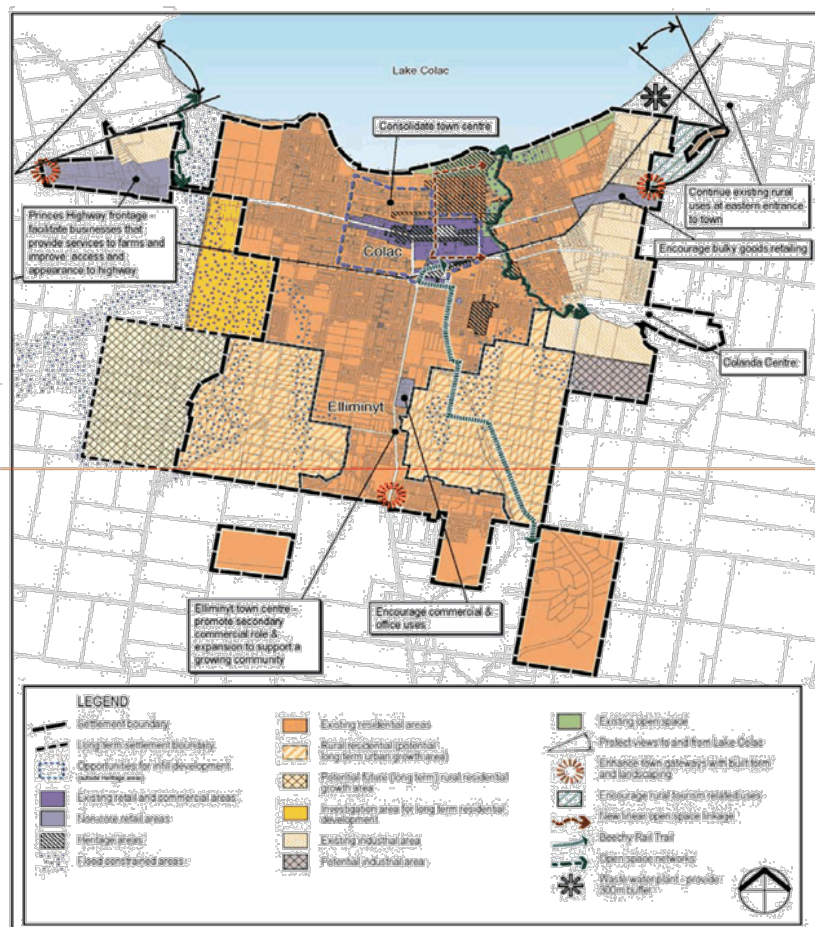
COLAC OTWAY PLANNING SCHEME

- Discourage any additional or new industrial development adjacent to Lake Colac.
- Encourage the relocation of existing 'inappropriate' industrial uses out of the town centre.
- Identify new industrial opportunities in Colac East which provide areas suited to a diverse range of light to general industrial activities.
- Improve the appearance of existing industrial development in Colac to provide more attractive and inviting entrances to the town.
- Designate land in Elliminyt for a community / commercial node.
- Provide for commercial type uses on Colac-Lavers Hill Road.
- Provide opportunities for expansion of the east Colac Highway Commercial area.
- Ensure major retail and commercial developments locate within the Colac CBD (Commercial 1 Zoned land only) rather than outside the town centre
- Minimise the impact of the Colac Water Reclamation Plant on development on nearby land.
- Ensure that future use and development of the Colac Water Reclamation Plant is not detrimentally affected by allowing inconsistent and potentially conflicting development to occur within its buffer area.
- Create a multi-purpose education, recreation and community precinct to focus community learning.
- Investigate options for a heavy vehicle by-pass of the Murray Street retail centre.
- Encourage redevelopment of underused or vacant sites (e.g. surface car parks, vacant land at the rear of buildings, upper levels of single storey buildings) in the CBD.
- Encourage the upgrading of shopfronts and building facades in the CBD, particularly on Murray Street and around Memorial Square.
- Support innovative uses that attract visitors and customers in disused areas in the Colac CBD.
- Encourage the removal of excessive roof top, above verandah and free standing signs, and other visually dominant signs, as sites are redeveloped.
- Develop a permeable network of active laneways and arcades in the CBD, including improved pedestrian thoroughfares between Murray and Bromfield Streets.
- Encourage and facilitate a high quality of architecture within the CBD through the implementation of building design guidelines.
- Encourage new development to provide an active frontage to the streetscapes and car parks, including the provision of active frontages to Bromfield Street for buildings fronting Murray Street.
- Encourage the reinstatement of verandahs on older buildings and encourage verandahs on new buildings for weather protection.
- Encourage planting on properties along the eastern and western entrances to Colac, particularly where it has potential to screen industrial activities.
- Undertake and implement a strategy for the co-ordination and design of all signage along the eastern and western entrance corridors to Colac.
- Encourage new development within the CBD to incorporate Environmentally Sustainable Design (ESD) initiatives.
- Maintain the 'fine grain' character of inner retail areas.

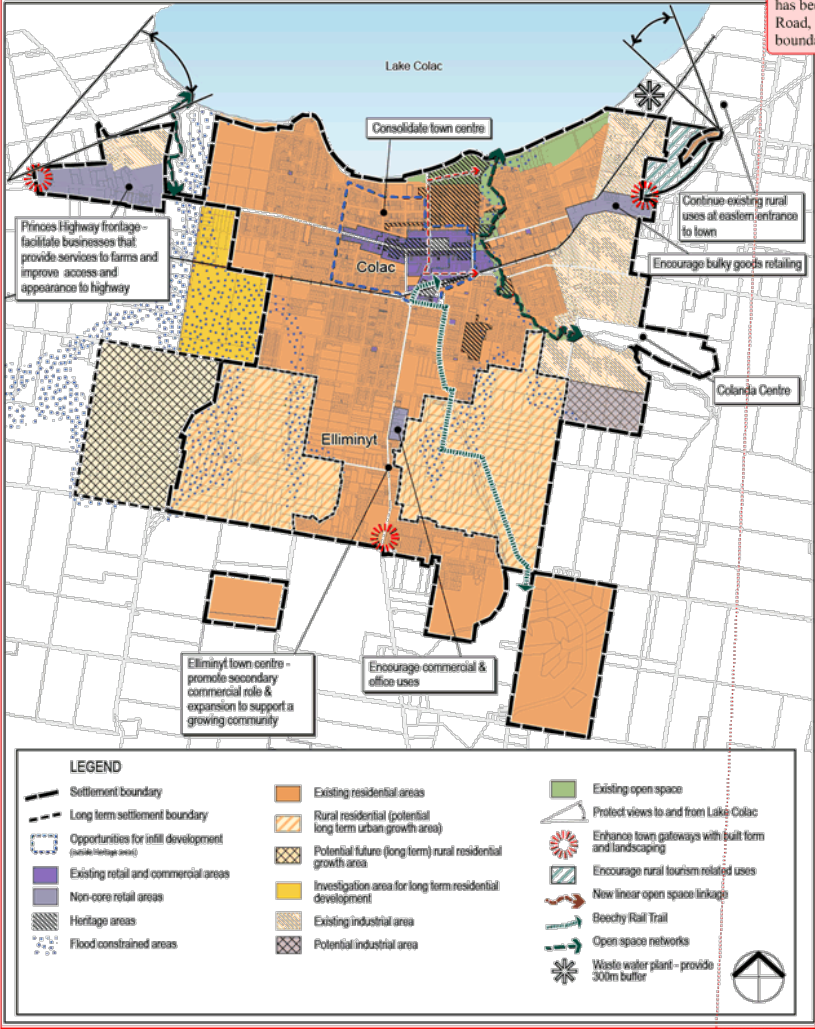
COLAC OTWAY PLANNING SCHEME

- Explore the potential of developing a neighbourhood park on the Irrewillipe Road Basin Reserve.
- Improve and enhance the pathways along Barongarook Creek.
- Improve and expand organised sports facilities at the Golf Club/Turf Club site.
- Investigate opportunities for open space at the former High School site.

Colac Framework Plan



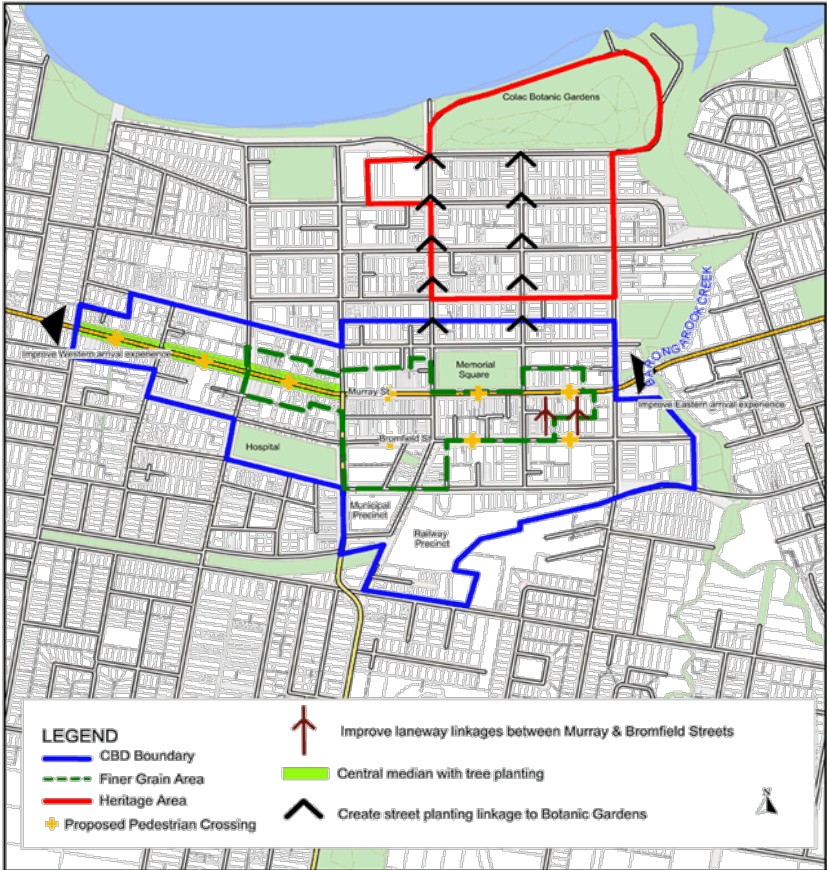
COLAC OTWAY PLANNING SCHEME



Comment [S1]: Colac Framework Plan has been amended to include 50 Harris Road, Eliminyt, within the settlement boundary.

COLAC OTWAY PLANNING SCHEME

Colac CBD Framework Plan



COLAC OTWAY PLANNING SCHEME

21.03-3
19/02/2015
C74

Apollo Bay and Marengo

Overview

A Structure Plan for Apollo Bay (including Marengo and Skenes Creek) was adopted by Council (April 2007) and articulates the preferred development future for this key coastal centre. Key issues to emerge from the Structure Plan were that:

- Apollo Bay, Marengo and Skenes Creek are to remain as distinct coastal settlements with development to be contained within coastal settlement boundaries.
- Each settlement has a separate identity and local character;
- A key role of Apollo Bay is to provide a diversity of housing opportunities consistent with its identity and local character;
- The natural beauty of the area, with its unspoilt beaches set against a dramatic backdrop of rolling hills, providing the overarching character which unites the settlements, to be reflected in new development;
- The seaside fishing village character of Apollo Bay, focused around a robust working harbour, is highly valued and this character should be preserved and strengthened by new development;
- Change in Apollo Bay, Marengo and Skenes Creek should take place with a demonstrated commitment to healthy lifestyles and ecological sustainability, and be responsive to the natural environment;
- The settlements should continue to provide for high quality living, offering improved community facilities and services, as well as economic development opportunities, for a self sustaining lifestyle.
- Water supply is a potential constraint to the future growth of Apollo Bay which can only proceed subject to the demonstrated availability of an adequate water supply.
- A settlement boundary and urban design review was completed in 2012. This reviewed a number of urban investigation areas. The settlement boundary now allows for sufficient urban development to cater for growth to 2030.

Objectives

- To develop Apollo Bay as an attractive residential community which provides a high quality environment as a significant tourist centre.
- To retain Apollo Bay, Marengo and Skenes Creek as distinct coastal settlements with their own local character.
- To ensure that the natural beauty of the area is reflected in new development.
- To preserve the seaside village character of Apollo Bay.
- To ensure that change demonstrates a commitment to sustainability and is responsive to the natural environment.

Strategies

- Ensure that the development of Apollo Bay and Marengo occurs generally in accordance with the strategic directions outlined in the Apollo Bay Framework Plan attached to this Clause.

COLAC OTWAY PLANNING SCHEME

Settlement Character and Form

- Consolidate the town centre of Apollo Bay, limit building heights and provide a greater diversity of accommodation at higher densities within and in close proximity to the commercial area.
- Improve pedestrian linkages in the town centre with new mid-block links between the Great Ocean Road and Pascoe Street.
- In the residential areas outside the town centre of Apollo Bay, limit building heights and ensure upper levels are well articulated to respect the character of the area and provide for a more traditional dwelling density to contribute to a diversity of housing choice.
- Require new development and streetscape works in the Apollo Bay town centre to build on and reinforce the fishing village coastal character of the township, and contribute to the creation of a vibrant public realm.
- Reinforce and improve the informal character, accessibility and amenity of streetscapes in the residential areas of Apollo Bay, Marengo and Skenes Creek, reflecting the distinct existing and preferred future character of each settlement in new improvements.
- Achieve excellent architectural quality in new development or improvements to existing buildings in the town centre, drawing on the existing valued qualities of the centre and setting a new direction in the use of innovative, high quality design.
- Promote Apollo Bay and Marengo as leaders in environmental sustainability within the Great Ocean Road Region and improve the ecological integrity of environmental features within and around settlements.
- Conserve and enhance heritage places as a significant factor in developing tourism.
- Upgrade Pascoe Street in the town centre to improve pedestrian and visual amenity and function.

The Size of Settlements

- Utilise natural boundaries, where appropriate, to define settlement edges and set limits to urban expansion.
- Define and maintain a hard edge to the urban area of each of these settlements, particularly when viewed from the Great Ocean Road.
- Ensure that urban development results in the efficient utilisation of existing infrastructure and minimises the requirements for new infrastructure.
- Encourage infill development of medium density housing and accommodation within walking distance of the commercial area of Apollo Bay, to reduce the pressure to expand the urban area, and provide alternative housing choice.

Activities: Business, Tourism, Community and Recreation

- Intensify commercial and business land uses within the commercial area of Apollo Bay and ensure a future supply of Business Zoned land to meet demand.
- Develop the Apollo Bay Harbour Precinct with a tourism, fishing, boating, commercial and recreational focus strengthening links to the town centre of Apollo Bay and providing net community benefits.
- Encourage future recreation facilities to be located together with other community facilities in a central and accessible location.
- Ensure that community, health, education and recreation facilities are provided to meet the needs of current and projected future residents and visitors to the area.

COLAC OTWAY PLANNING SCHEME

- Support the growth of tourism as a major employer for the region.
- Provide for future industrial development while minimising offsite impacts on surrounding residential uses, the environment (particularly local waterways) and views from residential areas and the Great Ocean Road.
- Improve the provision and quality of neighbourhood parks in the urban residential areas.
- Establish a future use for the Heathland Estate Reserve.

Landscape Setting and Environment

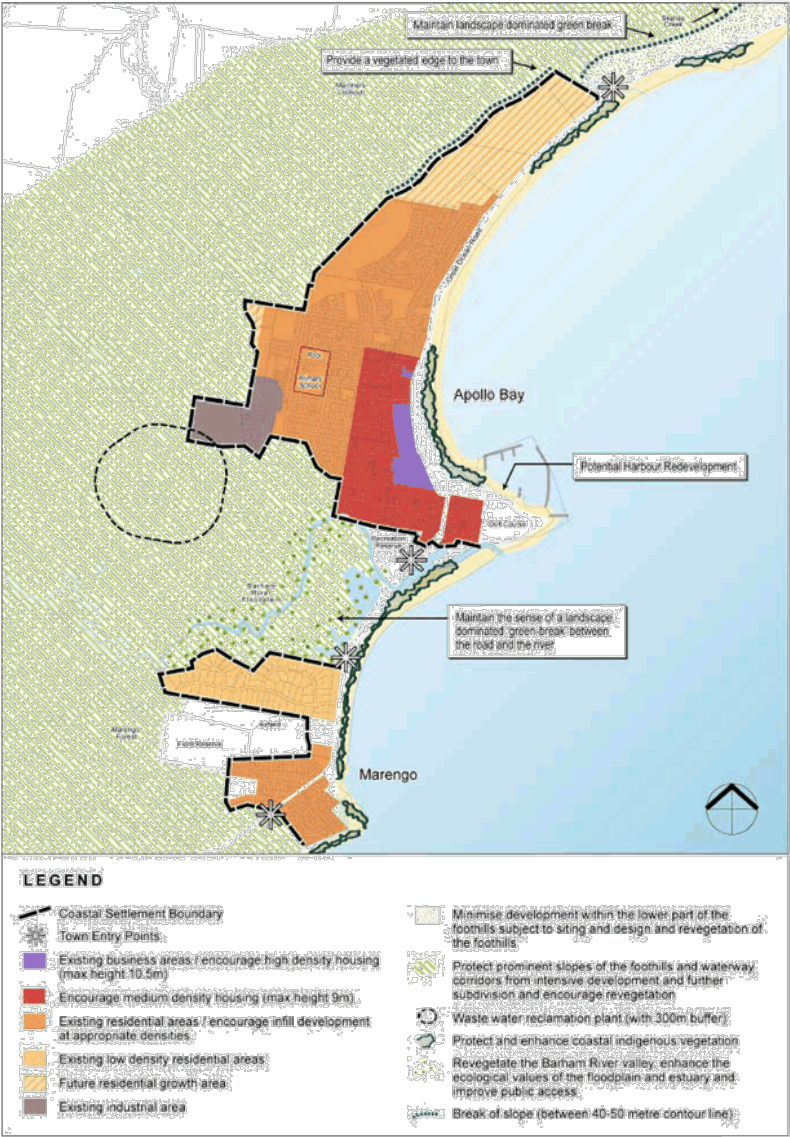
- Maintain the 'green-breaks' and landscape dominance between the settlements to ensure that each settlement remains distinct.
- Protect the Otway foothills as a scenic, undeveloped backdrop to Apollo Bay and Marengo.
- Recognise and protect ecological values and avoid development in areas at risk from the effects of flooding, wildfire, acid sulphate soil disturbance, erosion, landslip and salinity.
- Reinforce and enhance the identity and the sense of arrival and departure at the entrances to Apollo Bay and Marengo.
- Improve the appearance and amenity of the foreshore reserve in Apollo Bay and reduce the impact of the existing and future structures on the naturalness of the setting.
- Achieve improved visual and physical links between the Apollo Bay town centre and the beach.
- Protect and enhance the significant views and vistas available from the settlements, the beach and the harbour, as well as views available from key vantage points in the hills.

Access and Parking

- Strengthen the pedestrian and cyclist connections between Marengo, Apollo Bay and Skenes Creek.
- Create a highly walkable town centre in Apollo Bay with safe and convenient access to shops, community facilities and recreational activities.
- Manage the orderly flow of traffic at all times of the year and enhance pedestrian safety and movement.
- Ensure the future parking needs of Apollo Bay are met and parking congestion in the Great Ocean Road is minimised, with car parking for commercial development in the CBD to comply with the Apollo Bay Parking Precinct Plan (2011).
- Upgrade and provide new mid-block pedestrian linkages in the town centre to improve the utilisation of parking to the rear of shops.
- Consolidate and formalise car parking areas to the rear of the main shops in the town centre.
- Encourage greater use of car parks by improved signage.
- Improve the safety of pedestrian access across the Great Ocean Road to the foreshore reserve at key locations.
- Support, promote and improve public transport.
- Ensure continued and improved air access to the Apollo Bay region.

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Apollo Bay, Marengo and Skenes Creek Framework Plan



COLAC OTWAY PLANNING SCHEME

21.03-4
25/09/2014
C78

Birregurra

Overview

The township of Birregurra is located approximately 20 kilometres east of Colac and approximately 6 kilometres to the south of the Princes Highway. Birregurra is a small town offering a village lifestyle in an attractive rural setting to its diverse and active community. The town has a relatively compact urban form based on an attractive and connected network of grid streets and open space links, and sits discretely within its rural surrounds.

Development pressures, high costs of accommodation for tourists and workers and an increase in tourist numbers in Lorne and other coastal communities has seen more people exploring Birregurra for permanent living, holiday accommodation and recreation.

Birregurra is an attractive town for many reasons including for:

- The built form of the town and the many heritage buildings throughout the town and in particular along the south side of Main Street with attractive shop fronts many with verandahs.
- The consolidated commercial town core and community node that provides retail, community and health services that cater for resident's local needs and provides support for surrounding farming areas. The Church precinct located on the elevated land to the south of the town.
- The extent and variety of exotic and native vegetation existing throughout the town. The extent of the vegetation is clearly seen due to the elevated nature of the land, particularly on the southern side of the town.
- The topography of the land surrounding the town including the Barwon River valley and associated tributaries and undulating farming land.

The Birregurra Structure Plan 2013 and Birregurra Neighbourhood Character Study 2012 identify urban design and built form opportunities to improve the presentation of this important centre in the municipality. The Birregurra Structure Plan 2013 encourages infill development to accommodate growth within Birregurra without the need to expand the existing defined township boundary.

Settlement and Housing

Objectives

- To manage modest growth and development in Birregurra in a coordinated and sustainable manner that ensures Birregurra retains its rural township character.
- To retain and protect the township's significant and contributory heritage places and articulate Birregurra's history in the public realm.
- To encourage consolidation of commercial uses in the core town centre of Birregurra on Main Street and broaden the commercial, retail and tourism opportunities in the township.

Strategies

- Contain urban development within the existing defined township boundary.
- Encourage sensitive infill development on vacant lots and support further subdivision of larger developed lots within the existing township boundary.
- Control the density of development and apply development standards as recommended by the Neighbourhood Character Study 2012 to preserve character.

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- To encourage a mix of housing types and styles that provide diversity, affordability and respond to the community's life cycle needs.
- Support new commercial uses and re-development of existing premises on both sides of Main Street between Roadknight Street / Austin Street to the west and the unnamed watercourse / Strachan Street to the east and encourage active street frontages.
- Ensure any new commercial development to the rear of properties on Main Street has regard to sensitive residential interfaces.
- Support an increase and diversification of tourist based activities and accommodation in Birregurra.
- Encourage adaption and re-use of heritage buildings, especially in Main Street, and ensure new development provides a sympathetic design response to existing heritage buildings.
- Retain low building heights throughout the township and the single storey built form of Main Street.
- Consolidate civic, community and health facilities in a community node on the north-east edge of the town centre.
- Support retirement/aged care living in proximity to the community and health node, and Main Street.
- Direct any potential petrol station to locate in or close to the town centre, away from the heritage core and identified township gateways.
- Protect the ongoing integrity of industrial activities in the Industrial 1 zoned land and encourage consolidation of industrial uses in this area.
- Ensure any new development in the Industrial 1 Zone reflects the rural township character of Birregurra and has regard to visual amenity.
- New subdivisions should include a grid-based road network that easily integrates with the existing surrounding road network. Avoid cul-de-sacs and battleaxe driveways as a means of providing access to new residential lots.
- Ensure roads provide safe access for all users and that road upgrades retain and enhance the character of Birregurra and the informal nature of road reserves.
- Ensure an efficient and cost effective provision of physical infrastructure that addresses the ongoing needs of the community, whilst protecting the landscape and township character values of Birregurra

Landscape, Environment and Open Space

Objectives

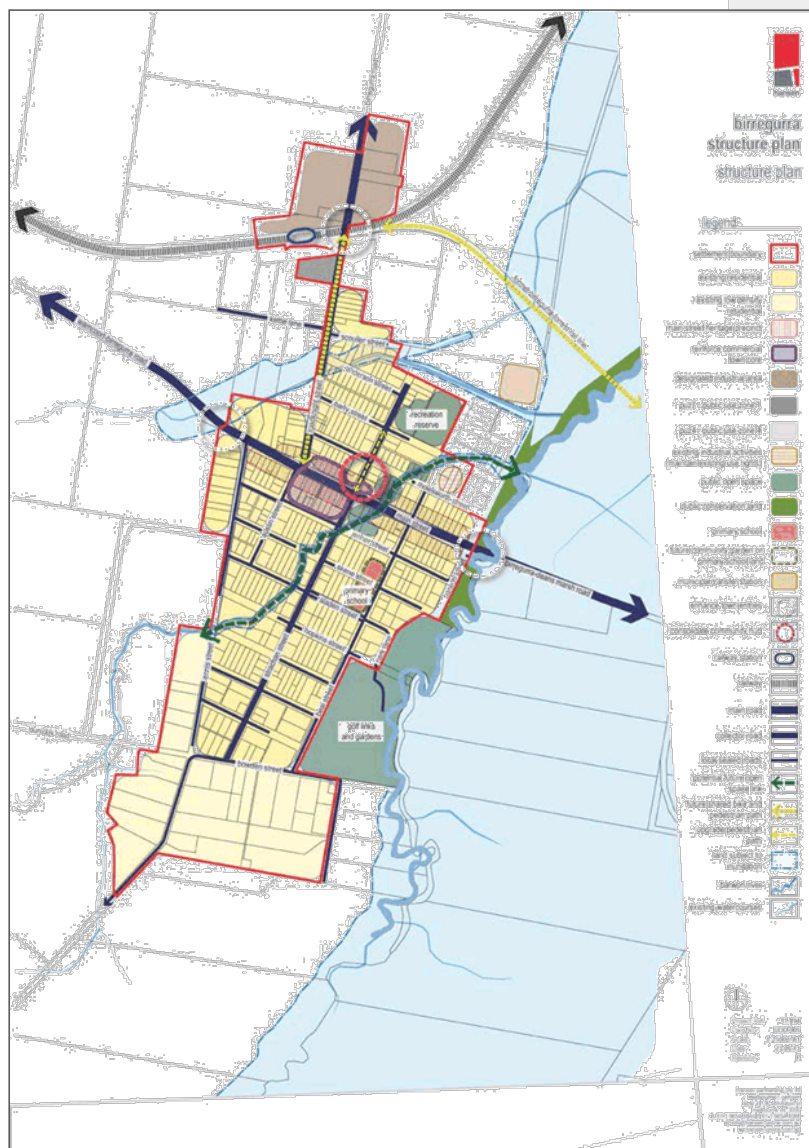
- Protect and extend areas of native vegetation, including endangered EVCs along waterways.
- Protect and enhance the landscape character and view lines of township entrances as defining elements of the north, east and west gateways.
- To preserve and enhance the Barwon River corridor and connected waterways.
- To establish a connected network of accessible public open space and recreation facilities that provide a range of passive and active recreation opportunities.
- To provide safe and improved opportunities for walking and cycling throughout the town and encourage walkable neighbourhood design in new developments.

COLAC OTWAY PLANNING SCHEME

Strategies

- Investigate the potential public open space corridor along the unnamed waterway running south-west to north-east through the middle of the town and the development of a linear shared pedestrian /cycle path connecting to parkland adjoining the Barwon River.
- Encourage built form along this open space corridor to:
 - Be appropriately set back from the waterway in accordance with Corangamite CMA requirements.
 - Provide an active interface through the avoidance of solid fencing to this boundary.
 - Provide pedestrian access to the corridor where possible.
- To encourage the retention of trees where possible and the planting of new canopy trees and understorey vegetation.
- Require the use of building envelopes or tree protection zones to protect vegetation on lots that contain significant trees.
- Encourage the dominance of landscape over built form in residential areas.
- Improve open space provision as the community expands and improve linkages between key destinations.
- Investigate development of the Tiger Rail Trail from Birregurra to Barwon Downs and Forrest.

Birregurra Framework Plan



COLAC OTWAY PLANNING SCHEME

21.03-5
18/07/2013
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Skenes Creek

Overview

Skenes Creek is a coastal hamlet set on rolling topography at the base of the Otway Ranges. There is a sense of openness to the town created by the spacious siting of buildings and expansive views to the coast and hillsides. A green wedge corridor through the centre of the township links the town with a vegetated hillside backdrop and is enhanced by regeneration of indigenous and appropriate coastal shrubs around dwellings and public areas.

Objective

- To protect the nationally significant Great Ocean Road Region landscape and the distinctive landscape qualities and coastal setting of Skenes Creek township.

Strategies

- Ensure new development responds to the above key issues and achieves the following Preferred Character Statement for the Character Areas identified at Schedule 4 to Clause 43.02.

Skenes Creek Precinct 1 – Preferred Character Statement

This precinct provides a native 'green wedge' for the whole township, extending from the hill slopes behind the town to the Great Ocean Road. The character of the precinct will be strengthened by the planting and regeneration of indigenous and native vegetation. Dwellings will be set far enough apart to accommodate substantial native bush areas including canopy trees, and will be set substantially below the vegetation canopy. The semi-rural feel of the area will be retained by the lack of fencing and frequent unmade roads. Views to the dwellings will be softened by native vegetation in frontages to major roads and in the public domain along road verges.

Skenes Creek Precinct 2 – Preferred Character Statement

This precinct will continue to be characterised by diverse coastal dwellings set amongst established coastal gardens. The sense of openness will be maintained by setting the buildings apart, minimising intrusive front fencing, and encouraging building forms that respect views to the surrounding hills and coast. The precinct will be united by consistent mature plantings of native and exotic coastal species in the public and private domains.

21.03-6
18/07/2013
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Kennett River, Wye River and Separation Creek

Overview

The structure plan for Kennett River, Wye River and Separation Creek articulates the preferred development future for these coastal townships. Key issues to emerge from the structure plan were that:

- Kennett River, Wye River and Separation Creek will remain as distinct coastal townships nestled in the foothills of the Otway Ranges.
- The primary roles of the townships will be to provide housing for permanent and part time residents and to provide a diverse range of holiday accommodation.

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- The existing and preferred character of the townships is characterised by low scale buildings which respond to the constraints of the topography in their coastal location and generally sit below the predominant tree canopy height.
- The informal, open and spacious character of the townships is highly valued and should be preserved and strengthened by new development.
- The impact of the townships on the natural environment will be as minimal as possible with water and wastewater being sustainably managed and vegetation acknowledged and valued.
- Future development within the townships should respond appropriately to a range of acknowledged environmental constraints including land slip, wildfire threat, coastal inundation and erosion, storm water management, water supply and effluent disposal.
- The townships have a low growth capacity and all future growth will be contained within existing urban or appropriately zoned land.

Objectives

- To protect and maintain the nationally significant Great Ocean Road Region landscape and the distinctive landscape qualities and coastal setting of Kennett River, Wye River and Separation Creek.
- To support limited tourist, commercial and retail services to the townships.
- To limit the growth of the coastal townships and discourage development outside of existing settlement boundaries.
- To preserve and enhance the environmental qualities of the townships and ensure development responds to the preferred neighbourhood character.
- To ensure that waste water from existing and proposed development is managed in a way that minimises its impact on the environment.
- To ensure that stormwater drainage systems respond to the constraints posed by the townships unique climatic, geological and environmental setting.
- To improve pedestrian access between the hamlets and the foreshores.
- To plan for the impacts of future climate change.

Strategies

- Maintain the existing settlement boundaries as identified on the framework plans forming part of this clause.
- Ensure that future growth of the townships is limited to infill development and renewal contained within existing settlement boundaries.
- Encourage any infill development within the townships, particularly tourist accommodation, to locate in the flatter, less vegetated areas near the centre of the townships (as identified on the framework plans forming part of this clause) but taking into account the need to respond to climate change induced coastal hazards.
- Ensure that any development outside the settlement boundaries is low scale and sensitively sited with minimal impact on the landscape and meets the criteria of the Great Ocean Road Region Landscape Assessment Study.
- Restrict commercial and retail development to small, incremental changes to existing facilities.
- Maintain and preserve the natural setting of the foreshores by minimising new structures in these areas.

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- Create or enhance safe pedestrian access from all parts of the townships to the foreshores.
- Encourage opportunities to improve the general store and café of Kennett River, including incorporating an outdoor dining area and improved car parking areas to be more landscaped and pedestrian friendly.
- Encourage more diverse accommodation in Separation Creek with small scale projects.
- Collaborate with State Government in developing and implementing new initiatives to manage the impacts of climate change in the future.
- Ensure all new development achieves the following Preferred Character Statement for the Character Precincts identified at Schedule 4 to Clause 43.02:

Kennett River Precinct 1 – Preferred Character Statement

This precinct will be dominated by continuous native bush, with dwellings set below and amongst remnant canopy trees. Frontages will be open and consist of diverse native understorey that screens views of buildings from roads. The low scale dwellings will avoid prominent locations and ridgelines, and will be sited to provide for the reasonable sharing of views to the coast where available. Vegetation will be retained or replaced with any new developments to screen buildings when viewed from the Great Ocean Road. Innovative house styles will be encouraged of a scale, materials and colours that blend with the bush character and follow the topography. The informal bush character of the precinct will be assisted by the streetscape planting and lack of formal kerbing.

Kennett River Precinct 2 – Preferred Character Statement

This precinct will consist of coastal style dwellings set amongst gardens of native species. A spacious garden character will be maintained by setting buildings apart and encouraging landscaping between dwellings. Dwellings will be carefully designed, sited and landscaped to be unobtrusive when viewed from roads and to provide for a sharing of views to the coast where available. Trees in both public and private domains will provide a sense of continuity through the precinct and visually link with the adjacent bushland areas.

Wye River Precinct 1 – Preferred Character Statement

This precinct will continue to be characterised by dominant native bush that forms a consistent canopy, linking to the adjacent bushland. Dwelling scale, bulk and siting will respond to the site and topography, allowing space and setbacks to maintain native bush, both as canopy and understorey. Buildings will be set beneath the canopy, and appropriately sited and designed so as to allow for the sharing of views to the coast where available, and to be hidden from view from the Great Ocean Road. The informality of the streetscapes will be retained by the lack of front fencing, frequent unmade roads and remnant vegetation.

Wye River Precinct 2 – Preferred Character Statement

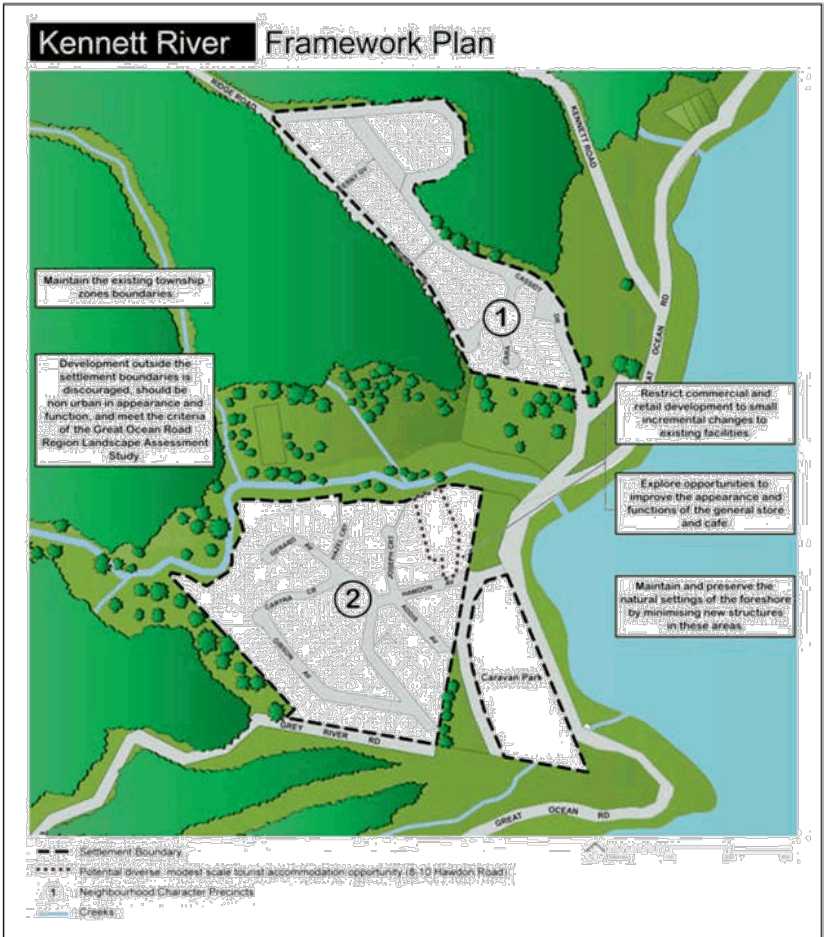
This precinct will achieve a more consistent native vegetation coverage to provide a unifying feature throughout. Space around dwellings will be sufficient to maintain trees and understorey, and minimises the appearance of building bulk and density. On hill slopes, buildings will relate to topography and be set amongst and beneath a dominant, native tree canopy. Buildings and structures in prominent locations when viewed from the Great Ocean Road will be designed to reduce their visual intrusion. Retention and planting of canopy trees in the public domain and around dwellings will be encouraged to establish a consistent tree canopy.

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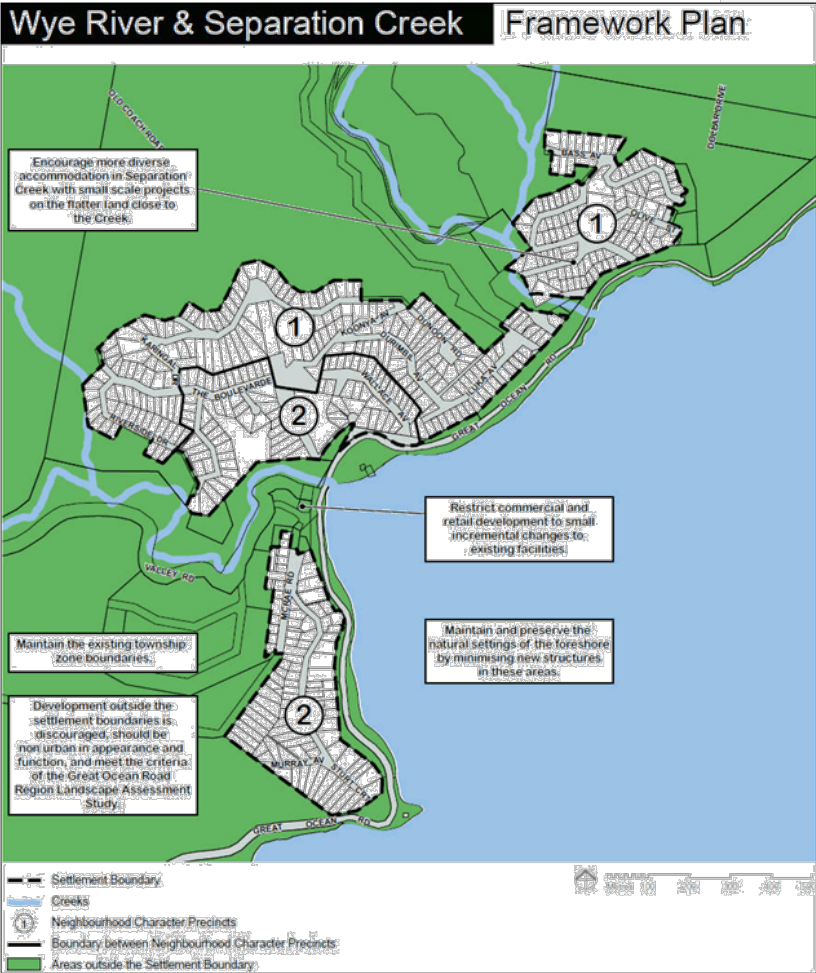
Separation Creek Precinct 1 – Preferred Character Statement

This precinct will consist of a mix of low, coastal style dwellings and newer coastal styles, in established gardens and amongst native canopy trees in the vegetated hillfaces. Dwellings will be of materials and colours that reflect the coastal setting, and be designed and sited so as to minimise intrusion into views from roads, public spaces and adjacent dwellings and impact on the topography. Establishment of native and coastal trees in public and private gardens will unite the precinct and provide visual links to the surrounding bushland and creek environs.

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21.03-7 Forrest

18/07/2013
C69

Overview

Forrest is located 32.6 kilometres from Colac and is placed at the foothills of the Otways approximately 161 kilometres from Melbourne and 76 kilometres from Geelong.

A Structure Plan for Forrest was adopted by Council (August 2011) and articulates the preferred development future for Forrest. Key issues to emerge from the Structure Plan were that:

- The role of Forrest as an outdoor recreation and tourism destination has been well established over recent years along with an emerging trend for rural lifestyle residential development.
- Forrest's tourism functions will continue to play a primary role in the town's growth and development into the future.
- There are significant environmental constraints within Forrest including bushfire, flooding and landslip risks that impact on future potential for expansion of the town.

Objectives

- To support Forrest's role within the Otways as a key destination for tourism and recreational pursuits and as a small town with limited potential for residential growth.

To limit residential development to the existing urban area contained within Forrest's settlement boundary, subject to the outcome of further investigation into the viability of development adjoining the north west edge of the town in accordance with the Forrest Framework Plan attached to this Clause.

- To encourage the development of accommodation facilities which contribute to the viability of tourism and recreation-based activities.
- To promote Grant Street as the primary location for future commercial activities within Forrest.
- To encourage development and activities which add commercial and recreational diversity to the Forrest Township.
- To ensure that the various cultural and environmental heritage assets of the township are protected, maintained and continue to be articulated within Forrest's private and public realm.
- To ensure new residential and commercial development is responsive to the environmental, biodiversity, conservation and landscape values of the local region.
- To ensure that development within Forrest responds to and mitigates any identified bushfire risks.
- To improve pedestrian access and movement along Grant Street.
- To facilitate the provision of community services and social infrastructure within Forrest which promote the town's liveability and increase social equity.

Strategies

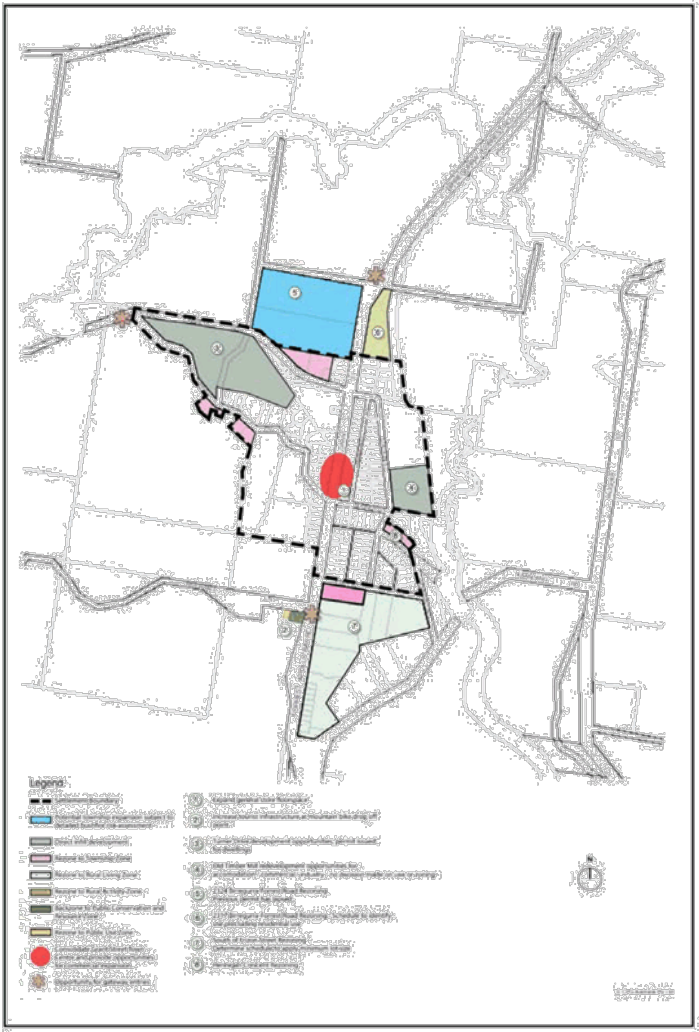
- Maintain settlement boundaries shown on the Framework Plan in this Clause pending detailed strategic assessment of bushfire risks and potential measures to manage bushfire risk for the town and broader area.
- Ensure that future growth of the township maximises infill development.

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- Concentrate small scale businesses and commercial uses (such as retail premises, shop, restaurant, industry and accommodation) along Grant Street between the Community Hall and Turner Drive/Blundy Street.
- Encourage some commercial development, particularly accommodation, to locate on Rural Activity Zoned land taking into account the need to respond to bushfire risks and the environmental values of the surrounding landscape.
- Encourage the re-development of the existing general store to provide additional floor space, an active street front and expanded provision of commercial services.
- Encourage and consolidate street based retailing in the form of cafes and outdoor seating on the eastern side of Grant Street.
- Upgrade existing pedestrian infrastructure including new footpaths along the eastern side of Grant Street to accommodate pedestrian access, seating and bicycle parking and ensure any new development is designed to activate the streetscape.
- Ensure land use and development does not detrimentally impact upon identified significant flora and fauna habitats, including areas of roadside vegetation.
- Support tourism related use and development within the town boundary taking into account the need to respond to bushfire risks and environmental values and to protect the amenity of nearby residential uses.

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Forrest Framework Plan



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21.03-8
18/07/2013
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Smaller Townships

Overview

It is important to protect the character of the smaller townships within the Shire, particularly those located along the spectacular Great Ocean Road and nestled within the majestic and beautiful Otway Ranges.

Township Master Plans (focussing on public infrastructure improvements) have been prepared for Carlisle River, Gellibrand, Forrest, Barwon Downs and Beech Forest. Urban Design Frameworks have been prepared for Beeac, Cressy, Lavers Hill and Swan Marsh. The Master Plans and Urban Design Frameworks identify urban design and built form opportunities to improve the presentation of these important centres in the municipality.

So as to improve the viability of small townships it is acknowledged that future planning needs to anticipate and respond to the needs of existing and future communities through provision of zoned and serviced land for housing, employment, recreation and open space, community facilities and related infrastructure.

The Rural Living Strategy 2011 highlights the role of small towns and settlements in supporting tourism and rural lifestyle demand.

The Rural Living Strategy 2011 also provides a strategic basis for future land use studies to investigate opportunities for small scale expansion within some of the Shire's small towns, including Alvie, Beeac, Cororooke, Gellibrand and Beech Forest. Gellibrand and Beech Forest's growth potential will be subject to an investigation into fire risk and effluent management issues.

Objectives

- To provide an attractive and safe residential environment within the smaller communities of the Shire.
- To encourage development of smaller townships in the Shire that contributes to their economic development, acknowledges and responds to environmental constraints and protects the broader landscapes within which these townships are located.
- To facilitate the ongoing economic future of small communities.
- To recognise the different roles of smaller townships and centres containing a range of community and other facilities.
- To maintain and enhance the environmental quality of small communities.

Strategies

- Ensure that development of the Shire's small communities occurs generally in accordance with relevant township masterplans, structure plans and other strategies.
- Encourage the development of small-scale economic activity which complements the resources and industries of the region.
- Encourage the location of tourist accommodation facilities within small communities in the region.
- Retain heritage places as significant components of the character and attractiveness of smaller townships.
- Encourage high quality design input to development in small communities.
- Maintain existing township zonings in Alvie, Cororooke and Beeac pending the preparation of town plans.

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- Maintain existing township zonings in Gellibrand and Beech Forest pending further strategic assessment of the potential for expansion having regard to bushfire risk and effluent management.
- Otherwise generally restrict the expansion of communities in potable water supply areas and areas subject to or at risk of landslip, high fire risk and flooding.
- Encourage the implementation of landscape features that recognise indigenous flora and fauna.

Specific Implementation

Policy guidance

Assess proposals in townships (other than Colac, Apollo Bay and Marengo) against the following criteria:

- Development should not exceed 8 metres in height, unless special characteristics of the site justify a higher structure and no off-site detriment is caused.
- Building site coverage should not exceed 50 per cent, except on business zoned land.
- The slope of the roof should relate to the topography of the surrounding landform. Dominant or multiple angular roof slopes and designs should be avoided.
- External building material colours should be of muted toning and roofing material should be non-reflective.
- External materials should be in harmony with the surrounding landscape of the settlement.
- Landscaping should enable development to blend into the surrounding area. This may be achieved by:
 - Using a mixture of low, medium and high growing native trees and shrubs, including some species of trees with a growing height above the roof level of the proposed building.
 - Providing replacement planting for vegetation that is removed.

When deciding on the design, siting, mass and scale of new development in townships (other than Colac, Apollo Bay and Marengo) consider, as appropriate:

- Whether it is a major development node or a settlement with limited development potential and only serving the immediate community.
- The visual character of the particular settlement and the likely impact of the development on that visual character.
- The view of the site from the Great Ocean Road and major viewing points in the Otway Ranges and the likely impact of the development on these views.

21.03-9

18/07/2013
C69

Rural Living

Overview

Council prepared and adopted a Rural Land Strategy (September 2007) which identified a range of issues affecting rural land use in the Shire, and has since adopted the Rural Living Strategy 2011. The Rural Living Strategy provides the basis for policy on the use and development of land for dwellings and subdivisions in rural areas. It identified the following in regards to rural living development within the Shire:

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- Rural land traditionally used for farming is being used for lifestyle purposes in the absence of land which can accommodate rural lifestyle demand. This is causing problems associated with increasing property values inhibiting farm growth, servicing, provision of infrastructure and conflict with adjoining land uses which has the potential to undermine the objective of protecting the agricultural base of the Shire.
- The greatest opportunities to accommodate rural living development are around Colac where there is greatest supply and fewest constraints for development.
- There are sufficient levels of services and infrastructure to accommodate demand for rural lifestyle development in Coragulac.
- There is scope to conduct investigations into the potential development of some smaller towns in the Shire to accommodate some moderate township expansion, which may contribute to the overall supply of land desirable for rural living purposes.

Objectives – Rural living

- To provide opportunities for rural residential style development in appropriate locations that do not negatively impact on the ability to farm.
- To recognise the function of already-developed old and inappropriate rural subdivisions as 'de facto' rural living developments;
- To restrict the intensification of existing old and inappropriate subdivisions and prevent the further encroachment of rural living development on surrounding farming land.

Strategies – Rural living

- Direct future rural living development to nominated areas where there are fewer economic, environmental, social, land use and servicing constraints for settlement.
- Recognise the function of already-developed old and inappropriate rural subdivisions as 'de facto' rural living developments.
- Restrict the development of existing old and inappropriate subdivisions through the implementation of lot sizes which limit further subdivision and prevent the further encroachment of rural living development on surrounding farming land.

COLAC OTWAY PLANNING SCHEME

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C78

SCHEDULE 17 TO THE DESIGN AND DEVELOPMENT OVERLAY

Shown on the planning scheme map as **DDO17**.

WYUNA ESTATE AREA

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C78

Design objectives

To provide a low fenced or unfenced rural landscape character along public open space reserves.

To ensure passive surveillance of public open space reserves.

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Buildings and works

A permit is not required to construct a building or construct or carry out works, other than a fence.

A permit is required to construct a fence that is:

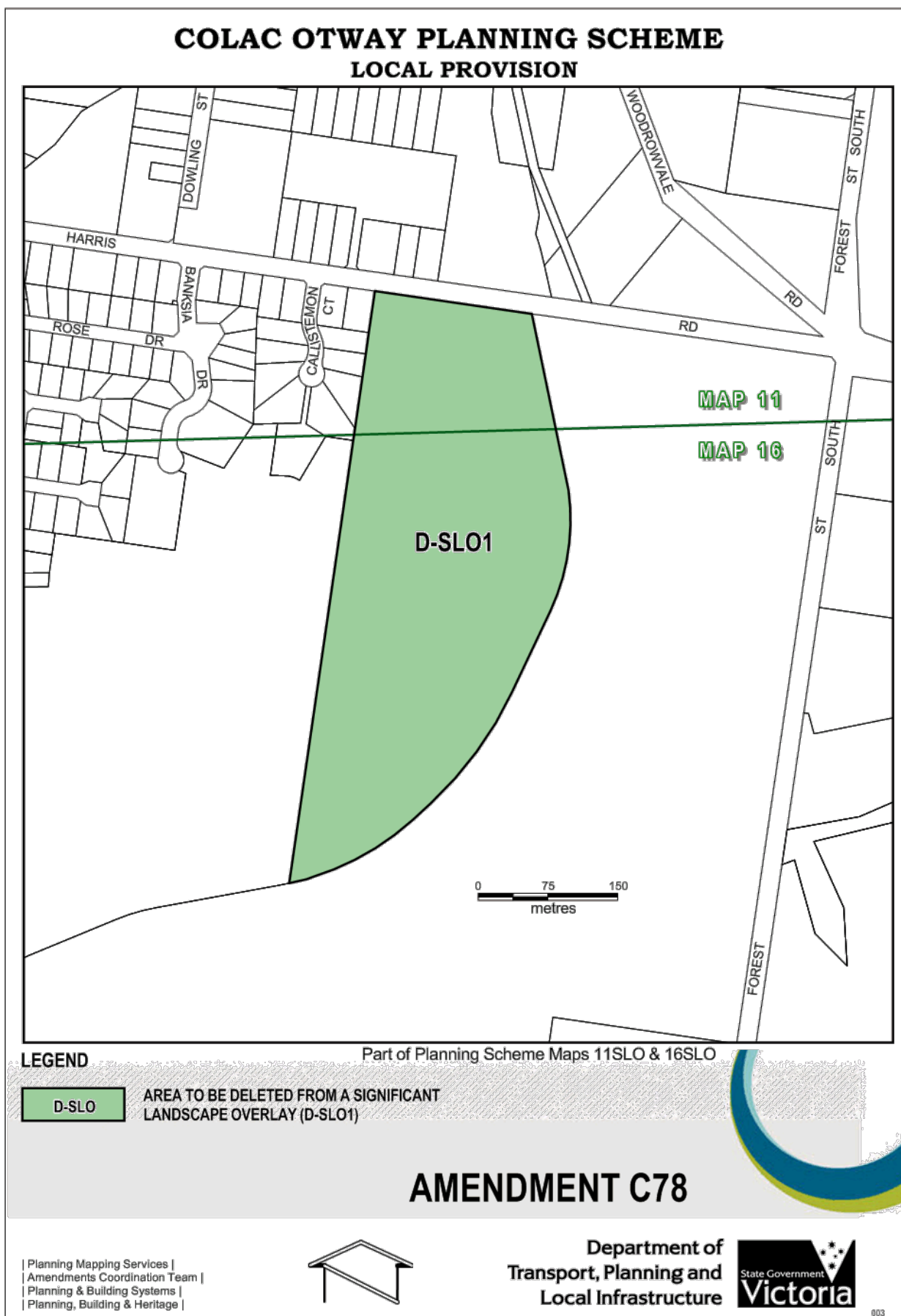
- more than 1.2 metres in height and located on or within 5 metres of a public open space reserve boundary, or
- constructed of materials which are less than 50 per cent transparent and located on or within 5 metres of a public open space reserve boundary.

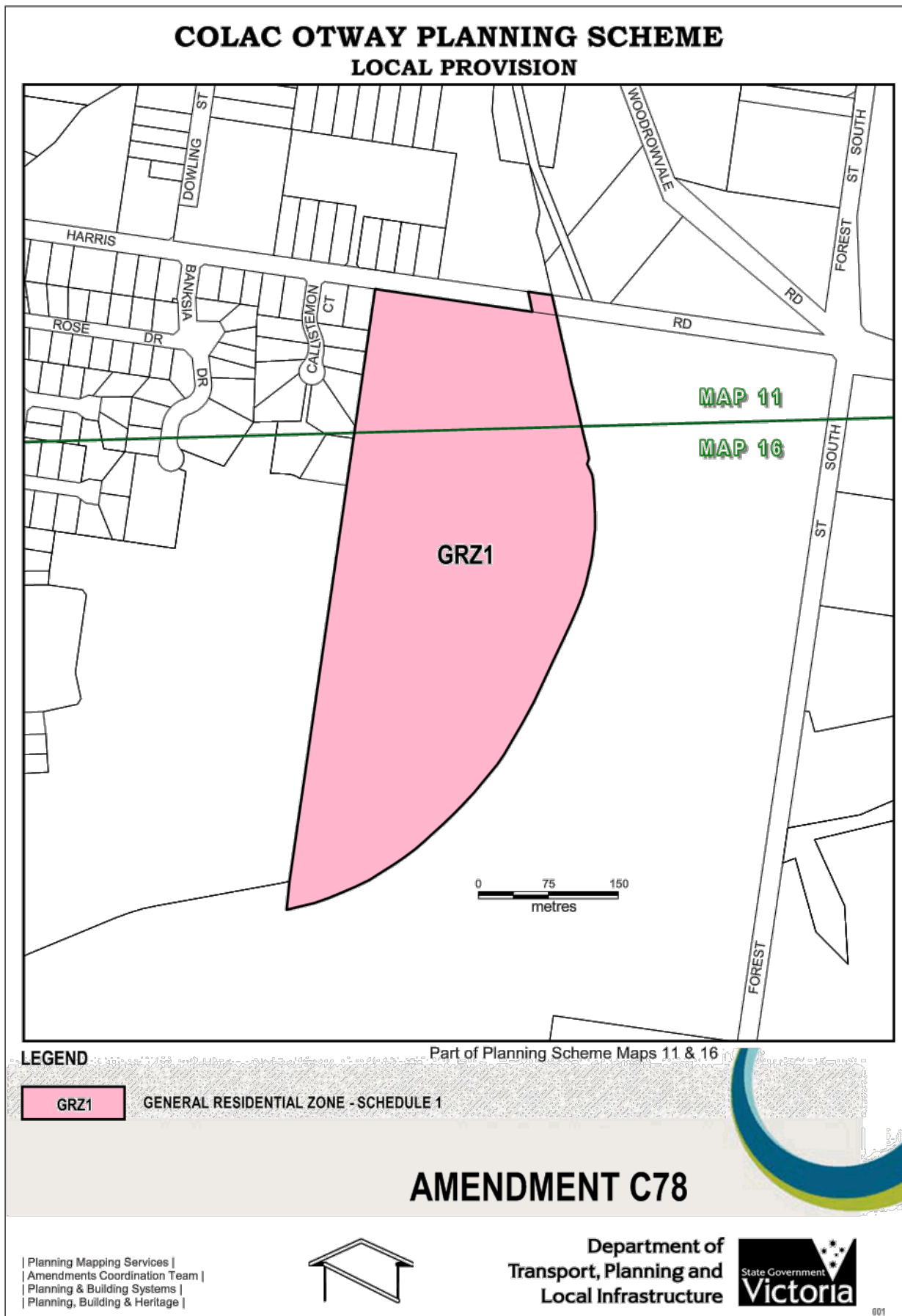
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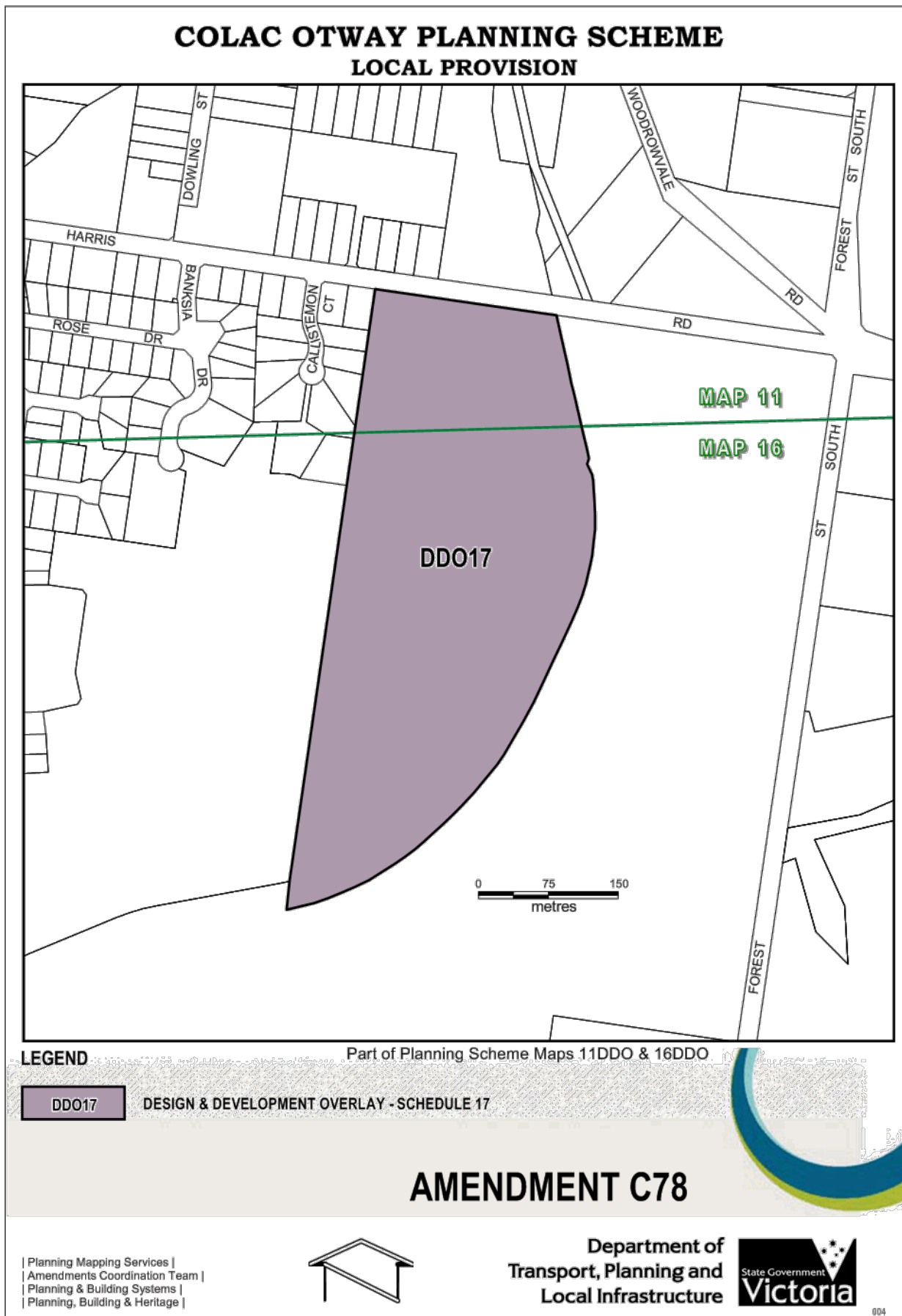
Decision guidelines

Before deciding on an application the responsible authority must consider:

- Whether the height and design of the proposed fence are:
 - Appropriate to facilitate passive surveillance of the public open space reserve.
 - Appropriate to the rural landscape character of the area.









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Colac Otway Shire Council Domestic Wastewater Management Plan Technical Document

July 2015

Prepared for: Colac Otway Shire Council



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Document Control Sheet

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| Project Manager: | Mark Saunders | | | | |
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| Synopsis: | This document has been developed to accompany and direct the Operational Plan (2015) to assist with detailed assessment of properties/parcels within the Shire to accommodate wastewater on-site. Together, both documents form the Domestic Wastewater Management Plan (DWMP). It provides additional detail and guidance on the relevant background documents (codes, policies, plans, legislation, regulations and standards) and the various constraints which impact upon or, is impacted upon, by domestic wastewater management (DWM) in the Shire. | | | | |
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Disclaimer

The information contained in this report is based on independent research undertaken by Whitehead & Associates Environmental Consultants Pty Ltd (W&A). To our knowledge, it does not contain any false, misleading or incomplete information. Recommendations are based on an appraisal of site conditions subject to the limited scope and resources available for this project, and follow relevant industry standards. The work performed by W&A included a limited system audit and site and soil investigation in addition to a desktop review, and the conclusions made in this report are based on the information gained and the assumptions as outlined. Under no circumstances, can it be considered that these results represent the actual conditions throughout the entire Shire due to the regional scale of this study.

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Document Certification

This Domestic Wastewater Management Plan has been prepared following the standards and guidelines set out in the following documents, where applicable:

- EPA Victoria (2013) Code of Practice – *Onsite Wastewater Management*;
- Department of Sustainability and Environment (2012) *Planning permit applications in open, potable water supply catchment areas*;
- EPA Victoria (2003) *State Environmental Protection Policy: Waters of Victoria*;
- EPA Victoria (2002) *State Environmental Protection Policy: Groundwaters of Victoria*;
- Municipal Association of Victoria (2014) *Victoria Land Capability Assessment Framework*, 2nd Ed; and
- AS/NZS 1547:2012 *On-site Domestic Wastewater Management* (Standards Australia/ Standards New Zealand, 2012).

To our knowledge, it does not contain any false, misleading or incomplete information. Recommendations are based on an honest appraisal of the sites' opportunities and constraints, subject to the limited scope and resources available for this project.

Supporting Author

Supporting technical contribution for this document was provided by Dr. Robert Van de Graaff (van de Graaff and Associates). Dr. Van de Graaff undertook detailed (field) soil investigation and has provided primary soil data and interpretation which has been utilised in the development of the methodology outlined in this document.

Whitehead and Associates Environmental Consultants

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Acronyms

| | |
|-------|---|
| AEP | Annual Exceedance Probability |
| ARI | Annual Recurrence Interval |
| AHD | Australian Height Datum |
| AWTS | Aerated Wastewater Treatment System |
| CMA | Catchment Management Authority |
| CA | Certificate of Approval |
| COS | Colac Otway Shire Council |
| DEM | Digital Elevation Model |
| DEPI | Department of Environment and Primary Industries (now known as DELWP) |
| DELWP | Department of Environment, Land, Water and Planning |
| DIR | Design Irrigation Rate |
| DLR | Design Loading Rate |
| DSE | Department of Sustainability and the Environment (former) |
| DSM | Decentralised Sewage Model |
| DWM | Domestic Wastewater Management |
| DWMP | Domestic Wastewater Management Plan |
| DWSC | Declared Water Supply Catchment |
| EPA | Environment Protection Authority |
| GIS | Geographic Information System |
| GMA | Groundwater Management Area |
| HPO | Health Protection Officer |
| LAA | Land Application Area |
| LCA | Land Capability Assessment |
| LGA | Local Government Area |
| LPED | Low-Pressure Effluent Distribution System |
| LRA | Land Resource Assessment |
| MAV | Municipal Association of Victoria |
| PIC | Plumbing Industry Commission |
| SEPP | State Environment Protection Policy |
| SILO | Scientific Information for Land Owners |
| VCAT | Victorian Civil and Administrative Tribunal |
| VVG | Visualising Victoria's Groundwater (Project) |
| WC | Water Corporation(s) |
| WMIS | Water Measurement Information System |
| WSPAs | Water Supply Protection Area(s) |

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1 Introduction

This document forms the Domestic Wastewater Management Plan (DWMP) together with the Operational Plan (2015), and has been prepared in order to assist with the detailed assessment of unsewered (developed and undeveloped) properties/parcels in the Colac Otway Shire municipal area (COS or "the Shire"). It provides additional detail and guidance on relevant background documents (codes, policies, plans, legislation, regulations and standards), an overview of on-site domestic wastewater management (DWM) within COS, the various constraints which impact upon or are impacted by on-site DWM, system sizing tables and DWM sensitivity analysis for locality and town/settlement prioritisation. The document also provides guidance for sustainable development in unsewered areas as detailed in the individual Locality Reports.

2 Council Policies and Plans

The DWMP has been developed to complement other Council policies and plans through the actions identified in the Operational Plan. The following is a brief outline of the various Council plans which have been included in the development of this DWMP.

2.1 Council Plan 2013 – 2017

Council's Vision Statement applies to all Council policies including the DWMP. The Vision of COS is:

"A sustainable community with a vibrant future" (COS, 2013)

The Vision and Mission statements will be achieved by implementing the five values of Council, respect, integrity, goodwill, honesty and trust; with the Council Plan structured around four key themes:

1. Good Governance – Ensure transparency of governance practices, the capability of our organisation and effective resource management;
2. A Planned Future – Facilitate the growth, liveability and development of the Shire and encourage innovation and efficiency in the local economy;
3. A Place to Live and Grow – Improve access to buildings, spaces, services and education to support and enable quality of life; and
4. A Healthy Community and Environment – Respect cultural differences, support a diverse range of healthy and creative activities, foster community safety and promote environmental sustainability.

The Council Plan outlines outcomes which must be achieved in line with the key values; these outcomes will be aligned with the DWMP.

2.2 Municipal Public Health and Wellbeing Plan 2013 – 2017

The Colac Otway Shire Municipal Public Health and Wellbeing Plan aims to enhance the health and wellbeing of the residents of COS. The main priorities in this plan are categorised into the following themes: embed key health and wellbeing enablers, plan for an ageing population, reduce significant levels of disadvantage in early years, increase levels of physical activity, protection through public and environmental health, support healthy eating and food security, support mental health and connectedness, prevention of violence against women and children, support healthy behaviours, and reduce harm from alcohol, tobacco and other drugs.

2.3 Colac Otway Planning Scheme

The Colac Otway Planning Scheme, approved under the *Planning and Environment Act 1987*, sets out planning policies for the municipality, and contains information about zones, overlays and other provisions which affect how land can be used and developed in COS. It identifies triggers for planning permit applications, and outlines application requirements and decision guidelines for the use, subdivision and development of land in the different zones.

On land where DWM is required, a planning application may need supporting information such as a Land Capability Assessment (LCA) to show that the property/parcel can accommodate a DWM system. Almost all applications within DWSCs must be referred to the relevant Water Corporation (WC). If the WC objects to the application, it must be refused by Council.

Under Section 173 of the *Planning and Environment Act 1987*, Council can enter into a legal agreement with the owner of land in its municipality, with the agreement binding the owner to the covenants specified in the agreement. Such S173 agreements can be used to prohibit, restrict or regulate the use of land, or can relate to conditions subject to which the land may be used or developed for specified purposes. A Planning Permit condition can require the owner to enter such a legal agreement, which is subsequently registered on the title of the property. Such a legal agreement may be required by Council or the WC's when planning applications are located within a DWSCs. In such cases, the Section 173 agreements often contain maintenance requirements for DWM systems, which on the sale of a property, transfer to an incoming owner.

2.4 Rural Living Strategy 2011

Council adopted a Rural Living Strategy in 2011 which considered the development potential of smaller towns/settlements in the municipality. The towns of Forrest, Birregurra, Beeac, Alvie, Cororooke and Coragulac were all identified as having moderate growth potential. Gellibrand, Lavers Hill and Beech Forest had "deferred" growth potential due to potential bushfire and water catchment constraints.

2.5 Council Budget

The Council Budget sets out finances for all Council projects and their management. To implement the DWMP, the Budget will need to provide scope for the management of the audit and inspection program required as part of the DWMP. The Budget currently allocates fees and charges for Septic Tank Permits. These fees and charges cover resources required to assess, discuss, permit the installation, inspect, and approve the use of new and modified systems. Council will need to consider options for implementing appropriate ongoing fees and charges for all unsewered properties to provide resources to undertake Actions and programs within the Operational Plan.

3 Legislation and Regulation

3.1 Legislation

3.1.1 Local Government Act 1989

The *Local Government Act 1989* outlines the provisions under which Council operates and empowers Councils to have local laws and regulations for DWM. The *Local Government Act 1989* empowers Council to enact local laws and set special charges for Council activities. Council can use these powers to develop local regulations for wastewater management, as long as these regulations are consistent with state policy and legislation and to raise revenue for its wastewater management programs.

3.1.2 Environment Protection Act 1970

The Environment Protection Act 1970 is used to regulate DWM systems.

Sections 53J – 53O of the Act deal with the requirements for permits and conditions of approval for the installation of DWM systems. Specifically the Act outlines the following requirements:

- A permit must be issued for the construction, installation or alteration of a septic tank system;
- An application for a permit is made by an owner to the Council and must be in accordance with the manner approved by Council;
- The application must be accompanied by plans and specifications of the proposed septic tank system. Specifications of the proposed treatment method are also to be provided;
- A person must comply with a permit and any conditions to which it is subject;
- The system must not be used until Council has issued a certificate approving the systems use;
- The occupier of premises on which a septic tank (DWM) system is installed is to maintain the system in accordance with the conditions of the permit for the system; and
- A person who applied for a permit, or the occupier of premises on which a DWM system is installed is liable to fines issued by Council if non-compliance with an installation permit is identified by Council.

Section 53 also states that the Council must lodge with the Environment Protection Authority (EPA) at the end of each financial year a report containing details of the following:

- Details of the number of permits issued for septic tank systems;
- The number of septic tank systems disconnected; and
- The number of septic tank systems which have been in use within the municipality during the financial year.

Part I Section 1B – 1L of the Act also requires that any application must have regard to the principles of environment protection, which include:

- Principle of integration of economic, social and environmental considerations;
- The precautionary principle;
- Principle of intergenerational equity;

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- Principle of conservation of biological diversity and ecological integrity;
- Principle of improved valuation, pricing and incentive mechanisms;
- Principle of shared responsibility;
- Principle of product stewardship;
- Principle of wastes hierarchy;
- Principle of integrated environmental management;
- Principle of enforcement; and
- Principle of accountability.

It is also important to note the principles state that:

- Measures should be cost effective and proportionate to the risk;
- An assessment of risk-weighted consequences is undertaken;
- Persons who generate pollution and waste should bear the cost of containing, avoiding and abatement; and
- Managing the impact is a shared responsibility.

Part III Section 16 of the Act allows for the preparation of State Environment Protection Policy (SEPP); the two relevant SEPPs for DWM are SEPP Waters of Victoria and SEPP Groundwaters of Victoria.

3.1.3 Water Act 1989

Section 183 of the *Water Act 1989*, provides a Water Corporation (WC) with the power to inspect and monitor existing septic tank systems within their sewerage district, and if the system does not comply with the *Environment Protection Act 1970* and the *Public Health and Wellbeing Act 2008*, then the WC can require the owner to connect to the sewer where it is available under Section 147 of the *Act*.

3.1.4 Planning and Environment Act 1987

The *Planning and Environment Act 1987* is 'enabling' legislation, with more detailed planning matters dealt with by subordinate instruments under the Act, such as the Victorian Planning Provisions, planning schemes, regulations and Ministerial Directions. Key components of the planning framework established by the Act include:

- The system of planning schemes that sets out how the land may be used and developed;
- The VPP, which provide the template for the construction and layout of planning schemes;
- The procedures for preparing and amending the VPP and planning schemes;
- The procedures for obtaining planning permits under planning schemes; and
- The procedures for settling disputes, enforcing compliance with planning schemes and other administrative procedures.

Planning schemes set out how land may be used and developed, including the requirements for obtaining planning permits. Where domestic wastewater is required, a planning permit may

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need supporting information such as a Land Capability Assessment (LCA) to show that the development can accommodate a DWM system.

All applications within drinking water catchments must be referred to the applicable WC. If the referral authority objects to the application it must be refused by Council.

As noted in Section 2.3 above, Under Section 173 of the *Planning and Environment Act 1987*, Council can require the preparation of a legal agreement. These agreements are often requested by Council or the Water Authorities when planning applications are located within a Declared Water Supply Catchment (DWSC). The Section 173 agreements often contain maintenance requirements for DWM systems, which on the sale of a property transfer to an incoming owner.

3.1.5 Public Health and Wellbeing Act 2008

The *Public Health & Wellbeing Act 2008* lists types of nuisances which may be dangerous to health or offensive; these nuisances include those arising from water or any matter which is dangerous to health or offensive, including wastewater. Council has a duty under this *Act* to remedy as far as is reasonably possible all nuisances arising in the Shire, and it is an offence to cause or allow a nuisance to occur. Under this *Act*, Council must investigate all complaints relating to a nuisance or the illegal management of domestic wastewater and take action to rectify the nuisance where necessary. This can include a direction from Council to the owner of a DWM system to cease to operate and/or upgrade their DWM system, by issuing a Prohibition Notice and/or an Improvement Notice to the owner.

3.1.6 State Environmental Protection Policy Waters of Victoria

The SEPP Waters of Victoria provides a regulatory framework for the protection and management of surface water environments in Victoria. This SEPP has three main policy sections; beneficial uses, environmental quality objectives and attainment program. The SEPP aims to protect surface water for a number of reasons, including but not limited to, human consumption after appropriate treatment, human consumption of aquatic fauna, recreation, agriculture and aquaculture.

The discharge of domestic wastewater in a manner which could enter surface waters has the potential to impact on the use of the water for any of the beneficial uses described above. As such, the discharge of domestic wastewater must be in accordance with buffer distances outlined in the current EPA Code of Practice so as to minimise any potential negative impacts on surface waters.

Environmental quality objectives are used to indicate and measure if the beneficial uses are being protected. The use of water quality and biological indicators, flow measurement, sediment quality and habitat indicators can be used in accordance with the policy to determine if the surface waters have been affected. The SEPP indicates the roles and responsibilities, and details actions and tools, for the protection of surface waters in Victoria.

This policy is used for assessing effluent disposal areas and in preparing LCAs. Clause 32 (b) allows EPA guidance and the current EPA Code of Practice to be mandatory. The policy requires regulatory authorities to assess the suitability of land with reference to EPA Publication 746.1 – Land Capability Assessment for On-site Wastewater Management and to ensure that permits comply with EPA Code of Practice and all EPA publications and bulletins.

3.1.7 State Environmental Protection Policy Groundwaters of Victoria

The SEPP Groundwaters of Victoria provides a regulatory framework for the protection and management of groundwater environments in Victoria. The reuse of domestic wastewater on-site can impact on groundwater via deep drainage. Careful design of systems can ensure impacts are minimised so that groundwater resources are not affected. The SEPP indicates the roles and responsibilities, and details actions and tools, for the protection of ground waters in Victoria. This policy requires effluent disposal to be carried out so as to protect groundwater. The preparation of a LCA must consider the potential impact, if any, on local and regional groundwater resources.

3.1.8 Victorian Building Regulations 2006

Under Part 8 of the Regulations (Building work in special areas), Clause 801 (Septic tank systems) applies as follows:

(1) The report and consent of the relevant council must be obtained to an application for a building permit that requires:

- (a) the installation or alteration of a septic tank system; or
- (b) the construction of a building over an existing septic tank system.

(2) The report and consent of the relevant council need not be obtained to an application for a building permit referred to in sub-regulation (1) if a permit for the construction, installation or alteration of the septic tank system that is relevant to the application has been issued under Part IXB of the Environment Protection Act 1970.

3.2 Regulatory Authorities

3.2.1 Council (Colac Otway Shire Council)

Council is responsible for issuing permits for new DWM systems under the *Environment Protection Act 1970*. Council is also responsible for the management of all DWM systems within the Shire; this includes the inspection of existing systems and ensuring compliance with Council and EPA requirements. The legal requirements of Council include:

- Council must issue a permit to install/alter before a DWM system can be installed;
- Application for a permit to install/alter must be completed by the owner/builder/installer and submitted to Council for assessment;
- A Council officer assesses application and plans and conducts site inspections. Further information may be requested from applicant;
- Permit to install issued with approved plan and conditions;
- System must comply with permit conditions and relevant EPA Certificate(s) of Approval;
- System is inspected by a Council officer during installation; and
- Council must issue a permit of use before the system can be used.

In addition, Council can enforce upgrades of systems which are failing and potentially causing human or environmental health impact. This is discussed further in the Operational Plan of the DWMP.

3.2.2 Environment Protection Authority Victoria (EPA)

EPA Victoria regulates what types of DWM systems are approved for use. Manufacturers must seek a Certificate of Approval (CA) of their system prior to releasing it on the market in Victoria. The EPA has a full list of all systems approved for use. The EPA has recently identified the need to reform its administration of the on-site wastewater management program. It intends to remove the requirement for individual treatment systems to hold an EPA Certificate of Approval and instead, will only approve types of systems (e.g. Aerated Wastewater Management Systems) rather than manufactured models as required by the *Environment Protection Act 1970*. From 1st July 2015, all existing CAs will be transformed to "interim certificates of compliance" valid until the reform is completed (target date 1st January 2016).

The EPA has developed policies and Codes of Practice to regulate the use of DWM systems. These policies and codes include:

- SEPP Waters of Victoria;
- SEPP Groundwaters of Victoria;
- EPA 891.3 Code of Practice – Onsite Wastewater Management, 2013;
- EPA 746.1 Land Capability Assessment – Onsite Wastewater Management, 2003; and
- EPA 760 Guidelines for Aerated Onsite Wastewater Treatment Systems.

The EPA is responsible for the following activities related to wastewater management:

- Issue CAs for each DWM system type;
- Approval of commercial wastewater management systems with wastewater loading in the range of 5,000-100,000L/day (EPA Works Approval, as discussed in the Operational Plan);
- Licencing commercial wastewater management systems with wastewater loading above 100,000L/day, and systems which discharge effluent to surface waters (as discussed in the Operational Plan);
- Inspection of licenced commercial wastewater management systems and review of Annual Performance Statements for licenced commercial wastewater management systems;
- Compliance and enforcement activities for commercial wastewater systems;
- Developing policies and Codes of Practice;
- Provision of technical advice to Councils, owners and installers; and
- Possible referral authority for subdivisions.

3.2.3 Plumbing Industry Commission (PIC)

- Licenses all plumbers, drainers and septic tank installers across Victoria; and
- Regulates the installation of all plumbing works including internal plumbing works on septic tank systems.

3.2.4 Municipal Association of Victoria (MAV)

MAV has developed a model LCA report and procedures for undertaking a LCA, to assist land capability assessors and regulators. This has been developed in accordance with EPA Codes and AS/NZS 1547:2012.

3.2.5 Water Corporations

Water and sewerage services within COS are provided by Barwon Water, with water also supplied by Southern Rural Water to the north of the Shire and by Wannon Water to the Carlisle River town. This DWMP covers areas where reticulated sewer service is not provided by Barwon Water and, hence, are unsewered.

The WCs have interest in protecting the DWSCs which are susceptible to impact from DWM systems. Both Barwon Water and Wannon Water are statutory referral authorities under the *Planning and Environment Act 1987* for planning applications in the DWSCs within the southern region of the Shire. Where specified development or subdivision is proposed within a DWSC, the proposal must be referred to the relevant WC for assessment prior to Council issuing a planning permit. There are two types of referral authorities – a determining referral authority, which has the power to require a permit application to be refused or for certain conditions to be included in a permit, and a recommending referral authority, which can only comment on an application. Responsible authorities must consider the comments made by a recommending authority, but are not obliged to refuse the application or to include any conditions required by the authority. However, a recommending referral authority is able to seek a review at VCAT if it objects or it requests conditions that are not included by the responsible authority in the permit.

Clause 66 of the COS Planning Scheme identifies which authorities are determining authorities and which are recommending authorities. The schedule to Clause 66.04 of the COS Planning Scheme lists Barwon Water and Wannon Water (Water Authorities) as determining referral authorities in the DWSC areas along with Southern Rural Water within the Warrion Water Supply Protection Area. Corangamite CMA is the only recommending authority listed.

Where existing DWM systems are located in an area that has sewer available, the WC can require the property be connected to sewer if the system is found to be causing a health or environmental risk.

3.2.6 Department of Environment, Land, Water and Planning

The Department of Environment, Land, Water and Planning (DELWP) (formerly known as the Department of Environment and Primary Industries) is responsible for the management of water resources, climate change, bushfires, public land, forests and ecosystems in Victoria. The DELWP may be consulted by Council for specialist advice where a DWM system may impact on land or water resources.

3.2.7 Catchment Management Authority

COS falls within the Corangamite Catchment Management Authority (CMA) and has a large catchment area for a number of different water resources. Where DWM systems exist within sensitive catchments, close examination of a system, its operation and performance must be undertaken to ensure the protection of the asset. The CMA has policies and management tools to assist with the management of the waterways. The role of the CMA is:

- To ensure the sustainable development of natural resource based industries;
- To maintain and where possible, improve the quality of land and water resources;

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- To conserve natural and cultural heritage;
- To involve the community in decisions relating to natural resource management within their region;
- To advise on matters relating to catchment management and land protection and the condition of land and water resources in the region; and
- To promote community awareness and understanding of the importance of land and water resources, their suitable use, conservation and rehabilitation.

3.3 Administrative Authorities

The Victorian Civil and Administrative Tribunal (VCAT) is a tribunal at which civil disputes, administrative decisions and appeals can be heard before a Judge or Tribunal Member. It provides a dispute resolution service for both government and individuals within Victoria.

In recent cases VCAT has questioned the quality of LCAs for DWM, particularly where a site is located within a DWSC. VCAT has also questioned the rigour of Council evaluation of these LCAs, and how the minimum development guideline of 1 dwelling per 40 hectares should be applied in the DWSC.

3.4 Standards and Guidelines

3.4.1 EPA Code of Practice – On-site Wastewater Management

The EPA Code of Practice On-site Wastewater Management Publication 891.3 (EPA, 2013) outlines the measures which are required to sustainably manage household wastewater so as to minimise public health and environmental impacts. This Code is not limited to DWM systems; it also applies to systems at other premises including small scale commercial systems. The Code outlines planning requirements, system selection and system maintenance following installation.

3.4.2 Model Land Capability Assessment (2014)

The Municipal Association of Victoria Model Land Capability Assessment (2014) was revised to reflect the requirements of the current EPA Code of Practice and also provides further details on in-soil effluent assimilation processes and their influence on system design.

3.4.3 Land Capability Assessment (2003)

The Land Capability Assessment On-site Wastewater Management Publication 746.1 (2003) outlines the process to be undertaken when assessing a site for its suitability for DWM. An LCA must be conducted by a suitably qualified consultant experienced in on-site domestic wastewater land capability. Land capability assessors should follow the conservative and 'best practice' Model LCA Report (MAV, 2014). Council's role is to assess the land capability and risk assessment report, flow rates, land application calculations and design; it is not part of Council's role to undertake the calculations or design the land application system for the property owner.

3.4.4 AS/NZS 1547:2012 On-site Domestic Wastewater Management

AS/NZS 1547:2012 provides standardised guidance for the sizing, design and construction of Land Application Areas (LAAs). If there is an inconsistency between the Australian Standard (2012) and the current EPA Code of Practice, the Code takes precedence. Where the current EPA Code of Practice is silent on a topic, the relevant Australian Standard (2012) should be followed.

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The Standard will be used to inform the selection of a suitable land application system, and where the standard sizing tables are not used, will inform the sizing of land application systems.

3.4.5 AS/NZS 3500:2003 Plumbing and Drainage

The Plumbing and Drainage Standard *AS/NZS 3500:2003* must be complied with for the installation of all plumbing work conducted on site.

Any design solution should be fitted and installed by a licensed plumbing contractor in compliance with the requirements of the Australian Standard (2003).

4 Overview of DWM in Colac Otway Shire

4.1 The Local Environment

Colac Otway Shire is characterised by a unique environment including DWSCs covering approximately 30% of the Shire in the central region, large expanses of bushland and farmland, natural waterways and complex soils which all affect the way wastewater is managed on-site. There is lush hinterland, fertile grasslands, wetlands, rolling hills and volcanic cones. There are a number of State and National Parks in the Shire; notably, the Great Otway National Park and Otway Forest Park. The Shire contains three defined river Basins; Barwon, Corangamite and Otway Coast.

The Shire's major urban centre is Colac, with Apollo Bay being the other main centre in the south of the Shire. Most of the residential and commercial development outside of these towns exists within numerous small to medium sized towns/settlements, the majority unsewered. Public Conservation and Resource Zones have been designated, particularly along the coastline and the southeast of the Shire, with some areas near the coast also in the Rural Conservation Zone. The Shire also has a significant percentage of land in Farming Zone, particular in the northern half of the Shire.

The diverse landscapes and climate patterns of the Shire present different opportunities and challenges for DWM. The constraints mapping (Section 6) describes in detail the different physical characteristics which are of most importance for sustainably managing treated effluent on-site, namely: climate, soils, slope, useable lot area and current Planning Scheme zone minimum lot size compliance.

4.1.1 Declared Water Supply Catchments

The Shire is drained by a number of large and small waterways, some of which enter the main drinking water supply for the Shire and surrounding regions. The protection of these waterways falls under the SEPP Waters of Victoria (2003). The active management of DWM systems in these special areas can help minimise any impacts on the surrounding environment.

The Shire incorporates a number of Declared Water Supply Catchments (DWSCs):

- Barwon Downs Wellfield Intake;
- Barham River;
- Gellibrand River;
- Gellibrand River South Otway;
- Upper Barwon;
- Pennyroyal Creek;
- Matthews Creek; and
- Gosling Creek.

These catchments provide drinking water to supply systems that are managed by Barwon Water and Wannon Water.

4.1.2 Soils

Site and soil investigations and sampling were conducted by Whitehead & Associates and Robert Van de Graaff & Associates on two separate occasions within the targeted localities and towns/settlements to compare against the soil mapping collated by Robinson *et al.* 2003 LRA. The results were documented and adjusted accordingly in the soil suitability constraint mapping detailed in Section 6.2.6.

The geology and inherent soils of the Shire are separated into 3 distinct regions; the Volcanic Western Plains in the north underlain by extrusive igneous geology, a central region between Colac and Gellibrand that is underlain by variable geology including both marine, non-marine sedimentary and alluvial deposits, and the Otway Ranges which are part of the Otway Group and consist of non-marine sedimentary geology. Within the rural region in the north of COS, soils are predominantly gradational and texture contrast soils with clay subsoils derived from volcanic (basalt) lithology of the Western Volcanic Plains. The soils within the Otway Ranges are predominantly gradational soils with clay loam to loamy sand subsoils, while variable soil types occur within the central and coastal regions of the Shire. The specific soil types for the targeted localities and towns/settlements are discussed in the individual Locality Reports.

4.1.3 Climate

Climate, specifically rainfall and evaporation, plays a significant role in determining the appropriate loading rates of effluent and associated sizing of land application areas for DWM. The Shire was found to consist of four (4) distinct climate zones based on the climate analysis detailed in Section 6.2.2. The higher rainfall and low evaporation in the cooler months makes DWM problematic in all four climate regions.

4.1.4 Bushfire

Bushfire risk areas are not incompatible with DWM; however bushfire risk has implications for planning town/settlement areas or allowing single dwellings, and can preclude residential intensification in certain areas.

4.2 DWM Systems and Trends in Colac Otway Shire

There are approximately 17,994 properties and 24,574 parcels within the Shire as of July 2015. The towns which are currently sewered are Colac, Apollo Bay, Skenes Creek, Marengo and Birregurra (currently undergoing sewer connections), resulting in approximately 8,801 properties/parcels that are currently sewered. There are approximately 8,803 unsewered properties/parcels which are not located within reasonable distance to a sewer, or to which no sewer connection exists; although it is not known how many of these are developed. All non-developable properties/parcels (i.e. National Park, State Forest, waterway or road) were not included in the unsewered property/parcel count and subsequent analyses.

Of those 8,803 properties/parcels, there are approximately 2,850 properties/parcels for which a DWM system is registered on Council's permit management system. It is expected that there are a number of properties/parcels within the Shire which have DWM systems which are unknown to COS, either constructed without a permit, before permits were required, or where continuity of records has been interrupted during amalgamation. It is also expected that there are some properties/parcels with DWM systems with permits which are not recorded in the Council's current record system. Therefore all of these numbers are approximate.

Historically, greywater was managed separately to blackwater and permitted to discharge off-site. Council no longer permits off-site discharge of greywater; however, there will be a number

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of systems still operating in this manner. The majority of older systems include a conventional septic tank (typically cylindrical, laid horizontally) with conventional absorption trenches. These can operate effectively in many cases; however, they do require regular maintenance. Common practice with these systems in Victoria is to bury the septic tank underground. Thus, the septic tanks are often difficult to locate and many property owners cannot locate them. This typically results in inadequate maintenance of the septic tank and in particular inadequate desludging. Without periodic desludging (every 3-5 years depending on occupancy), tanks become overloaded with solids and do not provide adequate residence time for effluent to enable suspended solids to settle out. These solids then carry over to the land application system (typically an absorption trench) and usually cause the soil to block up over time, causing failure of the trench and surcharge of effluent to the ground surface.

Newer systems installed in COS tend to provide higher levels of treatment through the use of AWTSSs, sand filters or greywater treatment systems, and no longer discharge greywater separately. These systems provide secondary treatment of the wastewater before discharge to LAA irrigation systems. These systems do require more maintenance than a septic tank and servicing every three months is a requirement for EPA approval.

Considering the date of issue of many of the permits, there may be a large number of systems operating which do not meet current Council or EPA requirements. Within the 9 months between the end of 2014 and July 2015, there have been 8 notified complaints to Council regarding DWM systems and associated land applications, with two of these referring to connection to sewer and stormwater issues. It is expected that issues may be identified with systems and works required to repair or upgrade systems, through the Council inspection program (see Section 7.4 of the accompanying Operational Plan). For a number of reasons, there are a large number of unknown system types; however, this is generally not an indication of poor performance of these systems.

Table 1 and Table 2 below provide a summary of the treatment and land application system types known in the Shire. The data was provided by COS (current August 2014) and represents currently registered DWM systems within COS's permit management system.

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Table 1: DWM System Types

| System Type | System Brand | Number of Systems Inspected |
|--|---------------------------------------|-----------------------------|
| Septic Tank | Unknown | 1,143 |
| AWTS | Unknown | 32 |
| | AquaNova | 38 |
| | Aquacycle | 3 |
| | Aquatreat | 3 |
| | Biocycle | 15 |
| | Biolytix | 13 |
| | Clearwater Bio-Filter | 2 |
| | Diston Bio-Rotor | 1 |
| | Econocycle | 27 |
| | Envirocycle | 20 |
| | Envirosepp | 186 |
| | Nova Clear | 3 |
| | Ozzi Kleen | 194 |
| | Ozzi Kleen greywater treatment system | 15 |
| | Septech | 29 |
| | Supertreat | 1 |
| | Taylex | 30 |
| | 20EP Sewage Plant | 2 |
| Composting | Biolet composting | 1 |
| | Clivus Multrum | 3 |
| | Ecolet | 1 |
| | Rota-loo | 3 |
| Sand Filter | Sand Filter | 280 |
| Other | Constructed Wetlands Reedbed | 1 |
| | Unknown | 1 |
| Worm Farm | A&A Worm Farm | 30 |
| | Unknown | 1 |
| Unknown | Unknown | 770 |
| Total (includes split treatment systems for blackwater & greywater) | | 2,848 |

Table 2: Land Application Methods

| Effluent Disposal Method | Number of Systems |
|---------------------------------|--------------------------|
| Drip Irrigation | 237 |
| Irrigation | 85 |
| Pressure Irrigation | 45 |
| Subsurface Irrigation | 368 |
| Trench | 600 |
| Transpiration Bed | 3 |
| Reln™ Drains | 2 |
| As Per Plan | 18 |
| Unknown | 1,482 |
| Total | 2,841 |

To date, 100% of systems with a permit in the Shire have been inspected by Council staff at least once. However, older systems without a permit, and those where tanks are buried and not able to be located, may not have been inspected by Council staff, either at the time of installation or since. Therefore there is a 'backlog' of systems that require inspection.

An important component of the inspection program is follow-up and compliance where rectification works have been required to improve system performance. It is important that Council ensures that rectification works (as ordered by Council) have been effectively undertaken.

The continuation and improvement of the audit and inspection program(s) requires appropriate resourcing. It is also recommended that the DWM Sensitivity Assessment results are used to inform inspection scheduling, with higher-risk properties prioritised early in the five-year program. The compliance monitoring program is detailed further in Section 7.4 of the Operational Plan.

4.3 DWM System Inspections in Drinking Water Catchments

Site assessments were undertaken for a representative sample of properties in unsewered towns/settlements located in the Declared Water Supply Catchments (DWSCs) in September 2014. Approximately 10% of permanently-occupied households in selected towns/settlements were inspected, encompassing a typical range of land sizes. The results are considered to be broadly reflective of the towns/settlements assessed.

4.3.1 Wastewater Treatment Systems

The proportion of combined (blackwater + greywater) wastewater systems was often higher than expected, as well-established rural localities and associated towns/settlements commonly

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have separate greywater and blackwater systems. The newer houses (<20 years) were more likely to have combined systems than older houses (>20 years).

Regardless of whether blackwater and greywater streams were separate or combined, septic tanks were often unsatisfactory in terms of accessibility for maintenance, capacity and/or structural integrity. Frequently, septic tanks were buried under more than 150mm of soil, making identification and access difficult and in some cases, the resident/owner was not aware of the septic tank location. Most systems had not been serviced or pumped out within the past 10 years. Many septic tanks allowed stormwater ingress through cracks or gaps alongside the lids, which were typically installed at or below ground level.

There were relatively few secondary treatment systems or greywater treatment systems installed at the inspected properties.

4.3.2 Effluent Disposal Systems

Where greywater was managed separately, it was typically directed off-lot, either to the street drain at the front or beyond the back fence (to neighbouring public land or private agricultural land). Due to the cool weather and high rainfall of the inspection period (early spring), effluent did not drain away and was often present in stagnant odorous pools near the point of discharge. In many cases, the direct flow path to nearby surface waters, including drains, creeks and rivers, was less than 100m, posing a high risk to public and environmental health.

Blackwater or combined effluent septic tanks typically discharged to conventional absorption trenches. It was often difficult or impossible to determine the dimensions and layout of trench systems, particularly as wet weather did not cause preferential growth of grass over trenches (as is the case in drier seasons). However, it was evident that many if not most trenches were undersized for the expected wastewater load (number of bedrooms), particularly when the age and potential for 'creeping failure'¹ of the system is taken into account.

However, the existing trenches may be acceptable for the typically small number of occupants of most households (an average of approximately 2 – 2.5 across the Shire, according to ABS 2011 Census data); in which case upgrades may not be immediately necessary.

¹ Refers to the progressive clogging of a soil absorption (trench) system along a linear front from the loading end to its terminus.

5 Preliminary Data Collection (Stage 1)

The following section details data acquisition undertaken for the project and used to process information for input into the Sensitivity Analysis. Section 4.1 of the Operational Plan details the methodology and results of the Sensitivity Analysis and overarching Risk Assessment Framework. The background legislative/regulatory requirements are discussed above in Sections 2 and 3.

5.1 Data Acquisition

Geographic Information System (GIS) data, covering a wide variety of physical and planning components, has been acquired from COS, the Department of Environment, Land, Water and Planning (DELWP), Wannon Water, Barwon Water, Southern Rural Water, FedUni, Visualising Victoria's Groundwater (VVG) Project by University of Ballarat and the former Department of Sustainability and the Environment (DSE).

The data obtained included: property and parcel (for targeted localities only) information (cadastre), roads, local government area (LGA) and locality boundaries, sewer network, septic system information, topography, LIDAR, planning scheme zonings and overlays, surface elevation contours (a range of levels), hydrology and drainage, potable reservoirs and offtake points, climate data including rainfall and evapotranspiration, flood prone land (land subject to inundation), 1 in 100 year annual recurrence interval (ARI) flood level, soil landscape, lithology and land system information, groundwater bore locations and information, watertable depths and potable water catchment boundaries. All data was received during late 2014, except for the parcel cadastre layer which was updated as of June 2015.

The GIS data supplied was used for the development of individual constraint maps, informative maps and overlay maps of the Shire. This information provided a comprehensive basis for risk assessment.

5.2 Property and Parcel Characterisation

Using cadastral data supplied by Council, the analysis identified approximately 17,994 'properties', comprising of 24,574 'parcels' within the Shire. For analysis presented throughout the DWMP, the parcel dataset was used within the targeted localities and associated towns/settlements, with the property dataset used for the remainder of the Shire.

All non-developable properties/parcels (i.e. National Park, State Forest, waterway or road etc.) are not included in the unsewered property/parcel count and subsequent analyses in the DWMP. Towns which are currently sewerred, including Colac, Apollo Bay, Skenes Creek, Marengo and Birregurra (currently undergoing sewer connections), account for approximately 8,801 properties/parcels within the Shire and have also been excluded from the analysis.

Further, parcels that were <400m² in area were excluded from the analysis as they represent a land area too small to sustainably accommodate unsewered development (building/associated improvements and DWM) on-site. These areas most likely represent dataset irregularities (i.e. artefacts) or Council or utility sites. There were 246 parcels excluded from further sensitivity analysis within the targeted localities. If necessary, assumptions can be drawn from the constraints of the surrounding properties/parcels.

Based on the raw dataset, and the exclusions described, there are approximately 8,803 unsewered properties/parcels which are not located within reasonable distance to a sewer, or to which no sewer connection exists; although it is not known how many of these are developed.

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The regions excluded from analysis as outlined above are shown as white regions (cadastre) on the subsequent Constraint and Sensitivity Analysis maps.

Some discrepancies may be found between other published total property/parcel numbers and those used, due to issues associated with lot amalgamation and subdivision over time and the current version of cadastre provided by the Council. The cadastre dataset used in this analysis will be progressively updated by Council to include the changes made to the properties/parcels within the Shire overtime.

6 GIS Data Analysis (Stage 2)

6.1 Domestic Wastewater Management Constraints

The individual constraint maps were created using a GIS, through QGIS™, which applied constraint classes for a number of built constraints and land capability constraints, including site and soil parameters. Five constraints were selected, which when consolidated, contribute to assessing the overall land capability for DWM systems, and were used as an input into the Sensitivity Analysis. These were selected based on the availability of digital data, and in the light of experience gained in designing and auditing DWM systems. The discrete constraints selected were:

- Climate;
- Useable Lot Area;
- Current Planning Scheme Zoning Minimum Lot Size Compliance;
- Slope (surface elevation); and
- Soil Suitability.

Sensitivity Analysis mapping refers to all unsewered properties/parcels, irrespective of whether they are developed or not. Properties/parcels that were excluded from the Sensitivity Analysis included those, sewered, zoned Public Park and Recreation Zone, Public Conservation and Resource Zone, and Road Zone as per the COS Planning Scheme, and areas that are categorised as waterbodies in the soil landscape mapping.

Thematic informative maps were also generated for existing lot size, current planning scheme zoning, vegetation, and geology. A sensitivity overlay was developed for landslip hazard and depth to groundwater to assist in refining the final risk rating as necessary for each property/parcel as generated by the Risk Assessment.

There were other parameters that could have been considered in a more detailed constraint assessment; however, such data was not available for this Risk Assessment and the scope of the project did not permit its collection. Nevertheless, the constraints chosen were considered acceptable for the purpose of quantifying the constraints for the broad-scale Risk Assessment outlined in the Operational Plan (2015). The maps have been produced for use at a broad scale (~1:330,000) and the limitations of the data used in the creation of these maps for input in the Sensitivity Analysis must be recognised and is detailed in Section 4.1 in the Operational Plan.

6.2 DWM Constraint Mapping

6.2.1 Constraint Classification Framework

For each of the constraints mentioned above, the degree of constraint in relation to DWM for all properties/parcels within the Shire was assessed and individually assigned a constraint class that is then used as an input into the Sensitivity Analysis. The criteria used to determine constraint categories were based on previous constraint assessments for unsewered towns in Australia undertaken by W&A and relevant Australian and Victorian guidelines for DWM.

Table 3 provides a rationale for the interpretations that were used to derive the constraint classes. The constraint classes give guidance towards the DWM requirements as stipulated by Council. For existing DWM systems, the level of constraint will commonly reflect the level of

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challenge that has been experienced in managing the system. This information will help guide property owners and Council in the ongoing management of existing systems.

Table 3: Rationale for DWM Constraint Ratings

| Constraint Class | Description |
|------------------|---|
| Very High | The constraint is present at a very high level and this significantly restricts opportunities for sustainable DWM. Traditional systems are 'typically' not appropriate and a detailed site and soil evaluation would be required to determine if DWM is achievable at all. If achievable, specialised, advanced treatment and land application systems may be required to overcome the constraint. |
| High | The constraint is present at a high level and this substantially restricts opportunities for sustainable DWM. Traditional systems (i.e. septic tanks and trenches) are 'typically' not appropriate and a detailed site and soil evaluation would be required to determine if they are supported. Otherwise specialised, advanced treatment and land application systems may be required to overcome the constraint. |
| Moderate | The constraint is present at a moderate level and this limits the range of DWM options that are appropriate for the site. A detailed site and soil evaluation is required to identify the most appropriate DWM system and mitigation measures to be employed. |
| Low | The constraint is present at a low level and is unlikely to substantially limit opportunities for DWM. In most cases appropriately designed and managed conventional systems will be acceptable. |

6.2.2 Climate

Climate, specifically rainfall and evaporation, plays a significant role in determining the appropriate loading rates of effluent and associated sizing of land application areas for DWM. The climate feature of most interest to DWM is the excess of rainfall over evaporation (more specifically evapotranspiration), which is denoted here as "moisture surplus". Moisture surplus can result in surface runoff, an increase in soil moisture storage (up to saturation point), and increasing deep infiltration to groundwater.

There are 21 Bureau of Meteorology (BoM) stations located throughout the Shire which record daily rainfall; however, none of these stations measure pan evaporation. The closest station to the Shire that records pan evaporation is at Durdidwarrah, located approximately 45km from the north-eastern Shire boundary. Pan evaporation data for the period 1973-2000 is available at this station.

To overcome this data limitation, this project uses interpolated, gridded data from SILO. SILO (Scientific Information for Land Owners) is a climate and meteorological data service developed and hosted by the Queensland Government, which provides representative data for the entire continent, produced using real climate data collected over long time periods by the BoM. The service provides a realistic representation of a broad range of climate statistics (including rainfall and evapotranspiration) for areas which are not serviced by local BoM stations.

Monthly rainfall and evapotranspiration data for 64 SILO data points at approximately 0.1 degree (~8.8km) grid spacing's was collected for the entire Shire. Figure 1 shows the rainfall distribution pattern throughout the Shire based on annual 70th percentile rainfall for each SILO data point. The percentile rainfall data was interpolated using GIS across the Shire to produce a grid with approximately 300m cell sizes. The data is considered to be a realistic representation

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of climate patterns throughout the Shire on a long term basis, suitable for use in DWM investigations and designs. The data was also used in the System Sizing Tables, discussed in Section 7.

For each SILO data point for each year, the monthly water 'excess' totals were calculated by subtracting the total monthly rainfall from total monthly average evapotranspiration. When a water excess occurs within any given month, the rainfall exceeds the evapotranspiration, resulting in meteorological water being retained within the soil profile. From this, the total number of 'wet' months for each year were calculated and the median taken for each SILO data point. The number of 'wet' months has been gridded and the interpolated values have been converted to the nearest integer. The distribution of the number of 'wet' months throughout the Shire is shown in Figure 2. From this, four (4) distinct climate zones were identified based on the number of months where rainfall exceeds evapotranspiration and were categorised as detailed below. Each property/parcel within the Shire was assigned to a climate zone as shown in Figure 3.

- Zone 1: 0 – 4 (soil moisture surplus) months of the year;
- Zone 2: 5 – 6 (soil moisture surplus) months of the year;
- Zone 3: >7 (soil moisture surplus) months of the year; and
- Zone 4: Average Annual Rainfall >1,600mm.

A property/parcel is assigned the more conservative climate zone if it is located along a climate zone boundary. Table 4 details the results of the climate zone constraint analysis for the Shire.

Similarly, the longest run of consecutive 'wet' months in each year was also determined and the median longest run was calculated for each SILO data point. The number of consecutive 'wet' months has been gridded and the interpolated values have been converted to the nearest integer. The distribution of the number of consecutive 'wet' months throughout the Shire is shown in Figure 4.

Overall, there is a strong trend in greater rainfall towards the south of the Shire, particularly along the Otway Range. This is consistent with higher topography and coastal conditions in those regions. The 'wet' months are typically found to coincide with the winter calendar months and had a similar increasing trend towards the south of the Shire. All of the targeted localities and towns/settlements are located within climate zones 2 - 4.

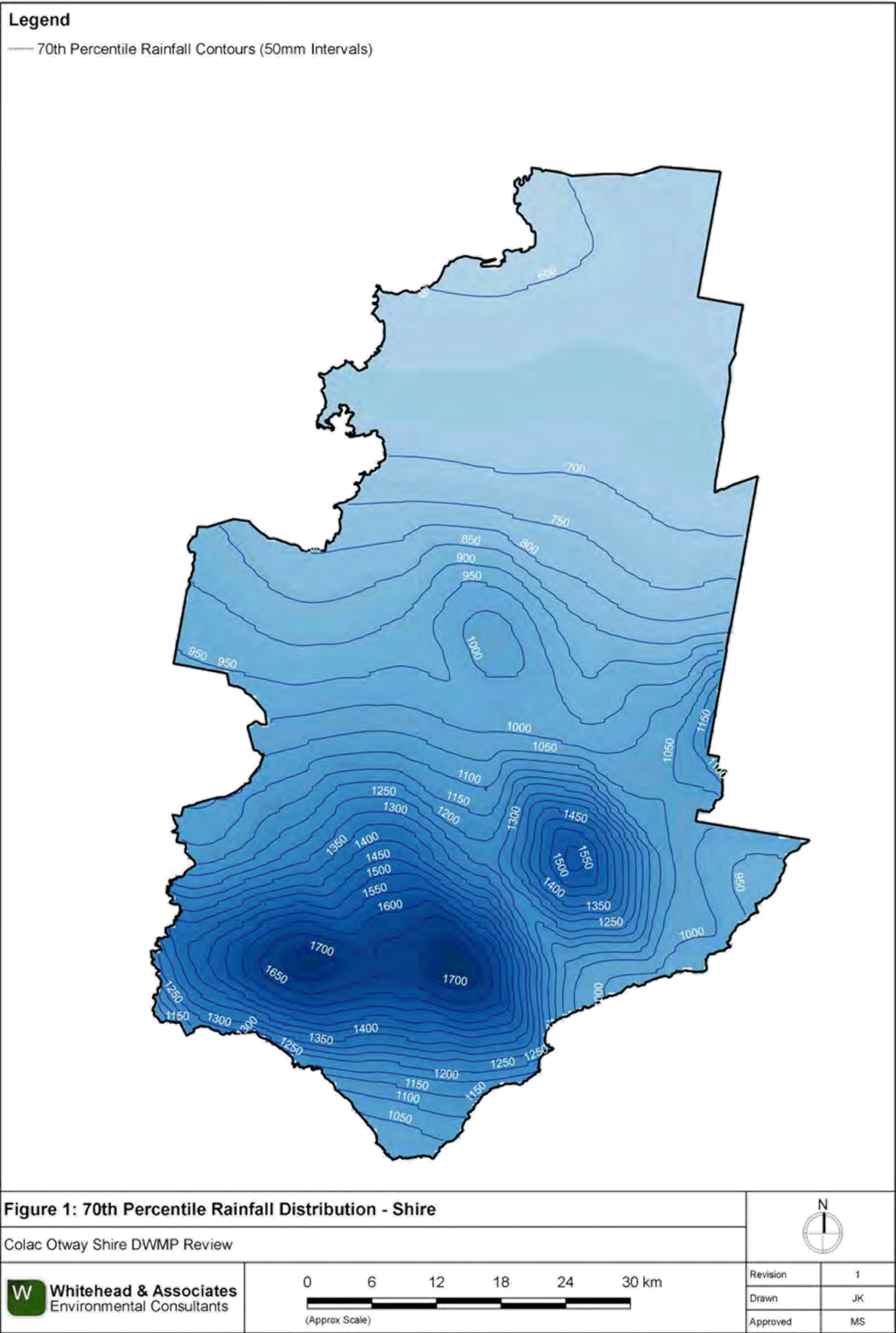
The acquired climate data obtained for this assessment will be made available to Council and will provide a very useful resource for Council in the preparation and review of LCAs in the future. Monthly 70th percentile rainfall and average evapotranspiration data is available for the majority of the unsewered localities and towns/settlements from Council for input into monthly water balances as part of a site specific LCA. The climate data that was used in the development of the System Sizing Tables is attached in Appendix C. This appended climate data also includes additional data for surrounding unsewered localities. Land Capability Assessors are also able to use site-specific SILO Data Drill climate data for LCA reports and DWM designs for particular properties/parcels. The use of such data should be clearly referenced and justified in the LCA report in each instance.

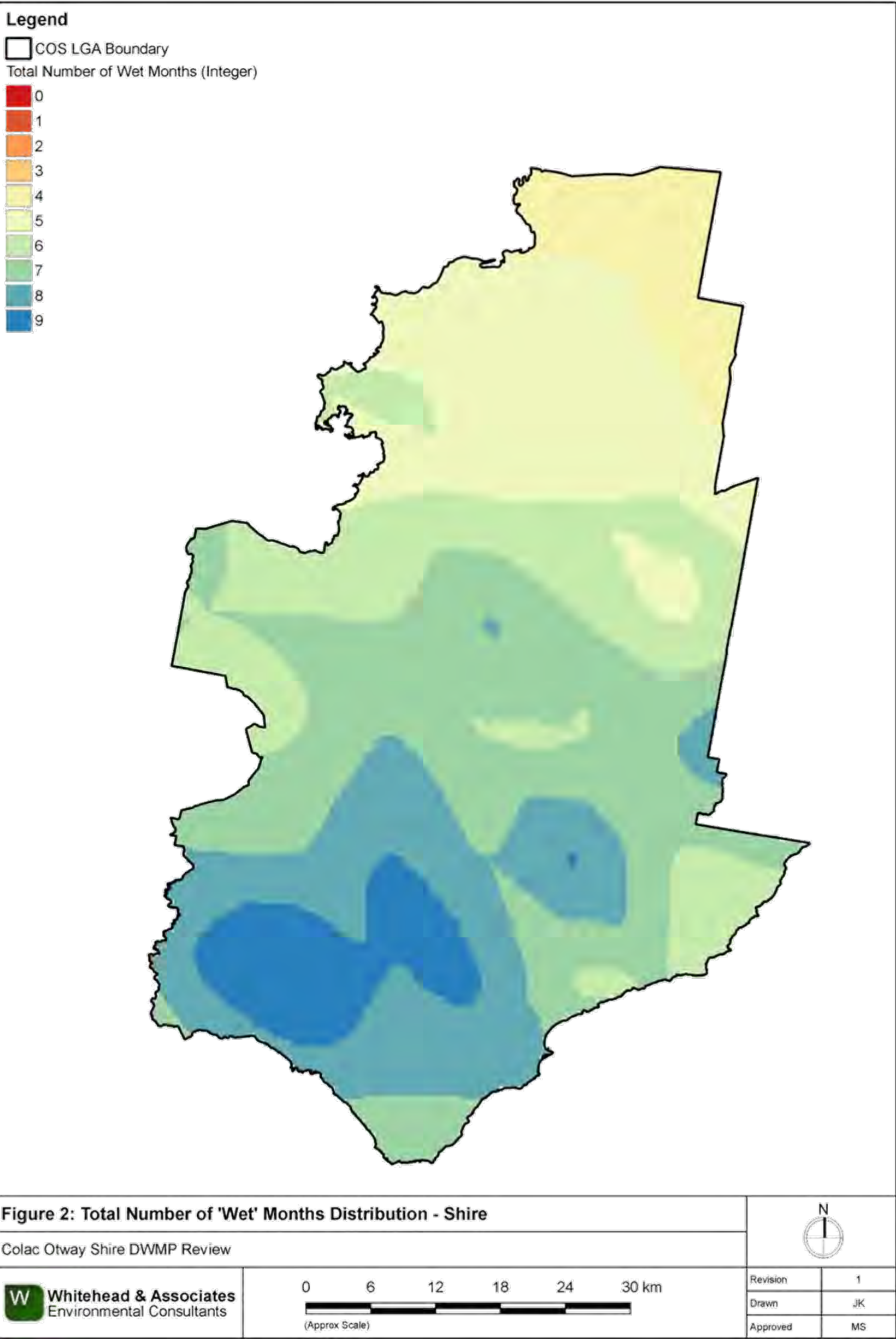
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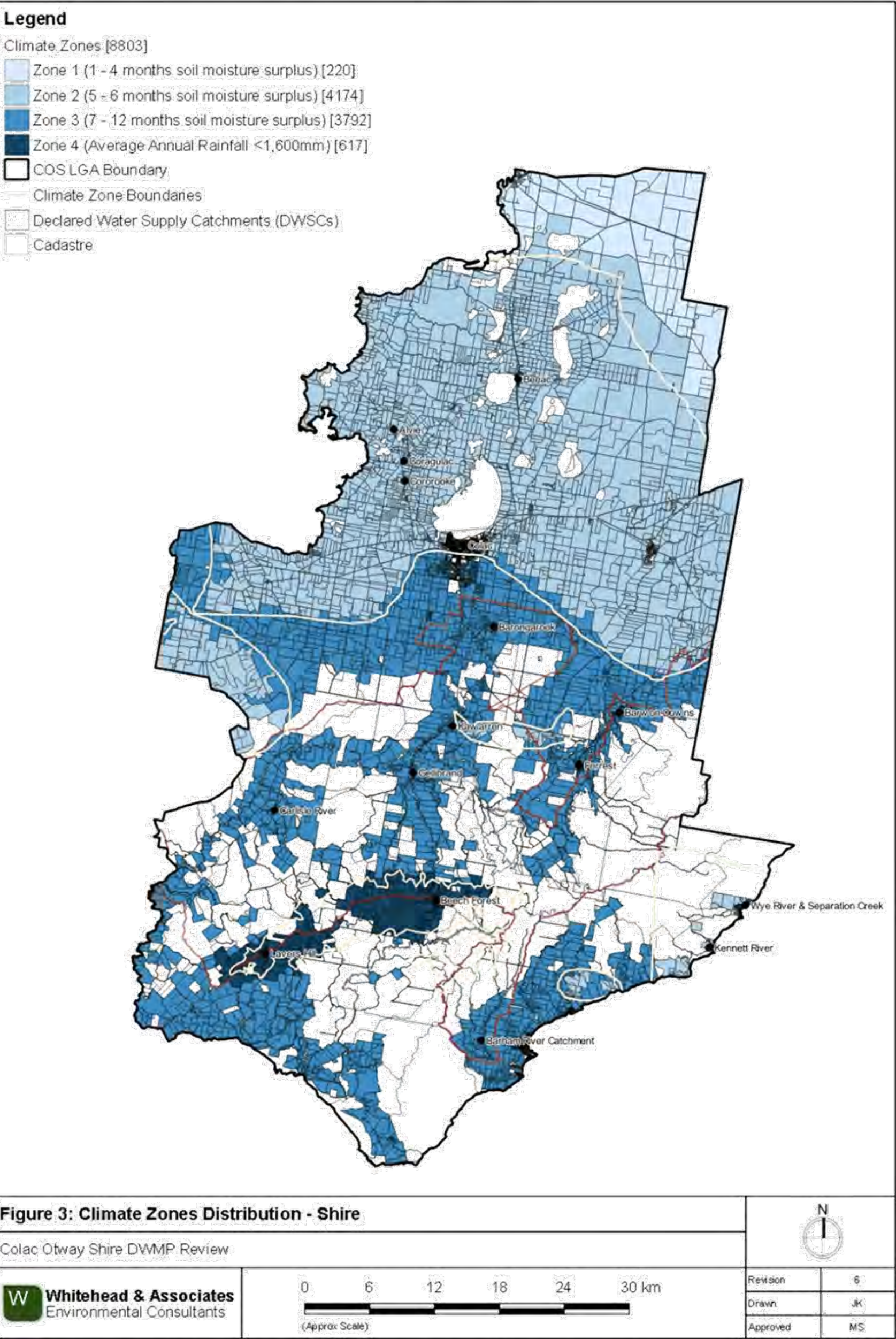
Table 4: Climate Zones Constraint Map Summary

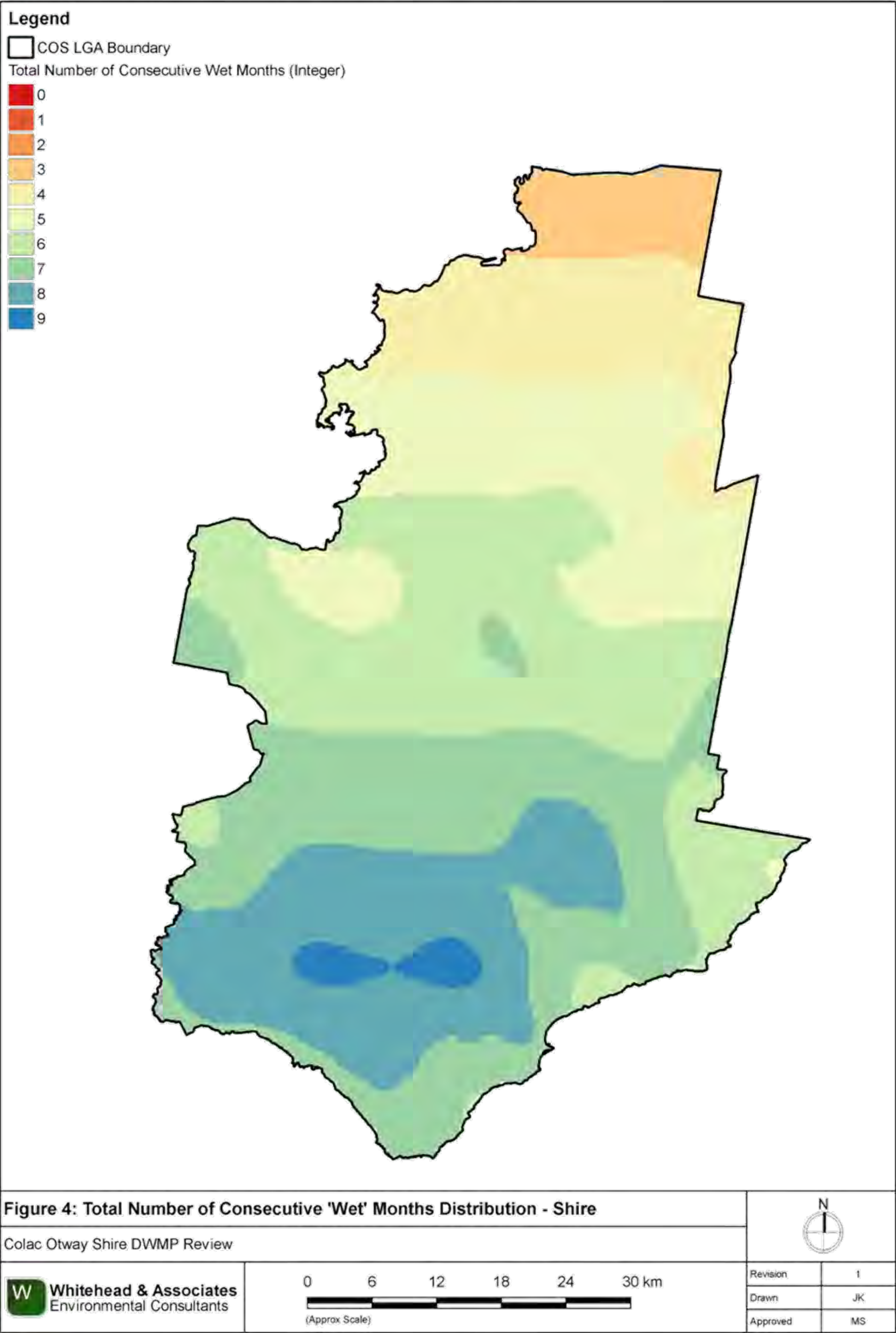
| | Total
Properties/
Parcels | Total Number in Assigned Constraint Class | | | |
|---|---------------------------------|---|--|---|---|
| | | Zone 4 | Zone 3 | Zone 2 | Zone 1 |
| | | Average
Annual
Rainfall
>1,600mm | >7 months
soil
moisture
surplus | 5 – 6
months soil
moisture
surplus | 0 – 4
months soil
moisture
surplus |
| Shire (Overall) | 8,803 | 617 | 3,792 | 4,174 | 220 |
| Alvie
Town (Locality) | 33 (174) | 0 (0) | 0 (0) | 33 (174) | 0 (0) |
| Barham River
(Apollo Bay)
Settlement (Locality) | 81 (366) | 0 (0) | 81 (366) | 0 (0) | 0 (0) |
| Barongarook
Settlement (Locality) | 101 (265) | 0 (0) | 101 (265) | 0 (0) | 0 (0) |
| Barwon Downs
Town (Locality) | 89 (267) | 0 (0) | 89 (266) | 0 (1) | 0 (0) |
| Beeac
Town (Locality) | 269 (603) | 0 (0) | 0 (0) | 269 (603) | 0 (0) |
| Beech Forest
Town (Locality) | 150 (354) | 150 (310) | 0 (44) | 0 (0) | 0 (0) |
| Carlisle River
Town (Locality) | 26 (250) | 0 (1) | 26 (246) | 0 (3) | 0 (0) |
| Coragulac
Town (Locality) | 69 (201) | 0 (0) | 0 (0) | 69 (201) | 0 (0) |
| Cororooke
Town (Locality) | 112 (301) | 0 (0) | 0 (0) | 112 (301) | 0 (0) |
| Forrest
Town (Locality) | 167 (354) | 0 (0) | 167 (325) | 0 (29) | 0 (0) |
| Gellibrand
Town (Locality) | 71 (276) | 0 (0) | 71 (276) | 0 (0) | 0 (0) |
| Kawarren
Settlement (Locality) | 72 (215) | 0 (0) | 46 (175) | 26 (40) | 0 (0) |
| Kennett River
Town (Locality) | 180 (186) | 0 (0) | 0 (1) | 180 (185) | 0 (0) |
| Lavers Hill
Town (Locality) | 84 (204) | 84 (188) | 0 (16) | 0 (0) | 0 (0) |
| Separation Creek
Town (Locality) | 121 (136) | 0 (0) | 0 (0) | 121 (136) | 0 (0) |
| Wye River
Town (Locality) | 377 (393) | 0 (0) | 0 (0) | 377 (393) | 0 (0) |

Whitehead and Associates Environmental Consultants









6.2.3 Useable Lot Area

The potential for sustainable DWM and the determination of suitable DWM system options is dependent on the amount of adequate area available for DWM. The useable lot area for effluent management broadly refers to available land (i.e. not built out or used for a conflicting purpose) where DWM will not be unduly constrained by site and soil characteristics.

The smaller the property/parcel, the more difficult it is to treat and retain wastewater onsite in accordance with legislative requirements. A properly sized land application area provides for long-term, sustainable effluent loading rates that match the assimilative capacity of the soil and vegetation systems. Conversely, improperly designed or undersized land application areas are more likely to fail and lead to potential adverse impacts on both public health and the environment. In recent years, understanding of sustainable effluent loading rates has improved and it is now commonly identified that many older existing systems, such as septic absorption trenches and evapotranspiration beds, are undersized by today's standards.

Useable lot area, irrespective of total property/parcel size, plays a key role in determining a property/parcel's capacity for sustainable long-term DWM and influences the selection of appropriate DWM systems. However, as a general rule, the smaller the property/parcel, the less land that will be available for effluent management after allowing for other development on the land. Older development controls and design standards (Codes etc.) did not always consider site-specific land capability constraints and, as a consequence, many existing and vacant residential properties/parcels may be too small to accommodate sustainable DWM systems, particularly by today's more informed standards.

There is no defined rule about what constitutes an appropriate minimum effluent management area, or in fact minimum useable area that is capable of providing such areas. This will vary depending on the physical constraints present on the property/parcel, the nature of the development, as well as the type of treatment and land application system used. The constraint class boundaries reflect the likelihood of a property/parcel having sufficient effluent management area available after allowing for typical improvements.

There are many factors that determine the available area on any given property/parcel, including:

- Maintenance of appropriate setback buffers from boundaries, buildings, driveways and paths, groundwater bores, dams, intermittent and permanent watercourse; and
- Total development area (including the dwelling, sheds, pools, driveways and garden paths, gardens unsuitable for effluent reuse, and any other hardstand areas, etc.).

Available areas may be unsuitable or constrained for DWM due to other factors, including (but not limited to):

- Excessive slope;
- Excessively shallow soils;
- Heavy (clay) soils with low permeability;
- Climate in regards to the degree of soil moisture surplus;
- Excessively poor drainage and/or stormwater run-on; and
- Excessive shading by vegetation.

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For this study, the useable lot area was determined by the setbacks to surface waterways, groundwater bores and land subject to inundation. The following sections detail the methodology and results for each analysis and the determination of the final useable lot area.

6.2.3.1 Proximity to Surface Waters

This section seeks to explain how the distance to waterways, lakes, dams and drinking water catchments influences the useable lot area calculation which forms part of the constraint mapping. This is of particular importance for properties/parcels within the DWSCs.

COS is located entirely within the Corangamite Catchment Management Area (CMA) and consists of the following defined three river basins; Barwon (to the east), Corangamite (north and west), and Otway Coast Basin (to the south).

A large portion (28%) of the Shire is located within a Declared Water Supply Catchment (DWSC). There are seven DWSCs located within the Shire; Gosling Creek, Pennyroyal Creek, Matthew Creek, Upper Barwon, Lorne, Barham River, Gellibrand River, Gellibrand River (South Otway), and Barwon Downs Wellfield Intake. Three of these DWSCs, Upper Barwon, Gellibrand River, and Gellibrand River (South Otway), have Special Area Plans. These DWSCs are detailed on the 'proximity to surface waterways informative map' in Appendix A and regionally below in Figure 5.

Buffer distances (setbacks) are usually provided between land application areas and sensitive receptors, such as surface watercourses, to help prevent adverse impacts on water quality, particularly should the DWM system fail. There is no simple and defined method for objectively determining safe buffer distances, so regulators often recommend conservative, minimum buffer distances that would be expected to satisfy the objective in the majority of situations.

The current EPA Code of Practice recommends three tiers of setback distances from surface waterways that are applicable to the Shire. Further, the Code specifies differing setback distances for primary (i.e. septic/trench) systems and secondary (or greywater) systems. The following (primary) buffers have been conservatively adopted and applied to the appropriate surface watercourse/waterway using data (1:25,000 scale) provided by DELWP. The resultant map is appended in Appendix A.

- 60m for non-potable watercourses, dams, wetlands, estuaries and surface water features (including the mean coastal high-tide mark and dams);
- 100m for potable watercourses² and surface waterway river bodies; and
- 300m for potable reservoirs or storages.

300m setbacks, similar to those applied for potable reservoirs, were also applied to the Water Corporation source points (i.e. offtake points, weirs, pumping stations, etc.) to ensure that the sensitivity of these local environments are accounted for.

No setbacks were applied to man-made drains or waterfalls, which would likely be accounted for within other watercourse/waterway setbacks.

Intuitively, the risk of DWM systems impacting on nearby receiving areas increases with decreasing separation distance. For a broad-scale risk assessment, it is appropriate to analyse

² It should be noted that the surface water map does not distinguish between permanent and intermittent watercourses. Diversion channels have been defined as a watercourse for this particular purpose.

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the separation distances that are available on a property/parcel basis and assign constraint classes accordingly.

AS/NZS 1547:2012 details instances where recommended setbacks from sensitive receptors can be relaxed to accommodate certain types of systems where standard buffer distances cannot be achieved. These systems would require individual assessment and design in order to meet the requirements of the Standard.

For properties/parcels constrained by proximity to surface waters, it might be possible to mitigate this constraint by:

- Secondary treatment with an AWTS or sand filter;
- Moving the LAA to increase buffer distance; or
- Replacing surface irrigation with subsurface irrigation.

As mentioned previously in Section 3.2.5, water services within the Shire are provided primarily by Barwon Water, with water also supplied by Southern Rural Water to the north of the Shire and by Wannon Water to the town of Carlisle River. Both Barwon Water and Wannon Water are referral authorities for developments within the DWSCs within the southern region of the Shire. The referral authorities for each DWSC in the Shire are detailed within Clause 66.04 and Schedule 3 of the Environmental Significance Overlay (ES03) of the COS Planning Scheme.

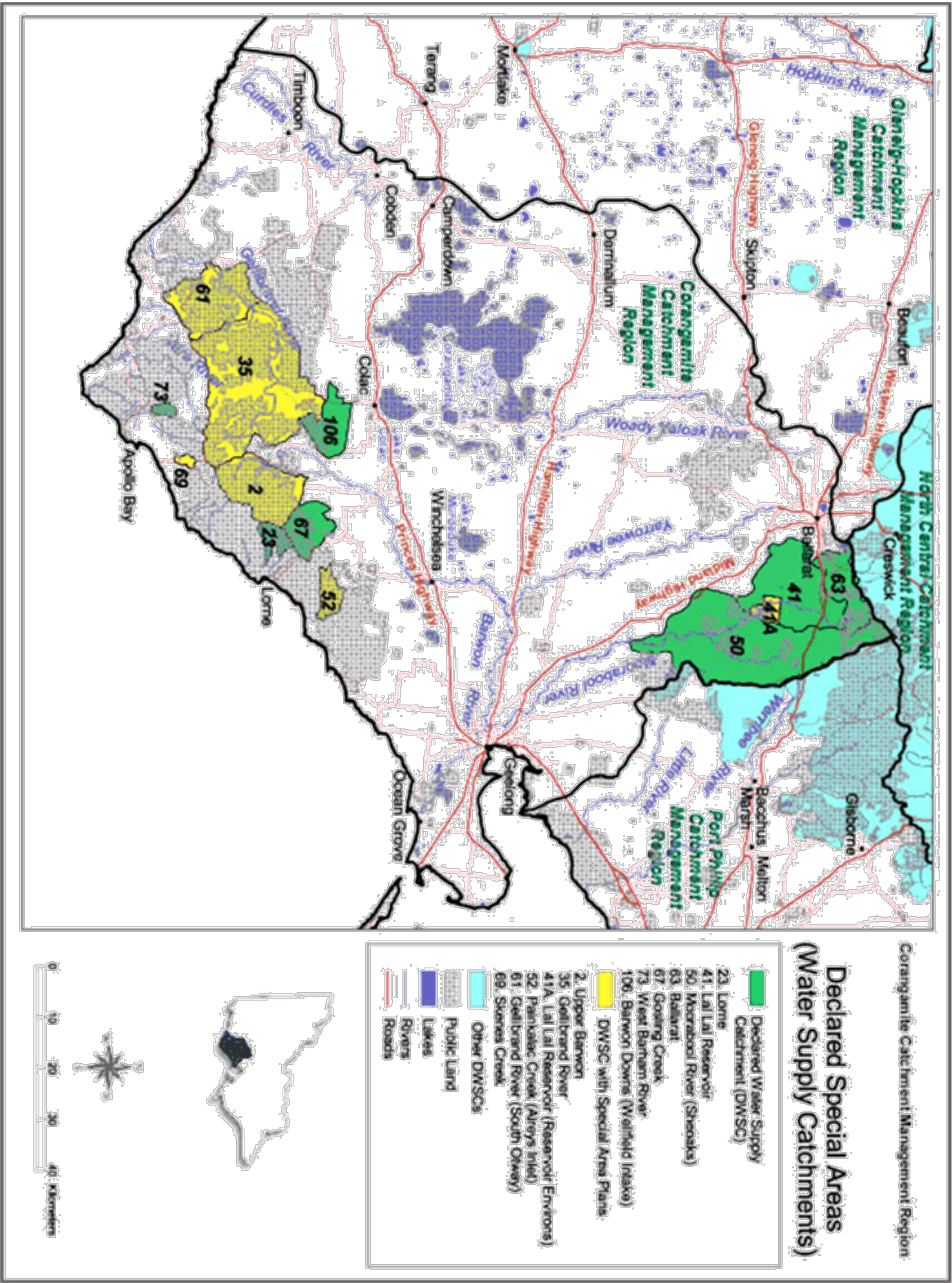


Figure 5: Corangamite CMA Declared Water Supply Catchments (DEPI, 2012)

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6.2.3.2 Proximity to Groundwater Bores

This section seeks to explain how the distance from DWM systems to groundwater bores can affect the quality of groundwater.

The principal groundwater resources in Victoria fall south of the Great Dividing Range and are generally contained in Tertiary or younger unconsolidated sediments. The Shire is located within the Otway-Torquay groundwater basins, within the Hopkins-Corangamite and Otway-Torquay groundwater catchment areas.

A Groundwater Management Unit refers to either a Groundwater Management Area or Water Supply Protection Area as determined within the Groundwater Catchment. Water Supply Protection Area(s) (WSPAs) are declared under Section 27 of the *Water Act 1989* to protect groundwater or surface water resources through the development of a management plan which aims for equitable management and long-term sustainability. There are nineteen WSPA declared in Victoria. A Groundwater Management Area(s) (GMAs) is defined as an area where groundwater of a suitable quality for irrigation, commercial or domestic and stock use is available or expected to be available. There are 34 GMAs declared in Victoria. There are four GMAs found within the Shire; Gerangamite to the east (60m depth), Gellibrand centrally located (at or near surface), Paaratte to the west (>120m depth) and Newlingbrook to the west (at or near surface). There is one declared WSPA within the Shire; Warrion WSPA, which is located within the north east of the Shire and within the targeted localities of Alvie, Cororooke and Coragulac. This is managed by Southern Rural Water. The western edge of Lake Corangamite forms the administrative boundary between Colac Otway Shire and Corangamite Shire Council and also a natural hydrogeological boundary to the Warrion WSPA. The principal aquifer is unconfined and predominantly consists of volcanic material, including fractured basalt and scoria. There is also a potential of the Hanson Plains Sand aquifer underlying the volcanic aquifer supplying groundwater to this system. DELWP and Southern Rural Water, on behalf of the Minister of Water, jointly monitor and manage groundwater resources within the Shire.

The location of land application areas in close proximity to groundwater bores increases the potential for contamination of the groundwater. When water is extracted from the groundwater bores a zone of influence is created, whereby the head level of the groundwater is altered. Buffer distances (setbacks) are recommended between land application areas and both potable and non-potable groundwater bores. The current EPA Code of Practice recommends a 50m setback (for Category 1 and 2a soils) and 20m setback³ (for Category 2b to 6 soils) be maintained from such resources to protect human health. A conservative approach was taken when developing this DWMP and a setback distance of 50m was used for all the groundwater bores located within the Shire.

The spatial data of the groundwater bore locations within the Shire was acquired from the Water Measurement Information System (WMIS) Database Interface as managed by DELWP. Using GIS, the recommended groundwater buffer setback was applied to all of the groundwater bores located within the Shire. There was a total of 2,329 groundwater bores that were identified within the Shire. The resultant map is appended in Appendix A.

As previously mentioned, AS/NZS 1547:2012 details instances where recommended setbacks can be relaxed to accommodate certain types of systems where standard buffer distances cannot be achieved. In most cases, the preferred result would be to have the identified bores

³ For secondary sewage and greywater effluent

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condemned and capped to prevent further use, negating the need for setbacks from these resources. However, it is acknowledged that this outcome would not be acceptable to some owners who utilise the resource.

For properties/parcels constrained by proximity to groundwater bores, it might be possible to mitigate the constraint by:

- Secondary treatment with an AWTS or sand filter;
- Moving LAA to increase buffer distance; or
- Replacing surface irrigation with subsurface irrigation.

6.2.3.3 Land Subject to Inundation

The DWM system, including any tanks, fields or trenches should be sited above any land subject to inundation.

Land that is subjected to frequent or intermittent inundation by floodwater has a significantly higher constraint for effective on-site DWM. Effluent management areas should not be located within flood prone regions as floodwaters have a higher probability of inundation leading to insufficient treatment of the effluent and an increase in potential environmental and public health risks.

Flood prone land, in the case of this report, is defined as land that is subject to inundation based on the 1 in 100 year flood level (1% Annual Exceedance Probability (AEP)) that delineates the areas likely to be inundated through statistical modelling or as determined by the floodplain management authority. Land subject to inundation was buffered from the useable lot area; the resultant map is appended in Appendix A.

It might be possible to mitigate the properties/parcels constrained by flood prone land by:

- Secondary treatment with an AWTS or sand filter;
- Using pressure compensating subsurface irrigation; or
- Raising level of application by constructing a raised bed or sand mound.

6.2.3.4 Useable Lot Area Analysis

The cadastre data set supplied by Council was queried to determine the spatial relationship between each property/parcel, its existing land area and the buffer zones (cohesively) to determine the useable lot area for each property/parcel within the Shire; whether developed or not. The following criteria were used to determine the useable lot area classification with regards to DWM suitability:

- High: useable area <0.15ha;
- Moderate: useable area 0.15 – 0.4ha;
- Low: useable area 0.4 – 40ha; and
- Compliant: useable area >40ha.

Properties/parcels containing less than 0.15ha of useable area invariably have a very limited available effluent management area and so DWM contained entirely on-site is in the vast majority of cases unsustainable, necessitating site specific hydraulic design for wastewater management. This is based on an assumed footprint of 500m² for an average building envelope

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and improvements (e.g. driveway) and allowing for an average appropriately sized LAA and reserve LAA on the remainder of the property/parcel.

If DWM is to be provided, it will be necessary to provide a high level of treatment and specialised land application design using systems such as sand mounds or pressurised subsurface irrigation, to ensure long term sustainability. Other mitigation measures like the adoption of water conserving practices will be important in ensuring the system's effectiveness. Such systems are likely to have limited opportunity for expansion, as may be required if the household wastewater load changes in response to increased occupancy, or if a new reticulated water supply becomes available. It should be taken into consideration that a property/parcel <0.15ha will not necessarily be totally unsuitable for DWM or currently be serviced by a failing system; however, it is likely to contain a number of significant limitations to the safe operation of DWM systems assessed at a broad scale.

In the case of properties/parcels with areas between 0.15ha and 0.4ha, and in the absence of any other significant physical constraints, the availability of land for effluent management usually increases proportionately with a corresponding improvement in the potential for sustainable DWM. The choice of options is likely to be slightly greater than that available for properties/parcels with useable area less than 0.4ha; however, detailed site and soil investigation is still important to identify the most appropriate solution as other bio-geophysical constraints may limit opportunities for sustainable DWM. Again, conventional systems may not be appropriate for these sites. These properties/parcels have been assigned a 'moderate' overall constraint class.

In most cases, properties/parcels larger than 0.4ha will have far fewer problems providing sufficient space for sustainable on-site DWM. For this reason these properties/parcels have been assigned a 'low' constraint class. Overall constraint for DWM for these properties/parcels will be determined by the land capability constraints.

Properties/parcels with a useable area larger than 40ha already meet the criteria prescribed by the Minister for Water's Guidelines (DSE, 2012) and are deemed to be compliant.

For properties/parcels constrained by useable area, it might be possible to mitigate this constraint by:

- Secondary treatment with an AWTS or sand filter;
- Secondary treatment with land application to trenches at higher loading rates as outlined in AS/NZS 1547:2012; or
- Increasing loading rate by use of sand mound.

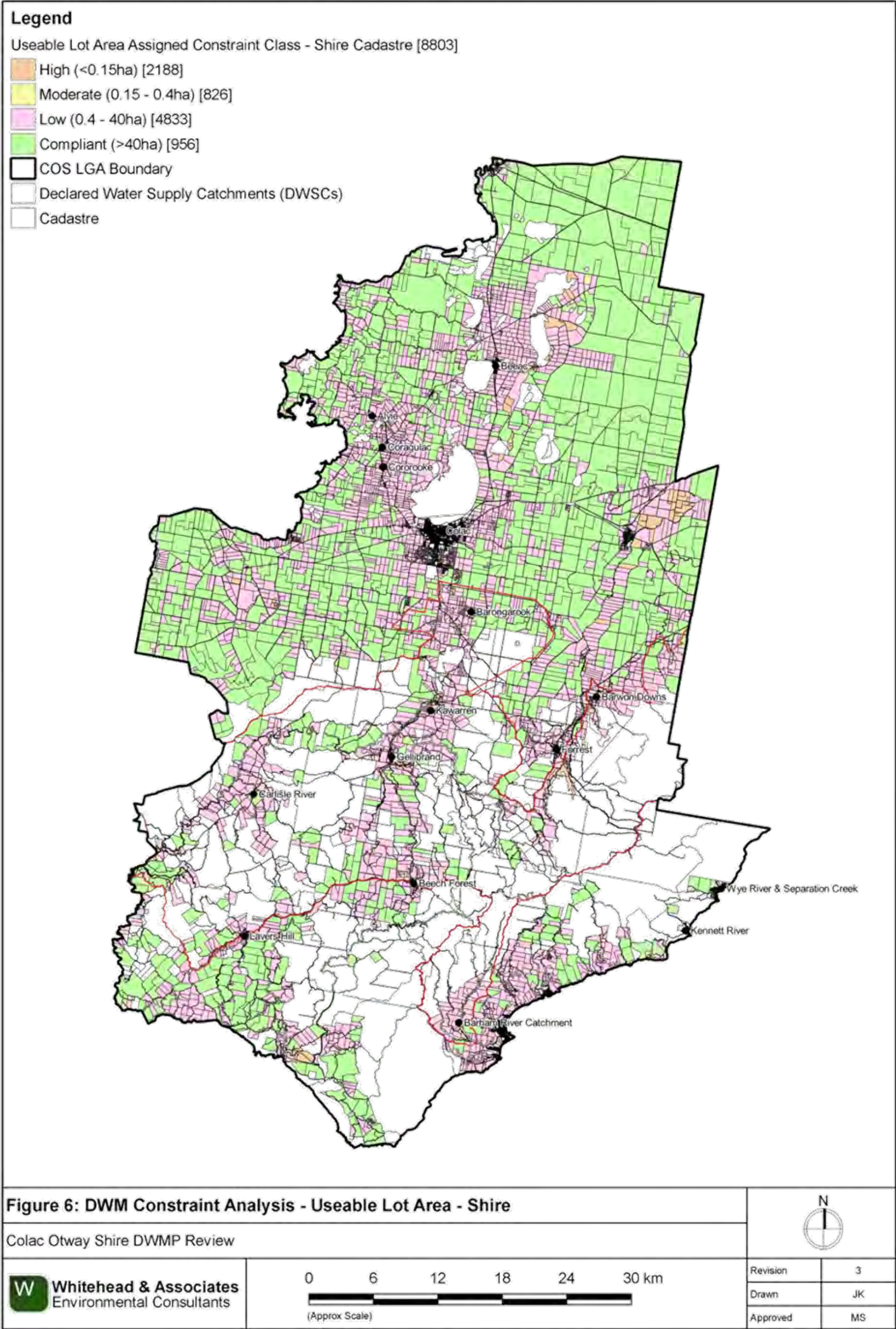
Table 5 details the results of the useable lot area constraint analysis for the Shire. The associated DWM constraint map for the Shire is provided as Figure 6.

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Table 5: Useable Lot Area Constraint Map Summary

| | Total
Properties/
Parcels | Total Number in Assigned Constraint Class | | | |
|---|---------------------------------|---|-----------------|-----------------|-----------|
| | | High | Moderate | Low | Compliant |
| | | <0.15ha | 0.15 –
0.4ha | 0.4ha –
40ha | >40ha |
| Shire (Overall) | 8,803 | 2,188 | 826 | 4,833 | 956 |
| Alvie
Town (Locality) | 33 (174) | 12 (23) | 11 (27) | 10 (111) | 0 (13) |
| Barham River
(Apollo Bay)
Settlement (Locality) | 81 (366) | 16 (76) | 8 (24) | 56 (260) | 1 (6) |
| Barongarook
Settlement (Locality) | 101 (265) | 18 (26) | 6 (16) | 77 (216) | 0 (7) |
| Barwon Downs
Town (Locality) | 89 (267) | 43 (77) | 23 (29) | 23 (154) | 0 (7) |
| Beeac
Town (Locality) | 269 (603) | 198 (236) | 58 (80) | 12 (275) | 1 (12) |
| Beech Forest
Town (Locality) | 150 (354) | 98 (125) | 39 (67) | 13 (146) | 0 (16) |
| Carlisle River
Town (Locality) | 26 (250) | 10 (41) | 5 (16) | 11 (170) | 0 (23) |
| Coragulac
Town (Locality) | 69 (201) | 26 (41) | 16 (33) | 27 (125) | 0 (2) |
| Cororooke
Town (Locality) | 112 (301) | 69 (95) | 26 (45) | 17 (158) | 0 (3) |
| Forrest
Town (Locality) | 167 (354) | 88 (129) | 55 (62) | 24 (157) | 0 (6) |
| Gellibrand
Town (Locality) | 71 (276) | 19 (58) | 33 (46) | 19 (158) | 0 (14) |
| Kawarren
Settlement (Locality) | 72 (215) | 37 (72) | 6 (16) | 29 (121) | 0 (6) |
| Kennett River
Town (Locality) | 180 (186) | 173 (175) | 6 (8) | 1 (2) | 0 (1) |
| Lavers Hill
Town (Locality) | 84 (204) | 52 (65) | 20 (26) | 12 (97) | 0 (16) |
| Separation Creek
Town (Locality) | 121 (136) | 119 (122) | 1 (4) | 1 (10) | 0 (0) |
| Wye River
Town (Locality) | 377 (393) | 330 (334) | 45 (45) | 2 (11) | 0 (3) |

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6.2.4 Current Planning Scheme Zone - Minimum Lot Size Compliance

As discussed in Section 6.2.3, area plays a key role in determining a property/parcel's capacity for sustainable long-term DWM and influences the selection of appropriate DWM systems. The COS Planning Scheme sets out policies and requirements for the use, development, subdivision and protection of land. The requirements and particular provisions for each zone are detailed within the COS Planning Scheme. The current zonings for the Shire were thematically mapped to assist Council with future development opportunities and identification of constraints in relation to DWM.

COS is seeking a relaxation of Guideline 1 of the Guidelines for Planning permit applications in open, potable water supply catchment areas (DSE, 2012) from the Water Corporations. If this relaxation is granted and a higher density of development within a DWSC is sought, then one of the requirements that must still be adhered to in accordance with 'Planning permit applications in open, potable water supply catchment areas' is that the minimum lot size specified for that zone must be met. The planning scheme zones were summarised into the fifteen (15) following zones and are appended as a thematic map in Appendix A:

- General Residential;
- Neighbourhood Residential;
- Township;
- Low Density Residential;
- Farming;
- Rural Activity;
- Rural Conservation;
- Rural Living;
- Commercial (1 & 2);
- Industrial (1 & 3)
- Public Park and Recreation;
- Public Conservation and Resource;
- Public Use;
- Road; and
- Special Use.

The majority of the Shire is in three zonings; Farming Zone in the northern section of the municipality, Public Conservation and Resource Zone in the southern region (relative to the Otway Ranges) and Rural Conservation Zone along the coastline.

Along with seweraged properties/parcels, land zoned Road Zone, Public Park and Recreation Zone and Public Conservation and Resource Zone, was excluded from the cadastral dataset as the suitability of this land for on-site DWM is irrelevant. A vegetation informative map was generated to provide a visual distribution of the National Parks and State Forests within COS and is attached in Appendix A.

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Existing land area and current zoning of the properties/parcels as per the COS Planning Scheme were used to determine whether existing properties/parcels complied with the minimum lot size as per the current zoning requirements. The existing lot size was compared with the minimum lot size specified for the prescribed zone for each lot to determine its compliance.

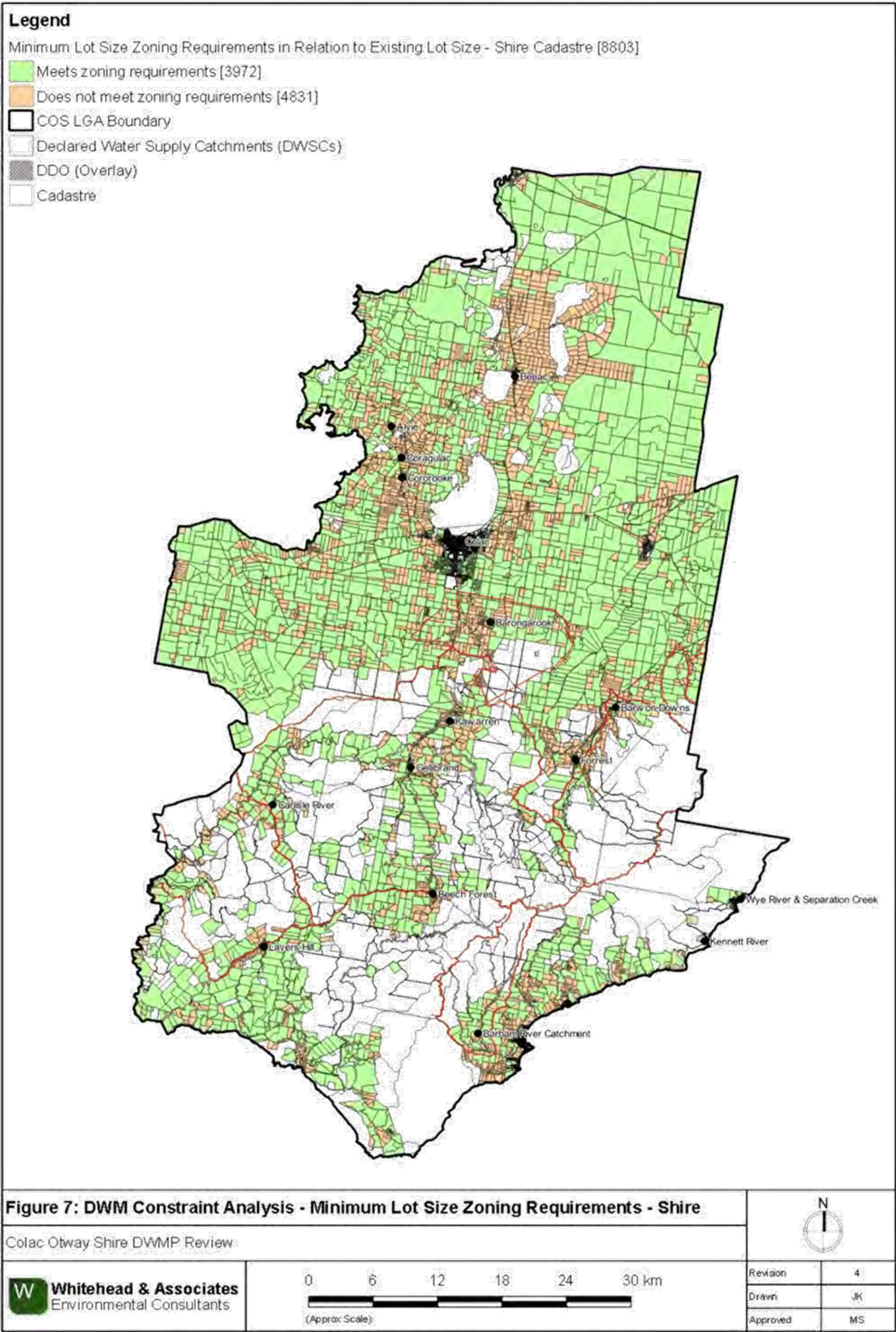
Table 6 details the results of the minimum lot size compliance with the planning scheme zoning requirements for the Shire. The associated DWM discrete constraint map for the Shire is provided as Figure 7.

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Table 6: Current Planning Scheme Zone - Minimum Lot Size Compliance

| | Total
Properties/Parcels | Total Number in Assigned Constraint Class | |
|---|-----------------------------|---|-----------|
| | | Non-Compliant | Compliant |
| Shire (Overall) | 8,803 | (4,831) | (3,972) |
| Alvie
Town (Locality) | 33 (174) | 5 (123) | 28 (51) |
| Barham River
(Apollo Bay)
Settlement (Locality) | 81 (366) | 59 (268) | 22 (98) |
| Barongarook
Settlement (Locality) | 101 (265) | 101 (250) | 0 (15) |
| Barwon Downs
Town (Locality) | 89 (267) | 5 (144) | 84 (123) |
| Beeac
Town (Locality) | 269 (603) | 6 (320) | 263 (283) |
| Beech Forest
Town (Locality) | 150 (354) | 3 (163) | 147 (191) |
| Carlisle River
Town (Locality) | 26 (250) | 0 (151) | 26 (99) |
| Coragulac
Town (Locality) | 69 (201) | 9 (128) | 60 (73) |
| Cororooke
Town (Locality) | 112 (301) | 43 (224) | 69 (77) |
| Forrest
Town (Locality) | 167 (354) | 17 (176) | 150 (178) |
| Gellibrand
Town (Locality) | 71 (276) | 4 (166) | 67 (110) |
| Kawarren
Settlement (Locality) | 72 (215) | 70 (186) | 2 (29) |
| Kennett River
Town (Locality) | 180 (186) | 0 (3) | 180 (183) |
| Lavers Hill
Town (Locality) | 84 (204) | 1 (91) | 83 (113) |
| Separation Creek
Town (Locality) | 121 (136) | 2 (17) | 119 (119) |
| Wye River
Town (Locality) | 377 (393) | 10 (23) | 367 (370) |

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6.2.5 Slope

The slope of the land affects what type, or even whether you can have, any wastewater disposal on the land. This is closely linked to the soil type and the soil's absorption capabilities.

AS/NZS 1547:2012 (Table K1) details a range of factors likely to limit the selection and applicability of land application systems, with slope gradient identified as one critical factor.

Steep slopes, particularly when combined with shallow or poorly drained soils, can lead to surface breakout of effluent downslope of the land application area. Conventional DWM systems are likely to be unsuitable and these properties/parcels will require a detailed site assessment and specific system design to produce a sustainable outcome. These steeply sloping sites are generally unsuitable for trenches and beds and can also be problematic for surface irrigation techniques. Conversely, flat and gently sloping sites are less likely to experience such problems and are considered lower risk.

Surface elevation for the Shire was gridded with a maximum cell size of 20m for the entire Shire and 5m for the localities (including the towns/settlements), with no vertical exaggeration to create a DEM. Where the 5m grids were derived, they took precedence over the 20m grid and an overall combined DEM was generated which is shown in Figure 8. The surface elevation for the Shire ranges from approximately 0m to 654m Australian Height Datum (AHD). Gridded slope data was derived from the DEM and combined with the cadastre data set to calculate the average slope as percent grade for each property/parcel within the Shire. The average slope was based on the centroid of each property/parcel. The slope ranged from 0 – 138%.

The following criteria were used to determine the DWM constraint classification on the average property/parcel slope:

- High: properties/parcels that have an average slope greater than 12%;
- Moderate: properties/parcels that have an average slope, inclusive of, and between 8% and 12%; and
- Low: properties/parcels that have an average slope less than 8%.

For properties/parcels constrained by steep slope, it might be possible to mitigate this constraint by:

- Applying a lower soil (effluent) loading rate over a larger area;
- Designing an irrigation system to ensure even distribution of effluent over the slope; or
- Terracing to create a level LAA.

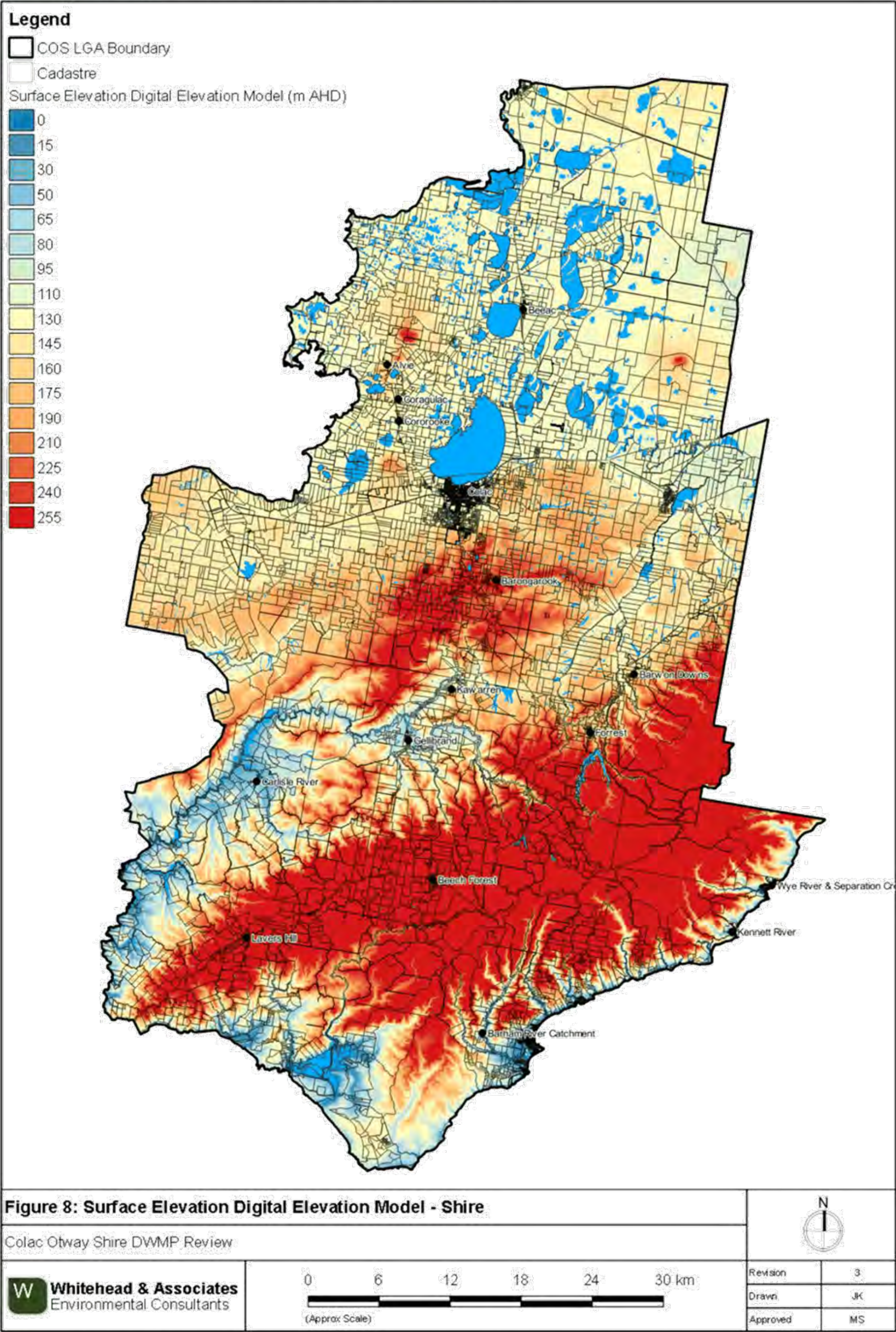
Table 7 details the results of the average property/parcel slope constraint analysis for the Shire. The associated DWM discrete constraint map for the Shire is provided as Figure 9.

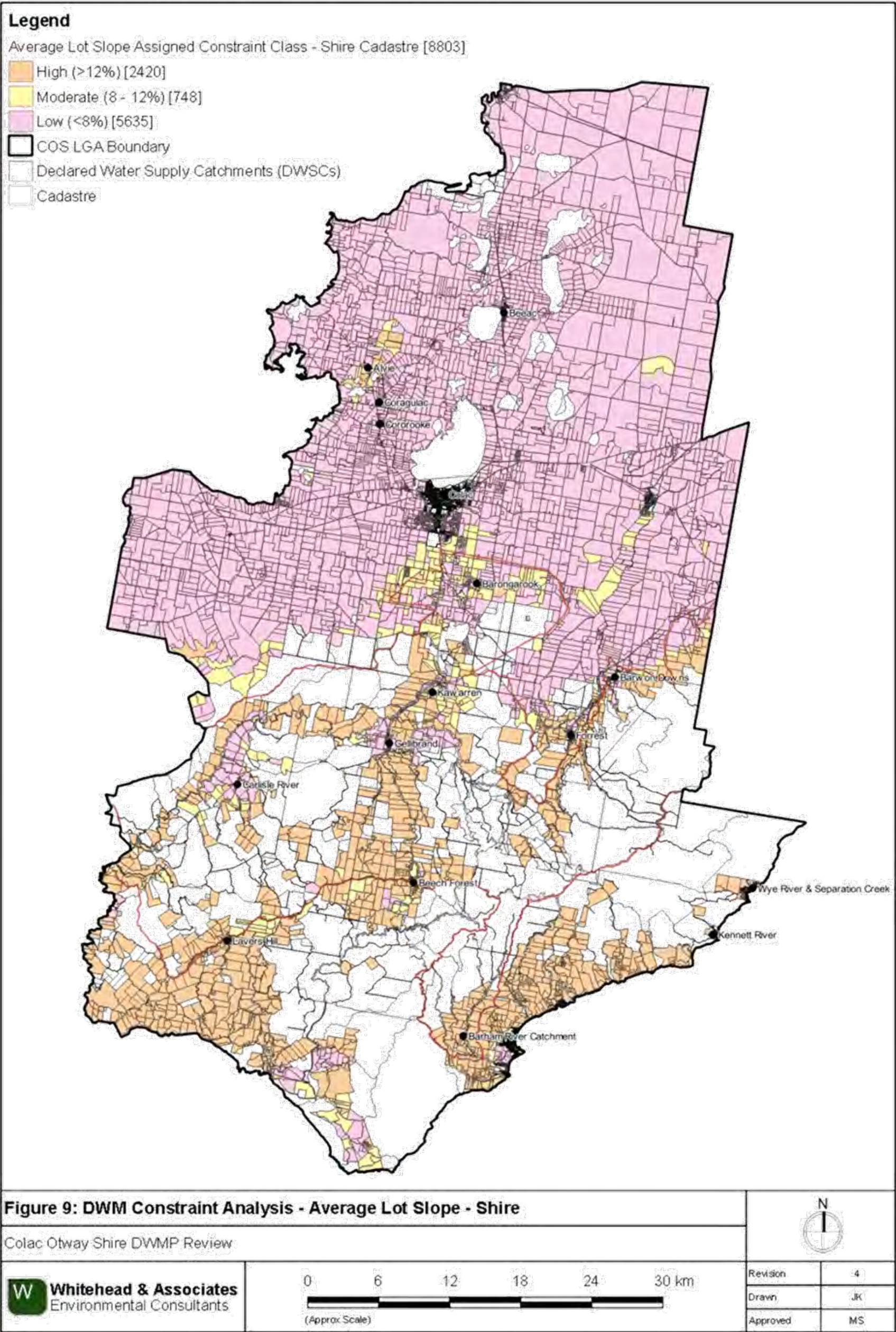
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Table 7: Average Property/Parcel Slope Constraint Map Summary

| | Total
Properties/
Parcels | Total Number in Assigned Constraint Class | | |
|---|---------------------------------|---|----------|-----------|
| | | High | Moderate | Low |
| | | >12% | 8 – 12% | <8% |
| Shire (Overall) | 8,803 | 2,420 | 748 | 5,635 |
| Alvie
Town (Locality) | 33 (174) | 1 (18) | 7 (15) | 25 (141) |
| Barham River
(Apollo Bay)
Settlement (Locality) | 81 (366) | 76 (285) | 3 (41) | 2 (40) |
| Barongarook
Settlement (Locality) | 101 (265) | 1 (16) | 16 (48) | 84 (37) |
| Barwon Downs
Town (Locality) | 89 (267) | 0 (50) | 1 (22) | 88 (195) |
| Beeac
Town (Locality) | 269 (603) | 0 (0) | 0 (0) | 269 (603) |
| Beech Forest
Town (Locality) | 150 (354) | 98 (229) | 26 (64) | 26 (61) |
| Carlisle River
Town (Locality) | 26 (250) | 0 (121) | 0 (32) | 26 (97) |
| Coragulac
Town (Locality) | 69 (201) | 0 (1) | 0 (2) | 69 (198) |
| Cororooke
Town (Locality) | 112 (301) | 0 (0) | 0 (2) | 112 (299) |
| Forrest
Town (Locality) | 167 (354) | 7 (88) | 22 (63) | 138 (203) |
| Gellibrand
Town (Locality) | 71 (276) | 0 (92) | 0 (25) | 71 (159) |
| Kawarren
Settlement (Locality) | 72 (215) | 6 (58) | 29 (74) | 37 (83) |
| Kennett River
Town (Locality) | 180 (186) | 159 (163) | 15 (15) | 6 (8) |
| Lavers Hill
Town (Locality) | 84 (204) | 26 (103) | 23 (56) | 35 (45) |
| Separation Creek
Town (Locality) | 121 (136) | 102 (117) | 5 (5) | 14 (14) |
| Wye River
Town (Locality) | 377 (393) | 363 (379) | 7 (7) | 7 (7) |

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6.2.6 Soil Suitability

Geology was also used as a reference towards the understanding of the soil and landform characteristics of the Shire.

The soil type and its absorption capabilities in this report refer to effluent treatment and what type of wastewater system is suitable. Soil that is not suitable for effluent treatment may be ideal for other uses such as farming and vice versa.

Soils and landform elements, along with associated lithology, play a vital role in the design, operation and performance of DWM systems. Key soil properties can be evaluated to assess a soil's capacity for absorption of wastewater, including soil texture, structure, depth, permeability, drainage characteristics, and depth to limiting layers such as bedrock, hardpans or watertables.

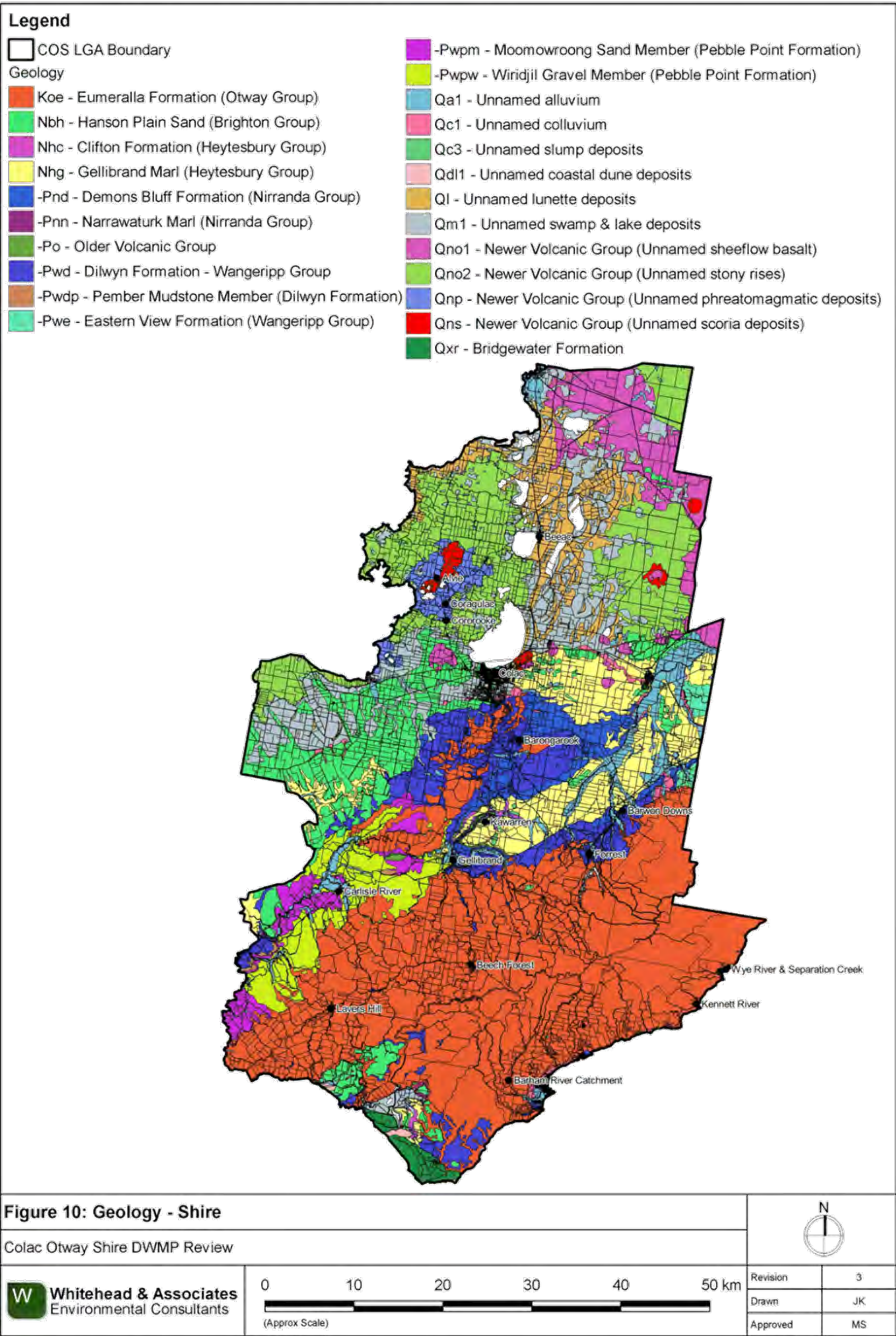
The surface geology of the Shire is shown in Figure 10 and the geological units were based on the 'Surface Geology of Victoria' dataset (1:250,000) that was obtained from GeoSciences Victoria (DEPI, 2011). The Shire is underlain by twenty-three (23) different surface lithological groups, with the northern region and the Otway Ranges underlain primarily by the Newer Volcanic Group and Eumeralla Formation, respectively.

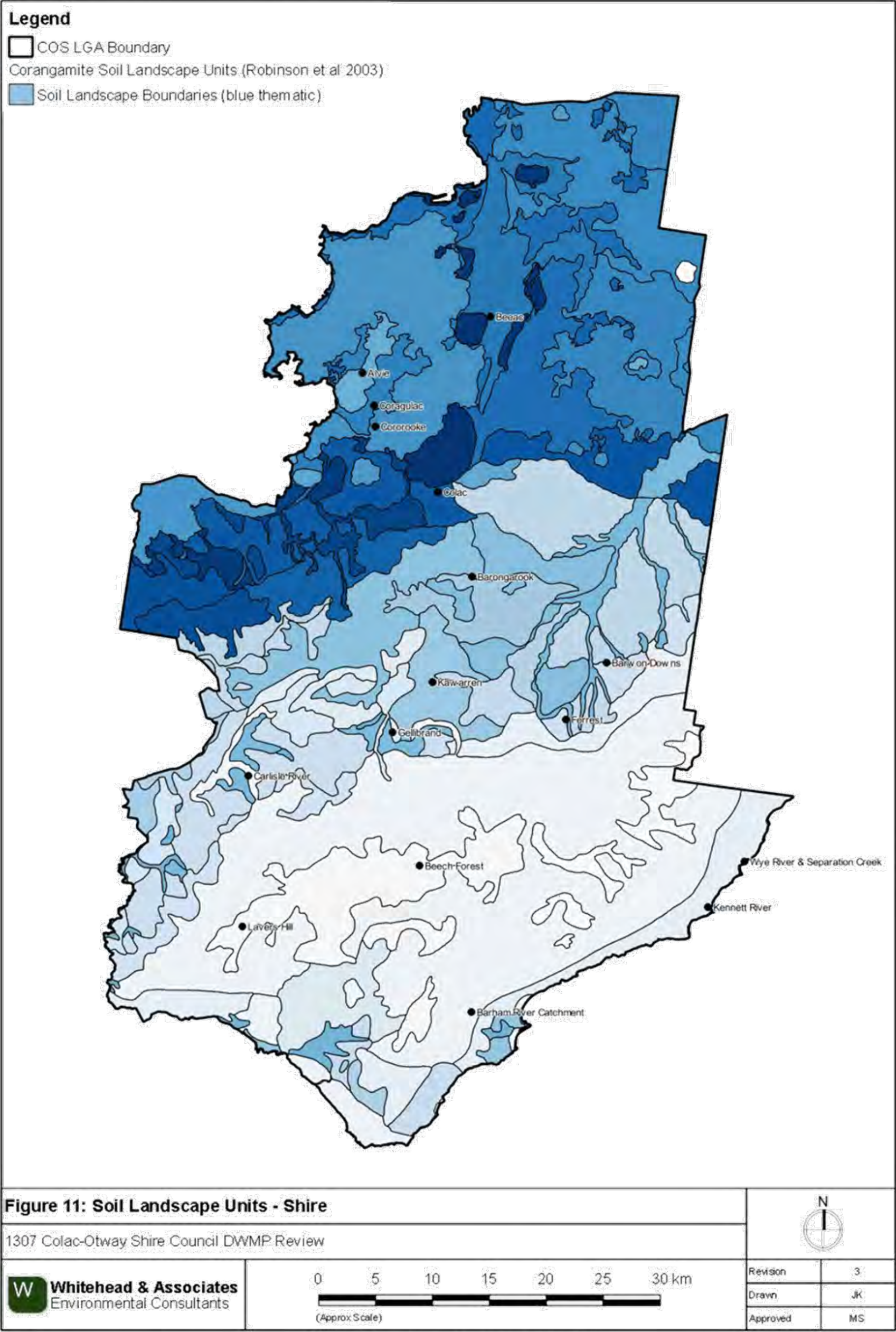
The most current soil-landform unit datasets were obtained from DELWP. The most current dataset, 'A Land Resource Assessment (LRA) of the Corangamite Region' (Robinson *et al.*, 2003), was used as the basis for the determination of soil suitability for DWM. The LRA draws substantially on earlier geology mapping and soil surveys, in particular those of Maher and Martin (1987) and Pitt (1981). Industry specific site investigations for dairying and cropping, a survey on a gas pipeline, and regional extension activities have provided other soil profile data. The purpose for this LRA was to integrate, within a new geomorphic framework for Victoria, map units and boundaries published in the earlier surveys to derive a consistent report and mapping for the region. The data (1:100,000) can only be effectively used as a strategic mapping tool for regional targeting of resources based on the location of susceptibilities in conjunction with other factors.

The LRA dataset provided different information on various soil and landform characteristics of the region; including, landform elements, slope, vegetation, soil description (Australian Soil Classification), topsoil and subsoil texture, depth of soil profile, soil structure, soil chemical characteristics, and many other productivity and land degradation constraints. There were fifty-seven (57) different soil landform units identified within the Shire. Figure 11 thematically identifies the different soil landform units and their associated locations. Refer to the accompanying LCA reports⁴ for additional detailed descriptions on each of the soil landform units.

It is important to note that soil landform units are not homogeneous. Importantly, it should be noted that, at this mapping scale, soil attributes are expected to vary within soil landform units. Due to the degree of variance within each soil landform unit (e.g. due to the soil catena), the soil characteristics with the most dominant landform element proportion (e.g. greatest percentage) were used as a representation for that soil landform unit. Refer to the accompanying LCA reports for site specific data. Site specific investigations are required to confirm the broad scale assessment of the soil landform units, as the presence of a minor soil landform component could result in varying attributes to the predominant component used for the soil suitability constraint analysis.

⁴ <http://vro.depi.vic.gov.au/dpi/vro/vrosite.nsf/pages/soil-home>





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The soil landform unit dataset was analysed to determine the key soil attributes that relate to soil suitability for DWM. There is a significant inter-relationship that exists between various soil attributes, resulting in depth, hydraulic and limitation hazards used to assess the final soil suitability with the Shire. The degree of constraint, or constraint class, was assigned to each soil landform unit within the Shire based on available data and the professional judgement, skills and experience of the project team. Reference was also to the AS/NZS 1547:2012, the current EPA Code of Practice, and the experience of the project team in the design and monitoring DWM systems.

Table 8 below outlines each of the hazards and the criteria used for the soil suitability constraint classifications.

The depth constraint of the soil was based on the depth of the soil profile to the limiting horizon, i.e. hardpan, groundwater or bedrock, for each soil landform unit. The depth constraint classes were determined based on the minimum depth requirements for sustainable DWM and taking into account the minimum separation requirements of 600mm (AS/NZS 1547:2012) from the base of the land application system to the limiting layer. This benchmark depth was based on the most constraining DWM application system, in terms of depth, absorption systems (trenches and beds). Soil absorption systems require 300 – 600mm depth from the surface for utilisation and also need to adhere to the minimum 600mm separation to the limiting layer requirements. Therefore, the minimum depth required for the sustainable installation of an absorption system is around 1m depth, based on an absorption system at 400mm depth. Greater depths of unsaturated soil provide increased treatment of effluent and reduced potential for lateral water movement.

The hydraulic constraint of the soil was determined based on limiting soil texture, structure and permeability. A DWM system should be sized according to the most limiting soil horizon to ensure that an appropriate effluent loading rate is applied. In most cases, this will be the subsoil horizon as the soils within COS predominantly consist of gradational and texture contrast soils with clay subsoils. The constraint criterion for the hydraulic hazard parameter was based on the soil category of the limiting soil horizon for each soil landform unit (as used in AS/NZS 1547:2012). Indicative permeability was taken from the EPA Code of Practice (Table 9, Appendix A), but this can be superseded if in situ permeability testing data can be provided.

A limitation constraint of the soil was also considered, which was based on qualitative descriptions provided within the individual soil landform unit reports. The limitations include both physical and chemical characteristics of the soil. Soil limitation is difficult to quantify, as most limitations can be overcome by amending the soil or introducing a management practice.

The following limitations were considered with regards to DWM; nutrient retention, soil stability and physical retention. Specifically these limitations refer to whether the soil is any of the following; dispersive, sodic, restricted drainage, low fertility, low P-sorb, Shrink Swell, Coarse Fragments, Very Acidic, Hardsetting

| | Consequence for DWM | | | |
|---------------------|---------------------|--|-----|------|
| | Low | | Mod | High |
| Dispersive | | | | |
| Sodic | | | | |
| Restricted Drainage | | | | |
| Low Fertility | | | | |
| Low P-sorb | | | | |
| Shrink Swell | | | | |
| Coarse Fragments | | | | |
| Very Acidic | | | | |
| Hardsetting | | | | |

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(self-mulching), coarse fragments (including hardpans), very acidic (aluminium toxicity) or hardsetting.

A significance weighting was applied to each of the soil constraint parameters to reflect the influence that each parameter has on the design, construction and operation of DWM systems. The significance weighting was determined through discussion with project team members and coordination with the Stakeholder Working Group. The following significance weightings were applied:

- Depth Hazard: 1.2;
- Texture Parameter: 1.2;
- Structure Parameter: 0.9;
- Indicative Permeability Parameter: 1;
- Limitation Hazard: 0.7.

Where soil landform unit information was not available or was incomplete, the characteristic was conservatively inferred using professional judgement and available information. This was only relevant for soil landform unit 92, as the type soil profile data was unavailable.

Most importantly, some of the soil landform units associated with the targeted localities and towns/settlements were cross referenced with site and soil investigations undertaken by both Whitehead & Associates and Robert Van de Graaff & Associates on two separate occasions. Generally the observed soil characteristics were the same as the literature documented in Robinson *et al.* (2003) LRA. However, where characteristics differed, the soil landform unit for the particular region around the test site was updated with the field specific data.

Although the soil suitability constraint for a particular soil landform unit may be high, it does not necessarily mean that wastewater could not be sustainably managed on-site. It gives guidance to the loading rate and type of system(s) that could be suitable. It is important to note that site specific investigation is still necessary to confirm the regional constraint assessment and to determine the appropriate method for sustainable DWM.

For properties/parcels constrained by unfavourable soil, it might be possible to mitigate this constraint by:

- Secondary treatment with an AWTs or sand filter;
- Applying a lower (soil) loading rate; or
- Improving soil by amelioration or importation of good quality soil.

Table 9 details the results of the soil suitability constraint analysis for the Shire. The associated DWM discrete constraint map for the Shire is provided as Figure 12. The soil suitability for properties/parcels within the Shire predominantly resulted in moderate to high constraint ratings due to the presence of clay subsoils derived from the basaltic lithology as mentioned above.

Table 8: Soil Suitability Constraint Classification Criteria

| Hazard Type | Parameter | Class | Description | Significance Weighting (%) |
|-------------------|---|-------------------|---|---|
| Depth Hazard | Profile Depth | Low (1) | Greater than 2 metres profile depth | Greater depths of unsaturated soil provide increased treatment of effluent (removal) and reduced potential for lateral water movement.

A significance of 1.2 (120%) is applied to the depth hazard rating for each soil to reflect the substantial influence this parameter has on the design, construction and operation of DWM systems. |
| | | Medium (2) | Greater than 1 metre to less than 2 metres profile depth | |
| | | High (3) | Less than 1 metre profile depth | |
| Hydraulic Hazard | Texture | Low (1) | Soil Category 2 & 3 (per AS/NZS 1547:2012). Dominant Sandy Loam (SL) to Loam (L) soils. | Used (along with structure) primarily to infer properties of soil permeability, porosity and aeration. Excessively free-draining soils (Cat 1) can be just as problematic as excessively poor-draining soils (Cat 6) for DWM. Soil 'renovation' capacity also linked to textural classification (i.e. OM content, Fe/Al content).

A significance of 1.2 (120%) is applied to the texture rating for each soil to reflect the influence this parameter has on the design, construction and operation of DWM systems. |
| | | Medium - Low (2) | Soil Category 4 (per AS/NZS 1547:2012). Dominant Clay Loam (CL) soils. | |
| | | Medium - High (3) | Soil Category 5 (per AS/NZS 1547:2012). Dominant Light Clay (LC) soils. | |
| | | High (4) | Soil Category 1 or 6 (per AS/NZS 1547:2012). Dominant Gravel (G) or Sand (S) or Medium Clay (MC) to Heavy Clay (HC) soils. | |
| | Structure | Low (1) | Strongly structured soils (per AS/NZS 1547:2012) in the dominant horizon. | Refers to the general organisation and stability of 'natural' soils. The development and distinctness of individual soil units (peds) and the level of cohesion both within peds and between adjacent peds. Soil structure can be altered by anthropogenic activity (mechanical, chemical inputs etc.). Field assessment required, making quantification subjective. Used as a primary indicator of soil stability and secondary indicator of soil permeability (along with texture).

A significance of 0.9 (90%) is applied to the structure rating for each soil to reflect the variability of reporting and interpretation. |
| | | Medium - Low (2) | Moderately structured soils (per AS/NZS 1547:2012) in the dominant horizon. | |
| | | Medium - High (3) | Weakly structured soils (per AS/NZS 1547:2012) in the dominant horizon. | |
| | | High (4) | Single-grained or Massive structure (apedal) soils (per AS/NZS 1547:2012) in the dominant horizon. | |
| | Indicative Permeability (K _{sat}) | Low (1) | Indicative K _{sat} within the range of 1.4m/d to 3.0m/d based on Soil Category 2b & 3a (per CoP 891.3, Table 9). | Initial values inferred from soil texture / structure (per CoP 891.3, Table 9) if no site-specific data available. In-situ permeability (permeameter) testing, per approved methods (i.e. AS/NZS 1547:2012) to be used if dedicated (site-specific) values are to be applied.

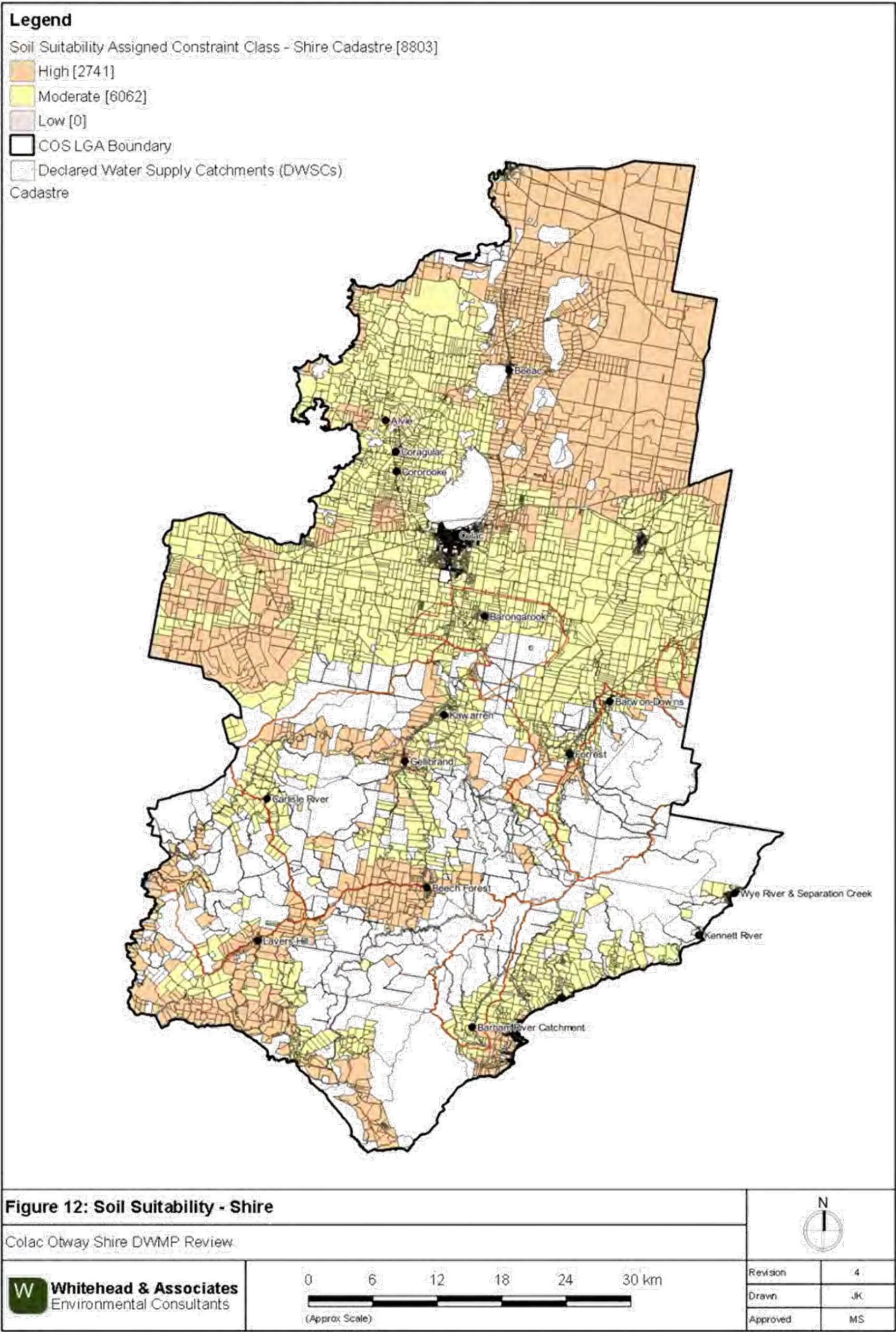
A significance of 1.0 (100%) is applied to the indicative permeability rating for each soil. |
| | | Medium (2) | Indicative K _{sat} greater than 3.0m/d or within the range of 0.5m/d to 1.4m/d based on Soil Category 1 & 2a or 3b & 4a (per CoP 891.3, Table 9). | |
| | | High (3) | Indicative K _{sat} less than 0.5m/d based on Soil Category 4b, 4c, 5a, 5b, 5c, 6a, 6b & 6c (per CoP 891.3, Table 9). | |
| Limitation Hazard | Nutrient Retention | Low | Soils with minor limitations; may include minor low fertility (CEC) or acidity. | A significance of 0.7 (70%) is applied to the limitation rating for each soil to reflect the limit and resolution of available information. |
| | Soil Stability | Medium | Non-sodic/dispersive soils; with low P-sorb, restricted drainage, shrink swell or coarse fragments; may include minor low fertility (CEC) or acidity. | |
| | Physical Restriction | High | Soils with dispersiveness and/or sodicity; may include minor low fertility (CEC), low P-sorb, restricted drainage, shrink swell, coarse fragments or acidity. | |

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Table 9: Soil Suitability Constraint Map Summary

| | Total
Properties/
Parcels | Total Number in Assigned Constraint Class | | |
|---|---------------------------------|---|-----------|-------|
| | | High | Moderate | Low |
| Shire (Overall) | 8,803 | 2,741 | 6,062 | 0 |
| Alvie
Town (Locality) | 33 (174) | 0 (15) | 33 (159) | 0 (0) |
| Barham River
(Apollo Bay)
Settlement (Locality) | 81 (366) | 2 (113) | 79 (253) | 0 (0) |
| Barongarook
Settlement (Locality) | 101 (265) | 0 (0) | 101 (265) | 0 (0) |
| Barwon Downs
Town (Locality) | 89 (267) | 0 (20) | 89 (247) | 0 (0) |
| Beeac
Town (Locality) | 269 (603) | 269 (561) | 0 (42) | 0 (0) |
| Beech Forest
Town (Locality) | 150 (354) | 150 (302) | 0 (52) | 0 (0) |
| Carlisle River
Town (Locality) | 26 (250) | 0 (44) | 26 (206) | 0 (0) |
| Coragulac
Town (Locality) | 69 (201) | 0 (0) | 69 (201) | 0 (0) |
| Cororooke
Town (Locality) | 112 (301) | 0 (14) | 112 (287) | 0 (0) |
| Forrest
Town (Locality) | 167 (354) | 0 (28) | 167 (326) | 0 (0) |
| Gellibrand
Town (Locality) | 71 (276) | 64 (125) | 7 (151) | 0 (0) |
| Kawarren
Settlement (Locality) | 72 (215) | 0 (13) | 72 (202) | 0 (0) |
| Kennett River
Town (Locality) | 180 (186) | 0 (0) | 180 (186) | 0 (0) |
| Lavers Hill
Town (Locality) | 84 (204) | 84 (189) | 0 (15) | 0 (0) |
| Separation Creek
Town (Locality) | 121 (136) | 0 (0) | 121 (136) | 0 (0) |
| Wye River
Town (Locality) | 377 (393) | 0 (0) | 377 (393) | 0 (0) |

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6.3 Sensitivity Overlay

A sensitivity overlay for landslip hazard and depth to groundwater has been generated for use by Council in conjunction with the final Risk Assessment map to determine if any additional constraints may impact on sustainable DWM at any given location within the Shire. These sensitivity overlays will be applied at Council's discretion upon reviewing any given property/parcel.

6.3.1 Landslip Hazard

COS contains areas which are susceptible to landslip, including land throughout the Otway Ranges. The Otway Group, or Eumeralla Formation, is considered to be one of the most landslip prone geological units within the Shire. Landslips occur in both the rock and soil materials, even where the rock is not significantly weathered.

A number of geotechnical studies have been undertaken within COS by various public agencies, including 'Landslip Risk Management in Colac Otway Shire' and 'Landslip Risk Management Related to Wastewater Disposal' both undertaken by Dalhaus Environmental Geology Pty Ltd.

All land included in the Erosion Management Overlay (EMO1 - COS Planning Scheme) has been identified as having a sufficiently high risk of potential instability to warrant specific review of these risks prior to works as detailed in Schedule 1 to the EMO (COS Planning Scheme).

The landslip prone regions are shown in informative Figure A5, attached in Appendix A. The figure shows that the primary regions of landslip are found south of Lavers Hill, Beech Forest, Forrest and Gellibrand towns and along the coastline and hinterlands around the Apollo Bay, Kennett River, Wye River and Separation Creek towns. Council may request additional supporting documentation to be provided with regards to DWM in these regions.

6.3.2 Groundwater Depth

If the soil is saturated and the groundwater depth is shallow, then there is a greater possibility of contaminating groundwater and increasing surface water runoff. This is particularly important in selecting the type of DWM system.

The depth to groundwater has direct implications on future development opportunities and can constrain the use of a DWM system. The location and type of land application system that can be installed on an individual property/parcel will be limited by the depth to groundwater at the site. If applied effluent moves into saturated soils, i.e. shallow groundwater located beneath a LAA, then potential contamination of the groundwater, aquifer and/or surface waters could occur. Saturated subsurface conditions are considered to be the most conducive to pathogen transport.

The current EPA Code of Practice states that a minimum depth of 1.5m must remain between the base of the land application system and the seasonal watertable. The greatest depth to groundwater from the natural ground surface would be required for trenches and beds, which are generally built to 600mm depth. Therefore, the minimum required depth to groundwater from the natural ground surface would be 2.1m. If this buffer cannot be maintained, a detailed DWM system design would be required. This calculated minimum depth to groundwater vertical setback distance is conservative; however, soil type would be the defining characteristic. For example, if the soil beneath the base of the LAA is sand, then the associated hydraulic conductivity would be high, with treated effluent reaching the groundwater table at a much quicker rate than if the soil was clay. Therefore, site specific DWM design is required in regions

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where the depth to groundwater may be an issue, and the appropriateness of the required vertical setback distance to groundwater will need to be assessed.

Groundwater depth within the Shire was inferred from the groundwater bore data from the WMIS Database Interface as managed by DELWP; this is the same dataset used for the proximity to groundwater bores constraint analysis. A total of 294 groundwater bores that are located within and around the vicinity of the Shire, based on the WMIS DEPI data, were used in the depth to groundwater analysis. The depth of groundwater from the natural surface was time-series monitored for each of these bores as part of the State Observation Bore Network (SOBN). The average reduced water level of the time-series data for the groundwater depth was assigned to each bore. The groundwater bores and associated depths to groundwater were then spatially mapped as point data using GIS. The point data was gridded with no vertical exaggeration (maximum cell size of 20m) to create a Digital Elevation Model (DEM). The groundwater depths are summarised along a thematic colour gradient from surface water (negative values) (deep blue) to 245m (red), with an average depth of 21.5m. Gridded groundwater depth data was derived from the DEM and combined with the cadastre data set for the centroid of each property/parcel. This interpolates an average depth to groundwater for each property/parcel within the Shire which is covered by the extent of the DEM.

The following criteria were used to determine the DWM constraint classification for the depth to groundwater (based on the centroid of each property/parcel):

- Non-Compliant (high risk): properties/parcels that have an average groundwater depth less than the minimum vertical separation distance of 2.1m as stipulated by the current EPA Code of Practice; and
- Compliant (low risk): properties/parcels that have an average groundwater depth more than the minimum vertical separation distance of 2.1m as stipulated by the current EPA Code of Practice.

The resultant groundwater depth and groundwater depth compliance maps are attached as informative Figures A6 and A7, respectively, in Appendix A. The depth to groundwater compliance mapping showed that there were 4,542 compliant and 1,496 non-compliant properties/parcels within COS based on available data.

Due to the limited number of groundwater bores with water level information, there are regions within the Shire that were not able to be included in the analysis, particularly in the southern half of the Shire. There were properties/parcels throughout the Shire, primarily in the southern region, that was not covered by the DEM and were excluded from the depth to groundwater analysis due to lack of data. These are shown as white in the respective map. Due to lack of available data, the depth to groundwater compliance is to be used for informative purposes only and site specific investigations will be necessary to determine the depth of groundwater in the regions with no available data or for those properties/parcels that are non-compliant.

For properties/parcels constrained by groundwater depth (shallow groundwater), it might be possible to mitigate this constraint by:

- Secondary treatment with an AWTS or sand filter; or
- Increasing separation distance between point of land application and watertable by constructing a raised bed or sand mound.

6.3.3 Vegetation

The National Parks and State Forests within COS have also been mapped and are presented as an informative map as Figure A7 in Appendix A. The Otway Ranges within the DWSCs is dominated by protected vegetated regions, which are also extensive along the Great Ocean Road extending into the north of the Apollo Bay, Wye River and Separation Creek localities. Great Otway National Park and Otway Forest Park form the primary classified vegetative areas within this region. The Otway Forest Park includes the mountain and foothill forest of the northern fall of the Otway Ranges, adjacent to the Great Otway National Park. The northern region of COS includes protected lakes of the Western Volcanic Plains.

6.4 Risk Assessment Summary

It is evident that variability in constraint exists between the targeted localities and towns/settlements within the Shire. Further detailed studies into the performance of existing on-site DWM systems within each of the targeted unsewered localities and towns/settlements is recommended to verify the findings of this broad-scale risk assessment, to provide a more detailed study on maximum property/parcel development density and hence minimum lot size in proposed development areas. This will aid Council in ensuring future development will not adversely impact environmental and public health. The Sensitivity Analysis, which consolidates the individual constraints, is detailed in Section 4.1 of the Operational Plan.

7 Land Application System Sizing Tables (Water Balance)

7.1 Overview

Water balance modelling was undertaken to determine the minimum footprint areas for a broad range of effluent land application systems that could be used in unsewered properties in the Shire. All six of the AS1547:2012 soil categories were used in the modelling, for three household sizes (based on number of bedrooms and likely maximum occupancy rate, for domestic dwellings). The results are provided in the System Sizing Tables (in the Locality Reports in Appendix B), which summarise the minimum basal (or 'wetted') area and the likely minimum total footprint area (including minimum spacing for trenches and beds) for different systems. The Sizing Tables are suitable for designing land application systems for Low and Moderate Risk properties only.

It is noted that most localities will only have two or three soil types, and that the system sizings provided for the other soil types are irrelevant for that location (unless a significant amount of topsoil is imported for the construction of the land application system, which is not common).

7.2 Water Balance Methodology

A water balance is a means of incorporating the impact of rainfall, evapotranspiration and plant and soil moisture fluxes into the design of effluent land application systems (from trenches to irrigation systems). Water balance is a critical factor in the effective design and operation of effluent land application systems. This is particularly relevant for the higher rainfall areas in the southern half of the Shire.

A simplistic water balance is expressed by the following equation:

$$\text{Precipitation} + \text{Applied Effluent} = \text{Evapotranspiration} + \text{Percolation} + \text{Runoff}$$

On the left hand side of the equation are the water INPUTS, factors that add to the moisture within an irrigation field. On the right hand side of the equation are the water LOSSES, factors that reduce the moisture content within an irrigation field. For a land application area to be balanced hydraulically the INPUTS should be equal to or less than the LOSSES, otherwise hydraulic overloading and failure may result if the inherent moisture storage capacity of the irrigation field is subsequently exceeded.

Rainfall data can be obtained from the Bureau of Meteorology and commonly water balances are undertaken using monthly rainfall data for a local weather station. Pan evaporation (Class A Pan) is less readily available, and usually is only available for selected weather stations. Evapotranspiration is the combination of evaporation and transpiration of moisture from the soil through the open pores in the leaves of plants. Evapotranspiration rates vary with changes to soil and air moisture as well as season, but can be estimated by applying appropriate monthly crop factors to pan evaporation data.

Percolation is equivalent to the rate of deep drainage of both rainfall and applied effluent through the soil and is controlled mainly by soil properties, but also in part by slope and other factors. The runoff factor allows for the fact that not all rainfall that falls on a ground surface will actually infiltrate the irrigation field and so contribute to soil moisture. During periods of high rainfall, the soil becomes saturated and excess rainfall runs off as it cannot percolate into the soil.

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If all factors in the water balance are expressed in terms of millimetres (mm) per month, then it is possible to solve the equation to determine a minimum land application area (footprint) such that the LOSSES match or exceed the INPUTS. This is usually done using pre-prepared spreadsheets to simplify the numerous calculations involved in running the balance for each month of the year.

The water balance methodology used for the Sizing Tables is the same as that described in the MAV Land Capability Assessment Framework (2014) and the specific inputs are discussed below.

7.3 Water Balance Inputs

7.3.1 Daily Wastewater Load

The daily wastewater load is the product of the design occupancy rate and the wastewater generation in L/person/day.

The current EPA Code of Practice specifies that the design occupancy rate is the number of bedrooms (including any rooms that could be used as a bedroom, such as a study or library) plus one. For example, a four bedroom home is expected to accommodate up to 5 persons in the normal course of events (this does not include accommodation, businesses or holiday homes). This takes into account the future potential occupancy, not just the current occupancy (which may be much smaller).

Table 4 of the EPA Code of Practice (2013) specifies a wastewater generation rate of 180L/person/day for households with standard water fixtures. The water balance uses this figure. However, where it can be demonstrated that full-reduction fixtures have been, or will be, installed in the household and will remain in place, then a design loading rate of 150L/person/day, in accordance with AS1547:2012 can be adopted for a site-specific DWM design. Alternatively if tank water is the only water source onsite, then a design loading rate of 120L/person/day, can be used in accordance with AS1547:2012, and the results in the System Sizing Tables will not apply.

The design wastewater loads used in water balance modelling are shown in Table 10 below.

Table 10: Design Wastewater Loads for Water Balance Modelling

| No. Bedrooms | Design Occupancy | L/person/day | L/household/day |
|--------------|------------------|--------------|-----------------|
| 1-3 | 4 | 180 | 720 |
| 4 | 5 | 180 | 900 |
| 5 | 6 | 180 | 1,080 |

7.3.2 Climate Data

For this project, interpolated rainfall and evapotranspiration data for each unsewered locality has been obtained from SILO databases, as discussed in Section 6.2.2 above. 70th percentile rainfall and average evapotranspiration data were used to create unique water balances for each system type for each locality. The data point closest to the town/settlement was used for the water balance, and in some cases more than one town/settlement shares the same climate data point due to proximity to that data point.

7.3.3 Runoff Factor

A conservative annual runoff factor of 10% (90% infiltration of rainfall) has been adopted for the entire Shire, which is likely to be an underestimate for the higher rainfall areas on and around the Otways.

7.3.4 Soil Type and Design Loading Rate or Design Irrigation Rate (DLR or DIR)

The DLRs and DIRs for the commonly used EPA-accepted methods of land application of effluent (as listed in Appendix A, Table 9, of the EPA Code of Practice, 2013) were used as the basis of water balance modelling and the sizing of the land application areas for all systems. All listed systems except for mounds were modelled, as mounds require a site-specific design which accounts for site factors (including, but not limited to, ground slope). For simplicity, every soil category (and subcategories depending on soil structure), have been modelled, regardless of whether they are observed in the locality. The DLR or DIR should be selected for the most limiting soil layer (usually the heavier-textured subsoil horizons). Where data was absent from the current EPA Code of Practice, average values were selected from AS1547:2012 (Table 5.2). For instance, the current EPA Code of Practice does not specify DLRs for absorption or evapotranspiration (ETA) beds for gravels, sands or weakly structured sandy loams, but acknowledges that these systems may be appropriate if the soil does not have a high perched or seasonal groundwater table.

7.4 Implications for High Rainfall Areas

The water balance is **highly** sensitive to the Design Loading Rate (DLR) or Design Irrigation Rate (DIR) selected. The DLR and DIR are considered to be conservative or 'safe' deep drainage percolation rates for land application systems that are sustainable for the long term. However, deep drainage percolation in DWM land application areas is not widely understood and the high variability of soil dynamics across regions means that a 'one size fits all' approach may not be the most appropriate method for designing a land application system for a particular site.

If the selected DLR or DIR, taken from the EPA Code of Practice, 2013 (Appendix A: Table 9), is low due to heavy-textured soils and the site is in a high rainfall region, then the required minimum land application area is proportionately large. This can pose difficulties for design and installation, particularly for systems that use gravity dosing (which is far less effective for large systems compared to pumped dosing).

Some areas within the Shire feature areas of particularly high rainfall and low winter evapotranspiration, which presents a case whereby the water balance, is unresolvable and therefore cannot produce consequential data. For these areas, Lavers Hill, Beech Forest, and the Barham River catchment (known as 'Paradise'), the water balance method as described above cannot be used to predict the minimum required area for effluent land application, and a site-specific, detailed system design is required. As a result of the water balance, the majority of properties in these localities are likely to be rated as High or Very High Risk, and therefore the Sizing Tables are not applicable. There may be properties/parcels in high rainfall areas that also have an unresolvable water balance in addition to the above mentioned localities.

Furthermore, the water balance and prescribed DLRs and DIRs do not take into consideration the possibility that the soil and/or bedrock in some high rainfall areas may have a natural permeability that is higher than that assumed from its textural category. In such instances, the DLR or DIR could be sustainably increased, thereby allowing for a smaller system footprint. A site-specific water balance would require detailed soil testing (including constant-head

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permeameter testing) to clearly demonstrate that the soil can sustainably accommodate a higher effluent loading, year-round. This approach is suitable for properties that are rated as Low, Moderate or High Risk.

In these high rainfall areas, site-specific design to select and size an appropriate DWM system and effluent disposal method is required to ensure that DWM is sustainable with no off-lot discharge. Innovative designs may be required and overarching measures to assist in managing the wastewater in these regions may include minimising wastewater generation, increasing reuse and increasing the land application footprint. It should be noted that there may be cases in which an appropriate solution cannot be devised or in which costs are prohibitive.

7.5 Footprint Area of Land Application Systems

The size of a land application system depends not only on the volume of the effluent to be applied, the quality of the soil and on local rainfall, but also on how the system is laid out and on the spacing of components (e.g. trenches) and the width of mandatory setbacks.

In a subsurface irrigation system, the drip-lines are often closely spaced and the land may be considered to have an even loading. Therefore, the total land application area is the required area as specified by the water balance (plus any setbacks which must be maintained). Irrigation systems can be designed to best fit the most suitable area, provided that the pump is capable of delivering effluent evenly throughout the entire system.

For absorption and ETA trenches and beds, wick trenches and Low Pressure Effluent Distribution (LPED) systems, a minimum spacing between trenches or beds must be observed to prevent overloading of the soil between them. The current EPA Code of Practice or AS1547:2012 specifies minimum spacings, which have been used to estimate a typical footprint area of the system, on the assumption that the longest acceptable trench or bed length has been used. These values are provided in the individual model spreadsheets for each system type. It is highlighted that the 'typical footprint' is indicative only, and is likely to represent the minimum footprint for a well-laid out system. The final area must be determined by the system designer/installer as part of the final DWM design (for all risk category properties).

8 Sub-catchment Analysis

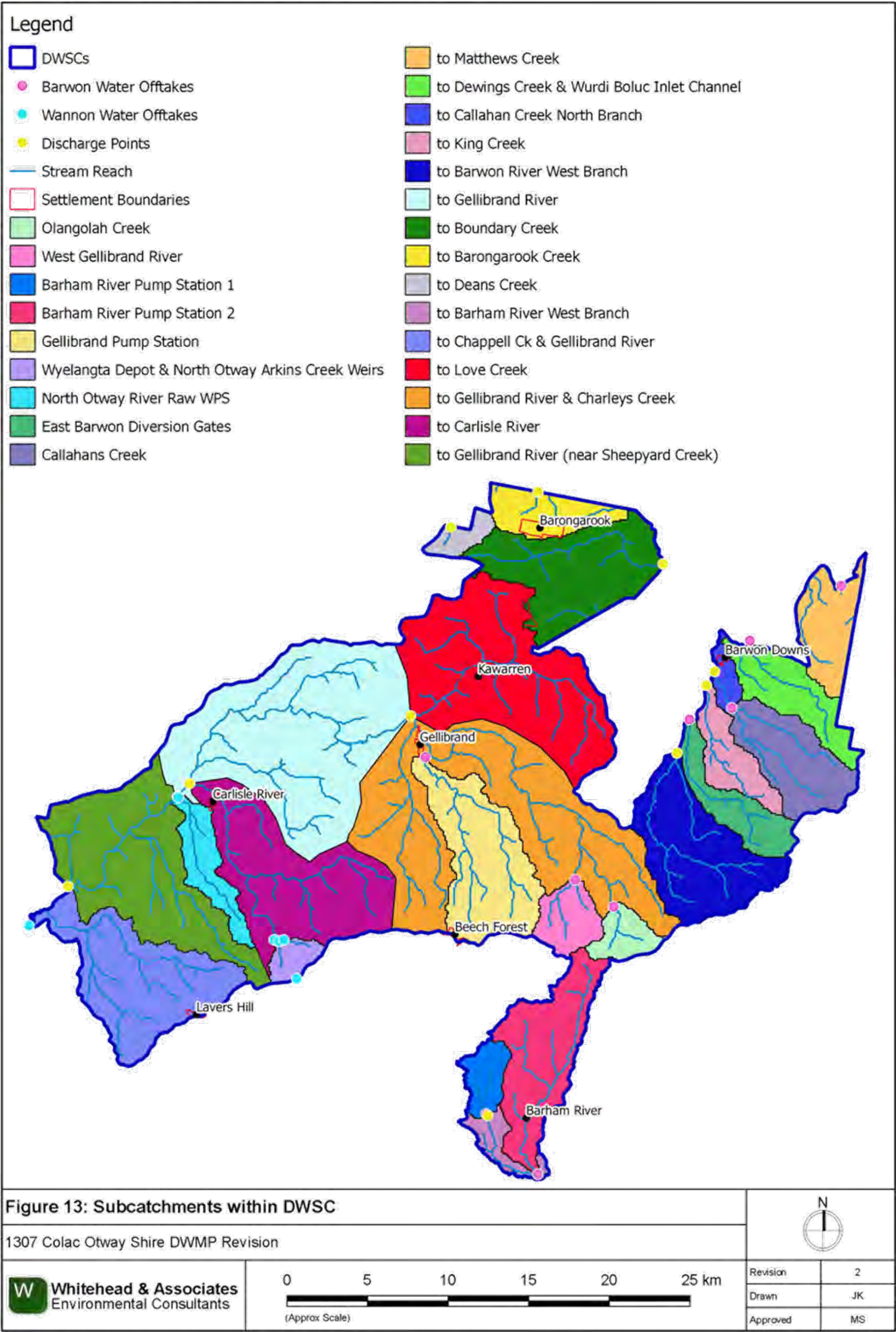
The Minister for Water's (2012) Guidelines for planning permit applications in potable water supply catchments specify that, to avoid the blanket application of a 1 in 40 hectare dwelling density in DWSCs, a DWMP must include consideration of the broader cumulative impact of DWM systems within a catchment. Aggregated 'cumulative' risk is area dependant, therefore it is important to delineate manageable areas for investigation and analysis. The DWSCs were therefore divided into smaller 'sub-catchments' so that the cumulative risk could be identified and to assist in prioritising further assessment and management resources. Sub-catchments are delineated based on areas of concern; whether that refers to offtake points, water quality sampling points or towns/settlements. The aim is to identify areas of concern that may pose a potential impact on water quality.

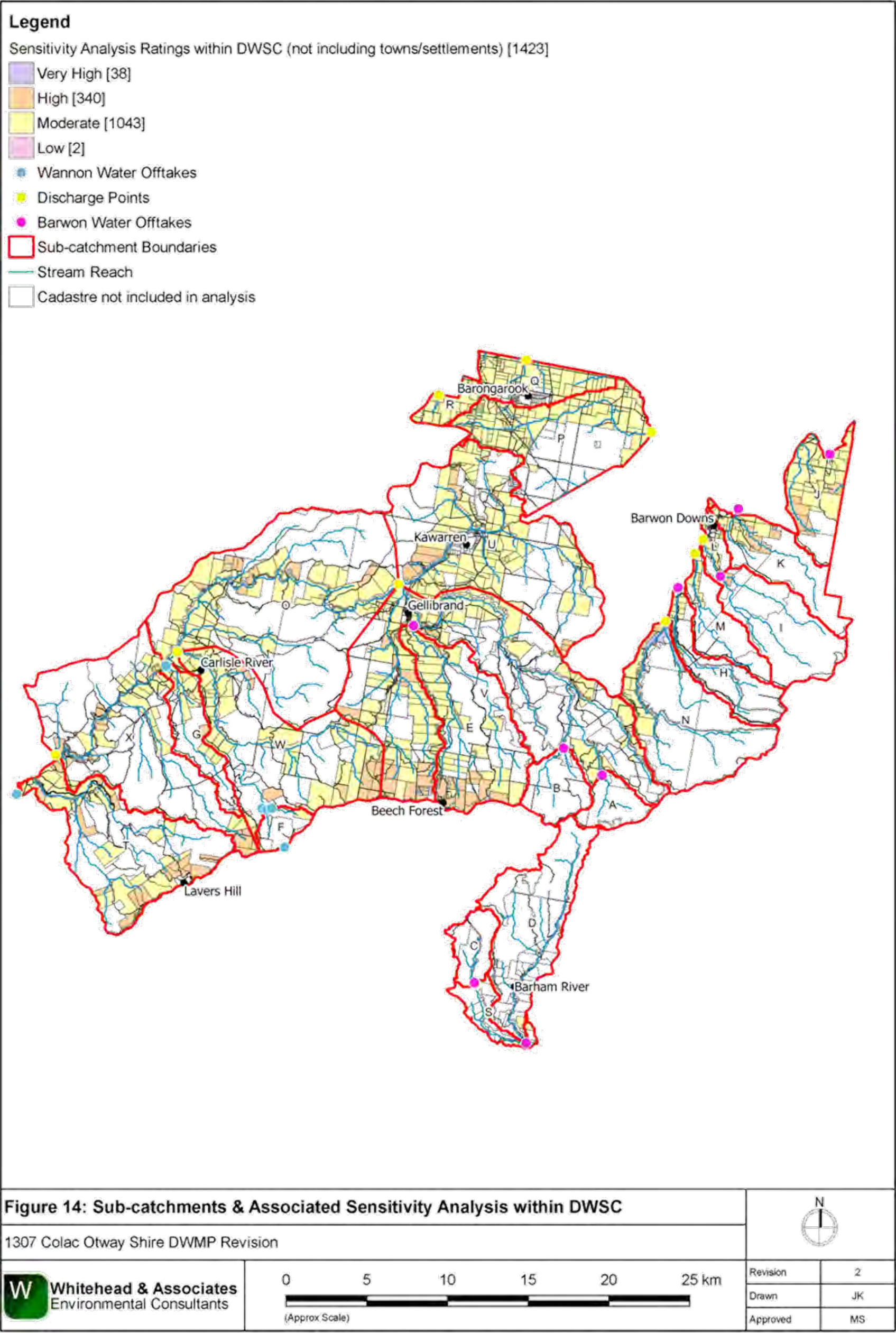
The sub-catchments were delineated using the TauDEM Sub-catchment Delineation tool in QGIS™. The Digital Elevation Model (DEM) developed in Section 6.2.5 and Water Corporation identified offtake and discharge points were used to inform the delineation of the sub-catchment boundaries. There are 9 identified Barwon Water offtakes, 6 identified Wannon Water offtakes and 10 identified discharge points. The Barwon Downs Wellfield Intake offtake points (seven in total) that refer to groundwater and multiple North Otway Wannon Water offtake points that are located in the same locality are not included in the sub-catchment analysis. For the purposes of this analysis, a sub-catchment is an area of terrain with one single outflow point. The residual regions were subdivided into a number of larger sub-catchments based on their discharge points.

Sub-catchment analysis can be applied at a variable scale. In addition to delineating the sub-catchments based on offtake and discharge points, smaller sub-catchments were delineated based on the town/settlement boundaries for the targeted unsewered towns/settlements located within the DWSC. The aim is to prioritise both the towns/settlements and sub-catchments within the DWSCs and to determine the relative contribution of risk of the town/settlement development within the larger sub-catchment.

Figure 13 shows the delineated sub-catchments and towns/settlements within the DWSC and the relative offtake and discharge points. The sub-catchment analysis resulted in the delineation of 24 individual sub-catchments, with 13 of these sub-catchments delineated based on offtake points. There were seven town/settlement sub-catchments identified. It is important to ensure that a high level of environmental health is maintained within these 13 sub-catchments in order to ensure that the drinking water supply is protected.

Section 4.4 of the Operational Plan details the prioritisation of both sub-catchments and towns/settlements based on cumulative Sensitivity Ratings. Figure 14 outlines the Sensitivity Rating mapping for the DWSCs.





9 Glossary of Terms

| Term | Definition |
|----------------------------|---|
| Aerobic treatment | Biological treatment processes that occur in the presence of oxygen (i.e. aerobic bacteria digest wastewater contaminants). Aerobic bacteria are organisms that require oxygen to survive and grow. |
| Anaerobic treatment | Biological treatment processes that occur in the absence of oxygen. |
| Blackwater | Wastewater from a toilet. |
| Desludging | Removal of the semi solid waste from a tank. |
| Effluent | Water discharged from a treatment plant. |
| Evapotranspiration | Transfer of water from the soil to the atmosphere through evaporation and plant transpiration. Calculated using the FAO Penman-Monteith method to derive (ET ₀). |
| Organic Matter | Material that comes from the tissues of organisms (plants, animals, or microorganisms) that are currently or were once living. |
| Greywater | Wastewater from showers, baths, sinks, washing machines, dish washers. |
| Hardpan | A layer of dense compacted hard soil. |
| Locality | The broader locality surrounding a town (place name within mapped boundaries). |
| Non-Potable | Water not suitable for human consumption. |
| Parcel | The smallest unit of land able to be transferred within Victoria's cadastral system, usually having one proprietor or owner (land.vic.gov.au).
For the purposes of this DWMP, parcel and lot are given to have the same meaning. |
| Peds | An aggregate of soil particles. |
| Permeability | The ability of the soil to allow water to pass through. |
| P-sorb | Phosphorus adsorption capacity of soil. |
| Property | Land under common occupation (land.vic.gov.au). May include multiple parcels. |
| Sensitivity | The 'likely' consequence of off-site (DWM) impacts based on the cumulative effect of individual property/parcel constraints (soil suitability, slope, useable lot area, climate and location) and variables affecting the specific land capability and associated limitations of the property/parcel to sustainably manage wastewater in compliance with SEPP objectives. |
| Settlement | An area of residential development within the Rural Living Zone (Barongarook and Kwarren) or Rural Conservation Zone (Barham River). |
| Sewage | Solid and liquid wastewater conveyed through sewers. |
| Sewerage | A system of sewers. |
| Town | The town servicing a locality, which is predominantly zoned |

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| Term | Definition |
|-------------|---|
| | Township Zone. It contains both residential and commercial development. |

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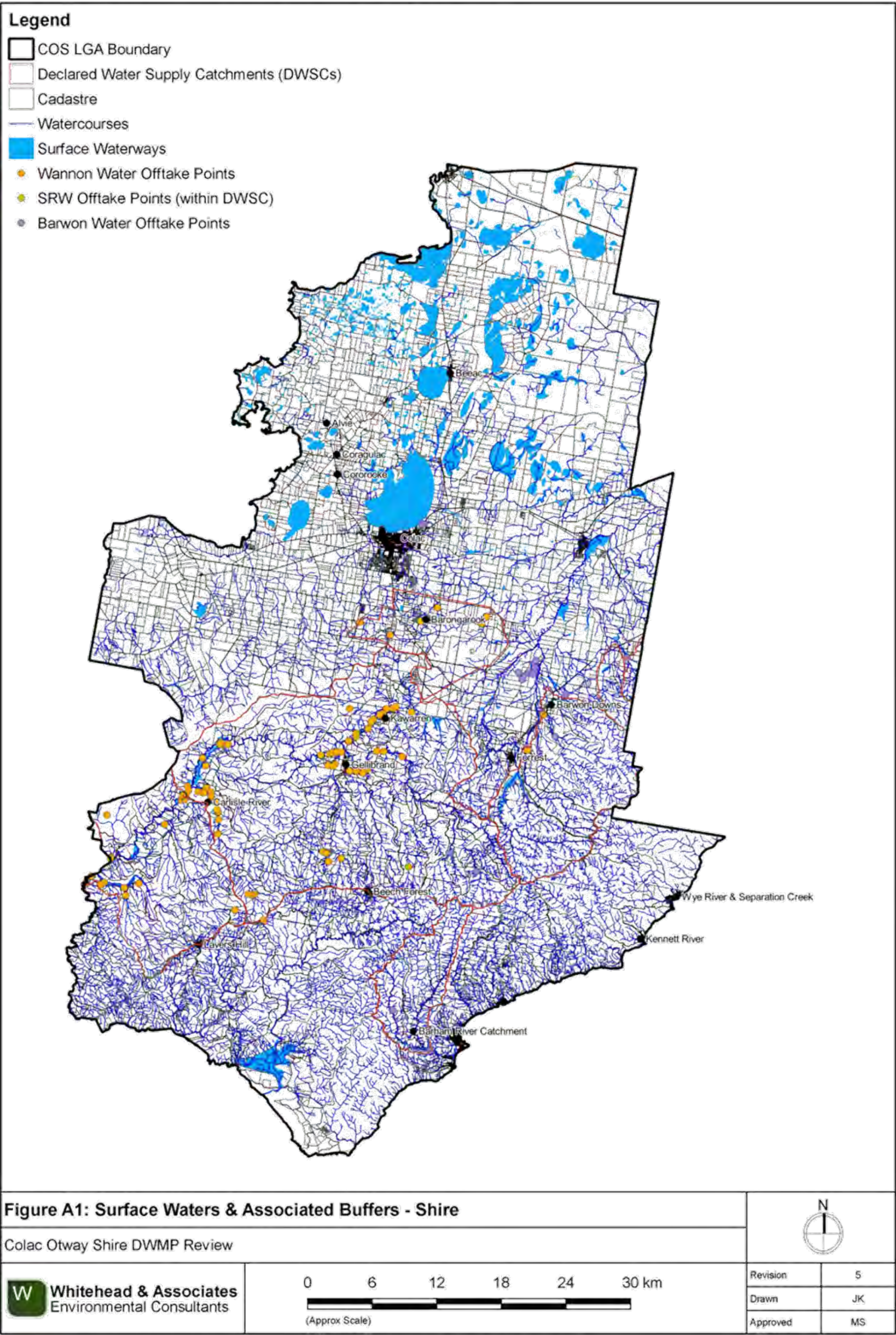
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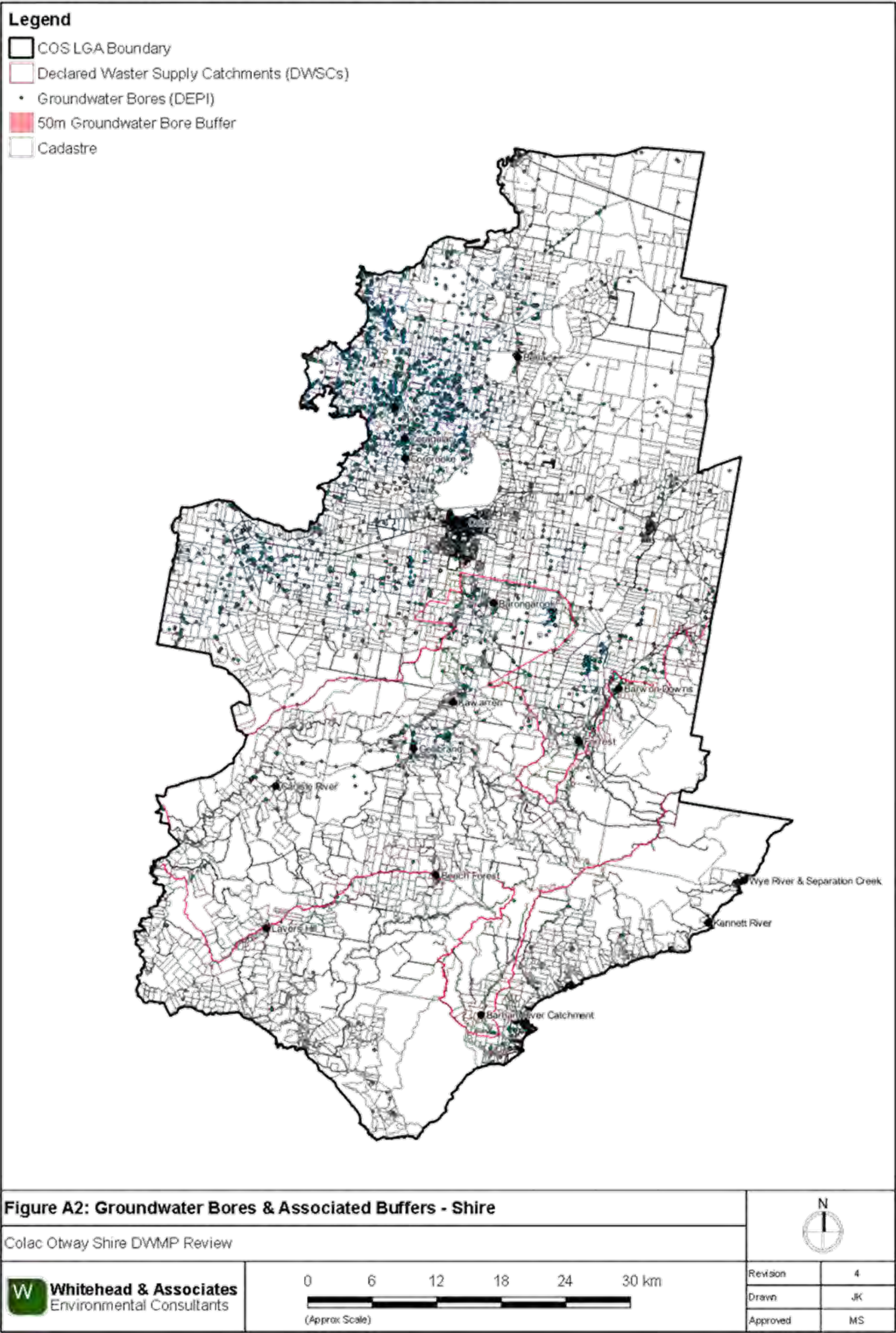
Appendix A

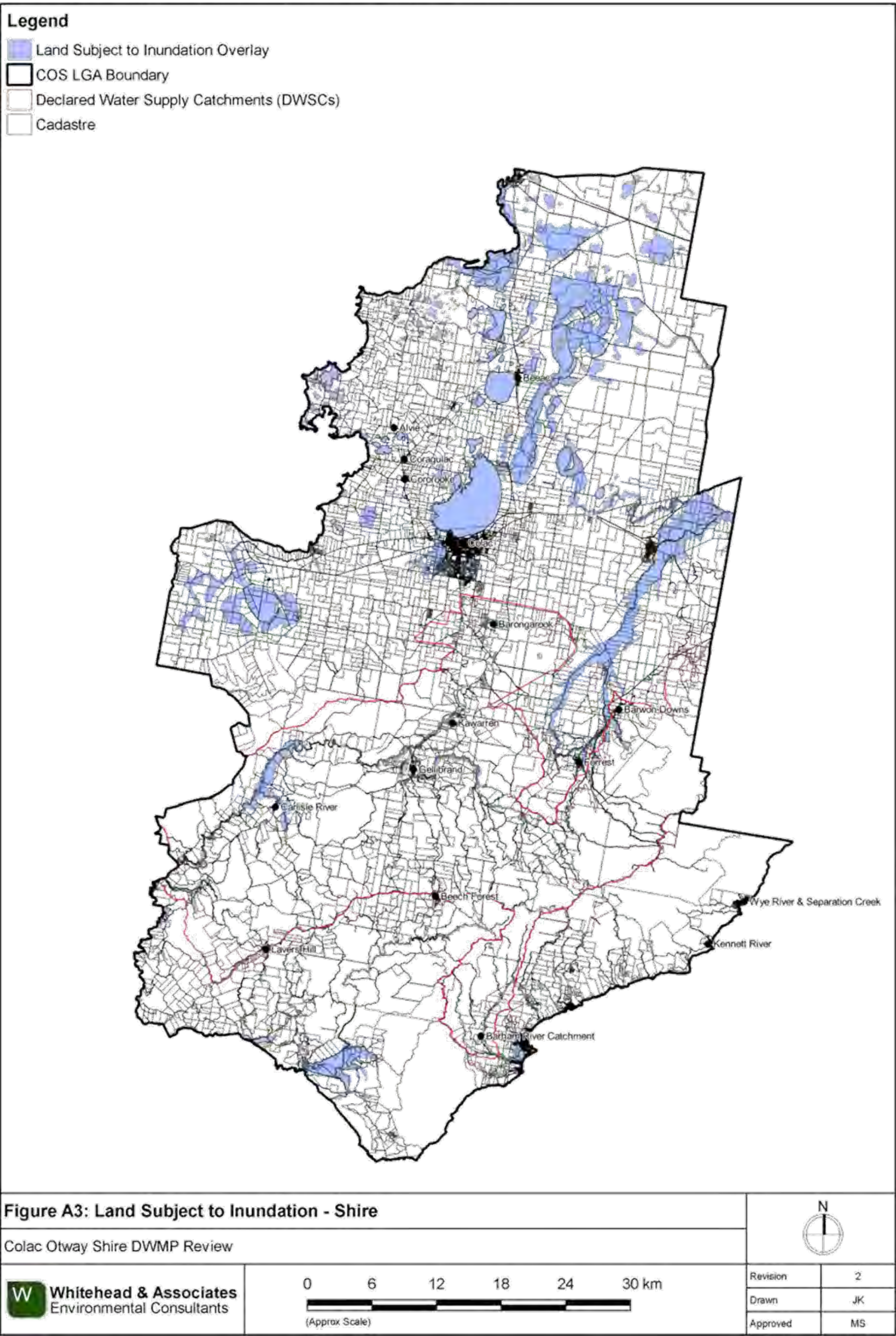
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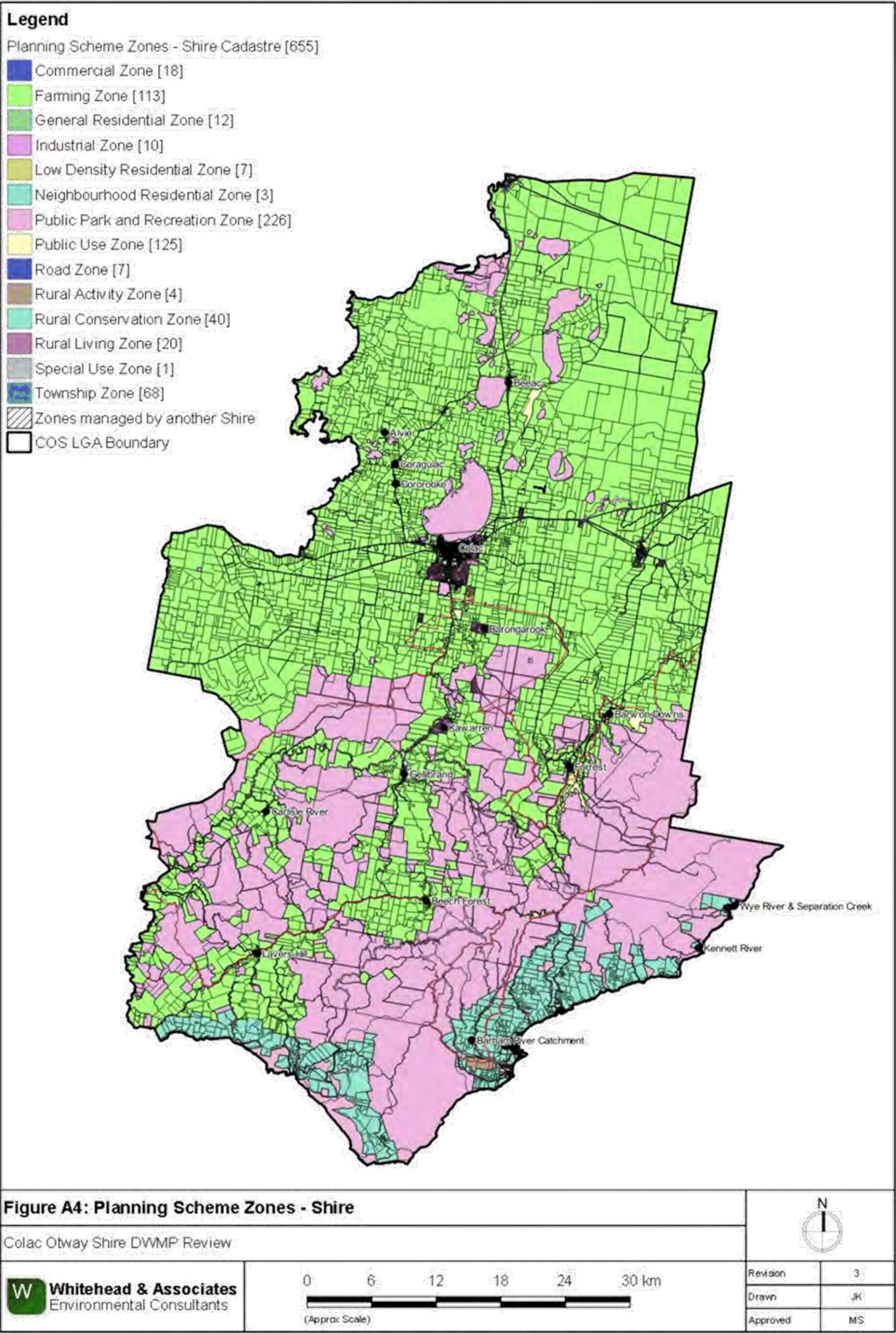
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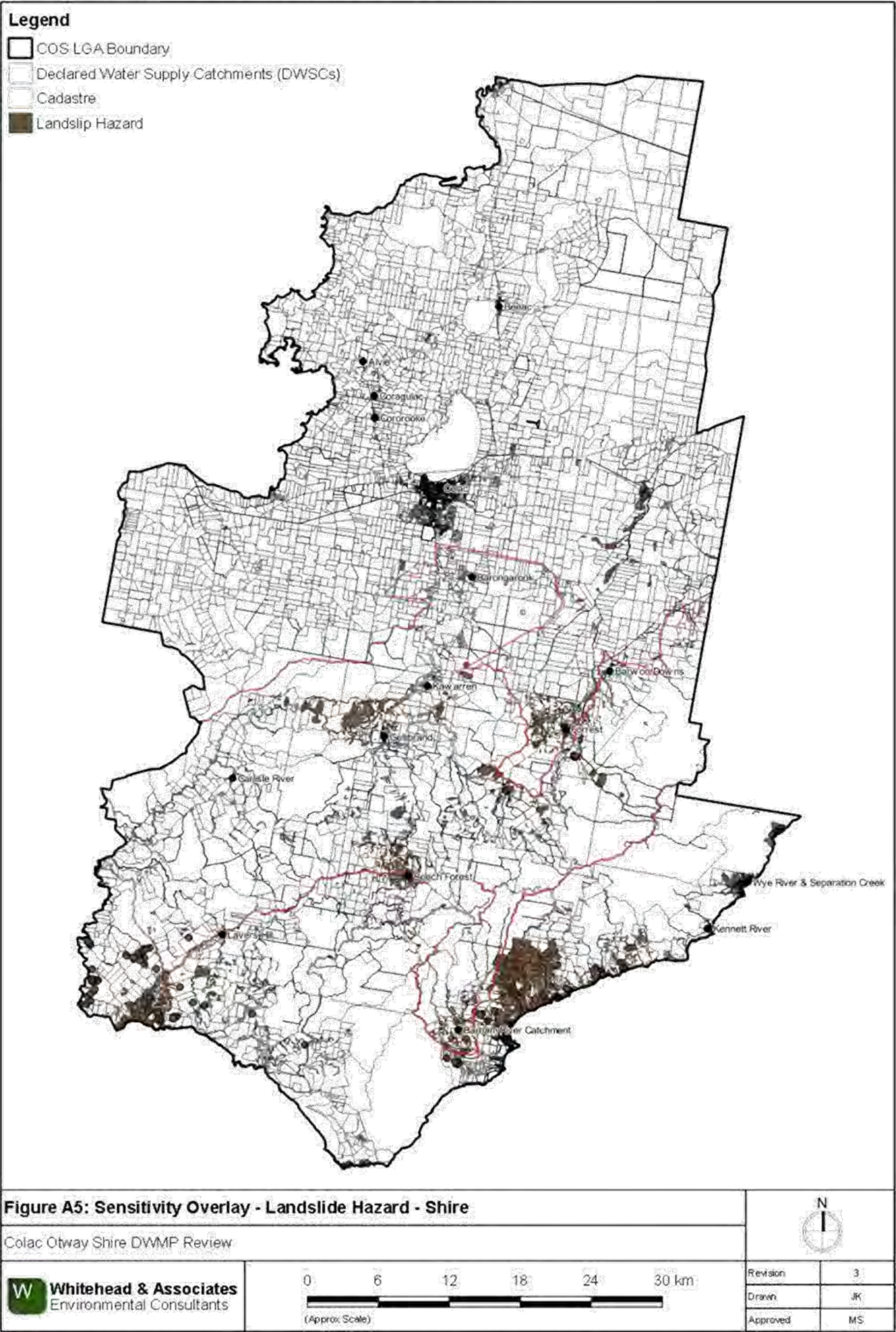
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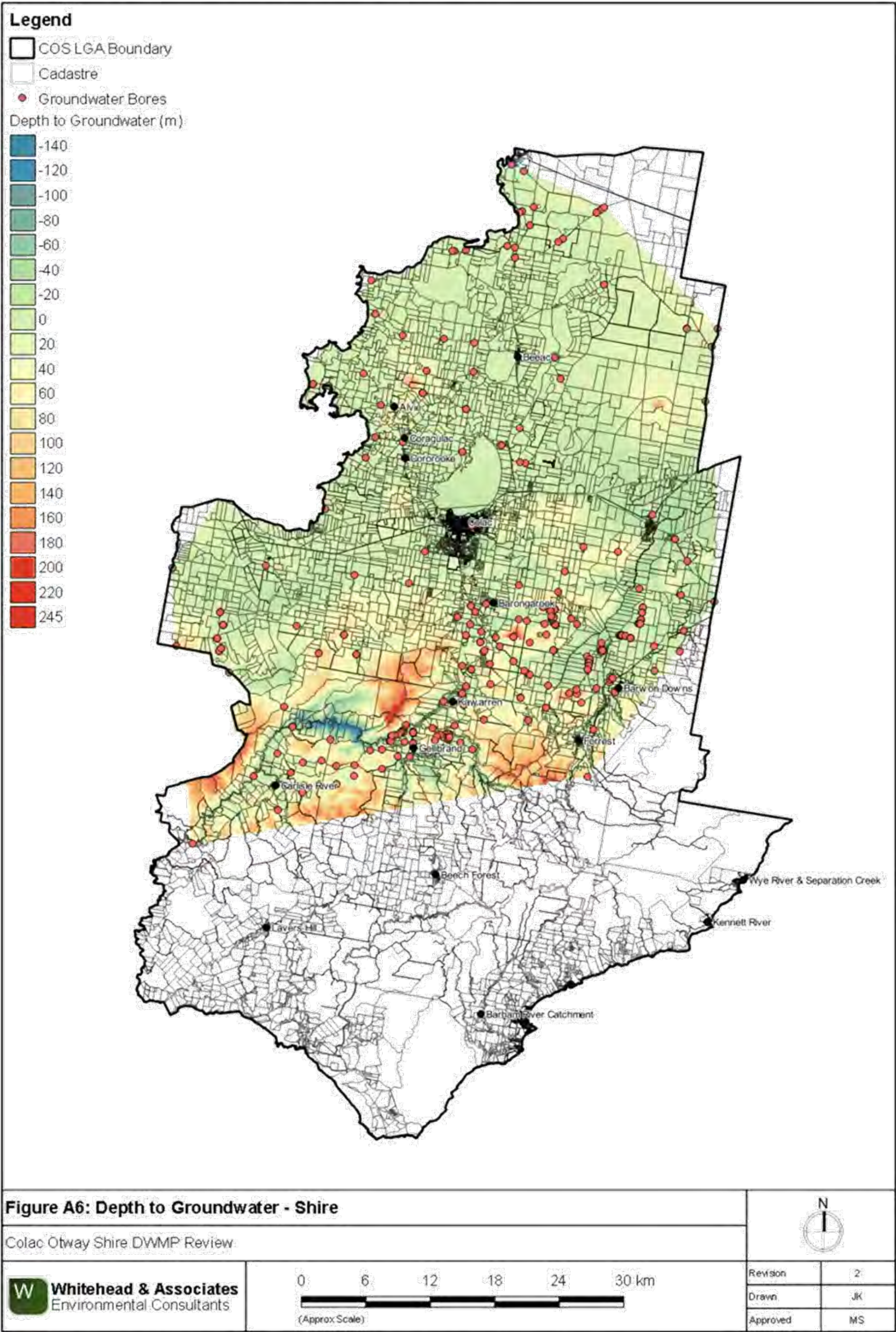


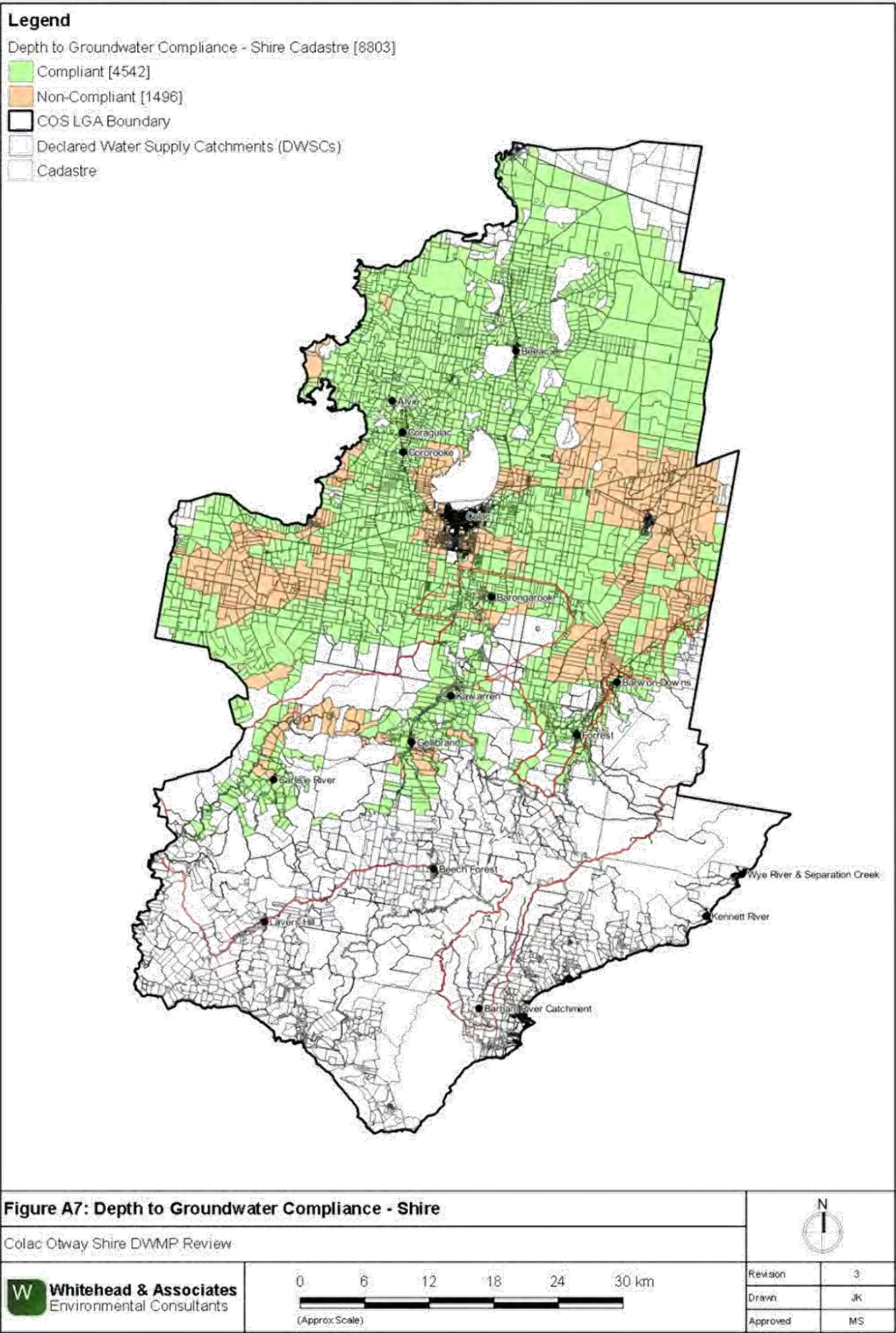


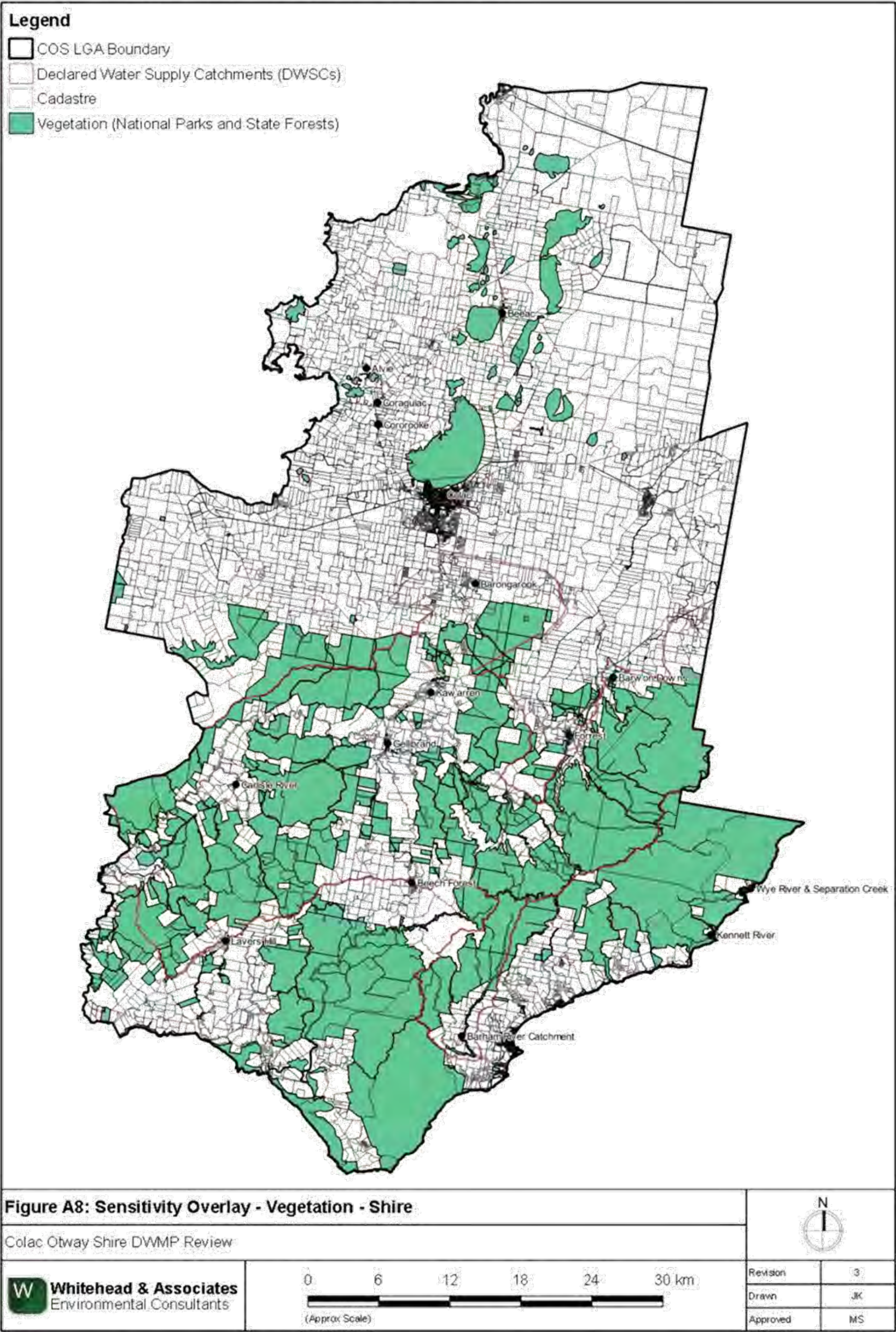












Appendix B

Locality Reports

Note: words have the following meanings in the DWMP (refer to glossary for further definition):

‘Town’ means the developed area/town which services the wider locality. ‘Towns’, which contain both residential and commercial development, are predominantly zoned Township Zone.

‘Settlement’ refers to residential areas in Barham River, Barongarook and Kewar, which are in the Rural Living Zone and Rural Conservation Zone.

‘Locality’ means the wider geographical area, inclusive of the town/settlement.

The white cadastre regions shown on the locality and town/settlement Sensitivity Rating maps refers to regions excluded from the study. Refer to Section 5 for more detail.

A. Alvie Locality Report

1a. Introduction

Alvie is a rural locality located approximately 12km northwest of Colac on the western side of Lake Corangamite within the Western Volcanic Plain landscape and Red Rock region. Alvie lies at the foot of the Red Rock Scenic Reserve, an old scoria formation that formed due to violent volcanic eruptions, which is a popular tourist attraction.

The locality has a population of approximately 276 residents. There are approximately 174 and 33 unsewered parcels located within the Alvie locality and town respectively, with 28 DWM system permits that have been inspected to date by COS. The current DWM permits and their associated treatment system and LAA method within the Alvie locality are summarised as follows:

- 2 AWTS (1 subsurface irrigation, 1 unknown);
- 20 septic tanks (6 trenches and 14 unknown);
- 1 worm farm (1 subsurface irrigation); and
- 5 unknown (2 trenches and 3 unknown).

No site investigations were conducted within the Alvie locality as part of the 2014 field assessments; however, soil investigations were conducted to confirm the soil type.

2a. Background Documentation

Refer to the following documents for additional detail specifically regarding the locality:

- Red Rock Region Community Infrastructure Plan (September, 2013);
- COS Planning Scheme; and
- Rural Living Strategy (2011)

3a. Summary of Constraints to DWM

| Characteristic | Description |
|--------------------------------|---|
| Climate Zone | Zone 2 |
| Surface waterways & catchments | Alvie contains a number of lakes, predominantly in the region to the south of the locality, that have formed within the Western Volcanic Plains; including Lake Coragulac (southeast near town), Lake Wernwrap, Lake Purdiguluc and Lake Gnalinegurk. |
| Groundwater | Proximity to groundwater bores: significant throughout the locality with a high density of groundwater bores. |
| Land subject to inundation | To the south of the town around the lakes. |
| Useable lot area | High: 12 (23) |

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| Characteristic | Description |
|--|---|
| Town (Locality) | Moderate: 11 (27)
Low: 10 (111)
Compliant: 0 (13) |
| Minimum lot size compliance with Planning Scheme Zoning | The town is predominantly zoned as Township, with some Public Use Zone. Land in the wider locality area is predominantly in the Farming Zone, with land associated with the lakes in the Public Conservation and Resource Zone.

Compliance is variable throughout the locality, with the majority of the town compliant.

Compliant: 28 (51)
Non-compliant: 5 (123) |
| Slope
Town (Locality) | High: 1 (18) (higher towards Lake Coragulac)
Moderate: 7 (15)
Low: 25 (141) |
| Geology | Northwest region – unnamed stony rises of Newer Volcanic Group;
Town – unnamed phreatomagmatic deposits (tuff rings) of Newer Volcanic Group;

Eastern and southern regions – unnamed scoria deposits (scoria cones and agglutinated spatter rims) of Newer Volcanic Group; and

Some unnamed non-marine swamp, lake and estuarine deposits. |
| Soil suitability
Town (Locality) | High: 0 (15)
Moderate: 33 (159)
Low: 0 (0)

The town consists of soil landscape unit '101' (moderate rating) which forms in the undulating low hills of the Western Volcanic Plains and consists of friable mottled black texture contrast soil and neutral black gradational soils to depths less than 1.5m. The soils consist of moderately structured clay loam over strongly structured medium clay to heavy clay. Limitations include restricted drainage.

The western and surrounding regions of the locality consists of soil landscape unit '114' (moderate rating) which forms in the undulating basalt plains and stony rises and consists of gradational and friable mottled textured contrast soils to depths of less than 1.5m. The soils consist of strongly structured clay loam over strongly structured medium clay.

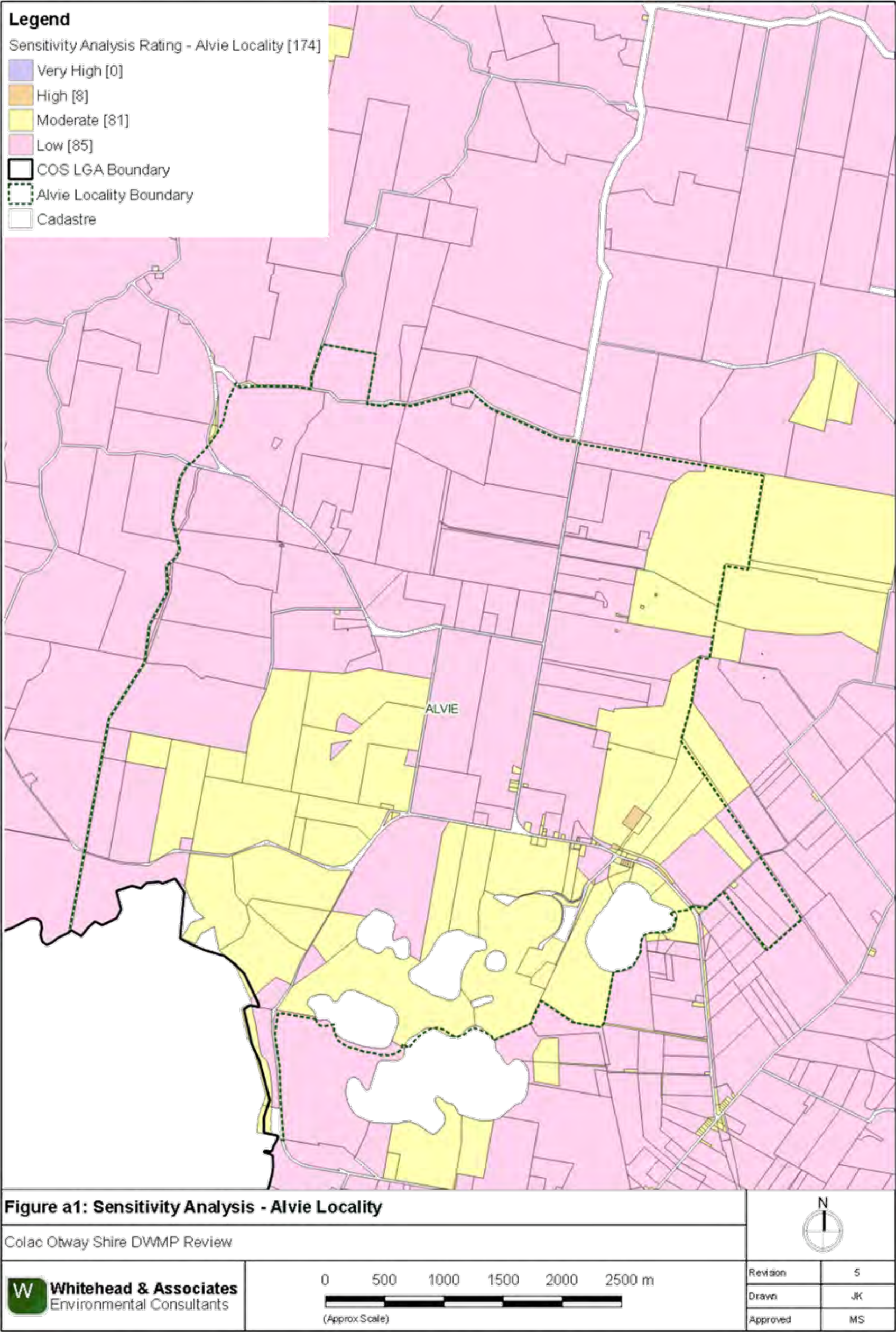
There are some landform depressions to the north of the town. |

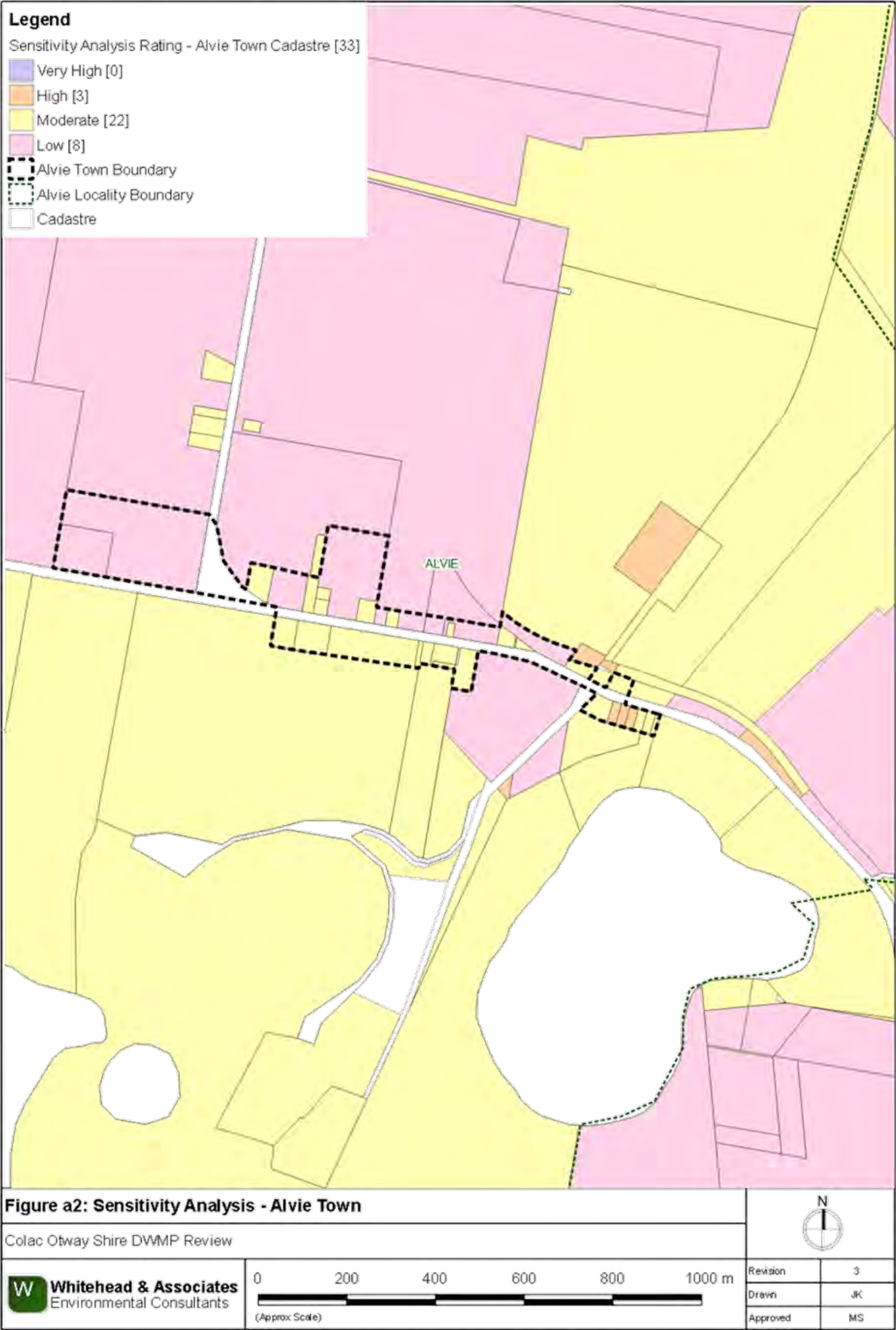
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| Characteristic | Description |
|--|--|
| Sensitivity Overlay | Depth to Groundwater Compliance: all compliant.
Landslip: Nil.
Vegetation: Red Rock Scenic Reserve and lakes to the south (Coragulac, Werowrap, Corangamite, and Gnalinegurk). |
| Sensitivity Analysis Rating Town (Locality) | Very High: 0 (0)
High: 3 (8)
Moderate: 22 (81)
Low: 8 (85) |

4a. Sensitivity Analysis (Maps)





5a. System Selection

Due to the dominance of heavy-textured soils in the Alvie area, conventional absorption trenches and beds are not likely to be feasible and are discouraged. Appendix A of the EPA Code of Practice (2013) prohibits LPED systems on Category 5 and 6 soils (medium to heavy clays). The System Sizing Tables (below) indicate which systems are likely to be the most appropriate for the locality.

6a. System Sizing Tables

The Sizing Tables for each system type were created using monthly 70th percentile water balances, using methods described in the MAV Model LCA, 2014. Monthly 70th percentile rainfall and average evapotranspiration data for Alvie was sourced from SILO (Scientific Information for Land Owners) climate databases, which are managed by the Queensland Government. The SILO databases use accurate meteorological data collected throughout Australia over long time periods.

The Design Loading Rates (DLRs) and Design Irrigation Rates (DIRs) were taken from the EPA Code of Practice. Where the Code of Practice has precluded use of a particular type of system on a certain soil type, it is shown as 'Not Applicable' for that soil type in the Sizing Tables. Where the evapotranspiration deficit requires unrealistically large land application areas for a particular system on a certain soil type, it is also shown as 'Not Applicable' for that soil type in the Sizing Tables. Detailed, site-specific LCAs and system designs would be required to further investigate the feasibility of systems deemed 'Not Applicable' in the sizing tables. Mitigation measures (such as importation of topsoil to appropriate depths in the land application area), may be required to sustainably achieve land application of effluent on constrained parcels.

The Sizing Tables for Alvie are provided below.

7a. General Conclusion

The parcels within Alvie have been predominantly assigned a Moderate or Low Sensitivity Rating to sustainable DWM. Predominantly, both Standard and Council LCAs will be required, with the use of System Sizing tables deemed appropriate. The constraints within Alvie are quite low in comparison to other localities, with particular attention directed towards ensuring that the quality of the groundwater resources is maintained and the correct decommissioning of groundwater bores occurs where necessary.

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| Alvie and Beeac | | | | | | | | | | | |
|---|-----------------------|---|-----------------|---------------------|--|--------------------------|--|---|---|--|--|
| Drip and Spray Irrigation Systems* - Secondary Treated Effluent only | | | | | | | | | | | |
| Development Type | 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 (m ²) not including spacing and setbacks | | | | | | | | | |
| | 1,080 | 268 | | 356 | 426 | 530 | 1,039 | | | | |
| | 5 + bedroom residence | 900 | | 223 | 297 | 355 | 866 | | | | |
| | 4 bedroom residence | 720 | | 127 | 237 | 284 | 693 | | | | |
| 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 | | | | | | | | | | | |
| Conventional Absorption Trenches and Beds - Primary or Secondary Treated Effluent | | | | | | | | | | | |
| Development Type | Soil Category | Gravels & Sands (1) | Sandy Loams (2) | Loams (3) | Weak Loams & High/Mod Clay Loams (3 & 4) | Weak Clay Loams (4) | Massive Clay Loams (4) | Light Clays (5) | Medium to Heavy Clays (6) | | |
| | DLR (mm) | | | | | | | | | | |
| Development Type | Daily (L/day) | Not supported (Alternative Land Application System Required) | | | | | | | | | |
| | 1,080 | | | | | | | | | | |
| | 4 bedroom residence | | | | | | | | | | |
| | 1-3 bedroom residence | | | | | | | | | | |
| Evapotranspiration-Absorption Trenches and Beds - Primary or Secondary Treated Effluent (Category 1 to 5) and Secondary Treated Effluent only (Category 6) | | | | | | | | | | | |
| Development Type | 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 effluent storage (m ²) not including spacing and setbacks | | | | | | | | | |
| | 1,080 | 58 | | 78 | 123 | 100 | 128 | 281 | | | |
| | 5 + bedroom residence | 900 | | 48 | 65 | 102 | 132 | 234 | | | |
| | 4 bedroom residence | 720 | | 39 | 52 | 82 | 106 | 188 | | | |
| 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 | | | | | | | | | | | |
| Development Type | 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 | 3 | N/A | N/A | | | | |
| Development Type | Daily (L/day) | Total min. basal or 'wetted' area required (m ²)* | | | | | | | | | |
| | 1,080 | 379 | | 460 | 584 | | | | | | |
| | 5 + bedroom residence | 900 | | 316 | 383 | 487 | | | | | |
| | 4 bedroom residence | 720 | | 253 | 307 | 390 | | | | | |
| 1-3 bedroom residence | | | | | | | | | | | |
| † required for zero wet weather storage (m ²) not including spacing & setbacks | | | | | | | | | | | |
| Wick Trenches and Beds - Secondary Treated Effluent Only | | | | | | | | | | | |
| Development Type | Soil Category | Gravels & Sands (1) | Sandy Loams (2) | 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 | 8 | 5 | | |
| Development Type | Daily (L/day) | Total min. basal or 'wetted' area required for zero wet weather effluent storage (m ²) not including spacing and setbacks | | | | | | | | | |
| | 1,080 | 46 | 38 | 58 | 123 | 100 | 128 | 281 | | | |
| | 5 + bedroom residence | 900 | 38 | 32 | 48 | 102 | 83 | 132 | 234 | | |
| | 4 bedroom residence | 720 | 31 | 25 | 39 | 82 | 67 | 106 | 188 | | |

B. Barham River Catchment (Apollo Bay) Locality Report

1b. Introduction

Barham River (also known informally as 'Paradise') is a rural settlement located in the hinterlands of the Apollo Bay locality on the south-eastern coast of COS. On maps, it is officially within the broader Apollo Bay locality, but it is distinguished by low density, unsewered residential properties primarily extending along Barham River Road and other minor roads. Many properties are rural-residential (including hobby farms). The landform consists of dissected low hills and alluvial terraces abutting rivers and streams at the base of the Otway Ranges. The entire Barham River ('Paradise') Catchment settlement is located within the Barham River DWSC as indicated by the surface water informative map A1, Appendix A.

Because it does not fit within specific Census locality boundaries, it is difficult to estimate the residential population of the Barham River Catchment settlement. The broader Apollo Bay locality (which includes the Barham River Catchment settlement) has a population of approximately 1,095 residents which reaches up to 15,000 in the peak holiday season.

The settlement of Apollo Bay is sewerred, with approximately 366 and 81 unsewered parcels located within the Apollo Bay locality and Barham River Catchment settlement, respectively. There are 140 DWM system permits that have been inspected by COS to date within the Barham River Catchment settlement/ Apollo Bay locality. The current DWM permits and their associated treatment system and LAA method are summarised as follows:

- 51 AWTS (7 subsurface irrigation, 16 drip irrigation, 8 irrigation, 3 trenches and 17 unknown);
- 2 composting toilets (1 drip irrigation);
- 56 septic tanks (27 trenches and 29 unknown);
- 2 worm farms (2 trenches); and
- 29 unknown (11 trenches, 1 reln drain, 1 subsurface irrigation, and 16 unknown).

2b. Background Documentation

Refer to the following documents for additional detail specifically regarding the locality:

- Apollo Bay Structure Plan (April 2007);
- Barham River Confluence Land Management Plan (February 2012);
- COS Planning Scheme; and
- Rural Living Strategy (2011)

3b. Site Assessment Results

The following table summarises the results from the representative audits conducted by Consultant staff in September 2014.

| Characteristic | Description |
|----------------|---|
| Land use | The Barham River Catchment settlement comprises a range of land |

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| Characteristic | Description |
|---|---|
| | uses, including rural living, small farms, and tourism. |
| Occupancy rates | 2 (as per Apollo Bay Gazetted Locality, ABS Census, 2011). |
| Typical soils | Sandy clays and clay loams over clay or weathered shallow bedrock as determined during field investigations. |
| AS/NZS 1547:2012 soil categories | 4 (Clay Loams), 5 (Light and Sandy Clays) and 6 (Medium to Heavy Clays). |
| Existing Systems | <p>Separate Blackwater and Greywater</p> <p>Of the three systems inspected during field investigations, one (33%) was assumed to comprise separate blackwater treatment in a septic tank, with direct greywater diversion within the property/parcel boundary. The septic tank was not accessed, as it could not be found. Time since last pump out was not determined.</p> <p>It was assumed that septic effluent is discharged to conventional absorption trenches; however, the LAA was not identified.</p> <p>Combined Blackwater and Greywater</p> <p>Two systems (67%) inspected have a combined wastewater treatment system, or were assumed to have based on layout of pipework and age of dwelling. The time since last pump-out was generally unknown (partly due to owner not being home to ascertain).</p> <p>Septic effluent discharged to one or more conventional absorption trenches (or was assumed to if trenches could not be identified). The trench dimensions were generally unclear, and it is likely that they were undersized for the number of bedrooms. The majority of trenches or/and available LAAs were located on land of less than 8% slope and appeared to be parallel with contours.</p> |

4b. Summary of Constraints to DWM

| Characteristic | Description |
|---|---|
| Climate Zone | Zone 3 |
| Surface waterways & catchments | <p>Approximately half of the broader Apollo Bay locality is within a DWSC. The entirety of the Barham River ('Paradise') Catchment settlement is located in the Barham River DWSC, which is the drinking water supply for connected properties in Apollo Bay. Barham River (east and west branches) is the major watercourse and has tributaries throughout the catchment.</p> <p>Barham River confluences with the Southern Ocean between the settlements of Marengo and Apollo Bay.</p> |

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| Characteristic | Description |
|--|---|
| Groundwater | Proximity to groundwater bores: primarily around semi-rural parcels on the outskirts (west and northwest) of Apollo Bay settlement.

No depth to groundwater data. |
| Land subject to inundation | Along the lower coastal creek reaches, particularly at the Barham River confluence with the Southern Ocean. |
| Useable lot area
Settlement
(Locality) | High: 16 (76)
Moderate: 8 (24)
Low: 56 (260)
Compliant: 1 (6) |
| Minimum lot size compliance with Planning Scheme Zoning | The Barham River ('Paradise') Catchment settlement is primarily zoned Rural Conservation Zone and is located to the west and northwest of the Apollo Bay town, in the foot slopes of the Otway Ranges.

Compliance is variable throughout the broader Apollo Bay locality, with a greater density of non-compliant parcels located to the south, west and north of the Apollo Bay settlement.

Compliant: 22 (98)
Non-compliant: 59 (268) |
| Slope
Settlement
(Locality) | High: 76 (285) (particularly around the Otway Ranges foot slopes)
Moderate: 3 (41)
Low: 2 (40) |
| Geology | Sedimentary Eumeralla Formation (early Cretaceous), fluvial braided stream deposits, unnamed Quaternary sedimentary (non-marine) colluvium and gully alluvium, and alluvial floodplain deposits. It differs along the coastline near the town of Apollo Bay. |
| Soil suitability
Settlement
(Locality) | High: 2 (113)
Moderate: 79 (253)
Low: 0 (0)

Northern region/hinterland region consists of soil landscape unit '61' (moderate rating) which forms in the deeply dissected hills of the Otway Ranges and consists of brown gradational soils to 1.2m depth. The soils consist of moderately structured silty loam over clay loam. Limitations include restricted drainage and very acidic soil.

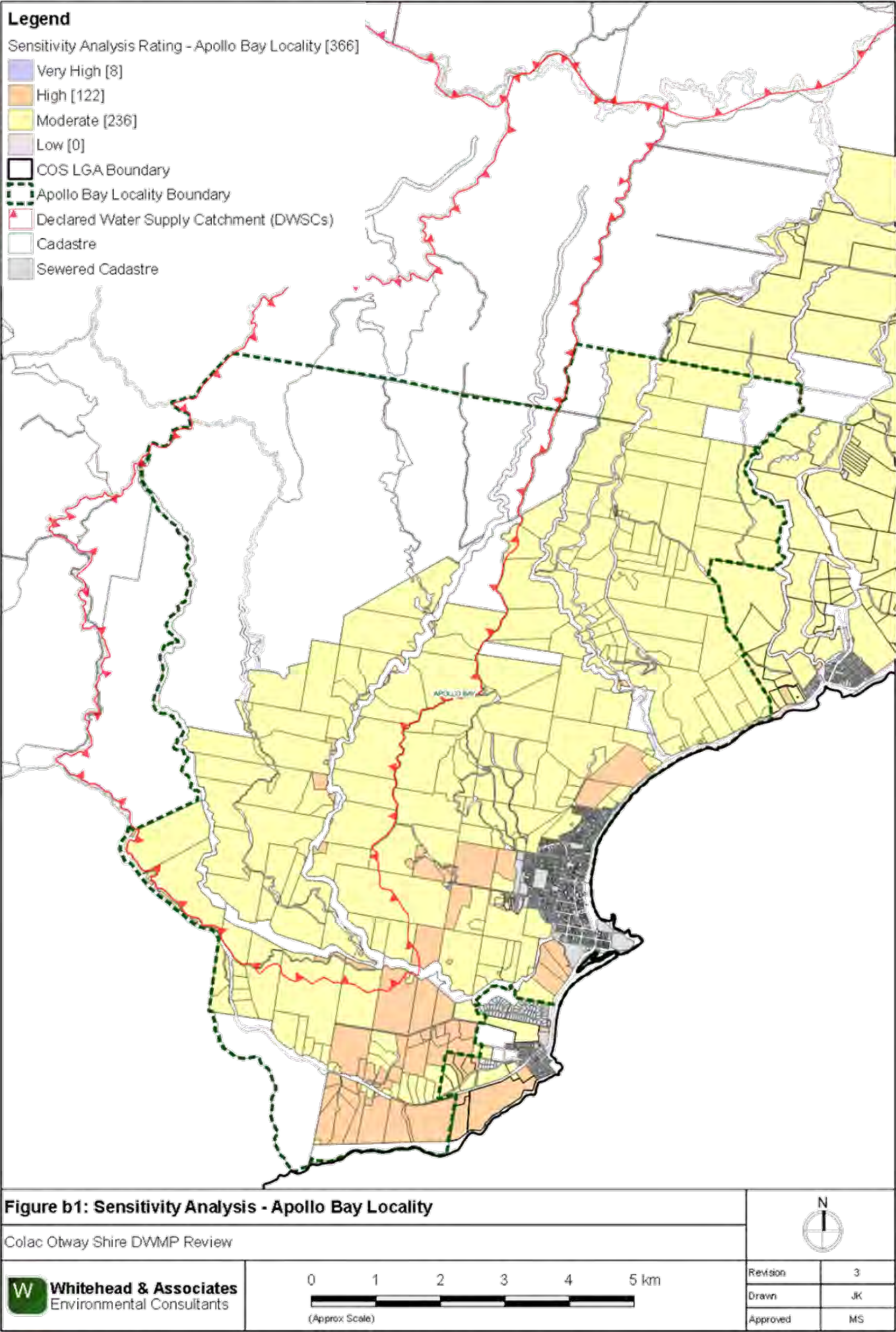
The western region of the Apollo Bay locality and extending northeast along the coastline towards Skenes Creek consists of soil landscape unit '64' (moderate rating) which forms in the similar landscape as |

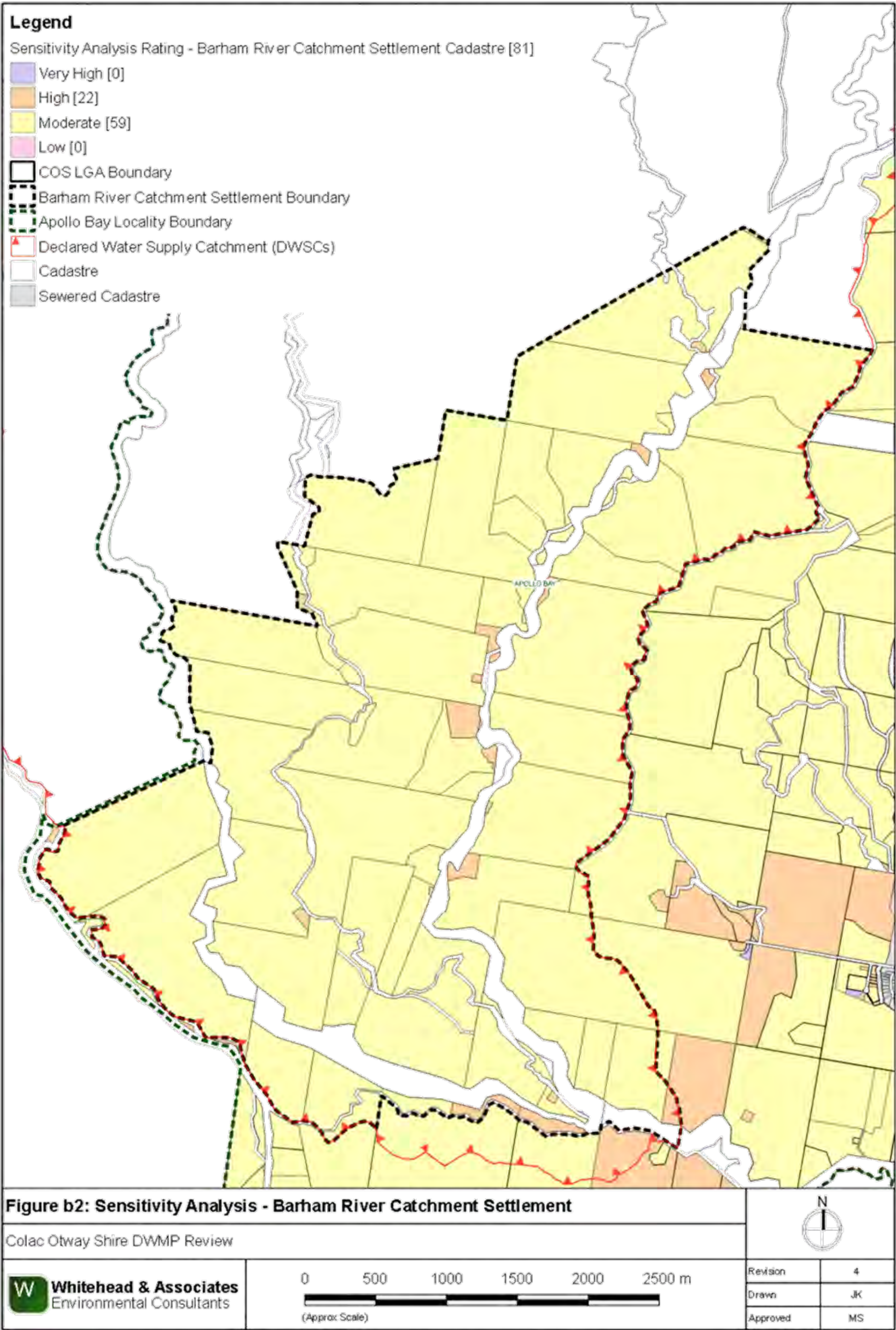
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| Characteristic | Description |
|--|--|
| | <p>detailed in '61'. It consists of brown texture contrast soils to 0.9m depth. The soils consist of weakly structured clay sand over strongly structured clay loam.</p> <p>The northern half of the Apollo Bay locality consists of soil landscape unit '62' (high rating) which forms in the alluvium, alluvial terraces, floodplains and coastal plains of the Sedimentary Western Plains and elevated longitudinal coastal dunes at Cape Otway and consists of red-yellow calcareous sand soils to 1.9m depth. The soils consist of apedal loamy sand over weakly structured sandy clay. Limitations include low fertility and coarse fragments.</p> <p>The southern half of the Apollo Bay locality consists of soil landscape unit '91' (high rating) which forms in the deeply dissected and uplifted plains with coastal cliffs and consists of grey sand soils with hardpans to more than 2m depth. The soils consist of weakly structured loamy sand over apedal sand. Limitations include low fertility and coarse fragments.</p> <p>There is a small region in the southwest of the locality that consists of medium clay deep grey gradational soils.</p> |
| Sensitivity Overlay | <p>No depth to groundwater data</p> <p>Landslip: extensive within the eastern (coastal) section of locality, significant in the foot slopes of the Otway Ranges.</p> <p>Vegetation: Great Otway National Park in the northwest.</p> |
| Sensitivity Analysis Rating
Settlement (Locality) | <p>Very High: 0 (8)</p> <p>High: 22 (122)</p> <p>Moderate: 59 (236)</p> <p>Low: 0 (0)</p> |

5b. Sensitivity Analysis (Maps)





6b. System Selection

Due to the dominance of heavy-textured soils in the Barham River Catchment settlement, conventional absorption trenches and beds are not likely to be feasible and are discouraged. Appendix A of the EPA Code of Practice (2013) prohibits LPED systems on Category 5 and 6 soils (medium to heavy clays).

The wet climate of the Barham River Catchment settlement makes it a higher risk for DWM and site-specific, detailed design will be required for unsewered parcels in this area. Mitigation measures (such as importation of topsoil to appropriate depths in the land application area), may be required to sustainably achieve land application of effluent on constrained parcels.

The Sizing Tables (discussed below) are not applicable for the Barham River Catchment settlement.

7b. System Sizing Tables

The Sizing Tables for each system type were created using monthly 70th percentile water balances, using methods described in the MAV Model LCA (2014). 70th percentile monthly rainfall exceeds average monthly evapotranspiration in eight months of the year in the Barham River area. As a result, there is a month-to-month surplus of hydraulic inputs and subsequently the monthly water balance does not resolve itself and cannot produce meaningful results for land application area sizing.

Site-specific detailed design is required for the Barham River Catchment settlement.

8b. General Conclusion

The majority of the parcels within the locality have been assigned a Moderate or High Sensitivity Rating to sustainable DWM. Predominantly, both Standard and Detailed LCAs will be required, with site-specific design a necessity due to the higher rainfall associated with this region. System Sizing Tables were not generated and a monthly water balance will need to be generated for system sizing for the Standard LCA. Particular attention needs to be directed towards ensuring that setbacks from surface waterways are maintained and that the systems selected are appropriate for steeper slopes with correct construction.

C. Barongarook Locality Report

1c. Introduction

Barongarook is located in the centre of COS approximately 9km south of Colac. The landform consists of dissected low hills and alluvial terraces abutting a stream on the northern foothills of the Otway Ranges. Notably, the entire settlement and surrounding locality is located within a DWSC, predominantly Barwon Downs Wellfield Intake DWSC and Gellibrand River DWSC in the southwest, as indicated by the surface water informative map, Appendix A.

Barongarook has two main settlement areas; a large one to the north and a smaller rural living settlement to the south. Barongarook locality has a population of approximately 464 residents. There are approximately 265 and 101 unsewered parcels located within the Barongarook locality and settlements, respectively, with 121 DWM system permits that have been inspected to date by COS. The current DWM permits and their associated treatment system and LAA method within the Barongarook locality are summarised as follows:

- 15 AWTS (5 subsurface irrigation, 4 drip irrigation, 1 irrigation and 4 unknown);
- 2 sand filters (1 subsurface irrigation and 1 drip irrigation);
- 64 septic tanks (11 trenches, 1 subsurface irrigation and 52 unknown); and
- 40 unknown (12 trenches, 3 subsurface irrigation, 3 irrigation, and 22 unknown).

No field investigations were conducted in the Barongarook locality as part of the 2014 field assessments; however, soil investigations were conducted to confirm the soil type.

2c. Background Documentation

Refer to the following documents for additional detail regarding the locality:

- Barongarook Covenant Reserve Land Management Plan (February, 2012);
- COS Planning Scheme; and
- Rural Living Strategy (2011).

3c. Summary of Constraints to DWM

| Characteristic | Description |
|--------------------------------|---|
| Climate Zone | Zone 3 |
| Surface waterways & catchments | The locality is located entirely within the Barwon Downs Wellfield Intake (Geelong) DWSC and Gellibrand River DWSC in the south. Boundary Creek is located to the south of the settlement, transversing southwest-northeast. Ten Mile Creek and Dividing Creek are also located to the south of the settlement. Tributaries of the Barongarook Creek West Branch flow into the surrounding region from the north into the settlement. |
| Groundwater | Proximity to groundwater bores: distributed throughout. |

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| Characteristic | Description |
|--|---|
| Land subject to inundation | Nil |
| Useable lot area
Settlement
(Locality) | High: 18 (26)
Moderate: 6 (16)
Low: 77 (216)
Compliant: 0 (7) |
| Minimum lot size compliance with Planning Scheme Zoning | The locality is predominately in the Farming Zone with some Public Conservation and Resource Zone to the southeast. The settlements (one in the south and the other in the north) are zoned Rural Living.
Parcels are predominantly non-compliant, including both settlement areas.
Compliant: 0 (15)
Non-compliant: 101 (250) |
| Slope
Settlement
(Locality) | High: 1 (16)
Moderate: 16 (48)
Low: 84 (37) |
| Geology | Dilwyn Formation of the Wangeripp Group (Eocene age) which consists of shallow marine, coastal barrier and back beach lagoonal deposits. Intertwined with Demons Bluff formation of the Niranda Group which consists of shallow marine and minor lagoonal deposits, with some alluvial and fluvial deposits associated with the Eumeralla Formation. |
| Soil suitability
Settlement
(Locality) | High: 0 (0)
Moderate: 101 (265)
Low: 0 (0)
Variable soil landscapes (four).

The majority of the locality and southern region of the northern settlement area consists of soil landscape unit '88' which forms along the rolling plains in the western part of the Barwon catchment and northern parts of the Gellibrand catchment and consists of grey sand soils to more than 2m depth. The soils consist of apedal sandy loam to sand over weakly structured sandy clay. Limitations include low fertility and coarse fragments.

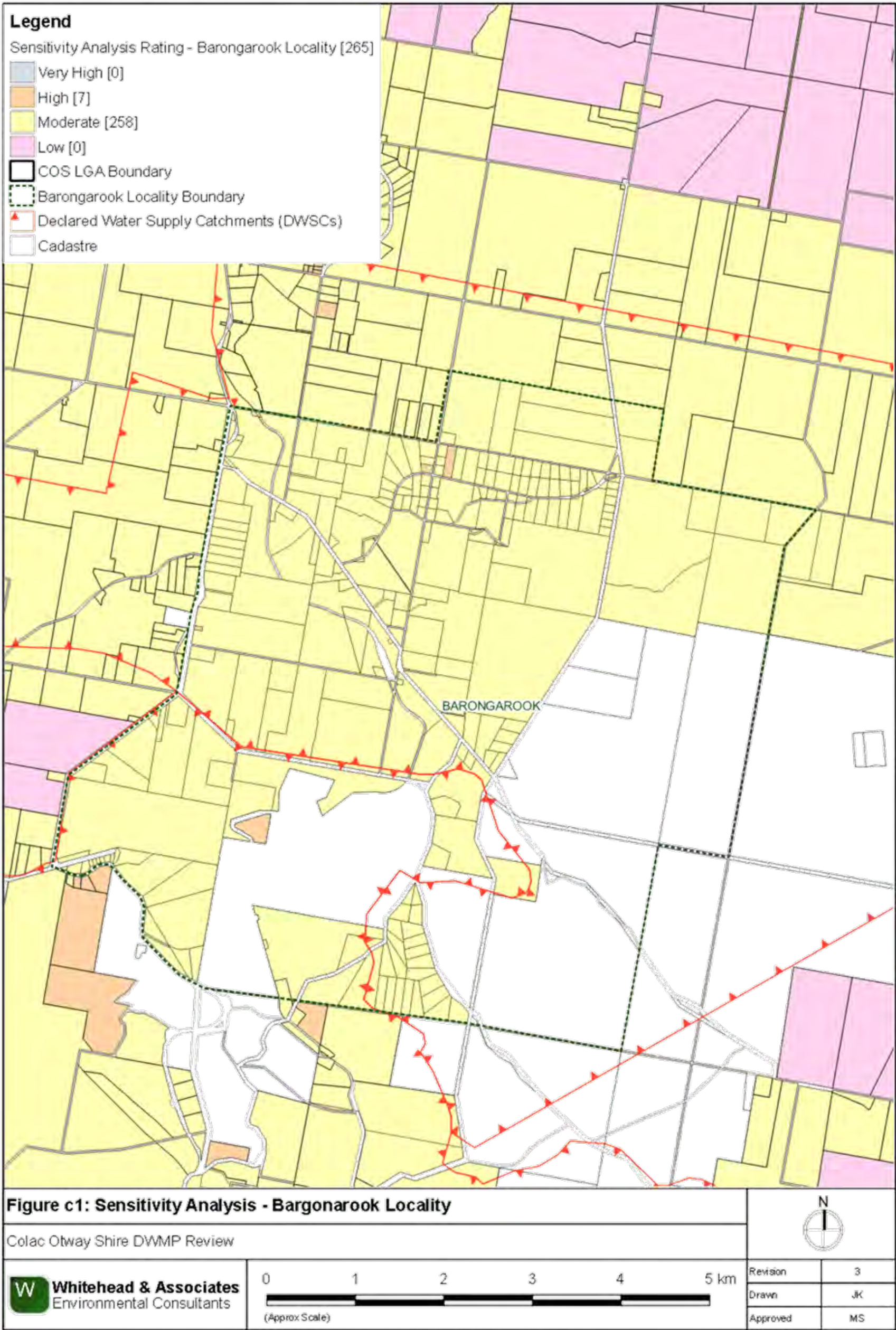
The northwest region of the locality consists of soil landscape unit '92' (moderate rating) which forms in the undulating plain in the north part of the Gellibrand River Catchment and consist of mottled yellow and red gradational soil to more than 2m depth. The soils consist of moderately |

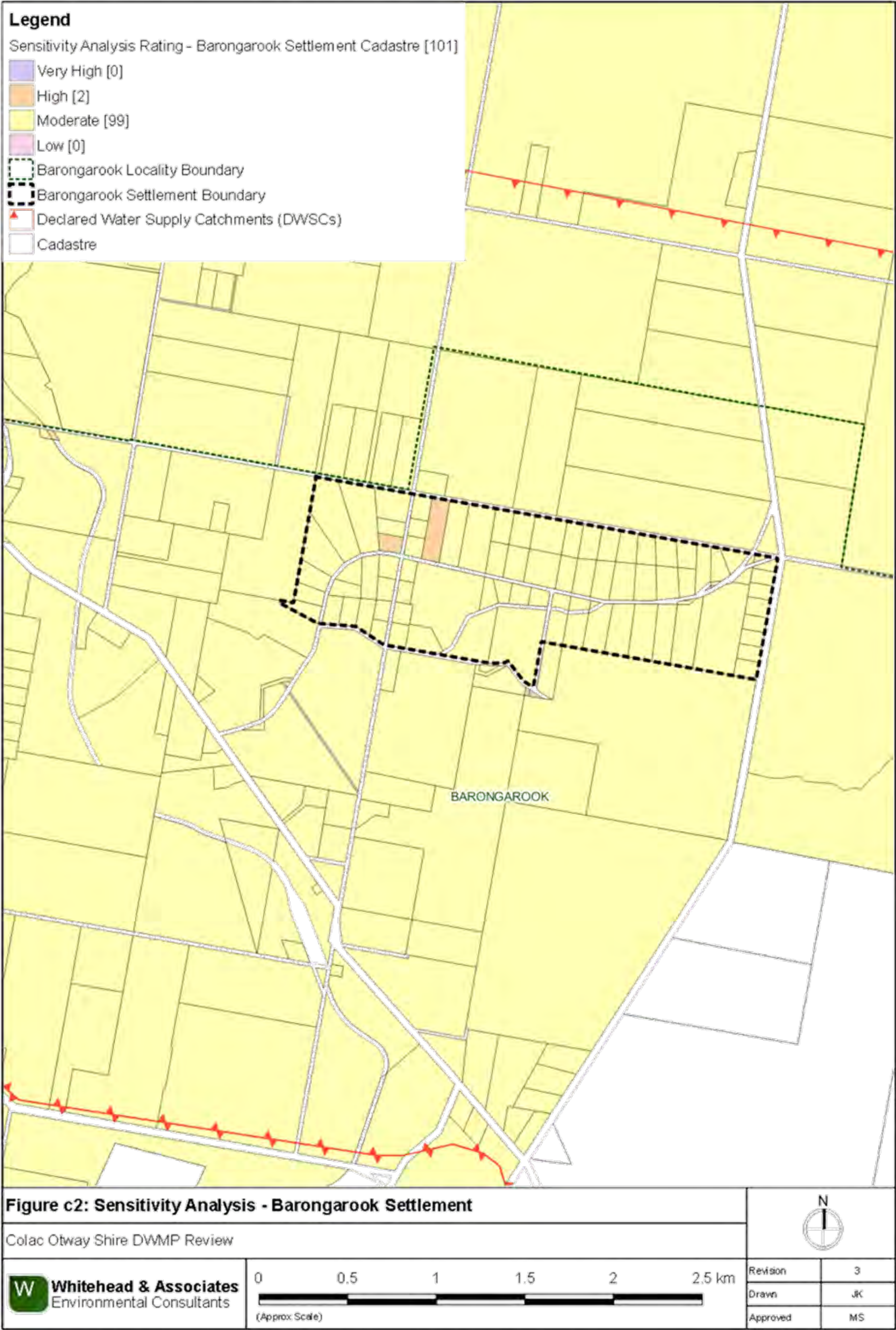
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| Characteristic | Description |
|--|--|
| | <p>structured sandy loam over light clay. Limitations include low fertility and low p-sorb.</p> <p>Around Bushbys Road in the northwest consists of soil landscape unit '93' (moderate rating) which forms in the gently undulating plain in the western parts of Barwon Catchment and consist of mottled gradational soil to more than 2m depth. The soils consist of weakly structured loam over moderately structured medium clay. Limitations include low fertility, p-sorb and coarse fragments.</p> <p>The southwest region of the locality consists of soil landscape unit '90' which forms on the rolling hills in the northern upper reaches of the Gellibrand catchment and consists of mottled gradational soil to more than 2m depth. The soil consists of apedal fine sandy loam over weakly structured silty clay loam. Limitations include low p-sorb, low fertility and restricted drainage.</p> |
| Sensitivity Overlay | <p>Depth to Groundwater Compliance: variable compliancy; predominantly compliant, except for the middle of the locality and a few parcels in the northern settlement.</p> <p>Landslip: minimal.</p> <p>Vegetation: Otway Forest Park and Great Otway National Park to the south to southeast.</p> |
| Sensitivity Analysis Rating Settlement (Locality) | <p>Very High: 0 (0)</p> <p>High: 2 (7)</p> <p>Moderate: 99 (258)</p> <p>Low: 0 (0)</p> |

4c. Sensitivity Analysis (Maps)





5c. System Selection

Due to the dominance of heavy-textured soils in the Barongarook locality, conventional absorption trenches and beds are not likely to be feasible and are discouraged. Appendix A of the EPA Code of Practice (2013) prohibits LPED systems on Category 5 and 6 soils (medium to heavy clays). The System Sizing Tables (below) indicate which systems are likely to be the most appropriate for the locality.

6c. System Sizing Tables

The Sizing Tables for each system type were created using monthly 70th percentile water balances, using methods described in the MAV Model LCA, 2014. Monthly 70th percentile rainfall and average evapotranspiration data for Barongarook was sourced from SILO (Scientific Information for Land Owners) climate databases, which are managed by the Queensland Government. The SILO databases use accurate meteorological data collected throughout Australia over long time periods.

The Design Loading Rates (DLRs) and Design Irrigation Rates (DIRs) were taken from the current EPA Code of Practice. Where the Code of Practice has precluded use of a particular type of system on a certain soil type, it is shown as 'Not Applicable' for that soil type in the Sizing Tables. Where the evapotranspiration deficit requires unrealistically large land application areas for a particular system on a certain soil type, it is also shown as 'Not Applicable' for that soil type in the Sizing Tables. Detailed, site-specific LCAs and system designs would be required to further investigate the feasibility of systems deemed 'Not Applicable' in the sizing tables. Mitigation measures (such as importation of topsoil to appropriate depths in the land application area), may be required to sustainably achieve land application of effluent on constrained parcels.

The Sizing Tables for Barongarook are provided below.

7c. General Conclusion

The parcels within the locality have predominantly been assigned a Moderate Sensitivity to sustainable DWM, with some parcels assigned a Low or High Sensitivity Rating. Predominantly, the Standard LCA will be required, with use of the System Sizing tables deemed appropriate. The Low Sensitivity Rating parcels within a DWSC are required to complete a Standard LCA as per the current EPA Code of Practice's requirements. Particular attention needs to be directed towards assessing cumulative impact of DWM systems on the environment to ensure that the DWSCs are protected and that groundwater resources are preserved.

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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 | | | | | | | |
| Development Type | Daily (L/day) | Total min. irrigation area required for zero wet weather effluent storage (m ²)† | | | | | | 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) | |
| | | DLR (mm) | DLR (mm) | DLR (mm) | DLR (mm) | DLR (mm) | DLR (mm) | DLR (mm) | DLR (mm) |
| Development Type | Daily (L/day) | 1,080 | 900 | 720 | 540 | 400 | 320 | 250 | 200 |
| 5 + bedroom residence | 1,080 | 1,080 | 900 | 720 | 540 | 400 | 320 | 250 | 200 |
| 4 bedroom residence | 900 | 900 | 720 | 540 | 400 | 320 | 250 | 200 | 160 |
| 1-3 bedroom residence | 720 | 720 | 540 | 400 | 320 | 250 | 200 | 160 | 130 |
| Not supported (Alternative Land Application System Required) | | | | | | | | | |

| 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 | 5 |
| | | | | | | | | | |
| DLR (mm) | 20* | 20* | 15 | 10 | 12 | 8 | 5 | | |
| Development Type | Daily (L/day) | Total min. basal or 'wetted area' required for zero wet weather storage (m ²) not including spacing & setbacks | | | | | | | |
| 5 + bedroom residence | 1,080 | 62 | 87 | 145 | 115 | 199 | 441 | | |
| 4 bedroom residence | 900 | 52 | 73 | 121 | 96 | 166 | 368 | | |
| 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 water table, including seasonal and perched water tables. 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) | |
| | | DLR (mm) | DLR (mm) | DLR (mm) | DLR (mm) | DLR (mm) | DLR (mm) | DLR (mm) | DLR (mm) |
| Development Type | Daily (L/day) | 1,080 | 900 | 720 | 540 | 400 | 320 | 250 | 200 |
| 5 + bedroom residence | 1,080 | 1,080 | 900 | 720 | 540 | 400 | 320 | 250 | 200 |
| 4 bedroom residence | 900 | 900 | 720 | 540 | 400 | 320 | 250 | 200 | 160 |
| 1-3 bedroom residence | 720 | 720 | 540 | 400 | 320 | 250 | 200 | 160 | 130 |
| † required for zero wet weather storage (m ²) not including spacing & setbacks | | | | | | | | | |

| Wick Trenches and Beds - Secondary Treated Effluent Only | | | | | | | | | |
|--|---------------------|-----------------|----------|---------------------|----------|------------------------|----------|-------------------------|----------|
| Soil Category | Gravels & Sands (1) | Sandy Loams (2) | | Weak Clay Loams (4) | | Massive Clay Loams (4) | | Strong Light Clays (5a) | |
| | | DLR (mm) | DLR (mm) | DLR (mm) | DLR (mm) | DLR (mm) | DLR (mm) | DLR (mm) | DLR (mm) |
| Development Type | Daily (L/day) | 1,080 | 900 | 720 | 540 | 400 | 320 | 250 | 200 |
| 5 + bedroom residence | 1,080 | 1,080 | 900 | 720 | 540 | 400 | 320 | 250 | 200 |
| 4 bedroom residence | 900 | 900 | 720 | 540 | 400 | 320 | 250 | 200 | 160 |
| 1-3 bedroom residence | 720 | 720 | 540 | 400 | 320 | 250 | 200 | 160 | 130 |
| Total min. basal or 'wetted area' required for zero wet weather storage (m ²) not including spacing & setbacks | | | | | | | | | |

D. Barwon Downs Locality Report

1d. Introduction

The Barwon Downs locality is located on the northern slopes of the Otway Ranges, with the town located on the northern foothills. The landform consists of dissected hills abutting rivers and streams, and alluvial terraces with relatively flat topography. The majority (approximately 80%) of the region is located within a DWSC, with the town located within the Upper Barwon DWSC. The region to the northeast of the town also falls within the Gosling Creek DWSC.

The locality has a population of approximately 167 residents. There are approximately 267 and 89 unsewered parcels located within the Barwon Downs locality and town, respectively, with 62 DWM system permits that have been inspected to date by COS. The current DWM permits and their associated treatment system and LAA method within the Barwon Downs region are summarised as follows:

- 8 AWTS (4 subsurface irrigation, 1 trench and 3 unknown);
- 1 composting toilet (1 unknown);
- 10 sand filters (10 subsurface irrigation);
- 30 septic tank (6 trenches and 24 unknown);
- 4 worm farms (3 trenches and 1 unknown); and
- 9 unknown (3 trenches and 6 unknown).

2d. Background Documentation

Refer to the following documents for additional detail regarding the locality:

- Barwon Downs Township Master Plan Report (June, 2006);
- COS Planning Scheme; and
- Rural Living Strategy (2011).

3d. Site Assessment Results

The following table summarises the results from the representative audits conducted by Consultant staff in September 2014.

| Characteristic | Description |
|------------------|---|
| Land use | Barwon Downs comprises a range of land uses, including dairy, forestry, rural living and tourism. |
| Occupancy rates | 2.3 (Barwon Downs State Suburb, ABS Census, 2011). |
| Typical soils | Yellow mottled duplex soil with very deep (60 cm) silt loam grading to silty clay loam surface and subsurface over strongly mottled clay subsoil; between 25-60 cm the subsurface was saturated (25 July 2014). Drainage is generally poor and permeability is generally low. |
| AS/NZS 1547:2012 | 5 (Light Clays) and 6 (Medium to Heavy Clays) |

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| Characteristic | Description |
|------------------|---|
| soil categories | |
| Existing Systems | <p>Separate Blackwater and Greywater</p> <p>Of the eight systems inspected during field investigations, seven systems (88%) comprised separate blackwater treatment in a septic tank or composting toilet, with direct greywater diversion to an adjacent paddock, street drain, trench or AWTs. Where discharged to paddocks or neighbouring vacant parcels, greywater was typically ponded near the diversion outlet pipe, and often in areas trampled by livestock (cattle and sheep).</p> <p>The blackwater septic tanks were typically 40+ years old and the time since last pump-out was unknown for the majority (due to owners not being home to ascertain). Septic effluent discharged to one or more conventional absorption trenches (or was assumed to if trenches could not be identified). The trench dimensions were generally unclear, and it is likely that most trenches were undersized for the number of bedrooms. The majority of trenches or/and available LAAs were located on land of less than 4% slope and appeared to be parallel with contours.</p> <p>One greywater diversion system was pumped with a home-made pump-well, with moveable sprinklers around fruit trees. The AWTs had not been serviced since installation approximately 4 years ago and the sprinkler heads periodically become blocked. Setback distances from boundaries were inadequate for this system.</p> <p>Combined Blackwater and Greywater</p> <p>One of the eight systems (13%) inspected was assumed to have a combined wastewater treatment system, based on layout of pipework and age of dwelling. Septic effluent discharged to a series of conventional absorption trenches which appeared to be working well and were adequately sized.</p> |

4d. Summary of Constraints to DWM

| Characteristic | Description |
|--------------------------------|--|
| Climate Zone | Majority Zone 3 |
| Surface waterways & catchments | The locality consists of an extensive drainage network. It is located within the DWSCs of Upper Barwon, Gosling Creek and a small part of Matthew Creek in the northeast. The locality is predominantly located within a DWSC, except for approximately 1km north of the most northern extent of the town. The major waterways include: Denn Creek to the east of the town, Callahan Creek North and South Branches and Barwon River East Branch to the west and south of the town, Dewing |

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| Characteristic | Description |
|--|--|
| | Creek, Seymour Creek, Kind Creek, and Mackie Creek. |
| Groundwater | Proximity to groundwater bores: primarily located around the town and north-western region of the locality. |
| Land subject to inundation | Along Barwon River East Branch and Callahan Creek. |
| Useable lot area
Town (Locality) | High: 43 (77)
Moderate: 23 (29)
Low: 23 (154)
Compliant: 0 (7) |
| Minimum lot size compliance with Planning Scheme Zoning | The locality is predominantly zoned Farming Zone to the north and Public Conservation and Resource Zone to the south. The town is zoned as Township Zone.

Compliance is variable throughout the locality, with the town predominantly compliant.

Compliant: 84 (123)
Non-compliant: 5 (144) |
| Slope
Town (Locality) | High: 0 (50) (in southern region)
Moderate: 1 (22)
Low: 88 (195) |
| Geology | Eumeralla Formation of the Otway Group is predominant in the east, intertwined with the Dilwyn Formation of the Wangeripp Group (Eocene age) which consists of shallow marine, coastal barrier and back beach lagoonal deposits. Intertwined with Demons Bluff formation of the Niranda Group which consists of shallow marine and minor lagoonal deposits, with some unnamed alluvium flood plain deposits along waterways. The northwest corner is underlain by Gellibrand Marl from the Heytesbury Group continental shelf deposit. |
| Soil suitability | High: 0 (20)
Moderate: 89 (247)
Low: 0 (0)

Variable soil throughout the locality (7 different units); however, it is noted that the locality is spatially expansive.

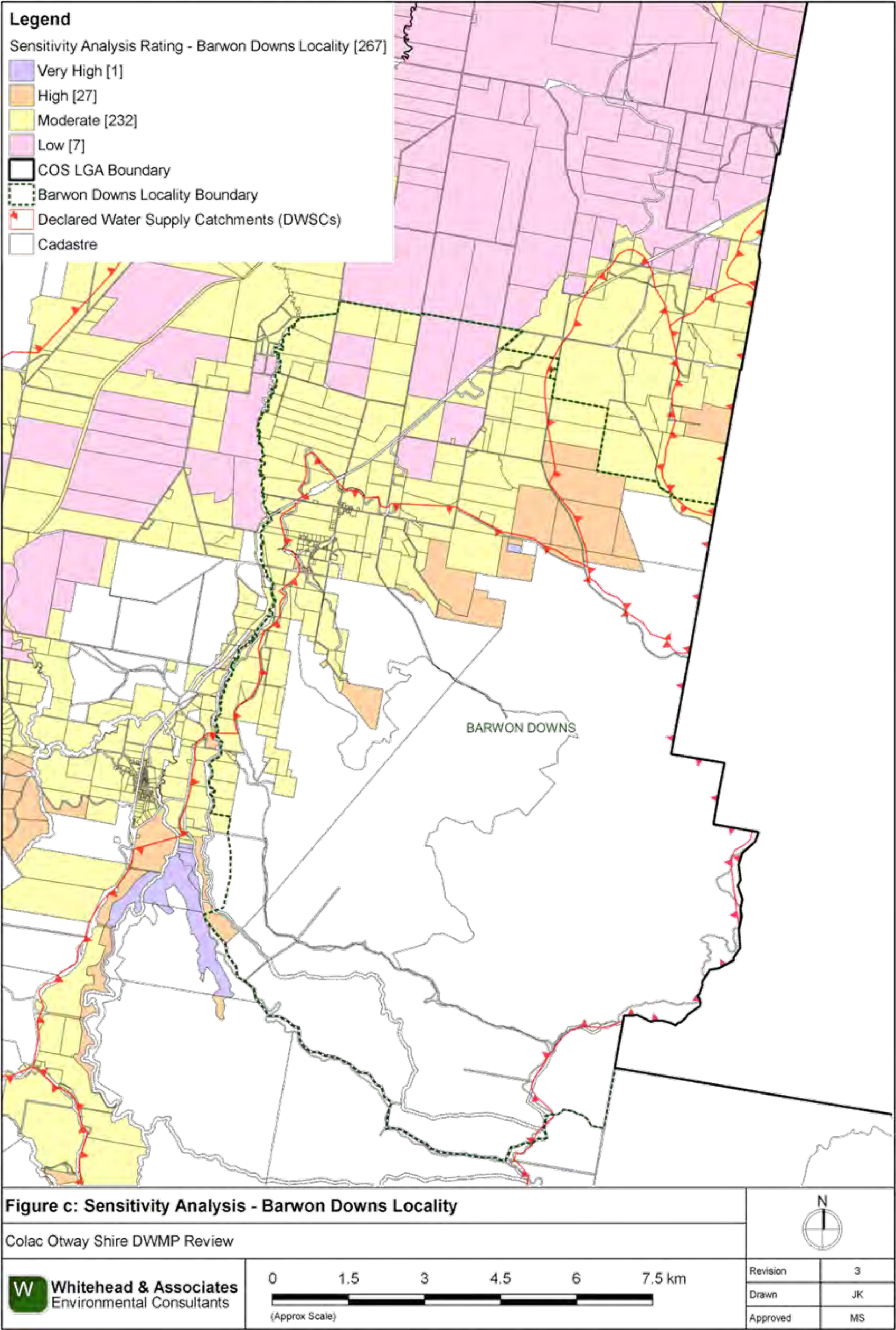
The town consists of soil landscape units '78' and '73' which form on the undulating plain inland of Otway Range and steep rolling hills on the northern periphery of the Otway Range and consists of texture |

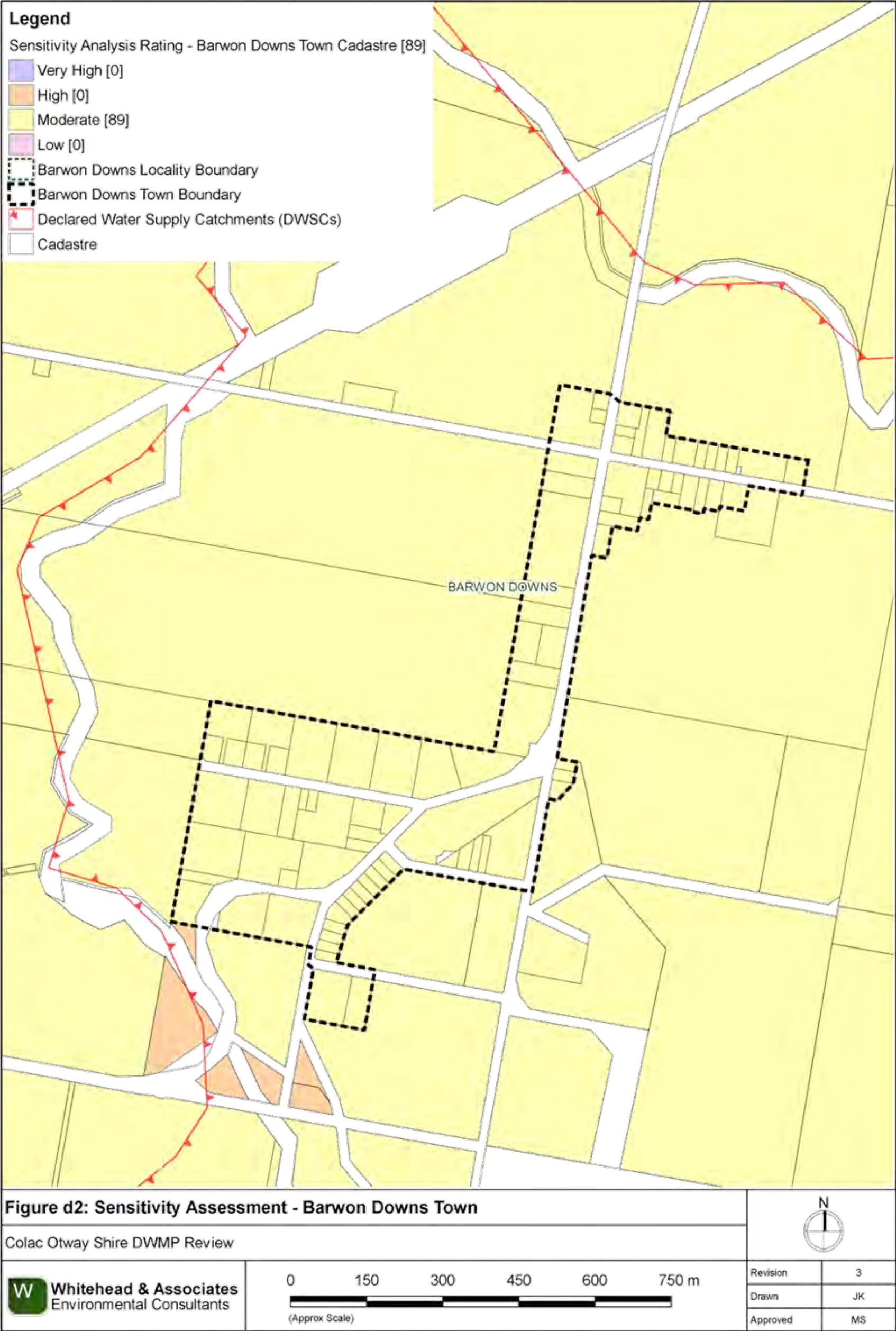
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| Characteristic | Description |
|--|--|
| | <p>contrast soils with ironstone to 2m depth. The soils consist of weakly structured sandy loam over strongly structured medium to heavy clay. Limitations include low fertility, low p-sorb, sodic, dispersive, restricted drainage and coarse fragments.</p> <p>The central west region consists of soil landscape unit '76' which form on the undulating plains and consist of grey sand soils to more than 2m depth. The soils consist of weakly structured loamy sand over apedal sand. Limitations include low fertility.</p> <p>The northeast to southwest transversing region consists of soil landscape unit '63' which forms on deeply dissected hills of the Otway Ranges and consists of brown texture contrast soils to 0.9m depth. The soils consist of weakly structured loam over strongly structured heavy clay. Limitations include sodicity and very acidic.</p> <p>The southern region consists of soil landscape unit '61' which also form on the deeply dissected hills of the Otway Ranges and consist of brown gradational soils to 1.2m depth. The soils consist of moderately structured silty loam over clay loam. Limitations include acidity and restricted drainage.</p> <p>The regions adjacent to the river consist of soil landscape unit '95' which forms on the alluvial floodplain of the Barwon River and its tributaries with numerous cut-off meanders. The soil consists of a moderately structured fine sandy clay loam over medium clay to more than 2m depth. Limitations include restricted drainage and dispersive.</p> |
| Sensitivity Overlay | <p>Depth to Groundwater Compliance: predominantly compliant, except to the north and west of the town along Barwon River East Branch.</p> <p>Landslip: some to the south</p> <p>Vegetation: Great Otway National, Otway Forest Park, and Barwon Downs bushland reserve.</p> |
| Sensitivity Analysis Rating Town (Locality) | <p>Very High: 0 (1)</p> <p>High: 0 (27)</p> <p>Moderate: 89 (232)</p> <p>Low: 0 (7)</p> |

5d. Sensitivity Analysis (Maps)





6d. System Selection

Due to the dominance of heavy-textured soils in the Barwon Downs locality, conventional absorption trenches and beds are not likely to be feasible and are discouraged. Appendix A of the EPA Code of Practice (2013) prohibits LPED systems on Category 5 and 6 soils (medium to heavy clays). The System Sizing Tables (below) indicate which systems are likely to be the most appropriate for the locality.

7d. System Sizing Tables

The Sizing Tables for each system type were created using monthly 70th percentile water balances, using methods described in the MAV Model LCA, 2014. Monthly 70th percentile rainfall and average evapotranspiration data for Barwon Downs was sourced from SILO (Scientific Information for Land Owners) climate databases, which are managed by the Queensland Government. The SILO databases use accurate meteorological data collected throughout Australia over long time periods.

The Design Loading Rates (DLRs) and Design Irrigation Rates (DIRs) were taken from the current EPA Code of Practice. Where the Code of Practice has precluded use of a particular type of system on a certain soil type, it is shown as 'Not Applicable' for that soil type in the Sizing Tables. Where the evapotranspiration deficit requires unrealistically large land application areas for a particular system on a certain soil type, it is also shown as 'Not Applicable' for that soil type in the Sizing Tables. Detailed, site-specific LCAs and system designs would be required to further investigate the feasibility of systems deemed 'Not Applicable' in the sizing tables. Mitigation measures (such as importation of topsoil to appropriate depths in the land application area), may be required to sustainably achieve land application of effluent on constrained parcels.

The Sizing Tables for the Barwon Downs locality are provided below.

8d. General Conclusion

The parcels within Barwon Downs, including the entire town, have predominantly been assigned a Moderate Sensitivity Rating to sustainable DWM. Predominantly, Standard LCAs will be required, with the use of System Sizing Tables deemed appropriate. The Low Sensitivity Rating parcels within a DWSC are required to complete a Standard LCA as per the current EPA Code of Practice's requirements. Particular attention needs to be directed towards ensuring that the soil stability and appropriate setbacks to surface waterways and groundwater bores are maintained.

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| Barwon Downs | | | | | | | | | | | |
|---|-----------------------|---|--|---------------------|--|--------------------------|--|---|---|--|--|
| Drip and Spray Irrigation Systems - Secondary Treated Effluent only | | | | | | | | | | | |
| Development Type | 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 (m ²) not including spacing or setbacks | | | | | | | | | |
| | 5 + bedroom residence | 1,080 | 419 | 684 | 1,000 | 1,863 | 2,556 | | | | |
| | 4 bedroom residence | 900 | 349 | 570 | 834 | 1,552 | 2,130 | | | | |
| | 1-3 bedroom residence | 720 | 280 | 456 | 667 | 1,242 | 1,704 | | | | |
| 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 | | | | | | | | | | | |
| Conventional Absorption Trenches and Beds - Primary Treated Effluent | | | | | | | | | | | |
| Development Type | 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) | | | | | | | | | | |
| Development Type | Daily (L/day) | Not supported (Alternative Land Application System Required) | | | | | | | | | |
| | 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) | | | | | | | | | | | |
| Development Type | 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 (m ²) not including spacing or setbacks | | | | | | | | | |
| | 5 + bedroom residence | 1,080 | 63 | 89 | 150 | 118 | 208 | 488 | | | |
| | 4 bedroom residence | 900 | 53 | 74 | 125 | 98 | 173 | 407 | | | |
| | 1-3 bedroom residence | 720 | 42 | 59 | 100 | 79 | 139 | 326 | | | |
| 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 | | | | | | | | | | | |
| Development Type | 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 | N/A | N/A | N/A | N/A | N/A | | | | |
| Development Type | Daily (L/day) | (Alternative Land Application System Required) | | | | | | | | | |
| | 5 + bedroom residence | 1,080 | | | | | | | | | |
| | 4 bedroom residence | 900 | | | | | | | | | |
| | 1-3 bedroom residence | 720 | | | | | | | | | |
| † required for zero wet weather storage (m ²) not including spacing or setbacks | | | | | | | | | | | |
| Wick Trenches and Beds - Secondary Treated Effluent Only | | | | | | | | | | | |
| Development Type | 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 | 8 | N/A | | |
| Development Type | Daily (L/day) | Total min. basal or 'wetted area' required for zero wet weather storage (m ²) not including spacing or setbacks | | | | | | | | | |
| | 5 + bedroom residence | 1,080 | 49 | 40 | 63 | 150 | 118 | 208 | | | |
| | 4 bedroom residence | 900 | 41 | 34 | 53 | 125 | 98 | 173 | | | |
| | 1-3 bedroom residence | 720 | 33 | 27 | 42 | 100 | 79 | 139 | (Alternative Land Application System Required) | | |

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E. Beeac Locality Report

1e. Introduction

Beeac is a rural town located on the northern side of Lake Beeac, approximately 19km north of Colac. The landform features undulating agricultural land on the Western Volcanic Plains.

The locality has a population of approximately 270 residents. There are approximately 603 and 269 unsewered parcels located within the Beeac locality and town, respectively, with 80 DWM system permits that have been inspected to date by COS. The current DWM permits and their associated treatment system and LAA method within the Beeac locality are summarised as follows:

- 11 AWTS (3 subsurface, 1 trench, 5 drip irrigation, 2 unknown);
- 2 sand filters (1 subsurface irrigation and 1 unknown);
- 43 septic tanks (11 trenches, 1 irrigation and 31 unknown); and
- 24 unknown (6 trenches, 1 subsurface irrigation, and 17 unknown).

No field investigations were conducted within Beeac locality as part of the 2014 field assessments; however, soil investigations were conducted to confirm the soil type. There have been noted issues with the earthen stormwater drains; particularly with regards to odour and amenity with standing water which could also contain wastewater in the form of greywater or combined wastewater. These earthen stormwater drains flow into Lake Beeac.

2e. Background Documentation

Refer to the following documents for additional detail regarding the locality:

- Urban Design Framework Plans for Beeac (2006/2007);
- Lake Beeac Catchment Plan (1998);
- Beeac Cemetery and Grasslands Land Management Plan (February, 2012);
- Colac Otway Domestic Wastewater Management Plan (2007);
- COS Planning Scheme; and
- Rural Living Strategy (2011).

3e. Summary of Constraints to DWM

| Characteristic | Description |
|--------------------------------|--|
| Climate Zone | Zone 2 |
| Surface waterways & catchments | The locality has an extensive coverage of lakes, with Lake Beeac forming the largest waterbody to the southwest of the town. Other waterbodies include: Lake Cunadare to the northwest, Thomas Lake, Cemetery Lake, Butchers Lake, Calvert Lough and constructed drainage network to the east of the town. |
| Groundwater | Proximity to groundwater bores: primarily located within the western |

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| Characteristic | Description |
|--|---|
| | half of the locality.

Groundwater is seasonally high at some sites but depth hasn't been ascertained. |
| Land subject to inundation | Extensive, particularly to the east of the town and around Lake Beeac. |
| Useable Lot Area
Town (Locality) | High: 198 (236)
Moderate: 58 (80)
Low: 12 (275)
Compliant: 1 (12) |
| Minimum lot size compliance with Planning Scheme Zoning | The locality is predominantly zoned Farming Zone, with some land around the lakes in the Public Conservation and Resource Zone. The town is zoned as Township Zone.

Compliance is variable throughout the locality; the Farming Zoned parcels are generally non-compliant to the east of the town and the town is compliant.

Compliant: 263 (283)
Non-compliant: 6 (320) |
| Slope
Town (Locality) | High: 0 (0)
Moderate: 0 (0)
Low: 269 (603) |
| Geology | Beeac is underlain by unnamed stony rises and hummocky lava flows of Newer Volcanic Group and unnamed non-marine sediments comprising swamp, lake deposits of clay, silt, sand and humic soil that is moderately sorted and unconsolidated. Northeast section have hills with gentle crests and flat plains located on lunette, lake and beach deposits of clay, quartz sand, coxiella shells and minor swamp deposits. |
| Soil suitability
Town (Locality) | Soil has moderate to poor drainage and consists predominantly of shallow silty loam or sandy grey silt topsoil, followed by moist dark grey to brown silty clay, over moist grey or grey/yellow clay. Soil permeability 0.08-0.06m/day

High: 269 (561)
Moderate: 0 (42)
Low: 0 (0)

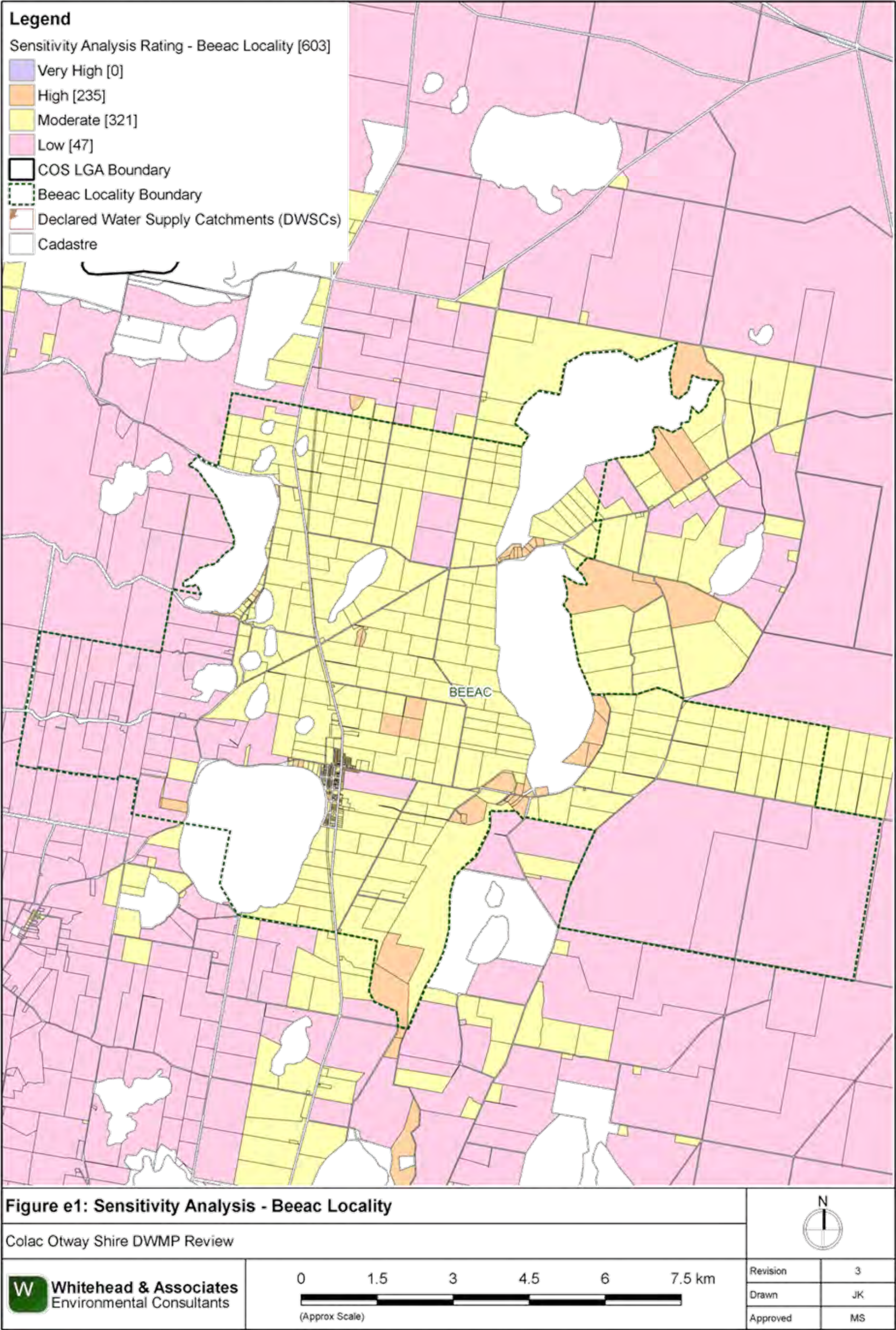
The town and majority of the locality consists of soil landscape unit '148' which forms on the gently undulating plains with low rises and |

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| Characteristic | Description |
|--|--|
| | <p>lunettes, swamps and lakes and consists of texture contrast soils to less than 2m depth. The soil consists of strongly structured medium clay over heavy clay. Limitations include restricted drainage, dispersive, very acidic, coarse fragments and sodic.</p> <p>Surrounding soil landscape '148' and to the east consists of soil landscape unit '153' which forms on gently undulating plains with swamps, lunettes and lakes and consists of textured contrast soils to less than 2m depth. The soils consist of strongly structured fine sandy clay loam over light to heavy clay. Limitations include restricted drainage, dispersive, very acidic, sodic and coarse fragments.</p> <p>The land to the west of the town consists of soil landscape unit '114' which forms on undulating basalt plains and stony rises. The soil consists of strongly structured clay loam to medium clay to less than 1.5m depth. Limitations include restricted drainage and coarse fragments.</p> |
| Sensitivity Overlay | <p>Depth to Groundwater Compliance: all compliant.</p> <p>Landslip: Nil.</p> <p>Vegetation: Lake Beeac to the south/southwest of town is an internationally important habitat for waterbirds, Lough Calvert Drainage Scheme (central), Lake Cundare, Cockatoo and Cemetery to the north of Lake Beeac.</p> |
| Sensitivity Analysis Rating Town (Locality) | <p>Very High: 0 (0)</p> <p>High: 198 (235)</p> <p>Moderate: 70 (321)</p> <p>Low: 1 (47)</p> |

4e. Sensitivity Analysis (Maps)



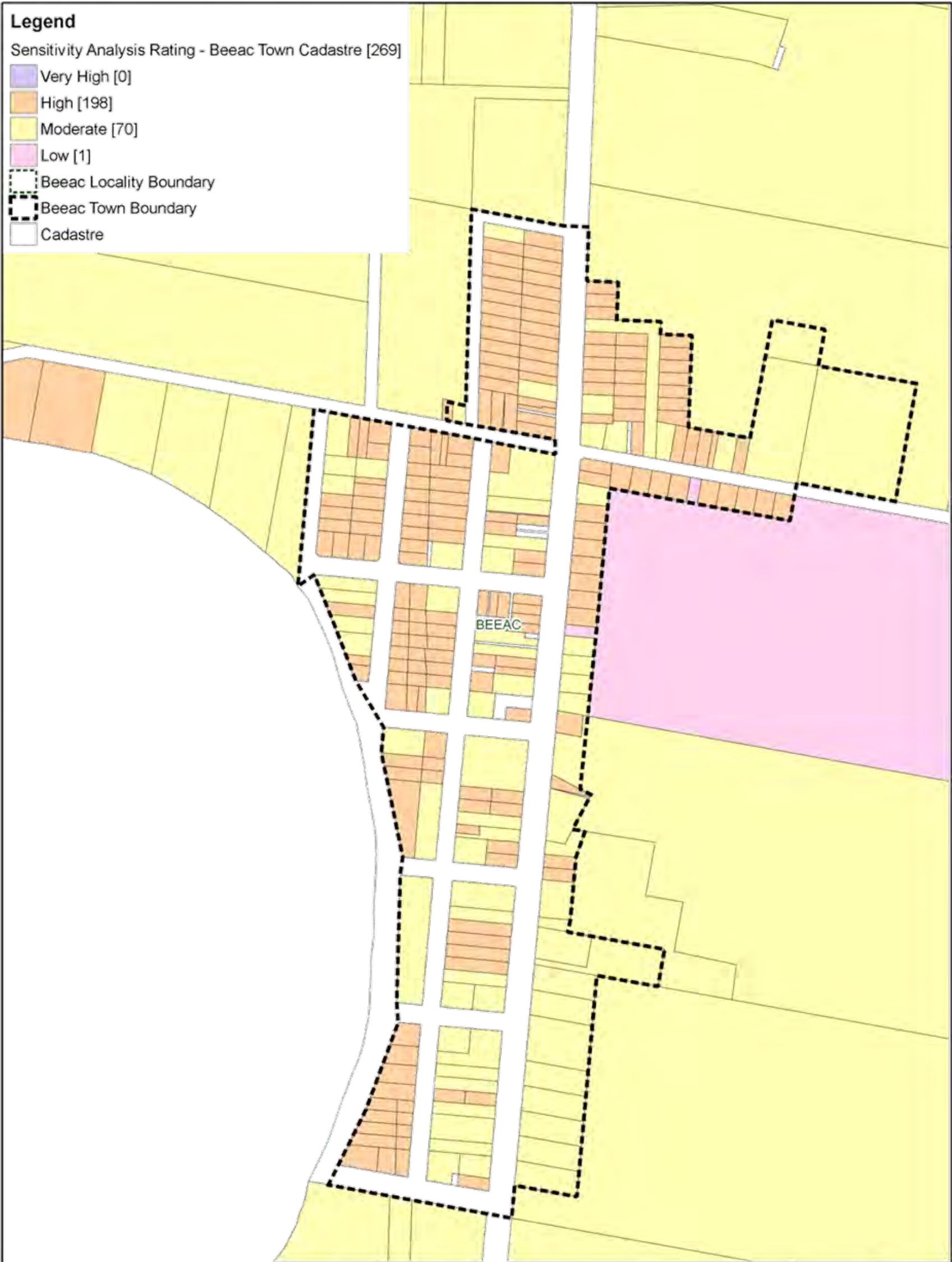
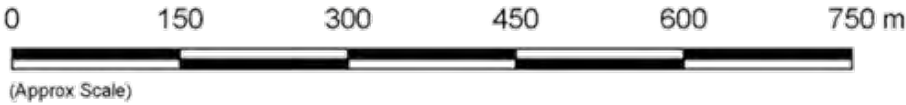


Figure e2: Sensitivity Analysis - Beeac Town

Colac Otway Shire DWMP Review



| | |
|----------|----|
| Revision | 3 |
| Drawn | JK |
| Approved | MS |

5e. System Selection

Due to the dominance of heavy-textured soils in the Beeac locality, conventional absorption trenches and beds are not likely to be feasible and are discouraged. Appendix A of the EPA Code of Practice (2013) prohibits LPED systems on Category 5 and 6 soils (medium to heavy clays). The System Sizing Tables (below) indicate which systems are likely to be the most appropriate for the locality.

6e. System Sizing Tables

The Sizing Tables for each system type were created using monthly 70th percentile water balances, using methods described in the MAV Model LCA, 2014. The water balances used monthly 70th percentile rainfall and average evapotranspiration data for Alvie, as it was compared with that of Beeac and found to be very similar, with very little size differences in water balance results. The climate data for Alvie was sourced from SILO (Scientific Information for Land Owners) climate databases, which are managed by the Queensland Government. The SILO databases use accurate meteorological data collected throughout Australia over long time periods.

The Design Loading Rates (DLRs) and Design Irrigation Rates (DIRs) were taken from the current EPA Code of Practice. Where the Code of Practice has precluded use of a particular type of system on a certain soil type, it is shown as 'Not Applicable' for that soil type in the Sizing Tables. Where the evapotranspiration deficit requires unrealistically large land application areas for a particular system on a certain soil type, it is also shown as 'Not Applicable' for that soil type in the Sizing Tables. Detailed, site-specific LCAs and system designs would be required to further investigate the feasibility of systems deemed 'Not Applicable' in the sizing tables. Mitigation measures (such as importation of topsoil to appropriate depths in the land application area), may be required to sustainably achieve land application of effluent on constrained parcels.

The Sizing Tables for the Beeac locality are provided below.

7e. General Conclusion

The Sensitivity Rating with regards to sustainable DWM varied throughout the Beeac locality. Council, Standard and Detailed LCAs will be required, with the use of the Sizing Tables deemed appropriate except for the Detailed LCA which requires site-specific design. Particular attention needs to be directed towards ensuring that systems are sized based on the most limiting soil horizon, that the amenity of the Lakes is maintained, that the minimum depth from the base of the land application area and the watertable are maintained, and that DWM system components and land application areas are constructed above the COS Planning Schemes land subject to inundation overlay.

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| 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 (m ²) not including spacing and setbacks | | | | | | | |
| 5 + bedroom residence | 1,080 | 268 | | 356 | 426 | 530 | 1,039 | | |
| 4 bedroom residence | 900 | 223 | | 297 | 355 | 442 | 866 | | |
| 1-3 bedroom residence | 720 | 127 | | 237 | 284 | 353 | 693 | | |
| 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 | | | | | | | | | |
| Conventional Absorption Trenches and Beds - Primary or Secondary Treated Effluent | | | | | | | | | |
| | Soil Category | Gravels & Sands (1) | Sandy Loams (2) | Loams (3) | Weak Loams & High/Mod Clay Loams (3 & 4) | Weak Clay Loams (4) | Massive Clay Loams (4) | Light Clays (5) | Medium to Heavy Clays (6) |
| Development Type | DLR (mm) | Not supported (Alternative Land Application System Required) | | | | | | | |
| 5 + bedroom residence | Daily (L/day) | | | | | | | | |
| 4 bedroom residence | 1,080 | | | | | | | | |
| 1-3 bedroom residence | 900 | | | | | | | | |
| 1-3 bedroom residence | 720 | | | | | | | | |
| Evapotranspiration-Absorption Trenches and Beds - Primary or Secondary 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 effluent storage (m ²) not including spacing and setbacks | | | | | | | |
| 5 + bedroom residence | 1,080 | 58 | | 78 | 123 | 100 | 128 | | 281 |
| 4 bedroom residence | 900 | 48 | | 65 | 102 | 83 | 132 | | 234 |
| 1-3 bedroom residence | 720 | 39 | | 52 | 82 | 67 | 106 | | 188 |
| Note: * Gravels, Sands and sandy loams are unsuitable for conventional absorption trenches and beds if there is a high water table, including seasonal and perched water tables. 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 | 3 | N/A | N/A | | |
| Development Type | Daily (L/day) | Total min. basal or 'wetted' area required (m ³)† | | | | | | | |
| 5 + bedroom residence | 1,080 | (Alternative Land Application System Required) | 379 | 460 | 584 | (Alternative Land Application System Required) | (Alternative Land Application System Required) | | |
| 4 bedroom residence | 900 | | 316 | 383 | 487 | | | | |
| 1-3 bedroom residence | 720 | | 253 | 307 | 390 | | | | |
| † required for zero wet weather storage (m ²) not including spacing & setbacks | | | | | | | | | |
| Wick Trenches and Beds - Secondary Treated Effluent Only | | | | | | | | | |
| | Soil Category | Gravels & Sands (1) | Sandy Loams (2) | 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 | 8 | 5 |
| Development Type | Daily (L/day) | Total min. basal or 'wetted' area required for zero wet weather effluent storage (m ²) not including spacing and setbacks | | | | | | | |
| 5 + bedroom residence | 1,080 | 46 | 38 | 58 | 123 | 100 | 128 | | 281 |
| 4 bedroom residence | 900 | 38 | 32 | 48 | 102 | 83 | 132 | | 234 |
| 1-3 bedroom residence | 720 | 31 | 25 | 39 | 82 | 67 | 106 | | 188 |

F. Beech Forest Locality Report

1f. Introduction

Beech Forest is located approximately 43km south of Colac on the northern edge of the Otway Ranges. The landform consists of rolling hills and crests of the Otway Ranges. Approximately half of the locality is located within a DWSC; with the northern region located within Gellibrand River DWSC and the southeast region located within Barham River DWSC. The main road through the town runs along a ridgeline that forms the DWSC boundary as indicated by the surface water informative map A1, Appendix A.

The locality has a population of approximately 479 residents. There are approximately 354 and 150 unsewered parcels located within the Beech Forest locality and town, respectively, with 34 DWM system permits that have been inspected to date by COS. The current DWM permits and their associated treatment system and LAA method within the Beech Forest locality are summarised as follows:

- 7 AWTS (1 irrigation, 3 drip irrigation, 2 trenches, and 1 unknown);
- 1 sand filter (1 drip irrigation);
- 12 septic tanks (4 trenches, 8 unknown);
- 1 worm farm (1 trench); and
- 13 unknown (6 trenches, 1 subsurface irrigation and 6 unknown).

2f. Background Documentation

Refer to the following documents for additional detail regarding the locality:

- Beech Forest Township Master Plan Report (May, 2004);
- COS Planning Scheme; and
- Rural Living Strategy (2011).

3f. Site Assessment Results

The following table summarises the results from the representative audits conducted by Consultant staff in September 2014.

| Characteristic | Description |
|-----------------|--|
| Land use | Beech Forest comprises a range of land uses, including dairy, forestry, rural living and tourism. |
| Occupancy rates | 2.3 (Beech Forest State Suburb, ABS Census, 2011). |
| Typical soils | Gradational profile of dark grey brown sandy clay loam grading to dark brown silty clay loam between 10-25cm, grading to dark brown to dark reddish brown sandy clay loam with excellent structure and fairly common small rock fragments. Drainage and permeability are variable depending on slope and position. |

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| Characteristic | Description |
|---|--|
| AS/NZS 1547:2012 soil categories | 4 (Clay Loams) |
| Existing Systems | <p>Separate Blackwater and Greywater</p> <p>Of the six systems inspected during field investigations, just one (17%) comprised separate blackwater treatment in a septic tank, with direct greywater diversion to the ground surface within the property/parcel boundary.</p> <p>The blackwater septic tank was 40+ years old and had been pumped out more than 15 years ago. Septic effluent discharged to one conventional absorption trench of approximately 3m length, on land of less than 4% slope and parallel with contours. There was no evidence of blackwater effluent surcharging to the surface. Soils were typically soft or boggy, mainly due to recent high rainfall.</p> <p>Combined Blackwater and Greywater</p> <p>Five of the six systems (83%) inspected had combined wastewater treatment systems or were assumed to have combined systems, based on layout of pipework and/or age of dwelling. One of these five systems is an Aerated Wastewater Treatment System (AWTS), for a commercial property. It is likely that the proportion of combined systems in Beech Forest is likely to be less than this; however, this should be confirmed by ongoing inspections by Council.</p> <p>Septic tank effluent discharged to one or more conventional absorption trenches, or was assumed to when the LAA could not be identified. Generally trenches were undersized for the number of bedrooms or there was inadequate suitable space for an appropriately sized LAA.</p> <p>The AWTS effluent discharged to a subsurface irrigation system of approximately 480m².</p> |

4f. Summary of Constraints to DWM

| Characteristic | Description |
|---|---|
| Climate Zone | Zone 3 and Zone 4 (entire town) |
| Surface waterways & catchments | <p>The northern half and the south-eastern corner of the locality are located within the Gellibrand River DWSC and Barham River DWSC, respectively. The DWSC boundary runs along the ridgeline, which forms the major road running through the middle of the town. The drainage network is extensive, with West Gellibrand Dam located in the northeast of the locality along the Gellibrand River.</p> <p>Waterways located within the DWSC are: Asplin Creek, Larder Creek East and West Branches, Little Larder Creek, McDonald Creek,</p> |

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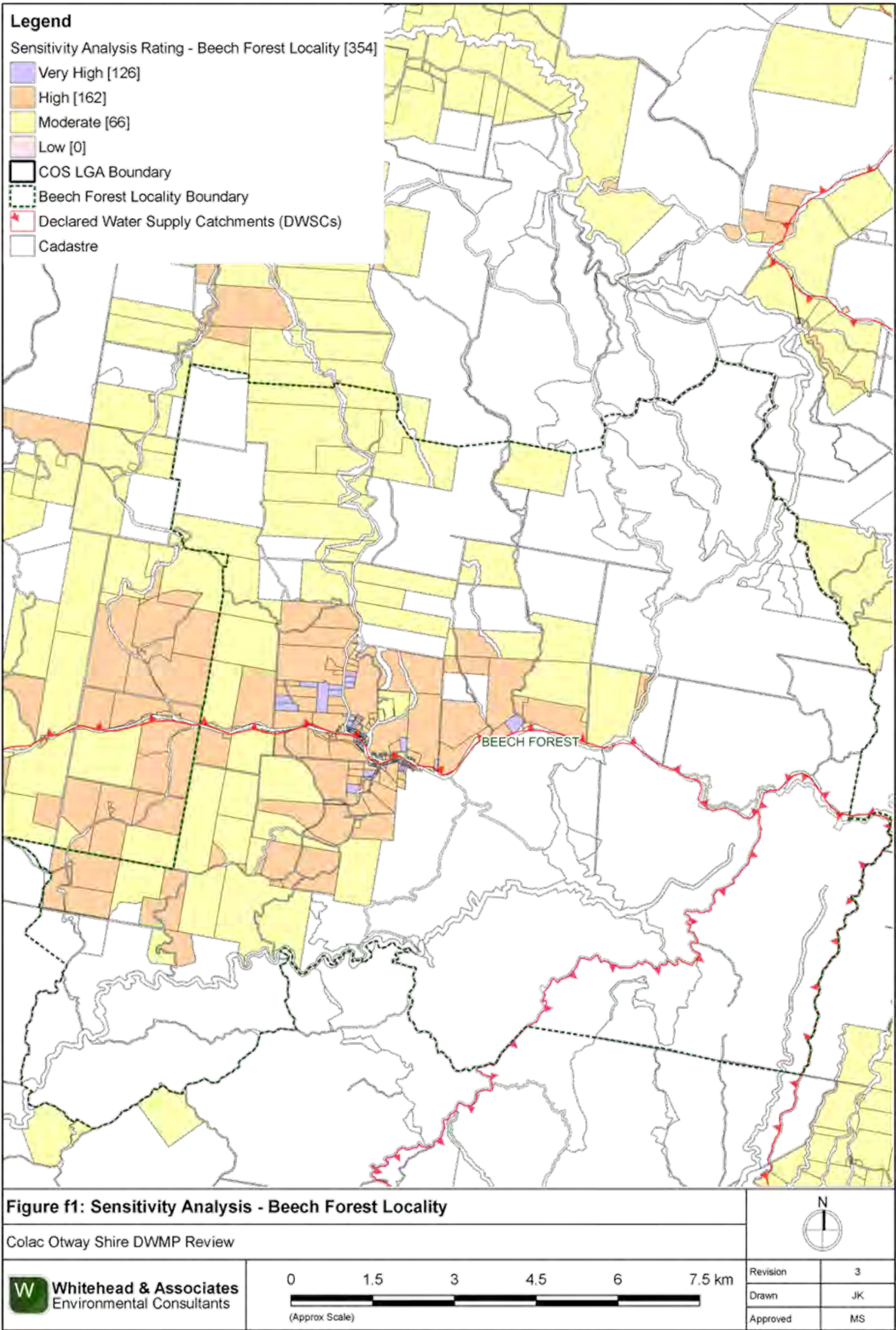
| Characteristic | Description |
|--|---|
| | <p>Charleys Creek, Barham River East Branch, Falls Creek, and Seaview Creek.</p> <p>Waterways located outside of the DWSC are: Aire River, Little Aire Creek, Youngs Creek, Corgram Creek, Farrell Creek, Beech Creek, and Deppeler Creek.</p> |
| Groundwater | Proximity to groundwater bores: minimal (only 3). |
| Land subject to inundation | Nil. |
| Useable Lot Area
Town (Locality) | <p>High: 98 (125)</p> <p>Moderate: 39 (67)</p> <p>Low: 13 (146)</p> <p>Compliant: 0 (16)</p> |
| Minimum lot size
compliance with
Planning Scheme
Zoning | <p>The locality is predominantly zoned Farming Zone to the west and Public Conservation and Resource Zone to the east. The town is zoned as Township Zone.</p> <p>Compliance is variable throughout the locality, with the smaller town parcels generally compliant and the larger rural parcels non-compliant.</p> <p>Compliant: 147 (191)</p> <p>Non-compliant: 3 (163)</p> |
| Slope
Town (Locality) | <p>High: 150 (302)</p> <p>Moderate: 0 (52)</p> <p>Low: 0 (0)</p> |
| Geology | Underlain by Eumeralla Formation of Otway Group which consist of fluvial and braided stream sedimentary deposits. |
| Soil suitability
Town (Locality) | <p>High: 150 (302)</p> <p>Moderate: 0 (52)</p> <p>Low: 0 (0)</p> <p>The central region of the locality, including the town, consists of soil landscape unit '60' which form on rolling hills along the top of the Otway Ranges. The soil consists of brown friable gradational soils with weakly structured clay loam over light clay to 0.9m depth. Limitations include restricted drainage.</p> <p>The remainder of the locality consists of soil landscape unit '61' which forms on the deeply dissected hills of the Otway Ranges and consists of brown gradational soils to 1.2m depth. The soils consist of</p> |

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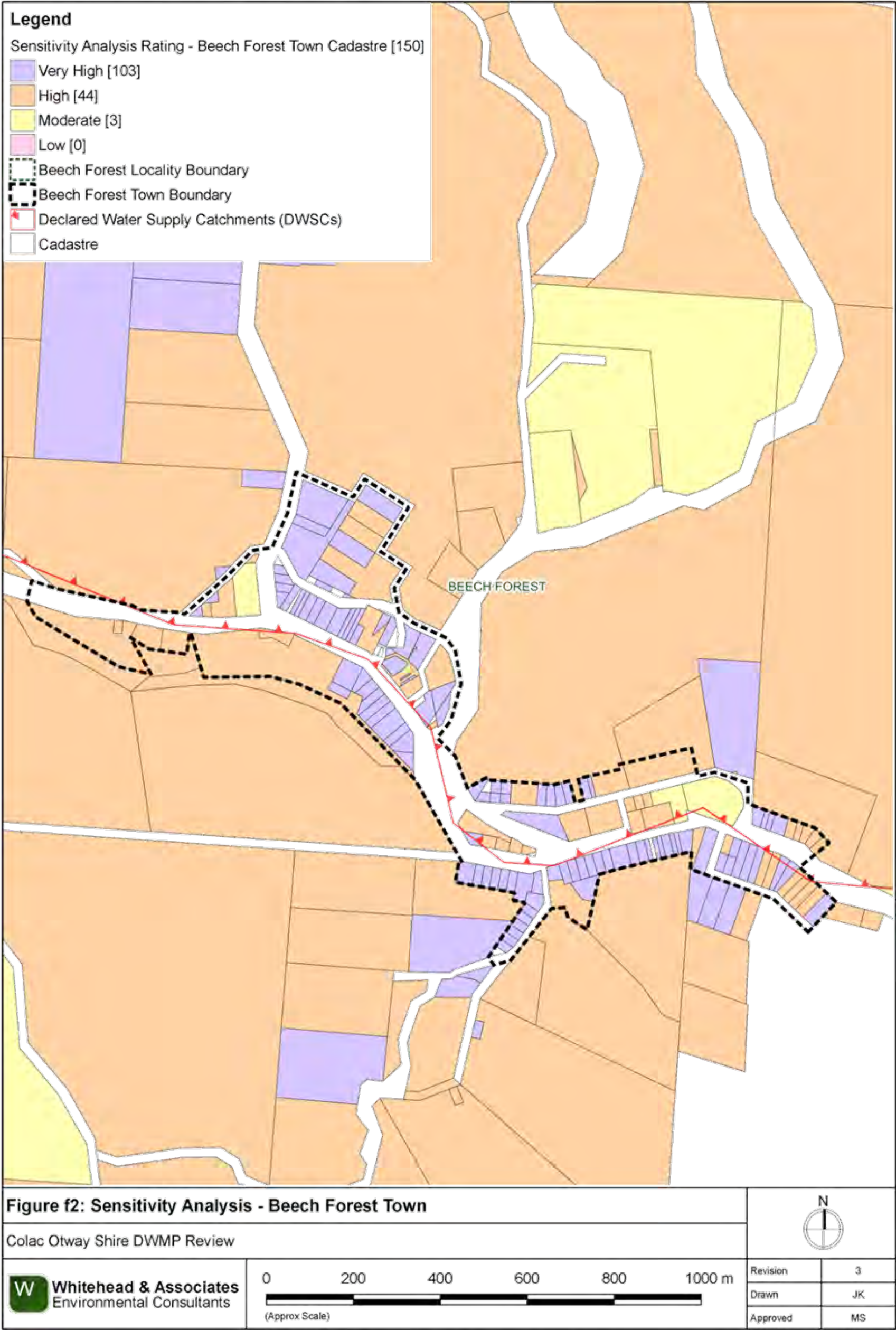
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| Characteristic | Description |
|--|--|
| | moderately structured silty loam over clay loam. Limitations include acidity and restricted drainage. |
| Sensitivity Overlay | No depth to groundwater data.
Landslip: extensive around locality
Vegetation: both sides of ridgeline. |
| Sensitivity Analysis Rating Town (Locality) | Very High: 103 (126)
High: 44 (162)
Moderate: 3 (66)
Low: 0 (0) |

5f. Sensitivity Analysis (Maps)



Colac Otway Shire Council Domestic Wastewater Management Plan - Technical Document



6f. System Selection

Due to the shallow soils in the Beech Forest locality, conventional absorption trenches and beds are not likely to be feasible and are discouraged. The System Sizing Tables (below) indicate which systems are likely to be the most appropriate for the locality.

7f. System Sizing Tables

The Sizing Tables for each system type were created using monthly 70th percentile water balances, using methods described in the MAV Model LCA, 2014. Monthly 70th percentile rainfall and average evapotranspiration data for Beech Forest was sourced from SILO (Scientific Information for Land Owners) climate databases, which are managed by the Queensland Government. The SILO databases use accurate meteorological data collected throughout Australia over long time periods.

The Design Loading Rates (DLRs) and Design Irrigation Rates (DIRs) were taken from the current EPA Code of Practice. Where the Code of Practice has precluded use of a particular type of system on a certain soil type, it is shown as 'Not Applicable' for that soil type in the Sizing Tables. Where the evapotranspiration deficit requires unrealistically large land application areas for a particular system on a certain soil type, it is also shown as 'Not Applicable' for that soil type in the Sizing Tables. Detailed, site-specific LCAs and system designs would be required to further investigate the feasibility of systems deemed 'Not Applicable' in the sizing tables. Mitigation measures (such as importation of topsoil to appropriate depths in the land application area), may be required to sustainably achieve land application of effluent on constrained parcels.

The Sizing Tables for the Beech Forest locality are provided below.

8f. General Conclusion

The parcels within Beech Forest have been assigned a Very High, High or Moderate Sensitivity Rating to sustainable DWM, with the majority of the town assigned a Very High or High Sensitivity Rating. Predominantly, both Detailed and Comprehensive LCAs will be required, with site-specific design a necessity due to the higher rainfall associated with this region. Site-specific design is required for all parcels that are located within Climate Zone 4, as per Figure 3 of the DWMP Technical Document, and System Sizing Tables cannot be used. Particular attention needs to be directed towards ensuring that appropriate loading rates and LAA method are selected for the shallow soils and steep slopes either side of the ridgeline. The locality is also extensively considered to be prone to landslip; a geotechnical report by a suitably qualified person will need to be conducted to address this constraint.

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| Beech Forest | | | | | | | | | | |
|---|-----------------------|--|--|--|--|--|--|---|---|--|
| Drip and Spray Irrigation Systems* - Secondary Treated Effluent only | | | | | | | | | | |
| Development Type | 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 | N/A | N/A | | | |
| Total min. irrigation area required for zero wet weather effluent storage (m²)† | | | | | | | | | | |
| Development Type | Daily (L/day) | 525 | 1,022 | 1,937 | (Alternative Land Application System Required) | | | | | |
| | 5 + bedroom residence | 1,080 | 438 | 851 | 1,614 | | | | | |
| | 4 bedroom residence | 900 | | | | | | | | |
| | 1-3 bedroom residence | 720 | 350 | 681 | 1,292 | | | | | |
| 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 or setbacks | | | | | | | | | | |
| Conventional Absorption Trenches and Beds - Primary Treated Effluent | | | | | | | | | | |
| Development Type | 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) | | | | | | | | | |
| Development Type | Daily (L/day) | Not supported (Alternative Land Application System Required) | | | | | | | | |
| | 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) | | | | | | | | | | |
| Development Type | 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 | | | |
| Total min. basal or 'wetted area' required for zero wet weather storage (m²) not including spacing & setbacks | | | | | | | | | | |
| Development Type | Daily (L/day) | 66 | 94 | 165 | 126 | 236 | | | | |
| | 5 + bedroom residence | 1,080 | 55 | 78 | 137 | 105 | | | | |
| | 4 bedroom residence | 900 | | | | | | | | |
| | 1-3 bedroom residence | 720 | 44 | 63 | 110 | 84 | 158 | | | |
| 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 | | | | | | | | | | |
| Development Type | 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 | N/A | N/A | N/A | N/A | N/A | | | |
| Development Type | Daily (L/day) | (Alternative Land Application System Required) | (Alternative Land Application System Required) | (Alternative Land Application System Required) | (Alternative Land Application System Required) | (Alternative Land Application System Required) | (Alternative Land Application System Required) | | | |
| | 5 + bedroom residence | 1,080 | | | | | | | | |
| | 4 bedroom residence | 900 | | | | | | | | |
| | 1-3 bedroom residence | 720 | | | | | | | | |
| Wick Trenches and Beds - Secondary Treated Effluent Only | | | | | | | | | | |
| Development Type | Soil Category | Gravels & Sands (1) | Sandy Loams (2) 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 | 8 | | |
| Total min. basal or 'wetted area' required for zero wet weather storage (m²) not including spacing & setbacks | | | | | | | | | | |
| Development Type | Daily (L/day) | 51 | 41 | 66 | 165 | 126 | 236 | | | |
| | 5 + bedroom residence | 1,080 | 42 | 34 | 55 | 137 | 105 | | | |
| | 4 bedroom residence | 900 | | | | | | | | |
| | 1-3 bedroom residence | 720 | 34 | 28 | 44 | 110 | 84 | 158 | | |

G. Carlisle River Locality Report

1g. Introduction

Carlisle River is, spatially, the largest locality and is located approximately 30km southwest of Colac. The landform consists of dissected hills abutting rivers and streams and alluvial terraces with relatively flat topography in the dissected uplands of the Otway Ranges. Notably, the majority of the locality is located within a DWSC.

The locality has a population of approximately 369 residents. There are approximately 250 and 26 unsewered parcels located within Carlisle River locality and town, respectively, with 25 DWM system permits that have been inspected to date by COS. The current DWM permits and their associated treatment system and LAA method within the Carlisle River locality are summarised as follows:

- 17 septic tanks (17 unknown); and
- 8 unknown (3 trenches, 5 unknown).

2g. Background Documentation

Refer to the following documents for additional detail regarding the locality:

- Carlisle River Township Master Plan Report (February, 2004);
- COS Planning Scheme; and
- Rural Living Strategy (2011).

3g. Site Assessment Results

The following table summarises the results from the representative audits conducted by Consultant staff in September 2014.

| Characteristic | Description |
|----------------------------------|---|
| Land use | Comprises a range of land uses, including dairy, forestry, rural living and tourism. |
| Occupancy rates | 2.3 (Part of Beech Forest State Suburb, ABS Census, 2011). |
| Typical soils | Duplex soil. Black silt loam with excellent structure to 40cm, very wet below 25cm, abruptly overlies strongly mottled yellow brown and grey light to medium stiff clay to 70+cm. Can include lenses of dark yellow brown and strong brown mottled coffee rock between 40-50cm. Drainage and permeability are variable depending on slope and position. |
| AS/NZS 1547:2012 soil categories | 4 (Clay Loams), 5 (Light Clays) and 6 (Medium to Heavy Clays). |
| Existing Systems | Separate Blackwater and Greywater
Of the three systems inspected during field investigations, one (33%) comprised separate blackwater treatment in a septic tank, with direct |

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| Characteristic | Description |
|----------------|--|
| | <p>greywater diversion to an adjacent paddock. The septic tank was not accessible, as it was covered by a concrete slab. It had been pumped out within the last two years.</p> <p>Septic effluent discharged to four conventional absorption trenches of 10m each, on slopes of less than 2%. Drainage was poor.</p> <p>Combined Blackwater and Greywater</p> <p>Two systems (67%) inspected have a combined wastewater treatment system, or were assumed to have based on layout of pipework and age of dwelling. The time since last pump-out was generally unknown (partly due to owner not being home to ascertain).</p> <p>Septic effluent discharged to one or more conventional absorption trenches (or was assumed to if trenches could not be identified). The trench dimensions were generally unclear, and it is likely that they were undersized for the number of bedrooms. The majority of trenches or/and available LAAs were located on land of less than 2% slope and appeared to be parallel with contours.</p> |

4g. Summary of Constraints to DWM

| Characteristic | Description |
|---|--|
| Climate Zone | Predominately within Zone 3 |
| Surface waterways & catchments | Located entirely within DWSCs, i.e. Gellibrand River and Gellibrand River (South Otway). Two major rivers transverse the locality; Gellibrand River north to south in the western region of the locality and Carlisle River to the north of the town. Other waterways include: Rusty Creek, Sandy Creek, Crinoline Creek, Leahy Creek, Arkins Creek, Boggy Creek, and Charley Creek. |
| Groundwater | Proximity to groundwater bores: located within the town and along the Gellibrand River and Carlisle River. |
| Land subject to inundation | Along northern and western boundaries associated with Gellibrand River and lower reaches of the Carlisle River confluence point. |
| Useable lot area
Town (Locality) | <p>High: 10 (41)</p> <p>Moderate: 5 (16)</p> <p>Low: 11 (170)</p> <p>Compliant: 0 (23)</p> |
| Minimum lot size compliance with Planning Scheme | <p>The locality is predominantly zoned Farming Zone and Public Conservation and Resource Zone. The town is zoned Township Zone.</p> <p>Compliance is variable throughout the locality, with all of the parcels</p> |

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| Characteristic | Description |
|---|---|
| Zoning | within the town compliant.
Compliant: 26 (99)
Non-compliant: 0 (151) |
| Slope
Town (Locality) | High: 0 (121)
Moderate: 0 (32)
Low: 26 (97) |
| Geology | Predominately underlain by the Wiridjil Gravel Member of the Pebble Point Formation, which is comprised of fluvial and braided stream deposits.

Moomowroong Sand Member of the Pebble Point Formation (marginal marine and beach deposits) is located near the town straddling unnamed alluvial floodplain deposits.

East to southeast - Eumeralla Formation of the Otway group which is comprised of fluvial and braided stream deposits. |
| Soil suitability
Town (Locality) | High: 00 (44)
Moderate: 26 (206)
Low: 0 (0)

Variable soil landscapes throughout the locality (7-8 in total).

The town consists of soil landscape unit '94' which forms on elevated, and in parts, uplifted and dissected system of ancient cut and depositional terraces of Gellibrand River. The soils consist of grey sand soils with structured clay underneath; strongly structured sandy loam over moderately structured medium clay; to depths of more than 2m. Limitations include low fertility and restricted drainage.

The area adjacent to the river consists of soil landscape unit '61' which forms on the deeply dissected hills of the Otway Ranges and consists of brown gradational soils to 1.2m depth. The soils consist of moderately structured silty loam over clay loam. Limitations include acidity and restricted drainage. |
| Sensitivity Overlay | Depth to Groundwater Compliance: variable compliancy, but generally compliant, except around the Gellibrand River and the confluence of Carlisle River.

Landslip: minimal

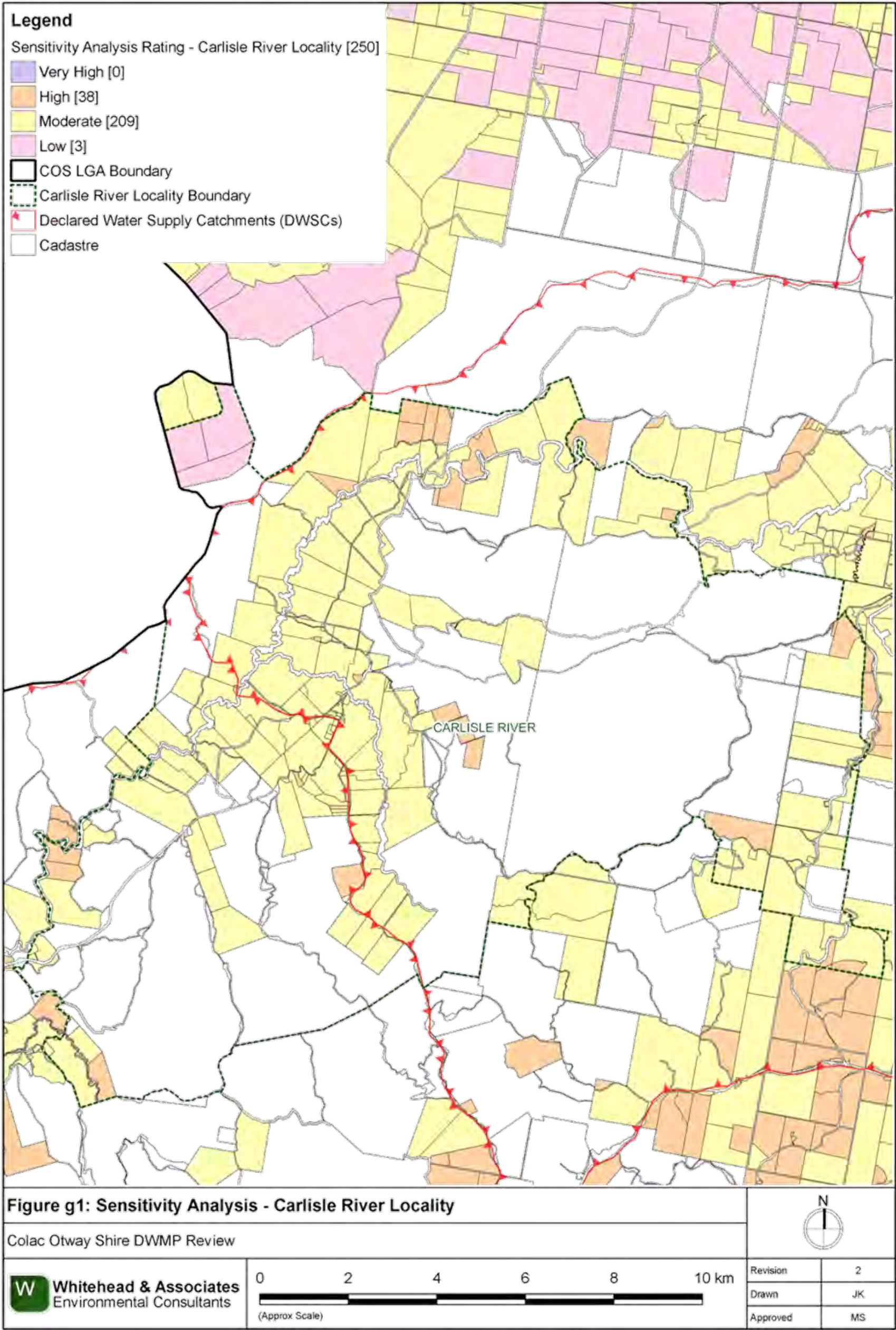
Vegetation: significant Great Otway National Park and Otway Forest Park. |
| Sensitivity | Very High: 0 (0) |

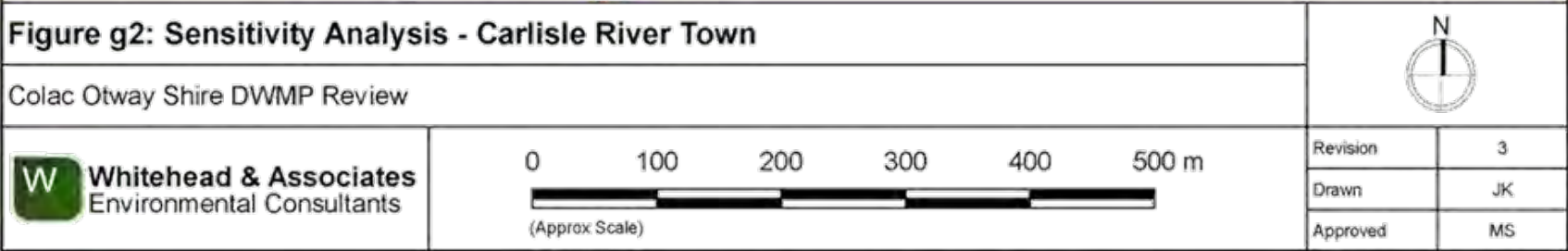
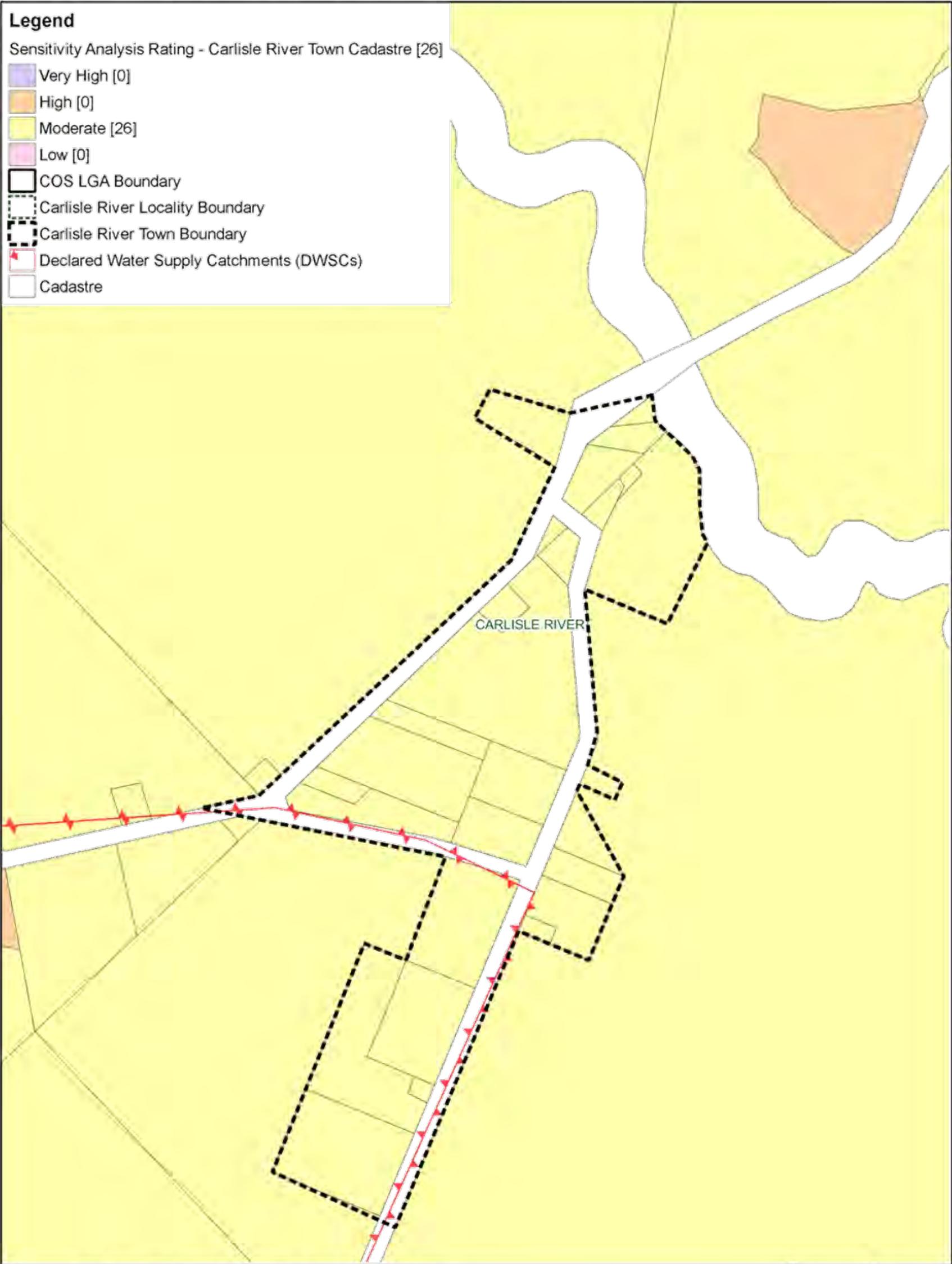
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| Characteristic | Description |
|-----------------|--------------------|
| Analysis Rating | High: 0 (38) |
| Town (Locality) | Moderate: 26 (209) |
| | Low: 0 (3) |

5g. Sensitivity Analysis (Maps)





6g. System Selection

Due to the dominance of heavy-textured soils in the Carlisle River locality, conventional absorption trenches and beds are not likely to be feasible and are discouraged. Appendix A of the EPA Code of Practice (2013) prohibits LPED systems on Category 5 and 6 soils (medium to heavy clays). The System Sizing Tables (below) indicate which systems are likely to be the most appropriate for the locality.

7g. System Sizing Tables

The Sizing Tables for each system type were created using monthly 70th percentile water balances, using methods described in the MAV Model LCA, 2014. Monthly 70th percentile rainfall and average evapotranspiration data for Carlisle River was sourced from SILO (Scientific Information for Land Owners) climate databases, which are managed by the Queensland Government. The SILO databases use accurate meteorological data collected throughout Australia over long time periods.

The Design Loading Rates (DLRs) and Design Irrigation Rates (DIRs) were taken from the current EPA Code of Practice. Where the Code of Practice has precluded use of a particular type of system on a certain soil type, it is shown as 'Not Applicable' for that soil type in the Sizing Tables. Where the evapotranspiration deficit requires unrealistically large land application areas for a particular system on a certain soil type, it is also shown as 'Not Applicable' for that soil type in the Sizing Tables. Detailed, site-specific LCAs and system designs would be required to further investigate the feasibility of systems deemed 'Not Applicable' in the sizing tables. Mitigation measures (such as importation of topsoil to appropriate depths in the land application area), may be required to sustainably achieve land application of effluent on constrained parcels.

The Sizing Tables for the Carlisle River locality are provided below.

8g. General Conclusion

The parcels within Carlisle River, including the town, have predominantly been assigned a Moderate Sensitivity Rating to sustainable DWM. Predominantly, Standard LCAs will be required, with the use of System Sizing Tables deemed appropriate. The Low Sensitivity Rating parcels within a DWSC are required to complete a Standard LCA as per the current EPA Code of Practice's requirements. Particular attention needs to be directed towards ensuring that appropriate setbacks to surface waterways and groundwater bores are maintained, that the DWM systems are sized based on the limiting soil horizon, and that the degree of slope is taken into consideration when designing the LAA.

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| | | | | | | | | | | | |
|---|---------------------|---|---------------------|--|--|--|---|---|-----|--|--|
| Carlisle River | | | | | | | | | | | |
| 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 | 4 | 3.5 | N/A | N/A | | | | | |
| Development Type | Daily (L/day) | Total min. irrigation area required for zero wet weather effluent storage (m²)† | | | | | | | | | |
| 5 + bedroom residence | 1,080 | 509 | 960 | 1,726 | (Alternative Land Application System Required) | (Alternative Land Application System Required) | | | | | |
| 4 bedroom residence | 900 | 424 | 800 | 1,439 | | | | | | | |
| 1-3 bedroom residence | 720 | 339 | 640 | 1,151 | | | | | | | |
| 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 or 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) | | | | | | | | | | |
| Development Type | Daily (L/day) | Not supported (Alternative Land Application System Required) | | | | | | | | | |
| 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 | N/A | N/A | | |
| 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 | 65 | 93 | 162 | 125 | 231 | (Alternative Land Application System Required) | (Alternative Land Application System Required) | | | |
| 4 bedroom residence | 900 | 54 | 77 | 135 | 104 | 192 | | | | | |
| 1-3 bedroom residence | 720 | 44 | 62 | 108 | 83 | 154 | | | | | |
| 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) | | | | | | | | | | |
| Development Type | Daily (L/day) | Not supported (Alternative Land Application System Required) | | | | | | | | | |
| 5 + bedroom residence | 1,080 | | | | | | | | | | |
| 4 bedroom residence | 900 | | | | | | | | | | |
| 1-3 bedroom residence | 720 | | | | | | | | | | |
| Wick Trenches and Beds - Secondary Treated Effluent Only | | | | | | | | | | | |
| Soil Category | Gravels & Sands (1) | Sandy Loams (2) | 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 | 8 | N/A | | |
| 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 | 50 | 41 | 65 | 162 | 125 | 231 | (Alternative Land Application System Required) | | | |
| 4 bedroom residence | 900 | 42 | 34 | 54 | 135 | 104 | 192 | | | | |
| 1-3 bedroom residence | 720 | 34 | 27 | 44 | 108 | 83 | 154 | | | | |

H. Coragulac Locality Report

1h. Introduction

Coragulac is a rural locality located approximately 13km northwest of Colac, in close proximity to the Cororooke and Alvie localities within the Red Rock region. The landform features undulating agricultural land on the Western Volcanic Plains.

Coragulac has a population of approximately 223 residents. There are approximately 201 and 69 unsewered parcels located within the Coragulac locality and town, respectively, with 38 DWM system permits that have been inspected to date by COS. The current DWM permits and their associated treatment system and LAA method within the Coragulac locality are summarised as follows:

- 6 AWTS (3 subsurface irrigation and 3 drip irrigation);
- 1 sand filter (1 trench);
- 20 septic tanks (4 trenches and 16 unknown); and
- 11 unknown (2 trenches and 9 unknown).

No field investigations were conducted within the Coragulac locality as part of the 2014 field assessments.

2h. Background Documentation

Refer to the following documents for additional detail regarding the locality:

- Red Rock Region Community Infrastructure Plan (September, 2013);
- COS Planning Scheme; and
- Rural Living Strategy (2011).

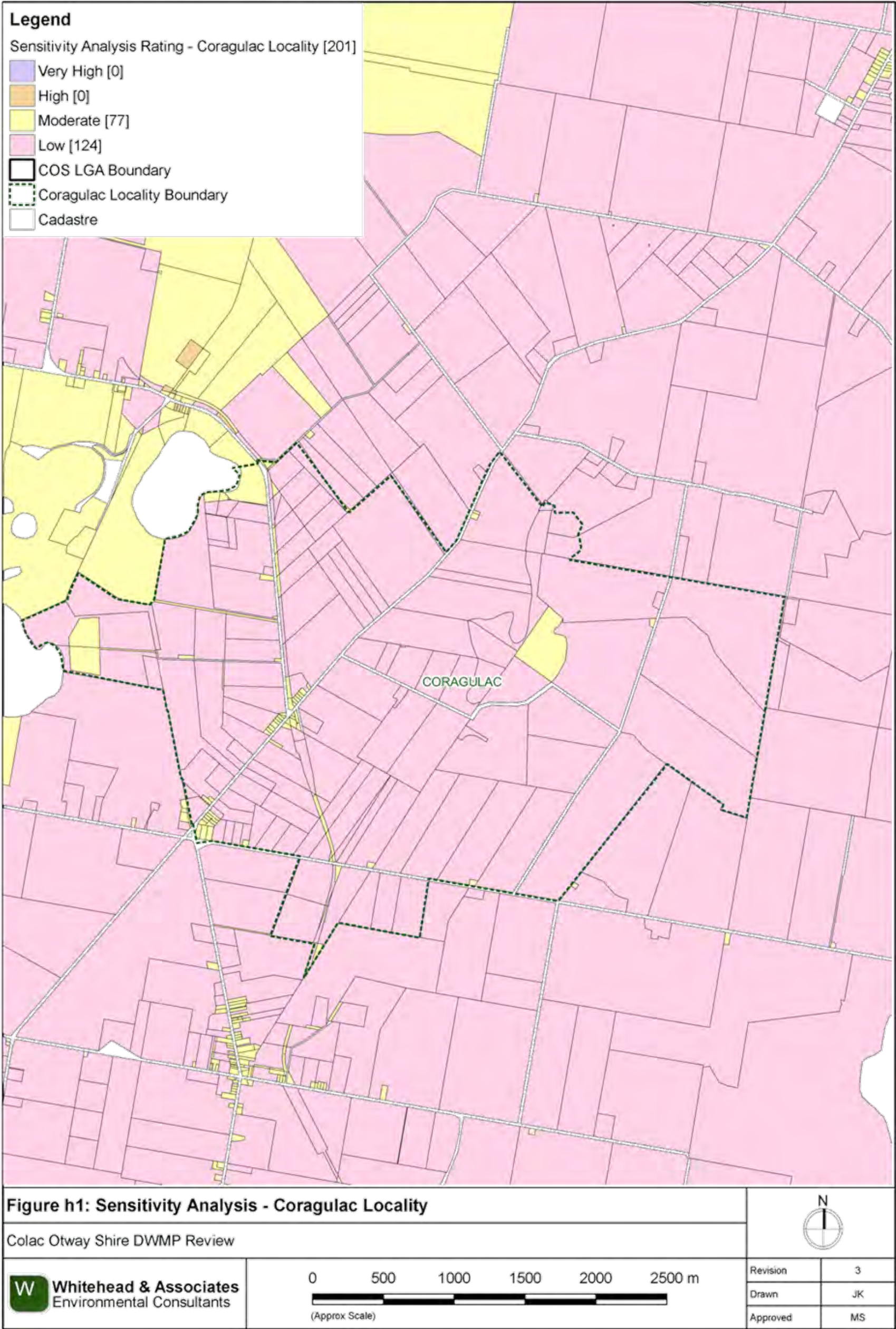
3h. Summary of Constraints to DWM

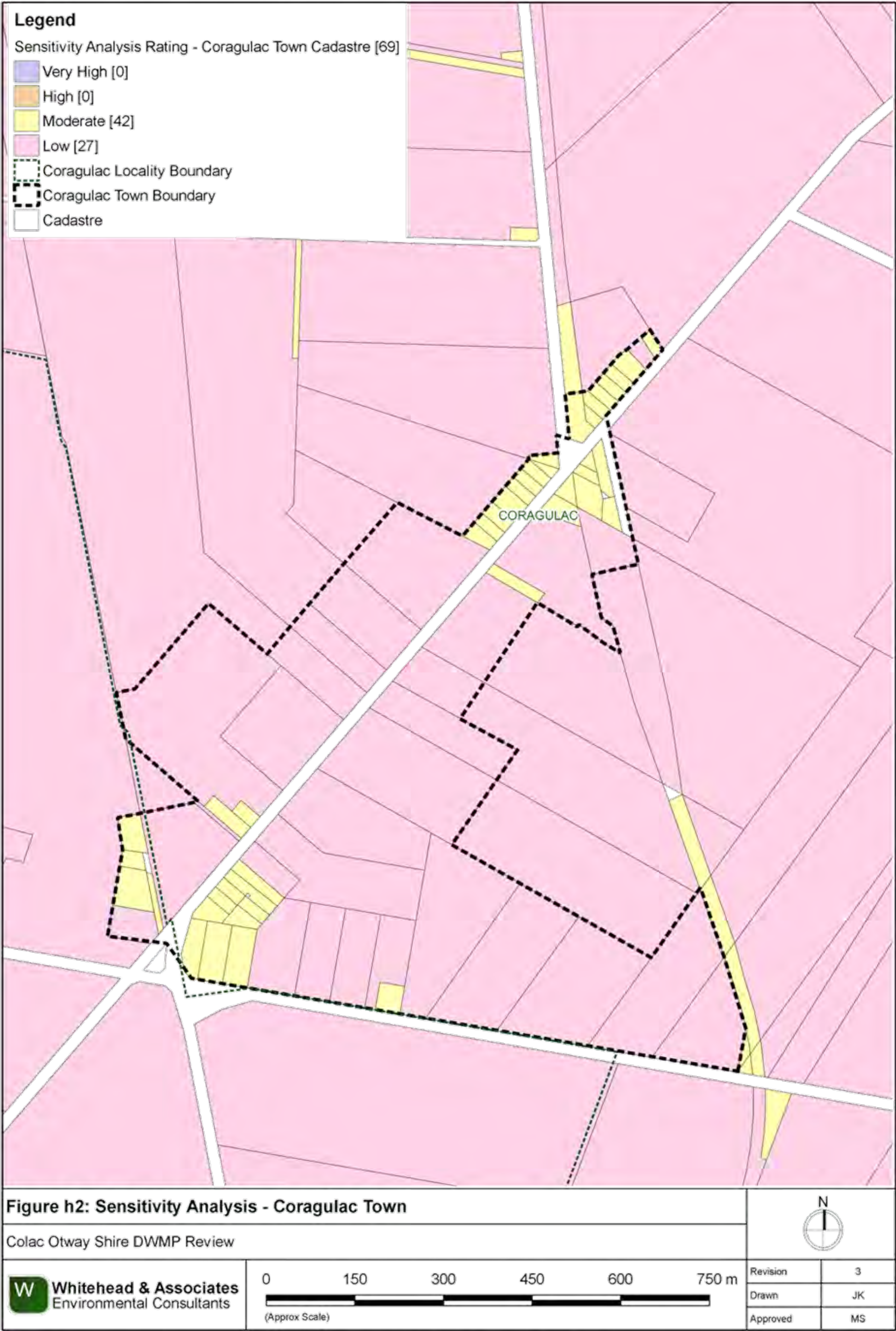
| Characteristic | Description |
|-------------------------------------|---|
| Climate Zone | Zone 2 |
| Surface waterways & catchments | Minimal surface waterways, with only Lake Coragulac and Lake Purdiguluc along the north-western locality border. Not located within a DWSC. |
| Groundwater | Proximity to groundwater bores: distributed throughout the locality, similar to Cororooke. |
| Land subject to inundation | Minimal; small amount to the west. |
| Useable lot area
Town (Locality) | High: 26 (41)
Moderate: 16 (33)
Low: 27 (125) |

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| Characteristic | Description |
|--|---|
| | Compliant: 0 (2) |
| Minimum lot size compliance with Planning Scheme Zoning | <p>The locality is predominantly zoned Farming Zone, with the town zoned Township Zone and Low Density Residential Zone.</p> <p>Compliance is variable throughout the locality, with the rural parcels surrounding the town generally non-compliant.</p> <p>Compliant: 60 (73)</p> <p>Non-compliant: 9 (128)</p> |
| Slope Town (Locality) | <p>High: 0 (1)</p> <p>Moderate: 0 (2)</p> <p>Low: 69 (198)</p> |
| Geology | Underlain by the Newer Volcanic Group with unnamed phreatomagmatic (tuff ring) deposits in the west (including the town) and unnamed stony rises and hummocky lava flows in the east. |
| Soil suitability Town (Locality) | <p>High: 0 (0)</p> <p>Moderate: 69 (201)</p> <p>Low: 0 (0)</p> <p>The locality consists of soil landscape units '123' and '114' which form on gently undulating plains and stony rises of the Volcanic Western Plains. Soil type changes significantly with landform, but generally consists of moderately to strongly structured, friable clay loam over strongly structured medium clay to less than 1.5m depth. Limitations include restricted drainage.</p> |
| Sensitivity Overlay | <p>Depth to Groundwater Compliance: all compliant.</p> <p>Landslip: Nil.</p> <p>Vegetation: locality borders Lake Coragulac to the northwest.</p> |
| Sensitivity Analysis Rating Town (Locality) | <p>Very High: 0 (0)</p> <p>High: 0 (0)</p> <p>Moderate: 42 (77)</p> <p>Low: 27 (124)</p> |

4h. Sensitivity Analysis (Maps)





5h. System Selection

Due to the dominance of heavy-textured soils in the Coragulac locality, conventional absorption trenches and beds are not likely to be feasible and are discouraged. Appendix A of the EPA Code of Practice (2013) prohibits LPED systems on Category 5 and 6 soils (medium to heavy clays). The System Sizing Tables (below) indicate which systems are likely to be the most appropriate for the locality.

6h. System Sizing Tables

The Sizing Tables for each system type were created using monthly 70th percentile water balances, using methods described in the MAV Model LCA, 2014. The water balances used monthly 70th percentile rainfall and average evapotranspiration data for a single geographic point between Coragulac and Cororooke, due to their proximity. The climate data was sourced from SILO (Scientific Information for Land Owners) climate databases, which are managed by the Queensland Government. The SILO databases use accurate meteorological data collected throughout Australia over long time periods.

The Design Loading Rates (DLRs) and Design Irrigation Rates (DIRs) were taken from the current EPA Code of Practice. Where the Code of Practice has precluded use of a particular type of system on a certain soil type, it is shown as 'Not Applicable' for that soil type in the Sizing Tables. Where the evapotranspiration deficit requires unrealistically large land application areas for a particular system on a certain soil type, it is also shown as 'Not Applicable' for that soil type in the Sizing Tables. Detailed, site-specific LCAs and system designs would be required to further investigate the feasibility of systems deemed 'Not Applicable' in the sizing tables. Mitigation measures (such as importation of topsoil to appropriate depths in the land application area), may be required to sustainably achieve land application of effluent on constrained parcels.

The Sizing Tables for the Coragulac locality are provided below.

7h. General Conclusion

The parcels within Coragulac have been assigned a Moderate or Low Sensitivity Rating to sustainable DWM. Both Standard and Council LCAs will be required, with the use of System Sizing Tables deemed appropriate. The constraints within Coragulac are quite low in comparison to other localities, with particular attention directed towards ensuring that the quality of the groundwater resources is maintained and the correct decommissioning of groundwater bores occurs where necessary.

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| Corrugulac | | | | | | | | | | |
|---|---|-----------------|---------------------|--|--------------------------|--|---|---|--|--|
| 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 | Total min. irrigation area required for zero wet weather effluent storage (m ²) not including spacing & setbacks | | | | | | | | | |
| 5 + bedroom residence | 1,080 | 287 | 390 | 476 | 610 | 1,397 | | | | |
| 4 bedroom residence | 900 | 239 | 325 | 396 | 508 | 1,164 | | | | |
| 1-3 bedroom residence | 720 | 191 | 260 | 317 | 407 | 932 | | | | |
| 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 | | | | | | | | | | |
| Conventional Absorption Trenches and Beds - Primary or Secondary Treated Effluent | | | | | | | | | | |
| Soil Category | Gravels & Sands (1) | Sandy Loams (2) | Loams (3) | Weak Loams & High/Mod Clay Loams (3 & 4) | Weak Clay Loams (4) | Massive Clay Loams (4) | Light Clays (5) | Medium to Heavy Clays (6) | | |
| DLR (mm) | | | | | | | | | | |
| Development Type | Not supported (Alternative Land Application System Required) | | | | | | | | | |
| 5 + bedroom residence | 1,080 | | | | | | | | | |
| 4 bedroom residence | 900 | | | | | | | | | |
| 1-3 bedroom residence | 720 | | | | | | | | | |
| Evapotranspiration-Absorption Trenches and Beds - Primary or Secondary 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 | Total min. basal or 'wetted' area required for zero wet weather effluent storage (m ²) not including spacing & setbacks | | | | | | | | | |
| 5 + bedroom residence | 1,080 | 59 | 80 | 127 | 103 | 165 | | 305 | | |
| 4 bedroom residence | 900 | 49 | 67 | 106 | 86 | 138 | | 254 | | |
| 1-3 bedroom residence | 720 | 39 | 54 | 85 | 69 | 110 | | 203 | | |
| Note: * Gravels, Sands and sandy loams are unsuitable for conventional absorption trenches and beds if there is a high water table, including seasonal and perched water tables. 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) | | 4 | 3.5 | 3 | 2.5 | | | | | |
| Development Type | Total min. basal or 'wetted' area for zero wet weather storage (m ²)† | | | | | | | | | |
| 5 + bedroom residence | 1,080 | 424 | 527 | 697 | 1,029 | N/A | | | | |
| 4 bedroom residence | 900 | 353 | 440 | 581 | 858 | (Alternative Land Application System Required) | | | | |
| 1-3 bedroom residence | 720 | 283 | 352 | 465 | 686 | | | | | |
| † not including spacing & setbacks | | | | | | | | | | |
| Wick Trenches and Beds - Secondary Treated Effluent Only | | | | | | | | | | |
| Soil Category | Gravels & Sands (1) | Sandy Loams (2) | 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 | 8 | 5 | | |
| Development Type | Total min. basal or 'wetted' area required for zero wet weather effluent storage (m ²) not including spacing & setbacks | | | | | | | | | |
| 5 + bedroom residence | 1,080 | 38 | 59 | 127 | 103 | 165 | | 305 | | |
| 4 bedroom residence | 900 | 32 | 49 | 106 | 86 | 138 | | 254 | | |
| 1-3 bedroom residence | 720 | 26 | 39 | 85 | 69 | 110 | | 203 | | |

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I. Cororooke Locality Report

1i. Introduction

Cororooke is a rural locality located approximately 7km northwest of Colac in close proximity to the Coragulac and Alvie localities within the Red Rock region. The landform features undulating agricultural land on the Western Volcanic Plains.

The locality has a population of approximately 383 residents. There are approximately 301 and 112 unsewered parcels located within the Cororooke locality and town, respectively, with 67 DWM system permits that have been inspected to date by COS. The current DWM permits and their associated treatment system and LAA method within the Cororooke locality are summarised as follows:

- 12 AWTS (5 drip irrigation, 1 irrigation, 1 trench and 5 unknown);
- 1 sand filter (1 drip irrigation);
- 41 septic tanks (3 trenches, 1 irrigation, 1 subsurface irrigation and 36 unknown); and
- 13 unknown (2 trenches and 11 unknown).

No field investigations were conducted in the Cororooke locality as part of the 2014 field assessments.

2i. Background Documentation

Refer to the following documents for additional detail regarding the locality:

- Red Rock Region Community Infrastructure Plan (September, 2013);
- COS Planning Scheme; and
- Rural Living Strategy (2011).

3i. Summary of Constraints to DWM

| Characteristic | Description |
|-------------------------------------|--|
| Climate Zone | Zone 2 |
| Surface waterways & catchments | Located outside of a DWSC. Minimal drainage features, with Lake Colac to the east. |
| Groundwater | Proximity to groundwater bores: distributed throughout the locality, similar to Coragulac. |
| Land subject to inundation | Nil but extensive to the east (associated with Lake Colac). |
| Useable lot area
Town (Locality) | High: 69 (95)
Moderate: 26 (45)
Low: 17 (158) |

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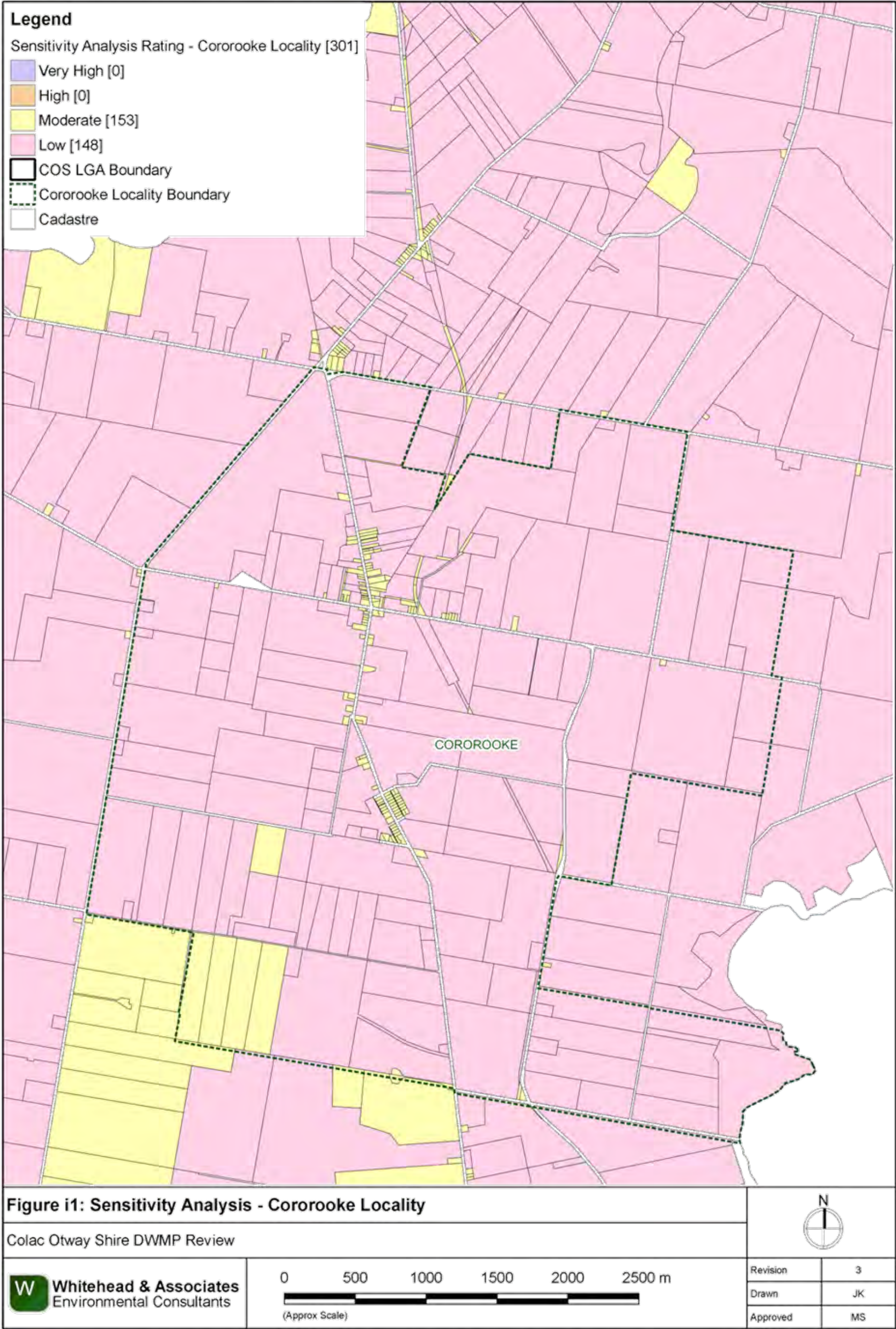
| Characteristic | Description |
|--|--|
| | Compliant: 0 (3) |
| Minimum lot size compliance with Planning Scheme Zoning | <p>The locality is predominantly zoned Farming Zone. The town is zoned Township Zone and Rural Living Zone.</p> <p>Compliance is variable throughout the locality, with the majority of the rural parcels non-compliant.</p> <p>Compliant: 69 (77)</p> <p>Non-compliant: 43 (224)</p> |
| Slope Town (Locality) | <p>High: 0 (0)</p> <p>Moderate: 0 (2)</p> <p>Low: 112 (299)</p> |
| Geology | <p>Variable.</p> <p>The town is predominately underlain by unnamed stony rises and hummocky lava flows of the Newer Volcanic Group Transversing east-west.</p> <p>North of the town – unnamed phreatomagmatic deposits (tuff rings) of Newer Volcanic Group</p> <p>South of the town – Quaternary unnamed swamp, lake and estuarine deposits.</p> <p>Southern region – Hanson Plain sand of the Brighton Group which is comprised of fluvial and minor shallow marine deposits</p> <p>Along southern boundary – unnamed sheet flow basalt of the Newer Volcanic Group.</p> |
| Soil suitability Town (Locality) | <p>High: 0 (14)</p> <p>Moderate: 112 (287)</p> <p>Low: 0 (0)</p> <p>Variable throughout locality (6 in total).</p> <p>The dominant soil landscape unit, which also includes the town, is '114' which forms on gently undulating plains and stony rises of the Volcanic Western Plains. Soil type changes significantly with landform, but generally consists of moderately to strongly structured, friable clay loam over strongly structured medium clay to less than 1.5m depth. Limitations include restricted drainage.</p> |
| Sensitivity Overlay | <p>Depth to Groundwater Compliance: all compliant, including town, except for the eastern parcels around Lake Colac.</p> <p>Landslip: Nil</p> |

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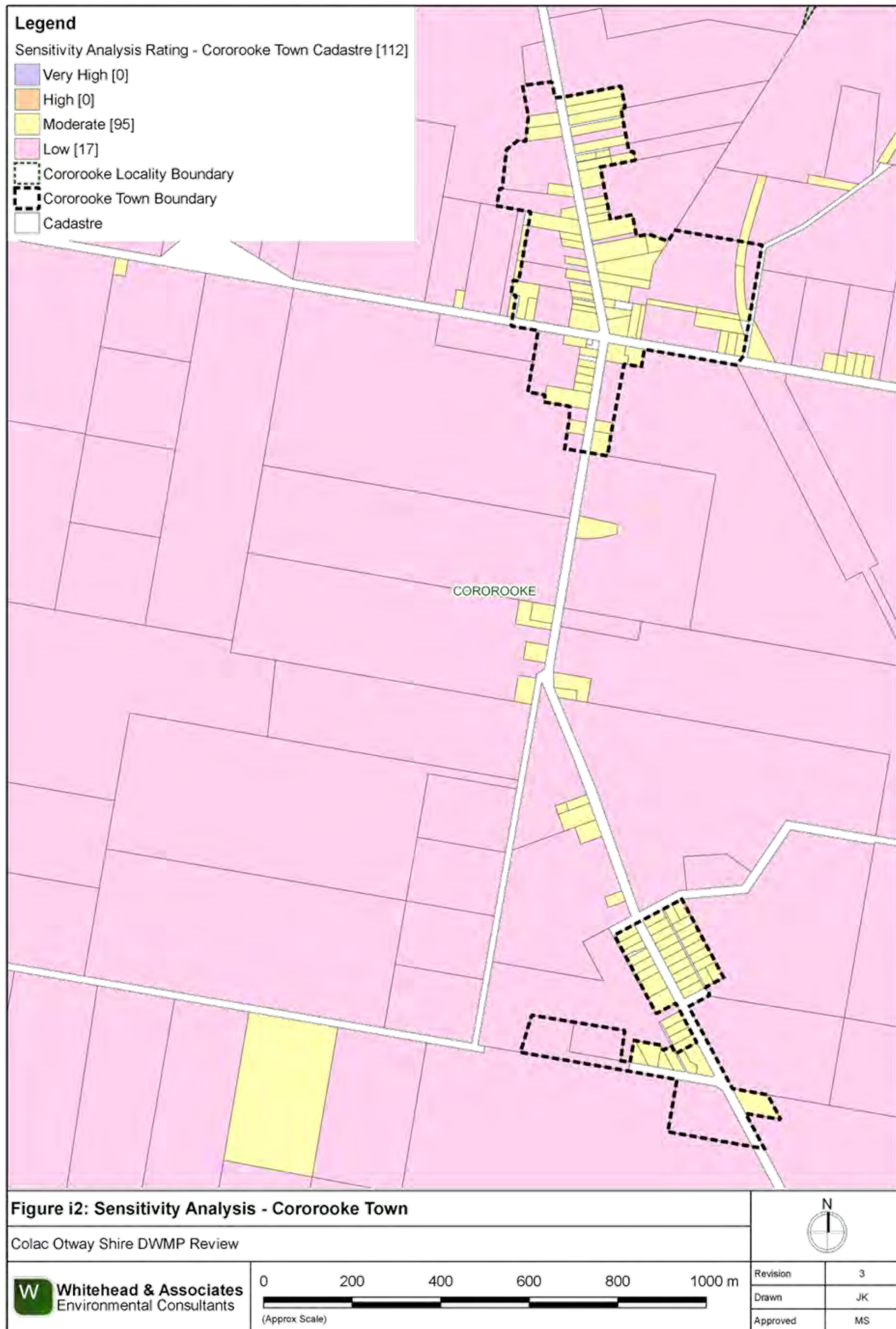
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| Characteristic | Description |
|---|--|
| | Vegetation: Lake Colac to southeast. |
| Final Sensitivity Rating
Town (Locality) | Very High: 0 (0)
High: 0 (0)
Moderate: 95 (153)
Low: 17 (148) |

4i. Sensitivity Analysis (Maps)



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5i. System Selection

Based on soil types and indicative depths, the Cororooke locality has the potential to sustainably accommodate a broad range of system types, depending on the influences of climate. The System Sizing Tables (below) indicate which systems are likely to be the most appropriate for the locality.

6i. System Sizing Tables

The Sizing Tables for each system type were created using monthly 70th percentile water balances, using methods described in the MAV Model LCA, 2014. The water balances used monthly 70th percentile rainfall and average evapotranspiration data for a single geographic point between Cororooke and Coragulac, due to their proximity. The climate data was sourced from SILO (Scientific Information for Land Owners) climate databases, which are managed by the Queensland Government. The SILO databases use accurate meteorological data collected throughout Australia over long time periods.

The Design Loading Rates (DLRs) and Design Irrigation Rates (DIRs) were taken from the current EPA Code of Practice. Where the Code of Practice has precluded use of a particular type of system on a certain soil type, it is shown as 'Not Applicable' for that soil type in the Sizing Tables. Where the evapotranspiration deficit requires unrealistically large land application areas for a particular system on a certain soil type, it is also shown as 'Not Applicable' for that soil type in the Sizing Tables. Detailed, site-specific LCAs and system designs would be required to further investigate the feasibility of systems deemed 'Not Applicable' in the sizing tables. Mitigation measures (such as importation of topsoil to appropriate depths in the land application area), may be required to sustainably achieve land application of effluent on constrained parcels.

The Sizing Tables for the Cororooke locality are provided below.

7i. General Conclusion

The parcels within Cororooke have been assigned a Moderate or Low Sensitivity Rating to sustainable DWM. Both Standard and Council LCAs will be required, with the use of System Sizing Tables deemed appropriate. The constraints within Cororooke are quite low in comparison to other localities. Particular attention should be directed towards ensuring that the quality of the groundwater resources is maintained and the correct decommissioning of groundwater bores occurs where necessary.

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Cororooke

| Drip and Spray Irrigation Systems - Secondary Treated Effluent only | | | | | | | | | | |
|---|-----------------------|---|-----------------|---------------------|--|--------------------------|--|---|---|--|
| Development Type | 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 (m ²) not including spacing & setbacks | | | | | | | | |
| | 1,080 | 287 | 390 | 476 | 610 | 1,397 | | | | |
| | 4 bedroom residence | 900 | 239 | 325 | 396 | 508 | 1,164 | | | |
| | 1-3 bedroom residence | 720 | 191 | 260 | 317 | 407 | 932 | | | |
| 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 | | | | | | | | | | |
| Conventional Absorption Trenches and Beds - Primary or Secondary Treated Effluent | | | | | | | | | | |
| Development Type | Soil Category | Gravels & Sands (1) | Sandy Loams (2) | Loams (3) | Weak Loams & High/Mod Clay Loams (3 & 4) | Weak Clay Loams (4) | Massive Clay Loams (4) | Light Clays (5) | Medium to Heavy Clays (6) | |
| | DLR (mm) | 20* | 20* | 15 | 10 | 6 | 4 | 5 | N/A | |
| Development Type | Daily (L/day) | Total min. basal or 'wetted' area required for zero wet weather effluent storage (m ²) not including spacing & setbacks | | | | | | | | |
| | 1,080 | 59 | 80 | 127 | 127 | 238 | 424 | 305 | (Alternative Land Application System Required) | |
| | 4 bedroom residence | 900 | 49 | 67 | 106 | 198 | 353 | 254 | | |
| | 1-3 bedroom residence | 720 | 39 | 54 | 85 | 159 | 283 | 203 | | |
| 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 | | | | | | | | | | |
| Evapotranspiration-Absorption Trenches and Beds - Primary or Secondary Treated Effluent (Category 1 to 5) and Secondary Treated Effluent only (Category 6) | | | | | | | | | | |
| Development Type | 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 effluent storage (m ²) not including spacing & setbacks | | | | | | | | |
| | 1,080 | 59 | 80 | 127 | 127 | 103 | 165 | 305 | | |
| | 4 bedroom residence | 900 | 49 | 67 | 106 | 86 | 138 | 254 | | |
| | 1-3 bedroom residence | 720 | 39 | 54 | 85 | 69 | 110 | 203 | | |
| 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 | | | | | | | | | | |
| Development Type | 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 | 3 | 2.5 | N/A | | | |
| Development Type | Daily (L/day) | Total min. basal or 'wetted' area for zero wet weather storage (m ²)† | | | | | | | | |
| | 1,080 | 424 | 527 | 697 | 897 | 1,029 | (Alternative Land Application System Required) | | | |
| | 4 bedroom residence | 900 | 353 | 440 | 581 | 858 | | | | |
| | 1-3 bedroom residence | 720 | 283 | 352 | 465 | 686 | | | | |
| † not including spacing & setbacks | | | | | | | | | | |
| Wick Trenches and Beds - Secondary Treated Effluent Only | | | | | | | | | | |
| Development Type | Soil Category | Gravels & Sands (1) | Sandy Loams (2) | 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 | 8 | 5 | |
| Development Type | Daily (L/day) | Total min. basal or 'wetted' area required for zero wet weather effluent storage (m ²) not including spacing & setbacks | | | | | | | | |
| | 1,080 | 46 | 38 | 59 | 127 | 103 | 165 | 305 | | |
| | 4 bedroom residence | 900 | 39 | 49 | 106 | 86 | 138 | 254 | | |
| | 1-3 bedroom residence | 720 | 31 | 26 | 39 | 85 | 69 | 110 | | |

J. Forrest Locality Report

1j. Introduction

Forest is located approximately 22km southeast of Colac in the northern hinterlands of the Otway Ranges. The town is located along a ridgeline that separates two well defined catchments. The majority of the locality is located outside DWSCs; however, small portions (10%) along the north-western and south-eastern boundaries fall within the Gellibrand River and Upper Barwon DWSCs, respectively.

The locality has a population of approximately 238 residents. There are approximately 354 and 167 unsewered parcels within the Forrest locality and town, respectively, with 130 DWM system permits that have been inspected to date by COS. The current DW permits and their associated treatment system and LAA method within Forrest are summarised as follows:

- 23 AWTs (9 drip irrigation, 2 trenches, 7 subsurface irrigation and 5 unknown);
- 38 sand filters (1 trench and 37 subsurface irrigation);
- 39 septic tanks (10 trenches, 1 irrigation and 28 unknown);
- 2 worm farms (2 trenches); and
- 28 unknown (10 trenches, 1 subsurface irrigation and 17 unknown).

No field investigations were conducted within the Forrest locality as part of the 2014 field assessments.

2j. Background Documentation

Refer to the following documents for additional detail regarding the locality:

- Forrest Structure Plan (2011);
- Colac Otway Domestic Wastewater Management Plan (2007);
- COS Planning Scheme; and
- Rural Living Strategy (2011).

3j. Summary of Constraints to DWM

| Characteristic | Description |
|--------------------------------|---|
| Climate Zone | Zones 2 and 3 |
| Surface waterways & catchments | A small region of the locality is located with DWSCs, being the Upper Barwon and Gellibrand River, but the town is located outside a DWSC. West Barwon Reservoir is located approximately 8km to the south of the town inside Barwon DWSC. Barwon River West Branch traverses north and east of the town. Other waterways within the locality include: Road Knight Creek, Porcupine Creek, and Barwon River East Branch.

Limited surface water concerns are located along the ridgeline. |
| Groundwater | Proximity to groundwater bores: distributed throughout the northern |

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| Characteristic | Description |
|--|---|
| | region and along the river, but density is less than other localities. |
| Land subject to inundation | Transverses locality north-south along Barwon River West Branch which runs along the eastern perimeter of the town. |
| Useable lot area
Town (Locality) | High: 88 (129)
Moderate: 55 (62)
Low: 24 (157)
Compliant: 0 (6) |
| Minimum lot size compliance with Planning Scheme Zoning | The locality is zoned a variety of different uses, predominantly being zoned Farming Zone, Public Conservation and Resource Zone, and Public Use Zone around the reservoir. The town is zoned as Township Zone, Rural Living Zone and Rural Activity Zone.

Compliance is variable throughout the locality, with the majority of the parcels within the town compliant and surrounding parcels non-compliant.

Compliant: 150 (178)
Non-compliant: 17 (176) |
| Slope
Town (Locality) | High: 7 (88)
Moderate: 22 (63)
Low: 138 (203) |
| Geology | Town – Dilwyn Formation of Wangeripp Group (shallow marine, coastal barrier and back beach lagoonal deposit);

North: Gellibrand Marl of Hytesbury Group (continental shelf deposit);

South – Eumeralla Formation of the Otway Group (fluvial and braided stream deposits) with alluvial flood plain deposits along the creek. |
| Soil suitability
Town (Locality) | High: 0 (28)
Moderate: 167 (326)
Low: 0 (0)

The town consists of soil landscape unit '73' which form on the steep rolling hills on the northern periphery of the Otway Range and consists of texture contrast soils with ironstone to 2m depth. The soils consist of weakly structured sandy loam over strongly structured medium to heavy clay. Limitations include low fertility, low p-sorb, sodic, dispersive, restricted drainage and coarse fragments.

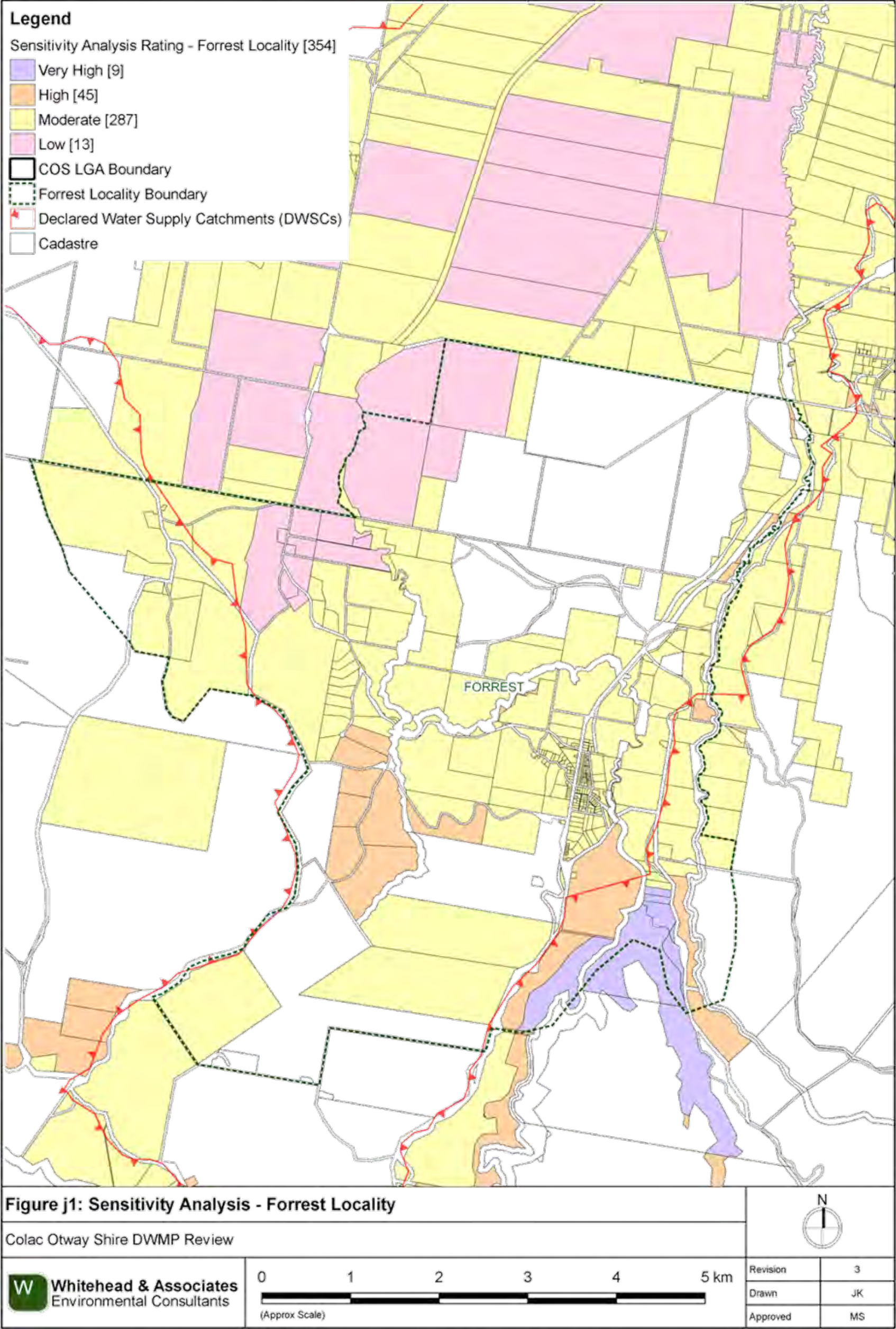
The regions adjacent to the river to the north and west of the town consist of soil landscape unit '95' which forms on the alluvial floodplain |

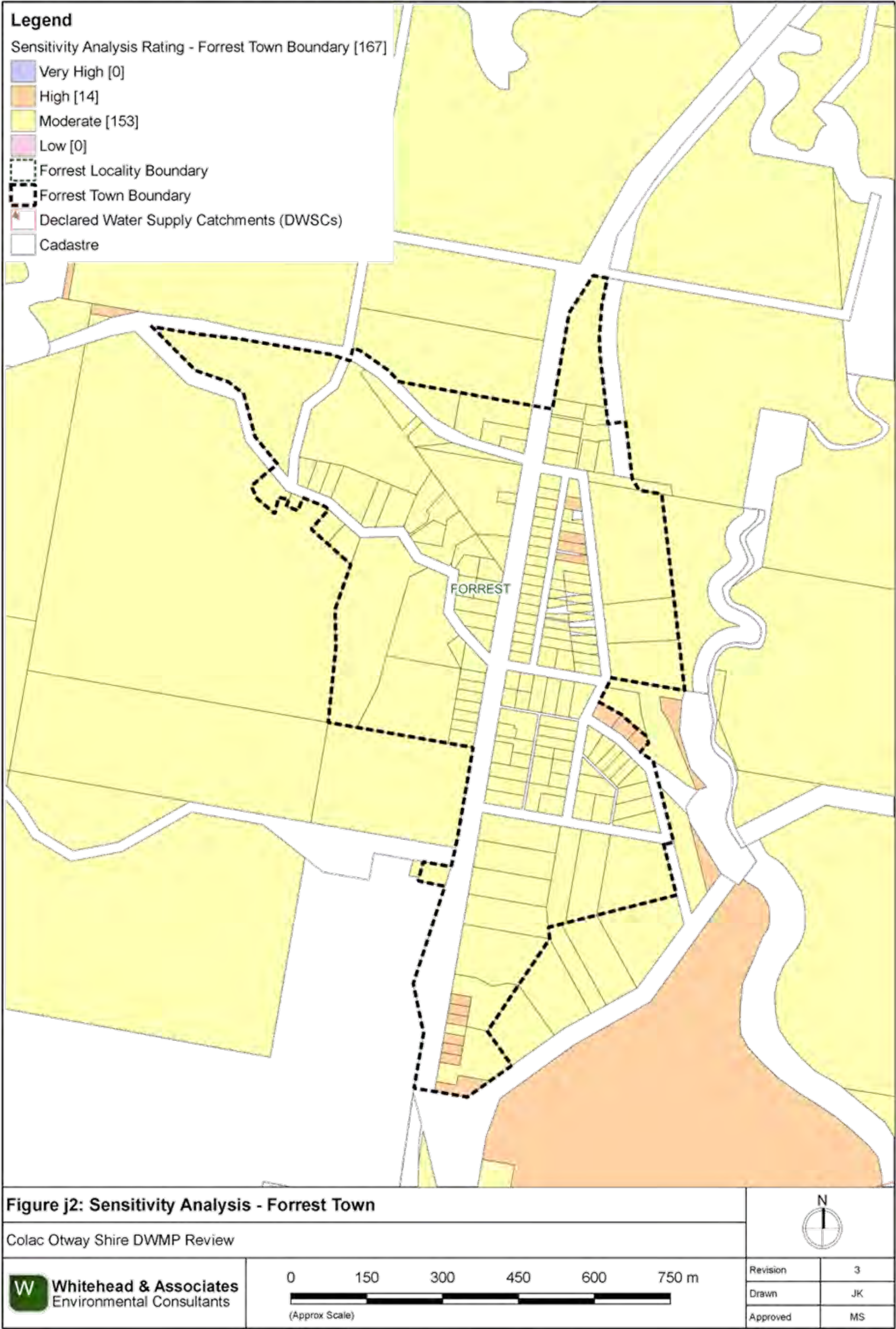
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| Characteristic | Description |
|--|---|
| | <p>of the Barwon River and its tributaries with numerous cut-off meanders. The soil consists of a moderately structured fine sandy clay loam over medium clay to more than 2m depth. Limitations include restricted drainage and dispersive.</p> <p>South and east facing slopes are linear and consist of in situ weathered rock with brown gradational soils covered by loam. North and west facing slopes consist of in situ weathered rock with brown duplex soils covered by loam.</p> |
| Sensitivity Overlay | <p>Depth to Groundwater Compliance: predominantly compliant, except in the northeast of the locality along Barwon River East Branch.</p> <p>Landslip: extensive around locality and surrounding locality</p> <p>Vegetation: Otway Forest Park surrounds the town, with a small region of Great Otway National Park.</p> |
| Sensitivity Analysis Rating Town (Locality) | <p>Very High: 0 (9)</p> <p>High: 14 (45)</p> <p>Moderate: 153 (287)</p> <p>Low: 0 (13)</p> |

4j. Sensitivity Analysis (Maps)





5j. System Selection

Due to the dominance of heavy-textured soils in the Forrest area, conventional absorption trenches and beds are not likely to be feasible and are discouraged. Appendix A of the EPA Code of Practice (2013) prohibits LPED systems on Category 5 and 6 soils (medium to heavy clays). The System Sizing Tables (below) indicate which systems are likely to be the most appropriate for the locality.

6j. System Sizing Tables

The Sizing Tables for each system type were created using monthly 70th percentile water balances, using methods described in the MAV Model LCA, 2014. The water balances used monthly 70th percentile rainfall and average evapotranspiration data for Gellibrand, as it was compared with that of Forrest and found to be very similar, with very little size differences in water balance results. The climate data for Gellibrand was sourced from SILO (Scientific Information for Land Owners) climate databases, which are managed by the Queensland Government. The SILO databases use accurate meteorological data collected throughout Australia over long time periods.

The Design Loading Rates (DLRs) and Design Irrigation Rates (DIRs) were taken from the current EPA Code of Practice. Where the Code of Practice has precluded use of a particular type of system on a certain soil type, it is shown as 'Not Applicable' for that soil type in the Sizing Tables. Where the evapotranspiration deficit requires unrealistically large land application areas for a particular system on a certain soil type, it is also shown as 'Not Applicable' for that soil type in the Sizing Tables. Detailed, site-specific LCAs and system designs would be required to further investigate the feasibility of systems deemed 'Not Applicable' in the sizing tables. Mitigation measures (such as importation of topsoil to appropriate depths in the land application area), may be required to sustainably achieve land application of effluent on constrained parcels.

The Sizing Tables are provided below.

7j. General Conclusion

The parcels within Forrest have been assigned all classes of Sensitivity Rating to sustainable DWM, with the majority of the parcels assigned a Moderate Sensitivity Rating. Predominantly, Standard LCAs will be required, with the use of System Sizing Tables deemed appropriate. The Low Sensitivity Rating parcels that fall within a DWSC are required to complete a Standard LCA as per the current EPA Code of Practice's requirements. Particular attention needs to be directed towards ensuring that the degree of slope is taken into consideration when designing the LAA. The locality is also extensively considered to be prone to landslip; a geotechnical report by a suitably qualified person will need to be conducted to address this constraint.

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| Forrest | | | | | | | | | | | |
|---|-----------------------|---|--|---------------------|--|--------------------------|--|---|---|--|--|
| Drip and Spray Irrigation Systems* - Secondary Treated Effluent only | | | | | | | | | | | |
| Development Type | 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 (m ²) not including spacing or setbacks | | | | | | | | | |
| | 1,080 | 380 | 586 | 489 | 804 | 1,269 | 1,881 | | | | |
| Development Type | 4 bedroom residence | 900 | 317 | 670 | 670 | 1,068 | 1,568 | | | | |
| | 1-3 bedroom residence | 720 | 254 | 391 | 536 | 854 | 1,254 | | | | |
| 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 | | | | | | | | | | | |
| Conventional Absorption Trenches and Beds - Primary Treated Effluent | | | | | | | | | | | |
| Development Type | 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) | | |
| | Daily (L/day) | Not supported (Alternative Land Application System Required) | | | | | | | | | |
| Development Type | Daily (L/day) | Not supported (Alternative Land Application System Required) | | | | | | | | | |
| | 1,080 | | | | | | | | | | |
| Development Type | 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) | | | | | | | | | | | |
| Development Type | 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 | | |
| | Daily (L/day) | 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 (m ²) not including spacing & setbacks | | | | | | | | | |
| | 1,080 | 62 | 87 | 144 | 144 | 114 | 197 | 431 | | | |
| Development Type | 4 bedroom residence | 900 | 52 | 72 | 120 | 95 | 164 | 360 | | | |
| | 1-3 bedroom residence | 720 | 42 | 58 | 96 | 76 | 131 | 288 | | | |
| Note: * Gravels, Sands and sandy loams are unsuitable for conventional absorption trenches and beds if there is a high water table, including seasonal and perched water tables. 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 | | | | | | | | | | | |
| Development Type | 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) | Total min. basal or 'wetted area'† | | | | | | | | | |
| | 1,080 | 717 | 1,073 | | | | | | | | |
| Development Type | 4 bedroom residence | 900 | 598 | 895 | | | | | | | |
| | 1-3 bedroom residence | 720 | 478 | 716 | | | | | | | |
| † required for zero wet weather storage (m ²) not including spacing & setbacks | | | | | | | | | | | |
| Wick Trenches and Beds - Secondary Treated Effluent Only | | | | | | | | | | | |
| Development Type | 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) | | |
| | Daily (L/day) | 25 | 30 | 20 | 10 | 12 | 8 | 8 | N/A | | |
| Development Type | Daily (L/day) | Total min. basal or 'wetted area' required for zero wet weather storage (m ²) not including spacing & setbacks | | | | | | | | | |
| | 1,080 | 48 | 40 | 62 | 145 | 114 | 197 | | | | |
| Development Type | 4 bedroom residence | 900 | 33 | 52 | 121 | 95 | 164 | | | | |
| | 1-3 bedroom residence | 720 | 32 | 27 | 42 | 97 | 76 | 132 | | | |

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K. Gellibrand Locality Report

1k. Introduction

Gellibrand is located approximately 21km south of Colac. It is located on elevated and dissected terraces or deeply dissected hills, abutting the Gellibrand River. Gellibrand is located on relatively flat land gently slopes in a northerly direction to the convergence of Charleys Creek and Lardner Creek. Notably, the entire locality is located within the Gellibrand River DWSC.

The locality has a population of approximately 383 residents. There are approximately 276 and 71 unsewered parcels located within the Gellibrand locality and town, respectively, with 104 DWM system permits that have been inspected to date by COS. The current DWM permits and their associated treatment system and LAA method within the Gellibrand locality are summarised as follows:

- 9 AWTs (5 drip irrigation, 1 trenches, 1 irrigation and 1 unknown);
- 1 constructed reed beds wetland (1 trench);
- 35 sand filters (1 drip irrigation and 34 subsurface irrigation);
- 34 septic tanks (12 trenches, 1 subsurface irrigation and 21 unknown); and
- 25 unknown (10 trenches and 15 unknown).

2k. Background Documentation

Refer to the following documents for additional detail regarding the locality:

- Gellibrand River Township Master Plan Report (October, 2005); and
- Colac Otway Domestic Wastewater Management Plan (2007);
- COS Planning Scheme; and
- Rural Living Strategy (2011).

3k. Site Assessment Results

The following table summarises the results from the representative audits conducted by Consultant staff in September 2014.

| Characteristic | Description |
|-----------------|---|
| Land use | Comprises of a range of land uses, including dairy, forestry, rural living and tourism. |
| Occupancy rates | 2.3 (Gellibrand State Suburb, ABS Census, 2011). |
| Typical soils | Duplex profile. Very dark grey brown sandy clay loam surface soil overlying abruptly at 35cm a strongly mottled yellow brown, grey, strong brown silty clay, overlying a stratum of white and yellow coarse gravelly sand with rounded quartz pebbles between 140-170cm, overlying strongly mottled clay to at least 200cm. Drainage and permeability are variable depending on slope and position. |

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| Characteristic | Description |
|----------------------------------|--|
| AS/NZS 1547:2012 soil categories | 5 (Light Clays) |
| Existing Systems | <p>Separate Blackwater and Greywater</p> <p>Of the seven systems inspected during field investigations, three systems (43%) comprised separate blackwater treatment in a septic tank, with direct greywater diversion to either an adjacent paddock or street drain. Where discharged to paddocks or neighbouring vacant parcels, greywater was typically ponded near the diversion outlet pipe, and often in areas trampled by livestock (cattle and sheep).</p> <p>The blackwater septic tanks were typically 40+ years old and less than half had been pumped out within the last ten years. Septic effluent discharged to one or more conventional absorption trenches, some of which could not be identified without the owner present. The majority of trenches were located on land of less than 8% slope and appeared to be parallel with contours (i.e. running across slope, not down it). There was evidence of blackwater effluent surcharging to the surface on one property (of three with separate blackwater and greywater systems). Soils were typically soft or boggy, mainly due to recent high rainfall.</p> <p>Combined Blackwater and Greywater</p> <p>Four of the seven systems (57%) inspected had combined wastewater treatment systems or were assumed to have combined systems, based on layout of pipework. It is likely that the proportion of combined systems in Gellibrand is likely to be less than this; however, this should be confirmed by ongoing inspections by Council.</p> <p>Septic effluent discharged to one or more conventional absorption trenches. At least one of the four properties had undersized trenches for the number of bedrooms; and on one property the LAA could not be identified and there was inadequate suitable space for an appropriately sized LAA.</p> |

4k. Summary of Constraints to DWM

| Characteristic | Description |
|--------------------------------|---|
| Climate Zone | Zone 3 |
| Surface waterways & catchments | The locality is located entirely within the Gellibrand River DWSC. There is an extensive drainage network surrounding the town; including Gellibrand River transversing southeast to northwest, Love Creek, Charleys Creek, Lardner Creek and Asplin Creek. |
| Groundwater | Proximity to groundwater bores: significantly dense distribution throughout the town and along the river, similar to Kewarren. |

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| Characteristic | Description |
|--|--|
| | Groundwater depth: 1.5 – 2m below surface. |
| Land subject to inundation | Extensive along Gellibrand River, Charleys Creek, Lardner Creek and Love Creek; envelopes the town. |
| Useable lot area
Town (Locality) | High: 19 (58)
Moderate: 33 (46)
Low: 19 (158)
Compliant: 0 (14) |
| Minimum lot size compliance with Planning Scheme Zoning | The locality is predominantly zoned Farming Zone and Public Conservation and Resource Zone. The town is zoned Township Zone, Public Park and Recreation Zone and Public Use Zone.

Compliance is variable throughout the locality, with the majority of the parcels within the town compliant.

Compliant: 67 (110)
Non-compliant: 4 (166) |
| Slope
Town (Locality) | High: 0 (92)
Moderate: 0 (25)
Low: 71 (159) |
| Geology | Various underlying geology.

Majority of town is a river terrace with clay and sand which is moderately sorted and poorly consolidated. Northern tip is alluvial floodplain with silt, sand, and gravel deposits which are also moderately sorted and poorly consolidated.

South – Eumeralla Formation of the Otway Group.

Dilwyn Formation of Wangeripp Group is directly south of town.

Older Volcanic Group (volcanic plugs, sills, dykes, pillow and pyroclastic deposits) to the east and north of town.

Wiridjil Gravel Member of Pebble Point Formation to west of town towards Carlisle River.

South eastern edge is a shallow marine deposit with sand, clay and silt. |
| Soil suitability
Town (Locality) | High: 64 (125)
Moderate: 7 (151)
Low: 0 (0)

The majority of the town is classified as having a high soil suitability |

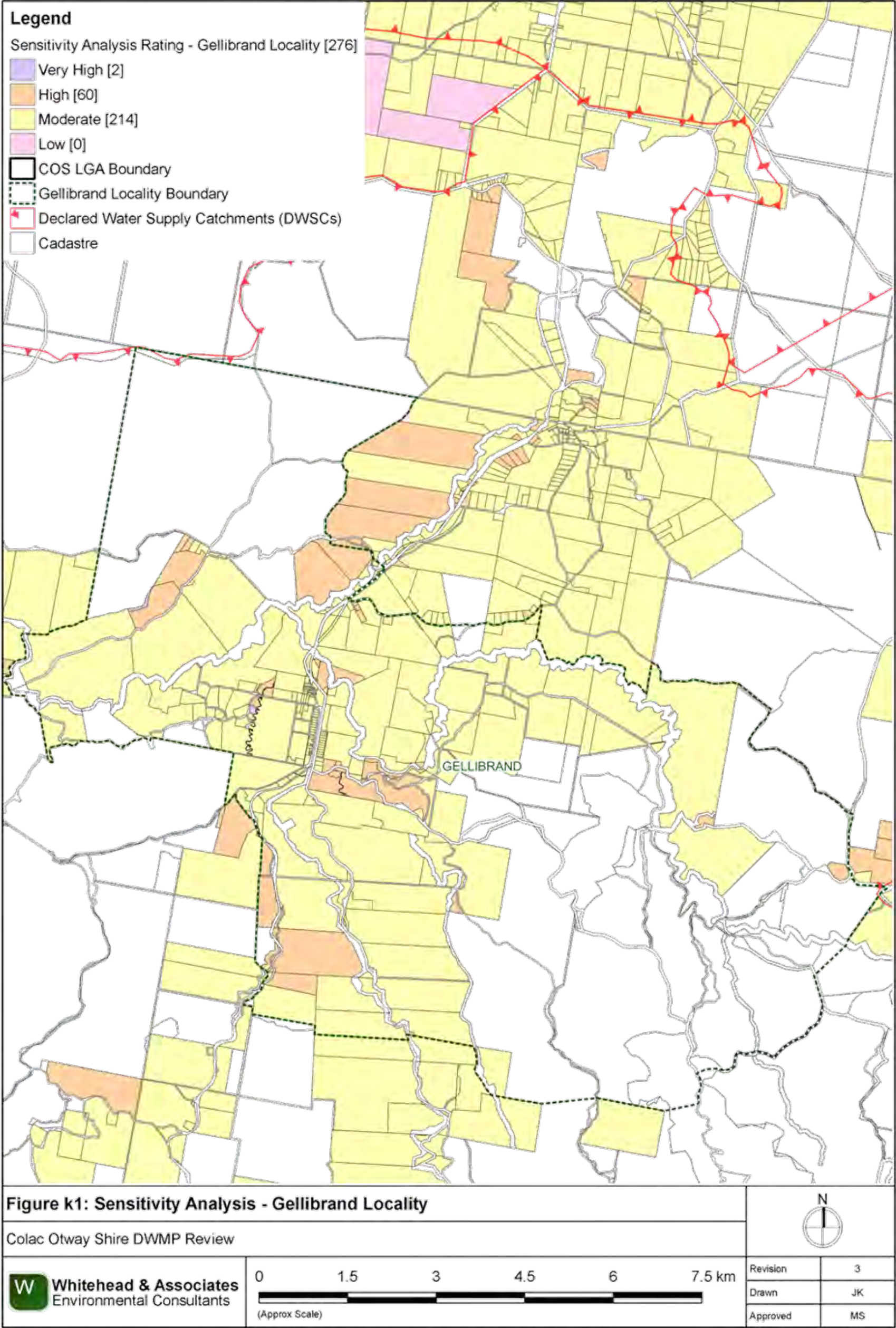
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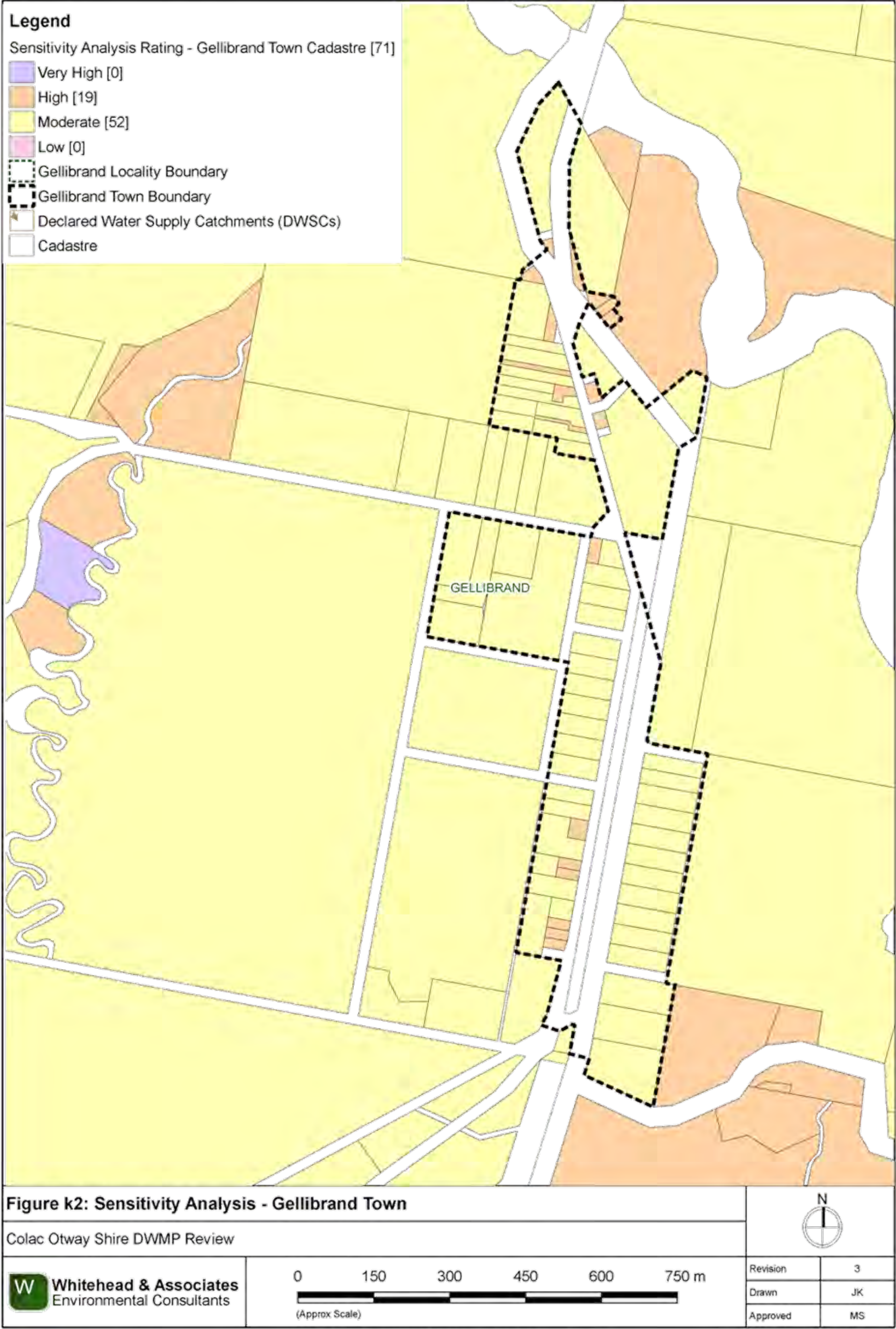
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| Characteristic | Description |
|--|--|
| | <p>constraint.</p> <p>The dominant soil landscape unit of the town consists of '67' which forms on deeply dissected hills abutting the Gellibrand River to the west of Love Creek. The soils consist of brown gradational soils, strongly structured sandy clay loam over weakly structured light clay, to 0.9m depth. Limitations include acidity.</p> <p>The western and southern regions of the town consist of soil landscape unit '94' which forms on elevated, and in parts, uplifted and dissected system of ancient cut and depositional terraces of Gellibrand River. The soils consist of grey sand soils with structured clay underneath; strongly structured sandy loam over moderately structured medium clay; to depths of more than 2m. Limitations include low fertility and restricted drainage.</p> <p>The northern region of the locality consists of soil landscape unit '90' which forms on the rolling hills in the northern upper reaches of the Gellibrand catchment and consists of mottled gradational soil to more than 2m depth. The soil consists of apedal fine sandy loam over weakly structured silty clay loam. Limitations include low p-sorb, low fertility and restricted drainage.</p> <p>The southern half of the locality consists of soil landscape unit '61' which forms on the deeply dissected hills of the Otway Ranges and consist of brown gradational soils to 1.2m depth. The soils consist of moderately structured silty loam over clay loam. Limitations include acidity and restricted drainage.</p> <p>Predominant soil is yellow sandy gravel fill over brown clayey sandy silt overlying dark brown silty fine sand.</p> <p>Soil capacity for good drainage but waterlogged during wetter months.</p> |
| Sensitivity Overlay | <p>Depth to Groundwater Compliance: variable throughout locality. Non-compliant particularly to the southeast of the locality around Gellibrand River and Lardner Creek.</p> <p>Landslip: excessive, particularly to northwest of town.</p> <p>Vegetation: Otway Forest Park in southeast corner.</p> |
| Sensitivity Analysis Rating Town (Locality) | <p>Very High: 0 (2)</p> <p>High: 19 (60)</p> <p>Moderate: 52 (214)</p> <p>Low: 0 (0)</p> |

5k. Sensitivity Analysis (Maps)

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6k. System Selection

Due to the dominance of heavy-textured soils in the Gellibrand locality, conventional absorption trenches and beds are not likely to be feasible and are discouraged. Appendix A of the EPA Code of Practice (2013) prohibits LPED systems on Category 5 and 6 soils (medium to heavy clays). The System Sizing Tables (below) indicate which systems are likely to be the most appropriate for the locality.

7k. System Sizing Tables

The Sizing Tables for each system type were created using monthly 70th percentile water balances, using methods described in the MAV Model LCA, 2014. Monthly 70th percentile rainfall and average evapotranspiration data for Gellibrand was sourced from SILO (Scientific Information for Land Owners) climate databases, which are managed by the Queensland Government. The SILO databases use accurate meteorological data collected throughout Australia over long time periods.

The Design Loading Rates (DLRs) and Design Irrigation Rates (DIRs) were taken from the current EPA Code of Practice. Where the Code of Practice has precluded use of a particular type of system on a certain soil type, it is shown as 'Not Applicable' for that soil type in the Sizing Tables. Where the evapotranspiration deficit requires unrealistically large land application areas for a particular system on a certain soil type, it is also shown as 'Not Applicable' for that soil type in the Sizing Tables. Detailed, site-specific LCAs and system designs would be required to further investigate the feasibility of systems deemed 'Not Applicable' in the sizing tables. Mitigation measures (such as importation of topsoil to appropriate depths in the land application area), may be required to sustainably achieve land application of effluent on constrained parcels.

The Sizing Tables for the Gellibrand locality are provided below.

8k. General Conclusion

The Rural Living Strategy (2011) identified Gellibrand as having 'deferred' growth potential, dependent on water catchment constraints and bushfire hazard being satisfactorily addressed. The Sensitivity Analysis concludes that development is feasible given its predominantly Moderate Sensitivity to DWM, particular within the town. Particular attention needs to be directed towards ensuring that appropriate setbacks to surface waterways, groundwater bores and flood prone areas are maintained, that the DWM systems are sized based on the limiting soil horizon and that the depth to groundwater during site-specific LCAs is ascertained. It is imperative that there is sufficient useable area to sustainably manage wastewater on-site. Some areas within the locality are considered to be extensively prone to landslip; a geotechnical report by a suitably qualified person will need to be conducted to address this constraint. Predominantly, Standard and Detailed LCAs will be required, with the use of System Sizing Tables deemed appropriate for the parcels assigned a Moderate Sensitivity Rating. The Low Sensitivity Rating parcels within a DWSC are required to complete a Standard LCA as per the current EPA Code of Practice's requirements.

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Gellibrand & Kawarren

| 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 | Total min. irrigation area required for zero wet weather effluent storage (m ²)† | | | | | | |
| 5 + bedroom residence | 1,080 | 379 | 584 | 800 | 1,269 | 2,329 | |
| 4 bedroom residence | 900 | 316 | 487 | 667 | 1,058 | 1,941 | |
| 1-3 bedroom residence | 720 | 253 | 389 | 533 | 846 | 1,553 | |
| 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 or 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) |
| | DLR (mm)
Daily (L/day) | | | | | | |
| Development Type | Not supported (Alternative Land Application System Required) | | | | | | |
| 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) |
| | DLR (mm)
Daily (L/day) | 20* | 20* | 15 | 10 | 12 | 8 |
| Development Type | Total min. basal or 'wetted area' required for zero wet weather storage (m ²) not including spacing & setbacks | | | | | | |
| 5 + bedroom residence | 1,080 | 62 | 87 | 145 | 114 | 197 | 433 |
| 4 bedroom residence | 900 | 52 | 73 | 121 | 95 | 164 | 361 |
| 1-3 bedroom residence | 720 | 42 | 58 | 97 | 76 | 132 | 289 |
| 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)
Daily (L/day) | 4 | 3.5 | | | | |
| Development Type | Total min. basal or 'wetted area'† | | | | | | |
| 5 + bedroom residence | 1,080 | 723 | 1,086 | N/A | N/A | N/A | |
| 4 bedroom residence | 900 | 603 | 905 | (Alternative Land Application System Required) | (Alternative Land Application System Required) | (Alternative Land Application System Required) | |
| 1-3 bedroom residence | 720 | 482 | 724 | | | | |
| † required for zero wet weather storage (m ²) not including spacing & setbacks | | | | | | | |

| Wick Trenches and Beds - Secondary Treated Effluent Only | | | | | | | |
|--|--|-----------------|---------------------|------------------------|-------------------------|---------------------------|-----------------------|
| Soil Category | Gravels & Sands (1) | Sandy Loams (2) | Weak Clay Loams (4) | Massive Clay Loams (4) | Strong Light Clays (5a) | Moderate Light Clays (5b) | Weak Light Clays (5c) |
| | DLR (mm)
Daily (L/day) | 25 | 30 | 20 | 10 | 12 | 8 |
| Development Type | Total min. basal or 'wetted area' required for zero wet weather storage (m ²) not including spacing & setbacks | | | | | | |
| 5 + bedroom residence | 1,080 | 49 | 40 | 62 | 145 | 114 | 197 |
| 4 bedroom residence | 900 | 41 | 33 | 52 | 121 | 95 | 164 |
| 1-3 bedroom residence | 720 | 33 | 27 | 42 | 97 | 76 | 132 |
| N/A (Alternative Land Application System Required) | | | | | | | |

L. Kawarren Locality Report

1I. Introduction

Kawarren is located approximately 16km south of Colac. It is located on rolling hills or dissected hills abutting rivers and streams or large flood plains with undulating agricultural land. Notably, approximately 90% of the locality is located within a DWSC; predominantly Gellibrand River DWSC and a small portion in the northeast corner located within Barwon Downs Wellfield Intake DWSC.

The locality has a population of approximately 236 residents. There are approximately 215 and 72 unsewered parcels located within the Kawarren locality and settlement, respectively, with 62 DWM system permits that have been inspected to date by COS. The current DWM permits and their associated treatment system and LAA method within the Kawarren locality are summarised as follows:

- 6 AWTS (1 drip irrigation, 1 trench, 1 irrigation and 2 unknown);
- 1 composting toilet (1 trench);
- 3 sand filter (1 irrigation and 2 subsurface irrigation);
- 36 septic tank (12 trenches and 24 unknown); and
- 16 unknown (10 trenches and 6 unknown).

2I. Background Documentation

Refer to the following documents for additional detail regarding the locality:

- COS Planning Scheme; and
- Rural Living Strategy (2011).

3I. Site Assessment Results

The following table summarises the results from the representative audits conducted by Consultant staff in September 2014.

| Characteristic | Description |
|-----------------|--|
| Land use | Comprises of a range of land uses, including dairy, forestry, rural living and tourism. |
| Occupancy rates | 2.3 persons (Part of the Gellibrand State Suburb ABS Census, 2011) ⁵ . |
| Typical soils | Grey brown fine sandy loam to fine sandy clay loam becoming mottled at 15cm, abrupt change at 30cm to mottled light yellow brown and grey brown silty clay loam, grading to increasing mottling with depth to bright dark yellow brown, strong brown silty clay loam with some black small concretions below 80cm depth. Drainage and permeability are variable depending on slope and position. |

⁵ No separate data for individual small townships and localities.

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| Characteristic | Description |
|----------------------------------|--|
| AS/NZS 1547:2012 soil categories | 4 (Clay Loams) to 5 (Light Clays) |
| Existing Systems | <p>Separate Blackwater and Greywater</p> <p>Of the 8 systems inspected during field investigations, 75% of systems comprised separate blackwater treatment in a septic tank, with direct greywater diversion to an adjacent paddock (not to street drains, due to blocks generally sloping away from the street frontage). Greywater was typically ponded near the diversion outlet pipe, and often in areas trampled by livestock (cattle and sheep).</p> <p>The blackwater septic tanks were typically 40+ years old and approximately half had been pumped out within the last ten years. Septic effluent discharged to one or more conventional absorption trenches, some of which could not be identified without the owner present. The majority of trenches were located on land of less than 8% slope and appeared to be parallel with contours (i.e. running across slope, not down it). There was no evidence of blackwater effluent surcharging to the surface; however soils were typically soft or boggy, mainly due to recent high rainfall.</p> <p>Combined Blackwater and Greywater</p> <p>25% of systems inspected had combined wastewater treatment systems or were assumed to have combined systems, based on layout of pipework. It is likely that the proportion of combined systems in Kewarren is less than this; however, this should be confirmed by ongoing inspections by Council.</p> <p>Septic effluent discharged to one or more conventional absorption trenches, which were all undersized for the number of bedrooms, and/or located in inadequately sized available land application areas (LAAs).</p> |

4l. Summary of Constraints to DWM

| Characteristic | Description |
|--------------------------------|--|
| Climate Zone | Zones 2 and 3. |
| Surface waterways & catchments | The locality is located within the Gellibrand River and Barwon Downs Wellfield Intake DWSCs. The waterways include: Love Creek to the north of the settlement, Yahoo Creek, Ten Mile Creek, and Porcupine Creek which contains an extensive waterbody. |
| Groundwater | Proximity to groundwater bores: significantly dense distribution throughout the settlement and along the river, similar to Gellibrand. |

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| Characteristic | Description |
|---|---|
| Land subject to inundation | Nil. |
| Useable lot area
Settlement
(Locality) | High: 37 (72)
Moderate: 6 (16)
Low: 29 (121)
Compliant: 0 (6) |
| Minimum lot size compliance with Planning Scheme Zoning | The locality is predominantly zoned Farming Zone and Public Conservation and Resource Zone. The settlement is zoned Rural Living Zone.

The majority of parcels are non-compliant, particularly within the settlement.

Compliant: 2 (29)
Non-compliant: 70 (186) |
| Slope
Settlement
(Locality) | High: 6 (58)
Moderate: 29 (74)
Low: 37 (83) |
| Geology | Gellibrand Marl of Heytesbury Group (continental shelf deposits) is dominant with Older Volcanic Group to the west and north of settlement. The Clifton Formation of Heytesbury Group straddles the Older Volcanic Group and alluvial flood plain deposits. Demons Bluff Formation of the Nirranda Group is to the north of locality. |
| Soil suitability
Settlement
(Locality) | High: 0 (13)
Moderate: 72 (202)
Low: 0 (0)

Variable soil landscapes throughout locality (5 in total).

The settlement and the majority of the locality consists of soil landscape unit '90' which forms on the rolling hills in the northern upper reaches of the Gellibrand catchment and consists of mottled gradational soil to more than 2m depth. The soil consists of apedal fine sandy loam over weakly structured silty clay loam. Limitations include low p-sorb, low fertility and restricted drainage.

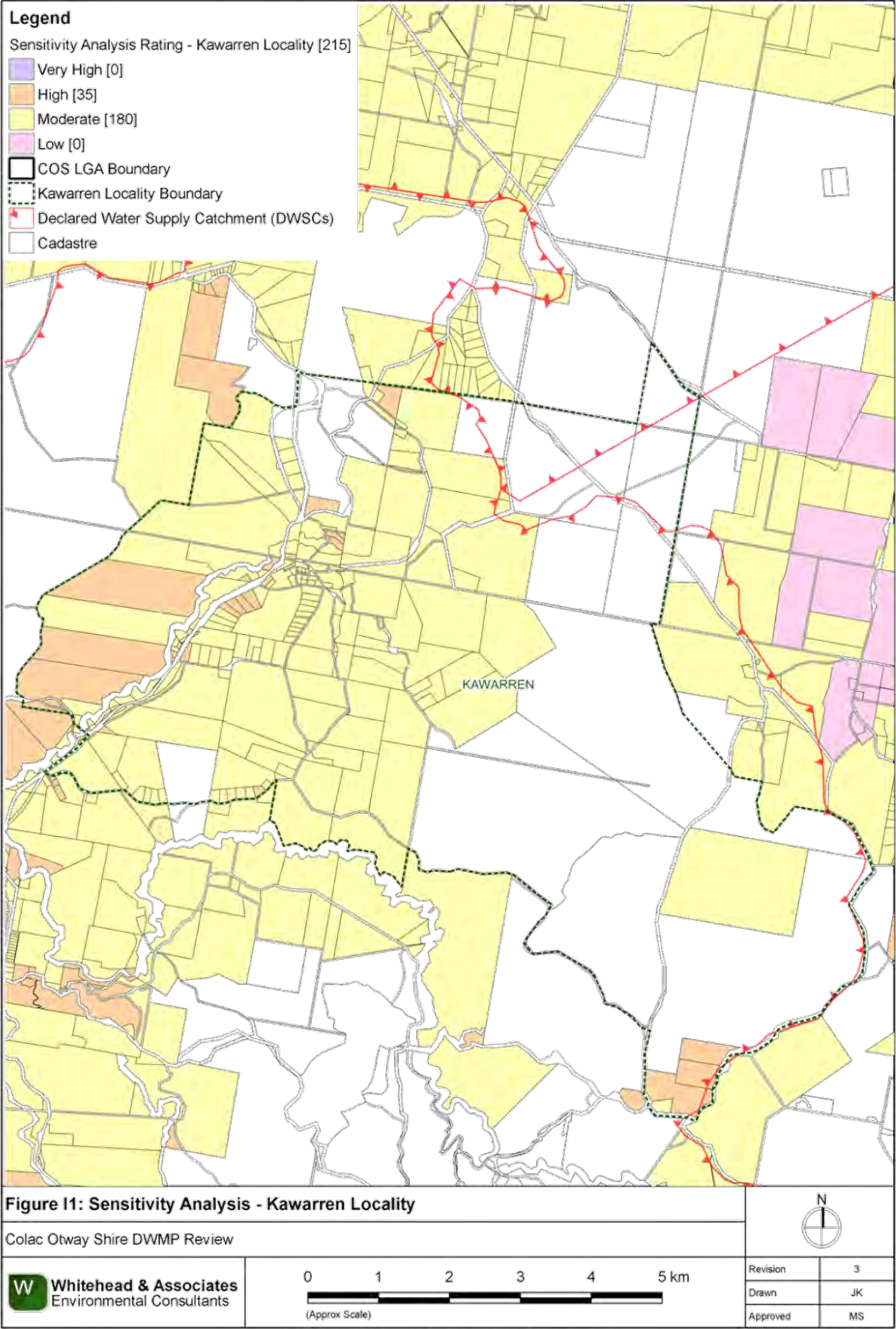
The settlement and to the east of the locality consists of soil landscape unit '76' which forms on undulating plains. The soil consists of grey sand soils to more than 2m depth with weak loamy sand overlying apedal sand. Limitations include low fertility. |

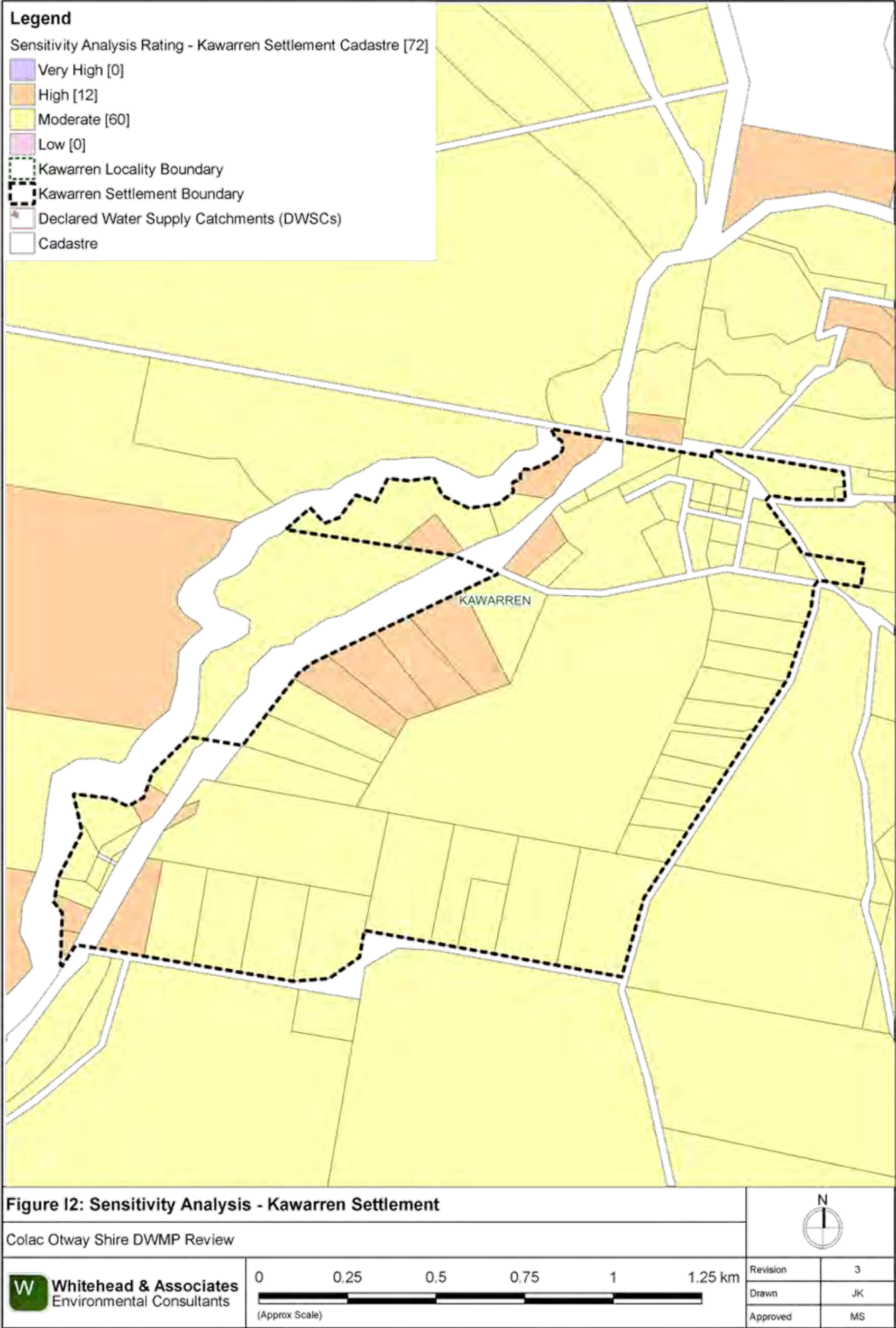
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| Characteristic | Description |
|--|---|
| Sensitivity Overlay | <p>Depth to Groundwater Compliance: predominantly compliant, except for along Love Creek which transverses northeast to southwest around the settlement.</p> <p>Landslip: minimal, with a few large regions to the east of the settlement.</p> <p>Vegetation: eastern half of locality consists of Otway Forest Park and Great Otway National Park.</p> |
| Sensitivity Analysis Rating Settlement (Locality) | <p>Very High: 0 (0)</p> <p>High: 12 (35)</p> <p>Moderate: 60 (180)</p> <p>Low: 0 (0)</p> |

5I. Sensitivity Analysis (Maps)





6l. System Selection

Based on soil types and indicative depths, the Kewarren locality has the potential to sustainably accommodate a broad range of system types, depending on the influences of climate. The System Sizing Tables (below) indicate which systems are likely to be the most appropriate for the locality.

7l. System Sizing Tables

The Sizing Tables for each system type were created using monthly 70th percentile water balances, using methods described in the MAV Model LCA, 2014. Monthly 70th percentile rainfall and average evapotranspiration data for Kewarren was sourced from SILO (Scientific Information for Land Owners) climate databases, which are managed by the Queensland Government. The SILO databases use accurate meteorological data collected throughout Australia over long time periods.

The Design Loading Rates (DLRs) and Design Irrigation Rates (DIRs) were taken from the current EPA Code of Practice. Where the Code of Practice has precluded use of a particular type of system on a certain soil type, it is shown as 'Not Applicable' for that soil type in the Sizing Tables. Where the evapotranspiration deficit requires unrealistically large land application areas for a particular system on a certain soil type, it is also shown as 'Not Applicable' for that soil type in the Sizing Tables. Detailed, site-specific LCAs and system designs would be required to further investigate the feasibility of systems deemed 'Not Applicable' in the sizing tables. Mitigation measures (such as importation of topsoil to appropriate depths in the land application area), may be required to sustainably achieve land application of effluent on constrained parcels.

The Sizing Tables for the Kewarren locality are provided below.

8l. General Conclusion

The parcels within the locality have predominantly been assigned a Moderate Sensitivity Rating to sustainable DWM; however, some parcels, particularly in the settlement, have been assigned a High and Low Sensitivity Rating. Predominantly, Standard LCAs will be required, with the use of System Sizing Tables deemed appropriate. The Low Sensitivity Rating parcels within a DWSC are required to complete a Standard LCA as per the current EPA Code of Practice's requirements. Particular attention needs to be directed towards ensuring that appropriate setbacks to surface waterways, groundwater bores and flood prone areas are maintained. It is imperative that there is sufficient useable area to sustainably manage wastewater on-site.

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Gellibrand & Kawarren

| 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 | Total min. irrigation area required for zero wet weather effluent storage (m ²)† | | | | | | |
| 5 + bedroom residence | 1,080 | 379 | 584 | 800 | 1,269 | 2,329 | |
| 4 bedroom residence | 900 | 316 | 487 | 667 | 1,058 | 1,941 | |
| 1-3 bedroom residence | 720 | 253 | 389 | 533 | 846 | 1,553 | |

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 or 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) |
| | DLR (mm)
Daily (L/day) | | | | | | |
| Development Type | Not supported (Alternative Land Application System Required) | | | | | | |
| 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) |
| | DLR (mm)
Daily (L/day) | 20* | 20* | 15 | 10 | 12 | 8 |
| Development Type | Total min. basal or 'wetted area' required for zero wet weather storage (m ²) not including spacing & setbacks | | | | | | |
| 5 + bedroom residence | 1,080 | 62 | 87 | 145 | 114 | 197 | 433 |
| 4 bedroom residence | 900 | 52 | 73 | 121 | 95 | 164 | 361 |
| 1-3 bedroom residence | 720 | 42 | 58 | 97 | 76 | 132 | 289 |

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)
Daily (L/day) | 4 | 3.5 | | | | |
| Development Type | Total min. basal or 'wetted area'† | | | | | | |
| 5 + bedroom residence | 1,080 | 723 | 1,086 | N/A | N/A | N/A | |
| 4 bedroom residence | 900 | 603 | 905 | (Alternative Land Application System Required) | (Alternative Land Application System Required) | (Alternative Land Application System Required) | |
| 1-3 bedroom residence | 720 | 482 | 724 | | | | |

† required for zero wet weather storage (m²) not including spacing & setbacks

| Wick Trenches and Beds - Secondary Treated Effluent Only | | | | | | | |
|--|--|-----------------|---------------------|------------------------|-------------------------|---------------------------|-----------------------|
| Soil Category | Gravels & Sands (1) | Sandy Loams (2) | Weak Clay Loams (4) | Massive Clay Loams (4) | Strong Light Clays (5a) | Moderate Light Clays (5b) | Weak Light Clays (5c) |
| | DLR (mm)
Daily (L/day) | 25 | 30 | 20 | 10 | 12 | 8 |
| Development Type | Total min. basal or 'wetted area' required for zero wet weather storage (m ²) not including spacing & setbacks | | | | | | |
| 5 + bedroom residence | 1,080 | 49 | 40 | 62 | 145 | 114 | 197 |
| 4 bedroom residence | 900 | 41 | 33 | 52 | 121 | 95 | 164 |
| 1-3 bedroom residence | 720 | 33 | 27 | 42 | 97 | 76 | 132 |

N/A
(Alternative Land Application System Required)

M. Kennett River Locality Report

1m. Introduction

Kennett River is a coastal locality along the south-eastern coastline of COS, approximately 20km northeast of Apollo Bay, in the heavily vegetated foothills of the south-eastern section of the Otway Ranges. The locality is not located within a DWSC.

There is a permanent population of approximately 236 people (not taking into account the high seasonal population fluctuation). There are 186 and 180 unsewered parcels within the Kennett River locality and town, respectively, and 111 DWM system permits that have been inspected to date by COS. The current DWM permits and their associated treatment system and LAA method within the Kennett River locality is summarised as follows:

- 31 AWTs (13 drip irrigation, 3 irrigation, 4 subsurface irrigation, 2 trenches and 9 unknown);
- 52 sand filters (50 subsurface irrigation, 1 trench and 1 unknown)
- 9 septic tanks (2 trenches and 7 unknown)
- 19 unknown (5 trenches, 1 subsurface irrigation and 13 unknown).

No field investigations were conducted in Kennett River as part of the 2014 field assessments.

2m. Background Documentation

Refer to the following documents for additional detail regarding the locality.

- Colac Otway Shire Coastal Community Revitalisation Project (April 2003);
- Colac Otway Shire, Three Towns Stormwater Management Strategy, Concept Study (October 2004);
- Concept Design for Wye River Separation Creek and Kennett River, (June 2006);
- Kennett River, Wye River and Separation Creek Structure Plans (February 2008);
- COS Planning Scheme; and
- Rural Living Strategy (2011).

3m. Summary of Constraints to DWM

| Characteristic | Description |
|--------------------------------|--|
| Climate Zone | Zone 2. |
| Surface waterways & catchments | The locality is not located within a DWSC. Kennett River and its tributaries form the major waterway within this region and confluences with the Southern Ocean. Kennett River east and west branches are located in the top of the catchment before merging. Additional waterways within the Kennett River locality include, Grey River and Carisbrook Creek which flows along the western locality boundary. |
| Groundwater | Proximity to groundwater bores: none. |

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| Characteristic | Description |
|--|---|
| Land subject to inundation | Along the confluences of Kennett River around the town. |
| Useable lot area
Town (Locality) | High: 173 (175)
Moderate: 6 (8)
Low: 1 (2)
Compliant: 0 (1) |
| Minimum lot size compliance with Planning Scheme Zoning | The locality is predominantly zoned Public Conservation and Resource Zone, with small sections of Rural Conservation Zone. The town is zoned Township Zone, with Public Use Zone along the foreshore.

The majority of the parcels are compliant. There are prescribed minimum lot sizes for subdivisions, as per Design and Development Overlay Schedule 4 (DDO4 – Coastal Towns: Skenes Creek, Kennett River, Wye River and Separation Creek).

Compliant: 180 (183)
Non-compliant: 0 (3) |
| Slope
Town (Locality) | High: 159 (163)
Moderate: 15 (15)
Low: 6 (8) |
| Geology | Eumeralla Formation of the Otway Group with alluvial floodplain deposits around the Kennett River confluence. |
| Soil suitability
Town (Locality) | High: 0 (0)
Moderate: 180 (186)
Low: 0 (0)

Along the coastline and town consists of soil landscape '64' (moderate rating) which forms in the similar landscape as detailed in '61'. It consists of brown texture contrast soils to 0.9m depth. The soils consist of weakly structured clay sand over strongly structured clay loam. The northern half of the locality consists of soil landscapes '61 and 59', which are located within the forested regions of the Great Otway National Park. |
| Sensitivity Overlay | No depth to groundwater data.

Landslip: minimal, found along the foreshore and a small section along the eastern boundary to the north of the town.

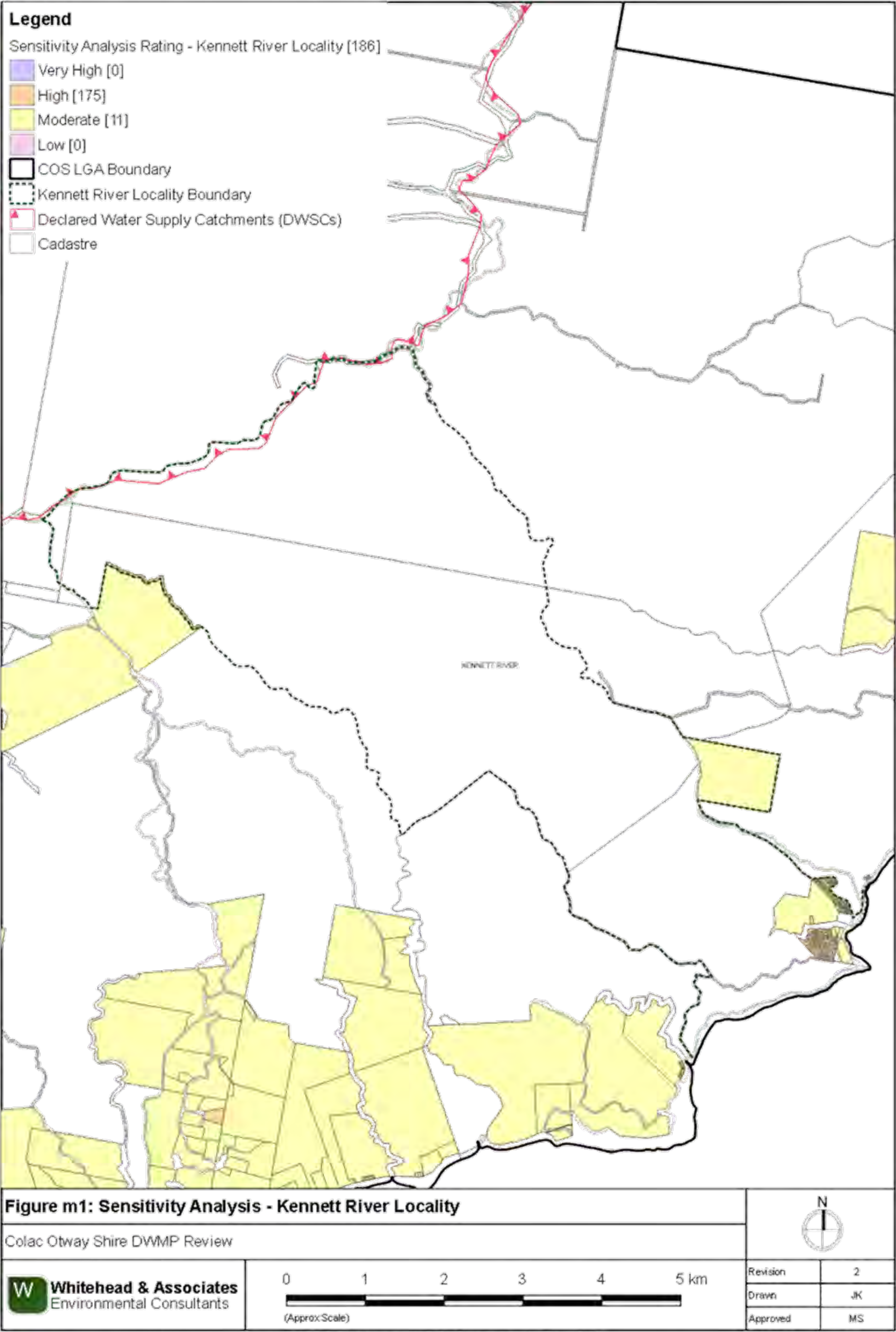
Vegetation: all land surrounding the town is defined as Great Otway National Park and Kennett River Coastal Reserve. |

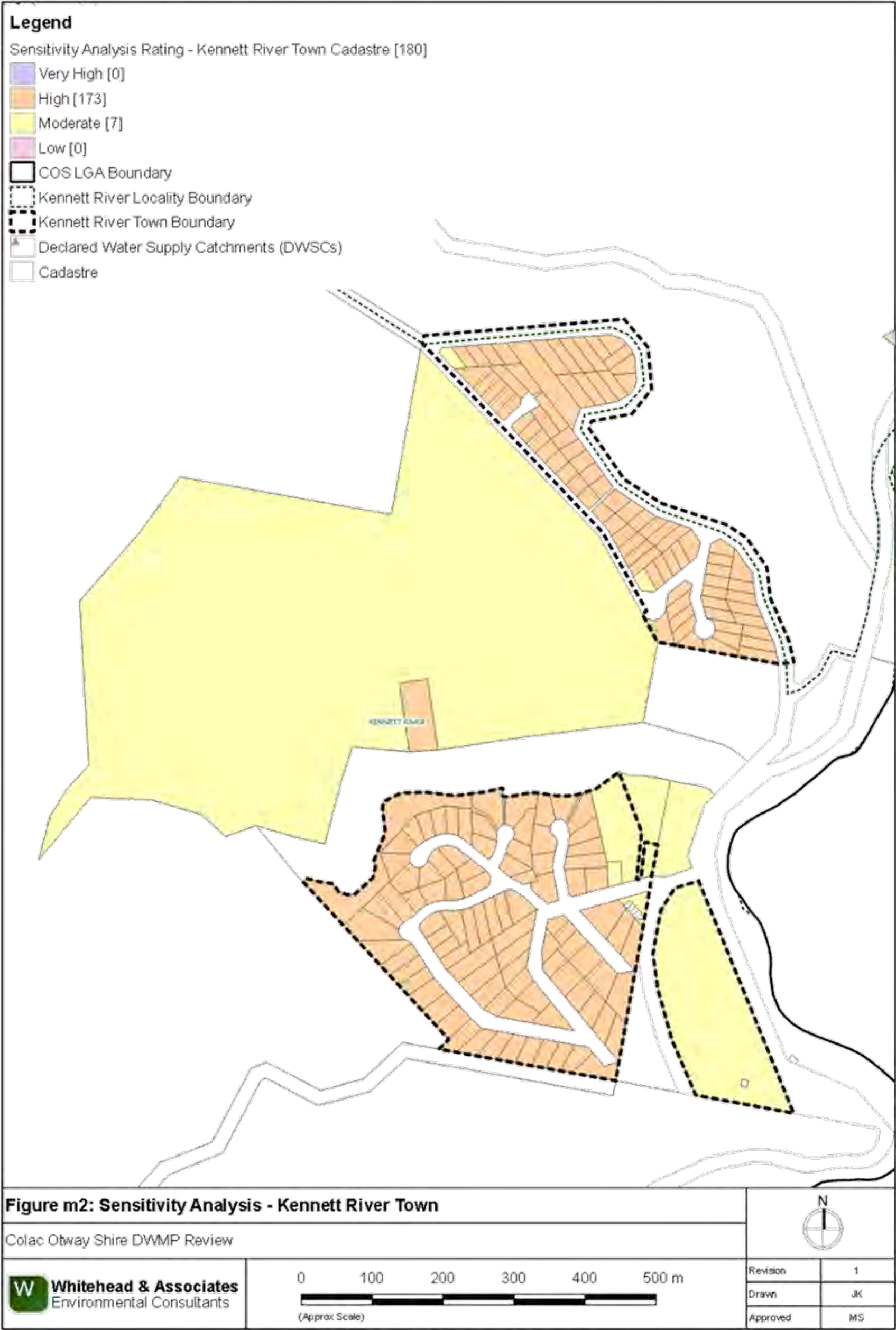
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| Characteristic | Description |
|--|---|
| Sensitivity
Analysis Rating
Town (Locality) | Very High: 0 (0)
High: 173 (175)
Moderate: 7 (11)
Low: 0 (0) |

4m. Sensitivity Analysis (Maps)





5m. System Selection

Soil types vary significantly in the Kennett River area depending on position in the landscape (i.e. sand deltas or hill slopes). Appendix A of the EPA Code of Practice (2013) prohibits conventional and modified trenches and beds as well as LPED systems on Category 1 soils (sands), which preclude these systems on the delta areas. Landslip risks and land gradients are major constraints for DWM on parcels located on the hillslopes in the locality. As such, site-specific LCA investigations and system designs are recommended; however the sizing tables (below) provide some guidance on which systems may be appropriate. Note that the DIR for subsurface irrigation systems has not been reduced to account for slopes above 10% (as is recommended in AS/NZS 1547:2012). Surface irrigation is not recommended on slopes greater than 10%.

6m. System Sizing Tables

The Sizing Tables for each system type were created using monthly 70th percentile water balances, using methods described in the MAV Model LCA, 2014. Monthly 70th percentile rainfall and average evapotranspiration data for the Kennett River and Sugarloaf area was sourced from SILO (Scientific Information for Land Owners) climate databases, which are managed by the Queensland Government. The SILO databases use accurate meteorological data collected throughout Australia over long time periods.

The Design Loading Rates (DLRs) and Design Irrigation Rates (DIRs) were taken from the current EPA Code of Practice. Where the Code of Practice has precluded use of a particular type of system on a certain soil type, it is shown as 'Not Applicable' for that soil type in the Sizing Tables. Where the evapotranspiration deficit requires unrealistically large land application areas for a particular system on a certain soil type, it is also shown as 'Not Applicable' for that soil type in the Sizing Tables. Detailed, site-specific LCAs and system designs would be required to further investigate the feasibility of systems deemed 'Not Applicable' in the sizing tables. Mitigation measures (such as importation of topsoil to appropriate depths in the land application area), may be required to sustainably achieve land application of effluent on constrained parcels.

The Sizing Tables for the Kennett River locality are provided below.

7m. General Conclusion

The parcels within the locality have been assigned a Moderate or High Sensitivity Rating to sustainable DWM, with the majority of the town assigned as High. Both Standard and Detailed LCAs will be required, with the use of System Sizing Tables deemed appropriate for the Standard LCAs. Particular attention needs to be directed towards ensuring that the DWM systems are sized based on the limiting soil horizon, which may be relatively shallow, and that the systems selected are appropriate for steeper slopes with correct construction. The majority of parcels within the region also have less than 1,500m² of useable area for DWM, which also does not exclude heavily vegetated areas. This will limit design options and it is imperative that the LCA DWM system design ensure that DWM is contained on-site.

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| | | | | | | | | | | |
|---|---|-----------------|---------------------|--|--|--|---|---|--|--|
| Kennett River (& Sugarloaf) | | | | | | | | | | |
| 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 | N/A | | | | |
| Development Type | Total min. irrigation area required for zero wet weather effluent storage (m ²)* | | | | | N/A | | | | |
| 5 + bedroom residence | 1,080 | 338 | 491 | 626 | 900 | (Alternative Land Application System Required) | | | | |
| 4 bedroom residence | 900 | 282 | 410 | 530 | 750 | | | | | |
| 1-3 bedroom residence | 720 | 225 | 328 | 424 | 600 | | | | | |
| 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 or 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) | 20* | 20* | 15 | 10 | 6 | 5 | 4 | | | |
| Development Type | Total min. basal or 'wetted area' required for zero wet weather storage (m ²) not including spacing or setbacks | | | | | | | | | |
| 5 + bedroom residence | 1,080 | 61 | 85 | 138 | 281 | 379 | 584 | | | N/A |
| 4 bedroom residence | 900 | 51 | 71 | 115 | 234 | 316 | 487 | | | (Alternative Land Application System Required) |
| 1-3 bedroom residence | 720 | 41 | 57 | 92 | 187 | 253 | 389 | | | |
| Note: * Gravels, Sands and sandy loams are unsuitable for conventional absorption trenches and beds if there is a high water table, including seasonal and perched water tables. Value based on average of conservative rate and maximum rate for Category 2b and 3a soils in AS1547:2012 | | | | | | | | | | |
| 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 | Total min. basal or 'wetted area' required for zero wet weather storage (m ²) not including spacing & setbacks | | | | | | | | | |
| 5 + bedroom residence | 1,080 | 61 | 85 | 138 | 110 | 185 | 379 | | | |
| 4 bedroom residence | 900 | 51 | 71 | 115 | 92 | 154 | 316 | | | |
| 1-3 bedroom residence | 720 | 41 | 57 | 92 | 74 | 124 | 253 | | | |
| Note: * Gravels, Sands and sandy loams are unsuitable for conventional absorption trenches and beds if there is a high water table, including seasonal and perched water tables. 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 - Slopes only | | | | | | | | | | |
| 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 | 3 | N/A | N/A | | | | |
| Development Type | Total min. basal or 'wetted area'† | | | | | | | | | |
| 5 + bedroom residence | 1,080 | 584 | 800 | 1,269 | (Alternative Land Application System Required) | (Alternative Land Application System Required) | | | | |
| 4 bedroom residence | 900 | 487 | 668 | 1,057 | | | | | | |
| 1-3 bedroom residence | 720 | 389 | 533 | 846 | | | | | | |
| † required for zero wet weather storage (m ²) not including spacing & setbacks | | | | | | | | | | |
| Wick Trenches and Beds - Secondary Treated Effluent Only | | | | | | | | | | |
| Soil Category | Gravels & Sands (1) | Sandy Loams (2) | 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 | 8 | 5 | | |
| Development Type | Total min. basal or 'wetted area' required for zero wet weather storage (m ²) not including spacing & setbacks | | | | | | | | | |
| 5 + bedroom residence | 1,080 | 39 | 61 | 138 | 110 | 185 | | | | 379 |
| 4 bedroom residence | 900 | 40 | 51 | 115 | 92 | 154 | | | | 316 |
| 1-3 bedroom residence | 720 | 32 | 41 | 92 | 74 | 124 | | | | 253 |

N. Lavers Hill Locality Report

1n. Introduction

Lavers Hill is located approximately 41km southwest of Colac within the southern section of COS. The locality centres on a narrow ridgeline on the Great Ocean Road. The landform consists of undulating, dissected crests and rolling hills of the Otway Ranges. Notably, the locality on the northern side of the ridgeline is located within the Gellibrand River (South Otway) DWSC as indicated by the surface water informative map A1, Appendix A.

The locality has a population of approximately 208 residents. There are approximately 204 and 84 unsewered parcels located within the Lavers Hill locality and town, with 42 DWM system permits that have been inspected to date by COS. The current DWM permits and their associated treatment system and LAA method within the Lavers Hill locality are summarised as follows:

- 12 AWTs (4 drip irrigation, 3 trenches, 1 subsurface irrigation and 4 unknown);
- 12 septic tanks (5 trenches, 1 subsurface irrigation and 6 unknown); and
- 18 unknown (11 trenches, 1 irrigation, 1 subsurface irrigation and 5 unknown).

2n. Background Documentation

Refer to the following documents for additional detail regarding the locality:

- Amended Urban Design Framework Plan for Lavers Hill (June, 2006);
- COS Planning Scheme; and
- Rural Living Strategy (2011).

3n. Site Assessment Results

The following table summarises the results from the representative audits conducted by Consultant staff in September 2014.

| Characteristic | Description |
|----------------------------------|--|
| Land use | Comprises a range of land uses, including dairy, forestry, rural living and tourism. |
| Occupancy rates | 2.3 (Part of the Beech Forest State Suburb, ABS Census, 2011). |
| Typical soils | Gradational profile with very dark grey brown silty clay loam topsoil becoming mottled with dark grey brown and dark yellow brown between 40-60 cm, then more strongly mottled dark yellow brown, yellow brown and grey brown silty clay to 80+ cm Drainage and permeability are variable depending on slope and position. |
| AS/NZS 1547:2012 soil categories | 4 (Clay Loams) and 5 (Light Clays). |
| Existing Systems | Separate Blackwater and Greywater |

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| Characteristic | Description |
|----------------|--|
| | <p>Of the six systems inspected during field investigations, two or three systems (33-50%) comprised separate blackwater treatment in a septic tank, with direct greywater diversion to an adjacent paddock or within the property boundary.</p> <p>The blackwater septic tanks were typically 30+ years old (or not found) and the time since last pump-out was generally unknown (partly due to owner not being home to ascertain). Septic effluent discharged to one or more conventional absorption trenches (or was assumed to if trenches could not be identified). The trench dimensions were generally unclear, and it is likely that most trenches were undersized for the number of bedrooms. One property had poorly-treated blackwater effluent being discharged to the ground surface from a broken pipe. LAA slopes ranged from 2-10%.</p> <p>Combined Blackwater and Greywater</p> <p>Three or four systems (50-67%) inspected have a combined wastewater treatment system, or were assumed to have based on layout of pipework and age of dwelling. This included one combined AWTs (less than 2 years old) for a commercial property, and a retrofitted AWTs using one of three existing septic tanks on another commercial property.</p> <p>Septic tank effluent discharged to a series of conventional absorption trenches in LAAs generally of less than 4% slope. Most trenches could be identified and all were undersized for the number of bedrooms and/or the type of property.</p> <p>The standalone AWTs discharged effluent to subsurface irrigation which appeared to be undersized based on the likely patronage over the peak tourism season, and had boggy sections.</p> <p>The retrofitted AWTs discharged effluent to an undersized trench LAA.</p> |

4n. Summary of Constraints to DWM

| Characteristic | Description |
|--------------------------------|---|
| Climate Zone | Zones 3 and 4. |
| Surface waterways & catchments | Lavers Hill is similar to Beech Forest, whereby the northern half of the locality is within a DWSC, Gellibrand River. The DWSC boundary runs along the ridgeline which forms the main road which divides the town. The waterways include: Chapple Creek South and North Branch, Skinner Creek, Sandy Creek, Melba Gully and Ford River West Branch. |
| Groundwater | Proximity to groundwater bores: Nil. |
| Land subject to | Nil |

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| Characteristic | Description |
|--|--|
| inundation | |
| Useable lot area
Town (Locality) | High: 52 (65)
Moderate: 20 (26)
Low: 12 (97)
Compliant: 0 (16) |
| Minimum lot size
compliance with
Planning Scheme
Zoning | The locality is predominantly zoned Farming Zone and Public Conservation and Resource Zone. The town is zoned Township Zone.

Compliance is variable throughout the locality, with the majority of the parcels on the southern side of the main road outside of the DWSC non-compliant.

Compliant: 83 (113)
Non-compliant: 1 (91) |
| Slope
Town (Locality) | High: 26 (103)
Moderate: 23 (56)
Low: 35 (45) |
| Geology | Predominately Eumeralla Formation of the Otway Group, with Wiridjil Gravel Member of the Pebble Point Formation to the northwest. |
| Soil suitability
Town (Locality) | High: 84 (189)
Moderate: 0 (15)
Low: 0 (0)

The ridgeline and town consists of soil landscape unit '60' which form on rolling hills along the top of the Otway Ranges. The soil consists of brown friable gradational soils with weakly structured clay loam over light clay to 0.9m depth. Limitations include restricted drainage.

Flanking either side of '60' is soil landscape unit '61' which forms on the deeply dissected hills of the Otway Ranges and consists of brown gradational soils to 1.2m depth. The soils consist of moderately structured silty loam over clay loam. Limitations include acidity and restricted drainage. |
| Sensitivity
Overlay | No depth to groundwater data.

Landslip: minimal.

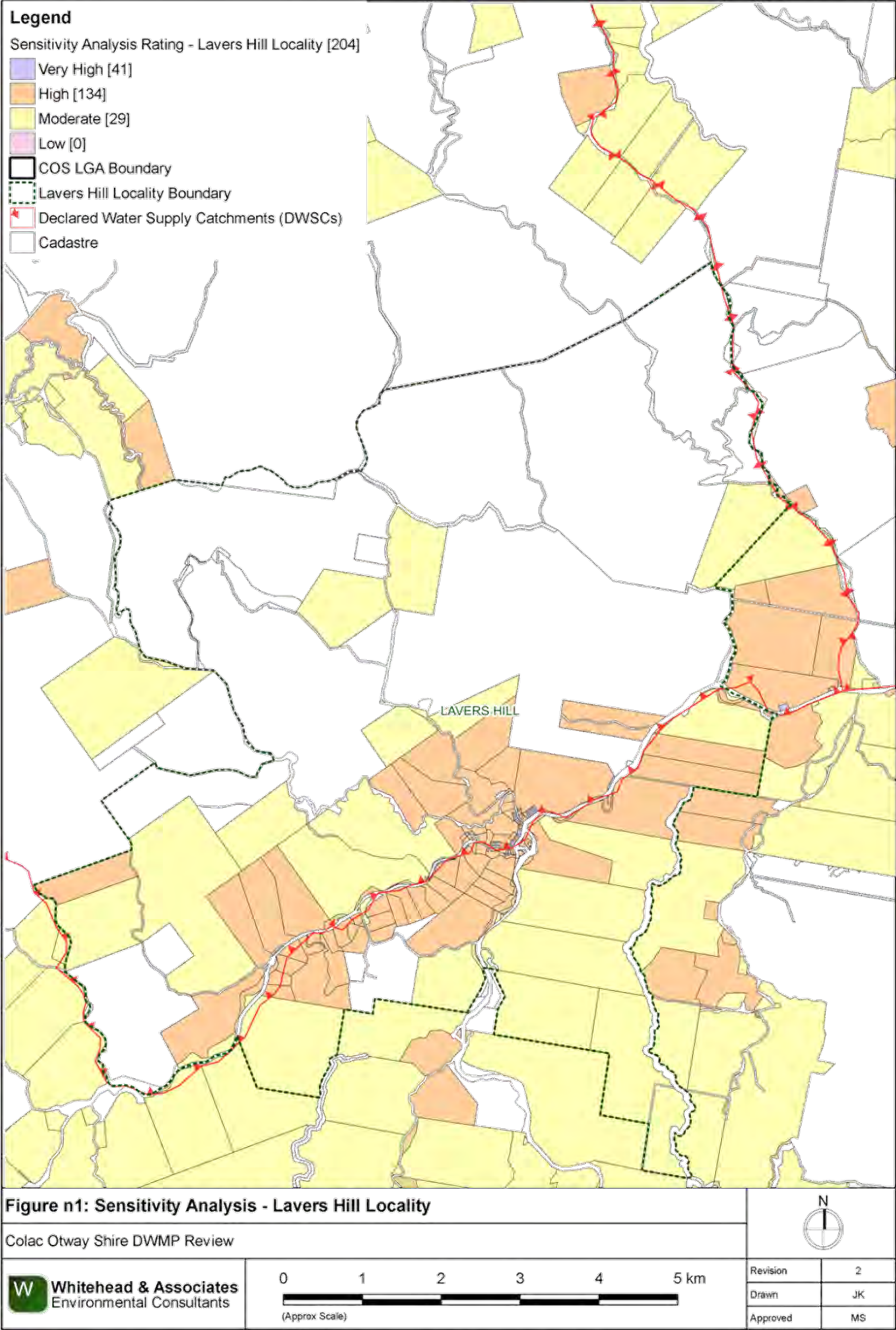
Vegetation: extensive regions of Great Otway National Park and Otway Forest Park primarily to the north of the town. |
| Sensitivity | Very High: 29 (41) |

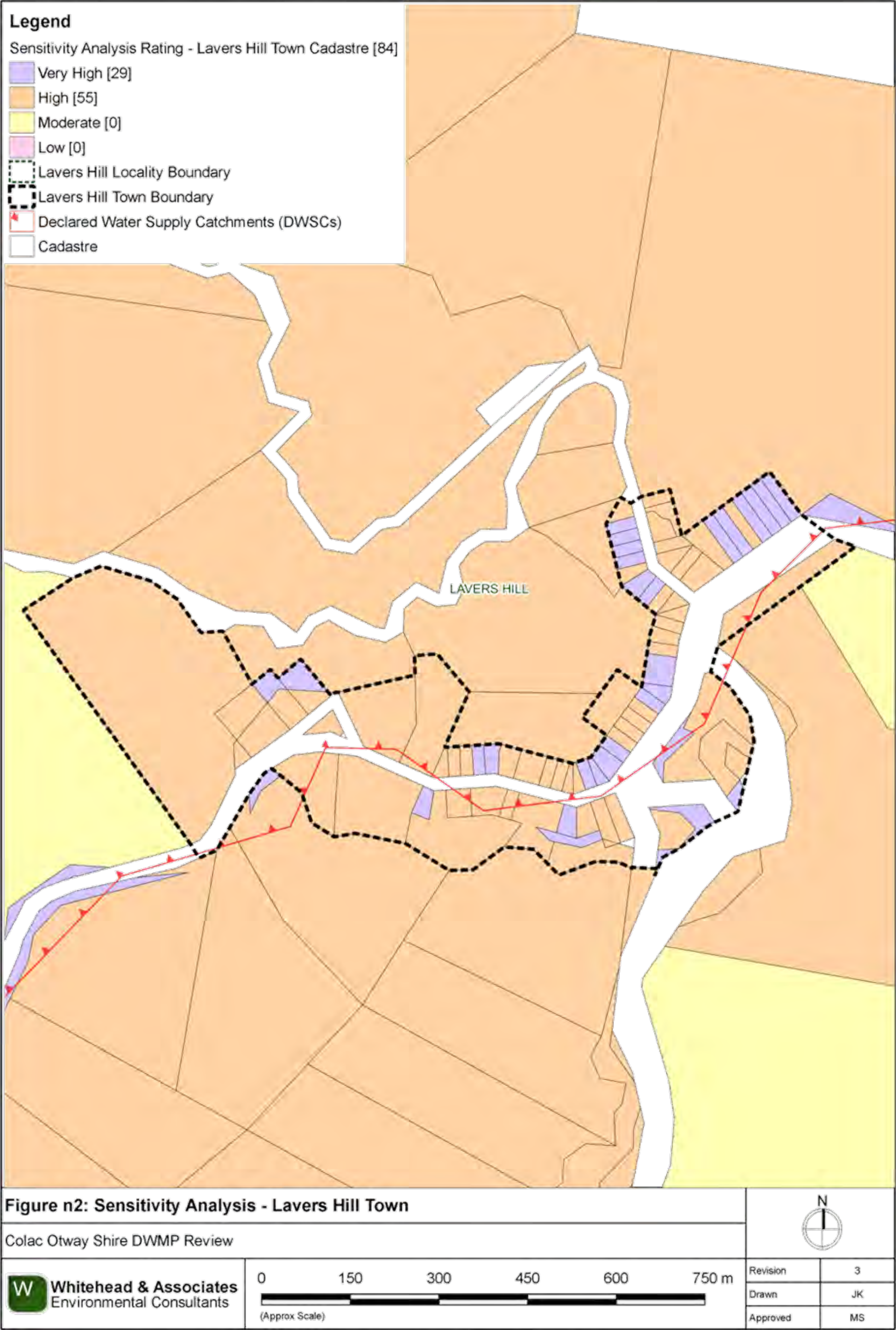
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| Characteristic | Description |
|-----------------|--------------------------------|
| Analysis Rating | High: 55 (134) |
| Town (Locality) | Moderate: 0 (29)
Low: 0 (0) |

5n. Sensitivity Analysis (Maps)





6n. System Selection

Due to the dominance of heavy-textured soils in the Lavers Hill locality, conventional absorption trenches and beds are not likely to be feasible and are discouraged. Appendix A of the EPA Code of Practice (2013) prohibits LPED systems on Category 5 and 6 soils (medium to heavy clays).

The wet climate of the Lavers Hill area makes it a high risk for DWM and site-specific, detailed land capability assessment and design will be required for unsewered parcels in this area. Mitigation measures (such as importation of topsoil to appropriate depths in the land application area), may be required to sustainably achieve land application of effluent on constrained parcels. The Sizing Tables (discussed below) are not applicable for the Lavers Hill locality.

7n. System Sizing Tables

The Sizing Tables for each system type were created using monthly 70th percentile water balances, using methods described in the MAV Model LCA, 2014. 70th percentile monthly rainfall exceeds average monthly evapotranspiration in nine months of the year in and around Lavers Hill. As a result, there is a month-to-month surplus of hydraulic inputs and subsequently the monthly water balance does not resolve itself and cannot produce meaningful results for land application area sizing. The wet climate of the Lavers Hill area makes it a high risk for DWM and site-specific, detailed design will be required for unsewered parcels in this area. Mitigation measures (such as importation of topsoil to appropriate depths in the land application area) may be required to sustainably achieve land application of effluent on constrained parcels.

8n. General Conclusion

The majority of the parcels within the locality have been assigned a High Sensitivity Rating to sustainable DWM. Predominantly, Detailed LCAs will be required, with all levels of LCA required to complete a site-specific design due to the higher rainfall associated with this region. System Sizing Tables were not generated for Lavers Hill and site-specific design is required for all parcels that are located within Climate Zone 4, as per Figure 3 of the DWMP Technical Document, and System Sizing Tables cannot be used. Particular attention needs to be directed towards ensuring that the DWM systems are sized based on the limiting soil horizon and that the systems selected are appropriate for steeper slopes with correct construction.

O. Wye River and Separation Creek Locality Report

1o. Introduction

Wye River and Separation Creek are two separate adjacent localities, with respective towns, that are located along the south-eastern coastline of COS approximately 23km northeast of Apollo Bay. They are located in the heavily vegetated foothills of the south-eastern section of the Otway Ranges. The localities are not located within a DWSC.

Previous studies have found that it is not technically feasible to sewer the towns, particularly due to the heavily vegetated steep slopes and landslip potential of the region. Extensive assessment, outlined in the background documentation listed below, has been conducted within this region about the perceived environmental and public health risks in both the Wye River and Separation Creek estuaries associated with DWM systems.

The localities have a population of approximately 144 residents, which does not reflect the high seasonal population fluctuation. There are approximately 393 and 377 unsewered parcels located within the Wye River locality and town, respectively, and 136 and 121 in the Separation Creek locality and town, respectively. There are 147 and 85 DWM system permits that have been inspected to date by COS for Wye River and Separation Creek respectively. The current DWM permits and their associated treatment system and LAA method within the Wye River and Separation Creek localities are summarised as follows:

Wye River:

- 81 AWTs (24 drip irrigation, 2 trenches, 11 irrigation, 16 subsurface irrigation and 28 unknown);
- 1 composting toilet (1 unknown);
- 31 septic tanks (5 trenches and 26 unknown);
- 5 worm farms (3 trenches and 3 irrigation); and
- 25 unknown (5 drip irrigation, 1 trench, 1 irrigation and 18 unknown).

Separation Creek:

- 34 AWTs (8 drip irrigation, 5 trenches, 4 irrigation, 7 subsurface irrigation, 10 unknown);
- 21 sand filters (21 subsurface irrigation);
- 15 septic tanks (1 subsurface irrigation, 1 trench and 13 unknown); and
- 15 unknown (2 trenches, 2 subsurface irrigation and 11 unknown).

There have been two official complaints relating to DWM systems directed to COS over the past year (2015); failed land application area with improvement directed by COS, and a system failing (odour) and unsuitably sized for intermittent holiday loading.

No field investigations were conducted in the Wye River and Separation Creek localities.

2o. Background Documentation

Refer to the following documents for additional detail regarding the localities.

- Wye River and Separation Creek Site Survey Property Reports (November 2013);

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- Wye River and Separation Creek Quantitative Microbial Risk Assessment and Ecological Risk Assessment (September 2014);
- Issues Paper Wastewater Management Wye River and Separation Creek (May 2002);
- Wye River Drainage Reserve Land Management Plan: Assessment and Recommendations (February 2012);
- Colac Otway Shire Coastal Community Revitalisation Project (April 2003);
- Colac Otway Shire, Three Towns Stormwater Management Strategy, Concept Study (October 2004);
- Concept Design for Wye River Separation Creek and Kennett River, (June 2006);
- Kennett River, Wye River and Separation Creek Structure Plans (February 2008);
- GIS Atlas - Climate Paper (June, 2000);
- COS Planning Scheme; and
- Rural Living Strategy (2011).

3o. Summary of Constraints to DWM

| Characteristic | Description |
|---|--|
| Climate Zone | Zone 2. |
| Surface waterways & catchments | The localities are not located within a DWSC. Both Separation Creek and Wye River form the major waterways within this region and confluence with the Southern Ocean. Additional waterways within Separation Creek include Jamieson Creek and Cumberland River. Additional waterways within Wye River include Monash Gully and Hitchcock Gully. |
| Groundwater | Proximity to groundwater bores: insignificant (only one). |
| Land subject to inundation | Along the confluences of Wye River and Separation Creek within the towns. |
| Useable lot area
Town (Locality) | High: WR 330 (334) SC 119 (122)
Moderate: WR 45 (45) SC 1 (4)
Low: WR 2 (11) SC 1 (10)
Compliant: WR 0 (3) SC 0 (0) |
| Minimum lot size compliance with Planning Scheme Zoning | The localities are predominantly zoned Rural Conservation Zone and Public Conservation and Resource Zone. The towns are predominantly zoned Township Zone.

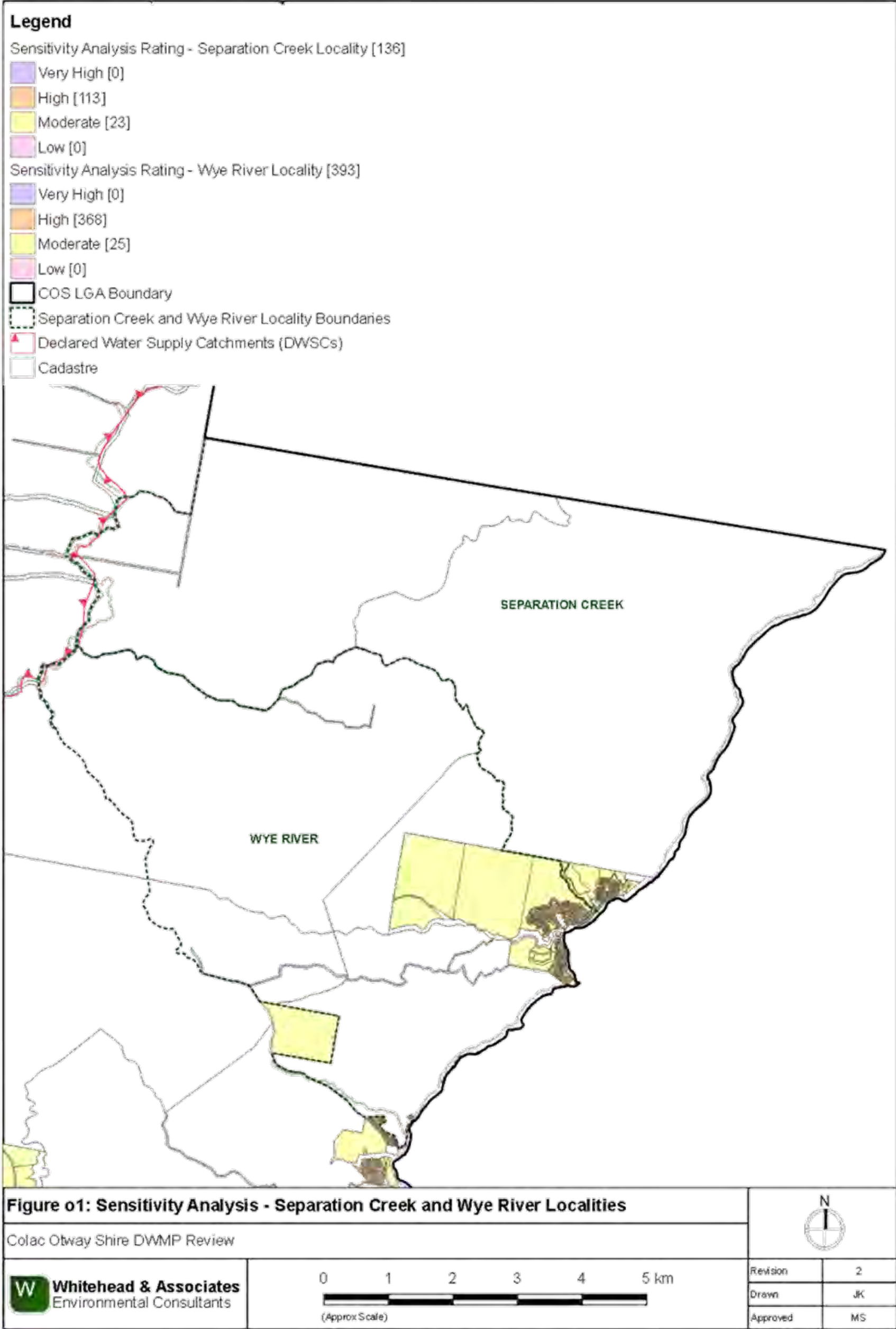
The majority of parcels are compliant, with only the larger parcels adjacent to the towns non-compliant. These are prescribed minimum lot sizes for subdivisions within the Township Zone, under the provisions of Design and Development Overlay Schedule 4 (DDO4 – Coastal |

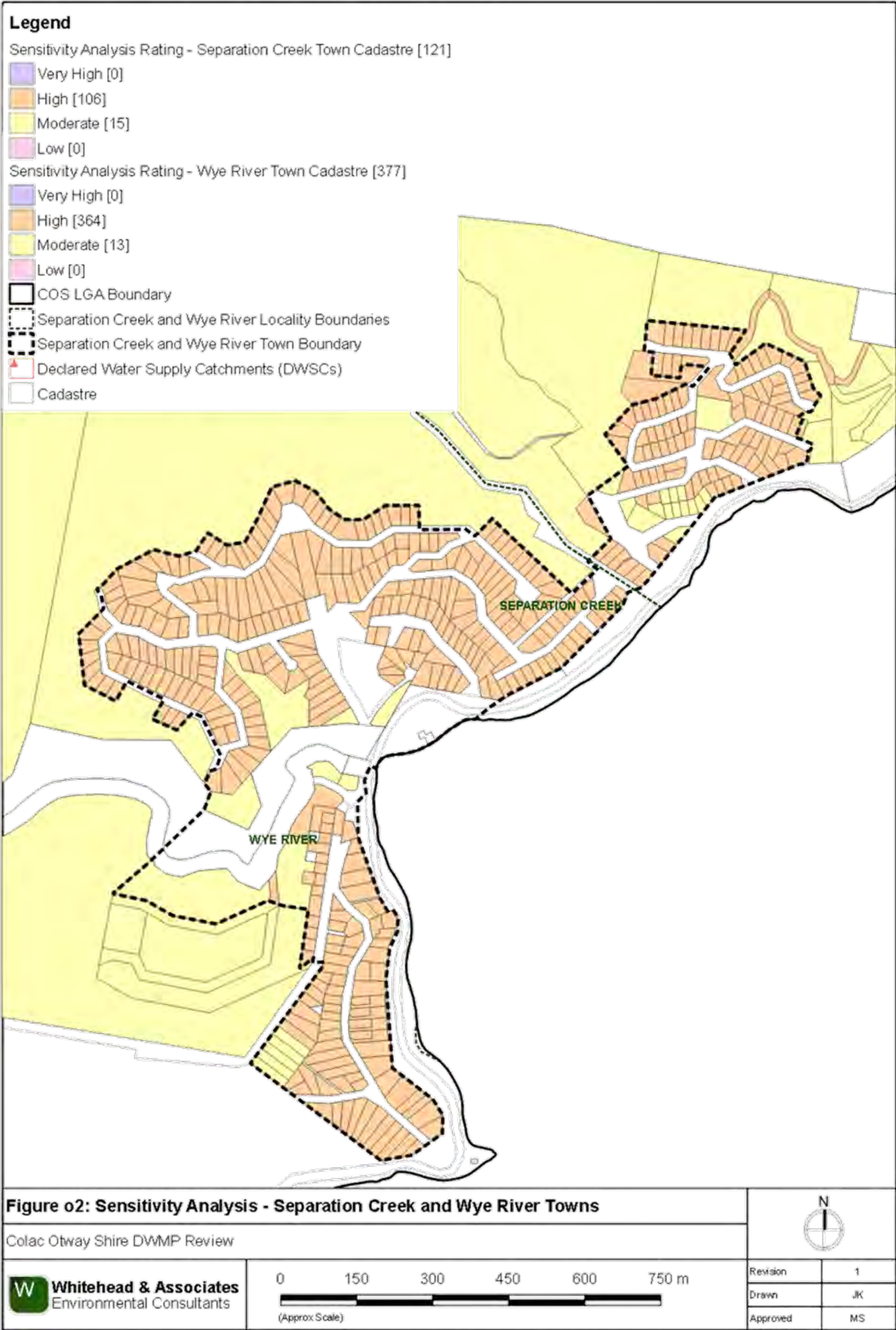
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| Characteristic | Description |
|--|---|
| | <p>Towns: Skenes Creek, Kennett River, Wye River and Separation Creek).</p> <p>Compliant: WR 367 (370) SC 119 (199)</p> <p>Non-compliant: WR 10 (23) SC 2 (17)</p> |
| Slope
Town (Locality) | <p>High: WR 363 (379) SC 102 (117)</p> <p>Moderate: WR 7 (7) SC 5 (5)</p> <p>Low: WR 7 (7) SC 14 (14)</p> |
| Geology | Eumeralla Formation of the Otway Group with alluvial flood plain deposits. |
| Soil suitability
Town (Locality) | <p>High: WR 0 (0) SC 0 (0)</p> <p>Moderate: WR 393 (377) SC 121 (136)</p> <p>Low: WR 0 (0) SC 0 (0)</p> <p>Along the coastline and the towns consists of soil landscape unit '64' (moderate rating) which forms in the similar landscape as detailed in '61'. It consists of brown texture contrast soils to 0.9m depth. The soils consist of weakly structured clay sand over strongly structured clay loam.</p> |
| Sensitivity
Overlay | <p>No depth to groundwater data.</p> <p>Landslip: extensive, particularly around coastal extents around the town.</p> <p>Vegetation: all land surrounding the town is defined as Great Otway National Park and Wye River Coastal Reserve.</p> |
| Sensitivity
Analysis Rating
Town (Locality) | <p>Very High: WR 0 (0) SC 0 (0)</p> <p>High: WR 364 (368) SC 106 (113)</p> <p>Moderate: WR 13 (25) SC 15 (23)</p> <p>Low: WR 0 (0) SC 0 (0)</p> |

4o. Sensitivity Analysis (Maps)





5o. System Selection

Soil types vary significantly in the Wye River and Separation Creek localities, depending on position in the landscape (i.e. sand deltas or hill slopes). Appendix A of the EPA Code of Practice (2013) prohibits conventional and modified trenches and beds as well as LPED systems on Category 1 soils (sands), which preclude these systems on the delta areas. Landslip risks and land gradients are major constraints for DWM on parcels located on the hillslopes in these localities. As such, site-specific LCA investigations and system designs are recommended; however the sizing tables (below) provide some guidance on which systems may be appropriate. Note that the DIR for subsurface irrigation systems has not been reduced to account for slopes above 10% (as is recommended in AS/NZS 1547:2012). Surface irrigation is not recommended on slopes greater than 10%.

6o. System Sizing Tables

The Sizing Tables for each system type were created using monthly 70th percentile water balances, using methods described in the MAV Model LCA, 2014. Monthly 70th percentile rainfall and average evapotranspiration data for the Wye River and Separation Creek localities was sourced from SILO (Scientific Information for Land Owners) climate databases, which are managed by the Queensland Government. The SILO databases use accurate meteorological data collected throughout Australia over long time periods.

The Design Loading Rates (DLRs) and Design Irrigation Rates (DIRs) were taken from the current EPA Code of Practice. Where the Code of Practice has precluded use of a particular type of system on a certain soil type, it is shown as 'Not Applicable' for that soil type in the Sizing Tables. Where the evapotranspiration deficit requires unrealistically large land application areas for a particular system on a certain soil type, it is also shown as 'Not Applicable' for that soil type in the Sizing Tables. Detailed, site-specific LCAs and system designs would be required to further investigate the feasibility of systems deemed 'Not Applicable' in the sizing tables. Mitigation measures (such as importation of topsoil to appropriate depths in the land application area), may be required to sustainably achieve land application of effluent on constrained parcels.

The Sizing Tables for the Wye River and Separation Creek localities are provided below.

7o. General Conclusion

The parcels within the localities have been assigned a Moderate or High Sensitivity Rating to sustainable DWM, with the majority of the towns assigned as High. Both Standard and Detailed LCAs will be required, with the use of System Sizing Tables deemed appropriate for the Standard LCAs. Particular attention needs to be directed towards ensuring that the DWM systems are sized based on the limiting soil horizon and that the systems selected are appropriate for steeper slopes with correct construction. The majority of parcels within the region also have less than 1,500m² of useable area for DWM, which also does not exclude heavily vegetated areas. This will limit design options and it is imperative that the LCA DWM system design ensures that DWM is contained on-site. The area is also extensively considered to be prone to landslip; a geotechnical report by a suitably qualified person will need to be conducted to address this constraint.

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Wye River and Separation Creek

| Drip and Spray Irrigation Systems* - Secondary Treated Effluent only - Slopes or Sand Delta | | | | | | | | | | |
|---|---------------------|--|-----------------|-----------|-----|----------------|--|-----------------|--|---|
| 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 | | | | |
| Development Type | Daily (L/day) | Total min. irrigation area required for zero wet weather effluent storage (m ²)* | | | | | | | | N/A
(Alternative Land Application System Required) |
| 5 + bedroom residence | 1,080 | 332 | | 480 | 616 | 862 | | | | |
| 4 bedroom residence | 900 | 277 | | 400 | 514 | 718 | | | | |
| 1-3 bedroom residence | 720 | 222 | | 320 | 411 | 575 | | | | |
| 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 or setbacks | | | | | | | | | | |

| Conventional Absorption Trenches and Beds - Primary Treated Effluent - Slopes only (not Sand Delta) | | | | | | | | | | | | | | | |
|---|---------------------|---|-----------------|-----|-----------|-----|--|---|---------------------|--|-----------------|--|------------------------|--|---|
| 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) | 20* | 20* | 15 | 10 | 6 | 5 | 4 | | | | | | | |
| Development Type | Daily (L/day) | Total min. basal or 'wetted area' required for zero wet weather storage (m ²) not including spacing or setbacks | | | | | | | | | | | | | |
| 5 + bedroom residence | 1,080 | 61 | 84 | 136 | 274 | 366 | 553 | | | | | | | | N/A

(Alternative Land Application System Required) |
| 4 bedroom residence | 900 | 51 | 70 | 114 | 228 | 305 | 461 | | | | | | | | |
| 1-3 bedroom residence | 720 | 41 | 56 | 91 | 183 | 244 | 369 | | | | | | | | |
| Note: * Gravels, Sands and sandy loams are unsuitable for conventional absorption trenches and beds if there is a high water table, including seasonal and perched water tables. Value based on average of conservative rate and maximum rate for Category 2b and 3a soils in AS1547:2012 | | | | | | | | | | | | | | | |

| Evapotranspiration-Absorption Trenches and Beds - Primary Treated Effluent (Category 1 to 5) and Secondary Treated Effluent only (Category 6) - Slopes only (not sand delta) | | | | | | | | | |
|---|---------------------|--|-----------------|------------|-------------------------|--------------------------|--|---|---|
| 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 (m ²) not including spacing & setbacks | | | | | | | |
| 5 + bedroom residence | 1,080 | 61 | | 84 | 136 | 109 | 182 | | 366 |
| 4 bedroom residence | 900 | 51 | | 70 | 114 | 91 | 152 | | 305 |
| 1-3 bedroom residence | 720 | 41 | | 56 | 91 | 73 | 121 | | 244 |
| Note: * Gravels, Sands and sandy loams are unsuitable for conventional absorption trenches and beds if there is a high water table, including seasonal and perched water tables. 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 - Slopes only (not Sand Delta) | | | | | | | | | |
|--|---------------|--|------------------------------------|-----------|----------------|--|--|--|--|
| Development Type | Soil Category | Gravels & Sands
(1) | Sandy Loams (2) | Loams (3) | Clay Loams (4) | Light Clays (5) | Medium to Heavy
Clays (6) | | |
| | DIR (mm) | | 4 | 3.5 | 3 | N/A | N/A | | |
| | Daily (L/day) | N/A | Total min. basal or 'wetted area'† | | | N/A | N/A | | |
| 5 + bedroom residence | 1,080 | (Alternative Land
Application
System Required) | 553 | 743 | 1,133 | (Alternative Land
Application System
Required) | (Alternative Land
Application
System Required) | | |
| 4 bedroom residence | 900 | | 461 | 620 | 944 | | | | |
| 1-3 bedroom residence | 720 | | 369 | 496 | 755 | | | | |
| † required for zero wet weather storage (m ²) not including spacing & setbacks | | | | | | | | | |

| Wick Trenches and Beds - Secondary Treated Effluent Only - Slopes or Sand Delta | | | | | | | | | |
|---|---------------------|--|---------------------|------------------------|-------------------------|---------------------------|-----------------------|---------------------------|-----|
| 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 | 8 | 5 |
| Development Type | Daily (L/day) | Total min. basal or 'wetted area' required for zero wet weather storage (m ²) not including spacing & setbacks | | | | | | | |
| 5 + Bedroom residence | 1,080 | 48 | 39 | 61 | 136 | 109 | 182 | 182 | 366 |
| 4 bedroom residence | 900 | 40 | 33 | 51 | 114 | 91 | 152 | 152 | 305 |
| 1-3 Bedroom residence | 720 | 32 | 26 | 41 | 91 | 73 | 121 | 121 | 244 |

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Appendix C

Monthly 70th Percentile Climate Data

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| Locality | Longitude | Latitude | 75th Percentile Annual Wet Rainfall | Average Annual Wet Rainfall | Average ET _a | Residual January | ET _a January | Rainfall February | ET _a February | Rainfall March | ET _a March | Residual April | ET _a April | Rainfall May | ET _a May | Rainfall June | ET _a June | Rainfall July | ET _a July | Rainfall August | ET _a August | Rainfall September | ET _a September | Rainfall October | ET _a October | Rainfall November | ET _a November | Rainfall December | ET _a December | |
|-------------------------|-----------|----------|-------------------------------------|-----------------------------|-------------------------|------------------|-------------------------|-------------------|--------------------------|----------------|-----------------------|----------------|-----------------------|--------------|---------------------|---------------|----------------------|---------------|----------------------|-----------------|------------------------|--------------------|---------------------------|------------------|-------------------------|-------------------|--------------------------|-------------------|--------------------------|-----|
| Curry | 143.7E | 38.1S | 622 | 543 | 863 | 32 | 146 | 32 | 119 | 34 | 88 | 44 | 61 | 48 | 37 | 49 | 26 | 50 | 29 | 66 | 57 | 42 | 55 | 61 | 56 | 69 | 46 | 128 | 42 | 136 |
| Avea (E. Warron) | 143.9E | 38.2S | 641 | 508 | 826 | 32 | 143 | 31 | 118 | 35 | 87 | 48 | 59 | 53 | 38 | 67 | 24 | 68 | 28 | 66 | 40 | 61 | 59 | 61 | 61 | 67 | 47 | 106 | 40 | 130 |
| Baieac | 143.8E | 38.2S | 644 | 576 | 822 | 32 | 144 | 31 | 119 | 36 | 86 | 48 | 59 | 51 | 38 | 55 | 25 | 66 | 20 | 63 | 41 | 69 | 69 | 69 | 69 | 47 | 106 | 40 | 131 | |
| Corrondale and Conguine | 143.9E | 38.2S | 740 | 685 | 811 | 34 | 140 | 33 | 115 | 39 | 86 | 54 | 59 | 61 | 38 | 67 | 24 | 68 | 27 | 78 | 40 | 69 | 69 | 69 | 69 | 51 | 104 | 43 | 128 | |
| Porto Velea (E. Larnet) | 143.8E | 38.2S | 748 | 673 | 813 | 34 | 140 | 33 | 115 | 39 | 86 | 55 | 59 | 63 | 38 | 67 | 24 | 71 | 26 | 79 | 40 | 70 | 69 | 67 | 69 | 52 | 104 | 44 | 127 | |
| Porto Velea (E. Larnet) | 143.8E | 38.2S | 681 | 614 | 815 | 32 | 138 | 31 | 114 | 38 | 85 | 47 | 59 | 67 | 37 | 61 | 25 | 63 | 27 | 69 | 41 | 64 | 64 | 69 | 69 | 40 | 104 | 44 | 125 | |
| Barragool | 143.8E | 38.4S | 1,007 | 828 | 863 | 44 | 133 | 43 | 110 | 52 | 91 | 71 | 54 | 68 | 34 | 88 | 22 | 109 | 26 | 106 | 37 | 104 | 99 | 97 | 81 | 69 | 98 | 57 | 121 | |
| Barragool | 143.8E | 38.4S | 1,048 | 848 | 848 | 44 | 133 | 44 | 108 | 56 | 88 | 77 | 54 | 80 | 34 | 89 | 22 | 108 | 26 | 117 | 37 | 104 | 101 | 92 | 81 | 69 | 97 | 59 | 118 | |
| Barrow Downs | 143.7E | 38.3S | 980 | 828 | 862 | 42 | 133 | 43 | 108 | 53 | 89 | 72 | 58 | 84 | 34 | 101 | 23 | 102 | 28 | 115 | 38 | 99 | 99 | 98 | 89 | 69 | 89 | 54 | 122 | |
| Callind | 143.8E | 38.4S | 1,025 | 828 | 875 | 44 | 133 | 40 | 110 | 53 | 90 | 72 | 59 | 84 | 34 | 101 | 23 | 102 | 28 | 115 | 38 | 99 | 99 | 98 | 89 | 69 | 89 | 54 | 122 | |
| Kennell | 143.8E | 38.5S | 1,002 | 865 | 886 | 44 | 133 | 41 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Kennell | 143.8E | 38.5S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
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| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | 102 | 24 | 109 | 27 | 123 | 40 | 109 | 109 | 107 | 89 | 89 | 89 | 59 | 123 | |
| Carle River | 143.8E | 38.6S | 1,022 | 865 | 886 | 44 | 133 | 40 | 110 | 54 | 91 | 78 | 63 | 88 | 34 | | | | | | | | | | | | | | | |



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Colac Otway Shire Council Domestic Wastewater Management Plan Operational Plan

July 2015

| | |
|---------------|--|
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Document Control Sheet

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| Synopsis: | This Operational Plan has been developed to accompany the Technical Document (2015), which together form the Domestic Wastewater Management Plan (DWMP), to identify domestic wastewater management (DWM) issues within the Shire and recommend management actions to ensure potential risks are appropriately managed. A key component of the DWMP is a domestic wastewater management risk assessment and mapping that has been completed for the Shire. This assessment identifies prioritised districts that are in need of improved domestic wastewater management practices. The DWMP also provides technical guidance and a strategy for community education. A framework for the regulation of domestic wastewater management system performance is also provided. | | | | |
| Client Details | | | | | |
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Mark Saunders | | | Issued by:
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Disclaimer

The information contained in this report is based on independent research undertaken by Jasmin Kable, Zoe Rogers and Mark Saunders of Whitehead & Associates Environmental Consultants Pty Ltd (W&A). To our knowledge, it does not contain any false, misleading or incomplete information. Recommendations are based on an appraisal of the site conditions subject to the limited scope and resources available for this project, and follow relevant industry standards. The work performed by W&A included a limited system audit and site and soil investigation in addition to a desktop review, and the conclusions made in this report are based on the information gained and the assumptions as outlined. Under no circumstances can it be considered that these results represent the actual conditions throughout the entire Shire due to the regional scale of this study.

Copyright Note

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Document Certification

This Domestic Wastewater Management Plan has been prepared following the standards and guidelines set out in the following documents, where applicable:

- EPA Victoria (2013) Code of Practice – *Onsite Wastewater Management*;
- Department of Sustainability and Environment (2012) *Planning permit applications in open, potable water supply catchment areas*;
- EPA Victoria (2003) *State Environmental Protection Policy: Waters of Victoria*;
- EPA Victoria (2002) *State Environmental Protection Policy: Groundwaters of Victoria*;
- Municipal Association of Victoria (2014) *Victoria Land Capability Assessment Framework*, 2nd Ed; and
- AS/NZS 1547:2012 *On-site Domestic Wastewater Management* (Standards Australia / Standards New Zealand, 2012).

To our knowledge, it does not contain any false, misleading or incomplete information. Recommendations are based on an honest appraisal of the sites' opportunities and constraints, subject to the limited scope and resources available for this project.

Supporting Author

Supporting technical contribution for this document was provided by Dr. Robert Van de Graaff (Van de Graaff and Associates). Dr. Van de Graaff undertook detailed (field) soil investigation and has provided primary soil data and interpretation which has been utilised in the development of the methodology outlined in this document.

Executive Summary

Colac Otway Shire Council (COS, the 'Council' or 'Shire') has developed a Domestic Wastewater Management Plan (DWMP) to assist with the efficient and effective management of domestic wastewater within the Shire in a way which will minimise the potential risk posed by domestic effluent upon public health, the physical environment and local receiving environments. COS is committed to the monitoring and management of on-site domestic wastewater management (DWM) systems within the Shire.

Under the provisions of the State Environment Protection Policy (Waters of Victoria) (SEPP), local Councils need to develop a DWMP in conjunction with relevant Water Corporations and the community. This DWMP has been prepared to ensure COS meets the requirements of the Minister for Water's Guideline 1 - Planning Permit Applications in Open, Potable Water Supply Catchment Areas (DSE, November 2012) for DWM; to ensure existing and future development does not compromise the Declared Water Supply Catchments (DWSCs, otherwise known as drinking water catchments) and to assist in maintaining a sustainable environment

The DWMP has been prepared to recognise, respond to and link with Council policies and Plans, current legislation and regulations and the relevant direction of State Regulatory Authorities. The DWMP also addresses recent changes in Codes of Practice, Australian Standards and guidelines relating to DWM, and recent advances in technology and management practices.

The DWMP describes the current situation relating to DWM in the Shire and identifies a range of actions Council seeks to implement. The DWMP is comprised of two documents; this Operational Plan, which contains the Action Plan, and legislative controls Council will put in place for the management of domestic wastewater in the Shire; and a Technical Document, which details the derivation of methodology for the Constraint Mapping, Sensitivity Analysis and the individual Locality Reports.

A number of key issues for DWM in COS have been identified:

- There are a number of sensitive catchments (DWSCs) within the Shire and the protection of these areas is important for the supply of potable water, maintenance of public health and the environment;
- Within the DWSCs, development is currently restricted to 1 dwelling per 40 hectares; the implementation of the DWMP by Council will enable Water Corporations to appropriately relax this restriction and assess development at a higher density within these catchments, on a case by case basis;
- Failing DWM systems have the potential to pollute the environment;
- There are a number of significant constraints, e.g. challenging soils, proximity to water bodies and existing small properties/parcels, which limit the effectiveness of DWM systems in some parts of the Shire. To enable improvements to be made in areas where existing DWM systems have historically proved problematic, Council needs to develop strategies to assist DWM system owners to upgrade or replace systems where appropriate;
- Physical environments (including climate patterns) may limit the effectiveness of DWM systems within the Shire and therefore many systems may require a high level of design and management to ensure each DWM system is sustainable; and
- To ensure that DWM systems associated with new development can operate in a sustainable manner, a high level of design and management is required and Council needs to develop policies and procedures to allow development to proceed in a manner which appropriately protects public health and the environment.

The fundamental purpose of any DWMP is the identification and management of the risk from DWM systems to public and environmental health. A comprehensive 5-staged Risk Assessment

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Framework (RAF) was developed with the aim of quantitatively and qualitatively assessing the consequences of unsewered development. The stages are outlined as follows:

- Stage 1: Data Collection - background information, legislation/regulatory/planning controls, and data collection and pre-processing.
- Stage 2: Data Analysis - development of individual constraint and informative maps for parameters that significantly impact on the degree of sensitivity of any given property/parcel on sustainable DWM.
- Stage 3: Sensitivity Analysis - weighted analysis of individual constraints which determines the final consolidated sensitivity of the unsewered properties/parcels within the Shire, based on an algorithm that takes into account the inter-relationships between the individual constraints.
- Stage 4: Procedural - Review requirements for development assessment under Planning Scheme and administrative controls.
- Stage 5: Cumulative Risk Analysis - optional component that prepares a semi-quantitative assessment of risk (Cumulative Impact) in a delineated Area-of-Concern (AOC) by comparing the probability of DWM system failure with the properties/parcels ability to contain DWM on-site (Sensitivity).

Taken together, all stages of the Risk Assessment Framework have substantial value as a development assessment tool and provide defensible identification and justification for prioritisation of existing management issues within the Shire. The RAF aims to provide Council with a reasoned and justified tool to prioritise resourcing, oversight and management for DWM systems within the Shire.

The DWMP has collated a substantial amount of information on existing DWM systems and the various environmental and built constraints that substantially impact on DWM outcomes. This information is presented as a series of constraint and thematic (informative and overlay) maps developed using Geographic Information Systems (GIS) which illustrate the significance of each element (slope, soil suitability, proximity to surface water and groundwater, etc.) to DWM within both the Shire as a whole and the targeted localities and associated towns/settlements. Individual constraints have been considered in the light of current standards for DWM as outlined in the Victorian Environment Protection Authority (EPA) current Code of Practice, Australian Standards and other commonly applied industry standards. For unsewered properties/parcels, each constraint is considered on the basis of information supplied by Council or relevant State Government agencies. DWM Sensitivity is described as Low, Moderate, High or Very High depending on the degree of sensitivity the property/parcel presents to DWM.

This information will assist Council to prioritise actions including programmed inspections, education of owners and occupants, the need for and level of land capability assessment and reporting required to support proposals for new DWM systems, and will provide guidance in identifying minimum standards of DWM servicing and appropriate technologies. It will also provide Council with guidance by defining areas where centralised wastewater servicing is most required.

The DWMP presents a prioritised Action Plan for the Shire with proposed timeframes for completion of the various tasks. The Action Plan provides actions which will be implemented to improve the effectiveness of DWM within COS, to protect public and environmental health and to ensure that future development within the Shire is sustainable and protects the sensitive waterways and potable drinking water catchments. The DWMP will also provide a valuable tool for the assessment of planning applications within drinking water catchment areas, all unsewered localities and associated towns/settlements, and direction for owners on the requirements that will need to be met.

The Operational Plan is supported by a more detailed Technical Document which outlines the basis on which the constraint mapping has been developed, presents the individual constraint and thematic maps for both the Shire and individual localities and towns/settlements, and

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presents minimum DWM treatment system and land application area sizing requirements for compliant sustainable DWM systems. The Technical Document can be obtained by contacting the Health Protection Unit at COS and it is also available on COS's website.

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Acronyms

| | |
|-------|--|
| AEP | Annual Exceedance Probability |
| ARI | Annual Recurrence Interval |
| AHD | Australian Height Datum |
| AO | Authorised Officer under Environmental Protection Act Division 5 Part IXB (1970) |
| AWTS | Aerated Wastewater Treatment System |
| CMA | Catchment Management Authority |
| COS | Colac Otway Shire Council |
| DEM | Digital Elevation Model |
| DEPI | Department of Environment and Primary Industries (now known as DELWP) |
| DELWP | Department of Environment, Land, Water and Planning |
| DIR | Design Irrigation Rate |
| DLR | Design Loading Rate |
| DSE | Department of Sustainability and the Environment (former) |
| DSM | Decentralised Sewage Model |
| DWM | Domestic Wastewater Management |
| DWMP | Domestic Wastewater Management Plan |
| EPA | Environment Protection Authority |
| GIS | Geographic Information System |
| GMAs | Groundwater Management Area |
| HPO | Health Protection Officer |
| LAA | Land Application Area |
| LCA | Land Capability Assessment |
| LGA | Local Government Area |
| LRA | Land Resource Assessment |
| MAV | Municipal Association of Victoria |
| PIC | Plumbing Industry Commission |
| SEPP | State Environment Protection Policy |
| SWG | Stakeholder Working Group |
| VCAT | Victorian Civil and Administrative Tribunal |
| VVG | Visualising Victoria's Groundwater (Project) |
| WC | Water Corporation(s) |
| WMIS | The Victorian Water Measurement Information System |
| WSPAs | Water Supply Protection Area(s) |

1 Introduction

1.1 Overview and Objectives

Colac Otway Shire Council (COS, 'the Shire' or 'Council') has a geographic area of approximately 3,433km² and a population of approximately 20,973 in 2013 with an estimated growth rate of 1% per annum (Council Plan, 2013-2017). There are approximately 2,850 on-site Domestic Wastewater Management (DWM) systems that Council has record of within the Shire. In addition, there are unsewered commercial (non-domestic) properties/parcels, such as cafes, pubs and dairy farms in the Shire, which are regulated by the EPA and Council. This Domestic Wastewater Management Plan (DWMP) covers the management of DWM systems within the Shire. Figure 1 identifies the unsewered areas of COS that forms the basis for this document.

The management of wastewater within COS is undertaken to protect human health and the environment. The Shire is characterised by towns, rural residential development, farming (including forestry), national parks and forests, and coastline; and includes large areas designated as Declared Water Supply Catchments (DWSCs) (around 30% of the Shire). The protection of surface waters, groundwater and human health are all requirements of the *Environment Protection Act 1970*. Under the provisions of this Act and other legislative guidelines, Councils are required to prepare a DWMP. This DWMP is a revision of the first DWMP (adopted in 2007) for COS since the requirements were prescribed.

This DWMP has been developed in accordance with the requirements of all the legislation and policies as outlined in Section 3, and in particular:

- *Environmental Protection Act, 1970*;
- Ministerial Guidelines for *Planning Permit Applications in Open, Potable Water Supply Catchments*, (DSE, 2012); and
- State Environmental Protection Policy (SEPP) for both Waters of Victoria and Groundwaters of Victoria.

The DWMP addresses the various aspects of wastewater, including its treatment and land application, and the cumulative impacts of DWM systems within DWSCs. The DWMP also addresses how DWM systems are managed in COS, including Permit to Install, use and the upgrade of systems. The ongoing monitoring of DWM system performance assists in the protection of public health and the environment.

The key objectives of this DWMP are as follows:

- To provide strategic direction for the development and management of wastewater throughout COS;
- To develop a prioritised program of DWM system compliance monitoring (scheduled inspections) by COS Health Protection staff over a five year period;
- To provide guidance to, and the minimum standards for, those preparing Land Capability Assessments within COS for existing and new developments;
- To develop a risk-based decision tool to provide guidance on the development potential of unsewered localities (including the more densely populated 'towns' and 'settlements') within and outside of the DWSCs, with regards to environmental and public health risks from DWM systems;
- To clarify the circumstances in which dwellings can be constructed within DWSCs at a higher density than 1 per 40 hectares;
- To provide greater certainty for landowners about the development potential of their land;

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- To provide guidance on appropriate maintenance, modifications and upgrades for under-performing and failing systems throughout the Shire;
- To provide guidance on what types of wastewater treatment and land application systems are appropriate (and inappropriate) for the physical constraints of unsewered localities;
- To provide guidance on appropriate education for DWM system owners and residents of unsewered properties;
- To provide clear direction for the assessment of new and modified DWM system applications and their ongoing compliance with legislative requirements; and
- To specify actions to achieve these objectives to ensure the DWMP delivers demonstrable results.

This Operational Plan forms the major component of this DWMP, and outlines the ongoing management of DWM systems within COS by Council staff, working with owners and residents. The Operational Plan is supported by the Technical Document which provides detail on the regulatory framework for DWM and the methodology used to generate the DWM constraint mapping and corresponding Sensitivity Analysis of the Shire and individual Locality Reports.

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1.2 Development of the DWMP

All Councils within Victoria are required to prepare a municipal DWMP. A DWMP is a planning and management document that provides a mechanism for the development, implementation and review of programs to protect public health, the local environment and local amenity. The DWMP establishes Council's policy on and commitment to sustainable ongoing wastewater management and its programs for compliance and enforcement. The DWMP establishes processes to ensure early and comprehensive consideration of wastewater management in the planning cycle and Council's responsibility for the monitoring and compliance of systems.

The DWMP assists landowners and Council staff to understand the requirements for development within the Shire in respect of DWM. With the information provided by the DWMP Council staff will be able to assist landowners and developers to determine the level of assessment that is required for a proposed development. The detailed risk-based assessments of unsewered localities and towns/settlements included in the DWMP equips Council staff to assess existing and proposed DWM systems within the Shire, with the overarching objective of improving wastewater management into the future. Council staff will also be able to assess the capacity of land to manage wastewater for future development using the risk assessment framework.

A Stakeholder Working Group (SWG) was established to oversee the project, comprising officers from Council, Barwon Water, Wannon Water, Southern Rural Water, EPA Victoria, the Department of Environment, Land, Water and Planning (DELWP), Corangamite Catchment Management Authority and the Department of Premier and Cabinet. An inception meeting and a preliminary risk assessment workshop was held at the outset of the project to determine the priority regions and issues, with regards to DWM within COS, to address within the revision of the DWMP and establish the methodology of the risk assessment framework.

Ongoing consultation between the Stakeholder Working Group and the consultant, including three face-to-face meetings, occurred throughout the development of the DWMP, which has resulted in a robust Plan which is accountable and achievable.

In accordance with Council's Community Engagement Policy (2010), a Community Engagement Strategy was developed for the project and consultation was undertaken with local communities and key stakeholders throughout the Shire. Council advertised the review of the DWMP on its website and conducted community consultation meetings, held during the week-long field investigations undertaken by Consultant staff from the 15th to 19th of September 2014. The meetings took place from 16th to 18th September 2014 in Colac, Beech Forest and Gellibrand. Consultant staff, as well as representatives from Council and Wannon Water, was present at these community meetings.

The field investigations undertaken by Consultant staff involved an audit of a representative sample of approximately 10% of existing on-site wastewater management systems and soil investigations in towns/settlements selected by the Stakeholder Working Group. The purpose of the investigations was to:

- confirm the nature and extent of the environmental and public health impacts associated with the existing wastewater management within the towns/settlements;
- identify the areas that may not need improvement if domestic wastewater management systems are operating effectively; and
- guide the Land Capability Assessment process to determine the capability of vacant lands within and around the towns/settlements, in terms of their suitability for sustainable on-site land application of effluent.

Summaries of the field assessment results are included in the Locality Reports included in Appendix B of the Technical Report.

COS understands the importance of community consultation and endeavours to ensure that the aims and outcomes of the DWMP are shared with the community, allowing opportunities for

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feedback and discussion. Feedback from members of the community from the initial round of consultation was reviewed and incorporated into the DWMP where possible. The concerns and suggestions most commonly raised during the community consultation process are listed as follows:

- Uncertainty about planning processes and time delays for obtaining development approvals, particularly for new development on small properties/parcels in the DWSCs.
- Uncertainty about Council and Water Corporations' requirements for new and upgraded DWMs, particularly within the DWSCs.
- Questioning the fairness of owners having to forgo potential property/parcel development or sales opportunities for small or non-compliant properties/parcels in the DWSCs (i.e. regulatory controls and expectations change between buying and developing or selling).
- The view that large, rural properties do not pose a threat to drinking water quality and should be allowed to utilise primary treatment DWM systems.

The draft DWMP will be updated following public exhibition of the Plan. Further liaison will also be carried out during this period with all relevant Water Corporations, neighbouring Councils and the EPA.

1.2.1 Guidelines – Planning Permit Applications in Open, Potable Water Supply Catchment Areas (DSE, 2012)

These Guidelines outline the requirements for development in declared water supply catchment areas (DWSC), where a planning permit is required to use land for a dwelling or to subdivide land, or to develop land pursuant to a schedule to the Environmental Significance Overlay that has a catchment or water quality protection as an object.

Guideline 1 requires that the density of dwellings should be no greater than one dwelling per 40 hectares and each property/parcel created in a subdivision should be at least 40 hectares in area. The dwelling density is established by calculating the number of dwellings within a one kilometre radius of the site of the proposed dwelling. The density requirement of Guideline 1 does not apply where:

- Category 1: A permit is not required (i.e. outside of the DWSC/Environmental Significance Overlay);
- Category 2: If the dwelling is connected to reticulated sewerage;
- Category 3: If the development is consistent with a Catchment Policy that has been prepared for the catchment and endorsed by the relevant Water Corporation following consultation with relevant stakeholders; and
- Category 4: The Water Corporation is satisfied that Council has prepared, adopted and is implementing a DWMP in accordance with DWMP requirements.

The preparation and implementation of this DWMP and Action Plan will allow COS to demonstrate that it has fulfilled the requirements of Ministerial Guideline 1. Once fulfilled, the Water Corporations have the ability to consider applications that would result in a higher density of development than would otherwise be permitted by Guideline 1 (currently constrained to a density of 1 in 40 ha). In order to relax this density requirement, all conditions of Guideline 1, as listed below, are to be met:

- The minimum lot size area specified in the zone for subdivision is met in respect of each lot;
- The Water Corporation is satisfied that the Council has prepared, adopted and is implementing a DWMP in accordance with the DWMP requirements; and

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- The proposal does not present an unacceptable risk to the catchment having regard to:
 - the proximity and connectivity of the proposal site to a waterway or a potable water supply source (including reservoir);
 - the existing condition of the catchment and evidence of unacceptable water quality impacts;
 - the quality of the soil;
 - the slope of the land;
 - the link between the proposal and the use of the land for a productive agricultural purpose;
 - the existing lot and dwelling pattern in the vicinity of the site;
 - any site remediation and/or improvement works that form part of the application; and
 - the intensity or size of the development or use proposed and the amount of run-off that is likely to be generated.

Note: this requires analysis in addition to a Land Capability Assessment (LCA) required pursuant to Guideline 2: Effluent Disposal and septic tanks system maintenance (DSE, 2012).

The preparation, adoption and implementation of a DWMP is required for the relaxation of Guideline 1. Many of the items for compliance with Guideline 1 will form part of the Operational Plan of this DWMP. These actions are identified in the DWMP and will result in the adoption of the DWMP by Council, and endorsement by the relevant stakeholders. Table 1 outlines how this will be achieved.

For the DWMP to be considered for endorsement by the Water Corporations, COS is also required to demonstrate that suitable resourcing for implementation, including monitoring, enforcement, review and auditing, is available.

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Table 1: Guideline 1 Requirements

| Action | Details | Completed within this DWMP | Comments/Reference |
|---|--|----------------------------|---|
| The DWMP must be prepared or reviewed in consultation with all relevant stakeholders. | Other local governments with which catchments are shared | Yes | Liaison with abutting Councils will be undertaken during the public exhibition period. Detailed in Section 1.2 of the Operational Plan. |
| | EPA | Yes | A representative from the EPA was a part of the working group. All documentation relating to the preparation of the DWMP was provided to the EPA, which was also invited to comment on all drafts developed. Detailed in Section 1.2 of the Operational Plan. |
| | Local Water Corporations | Yes | This DWMP was prepared and progressively reviewed by a working group that included representatives from Barwon Water, Wannon Water, Southern Rural Water and the Corangamite Catchment Management Authority. All documentation relating to the preparation of the DWMP was provided to the Water Corporations, which were also invited to comment on all drafts developed. Detailed in Section 1.2 of the Operational Plan. |
| The DWMP must comprise a strategy including timelines and priorities to: | Prevent discharge of wastewater beyond lot boundaries | Yes | Assessment of DWM sensitivity and assessment protocols to ensure best possible DWM system is installed. Section 6 outlines the responsibilities of property/parcel owner's, LCA assessors and Council with regards to effective DWM system design, installation and maintenance. Continual education of the community as per Action 13. All properties/parcels will follow the LCA procedure outlined in Section 4.2 of the Operational Plan for their given Sensitivity Rating. |
| | Prevent individual and cumulative impacts on groundwater and surface water beneficial uses | Yes | Assessment of DWM sensitivity and assessment protocols to ensure best possible DWM system is installed. Particular considerations to slope, soil, useable lot area and climate have been addressed within the Sensitivity Analysis. Section 4 of the Operational Plan details the methodology and results of the Sensitivity Analysis for each property/parcel within the Shire as well as providing a tool to assess the cumulative impact of DWM systems within particular areas of concern, i.e. within a sub-catchment (Stage 5). |
| | The DWMP must provide for: | Yes | Ongoing. Improvement of data management system to allow for effective management of existing permits and conditions. Targeted compliance system audit to be undertaken |
| | Effective monitoring of the condition of DWM systems, including compliance with | | |

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| Action | Details | Completed within this DWMP | Comments/Reference |
|--------|---|----------------------------|---|
| | | | |
| | permit conditions | | as a part of the Action Plan. Detailed in Sections 7 and 8. |
| | The results of monitoring provided to stakeholders | Yes | Ongoing – annually (on date of DWMP Adoption). Report shall include summary of systems inspected, risk rating of systems, and results of any recommended upgrade works or compliance requirements. Detailed in Actions 15b and 17 a, b, and c. |
| | Enforce action where non-compliance is identified | Yes | Ongoing – It has been shown in the inspection program that compliance can be achieved without taking enforcement action in the majority of cases; however, Section 8 outlines enforcement actions for ongoing non-compliance. Council also has compliance response escalation points available for it to commensurate to level of non-compliance (see Section 8.4.1). |
| | A process review and update of the DWMP every five (5) years | Pending - 2020 | Mid-yearly review of the DWMP proposed for 2020. A 2017 review of the implementation of the DWMP will ensure the DWMP is on track and functioning. Detailed in Action 17c. |
| | Independent audit by an accredited auditor of the implementation of the DWMP, monitoring and enforcement every three (3) years | Pending - 2018 | Audit to ensure that the work undertaken is done so in accordance with the DWMP. Detailed in Action 17b and c, and 15 a and b. |
| | The results of the audit is to be provided to all stakeholders as soon as possible after the audit | Pending- 2018 | Results of the audit will be provided to all stakeholders for review after the audit. |
| | COS is required to demonstrate that suitable resourcing for implementation, including monitoring, enforcement, review and audit is in place | Yes | This is detailed in Section 7 and of the DWMP and the Action Plan (Section 13). |

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1.3 Previous Reports and Plans

This DWMP is a revision of Council's 2007 DWMP, which in turn expanded on the 2002 Wastewater Management Strategy. Data from system inspections informed the previous reports and has been added to this Plan. Additionally, several detailed investigations in localities and towns/settlements have been carried out over the past decade, which also inform this DWMP.

1.3.1 Evaluation of 2007 DWMP

The COS (2007) DWMP was a redraft of the COS (2002) Wastewater Management Strategy. The COS (2002) Wastewater Management Strategy incorporated an audit of septic tank systems throughout the Shire, with subsequent Issue Papers being derived from the locality and town/settlements assessments by Council staff.

The audit of the septic tank systems indicated that at least 30% of properties were discharging sand filter and AWTs effluent and sullage offsite. It is reasonable to suggest that the majority of systems may be defective at some point in time, as the sullage was untreated and systems were not regularly checked. Inspection of open drains and streams in inland towns/settlements indicated that discharge of sullage water was causing nuisance conditions and environmental damage. In some areas, sullage water was ponding in open street drains causing excessive weed growth, odour problems and mosquito breeding. It was also apparent, through observations and water testing, that sullage water was polluting streams and causing unsightly conditions. A summary of the audit of DWM systems undertaken in 2002 is provided in the 2007 COS DWMP (pp.42).

The towns that were identified during the audit as having the highest priority to improve wastewater management were Wye River, Separation Creek, Kennett River and Birregurra; Forrest, Cressy and Gellibrand were also assessed as part of the Issue Paper assessments.

The results of the COS (2002) Wastewater Management Strategy assisted with future planning and directed sewer preferences for the targeted towns. Birregurra and Skenes Creek have since been seweraged, but Wye River and Separation Creek were found to not be suitable for sewer due to the heavily vegetated steep sloping topography and significant land instability (landslip risk). Consultants (SKM) were engaged by Barwon Water to assess the impact of wastewater on local estuaries, with the resultant report (2013-2014) detailing the results.

The COS (2007) DWMP outlined a number of actions that were recommended to be undertaken for improved DWM within the Shire. A number of the actions were completed and many are in progress. All actions which were not implemented from the (COS) 2007 Operational Plan have been reassessed for their relevance and included in the current Operational Plan where appropriate. Some actions are ongoing and have also been included in the revised Operational Plan as items which require continuing undertakings. Those actions which were not undertaken or implemented in the COS (2007) Operational Plan are detailed in Table 2 below.

Many of the actions were not undertaken due to resource or time limitations, or they required further actions and Council approval.

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Table 2: COS (2007) DWMP Actions not Completed at August 2014

| DWMP Item | Recommendation | Status | DWMP 2015 |
|--------------------------------------|---|---|---|
| Legislation/
Codes of
Practice | Stipulate the information that should be included in assessments. | Informal. | Policies and Procedures to be documented. |
| Education
Program | Education kit for homeowner on the proper use and maintenance of septic tank systems. This should include statements/information on: <ul style="list-style-type: none"> The vegetation that is suitable to plant around septic tank systems; The things that go wrong when owners attempt to repair or upgrade systems without reference to experienced drainers/plumbers and Council; A notice indicating that systems cannot be altered without Council's consent and a suggestion that they always contact Council before undertaking any works other than basic repairs on their systems; A suggestion that homeowners self-regulate or take positive action. For example, advising owners that it is not acceptable to discharge wastewater onto neighbouring properties and asking them to seek Council advice as to what to do to rectify the problem. Another example, would be to ask homeowners that discharge greywater off site to consult with Council about possible methods of disposal; Advice to owners of treatment plants that they must comply with the conditions of the permit to use with respect to quarterly maintenance tests and annual effluent tests. | In Progress: 2 x brochures; information on Council website. | Council to revise existing educational materials (print and web-based) to reflect DWMP and current best practice. |
| | Meet owners informally on site to explain the operation of and how to best maintain their systems. | Informal (during inspections) | Inspections procedures documented. |
| | Conduct an annual forum with plumbers, treatment plant installers, maintenance contractors, etc. to | Not Actioned. | Annual briefing for all DWM professionals |

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| DWMP Item | Recommendation | Status | DWMP 2015 |
|----------------------------------|--|--|---|
| | discuss relevant waste management issues. | | regarding the 2015 DWMP. |
| | Investigate the best mechanism of advising prospective purchasers of unsewered properties of the implications of the lot being unsewered; e.g. maintenance of septic tank system, potential restriction on development, etc. | Not Actioned. | Broad public education program across Shire, including potential owners of DWM homes. All educational material to be provided on website. |
| Monitoring and maintenance | <p>Introduce a monitoring program of septic tank systems. Special attention should be paid to septic tank systems that are located in water catchment areas, close to waterways and groundwater supplies. This monitoring program should involve the following:</p> <ul style="list-style-type: none"> Regular and random measurement of septic tank sludge levels; Inspection of systems to ensure that tanks, pits, pumps etc. are in good working order; Inspection of systems to ensure that they are operating properly and in accordance with their permits to use; Ensuring owners of treatment plants submit their quarterly maintenance reports and undertake annual tests of effluent quality. Carefully reviewing these reports and taking action where appropriate; Random testing of the sand filter effluent. Carefully reviewing the test results and taking appropriate action; Random onsite inspection of septic tank systems. Mapping of systems using GPS and requesting owners to rectify defects/failing systems; and A water sampling program. | Informal (e.g. in response to complaints); Water sampling program in progress. | Risk-based Compliance Monitoring Program documented, to be finalised and implemented by Council officers. |
| Localities and Towns/Settlements | Conduct community consultation around the draft Issues Papers prior to presenting a report to Council for endorsement. | Not Actioned. | Comprehensive community engagement in preparation of DWMP. |

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| DWMP Item | Recommendation | Status | DWMP 2015 |
|-----------|---|---------------|---|
| | Develop domestic wastewater management plans for Cressy, Gellibrand, Beeac, Forrest, and other smaller localities and towns/settlements. Define minimum standards for domestic wastewater treatment and disposal systems and procedures for upgrading systems. Particularly focus on developing specific strategies for reducing and improving the quality of off-site discharge of wastewater; water reuse, water conservation, kitchen waste to septic system, more regular emptying of grease traps, and installation of grease traps. Involve the communities in these processes. | Not Actioned. | Individual Locality Reports for targeted localities and towns/settlements - define minimum standards for DWM systems.
Educational program to improve owner understanding and maintenance of DWM systems. |
| | Identify the vacant blocks in each locality which are unsuitable for development. Give consideration as to what action should be taken with respect to these blocks; advising the owners, requiring consolidation with adjacent blocks prior to development, changing the zoning of the blocks. | Not Actioned. | Risk Assessment and Constraint Maps identify DWM risks for all properties/parcels in each locality and town/settlement. |
| | Investigate the merits of advising owners of developed properties that would be difficult to further develop from a wastewater perspective of the limitations of their properties. | Not Actioned. | Policies and Procedures to be documented and publicly promoted. |
| Planning | Introduce a minimum lot size for developments and subdivisions in unsewered towns/settlements. | Not Actioned. | Risk Assessment and Constraints Maps. |
| | Ensure that Councils' planning processes, planning scheme, local structure plans and neighbourhood character studies take into consideration the relevant findings of this plan. | In Progress. | Brief Planning staff on DWMP; DWM register to link with property/planning records; Small Town Plans to be developed for Alvie, Beeac and Cororooke (as identified in the Strategic Planning Work Program). |
| Funding | Investigate the feasibility of introducing a special charge to fund the activities recommended in this plan. | Not Actioned. | Recommend this is considered by Council. |
| Reviewing | Undertake minor and major reviews of this plan on a regular basis. | Not Actioned. | Review timeline documented. |

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1.4 Implementation and Review

The effectiveness of the DWMP and the Risk-based Compliance Monitoring Program will depend on the ability of Council to implement the Action Plan (Section 13) and the monitoring program. The implementation of the 5 year Risk-based Compliance Monitoring Program (refer to Section 7.4) will require Health Protection Unit staff to undertake regular system inspections on a priority basis, to update and maintain databases, and to prepare compliance plans and reports. COS will be required to resource the equivalent of one to two staff members to prepare and undertake this program and allocations within the Council budget will need to be made to accommodate this program. System inspections can take more than an hour to complete (not including travel and record keeping) and can require follow-up inspections and education of system owners. The detailed program, including identifying priorities and scheduling, will need to be prepared by the Health Protection Unit prior to commencement of the DWMP, using the outline of the program presented in Section 7.4 of this Operational Plan.

In addition, staff must be trained in onsite wastewater assessment and be familiar with plumbing requirements to ensure compliance with repair and/or upgrade orders that can be made for systems under the program. Follow-up visits to properties to ensure compliance are likely to be required.

The SEPP requires that the DWMP is independently audited every three years (Refer Section 13 Action No. 18c) so as to ensure the DWMP is being implemented appropriately. Resource funding and time allocation must be made by Council to undertake this review.

1.4.1 Monitoring and Reporting

The effectiveness of the DWMP will be measured by a comprehensive monitoring and reporting process. Further to the requirements in the SEPP, Council will monitor and report annually to the Water Corporations (Refer Section 13, Action 18b) on a range of performance indicators listed in this DWMP, including but not limited to:

- the number of complaints about poorly functioning DWM systems;
- the number of system inspections for each risk category;
- the number of systems needing rectification (following inspection);
- the number of systems rectified;
- the number of systems still needing rectification; and
- the assessment of the results of surface and/or groundwater quality monitoring in respect to DWM and its potential impacts on water quality;

This reporting will not only indicate the progress of Operational Plan implementation, but it will also provide an indication of the effectiveness of the actions to improve environmental and public health and cumulative DWM risk across the Shire.

2 Overview of Domestic Wastewater Management

2.1 What is Wastewater?

Wastewater is water-borne waste material and includes all normal wastes from residences, as well as many forms of waste matter from other establishments. Domestic wastewater is derived from household waste streams: kitchen; bathroom (basin, bath and shower); laundry and toilet. Industrial and commercial wastewater varies widely in character and often requires specialised treatment processes as it may contain substances that are harmful to the biological processes utilised for treatment processes. Domestic wastewater is commonly described in these three forms:

- Blackwater – “water grossly contaminated with human excreta” e.g. toilet water, composting toilet leachate;

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- Greywater – “water that is contaminated by but does not contain human excreta” e.g. kitchen, bath and laundry water. Also referred to as ‘sullage’; and
- Combined – “a combination of both black and grey water.”

Domestic wastewater quality can vary greatly due to numerous factors; however Table 3 outlines typical values for domestic wastewater quality parameters.

Table 3: Typical Domestic Wastewater and Septic Effluent Quality¹

| Parameter (mg/L) | Untreated Wastewater | Septic Effluent |
|--|----------------------|-----------------|
| Biological Oxygen Demand (BOD ₅) | 150-300 | 100-200 |
| Total Suspended Solids (TSS) | 150-300 | 20-100 |
| Ammonium (NH ₄ ⁺) | ~10 | ~40 |
| Organic Nitrogen | ~30 | ~15 |
| Ammonia (NO ₃ ⁻) | 4-13 | <1 |
| Ortho Phosphate | 6-10 | 10-15 |
| Organic Phosphorus | 4-15 | <4 |

2.2 The Historical Context

Historically the management of domestic wastewater systems, throughout Victoria, has been difficult. Local Councils are the regulatory authority for DWM and have generally been limited by time and financial support from implementing effective DWMPs. Many Councils’ throughout Victoria (and Australia) have previously provided very limited programs for DWM, focusing on an approval scheme for new systems and a basic system monitoring program, as time permits. There are limited cost recovery options for Councils to monitor increasingly complex and larger numbers of systems as the peri-urban areas experience rapid growth throughout Victoria. There is increasing pressure on all Councils within Victoria to improve DWM so that existing and future development does not impact on public health and the environment.

2.3 Wastewater Treatment

Wastewater is typically managed in urban environments in a community sewerage system, with treatment at a centralised wastewater treatment plant with disposal via discharge to waterways or land application. In areas where a centralised sewerage system cannot be provided, wastewater is managed on-site at each individual property/parcel. On-site domestic wastewater is managed by a variety of treatment systems, including but not limited to:

- Septic Tanks;
- Aerated Wastewater Treatment Systems;
- Wet Composting Systems;
- Sand Filters; and
- Textile (fabric) Filters.

¹ Information collated from a range of sources including AS1546.1:2008, AS1547:2012, EPA Publication 760 (2002), NRMCC (2006) and NSW DLG (1998). Note all concentrations are highly variable.

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Appendix A provides detailed information about treatment systems. Following treatment, the effluent is then either disposed of or reused within the boundaries of the property/parcel. The type of disposal or reuse system depends on the type of treatment system and the quality of effluent (primary or secondary). Most systems apply effluent within the soil profile in a dedicated area on the property/parcel (often referred to as the Land Application Area or the disposal area). Highly treated and disinfected greywater can be used internally for toilet flushing and cold water supply to the laundry; however such systems are not common due to relatively high costs. Further details on land application systems are provided below.

2.4 Land Application of Treated Effluent

There are a range of effluent disposal or reuse systems that apply effluent to the soil profile. Systems that are suitable for primary-treated effluent (from septic tanks and wet composting systems) include:

- Conventional Absorption Trenches and Beds;
- Evapotranspiration-Absorption (ETA) Trenches and Beds;
- Modified ETA Trenches and Beds – such as 'Wick Trenches' and modified pipe systems;
- Wisconsin or Sand Mounds; and
- Low Pressure Effluent Distribution (LPED).

Systems that are suitable for secondary-treated and disinfected effluent (from accredited secondary treatment systems only) include:

- All of the above systems suitable for primary effluent (although less commonly used);
- Surface spray or drip irrigation;
- Covered surface drip irrigation; and
- Subsurface drip irrigation.

Appendix A provides detailed information about land application systems.

2.5 Environmental & Health Risks of Domestic Wastewater Management

Domestic wastewater can be highly variable in quantity and quality, which can impact on the performance of DWM treatment systems. Primary treatment in septic tank systems relies on the anaerobic breakdown of organic matter by microbes and the settling of solids. Shock loads or biocide use within the home can impact on the ability of these microbes to treat the wastewater and solids passing through the first treatment stage, resulting in poor quality of effluent being discharged to the environment.

DWM system failures are most often a result of poor system design, poor installation practices, inadequate maintenance and sometimes insufficient land area, all of which contribute to potential public and environmental health impacts. These are discussed below.

2.5.1 Human Health

The principal groups of organisms found in natural waters and wastewater include: bacteria, fungi, protozoa, rotifers, algae and viruses. Not all of these pose potential human and public health risks. Organisms with the potential to pose health risks to humans are known as "pathogenic" organisms and may be classified into three broad categories:

1. **Bacteria** – domestic wastewater contains a wide variety and concentration of pathogenic and non-pathogenic bacteria. There are many waterborne infectious diseases e.g. typhoid and cholera. Infectious doses of disease causing bacteria in wastewater can lead to illness. Testing for pathogens is difficult and expensive, therefore

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indicator bacteria from the intestinal tract of uninfected humans and warm blooded animals is used; for example coliform bacteria such as *Escherichia coli* are used as an indicator of potential pathogenic/faecal contamination in water.

2. **Parasites** – (Protozoa and Helminths). The two dominant protozoan parasites of concern in the treatment of wastewater are:
 - *Cryptosporidium*; and
 - *Giardia*.

These are both resistant to standard disinfection methods and pose considerable risk to susceptible members of the community (children, elderly and immune-compromised). Helminths or intestinal worms, e.g. tapeworms and roundworms, are also commonly found in wastewater. These release millions of environmentally resilient eggs throughout their lifespan.

3. **Viruses** – contamination of domestic wastewater by viruses may lead to major outbreaks, such as Hepatitis A (referred to as infectious hepatitis), which is the most dominant waterborne virus. Polio Virus is also transmitted in wastewater. Viruses can cause widespread illness in epidemic patterns. Viruses are more common and diverse than bacteria in the aquatic environment.

The ability of pathogens to survive in the environment varies substantially, depending on environmental conditions and the type and life-stage of the organism. Some organisms produce highly resilient spores which can persist in unfavourable conditions for long time periods and can be transported large distances in water and groundwater.

Furthermore, nitrogen in the form of nitrate is highly mobile in the soil/water environment and can also be a potential public health risk if exposure is high (however this has not been identified as a particular risk for the relatively low-density towns of regional Australia).

Exposure to any of the above, via direct or indirect contact with wastewater, poses a human health risk.

2.5.2 Environmental

Nutrients, along with trace quantities of other elements, are essential for biological growth. Phosphorus (P) and Nitrogen (N) are the principal nutrients of concern with regard to DWM systems and are present in a range of compounds in raw wastewater and treated effluent. In excess, phosphate and nitrate encourage vigorous growth of algae and aquatic plants in surface water systems, which can lead to ecological disruptions and reduced water quality. Poor-quality raw supply water is more difficult and costly to treat for drinking water purposes, compared to water taken from catchments where pollution inputs are reduced.

2.5.3 Social

The poor management of DWM systems has potential financial implications where it may adversely impact on drinking water supplies by contamination. Where DWM systems cause pollution from effluent discharges to waterways, there is a requirement for a higher level of treatment of drinking water prior to distribution. Where failing DWM systems cause odours or discharge into adjoining properties, there is an adverse impact on public amenity and these may cause a nuisance. There are financial implications for owners who have a failing DWM system and are required to complete upgrade works. New systems can be expensive and some owners may not have the finances to undertake works immediately, resulting in continuing system failures.

2.5.4 Summary

Table 4 below summarises the risks common to all DWM systems (treatment and land application components). The operation of a large number of DWM systems within a catchment may have long term negative and cumulative impacts on that particular area and on downstream water bodies. However, where systems are correctly designed, installed and

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managed (including upgrades to existing systems where necessary), the risks of cumulative impacts to the downstream environment are substantially reduced. As such, the sustainable density of DWM systems is higher when systems are operating optimally, compared to when a proportion (or all) systems are underperforming or failing in some way.

Table 4: Health and Environmental Risks of DWM Systems

| Risk | Typical Cause | Potential Impacts |
|--------------------------------------|---|----------------------------------|
| Ineffective regulation | Lack of staff/ time | Environmental, Health and Social |
| Off-site discharge | Failing/ poorly managed/ damaged/ unapproved treatment and/or land application system(s)/ previous approved practices for off-site discharges | Environmental, Health and Social |
| Disinfection failure | No disinfection (chlorine)/ poor upstream treatment | Health |
| Failure of treatment system | Lack of maintenance/ poor installation/ age of system | Environmental, Health and Social |
| Surcharge from land application area | Peak loads/ overload of system/ failure of land application system / undersized or poorly designed system | Environmental, Health and Social |
| Failure of land application system | Clogging layer in trenches or beds/ broken pipes/ inappropriate hydraulics | Environmental, Health and Social |
| Human contact with effluent | Poor OH&S in maintenance/ inappropriate disposal methods | Health and Social |
| Owner ignorance | Lack of knowledge of system | Environmental, Health and Social |
| Damage to land application system | Access by vehicles or stock/ inappropriate boundaries | Health and Social |
| Odour | Inadequate treatment in systems/ mechanical fault | Social |
| Groundwater contamination | Effluent disposal area overloaded (undersized and/or failing) | Environmental, Health and Social |
| Surface water contamination | Surface runoff of effluent in area with reduced setback distance buffers/ recharge from contaminated GW | Environmental, Health and Social |
| Human or animal disease outbreak | Direct or indirect pathogen exposure due to any of above causes | Health and Social |
| Degradation of soils | Undersized or failing land application system/ usually high strength effluent | Environmental and Social |
| Increased algae growth | Excess nitrate and phosphate in surface waters | Environmental, Health and Social |
| Degradation of native vegetation | Excess nitrate and phosphate in soils and/ or surface waters | Environmental and Social |

3 Legislation and Policies

3.1 Council's Plans and Policies

The DWMP has been developed to fit with other Council Policies and Plans through actions identified in the Action Plan. The following lists the various Council Plans which have been included in the DWMP review, which are discussed further within the Technical Document.

- Council Plan 2013 – 2017;
- Colac Otway Shire Municipal Public Health and Wellbeing Plan 2013 – 2017;
- Colac Otway Planning Scheme;
- Colac Otway Rural Living Strategy; and
- Council Budget.

3.2 Legislation

A summary of the legislation and their stipulated requirements relevant to the regulation of DWM systems are detailed in the Technical Document. The relevant legislation includes:

- *Local Government Act 1989*;
- *Environment Protection Act 1970*;
- *Water Act 1989*;
- *Planning and Environment Act 1987*;
- *Public Health and Wellbeing Act 2008*;
- State Environmental Protection Policy Waters of Victoria;
- State Environmental Protection Policy Groundwater of Victoria; and
- Victorian Building Regulations 2006.

3.3 Regulatory and Legislated Authorities

DWM involves, to varying degrees, a number of regulatory agencies:

- Council (Colac Otway Shire Council);
- Environment Protection Authority Victoria (EPA);
- Plumbing Industry Commission (PIC);
- Municipal Association of Victoria (MAV);
- Barwon Water;
- Wannon Water;
- Southern Rural Water;
- Department of Environment, Land, Water and Planning (DELWP); and
- Corangamite Catchment Management Authority.

3.4 Administrative Authorities

VCAT is a tribunal which deals with civil disputes, administrative decisions and appeals that are heard before Judge or Tribunal member. It provides a dispute resolution service for both government and individuals within Victoria.

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In recent cases, VCAT has questioned the quality of LCAs for DWM, particularly where a site is located within a potable water supply catchment. VCAT has also questioned the rigour of Council evaluation of these LCAs and how the minimum development guideline of 1 dwelling per 40 hectares should be applied in the DWSCs (ref. 'Guidelines – Planning Permit Applications in Open, Potable Water Supply Catchment Areas' – DSE, 2012).

3.5 Standards and Guidelines

The design, operation and management of DWM systems are supported by a number of standards and guidelines:

- EPA Code of Practice – Onsite Wastewater Management, Publication 891.3 (2013);
- Land Capability Assessment – Onsite Wastewater Management, Publication 746.1 (2003);
- AS/NZS 1547:2012 Onsite Domestic Wastewater Management;
- AS/NZS 3500:2003 Plumbing and Drainage; and
- Guidelines – Planning Permit Applications in Open, Potable Water Supply Catchment Areas (DSE, 2012).

4 Risk Assessment Framework

Risk Assessment is practiced by individuals and organisations all of the time. However, with the evolving complexity of society, a need for formal Risk Assessment has arisen since the 1950's. This began with studies of food safety and was progressively adopted in the fields of public health and environmental impact. Formal risk assessment has proven to be an effective way of making decisions in situations involving considerable complexity and uncertainty.

Formal recognition of the value, intent and application of risk assessment is provided in the international standard for formal risk management and associated guidelines (Standards Australia, 2009; IEC/ISO, 2009). AS/NZS ISO 31000:2009 (Risk Management) defines risk as the "effect of uncertainty on objectives", where an effect is a (+/-) deviation from the expected and objectives can apply to differing aspects (e.g. environmental goals) or at differing scales (e.g. strategic). In more general terms, Risk is often expressed in terms of the 'consequences' of an event or action and the associated 'likelihood' of that event/action occurring.

The fundamental purpose of any DWMP is the identification and management of risk from DWM systems to public and environmental health. A means of addressing the DWM issues raised by the unsewered towns/settlements, both within and outside of DWSCs, is to prepare a Risk Assessment tool that scientifically measures possible impacts of DWM systems on public and environmental health. A comprehensive 5-staged Risk Assessment model (Framework) (RAF) has been developed for this DWMP to assist Council in analysing risk at variable scales (Shire-wide to individual property/parcel).

Figure 2 provides an overview of how each stage of the Risk Assessment Framework refines the risk assessment process. It also identifies the parameters applied and outputs derived at each stage in the process.

Together, all stages of the Risk Assessment have substantial value as a development assessment tool and provide a defensible identification and justification for prioritisation of existing management issues within the localities and towns/settlements. It incorporates tools that assess the bio-geophysical capability for DWM in existing unsewered localities and towns/settlements, recently developed unsewered subdivisions and undeveloped unsewered land. It will be primarily used:

- To determine the level of technical investigation to be undertaken as part of a development application in an unsewered area;
- To identify existing priority unsewered localities and towns/settlements that require more detailed investigations to determine needs (i.e. improvement actions or plans);
- As a guide to develop a monitoring strategy for existing DWM systems in the Shire; and
- As a guide to Council for strategic planning of future unsewered development.

The overall Risk Assessment aims to provide Council with a reasoned and justified tool to prioritise future development, and to implement monitoring and upgrading of DWM systems within the Shire by highlighting regions with elevated DWM risk profiles (e.g. towns/settlements with a large numbers of small properties/parcels and older DWM systems). Consideration of both individual (property/parcel) and cumulative (regional) DWM risk provides a versatile tool for:

- a) examining changes from an accepted 'baseline' condition (i.e. water quality or environmental indicators).
- b) preparing cost/benefit analyses for upgrade/improvement options (i.e. DWM vs. sewerage).
- c) comparing alternate land use/development scenarios (i.e. development density).

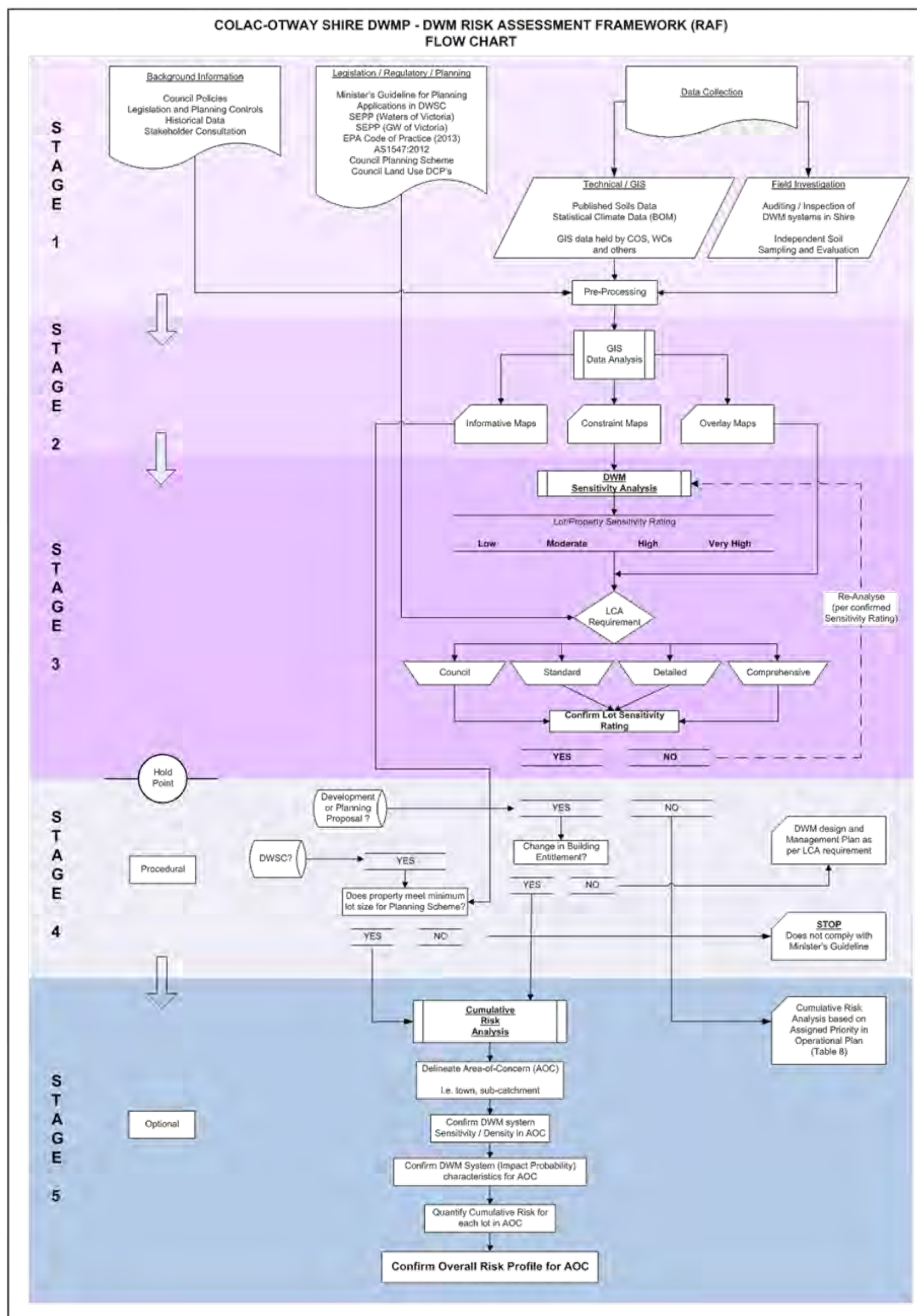


Figure 2: Risk Assessment Framework

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4.1 DWM Sensitivity Analysis (Stage 3)

4.1.1 Methodology and Rationale

The primary objective of the DWMP is to assess all 'unsewered' 'developable' properties/parcels within COS to determine their suitability to sustainably manage domestic wastewater on-site in compliance with legislative (i.e. SEPPs) and regulatory (i.e. Code) requirements. The inter-relationship of a wide range of individual constraints and variables affect the specific land capability and associated limitations for sustainable on-site DWM. Understanding this inter-relationship can be difficult, particularly in terms of assessing the relative contributions of individual constraints in a broad-scale evaluation.

The DWM Sensitivity Analysis involved assessing the cumulative effect of the individual constraints detailed in Section 6 of the Technical Document: soil suitability, slope, useable lot area, climate and location (i.e. whether or not a property/parcel is located within a DWSC) for all of the unsewered properties/parcels within COS. Each property/parcel was assigned a rating class for each of the individual constraints based on the criteria detailed in Section 6 of the Technical Document.

The following algorithm was developed using professional judgement and reviews of current literature. The algorithm generally follows the rationale developed for the Mansfield Domestic Wastewater Management Plan Pilot Project (Mansfield Shire Council, 2014); with adaptation by the Stakeholder Working Group (SWG) to reflect COS specific concerns. It details how the individual constraints were combined to determine the final Sensitivity Rating for each unsewered property/parcel within COS:

$$((\text{Soil Suitability} + \text{Slope}) \times ((2 \times \text{Useable Lot Area}) + \text{Climate})) / 10$$

The algorithm incorporates the constraints imposed by landform and soil characteristics, as well as the local climate which will impact on the selection and sizing of DWM systems for any given location. The useable lot area refers to the physical constraints imposed by prescribed setbacks from sensitive features, such as surface waterways (permanent and intermittent), groundwater bores and flood prone land. The existing vegetation on a property/parcel, as well as the proposed development footprint (i.e. building envelope and improvements), will also impact on the resultant useable lot area. If there is insufficient area remaining, the property/parcel will be unable to sustainably manage the wastewater on-site and, hence, not comply with the requirements of the SEPP.

The final sensitivity value (number) derived from the algorithm for each property/parcel was assessed to determine the appropriate 'Sensitivity Rating' ranges. Further information on the development of the Sensitivity Rating classification is provided in the Technical Document (Section 6.2.1). The following outlines the respective ranges and associated final Sensitivity Rating classes:

- Very High: > 5.5;
- High: $4 \leq x \leq 5.5$;
- Moderate: $2 \leq x \leq 4$; and
- Low: < 2.

Further, all properties/parcels were identified as being located within, or outside, a DWSC. This step was included to ensure that all properties/parcels located within a DWSC are subject to a LCA prior to development, as per Section 3.6 of the EPA Code of Practice (2013). For example, for a 'low' Sensitivity Rating property/parcel within a DWSC, the algorithm automatically increases the rating to 'moderate' to ensure that a LCA is undertaken, in accordance with the Code of Practice.

The criteria used to determine the Sensitivity Rating categories were based on previous constraint assessments for unsewered towns in Australia undertaken by W&A, and relevant Australian and Victorian guidelines for DWM. Table 5 provides a rationale for the interpretations

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that were used to derive the ratings, which is also discussed in Section 6.2.1 of the Technical Document.

The final Sensitivity Ratings give guidance towards the DWM requirements as stipulated by Council. For existing DWM systems, the level of sensitivity will commonly reflect the level of challenge that has been experienced in managing the system. This information will help guide owners and Council in the ongoing management of existing systems.

Table 5: Sensitivity Rating Descriptions

| Sensitivity Rating | Description |
|--------------------|---|
| Very High | Constraints are present at a very high level and this significantly restricts opportunities for sustainable DWM. Traditional systems are 'typically' not appropriate and a detailed site and soil evaluation would be required to determine if DWM is achievable at all. If achievable, specialised, advanced treatment and land application systems may be required to overcome the constraint. |
| High | Constraints are present at a high level and this substantially restricts opportunities for sustainable DWM. Traditional systems (i.e. septic tanks and trenches) are 'typically' not appropriate and a detailed site and soil evaluation would be required to determine if they are supported. Otherwise specialised, advanced treatment and land application systems may be required to overcome the constraint. |
| Moderate | Constraints are present at a moderate level and this limits the range of DWM options that are appropriate for the site. A detailed site and soil evaluation is required to identify the most appropriate DWM system and mitigation measures to be employed. |
| Low | Constraints are present at a low level and are unlikely to substantially limit opportunities for DWM. In most cases appropriately designed and managed conventional systems will be accepted. |

The terms relate to the underlying level of sensitivity to DWM posed by the property/parcel. These factors are used to direct management (planning) decisions and subsequently, the level or intensity of site-specific investigation (LCA) required.

4.1.2 Sensitivity Analysis Mapping

The final Sensitivity Rating for each individual unsewered property/parcel within COS is shown in Figure 3 and Table 6, which detail the results of the Sensitivity Analysis for the Shire. The final Sensitivity Rating and final map for each of the targeted localities and associated towns/settlements are detailed in the respective Locality Reports in Appendix B of the Technical Document. The targeted localities were highlighted as priority regions of investigation by Council and the SWG. The localities considered in this DWMP are: Alvie, Barham River Catchment (Apollo Bay locality hinterland), Barongarook, Barwon Downs, Beeac, Beech Forest, Carlisle River, Coragulac, Cororooke, Forrest, Gellibrand, Kwarren, Kennett River, Separation Creek and Wye River. The towns represent the developed 'centre' of each locality and are predominantly zoned Township Zone. Barham River, Barongarook and Kwarren, which are within the Rural Living Zone and Rural Conservation Zone, are referred to as 'settlements'. The town/settlement boundaries were primarily based on the zoning boundaries.

The parcels within each town/settlement include both commercial and domestic DWM systems without distinction. Town/settlement boundaries may also, on occasion, transect a given parcel. In that instance the parcel is considered to be within the town/settlement boundary and its Sensitivity Rating will be applied to the entire parcel.

Council maintains a database of the calculated Sensitivity Ratings for all the unsewered properties within the Shire, which will be updated as they are validated by LCA or by Council inspection as part of this DWMP.

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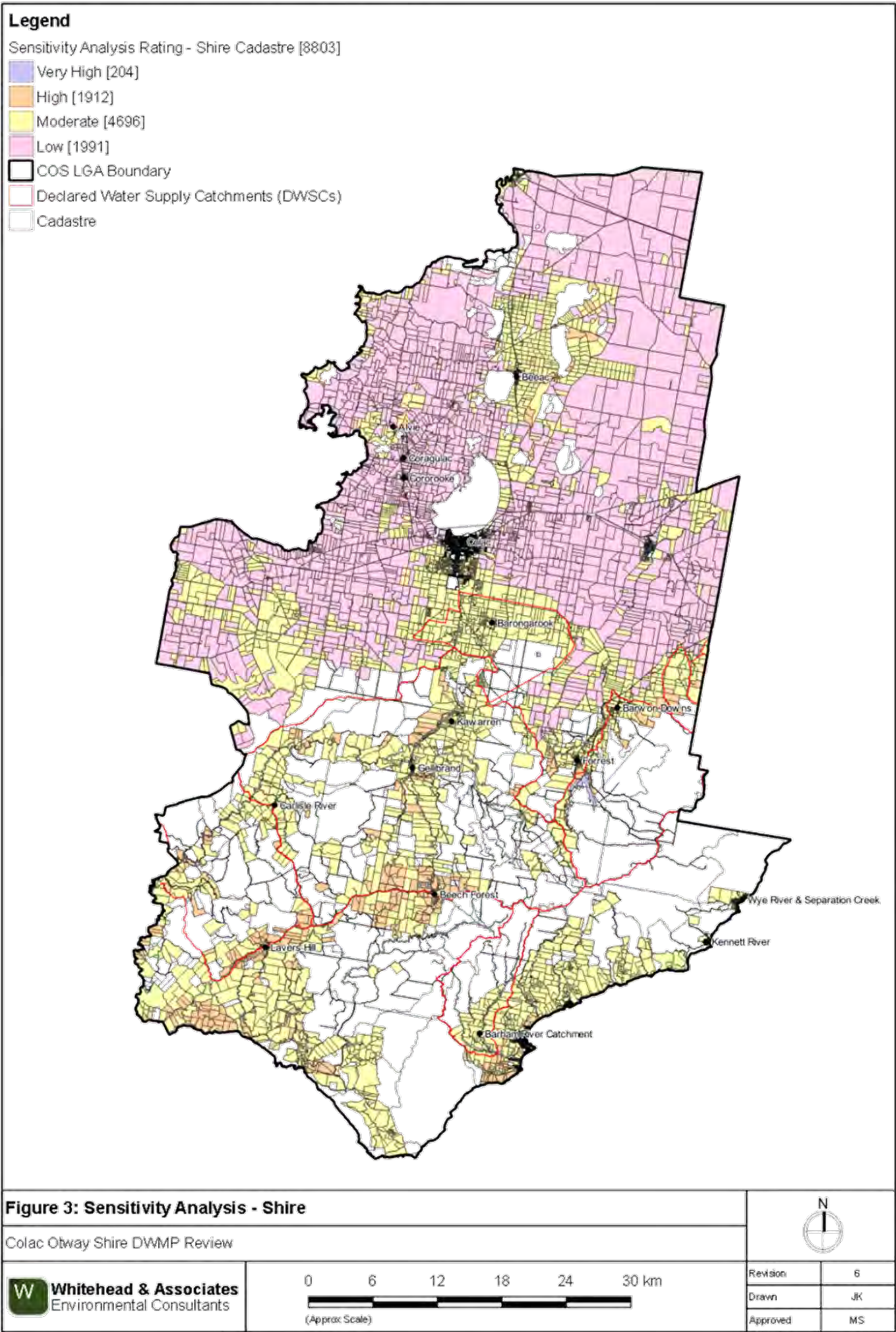
An owner can contact Council to obtain the data for the final Sensitivity Rating of their land. Council intends to develop an interactive map interface on the Council website where residents can access the final Sensitivity Analysis map. This item is included in the DWMP Action Plan.

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Table 6: Final Sensitivity Rating Summary

| | Total Properties/
Parcels | Total Number in Final Sensitivity Rating* | | | |
|---|------------------------------|---|-----------|-----------|----------|
| | | Very High | High | Moderate | Low |
| Shire (Overall) | 8,803 | 204 | 1,912 | 4,696 | 1,991 |
| Alvie
Town (Locality) | 33 (174) | 0 (0) | 3 (8) | 22 (81) | 8 (85) |
| Barham River
(Apollo Bay)
Settlement (Locality) | 81 (366) | 0 (8) | 22 (122) | 59 (236) | 0 (0) |
| Barongarook
Settlement (Locality) | 101 (265) | 0 (0) | 2 (7) | 99 (258) | 0 (0) |
| Barwon Downs
Town (Locality) | 89 (267) | 0 (1) | 0 (27) | 89 (232) | 0 (7) |
| Beeac
Town (Locality) | 269 (603) | 0 (0) | 198 (235) | 70 (321) | 1 (47) |
| Beech Forest
Town (Locality) | 150 (354) | 103 (126) | 44 (162) | 3 (66) | 0 (0) |
| Carlisle River
Town (Locality) | 26 (250) | 0 (0) | 0 (38) | 26 (209) | 0 (3) |
| Coragulac
Town (Locality) | 69 (201) | 0 (0) | 0 (0) | 42 (77) | 27 (124) |
| Cororooke
Town (Locality) | 112 (301) | 0 (0) | 0 (0) | 95 (153) | 17 (148) |
| Forrest
Town (Locality) | 167 (354) | 0 (9) | 14 (45) | 153 (287) | 0 (13) |
| Gellibrand
Town (Locality) | 71 (276) | 0 (2) | 19 (60) | 52 (214) | 0 (0) |
| Kawarren
Settlement (Locality) | 72 (215) | 0 (0) | 12 (35) | 60 (180) | 0 (0) |
| Kennett River
Town (Locality) | 180 (186) | 0 (0) | 173 (175) | 7 (11) | 0 (0) |
| Lavers Hill
Town (Locality) | 84 (204) | 29 (41) | 55 (134) | 0 (29) | 0 (0) |
| Separation Creek
Town (Locality) | 121 (136) | 0 (0) | 106 (113) | 15 (23) | 0 (0) |
| Wye River
Town (Locality) | 377 (393) | 0 (0) | 364 (368) | 13 (25) | 0 (0) |

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4.1.3 Evaluation of Final Sensitivity Analysis

The Sensitivity Analysis resulted in the properties/parcels throughout the majority of the Shire being assigned a Moderate Sensitivity Rating. The final Sensitivity Analysis map highlights the inherent relationship that results in only one or two individual constraints (e.g. soil suitability) generally affecting any given property/parcel. This relationship is described further in the individual Locality Reports (Appendix B, Technical Document). Each locality and associated town/settlement has particular DWM constraints that need to be addressed.

The mapping identifies approximately:

- 22.6% of properties/parcels within the Shire with a Low Sensitivity Rating;
- 53.4% of properties/parcels with a Moderate Sensitivity Rating;
- 21.7% of properties/parcels with a High Sensitivity Rating; and
- 2.3% of properties/parcels with a Very High Sensitivity Rating.

The spatial distribution of the levels of sensitivity appears to be distinctly influenced by topographical features, such as the Otway Ranges. The northern half of the Shire appears to pose a lower sensitivity to sustainable DWM, whereas, the southern half of the Shire, including the coastline, generally poses a moderate sensitivity to sustainable DWM. Therefore, prioritisation should be towards the areas that pose a higher level of sensitivity.

According to the individual constraint maps as detailed in the Technical Document, the parameters contributing the greatest limitation to DWM within the Shire are soil suitability (which is often due to clayey soils derived from the basaltic parent rocks), slope, climate and useable lot area, (generally associated with surface waterways, particularly within the DWSCs in the Otway Ranges).

It is essential that the limitations of the data used to compile these maps are recognised when using the Sensitivity Analysis map. Whilst individual properties/parcels have been assigned a Sensitivity Rating, it is not sufficiently detailed to allow determination of individual system performance or land capability for individual properties/parcels. This is why the term Risk Assessment is used to describe the methodology and resultant outputs. An allotment categorised as having a Very High Sensitivity rating will not necessarily be totally unsuitable for on-site DWM or currently be experiencing poor system performance or system failure; however, it is likely to contain a number of significant limitations to the safe operation of on-site DWM systems assessed at a very broad scale.

Overall Sensitivity Ratings should be used to justify the requirement for more detailed individual property/parcel LCAs, more rigorous assessment of development proposals and to target investment in the inspection and management of existing on-site DWM systems, rather than to define system performance or land capability.

Furthermore, the degree of risk depends on the type of effluent disposal system and generated effluent quality (e.g. subsurface irrigation can be installed on slopes up to 15 – 20% in some cases, but this would be impractical for trenches). This relationship is detailed further in Section 6.2.5 of the Technical Document. Physical constraints can often be overcome or substantially mitigated by a range of measures (such as terracing, importing topsoil fill, installing stormwater diversions, removing vegetation or planting nutrient tolerant vegetation), thereby increasing the 'suitability' of the available area.

4.2 Land Capability Assessment (Stage 3)

A Land Capability Assessment (LCA) is required when submitting a Planning Permit application or when a Certificate to Install a DWM system is required. A LCA must be conducted in accordance with the minimum standards outlined in the current EPA Code of Practice and AS/NZS 1547:2012 and should be guided by the Victorian Model Land Capability Assessment Framework (MAV, 2014). A LCA needs to demonstrate that the requirements of the SEPP will be met.

The Sensitivity Rating determined by the Sensitivity Analysis will act as the default LCA standard for properties/parcels as defined by this DWMP. It is important to note that there may be circumstances where the desktop sensitivity analysis results do not correlate perfectly with actual site conditions. In these circumstances, an increase or decrease in the Sensitivity Rating and LCA requirements may occur at the discretion of Council through completing a Site Inspection and Field Investigation. Therefore, the results of site-specific LCAs will constantly update the Sensitivity Analysis database held by Council, which will improve site understanding and validity of results.

It may be suitable for accredited LCA assessors to provide a clause within the contract warning clients of a potential fluctuation of requirements, and hence cost, that is dependent on Sensitivity Rating confirmation of the property/parcel. The current EPA Code of Practice states that Council's Health Protection Officers (HPOs) or other Authorised Officers (AO) can determine what comprises a satisfactory LCA.

The MAV has developed a model LCA report and procedures to assist LCA assessors and regulators. As a minimum, LCAs should follow the 12-stage best practice model detailed within the current EPA Code of Practice and Victorian LCA Framework (MAV 2014). The specific LCA requirements for the determined Sensitivity Ratings (very high, high, moderate and low) are detailed below.

When completing a LCA, the results from LCA stages 1-3 must be confirmed with Council in order to assess the final Sensitivity Rating for the property/parcel and to confirm final LCA requirements for DWM system selection and design. A Site Plan showing the available effluent management area(s) must be provided, along with the Sensitivity Proforma Checklist (example shown below in Table 7), for Council assessment. A copy of the Sensitivity Proforma Checklist can also be found in Appendix B. Copies of the minimum requirements for assessment and reporting for each level of LCA are provided in Appendix C.

Table 7: Sensitivity Proforma Checklist Example

| Parameter | Site specific input |
|--|---|
| PFI Identification Number ² | (e.g. 5763482) |
| Property/Parcel Address | (e.g. 57 Main Road) |
| Locality | (e.g. Barongarook) |
| Zoning and Overlay | (e.g. Township Zone) |
| Area (ha) | (e.g. 4ha) |
| Soil Texture | Soil Category as per AS/NZS 1547:2012 (e.g. Category 4 - Clay loam) |
| Soil Depth (m) | Depth to limiting layer (1.7m) |
| Soil Structure | Weak, moderate, strong, massive or apedal (e.g. weak) |
| Soil Limitations | (e.g. sodic and low fertility) |
| Permeability (Ksat) (m/day) | Indicative as per AS/NZS 1547:2012 or directly measured in-situ (e.g. 0.1m/day) |
| Slope (%) | Average slope (e.g. 4%) |
| Presence of Surface Waters | Distance to nearest surface waters |
| Useable Lot Area (ha) | Apply all relevant setback distances (e.g. 1.5ha) |

With regards to DWM system selection and sizing, the hydraulic permeability and corresponding 'design' loading rate for the most limiting soil horizon within 1.2m of the soil surface must be used. This conservative approach ensures that the loading of wastewater on the soil can be supported for the entire soil profile to ensure that surface runoff and excessive deep drainage does not occur. The DWM systems should be sized either:

- as per the System Sizing Tables (Section 7 of the Technical Document) if permitted by this DWMP; or
- by site-specific design as detailed by the respective LCA requirements explained below.

4.2.1 Requirements for Low Sensitivity Properties/Parcels

For Low Sensitivity Rating properties/parcels, it is envisaged that a LCA will generally not be necessary, unless deemed so by Council staff. Applications for low sensitivity properties/parcels can be assessed using the Sensitivity Proforma Checklist (Table 7 and Appendix B) and/or the 'Site Information Sheet' template in Appendix D of AS1547:2012 to confirm and record the site and soil characteristics. If available for the location, the proposed treatment and land application system combination can be selected from the System Selection (Appendix A) and Sizing Tables (Locality Reports in Appendix B of the Technical Document).

Council may visit the site to confirm site and soil details are as per the Proforma detail and that the proposed DWM treatment and land application system is appropriate for the site. If a Low

² Either parcel or property identifier

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Sensitivity Rating property/parcel is located within a region of increased sensitivity or DWM constraint, Council staff may require, at their discretion, a Standard LCA Assessment and Report to be completed (Table C1, Appendix C). This may include properties/parcels that are located in areas prone to landslip, high groundwater regions, Groundwater Water Supply Protection Areas (i.e. Warrion), or Groundwater Management Areas.

For Low Sensitivity Rating properties/parcels located within a DWSC, a LCA is mandatory as per Section 3.6 of the EPA Code of Practice (2103); therefore, they are automatically required to complete a Standard LCA as detailed in Table C1, Appendix C.

For Moderate, High and Very High Risk properties/parcels, or other properties where Council has ordered that a LCA should be prepared, the following guidelines (or as amended) should be adhered to by the consultant preparing the LCA on behalf of the owner:

- EPA Code of Practice – On-site Wastewater Management, Publication 891.3 (2013);
- AS/NZS 1547:2012; and
- Municipal Association of Victoria – Model Land Capability Assessment Guideline (2014).

4.2.2 Requirements for Moderate Sensitivity Properties/Parcels

For Moderate Sensitivity Rating properties/parcels, a Standard LCA is required (Appendix C, Table C1) which includes Site Inspection and Field Investigations. However, where appropriate, system design can be determined using the System Selection (Appendix A) and Sizing Tables (Section 7 and the Locality Reports in Appendix B of the Technical Document).

A provision is made for Moderate sensitivity rating properties/parcels located within Climate Zone 4 (Otway Ridge region) that they must complete Section 6 'System Selection and Design' as per the Detailed LCA procedure, as site-specific design is required for system sizing. This is to ensure that the sensitivity of the Otways and increased difficulty in DWM design due to high rainfall is taken into consideration.

4.2.3 Requirements for High Sensitivity Properties/Parcels

For High Sensitivity Rating properties/parcels, a Detailed LCA is required (Appendix C, Table C2) which requires information in addition to the Standard LCA. The main requirement of a Detailed LCA is to undertake a monthly water balance for sizing the DWM system (Stage 6). More comprehensive soil testing is also required to assist with appropriate system selection and ensuring any necessary mitigation measures are implemented into the site management plan.

System Selection and Sizing Tables are not available for High Sensitivity Rating properties/parcels.

4.2.4 Requirements for Very High Sensitivity Properties/Parcels

For Very High Sensitivity Rating properties/parcels, a Comprehensive LCA is required (Appendix C, Table C3) which understandably requires a higher level of assessment and reporting due to the inherent constraints and risks associated with sustainable DWM on the property/parcel. A Comprehensive LCA requires in-situ permeability testing, viral die-off modelling, soil chemical analysis, conservative monthly or daily water balance, an annual nutrient balance and a detailed site specific hydraulic design in addition to the standard LCA requirements.

4.2.5 Generic LCA Requirements - Overlays

As detailed in Stage 1 of each LCA procedure (Appendix C), confirmation of any relevant sensitivity overlays (e.g. landslip) with Council is required. If any sensitivity is identified, this needs to be specifically addressed within the LCA. Discussion with Council is required to determine the necessary requirements to be met. If the site is located within an identified landslip region, then a geotechnical report (DWM relevant) will likely need to be completed; refer to Stage 4 [pp.34] of the EPA Code of Practice (2013) for detail.

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If the site is located within a known shallow groundwater region, the depth to (permanent and shallow) groundwater will need to be determined and discussed within the LCA report.

Additional LCA requirements:

- All Low Sensitivity Rating properties/parcels within a DWSC are required as a minimum to do a Standard LCA as per the current EPA Code of Practice requirements; and
- All properties/parcels located within Climate Zone 4, associated with the higher rainfall in the Otway Ridge (i.e. Lavers Hill, Fergusson and Beech Forest), are required to undertake site-specific design and cannot use the System Sizing Tables.

It should be noted that a LCA may indicate that it is not possible to design an appropriate DWM system for a given site and sometimes costs for construction may be prohibitive. However, the onus of justification rests with the LCA assessor who may demonstrate to Council/WC satisfaction that the risk from a proposed DWM system combination has been adequately addressed by design or management measures.

4.3 Sensitivity Analysis Summary

The recognised limitations emphasise that the Sensitivity Analysis should only be used as a guide to distinguish regions within the Shire with relatively higher levels of sensitivity to DWM related public and/or environmental health outcomes. The results can be used to target more detailed investigations into suitability for on-site DWM. The Sensitivity Analysis maps help to target the main bio-physical DWM constraints associated with a specific property/parcel which, with appropriate individual assessment and design, can potentially be mitigated or overcome.

Useable lot area, irrespective of total property/parcel size, plays a key role in determining a properties/parcels capacity for sustainable long-term on-site DWM and influences the selection of appropriate systems. As a general rule, the smaller the property/parcel, the less land that will be available for effluent management after allowing for other development of the land. It is difficult to define the minimum lot size that would be required throughout the Shire to ensure long-term on-site DWM without further detailed study. This will vary depending on the physical constraints of the property/parcel and the nature of the development as well as the type of treatment and land application system used.

The Minister for Water's Guideline 1 requires that the density of unsewered dwellings should be no greater than one dwelling per 40 hectares and each lot created in a subdivision should be at least 40 hectares in area within DWSCs. In order to allow for consideration of a relaxation of this Guideline, a LCA needs to demonstrate that DWM is sustainable with no off-property/parcel discharges and that the minimum zoning lot size requirements in the Planning Scheme are met. Further assessment on sustainable property/parcel densities within specific sub-catchments is required.

It is also evident that variability in constraint exists between the different unsewered localities within the Shire. Further detailed studies into the performance of existing on-site DWM systems within each of the targeted unsewered towns/settlements is recommended to verify the findings of this broad-scale assessment, to provide a more detailed study on maximum property/parcel development density and hence minimum lot size in proposed development areas. This will aid Council in ensuring future development will not adversely impact environmental and public health.

4.4 Prioritisation of Investigation Areas

A key role of the DWMP and Action Plan is to guide the systematic investigation and management of unsewered development within the Shire. Investigation may include:

- Improving and expanding the existing Council DWM database through inspection of undocumented properties;
- Focussing compliance and monitoring activities in areas where risk of adverse DWM outcomes (i.e. High/ Very High Sensitivity Rating properties/parcels) are concentrated;

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- Developing a greater understanding of the risks of increasing unsewered development density within an Area-of-Concern, which may be described at various scales (i.e. town/settlement, off-take, catchment area etc.); and
- Guiding strategic planning initiatives to enhance environmental objectives (i.e. water quality targets) or to examine alternative wastewater servicing solutions for unsewered areas.

It is not feasible to deal with the requirements of the entire Shire simultaneously so a process for ranking the priority of 'core' and 'non-core' Areas-of-Concern (AOCs) for investigation effort is required.

'Core' areas include the targeted towns/settlements (as agreed by the Stakeholder Working Group) and delineated sub-catchments within the DWSCs (following the methodology detailed in Section 7 in the Technical Document). 'Non-Core' areas comprise remaining areas within the Shire boundary (residual regions) which were assigned based on their geographic location (i.e. north or south). Prioritisation involved analysis at varying scales to address the variable goals of COS and the WCs.

Priority is based on the density of DWM sensitivity (Sensitivity Density) within each AOC. Sensitivity Density is reported as the aggregated DWM sensitivity (value) per unit area (km²). The methodology for calculating Sensitivity Density within each AOC is as follows:

- Delineate the AOC (i.e. town/settlement, sub-catchment or residual region);
- Confirm the number of unsewered properties/parcels within the AOC;
- Calculate the cumulative 'Sensitivity Value' for the investigation properties/parcels within the AOC (sum of all values);
- Calculate the cumulative area of the investigation properties/parcels within the AOC (sum of individual property/parcel areas);
- Calculate the DWM Sensitivity Density for each AOC (cumulative DWM 'Sensitivity' value per unit area - km²); and
- Assign the priority ranking of each AOC based on the assigned sensitivity density value.

Town/settlement priority is based on the 'DWM Sensitivity Density' of all unsewered properties/parcels within the delineated town/settlement boundaries. Sub-catchment priority reflects the 'DWM Sensitivity Density' for all unsewered properties/parcels within the designated sub-catchment, less the properties/parcels already included in the town/settlement analysis. This approach follows the intention of the *Guidelines for Planning Permits in Open Potable Water Supply Catchment Areas* (DSE, 2012) where any development proposal must demonstrate that "the proposal does not present an unacceptable risk to the quality and quantity of water generated by the catchment [all land uses] having regard to the land capability assessments, land condition and management conditions of the site and catchment". Properties/parcels that were located within more than one sub-catchment were included in both sub-catchments to ensure conservatism as it is unknown at a regional scale where the development, or potential, is located on the property/parcel.

To complete the picture for the Shire, those areas within the LGA boundary that have not been accounted for in the town/settlement or sub-catchment priority analyses are included as residual regions. These areas are outside of the DWSC boundaries to the north and south of the Shire.

The prioritisation will assist in decision making and planning for future development within the AOCs. Additional detailed analysis and compliance regimes can then be developed with the aim of protecting the environment and public health, whilst allowing for development consistent with Council strategies and planning controls.

Table 8 outlines the results and rankings of the Prioritisation Analysis for each AOC in descending order based on cumulative sensitivity to DWM.

Table 8: Prioritisation Summary

| Priority Ranking | Area of Concern (AOC) | Location/ Description | Unsewered Lots within AOC | Cumulative Sensitivity Rating | AOC area (km ²) | Sensitivity Density (per km ²) |
|------------------|---|--|---------------------------|-------------------------------|-----------------------------|--|
| Towns | | | | | | |
| 1 | Kennett River | Outside DWSC | 180 | 865 | 0.26 | 3,327 |
| 2 | Wye River and Separation Creek | Outside DWSC | 498 | 2,386 | 0.72 | 3,314 |
| 3 | Beech Forest | Within DWSC; Sub-catchments E, V and outside | 150 | 917 | 0.49 | 1,871 |
| 4 | Beeac | Outside DWSC | 269 | 1,008 | 0.63 | 1,600 |
| 5 | Lavers Hill | Within DWSC; Sub-catchments T and outside | 84 | 444 | 0.38 | 1,168 |
| 6 | Cororooke | Outside DWSC | 112 | 300 | 0.35 | 857 |
| 7 | Forrest | Outside DWSC; Sub-catchment N (slightly) | 167 | 522 | 0.72 | 725 |
| 8 | Barwon Downs | Within DWSC; Sub-catchments K, L and outside | 89 | 253 | 0.41 | 617 |
| 9 | Gellibrand | Within DWSC; Sub-catchments E, V and U | 71 | 250 | 0.45 | 556 |
| 10 | Alvie | Outside DWSC | 33 | 87 | 0.19 | 457 |
| 11 | Coragulac | Outside DWSC | 69 | 165 | 0.59 | 280 |
| 12 | Carlisle River | Within DWSC; Sub-catchments W and G | 26 | 70 | 0.27 | 258 |
| 13 | Kawarren | Within DWSC; Sub-catchment U | 72 | 225 | 2.01 | 112 |
| 14 | Barongarook Settlement | Within DWSC; Sub-catchments Q and P | 101 | 251 | 2.99 | 84 |
| 15 | Barham River Catchment Settlement | Within DWSC; Sub-Catchments D and S | 81 | 316 | 18.08 | 17 |
| SUB-CATCHMENTS | | | | | | |
| 1 | B - West Gellibrand River | Offtake | 2 | 7.2 | 0.03 | 240 |
| 2 | O - Gellibrand River | Discharge | 115 | 362.2 | 43.67 | 98.7 |
| 3 | W - to Carlisle River | Discharge | 129 | 488.1 | 46.88 | 70.9 |
| 4 | H - East Barwon Diversion Gates | Offtake | 35 | 145 | 3.83 | 37.9 |
| 5 | M - to King Creek | Discharge | 19 | 66.8 | 2.84 | 23.5 |
| 6 | F - WyeLangta Depot and North Arkins Creek | Offtake | 16 | 62.6 | 2.76 | 22.7 |
| 7 | N - to Barwon River West Branch | Discharge | 58 | 256.4 | 12.47 | 20.6 |
| 8 | L - to Callahan Creek North Branch | Discharge | 31 | 97.2 | 5.06 | 19.2 |
| 9 | K - to Dewings Creek (Murdie Boluc Inlet Channel) | Discharge | 44 | 134.7 | 9.61 | 14 |
| 10 | E - Gellibrand Pump Station | Offtake | 119 | 463.8 | 33.56 | 13.8 |
| 11 | V - to Gellibrand River and Charleys Creek | Discharge | 242 | 887.8 | 65.18 | 13.6 |
| 12 | T - to Chappell Creek and Gellibrand River | Discharge | 204 | 845.4 | 67.83 | 12.5 |
| 13 | X - to Gellibrand River (near Sheepyard Creek) | Discharge | 67 | 248.4 | 23.42 | 10.6 |
| 14 | R - to Deans Creek | Discharge | 43 | 107 | 10.7 | 10 |
| 15 | I - Callahans Creek | Offtake | 1 | 4.2 | 0.43 | 9.8 |
| 16 | P - Boundary Creek | Discharge | 171 | 386.7 | 40.18 | 9.6 |
| 17 | G - North Otway River Raw WPS | Offtake | 29 | 93.5 | 9.89 | 9.5 |
| 18 | Q - to Barongarook Creek | Discharge | 109 | 283.7 | 31.81 | 8.9 |
| 19 | J - to Matthews Creek (to the north) | Discharge | 57 | 151.6 | 24.27 | 6.2 |
| 20 | D - Barham River Pump Station 2 | Offtake | 7 | 23.7 | 3.85 | 6.2 |
| 21 | S - to Barham River West Branch | Discharge | 7 | 24.4 | 4.33 | 5.6 |
| 22 | U - to Love Creek | Discharge | 228 | 690.6 | 60.31 | 1.5 |
| 23 | A - Olangolah | Offtake | 0 | 0 | 0 | 0 |
| 24 | C - Barham River Pump Station 1 | Offtake | 0 | 0 | 0 | 0 |
| Residual Regions | | | | | | |
| 1 | Southern | Residual area outside DWSC | 1,018 | 3,782 | 255.6 | 14.8 |
| 2 | Northern | Residual area outside DWSC | 4,049 | 8,780 | 1,597.50 | 5.5 |

4.5 Cumulative Impact Assessment of DWM

Cumulative Impact Assessment (CIA) is an indicative risk assessment tool used to provide guidance on potential risks associated with existing or proposed development in unsewered areas. It provides a means of quantifying risks and comparing them with identified benchmarks (i.e. baseline or pre-developed conditions) or performance targets (i.e. water quality indicators). The CIA looks at existing DWM systems within an area and determines the environmental and health impacts that could occur from changes in DWM management (i.e. compliance monitoring), increasing density of DWM systems (i.e. development) or other improvements (i.e. DWM system upgrades).

Example1: CIA would allow Council to test the benefits of implementing a targeted (DWM) improvement program in an AOC (e.g. town/settlement).

Following site inspection (see Section 7.4.2 of this Plan), Council would analyse the combined outcome of DWM sensitivity and (DWM) system combination for each property/parcel in the AOC using the procedure described in Section 4.5.1.1 (below). The derived value combinations for each property/parcel would then be inserted into a Cumulative Risk Analysis matrix (see Figure 5) to determine the underlying DWM 'Risk Profile' for the AOC.

Quantification of this 'baseline' dataset would then allow Council to examine the sensitivity of the 'cumulative risk' of the AOC to alternate improvement scenarios (i.e. householder education, increased monitoring effort, voluntary system upgrades etc.) and test the benefits of each approach using only desktop investigation tools.

The Minister for Water's Guidelines state that a DWMP must provide a strategy to prevent both individual and cumulative impacts on groundwater and surface water beneficial uses and to also prevent discharge of wastewater off-lot.

Further, the EPA Code of Practice (Section 1.6) states:

*"While this Code primarily refers to single allotments, the **cumulative impact of all wastewaters within a subdivision, a commercial precinct or a township should be taken into account when assessing the capability of a lot to absorb treated effluent without negatively impacting its surroundings.** This is particularly important in areas scheduled as open potable water supply catchments (DSE 2012).*

To minimise the cumulative impact of wastewater, effluent must be contained onsite within the boundaries of the allotment. This aims to prevent the transport of nutrients, pathogens and other pollutants to surface waters and to prevent any negative impacts on 'groundwater beneficial uses' within the catchment (Clause 32, SEPP WoV 2003; SEPP GoV 1997).

*For existing **premises with an offsite discharge or a failing system on a small block the wastewater management system should be upgraded to contain as much of the effluent as possible on the allotment**".*

There is no pro-forma methodology for completing CIA for DWM. It is possible to use extensive modelling of DWM system performance and catchment run-off and pollutant characteristics to estimate the potential human health and environmental impacts of multiple DWM systems. However, the level of detail and complexity can be varied to reflect the potential risk (a function of the likelihood and/or consequence of failure) a specific proposal poses to human and ecosystem health.

This DWMP proposes a semi-quantitative approach using the outcomes of the Sensitivity Analysis, (DWM) system detail and compliance/performance information to develop an adaptable DWM 'Cumulative Risk' procedure.

The following sections detail a methodology to develop procedural and management systems within and throughout the DWMP implementation process that will allow for integration of strategic information (i.e. planning schemes or proposals), generated data (i.e. DWM Sensitivity Analysis) and collected data (e.g. water quality, system inspection information) into a usable risk assessment tool.

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It is acknowledged that this type of procedure is “aspirational” in nature and should be considered an **OPTIONAL** component of the DWMP. However, this limitation should not detract from the consideration and value of such an undertaking. Risk Assessment is a two-dimensional analysis that reflects not only the consequence of an event or action (DWM Sensitivity Analysis), but also the ‘likelihood’ of that event/action occurring. The proposed ‘Cumulative Risk’ procedure provides a flexible (semi-qualitative) approach to measuring the likelihood of an adverse (DWM-related) event in an AOC. This attribute is referred to as the ‘Impact Probability’ rating hereafter in this document.

4.5.1 Development Assessment Procedure (Stage 4)

Stage 4 of the Risk Assessment Framework is a ‘procedural’ step for determining the need for further investigation and analysis.

Proposals for development exempt from planning permit requirements (e.g. dwelling in Township Zone that is not covered by any overlays) will proceed directly to the preparation of a LCA as per the requirements set out in Section 4.2 of this document.

Development and planning proposals for properties/parcels located within the DWSC must comply with the minimum lot size specified for the current zoning as per the Planning Scheme. If a property/parcel does not achieve the minimum area, then it is deemed as non-compliant with the Minister for Water’s Guidelines. Assuming the proposal is compliant with minimum lot size criteria, COS or the WCs may consider proceeding to the (Stage 5) Cumulative Risk procedure to develop a baseline condition by which the proposal may be assessed.

Finally, irrespective of where or how development will proceed within COS, Council may consider examining the ‘Cumulative Risk’ of all unsewered development areas using the proposed methodology as part of a longer term goal for managing domestic wastewater systems in the Shire.

4.5.2 Cumulative Risk Analysis (Stage 5)

The potential for DWM systems to result in consequential degradation of both surface water and groundwater resources depends on the nature of the discharge (i.e. surface or subsurface) and the capacity of the property/parcel to assimilate the effluent and attenuate associated pollutants such as nitrogen, phosphorous and pathogens. System age, selection, sizing and design, as well as correct operation and maintenance, also contribute to the potential under-performance³ of a DWM system.

Programs need to be put in place to minimise DWM system under-performance and to rapidly identify and address events when they occur. The following methodology assesses the cumulative impact of DWM systems on environmental and public health by comparing the probability of DWM system under-performance with the ability to contain DWM on-site (Sensitivity Rating).

As part of Council’s compliance monitoring system, detailed in Section 7, a database of DWM system information will be constantly updated and managed to assess the current situation and prioritise improvements or upgrades. From knowing details about a particular DWM system, the probability of under-performance can be estimated. Key DWM system attributes used to estimate the probability of system under-performance are:

- The treatment system (e.g. septic tank) and land application system (e.g. leach drain) combination in operation;
- The expected wastewater volume (loading) treated by the DWM system; and
- The system’s age and assumptions about the effluent quality proposed/likely to be produced.

³ Identified deficiency (management, structural or operational) leading to actual or potential off-site discharge of untreated or poorly treated (DWM) effluent in such a manner or quantity that it may cause consequential impact to off-site environmental resources (water quality) or public health outcomes.

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The probability of under-performance of a DWM system is based on its degree of potential to cause environmental or public health impacts. Figure 4 (following) presents an 'Impact Probability' matrix based on the attributes previously described. The rating is presented on a scale of one to five representing recently constructed, heavily designed or highly managed systems (e.g. publicly managed community systems) at the lower end of the scale (1) through to ageing, outdated and non-managed systems (e.g. split black/grey water systems) at the other (5).

Example 2: A domestic all-waste system, such as an AWTs (with disinfection), discharging to an irrigation land application area. If the system was installed within the last 5 years it would be expected to hold a current EPA Certificate of Approval and be capable of reliably achieving secondary effluent quality standards. The land application area would be expected to have been designed, sized and located according to current best-practice procedure (i.e. EPA Code of Practice), with irrigation by way of subsurface or covered drip application. This system would be expected to be managed by contractual arrangement with a qualified system maintainer, with regular reporting to Council. The likely 'Impact Probability' rating for this system would be:

(2) Low-Moderate probability that hydraulic (surface/subsurface), organic and nutrient safeguards (design, performance, mitigation) may not be sufficient to prevent consequential impact to off-site environmental resources (water quality) or public health outcomes. .

If the same system was >10 years old, the AWTs may no longer hold an EPA Certificate of Approval (or may no longer be manufacturer supported). The technology/design of the system may not be able to reliably achieve secondary effluent quality standards and may not include disinfection. The land application area would likely have been designed, sized and located according to outdated procedures, with irrigation by way of surface (i.e. sprinkler type) application. There is a reduced likelihood that this system would be managed by contractual arrangement with a qualified system maintainer. The likely 'Impact Probability' rating for this system would be:

(5) High probability that hydraulic (surface/subsurface), organic and nutrient safeguards (design, performance, mitigation) may not be sufficient to prevent consequential impact to off-site environmental resources (water quality) or public health outcomes.

The extent and resultant impact of DWM system under-performance varies greatly, and the consequences for water quality will depend primarily on the degree and spatial density of events in the AOC. Under some conditions, even when a DWM system under-performs, effluent will still be retained on-lot. However, in other circumstances, DWM system under-performance may be minor but may quickly enter a sensitive environment (e.g. creek) and cause detrimental effects.

Therefore, it is important to determine the particular sensitivity of each AOC. In some cases (i.e. highly developed or degraded areas) the 'tolerable' level of DWM system under-performance may be greater than expected in an AOC of greater resource value (i.e. DWSC). The tolerance level will vary between AOC's due to the wide range in environment dynamics, system combinations and sensitivities.

The key objective being determined by the SEPP requirements of "On-site domestic wastewater needs to be managed to prevent the transport of nutrients, pathogens and other pollutants to surface waters and to prevent any impacts on [water/groundwater] beneficial uses". Beneficial use being defined as "a use of the environment which is conducive to public benefit, welfare, safety, health or aesthetic enjoyment and which requires protection from the effects of waste discharges".

The beneficial uses relating to this DWMP, and also Colac Otway Shire generally (including DWSCs), include:

- water suitable for human consumption;
- water based recreation;
- water suitable for agriculture;

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- aquatic ecosystems; and
- water suitable for the consumption of aquatic organisms (e.g. fish).

The *Policy Impact Assessment* (PIA) for the SEPP (WoV), prepared by the EPA (2003), describes how setting targets to measure the environmental quality of waterways should aim to drive continuous improvement (Section 6.4 Policy Purpose), stating that:

“This guidance helps [these] organisations understand what they need to do to improve environmental quality and protect beneficial uses. The goals provide some specific areas of focus for the next 10 years, to ensure that actions important to protect beneficial uses are implemented. This does not mean however that all environmental quality objectives need to be attained or actions fully implemented within that timeframe, but that progressive improvement is made towards their attainment. Therefore, actions in the attainment program need to be implemented in a priority-driven and practicable manner”.

It is particularly important within DWSCs to ensure that the quality of the resources is maintained; therefore, the overall cumulative impact on a sub-catchment should be assessed to ascertain particular risks and implement correct operational and management procedures to reduce any potential risks.

4.5.2.1 Pilot Study (Separation Creek)

To demonstrate the benefit and applicability of the CIA approach to DWM system management in COS, a small ‘pilot’ study was conducted for the Separation Creek town (AOC). Council holds a substantial database of DWM system records for the coastal towns of Wye River and Separation Creek and a number of other environmental and water quality investigations have been prepared for the area in recent years.

The Separation Creek (DWM) data set was analysed and interpreted to determine Impact Probability ratings for each of the 123 unsewered properties/parcels identified within the town boundary. Using the methodology described previously, these values were then correlated with the corresponding Sensitivity Ratings for each property/parcel using a ‘Cumulative Risk Analysis’ matrix. A copy of the matrix prepared for the pilot study is provided as Figure 5.

As shown, the underlying **Risk Profile** for Separation Creek is ‘High-Very High’ based on existing information. Where available information on system type/age/performance has been limited, the analysis has taken a conservative ‘worst-case’ approach. The data set would be improved based on site-specific investigation and compliance monitoring as part of the DWMP implementation. Where ‘0’ values are recorded, the property/parcel has been identified as ‘vacant’.

The pilot study has shown the use of the CIA procedure is a useful component of a holistic assessment of DWM risk within the Shire. Using the existing situation (baseline condition) as a starting point, Council is able to compare and contrast a range of options to address DWM impacts from the town. Changes from baseline condition can be confirmed by follow up investigations of environmental/water quality or other indicator targets (as defined).

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| | | System Age | | | Unknown |
|---|-----------|---|--|--|--|
| | | < 5years | 5-10 years | > 10 years | Unknown |
| System Combination | | The asset system /land application combination designed, sized and treated according to current best practice (COP or similar). Both hydraulic and nutrient loading considered in land application using current technology. Current VMC Certificate of Approval. Contravention maintenance arrangement in place (secondary effluent standard or better). Infrastructure (tanks, pipes, pumps etc.) fitted and reported and expected to be in 'near new' condition. | Treatment system /land application combination may be designed, sized and located according to superseded standards. Nutrient loading may only be considered in land application sizing. Treatment system may no longer hold current VMC Certificate of Approval. Contravention maintenance arrangement may be in place (secondary effluent standard or better). Infrastructure (tanks, pipes, pumps etc.) generally localisable and may contain non-visible, unidentified or unreported damage. | Treatment system /land application combination likely designed, sized and located according to outdated standards. Nutrient loading may only be considered in land application sizing. Treatment system may no longer hold current VMC Certificate of Approval. Contravention maintenance arrangement may not be included (secondary effluent standard or better). Infrastructure (tanks, pipes, pumps etc.) location may be unknown and likely to contain non-visible, unidentified or unreported damage. | System details not available or confirmed. Assumes worst-case environmental/public health risk outcome until determined otherwise. |
| | Split | Split waste system. Rawwaste septic tank followed by subsurface disposal (trench or pipe). Greywater discharge typically to stormwater system (may include sand filter treatment prior) or uncontrolled discharge. | 5 | 5 | 5 |
| | Primary | All waste system (black/greywater). Treatment in septic tank, composting/aerobic culture system (or similar) to primary effluent standard, followed by discharge to subsurface trench/bed or LFED (below ground application). | 4 | 4.5 | 5 |
| | Secondary | All waste system (black/greywater). Treatment in AWTs, membrane and/or biological or media filter system to secondary effluent standard (including disinfection), followed by discharge to subsurface or surface land application. | 3 | 4 | 4 |
| | Tertiary | All waste system (black/greywater). Treatment in secondary treatment system (as above) plus demonstrably achieving advanced secondary effluent standard (including nutrient removal) suitable for high-quality uses (surface / subsurface landscape irrigation). | 2 | 3 | 3.5 |
| Domestic System - single-residential dwelling or equivalent (<2,000L/day) | | | | | |
| | Primary | All waste system (black/greywater). Treatment in single or multiple septic tank(s), composting/aerobic culture system (or similar) to primary effluent standard, followed by discharge to subsurface trench/bed or LFED (below ground application). | 3 | 4 | 5 |
| | Secondary | All waste system (black/greywater). Treatment in commercial AWTs, membrane and/or biological or media filter system to secondary effluent standard (including disinfection), followed by discharge to subsurface or surface land application. | 2 | 3 | 4 |
| | Tertiary | All waste system (black/greywater). Treatment in secondary treatment system (as above) plus demonstrably achieving advanced secondary effluent standard (including disinfection and/or nutrient removal) suitable for high-quality uses (surface / subsurface landscape irrigation). | 1 | 2 | 3 |
| Commercial System - large scale (>2,000 L/day) systems managing combined wastewater from multiple dwellings or non-residential landuses | | | | | |
| | Primary | All waste system (black/greywater). Treatment in single or multiple septic tank(s), composting/aerobic culture system (or similar) to primary effluent standard, followed by discharge to subsurface trench/bed or LFED (below ground application). | 3 | 4 | 5 |
| | Secondary | All waste system (black/greywater). Treatment in commercial AWTs, membrane and/or biological or media filter system to secondary effluent standard (including disinfection), followed by discharge to subsurface or surface land application. | 2 | 3 | 4 |
| Community System - reticulated sewer, STEP/STEG, low-pressure/vacuum sewer or similar | | | | | |
| | Variable | Decentralised collection/treatment/land application system(s) servicing multiple dwellings, properties and/or landuses. May include local collection/treatment for local infrastructure and remote land application options. Centralised management by Water Authority or contracted entity. | 1 | 1 | 2 |

- 5
- High probability that hydraulic (surface/subsurface), organic and nutrient safeguards (design, performance, mitigation) may not be sufficient to prevent consequential impact to off-site environmental resources (water quality) or public health outcomes.
- 4
- Moderate-High probability that hydraulic (surface/subsurface), organic and nutrient safeguards (design, performance, mitigation) may not be sufficient to prevent consequential impact to off-site environmental resources (water quality) or public health outcomes.
- 3
- Moderate probability that hydraulic (surface/subsurface), organic and nutrient safeguards (design, performance, mitigation) may not be sufficient to prevent consequential impact to off-site environmental resources (water quality) or public health outcomes.
- 2
- Low-Moderate probability that hydraulic (surface/subsurface), organic and nutrient safeguards (design, performance, mitigation) may not be sufficient to prevent consequential impact to off-site environmental resources (water quality) or public health outcomes.
- 1
- Low probability that hydraulic (surface/subsurface), organic and nutrient safeguards (design, performance, mitigation) may not be sufficient to prevent consequential impact to off-site environmental resources (water quality) or public health outcomes.
- User Defined
- User* may interpret matrix based on individual site or system characteristics and present (decimal) value within assigned range (qualitative assessment).

Figure 4: DWM Impact Probability Matrix

Whitehead & Associates Environmental Consultants

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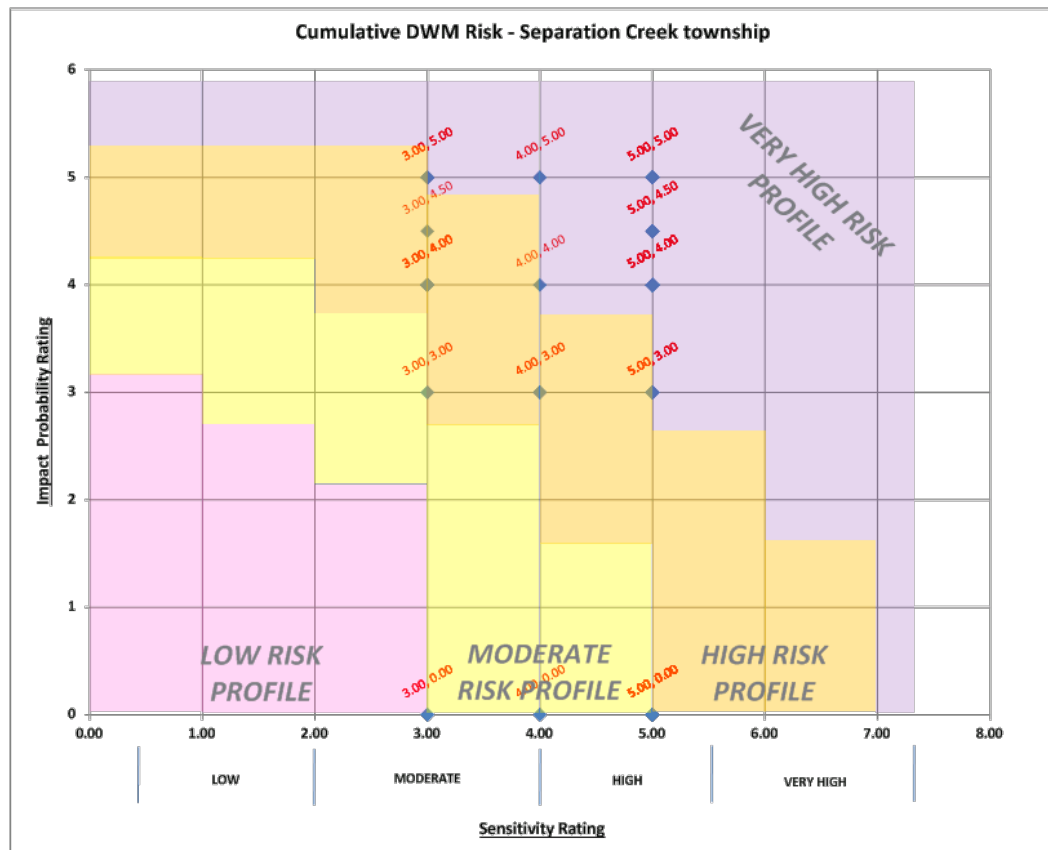


Figure 5: Cumulative Risk Analysis (Matrix)

4.6 Limitations of the Risk Assessment Framework

There are several limitations inherent in the methodology adopted to assess the variation in on-site domestic wastewater related sensitivity throughout the Shire. Briefly, these are due to:

- The use of broad-scale mapping and desktop analysis, with only limited field-truthing of physical attributes;
- A lack of digital data in some areas;
- The present level of scientific understanding and uncertainties relating to the physical and chemical processes and their implications for sustainable on-site DWM. Current best practice derived from wide experience in Australia, New Zealand and the United States was used in this assessment;
- The limited availability, quality and accuracy of attribute data; and
- Limitations in the method of assessing the inter-relationship and cumulative effect of individual attributes and constraints.

The recognised limitations emphasise that the Sensitivity Analysis mapping should only be used as a preliminary attempt to distinguish regions within the Shire with relatively higher levels of risk to public and/or environmental health and with the objective of determining preliminary priority for future wastewater servicing. The Sensitivity Analysis can be used to target more detailed investigations into suitability for on-site DWM as detailed in Section 4.5.2.

5 Development Planning and Assessment

5.1 Assessment of DWM Proposals

Council's procedures for assessing DWM proposals are detailed in Sections 4, 6 and 7 of this Operational Plan. All DWM proposals must be submitted to Council with a 'Permit to Install' application form for the proposed treatment and land application systems. DWM proposals in defined Water Supply Protection Areas will be referred to the relevant Water Corporation (and other agencies, as required). The Action Plan (Action No. 1) includes a review and finalisation of Council procedures for the assessment of DWM proposals.

A LCA will not be necessary for Low Sensitivity properties outside of DWSCs (as identified by the Sensitivity Analysis mapping), unless Council considers it is necessary due to site-specific factors. The minimum Sizing Tables (in the Locality Reports in Appendix B of the Technical Document) will be appropriate for Low and Moderate Risk properties outside of the DWSCs and not within Climate Zone 4 (unless otherwise determined by Council). LCAs and detailed designs will be required for all properties/parcels located within DWSCs and all High and Very High Sensitivity Rating properties/parcels (and any other property/parcel as determined by Council).

Records of development and rezoning applications in unsewered localities provides useful data about development pressures across the Shire and can be used to inform strategic land use and development planning decisions in the unsewered towns/settlements and their surrounds.

5.2 Development Potential in Unsewered Localities

The Colac Otway Shire Rural Living Strategy (2011) investigated existing localities for their future development potential. It identified 'moderate' development potential in Forrest, Beeac, Alvie, Cororooke (apart from Langdons Lane), and Coragulac (all of which are located outside of DWSCs). Detailed assessments and maps of each of these towns/settlements (which include the surrounding locality area) are provided in the Locality Reports in Appendix B of the Technical Document. The results of the Sensitivity Analysis mapping indicate that these localities are generally of Low to Moderate Sensitivity for DWM and therefore could support further expansion with appropriate planning. Obviously other factors such as bushfire implications would also have to be considered.

The Rural Living Strategy (2011) identified Gellibrand, Lavers Hill and Beech Forest as having 'deferred' growth potential, dependent on water catchment constraints and bushfire hazard being satisfactorily addressed. Detailed assessments and maps of each of these localities (including the towns/settlements) are provided in the Locality Reports in Appendix B of the Technical Document. The results of the Sensitivity Analysis mapping indicate that of these three localities, Gellibrand has the most development potential, with a higher proportion of Low and Moderate Sensitivity across the broader locality area compared to Lavers Hill and Beech Forest. This is primarily due to higher rainfall and typically steeper slopes in Lavers Hill and Beech Forest compared to Gellibrand. However, where the long-term sustainability of proposed DWM systems can be supported by appropriately detailed LCA and DWM system design, expansion of these towns is not precluded by the Sensitivity Analysis mapping.

5.3 Minimum Lot Size for New Developments

The Sensitivity Analysis mapping will assist Council in planning for future development and determining minimum lot sizes for future subdivisions. The assessment of a site for wastewater management potential is important as it can assist in understanding the site's potential for development. Historically, wastewater management was overlooked in early planning stages and it has resulted in a number of subdivided parcels within towns and low density residential areas (i.e. settlements) being significantly undersized. Due to small lot size, these parcels have been given a High Sensitivity Rating in the Sensitivity Analysis and generally wastewater management on these parcels is constrained and potentially unsustainable. This does not automatically preclude them from development; however, appropriately detailed LCA and

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design will be required to the satisfaction of Council and other stakeholders, including the relevant Water Corporation (in accordance with the Sensitivity Rating). Where DWM is not supported on small properties/parcels, consolidation with adjacent undeveloped properties/parcels (where feasible) is the most likely pathway to allowing development proposals to be considered on the land subject to appropriate zoning of the properties/parcels in question, and approval by Council and other relevant stakeholders. Such approval will also take into account other planning controls relating to the land.

Where rezoning of land is being considered or Structure Plans are being developed, Council can use the Sensitivity Analysis to determine suitable development potential and density. The results of the Sensitivity Analysis mapping and DWM system inspections carried out in September 2014, support a general minimum lot size of 0.4ha (4,000m²), assuming that there is adequate 'useable' land for DWM, including a sustainable effluent disposal or reuse system contained entirely within the property/parcel boundary. This minimum lot size is a broad guideline only; detailed LCAs must be carried out for all subdivision and single-lot developments within all DWSCs.

Constrained properties, such as those with steep slopes, very shallow soils or in close proximity to surface waters or groundwater bores, will need to demonstrate that they have adequate available land for the sustainable application of treated effluent. 0.4ha may be too small in such instances; however, innovative building design and lot layout can mitigate constraints on previously undeveloped or redevelopment sites.

5.4 Stormwater Management

The field investigations in September 2014 identified stagnant stormwater in road drains in towns/settlements following wet weather, which was exacerbated by the inflow of greywater directly discharged from properties. Improvements to street drainage can be investigated on a needs basis for towns/settlements following the incremental upgrading and/or replacement of DWMs in towns/settlements. However, generally speaking, there is no urgency to upgrade street drains or improve street drainage while greywater connections to street drains persist. Where greywater is found to be discharging to stormwater drains during onsite system audits, upgrade works will be required to the discretion of Council to redirect greywater to the onsite wastewater system and land application area. The progressive upgrade of stormwater drains will improve stormwater drainage in the Shire and would require discussions between the relevant Council departments and fall under the Colac Otway Shire Stormwater Management Plan (2002).

6 Effective DWM System Design, Approval, Installation and Operation

This section broadly describes how planning and operation of DWM systems should be carried out by owners in unsewered localities of the Shire, with reference to the Sensitivity Analysis and Risk Assessment Framework described in detail in the Technical Document. The level of detail required to support a proposal for DWM on an unsewered property/parcel is outlined in the relevant LCA, which reflects the properties/parcels Sensitivity Rating.

6.1 Council's Responsibilities

Council is responsible for issuing permits for new and altered DWM systems under the *Environment Protection Act 1970*. Council is also responsible for the management of all DWM systems within the Shire; this includes the inspection of existing systems and ensuring compliance with Council, EPA and legislative requirements (including the *Health and Wellbeing Act 2008*). Council will update and prepare procedures (Refer to the Action Plan in Section 13: Action No. 10) in line with the relevant requirements. The legal requirements of Council include (but are not limited to):

- Application for a 'Permit to Install/Alter' must be completed by the owner/builder/installer and submitted to Council for assessment;
- The system must comply with current Standards and the current EPA Code of Practice;
- Council must issue a 'Permit to Install/Alter' before a DWM system can be installed;
- A Council officer assesses the application and plans and conducts site inspections. Further information may be requested from the applicant;
- Council issues a 'Permit to Install' with approved plans and conditions or refuses application;
- The system must comply with permit conditions and its relevant EPA Certificate of Approval. As detailed in Section 3.2.2 of the Technical Document, the EPA will only issue Certificates of Approval for *types* of systems (i.e. AWTs) from January 2016, pending review;
- The system is inspected by a Council officer during installation;
- Council must issue a 'Permit of Use' before the DWM system can be used;
- Council can issue fines to a system owner if an installation permit is not complied with; and
- Council can issue a Prohibition Notice and/or an Improvement Notice to the owner of a DWM system, to ensure the system ceases to operate and/or is upgraded to appropriately reduce the risk of human or environmental health impacts.

Inspection staff may inspect the site of a proposed DWM system at multiple stages during the assessment and installation process, as determined on a case-by-case basis. Key site inspection milestones can include (but are not limited to):

1. Pre-installation site inspection to ensure the site is suitable for the proposed DWM system (i.e. ground-truthing of the Land Capability Assessment);
2. Inspection during the installation stage, before excavations are back-filled (i.e. trenches are open and the wastewater treatment system has been installed but not backfilled, and not yet turned on), to ensure the system has been installed correctly; and
3. A post-installation inspection to ensure that the installation is complete and that the system is operating correctly.

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The number of inspections carried out must be weighed against the available resources (staff time) to carry out the inspections. Low risk sites may require just one inspection, whereas high risk sites may require three or more inspections, depending on the circumstances of each proposal.

Upgrade options for non-compliant systems are discussed in further detail in Section 8.

6.2 Owners' Responsibilities

The owners and residents (i.e. tenants) of unsewered dwellings and commercial operations have primary responsibility for the operation and maintenance of the DWM system. In accordance with the EPA Code of Practice, owners and occupiers must ensure that the DWM system is operated, maintained and monitored in accordance with Council requirements. This requires a proactive approach from owners and residents to (as a minimum):

- familiarise themselves with the type of system (treatment and land application components);
- identify the location of all system components on the site;
- regularly inspect their system for any signs of problems;
- regularly maintain their system to prevent problems from occurring (or worsening);
- follow any instructions issued by Council pertaining to their system; and
- to upgrade or replace their system where insurmountable problems are occurring.

Details on appropriate DWM system maintenance are provided in Section 6.5 and Section 8 of this Operational Plan. Details on options for upgrading and replacing DWM systems are provided in Section 8 of this Operational Plan. Objectives to achieve better DWM system management by owners and residents are included in the Action Plan in Section 13.

6.3 LCA Assessor/System Designer's Responsibilities

The professional engaged to undertake the LCA and the DWM system design has a responsibility to prepare a site-specific DWM design and supporting documentation that demonstrates that the requirements of the SEPP will be met. In addition, the assessor/designer is required to undertake the level of investigation and reporting appropriate to the Sensitivity Rating applied to the property/parcel, as prescribed in Appendix C: Land Capability Assessment Checklists. The following sections provide general advice on design, installation and maintenance of DWM systems, that applies to all unsewered properties in the Shire.

6.4 DWM System Design

6.4.1 Treatment Systems

Where a new system or major upgrade works are proposed in COS, the system must comply with the current Standards and Code of Practice. Where an existing system is operating effectively but does not comply with the current EPA Code of Practice or Standards, the system will be monitored; however, unless a failure occurs, the owner will not be required to upgrade or replace the system.

Appendix C of the EPA Code of Practice (2013) provides useful guidance on factors to consider when selecting an EPA-approved DWM system. Site constraints (including for effluent disposal or reuse) are a major factor when deciding on a treatment system.

For the installation of new proprietary treatment systems, the selected system must have current accreditation by the EPA. Custom-design treatment systems (e.g. sand filters only) must be designed in accordance with the following:

- EPA Certificate of Approval for Sand Filters No. 1.3/03 (2003); and

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- EPA Publication No. 500: Code of Practice for Small Wastewater Treatment Plants (1997).

In addition, the South Australian Department of Health Septic Tank Standard Supplement A: Aerobic Sand Filters (1995) provides useful and detailed information on the design, installation and operation of sand filter systems.

6.4.2 Land Application Systems

The key issues that influence the selection and design of land application systems (domestic or commercial) are:

- The level of treatment of the effluent (primary, secondary or advanced secondary);
- Soil characteristics (particularly texture, structure, depth, dispersibility and phosphorus adsorption capacity);
- Site characteristics (particularly slope, aspect and shading); and
- Proximity to sensitive receiving environments (such as surface waters and groundwater).

The degree of constraint for sustainable land application of effluent can be a major factor in selecting a treatment system.

The design of the land application system must be carried out consistently with the two guidelines cited in 6.4.1 above, as well as the *Australian Standard 1547:2012*.

It is preferable to design the land application area based on both a water and nutrient balance (as described in the MAV Model LCA, 2014); however, the level of detail required depends on the risk category of the property/parcel and any other factors as determined by Council and/or the LCA assessor. For Low and Moderate Risk properties, the standard Sizing Tables (Appendix B of the Technical Document) may be used to determine the minimum area for the chosen land application system, based on climate and soils.

There are various options to mitigate constrained sites. For example, it may be appropriate to import lighter-textured topsoil (to appropriate depths) to the land application area in order to increase the DLR/DIR and thereby reduce the minimum required area of the system.

The Sizing Tables for each system type were created using monthly average water balances, using methods described in MAV Model LCA, 2014. Further details are provided in Appendix B of the Technical Document.

6.5 Installation

Often system failures will occur as a result of poor installation practices. The installation of DWM systems must be undertaken by a licensed plumber or system installer who is familiar with the requirements of Council, the Guidelines and Standards, and has experience in installing DWM systems. Issues such as poor drainage around tanks and uneven distribution of effluent throughout trenches or irrigation systems can all result in effluent ponding, runoff or impacts on human and environmental health which can easily be avoided.

6.6 Maintenance

For a system to operate and perform as it was designed, the system must be installed in accordance with the manufacturer's requirements and regular maintenance must be undertaken in accordance with the maintenance procedures outlined in Section 8.2 of this Operational Plan.

By undertaking these regular maintenance tasks a system can operate effectively without major problems; however, a lack of care for any one, or all, of these items can result in system failures.

Secondary treatment systems such as Aerated Wastewater Treatment Systems (AWTS) rely on primary treatment as well as the addition of oxygen for the aerobic breakdown of organic matter by aerobic microbes in a secondary stage which is generally followed by disinfection, usually by

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chlorine. If there has been poor primary treatment of effluent, it can be detrimental to the secondary treatment process and most commonly disinfection will not be effective. These systems require regular maintenance and monitoring by a qualified service agent in accordance with specific EPA Certificates of Approval.

7 Compliance Monitoring

7.1 Record Keeping

Electronic database records of applications and permits for DWM systems in the Shire date back to 2002 and hardcopies to the 1970s. The current record system for DWM system applications and permits is as follows:

- Application and permits are electronically registered in the Health Protection Unit's database. Details of the type of system, the permit conditions, the issue dates and the inspection results are kept on the database. This register dates back to 2002. The electronic database is linked to Council's main property/parcel database which allows for the effective integration and recovery of information.
- Hard copy records of plans, permits and inspections notes are kept on the relevant property/parcel files. It is thought that information should be available for most of the DWM systems that have been installed since 1970 (and all since 2002).
- Hard copies of active files are kept by the Health Protection Unit.

It is recommended that key data from all hard copy files for the period 1970-2002 is manually entered into the existing records databases, starting with the active files that have been in recent use (refer to Action No. 3 of Section 13 of the Action Plan). The existing information will be used to inform whether systems are likely to be compliant or non-compliant in terms of their operational risk classification (Section 7.4 below), prior to ground-truthing undertaken during the compliance monitoring program.

7.2 Electronic Records of Inspections

The use of a paper based records system for field work can be time consuming and requires extra staff to enter the details into the database upon return to the office. It is recommended that the proposed monitoring program and the existing records database are supported by a portable, hand-held device (e.g. tablet or small laptop) loaded with software that includes the system inspection proforma (i.e. the inquiry fields to be completed by the Council Officer). The device would also record the GPS coordinates of the system components (tank and application area/s).

In addition, it is recommended that COS investigates the feasibility of an online system linked to the central database whereby service agents and plumbers can log in to record an AWTs service or system maintenance report. This would enable Council staff to cut down on some of the administration duties and increase productivity elsewhere.

However, if resources are limited, the above options should be delayed in order to ensure that adequate staff time is allocated to complete the system inspections, record data and implement the follow-up actions as required by the compliance monitoring.

In the absence of electronic inspection software, hard-copy inspection checklists have been developed based on existing templates in use by COS and current best practice.

Refer to Action No. 4 of the Action Plan in Section 13 for details on the implementation of electronic records.

7.3 Fees or Charges for DWM System Owners

Many rural and regional Councils with a high proportion of DWM systems have introduced an annual fee or charge for owners of unsewered properties, to help resource inspection programs as well as education programs. Adequate resourcing is a prerequisite to implementing the DWMP and monitoring its effectiveness. It is recommended that COS investigate the options for implementing an appropriate fee or charge to fund the Actions and programs in this Plan (refer to Action No. 2 of the Action Plan in Section 13).

7.4 Risk-Based Compliance Monitoring Program

7.4.1 Overview

The effective management of DWM systems requires a robust and well-resourced inspection and compliance program for existing and future systems.

The results of the Sensitivity Analysis (Section 4.1.2) and Prioritisation and Assessment (Section 4.4) were used in the development of the risk-based compliance monitoring program to be finalised and implemented by Council staff. The overarching principle is that the priority and frequency of DWM system inspections is largely determined by the property/parcel Sensitivity Rating as mapped, and the age of the systems (with the oldest, highest risk properties being highest priority). In addition, other factors can trigger case-by-case inspections, of any system, including:

- A complaint made by a member of the public in relation to a system;
- The owners of a system lodge a planning permit to alter the associated dwelling or commercial premises;
- Council reasonably suspects there is a nuisance caused by a system; or
- Where it is a condition of approval that the system be maintained to a certain standard (systems approved since 1996).

The 2007 COS Domestic Wastewater Management Plan described the results of the 2002 audit of properties in unsewered localities, which predicted that within 10 years (from 2002), 77% of systems across the Shire would have reached the end of their serviceability. As this audit is now more than 10 years old, it follows that this milestone has been reached (disregarding incremental replacement and upgrades of some existing DWM systems across the Shire). As such, it is important that all DWM systems are inspected as part of the compliance monitoring program; however, the short-term focus (refer to Action No. 7 of the Action Plan in Section 13) is on those properties where the environmental and human health impact is likely to be the greatest (i.e. High and Very High Risk properties/parcels as shown by the Sensitivity Analysis).

7.4.2 Inspection Program

Council has carried out inspections of all (except for the historical records entered into the database, e.g. pump-out receipt records) the existing DWM systems with permits within the Shire to date; at least once for each system. However, records are not available for every inspection carried out (particularly older systems). All system inspection records are to be incorporated into the wastewater management database; including data entry for pre-2002 hard-copy files and revisiting properties for which no records were created.

The inspection program involves:

1. Permit approval inspections;
2. Compliance inspection;
3. Unpermitted system detection and capture; and
4. Ad-hoc inspection by request or complaint.

Permit approval process:

Council inspects a DWM system prior to approving it for use.

Compliance inspection:

Compliance inspection will continue on an ongoing bases; however, it is likely that extra (equivalent to 1-2 staff) staff resources will be required in the first 2-3 years of the program, to address the back-log of system inspections. The Very High and High Sensitivity Rating properties/parcels should be assessed as a priority before Medium Sensitivity properties/parcels.

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Table 8 in Section 4.4 details the prioritisation for the targeted localities with regards to their DWM sensitivity. Council will use this priority to inform list in the order of the inspections. To clear some of the backlog for compliance audits, a targeted DWM system audit program will be undertaken. Action 7 of the Action Plan (Section 13) details the projected timeframes for completion and the resources required.

Unpermitted system detection and capture:

Identification of improved properties without a record of permit will be undertaken using indicative data. An approach based on a case-by-case basis will be used to ensure these unpermitted systems comply with current legislation.

Ah-hoc inspection by request or complaint:

Inspections can be made in response to nuisance complaints from system owners or the general public or in response to other actions as Council deems appropriate, on a case-by-case basis.

An overview of the inspection program is provided below in the following stages:

1. All of the properties/parcels assigned a Very High or High Sensitivity Rating should be investigated as a priority, within two years of implementation of this DWMP;
2. All of the properties/parcels assigned a Moderate Sensitivity Rating should be investigated after the completion of stage 1, within 3-4 years of implementation of this DWMP;
3. Subsequently, all of the properties/parcels assigned a Low Sensitivity Rating should be investigated after the completion of stages 1 and 2 as required.

Where inspections of individual towns/settlements are required to develop or revise planning strategies or other reports, low-priority properties/parcels in the locality can be inspected before high-priority properties/parcels in other localities, at the discretion of Council officers.

Other factors also need to be taken into consideration with regards to the inspection program and are as follows:

- Properties with septic tanks and trenches should be inspected as a priority within each risk classification group;
- Properties older than 30 years (pre 1985) should be inspected prior to newer systems within each risk classification group;
- All properties with a Section 173 Agreement under the *Planning and Environment Act 1987* relating to DWM will be inspected within 3 years of the implementation of this DWMP (regardless of the operational risk classification or Final Sensitivity rating) and a report will be forwarded to the relevant Water Corporations;
- Additional inspections can be made in response to nuisance complaints from system owners or the general public or in response to other actions as Council deems appropriate, on a case-by-case basis.

7.4.3 Inspection Protocol

Appendix D provides a system inspection proforma to record details and observations in the field, for entering into Council's database.

In summary, the proforma records key DWM system information, including (but not limited to):

- exact location and GPS coordinates of system components
- type of treatment and land application systems
- performance and compliance of systems (e.g. if there are any maintenance issues which need to be addressed, and their urgency)

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The results of inspections are highly valuable for improving and refining the risk assessment tools and for providing a rationale for the rectification or replacement of poorly functioning DWM systems.

Section 8 outlines the various methods for rectification or upgrade works which may be required following an inspection of a system.

8 Onsite System Maintenance and Upgrade Options

8.1 Non-compliant Systems

The potential management strategies for failing systems include the repair, improvement or replacement of systems (or components). The high priority localities (detailed in Table 8, Section 4.4) will form the focus of improvement works in terms of the implementation of this DWMP. Every effort will be made to ensure owners are aware of their responsibilities and are willing to commit resources to such projects. However, it is recognised that many existing DWM systems are several decades old and/or are located on properties/parcels that may be unsuitable for DWM. Existing systems may be undersized or have direct greywater discharge off-lot, in most cases approved by Council at the time they were installed.

While it is now clear that such practices are no longer appropriate and may be creating unacceptable risks, it is acknowledged that many of these problems will take time to rectify. It is not intended that the inspection and compliance program take a 'hard-line' approach and require all non-compliant systems to be upgraded immediately. However, a commitment is required from owners, Council, and State and regional management entities to improve DWM practices in a progressive and incremental manner, with a focus on high-priority systems.

8.2 Maintenance of Existing Systems

The following maintenance actions should be undertaken by the owner or a qualified service agent in order to minimise the risk of system failure (compliant and non-compliant systems alike):

- Regular desludging of septic or primary tank as required by EPA Certificates of Approval for each type of system. The 2007 Plan noted that failure to regularly desludge septic tanks caused the majority of preventable problems with onsite systems, as evidenced by plumbers servicing unsewered areas. A pump-out should significantly improve performance; however, this will not rectify existing damage to the disposal areas resulting from excess suspended solids;
- Checking of all system chambers and other checks as required by system manufacturers for secondary systems;
- Addition of chlorine for disinfection where an AWTs with chlorination is used;
- Ensuring householders do not discharge chemicals used within the house to the system i.e. bleaches, antibacterial cleaning products, paints, dyes etc.;
- Ensuring that the system is not turned off at any time;
- Responding to system alarms as this usually indicates a system failure or problem;
- If the secondary treatment system (of any type) is more than five years old, then effluent samples should be collected for analysis of BOD₅, TSS and faecal coliforms/*E. coli* to assess whether the system is still functioning to its specification and achieving the target effluent quality as prescribed by EPA Victoria; and
- Ensuring sprinklers or irrigation area is maintained, i.e. lawn mowing, checking that sprinklers/distribution lines are not damaged and that flushing of lines is undertaken periodically.

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By undertaking these regular maintenance tasks, a compliant system can be expected to operate effectively without major problems. Maintenance measures can also benefit non-compliant systems by mitigating the risks posed by the system failure (e.g. if an irrigation area is surcharging effluent, it is preferable that the effluent is disinfected).

System modification and upgrade options for failing or undersized systems are discussed below.

8.3 Modifications for Existing Systems

In some cases, it is not necessary to replace all of the system components. Risks from defective DWM systems can be appropriately managed by modifying a system. The required modifications should be determined on a case-by-case basis, and discussed with Council prior to implementation. If existing septic tanks are to be modified or repaired, they must be structurally sound and adequately sized for the number of bedrooms in the dwelling. Otherwise, they should be replaced with an adequately sized septic tank.

Typical modifications are discussed below.

8.3.1 Install Service Riser for Septic Tank Access

Inaccessible tanks (those that have been buried or built over) are highly unlikely to be inspected or pumped out as regularly as is required for optimum system performance (3-5 years for pump outs as recommended by AS/NZS 1547:2012). Tanks are often installed completely below ground to achieve minimum fall for gravity drainage from the dwelling; however, buried septic tanks often result in owners not knowing where the septic tank is (especially after properties change ownership). Non-accessible tanks were common in the audits of existing systems in the Shire undertaken by the consultants and were deemed to be in an unsatisfactory condition as a result, due to the very high likelihood that the tank had not been adequately serviced or desludged.

Service risers are typically made from concrete or high density plastic and must be installed by a suitably experienced professional (such as a plumber). Care should be taken to ensure that tank and riser lids, and any other potential inlet points, are protected from groundwater and surface water ingress.

8.3.2 Minor Repairs

The structural integrity and design of the septic tank also determine its suitability for continued use. Generally, the older a septic tank, the more likely it is to have cracks, missing components (e.g. outlet 'T junctions'), poorly sealed access openings, corrosion, or other physical problems. It is possible to mitigate or repair these issues, and the estimates have assumed a nominal cost of \$500 per identified tank to carry out minor repairs. Repairing cracks will need to be done when the tank is empty (after it has been pumped out), with care taken to ensure that all cracks are identified and repaired.

AWTS and sand filter components can often require repair or replacement following flooding, electrical faults or pump failure. Pumps can be removed and replaced when necessary and internal pipes can be replaced where necessary if they have been dislodged or damaged. A suitably qualified service agent or the system manufacturer should undertake these repairs.

8.3.3 Install Outlet Filters in Septic Tanks

The simplest way to improve the performance of a standard septic tank is to retrofit the outlet pipe with an outlet filter. Filters of various designs are commercially available and can provide significant solids retention. Filters have a large surface area to limit clogging and reduce maintenance requirements. Filters can reduce the impacts of solids carry over to the land application area or secondary treatment system. Filters should be removed and cleaned (hosed onto grass or gardens with limited human and animal contact) and replaced in the septic tank at least twice per year.

8.4 Upgrade/Replacement of Existing Systems

Where a new system or major upgrade works are required (i.e. substantial repair, expansion or replacement of either the treatment system and/or land application system), the system must comply with the current Standards and EPA Code of Practice. Where an existing system is shown to be operating effectively but does not comply with the current EPA Code of Practice or Standards, then the system should be monitored. However, unless a failure occurs or a house extension/modification is proposed, the owner should not be required to upgrade or replace the system as long as it is performing as per the original permit conditions. (This situation is common for older homes where trenches may be undersized for the number of bedrooms, but only one or two people are living in the dwelling).

Replacement of systems and system components should be carried out according to the site-specific conditions and requirements of the property/parcel, and by an appropriately qualified and experienced person. Common upgrade and replacement options for DWM systems are discussed below.

8.4.1 Enforcement of Upgrade Works

Under the *Environment Protection Act 1970*, Councils have the power to enforce compliance with Council permits, Certificate of Approval conditions and issue penalty infringement notices to premises where owners do not have their system regularly maintained by a professional service technician.

In addition the SEPP Waters of Victoria (Clause 32) prohibits offsite discharge of wastewater from onsite wastewater management systems to stormwater drains, waterways or beaches. COS will endeavour to liaise with an occupier to ensure upgrade works are undertaken; however, in some circumstances enforcement will be required to ensure compliance with the *Environment Protection Act 1970*.

Enforcement will either proceed under the *Environment Protection Act 1970* if the conditions or maintenance requirements of a permit are not being complied with, or the system has been installed without a permit, using an infringement notice or summons to court. If the failing system does not have a current permit (age) then an Improvement Notice may be issued under the *Public Health and Wellbeing Act 2008*, if the failing system is found to be a nuisance (detrimental to health or offensive).

To aid in the management of DWM systems and to allow a proportionate response, the development of Local Laws will be investigated.

8.4.2 Replacement of Septic Tanks

It is envisaged that where simple repairs and pump-outs fail to meet compliance standards, existing septic tanks will require complete replacement, due to being undersized, structurally unsound and/or discharging effluent inappropriately.

Where appropriate, septic tanks can be replaced with another septic tank, in accordance with a LCA report and design for the property's/parcel's specific circumstances. However, for permanently-occupied premises, it is likely that an upgrade to a secondary treatment system will be the preferred outcome (in accordance with a site-specific LCA and design report by an appropriately qualified professional).

All proprietary treatment systems must have current accreditation from the EPA, which is called a Certificate of Approval.

Secondary treatment systems allow greater flexibility for land application options for the treated effluent. The existing trenches can be used to receive the secondary effluent from a new treatment system, with or without trench rejuvenation (discussed below) as required. Alternatively, the existing trenches can be decommissioned (and rehabilitated with clean soil where required) and replaced with a different land application system (including irrigation systems).

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Where existing septic tanks are performing adequately (or have this capability), they can be retained and used as part of the secondary treatment system. The suitability of the existing tank for this purpose needs to be thoroughly assessed by a suitably qualified wastewater professional. In most cases, it will be more straightforward to decommission the septic tank and replace it with a new treatment system. Disposal options for decommissioned septic tanks include collapse and in-fill, removal to off-site landfill, or appropriate sterilisation for non-potable water storage; in accordance with the current EPA Code of Practice.

8.4.3 Upgrades, Extensions and Replacements for Trenches

Trenches and beds have relatively small footprint areas and rely substantially on effluent absorption, thus imposing high loading rates on the soil. This increases the risk of systems being overloaded and failing hydraulically in the long term, with potential adverse health and environmental impacts. Furthermore, prolonged effluent application through absorption systems increases the risk of soil degradation by increasing salinity and sodicity, as well as the development of a 'clogging layer.' Over time, the organic load in effluent forms a clogging layer in the soil around the trench, which reduces the porosity of the soil and limits soil absorption of effluent. Higher suspended solids concentration in the primary-treated effluent increases the rate of development of the clogging layer. The suspended solids concentration of septic tank effluent generally increases as the pump out rate decreases (particularly if there is no outlet filter installed).

A range of options for upgrading or replacing trenches and beds is provided below. Site constraints, particularly available suitable space, will determine what options are feasible, and will be determined on a case by case basis as part of the recommended servicing strategy. Properties with inadequate suitable space to replicate or extend their trenches will be most suited to trench rejuvenation, and potentially replacement of the septic tank with a secondary treatment system.

Trench Rejuvenation

Provided the trenches are structurally sound and the clogging layer is not excessively developed, it is possible to 'rejuvenate' existing trenches by oxidising the clogging layer, either using an oxidising chemical, physical aeration (compressed air blowers) or both. This technique in combination with septic tank pump-out (if required) and installation of an outlet filter has good potential to improve overall system performance, and is relatively low-cost. This solution will only be appropriate as a long-term solution on properties/parcels with adequate available space for effluent disposal and if the existing trench system is appropriately sized for the number of occupants or number of bedrooms. However, it could be a valuable interim solution for properties/parcels without adequate available space, prior to implementation of a compliant solution.

Replace, Replicate or Expand Trenches

Where rejuvenation is not an option (e.g. if trenches are physically damaged or collapsed), there is scope for trenches to be excavated and replaced in-situ, using imported materials including topsoil (preferably loam or sandy loam) and improving the existing subsoils (see below). This is the most feasible option for small properties/parcels, or where other areas have been used for other improvements.

If there is adequate available space elsewhere on the property/parcel that has not been used for trenches previously, it is likely to be more straightforward and cost-effective to replicate the trenches in this area. This is more likely to be achievable on larger properties/parcels.

If the existing trenches are undersized, and there is adequate suitable space adjacent to the terminal ends of the trenches, then the trenches can be extended to the minimum required size (as described in the Sizing Tables). The existing section of trench can also be rejuvenated to improve performance, or replaced if required.

Soil Amelioration

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In practice, the most limiting layer to water movement is usually the heavier textured, clayey subsoil in the profile. Quite often, the soil chemistry of this layer is dominated by adsorbed sodium ions and/or magnesium ions, causing the clay particles to be easily dispersed and mobilised when in contact with water. When used for effluent dispersal these clay particles move down with the percolating water and clog up the fine pores, thus reducing the soil's permeability.

Subsoil clay that is dispersive must be treated with gypsum (calcium sulphate) to counteract the excessive sodium and magnesium and bring about a strong flocculated condition of the clay particles.

Shallow topsoil or topsoil that is too sandy may also limit the growth of the vegetation in the land application area. For optimal growth of typical vegetation used with DWM systems, the topsoil should be at least 250mm deep and have at least 5% organic matter.

Alternative Trench Designs

Over the years there have been various modifications to conventional absorption trenches and beds, some of which have been developed into proprietary 'off-the-shelf' products including various brands of self-supporting arch drains and the *Advanced Enviro-Septic™* modular trench.

Other modified designs are based on existing technologies which, although not formally approved, have been shown to enhance performance. One recent example of this is the 'wick' trench, developed for use in clay soils as an alternative to standard absorption trenches (referred to in the current EPA Code of Practice as a 'wick trench or bed'). This system can be described as a conventional absorption trench adjacent to a shallower evapotranspiration/absorption bed, with a continuous layer of geotextile fabric laid under the trench and up into the evapotranspiration bed. The geotextile acts as a wick, using capillary movement, to distribute some of the effluent over the transpiration bed adjacent to the trench. This provides a larger surface area than would be available using the trench alone, with a greater potential for evapotranspiration and greater infiltration capacity. Typically the evapotranspiration/absorption bed is approximately twice the width of the trench. This option requires a larger area than conventional trenches, but smaller than that required for irrigation.

8.5 Decentralised or Clustered Wastewater Management

Where local conditions (including dwelling density and layout) allow, it may be feasible for small groups of properties to enter into a decentralised servicing arrangement whereby raw wastewater or primary-treated effluent is collected from each property/parcel in a common pipe, for off-site treatment and discharge, or treatment and discharge on one or more of the serviced properties/parcels. Systems include pressure sewer, vacuum sewer and Common Effluent Discharge (CED) systems.

This option is unlikely to be further explored by landowners due to the complexity involved. This option would best be classified as a commercial wastewater system and would require investigations and approvals by a range of stakeholders (including, but not limited to, Council and the relevant Water Corporations). Off-site treatment and/or disposal is likely to trigger the regulatory involvement of the EPA. EPA Works Approval and licensing is discussed below. Options for connection to reticulated sewerage or a decentralised cluster system are typically more expensive when compared to onsite alternatives.

9 Commercial Wastewater Management Systems

9.1 Overview

Wastewater Treatment Systems with a design capacity between 5,000 - 100,000L/day require Works Approval from the EPA. Systems in this range which discharge solely to land in accordance with specification acceptable to EPA are exempt from ongoing licensing. Acceptable practices are defined in guidance material, the EPA Vic Guidelines for Wastewater Re-Use, Publication 464. As of May 2015 there are 2 commercial premises within COS which have undergone the EPA Works Approval process but are not licensed.

The Environment Protection (Scheduled Premises and Exemptions Regulations) 2007 define which activities require EPA Works Approval and licensing under the Environment Protection Act. A Works Approval is statutory document which allows scheduled works to be constructed, subject to whatever conditions the EPA deems appropriate as part of the assessment process. As part of the approval process, the EPA assesses any potential environmental impacts from the proposal, ways to mitigate any impacts, compliance with policy requirements (including protection of beneficial uses), and comments from referral agencies and the general public.

Systems with a design capacity greater than 100,000 L/day are subject to works approval as above and also to ongoing licensing from the EPA. The EPA licences set acceptable waste discharge and management criteria. They are publically available documents that can be viewed at <http://www.epa.vic.gov.au/our-work/licences-and-approvals/search-licence>. In some cases, the EPA may approve an exemption from the need to obtain Works Approval for current licence holders who are upgrading an existing system. The EPA periodically inspects all licenced sites, with the frequency informed by a range of factors related to the degree of environmental risk posed by the site. Targeted inspections can also be made based on intelligence and pollution report information. Licenced sites are required to submit an Annual Performance Statement detailing their performance against the licence conditions. These are also public documents that can be searched on the above link. The EPA conducts a combination of targeted and random assessments of Annual Performance Statements. As of May 2015, the EPA notified Council that there are 3 licenced wastewater discharge sites in COS.

There are other types of industrial activity (not wastewater treatment) that are not directly regulated under the Environment Protection (Scheduled Premises and Exemptions Regulations) 2007 that still have potential to impact on water quality. Examples include dairy farm effluent management and stormwater from commercial and light industrial operations, particularly in unsewered areas. The EPA has a role in pollution prevention and response in these activities. The EPA's approach to these issues is outlined in the Compliance and Enforcement Policy, Publication 1388. The Compliance and Enforcement Policy articulates the EPA's approach, method and priorities for ensuring compliance with Council's Acts and carrying out Council's compliance and enforcement powers

Council is responsible for the management of all wastewater systems <5,000L/day, which includes some commercial systems. It is important to note that commercial enterprises, such as small factories and cafes operating in unsewered areas, often generate less than 2,000L of wastewater per day and therefore are regarded from an operational perspective as domestic systems. The characteristics of the wastewater will differ from a typical residential dwelling, but the wastewater is expected to contain the same broad ranges of contaminants (unless the commercial enterprise is producing high strength or unusual wastes, such as small-scale food, alcohol or chemical processing, in which case it should be regarded as a commercial development). Commercial enterprises generating up to 5,000L/day in Colac Otway Shire include (but are not limited to) restaurants, pubs, tourist accommodation, adventure parks, dairies, breweries and food processing facilities.

There is limited available information on the performance of commercial systems in the Shire. COS have identified importance of gathering all of the commercial system data for the Shire,

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which is noted as Action 8 in the Action Plan. Commercial systems within COS will be managed as per the same criteria as domestic systems, with some consideration for the specific waste stream. Generally speaking, commercial treatment plants are often the same age as the development they service, and are upgraded or replaced only when a noticeable problem is observed, and/or the development is modified to alter (usually increase) design flows (e.g. expanding operations). Without proactive enforcement from the regulator, system maintenance, monitoring and record-keeping can become lax over time, with system performance suffering as a result. Generally speaking, older commercial systems are often non-compliant with current expectations and standards (e.g. are licenced to discharge treated effluent to surface watercourses or within watercourse buffers). However, they continue operating until improvements are triggered, typically by the identification of problems, the redevelopment of the premises, or proactive intervention by regulators, local government or other agencies.

9.2 Risks Associated with Commercial Systems

The most common causes of failure or underperformance of commercial wastewater treatment systems include the following:

- Surge loads, e.g. peak holiday seasons or production cycles in factories;
- Irregular and/or ineffective maintenance and upgrades;
- Inadequate desludging; and
- AWTs and other aerobic systems being switched off for long periods of time, leading to die-off of aerobic microorganisms and delayed start-up and poor performance when switched back on.

The most common causes of failure or underperformance of commercial effluent disposal or reuse systems include the following:

- Inappropriate design, including undersized land application area for peak loads (without appropriate load buffering);
- Inadequate setback buffers from sensitive receptors, such as watercourses, which no longer meet the minimum buffers in the current EPA Victoria Code of Practice;
- Poor or inappropriate installation;
- Inadequate maintenance, including regular back-flushing of irrigation systems with clean water to prevent solids build-up and delays to repairs (e.g. broken sections of pipe); and
- 'Creeping failure' of trench and bed systems as soils and media become blocked with suspended solids from poorly designed and/or poorly maintained treatment systems.

9.3 Management Strategies for Commercial Systems

9.3.1 Wastewater Treatment Systems

All commercial wastewater treatment systems should have an up-to-date Operation and Maintenance (O&M) Plan or Manual which includes a diagram of the system and provides instructions for all maintenance schedules required for the system, and details of who is responsible for the management and maintenance of the system.

Regular maintenance by appropriately trained staff and/or contractors is essential. Depending on the scale and complexity of the treatment system, and the nature of the wastewater to be treated, daily low-level maintenance may be required. This can often be carried out by regular, appropriately trained, staff (e.g. checking effluent levels, visually checking and/or testing samples of effluent for treatment performance, etc.). More specialised maintenance must be carried out by appropriately qualified and experienced personnel.

Routine inspections of the wastewater treatment and land application systems at EPA-licensed commercial properties should be carried out by an appropriately qualified and experienced contractor. The contractor should be independent, i.e. not an employee or regular contractor of

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the owner of the premises. More recent EPA licences typically include a schedule of inspections.

Council is responsible for monitoring commercial systems <5,000L/day. These systems should be included in the Council inspection program and, where problems or complaints are received, Council should assess and manage the system in a similar fashion to a domestic system and also inform the EPA of the investigation. The EPA is responsible for carrying out additional investigations at its own discretion, including in response to complaints about a system from Council or members of the public.

Council is required to maintain a database of all commercial systems within COS; this data base will also include a list of EPA Works Approved sites as well as EPA licenced premises. This database will be maintained and updated annually and include any maintenance records of the premises (commercial 2,000-5,000L/day) under Council control. This is included in the Action Plan (Action No. 8b).

9.3.2 Effluent Management Systems

The issues surrounding selection, design, installation and maintenance of commercial-scale effluent management systems are largely the same as for domestic systems. However, potential problems associated with scale and flow-balancing are introduced with large and/or irregular effluent flows. For seasonal developments, part of the effluent land application area may need to be switched off, or alternatively the off-season (reduced) effluent load can be distributed throughout the entire area over longer time periods using a flow sequencing control system.

All effluent management areas require regular maintenance and should be closely monitored to ensure effective operation and even distribution of effluent. An Operation and Maintenance Manual or Plan should be developed (if not in existence) and regularly referred to by staff and contractors. Land application areas that are turfed will require regular mowing (and lawn clippings removed from the area). Other vegetation types should be pruned and maintained as necessary to ensure nutrients are being removed by plant uptake.

Commercial systems less than 5,000L/day should be serviced and maintained in accordance with the system manufacturer's requirements. Secondary treatment systems will require servicing quarterly; however, some commercial systems will require daily monitoring by an onsite system operator. Results of system servicing should be submitted to Council on a quarterly basis or in accordance with the system conditions of approval to operate. Where system maintenance records are not supplied to Council as required, follow up action should be taken by Council to ensure the system is serviced appropriately.

Commercial systems which are licensed by the EPA will require effluent quality monitoring (at the outlet point of the treatment system) to ensure the effluent quality meets the requirements for its end use. For example, surface irrigation requires disinfection (indicated by concentrations of pathogen indicator organisms, as well as residual chlorine levels, if chlorine is the method of disinfection used).

10 Educational Programs

COS currently uses DWM systems inspections as an opportunity to educate system owners 'one-on-one' in order to improve system maintenance and performance. In addition, the COS website has an extensive section dedicated to DWM in the Shire, which explains how owners and residents of unsewered properties can best manage their systems in order to protect human and environmental health. This online content is supported by printed publications which are available at Council offices and are given to owners and residents during system inspections where appropriate. There is scope for printed and online information to be updated to reflect the revised DWMP and Victorian government documents (including the current EPA Code of Practice) and to provide more useful guidance and information for home owners and residents (see Section 10). The education program is outlined in the Action Plan in Section 13 (Action Numbers 12 & 13).

11 Downstream Water Quality Monitoring

Currently, COS undertakes regular sampling of targeted drains and streams to monitor the level of *E. coli* contamination of wastewater, as well as other parameters at some locations (including Electrical Conductivity, sodium concentration, pH and nutrients). High pH, EC and sodium together can indicate the presence of greywater contamination as laundry products are typically alkaline and have a high salt content (as a filler in powder detergents). However, *E. coli* is not human-specific and high concentrations can be caused by other animals (including livestock) and birds (including wetland birds), and the forestry industry can impact on downstream water quality.

A Water Quality Monitoring Program is undertaken by Council and the Catchment Management Authorities where water samples are collected at a number of significant points throughout the Shire; water quality sampling is undertaken for monitoring of recreational areas as well as drinking water catchment areas. In addition, regular testing of ground and surface water for faecal and nutrient contamination can be undertaken, to indicate problem areas and to help assess the effectiveness of Council management practices for DWM systems. There should also be a review of the existing water quality data collected by other authorities in the Shire (including Water Corporations), where this data is relevant and available. A detailed water quality monitoring program is beyond the scope of this DWMP and could form part of a broader water quality monitoring program that considers a range of regional stakeholders and objectives.

It is recommended that human-specific contamination indicators should be targeted for downstream water quality testing, to rule out non-human sources of generic contaminants (pathogens, nutrients and chemical compounds). Commonly used indicators include:

- Optical brighteners used in laundry detergents (especially soaking detergents); and
- Faecal sterol compounds.

Targeted sampling is more costly and can be carried out periodically (e.g. every two years).

12 Risk Mitigation in DWM Design and Installation

The DWM risks identified across unsewered areas in the DWMP are based on the predominance of standard (primary) septic tanks with conventional absorption trenches throughout the Shire (as confirmed by Council records and supported by field investigations). The summary table below outlines some possible ways these risks can be mitigated.

Table 9: Risk Mitigation for various constraints

| Risk Category | Issue | Possible solutions | Methods | Benefits |
|---------------|---|---|--|---|
| Soils | Poor soils make it difficult for the site to contain effluent. | Enhanced treatment of effluent. | Septic System and Sand Filter. | Passive system; only uses electricity for pumps. Sand life should exceed 10 years before replacement. |
| | | | AWTS 20/30. | Higher standard of treatment suitable for sub-surface effluent disposal in poorer soils. |
| | | | AWTS 20/30/10. | Disinfection stage decreases public health risk. Higher standard of treatment suitable for sub-surface effluent disposal in poorer soils. |
| | | Remediate soils. | Addition of gypsum/lime as per LCA recommendation. | Can assist in improving effluent adsorption capabilities of dispersive soil. |
| | | Import better quality soils. | Sandy loams, loams and clay loams with <10% gravel content. | Soils can be selected for suitable characteristics (e.g. permeability) and also increase profile depth. |
| Slope | Steep slopes can be destabilised by effluent, and it is difficult to contain effluent onsite. | Terracing. | Reduce slopes by creating flatter areas (ensure soil depth is adequate if using cut and fill). | Ease of access and maintenance (e.g. mowing) and other controls (e.g. erosion). |
| Lot size | The smaller the property/parcel the less area is available for effluent disposal. | Reduce house size (number of bedrooms). | To be done at the planning and design stage. | If a house is smaller with fewer occupants it will generate less wastewater. |
| | | Reduce footprint of house and other improvements. | To be done at the planning and design stage. | To ensure there is enough area to use for effluent disposal, reduce the space occupied by the house, shed, driveway etc. |
| | | Consider mound system as land | | Permits highest effluent loading rate per square metre. |

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| Risk Category | Issue | Possible solutions | Methods | Benefits |
|---|---|---|---|--|
| | | application option. | | |
| Water-courses/
Groundwater Bores | The Code has setback distances from watercourses and groundwater bores. | Ensure entire system (including house) is located outside of setbacks and consider treatment options. | Increase wastewater treatment standard. | Setbacks can be reduced when higher treatment standards (e.g. advanced secondary with disinfection) are used. |
| Flood Prone Land | Wastewater should not be disposed of in flood prone land. | Ensure entire system (including house) is located away from flood prone land. | | Waters are protected from contamination. System is protected from inundation of water which eliminates the potential need for costly system replacement. |

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13 Action Plan Timeline

This Action Plan Timeline outlines the management strategies and actions to address priorities. The Health Protection Unit will have the primary responsibility for the coordination and implementation of the recommendations. Council's Planning, Environment, Infrastructure, Building and GIS staff will assist them.

| Item Number | Action | Description | Term | Due Date | Responsibility | Resource Funding |
|-------------|--|--|-------|----------|--|--|
| 1 | Preparation of policies and procedures | <ul style="list-style-type: none"> Prepare (or revise/finalise) and document the following to ensure they are in line with this DWMP: DWM system inspection procedure and program Non-compliance with inspection procedure Complaint inspection procedure Rectification/upgrade works procedure Issuing of fines/notice procedure Permit to Install procedure Approval to Use procedure Compliance and Enforcement Policy | Short | 2015 | Health Protection Coordinator | Within current resourcing |
| 2 | Fees and Charges | In order to fund the Actions in this Plan, Council will need to consider sustainable options for ensuring appropriate resources. | Short | 2015 | Manager Planning, Building and Health | Within current resourcing |
| 3 | Database management | <ul style="list-style-type: none"> Update/expand Council's DWM system database to record all property/parcel and system details (including from existing hard copy files). Ensure DWM database is linked to the general property/parcel database to alert of change of ownership/development applications etc. Assess suitability of existing system and vendor to support Actions of DWMP Undertake required works | Short | 2015 | Health Protection Coordinator, IT/GIS (assistance) | Unknown. Dependencies IT Health check Quote for works Process mapping Enhancement of IT system not yet costed – to be investigated. Ongoing data |

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| Item Number | Action | Description | Term | Due Date | Responsibility | Resource Funding |
|-------------|--|--|--------------------|----------|--|--------------------------------------|
| 4a | Continuation of improvement of data collection | Update a GIS layer for DWM systems in the Shire. Ensure cadastral (property/parcel data) is routinely updated. | Ongoing | Ongoing | GIS Officer | Within current resourcing |
| 4b | | Development of additional fields within database to update Risk Assessment Rating (following system inspection/LCA report). | Short-Medium | 2016 | Health Protection Coordinator, IT/GIS (assistance) | A part of action item 3 |
| 4c | | Development of geo-referencing of "as constructed plans" and incorporated as a GIS layer. | Medium (Desirable) | 2016 | Health Protection Coordinator, IT/GIS (assistance) | Budget bid/ within current resources |
| 5 | GIS Training | Train Health Protection Unit in GIS in order to prepare DWM maps as requested. | Short | 2015 | GIS Officer, HPO, Health Protection Coordinator | Within current resources |
| 6a | Sensitivity Analysis Mapping | Regularly update GIS layer for Sensitivity Ratings as required (following system inspection/LCA report). Printed maps to be updated at least annually. | Ongoing | Ongoing | GIS Officer & HPO | Within current resources |
| 6b | | Develop an interactive map interface on Council's website of the final Sensitivity map. | Short – ongoing | 2015 | GIS Officer, HPO | Within current resources |

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| Item Number | Action | Description | Term | Due Date | Responsibility | Resource Funding |
|-------------|---|---|----------------|--------------|--|--|
| 7a | Implement the Risk-based Compliance Monitoring Program | Determination of properties/parcels within selected areas that contain septic systems | Short-Ongoing | 2015-2016 | Health Protection Coordinator, HPO | Within current resources |
| 7b | | Targeted system audits within selected towns/settlements | Medium-Long | 2016-2019 | HPO | 364 person days over 3 years |
| 7c | | Ongoing | Long | 2019+ | HPO | 0.5-1.0 FTE |
| 8a | Commercial Systems | Undertake system audits of all commercial systems (2,000≤x≤5,000L/day). | Short-ongoing | 2016 | HPO | Within current resources (8 person days) |
| 8b | | Obtain copies and regularly update a list of EPA licences for all commercial systems >5,000L/day. | Medium | 2016 | Health Protection Coordinator, HPO | Within current resources |
| 9a | Septic Tank (DWM system) Permit Conditions and Compliance | Undertake compliance audits of new installations. | Ongoing | Ongoing | Health Protection Coordinator, HPO | Within current resources |
| 9b | | Enforce compulsory upgrades of systems, as required (case-by-case). | Ongoing | Ongoing | Health Protection Coordinator, HPO | 0.5 – 1 FTE / 4 years |
| 9c | | Enforce mandatory maintenance of systems (depending on system type). | Medium-Ongoing | 2016-Ongoing | HPO | |
| 9d | | Advocate development and implementation of local laws to allow for effective management of DWM systems, allowing for a proportionate enforcement. | Medium | 2016 | Health Protection Coordinator | Within current resources |
| 10a | | Review Locality Reports in DWMP and system inspection data to inform planning decisions regarding unsewered towns. | Ongoing | Ongoing | Planning, Building and Health Manager, Health Protection | Within current resources |

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| Item Number | Action | Description | Term | Due Date | Responsibility | Resource Funding |
|-------------|-------------------------------------|---|------------------|-----------|---|--|
| 10b | | Ensure broader Council planning processes and decisions take into consideration the DWMP and ongoing inspections. Brief all Planning staff on the DWMP. | Ongoing | Ongoing | Health Protection Coordinator, HPO | Within current resources |
| 10c | | Undertake cumulative impact assessments based on town/settlement and sub-catchment priorities. | Medium – Ongoing | 2016-2017 | Health Protection Coordinator, HPO, external professional | Within current resources |
| 11 | | Discuss individual systems with owners during the application process and in response to enquiries from owners. Develop mechanisms to prompt pro-active education upon purchase of property/parcel. | Ongoing | Ongoing | HPO, Health Protection Coordinator | Within current resources |
| 12a | Broader Community Education Program | <ul style="list-style-type: none"> • Provide details about permit process on Council's website. • Promote policies and educational materials to the community and service providers. • Educate future/potential owners of homes with DWM systems | Short | 2015 | Health Protection Unit and Community Relations Officer | Within current resources |
| 12b | | <ul style="list-style-type: none"> • Revise existing educational material for distribution to residents and on website. • Develop new educational material for distribution to residents and on website. | Short-Medium | 2015-2016 | Health Protection Unit and Community Relations Officer | Within current resources |
| 13a | DWM Professionals Briefing | Conduct a briefing session and/or potential training with local DWM & LCA consultants, plumbers and system maintenance contractors to inform and educate on the new requirements of the DWMP. | Short | 2015 | Health Protection Coordinator, Professional Consultant | 2 x sessions
Whitehead & Associates |

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| Item Number | Action | Description | Term | Due Date | Responsibility | Resource Funding |
|-------------|---------------------|--|--------------------------------------|------------------------------|--|--------------------------------------|
| 13b | | Development of 'self-service' GIS information for Plumbers and LCA Assessors | Medium | 2016 | Health
Protection Unit,
GIS Officer,
Manager
Planning,
Building and
Health | Within current resources |
| 14 | Resource Allocation | Investigate staffing requirements for the implementation of the DWMP including system monitoring, compliance and enforcement of DWMP (& this Action Plan).
• Implementation phase
• Ongoing administration of DWMP | Immediate | 2015 | Planning,
Building and
Health
Manager and
Health
Protection
Coordinator | Within current resources |
| 15a | External Auditing | Investigate options for external auditing to be commenced in order to meet the requirements of DELWP. | Long | 2017 | Health
Protection
Coordinator
and Water
Corporations | Within current resources |
| 15b | | Undertake external auditing of DWMP, including monitoring and enforcement. | Long (to be completed every 3 years) | 2018 | Health
Protection
Coordinator
and Water
Corporations | Unknown. To be considered in future. |
| 16 | Future Planning | This DWMP proposes many Actions over the next 3 years. Future planning should be considered for the review in 2018. | Long | 2018 | Health
Protection
Coordinator,
Water
Corporations
and External
Auditor | Within current resources |
| 17a | Reviews | 6 monthly progress review. | Short | 6 Months after DWMP Adoption | Health
Protection
Coordinator
and | Within current resources |

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| Item Number | Action | Description | Term | Due Date | Responsibility | Resource Funding |
|-------------|--------|--|----------|---------------|--|--------------------------|
| 17b | | Annual progress review of 2015 DWMP | Annually | 2016, 2017 | Health Protection Coordinator and Stakeholders | Within current resources |
| 17c | | Major (three-yearly) audit and review of 2015 DWMP | Long | 2018 and 2020 | Health Protection Coordinator, Stakeholders and External Auditor | Within current resources |

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14 Glossary of Terms

| Term | Definition |
|---------------------|---|
| Aerobic treatment | Biological treatment processes that occur in the presence of oxygen (i.e. aerobic bacteria digest wastewater contaminants). Aerobic bacteria are organisms that require oxygen to survive and grow. |
| Anaerobic treatment | Biological treatment processes that occur in the absence of oxygen. |
| Blackwater | Wastewater from a toilet. |
| Desludging | Removal of the semi solid waste from a tank. |
| Effluent | Water discharged from a treatment plant. |
| Evapotranspiration | Transfer of water from the soil to the atmosphere through evaporation and plant transpiration. Calculated using the FAO Penman-Monteith method to derive (ET ₀). |
| Organic Matter | Material that comes from the tissues of organisms (plants, animals, or microorganisms) that are currently or were once living. |
| Greywater | Wastewater from showers, baths, sinks, washing machines, dish washers. |
| Hardpan | A layer of dense compacted of hard soil. |
| Locality | The broader locality surrounding a town (place name within mapped boundaries). |
| Non-Potable | Water not suitable for human consumption. |
| Parcel | The smallest unit of land able to be transferred within Victoria's cadastral system, usually having one proprietor or owner (land.vic.gov.au).

For the purposes of this DWMP, parcel and lot are given to have the same meaning. |
| Peds | An aggregate of soil particles. |
| Permeability | The ability of the soil to allow water to pass through. |
| P-sorb | Phosphorus adsorption capacity of a soil. |
| Property | Land under common occupation (land.vic.gov.au). May include multiple parcels. |
| Sensitivity | The 'likely' consequence of off-site (DWM) impacts based on the cumulative effect of individual property/parcel constraints (soil suitability, slope, useable lot area, climate and location) and variables affecting the specific land capability and associated limitations of the property/parcel to sustainably manage wastewater in compliance with SEPP objectives. |

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| Term | Definition |
|-------------|--|
| Settlement | An area of residential development within the Rural Living Zone (Barongarook and Kwarren) or Rural Conservation Zone (Barham River). |
| Sewage | Solid and liquid wastewater conveyed through sewers. |
| Sewerage | A system of sewers. |
| Town | The town servicing a locality, which is predominantly, zoned Township Zone. It contains both residential and commercial development. |

15 References (Cited and Used)

- Department of Local Government NSW (1998) Environment and Health Protection Guidelines: On-site Sewage Management for Single Households.
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- Environment Protection Authority Victoria (2003) State Environment Protection Policy - Waters of Victoria.
- Environment Protection Authority Victoria (2003) Guidelines for Environmental Management: Use of Reclaimed Water, Publication 464.2.
- Environment Protection Authority Victoria (2013) Code of Practice for Onsite Wastewater Management, Publication 891.3.
- Hazelton, P. and Murphy, B. (2007) Interpreting soil test results – what do all the numbers mean? CSIRO Publishing.
- Isbell, R.F. (1996) The Australian Soil Classification. CSIRO Publishing, Melbourne.
- Natural Resource Management Ministerial Council et al. (2006) Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 1).
- Municipal Association of Victoria, Department of Environment and Sustainability and EPA Victoria (2014) Victorian Land Capability Assessment Framework.
- Standards Australia/ Standards New Zealand (2012) AS/NZS 1547:2012 On-site domestic-wastewater management.
- Standards Australia/ Standards New Zealand (2008) AS/NZS 1546.1:2008 On-site domestic-wastewater treatment units – Septic tanks.
- USEPA (2002) Onsite Wastewater Treatment Systems Manual. United States Environmental Protection Agency.

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Appendix A

Evaluation of Wastewater Management Systems

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1. Overview

This Section provides a review of the range of accredited wastewater treatment systems and available land application systems available for domestic and commercial application in Victoria, with particular consideration given to their suitability for use in the study area.

As of July 2015, the EPA will transform all existing Certificates of Approval to 'interim certificates of compliance', which will be valid until the reform is completed, and will start taking new applications for interim certificates of compliance. Any interim certificates issued will be valid until the reform is completed. As of January 2016, the EPA will no longer issue Certificates of Approval (CA) for individual proprietary systems; instead, the EPA will approve types of treatment systems (i.e. the key technology employed by systems, by which systems are categorised). Accreditation of wastewater treatment technologies is routinely reviewed by the EPA and the EPA website should be regularly consulted for an up-to-date list of accredited systems.

2. Key issues for System Selection and Design

2.1 Wastewater Treatment

For domestic and commercial wastewater management systems alike, the key issues that determine the selection of wastewater treatment systems are:

- Flow volumes/loads;
- Flow rates and peaks (including intermittent usage);
- Wastewater strength (particularly organics); and
- The degree of constraint of the site for land application of effluent.

Depending on the nature of the development, these aspects of wastewater management can vary significantly and pose challenges to the system designer and owner. Specialist design is typically required for commercial wastewater streams and for seasonal fluctuations in flows (such as holiday rental properties). Section 4 below discusses each of the treatment technologies widely available, and their opportunities and limitations.

In addition, there are considerations relating to costs and practicalities, such as system footprint and ease of installation and servicing. Appendix C of the EPA Code of Practice (2013) provides useful guidance on the factors to consider when selecting an EPA-approved DWM system.

2.2 Land Application of Effluent

The key issues that influence the selection and design of land application systems (domestic or commercial) are:

- The level of treatment of the effluent (primary, secondary or advanced secondary);
- Soil characteristics (particularly texture, structure, depth, dispersibility and phosphorus adsorption capacity);
- Site characteristics (particularly slope, aspect and shading); and
- Proximity to sensitive receiving environments (such as surface waters and groundwater).

For constrained sites, the preferred effluent management strategy can dictate the level of wastewater treatment required. For example, a small property/parcel with insufficient area to apply the entire effluent load may require a composting toilet with advanced greywater treatment for beneficial reuse to reduce volume of treated effluent being applied to the limited available space. In some cases, there may be no suitable solution, or a pump-out tank may be required to tanker wastewater off-site for disposal at an approved facility.

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3. Pump-out Systems

Pump-out systems convey raw wastewater or septic tank effluent to a holding tank (also known as a pump-out tank or collection well) for removal by licenced tanker (pump-truck) for disposal in an approved sewer main access hatch or municipal sewage treatment plant (under contract). They are generally regarded as a last resort, typically used to service properties where:

- there is inadequate available space to sustainably assimilate treated effluent by land application;
- existing land application systems have failed and cannot be safely used to apply effluent; or
- the property/parcel will be connected to sewer in future (i.e. an interim solution).

Adequate sizing of holding tanks is important to ensure that adequate storage capacity is provided to allow lead time to arrange a licenced pump-out contractor.

Holding tanks should be fitted with high water level alarms and must incorporate both audible (buzzer) and visual (strobe) alarm components. The following minimum standards are required for high water alarm systems:

- a muting facility for the audible alarm is to be incorporated into the alarm design. The muting facility shall reset to audible after 24-hours;
- the alarm panel shall be located in a visible position within the building or other location approved by Council;
- the float switch shall be set at a level such that on activation, two (2) days storage remains within the collection well; and
- provision of an information sign that provides contact names and telephone numbers should the alarm be activated.

All wastewater or effluent holding tanks should be installed with adequately sealed lids, and positioned, so that they do not impact on existing structures or neighbouring properties and stormwater is diverted around the tanks. Stormwater ingress must be avoided, as it can result in excessive pump out costs and may result in displacement of raw wastewater to the ground surface, posing a significant human health and environmental risk. The tanks must be positioned to allow access by a pump-truck and its vacuum hose attachment.

AS/1547.1:2008 is broadly applicable to the design, installation and maintenance of holding for domestic and small commercial systems.

4. Wastewater Treatment Systems

There are currently four broad categories of wastewater treatment system types that are accredited by the EPA:

1. Greywater treatment systems;
2. Combined wastewater or blackwater-only primary treatment systems;
3. Combined wastewater secondary domestic treatment systems; and
4. Combined wastewater secondary commercial treatment systems.

A brief summary of each is provided below. For more detailed information, consult the current EPA Code of Practice. Tables comparing the specific types of treatment and land application systems, and their suitability for use within various areas of the Shire, are provided at the end of this Appendix.

4.1 Greywater Treatment Systems

Greywater treatment systems are accredited to treat laundry, shower, bath, hand-basin and kitchen greywater only. Blackwater (toilet waste) must never be treated in greywater treatment systems. It is preferable that kitchen water is kept separate from the other greywater streams

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and treated with the blackwater stream, as kitchen greywater can be relatively high in contaminants compared to other greywater streams. Greywater treatment systems can be useful for upgrading direct-diversion greywater systems where blackwater is to be kept separate, particularly if kitchen wastewater can be re-plumbed to the blackwater septic tank to prevent it entering the greywater treatment system.

Greywater that is treated to advanced secondary standard, in accordance with the current EPA Code of Practice, is of 'advanced secondary' standard that can be used for toilet flushing, cold water supply to clothes washing machines, and surface and subsurface irrigation. Advanced secondary effluent must achieve the following criteria:

- Biochemical Oxygen Demand (BOD₅): <10mg/L
- Total Suspended Solids (TSS): <10mg/L
- *E. coli* or thermotolerant coliforms (if disinfected): <10cfu/100mL

This is also referred to as the 10/10/10 standard by EPA Victoria. The nutrient removal performance varies considerably between and within advanced secondary treatment system types. Only greywater systems are accredited by EPA Victoria to achieve this standard. The operational costs of greywater systems can outweigh the benefits of reusing the recycled water. For this reason, they are most commonly used when potable water supply is not reliable (e.g. for households supplied by rainwater tank in a low-rainfall area).

4.2 Primary Treatment Systems

According to the EPA, there are four broad categories of primary treatment systems (for use with combined wastewater, blackwater only or as pre-treatment for greywater treatment systems):

1. Septic tanks;
2. Incinerating toilets (toilet waste only);
3. Wet composting systems (combined wastewater); and
4. Composting toilets (toilet waste only).

Primary-treated effluent quality can vary considerably, depending on a broad range of factors, and there are no minimum standards specified by EPA Victoria. Incinerating toilets do not produce effluent and composting toilets produce a concentrated leachate, to which effluent quality standards do not apply.

4.2.1 Septic Tanks

Septic tanks (for combined wastewater or blackwater only) are traditionally the most common type of treatment system in established localities without reticulated sewerage. They can also be used as pre-treatment for greywater treatment systems, although this is far less common. The technology is passive, whereby wastewater is gravity fed to a single tank (typically concrete or plastic), ideally fitted with a baffle and inlet and outlet 'T-pieces' to prevent extrusion of solids into the trenches or backflow to the inlet. Dense solids settle to the bottom of the tank to form sludge, while a lower-density scum forms at the surface (comprised of cellulose, fats, oils, grease and other materials). Anaerobic digestion of colloidal and dissolved organic solids occurs, and some nitrogen and phosphorus is also removed. The primary-treated effluent is discharged by gravity for further treatment in a secondary treatment system or to a land application system suitable for primary effluent (such as trenches, beds or a mound).

Septic tanks should be pumped out before sludge build-up or scum thickness reduces the available capacity for wastewater detention to the point where treatment efficacy is being impacted. Depending on tank capacity, household occupancy and influent strength, the pump-out period would be required every 3-5 years for combined wastewater and blackwater septic tanks (the EPA currently requires septic tanks be desludged every three years to ensure maximum effectiveness), and about 10-15 years for greywater only.

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Septic tanks are subject to AS/NZS1546.1:2008 (On-site domestic wastewater treatment units – septic tanks) as well as the current EPA Code of Practice and current EPA Certificate of Approval.

4.2.2 Incinerating Toilets

Incinerating toilets are rarely installed and are most suited to situations where a very small footprint and nil water use (and wastewater generation) are required. There are few models on the market, but all are similar in design and operation: wastewater is captured in a cone-shaped bowl or void, generally upon a fresh paper liner for each use system. With the push of a lever or button, the waste drops into the electric incineration chamber below which is sealed off from the bowl, but is vented to the outdoors (or to an approved ventilation system). A small amount (approximately 1 tablespoon) of ash is produced with each use and the ash collection trap must be cleaned approximately weekly (depending on frequency of use). The energy costs of this system are very high compared to other treatment systems.

4.2.3 Wet composting systems (combined wastewater)

Wet composting systems are also known as 'worm farms' and 'biological filters' and have increased in popularity over the past decade. Raw wastewater is discharged directly to the top of the filter (contained in a plastic tank similar to a septic tank) and a rich humus layer develops that separates the solids from liquid prior to composting the solids with the aid of soil micro- and macro- fauna, including earthworms. The liquid is discharged by gravity to absorption trenches and the composted solids are periodically removed by maintenance staff (every two years). The system is a passive, biologically-driven treatment process that mimics processes occurring in nature.

4.2.4 Composting toilets (waterless or low-flush)

The EPA list refers to only dry (waterless) composting toilets; however low-flush models are also available, although they are less common. Composting toilets are generally installed for water saving or lifestyle reasons (e.g. 'eco homes' or remote homes with limited water supply). They are very rarely retrofitted into existing homes, and require a separate greywater treatment system to treat all greywater streams (including kitchen greywater).

Any liquid in the system (including urine) forms a concentrated leachate which is disposed of by gravity drainage to a small absorption trench, which has long-term sustainability implications and is not suitable for areas with shallow soils, heavy-textured soils or high water tables. Alternatively, the leachate can be collected in a sealed container for disposal at a licenced wastewater treatment facility.

Waterless composting toilets are subject to AS/NZS1546.2:2008 ('On-site domestic wastewater treatment units – waterless composting toilets') as well as the current EPA Code of Practice and current EPA Certificate of Approval.

4.3 Combined Wastewater Secondary Domestic Treatment Systems

According to the EPA, there are four broad categories of domestic secondary treatment systems:

1. Aerated wastewater treatment systems (AWTS)
2. Membrane Filters
3. Reedbeds
4. Sand and other Media Trickling Filters

The technologies used in domestic-scale systems are also often used in commercial systems (discussed in 4.3 below). The minimum standards for secondary effluent quality in Victoria (as per the current EPA Code of Practice) are as follows:

- Biochemical Oxygen Demand (BOD₅): <20mg/L
- Total Suspended Solids (TSS): <30mg/L

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- *E. coli* or thermotolerant coliforms (if disinfected): <10cfu/100mL

Nutrient removal performance varies considerably between secondary treatment systems and largely depends on design and operation (as well as influent nutrient concentrations).

4.3.1 Aerated wastewater treatment systems (AWTS)

Domestic AWTS are pre-fabricated, mechanically aerated wastewater treatment systems designed to treat wastewater flows of <2,000L/day. They are tank-based systems, comprising either one or two discrete tanks that typically employ the following processes:

- settling of solids and flotation of scum in an anaerobic primary chamber or separate primary tank (effectively operating as a septic tank). This stage is omitted in some models.
- oxidation and consumption of organic matter through aerobic biological processes using (active or passive) mechanical aeration.
- clarification – secondary settling of solids.
- disinfection – usually by chlorination but occasionally using ultraviolet irradiation.
- regular removal of sludge to maintain the process.

AWTS are typically supplied as stand-alone, proprietary systems. They require regular maintenance in accordance with the EPA Certificate of Approval for the specific model (usually quarterly) to ensure satisfactory performance and adequate disinfection. The operating (power) costs of AWTS are relatively high compared to more passive systems such as trickling filters and reed beds, as the aerobic treatment phase requires air blowers to be run for several hours each day.

AWTS are generally **not** suitable for premises with intermittent use or surge loads, such as holiday homes and commercial premises with very low flow/high flow wastewater cycles. AWTS must not be switched off when not in use as the deprivation of oxygen will kill the aerobic bacteria within a few days and populations can take weeks to be re-established when the system is turned on and wastewater supply resumes. Some AWTS models have a low-flow switch which re-circulates effluent to keep aerobic bacteria alive when not in use.

AWTS are subject to AS/NZS1546.2:2008 ('On-site domestic wastewater treatment units – waterless composting toilets') as well as the current EPA Code of Practice and current EPA Certificate of Approval for the specific AWTS model.

4.3.2 Membrane Filters

Membrane filters provide advanced secondary treated effluent using microfiltration or reverse osmosis membranes, usually following primary and secondary treatment in separate chambers or tanks. Use of membranes requires high energy use and therefore the ongoing costs as well as upfront costs of membranes systems which are high when compared to other systems. Furthermore, the systems require regular, ongoing maintenance to ensure membranes are not damaged or remain fouled.

4.3.3 Reedbeds

The wastewater influent must first undergo primary treatment (e.g. a septic tank) prior to being treated in a reedbed. A reedbed is also known as subsurface-flow reedbed or constructed wetland and is designed to ensure that effluent flows beneath the gravel media surface, within the root zone of wetland plants, to ensure there is no standing water in the system. The system is lined with an impermeable membrane and constructed so that effluent flows horizontally through the media, via gravity. The wetland plants (macrophytes) and microbiological biofilms that develop on roots and gravel surfaces remove contaminants and pathogens from the effluent as it passes through. The treated effluent drains to a collection sump, from which it is pumped or discharged by gravity to the land application area (e.g. subsurface irrigation or absorption trench).

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Reed beds are generally much more effective at nitrogen removal than phosphorus removal, with phosphorus removal expected to decline over time as the substrate becomes P-saturated. Although they are often touted as 'maintenance-free,' periodic replacement of the filter media assists in ongoing phosphorus removal.

Reedbeds are suitable for intermittent use and low-flow scenarios; however very high strength wastes (particularly BOD₅ and nutrients) can overwhelm the system and lead to poor treatment. For consistently high-strength influent wastewater (such as food or dairy processing premises), an additional primary treatment stage or secondary pre-treatment stage may be required, with the reedbed providing final effluent 'polishing'.

4.3.4 Sand and other Media Trickling Filters

For all sand and media filters, the influent must first undergo primary treatment (e.g. a septic tank). Sand and textile media filters are configured to provide a very large surface area to volume ratio, which hosts aerobic microorganisms that treat the effluent as it passes over the sand or media, usually by gravity. Proprietary filter systems typically incorporate the primary treatment tank into a stand-alone unit and recirculate a proportion of the treated effluent through the filter to improve effluent quality. The system is typically located below or at ground level. Sand filters can also be single-pass (i.e. non-recirculating) and therefore require a larger surface area to ensure adequate hydraulic residence time (HRT) of effluent.

Sand and textile media filters are generally more resilient to intermittent flows and shock loading than AWTs, and can have significantly lower operating costs. Recirculating systems (textile and some sand filters) have a relatively small footprint (and demand for materials) compared to single-pass sand filters; however, single pass filters can be designed with passive (gravity) dosing, requiring no electricity to operate. Site-specific hydraulic designs are required to support passive dosing systems.

For consistently high-strength influent wastewater (such as food or dairy processing premises), an additional primary treatment stage or secondary pre-treatment stage may be required, with the filter providing final effluent 'polishing'.

4.3.5 Combined Wastewater Secondary Commercial Treatment Systems

These systems are for predominantly human waste (minimal trade wastes) with flows 2,000-5,000L/day (in accordance with EPA 2015 regulations). The treatment technologies used are broadly similar to those used in domestic wastewater treatment systems, but are expanded in scale. Some systems are modular in design, using numerous small treatment units either in series or in parallel, allowing expansion of treatment capacities where required (including bringing standby units online for peak loads or permanent increases in influent loads). In many cases, companies will provide systems to both the domestic and the commercial market.

5. Land Application Systems for Treated Effluent

The range of available land application systems is discussed below; and tables at the end of this Appendix provide a summary of onsite wastewater management treatment and land application systems available, and their suitability for use in various regions of the Shire (with consideration of system compatibility, and seasonal variance of flows from intermittently occupied holiday dwellings and seasonally-operating small businesses).

5.1 Absorption Trenches and Beds

Conventional absorption trenches and beds have conventionally been used for land application of septic tank effluent. Both options rely substantially on effluent absorption to the soil and impose relatively high loading rates on the soil (compared to irrigation). This increases the risk of systems being overloaded and failing hydraulically in the long term, with potential adverse health and environmental impacts. Furthermore, prolonged effluent application through absorption systems increases the risk of soil degradation by increasing salinity and sodicity, as well as the build-up of impermeable or slowly-permeable 'bio-mats' which can prevent movement of effluent into the soil, leading to 'creeping failure'. These disposal systems offer very limited opportunity for effective reuse of effluent and do not represent current best practice.

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Over the years there have been various modifications to conventional absorption trenches and beds, some of which have been developed into proprietary 'off-the-shelf' products including various brands of self-supporting arch drains and the *Advanced Enviro-Septic™* modular trench.

Absorption trenches and beds are considered inappropriate for sites with shallow soils, high groundwater or heavy-textured (clay-based) soils, due to limited infiltration capacity. They are also generally not suitable for gravels and sands, as the very high permeability of these materials can inhibit beneficial treatment within the soil profile and allow effluent to rapidly percolate to the groundwater table. Areas with high rainfall are also at high risk of surface and groundwater contamination from conventional trenches and beds. Absorption trenches and beds can also be used with secondary-treated effluent, which can be dosed at a higher rate than primary-treated effluent (in accordance with Table 9 of the EPA Code of Practice (2013) and Table 5.2 of AS1547:2012).

5.2 Evapotranspiration-Absorption Trenches and Beds

Evapotranspiration-absorption (ETA) beds are essentially shallower absorption trenches or beds that allow some plant uptake of the effluent from the soil profile, reducing the amount of effluent that is leached to deeper soils and groundwater. They can improve environmental and public health outcomes for areas with heavy-textured or shallow soils, or high watertables, compared to absorption trenches and beds. However, they are prone to similar problems to conventional absorption trenches, including build-up of bio-mats and rapid percolation in highly-permeable soils. ETA systems are suitable for both primary and secondary treated effluent; however the DLRs nominated by both the current EPA Code of Practice and AS1547:2012 do not vary with the level of treatment (as is the case for absorption systems).

5.3 Modified ETA Trenches and Beds

In recent years, there have been several proprietary and custom-built modifications to standard ETA trenches and beds, which further optimise evapotranspiration of effluent and minimise deep drainage. The most common example is the custom-made geotextile-wrapped and/or lined arch or pipe trenches, which use capillary action in the geotextile to 'wick' effluent into the topsoil and root zone above (referred to in the current EPA Code of Practice as a 'wick trench or bed'). Wick trenches/beds are generally considered suitable for low-permeability soils. Like standard ETA systems, the modified versions are suitable for both primary and secondary treated effluent. The EPA Code of Practice nominates Design Loading Rates (DLRs) for wick trenches using secondary-treated effluent. For primary-treated effluent, however, the nominated DLRs for standard ETA systems in Table 5.2 of AS1547:2012 should be adopted. The long term performance of modified ETA systems has not been tested as they are a relative recent innovation. Use of primary-treated effluent could result in clogging of geotextile materials over time.

5.4 Mounds

Sand mounds, also known as Wisconsin mounds, are often an appropriate on-site solution for properties/parcels with limited space, shallow soil profiles, poor drainage or high water tables. Mounds are effectively raised soil absorption systems comprising layered fill, into which effluent is dosed. Effluent receives further treatment as it percolates down through the mound and is then absorbed by the natural soils below the mound. A properly designed mound can have a higher evapotranspiration potential than an ETA bed of equivalent size, further enhancing effluent disposal on constrained properties/parcels.

The basal footprint of a domestic mound is typically in the order of 7m wide by at least 20m long, and there are considerable up-front cost in the materials and construction of mounds. Mounds are suitable for primary or secondary treated effluent, and provide further treatment of effluent as it moves through the sand profile.

In addition, there are proprietary mound systems which use a modified fill media primarily from industrial waste products of aluminium or iron smelting, which have a very high phosphorus adsorption capacity. When designed, installed and maintained correctly, these systems can

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present a good solution for constrained sites. However, the success of these systems has been variable in the past, largely due to inappropriate design and installation. Table 9 of the EPA Code of Practice (2013) and Table 5.2 of AS1547:2012 provide DLRs for mounds.

5.5 Low Pressure Effluent Distribution (LPED) Irrigation

LPED irrigation systems were originally developed for use in Category 1 and 2 soils (as per AS/NZS 1547:2012) where conventional absorption beds can result in overloading of soils at the proximal section of the trench while under-loading the remainder of the trench. Note that Table 9 of the EPA Code of Practice prohibits the use of LPED systems in Category 1 soils (gravels and sands) and Category 2a soils (weakly structured sandy loams). LPED systems can be beneficial for Category 5 soils; however, the large area they must occupy for such soils would be better served by subsurface irrigation (using secondary treated effluent) – see Section 5.7 below.

In LPED systems, effluent is discharged into 25-30mm perforated pipes contained within 50-100mm slotted pipes, to distribute effluent more evenly into the surrounding aggregate and to prevent soil intrusion into the perforations. The pipes are laid in narrow, shallow trenches (filled with aggregate and capped with topsoil), in order to optimise contact with aerobic bacteria in topsoil and to facilitate plant uptake of effluent. The system can be pressurised using a pump or a passive dosing device (i.e. a Flout™ or a siphon), with a detailed hydraulic design to ensure even distribution throughout the system. LPED irrigation can be used with either primary or secondary effluent, but is more commonly used as an alternative to trench and bed systems for primary effluent. It is recommended that an outlet filter is installed on primary treatment systems to reduce the amount of suspended solids and organics being conveyed into the LPED system. Table 9 of the EPA Code of Practice (2013) and Table 5.2 of AS1547:2012 provide DLRs for LPED systems (one rate for both primary and secondary effluent). Detailed design and installation advice is provided in Auckland Regional Council (2004) Technical Publication 58 (however the local DLRs must be used instead of those specified by ARC).

5.6 Surface Spray Irrigation

Surface spray irrigation (using mist or droplet sprinklers) while increasing in popularity over the past 20 years, is now considered an outdated technology that can pose unacceptable public and environmental health risks due to potential exposure and also surface runoff during rainfall. Often, an inadequate number of sprinklers are installed to ensure even coverage over an adequately large area; and commonly the sprinklers are not fixed and must be frequently moved by the resident to reduce over-loading (which is often neglected over time). In addition, surface irrigation is not considered appropriate for slopes greater than 10%, as the risk of runoff increases. Surface spray irrigation is more suitable for relatively large and flat areas, with limited access to the irrigation field and large buffer distances to surface watercourses and drains. For typical domestic and small commercial sites, subsurface or covered-surface (i.e. under mulch) drip irrigation is considered best practice. Table 9 of the EPA Code of Practice (2013) and Table 5.2 of AS1547:2012 provide Design Irrigation Rates (DIRs) for surface irrigation systems.

5.7 Subsurface or Covered-surface Drip Irrigation

Subsurface drip irrigation or covered-surface drip irrigation systems are becoming more popular in recent years. Properly designed systems apply effluent at much lower volumetric rates and over larger areas than absorption or ETA trenches/beds or mounds. Coverage is often better than can be achieved by surface irrigation.

Effluent is applied in the root zone of plants (100-150mm below the surface) at a rate that more closely matches plant and soil requirements (evapotranspiration), leading to more effective effluent reuse. The reliance on soil absorption is relatively low and hence the risk of contaminants accumulating in the soil or leaching to groundwater is also low.

Subsurface drip irrigation typically comprises a network of proprietary, pressure-compensating drip-irrigation line that is specially designed for use with effluent and contains specially designed emitters that reduce the risk of blockage, biofilm development and root intrusion. Subsurface irrigation virtually eliminates the risk of people inadvertently coming into contact with effluent

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and also minimises the risk of effluent being transported off-site, even during rain. Subsurface irrigation may be installed on sloping properties/parcels, provided the application rate is reduced accordingly to ensure that effluent migration down slope is taken up adequately within the root system (as per Table M2 of AS/NZS 1547:2012).

When properly designed, installed and operated, the system will ensure good distribution of effluent at uniform, controlled application rates. By properly sizing the land application areas to ensure sustainable hydraulic and nutrient loading rates, water and nutrients can be effectively utilised and are unlikely to seep to groundwater or run-off to surface waters. Care must be taken in designing and installing irrigation systems in areas that experience temperatures below freezing. Table 9 of the EPA Code of Practice (2013) and Table 5.2 of AS1547:2012 provide Design Irrigation Rates (DIRs) for subsurface irrigation systems.

6. System Selection

The following tables provide an overview of the range and application of EPA-accredited wastewater treatment system types, their compatibility with land application systems, and their suitability for use across unsewered areas of the Shire (based on soil characteristics only). Individual proprietary systems (i.e. brands) are not discussed.

The influence of climate patterns on land application system sizing is addressed in the Land Application System Sizing Tables which are included in the Locality Reports in Appendix B of the Technical Document. Note that the assessment of land application system suitability is based on the type and depth of soils identified in the locality, not the water balance for the locality. The Sizing Tables identify situations where the water balance does not resolve itself and minimum application areas cannot be determined using the water balance approach.

However, it may be possible to design and construct these systems in areas with high rainfall, following detailed LCA and system design, and potential mitigation measures such as the importation of topsoils to reduce effluent loading rates.

Table 10: DWM System Compatibility Matrix

| Onsite Wastewater Management System | Absorption Trenches/Beds | Standard and Modified ETA Trenches/Beds | Mounds | LPED Irrigation | Surface or Subsurface Irrigation ¹ | Toilet flushing and cold water supply to washing machines |
|---|--------------------------|---|--------|-----------------|---|---|
| PRIMARY TREATMENT | | | | | | |
| Septic Tanks | YES | YES | YES | YES | NO | NO |
| Wet Composting Systems/Biological Filters | YES | YES | YES | YES | NO | NO |
| SECONDARY TREATMENT | | | | | | |
| AWTS | YES | YES | YES | YES | YES | NO |
| Membrane Filters | YES | YES | YES | YES | YES | NO |
| Reed Beds | YES | YES | YES | YES | YES | NO |
| Sand or Media Trickling Filters | YES | YES | YES | YES | YES | NO |
| ADVANCED SECONDARY TREATMENT | | | | | | |
| Greywater Treatment Systems | YES | YES | YES | YES | YES | YES |

¹ pressure-compensating, subsurface drip irrigation is preferred to surface spray or drip irrigation.

Table 11: Effluent Management Suitability by Locality

| Locality ¹ | AS/NZS 1547:2012
Category of Limiting
Soil Horizon | Indicative Topsoil Depth
(cm) ² | Absorption
Trenches/Beds | Standard and
Modified ETA
Trenches/Beds | Mounds | Surface or
Subsurface
Irrigation ³ | LPED Irrigation |
|---|--|---|-----------------------------|---|---------------|---|-----------------|
| Alvie | 4 and 5 | 0-60 | NOT SUPPORTED | POSSIBLE | POSSIBLE | POSSIBLE | POSSIBLE |
| Barham River Catchment
(within Apollo Bay) | 5 and 6 | 0-50 | NOT SUPPORTED | POSSIBLE | POSSIBLE | POSSIBLE | POSSIBLE |
| Barongarook | 4 and 5 | 0-60 | NOT SUPPORTED | POSSIBLE | POSSIBLE | POSSIBLE | POSSIBLE |
| Barramungah | 4 | 0-70 | POSSIBLE | POSSIBLE | POSSIBLE | POSSIBLE | POSSIBLE |
| Barwon Downs | 5 and 6 | 0-60 | NOT SUPPORTED | POSSIBLE | POSSIBLE | POSSIBLE | POSSIBLE |
| Beac | 5 and 6 | 0-70 | NOT SUPPORTED | POSSIBLE | POSSIBLE | POSSIBLE | POSSIBLE |
| Beech Forest | 4 | 0-50 (total profile depth) | NOT SUPPORTED | POSSIBLE | POSSIBLE | POSSIBLE | POSSIBLE |
| Carlisle River | 5 and 6 | 0-40 | NOT SUPPORTED | POSSIBLE | POSSIBLE | POSSIBLE | POSSIBLE |
| Coragulac | 5 | 0-30 | NOT SUPPORTED | POSSIBLE | POSSIBLE | POSSIBLE | POSSIBLE |
| Cororooke | 4 | 0-50 | POSSIBLE | POSSIBLE | POSSIBLE | POSSIBLE | POSSIBLE |
| Ferguson | 4 | 0-60 | POSSIBLE | POSSIBLE | POSSIBLE | POSSIBLE | POSSIBLE |
| Forrest | 4 and 5 | 0-20 | NOT SUPPORTED | POSSIBLE | POSSIBLE | POSSIBLE | POSSIBLE |
| Gellibrand | 5 | 0-40 | NOT SUPPORTED | POSSIBLE | POSSIBLE | POSSIBLE | POSSIBLE |
| Kawarren | 4 and 5 | 0-80 | POSSIBLE | POSSIBLE | POSSIBLE | POSSIBLE | POSSIBLE |
| Kennett River | 4 | 0-90 | NOT SUPPORTED | NOT SUPPORTED | POSSIBLE | POSSIBLE | POSSIBLE |
| Lavers Hill | 4 and 5 | 0-50 | NOT SUPPORTED | POSSIBLE | POSSIBLE | POSSIBLE | POSSIBLE |
| Weeaprolnah | 4 and 5 | 0-50 (total profile depth) | NOT SUPPORTED | POSSIBLE | POSSIBLE | POSSIBLE | POSSIBLE |
| Wye River/ Separation
Creek | 1 (delta) - OR
4 (slopes) | various | NOT SUPPORTED | NOT SUPPORTED | NOT SUPPORTED | POSSIBLE | NOT SUPPORTED |
| Wyeianglah | 4 and 5 | 0-70 | POSSIBLE | POSSIBLE | POSSIBLE | POSSIBLE | POSSIBLE |

¹ Although system types are stated to be possible for a given location, a site specific design using a water balance may deem it as unsuitable for the given lot, particularly in the high rainfall areas of the Otway Ranges.

² Soil profile information taken from field assessments of representative site's in each locality by Robert van der Graaff in July 2014, and/or W&A in September 2014. Site assessments may identify different soils.

³ Pressure-compensating, subsurface drip irrigation is preferred to surface spray or drip irrigation

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Appendix B

Sensitivity Proforma Checklist

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| Parameter | Site specific input |
|-----------------------------|----------------------------|
| PFI Identification Number | |
| Property/Parcel Address | |
| Locality | |
| Zoning | |
| Area (ha) | |
| Soil Texture | |
| Soil Depth (m) | |
| Soil Structure | |
| Soil Limitations | |
| Permeability (Ksat) (m/day) | |
| Slope (%) | |
| Presence of Surface Waters | |
| Useable Lot Area (ha) | |

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Appendix C

Land Capability Assessment Checklists

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Table C1: Minimum Requirement for a Standard LCA Assessment and Report

| Report Element | Standard Requirements | Completed |
|--|--|--------------------------|
| 1. Introduction and Background | Report summary/ executive summary. | <input type="checkbox"/> |
| | Confirmation of Sensitivity Rating. | <input type="checkbox"/> |
| | Confirmation of any relevant sensitivity overlays (e.g. landslip) as per communications with Council. | <input type="checkbox"/> |
| | Confirmation that property/parcel(s) meets minimum lot size criteria for COS Planning Scheme Zone. | <input type="checkbox"/> |
| | Current land use and development overview (including occupancy); single property/parcel, increase in building entitlements (subdivision) or non-domestic development. | <input type="checkbox"/> |
| | Name, contact details and qualifications (insurances) of LCA assessor (author). | <input type="checkbox"/> |
| | Site location (including address and property/parcel details) and owner. | <input type="checkbox"/> |
| | Property/parcel area. | <input type="checkbox"/> |
| | Proposed/existing water supply. | <input type="checkbox"/> |
| | Availability of sewer. | <input type="checkbox"/> |
| | Locality map showing the site in relation to surrounding region. | <input type="checkbox"/> |
| 2. Site Inspection and Field Investigations | Gather information on relevant Council, Water Corporation, Catchment Management Authority and State Government requirements, including restrictions and caveats on title, and planning/building/bushfire/flood controls, e.g. zones and overlays. Note Environmental Significant Overlays, potable water supply and DWSCs. Impose this information on a base map (or site plan) which shows their location with respect to title boundaries. | <input type="checkbox"/> |
| | Broad overview of locality and landscape characteristics that may pose a constraint to the sustainable application of wastewater on the site and adjacent land, e.g. climatic information, groundwater and bore water information. (Refer to stage 3 pp.34 EPA Code of Practice (2013)). | <input type="checkbox"/> |
| | Details of date, time and methodology of site inspection and field investigations. | <input type="checkbox"/> |
| | Site assessment that considers all of the parameters as per Table 1 of the Victorian LCA Framework (2014). Detailed explanation of the level of constraint with regards to DWM and recommended mitigation measures to overcome these constraints. | <input type="checkbox"/> |
| | Minimum of two soil test pits or auger holes within the identified available effluent management area(s), with additional test pits required for more than one soil type (multiple soil landscapes or facets) as per the current EPA Code of Practice. | <input type="checkbox"/> |
| | Soil assessment that considers the following parameters from Table 2 of the Victorian LCA Framework (2014):
<ul style="list-style-type: none"> • colour and mottling; • electrical conductivity; • Emerson Aggregate Class; • permeability and design loading rate (using soil texture); • pH; • rock fragments; • soil depth; • soil texture (field textural analysis); and • depth to watertable (if required). Detailed explanation of the level of constraint with regards to DWM and recommended mitigation measures to overcome these constraints. | <input type="checkbox"/> |

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| Report Element | Standard Requirements | Completed |
|--|--|--------------------------|
| 3. Available Area and Setback Distances | Calculation of available effluent management area and location on the Site Plan. | <input type="checkbox"/> |
| | Discussion regarding the achievability of the applicable setback distances (Table 5 of the EPA Code of Practice (2013)). Justification required. | <input type="checkbox"/> |
| 4. LCA Confirmation | Confirm the results from Stages 1-3 of the LCA checklist with Council to assess the final Sensitivity Rating for the site to confirm LCA requirements for system selection and design. Provide a Site Plan showing the available effluent management area(s) and completed Sensitivity Proforma Checklist. | <input type="checkbox"/> |
| 5. Cumulative Impacts | Using the desktop and site assessment information for the site, comment on any possible cumulative detrimental impacts that the development may have on beneficial uses of the surrounding land, surface water and groundwater. | <input type="checkbox"/> |
| 6. System Selection and Design* | Design maximum wastewater load (generation rates) and organic load for the proposed development. | <input type="checkbox"/> |
| | Description of existing system (if applicable). | <input type="checkbox"/> |
| | Target effluent treatment quality. | <input type="checkbox"/> |
| | Description and location of applicable DWM treatment system options (refer to relevant Locality Report and EPA website for list of currently approved systems). | <input type="checkbox"/> |
| | List of effluent land application options and detailed description of preferred option and location (as per relevant Locality Report). Sizing of land application area as per the system Sizing Tables detailed in the Technical Document. | <input type="checkbox"/> |
| 7. Mitigation Measures | Detailed discussion of mitigation measures to overcome any site or soil constraints posed to the sustainable treatment and application of wastewater on-site. This may include the following: <ul style="list-style-type: none"> • Storm water management • Soil amelioration; and • Vegetation establishment and management. | <input type="checkbox"/> |
| 8. Site Management Plan | Description of ways to improve wastewater and DWM system performance for residents' reference. | <input type="checkbox"/> |
| | Operation and Management Plan. | <input type="checkbox"/> |
| 9. Conclusion | Conclusion summarising all the important design, sizing and mitigation requirements to ensure sustainable on-site DWM. | <input type="checkbox"/> |
| 10. Site Plan Requirements | Site address, including property/parcel number and street number. | <input type="checkbox"/> |
| | All title boundaries. | <input type="checkbox"/> |
| | All relevant zones and overlays and/or restrictions (e.g. Council zoning and overlays, including Environmental Significant Overlays and DWSCs). | <input type="checkbox"/> |
| | Type of catchment (e.g. potable or other special water supply catchment). | <input type="checkbox"/> |
| | North arrow. | <input type="checkbox"/> |
| | Location of groundwater bores. | <input type="checkbox"/> |
| | Contour lines (at maximum 1 in 10m intervals), direction of slope and grade. | <input type="checkbox"/> |
| | Location of soil test pits or auger holes. | <input type="checkbox"/> |
| | Location of any significant site features e.g. rock outcrops or waterlogged regions. | <input type="checkbox"/> |
| | Location of intermittent and permanent surface waterways (dams, creeks, reservoirs and springs). | <input type="checkbox"/> |
| | Location of 1% and 5% Annual Exceedance Probability flood level | <input type="checkbox"/> |

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| Report Element | Standard Requirements | Completed |
|---|---|--------------------------|
| | contours lines (if applicable). | |
| | Location, depth and specified use of groundwater bores on the site and adjacent properties from the register of the relevant Rural Water Corporation. | <input type="checkbox"/> |
| | Depth to groundwater table in winter (if less than 2.1m deep). | |
| | Vegetation cover (can use aerial image as base map). | <input type="checkbox"/> |
| | Relevant setback distances as per Table 5 EPA Code of Practice (2013). | <input type="checkbox"/> |
| | Location of existing and proposed buildings, sheds, driveways, paths and any other improvements. | <input type="checkbox"/> |
| | Available effluent management area(s). | <input type="checkbox"/> |
| | Location of proposed land application area (sized to scale). | <input type="checkbox"/> |
| | Location of proposed stormwater cut-off drains adjacent to the land application area. | <input type="checkbox"/> |
| | Location of proposed DWM system (nominal). | <input type="checkbox"/> |
| | Location of reserve land application area (sized to scale). | <input type="checkbox"/> |
| 11. Appendices | Figures | <input type="checkbox"/> |
| | Site Plan | <input type="checkbox"/> |
| | Soil bore logs for all test pits or auger holes | <input type="checkbox"/> |
| | Certificate of Title(s) for property/parcel (plan) | <input type="checkbox"/> |
| | Proposed building plans | <input type="checkbox"/> |
| | Planning Permit application (where applicable) | <input type="checkbox"/> |
| | Septic Tank Permit application | <input type="checkbox"/> |
| <p>* If site is located within Climate Zone 4, then site specific design is required and the Sizing Tables cannot be used. This is due to the higher rainfall and the need to utilise a water balance for design purposes. The LCA is to remain the same, except Stage 6 is to follow the requirements set out in the Detailed LCA Proforma.</p> <p>** Properties/parcels with a Low Sensitivity Rating that are located within a DWSC are required to complete this Standard LCA as per the current EPA Code of Practice requirements.</p> | | |

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Table C2: Minimum Requirements for a Detailed LCA Assessment and Report

| Report Element | Detailed Requirements | Completed |
|--|---|--------------------------|
| 1. Introduction and Background | Report summary/ executive summary. | <input type="checkbox"/> |
| | Confirmation of Sensitivity Rating. | <input type="checkbox"/> |
| | Confirmation of any relevant sensitivity overlays (e.g. landslip) as per communications with Council. | <input type="checkbox"/> |
| | Confirmation that property/parcel(s) meets minimum lot size criteria for COS Planning Scheme Zone. | <input type="checkbox"/> |
| | Current land use and development overview (including occupancy); single property/parcel, increase in building entitlements (subdivision) or non-domestic development. | <input type="checkbox"/> |
| | Name, contact details and qualifications (insurances) of LCA assessor (author). | <input type="checkbox"/> |
| | Site location (including address and property/parcel details) and owner. | <input type="checkbox"/> |
| | Property/parcel area. | <input type="checkbox"/> |
| | Proposed/existing water supply. | <input type="checkbox"/> |
| | Availability of sewer. | <input type="checkbox"/> |
| | Locality map showing the site in relation to surrounding region. | <input type="checkbox"/> |
| | Site survey plan (2m contours) will need to be conducted by a qualified surveyor. | <input type="checkbox"/> |
| 2. Site Inspection and Field Investigations | Gather information on relevant Council, Water Corporation, Catchment Management Authority and State Government requirements, including restrictions and caveats on title, and planning/building/bushfire/flood controls, e.g. zones and overlays. Note Environmental Significant Overlays, potable water supply and DWSCs. Impose this information on a base map (or site plan) which shows their location with respect to title boundaries. | <input type="checkbox"/> |
| | Broad overview of locality and landscape characteristics that may pose a constraint to the sustainable application of wastewater on the Site and adjacent land, e.g. climatic information, groundwater and bore water information. (Refer to stage 3 pp.34 EPA Code of Practice (2013)). | <input type="checkbox"/> |
| | Details of date, time and methodology of site inspection and field investigations. | <input type="checkbox"/> |
| | Site assessment that considers all of the parameters as per Table 1 of the Victorian LCA Framework (2014). Detailed explanation of the level of constraint with regards to DWM and recommended mitigation measures to overcome these constraints. | <input type="checkbox"/> |
| | Minimum of two soil test pits or auger holes within the identified available effluent management area with additional test pits required for more than one soil type (multiple soil landscapes or facets) as per the current EPA Code of Practice. | <input type="checkbox"/> |
| | Soil assessment that considers all of the parameters in Table 2 of the Victorian LCA Framework (2014):
<ul style="list-style-type: none"> • colour and mottling; • electrical conductivity; • Emerson Aggregate Class; • permeability and design loading rate (using soil texture); • pH; • rock fragments; • soil depth; • soil texture (field textural analysis); • watertable (depth to); • cation exchange capacity (CEC); | <input type="checkbox"/> |

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| Report Element | Detailed Requirements | Completed |
|--|---|--------------------------|
| | <ul style="list-style-type: none"> sodicity (Exchangeable Sodium Percentage ESP); and Sodium Absorption Ratio (SAR). <p>Detailed explanation of the level of constraint with regards to DWM and recommended mitigation measures to overcome these constraints.</p> <p>Soil permeability testing conducted in situ for the soil within the available effluent management area as per constant head well permeameter method (AS/NZS 1547:2012) can be undertaken if desired, otherwise soil texture classification and application of effluent using the loading rates within the AS/NZS 1547:2012 is satisfactory.</p> | |
| | Detailed review of available published soils information for the site. Soil landscapes and different soil facets should be mapped on the Site Plan. | <input type="checkbox"/> |
| 3. Available Area and Setback Distances | Calculation of available effluent management area and location on Site Plan. | <input type="checkbox"/> |
| | Discussion regarding the achievability of the applicable setback distances (Table 5 of the EPA Code of Practice (2013)). Justification required. | <input type="checkbox"/> |
| 4. LCA Confirmation | Confirm the results from Stages 1-3 of the LCA checklist with Council to assess the final Sensitivity Rating for the site to confirm LCA requirements for system selection and design. Provide a Site Plan showing the available effluent management area(s) and completed Sensitivity Proforma Checklist. | <input type="checkbox"/> |
| 5. Cumulative Impacts | Using the desktop and site assessment information for the site, comment on any possible cumulative detrimental impacts that the development may have on beneficial uses of the surrounding land, surface water and groundwater. | <input type="checkbox"/> |
| 6. System Selection and Design | Design maximum wastewater load (generation rates) and organic load for the proposed development. | <input type="checkbox"/> |
| | Description of existing system (if applicable). | <input type="checkbox"/> |
| | Target effluent treatment quality. | <input type="checkbox"/> |
| | Assess the capacity of the land to assimilate the treated wastewater based on the data collected and the total dissolved salts (TDS) in the potable water supply (see Section 2.3.4 and Appendix G of EPA Code of Practice (2013)) for both levels of effluent quality, primary and secondary. | <input type="checkbox"/> |
| | Description and location of applicable DWM treatment system options (refer to the EPA website for list of currently approved systems). | <input type="checkbox"/> |
| | List of effluent land application options and detailed description of preferred option and location. | <input type="checkbox"/> |
| | Monthly water balance sizing the preferred effluent land application area. The 70 percentile climate data must be used for your location within the relevant Climate Zone, as detailed in Section 6.2.2 of Technical Document. A copy of the 70 th percentile climate data is attached in Appendix C of the Technical Document. All inputs, results and justification to be shown in the report. | <input type="checkbox"/> |
| 7. Mitigation Measures | <p>Detailed discussion of mitigation measures to overcome any site or soil constraints posed to the sustainable treatment and application of wastewater on-site. This may include the following:</p> <ul style="list-style-type: none"> Storm water management Soil amelioration; and Vegetation establishment and management. | <input type="checkbox"/> |
| 8. Site | Description of ways to improve wastewater and DWM system performance for residents' reference. | <input type="checkbox"/> |

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| Report Element | Detailed Requirements | Completed |
|-----------------------------------|---|--------------------------|
| Management Plan | Operation and Management Plan. | <input type="checkbox"/> |
| 9. Conclusion | Conclusion summarising all the important design, sizing and mitigation requirements to ensure sustainable on-site DWM. | <input type="checkbox"/> |
| 10. Site Plan Requirements | Site address, including property/parcel number and street number. | <input type="checkbox"/> |
| | All title boundaries. | <input type="checkbox"/> |
| | All relevant zones and overlays and/or restrictions (e.g. Council zoning and overlays, including Environmental Significant Overlays and DWSCs). | <input type="checkbox"/> |
| | Type of catchment (i.e. potable or other special water supply catchment). | <input type="checkbox"/> |
| | North arrow. | <input type="checkbox"/> |
| | Location of groundwater bores. | <input type="checkbox"/> |
| | Contour lines (2m intervals from survey plan), direction of slope and grade. | <input type="checkbox"/> |
| | Location of soil test pits or auger holes. | <input type="checkbox"/> |
| | Location of any significant site features e.g. rock outcrops or waterlogged regions. | <input type="checkbox"/> |
| | Location of intermittent and permanent surface waterways (dams, creeks, reservoirs and springs). | <input type="checkbox"/> |
| | Location of 1% and 5% Annual Exceedance Probability flood level contours lines (if applicable). | <input type="checkbox"/> |
| | Location, depth and specified use of groundwater bores on the site and adjacent properties from the register of the relevant Rural Water Corporation. | <input type="checkbox"/> |
| | Depth to groundwater table in winter (if less than 2.1m deep). | <input type="checkbox"/> |
| | Vegetation cover (can use aerial image as base map). | <input type="checkbox"/> |
| | Relevant setback distances as per Table 5 EPA Code of Practice (2013). | <input type="checkbox"/> |
| | Location of existing and proposed buildings, sheds, driveways, paths and any other improvements. | <input type="checkbox"/> |
| | Available effluent management area(s). | <input type="checkbox"/> |
| | Location of proposed land application area (sized to scale). | <input type="checkbox"/> |
| | Location of proposed stormwater cut-off drains adjacent to the land application area. | <input type="checkbox"/> |
| | Location of proposed DWM system (nominal). | <input type="checkbox"/> |
| | Location of reserve land application area (sized to scale). | <input type="checkbox"/> |
| 11. Appendices | Copy of the monthly water balance calculations. | <input type="checkbox"/> |
| | Figures. | <input type="checkbox"/> |
| | Site Plan. | <input type="checkbox"/> |
| | Soil bore logs for all test pits or auger holes. | <input type="checkbox"/> |
| | Certificate of Title (s) for property/parcel (plan). | <input type="checkbox"/> |
| | Proposed building plans. | <input type="checkbox"/> |
| | Planning Permit application (where applicable). | <input type="checkbox"/> |
| | Septic Tank Permit application. | <input type="checkbox"/> |

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Table C3: Minimum Requirements for a Comprehensive LCA Assessment and Report

| Report Element | Comprehensive Requirements | Completed |
|--|---|--------------------------|
| 1. Introduction and Background | Report summary/ executive summary. | <input type="checkbox"/> |
| | Confirmation of Sensitivity Rating. | <input type="checkbox"/> |
| | Confirmation of any relevant sensitivity overlays (e.g. landslip) as per communications with Council. | <input type="checkbox"/> |
| | Confirmation that property/parcel(s) meets minimum lot size criteria for COS Planning Scheme Zone. | <input type="checkbox"/> |
| | Current land use and development overview (including occupancy); single property/parcel, increase in building entitlements (subdivision) or non-domestic development. | <input type="checkbox"/> |
| | Name, contact details and qualifications (insurances) of LCA assessor (author). | <input type="checkbox"/> |
| | Site location (including address and property/parcel details) and owner. | <input type="checkbox"/> |
| | Property/parcel area. | <input type="checkbox"/> |
| | Proposed/existing water supply. | <input type="checkbox"/> |
| | Availability of sewer. | <input type="checkbox"/> |
| | Locality map showing the site in relation to surrounding region. | <input type="checkbox"/> |
| | Site survey plan (2m contours) will need to be conducted by a qualified surveyor. | <input type="checkbox"/> |
| 2. Site Inspection and Field Investigations | Gather information on relevant Council, Water Corporation, Catchment Management Authority and State Government requirements, including restrictions and caveats on title, and planning/building/bushfire/flood controls, e.g. zones and overlays. Note Environmental Significant Overlays, potable water supply and DWSCs. Impose this information on a base map (or site plan) which shows their location with respect to title boundaries. | <input type="checkbox"/> |
| | Broad overview of locality and landscape characteristics that may pose a constraint to the sustainable application of wastewater on the Site and adjacent land, e.g. climatic information, groundwater and bore water information. (Refer to stage 3 pp.34 EPA Code of Practice (2013)). | <input type="checkbox"/> |
| | Details of date, time and methodology of site inspection and field investigations. | <input type="checkbox"/> |
| | Site assessment that considers all of the parameters as per Table 1 of the Victorian LCA Framework (2014). Detailed explanation of the level of constraint with regards to DWM and recommended mitigation measures to overcome these constraints. | <input type="checkbox"/> |
| | Minimum of two soil test pits or auger holes within the identified available effluent management area with additional test pits required for more than one soil type (multiple soil landscapes or facets) as per the current EPA Code of Practice. | <input type="checkbox"/> |
| | Soil assessment that considers all of the parameters in Table 2 of the Victorian LCA Framework (2014):
<ul style="list-style-type: none"> • colour and mottling; • electrical conductivity; • Emerson Aggregate Class; • permeability and design loading rate (using soil texture); • pH; • rock fragments; • soil depth; • soil texture (field textural analysis); • watertable (depth to); • cation exchange capacity (CEC); and | <input type="checkbox"/> |

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| Report Element | Comprehensive Requirements | Completed |
|--|---|--------------------------|
| | <ul style="list-style-type: none"> sodicity (Exchangeable Sodium Percentage ESP). Phosphorous Sorption Capacity is also required to be measured for the soil to which the effluent will be applied to. Detailed explanation of the level of constraint with regards to DWM and recommended mitigation measures to overcome these constraints. Soil permeability testing conducted in situ for the soil within the available effluent management area as per constant head well permeameter method (AS/NZS 1547:2012) must be undertaken to determine the sustainable daily effluent loading rates. | |
| | Detailed review of available published soils information for the site. Soil landscapes and different soil facets should be mapped on the Site Plan. | <input type="checkbox"/> |
| 3. Available Area and Setback Distances | Calculation of available effluent management area and location on Site Plan. | <input type="checkbox"/> |
| | Discussion regarding the achievability of the applicable setback distances (Table 5 of the EPA Code of Practice (2013)). Justification required. | <input type="checkbox"/> |
| 4. LCA Confirmation | Confirm the results from Stages 1-3 of the LCA checklist with Council to assess the final Sensitivity Rating for the site to confirm LCA requirements for system selection and design. Provide a Site Plan showing the available effluent management area(s) and completed Sensitivity Proforma Checklist. | <input type="checkbox"/> |
| 5. Cumulative Impacts | Using the desktop and site assessment information for the site, comment on any possible cumulative detrimental impacts that the development may have on beneficial uses of the surrounding land, surface water and groundwater. | <input type="checkbox"/> |
| | Viral Die-off Modelling to address pathogen transport concerns from the proposed land application area (e.g. Cromer <i>et al.</i> 2001). | <input type="checkbox"/> |
| 6. System Selection and Design | Design maximum wastewater load (generation rates) and organic load for the proposed development. | <input type="checkbox"/> |
| | Description of existing system (if applicable). | <input type="checkbox"/> |
| | Target effluent treatment quality. | <input type="checkbox"/> |
| | Assess the capacity of the land to assimilate the treated wastewater based on the data collected and the total dissolved salts (TDS) in the potable water supply (see Section 2.3.4 and Appendix G of EPA Code of Practice (2013)) for both levels of effluent quality; primary and secondary. | <input type="checkbox"/> |
| | Description and location of applicable DWM treatment system options (refer to EPA website for list of currently approved systems). | <input type="checkbox"/> |
| | List of effluent land application options and detailed description of preferred option and location. Land application area to be sized on the most limiting balance as detailed below. | <input type="checkbox"/> |
| | A water balance is required to size the preferred effluent land application area for the proposed development scenario. A monthly water balance using the prescribed 70 th percentile climate data must be used for your location within the relevant Climate Zone, as detailed in Section 6.2.2 of the Technical Document or a daily water balance (i.e. MEDLI) using average climate data must be undertaken. A copy of the 70 th percentile climate data is attached in Appendix C of the Technical Document. All inputs, results and justification to be shown in the report. | <input type="checkbox"/> |
| | Undertake an annual nutrient balance (refer to pp.33 MAV (2014) for example methodology) for the proposed development scenario. All inputs, results and justification to be shown in the report. | <input type="checkbox"/> |
| | Prepare a site specific detailed hydraulic design for the land | <input type="checkbox"/> |

Whitehead & Associates Environmental Consultants

Colac Otway Shire Domestic Wastewater Management Plan – Operational Plan

| Report Element | Comprehensive Requirements | Completed |
|-----------------------------------|--|--------------------------|
| | application area suitable for supplier quotation and construction. | |
| 7. Mitigation Measures | Detailed discussion of mitigation measures to overcome any site or soil constraints posed to the sustainable treatment and application of wastewater on-site. This may include the following: <ul style="list-style-type: none"> • Storm water management • Soil amelioration; and • Vegetation establishment and management. | <input type="checkbox"/> |
| 8. Site Management Plan | Description of ways to improve wastewater and DWM system performance for residents' reference. | <input type="checkbox"/> |
| | Operation and Management Plan. | <input type="checkbox"/> |
| 9. Conclusion | Conclusion summarising all the important design, sizing and mitigation requirements to ensure sustainable on-site DWM. | <input type="checkbox"/> |
| 10. Site Plan Requirements | Site address, including property/parcel number and street number. | <input type="checkbox"/> |
| | All title boundaries. | <input type="checkbox"/> |
| | All relevant zones and overlays and/or restrictions (e.g. Council zoning and overlays, including Environmental Significant Overlays and DWSCs). | <input type="checkbox"/> |
| | Type of catchment (e.g. potable or other special water supply catchment). | <input type="checkbox"/> |
| | North arrow. | <input type="checkbox"/> |
| | Location of groundwater bores. | <input type="checkbox"/> |
| | Contour lines (2m intervals from survey plan), direction of slope and grade. | <input type="checkbox"/> |
| | Location of soil test pits or auger holes. | <input type="checkbox"/> |
| | Location of any significant site features e.g. rock outcrops or waterlogged regions. | <input type="checkbox"/> |
| | Location of intermittent and permanent surface waterways (dams, creeks, reservoirs and springs). | <input type="checkbox"/> |
| | Location of 1% and 5% Annual Exceedance Probability flood level contours lines (if applicable). | <input type="checkbox"/> |
| | Location, depth and specified use of groundwater bores on the site and adjacent properties from the register of the relevant Rural Water Corporation. | <input type="checkbox"/> |
| | Depth to groundwater table in winter (if less than 2.1m deep). | |
| | Vegetation cover (can use aerial image as base map). | <input type="checkbox"/> |
| | Relevant setback distances as per Table 5 EPA Code of Practice (2013). | <input type="checkbox"/> |
| | Location of existing and proposed buildings, sheds, driveways, paths and any other improvements. | <input type="checkbox"/> |
| | Available effluent management area(s). | <input type="checkbox"/> |
| | Location of proposed land application area (sized to scale). | <input type="checkbox"/> |
| | Location of proposed stormwater cut-off drains adjacent to the land application area. | <input type="checkbox"/> |
| | Location of proposed DWM system (nominal). | <input type="checkbox"/> |
| | Location of reserve land application area (sized to scale). | <input type="checkbox"/> |
| 11. Appendices | Copy of the water (hydraulic) balance calculations. | <input type="checkbox"/> |
| | Copy of the nutrient balance calculations. | <input type="checkbox"/> |
| | Figures. | <input type="checkbox"/> |
| | Site Plan. | <input type="checkbox"/> |
| | Soil bore logs for all test pits or auger holes. | <input type="checkbox"/> |

Whitehead & Associates Environmental Consultants

Colac Otway Shire Domestic Wastewater Management Plan – Operational Plan

| Report Element | Comprehensive Requirements | Completed |
|----------------|---|--------------------------|
| | Copy of the Survey Plan. | <input type="checkbox"/> |
| | Certificate of Title(s) for property/parcel (plan). | <input type="checkbox"/> |
| | Proposed building plans. | <input type="checkbox"/> |
| | Planning Permit application (where applicable). | <input type="checkbox"/> |
| | Septic Tank Permit application. | <input type="checkbox"/> |

Colac Otway Shire Domestic Wastewater Management Plan – Operational Plan

Appendix D

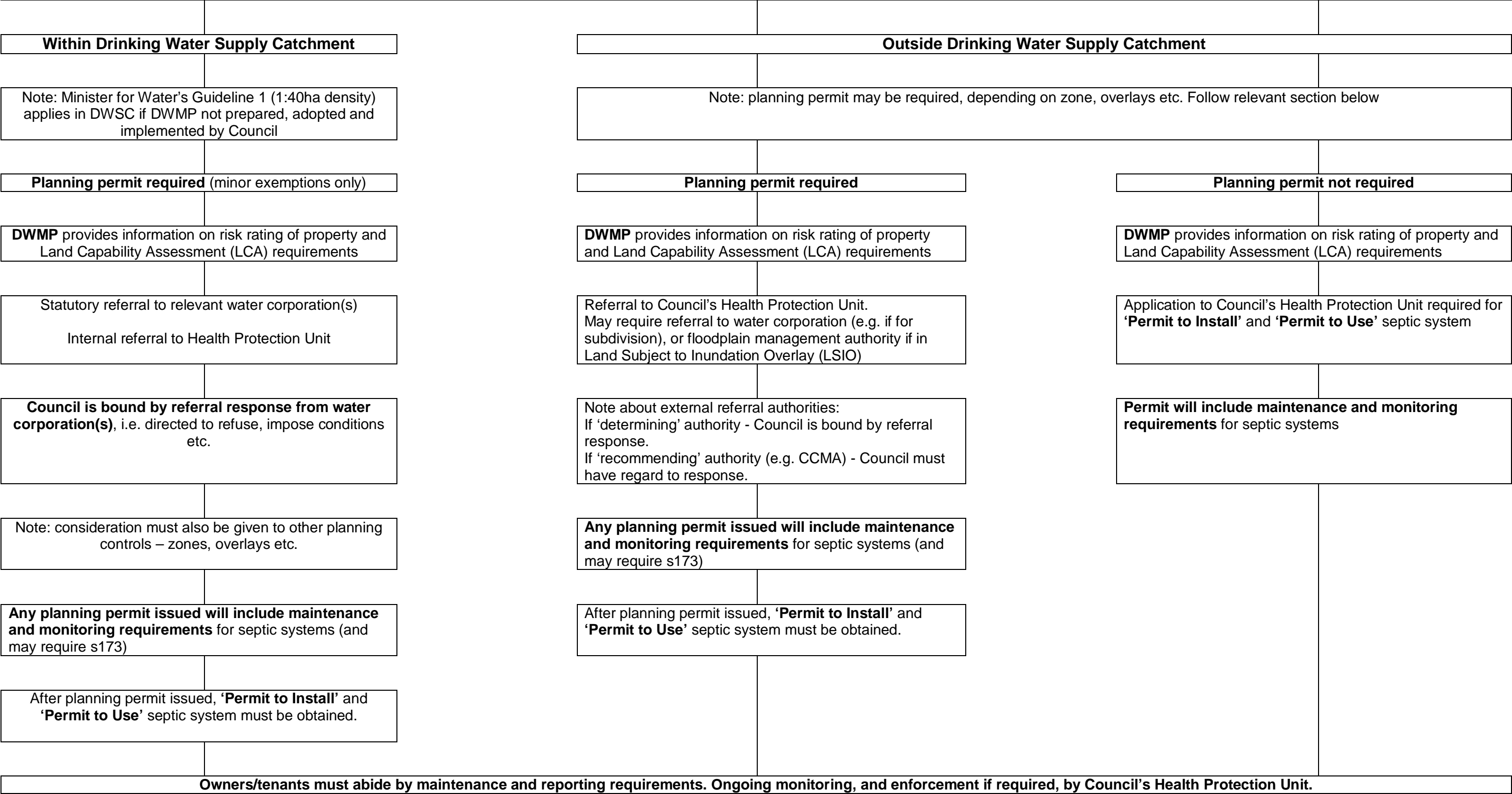
System Inspection Proforma

| | | | | | |
|--|--|------------------------|--------------|----------------|------------------------------|
| Date & Time of Inspection | | GPS Coordinates of LAA | | | |
| Property Address: | | South | | East | Aspect: |
| Property Owners/Contact: | | Owner Present: | | | |
| Inspected By | | Yes | No | | |
| Inspection Protocol | | | | | |
| Risk Rating | | Low (1) | Medium (2) | High (3) | Upgrades Required / Comments |
| Treatment System | | | | | |
| Grease Trap | | | | | |
| Is Grease trap adequately sized, maintained and functioning? | | Yes | No | | |
| Greywater | | | | | |
| Is greywater directed to street/drain? | | No | | Yes | |
| If fitted, is greywater diversion device operating correctly? | | Yes | No | No | |
| Septic Tank | | | | | |
| Is the tank(s) accessible for inspection and maintenance? | | Yes | No | | |
| Do the tank(s) and lid(s) appear structurally sound? | | Yes | | No | |
| Is the tank(s) adequately sealed? | | Yes | | No | |
| Is the tank area subject to stormwater or groundwater inundation? | | No | | Yes | |
| Do any tank(s) require urgent repair or replacement? | | No | | Yes | |
| Tank dimensions: | | | | | |
| Type | Plastic Concrete Other: | | | | |
| Volume (L) | | | | | |
| Baffle? | Yes No Damaged | Yes | Damaged | Damaged | |
| Outlet height (mm) | | | | | |
| Liquid height (mm) | | | | | |
| Scum Depth (mm) | | | | | |
| Sludge Depth (mm) | | | | | |
| Operation: | Are Both T pieces (junctions) attached and working? | Yes | No | | |
| | Does the tank require desludging? | No | Yes | | |
| | Is septic tank providing adequate anaerobic treatment? | Yes | No | No | |
| Pump/ pump wells/controls | | | | | |
| Is the pumpwell(s) of adequate capacity (e.g. emergency storage)? | | Yes | No | | |
| Is the system fitted with a high level alarm? | | Yes | | No | |
| Are there any electrical hazards / issues with the system? | | No | | Yes | |
| Is there a suitable control system for the pump? | | Yes | No | | |
| Is the pump operational and in a satisfactory condition? | | Yes | No | No | |
| Is pump well in satisfactory condition? (Yes - Low, No - Medium or High) | | Yes | No | No | |
| AWTS | | | | | |
| Is the AWTS operating satisfactorily? (Yes - Low, No - Medium or High) | | Yes | No | No | |
| Are the blowers working? | | Yes | No | | |
| Is there sludge or scum accumulation in aeration chamber, clarification chamber or irrigation chamber? | | No | Yes | Yes | |
| Is the chlorine dispenser fitted and functioning? | | Yes | No | No | |
| Residual Chlorine (mg/L) | | | | | |
| Is system regularly serviced by a contractor? | | Yes | No | No | |
| Land Application Area | | | | | |
| Absorption Trenches/Beds | | | | | |
| Dimensions (m) | Slope (%) approx. | <8% | 8-12% | >12% | |
| Is the land application area of adequate size? | | Yes | No | No | |
| Is there a suitable vegetation cover over the land application area? | | Yes | No | No | |
| Is there adequate exposure of the land application area? (i.e. not too shaded, or southerly aspect?) | | Yes | No | | |
| Is the land application area wet or boggy? | | No | Yes | Yes | |
| Is there evidence of surface ponding or runoff from the land application area? | | No | Yes | Yes | |
| Is the area prone to poor drainage, flooding or high groundwater? | | No | Yes | Yes | |
| Are there any damaged or collapsed sections of the land application area? | | No | Yes | Yes | |
| Is there evidence of or access for vehicle and animal traffic? | | No | Yes | | |
| Does the land application area appear to be level and in line with contours? | | Yes | No | No | |
| Are buffer distances to trenches/beds adequate? | | Yes | No | No | |
| Surface/Subsurface Irrigation | | | | | |
| Dimensions (m ²) | Slope (%) approx. | | | | |
| Is the land application area wet or boggy? | | No | Yes | Yes | |
| Is there evidence of surface ponding or runoff from the land application area? | | No | Yes | Yes | |
| Are buffer distances to irrigation area adequate? | | Yes | No | No | |
| Are all sprinklers working? | | Yes | No | No | |
| Overall Assessment | | | | | |
| Were you able to locate and access the whole system? | | Yes | No | No | |
| Was the system discharging effluent to the ground surface in an unsatisfactory manner? | | Yes | No | No | |
| General Condition of system | Good (Low) Satisfactory (Medium) Unsatisfactory (High) | Good | Satisfactory | Unsatisfactory | |
| Proximity to Sensitive environments (streams, rivers) | | >100m | 50-100m | <50m | |
| Located within a drinking water catchment? Y/N Distance to reservoir/stream: | | | | | |
| Overall Highest Risk Rating | | | | | |
| Are works required on the system? | | Minor | Moderate | Major | Nil |
| Details of Required Works: | | | | | |

COLAC OTWAY SHIRE DRAFT DOMESTIC WASTEWATER MANAGEMENT PLAN (DWMP) 2015

DWMP preparation and implementation required by State Environment Protection Policy (SEPP) Waters of Victoria

Unsewered areas covered by COS draft DWMP: Water catchments (including Barham River, Barwon Downs, Beech Forest, Carlisle River, Forrest, Gellibrand, Kawarren and Lavers Hill) Alvie, Barongarook, Beeac, Coragulac, Cororooke, Kennett River, Wye River and Separation Creek



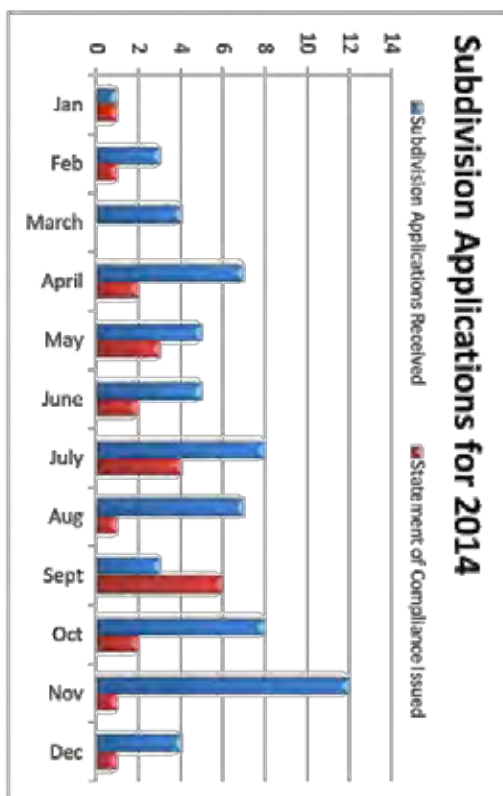
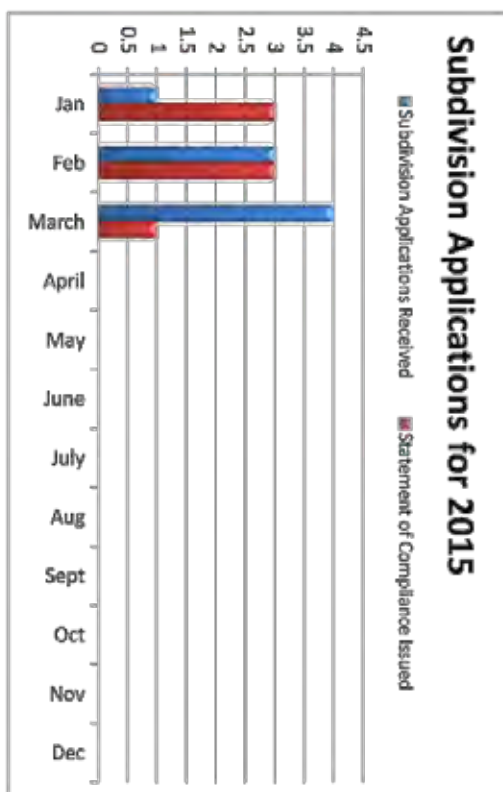
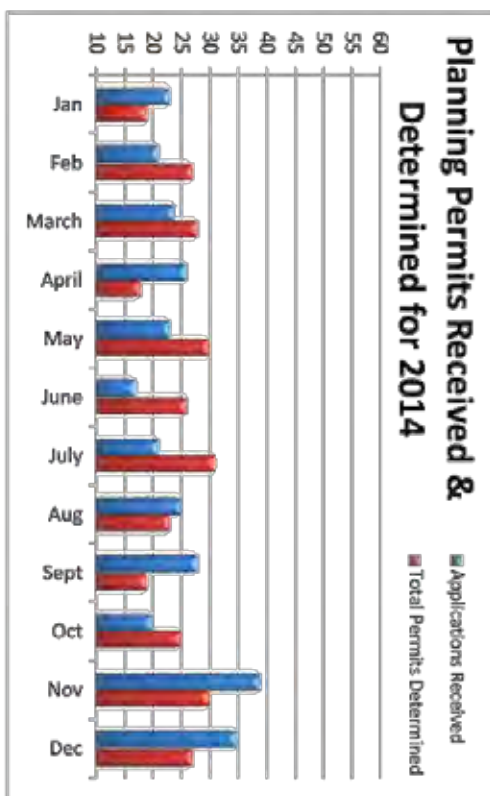
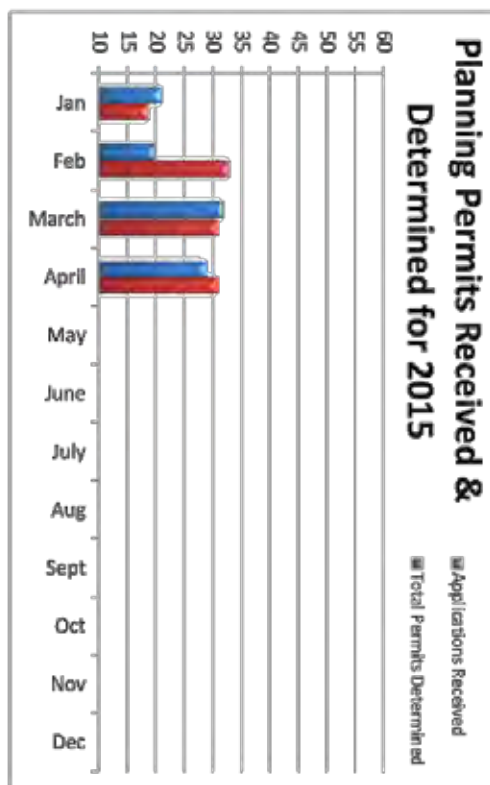
PLANNING STATISTICAL REPORT - MARCH 2015 - (DETERMINATIONS)

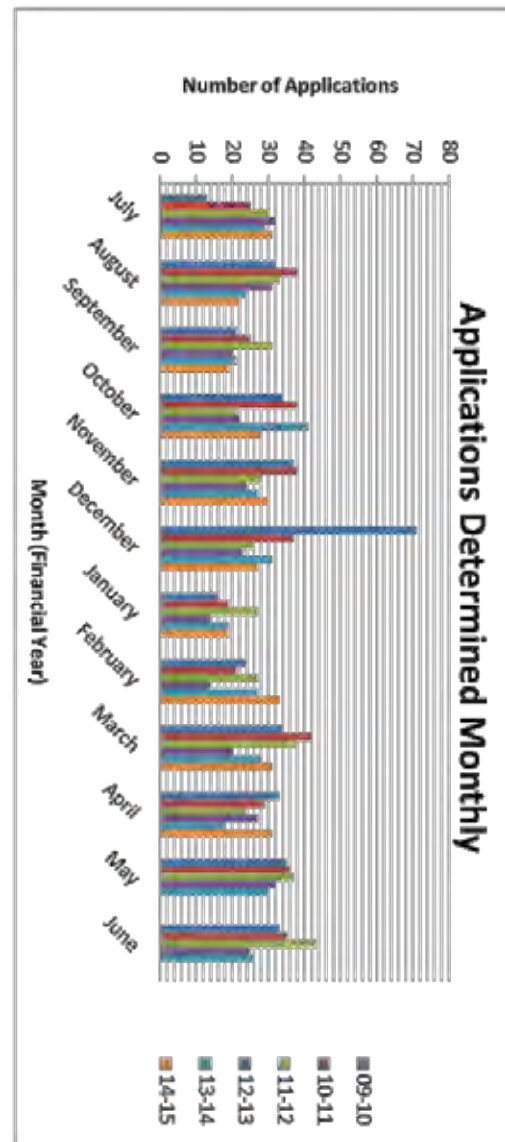
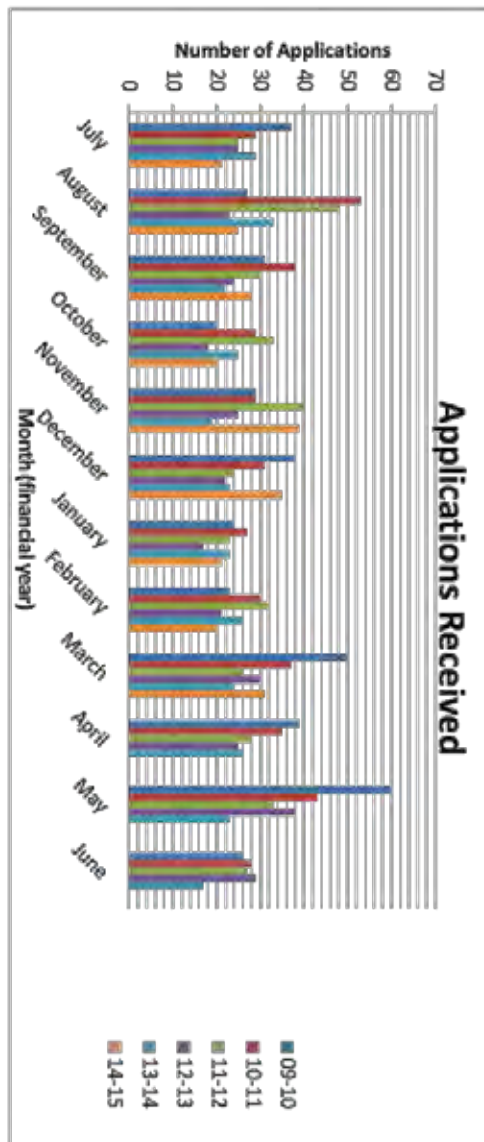
| APPLICATION NUMBER | DATE RECEIVED | LOCATION | PROPOSAL | STATUTORY DAYS | DATE DETERMINED | DETERMINATION AND AUTHORITY |
|--------------------|---------------|------------------------------------|---|----------------|-----------------|------------------------------|
| 175/2014-1 | 5-SEP-14 | 465 MELROSE ROAD
WARRION | USE AND WORKS RELATED TO
STONE EXTRACTION AND
ASSOCIATED ADVERTISING | 133 | 25-MAR-15 | PERMIT ISSUED BY
DELEGATE |
| 228/2014-1 | 17-NOV-14 | 1285 LARPENT ROAD
LARPENT | TWO (2) LOT SUBDIVISION | 79 | 6-MAR-15 | PERMIT ISSUED BY
DELEGATE |
| 232/2014-1 | 21-NOV-14 | 2643 COLAC FOREST
ROAD FOREST | USE AND DEVELOPMENT OF
THE LAND FOR A DWELLING | 59 | 30-MAR-15 | PERMIT ISSUED BY
DELEGATE |
| 238/2014-1 | 21-NOV-14 | 2 SHURVELLS ROAD
ELMINYT | USE OF EXISTING SHED AS
TEMPORARY DWELLING AND
ASSOCIATED WORKS | 74 | 5-MAR-15 | PERMIT ISSUED BY
DELEGATE |
| 243/2014-1 | 28-NOV-14 | 92-98 FOREST STREET
COLAC EAST | BUILDINGS AND WORKS
COMPRISING EXTENSION TO
OFFICE AND DISPLAY OF
BUSINESS IDENTIFICATION
SIGNAGE | 57 | 12-MAR-15 | PERMIT ISSUED BY
DELEGATE |
| 263/2014-1 | 15-DEC-14 | 12 QUEEN STREET
COLAC | BUILDINGS AND WORKS
COMPRISING CONSTRUCTION
OF DWELLING AND FENCE, AND
REMOVAL OF ONE TREE IN THE
ROAD RESERVE | 63 | 12-MAR-15 | PERMIT ISSUED BY
DELEGATE |
| 265/2014-1 | 16-DEC-14 | 130 WOODROWVALE
ROAD ELLMINYT | BUILDINGS AND WORKS
COMPRISING CONSTRUCTION
OF DWELLING | 49 | 18-MAR-15 | PERMIT ISSUED BY
DELEGATE |
| 269/2014-1 | 17-DEC-14 | 4 HART STREET
COLAC | USE AND DEVELOPMENT OF
THE LAND FOR A STORE AND
ASSOCIATED WORKS | 48 | 30-MAR-15 | PERMIT ISSUED BY
DELEGATE |
| 270/2014-1 | 17-DEC-14 | 256-258 MURRAY
STREET COLAC | BUILDINGS AND WORKS
COMPRISING ALTERATIONS TO
SHOP | 62 | 26-MAR-15 | PERMIT ISSUED BY
DELEGATE |
| 272/2014-1 | 16-DEC-14 | 87 WILSON STREET
COLAC | BUILDINGS AND WORKS
COMPRISING TWO (2)
ADDITIONAL SHEDS | 97 | 24-MAR-15 | PERMIT ISSUED BY
DELEGATE |
| 274/2014-1 | 19-DEC-14 | 42 HUGH MURRAY
DRIVE COLAC EAST | TWO (2) LOT SUBDIVISION, USE
AND DEVELOPMENT OF THE
LAND FOR MANUFACTURING
SALES, DISPLAY SIGNAGE AND
WAIVER OF THREE CAR
SPACES | 57 | 26-MAR-15 | PERMIT ISSUED BY
DELEGATE |

| APPLICATION NUMBER | DATE RECEIVED | LOCATION | PROPOSAL | STATUTORY DAYS | DATE DETERMINED | DETERMINATION AND AUTHORITY |
|--------------------|---------------|--|---|----------------|-----------------|-----------------------------|
| 1/2015-1 | 6-JAN-15 | 30 SKENES CREEK VALLEY ROAD SKENES CREEK | BUILDINGS AND WORKS COMPRISING CONSTRUCTION OF REPLACEMENT OUTBUILDING | 51 | 26-MAR-15 | PERMIT ISSUED BY DELEGATE |
| 7/2015-1 | 9-JAN-15 | 51 LAWES STREET ELLIMINYT | BUILDINGS AND WORKS COMPRISING CONSTRUCTION OF AN OUTBUILDING | 51 | 26-MAR-15 | PERMIT ISSUED BY DELEGATE |
| 13/2015-1 | 23-DEC-14 | 19 DUNOON STREET COLAC | BUILDINGS AND WORKS COMPRISING AN EXTENSION TO THE EXISTING KINDERGARTEN | 49 | 26-MAR-15 | PERMIT ISSUED BY DELEGATE |
| 17/2015-1 | 22-JAN-15 | 1475 CORANGAMITE LAKE ROAD ALVIE | BUILDINGS AND WORKS COMPRISING CONSTRUCTION OF A FARM BUILDING | 47 | 10-MAR-15 | PERMIT ISSUED BY DELEGATE |
| 18/2015-1 | 23-JAN-15 | 150 LUCAS ROAD CARLISLE RIVER | BUILDINGS AND WORKS FOR AN EXTENSION TO AN EXISTING DWELLING AND CONSTRUCTION OF AN OUTBUILDING | 25 | 18-MAR-15 | PERMIT ISSUED BY DELEGATE |
| 19/2015-1 | 17-DEC-14 | 91-149 FOREST STREET COLAC | TWO (2) LOT RE-SUBDIVISION | 91 | 18-MAR-15 | PERMIT ISSUED BY DELEGATE |
| 25/2015-1 | 29-JAN-15 | 36 MORLEY AVENUE WYE RIVER | CREATION OF CARRIAGEWAY EASEMENT | 48 | 19-MAR-15 | PERMIT ISSUED BY DELEGATE |
| 27/2015-1 | 6-FEB-15 | 16 BASS AVENUE SEPARATION CREEK | BUILDINGS AND WORKS COMPRISING AN EXTENSION TO AN EXISTING DWELLING | 51 | 30-MAR-15 | PERMIT ISSUED BY DELEGATE |
| 32/2015-1 | 10-FEB-15 | 47 MORLEY AVENUE WYE RIVER | CREATION OF CARRIAGEWAY EASEMENT | 36 | 19-MAR-15 | PERMIT ISSUED BY DELEGATE |
| 38/2015-1 | 18-FEB-15 | 14 SKENE STREET COLAC | BUILDINGS AND WORKS COMPRISING AN EXTENSION TO THE EXISTING BUILDING | 5 | 18-MAR-15 | PERMIT ISSUED BY DELEGATE |

| APPLICATION NUMBER | DATE RECEIVED | LOCATION | PROPOSAL | STATUTORY DAYS | DATE DETERMINED | DETERMINATION AND AUTHORITY |
|---|---------------|--|--|----------------|-----------------|--|
| 39/2015-1 | 18-FEB-15 | 218 SINCLAIR STREET
SOUTH ELLIMINYT | DISPLAY OF ONE (1) BUSINESS
IDENTIFICATION SIGN AND
BICYCLE PARKING
DISPENSATION | 9 | 31-MAR-15 | PERMIT ISSUED BY
DELEGATE |
| 41/2015-1 | 19-FEB-15 | 202-204 MURRAY
STREET COLAC | DISPLAY OF REPLACEMENT
ABOVE VERANDAH SIGNAGE | 9 | 4-MAR 2015 | PERMIT ISSUED BY
DELEGATE |
| 47/2015-1 | 3-MAR-15 | 357 KILLALA ROAD
APOLLO BAY | BUILDINGS AND WORKS
COMPRISING AN EXTENSION
TO THE EXISTING DWELLING | 23 | 26-MAR-15 | PERMIT ISSUED BY
DELEGATE |
| 52/2015-1 | 10-MAR-15 | 28 DENNIS STREET
COLAC | INSTALLATION OF ROLLER
DOOR | 8 | 18-MAR-15 | PERMIT ISSUED BY
DELEGATE |
| 60/2014-1 | 17-MAR-14 | 3 MULLER ROAD
SKENES CREEK | DEVELOPMENT OF A DWELLING | 26 | 30-MAR-15 | NOTICE OF DECISION
TO GRANT PERMIT BY
DELEGATE |
| 24/2013-1 | 25-OCT-13 | 10 OLIVE STREET
SEPARATION CREEK | ALTERATION AND ADDITIONS
TO EXISTING DWELLING | 279 | 13-MAR-15 | NOTICE OF DECISION
TO GRANT PERMIT BY
DELEGATE |
| 204/2014-1 | 12-DEC-14 | 35 STATION STREET
FORREST | USE AND DEVELOPMENT OF
THE LAND FOR INDUSTRY
(BEVERAGE PRODUCTION)
RESTAURANT, FUNCTION
CENTRE, TOURIST
ACCOMMODATION, LIQUOR
LICENCE AND ADVERTISING
SIGNAGE AND REDUCTION IN
CAR PARKING AND BICYCLE
FACILITIES | 44 | 12-MAR-15 | NOTICE OF DECISION
TO GRANT PERMIT BY
COUNCIL |
| AVERAGE STATUTORY DAYS TO DETERMINE PLANNING APPLICATIONS | | | | 52 | | |

| PLANNING STATISTICAL REPORT – MARCH 2015 (PERMITS NOT REQUIRED, WITHDRAWN AND LAPSED APPLICATIONS) | | | | | | |
|--|---------------|--------------------------------------|--|----------------|-----------------|-----------------------------|
| APPLICATION NUMBER | DATE RECEIVED | LOCATION | PROPOSAL | STATUTORY DAYS | DATE DETERMINED | DETERMINATION AND AUTHORITY |
| 173/2014-1 | 8-SEP-14 | 225 OLD BEECH FOREST ROAD GELLIBRAND | CONSTRUCTION OF EFFLUENT POND | 14 | 5-MAR-15 | WITHDRAWN |
| 239/2014-1 | 20-NOV-14 | 170 MOOLERIC ROAD BIRREGURRA | CONSTRUCTION OF A DWELLING | 1 | 31-MAR-15 | LAPSED |
| 21/2015-1 | 16-DEC-14 | 275 BARHAM RIVER ROAD APOLLO BAY | RE-SUBDIVISION OF THE LAND INTO TWO (2) LOTS | 87 | 13-MAR-15 | WITHDRAWN |
| TOTAL AVERAGE STATUTORY DAYS (ALL APPLICATIONS) | | | | 51 | | |





BUILDING DEPARTMENT REPORT - TOTAL BUILDING PERMITS 2015 (YEAR TO DATE)

| | New Dwelling | | Domestic (Other) | | New Commercial | | Commercial (Other) | | New Public/Health | | Public/Health (Other) | | Municipal Totals | |
|--------------|--------------|---------------------|------------------|---------------------|----------------|-------------|--------------------|-------------------|-------------------|-----------------|-----------------------|-------------------|------------------|---------------------|
| | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) |
| Jan | 3 | \$ 603,312 | 23 | \$ 298,464 | 0 | \$ - | 2 | \$ 226,231 | 0 | \$ - | 1 | \$ 83,160 | 29 | \$ 1,211,167 |
| Feb | 9 | \$ 2,064,347 | 33 | \$ 1,325,813 | 0 | \$ - | 3 | \$ 641,100 | 0 | \$ - | 0 | \$ - | 45 | \$ 4,031,260 |
| Mar | 9 | \$ 2,347,398 | 27 | \$ 1,106,568 | 0 | \$ - | 1 | \$ 10,000 | 1 | \$ 9,984 | 3 | \$ 283,428 | 41 | \$ 3,757,178 |
| Apr | | | | | | | | | | | | | | |
| May | | | | | | | | | | | | | | |
| Jun | | | | | | | | | | | | | | |
| Jul | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | |
| Sep | | | | | | | | | | | | | | |
| Oct | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | |
| Total | 21 | \$ 5,015,057 | 83 | \$ 2,730,645 | 0 | \$ - | 6 | \$ 877,331 | 1 | \$ 9,984 | 4 | \$ 366,588 | 115 | \$ 8,999,605 |

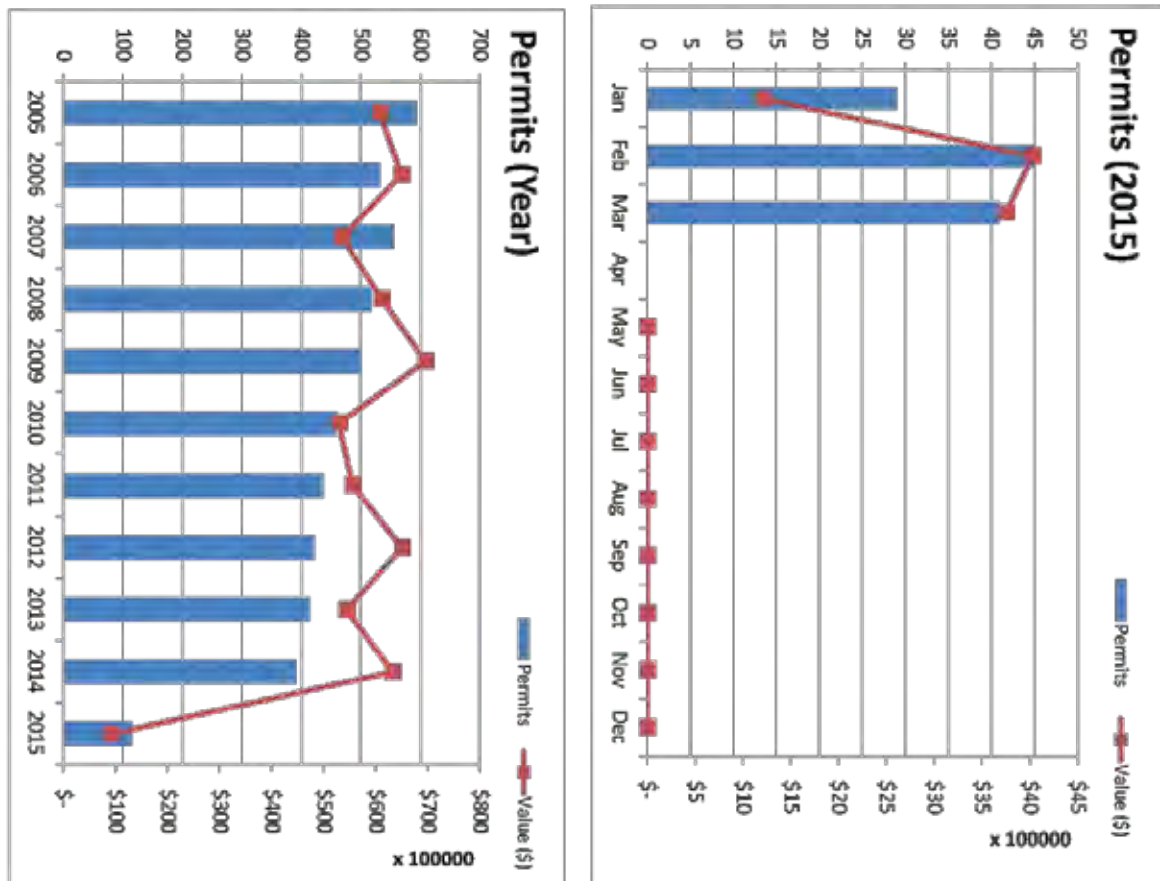
Note: Current month figures are to date only.

BUILDING DEPARTMENT REPORT - YEARLY COMPARISON (CURRENT YEAR TO DATE)

| | New Dwelling | | Domestic (Other) | | New Commercial | | Commercial (Other) | | New Public/Health | | Public/Health (Other) | | Municipal Totals | |
|------|--------------|--------------|------------------|--------------|----------------|-------------|--------------------|-------------|-------------------|-------------|-----------------------|--------------|------------------|--------------|
| | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) |
| 2011 | 130 | \$34,883,520 | 259 | \$11,427,948 | 11 | \$4,897,695 | 21 | \$1,768,619 | 1 | \$550,000 | 15 | \$2,041,271 | 437 | \$55,569,053 |
| 2012 | 112 | \$37,509,600 | 259 | \$9,248,333 | 12 | \$9,024,422 | 22 | \$2,272,199 | 2 | \$2,913,411 | 15 | \$4,057,333 | 422 | \$65,025,298 |
| 2013 | 113 | \$30,065,304 | 252 | \$11,629,479 | 8 | \$620,000 | 24 | \$1,526,120 | 7 | \$3,849,610 | 10 | \$6,707,886 | 414 | \$54,398,399 |
| 2014 | 102 | \$32,811,300 | 248 | \$9,138,265 | 6 | \$6,165,846 | 15 | \$1,032,065 | 7 | \$641,868 | 13 | \$12,890,553 | 391 | \$62,699,897 |
| 2015 | 21 | \$5,015,057 | 83 | \$2,730,645 | 0 | \$ - | 6 | \$877,331 | 1 | \$9,984 | 4 | \$366,588 | 115 | \$8,999,605 |

Note: Current year figures are to date only.

| Definition
(Examples) | New Dwelling | | Domestic (Other) | | New Commercial | | Commercial (Other) | | New Public/Health | | Public/Health (Other) | | Municipal Totals | |
|---|--------------|------------|------------------|------------|----------------|------------|--------------------|------------|-------------------|------------|-----------------------|------------|------------------|------------|
| | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) |
| Dwellings
Multi-Development
Re-Erection | | | | | | | | | | | | | | |
| Extensions/Alteration
Veranda/Deck
Shed/Garage
Swimming Pool | | | | | | | | | | | | | | |
| Office
Shop
Restaurant
Factory/Warehouse | | | | | | | | | | | | | | |
| Extension/Alteration
Fit Out
Demolition | | | | | | | | | | | | | | |
| Hospital
Medical Clinic
School | | | | | | | | | | | | | | |
| Hall
Church
Utilities | | | | | | | | | | | | | | |
| Extension/Alteration
Demolition | | | | | | | | | | | | | | |



PLANNING STATISTICAL REPORT - APRIL 2015 - (DETERMINATIONS)

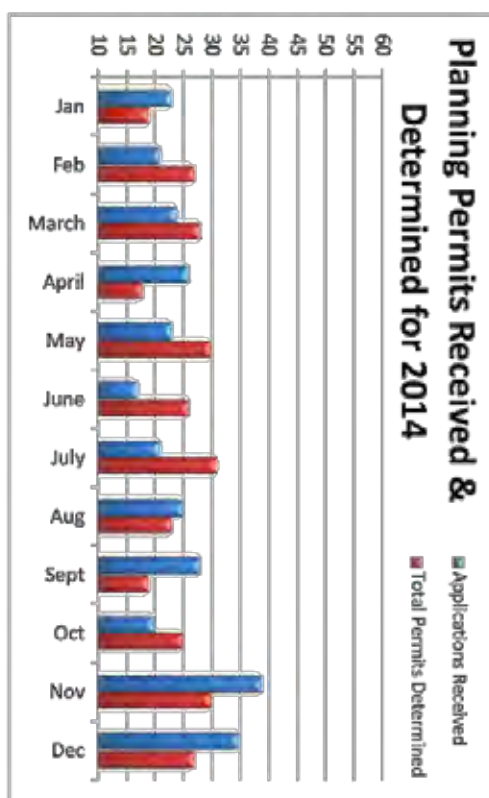
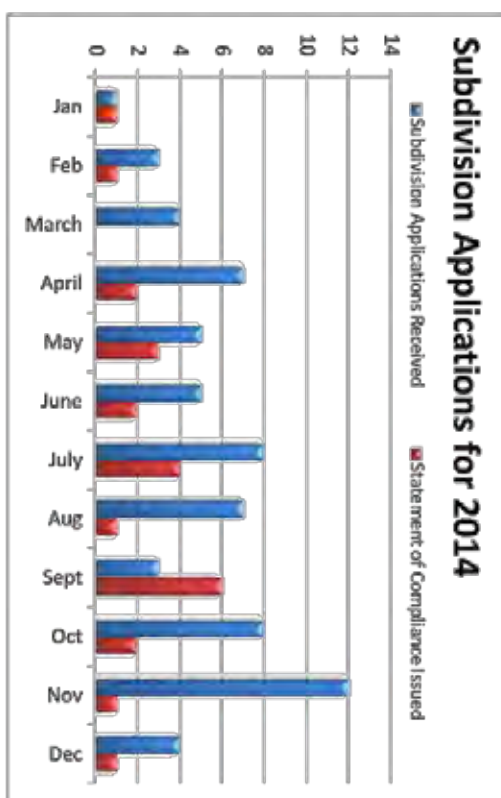
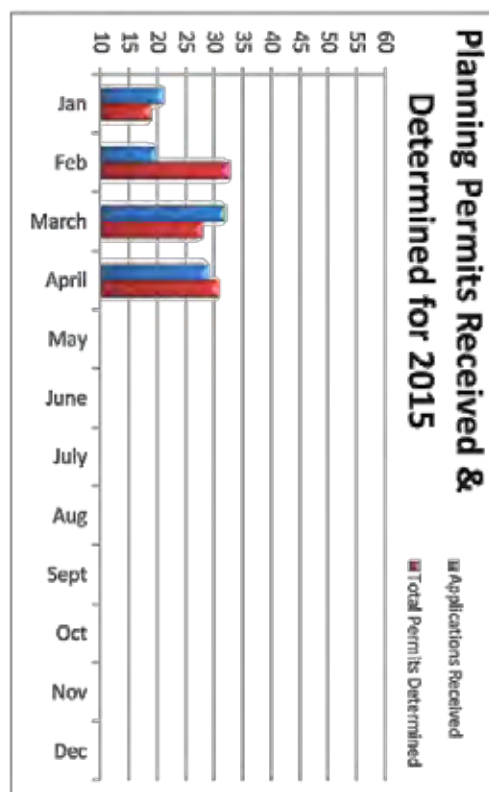
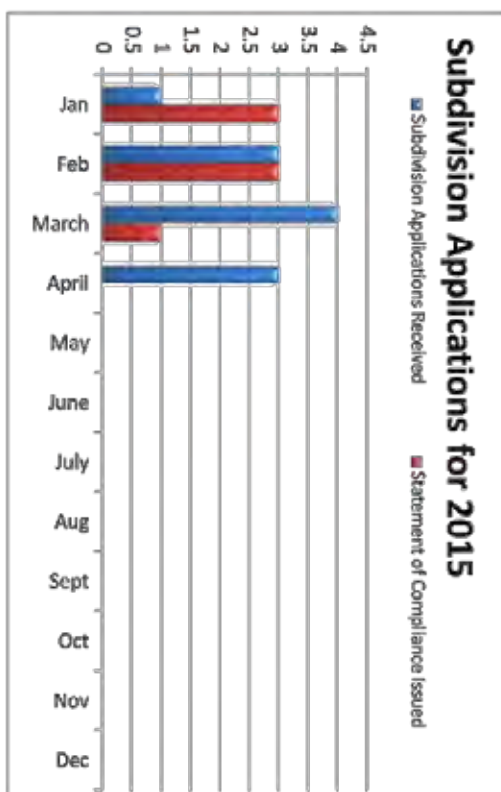
| APPLICATION
NUMBER | DATE
RECEIVED | LOCATION | PROPOSAL | STATUTORY
DAYS | DATE DETERMINED | DETERMINATION AND AUTHORITY |
|-----------------------|------------------|---|---|-------------------|-----------------|---------------------------------|
| 190/2014-1 | 30-SEP-14 | 16 DEHNERTS
TRACK BEECH
FOREST | BUILDINGS AND WORKS FOR THE
CONSTRUCTION OF A SINGLE
STOREY DWELLING | 13 | 30-APR-15 | PERMIT ISSUED BY
DELEGATE |
| 191/2014-1 | 29-SEP-14 | 115 KARACASAYS
ROAD CARLSLE
RIVER | BUILDINGS AND WORKS
COMPRISING EXTENSION TO
EXISTING DWELLING | 2 | 30-APR-15 | PERMIT ISSUED BY
DELEGATE |
| 194/2014-1 | 30-SEP-14 | 5 REYNOLDS
ROAD
BARONGAROOK | USE AND DEVELOPMENT OF THE
LAND FOR A DWELLING | 83 | 13-APR-15 | REFUSAL TO GRANT BY
DELEGATE |
| 244/2014-1 | 27-NOV-14 | 45 GARDNER
STREET BEECH
FOREST | CONSTRUCTION OF A 5 METRE
EXTENSION TO EXISTING
TELECOMMUNICATIONS FACILITY,
ANCILLARY ANTENNAS, EQUIPMENT
CABINETS AND WORKS | 53 | 8-APR-15 | PERMIT ISSUED BY
COUNCIL |
| 246/2014-1 | 27-NOV-14 | 35 WARRION
HILL ROAD
WARRION | DEVELOPMENT OF A
TELECOMMUNICATIONS FACILITY
(25M HIGH MONOPOLE), ASSOCIATED
ANTENNAS, EQUIPMENT CABINETS
AND WORKS | 53 | 8-APR-15 | PERMIT ISSUED BY
COUNCIL |
| 250/2014-1 | 3-DEC-14 | 261-263 MURRAY
STREET COLAC | BUILDINGS AND WORKS
COMPRISING ALTERATIONS AND
ADDITIONS TO THE EXISTING
MCDONALDS RESTAURANT AND
ALTERATIONS TO BUSINESS
IDENTIFICATION SIGNAGE | 13 | 2-APR-15 | PERMIT ISSUED BY
DELEGATE |
| 253/2014-1 | 4-DEC-14 | 335 SWAN
MARSH ROAD
SWAN MARSH | USE AND DEVELOPMENT OF A
TELECOMMUNICATIONS FACILITY (35
METRE HIGH MONOPOLE),
ASSOCIATED ANTENNAS,
EQUIPMENT CABINETS AND
ASSOCIATED WORKS | 52 | 8-APR-15 | PERMIT ISSUED BY
COUNCIL |
| 259/2014-1 | 11-DEC-14 | 175 TRASKS
ROAD
WARNCOORT | USE AND DEVELOPMENT OF A
TELECOMMUNICATIONS FACILITY (50
METRE HIGH LATICE TOWER),
ASSOCIATED ANTENNAS,
EQUIPMENT CABINETS AND | 56 | 8-APR-15 | PERMIT ISSUED BY
COUNCIL |

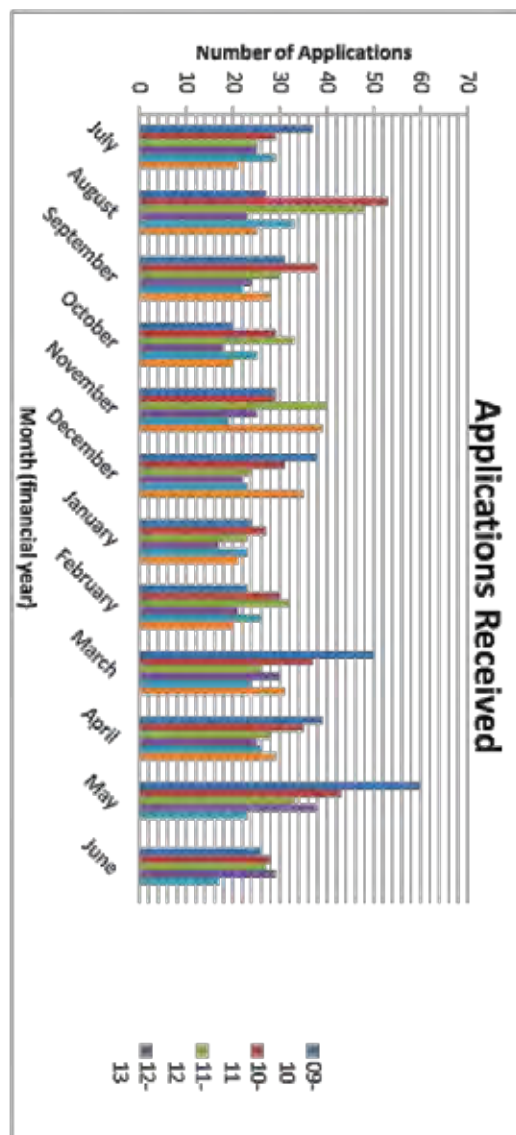
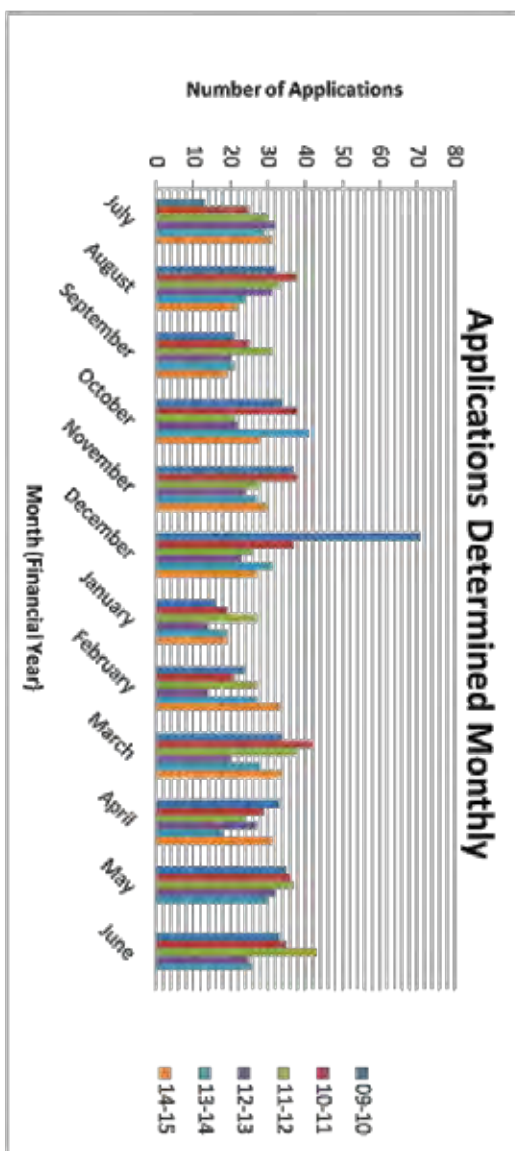
| APPLICATION NUMBER | DATE RECEIVED | LOCATION | PROPOSAL | STATUTORY DAYS | DATE DETERMINED | DETERMINATION AND AUTHORITY |
|--------------------|---------------|---|---|----------------|-----------------|-----------------------------|
| | | | ASSOCIATED WORKS | | | |
| 260/2014-1 | 11-DEC-14 | 385 WONGA ROAD
GELLIBRAND | DEVELOPMENT OF A TELECOMMUNICATIONS FACILITY (50 METRE HIGH LATICE TOWER), ASSOCIATED ANTENNAS, EQUIPMENT CABINETS AND ASSOCIATED WORKS | 53 | 8-APR-15 | PERMIT ISSUED BY COUNCIL |
| 266/2014-1 | 16-DEC-14 | 50 BARONGAROOK ROAD
BARONGAROOK | USE AND DEVELOPMENT OF A TELECOMMUNICATIONS FACILITY (50 METRE HIGH LATICE TOWER), ASSOCIATED ANTENNAS, EQUIPMENT CABINETS AND ASSOCIATED WORKS | 52 | 8-APR-15 | PERMIT ISSUED BY COUNCIL |
| 8/2015-1 | 12-JAN-15 | 5400 HAMILTON HIGHWAY
BARUNAH PLAINS | USE AND DEVELOPMENT OF THE LAND FOR WIND MEASUREMENT BY AN ANEMOMETER | 31 | 24-APR-15 | PERMIT ISSUED BY DELEGATE |
| 29/2015-1 | 6-FEB-15 | 160 BIRREGURRA YEODENE ROAD
YEODENE | BUILDINGS AND WORKS COMPRISING AN EXTENSION TO THE EXISTING DWELLING | 52 | 28-APR-15 | PERMIT ISSUED BY DELEGATE |
| 37/2015-1 | 17-FEB-15 | 260 BIRREGURRA FOREST ROAD
BIRREGURRA | CONSTRUCTION OF AGRICULTURAL SHED | 43 | 17-APR-15 | PERMIT ISSUED BY DELEGATE |
| 44/2015-1 | 24-FEB-15 | 105 CASHINS ROAD
KAWAAREN | USE OF THE LAND FOR ANIMAL KEEPING AND TRAINING (FIFTEEN SHOW DOGS) | 57 | 24-APR-15 | PERMIT ISSUED BY DELEGATE |
| 46/2015-1 | 2-MAR-15 | 58 CALVERT STREET COLAC | DEMOLITION OF BUILDING AND OUTBUILDING | 42 | 13-APR-15 | PERMIT ISSUED BY DELEGATE |
| 48/2015-1 | 4-MAR-15 | 1105 IRREWILLIPE ROAD
BARONGAROOK WEST | BUILDINGS AND WORKS COMPRISING CONSTRUCTION OF REPLACEMENT AGRICULTURAL SHED | 20 | 28-APR-15 | PERMIT ISSUED BY DELEGATE |
| 50/2015-1 | 4-MAR-15 | 17 ANDERSON STREET | CONSTRUCTION OF AN OUTBUILDING | 43 | 17-APR-15 | PERMIT ISSUED BY DELEGATE |

| APPLICATION NUMBER | DATE RECEIVED | LOCATION | PROPOSAL | STATUTORY DAYS | DATE DETERMINED | DETERMINATION AND AUTHORITY |
|--------------------|---------------|------------------------------------|--|----------------|-----------------|-------------------------------|
| | | BIRREGURRA | | | | |
| 57/2015-1 | 18-MAR-15 | 5 REYNOLDS ROAD BARONGAROOK | BUILDING AND WORKS FOR THE CONSTRUCTION OF A FARM SHED AND WATER TANK | 30 | 17-APR-15 | PERMIT ISSUED BY DELEGATE |
| 58/2015-1 | 18-MAR-15 | 80 HUGH MURRAY DRIVE COLAC EAST | CONSTRUCTION OF A BUILDING TO BE USED FOR INDUSTRY (PLUMBING SHOP) | 15 | 17-APR-15 | PERMIT ISSUED BY DELEGATE |
| 65/2015-1 | 20-MAR-15 | 66-68 MURRAY STREET COLAC | DISPLAY BUSINESS IDENTIFICATION SIGNAGE | 2 | 9-APR-15 | PERMIT ISSUED BY DELEGATE |
| 73/2015-1 | 27-MAR-15 | 885 TOMAHAWK CREEK ROAD IREWILLIPE | CONSTRUCTION OF AN AGRICULTURAL BUILDING (DAIRY) | 21 | 17-APR-15 | PERMIT ISSUED BY DELEGATE |
| 77/2015-1 | 1-APR-15 | 21 MURRAY STREET COLAC | PAINTING FRONT OF BUILDING | 2 | 7-APR-15 | PERMIT ISSUED BY DELEGATE |
| 78/2015-1 | 2-APR-15 | 17 PANORAMA CRESCENT MARENGO | BUILDINGS AND WORKS COMPRISING CONSTRUCTION OF A DWELLING AND REMOVAL OF VEGETATION | 11 | 13-APR-15 | PERMIT ISSUED BY DELEGATE |
| 83/2015-1 | 7-APR-15 | 1285 TIMBOON COLAC ROAD BUNGADOR | BUILDINGS AND WORKS COMPRISING EXTENSION OF TWO (2) AGRICULTURAL BUILDINGS | 10 | 17-APR-15 | PERMIT ISSUED BY DELEGATE |
| 247/2014-1 | 27-NOV-14 | 105 CORUNNUN ROAD COROROOKE | USE AND DEVELOPMENT OF A TELECOMMUNICATIONS FACILITY (40 METRE HIGH LATTICE TOWER), ASSOCIATED ANTENNAS, EQUIPMENT CABINETS AND ASSOCIATED WORKS | 51 | 8-APR-15 | NOTICE OF DECISION BY COUNCIL |

| APPLICATION NUMBER | DATE RECEIVED | LOCATION | PROPOSAL | STATUTORY DAYS | DATE DETERMINED | DETERMINATION AND AUTHORITY |
|--|---------------|-------------------------------|---|----------------|-----------------|--------------------------------|
| 4/2015-1 | 7-JAN-15 | 100 BEAL STREET
BIRREGURRA | DEVELOPMENT OF THE LAND FOR A DWELLING | 59 | 8-APR-15 | NOTICE OF DECISION BY DELEGATE |
| 219/2013-1 | 23-SEP-13 | 18 KARINGAL DRIVE WYE RIVER | CONSTRUCTION OF A TWO (2) STOREY DWELLING AND NATIVE VEGETATION REMOVAL (5 TREES) | 22 | 17-APR-15 | NOTICE OF DECISION BY DELEGATE |
| AVERAGE STATUTORY DAYS TO DETERMINE PLANNING APPLICATIONS | | | | 31 | | |

| PLANNING STATISTICAL REPORT - APRIL 2015 (PERMITS NOT REQUIRED, WITHDRAWN AND LAPSED APPLICATIONS) | | | | | | |
|---|---------------|---|---|----------------|-----------------|-----------------------------|
| APPLICATION NUMBER | DATE RECEIVED | LOCATION | PROPOSAL | STATUTORY DAYS | DATE DETERMINED | DETERMINATION AND AUTHORITY |
| 197/2014-1 | 6-OCT-14 | 1 UPPER GELLIBRAND ROAD
BARRAMUNGA | CHANGE OF USE FROM CAMP HALL TO DWELLING | 102 | 2-APR-15 | WITHDRAWN |
| 6/2015-1 | 6-JAN-15 | 27 NEALE STREET
ELMINNYT | BUILDINGS AND WORKS FOR THE CONSTRUCTION OF A SINGLE DWELLING | 1 | 5-APR-15 | APPLICATION LAPSED |
| 33/2015-1 | 10-FEB-15 | 1550 COLAC LAVERS HILL ROAD
KAWARREN | CONSTRUCTION OF A GARAGE | 1 | 28-APR-15 | APPLICATION LAPSED |
| TOTAL AVERAGE STATUTORY DAYS (ALL APPLICATIONS) | | | | 35 | | |





BUILDING DEPARTMENT REPORT – TOTAL BUILDING PERMITS 2015 (YEAR TO DATE)

| | New Dwelling | | Domestic (Other) | | New Commercial | | Commercial (Other) | | New Public/Health | | Public/Health (Other) | | Municipal Totals | |
|--------------|--------------|------------------|------------------|------------------|----------------|----------------|--------------------|----------------|-------------------|--------------|-----------------------|----------------|------------------|-------------------|
| | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) |
| Jan | 3 | 603,312 | 23 | 298,464 | 0 | - | 2 | 226,231 | 0 | - | 1 | 83,160 | 29 | 1,211,167 |
| Feb | 9 | 2,064,347 | 33 | 1,325,813 | 0 | - | 3 | 641,100 | 0 | - | 0 | - | 45 | 4,031,260 |
| Mar | 9 | 2,347,398 | 27 | 1,106,368 | 0 | - | 1 | 10,000 | 1 | 9,984 | 3 | 283,428 | 41 | 3,757,178 |
| Apr | 4 | 1,067,134 | 20 | 715,945 | 2 | 218,000 | 1 | 9,900 | 0 | - | 1 | 67,922 | 28 | 2,068,901 |
| May | 0 | - | 0 | - | 0 | - | 0 | - | 0 | - | 0 | - | 0 | - |
| Jun | 0 | - | 0 | - | 0 | - | 0 | - | 0 | - | 0 | - | 0 | - |
| Jul | 0 | - | 0 | - | 0 | - | 0 | - | 0 | - | 0 | - | 0 | - |
| Aug | 0 | - | 0 | - | 0 | - | 0 | - | 0 | - | 0 | - | 0 | - |
| Sep | 0 | - | 0 | - | 0 | - | 0 | - | 0 | - | 0 | - | 0 | - |
| Oct | 0 | - | 0 | - | 0 | - | 0 | - | 0 | - | 0 | - | 0 | - |
| Nov | 0 | - | 0 | - | 0 | - | 0 | - | 0 | - | 0 | - | 0 | - |
| Dec | 0 | - | 0 | - | 0 | - | 0 | - | 0 | - | 0 | - | 0 | - |
| Total | 25 | 6,072,191 | 103 | 3,446,590 | 2 | 218,000 | 7 | 887,231 | 1 | 9,984 | 5 | 434,510 | 143 | 11,068,506 |

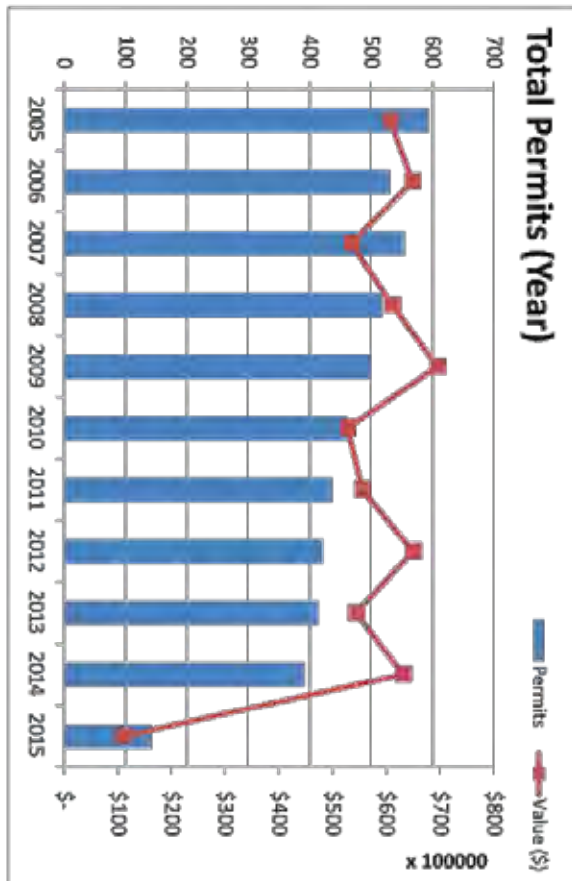
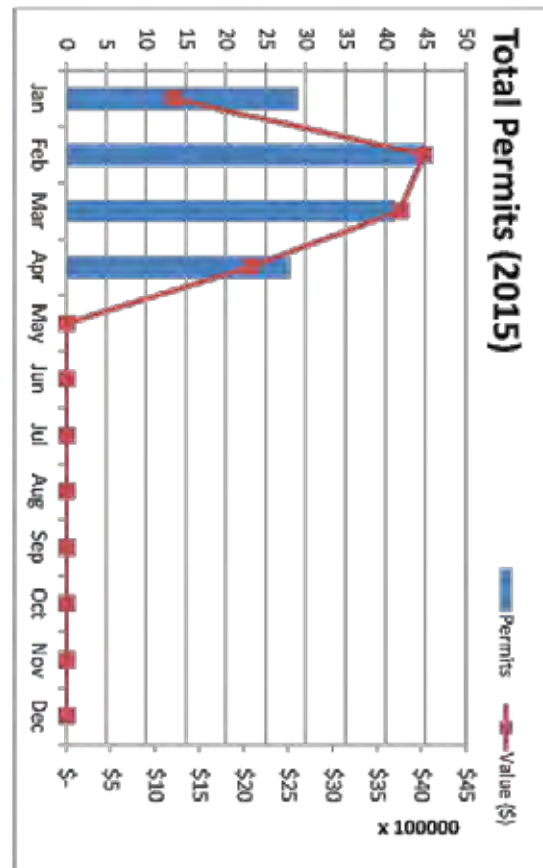
Note: Current month figures are to date only.

BUILDING DEPARTMENT REPORT – YEARLY COMPARISON (CURRENT YEAR TO DATE)

| | New Dwelling | | Domestic (Other) | | New Commercial | | Commercial (Other) | | New Public/Health | | Public/Health (Other) | | Municipal Totals | |
|------|--------------|------------|------------------|------------|----------------|------------|--------------------|------------|-------------------|------------|-----------------------|------------|------------------|------------|
| | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) |
| 2011 | 130 | 34,883,520 | 259 | 11,427,948 | 11 | 4,897,695 | 21 | 1,768,619 | 1 | 560,000 | 15 | 2,041,271 | 437 | 55,569,053 |
| 2012 | 112 | 37,509,600 | 259 | 9,248,333 | 12 | 9,024,422 | 22 | 2,272,199 | 2 | 2,913,411 | 15 | 4,057,333 | 422 | 65,025,298 |
| 2013 | 113 | 30,065,304 | 252 | 11,629,479 | 8 | 620,000 | 24 | 1,526,120 | 7 | 3,849,610 | 10 | 6,707,886 | 414 | 54,398,399 |
| 2014 | 103 | 33,310,220 | 248 | 9,138,265 | 6 | 6,185,846 | 15 | 1,032,065 | 7 | 641,868 | 13 | 12,890,553 | 392 | 63,198,817 |
| 2015 | 25 | 6,072,191 | 103 | 3,446,590 | 2 | 218,000 | 7 | 887,231 | 1 | 9,984 | 5 | 434,510 | 143 | 11,068,506 |

Note: Current year figures are to date only.

| Definition
(Examples) | New Dwelling | | Domestic (Other) | | New Commercial | | Commercial (Other) | | New Public/Health | | Public/Health (Other) | | Municipal Totals | |
|---|--------------|------------|------------------|------------|----------------|------------|--------------------|------------|-------------------|------------|-----------------------|------------|------------------|------------|
| | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) |
| Dwellings
Multi-Development
Re-Erection | | | | | | | | | | | | | | |
| Extensions/Alteration
Veranda/Deck
Shed/Garage
Swimming Pool | | | | | | | | | | | | | | |
| Office
Shop
Restaurant
Factory/Warehouse | | | | | | | | | | | | | | |
| Extension/Alteration
Fit Out
Demolition | | | | | | | | | | | | | | |
| Hospital
Medical Clinic
School | | | | | | | | | | | | | | |
| Hall
Church
Utilities | | | | | | | | | | | | | | |
| Extension/Alteration
Demolition | | | | | | | | | | | | | | |



PLANNING STATISTICAL REPORT – MAY 2015 – (DETERMINATIONS)

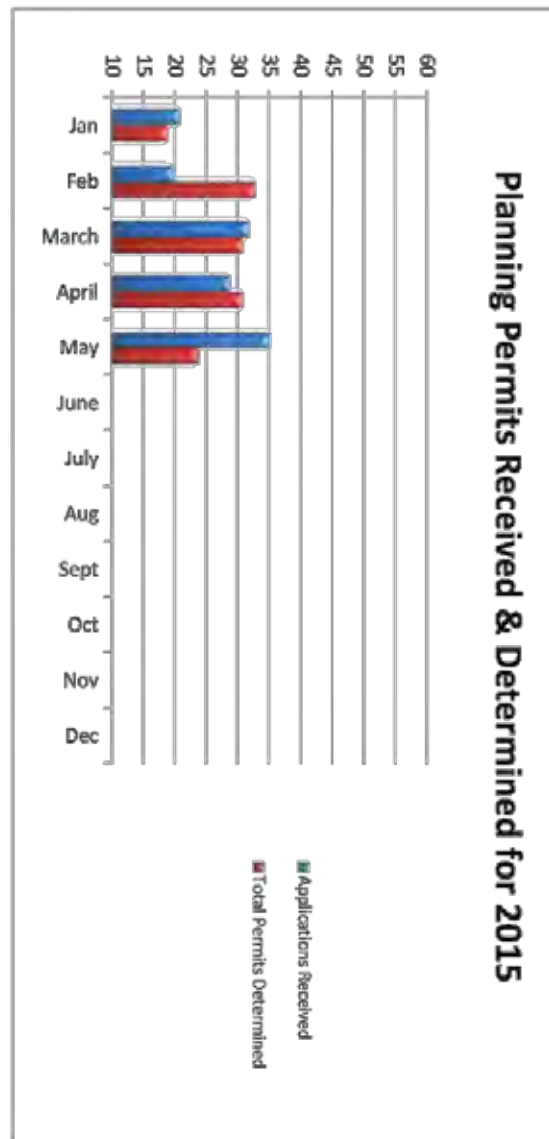
| APPLICATION NUMBER | DATE RECEIVED | LOCATION | PROPOSAL | STATUTORY DAYS | DATE DETERMINED | DETERMINATION AND AUTHORITY |
|--------------------|---------------|--------------------------------------|---|----------------|-----------------|------------------------------|
| 55/2013-1 | 20-MAR-13 | 22 POUND ROAD ELLIMINYT | USE AND DEVELOPMENT OF THE LAND FOR A DWELLING AND SHED | 4 | 1-MAY-15 | PERMIT ISSUED BY DELEGATE |
| 106/2014-1 | 26-MAY-14 | 65 KAANGLANG ROAD FOREST | USE AND DEVELOPMENT OF THE LAND FOR A DWELLING | 290 | 8-MAY-15 | REFUSAL TO GRANT BY DELEGATE |
| 166/2014-1 | 28-AUG-14 | 5490 GREAT OCEAN ROAD WONGARRA | RETROSPECTIVE WORKS COMPRISING AN EXTENSION TO EXISTING DWELLING | 52 | 15-MAY-15 | PERMIT ISSUED BY DELEGATE |
| 201/2014-1 | 17-OCT-14 | 37 ROSENEATH ROAD WARNOCOORT | VARIATION OF EASEMENT AND CREATION OF ACCESS TO ROAD ZONE CATEGORY 1 | 81 | 19-MAY-15 | PERMIT ISSUED BY DELEGATE |
| 213/2014-1 | 30-OCT-14 | 170-172 AIREYS STREET ELLIMINYT | SUBDIVISION OF LAND INTO TWO (2) LOTS | 34 | 19-MAY-15 | PERMIT ISSUED BY DELEGATE |
| 231/2014-1 | 21-NOV-14 | 790 BLUE JOHANNA ROAD JOHANNA | USE & DEVELOPMENT OF THE LAND FOR A DWELLING | 69 | 6-MAY-15 | PERMIT ISSUED BY DELEGATE |
| 11/2015-1 | 15-JAN-15 | 1 BOWDEN STREET BIRREGURRA | USE & DEVELOPMENT OF THE LAND FOR A DWELLING | 5 | 19-MAY-15 | PERMIT ISSUED BY DELEGATE |
| 34/2015-1 | 11-FEB-15 | 52 FERRIER DRIVE MARENGO | BUILDINGS & WORKS COMPRISING CONSTRUCTION OF AN OUTBUILDING | 43 | 12-MAY-15 | PERMIT ISSUED BY DELEGATE |
| 40/2015-1 | 13-FEB-15 | 41-51 HOPKINS STREET BIRREGURRA | REMOVAL OF TWO (2) TREES | 54 | 26-MAY-15 | PERMIT ISSUED BY DELEGATE |
| 45/2015-1 | 25-FEB-15 | 96 CHRISTIES ROAD ELLIMINYT | BUILDINGS & WORKS COMPRISING CONSTRUCTION OF A CLUBHOUSE | 62 | 26-MAY-15 | PERMIT ISSUED BY DELEGATE |
| 53/2015-1 | 16-MAR-15 | 51 FYANS STREET COLAC | CONSTRUCTION OF STORAGE SHED | 57 | 12 MAY-15 | PERMIT ISSUED BY DELEGATE |
| 56/2015-1 | 17-MAR-15 | 155 MOUNT HESSE ESTATE ROAD OMERSLEY | BUILDINGS AND WORKS COMPRISING ALTERATIONS AND EXTENSION TO THE EXISTING DWELLING | 44 | 11-MAY-15 | PERMIT ISSUED BY DELEGATE |
| 59/2015-1 | 18-MAR-15 | 6 HUGH MURRAY DRIVE COLAC EAST | USE & DEVELOPMENT OF THE LAND FOR PANEL BEATING | 21 | 26-MAY-15 | PERMIT ISSUED BY DELEGATE |

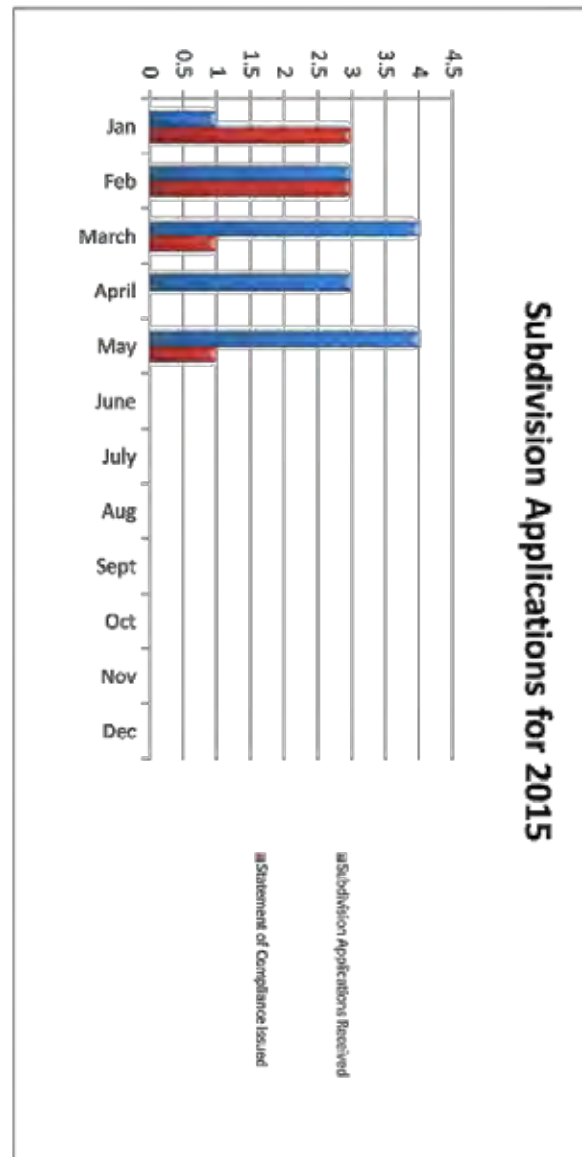
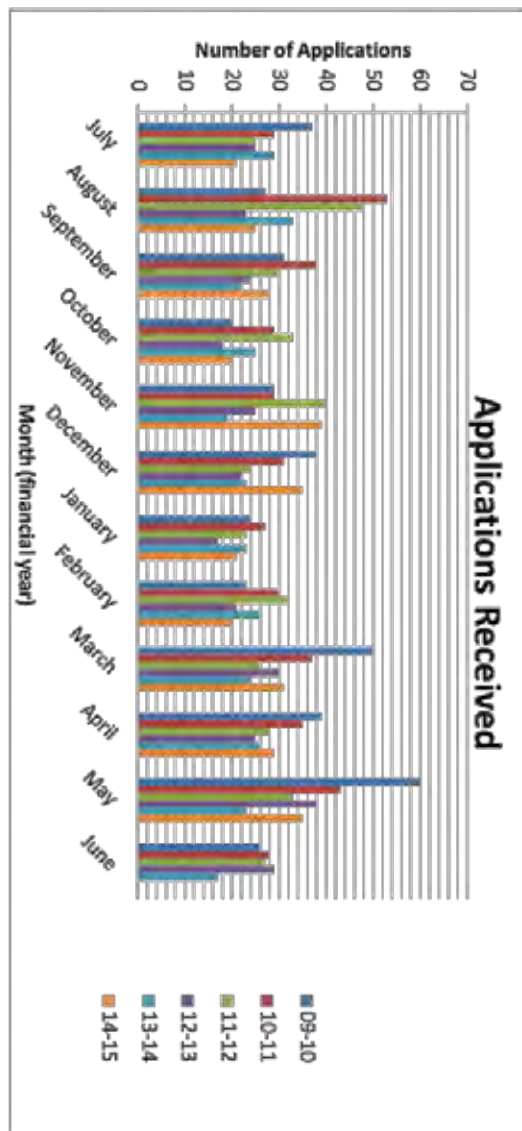
| APPLICATION NUMBER | DATE RECEIVED | LOCATION | PROPOSAL | STATUTORY DAYS | DATE DETERMINED | DETERMINATION AND AUTHORITY |
|--------------------|---------------|--|---|----------------|-----------------|-----------------------------|
| 70/2015-1 | 24-MAR-15 | 204 QUEEN STREET ELLIMINYT | BUILDINGS & WORKS COMPRISING EXTENSIONS TO DWELLING | 51 | 15-MAY-15 | PERMIT ISSUED BY DELEGATE |
| 71/2015-1 | 24-MAR-15 | 515 GREAT OCEAN ROAD APOLO BAY | BUILDINGS & WORKS COMPRISING CONSTRUCTION OF A REPLACEMENT DWELLING | 30 | 20-MAY-15 | PERMIT ISSUED BY DELEGATE |
| 74/2015-1 | 30-MAR-15 | 96 MAIN STREET BIRREGURRA | DEMOLITION OF TOILET BLOCK & CONSTRUCTION OF SHED | 32 | 1-MAY-15 | PERMIT ISSUED BY DELEGATE |
| 76/2015-1 | 1-APR-15 | 470 OLD YEO ROAD YEO | BUILDINGS & WORKS COMPRISING CONSTRUCTION OF AN AGRICULTURAL SHED | 33 | 26-MAY-15 | PERMIT ISSUED BY DELEGATE |
| 88/2015-1 | 16-APR-15 | 1270 IRREWILLIPE ROAD BARONGAROOK WEST | CONSTRUCTION OF FIBREGLASS SWIMMING POOL AND SAFETY BARRIER | 4 | 25-MAY-15 | PERMIT ISSUED BY DELEGATE |
| 89/2015-1 | 16-APR-15 | 7 MAIN STREET BIRREGURRA | SINGLE CAR GARAGE AND FRONT BOUNDARY FENCE | 40 | 28-MAY-15 | PERMIT ISSUED BY DELEGATE |
| 98/2015-1 | 30-APR-15 | 12 UNNAMED ROAD ELLIMINYT | DEVELOPMENT OF THE LAND FOR A DWELLING & OUTBUILDING | 25 | 25-MAY-15 | PERMIT ISSUED BY DELEGATE |
| 101-2015-1 | 6-MAY-15 | 75 CORANGAMITE STREET COLAC | REALIGNMENT OF BOUNDARY | 19 | 25-MAY-15 | PERMIT ISSUED BY DELEGATE |
| 109/2015-1 | 13-MAY-15 | 2140 COLAC FOREST ROAD GERANGAMETE | CONSTRUCTION OF A FARM MACHINERY SHED | 7 | 20-MAY-15 | PERMIT ISSUED BY DELEGATE |
| 126/2015-1 | 26-MAY-15 | 216-218 MURRAY STREET COLAC | DISPLAY OF BUSINESS IDENTIFICATION SIGNAGE | 1 | 27-MAY-15 | PERMIT ISSUED BY DELEGATE |

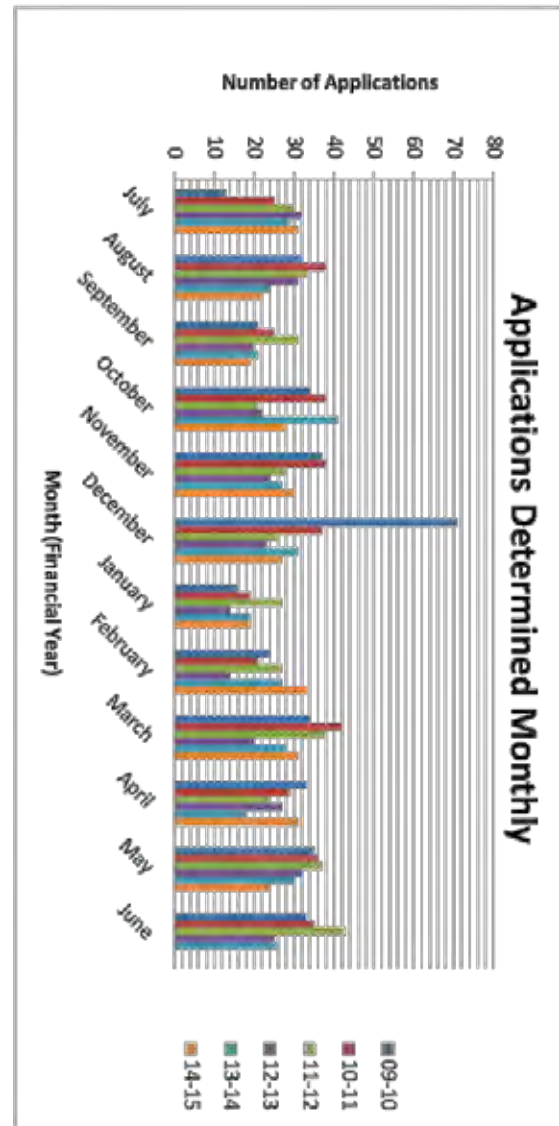
| APPLICATION NUMBER | DATE RECEIVED | LOCATION | PROPOSAL | STATUTORY DAYS | DATE DETERMINED | DETERMINATION AND AUTHORITY |
|--|---------------|---------------------------------|---|----------------|-----------------|-----------------------------------|
| 257/2014-1 | 10-DEC-14 | 18 OZONE STREET
SKENES CREEK | BUILDINGS & WORKS
COMPRISING AN EXTENSION
TO THE DWELLING | 49 | 13-MAY-15 | NOTICE OF DECISION BY
DELEGATE |
| AVERAGE STATUTORY DAYS TO DETERMINE PLANNING APPLICATIONS | | | | 46 | | |

PLANNING STATISTICAL REPORT – MAY 2015 (PERMITS NOT REQUIRED, WITHDRAWN AND LAPSED APPLICATIONS)

| APPLICATION NUMBER | DATE RECEIVED | LOCATION | PROPOSAL | STATUTORY DAYS | DATE DETERMINED | DETERMINATION AND AUTHORITY |
|--|---------------|-----------------------------------|--|----------------|-----------------|--------------------------------|
| 217/2013-1 | 17-SEP-13 | 3A HARRIS
ROAD
ELLMINT | LANDSCAPING TO FILL EXCESSIVE
SLOPE NE CORNER OF LOT | 1 | 7-MAY-15 | WITHDRAWN |
| 207/2014-1 | 23-OCT-14 | 200 BUSTY
ROAD
APOLLO BAY | TWO (2) LOT RE-SUBDIVISION AND
USE & DEVELOPMENT OF A
DWELLING | 1 | 1-MAY-15 | PLANNING APPLICATION
LAPSED |
| 94/2015-1 | 27-APR-15 | 55 JONES ROAD
STONVYFORD | SUBDIVISION OF LAND INTO FOUR
(4) LOTS | 22 | 19-MAY-15 | WITHDRAWN |
| 104/2015-1 | 7-MAY-15 | 35-39 MAIN
STREET
BIRRGURRA | TO PAINT THE POSTS,
BALUSTRADE, SEATS & CEILING
LINING IN THE EXISTING ROTUNDA
AND TO PAINT THE TIMBER
SLATES ON EXISTING SEATS IN
THE MEDIAN STRIP | 1 | 7-MAY-15 | WITHDRAWN |
| TOTAL AVERAGE STATUTORY DAYS (ALL APPLICATIONS) | | | | 40 | | |







BUILDING DEPARTMENT REPORT - TOTAL BUILDING PERMITS 2015 (YEAR TO DATE)

| | New Dwelling | | Domestic (Other) | | New Commercial | | Commercial (Other) | | New Public/Health | | Public/Health (Other) | | Municipal Totals | |
|--------------|--------------|------------------|------------------|------------------|----------------|----------------|--------------------|------------------|-------------------|--------------|-----------------------|----------------|------------------|-------------------|
| | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) |
| Jan | 3 | 603,312 | 24 | 301,464 | 0 | - | 2 | 226,231 | 0 | - | 1 | 83,160 | 30 | 1,214,167 |
| Feb | 9 | 2,064,347 | 33 | 1,325,813 | 0 | - | 3 | 641,100 | 0 | - | 0 | - | 45 | 4,031,260 |
| Mar | 9 | 2,347,398 | 28 | 1,109,968 | 0 | - | 1 | 10,000 | 1 | 9,984 | 3 | 283,428 | 42 | 3,780,678 |
| Apr | 5 | 1,329,665 | 24 | 807,885 | 2 | 218,000 | 2 | 34,900 | 0 | - | 1 | 67,922 | 34 | 2,458,372 |
| May | 6 | 1,894,900 | 10 | 761,611 | 0 | - | 2 | 265,000 | 0 | - | 0 | - | 18 | 2,921,511 |
| Jun | | | | | | | | | | | | | | |
| Jul | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | |
| Sep | | | | | | | | | | | | | | |
| Oct | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | |
| Total | 32 | 8,239,622 | 119 | 4,306,641 | 2 | 218,000 | 10 | 1,177,231 | 1 | 9,984 | 5 | 434,510 | 169 | 14,385,988 |

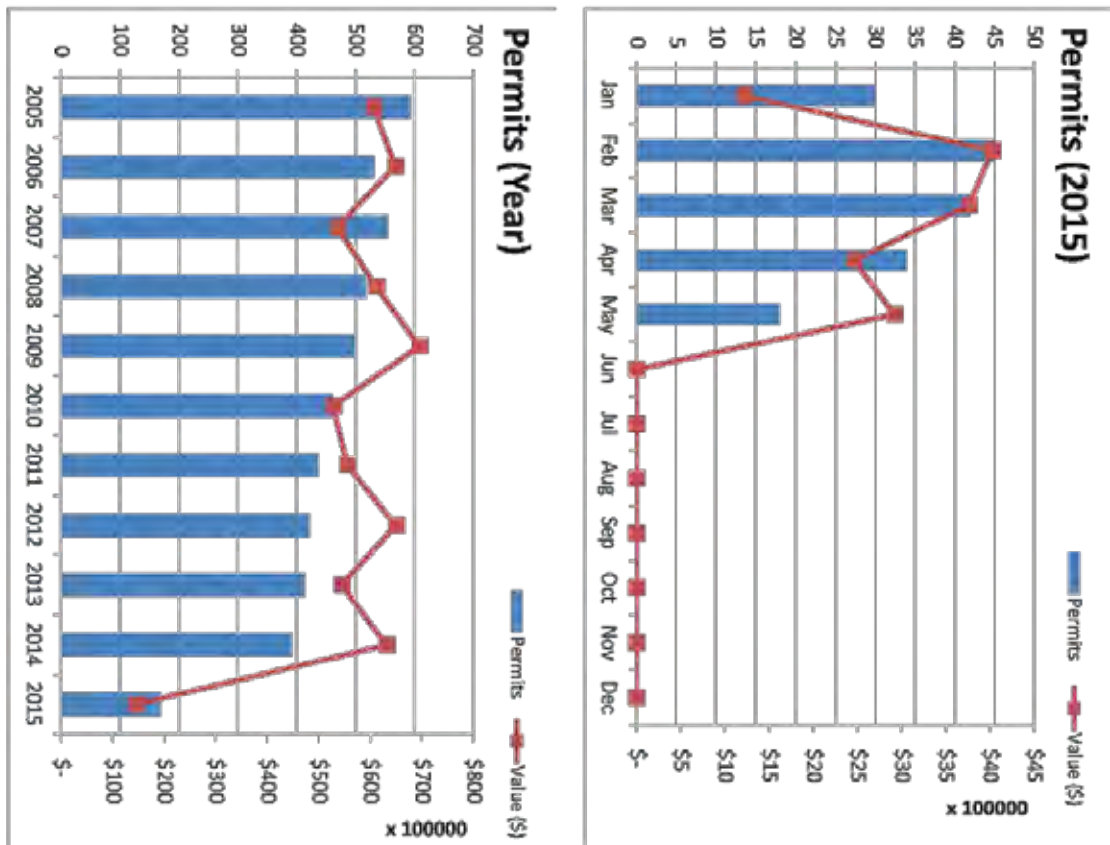
Note: Current month figures are to date only.

BUILDING DEPARTMENT REPORT - YEARLY COMPARISON (CURRENT YEAR TO DATE)

| | New Dwelling | | Domestic (Other) | | New Commercial | | Commercial (Other) | | New Public/Health | | Public/Health (Other) | | Municipal Totals | |
|------|--------------|--------------|------------------|--------------|----------------|-------------|--------------------|-------------|-------------------|-------------|-----------------------|--------------|------------------|--------------|
| | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) |
| 2011 | 130 | \$34,883,520 | 259 | \$11,427,948 | 11 | \$4,897,695 | 21 | \$1,768,619 | 1 | \$550,000 | 15 | \$2,041,271 | 437 | \$55,589,053 |
| 2012 | 112 | \$37,509,600 | 259 | \$9,248,333 | 12 | \$9,024,422 | 22 | \$2,272,199 | 2 | \$2,913,411 | 15 | \$4,057,333 | 422 | \$65,025,298 |
| 2013 | 113 | \$30,065,304 | 252 | \$11,629,479 | 8 | \$620,000 | 24 | \$1,526,120 | 7 | \$3,849,610 | 10 | \$6,707,866 | 414 | \$54,398,399 |
| 2014 | 102 | \$32,811,300 | 248 | \$9,138,265 | 6 | \$6,165,846 | 15 | \$1,032,065 | 7 | \$641,868 | 13 | \$12,890,553 | 391 | \$62,899,897 |
| 2015 | 32 | \$8,239,622 | 119 | \$4,306,641 | 2 | \$218,000 | 10 | \$1,177,231 | 1 | \$9,984 | 5 | \$434,510 | 169 | \$14,385,988 |

Note: Current year figures are to date only.

| Definition
(Examples) | New Dwelling | | Domestic (Other) | | New Commercial | | Commercial (Other) | | New Public/Health | | Public/Health (Other) | | Municipal Totals | |
|---|--------------|------------|------------------|------------|----------------|------------|--------------------|------------|-------------------|------------|-----------------------|------------|------------------|------------|
| | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) |
| Dwellings
Multi-Development
Re-Erection | | | | | | | | | | | | | | |
| Extensions/Alteration
Veranda/Deck
Shed/Garage
Swimming Pool | | | | | | | | | | | | | | |
| Office
Shop
Restaurant
Factory/Warehouse | | | | | | | | | | | | | | |
| Extension/Alteration
Fit Out
Demolition | | | | | | | | | | | | | | |
| Hospital
Medical Clinic
School | | | | | | | | | | | | | | |
| Hall
Church
Utilities | | | | | | | | | | | | | | |
| Extension/Alteration
Demolition | | | | | | | | | | | | | | |



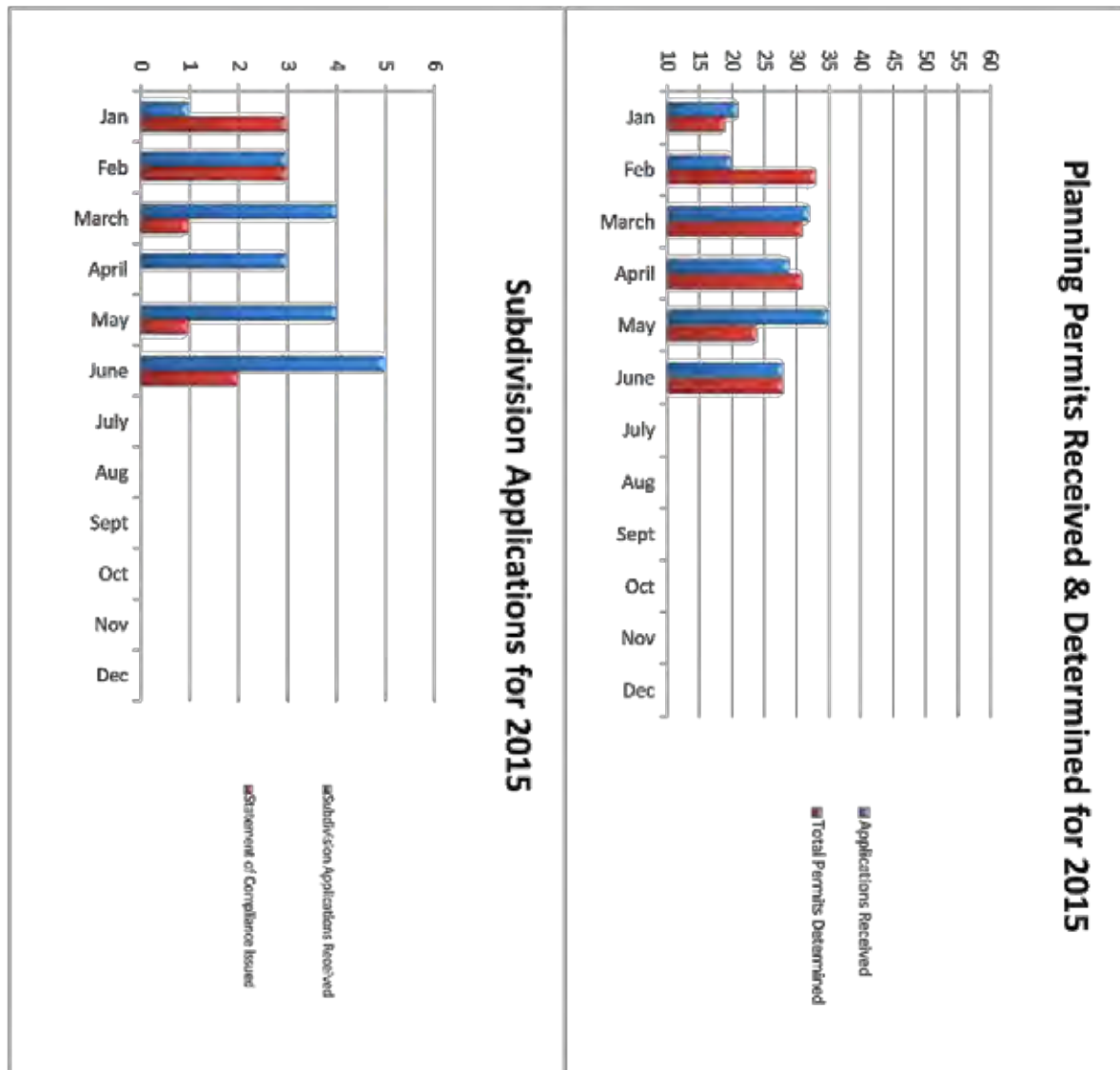
PLANNING STATISTICAL REPORT – JUNE 2015 – (DETERMINATIONS)

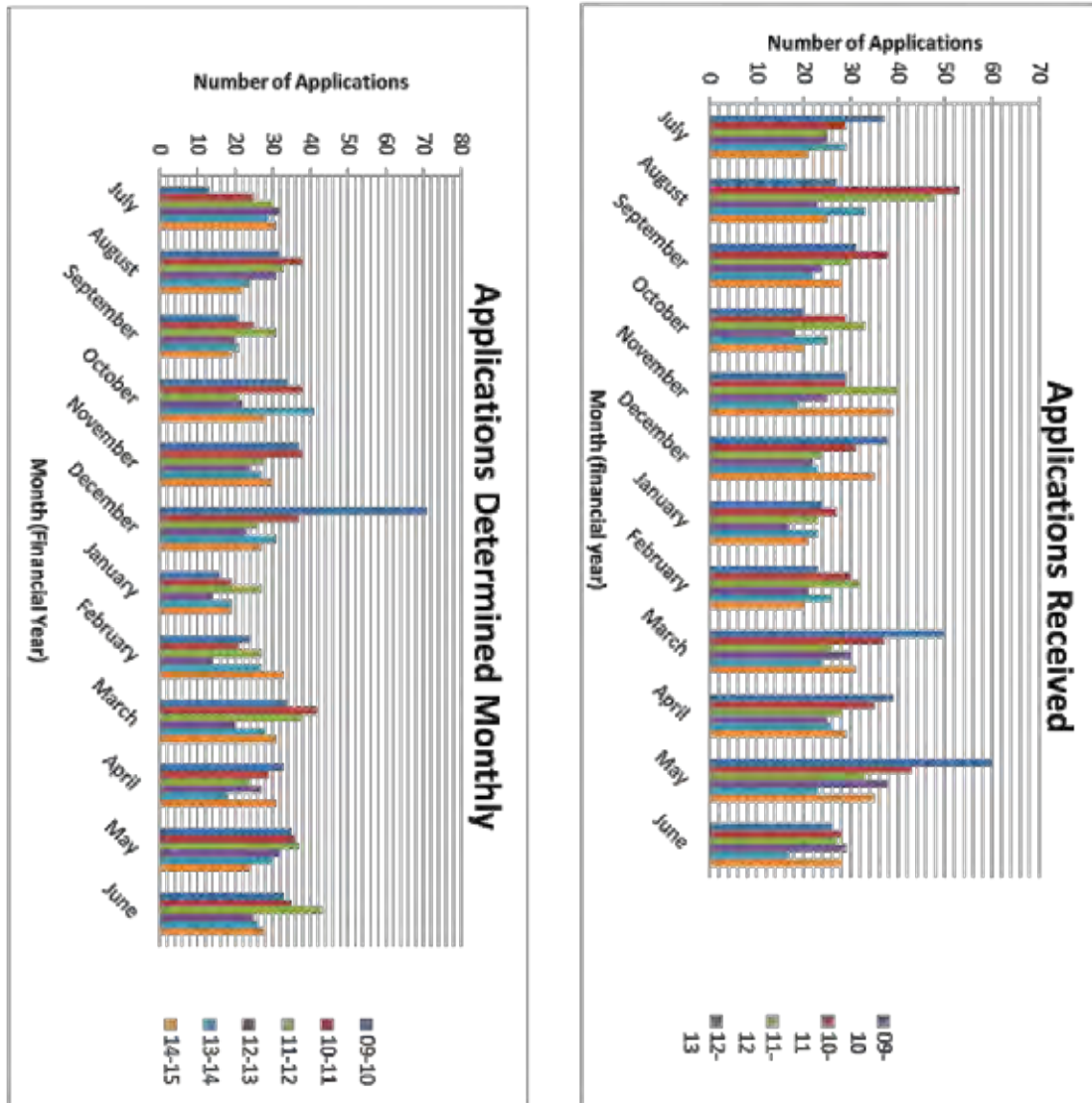
| APPLICATION NUMBER | DATE RECEIVED | LOCATION | PROPOSAL | STATUTORY DAYS | DATE DETERMINED | DETERMINATION AND AUTHORITY |
|--------------------|---------------|--------------------------------|--|----------------|-----------------|---------------------------------------|
| 43/2007-4 | 8-APR-15 | 18 ROSS STREET COLAC | DEVELOP SEVEN (7) SINGLE STOREY DWELLINGS AND EIGHT (8) LOT SUBDIVISION | 15 | 2-JUN-15 | PERMIT ISSUED BY DELEGATE - AMENDMENT |
| 92/2014-2 | 22-APR-15 | 66 MAIN ROAD GELLIBRAND | CONSTRUCTION OF OFFICE AND ASSOCIATED DEPOT BUILDINGS, REMOVAL OF NATIVE VEGETATION AND ALTERATION AND CREATION OF ACCESSSES TO A ROAD IN A ROAD ZONE CATEGORY 1 | 43 | 24-JUN-15 | PERMIT ISSUED BY DELEGATE - AMENDMENT |
| 94/2014-2 | 17-APR-15 | 54 OLD COACH ROAD SKENES CREEK | BUILDINGS AND WORKS COMPRISING EXTENSION TO DWELLING | 39 | 2-JUN-15 | PERMIT ISSUED BY DELEGATE - AMENDMENT |
| 7/2015-2 | 13-MAY-15 | 51 LAWES STREET ELLIMINT | BUILDINGS AND WORKS COMPRISING CONSTRUCTION OF AN OUTBUILDING | 41 | 23-JUN-15 | PERMIT ISSUED BY DELEGATE - AMENDMENT |
| 202/2014-1 | 17-OCT-14 | 145 EVANS TRACK JOHANNA | USE AND DEVELOPMENT OF DWELLING, BUILDING AND WORKS, OUTBUILDING/ BUSHFIRE SHELTER AND ASSOCIATED NATIVE VEGETATION REMOVAL | 78 | 26-JUN-15 | PERMIT ISSUED BY DELEGATE |
| 245/2014-1 | 28-NOV-14 | 80 QUEEN STREET COLAC | SUBDIVISION OF THE LAND INTO THREE (3) LOTS AND CREATION OF ACCESS TO RD21 | 23 | 24-JUN-15 | PERMIT ISSUED BY DELEGATE |
| 43/2015-1 | 24-FEB-15 | 241 MURRAY STREET COLAC | BUILDINGS AND WORKS COMPRISING ALTERATIONS TO THE BUILDING FAÇADE | 87 | 5-JUN-15 | PERMIT ISSUED BY DELEGATE |
| 54/2015-1 | 16-MAR-15 | 16 OAK AVENUE APOLLO BAY | CHANGE OF USE TO INCLUDE MANUFACTURING SALES AND FOOD AND DRINK PREMISES (CAFE USE) AND WAIVER OF THE | 51 | 2-JUN-15 | PERMIT ISSUED BY DELEGATE |

| APPLICATION NUMBER | DATE RECEIVED | LOCATION | PROPOSAL | STATUTORY DAYS | DATE DETERMINED | DETERMINATION AND AUTHORITY |
|--------------------|---------------|-------------------------------------|--|----------------|-----------------|-----------------------------|
| | | | LOADING AND UNLOADING PROVISION | | | |
| 60/2015-1 | 19-MAR-15 | 327 SINCLAIR STREET SOUTH ELLIMINYT | BUILDINGS AND WORKS COMPRISING AN EXTENSION TO THE DWELLING | 52 | 23-JUN-15 | PERMIT ISSUED BY DELEGATE |
| 63/2015-1 | 20-MAR-15 | 485 SPEEDWAY ROAD JANCOURT EAST | BUILDINGS AND WORKS COMPRISING THE INSTALLATION OF FIVE SHIPPING CONTAINERS TO BE USED FOR ANCILLARY STORAGE | 31 | 9-JUN-15 | PERMIT ISSUED BY DELEGATE |
| 80/2015-1 | 7-APR-15 | 5495 GREAT OCEAN ROAD YUULONG | ALTERATIONS AND ADDITIONS TO EXISTING DWELLING | 66 | 12-JUN-15 | PERMIT ISSUED BY DELEGATE |
| 82/2015-1 | 7-APR-15 | 13 PRIME STREET BIRREGURRA | TWO (2) LOT SUBDIVISION | 77 | 24-JUN-15 | PERMIT ISSUED BY DELEGATE |
| 87/2015-1 | 16-APR-15 | 119-243 HART STREET COLAC | CONSTRUCTION OF MEDIA BUILDING ASSOCIATED WITH EDUCATION CENTRE | 5 | 9-JUN-15 | PERMIT ISSUED BY DELEGATE |
| 90/2015-1 | 23-APR-15 | 11 ARTHUR COURT APOLLO BAY | CONSTRUCTION OF TWO (2) STORAGE SHEDS | 43 | 5-JUN-15 | PERMIT ISSUED BY DELEGATE |
| 91/2015-1 | 17-APR-15 | 1920 IRREWILLIPE ROAD IRREWILLIPE | ADDITIONS AND ALTERATIONS TO THE EXISTING DWELLING AND GARAGE | 34 | 24-JUN-15 | PERMIT ISSUED BY DELEGATE |
| 93/2015-1 | 22-APR-15 | 45 HUGH MURRAY DRIVE COLAC EAST | CONSTRUCTION OF A STORE (STORAGE SHED) | 13 | 23-JUN-15 | PERMIT ISSUED BY DELEGATE |
| 95/2015-1 | 28-APR-15 | 25 STRACHAN STREET BIRREGURRA | BUILDINGS AND WORKS COMPRISING CONSTRUCTION OF AN OUTBUILDING | 31 | 23-JUN-15 | PERMIT ISSUED BY DELEGATE |

| APPLICATION NUMBER | DATE RECEIVED | LOCATION | PROPOSAL | STATUTORY DAYS | DATE DETERMINED | DETERMINATION AND AUTHORITY |
|--------------------|---------------|--|--|----------------|-----------------|-----------------------------|
| 96/2015-1 | 29-APR-15 | 140 NICHOLAS LANE
BIRREGURRA | EXTENSION TO EXISTING DWELLING | 35 | 25-JUN-15 | PERMIT ISSUED BY DELEGATE |
| 103/2015-1 | 30-APR-15 | 15-17 HART STREET COLAC | CONSTRUCTION OF A GAZEBO AND LANDSCAPING | 38 | 18-JUN-15 | PERMIT ISSUED BY DELEGATE |
| 106/2015-1 | 11-MAY-15 | 200 COLLINS ROAD
IRREWARRA | EXTENSION TO EXISTING SHED | 18 | 2-JUN-15 | PERMIT ISSUED BY DELEGATE |
| 113/2015-1 | 14-MAY-15 | 551
CORANGAMITE LAKE ROAD
CORROOKE | CONSTRUCTION OF VERANDA/CANOPY AT THE REAR OF THE BUILDING | 4 | 29-JUN-15 | PERMIT ISSUED BY DELEGATE |
| 115/2015-1 | 18-MAY-15 | 870 FOREST APOLLO BAY ROAD
BARRAMUNGA | CREATION OF A CARRIAGEWAY EASEMENT OVER AN EXISTING ACCESS | 25 | 23-JUN-15 | PERMIT ISSUED BY DELEGATE |
| 120/2015-1 | 20-MAY-15 | 39 NOEL STREET APOLLO BAY | REMOVE THE BUILDING ENVELOPE RESTRICTIONS ON TITLE | 35 | 25-JUN-15 | PERMIT ISSUED BY DELEGATE |
| 129/2015-1 | 29-MAY-15 | 64 HIGH MURRAY DRIVE COLAC EAST | CONSTRUCTION OF A BUILDING TO BE USED FOR WAREHOUSE (PLUMBING STORAGE) | 20 | 18-JUN-15 | PERMIT ISSUED BY DELEGATE |
| 130/2015-1 | 29-MAY-15 | 42 CALVERT STREET COLAC | DEMOLITION OF EXISTING SHED AND CONSTRUCTION OF A SHED/CARPORT | 4 | 2-JUN-15 | PERMIT ISSUED BY DELEGATE |
| 134/2015-1 | 4-JUN-15 | 580
BIRREGURRA DEANS MARSH ROAD WHOOREL | CONSTRUCTION OF STABLES | 20 | 24-JUN-15 | PERMIT ISSUED BY DELEGATE |

| APPLICATION
NUMBER | DATE
RECEIVED | LOCATION | PROPOSAL | STATUTORY
DAYS | DATE
DETERMINED | DETERMINATION AND AUTHORITY |
|---|------------------|--|--|-------------------|--------------------|--|
| 147/2015-1 | 16-JUN-15 | 7 MAIN STREET
BIRREGURRA | REMOVAL OF DAMAGED/ERODED
CHIMNEY AND RELOCATION OF
1.0M X 1.0M WINDOW | 8 | 24-JUN-15 | PERMIT ISSUED BY DELEGATE |
| 275/2014-1 | 22-DEC-14 | 372 AND 374
QUEEN STREET
ELLIMINYT | SUBDIVISION OF LAND INTO FIVE
(5) LOTS | 44 | 5-JUN-15 | NOTICE OF DECISION ISSUED BY
DELEGATE |
| AVERAGE STATUTORY DAYS TO DETERMINE PLANNING APPLICATIONS | | | | 35 | | |





BUILDING DEPARTMENT REPORT - TOTAL BUILDING PERMITS 2015 (YEAR TO DATE)

| | New Dwelling | | Domestic (Other) | | New Commercial | | Commercial (Other) | | New Public/Health | | Public/Health (Other) | | Municipal Totals | |
|--------------|--------------|------------------|------------------|------------------|----------------|------------------|--------------------|------------------|-------------------|--------------|-----------------------|----------------|------------------|-------------------|
| | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) |
| Jan | 3 | 603,312 | 24 | 301,464 | 0 | - | 2 | 226,231 | 0 | - | 1 | 83,160 | 30 | 1,214,167 |
| Feb | 9 | 2,064,347 | 34 | 1,330,763 | 0 | - | 3 | 641,100 | 0 | - | 0 | - | 46 | 4,036,210 |
| Mar | 10 | 2,369,250 | 29 | 1,125,268 | 0 | - | 1 | 10,000 | 1 | 9,984 | 3 | 283,428 | 44 | 3,787,930 |
| Apr | 5 | 1,329,665 | 25 | 821,915 | 2 | 218,000 | 2 | 34,900 | 0 | - | 1 | 67,922 | 35 | 2,472,402 |
| May | 7 | 1,904,700 | 22 | 1,693,746 | 1 | 1,937,500 | 2 | 265,000 | 0 | - | 0 | - | 32 | 5,800,946 |
| Jun | 8 | 1,331,603 | 16 | 1,046,382 | 0 | - | 1 | 56,000 | 0 | - | 0 | - | 25 | 2,433,985 |
| Jul | | | | | | | | | | | | | | |
| Aug | | | | | | | | | | | | | | |
| Sep | | | | | | | | | | | | | | |
| Oct | | | | | | | | | | | | | | |
| Nov | | | | | | | | | | | | | | |
| Dec | | | | | | | | | | | | | | |
| Total | 42 | 9,592,877 | 150 | 6,319,538 | 3 | 2,155,500 | 11 | 1,233,231 | 1 | 9,984 | 5 | 434,510 | 212 | 19,745,640 |

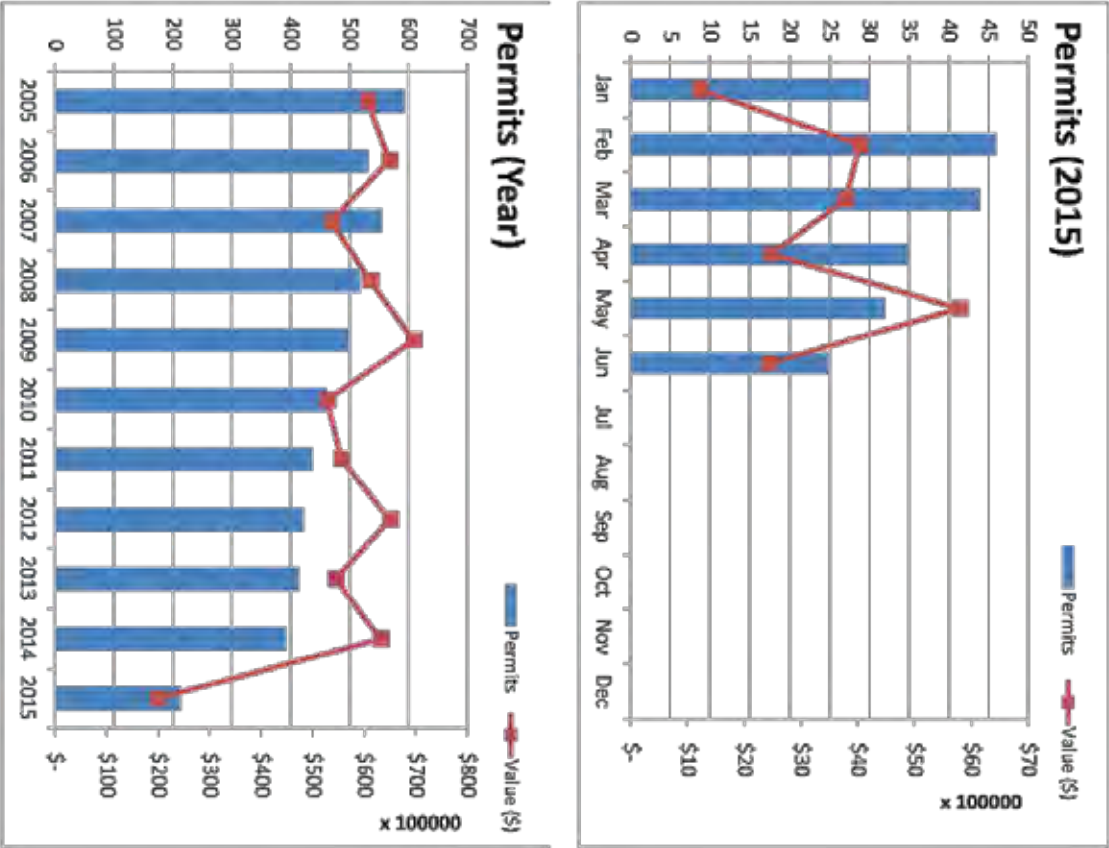
Note: Current month figures are to date only.

BUILDING DEPARTMENT REPORT - YEARLY COMPARISON (CURRENT YEAR TO DATE)

| | New Dwelling | | Domestic (Other) | | New Commercial | | Commercial (Other) | | New Public/Health | | Public/Health (Other) | | Municipal Totals | |
|------|--------------|------------|------------------|------------|----------------|------------|--------------------|-------------|-------------------|------------|-----------------------|------------|------------------|------------|
| | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) |
| 2011 | 130 | 34,883,520 | 259 | 11,427,948 | 11 | 4,897,695 | 21 | \$1,768,619 | 1 | 550,000 | 15 | 2,041,271 | 437 | 55,569,053 |
| 2012 | 112 | 37,509,600 | 259 | 9,248,333 | 12 | 9,024,422 | 22 | \$2,272,199 | 2 | 2,913,411 | 15 | 4,057,333 | 422 | 65,025,298 |
| 2013 | 113 | 30,065,304 | 252 | 11,629,479 | 8 | 620,000 | 24 | \$1,526,120 | 7 | 3,849,610 | 10 | 6,707,886 | 414 | 54,398,399 |
| 2014 | 103 | 33,310,220 | 248 | 9,141,465 | 6 | 6,185,846 | 15 | \$1,032,065 | 7 | 641,868 | 13 | 12,890,553 | 392 | 63,202,017 |
| 2015 | 42 | 9,592,877 | 150 | 6,319,538 | 3 | 2,155,500 | 11 | \$1,233,231 | 1 | 9,984 | 5 | 434,510 | 212 | 19,745,640 |

Note: Current year figures are to date only.

| Definition
(Examples) | New Dwelling | | Domestic (Other) | | New Commercial | | Commercial (Other) | | New Public/Health | | Public/Health (Other) | | Municipal Totals | |
|--|--------------|------------|------------------|------------|----------------|------------|--------------------|------------|-------------------|------------|-----------------------|------------|------------------|------------|
| | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) | No. | Value (\$) |
| Dwellings
(Null Development
Re-Erection) | | | | | | | | | | | | | | |
| Extension/Alteration
Veranda/Deck
Shed/Garage
Swimming Pool | | | | | | | | | | | | | | |
| Office
Shop
Restaurant
Factory/Warehouse | | | | | | | | | | | | | | |
| Extension/Alteration
Fit Out
Demolition | | | | | | | | | | | | | | |
| Hospital
Medical Clinic
School | | | | | | | | | | | | | | |
| Hall
Church
Utilities | | | | | | | | | | | | | | |
| Extension/Alteration
Demolition | | | | | | | | | | | | | | |





Old Beechy Rail Trail Committee Meeting

Meeting Venue: Meeting Room 1, COPACC

30 March, 2015

Time: 10.00am to 12.30pm

MINUTES

| | ITEMS & ACTIONS | RESPONSIBLE OFFICER | ACTION DUE DATE |
|----|---|---------------------|-----------------|
| 1. | ATTENDEES
Chris Smith (Chair), Jodie Fincham (COS), Noel Barry, Tony Grogan, Tricia Jukes, Bernard Jordan, Cyril Marriner.
Minutes: Vicki Jeffrey (COS) | | |
| 2. | APOLOGIES
Christine Humphris, Phil Dandy, Anthony Zappelli, John Wilson (COS), Bernard Jordan | | |
| 3. | CONFIRMATION OF MINUTES FROM PREVIOUS MEETING 2 February 2015
Corrections
Friends Report – Lovatt shelter installed over 2 weekends.
Kawarren Reserve – The Beechy Rail 'alignment' passes through the Kawarren Reserve.

Moved – Jodie Fincham
Seconded – Tricia Jukes
Carried | | |
| 4. | BUSINESS ARISING from previous minutes.

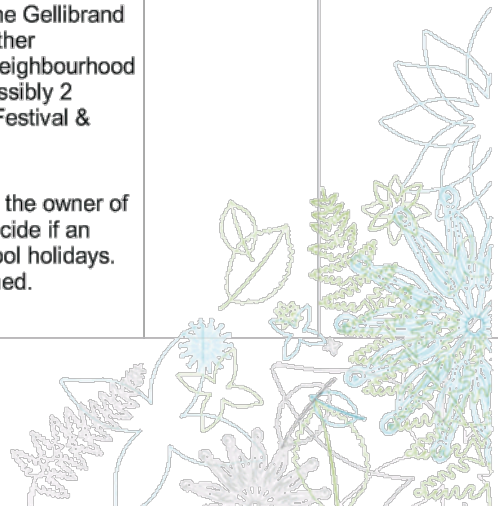
<i>Discussion of future development plans, goals, marketing of "Friends of the Old Beechy Rail Trail". Giving consideration to OBRT Charter and Instrument of Delegation.</i>

Sub-committee has met to discuss the promotion of the trail. Set up a group email, possibly Facebook. There is a COS policy on social media. Investigate with COS PR department to possibly set up a facebook address.

<i>Golden Gumboot Event</i>
Decided to not go ahead in 2015 however the owner of the Gellibrand store has offered assistance. Sub-committee to have further discussions with her. Perhaps work with the Gellibrand Neighbourhood house. Chris/Tricia/Tony to meet at the general store. Possibly 2 weeks only in the September school holidays. Possible Festival & Events Support Scheme application for funding.

MOTION – A sub-committee of Tricia/Tony/Chris to meet the owner of the Gellibrand General store to further investigate and decide if an application for funding is required for the September school holidays. Further details to come back to the meeting to be confirmed.
Moved – Tricia Jukes | Vicki to Tricia | |

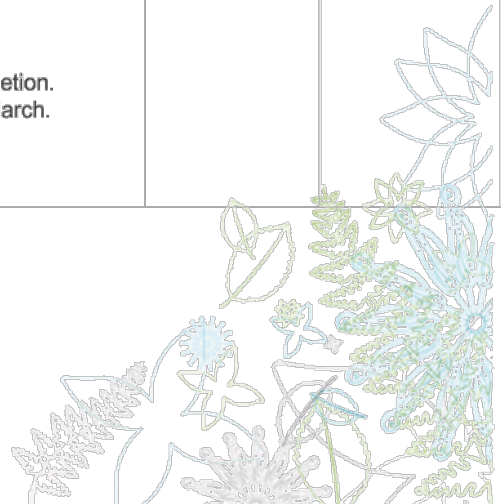
OBRT Meeting – 30/3/2015





| | | | |
|----|---|--|--|
| | <p>Seconded – Noel Barry
Carried – All</p> <p><i>Development of draft Information/Fact Sheet for Licence agreements with private land owners.</i></p> <ul style="list-style-type: none"> Jodie provided a final Fact Sheet and distributed copies after comments received. Submitted to council during a briefing session and some minor amendments submitted. Details provided in an email to Jodie Fincham from councillors. Flow chart also developed and distributed. <p><i>Kawarren sign</i></p> <ul style="list-style-type: none"> Tony to discuss with Christine Towers. <p><i>No Smoking Signs</i></p> <ul style="list-style-type: none"> Signs have been removed. <p><i>Traker Counters</i></p> <ul style="list-style-type: none"> 3 counters have been purchased. Locations as detailed in previous minutes. Beech Forest counter to be returned to the manufacture for possible free replacement. The Friends will complete the installations. <p>Moved – Tricia Jukes
Seconded – Cyril Marriner</p> | | |
| 5. | <p>CORRESPONDENCE IN</p> <ul style="list-style-type: none"> Email – Confirmation from Andrew Daffy that 'No smoking' sign has been removed. Email – Request for brochures for OBRT display at OBRT Fun Run. Request for additional maps/brochures at Gellibrand Info Centre – Tricia Jukes. Proposed Letter of Support for Lavers Hill to Melba Gully path – Tony Grogan. Email – Request for details of opening Dinmont to Ditchley and official opening details – Stephen Lodge, Rail Trails Australia. Email – Friends – Trees down on trail and interest in working with Kawarren group on trail development. Email from Phil Dandy re trees down on the trail. OBRT Newsletter Rail Trail Connection – Page 3 reference to OBRT completion. Emails and RSVP's for the Opening event of Friday 27 March. | | |

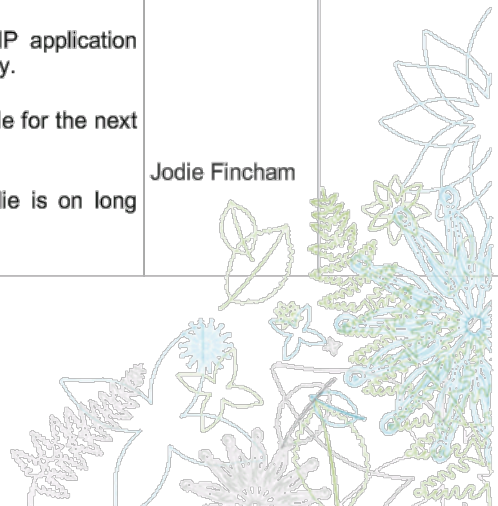
OBRT Meeting – 30/3/2015





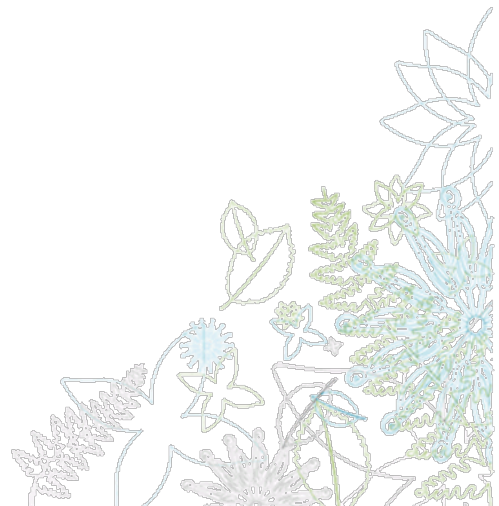
| | | | |
|-----|---|--------------------------------|--|
| 6. | CORRESPONDENCE OUT <ul style="list-style-type: none"> Invitations and emails for the Opening event of Friday 27 March. | Jodie Fincham
Vicki Jeffrey | |
| 7. | WORKS REPORT – Capital Works Co-ordinator (John Wilson) <ul style="list-style-type: none"> John Wilson to supply on his return from annual leave. | John Wilson | |
| 8. | FRIENDS REPORT <ul style="list-style-type: none"> Lovatt shed approval required by John Wilson. Vicki to email John to contact Noel in regards to the sign off form. New sections Beech Forest to Ferguson, and Dinmont to Ditchley. Christine Humphris and her husband have donated a seat. Investigate how many seats are required and then apply through the Community Funding Program – Recreation Facilities for the OBRT. Include in this application re-printing of brochures. <p>MOTION – Tricia to provide costs on 5,000 brochures re-print and Noel costs on 8 new seats.
Moved – Tony Grogan
Seconded – Cyril Marriner</p> <ul style="list-style-type: none"> Kawarren school – potential new section (south side of Kawarren school). Map circulated. Further promotion ideas of the trail from Phil Dandy. A list of details to be submitted to the committee. Photos of Gwentyth Knox cutting the ribbon for the Historical Society circulated. | Vicki Jeffrey | |
| 9. | TREASURERS REPORT <ul style="list-style-type: none"> As per copy presented – balance \$4991.01 Email Christine Humphris for costs of catering for the opening. Thank you card to be sent to Christine including Linda and Jackie on behalf of the committee. | Vicki Jeffrey
Vicki Jeffrey | |
| 10. | Executive Officer Report – Jodie Fincham <p><u>RIDF Funding (Regional Infrastructure Development Funding)</u></p> <ul style="list-style-type: none"> Funding has been completed. Minutes of meeting at Lavers Hill – Melba Gully. STIP application submitted for concept plans. Map submitted by Noel Barry. Official Opening of 27 March – Photos reviewed. Pedestrian counters – No report. Report will be available for the next meeting. Fact Sheet and Flowchart submitted. New Recreation Officer will be Lucy Vesey whilst Jodie is on long service leave. | Jodie Fincham | |

OBRT Meeting – 30/3/2015





| | | | |
|-----|---|---|--|
| 11. | <p>GENERAL BUSINESS</p> <ul style="list-style-type: none"> Regional Development Victoria did not attend the Opening or send an apology. Tony Grogan thanked Cr Chris Smith on a great job as MC at the opening. Cyril Marriner mentioned that the walk up to the Buchanan sign was very special. Tricia Jukes mentioned that the history talk that Noel Barry gave was particularly interesting on the Buchanan station. It was very appropriate that Gwenyth Knox attended and cut the ribbon. Neil Longmore apologised for not attending. Thanks to Jodie Fincham for her 5 years association with the project and sourcing funding. Investigate funding possibilities for the next stage including Crowes from Melba Gully. John Wilson – business case for interpretative signage. Issue of one pad of tear off maps to Tony Grogan for the Gellibrand Information Centre. Update Distribution List. Five trips have been completed on the trail. Passed 5,000 passengers. Donations collected from passengers to be given to the committee. No incidents to report. Afternoon tea now provided at the Gellibrand General Store on these trips. <p>MOTION - Noel Barry requested that the Dinmont and Binool signs need replacement.
Moved – Tony Grogan
Seconded – Tricia Jukes</p> <p>Meeting closed 11.50am.
Next meeting – Monday, 1 June, 2015 - 10am to 12.30pm.</p> | <p>John Wilson</p> <p>Vicki Jeffrey</p> | |
|-----|---|---|--|



| | | |
|--|--|-----------------|
| 
Agenda | <h1>Councillor Briefing</h1> <p>Wednesday, 17 June 2015
Indoor Tennis Centre & COPACC Meeting Room
3.00pm to 6.05pm</p> | |
| | <p>ATTENDEES:
Cr Lyn Russell, Cr Stephen Hart, Cr Frank Buchanan (from 4:00pm), Cr Michael Delahunty (left at 5:45pm), Cr Brian Crook</p> <p>Sue Wilkinson (CEO) (from 4:15pm)
Colin Hayman (GM, Corporate & Community Services)
Doug McNeill (A/GM, Sustainable Planning & Development)
Paula Gardiner (A/GM, Infrastructure & Services)</p> <p>Apology:
Cr Terry Woodcroft, Phil Corluka</p> <p>Absent:
Cr Chris Smith,</p> | |
| | <h2>Agenda Topics</h2> | |
| 3.00 pm – 4.00 pm | Tour of Indoor Tennis Centre | Ian Seuren |
| 4.00 pm | <p>Declaration of Interest
Cr Michael Delahunty – Great Ocean Road Plan – re Marriner Falls (4:25pm – 4:26pm)
General Business – re Acciona (5:35pm - 5:38pm)</p> | |
| 4.00 pm – 4.15 pm | <p>Councillor Briefing – Councillors only
Confidential staff matter</p> | |
| 4.15 pm – 4.30 pm | Draft Strategic Master Plan for the Great Ocean Road Region | Tony White |
| 4.30 pm – 4.45 pm | Local Government Community Satisfaction Survey Results | Carmen Lawrence |
| 4:45 pm – 5:00 pm | <p>General Business
Safe Haven Enterprise Visa Scheme</p> | |
| 5.00 pm – 5.35 pm | 2015-2016 Draft Budget – verbal update | Ashley Roberts |
| 5.35 pm – 6.05 pm | General Business | |



Assembly of Councillors Record

This Form MUST be completed by the attending Council Officer and returned IMMEDIATELY to Document Management Co-ordinator for filing. A copy of the completed form must be provided to the Executive Officer to the CEO, Mayor & Councillors for reporting at the next Ordinary Council Meeting.

Assembly Details:

Date: 19 / 06 / 2015

Time: 9.00 am

Assembly Location: Colac Regional Selling Centre

(some e.g's. COPACC, Colac Otway Shire Offices, 2 - 6 Rae Street, Colac, Shire Offices – Nelson Street, Apollo Bay

In Attendance:

Councillors: Cr Buchanan / / /
 / / /

Officer/s: Paula Gardiner / Greg Anderton / Tony White / Graeme Riches
 Doug McNeill / Kristy Cochrane / /

Matter/s Discussed: ...Colac Regional Selling Centre operations & future directions – Safety at the Saleyards, COS Restructure and Responsibility for the Saleyards, Development of the Business Plan, Soft Floor Options, Priority Lists for Works Improvements, External Promotion of the Saleyards, Update Regional Selling Centre discussions, Saleyards throughput figures, Other Business, General Business,

.....
 (some e.g's. Discussion s with property owners and/or residents, Planning Permit Application No. xxxx re proposed development at No. xx Pascoe Street, Apollo Bay, Council Plan steering committee with Councillors and officers.)


Conflict of Interest Disclosures: (refer page 5)

Councillors: / / /
 / / /

Officer/s: / / /
 / / /

Left meeting at:


Completed by:

| | | |
|--|--|-----------|
| 
Agenda | <h1 style="text-align: center;">Councillor Briefing</h1> <p style="text-align: right;">Monday, 22 June 2015
 COPACC Meeting Room
 12.00 pm to 12.45 pm</p> | |
| | <p>ATTENDEES:
 Cr Frank Buchanan, Cr Brian Crook Cr Lyn Russell, Cr Stephen Hart (to 12.30pm), Cr Michael Delahunty,</p> <p>Sue Wilkinson (Chief Executive Officer)
 Colin Hayman (GM, Corporate & Community Services)
 Doug McNeill (Acting GB Sustainable Planning & Development)
 Paula Gardiner (Acting GM Infrastructure & Services)
 Ashley Roberts (Manager Finance & Customer Services)
 David Testa (Financial Operations Coordinator)</p> <p>Mike Said – Chairperson, Audit Committee</p> <p>Apologies:
 Nil</p> | |
| | <h2 style="text-align: center;">Agenda Topics</h2> | |
| 12.00 pm – 12.15 pm | Lunch | |
| 12.15 pm | Declaration of Interest | |
| 12.15 pm – 12.45 pm | Presentation of the Audit Committee
Chairperson's Half Yearly Report to Council | Mike Said |

Confidentiality Statement:

This briefing is deemed confidential under section 89(2) (a) (d) and (h) of the Local Government Act 1989 as it refers to personnel matters, contractual matters and any other matter which would prejudice the Council or any person.

Sue Wilkinson
 Chief Executive Officer

| | | |
|--|---|--|
| 
Colac Otway
SHIRE
Agenda | <h1>Councillor Briefing</h1> <p>Wednesday, 24 June 2015
COPACC Meeting Rooms
1.10pm to 3.10pm</p> | |
| | <p>ATTENDEES:
 Cr Lyn Russell, Cr Stephen Hart, Cr Frank Buchanan, Cr Terry Woodcroft, Cr Brian Crook</p> <p>Sue Wilkinson (CEO)
 Colin Hayman (GM, Corporate & Community Services)
 Doug McNeill (A/GM, Community & Development Services)
 Paula Gardiner (A/GM, Infrastructure & Leisure Services)
 Rhonda Deigan (Executive Officer to CEO, Mayor & Councillors)</p> <p>Part: Ashley Roberts – 1.15pm to 2.30pm</p> <p>Apology: Nil</p> <p>Absent: Cr Chris Smith, Cr Michael Delahunty</p> | |
| | <h2>Agenda Topics</h2> | |
| 1.10 pm | <p>Declaration of Interest
 Cr Crook: Item OM152406-3 2015-2016 Community Funding Program
 Cr Russell: Item OM152406-11 Contract 1521 and item OM152406-24 Contract 1521
 Cr Woodcroft: Items OM152604-1 CEO Progress Report to Council & OM152604-2 Festival & Events Support Scheme 2015-2016 & OM152406-3 2015-2016 Community Funding Program
 Cr Hart: OM152406-15 2015/2016 Small Town Improvement Program (STIP) Allocation of Funds
 Cr Buchanan: OM152406-2 Festival & Events Support Scheme 2015-2016</p> | |
| 1.10 pm | <p>Councillor Briefing Session/Meeting Preparation
 Cr Woodcroft declared a conflict of interest in items OM152406-1 and OM152406-2 and left meeting between 1.43pm to 1.54pm
 Cr Buchanan declared a conflict of interest in item OM152406-2 and left the meeting from 1.45pm to 1.54pm
 Crs Crook and Woodcroft declared a conflict of interest in item OM152406-3 and left the meeting between 1.55pm to 1.57pm.
 Cr Russell declared a conflict of interest in item OM152406-11 Contract 1521 and left meeting between 2.30pm to 2.31pm
 Cr Hart declared a conflict of interest in item OM152406-15 2015/2016 Small Town Improvement Program (STIP) Allocation of Funds and left the meeting between 2.38pm to 2.41pm</p> | |
| 2.55pm – 3.10pm | <p>General Business
 <input type="checkbox"/> Update on Marriner's Falls
 <input type="checkbox"/> Other Business</p> | |

| | | |
|--|--|---|
| 
Agenda | <h1>Councillor Briefing</h1> <p>Wednesday, 8 July 2015
COPACC Meeting Room
10.00 am to 2.50 pm</p> | |
| | <p>ATTENDEES:
Cr Frank Buchanan (Mayor), Cr Lyn Russell, Cr Stephen Hart (until 1.10pm),
Cr Terry Woodcroft, Cr Brian Crook</p> <p>Sue Wilkinson (CEO)
Colin Hayman (GM, Corporate & Community Services)
Doug McNeill (A/GM, Sustainable Planning & Development)
Paula Gardiner (A/GM, Infrastructure & Services)</p> <p>Apology: Cr Michael Delahunty
Absent: Cr Chris Smith</p> | |
| | <h2>Agenda Topics</h2> | |
| 10.00am | Declaration of Interest
Crs Russell & Hart – Coles Supermarket Road Closure | |
| 10.00am – 10.20am | Bluewater Fitness Centre Update – confidential | Sue Wilkinson |
| 10.20am – 10.40am | COPACC Lease Update - confidential | Ian Seuren |
| 10.40am – 10.55am | Review of Procurement Policy | Colin Hayman |
| 10.55am – 11.20am | General Business | |
| 11.20am – 12.10pm | Coles Supermarket Road Closure
Having declared a conflict of interest in this item,
Crs Hart & Russell left the meeting from 11.20am to 12.10pm | Blaithin Butler / Clive Brooker |
| 12.10pm – 12.30pm | Lunch | |
| 12.30pm – 2.40pm | Domestic Wastewater Management Plan (DWMP) Briefing & Case Study
Cr Hart declared a conflict of interest in this item and left the meeting at 1.10pm. | Blaithin Butler/Greg Fletcher/Jonathan Brett Whitehead & Associates – Mark Saunders |
| 2.40pm – 2.50pm | General Business | Sue Wilkinson |



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| | | | |
|--|--|--|-------------------|
| TITLE PLAN | | EDITION 1 | TP 314918D |
| Location of Land
Parish: OLANGOLAH
Township:
Section:
Crown Allotment: 14G
Crown Portion:
Last Plan Reference:
Derived From: VOL 7818 FOL 164
Depth Limitation: 50 FEET | | Notations:
SUBJECT TO THE RESERVATIONS EXCEPTIONS CONDITIONS AND POWERS CONTAINED IN CROWN GRANT VOL 7818 FOL 164 AND NOTED ON SHEET 2 OF THIS PLAN
ANY REFERENCE TO MAP IN THE TEXT MEANS THE DIAGRAM SHOWN ON THIS TITLE PLAN | |
| Description of Land / Easement Information
COLOUR CODE
Y = YELLOW | | THIS PLAN HAS BEEN PREPARED FOR THE LAND REGISTRY, LAND VICTORIA, FOR TITLE DIAGRAM PURPOSES AS PART OF THE LAND TITLES AUTOMATION PROJECT
COMPILED: 14-02-2000
VERIFIED: A.D. | |
| | | | |
| LENGTHS ARE IN LINKS:
Metres = 0.3048 x Feet
Metres = 0.201168 x Links | | Sheet 1 of 2 sheets | |

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| TITLE PLAN | EDITION 1 | TP 334754U | | | | | | |
|--|---|--|-----------------------------|--|---|--|------------------------|--|
| Location of Land
Parish: OLANGOLAH
Township:
Section:
Crown Allotment: 14A (PT)
Crown Portion:

Last Plan Reference:
Derived From: VOL 8135 FOL 278
Depth Limitation: NIL | | Notations

ANY REFERENCE TO MAP IN THE TEXT MEANS THE DIAGRAM SHOWN ON THIS TITLE PLAN | | | | | | |
| Description of Land / Easement Information | | THIS PLAN HAS BEEN PREPARED FOR THE LAND REGISTRY, LAND VICTORIA, FOR TITLE DIAGRAM PURPOSES AS PART OF THE LAND TITLES AUTOMATION PROJECT
COMPILED: 25/02/2000
VERIFIED: G.B. | | | | | | |
| | | | | | | | | |
| <table border="1" style="margin: auto;"> <tr> <th colspan="2">TABLE OF PARCEL IDENTIFIERS</th> </tr> <tr> <td colspan="2">WARNING: Where multiple parcels are referred to or shown on this Title Plan this does not imply separately disposable parcels under Section 8A of the Sale of Land Act 1962</td> </tr> <tr> <td colspan="2">PARCEL 1 = CA 14A (PT)</td> </tr> </table> | | | TABLE OF PARCEL IDENTIFIERS | | WARNING: Where multiple parcels are referred to or shown on this Title Plan this does not imply separately disposable parcels under Section 8A of the Sale of Land Act 1962 | | PARCEL 1 = CA 14A (PT) | |
| TABLE OF PARCEL IDENTIFIERS | | | | | | | | |
| WARNING: Where multiple parcels are referred to or shown on this Title Plan this does not imply separately disposable parcels under Section 8A of the Sale of Land Act 1962 | | | | | | | | |
| PARCEL 1 = CA 14A (PT) | | | | | | | | |
| LENGTHS ARE IN
LINKS | Metres = 0.3048 x Feet
Metres = 0.201168 x Links | Sheet 1 of 1 sheets | | | | | | |

Delivered by LANDATA® Land Victoria timestamp 28/05/2015 15:38 Page 1 of 1

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| TITLE PLAN | | EDITION 1 | | TP 812454T | |
|---|---------------------|----------------|---|-------------------------------|--|
| Location of Land
Parish: OLANGOLAH
Township: —
Crown Allotment: 14 A (PART)
Crown Portion: —
Section: —
Last Plan Reference: LP 5471
Title References: VOL 10127 FOL 711
Depth Limitation: NIL | | | Notations
NOTE 1: LOT 1= PART OF LOT 27 ON LP 5471 AND PART OF CROWN ALLOTMENT 14 A | | |
| Easement Information
E - Encumbering Easement R - Encumbering Easement (ROAD) A - Appurtenant Easement | | | | | THIS PLAN HAS BEEN PREPARED BY
LAND REGISTRY, LAND VICTORIA
FOR TITLE DIAGRAM PURPOSES |
| Easement Reference | Purpose / Authority | Width (Metres) | Origin | Land benefited / In favour of | |
| | | | | | |
| | | | | | Checked by: <i>[Signature]</i>
Assistant Registrar of Titles
Date 12/3/04 |
| MEASUREMENTS ARE IN METRES | | | | | |
| LENGTHS ARE IN METRES | SCALE | SHEET SIZE A3 | | | |
| Sheet 1 of 1 Sheet | | | | | |



AUDIT COMMITTEE MEETING

SUMMARY MINUTES

22 JUNE 2015

at 9:00 AM

COPACC Meeting Room

Next Meeting:
2 September 2015 at 8.30 am
COPACC Meeting Rooms, Colac

Colac Otway Shire
PO Box 283
Colac Victoria 3250
E: info@colacotway.vic.gov.au
www.colacotway.vic.gov.au

Customer Service Centre
Colac: 2-6 Rae Street
Apollo Bay: 69-71 Nelson Street
P: (03) 5232 9400
F: (03) 5232 9566



**COLAC-OTWAY SHIRE AUDIT MEETING
22 JUNE 2015
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AUDIT COMMITTEE MEETING

CORPORATE AND COMMUNITY SERVICES

MINUTES of the **AUDIT COMMITTEE MEETING OF THE COLAC-OTWAY SHIRE COUNCIL** held at the COPACC Meeting Room on 22 June 2015 at 9.00 am.

1. OPENING OF MEETING

2. PRESENT

Mike Said (Chair)
Ms Linda MacRae
Cr Michael Delahunty
Cr Stephen Hart

Sue Wilkinson, Chief Executive Officer
Colin Hayman, General Manager, Corporate & Community Services
Mr Ashley Roberts, Manager Finance & Customer Services
Mr David Testa, Financial Operations Coordinator
Ms Carmen Lawrence, Manager Organisational Support & Development (9 am to 10.55 am)
Mr Manny Peralta (10.00 am to 10.45 am)
Mr Martin Thompson, Cröwe Horwath
Mr Stephen O'Kane, LDAssurance

3. APOLOGIES

4. DISCLOSURE OF ANY CONFLICTS OF INTEREST

5. CONFIRMATION OF MINUTES – PREVIOUS MEETING

6. BUSINESS ARISING FROM THE PREVIOUS MEETING(S)

7. CEO'S DECLARATION OF LEGAL COMPLIANCE

AUDIT COMMITTEE MEETING

CORPORATE AND COMMUNITY SERVICES

AC152206-1 5. CONFIRMATION OF MINUTES 18 MARCH 2015

| | | | |
|-------------|--------------------------------|-----------|---------------|
| AUTHOR: | Colin Hayman | ENDORSED: | Sue Wilkinson |
| DEPARTMENT: | Corporate & Community Services | FILE REF: | F14/6177 |

The change in the date of the Audit Committee meeting from 17 June 2015 to Monday 22 June 2015 was noted.

Recommendation(s)

That the Audit Committee endorse the minutes of the Colac Otway Shire's Audit Committee meeting held on 18 March 2015.

Resolution

Moved Cr Stephen Hart seconded Ms Linda MacRae

That the Audit Committee endorse the minutes of the Colac Otway Shire's Audit Committee meeting held on 18 March 2015.

Carried

AC152206-2

7. CEO'S STATEMENT OF COMPLIANCE

| | | | |
|-------------|--------------------------------|-----------|---------------|
| AUTHOR: | Sue Wilkinson | ENDORSED: | Sue Wilkinson |
| DEPARTMENT: | Corporate & Community Services | FILE REF: | F14/6177 |

Recommendation(s)

That the Audit Committee notes the following issue from the CEO's Statement of Compliance:

- Update on Conflict of Interest***

Resolution

Moved Cr Michael Delahunty and seconded Cr Stephen Hart

That the Audit Committee notes the following issue from the CEO's Statement of Compliance:

- Update on Conflict of Interest***

Carried

AUDIT COMMITTEE MEETING

CORPORATE AND COMMUNITY SERVICES

AC152206-3

**8.1 A - FINANCIAL REPORTING - THIRD QUARTER
FINANCIAL PERFORMANCE REPORT 2014/2015**

| | | | |
|-------------|-----------------------------------|-----------|--------------|
| AUTHOR: | Ashley Roberts | ENDORSED: | Colin Hayman |
| DEPARTMENT: | Corporate &
Community Services | FILE REF: | F14/6177 |

Purpose

The purpose of this report was to provide the Audit Committee with a copy of the Third Quarter, Financial Performance Report for 2014/2015.

Recommendation(s)

That the Audit Committee receives the report on the Third Quarter Financial Performance Report for 2014/12015 for information.

Resolution

Moved Ms Linda MacRae and seconded Cr Michael Delahunty

That the Audit Committee receives the report on the Third Quarter Financial Performance Report for 2014/12015 for information.

Carried

AC152206-4

**8.1 B - FINANCIAL REPORTING - DRAFT BUDGET 2015-
2016**

| | | | |
|-------------|-----------------------------------|-----------|--------------|
| AUTHOR: | Ashley Roberts | ENDORSED: | Colin Hayman |
| DEPARTMENT: | Corporate &
Community Services | FILE REF: | F14/6177 |

Purpose

The purpose of this report was to provide the Audit Committee with details of the Budget process for 2015-2016.

Recommendation(s)

That the Audit Committee notes the report on the Draft Budget 2015-2016.

Resolution

Moved Cr Stephen Hart and seconded Ms Linda MacRae

That the Audit Committee notes the report on the Draft Budget 2015-2016.

Carried

AUDIT COMMITTEE MEETING

CORPORATE AND COMMUNITY SERVICES

AC152206-1

**8.1 C - FINANCIAL REPORTING - SHELL FINANCIAL
STATEMENTS 2014-2015**

| | | | |
|-------------|-----------------------------------|-----------|--------------|
| AUTHOR: | Ashley Roberts | ENDORSED: | Colin Hayman |
| DEPARTMENT: | Corporate &
Community Services | FILE REF: | F14/6177 |

Purpose

The purpose of this report was to provide the Audit Committee with a copy of the Shell Financial Statements for 2014-2015.

Recommendation(s)

That the Audit Committee notes the report on the Shell Financial Statements for 2014-2015.

Resolution

Moved Cr Michael Delahunty and seconded Cr Stephen Hart

That the Audit Committee notes the report on the Shell Financial Statements for 2014-2015.

Carried

AC152206-6

**8.3 A - RISK MANAGEMENT - RISK MANAGEMENT
ADHERENCE REPORT**

| | | | |
|-------------|-----------------------------------|-----------|--------------|
| AUTHOR: | Carmen Lawrence | ENDORSED: | Colin Hayman |
| DEPARTMENT: | Corporate &
Community Services | FILE REF: | F14/6177 |

Purpose

This report provided summary information on the key and pending risk activities for the organisation as at 29 May 2015.

Recommendation(s)

That the Audit Committee receives the Risk Management Adherence Report as at 29 May 2015.

Resolution

Moved Cr Michael Delahunty and seconded Cr Stephen Hart

- 1. That the Audit Committee receives the Risk Management Adherence Report as at 29 May 2015***
- 2. That The Audit Committee recommends that a report on Extreme and High Risks identified in the Strategic Risk Register and any explanatory reports be presented to Council on a 6 monthly basis.***

Carried

AUDIT COMMITTEE MEETING

CORPORATE AND COMMUNITY SERVICES

**AC152206-7 8.4 A - FRAUD PREVENTION/AWARENESS - FRAUD
CONTROL PROGRAM**

| | | | |
|-------------|-----------------------------------|-----------|--------------|
| AUTHOR: | Ashley Roberts | ENDORSED: | Colin Hayman |
| DEPARTMENT: | Corporate &
Community Services | FILE REF: | F14/6177 |

Purpose

The purpose of this report was to provide the Audit Committee with a copy of the Fraud Control Program for the period 29 January 2015 to 30 May 2015.

Recommendation(s)

That the Audit Committee receives the Fraud Control Program Report for the period 29 January 2015 to 30 May 2015.

Resolution

Moved Ms Linda MacRae and seconded Cr Michael Delahunty

That the Audit Committee receives the Fraud Control Program Report for the period 29 January 2015 to 30 May 2015.

Carried

**AC152206-8 8.5 A - BUSINESS CONTINUITY - REVIEW AND EXERCISING OF
THE CORPORATE BUSINESS CONTINUITY AND CRITICAL
INCIDENT MANAGEMENT PLANS AND TESTING OF THE IT
DISASTER RECOVERY PLANS**

| | | | |
|-------------|-----------------------------------|-----------|--------------|
| AUTHOR: | Carmen Lawrence | ENDORSED: | Colin Hayman |
| DEPARTMENT: | Corporate &
Community Services | FILE REF: | F14/6177 |

Purpose

The purpose of this report was to provide an update to the Audit Committee on the Review and Testing of the various Management Plans and Testing of the IT Disaster Recovery Plan.

Recommendation(s)

That the Audit Committee notes the report on the review and testing of the Corporation Business Continuity and Critical Incident Management Plans and testing of the IT Disaster Recovery Plan.

Resolution

Moved Ms Linda MacRae and seconded Cr Michael Delahunty

That the Audit Committee notes the report on the review and testing of the Corporation Business Continuity and Critical Incident Management Plans and testing of the IT Disaster Recovery Plan.

Carried

AUDIT COMMITTEE MEETING

CORPORATE AND COMMUNITY SERVICES

AC152206-9

8.6 A - INTERNAL AUDIT - INTERNAL AUDIT PROGRESS

| | | | |
|-------------|--------------------------------|-----------|---------------|
| AUTHOR: | Colin Hayman | ENDORSED: | Sue Wilkinson |
| DEPARTMENT: | Corporate & Community Services | FILE REF: | F14/6177 |

Purpose

The purpose of this report was to provide the Audit Committee with the Internal Audit Progress Reports for the periods 2013 to 2015.

Recommendation(s)

That the Audit Committee notes the Internal Audit Progress Reports for the periods 2012/2013 to 2014/2015.

Resolution

Moved Cr Michael Delahunty and seconded Cr Stephen Hart

That the Audit Committee notes the Internal Audit Progress Reports for the periods 2012/2013 to 2014/2015.

Carried

AUDIT COMMITTEE MEETING

CORPORATE AND COMMUNITY SERVICES

AC152206-10 8.6 B - INTERNAL AUDIT - ANNUAL AUDIT PLAN FOR
2015/2016 AND 2016/2017

| | | | |
|-------------|-----------------------------------|-----------|---------------|
| AUTHOR: | Colin Hayman | ENDORSED: | Sue Wilkinson |
| DEPARTMENT: | Corporate &
Community Services | FILE REF: | F14/6177 |

Purpose

The purpose of this report was to provide the Audit Committee with the Annual Audit Plan for the period July 2015 to June 2016 and a draft Audit Program for 2016/2017.

Recommendation(s)

That the Audit Committee endorses the Audit Projects for 2015/2016:

- *Fees and Charges*
- *Human Resources*
- *Insurance and Risk Management*
- *Purchasing Cards.*

Resolution

Moved Ms Linda MacRae and seconded Cr Michael Delahunty

That the Audit Committee :

1. Endorses the Audit Projects for 2015/2016:

- *Review of Depot Operations*
- *Human Resources*
- *Insurance and Risk Management*
- *Purchasing Cards.*

2. Notes that the Fees and Charges Audit Project is to be deferred.

3. Notes that the draft Memorandum of Audit Planning (MAP) for the Review of Depot Operations is to be circulated to Audit Committee members for comment and sign off.

Carried

AUDIT COMMITTEE MEETING

CORPORATE AND COMMUNITY SERVICES

AC152206-11

**8.7 A - EXTERNAL AUDIT - INTERIM FINANCIAL AUDIT 30
JUNE 2015**

| | | | |
|-------------|-----------------------------------|-----------|--------------|
| AUTHOR: | Ashley Roberts | ENDORSED: | Colin Hayman |
| DEPARTMENT: | Corporate &
Community Services | FILE REF: | F14/6177 |

Purpose

The purpose of this report was to provide the Audit Committee with a copy of the Interim Financial Audit undertaken by Council's External Auditors LD Assurance Chartered Accountants.

Recommendation(s)

That the Audit Committee:

- 1. Receives the Interim Management Letter from the Victorian Auditor-General's Office for the financial year ending 30 June 2015.***
- 2. Notes the individual issues and the management comments and action plan.***

Resolution

Moved Cr Stephen Hart and seconded Ms Linda MacRae

That the Audit Committee:

- 1. Receives the Interim Management Letter from the Victorian Auditor-General's Office for the financial year ending 30 June 2015.***
- 2. Notes the individual issues and the management comments and action plan.***

Carried

AUDIT COMMITTEE MEETING

CORPORATE AND COMMUNITY SERVICES

AC152206-12 8.8 A - COMPLIANCE - EXCESS ANNUAL LEAVE REPORT

| | | | |
|-------------|--------------------------------|-----------|--------------|
| AUTHOR: | Ashley Roberts | ENDORSED: | Colin Hayman |
| DEPARTMENT: | Corporate & Community Services | FILE REF: | F14/6177 |

Purpose

The purpose of this report was to highlight to the Audit Committee the level of accrued annual leave approaching or exceeding the accepted maximum of eight (8) weeks.

Recommendation(s)

That the Audit Committee receives the Annual Leave Report as at 25 May 2015 for information.

Resolution

Moved Ms Linda MacRae and seconded Cr Michael Delahunty

That the Audit Committee receives the Annual Leave Report as at 25 May 2015 for information.

Carried

AC152206-13 8.8 B - COMPLIANCE - COMPLIANCE REGISTER 2014/2015

| | | | |
|-------------|--------------------------------|-----------|---------------|
| AUTHOR: | Colin Hayman | ENDORSED: | Sue Wilkinson |
| DEPARTMENT: | Corporate & Community Services | FILE REF: | F14/6177 |

Purpose

The purpose of this report was to provide the Audit Committee with a copy of the updated Compliance Register for 2014/2015.

Recommendation(s)

That the Audit Committee notes the report on the Compliance Register as at 29 May 2015.

Resolution

Moved Cr Michael Delahunty and seconded Ms Linda MacRae

That the Audit Committee notes the report on the Compliance Register as at 29 May 2015.

Carried

AUDIT COMMITTEE MEETING

CORPORATE AND COMMUNITY SERVICES

AC152206-14

8.8 C - COMPLIANCE - INDEPENDENT BROAD BASED ANTI-CORRUPTION COMMISSION - LOCAL GOVERNMENT: REVIEW OF COUNCIL WORKS DEPOTS

| | | | |
|-------------|--------------------------------|-----------|---------------|
| AUTHOR: | Colin Hayman | ENDORSED: | Sue Wilkinson |
| DEPARTMENT: | Corporate & Community Services | FILE REF: | F14/6177 |

Purpose

The purpose of this report was to provide the Audit Committee with information on a report on "Local Government: Review of Council Works Depots" undertaken by the Independent Broad-Based Anti-Corruption Commission (IBAC).

The following six councils were chosen to participate in the project:

- Benalla Rural City
- Central Goldfields Shire
- Corangamite Shire
- Glenelg Shire
- Greater Dandenong City
- Whitehorse City

Recommendation(s)

That the Audit Committee notes the Independent Broad-Based Anti-Corruption Commission report on Local Government: Review of Council Works Depots.

Resolution

Moved Ms Linda MacRae and seconded Cr Michael Delahunty

That the Audit Committee notes the Independent Broad-Based Anti-Corruption Commission report on Local Government: Review of Council Works Depots.

Carried

AUDIT COMMITTEE MEETING

CORPORATE AND COMMUNITY SERVICES

**AC152206-15 8.9 A - REPORTING RESPONSIBILITIES - VICTORIAN AUDITOR
GENERAL - LOCAL GOVERNMENT RESULTS OF THE 2013-14
AUDITS**

| | | | |
|-------------|-----------------------------------|-----------|---------------|
| AUTHOR: | Colin Hayman | ENDORSED: | Sue Wilkinson |
| DEPARTMENT: | Corporate &
Community Services | FILE REF: | F14/6177 |

Purpose

The purpose of the report was for the Audit Committee to consider the Victorian Auditor-General's report "Local Government: Results of the 2013/2014 Audits".

Recommendation(s)

That the Audit Committee receives the report 'Victorian Auditor General – Local Government: Results of the 2013/2014 Audits' and notes that Council has maintained a low risk financial sustainability over the past six years.

Resolution

Moved Cr Stephen Hart and seconded Ms Linda MacRae

That the Audit Committee receives the report 'Victorian Auditor General – Local Government: Results of the 2013/2014 Audits' and notes that Council has maintained a low risk financial sustainability over the past six years.

Carried

**AC152206-16 8.9 B - REPORTING RESPONSIBILITIES - OPERATIONAL
PLAN THIRD QUARTER**

| | | | |
|-------------|-----------------------------------|-----------|--------------|
| AUTHOR: | Carmen Lawrence | ENDORSED: | Colin Hayman |
| DEPARTMENT: | Corporate &
Community Services | FILE REF: | F14/6177 |

Purpose

The purpose of this report was to provide the Audit Committee with a copy of the Operational Plan Third Quarter Performance Report for the period to March 2015.

Recommendation(s)

That the Audit Committee receives the report on the Operational Plan Performance Report to March 2015.

Resolution

Moved Ms Linda MacRae and seconded Cr Stephen Hart

That the Audit Committee receives the report on the Operational Plan Performance Report to March 2015

Carried

AUDIT COMMITTEE MEETING

CORPORATE AND COMMUNITY SERVICES

AC152206-17

**8.9 C - REPORTING RESPONSIBILITIES - COUNCIL PLAN
(INCLUDING STRATEGIC RESOURCE PLAN)**

| | | | |
|-------------|--------------------------------|-----------|--------------|
| AUTHOR: | Carmen Lawrence | ENDORSED: | Colin Hayman |
| DEPARTMENT: | Corporate & Community Services | FILE REF: | F14/6177 |

Purpose

The purpose of this report was to provide the Audit Committee with details of the revised Council Plan 2013/2017 including the Strategic Resource Plan (SRP) 2015/16 to 2018/19.

Recommendation(s)

That the Audit Committee notes the report on the Council Plan (incl. Strategic Resource Plan).

Resolution

Moved Ms Linda MacRae and seconded Cr Michael Delahunty

That the Audit Committee notes the report on the Council Plan (incl. Strategic Resource Plan).

Carried

AC152206-18

8.10 A - OTHER - AUDIT COMMITTEE PLAN

| | | | |
|-------------|--------------------------------|-----------|---------------|
| AUTHOR: | Colin Hayman | ENDORSED: | Sue Wilkinson |
| DEPARTMENT: | Corporate & Community Services | FILE REF: | F14/6177 |

Purpose

The purpose of this report was for the Audit Committee to note the Audit Committee Plan for 2014/2015.

Recommendation(s)

That the Audit Committee notes the updated Audit Committee Plan for 2014/2015.

Resolution

Moved Cr Stephen Hart and seconded Ms Linda MacRae

That the Audit Committee notes the updated Audit Committee Plan for 2014/2015.

Carried

AUDIT COMMITTEE MEETING

CORPORATE AND COMMUNITY SERVICES

**AC152206-19 8.10 B - OTHER - BLUEWATER FITNESS CENTRE
REDEVELOPMENT**

| | | | |
|-------------|-----------------------------------|-----------|---------------|
| AUTHOR: | Colin Hayman | ENDORSED: | Sue Wilkinson |
| DEPARTMENT: | Corporate &
Community Services | FILE REF: | F14/6177 |

Purpose

The purpose of this report was to provide the Audit Committee with a report on progress of the Bluewater Fitness Centre (BWFC) Redevelopment Project.

Recommendation(s)

That the Audit Committee notes the progress of the Bluewater Fitness Centre Redevelopment Project.

Resolution

Moved Cr Stephen Hart and seconded Ms Linda MacRae

That the Audit Committee notes the progress of the Bluewater Fitness Centre Redevelopment Project.

Carried

**AC152206-20 8.10 C - OTHER - LOCAL GOVERNMENT PERFORMANCE
REPORTING FRAMEWORK UPDATE**

| | | | |
|-------------|-----------------------------------|-----------|--------------|
| AUTHOR: | Carmen Lawrence | ENDORSED: | Colin Hayman |
| DEPARTMENT: | Corporate &
Community Services | FILE REF: | F14/6177 |

Purpose

The purpose of this report was to provide the Audit Committee with an update on the organisation's readiness to commence the annual collection and reporting of the Local Government Performance Reporting Framework (LGPRF) data.

Recommendation(s)

That the Audit Committee notes the report on the Local Government Performance Reporting Framework.

Resolution

Moved Cr Stephen Hart and seconded Ms Linda MacRae

That the Audit Committee

- 1- Notes the report on the Local Government Performance Reporting Framework.***
- 2- Recommends to Council that the VAGO Agent tests the quality of systems in place for the non-financial auditable indicators.***
- 3- Notes with concern the ongoing impact on staff time involved in the Performance Reporting Framework and the sub optimal development of the Framework.***

Carried

AUDIT COMMITTEE MEETING

CORPORATE AND COMMUNITY SERVICES

AC152206-21

8.10 D - OTHER - RATE CAPPING

| | | | |
|-------------|--------------------------------|-----------|---------------|
| AUTHOR: | Colin Hayman | ENDORSED: | Sue Wilkinson |
| DEPARTMENT: | Corporate & Community Services | FILE REF: | F14/6177 |

Purpose

The purpose of this report was to provide details of an interim submission on Rate Capping that has been forwarded to the Essential Services Commissioner (ESC).

Recommendation(s)

That the Audit Committee notes the report on Rate Capping.

Resolution

Moved Cr Michael Delahunty and seconded Cr Stephen Hart

That the Audit Committee:

- 1- Notes the report on Rate Capping.*
- 2- Notes that the submission has not been formally adopted by Council.*
- 3- Notes that the submission is publically available.*

Carried

AC152206-22

8.10 E - OTHER - COPACC UPDATE REPORT

| | | | |
|-------------|--------------------------------|-----------|---------------|
| AUTHOR: | Colin Hayman | ENDORSED: | Sue Wilkinson |
| DEPARTMENT: | Corporate & Community Services | FILE REF: | F14/6177 |

Purpose

The purpose of this report was to provide an update on Colac Otways Performing Arts and Cultural Centre (COPACC).

Recommendation(s)

That the Audit Committee notes the report on the COPACC Update.

Resolution

Moved Ms Linda MacRae and seconded Cr Michael Delahunty

That the Audit Committee notes the report on the COPACC Update.

Carried

MEETING WITH INTERNAL AUDITOR

As per clause 6.6.6 of the Audit Committee Charter:

"Provide an opportunity for the audit committee to meet with the internal auditor to discuss any matters that the audit committee or internal auditor believes should be discussed privately."

Noted to include an in camera meeting of the Audit Committee and the Internal Auditor on an annual basis in the Audit Committee Plan.

The members of the Audit Committee met with Martin Thomson of Crowe Horwath between 11.40 am and 11.55 am.

The Meeting Was Declared Closed at 11.55 am

MINUTES TO BE CONFIRMED at the meeting to be held on 2 SEPTEMBER 2015 AT 8.30 AM