AGENDA APPENDIX

Council Meeting

Wednesday 23 September 2015

AGENDA ITEM FOR SEPARATE DISTRIBUTION TO COUNCILLORS AND EXECUTIVE LEADERSHIP TEAM DUE TO DOCUMENT SIZE.

THE ITEM IS ACCESSIBLE VIA THE COUNCIL WEBSITE OR BY CONTACTING COUNCIL ON 03 5662 9200.

E.2 DRAFT DOMESTIC WASTEWATER MANAGEMENT PLAN – 2016-2020

Appendix 1 – Municipal Domestic Wastewater Management Plan 2016-2020

South Gippsland
Shire Council

Municipal Domestic Wastewater Management Plan 2016-2020

Version: 2.2

CONTENTS

1 CONTEXT

Local government has a longstanding role in public health protection, and promotion. Much of the early public health effort was spent developing basic infrastructure such as drains, roads and waste management. Although determinants of health over the last century have changed, control of human waste and waste management continues to be a critical human health and environmental issue. [1]

South Gippsland properties have been serviced by a variety of wastewater management systems since early settlement in the 19th century. The legislative framework regulating septic tank systems has also changed since that time.

Permits to install septic tank systems were initially approved under the Health Act 1958 and later transferred to the new Environment Protection Act 1970 in the 1980's. These introduced improved standards to new systems, without retrospectively applying these standards to existing systems.

Upgrading existing septic tank systems usually occurs when owners choose to reinstall or alter the system, for example, when adding extra bedrooms to homes. Large upgrade programs have not occurred since the 1950, 60 and 70s as a replacement for old pan toilets (collection in buckets that were picked up by Council contractors). Many of the septic tank systems installed at this time still remain in use.

Best practice standards and anecdotal evidence (including site audits conducted by SGW in some towns) suggests that most existing systems installed prior to 1980 are approaching the end of their useful life and are not likely to be adequately designed (sized) for increased water flow rates generated under full occupancy. In addition, a number of townships are provided with a reticulated surface or ground water supply that is likely to result in increased pressure on systems from higher water consumption. This presents a risk to public health and the environment through:

- the potential for contamination of the catchment areas from which we draw our drinking water supplies;
- the contamination and pollution of recreational waters; and
- the short and long-term degradation of the natural environment.

Council is responsible for the regulation of domestic wastewater within its municipal boundary and for maintaining the municipal district in a clean and sanitary state. Sustaining this effort requires integrated planning, appropriate resources and renewed capacity building within Council and its local communities.

Over 8000 onsite wastewater management systems (commonly known as septic tank systems) are in use within South Gippsland Shire (250,000 systems are estimated to be in use across Victoria). The core properties of 12 South Gippsland townships[2] are serviced by sewer, the remaining areas beyond these properties, including 15 townships rely on onsite wastewater management by septic tank systems.

The numbers of septic tank systems continue to increase through infill development of existing allotments and new subdivisions that are not provided with sewer.

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[1] MAV, DWM – Planning Guide, 2003 – Amended

[2] Townships include; *Sewered:* Foster, Korumburra, Leongatha, Meeniyan, Mirboo North, Nyora, Loch, Poowong (under construction), Port Welshpool, Toora, Welshpool, Waratah Bay *Septic Tanks:* Agnes, Bena, Buffalo, Dumbalk, Fish Creek, Jumbunna, Kongwak, Koonwarra, Port Franklin, Sandy Point, Stony Creek, Tarwin Lower, Venus Bay, Walkerville, Yanakie,

Management of wastewater provides significant opportunity to reuse water and extend the length and value of the water life cycle. This is achieved through utilising the following principles of waste hierarchy:

- avoid generating wastewater;
- reduce wastewater volume (by minimising water use);
- reuse untreated greywater (for temporary purposes in dry weather); and
- recycle treated wastewater.[3]

Improvement of wastewater management within the Shire will rely upon:

1. Solution driven and collaborative partnerships with affected communities;
2. Clear policy to facilitate decisions;
3. Commitment to advocate and facilitate improved outcomes by Council, water corporations (authorities) and EPA Victoria;
4. Inclusion in Council's Plan, budgetary processes and linkages to other key policies such as the Municipal Public Health Plan and Storm Water Management Plan; and
5. Availability of State funding and legislative change to facilitate and implement improved wastewater management in the long term.

1.1 Aim

The Municipal Domestic Wastewater Management Plan (MDWMP) seeks to:

- identify risks to our health and environment and ways to improve onsite wastewater management.
- inform local water authorities and the EPA of towns that may require installation of a reticulated sewerage system.
- link to planning, storm water management and water supply (water authority) policies.

Consultation found:

- Further unsewered development should be discouraged in coastal towns.
- Funding support for improvements is required.
- More contact with the community regarding septic tank maintenance is required.

[3] EPA Victoria, Code of Practice Onsite Wastewater Management Publication 891.3 February 2013, **http://www.epa.vic.gov.au/~/media/Publications/891%203.pdf**, Accessed on 05/03/2015

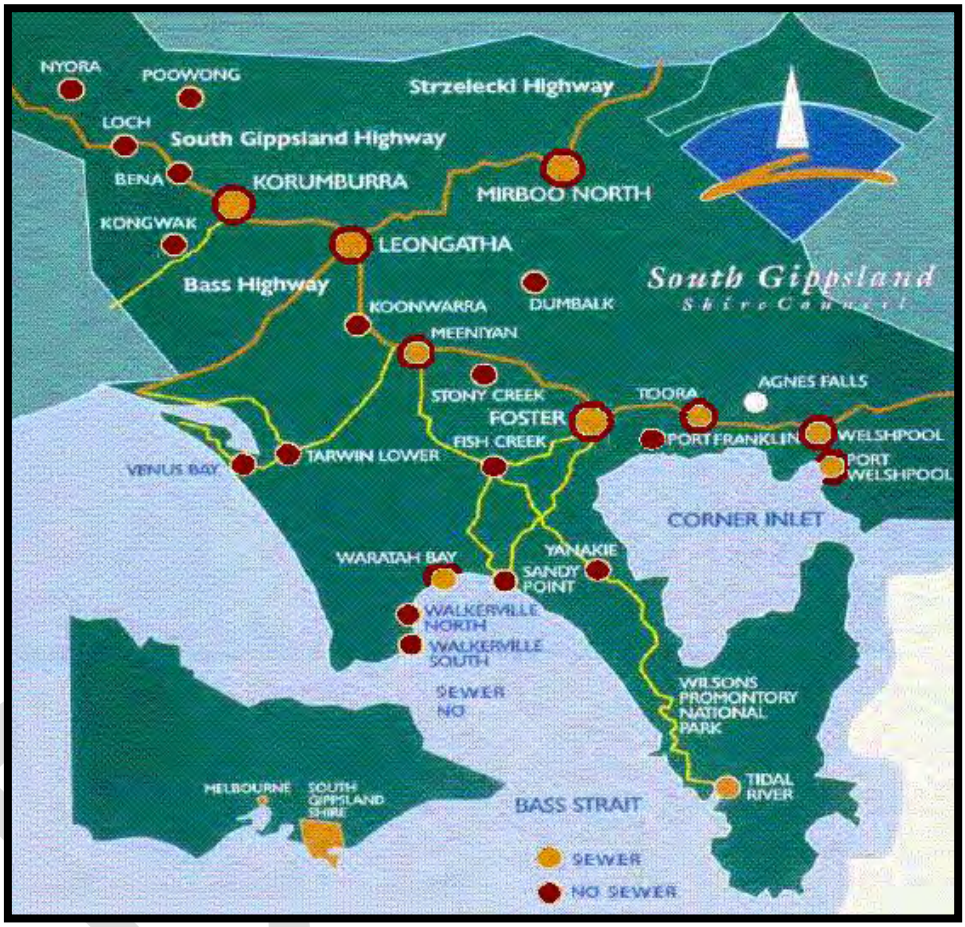
1.2 Scope

This plan applies to all areas of South Gippsland Shire not provided with reticulated (piped) sewerage services, with a particular focus on townships.

It applies to all domestic and commercial onsite wastewater management systems installed or proposed that have a maximum daily flow rate of less than 5,000 L/d. Systems exceeding this limit are regulated by EPA Victoria and are beyond the scope of this document.

The planning horizon for this document is **five years** to guide Council and local authorities in the development of long term solutions for townships and other waste water risk affected areas.

Figure 1 - South Gippsland Shire Council township location and wastewater status



Consultation found:

- Plan should be 5 years to be consistent with proposed changes to management of wastewater in Water Supply Areas.

1.3 Related Legislation and policy

A variety of legislation relates to wastewater management in Victoria. Onsite wastewater management systems (septic tank systems) are governed or impacted by the following Acts, in order of decreasing importance:

- Environment Protection Act 1970, Part 9B – Septic Tank Systems, Sections 53 (including associated sections, policies and Codes of Practice)
- Public Health & Wellbeing Act 2008
- Building Act 1993 and Building Regulations 2006
- Planning and Environment Act 1987
- Local Government Act 1989
- Water Act 1989
- Catchment and Land Protection Act 1994

Domestic wastewater management has a pervasive impact upon community asset and health management, demonstrated through its strong links to Council, Regional and State policies. It must be considered in the management of assets (e.g. buildings in un-sewered areas, storm water drains and roads), flood management and the planning of sustainable and healthy township development.

Auditor General Victoria

In June 2006, the Auditor General Victoria delivered a performance audit report, *Protecting our environment and community from failing septic tanks*[4]. The report identified a number of actions relevant to Local Government authorities to improve wastewater management performance in regional areas. These included:

- Use all available data sets to plan and make decisions
- Ensure owners and/or tenants understand that they have a septic system and the responsibilities they have that are associated with that
- Reassess the resourcing levels needed to fulfil the legislative responsibility of LG

It also commented on the methodology for determining risk level. While authorities have used bacterial counts to determine risk in the past, for example E.coli counts in stormwater drains, the Auditor General Victoria stated, “We consider obtaining specific data on bacteria and nutrient levels to confirm local government’s visual assessments is unnecessary. If further evidence is required to highlight the issue to the community or decision making authorities, less expensive techniques could be used.”[5]

[4] Auditor General Victoria, *Protecting our environment and community from failing septic tanks,* Victorian Government Printer, June 2006.

[5] Ibid, p 45

Council Plan

Council's purpose is to provide leadership for the good governance of the Shire and its local communities. Council undertakes its responsibilities in accordance with the Local Government Act 1989 and other Acts for the peace, order and good government of the Shire.

The Council Plan is a key strategic document that outlines Councils priorities and approach to achieving its key outcomes over the 4 year term of the Council.

This Domestic Wastewater Management Plan works toward a number of Council's key objectives as outlined in the Council Plan 2013-17. The key objectives addressed include:

Objective 1.3: Improve the sustainability of the local and regional environment

- *Strategy 1.3.1: We will actively engage businesses, farmers, industries and individuals in creating a clean, green Shire, where environmental sustainability is embraced and practiced.*
- *Strategy 1.3.2: We will promote sustainable waste management practices, energy efficiency and management of our natural resources.*

Objective 3.1: Deliver affordable, modern community services and facilities through an integrated approach to planning and infrastructure development.

- *Strategy 3.1.4: We will plan for the service needs of the Shire's changing demographic.*
- *Strategy 3.1.5: We will encourage sustainable development that promotes the health, well-being and unique character of the community.*
- *Strategy 3.1.6: We will refine the provision of Council services through reviews focused on evolving community needs, realistic and affordable service standards and efficient management of resources.*

SGSC Planning Scheme

Many wastewater management problems can be prevented through adequate development planning & control.

The *Planning and Environment Act 1987* requires controls on the use and development of land in a planning scheme to address the objectives and strategies contained within the Municipal Strategic Statement (MSS) for the municipality. The MSS informs (through Local Planning Policies) the long-term directions about land use and development in the municipality and provides the rationale for specific provisions in the planning scheme.

The State Planning Policy Framework (SPPF) contains strategic issues of State importance which must be considered when decisions are made. It identifies required planning for the provision of water supply, sewerage and drainage services that efficiently and effectively meet State and community needs and protects the environment (Clause 19.03-2 20/09/2010 VC71). The SPPF strategies include:

- Ensure water quality in water supply catchments is protected from possible contamination by urban, industrial and agricultural land uses.
- Provide for sewerage at the time of urban subdivision, or ensure lots created by the subdivision are capable of adequately treating and retaining all domestic wastewater within the boundaries of each lot.
- Plan urban storm water drainage systems to:
    - Coordinate with adjacent municipalities and take into account the catchment context.

- Include measures to reduce peak flows and assist screening, filtering and treatment of storm water, to enhance flood protection and minimise impacts on water quality in receiving waters.
- Prevent, where practicable, the intrusion of litter.

- Encourage the re-use of wastewater including urban run-off, treated sewage effluent and run-off from irrigated farmland where appropriate.

The following policies are to be considered where relevant:

- State Environment Protection Policy (Waters of Victoria).
- Victoria's Litter Reduction Strategy (Environmental Protection Authority, 1995).
- Any relevant Environment Protection Authority guidelines.
- Litter Prevention and Control Strategy for the Greater Melbourne Area (Waste Management Council, 1995).
- Urban Stormwater Best Practice Environmental Management Guidelines (Victorian Stormwater Committee, 1999 as amended).
- Guidelines for Environmental Management: Code of Practice – Onsite Wastewater Management (Publication 891.2, Environment Protection Authority, 2008.
- Guidelines for planning permit applications in open, potable water supply catchment areas (Department of Planning and Community Development, 20012).

Council undertakes an ongoing program to develop Township Structure Plans and Design Frameworks in consultation with communities. Structure Plans have been prepared for Foster, Korumburra, Leongatha, Loch, Meeniyan, Mirboo North, Nyora and Poowong. Urban Design Frameworks have been prepared for Tarwin Lower, Venus Bay, Sandy Point and Waratah Bay. Wider strategic plans include the South Gippsland Rural Land Use Strategy (2011) and the Housing and Settlement Strategy (2013).

These policies all acknowledge the potential issues associated with the lack of reticulated sewerage within townships and indicate that future growth or increases in density should be discouraged until reticulated sewerage is made available or adequate onsite wastewater management options are available and proven to be sustainable. Further details are outlined in the *Township Management Plans*, see section 4.

Local Environmental Priority Statement

In 2009, Council committed to the Victorian Local Sustainability Accord with the DSE (now DELWP) to improve collaboration between the State and Council in improving sustainability outcomes in the municipality. Council's Local Environment Priority Statement[6] identifies wastewater management as a priority area for collaboration and improvement.

Regional and State Strategies

Domestic wastewater management also has implications for areas with regional, state and in some cases of national and international significance. Some of these significant areas include Westernport Bay, Corner Inlet, Anderson Inlet and the Strzelecki Ranges.

A number of regional authorities identify wastewater management as an important area for consideration. These include; Melbourne Water, South Gippsland Water, Gippsland Water, West Gippsland Catchment Management Authority and Southern Rural Water. The main relevant documents are:

[6] South Gippsland Shire Council: *Local Environment Priority Statement, 2009.*

- South Gippsland Water, *Water Plan 3, 2013-2018.*
- Gippsland Water, *Water Plan 3*, *2013-2018.*
- West Gippsland Catchment Management Authority, *West Gippsland Regional Catchment Strategy* 2013-2019, 2012.[7]
- West Gippsland Catchment Management Authority, **West Gippsland Waterway Strategy 2014-2022**[8]

Consultation found:

- Links with Strategic Planning policies need to be robust and engaged.
- Partnerships with local water authorities require clarification and strengthening.

[7]West Gippsland Catchment Management Authority, West Gippsland Regional Catchment Strategy 2013-2019 – Parts 1 & 3, **http://www.wgcma.vic.gov.au/wp-content/uploads/2015/01/RCSpart1.pdf** & **http://www.wgcma.vic.gov.au/wp-content/uploads/2015/01/RCSpart3.pdf** Accessed on 5/3/2015

[8] West Gippsland Catchment Management Authority, *West Gippsland Waterway Strategy 2014-2022*, **http://www.wgcma.vic.gov.au/our-region/waterways/waterway-strategy**, Accessed: on 5/3/2015

1.4 Plan Development and Distribution

This plan has been developed to meet the requirements of the State Environment Protection Policy (Waters of Victoria) and to provide the community and Council with direction to improve wastewater management within the municipality.

In early 2012 Steering and Reference Committees were formed to conduct a review of the 2007-2011 DWMP.

The Steering Committee's responsibilities were as follows:

- To develop, implement, monitor and review the Domestic Wastewater Management Plan for South Gippsland Shire Council;
- To identify relevant staff or organisations and their roles in implementation of the MDWMP;
- To consider information collected from the community through consultation activities;
- To provide all relevant staff with regular updates on domestic wastewater management;
- To review and amend the MDWMP as required; and
- To periodically participate in regional and state-wide discussions and events on domestic wastewater.

Council engaged a Strategic Wastewater Management Officer to review the actions of the previous MDWMP and liaise with key stakeholders to develop this draft document for community consultation.

A review of the MDWMP 2007-2011 found that while progress had been made in the availability of system installation data and completion of some land capability assessments, most actions identified remained incomplete. This has been attributed to designated resources being not available to complete projects and a lack of clarity in what outcomes were desired.

In renewing the plan, emphasis has been placed upon improving accuracy of data, clarity through simplifying language and structure, enhancing township information (*Township Management Plans*) and maximising consultation with the community and other stakeholders.

A Consultation Plan was developed (refer to *Appendix B*) to direct stakeholder engagement and consultation activities which has included:

- Establishment of a Project Reference Committee
- Regional Stakeholder Meetings
- Community Stakeholder Group Meetings
- Information distributed to absentee owners through Council rates mail out.

Stakeholder meetings were held with key community groups and local authorities between June - August 2012 in collaboration with South Gippsland Water. The meetings asked the groups to provide information on their local values and the wastewater related threats they observed within their local area. Council provided the groups with information on identified risks to public and environmental health, good management practices for septic tanks and discussion of improvement options, including sewer.

The exhibition of the Draft MDWMP included more than 30 days of public exhibition, referral to key stakeholder groups/organisations, facilitated public meetings, media releases and a consultation survey.

Information collected during the stakeholder and public exhibition consultation periods assisted in the development of this document. While not representative of all septic tank owners it provides some insight into the challenges and opportunities that need to be addressed in the delivery of Council's services. The MDWMP development and consultation has provided ongoing opportunities to communicate with community members not previously accessible.

Detail of the information collected during community consultation is included throughout the document within the relevant sections and as part of the *MDWMP Strategies and Implementation Plan* – section 3.3 and 3.4

Information gathered during exhibition and consultation has been reviewed by the Steering and Reference Committee.

The progress of the DWMP was delayed in 2012 while Council and South Gippsland Water addressed the implications of the newly published Ministerial Guidelines: *Planning Permit Applications in Open, Potable Water Supply Catchments (DSE 2012)* and how they related to the Tarwin River Potable Water Supply Catchment. Following the completion of the 2014 ECOS Report: *Tarwin Water Supply Catchment Water Quality Management Plan* and in principle agreements with South Gippsland Water, Council is now in a position to proceed with the adoption of this plan.

Consultation findings

- Ability to effectively connect and communicate with community members, including through community groups, varies greatly between townships.
- Community noticeboards are underutilised and are effective ways to communicate.
- Direct mail outs are useful to communicate with absentee owners, preferably combined with Rates communications, where possible.

2 WHERE WE ARE NOW

Wastewater may be treated and disposed of by either **onsite** or **offsite** systems. These systems provide different levels of wastewater treatment and management.

The main offsite system in use within the municipality is reticulated (piped) lagoon sewerage treatment system (mechanical treatment plants at Korumburra & Leongatha); these are managed by water authorities.

The type of onsite (septic tank) wastewater management system approved for a particular area or township is dependent upon the local conditions. Each township within South Gippsland Shire is uniquely placed within the environment. This means that each will have different conditions (soil types, weather, local vegetation, water sources) that will positively or negatively affect the ability to maintain adequate onsite wastewater management.

Most townships were created many years ago without a coordinated long-term township plan. Properties were subdivided to create small lot sizes that were not required to treat and retain all wastewater within the property boundaries. Subsequent legislative amendments require all new developments to adequately treat waste water onsite.

Existing township structures (allotment pattern), increasing population, changing water use patterns and the existence of ageing septic tank system have created adverse conditions and amenity within some townships and areas.

Challenges

- Increasing numbers of vulnerable population groups, being the aged and the young.
- Adaption of policies and programs to changing demographics.
- High proportion of "absentee" ownership, making engagement, education and resolution more difficult.

Opportunities

- Decreases in household sizes generally decrease the risks posed by existing septic tank systems, providing it results in a wastewater flow decrease.
- Collaborate with agencies connected with vulnerable groups to improve knowledge of good practices in relation to disease transmission and waste water management.
- Improve information and support for tourists and tenants to better manage septic tank

2.1 Demographics

The size and characteristics of households and townships affect the availability for land and resources to manage wastewater adequately. Properties within the municipality vary in shape, size and use. Townships also vary in shape and size, many being created along ridges or in valleys, close to water supplies and agricultural land.

Good wastewater management relies upon suitable conditions to exist for safe disposal of wastewater to the environment. The variety of conditions found in townships and on individual properties has created a complex set of conditions to be considered when planning for improved wastewater management.

2.1.1 Population

Population has a direct impact on the density of onsite wastewater management systems within a township and on the economic viability of offsite wastewater management options, such as reticulated sewer. In the past this has meant that townships under 300 were not considered viable for sewerage systems.

It is also important to note that the age groups are relevant to wastewater as young children and ageing persons are more susceptible to illness from wastewater contamination. A total of 13,050 persons within South Gippsland will be of a vulnerable age (under four and over 60 years) by 2031, an increase of 43% on 2011 numbers.[9] While it is important to protect local vulnerable groups, the wider vulnerable population within Gippsland and Victoria is also expected to rise, having implications for the health of visitors to our municipality.

Population growth places greater demands for improvements to infrastructure, services, and for increased development and density. All of these have implications for wastewater management. *Table 1* illustrates population growth is expected to occur in coastal townships and closer to Melbourne.

Table 1 – Population projections

(State Government of Victoria, Victoria in Future, 2012 & 2015)

Locations	Projected populations					
	2011	2016	2021	2026	2031	2011-31 % increase
South Gippsland (ViF 2015)	27,515	-	29,677	-	32,764	19.1
West (ViF 2012) (including Loch, Poowong, Nyora, Bena & Kongwak)	8,701	8,963	9,337	9,767	10,198	17.2
Central (ViF 2012) (including Meeniyan, Koonwarra, Dumbalk, Tarwin Lower, Venus Bay, Walkerville & Walkerville South)	13,853	14,135	14,707	15,291	15,857	14.5
East (ViF 2012) (including Sandy Point, Fish Creek, Port Franklin, Agnes & Yanakie)	5,898	6,018	6,143	6,294	6,454	9.4

The municipality is subject to significant seasonal population change, mainly in coastal townships. While the annual amount of wastewater generated in coastal (holiday) properties is likely to be lower than for permanent occupancy, coastal wastewater management systems are more likely to receive higher flows over shorter periods of time. This can significantly reduce the effectiveness of the onsite wastewater management (septic tank) system to treat and dispose of wastewater safely.

These areas are also often adjacent to shallow ground water fields and utilise groundwater from bores for household activities. Contamination of these bores may place visitors at risk, as, while it is discouraged by Council officers, it is likely that bore water continues to be used for close contact domestic purposes, such as showering and refilling water tanks in times of low rainfall.

[9] Victorian Government, *Victoria in Future, **http://www.dt pli.vic.gov.au** 2015*

2.1.2 Household size & Types

Everyone creates wastewater in their everyday activities. The amount of wastewater created can often vary between people and between days.

Dramatic increases to wastewater flow rates, for example many washing loads completed within a short time frame or two or more persons showering consecutively, can severely reduce the effectiveness of an onsite wastewater management system.

In South Gippsland (Local Government Areas):

- 70.9% are family households, 27.0% are single person households and 2.2% are group households.
- within occupied private dwellings, the average number of bedrooms was 3.1. The average household size is 2.4 people[10].

Family and share households are more likely to create large "shock" loads to systems, causing existing systems to fail more severely and regularly. For example a family of four can potentially create 360L of waste water within an hour from morning showering alone (based on 9L/min showerhead).

Single occupant households are more likely to be able to manage their wastewater with existing systems due to the lower flow rates generated.

2.1.3 Ownership & Occupation

Ownership and occupation impact upon the likelihood of investment in improvement to properties more generally and specifically to septic tank systems.

In South Gippsland (Local Government Area):[11]

- 71.3% of private dwellings were occupied and 28.7% were unoccupied. More properties are unoccupied in coastal townships, with 87% & 89% unoccupied in Venus Bay and Sandy Point respectively.
- Of the occupied private dwellings, 43.9% were owned outright, 33.8% were owned with a mortgage and 18.5% were rented.

While the consequences of failed septic tank systems are generally observed by property occupants in the first instance, for example back flow of waste into house or discharge of effluent in garden, they are often not in a position to improve their systems, particularly if renting.

Ownership does not necessarily correlate to ability to pay for improvements either. Household budgets often have less disposable income when payment of a mortgage is required and capital improvement to investment rental properties is uncommon.

Consultation findings

- Many properties are not fully occupied, and are holiday houses, particularly in the coastal townships.
- Alternative communication options need exploring for rental occupiers and holiday makers, e.g. through real estate agents (See Implementation Plan)
- Most interest in wastewater management planning shown by community members 45 years old +.

[10] ABS, Census, South Gippsland Local Government Area - Quick Stats **http://www.censusdata.abs.gov.au/census_services/getproduct/census/2011/quickstat/LGA26170?opendocument&navpos=220** , 2011.

[11] Ibid

2.2 Settlement Planning

Settlement development is an important component of strategic township planning. Council adopted it's Housing & Settlement Strategy in 2013[12] and is now incorporated into the Planning Scheme (SGSC Planning Scheme Amendment C80, 5 June 2014). Council's Housing & Settlement Strategy identifies townships that are provided with sewerage services as areas to support boundary expansion through development. All developments in these areas will usually be required to provide connection to the existing sewerage system in consultation with the local water authority.

In townships **not** provided with sewerage, any growth through subdivision and rezoning is to be discouraged until sewerage is provided.

The HSS maintains that "in the smaller settlements that do not have access to reticulated sewer, development will be encouraged only within the settlement boundary" (HSS, 2013). This position is supported by this policy with the proviso that all developments must meet strict waste water management design and performance standards (refer to *Section 2.10 – System Performance*, p 23). The strategy provides for planning controls that ensure "an adequate supply of Low Density Residential Zone land on the periphery of larger settlements where this is consistent with structure planning and access to reticulated sewer is available." (HSS, 2013) It also provides for the consolidation of small farming zoned lots within old crown township areas, for example Jumbunna & Port Franklin, "in order to avoid negative impacts associated with full development" (HSS, 2013).

Development of townships has occurred over a long period of time during which wastewater management best practices have changed. The requirement to dispose of all waste water within the property boundary has meant that minimum lot sizes have had to increase. **Existing township allotments** are generally **key areas** requiring wastewater management improvements.

2.2.1 Allotment Characteristics

The size of an allotment does not by itself determine its ability to effectively treat and contain wastewater onsite. Soil types and other climatic factors mean that each township (and sometimes different parts of one town) may have a varied ability to treat and contain wastewater within the allotment's boundaries.

Within South Gippsland, townships typically have a high proportion of allotments under 1000 square metres. Some as small as 400 square metres exist. These allotments are least likely to be capable of containing wastewater onsite, increasing the wastewater system density, creating wastewater and contaminated stormwater problems.

Some allotments between 1000 and 2000 square metres are also often of interest as these lots may not be able to contain wastewater onsite without installation of more technologically complex systems or development restrictions.

Table 2 provides numbers of allotments grouped by size range in each township. It provides the best available estimate of the effluent area required for a 3 bedroom house with secondary treated effluent.[13]

The total number of allotments may indicate a township's ability to finance the capital costs of improved wastewater management options, such as sewer. Generally, it is assumed that the greater the number of allotments within a township, the greater the ability to share costs.

[12] South Gippsland Shire Council, *Housing and Settlement Strategy* September 2013, **http://www.southgippsland.vic.gov.au/files/Strategic_Planning/HSS_Low_Res.pdf** , Accessed 05/03/2015

[13] This is an estimate only and is not in any way legally binding. Individual site assessments are required to determine appropriate effluent area requirements.

Table 2 – Townships with restrictive lot sizes:

Allotment areas and estimated effluent dispersal area required for sustainable management within residential and commercial zones (excludes properties owned by the State and Council).

Township	< 500 m^2	500 > 1000 m^2	1000 > 2000 m^2	2000 ≥ 4000 m^2	4000 > 10000 m^2	>10000 m^2	TOTAL[a]	Estimated required effluent area (m^2)[b]	Number of concern[c]
Agnes	1	1	3	6	6	25	42	800	**2**
Bena	0	10	11	6	11	86	124	400	**3**
Buffalo	0	1	9	3	18	109	140	500	**0**
Dumbalk	0	50	33	14	16	86	199	250	**0**
Fish Creek	5	55	41	17	74	274	466	700	**50**
Jumbunna	0	6	4	5	7	37	59	450	**0**
Kongwak	0	9	11	6	8	50	84	800	**9**
Koonwarra	0	1	14	10	38	115	178	600	**0**
Loch	2	64	40	14	26	116	262	500	**15**
Nyora	1	43	59	28	135	307	573	900	**49**
Poowong	3	53	61	19	57	124	317	800	**56**
Port Franklin	1	15	46	27	2	9	100	500	**1**
Sandy Point	22	624	82	10	19	22	779	800[d]	**646**
Stony Creek	0	1	19	12	23	83	138	750	**1**
Tarwin Lower	7	52	32	28	59	128	306	400	**45**
Venus Bay	23	1785	417	44	36	42	2347	800[d]	**1807**
Walkerville	1	224	48	12	5	17	307	550	**207**
Walkerville South	2	22	14	3	2	2	45	800	**24**
Yanakie	3	23	4	28	33	118	209	800	**26**
TOTAL	71	3039	948	292	575	1750	6675		**2942**

NOTES:

[a] Includes properties in all zones within locality. Properties where area is unknown (6 properties across townships) are not included.

[b] According to current knowledge for application of secondary treatment and the predominant soil type. It assumes full containment within allotment boundaries for a three-bedroom home, all EPA minimum setback distances are met and is free from adverse site conditions, e.g. water ways, groundwater springs.

[c] Calculated by determining the number of properties with an area less than the area for sustainable effluent dispersal when assuming 200 m^2 for buildings.

[d] This figure is for sustainable onsite management of wastewater. EPA Victoria agreed interim standard currently applied. Interim Standard is 250 m^2.

2.2.2 Allotment Density

The impact of onsite domestic wastewater management on the local environment is increased by the concentration of wastewater disposed to land. The number of houses per square hectare becomes an important consideration when assessing the current conditions within a particular township or area. Wastewater density issues are more acute within townships – refer to *Table 4*.

As long as the soil is able to contain wastewater onsite both horizontally and vertically to the ground water for long enough to be processed by its microorganisms, density is not likely to cause negative cumulative effects. However, in existing sandy soil townships, the groundwater is very shallow and effluent flows through soil quickly; hence spreading it thinly and slowly via drip irrigation is necessary and is better than trench disposal systems. Pathogens are still an issue as hepatitis A and other viruses persist in the environment for longer may not be adequately processed before being pumped up as a domestic groundwater supply.

In the Declared Water Supply Catchments, system density must meet the Ministerial Guidelines, *Planning permit applications in open potable water supply catchments, 2012* to protect water quality for drinking water supply purposes.

Onsite systems are not recommended for high density of dwellings[14] - refer to *Table 3*. While many townships still contain undeveloped allotments, it is reasonable to assume that in the current development climate, development requests will be lodged for most properties within a 25 year period (system design life). This means that when considering the most appropriate improvement options for townships, density must be considered by allotments rather than by dwelling numbers.

Table 3 - General allotment density requirements

GENERAL DENSITY REQUIREMENTS[15]		
Allotment per hectare	**Allotment sizes[16]**	**Recommended waste water system** (sewerage to be considered for lots <1000 m^2)[17]
>10	<1000 m^2	Advanced / Secondary treatment or common effluent (sewer)
2.5-10	1000 – 4000 m^2	May require LCA to determine appropriate design
<2.5	>4000 m^2	Septic tanks suitable subject to site assessment.

Assessment of allotment density (used instead of dwelling density for future planning purposes) is a significant consideration during a township land capability assessment. This is of particular interest in townships that will need to use onsite wastewater treatment systems, due to prohibitive expense of offsite solutions.

The number of allotments built upon varies depending upon the township. Most townships have vacant allotments (infill) allowing for growth. Any expansion, including infill development in unsewered townships, may be restricted until long-term sustainable wastewater management improvement options are implemented.

[14] EPA Victoria, Code Of Practice for Septic Tanks, 1996

[15] EPA Victoria, Code Of Practice for Septic Tanks, 1996

[16] Based on simple extrapolation, 10000 m^2 divided by number of allotments. Mix of allotment sizes within an area will change the density.

[17] EPA Victoria, Code Of Practice for Septic Tanks, 1996

Commercial activities such as takeaway food stores, restaurants and hotels can generate large volumes of wastewater quickly. They often use large volumes of cleaning chemicals which can kill or impede the microorganisms required for effective wastewater treatment. This combination presents greater wastewater management challenges and potentially poses a greater risk to public health and the environment if not managed adequately.

Consultation findings

- Density was recognised as an issue particularly in the coastal townships.
- Density within Water Supply Areas is of particular concern and is a matter for ongoing consultation with South Gippsland Water. Consultation with Gippsland Water will need to be commenced also in relation to the Little Morwell River WSA.

Table 4 – Current and potential township densities

Number of properties and proportion requiring onsite wastewater management compared with vacant land.

Suburb	Vacant lots	Developed lots	Allotments	Area (ha) [a]	Current density [b] (dwellings per ha)	Potential density [c] (lots per ha)
Agnes	4	57	61	460	0.12	0.13
Bena	2	138	140	104	1.32	1.34
Buffalo	9	186	195	11	16.33	17.12
Dumbalk	9	262	271	155	1.69	1.75
Fish Creek	30	576	606	57	10.06	10.58
Jumbunna	1	74	75	2	34.20	34.66
Kongwak	2	123	125	54	2.29	2.33
Koonwarra	7	232	239	36	6.49	6.69
Loch	10	286	296	36	7.86	8.13
Nyora	42	523	565	618	0.85	0.91
Poowong	28	316	342	97	3.04	3.45
Port Franklin	12	90	102	30	3.27	3.54
Sandy Point	106	775	881	88	8.80	10.01
Stony Creek	6	197	203	10	18.81	19.38
Tarwin Lower	43	384	427	36	10.56	11.75
Venus Bay	737	2408	3145	395[d]	6.10	7.97
Walkerville	104	349	453	26	13.62	21.19
Walkerville South	6	39	45	18	2.22	2.56
Yanakie	23	297	320	91	3.27	3.52

RED shading denotes secondary treatment required and **ORANGE** shading denotes LCA may be required.

[a] Area calculated based on properties that are generally not within the Farming Zone. This excludes properties whose area is unknown. Agnes is a small strip of houses within a Farming Zone.
[b] Developed lots divided by area in hectares.
[c] Total lots divided by area in hectares.
[d] The area includes estate three which contains much larger properties thus it reduces the overall density. The density in Estate 1 & 2 is expected to be much higher.

2.3 Climate

High rainfall and low evaporation rates create adverse conditions for treatment and disposal of wastewater throughout the municipality. The long term average annual rainfall is between 898.8 mm/yr (Leongatha) and 1047 mm/yr (Fish Creek). Average annual evaporation rates are between 1000 to 1200 mm/yr.[18] The volume of waste water generated by a household combined with annual rainfall equals the total volume of water that the environment receives for treatment and distribution through the water catchments.

Evaporation indicates how much water can be evaporated into the atmosphere. Evaporation rates are higher in areas that have good access to sun and wind. These rates vary considerably each season. When rainfall is high in winter and spring, evaporation rates are generally lower, reducing the environments ability to adequately treat and disperse wastewater via filtration, evaporation and transpiration without discharge to waterways and ground waters.

Current research on climate change in Victoria has suggested that overall the State is likely to become warmer, however this will not necessarily translate to an improvement in wastewater management conditions. Despite anticipated improvements to evaporation, this region is likely to experience increases in extreme weather events, including flooding or storm surges.[19]

During extreme weather events and for some time after, the effectiveness of wastewater management systems are reduced. The ability of many of the areas to quickly soak up and retain water is also retarded by the clay soil types found there, potentially exacerbating flash flood risk in dry conditions and carrying wastewater contaminants further down into the catchment.

Consultation findings

- In recent years, flood events have created significant problems with the townships of Fish Creek and Sandy Point.
- Coastal areas have shallow ground water that is replenished from direct rainfall only and can be overloaded, come to the surface and damage or reduce the effectiveness of septic tanks. Septic tanks have been observed as "floating" during such events.

[18] Bureau of Meteorology, **http://www.bom.gov.au/climate/data/**,2012 - Data averages from 1961-1990,

[19] *DSE, Climate Change in West Gippsland, 2004*

2.4 Fresh water sources

Watercourses and groundwater are important sources of water for livestock, human populations (agriculture, industry and drinking water) and native plants, as well as core and support habitats for many of our native animals.

Many townships were developed close to water sources, beginning the ongoing connection between the township's health and prosperity and the watercourse. Over time, growth of the townships has increased pressures on the health of the watercourses, including increased wastewater discharges.

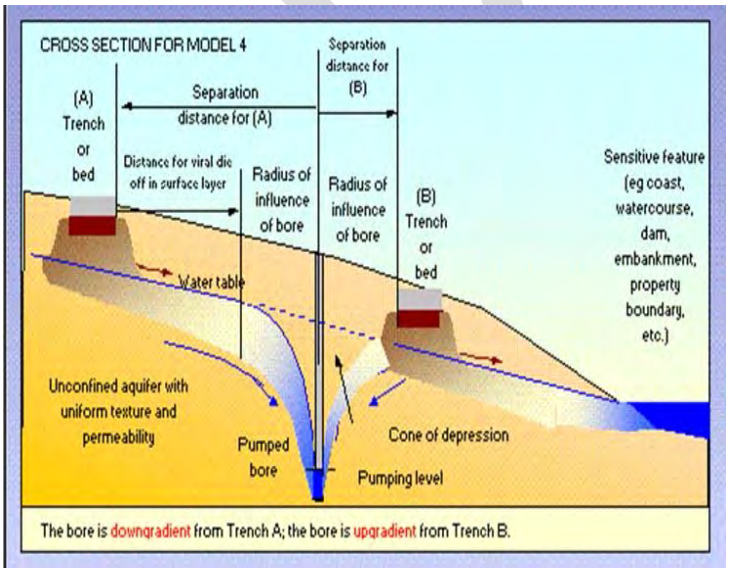
Water catchments are areas that are specifically designated for the purposes of potable water supply catchment. Southern Rural Water (SRW) generally manages water extraction from catchments. Local water authorities take water from the catchment for the supply of potable water to communities. Water is extracted from the catchment in three ways;

- collection in a dam or reservoir;
- extraction from river flows; and
- extraction of groundwater (licensed by SRW).

A number of townships are still serviced with water from 'open' water catchments or Water Supply Areas (no restriction of access to catchment and is generally cleared hills used for agriculture). South Gippsland Water supplies Meeniyan and Dumbalk with water from the Tarwin River Water Supply Area. Gippsland Water supplies Mirboo North with water from the Little Morwell River Water Supply Area. During extended periods of low rainfall Leongatha and Korumburra have also received supplementary water from the Tarwin River water supply catchment. Supplies for many towns across the municipality are drawn from streams fed from open catchments containing farms and houses.

In addition to responsible septic tank operation, catchment management activities such as fencing & re-vegetation of waterway riparian zones (edges) are particularly important. Both protect fresh water sources from contaminants from wastewater management, farming and forestry related sources.

In the sandy coastal areas of Venus Bay and Sandy Point there are no storm water drains, instead rainwater percolates through the sandy soil and is collected in underground reservoirs known as groundwater aquifers. Groundwater is affected by the adjacent salt-water tides, rising and falling periodically. In some cases it surfaces above ground level at high tide in the lowest lying areas of Venus Bay or during periods of high rainfall.



Private bores pump groundwater for general household uses (excluding drinking in most cases) as a supplement for rainwater tanks in most coastal towns. Maximum retention of wastewater within the sand structure is desirable in these townships to provide adequate time for not only plants to absorb nutrients but also to kill pathogenic (disease causing) bacteria and viruses.

In the coastal townships of Venus Bay and Sandy Point the sand is generally coarse and allows wastewater to pass very quickly to the ground water. In some areas, impervious soil layers may exist between sand layers and provide some protection of deeper ground waters from wastewater incursion. The way

in which wastewater travels vertically and horizontally within the soil layers and ground water is complex. Council and EPA Victoria maintain concerns that wastewater incursion is adversely affecting the quality of shallow ground waters in these areas.

2.4.1 Declared Water Supply Catchments

There are 10 potable water supply catchment areas declared under the Catchment and Land Protection Act 1994, known as Declared Water Supply Catchments (DWSC), within South Gippsland Shire:

Table 5 – Declared water supply catchments and beneficiaries

Catchment	Towns served	Catchment	Towns served
Agnes River	Agnes, Toora, Port Franklin, Port Welshpool, Welshpool, Hedley	Little Bass	Poowong, Loch, Nyora
Battery Creek	Fish Creek	Mirboo North	Mirboo North
Bell View/Ness Creek	Korumburra	Ruby Creek	Leongatha, Koonwarra
Deep Creek	Foster	Tarwin River	Dumbalk, Meeniyan
Lance Creek (Minor intrusion into South Gippsland Shire)	Lance Creek, Wattlebank, Wonthaggi, Cape Paterson, Inverloch	Walkely Creek (Minor intrusion into South Gippsland Shire)	Raw water customers and bulk entitlement for Gippsland Water use.

Density of wastewater systems is an important public health consideration within Declared Water Supply Catchment areas (DWSC) (refer to *Section 2.2.2 - Allotment Density)*. The higher the density, the higher the potential concentration of harmful contaminants discharged to land, storm water drains and ground waters. The Ministerial Guidelines, *Planning permit applications in open, potable water supply catchment areas* (DSE, 2012), specifies a maximum density of 1 house per 40 hectares (or 8 dwellings per 1km radius) unless a Catchment Policy and approved DWMP have been adopted.

The Tarwin River Potable Water Supply Catchment comprises approximately 1/3 of the Shire of South Gippsland and encompasses many towns including Meeniyan, Korumburra, Leongatha, Dumbalk, Koonwarra, Mirboo North and Stony Creek (Ref: Fig 2). The Ministerial Guidelines are a restriction on development within the shire and conflict with Council's Rural Land Use Strategy which supports development of dwellings on existing Farm Zone lots of 4.1Ha or less.

Based on the findings of the 2014 ECOS report: *Tarwin Water Supply Catchment Water Quality Management Plan*[20]*,* in which riparian plantings and maintenance of wastewater systems were identified as best practice requirements to protect public health, Council has prepared a Tarwin River Potable Water Supply Catchment Policy for consideration of South Gippsland Water. The policy adopts a scientific, risk based approach to the assessment of planning permit applications and references best practice wastewater management through this DWMP.

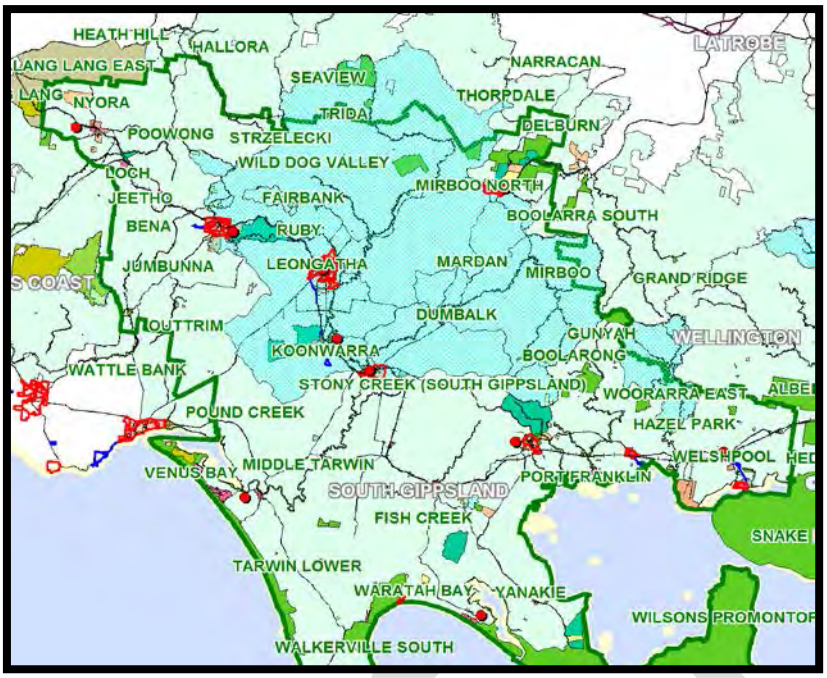
Other DWSCs within the shire are less expansive and are not covered by the ECOS study or Catchment Policy. Ministerial Guidelines continue to apply in these catchments.

Land Capability Assessments are required for new developments in all DWSCs and increased EPA set-back distances apply[21].

[20] Ecos Environmental Consulting and Water Technology (2014) *Tarwin Water Supply Catchment Water Quality Management Plan*..

[21] EPA Code of Practice – Onsite Wastewater Management, Publication 891.3, Feb 2013.

Figure 2 – Water Supply Catchments (light blue) and sewerage services (red)

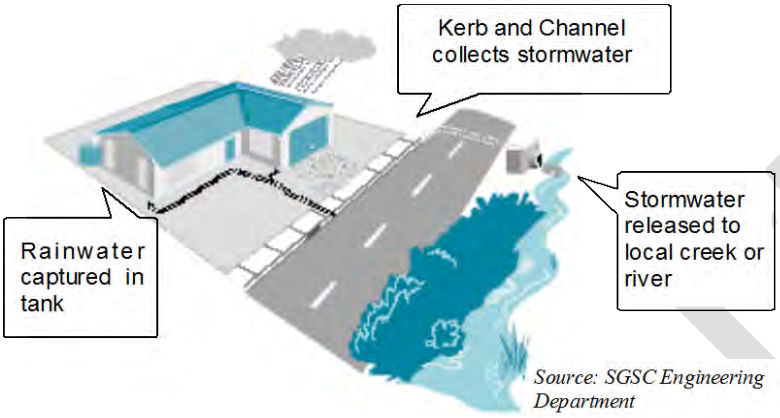


2.4.2 Stormwater and groundwater quality

Once wastewater travels beyond the property boundary, either through system failure or permitted discharge, it ends up in either the storm water drainage system or the ground water.

Council staff have received complaints regarding odours from storm water drains and observed nutrient rich wastewater stagnating in storm water drains across the municipality.

Figure 3 - Stormwater Pathways



Challenges

- Lack of ongoing monitoring of storm and ground waters.
- Lack of community understanding of the water cycle, storage interactions and potential threats from treated and untreated waste water.

Opportunities

- Multiple benefits achievable through better engagement of residents in education programs, community based monitoring and improvement to design and

Historical analysis of storm water samples in Meeniyan, Nyora, Loch and Poowong indicated that often the storm water within the townships contains high levels of pathogenic (disease causing) organisms and nutrients, such as nitrogen and phosphorus. The soil, infrastructure and climate conditions causing discharge of untreated and partially treated wastewater are similar in many other townships.

Studies of groundwater samples collected in Sandy Point and Venus Bay since 1994[22] have indicated a significant potential for a decrease in the water quality during high wastewater flows in the holiday periods. The presence of E.coli, an indicator of faecal contamination, found in some bore water samples, has raised concerns that the groundwater in these areas is not of sufficient quality / safety for household uses (drinking and other close contact uses).

Consultation findings

- In recent years, flood events have created issues within the townships of Fish Creek and Sandy Point.
- Port Franklin has significant problems with stormwater drains being overgrown with weeds and inadequately drained.
- Discharge of grey water to the storm water curb and channel in Fish Creek creates significant issues with visual amenity and odour. Monitoring of the storm water and receiving waters for impact requested.
- Ongoing monitoring of ground waters in Venus Bay and Sandy Point has been requested to confirm anticipated impacts from septic tank systems.

[22] Southern Rural Water, (Hydro Technology & Sinclair Knight Merz), Venus Bay and Sandy Point Groundwater Investigations, Progress and Management Options Reports, 1994-1997,

2.5 Environmentally Significant Areas

The South Gippsland Shire Council's *Planning Scheme* schedules six types of Environmental Significance Overlays (ESO); Natural Significance, Water Catchments, Coastal Areas, Sewage Treatment Plant and Environs, Susceptible to Erosion and Susceptible to Flooding.

When assessing existing and proposed wastewater management systems, it is important to assess the implications of the management of the system on the values that the overlay protects, for example water catchments. Conversely, the identified issues the overlay addresses, for example, erosion or flooding, can significantly affect the adequacy of the existing or proposed system.

Under certain circumstances, as defined in the SGSC Planning Scheme, development and other activities on properties within an ESO trigger a requirement for a planning permit and referral to relevant authorities. At this stage, there is opportunity to assess all relevant environmentally significant implications to better plan development and manage wastewater.

2.6 Soil type

The adequacy of the soil for wastewater treatment is dependent upon the proportion of clay, loam and sand, as each provides a particular bio/physio-chemical treatment (clay binds phosphorus) or allows space and air (sand particles) for microorganisms to survive and use wastewater components for biological processes.

Soils and soil-based systems are defined in *Australian and New Zealand Standard AS/NZS 1547 (2012).* Qualified persons use these soil types along with other site specific and climatic conditions to determine the type and dimensions required of a wastewater treatment system.

High clay content soils are generally regarded as poor for wastewater treatment as they do not provide enough air space to cope with typical flow rates or retain effluent long enough for adequate treatment by microorganisms. They are often highly dispersive, creating an impervious barrier that deflects water to run off rather than be absorbed into the soil and generally require larger effluent disposal areas.

The particle size of sandy soils is particularly of interest in coastal settlements, as most of South Gippsland coastal soils are composed of large particle sands that create larger pores, allowing the wastewater to pass through more rapidly. Testing of sandy soils in 2004 found that the percolation rate (distance wastewater passes through soil over an hour) is as high as 2 – 3 metres per hour. Combined with shallow groundwater levels (ranging between 0.5 – 5 metres below ground), in certain areas wastewater is not retained in the sand long enough for adequate treatment to occur before discharging to groundwater.

Table 6 - General soil type classification and location in South Gippsland

Loam	Dumbalk	Leongatha		
Clay	Agnes	Bena	Buffalo	Fish Creek
	Foster	Jumbunna	Kongwak	Koonwarra
	Korumburra	Loch	Meeniyan	Mirboo North
	Nyora	Poowong	Port Franklin	Port Welshpool
	Stony Creek	Toora	Welshpool	
Sand/Clay	Walkerville	Walkerville South	Yanakie	
Sand	Sandy Point	Venus Bay	Tarwin Lower	Waratah Bay

Soil types in townships will indicate the general suitability of the land to adequately treat wastewater. Combined with other factors such as topography (hills or valleys), local vegetation and lot sizes, soil type will generally influence the prioritisation of townships for improvement projects and programs.

A Land Capability Assessment, by a suitably qualified person, can be used to determine an individual property's soil type, ability to treat wastewater and recommendations for adequate treatment options.

A number of Township Land Capability Assessments have been commissioned by Council. These have been completed for the sandy soil areas of Venus Bay, Sandy Point and the townships of Tarwin Lower, Fish Creek and Walkerville's Prom Views Estate. These assessments provide information on restrictive factors and recommended designs for septic tank systems in those areas.

2.7 Vegetation

Vegetation is used by septic tank effluent disposal areas to remove nutrients such as nitrogen and phosphorus from wastewater and absorb and transpire water to the atmosphere. Plants that grow well in wet areas and that do not have invasive roots are preferred for planting in effluent disposal areas.

Plant evapo-transpiration rates are critical to achieving adequate wastewater treatment in sandy soils that are unable to absorb or retain wastewater for long periods. The rate that this occurs is roughly proportional to the local evaporation rate.

During the winter months, plant growth slows down (reducing nutrient uptake) and excessive rainfall can often result in a dramatic reduction in the effectiveness of onsite wastewater management systems, particularly those reliant upon evaporation and transpiration.

Consultation findings

- Maintenance of biodiversity values is now in conflict with Bush Fire Management Overlay requirements and requirement to remove vegetation for effluent disposal.
- Area susceptible to flooding should not be allowed to be developed.
- Township Land Capability Assessment's now provide a scientific basis for design standards.

2.8 Systems in use

More than 8000 onsite wastewater treatment (septic tank) systems have been installed and are in use within the municipality. The majority of these systems are permitted and monitored by Council.

An upgrade program was implemented in the 1950's and 60's by the then State Government Health Department to remove pan toilets (buckets) and install one of two systems:

- the pit toilet, known as a 'septic closet', on properties not serviced by water; or
- 'new' septic tank toilet only systems.

Similar to the septic tank systems, the pit toilets overflowed into an effluent disposal trench. The number of these systems still in service within South Gippsland is unknown but is likely to be very low.

With few occurrences of system upgrade, the majority of systems installed and in use are toilet only systems, which treat only the toilet wastewater. The remaining portion of wastewater from showers, baths, basins, etc, is discharged to local creeks, rivers and ground waters via the storm water system.

Improved regulation and management of septic systems reduces the discharge of dangerous bacteria, nutrients (e.g. nitrogen and phosphorus), heavy metals or other contaminants to the ground or surface waters (local rivers or dams).

Over time, wastewater technology has improved, providing a greater variety of systems for installation and proprietary opportunities. While the majority of systems are still likely to utilise primary treatment only, it is expected that approximately 2000 secondary treatment systems, that require increased levels of servicing, have been installed. Many of these have been in the southern coastal areas of the Shire, refer to *Figure 5*.

Table 7 - Onsite wastewater treatment systems by type

System Type	Installed	Est. No.[23]
Toilet Only Septic tank and trenches with grey water discharged to storm water (includes farmhouse systems) Toilet only septic tank and sand filter to storm water	1960-1970 1970-1980	**1038** *(13%)*
All waste septic tank to trenches (trench length varies with age)	1970 - present	**4390** *(55%)*
Other primary treatment (including composting toilets, worm farms, grey water treatment)	1994 - present	**159** *(2%)*
Mechanical Treatment Plants (20/30 standard) to trenches, surface or subsurface irrigation	1993 - present	**2075** *(26%)*
Other secondary treatment (including sand filters, amended soil filters, advanced worm farms, reed beds)	1994 - present	**320** *(4%)*
TOTAL		**7982**

[23] Extrapolation from Council Wastewater Database, 2012 and Rates database 2012.

Figure 4 - Typical System Types

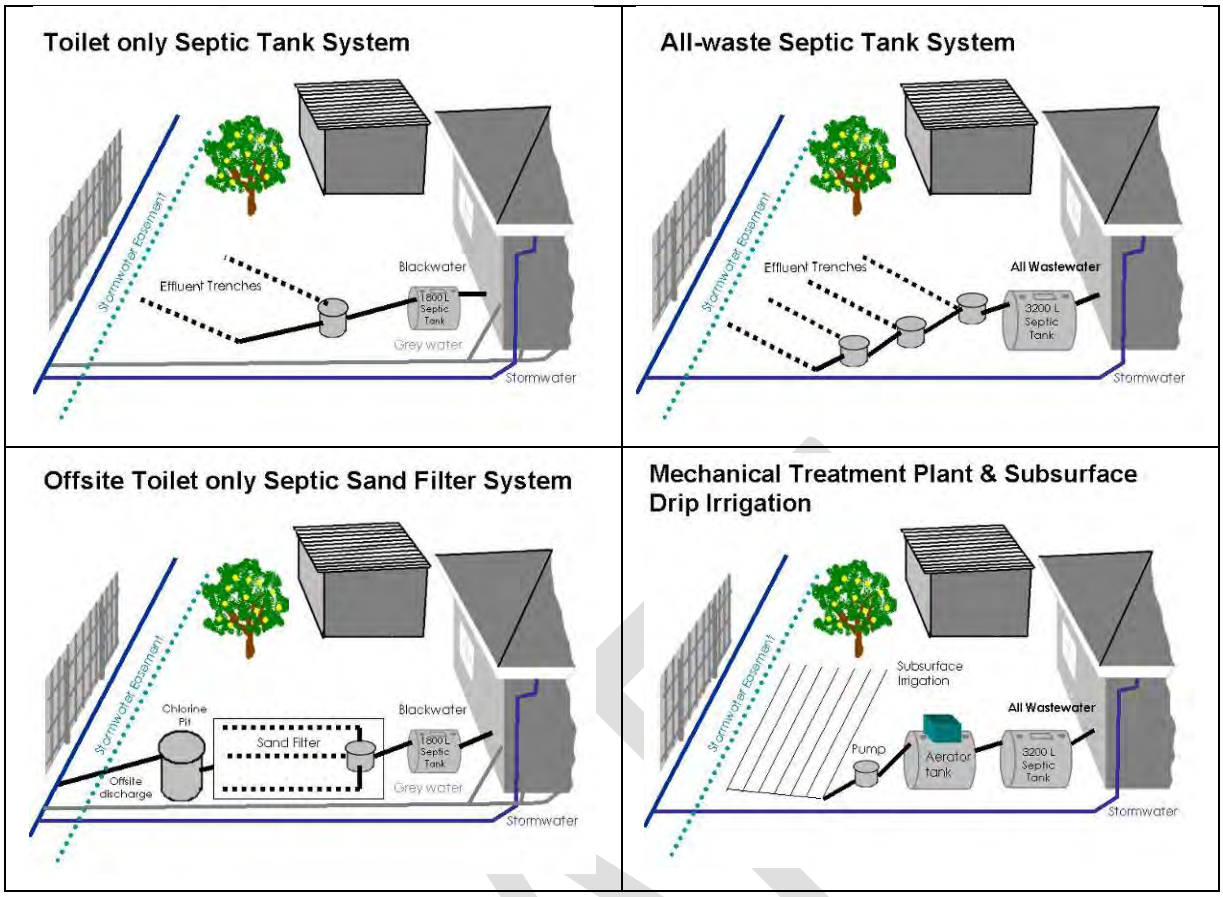
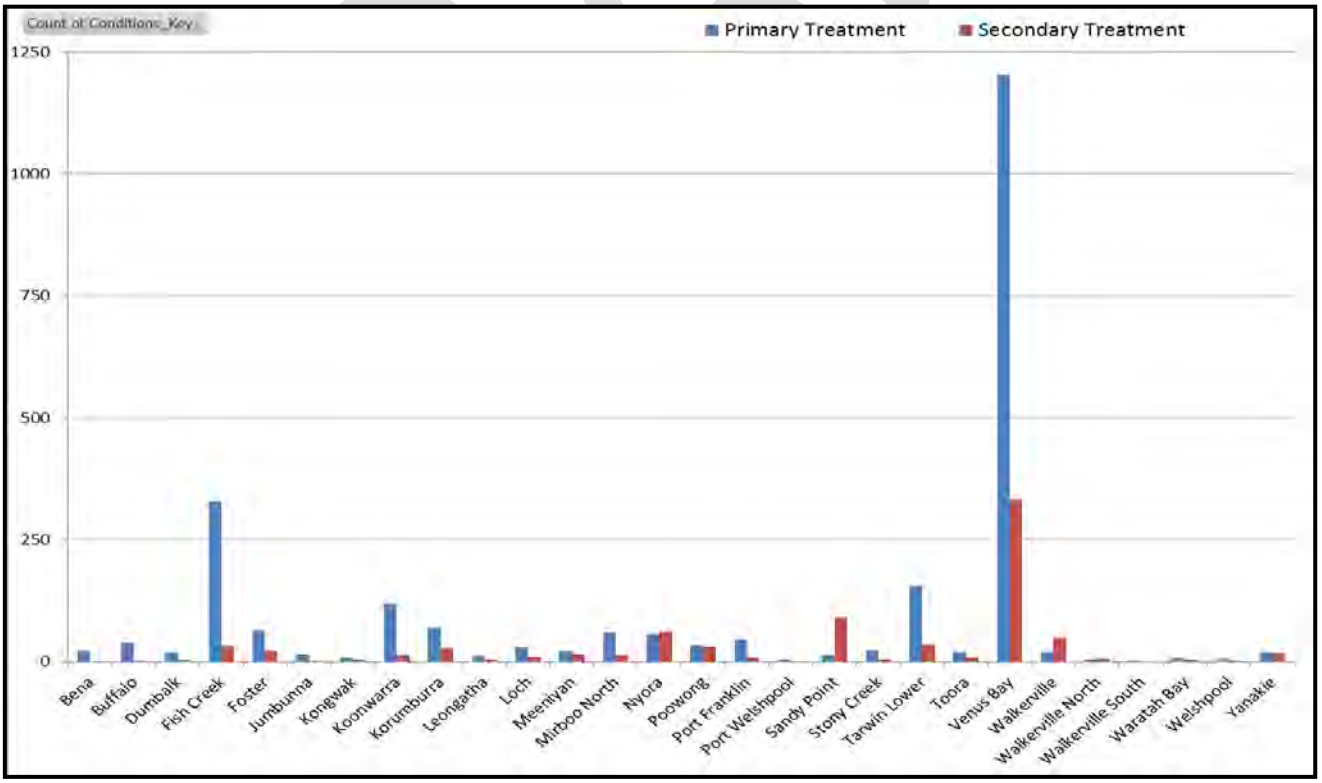


Figure 5 - Number of systems by township, based on treatment level.



Consultation findings

- Most systems installed are likely to be all waste septic tank systems.
- Mechanical treatment plants and toilet only systems which a generally pose higher risks (due to location, maintenance and/or system condition) are also prominent.

2.9 Information

In accordance with legislative requirements, Council collects and stores information on septic tank systems in use during the assessment and approval of septic tank systems. Council also uses this information for monitoring the use and maintenance of these systems.

Much of the information held in relation to systems installed prior to the year 2000 is not retained by Council in a single electronic database. Historical information is generally held in hard copy files and in some cases information relating to individual systems may not be available at all.

In 2009, Council commenced a History Uptake Project which has increased the level of electronically available data in townships identified as priorities for improvement.

Local knowledge and expert opinion has been utilised during the stakeholder consultation to build information relating to the following:

- Values – important locations or conditions within townships and the municipality
- Threats – wastewater infrastructure (tanks & pipes) and practices (e.g. water, chemical usage and maintenance frequency) that exist or have the potential to threaten the identified values.
- Improvement Options – which options are viable for each town or area and warrant further investigation and consultation.

Council and its partners, South Gippsland Water and EPA Victoria, continue to further develop an understanding of and access to the information required to improve decision making processes.

Challenges

- Incomplete or inaccessible information on existing wastewater management systems.
- Limited monitoring, compliance and enforcement programs, resulting in low detection of failures.
- Lack of complaint from property owners likely resulting from their properties generally creating similar problems.
- Low profile of wastewater management coupled with high costs of improvement options reduces incentives for change to best practice standards.

Opportunities

- Improved decision making by improving information collection and reporting technology.
- Improved communication with residents and other stakeholders.
- Development of improvement option

Consultation findings

- Council is expected to be able to determine the type of system in use and provide specific information to owners. This currently cannot be achieved in all cases.
- Information needs to be distributed more effectively and regularly to stakeholders.

2.10 System performance

2.10.1 Design

General design and performance standards for wastewater management systems are determined by EPA Victoria and are published in a Certificate of Approval for each system type, the *Guidelines for Environmental Management: Code of Practice – Onsite Wastewater Management (Publication 891.2, 2008)* and *AS1547:2012 – On-site Domestic-Wastewater Management*. Council issues permits to install septic tank systems requiring compliance with these standards and other relevant site specific requirements.

Systems are generally designed to be used over a 15-25 year life cycle under typical use patterns (e.g. full occupancy). After this time the system is intended to be renewed or replaced. As many systems in use are older than 25 years, Council expects that these systems require significant works to maintain adequate treatment and operational standards.

All waste water discharged by a household each day must be treated and contained within the property boundaries. The system's design is generally based on the amount of waste water to be treated, treatment level to be applied and the ability of the soil and vegetation to treat contaminants.

Challenges

- Lack of user knowledge of system design and maintenance requirements.
- Maintenance and system requirements (EPA and Council policies) have changed a number of times since first septic tanks installed without introduction of retrospective permit conditions.
- Inconsistent maintenance requirements across system types and locations.

Opportunities

- Improved efficacy of design through improved soil, vegetation and climate information.
- Improved owner/operator knowledge to improve system use and maintenance.
- Reviewing maintenance reports of systems will provide knowledge of how well they do or do not work under

Based on current guidelines and knowledge, (Ref: Table 2, section 2.1.3) 13% of township allotments (excluding Venus Bay and Sandy Point) are too small to adequately contain all wastewater on site. In Venus Bay and Sandy Point 78% of allotments are considered too small to sustainably contain all wastewater on site however failure of these systems will generally not impact above ground.

2.10.2 Maintenance

All systems require some form of maintenance, for example, septic tanks require periodic sludge removal and inspection at least every three years, treatment plants require servicing every three months. Maintenance activities must be reported to Council, however very few maintenance reports are submitted annually. The lack of reporting suggests that maintenance is not undertaken as required. This jeopardises the integrity of the septic tank systems including their ability to reduce inherent risks to public and environmental health.

Systems are deemed to have "failed" and subject to compliance action where they do not meet performance standards. Council also considers the following as indicators of system failure:

- Proximity to identified faecal contamination in storm water systems; and
- Emergence of wastewater from adjacent embankments.

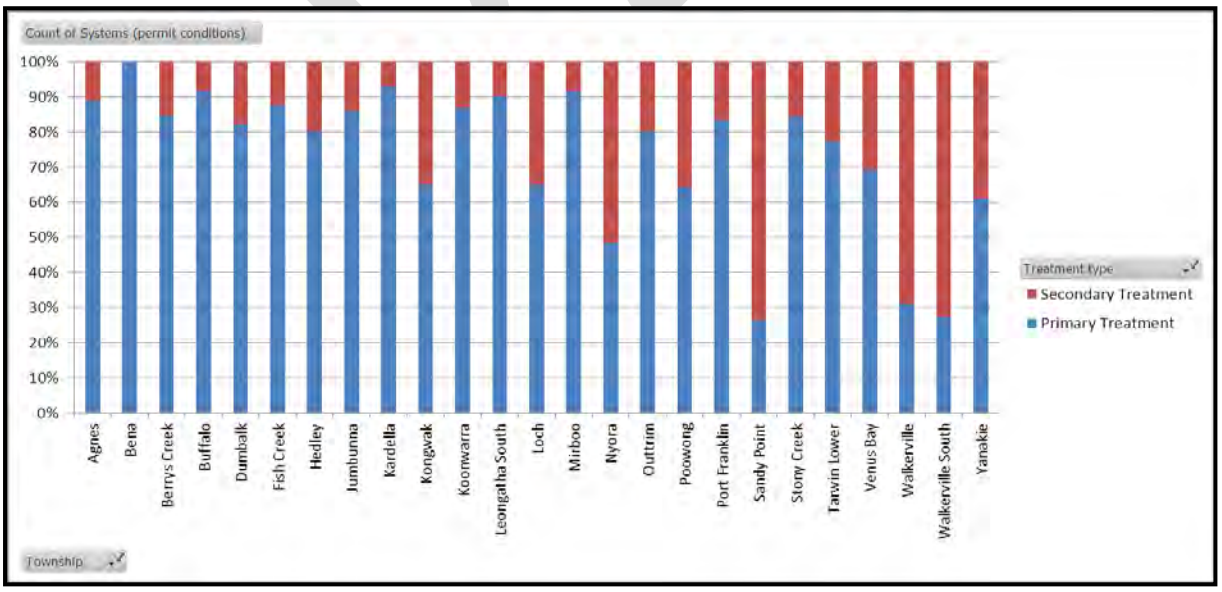
Audits conducted by SGW in Loch, Nyora, Poowong & Meeniyan found that most systems installed more than 20 years ago (before 1982) were not adequately maintained and had periodically "failed". These townships are similar to others within the municipality which are expected to also have similar rates of inadequate or "failing" systems.

In Loch, 50% of the 139 properties inspected had toilet only systems. Of the other half, being all waste septic tanks and treatment plants, the effluent areas are wet with some signs of pooling or over land discharge, creating environmental issues.[24]

In Nyora, 24% of the 255 properties inspected had toilet only systems and 62% were all waste septic tanks and treatment plants. Of the latter, the effluent areas were observed as being wet with some signs of pooling or over land discharge, creating environmental issues[25].

In Poowong, 72% of the 157 properties inspected had toilet only systems and 28% were all waste septic tanks and treatment plants. Of the latter, some effluent areas were observed as being wet with some signs of pooling or over land discharge, creating environmental issues[26].

Figure 6 – Proportion of primary to secondary treatment systems within townships



[24] Casey Property Services, Loch Property Audit Report, South Gippsland Water, February 2007
[25] Casey Property Services, Nyora Property Audit Report, South Gippsland Water, April 2007
[26] Casey Property Services, Poowong Property Audit Report, South Gippsland Water, March 2007

2.11 Complaints (Customer Requests)

Council must investigate and resolve, where reasonable, complaints relating to wastewater management utilising the Septic Tank provisions of the *Environment Protection Act 1970* or the Nuisance Provisions of the *Public Health & Wellbeing Act 2008*. Complaint investigation under the *Public Health & Wellbeing Act 2008* requires Council to assess the risk to health or existence of nuisances.

Considerable evidence points to widespread issues such as odour from storm water drains and contaminated ground waters. Council receives relatively few complaints regarding wastewater. This is likely to be due to:

- residents becoming accustomed to the existing conditions;
- owners aware that their own properties could have similar problems and do not want to highlight the issues;
- storm water systems are diluting and carrying problems away from populated areas; and
- ground water systems are not visible and quality levels not accessible to a mostly transient (absentee ownership high in coastal areas) and seasonal population.

The predominant complaint or concern received by Council is the smell of storm water drains or old existing grey water discharges.

Solutions to complaints are not readily identifiable as many relate to highly dense townships which are unable to utilise onsite (septic tank) waste water management and are not likely to receive offsite (sewerage) system infrastructure for many years.

Council anticipates that community expectations of amenity levels, public health and environmental protection may change in the future as township demographics change and systems deteriorate with age. This may result in a higher expectation of amenity and an increase in complaint numbers.

Challenges

- Lethargy by residents to complain about a neighbour when their situation is similar.
- Consolidation of waste water complaint histories between Councils Engineering and Public Health teams, relating to storm and domestic waste water concerns.
- Difficult to rectify issues in areas that are not suitable for onsite (septic tank) wastewater management, such as high density townships.

Opportunities

- Initiate community education and collaboration to improve township odour complaints through engagement and agreement on wider improvement options to be considered.
- Focused investigations providing evidence for improvement options and funding

Consultation findings

- Communities generally have a lack of knowledge in relation to septic tank basic operation, maintenance and lifecycle costs.
- Systems are not being used and maintained (nearly 14% never maintain their system), particularly mechanical treatment plants in coastal areas, in accordance with their manufacturers' specifications. For example, treatment plants are turned off when not occupied to save power.
- Education is not enough to effect behaviour change, compliance monitoring or contracted regular maintenance for all septic tanks is necessary.

2.12 Reticulated sewerage

Reticulated sewerage is the main improvement option for areas where onsite treatment systems will not adequately treat and dispose of wastewater. It removes all wastewater from individual sites to a local treatment facility for treatment and sustainable reuse. These systems are designed for a 50 year life cycle.

The development, implementation, delivery and ongoing management of reticulated sewerage schemes are the responsibility of local water authorities. Reticulated sewerage services within declared sewerage districts are provided by South Gippsland Water and Gippsland Water in areas of South Gippsland. These authorities also provide town water from Declared Water Supply Catchments. These services are provided on a user pays principle.

When a town is provided with reticulated sewerage, an area is defined as a Declared Sewerage District. The local Water Authority may require, by notice, all properties within a sewerage district to connect to the sewerage system.[27] Proposed developments on properties within sewerage districts that do not wish to connect to the sewer must seek permission to treat and disperse wastewater onsite from South Gippsland Shire Council and the water authority.[28]

If sewer is available, new lots must connect to sewer or be adequately sized to treat and contain all wastewater onsite. Developers must liaise with the relevant water authority to determine design and cost of required sewer extension.

South Gippsland Water services the majority of the municipality and has developed a Water Plan to coordinate their responsibilities. The State Government and South Gippsland Water are currently implementing a new scheme for the townships of Loch, Nyora and Poowong.

Challenges

- Funding availability for reticulated sewerage schemes inconsistent.
- Cost to property owners for sewer scheme infrastructure in the absence of grant funding.

Opportunities

- Risks better managed by central water authority.
- Less maintenance responsibilities for property owners.
- Improved availability for utilisation of property area (building extensions, sheds, pools, large trees).
- Provision of treated water for reuse within the community (recreational area

The cost of future sewerage scheme implementation will be primarily the responsibility of the property owners who will directly benefit from the service. In some cases, applications for funding from State Government Treasury (from tax paid) may be available to subsidise the cost of the scheme.

[27] *Water Act 1989,* Section 147

[28] *Water Act 1989,* Section 180

Further information on proposed and current reticulated sewerage systems may be sought from the relevant Water Authority.

Table 8 - Number of properties with sewer compared with those with onsite septic tank systems

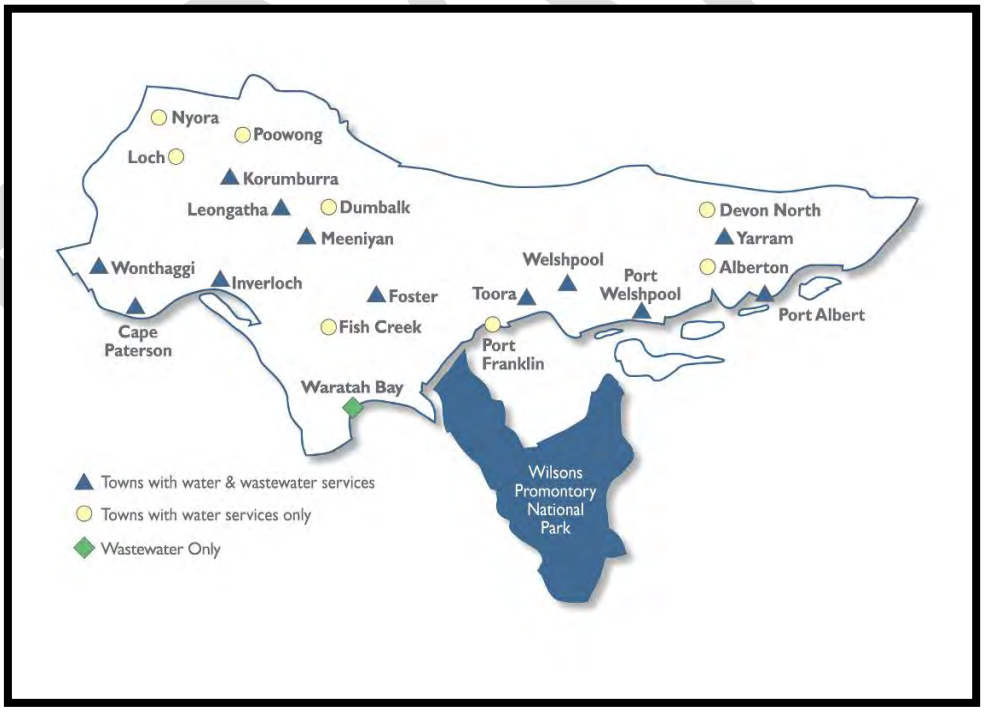
Type	Residential	Commercial	Subtotal	Vacant	Total
Sewer districts – SGW	5028	585	*5613*	377	5990
Sewer districts – GW *			*579*	44	623
Septic	7654	907	*7982*	4777	12759
Total properties[1]	12682	1492	*14174*	5198	19372

[1]Properties that have a land use type requiring wastewater management services from 5/6/2012.
* Residential / commercial not available from Gippsland Water.

Table 9 - Declared sewerage districts.

Town	Authority
Foster, Korumburra, Leongatha, Loch*, Nyora*, Meeniyan, Poowong*, Port Welshpool, Toora, Waratah Bay, and Welshpool. *Under construction.	South Gippsland Water (SGW)
Mirboo North	Gippsland Water (GW)

Figure 7 - South Gippsland Water and Sewerage Services



Consultation findings

- Lack of awareness of the delineation of roles between water authorities and local government within the community.
- Lack of clarity of process to guide communities towards improvement through the implementation of sewerage.
- Cost of sewerage at full cost recovery is untenable and unpopular.

3. HOW WE IMPROVE

Wastewater management improvements are vital for the long-term health and prosperity of townships. Using wastewater (septic) systems beyond their design life increases the risks to public health and the environment and needs to be managed effectively.

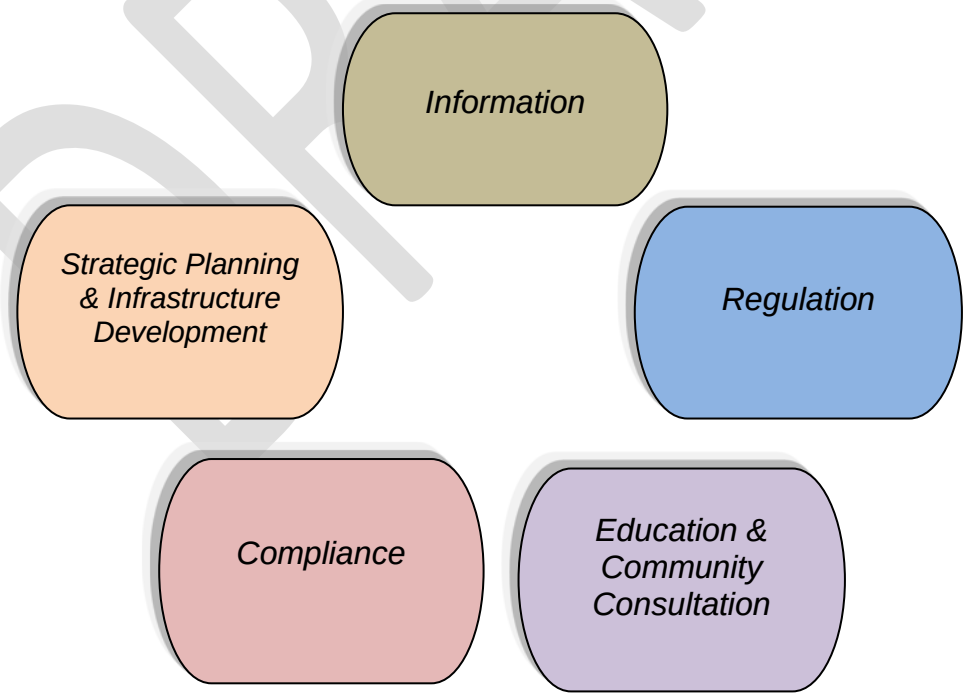
Not all systems or townships are designed to perform equally, nor are all environments equally sensitive to wastewater discharge. A risk based approach is taken to ensure that Council is conducting its wastewater management activities efficiently and effectively. This approach also provides Council with the direction to seek wider wastewater management improvements, such as sewer, and the funding that is needed to implement such improvements. The goal is to reduce risks to public health and the environment to an acceptable level over a period of time within available Council resources.

Wastewater management involves a range of issues, including those that currently exist or have the potential to exist. Each issue is very particular in its characteristics and therefore the methods to resolve them must be flexible yet specific.

Improvement options for wastewater management fall into two general categories; onsite wastewater (septic tank) systems and sewer schemes. In some cases, these are combined, such as common effluent systems, to provide greater variety of opportunity for water use and reuse by residents.

To improve wastewater management, strategies are required that address strategic planning and infrastructure, information, regulation, compliance and education and community consultation.

Strategies focused under these five areas will be required to address the range of existing and potential issues across the municipality and within each township.



3.1 Assessing the risks

Wastewater poses a public health, environmental, legal and economic risk. South Gippsland is an area that prides itself on its natural assets as well as living amenity – *Come for the Beauty, Stay for the Lifestyle*. Poor wastewater management threatens these values and undermines the municipality's ability to attract more residents, businesses and tourists to the area.

Risk is regarded as a characteristic of a situation or action where multiple outcomes are possible and at least one of the possibilities is undesired. The assessment of this risk is the systematic process of identifying, describing and quantifying such risks. Risk assessments enable the generation, evaluation and implementation of management options. It requires the capacity to look ahead, survey and anticipate sources of risk. It can be used for setting standards and priorities and plays an important role in responsible decision making.

It is generally agreed that while all wastewater generation inherently poses a risk to public health, not all risks are equal in likelihood. The assessment of comparative wastewater threats is generally dependent upon three particular variables:[29]

- the proportion of effectively operating septic systems;
- the proportion of the types of systems installed; and
- concentration of effluent within the sub-catchment area.

Council assesses risk across the municipality to provide sufficient information to prioritise areas for targeted management strategies and action plans.[30] In preparing this document the MDWMP 2012 Reference Committee conducted a risk assessment, defining the importance of local values and the level of threats posed by wastewater related conditions. This assessment is a reflection of local knowledge and experience of local conditions and technical/analytical data (where available).

In addition, local consideration of the findings was verified through a series of community focus groups and stakeholder surveys.

[29] *MAV, DWM – Planning Guide, 2003 (amended)*

[30] *MAV, Ibid*

3.1.1 Values & Threats

What is important to us?

Each area of the municipality has values that wastewater management may impact or threaten depending upon the surrounding natural environment. South Gippsland contains natural environments and surface waters, recognised both nationally and internationally. These assets provide residents with an enjoyable place to live and work, generating local income through our growing tourism industry.

It is well known that human waste contains many infectious pathogens and if not appropriately managed present a risk to public health. Human wastewater also contains nutrients, including nitrogen and phosphorus, chemicals and suspended solids that can cause degradation of the environment and toxic algal blooms under certain conditions.

Values in the areas of public health, environmental sustainability and economic viability are important to wastewater management in the Shire and include:

1. Disease prevention (public health)
2. Visual / odour amenity
3. Stormwater management (flood protection)
4. Surface water quality
5. Aquatic biodiversity
6. Development potential
7. Public access (to public spaces)
8. Property value
9. Groundwater quality
10. Vegetation

Consultation findings

- The top three values, on the basis of the average, to be protected were disease prevention, visual odour / amenity, aquatic biodiversity.

What threatens our values?

Determining the risk to local values requires clearly identifying threats posed by different system types and existing conditions. Council prioritises the following wastewater management related threats:

1. Failed primary systems
2. Lack of user knowledge
3. Ineffective / inadequate regulation
4. Town / ground water supply availability
5. Untreated off-site sullage discharge
6. Density of wastewater systems
7. Historical data availability
8. Failed tertiary system
9. Grey water diversion to garden
10. Adequate primary system
11. Failed secondary system
12. Offsite discharge secondary system
13. Adequate secondary system

Consultation findings

- Overall, the lack of user knowledge, monitoring by Council and the close proximity of townships to environmentally sensitive environments were identified as being the greatest threats.

3.1.2 Township Risks

A wide variety of risks exist in each township, requiring action to remove or reduce them. The magnitude of risk posed by threats is dependent on the individual characteristics of each township. These include, the size of the threats, significance of the local environment, quality of the storm water infrastructure, exposure of threats to the public and availability of threat reduction measures, for example setback distances.

The level of information gathered, analysed and understood at any particular time affects the level of risk posed by wastewater management in each township. Since 2007, significant changes in the information available to Council and legislative interpretation have occurred. A current risk assessment and updated priority listing are an important step in the development of this plan.

Each township is likely to have an area posing a high risk to public health or the environment. Generally, high-risk areas will have one or more of the following characteristics:

- properties less than 1000 square metres (particularly in towns with very low or high soil percolation rates);
- more than five older toilet only systems with grey water discharges to the storm water catchment;
- high levels of faecal bacteria and/or nutrients identified in nearby storm water drains or groundwater;
- high likelihood of human contact with contaminated storm water, groundwater or waterways e.g. open drains and groundwater bore use;
- environmentally significant vegetation in the area;
- undersized storm water infrastructure unable to cope with anticipated increase in flow rates and regular contamination by domestic wastewater;
- steep grades prone to instability exacerbated by high rainfall, moving ground water springs and high wastewater loading; or
- inadequate and failing wastewater infrastructure.

In addition to townships, rural land also presents wastewater management related concerns, albeit to a lesser degree. In particular areas where there are groupings of smaller lots, in Declared Water Supply Catchments, environmentally significant areas and where house lots are excised from farms. These areas are to be given priority consideration within the rural context and special conditions may be applied to control identified risks.

In identified high risk areas, investigative sampling of storm water and/or ground waters may be used to monitor impacts of wastewater disposal in the area.

Township Land Capability Assessments are used to provide detailed investigation in areas of excessive risk to determine the limiting risk factors and appropriate design standards for onsite wastewater treatment systems.

Township Land Capability Assessments have been completed for **Fish Creek, Sandy Point, Tarwin Lower, Walkerville (Prom Views), and Venus Bay** townships and resulted in the implementation of minimum waste water treatment system design and installation standards.

The standards to be applied are discussed within each *Township Management Plan*, (Section 4).

Table 10 - Council township priority listing 2003 – 2015

TOWN NAME	2015	2007	2003 [31]
Sandy Point	**1**	12	8
Venus Bay	**2**	10	7
Fish Creek	**3**	6	6
Walkerville	**4**	11	10
Port Franklin	**5**	4	8
Tarwin Lower	**6**	1	9
Walkerville South	**7**	11	11
Koonwarra	**8**	5	5
Walkerville – Prom Views[32]	**9**	9	11
Bena	**10**	16	-
Dumbalk	**11**	17	11
Kongwak	**12**	13	12
Yanakie	**13**	14	-
Jumbunna	**14**	21	-
Stony Creek	**15**	15	-
Agnes	**16**	19	-
Buffalo	**17**	18	-
Outtrim	**18**	20	-
Meeniyan (2007 – 2, 2003 – 1) is now sewered.			
Nyora (2007 – 3, 2003 – 2), Loch (2007 – 8, 2003 – 4), Poowong (2007 – 7, 2003 – 3) are under construction.			

3.2 Improvement Options

3.2.1 Sustainability

Where appropriate, Council encourages “passive” systems that require minimum energy input and reduce the amount of water generated. Systems that enable recycling of wastewater for purposes such as laundering and toilet flushing are encouraged where health risks can be adequately mitigated.

In general, sustainable systems:

[31] SGSC, Un-sewered Towns Priority Assessment, 2003. Assessed townships less than 40 persons
[32] Officially forms part of Walkerville with Walkerville North, subdivided estate with small lot sizes.

- minimise the amount of water discharged for treatment through water saving design and devices;
- use minimal energy for treatment and disposal;
- have minimal maintenance requirements;
- use existing natural landforms to maximise treatment potential, minimise total impact upon the environment and retain water within the property for beneficial use;
- maintain a water balance – minimise effluent infiltration in favour of evaporation or transpiration to atmosphere by plants;
- maintain a nutrient balance – remove maximum amount of nitrogen and phosphorus by uptake into plants, thus reducing their release to surface and ground waters; and
- designed specifically for household habits and site conditions.

These are important to protect local amenity, waterways and ecology.

3.2.2 Stakeholders

Responsibility for improved wastewater management within the municipality is a shared one. Council is committed to working with residents and local authorities to plan for and implement programs to improve wastewater management practices and infrastructure for the benefit of public health and the environment.

Table 11 - Stakeholders and responsibilities

DSE • Manage strategic wastewater management policy development and implementation at the state level. • Advise the Victorian Government's long term investment strategy to provide funding support for improvements where practicable.
EPA Victoria • Provide laws and standards of practice for implementation by local government, • Approve types of wastewater systems suitable for use in Victoria, • Assess development proposals and issue works approvals for wastewater systems discharging more than 5000 l/day, • Advocate for implementation of Best Practice in wastewater management. • Investigate and regulate water pollution events.
WGCMA • Prepare catchment management plans for implementation.
South Gippsland Water and Gippsland Water • Operate sewerage schemes in accordance with the Water Act 1989 and associated EPA licences. • Provide centralised sewerage schemes to areas identified by Council and/or EPA as being necessary to remedy public health or environmental risks.[33]

[33] State Environment Protection Policy (Waters of Victoria)

Property Owners & Residents

Maintain individual onsite wastewater (septic tank) management systems to the requirements of their Septic Tank Permit to Install, relevant legislation and policy.

Consultation findings

- All stakeholders, particularly Government authorities need to work together to clarify options for improvement and statutory roles and duties.
- More information needs to be disseminated to property owners and residents.

3.2.3 Options

Each township or area has specific conditions that will influence the most suitable improvement option available to its residents. Key considerations involved in deciding to proceed with an improvement option are:

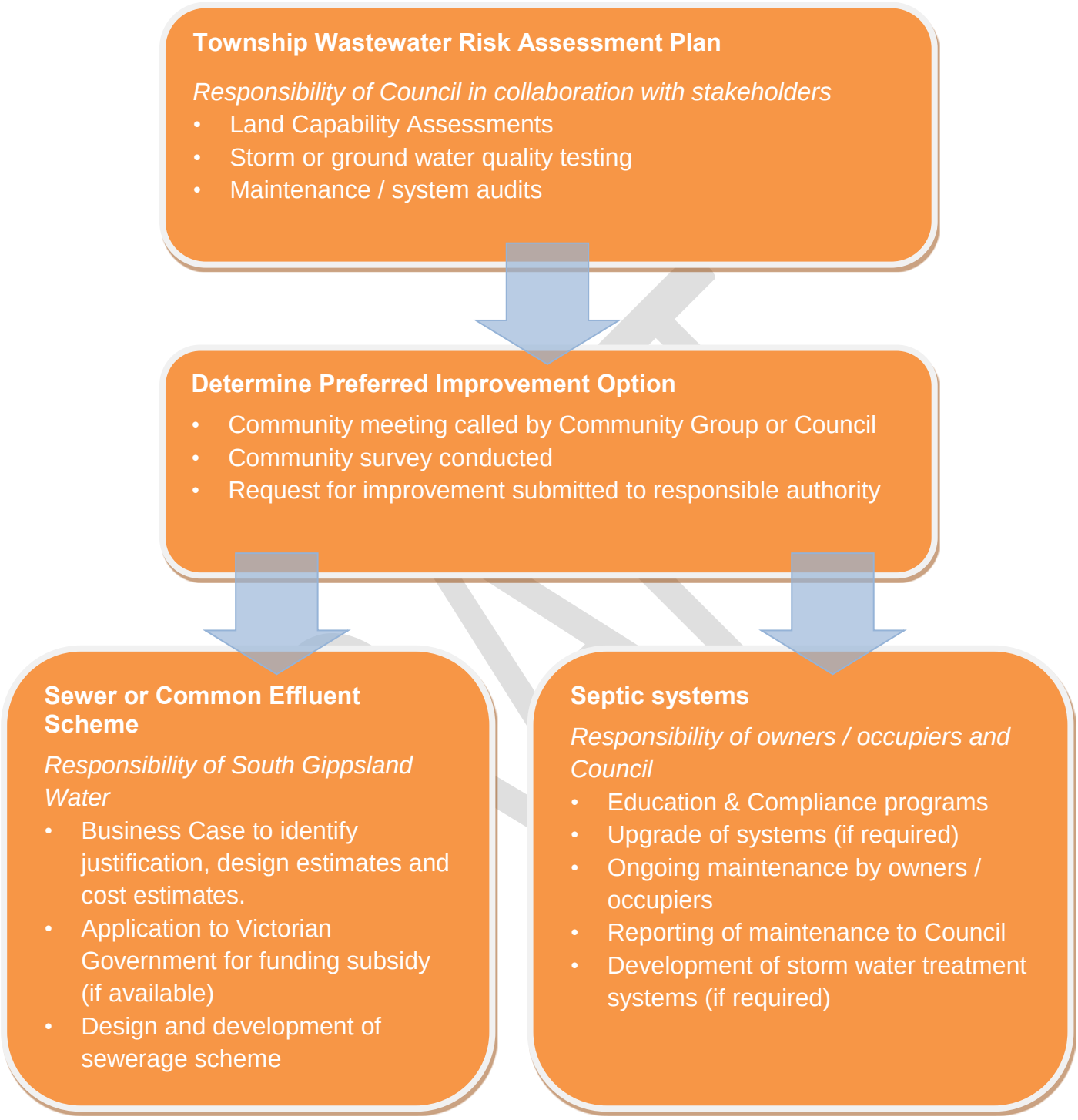
- suitability of existing infrastructure (systems) and site conditions for continued onsite treatment and disposal;
- availability / affordability of onsite technology;
- viability of offsite options;
- community support for improvement option (usually >70% support for sewer is required for Victorian Government funding); and
- not all townships are suitable or viable for the installation of a high capital cost sewerage system. This requires Council and other local authorities to investigate and identify other solutions to manage identified risks.

All systems will require renewal. Sewerage schemes are typically designed and funded for a life cycle of 50 years (upgrades may provide extension of many decades beyond this) compared with onsite wastewater (septic tank) management systems being only 15-25 years.[34]

While major changes in the environment or climate may significantly impact all system types, they will typically be designed to cope with expected yearly climatic variations (such as winter rainfall) and household daily flow rate changes (full household occupancy is assumed). All systems will be designed with some margin built in to maximise the sustainability of the system throughout its lifecycle.

[34] AS1547 – Onsite Wastewater Management, 2008

Figure 8 – Township Improvement Process



Consultation findings

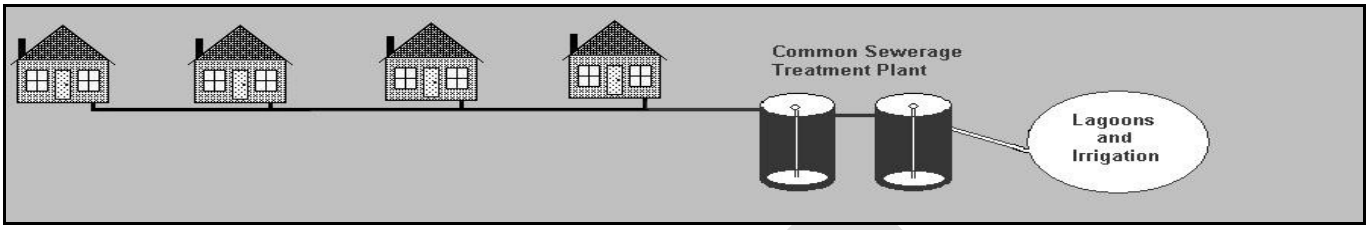
- Improvement processes need to be clarified and communicated to communities.
- Alternatives to conventional sewer need to be considered and assessed against other options.
- Education and compliance is the preferred option for improvement in the first instance, and then consider further options where risks are clearly identified.

There are four main designs for improved wastewater management that are altered and/or linked depending upon the needs of the community, land and climate conditions and economic considerations. These options have been identified to provide an improved and sustainable wastewater management system that adequately protects public health and the local environment.

Conventional Sewer

All wastewater (including solids) is piped to a central wastewater treatment plant managed by the local water authority or private contractor.

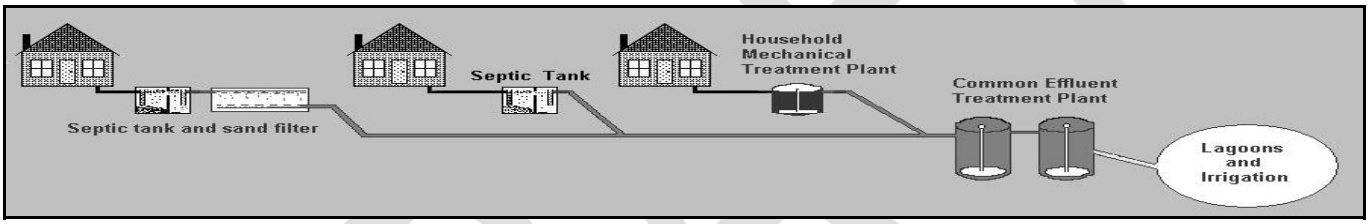
Figure 9 - Conventional Sewer



Common Effluent Disposal Systems

All or some of wastewater is partially treated onsite and liquid effluent is then piped offsite to a central wastewater treatment plant managed by the local water authority or private contractor.

Figure 10 - Common Effluent Disposal Systems, e.g. Septic Tank Effluent Disposal System – STEDS



Effective Onsite Wastewater Management (septic tank systems)

All waste water is treated and dispersed onsite, within the property boundaries. These systems are managed and maintained in good working order by property owners / occupiers. Installation and operation of these systems is regulated by Council according to the provisions of the *Environment Protection Act 1970* and EPA Victoria requirements. Manufacturers design systems and are regulated by EPA Victoria.

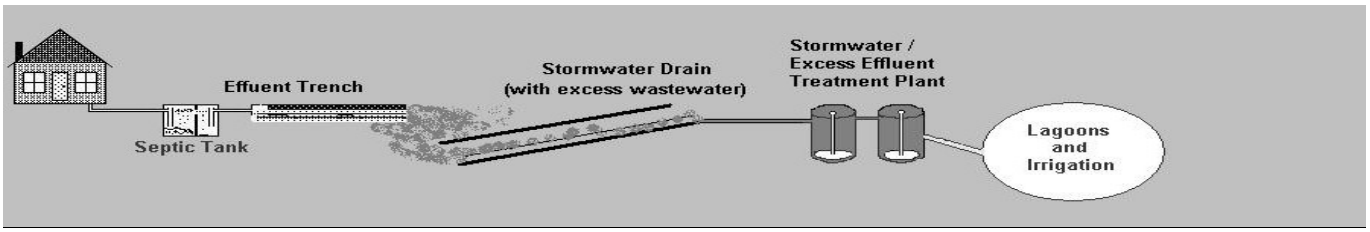
Stormwater Remediation for existing problem areas

Where all wastewater is not able to be sustainably treated and contained within boundaries due to site, system and/or environmental conditions, it is discharged to private or public land or the municipal storm water system without formal approval. Within these areas it may informally receive further treatment and flow to local waterways through growth of vegetation (often weeds that cause blockage of stormwater systems), retention time and exposure to solar radiation.

Increased management and investment in the informal offsite treatment, such as construction of reed beds or retention lagoons are options for improvements, where full onsite containment or sewer is not a viable option.

This option provides multiple benefits by the upgrade of storm water systems to embody Water Sensitive Urban Design principles, including; improved storm water quality, habitat and biodiversity provision and enhanced public open space. In addition, it is likely to provide an opportunity for improved water management within the town through engagement and education of community members.

Figure 11 - Onsite wastewater management, offsite treatment of excess wastewater where required.



3.2.4 Costs & Funding

Improvement to wastewater management is primarily at the cost to the property owner. If an onsite wastewater (septic tank) system fails, it is the owners' responsibility to fund its replacement.

Council provides statutory and strategic services to all residents provided with onsite wastewater (septic tank) services. Fees are charged for these services based on Best Value Principles. These are not full cost recovered and are partially funded from the property rate base.

Previously installed septic tank systems incur some maintenance costs to owners, for septic tanks and effluent trenches and to Council (all ratepayers) for storm water systems receiving untreated grey waters. In addition, if existing septic tanks systems are not managed correctly the public & environmental health costs are real but difficult to calculate.

Where septic tank systems are required to be replaced with secondary treatment systems, property owners can expect to pay approximately $15,000 plus associated permit fees and ongoing annual maintenance costs. In some cases, this means that the cost of sewer may be less than or equivalent to the costs for responsible management of wastewater onsite.

In areas where sewer is considered the most appropriate improvement option, property owners can expect to pay the local water authority between $20,000 and $30 000 (approximate only, costs are dependent upon local conditions) plus associated plumbing costs. Where a sewerage system is required to address public or environmental health concerns, the local water authority will partner with Council to prepare a business case to apply for Victorian Government funding / subsidy. Historically >70% community support for sewer is required for a successful Victorian Government funding bid.

The amount that owners will be required to pay the local water authority is specific to the proposed scheme, dependent upon the capital costs and the funding available from both the local water authority and the Victorian Government.

Previous commitments by the Victorian Government to owner contribution capping have been rescinded and will not apply in the future. These funding contribution arrangements are still available to the townships of Loch, Meeniyan, Nyora and Poowong, being $800 upfront or $80 per annum over 20 years, to be paid by owners plus plumbing costs for connection to sewer main. The charge is applied to the land and upon its sale also transfers to new owners.

Consultation findings

- Most respondents indicated that they were not prepared to invest at all in improved wastewater management.
- Of those who considered investment is appropriate, most would be prepared to invest a maximum of $5000.
- Long term payback options were not seen to be important for the majority of respondents. However, comments made during meetings indicate that for sewer and septic upgrade this should be available.

3.3. Strategies

Council commits to implementing the following strategies to improve the management of wastewater across the municipality. The success of this plan relies upon the active involvement of all stakeholders and Council. Actions are identified within an *Implementation Plan*, (section 3.4) that will contribute to the implementation of these strategies and will be monitored annually and reviewed tri-annually.

3.3.1 Information Management

Access to adequate and reliable information is important for effective and fair decision making. Council seeks to improve the capture, storage and use of data relating to wastewater management systems and statutory processes.

GOAL
Capture appropriate septic tank system data that is easily accessible for reporting purposes and to improve processes, efficiently target resources and assist strategic wastewater planning
STRATEGIES
1. Improve the quality and quantity of wastewater related information captured. 2. Better utilise ICT tools to efficiently collect and store wastewater data.

3.3.2 Strategic Planning & Infrastructure Development

Wastewater management is closely linked with township structure, development and other infrastructure such as stormwater. Policies and programs in these areas need to be informed by and inform wastewater management activities.

Understanding long term development (or restriction) of townships as well as climatic/environmental changes will provide opportunities to improve wastewater management.

GOAL
Plan for the long term sustainability of townships through appropriate development controls of land and infrastructure.
STRATEGIES
1. Reduce risks through available mitigation remedies. 2. Investigate alternative, community scale treatment systems for priority townships, and availability of funding. 3. Liaise with appropriate departments to ensure that planning and infrastructure proposals adequately address wastewater management needs for townships.

3.3.3 Regulatory Management

All Council wastewater management activities are directed by legislation and policy. The Environment Protection Act 1970, used to manage septic tank systems, is based on 1988 legislation and is in need of reform to reflect current technology and improve processes. The use of work arounds using alternative legislation and creation of Council policy are currently required to address identified risks.

GOAL
To influence the regulatory framework in which Council must operate to manage wastewater and develop Council policy and procedures utilizing available tools.
STRATEGIES
1. Influence and assist Government agencies and other stakeholders to improve the regulatory framework within which Council operates. 2. Develop alternative or innovative uses of existing legislative provisions to enhance wastewater management processes. 3. Develop Council wastewater policy through evidence based investigation and use of improved data collection and management.

3.3.4 Education and Community Consultation

Educating owners and operators of septic tank systems is an important function of Council which facilitates an improved understanding on how they should operate their system and what maintenance is required. This enables sustainable and effective operation of septic tank systems for the benefit of the community.

Council engages and collaborates with communities to develop programs and projects for improved wastewater management. Community support for large scale improvement options such as reticulated sewerage is integral to the success of its implementation and the likelihood of obtaining funding support.

GOAL
Provide fair, accurate and accessible information on good wastewater management principles, practices and improvement options.
STRATEGIES
1. Raise profile of wastewater system operation and maintenance requirements within the municipality and region. 2. Provide regular opportunities to improve community and stakeholder understanding and support of improved wastewater management projects and programs.

3.3.5 Compliance Management

On-site wastewater systems require ongoing servicing and maintenance to ensure effective treatment of wastewater to the level required for protection of public health and environmental values. Responsibility for this ongoing cost lies with the property owner. While education programs assist responsible property owners manage their wastewater systems correctly, there will always be a percentage of the population who fail to comply with their responsibilities either through ignorance, negligence or for financial reasons.

Compliance activities need to be coordinated to maximise behavioural change through education and facilitation means, and minimise the need for enforcement activities.

Council is committed to ensuring that all property owners are educated and assisted to correctly fulfil their responsibilities and, where necessary compliance and enforcement action taken.

GOAL

To implement an efficient and comprehensive program of education, facilitation and enforcement to ensure property owners fulfil their responsibilities for the maintenance of their on-site wastewater systems so as to prevent public health or environmental risks.

STRATEGIES

1. Implement an education and facilitation program to assist property owners to understand and comply with their legal responsibilities for monitoring and maintenance of their wastewater systems.
2. Improve electronic data capture and storage to maximise administrative efficiencies and assist in appropriate targeting of resources.
3. Establish an audit and enforcement program to ensure that property owners and service technicians or agents adequately fulfil their responsibilities.

3.4. Implementation Plan

1. Information Management

Capture appropriate septic tank system data that is easily accessible for reporting purposes and to improve processes, efficiently target resources and assist strategic wastewater planning.

No.	*Strategies, Projects, Programs*	*Actions*	*Outcomes*
1	Improve the quality and quantity of wastewater related information captured.	A. Identify & collect the appropriate information required for all installed septic tank systems. B. Data capture processes to be reviewed to ensure efficiency of data entry and appropriate use of data fields for reporting and document processing purposes. C. Develop & maintain partnerships and reporting agreements with service agents to improve reporting accuracy and efficiency.	• Consistency. • Improved data entry efficiencies and storage within a central database. • Improved access to information for strategic planning • Improved servicing and reporting. • Improved availability of data for use in decision making. • Better access to information by owners and other stakeholders.
2	Better utilise ICT tools to efficiently collect and store wastewater data.	A. Maintain a relevant and accurate web page, with and links to/from relevant external pages. B. Cross reference wastewater licence information with other relevant permit controls, e.g. building or planning permits. C. Utilise “in the field” data management and communication tools. D. Investigate suitable data sources for groundwater levels, soil types, effective transpiration rates and treatment ability to identify high-risk areas. E. Investigate costs and potential benefits of GIS based wastewater mapping system including retrospective data entry.	• Improved data for strategic planning and decision making. • Streamlined process to reduce administration burden. • Consistent application of wastewater management legislation policy applied. • Improved reporting and hazard analysis. • Identification of exact location of septic tank systems using GPS technology.

2. Strategic Planning & Infrastructure Development

Plan for the long term sustainability of townships through appropriate development controls of land and infrastructure.

No.	*Strategies, Projects, Programs*	*Actions*	*Outcomes*
1	Reduce risks through available mitigation remedies.	A. Investigate health protection measures to address high-risk open and accessible contaminated storm water drains or ground waters. B. Seek improved maintenance and development of stormwater drainage in priority townships in partnership with Maintenance and Engineering Departments. C. Apply for funding opportunities as they arise to implement improvement options in priority townships.	• Where risks are identified, they are adequately mitigated. • Stormwater does not interfere with onsite wastewater management. • Discharges from stormwater systems are improved to protect environmental values. • Subsidies obtained for improvements in priority townships.
2	Investigate alternative, community scale treatment systems for priority townships, and availability of funding.	A. Investigate innovative and sustainable community scale or onsite wastewater treatment and water cycle management solutions in partnership with key stakeholders.	• Shovel ready projects developed ready for funding and implementation. • Subsidies are obtained for improvements in priority townships.
3	Liaise with appropriate departments to ensure that planning and infrastructure proposals adequately address wastewater management needs for townships.	A. Assess existing block density in un-sewered townships and investigate options to reduce density to sustainable levels. B. Develop clear policy guidelines for future developments within un-sewered townships and for un-sewered allotments within sewered townships. C. Review Planning Scheme and other relevant Council policies to identify opportunities for improvements to existing wastewater management clauses and/or policies. D. Continue to investigate and update appropriate design standards for high risk townships so as to inform any future improvement plans.	• Sustainable and safe concentration of wastewater disposed of within townships. • Clarified requirements for development within un-sewered townships. • Consistent direction given as to wastewater management requirements across Council. • Design standards developed and implemented for high risk townships. • Inappropriate developments refused.

3. Regulatory Management

To influence the regulatory framework in which Council must operate to manage wastewater and develop Council policy and procedures utilising available tools.

No.	Strategies, Projects, Programs	Actions	Outcomes
1	Influence and assist Government agencies and other stakeholders to improve the regulatory framework within which Council operates.	A. Seek the development and implementation of improved wastewater management legislation and guidelines. B. Influence government agencies to better coordinate wastewater and water supply policy and legislation. C. Work with EPA Victoria to facilitate improved designs for high risk areas, such as coarse sand and heavy clay.	• Improved relationships with government agencies and potential funding bodies. • Improved capability to implement wastewater management initiatives. • Improved understanding of high risk areas and best practice wastewater management.
2	Alternative or innovative uses of existing legislative provisions to enhance wastewater management processes.	A. Investigate options for applying controls to bore installation and use in sandy soil townships. B. Review wastewater management controls for temporary or seasonal use facilities (Building sites, festivals, camping on private land).	• Better coordination of policy and legislation to protect public health. • Reduced impact on amenity, environmental and public health from use of temporary or seasonal use facilities.
3	Develop Council wastewater policy through evidence based investigation.	A. Investigate funding options to undertake Land Capability Assessments of priority townships and implement findings into Council strategic and statutory policies and programs. B. Where appropriate, standardise guidelines and processes with neighbouring Councils, and water authorities. C. Conduct targeted monitoring of storm water systems, surface waters and ground waters in high risk areas.	• Better information for decision making and educational activities. • Consistency in regulation across the region. • Improve service delivery. • Improve compliance with relevant legislation & policy.

. 4. Education and Community Consultation

Provide fair, accurate and accessible information on good wastewater management principles, practices and improvement options.

No.	*Strategies, Projects, Programs*	*Actions*	*Outcomes*
1	Raise profile of wastewater system operation and maintenance requirements within the municipality and region.	A. Attend the SGSC Sustainability Festival and other relevant community events to promote wastewater management best practice B. Implement targeted education campaigns to property owners, occupiers and agents in high-risk areas at appropriate times. C. Provide readily accessible wastewater management information in hard copy and web based format.	• Improved access to information and raised awareness in the community. • Risks to health and the environment from poor wastewater management are reduced. • Improved understanding • Improved management of septic tank systems and reduction of associated problems during peak use times, such as school holidays.
2	Provide regular opportunities to improve community and stakeholder understanding and support of improved wastewater management projects and programs.	A. Develop and implement an ongoing community education program. B. Provide information on septic tank system best practice to property owners via community outlets and Council publications. C. Liaise with communities and local water authorities to progress community sewerage, where appropriate. D. Work with EPA, Water Authorities, CMAs and other interested stakeholders to achieve shared goals.	• Owners and operators of septic tanks are informed and engaged in the management of their systems. • Increased awareness of basic septic tank maintenance requirements and wastewater management issues. • Communities engaged in improvement process with key agencies to progress improvement. • Stakeholders engaged in improvement projects with each other to progress improvement.

. 5. Compliance Management

To implement an efficient and comprehensive program of education, facilitation and enforcement to ensure property owners fulfil their responsibilities for the maintenance of their on-site wastewater systems so as to prevent public health or environmental risks.

No.	*Strategies, Projects, Programs*	*Actions*	*Outcomes*
1	Implement an education and facilitation program to assist property owners to understand and comply with their legal responsibilities for monitoring and maintenance of their wastewater systems.	A. Utilise web-based and hard copy information to promote correct maintenance of wastewater systems B. Publish contact lists of appropriate servicing agents. C. Send reminders to all owners requiring annual service contracts or 3 yearly de-sludging of primary systems.	• Property owners informed and educated on their wastewater management responsibilities. • Property owners assisted to identify and contact appropriate servicing agents.
2	Improve electronic data capture and storage to maximise administrative efficiencies and assist in appropriate targeting of resources.	A. Update existing hard copy records onto Council's electronic database. B. Establish efficient reporting mechanisms for service agents and home owners.	• Improved data to efficiently manage education and compliance program. • Wastewater management administration costs minimised in the medium to long term.
3.	Establish an audit and enforcement program to ensure that property owners and service technicians or agents adequately fulfil their respective responsibilities	A. Implement a system to follow-up on owners who fail to maintain service contracts – refer Appendix B. B. Review service reports and follow-up any reported failures – refer Appendix C. C. Implement an audit program to confirm accuracy of service reports and wastewater treatment system performance.	• Property owners comply with their wastewater management responsibilities. • Increased confidence in quality and accuracy of service reports. • Performance of treatment system types and service technicians monitored. • Improved data on performance of treatment plant systems and disposal fields.

4. TOWNSHIP MANAGEMENT PLANS

Bena

Overview

Bena is located along a ridge in the Strzelecki Ranges west of Korumburra. The Bena district covers an area of approximately 30 square kilometres.

The township core is zoned Township (business and residential). This area covers approximately 0.08 square kilometres and currently has approximately 50 properties. Of these properties an estimated 20 have been developed. The population is fairly static and is not generally subject to seasonal variation during holiday periods.

The elevation of the residential area is between 220 and 230 metres with gradient between 1 in 4 and 1 in 20.

Current wastewater management

It is assumed that due to the age of the properties, most of the township is serviced by toilet only septic tank systems, with the grey water connected to the constructed storm water piped system. A more detailed investigation of our records will be required to confirm this assumption.

Recommended Improvement Option

This township is not likely to be viable for sewerage implementation or for full onsite containment of treated wastewater. This is due to the reasonably sized allotments and small population within the township. Commencement of improved maintenance of existing systems and investigation of a Stormwater Remediation Project is recommended.

Dumbalk

Overview

Dumbalk is located north-east of Meeniyan and is within the Tarwin River east catchment, which supplies water to the township and its downstream neighbour Meeniyan. Dumbalk is within 1-2 kilometres of the Tarwin River East Branch and is between 40 to 60 metres above sea level.

The grade within Dumbalk varies from 1 in 8 to 1 in 44. The township consists of 0.1 square kilometres of Township Zoned land and 0.04 square kilometres of Low Density Residential Zoned land to the west of the township zone. The township is not subject to seasonal population variations with most properties being permanently occupied and supports a population of 412 (ABS, Census, 2011). The township is serviced with reticulated water.

Current wastewater management

Dumbalk typically has good soil for onsite treatment and disposal of wastewater however the blocks are small and generally highly developed.

An audit of 100 properties conducted by South Gippsland Water in 2007,[35] found that approximately 41% of properties are all waste septic tank systems that were fairly wet and some are showings signs of failure such as effluent pooling. Approximately 34% are serviced with toilet only septic tank systems, with the grey water connected to the constructed storm water system. The grey water is mostly discharged to the creek which runs adjacent to the township and is connected to the Tarwin River. Approximately 8% are serviced with worm farm systems or Mechanical Treatment Plants, problems with which were not reported.

Recommended Improvement Option

Some interest exists within the Dumbalk community to consider sewerage to increase development potential of the township. Investigation of a Common Effluent Disposal sewerage design incorporating beneficial reuse options was undertaken in 2005 under the previous State Government's Innovations Project. Implementation of the design was considered to be economically unviable.

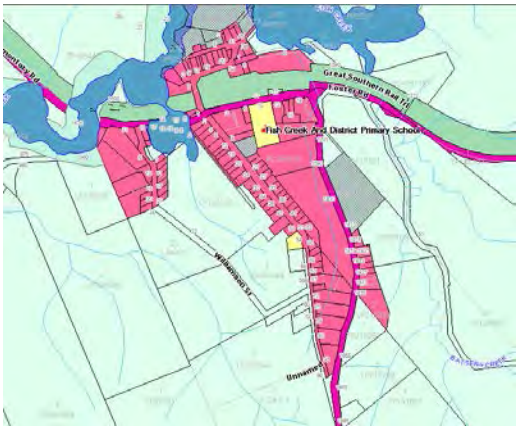
This township is not likely to be viable for sewerage implementation. Commencement of improved maintenance of existing systems and investigation of small scale contaminated storm water treatment is recommended.

Storm water quality should also be monitored, in collaboration with the community to assess impacts to the adjacent water ways and determine further works that may be required for its protection.

Fish Creek

Overview

Fish Creek is located approximately 15 kilometres south east of Meeniyan and 10 kilometres south west of Foster. It is between 50 and 80 metres above sea level and an area of significant rural lifestyle area in an existing farming community of 791 persons (ABS, Census, 2011).



Fish Creek town centre covers approximately 0.3 square kilometres and is adjacent to the Fish Creek. The town centre consists of a vibrant commercial area, houses and services such as churches, recreation facilities, hotel/motel and school. Approximately 80% of the estimated 120 existing allotments are developed, providing little opportunity to expand without further rezoning and subdivision of land. The occupancy of Fish Creek is generally static with some small increases from tourism during holiday periods. The township is serviced with reticulated water.

The soil in the area generally consists of clay and is subject to groundwater springs. The lower areas of the township are also subject to seasonal flooding, damaging residential properties and road infrastructure.

[35] Casey Services (Aust) Pty Ltd for SGW, Dumbalk Sewerage Scheme Property Audits – Final Report, July 2007.

Current wastewater management

Council has reviewed available information on the systems installed within Fish Creek. The township is mostly serviced with toilet only septic tank systems with connection of grey water to open storm water curb and channels and pipes. This storm water is discharged to the Fish Creek which is part of the Tarwin River catchment.

The presence of grey water in the street curb and channels is a risk to public health as well as subsequent environmental risk once it reaches the nearby open drainage system and the Fish Creek. The amenity within the township is adversely affected by the stagnating grey water, creating offensive odours, particularly during the warmer summer months.

A Land Capability Assessment has been undertaken for the township which determined that many allotments are too small for onsite treatment and disposal without significant special design and cost.[36]

As a general rule allotments smaller than 1000 m^2 will require the completion of an individual Land Capability Assessment to meet best practice. For other allotments, the minimum design standard required for a three bedroom home (580L day) is as follows:

- Provision of a **wastewater management envelope** (includes reserve area) which is at least **500 m^2**. Reserve area may be reduced with special assessment and approval;
- **Secondary Treatment** of effluent discharged to a minimum of **203 m^2 drip irrigation (1 m centres);**
- Application of ½ kg/m^2 of gypsum to effluent disposal area; and
- Diversion of all storm water from effluent disposal area.

Best practice would also include:

- Water fittings and appliances to be a **minimum of 3 star WELS** (Water Efficiency Labelling & Standards).
- Advanced secondary treatment systems with disinfection.
- Household reuse of advanced secondary treated effluent.

Recommended Improvement Option

The community, through consultation and community planning activities, has indicated a strong interest in the implementation of offsite wastewater management for the township, being sewer or suitable alternative. This is understood to be a response to odour problems experienced during summer, generated by grey water discharges to the storm water drains and possible septic tank system failure.

Storm water quality should also be monitored to assess impacts to the adjacent water ways to provide further information on current risks.

Due to the number of allotments unable to sustainably contain wastewater within their boundaries and the resultant amenity and public health risks, the township requires the provision of sewer.

In the absence of a sewerage service, commencement of improved maintenance of existing systems and investigation of small scale contaminated storm water treatment is recommended.

[36] EWS Environmental P/L, *Land Capability Assessment for Onsite Wastewater Management – Township of Fish Creek, May 2008*

Jumbunna

Overview

Jumbunna is a small township located approximately six kilometres south west of Korumburra in the Strzelecki Ranges at approximately 200 metres above sea level.

The town centre includes 0.07 square kilometres of Township Zoned land consisting of approximately 15 houses. The soil is generally clay and the area is known to contain groundwater springs.

Current wastewater management

It is assumed that many of the systems within the township are older septic tanks systems. The presence of medium to heavy clay and ground water springs in the area is expected to make effective septic tank system operation difficult during times of high rainfall.

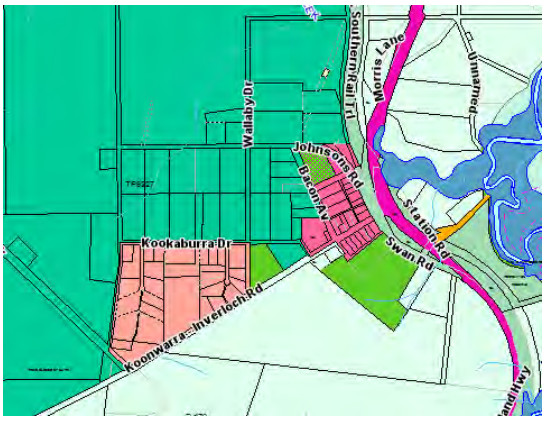
Recommended Improvement Option

The township will benefit from improved maintenance of existing systems with replacement of systems where failure to meet performance standards is established.

Koonwarra

Overview

Koonwarra is located approximately seven kilometres south of Leongatha and covers approximately 37 square kilometres. The township is within the Tarwin River west branch catchment and is between 40 to 70 metres above sea level. The approximate grade of the area ranges from 1 in 8 to 1 in 14. The township is adjacent to large areas of swampland and is located approximately 600 metres from the Tarwin River west branch.



The town centre consists of approximately 0.1 square kilometres of Township Zoned land and 0.2 square kilometres of Low Density Residential Zoned properties to the south west. Stock sale yards, servicing South Gippsland are located on the South Gippsland Highway to the north of the township. There is limited opportunity for infill development within the town and further expansion of the township is unlikely without the provision of sewer.

The population is generally permanent occupancy of 385 (ABS, Census, 2011) with additional loadings from tourists visiting the townships shops and/or accommodation premises. A 'farmers market' is also held in the township once per month.

Current wastewater management

The majority of properties are serviced with all waste septic tank systems. Approximately 30% are serviced by toilet only septic tank systems and 10% are serviced by secondary treatment systems

where the soil is considered to be poor, consisting of clay including a substance known as coffee rock, which is highly problematic for wastewater treatment and disposal.

The presence of clay and ground water springs in the area has meant effective septic tank system operation is problematic during times of high rainfall.

Recommended Improvement Option

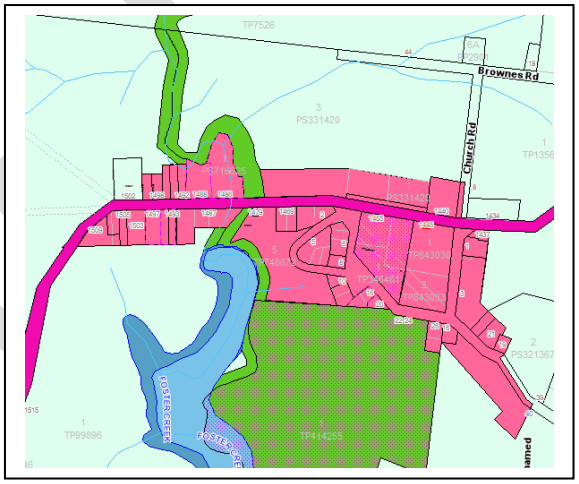
The township requires improved maintenance of existing systems. This includes upgrading of existing systems where performance standards cannot be met.

Storm water quality should also be monitored to assess impacts to the adjacent water ways, including the Tarwin River.

A future connection to the Leongatha Wastewater Management Treatment Facility could be investigated if sufficient community interest is shown.

Kongwak

Overview



Kongwak is located approximately 13 kilometres south west of Korumburra and covers approximately 28 square kilometres. The township is between 60 and 80 metres above sea level and is within the Powlett River catchment which discharges directly to Bass Strait. The grades range from 1 in 3 to 1 in 40 along the Powlett River Basin.

The Foster River cuts directly through the centre of the township and receives storm water likely to be contaminated with some grey water.

The population is generally permanent occupancy but visitation increases during the weekly Sunday craft and collectables market. A primary school, community hall and an art gallery service the township and surrounding areas. Some light industrial and commercial businesses operate on the south-eastern edge of the township.

Current wastewater management

It is assumed that most of the existing properties are serviced with all waste septic tank systems. A more detailed investigation of our records will be required to confirm this assumption. A small number of properties have been provided with secondary treatment systems due to constrained property conditions.

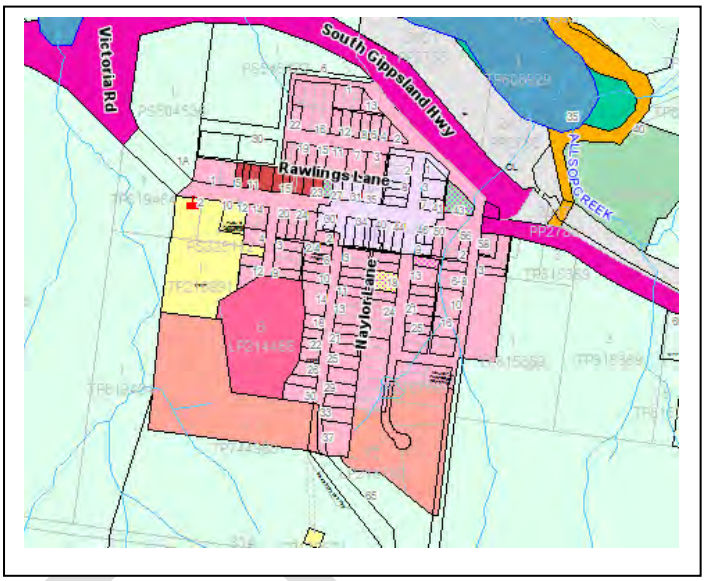
Recommended Improvement Option

The township requires improved maintenance of existing systems. This includes upgrading of existing systems where performance standards cannot be met.

Storm water quality should also be monitored to assess impacts to the adjacent water way, possibly in collaboration with the local community.

Loch

Overview



The township of Loch is located within moderately sloped terrain and supports 172 persons (ABS, 2006). The outlying northern residential area is separated from the township by the South Gippsland Highway bypass. The residential area is between 110 and 130 metres above sea level and is within a single water catchment linked to the Bass River, approximately 0.5 kilometres north of the township. The township is serviced with reticulated water.

A significant proportion of the Township Zone consists of lot sizes too small to meet current land capability requirements (Earthtech Report, 2003 and EPA, *Land Capability Assessment, Publication 746.1*, March 2003 and *Septic Tank Code of Practice, Publication 891*, March 2003).

The soil type in the township and fringe areas is generally clay that does not allow adequate drainage capability. There are land stability problems on rural land around the township.

A series of storm water sampling conducted in 2001 and 2004 by Council found high levels of bacteria (*E coli* and faecal *Streptococcus*) indicating that it is regularly contaminated by wastewater and is therefore posing a risk to the local environment and public health.

The Loch Structure Plan of 2011 identifies that "on-site retention and treatment of waste water, …. has been a restriction on development" as well as steep slopes. Growth has also been restricted by the need for "extensions to reticulated water, storm water, roads, energy and telecommunications services". It recommends that the existing Township Zoned land is able to accommodate the potential growth. Any further development "should occur through a carefully staged process and radiate outwards from existing development" and must not occur until reticulated sewerage is available[37].

Current wastewater management

An audit conducted of 139 properties by South Gippsland Water in 2007,[38] found that approximately 50% of properties are all waste septic tank systems that were fairly wet and some are showings signs of failure such as effluent pooling. Approximately 50% are serviced with toilet only septic tank systems, with the grey water connected to paddocks or open street storm water drains.

The contaminated storm water is carried by larger open storm water drains to the Bass River which discharges to the Westernport which is an area of national significance and recreational water activity, including significant fishing opportunities.

Recommended Improvement Option

Following recommendation by Council and significant community consultation, a sewerage service is planned for implementation (along with Nyora and Poowong) in 2017.

[37] Planisphere, **Loch Structure Plan**, South Gippsland Shire, 2011, p 2, 10

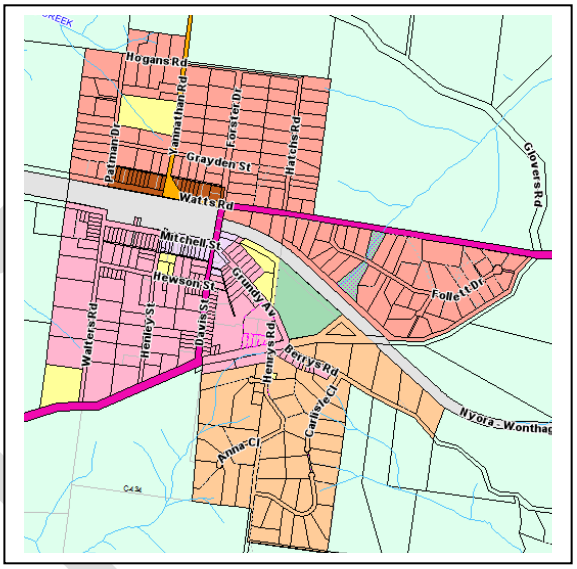
[38] Casey Services (Aust) Pty Ltd for SGW, Loch Sewerage Scheme Property Audits – Final Report, February 2007.

This scheme is substantially subsidised by the Victorian Government and South Gippsland Water under the then Small Town Water and Sewerage Supply Program. Owners will be required to pay house connection costs of approximately $2500 and a contribution of $800 to develop the scheme (which may be paid over 20 years to SGW).

In the lead up to sewerage service implementation, commencement of improved maintenance of existing systems and upgrade where required is recommended.

Nyora

Overview



Nyora is located within undulating terrain and is divided by the South Gippsland Railway line (currently disused). The residential area is between 110 and 130 metres above sea level. It is the closest town in the South Gippsland Shire to employment opportunities in Melbourne's south-eastern growth corridor. The township is serviced with reticulated water.

Nyora township is built upon mostly heavy clay soils with some patches of well draining soils and sand in some fringe areas of the town. The residential area is within approximately five separate water catchments, which service a population of 1332 (ABS, Census, 2011) comprising of household, farming and recreational uses.

A significant proportion of the township zone consists of lot sizes too small to meet current land capability requirements (Earthtech Report, 2003 and EPA, *Land Capability Assessment, Publication 746.1*, March 2003 and *Septic Tank Code of Practice, Publication 891*, March 2003). Many of the larger title estates in the township are more recent and have all waste septic tank systems, however there is evidence that suggests many of these are not maintained.

A series of storm water sampling conducted in 2001 and 2004 by Council found high levels of bacteria (*E.Coli* and faecal *Streptococcus*) indicating that it is regularly contaminated by wastewater, posing a risk to the local environment and public health.

The Nyora Structure Plan of 2011 identifies that development is "restricted by the absence of reticulated sewerage and the resulting reliance on 'on site' commercial and domestic waste water treatment systems". Growth is not only restricted by lack of sewerage and will also require "extensions to reticulated water, storm water, roads, energy and telecommunications services will also be required". It recommends that there be no further expansion of the General Residential Zone 1 until sewerage is provided and that generally development be discouraged in "areas susceptible to water logging"[39].

Current wastewater management

An audit conducted of 255 properties by South Gippsland Water in 2007,[40] found that approximately 62% of properties are all waste septic tank systems that were fairly wet and some are showings signs of failure such as effluent pooling. Approximately 24% are serviced with toilet only septic tank systems, with the grey water connected to paddocks or open street storm water drains. The contaminated storm water is carried by larger open storm water drains to the Bass

[39] Planisphere, **Nyora Structure Plan**, South Gippsland Shire, 2011, p 3-4, 10, 16

[40] Casey Services (Aust) Pty Ltd for SGW, Nyora Sewerage Scheme Property Audits – Final Report, April 2007.

River which discharges to the Westernport which is an area of national significance and recreational water activity, including significant fishing opportunities. Approximately 14% of properties were unable to be accurately assessed.

Recommended Improvement Option

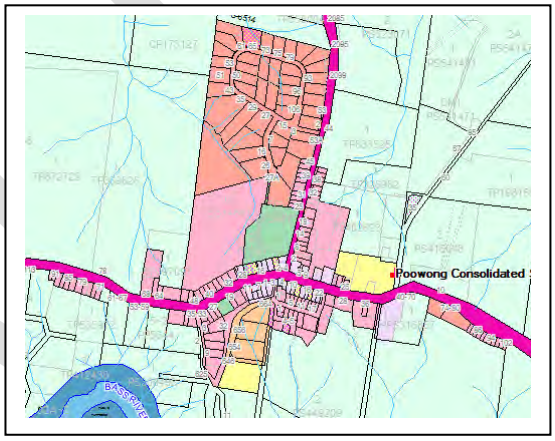
Following recommendation by Council and significant community consultation, a sewerage service is planned for implementation (along with Loch and Poowong) in 2017.

This scheme is substantially subsidised by the Victorian Government and South Gippsland Water under the then Small Town Water and Sewerage Supply Program. Owners will be required to pay house connection costs of approximately $2500 and a contribution of $800 to develop the scheme (which may be paid over 20 years to SGW).

In the lead up to sewerage service implementation, commencement of improved maintenance of existing systems and upgrade where required is recommended.

Poowong

Overview



The township of Poowong is located within steep undulating terrain servicing a population of 610 persons (ABS, Census, 2011). The main street is located on a ridge with residential zones on either side of the ridge. These residential properties are approximately 190 metres above sea level (Earthtech Report, 2003). Major industry in the area includes an abattoir to the northeast and a dairy factory to the east. The township is serviced with reticulated water.

The township discharges to a number of water catchments to the north and south. Some constructed storm water drains discharge to open drains through surrounding farmland servicing Poowong.

The Earthtech Report 2003 found that a significant proportion of the township zone consisted of lot sizes too small to meet current land capability requirements (EPA's Land Capability Assessment, Publication 746.1 March 2003 and Septic Tank Code of Practice, Publication 891, March 2003).

A series of storm water sampling conducted in 2001 and 2004 by Council found high levels of bacteria (*E.Coli* and faecal *Streptococcus*) indicating that it is regularly contaminated by wastewater and is therefore posing a risk to the local environment and public health.

The Poowong Structure Plan of 2011 identifies that "on-site retention and treatment of waste water, …. has been a restriction on development" as well as steep slopes and the need to maintain Industry buffer zones. Growth has also been restricted by the need of "extensions to reticulated water, storm water, roads, energy and telecommunications services". It recommends that the existing Township Zoned land is able to accommodate the potential growth. Any further development "should occur through a carefully staged process and radiate outwards from existing development" and must not occur until reticulated sewerage is available.[41]

Current wastewater management

An audit conducted of 161 properties by South Gippsland Water in 2007,[42] found that approximately 28% of properties are all waste septic tank systems that were fairly wet and some

[41] Planisphere, **Poowong Structure Plan**, South Gippsland Shire, 2011, p 2, 11

[42] Casey Services (Aust) Pty Ltd for SGW, Poowong Sewerage Scheme Property Audits – Final Report, March 2007.

are showing signs of failure such as effluent pooling. Approximately 72% are serviced with toilet only septic tank systems, with the grey water connected to paddocks or open street storm water drains.

The contaminated storm water is carried by larger open storm water drains to the Bass River which discharges to the Westernport which is an area of national significance and recreational water activity, including significant fishing opportunities.

Recommended Improvement Option

Following recommendation by Council and significant community consultation, a sewerage service is currently under construction as part of the Loch, Nyora, Poowong Sewerage Scheme.

This scheme is substantially subsidised by the Victorian Government and South Gippsland Water under the then Small Town Water and Sewerage Supply Program. Owners will be required to pay house connection costs of approximately $2500 and a contribution of $800 to develop the scheme (which may be paid over 20 years to SGW).

In the lead up to sewerage service implementation, commencement of improved maintenance of existing systems and upgrade where required is recommended.

Port Franklin

Overview

Primarily a fishing village, Port Franklin is located approximately seven kilometres southeast of Foster in the eastern region of the Shire. It supports a static population of approximately 115 persons (ABS, 2006) and is subject to small to medium seasonal variation. Some further infill development is available with further development of the township unlikely without rezoning of adjacent farming land. The township is serviced with reticulated water.

It is located immediately adjacent to the Franklin River and Corner Inlet at approximately sea level. The soils are generally clay and marine sediments offering poor wastewater treatment capability.

The South Gippsland Eastern District Urban Design Framework 2011 project engaged the communities of **Port Franklin** and identified a desire to "improve the town's amenity value and protect the environment of Corner Inlet by improving the quality of wastewater discharged from development in the town". It also suggested that "development within the township be discouraged in the absence of sewer". [43]

Current wastewater management

A mix of toilet only and all waste septic tank systems have been installed in the township. Grey water is connected to the storm water drains, many of which are not piped, and then discharged directly to Corner Inlet through the adjacent mangrove swamp.

Residents have advised that odour problems exist within the township during the warmer summer months.

[43] Planisphere, *South Gippsland Eastern District Urban Design Frameworks*, South Gippsland Shire Council, 2011.

Council has not undertaken any testing of the storm water system but it is likely the storm water will contain bacterial contamination.

Recommended Improvement Option

The township requires improved maintenance of existing systems. This will include the upgrade of existing systems where performance standards cannot be met.

Storm water quality should also be monitored to assess impacts to the adjacent Corner Inlet.

It is possible that the community may support the development and implementation of a sewerage service to the township and the proximity to the Toora Wastewater Management Treatment Facility may prove a cost effective option.

The investigation of a connection to the Toora Wastewater Management Treatment Facility should be considered if sufficient community interest is shown.

Sandy Point

Overview

Sandy Point is a coastal township that is a popular summer vacation location. The township's population of 197 (ABS, Census, 2011) is subject to high seasonal fluctuations from holiday makers. Most of the property owners (89%) do not live within the municipality and are likely to require information on septic tank management.

Approximately 618 of the 774 allotments are developed and occupied. It is serviced by a takeaway shop, real estate, a caravan park and receives a rubbish collection service.

The township is adjacent to the significant coastal park along Waratah Bay to the south and Shallow Inlet to the north-east. The soil is generally coarse sand and the groundwater level is quite shallow.

The Urban Design Framework Settlement Background Paper Sandy Point in 2006 identified that expected population growth will place "pressure on environment if infrastructure is not adequate and causes seepage of septic systems into water ways and stormwater runoff into estuaries". It identifies that the currently "available infrastructure is a major impediment to any further development" along with impacts relating to poor drainage & flooding along the north boundary of the town and Sandy Point Road, acid-sulphate soils to north of township, cultural heritage and environmental significance sites and that adequate land stock is currently available in the short term.

It directs that future development should be confined to infill of lots within the existing boundary of the village and any expansion be subject to a series of development prerequisites, including those previously mentioned. [44]

[44] Connell Wagner, Urban Design Framework Settlement Background Paper Sandy Point, South Gippsland Shire, 2006, p 15 & 46

Current wastewater management

Significant development of allotments since the mid 1990's has resulted in approximately 20% of properties now being provided with a secondary treatment system. The remaining properties are most likely provided with either a toilet only or all waste septic tank system.

The grey water from the properties serviced with toilet only systems is discharged into soak pits which leaches directly to the ground water. In addition, the length of trench installed during the 1970 and 80s is not likely to be able to sufficiently retain water in soil to enable transpiration of effluent by plants.[45]

The amount of wastewater generated is likely to increase substantially during the holiday periods with properties often reaching or exceeding expected occupancy levels. There is also a trend towards a higher level of permanent occupancy. This places an increased pressure on existing systems to adequately treat and dispose of wastewater. This is likely to increase contamination of ground water.

Ground water quality studies since the 1990's have indicated that this has occurred. In response, Southern Rural Water recommended that septic tank system management be improved. Council has installed signage warning visitors that the bore water is not suitable for human consumption. Ongoing and regular monitoring of bore water is required to firmly establish that septic tank systems are adversely affecting ground water quality.

Recommended Improvement Option

Due to the proximity and use of the ground water for household uses in the area, the township must commence improved maintenance of existing systems as a priority. This may include the upgrade of existing systems where performance standards cannot be met and sewer is not available.

A Land Capability Assessment has been undertaken for the township which determined that some allotments are too small for onsite treatment and disposal without significant special design and cost.[46] The minimum design standard required for a three bedroom home (460L day) is as follows:

- **Secondary Treatment** of effluent discharged to a minimum of **250 m^2 drip irrigation (0.6 m centres)**; or
- Advanced secondary treatment systems discharged to a minimum of **160 m^2 drip irrigation**; and
- Ground Water **Bores** must be at least 20 **metres** from effluent disposal area/s.

Best Practice would also include:

- Water fittings and appliances to be a **minimum of 3 star WELS** (Water Efficiency Labelling & Standards).
- Household reuse of advanced secondary treated effluent.
- Disinfection of treated effluent.

Ground water quality monitoring of property bores (particularly shallow ones) should also be undertaken to determine the extent of impacts from septic tank systems. This should be conducted in addition to audits of septic tank systems that will provide further information on the types of systems installed and their suitability.

[45] Sample study of Venus Bay systems installed indicated the typical sizes approved within various timeframes.

[46] Wastewater Management in Coastal Settlements of Gippsland Project, Part 2: Report on Strategies for Domestic Wastewater in Gippsland, 2004

It is possible that the community may support the development and implementation of a sewerage service to the township if risks to ground water quality and public health are clearly identified. The proximity to the Waratah Bay Wastewater Management Treatment Facility may prove a cost effective option as its development considered a future connection servicing Sandy Point in the future, if required.

The investigation of a connection to the Waratah Bay Wastewater Management Treatment Facility should be considered if evidence of significant risks is discovered and sufficient community interest is shown.

Stony Creek

Overview

Stony Creek is located approximately two kilometres to the south east of Meeniyan and approximately 50 metres above sea level. The blocks range between 1000 to 3000 square metres in a grid around the rail trail which would have been the original town centre when the train was still in use. It supports a mostly static population of 446 (ABS, Census, 2011) and is well known for regular horse races at the Stony Creek Racecourse. It is located adjacent to the popular South Gippsland Rail Trail that runs between Leongatha and Foster.

The soil is generally poor for wastewater management, having high clay content and is subject to groundwater springs. It is generally accepted that secondary treatment is required to reduce the irrigation areas to around 1000 square metres.

Current wastewater management

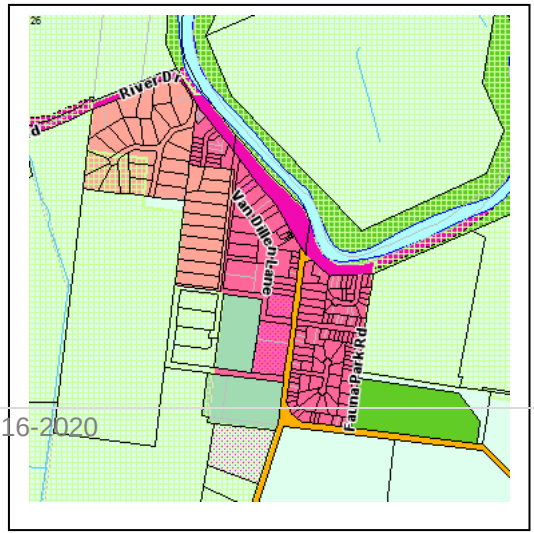
The majority of septic tank systems installed are all waste systems with some secondary treatment systems installed in recent years to address difficult site conditions, including wet clay soils.

Recommended Improvement Option

The township requires improved maintenance of existing systems. This may include the upgrade of existing systems where performance standards cannot be met.

Storm water quality should be monitored to assess impacts to the adjacent waterways, including the Tarwin River.

It is possible that in the future the community may support the development and implementation of a sewerage service to the township and the proximity to the Meeniyan Wastewater Management Treatment Facility may prove a cost effective option.



The investigation of a connection to the Meeniyan Wastewater Management Treatment Facility should be considered if sufficient community interest is shown.

Tarwin Lower

Overview

Tarwin Lower was settled along the lower Tarwin River, primarily as a service township for the surrounding

farmland. It consists of 381 allotments over a Township Zoned area of 0.03 square kilometres and supports a population of 363 (ABS, Census, 2011). On the western edge is 0.01 square kilometres of Low Density Residential Zoned land.

It is surrounded by a flood plain and serviced by a primary school, service station, commercial businesses including takeaway, hotel, motel and a golf course on the north-eastern edge. It is located immediately adjacent to the lower Tarwin River and is an increasingly popular vacation area, attracting fishing enthusiasts and canoeists.

The Urban Design Framework Settlement Background Paper Tarwin Lower in 2006 identified that expected population growth will place "pressure on environment if infrastructure is not adequate and causes seepage of septic systems into water ways and stormwater runoff into estuaries".

It identifies that the currently "available infrastructure is a major impediment to any further development" along with impacts relating in particular to flooding along Tarwin River and acid-sulphate soils as well as cultural heritage and environmental significance sites and that adequate land stock is currently available in the short term.

It directs that future development should be confined to infill of lots within the existing boundary of the township and any expansion be subject to a series of development prerequisites, including those previously mentioned. [47]

Current wastewater management

The majority of properties are serviced with all waste septic tank systems. Approximately 30% are serviced by toilet only septic tank systems and 30% are serviced by secondary treatment systems. The remainder are likely to be all waste septic tank systems.

Recommended Improvement Option

The township requires improved maintenance of existing systems as a priority to mitigate contamination during flood events to the Tarwin River and nationally recognised Anderson's Inlet. This may include the upgrade of existing systems where performance standards cannot be met.

A Land Capability Assessment has been undertaken for the township which determined that many allotments are too small for onsite treatment and disposal without significant special design and cost.[48] As a general rule allotments smaller than 1000 m^2 will require the completion of an individual Land Capability Assessment to meet Best Practice. For other allotments, the minimum design standard required for a three bedroom home (580L day) is as follows:

- Provision of a **wastewater management envelope** (includes reserve area) which is at least **450 m^2**. Reserve area may be reduced with special assessment and approval;
- **Secondary Treatment** of effluent discharged to a minimum of **250 m^2 drip irrigation (0.6 m centres)**;
- Properties west of School Road will require assessment for flooding potential and impact;
- Ground Water **Bores** must be at least **20 metres** from effluent disposal area/s; and
- Diversion of all storm water from effluent disposal area.

Best Practice would also include:

- Water fittings and appliances to be a **minimum of 3 star WELS** (Water Efficiency Labelling & Standards).

[47] Connell Wagner, Urban Design Framework Settlement Background Paper Tarwin Lower, South Gippsland Shire, 2006, p 13, 26-29 & 42.

[48] EWS Environmental P/L, *Land Capability Assessment for Onsite Wastewater Management – Township of Fish Creek, May 2008*

- Advanced secondary treatment systems with disinfection.
- Household reuse of advanced secondary treated effluent.

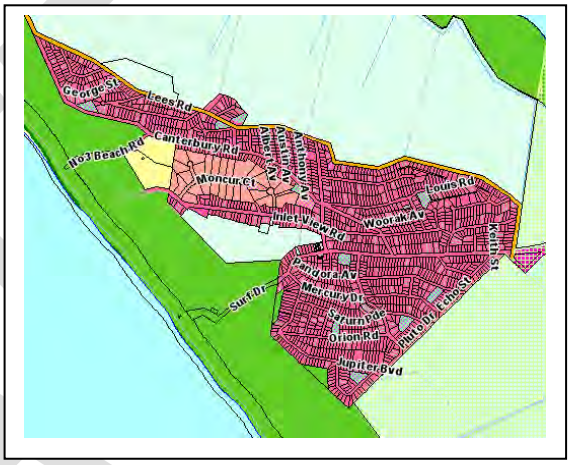
Stormwater quality should also be monitored to assess impacts to the adjacent river and inlet. This should be conducted in addition to audits of septic tank systems that will provide further information on the types of systems installed and their suitability.

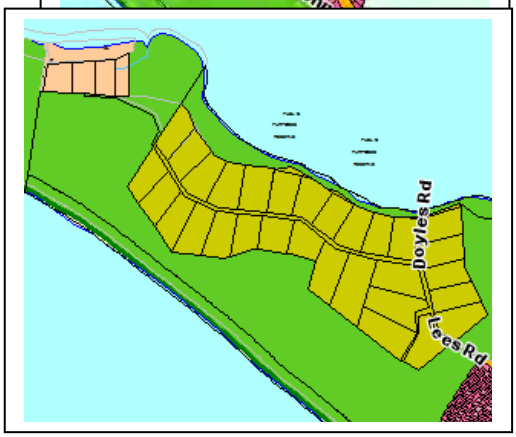
It is possible that the community may support the development and implementation of a sewerage service to the township if risks to ground water quality and public health are clearly identified.

The investigation of a sewerage scheme including a new Wastewater Management Treatment Facility should be considered if evidence of significant risk is discovered and sufficient community interest is shown.

Venus Bay

Overview





Venus Bay township is a coastal settlement of 2314 allotments and 1586[49] dwellings. The township is divided into three separate estates spanning Venus Bay, the adjacent coastal park to the south and Anderson's Inlet to the north. The township is serviced by takeaway stores, real estate agents and a small supermarket to support a population of 589 people.[35] No town water is supplied but groundwater is available for household uses, excluding drinking.

The township is a holiday destination and subject to high seasonal popluation fluctuations. Most property owners (89%) do not live within the municipality and are likely to require information on septic tank management.

The median age is 54 years and it has one of the highest lone person households in the Shire, being 42.4%. This is significant for wastewater management as older persons are generally more susceptible to infectious diseases. It is also reasonable to assume that single persons are less likely to be able to pay for capital improvements to their wastewater management systems. This assumption is supported by the median weekly household income for the locality is $544.[35]

Three bedrooms dwellings make up 57.1% of all dwellings. However, the average occupancy per household within the locality is only 1.8, meaning there is significant potential for an increase in current wastewater flows within the township.[35]

The land is generally coarse sand and the groundwater level is quite shallow.

The Urban Design Framework Settlement Background Paper Venus Bay in 2006 identified that expected population growth will place "pressure on environment if

[49] ABS, Census 2011 - **Venus Bay Quick Stat**, 2011.

infrastructure is not adequate and causes seepage of septic systems into water ways and stormwater runoff into estuaries". It identifies that the currently "available infrastructure is a major impediment to any further development" along with impacts relating to acid-sulphate soils, cultural heritage and environmental significance sites and that adequate land stock is currently available.

It directs that future development should be confined to infill of lots within the existing boundary of the township's estates and any expansion be subject to a series of development prerequisites, including those previously mentioned [50].

Current wastewater management

Significant development of allotments since the mid 1990's has resulted in approximately 30% of properties now being provided with a secondary treatment system. The remaining properties are most likely provided with either a toilet only or all waste septic tank system.

Grey water from the properties serviced with toilet only systems is discharged into soak pits which leaches directly to the ground water. In addition, the length of trench installed during the 1970s and 80s is unlikely to be able to sufficiently retain water in soil to enable transpiration of effluent by plants.[51]

The amount of wastewater generated is likely to increase substantially during the holiday periods with properties often reaching or exceeding expected occupancy levels. There is also a trend towards a higher level of permanent occupancy. This places an increased pressure on existing systems to adequately treat and dispose of wastewater. This is likely to increase contamination of ground water.

Ground water quality studies since the 1990's have indicated that this has occurred. In response, Southern Rural Water recommended that septic tank system management be improved. Council has installed signage warning visitors that the bore water is not suitable for human consumption. Ongoing and regular monitoring of bore water is required to firmly establish that septic tank systems are adversely affecting ground water quality.

Recommended Improvement Option

Due to the proximity and use of the ground water for household uses in the area, the township must commence improved maintenance of existing systems as a priority. This may include the upgrade of existing systems where performance standards cannot be met and sewer is not available.

A Land Capability Assessment has been undertaken for the township which determined that some allotments are too small for onsite treatment and disposal without significant special design and cost.[52] The minimum design standard required for a three bedroom home (460L day) is as follows:

- **Secondary Treatment** of effluent discharged to a minimum of **250 m^2 drip irrigation (0.6 m centres)**; or
- Advanced secondary treatment systems discharged to a minimum of **160 m^2 drip irrigation**; and
- Ground Water **Bores** must be at least 20 **metres** from effluent disposal area/s.

Best Practice would also include:

- Water fittings and appliances to be a **minimum of 3 star WELS** (Water Efficiency Labelling & Standards).

[50] Connell Wagner, Urban Design Framework Settlement Background Paper Venus Bay, South Gippsland Shire, 2006

[51] Sample study of Venus Bay systems installed indicated the typical sizes approved within various timeframes.

[52] Wastewater Management in Coastal Settlements of Gippsland Project, Part 2: Report on Strategies for Domestic Wastewater in Gippsland, 2004

- Household reuse of advanced secondary treated effluent.
- Disinfection of treated effluent.

Ground water quality monitoring of property bores (particularly shallow ones) should also be undertaken to further determine the extent of impacts from septic tank systems. This should be conducted in addition to audits of septic tank systems that will provide further information on the types of systems installed and their suitability.

It is possible that the community may support the development and implementation of a sewerage service to the township if risks to ground water quality and public health are clearly identified.

The investigation of a sewerage scheme including a new Wastewater Management Treatment Facility should be considered if evidence of significant risk is discovered and sufficient community interest is shown.

Walkerville

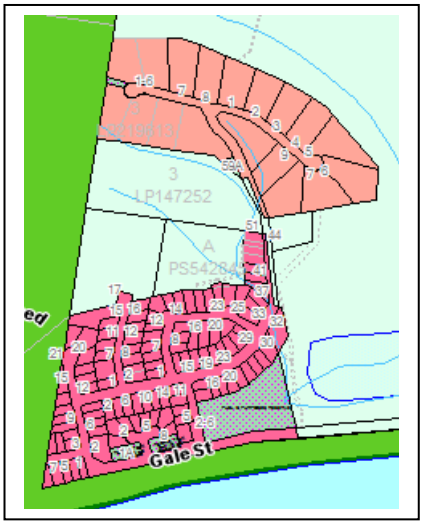
Overview

Promontory Views is a small settlement located approximately 800 metres inland above Waratah Bay and is approximately 100 metres above sea level. Its population is subject to seasonal variation. The soil type is patchy, being a combination of sand and clay and subject to perched groundwater as indicated by observations of yabby burrows on some properties.

The Estate is quite different in location and development to the area commonly known as Walkerville North which lies along the edge of Waratah Bay to the south of the Waratah Bay township. Adjacent to the privately owned properties, which are a maximum of 10 metres above sea level is the Cape Liptrap Coastal Park. The area is subject to significant seasonal population variation. The soil type is generally clay to sand depending upon distances from the beach.

Walkerville (North) is serviced with a Caravan and Camping Ground adjacent to the beach and a small kiosk.

The Areas Between Settlements, Coastal UDF 2006 project sought to determine the "capacity of each settlement in relation to its environment and capacity to sustain growth" and "direct and manage development and infrastructure pressures into defined settlement areas". It identifies "inappropriate subdivisions" and "existing developments with poor services" as problem "hotspots" and discourages growth of existing settlements (i.e. Walkerville and Promontory Views)[53].



Current wastewater management

Nearly half (46%) of the systems installed in Walkerville are secondary treatment systems. A number of toilet only systems exist within the township and grey water from these properties is discharged to the constructed stormwater system.

There are104 vacant undeveloped residential lots. The area

[53] Connell Wagner, **Areas Between Settlements, Coastal UDFs**, South Gippsland Shire Council, 2006, p25

is predominantly a holiday location, with periods where full occupancy is expected to be reached and sometimes exceeded.

The storm water from the Prom Views Estate is transported to a retarding basin on the north boundary of the settlement and is used by the neighbouring farmer for stock watering purposes. Council monitors the quality of this storm water on a regular basis.

Recommended Improvement Option

The township requires improved maintenance of existing systems. This may include the upgrade of existing systems where performance standards cannot be met.

A Land Capability Assessment has been undertaken for the Prom Views Estate[54] which determined that some allotments are too small for onsite treatment and disposal without significant special design and cost.[55] Identified medium and high risk sites will require special design through a site specific LCA. For other allotments, the minimum design standard required for a three bedroom home (580L day) is as follows:

- Provision of a **wastewater management envelope** (includes reserve area) which is at least **400 m^2**. Reserve area may be reduced with special assessment and approval;
- **Secondary Treatment** of effluent discharged to a minimum of:
    - **350 m^2 drip irrigation**; or
    - **79 metres of 700 mm effluent absorption trenches (2 m centres), evenly distributed under pressure**;
- Diversion of all storm water from effluent disposal area; and
- Application of 0.4 kg/m^2 of gypsum to effluent disposal area.

Best Practice would also include:

- Water fittings and appliances to be a **minimum of 3 star WELS** (Water Efficiency Labelling & Standards).
- Advanced secondary treatment systems with disinfection.
- Household reuse of advanced secondary treated effluent.

Storm water quality should continue to be monitored to assess impacts to the quality of the water within the retarding basin.

It is possible that in the future the community may support the development and implementation of a sewerage service to the township and the proximity to the Waratah Bay Wastewater Management Treatment Facility may prove a cost effective option.

The investigation of a connection to the Waratah Bay Wastewater Management Treatment Facility should be considered if needed and sufficient community interest is shown.

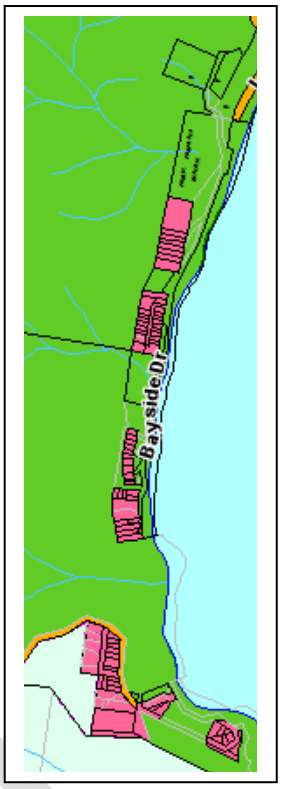
Walkerville South

[54] Land Safe P/L, *Township Land Capability Assessment of The Prom Views Estate – Walkerville*, September 2011

[55] EWS Environmental P/L, *Land Capability Assessment for Onsite Wastewater Management – Township of Fish Creek, May 2008*

Overview

Walkerville South is located on the municipality's southern coastline adjacent to the Cape Liptrap Coastal Park and Waratah Bay. The soil type is a combination of sand and clay.



The residential area consists of approximately 47 properties, with the majority being on a small cape, spilling down the side of the hill to the beach. The area is significantly affected by seasonal population variations.

Current wastewater management

Most properties developed or renewed in recent years are provided with secondary treatment systems to address difficult site conditions and close proximity to Waratah Bay. The remainder are mostly likely to be toilet only systems with some all waste systems installed.

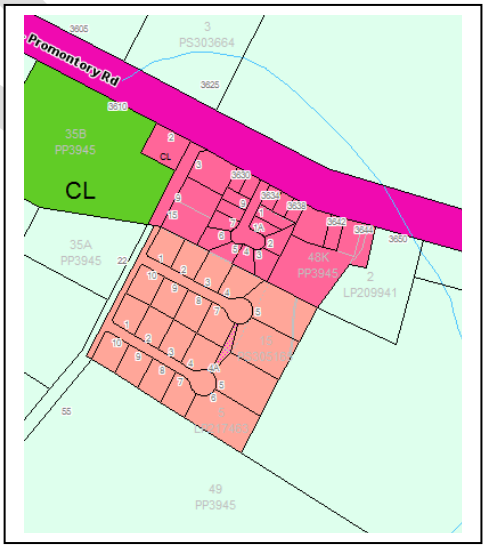
Recommended Improvement Option

The township requires improved maintenance of existing systems. This may include the upgrade of existing septic tank systems to secondary treatment systems where performance standards cannot be met.

Yanakie

Overview

Yanakie is located 16 kilometres south of Foster at the gateway to the Wilsons Promontory National Park. It lies between the Shallow and Corner Inlets, both being of national significance, the latter is internationally recognised. The soil type varies between clay and sand.



The township consists of approximately 114 houses and its population of 382 (ABS, Census, 2011) is subject to seasonal variations, with many properties operating accomodation businesses. It is expected that tourism ventures will increase in the future to service Wilson's Promontory National Park.

Current wastewater management

Approximately a third of properties (27%) are provided with secondary treatment systems. An audit of 23 properties conducted by South Gippsland Water in 2007,[56] found that most properties are provided with all waste septic tank systems. No toilet only systems were found.

Recommended Improvement Option

The township requires improved maintenance of existing systems. This may include the upgrade of existing systems where performance standards cannot be met.

The management of wastewater at the Corner Inlet Caravan Park should be a priority for this township as it is located in very sensitive environment, being adjacent to the Corner Inlet.

[56] Casey Services (Aust) Pty Ltd for SGW, Yanakie Sewerage Scheme Property Audits – Final Report, March 2007.

Small townships and rural areas

Generally all of these townships face the same barriers and have similar information gathering histories. This Plan will not specifically consider these areas a priority, however Council acknowledges many individual properties still face significant wastewater management issues. Many of the actions common to all townships will address issues within these townships. These areas also provide opportunities for pilot testing of innovative schemes or systems. The South Gippsland Planning Scheme Municipal Strategic Statement (MSS) recommends that low cost sewerage options be investigated for small townships.

Agnes

Agnes covers 16 square kilometres, is 15 metres above sea level and has a grade of 1 in 41. It is on the coastal plain of the eastern Strzelecki Ranges between Toora and Welshpool. Agnes comprises of one cluster of approximately 17 properties along the South Gippsland Highway. Each lot is Farming Zone and is approximately 2000 square metres with approximately 7 of the 17 properties currently developed. A public park is located within 150 metres of the Agnes River, which discharges to the Corner Inlet.

The South Gippsland Eastern District Urban Design Framework 2011 project engaged the community of **Agnes** and identified a desire to "protect the amenity of dwellings in close proximity to the South Gippsland Highway and to discourage non-residential uses within the Low Density Residential Zones". It suggested rezoning "the strip of residential lots on the north side of the South Gippsland Highway from Farming Zone to Low Density Residential Zone and discourage non-residential uses through application of a Local Policy".[57]

Berrys Creek

Berrys Creek is a small cluster of properties just off the Strzelecki Hwy between Leongatha and Mirboo North. It is located within the Tarwin River Special Water Supply Catchment adjacent to Berrys Creek, which discharges to the Tarwin River west branch and is surrounded by farming land. Surrounding soils are considered to be heavy clay and subject to landslip. Some blocks within the central grouping are too small for full onsite containment of wastewater.

Buffalo

Buffalo is located in the central south east of the municipality between Meeniyan and Fish Creek. It is located adjacent to the Rail Trail and consists of approximately 15 houses and supports a population of 496 (ABS, Census, 2011) within the wider rural area.

Mirboo

Mirboo consists of approximately 20 properties in the northeast of the municipality and is generally surrounded by cleared hills and farming activity.

It is serviced by a recreational reserve, tennis court and hall.

It is immediately adjacent to a creek within the Tarwin River Water Supply Catchment. Its close proximity to the WSC makes it an area of interest and requires further investigation and cooperation with the local water authority to ensure properties are developed within existing use rights and with minimising risk to the water supply quality.

Outtrim

Outtrim is centrally located within the Shire on the border with Bass Coast Shire Council and is predominantly larger farmland properties. The township was initially subdivided into small

[57] Planisphere, *South Gippsland Eastern District Urban Design Frameworks*, South Gippsland Shire Council, 2011.

township blocks and settled in the 1890's to service a coal mine in the area. A recreational field and hall service the area.

Rural areas

Many rural properties exist in difficult and environmentally sensitive areas, for example, areas in the hills are subject to erosion, groundwater springs and/or within Declared Water Supply Catchments. These properties are generally zoned as Farming Zone and used for agriculture.

Current wastewater management

Most small settlements have been provided with old toilet only or small all waste septic tank systems.

Older rural properties typically were provided with toilet only systems, disposal to trenches and grey water piped to nearby paddock and discharged directly to the surface of the ground. Dwellings have often been later excised from the larger farm allotment and sold. In some cases the grey water discharges have caused problems for neighbouring properties.

Recommended Improvement Option

Further development of small settlements is not encouraged although these rural settlements generally pose a reduced risk than those in townships due to their lower density. However, these areas still require commencement of improved maintenance of existing systems, particularly those in environmentally sensitive areas (landslip, erosion, declared water supply catchments). This may include the upgrade of existing systems where performance standards cannot be met.

All new developments must meet current design and performance standards, with particular attention to allotment density considerations and waterway setbacks in Declared Water Supply Catchments.

Sewered Townships

The provision of sewer to a township does not necessarily remove all onsite (septic tank) wastewater management issues. Some properties may continue to use septic tank systems without active compliance by the relevant water authority or choose to partially or fully, utilise their wastewater onsite as part of an integrated water management system. Economic and topography barriers to provision of sewer to properties at the edge of the township boundaries where allotment density is lower or in particularly hilly areas may also exist. The townships are also serviced with reticulated water.

The South Gippsland Eastern District Urban Design Frameworks (EDUDF, September 2011) engaged the communities of **Toora, Welshpool & Port Welshpool** in "establishing strategies and priority works for the future that reflect the values and aspirations of the residents and reinforce local sense of place. The project [focussed] on the physical aspects of the towns, localities, their images and identities"[58].

Structure Plan's have been developed for the townships of Foster, Korumburra, Leongatha and Mirboo North to identify areas for possible expansion within defined prerequisites.

Any expansion of sewered township boundaries will generally require connection to sewer unless onsite containment of wastewater can be established through a Land Capability Assessment.

Foster

Foster is the 'gateway' to Wilson's Promontory National Park in the south-eastern area of the Shire, consisting of 1.4 square kilometres of residential zoned property and 0.03 square kilometres of Low Density Residential Zoned land. It is a service centre for the eastern area as well as the coastal settlements such as Sandy Point, Waratah Bay and Walkerville.

Foster currently supports a permanent population of 1667 (ABS, Census, 2011) and is generally not subject to seasonal variations, although an increase on the services generally occurs during holiday periods. The township is dissected by a waterway and is serviced with a town water supply.

South Gippsland Water supplies the township with a potable water supply and services the township with centralised sewerage.

Korumburra

Korumburra is the second largest urban settlement in the South Gippsland Shire and a major service centre for the western section of the Shire. It is in the central west area of the Shire and within the Strzelecki Ranges at a maximum elevation of approximately 230 metres above sea level. The soil is generally clay and subject to erosion and groundwater springs.

The population is approximately 4373 (ABS, Census, 2011) persons and not seasonally variable. Korumburra is increasingly coming under development pressure within the sewer interface and is identified within Council's Overall Settlement Plan as an area for growth.

The Northern edge of Korumburra is located within the Tarwin River Special Water Supply Catchment.

South Gippsland Water supplies the township with a potable water supply and services the township with centralised sewerage.

Leongatha

Leongatha is the major service centre and largest urban settlement in South Gippsland, centrally located at a maximum elevation of 100 metres above sea level. The soil is generally loam

[58] Planisphere, *South Gippsland Eastern District Urban Design Frameworks*, South Gippsland Shire Council, 2011.

although some areas on the fringe of the township are subject to shallow groundwater and clay soils.

It currently maintains a population of approximately 5332 (ABS, Census, 2011) that is not subject to seasonal variation. Leongatha is increasingly coming under development pressure within the sewer interface and is identified within Council's Overall Settlement Plan as an area for growth.

Leongatha is located within the Tarwin River Special Water Supply Catchment.

South Gippsland Water supplies the township with a potable water supply and services the township with centralised sewerage.

Meeniyan

Meeniyan is south east of Leongatha and is primarily a residential township with a population of 645 (ABS, Census, 2011). The commercial sector services the residential population, surrounding farms and tourists travelling to the coastal areas of the Shire, including Wilson's Promontory. Most properties are subject to full time occupancy. The central Township Zone lies adjacent to the Tarwin River flood plain to the north.

Most of the township is made up of older small titles, with some as small as 337 square metres in area. Sites of this size do not provide adequate space to contain all waste within the site (based on a 3 bedroom home – *Land Capability Assessment, Publication 746.1*, March 2003 and *Septic Tank Code of Practice, Publication 891*, March 2003).

Storm water sampling conducted in 2001 and 2004 by Council found high levels of bacteria (*E.Coli* and faecal *Streptococcus*) indicating that it is regularly contaminated by wastewater and therefore pose a risk to the local environment and public health.

The Meeniyan Structure Plan of 2011 identifies that topography, native vegetation, rural land-use activity and areas of environmental or landscape significance and sensitivity are restrictions on development within the township. It recommends that any future development of land east of Geale Street to Meeniyan Promontory Road "at Low Density Residential Zone densities should provide for connection to the reticulated sewerage system" and more generally, to require new residential developments to connect to the reticulated sewerage system.[59]

Meeniyan is located within the Tarwin River Special Water Supply Catchment.

South Gippsland Water provides the township with reticulated water and sewerage.

Many properties are yet to connect to the newly installed sewerage system. Council is working with SGW to increase the connection to sewer rate.

Mirboo North

Mirboo North is located on the 'Grand Ridge' of the Strzelecki Ranges. Its approximate maximum elevation is 250 metres above sea level. It supports a static population of approximately 2296 persons (ABS, Census, 2011).

The southern part of Mirboo North is located within the Tarwin River Special Water Supply Catchment area.

Gippsland Water supplies the township with a potable water supply and reticulated sewerage.

Port Welshpool

Port Welshpool is located in the east of the municipality on the edge of Corner Inlet. It lies at or near sea level with a maximum elevation of 10 metres above sea level. The land within the township is generally clay and marine sediments. It supports a population of 179 persons (ABS, 2006)

[59] Planisphere, **Meeniyan Structure Plan**, South Gippsland Shire, 2011, p 5, 10

South Gippsland Water supplies the township with a potable water supply and reticulated sewerage.

Toora

Toora is located in the east of the municipality, located between the eastern Strzelecki Range and Corner Inlet. Its location, vistas and proximity to Wilson's Promontory and Corner Inlet is increasing its popularity for holiday homes. The wider Toora area supports a population of 887 (ABS, Census, 2011), with the maximum elevation within the township is 30 metres above sea level.

South Gippsland Water supplies the township with a potable water supply and reticulated sewerage.

Waratah Bay

Waratah Bay (township) is adjacent to Waratah Bay approximately 13 km south of Fish Creek. It is mostly a seasonally populated area of approximately 92 houses. The soil type is sand, the township located on sand dunes.

South Gippsland Water services the township with a sewerage system but not reticulated water.

Low-density rural living properties on the northern edge of the township and those township properties not connected to sewer continue to be serviced with onsite wastewater management systems.

Welshpool

Welshpool is four kilometres inland from Corner Inlet and 22 kilometres east of Foster. The township is not generally subject to seasonal population variations and supports approximately 98 houses and a population of 439 (ABS, Census, 2011). The soil type is generally clay.

South Gippsland Water services the township with a reticulated water supply and sewerage system.

Current wastewater management

All these towns are provided with sewerage services. While the majority of properties will be connected to the sewer in the future, some may still be serviced by septic tank systems. Those properties located within the sewer district that are using septic tanks are subject to the local water authorities rules and regulations and are required to regularly maintain their systems.

At the edges of these towns, some properties remain on septic tank systems that have a limited life or are not sufficiently sized for the site conditions.

Meeniyan has only recently been provided with sewerage services. Existing septic tank systems are still in operation on some properties and remain unsustainable.

Recommended Improvement Option

Council will work with South Gippsland Water to ensure that all properties within sewerage districts that cannot adequately treat and contain wastewater within their boundaries are connected to sewer as soon as practicable.

All extensions to the township boundary through rezoning and subdivision are to be provided with sewer.

APPENDIX A – ACRONYMS AND DEFINITIONS

DHS – Department of Human Services

DSE – Department of Sustainability and Environment

E.coli – bacteria of faecal origin used as an indicator of contamination and potential health risk.

Effluent disposal trenches

Commonly used to distribute domestic wastewater effluent on to land so that it is used and treated by plants and soil. These trenches consist generally of slotted piping contained within an aggregate filled trench. Grass or other plants and trees with shallow non-invasive roots are grown on top.

Effluent

Partially treated wastewater – solids removed.

EPA – Environment Protection Authority

Evaporation

Conversion of water into vapour, which is then released to the atmosphere.

Grey water

Cleaning activities undertaken in the kitchen, bathroom and laundry generate wastewater that is known as *grey water*. This waste stream is deemed to be infectious as it may contain dangerous bacteria and viruses.

Land Capability Assessment

Assessment by a suitably qualified person/s of property, particularly the soil, to determine its capability to treat and contain wastewater within property boundaries.

On-site wastewater management or septic tank systems

These systems aim to treat and dispose of wastewater within the boundaries of individual properties. To achieve this, these systems use settling of solids, biological processing, evaporation and vegetation (plants) to convert wastewater to a safer form. The property owner manages and operates these systems and is regulated by Council under the *Environment Protection Act 1970 and Health Act 1958*.

Off-site wastewater management or reticulated (piped) sewerage schemes

Involve the partial or full collection and treatment of wastewater in community treatment plants. These schemes discharge treated effluent to land or surface waters, and are heavily monitored and regulated to maintain high treatment standards. This type includes all forms of town sewerage schemes and is managed and operated by South Gippsland Water (SGW) and regulated by the Environment Protection Authority (EPA) under the *Water Act 1989* and *Environment Protection Act 1970*.

Potable water

Water that is safe for human consumption.

PPWCMA – Port Phillip and Westernport Catchment Management Authority.

Primary treatment

Initial treatment of wastewater usually involving settling of solids and digestion by bacteria.

Secondary treatment

Further treatment of primary treated wastewater; usually where air is introduced to the effluent to treat it further to obtain at least 20 Biological Oxygen Demand and 30 Suspended Solids.

Reticulated

Piped, for example reticulated (piped) sewerage.

Septic Tank

An 1800 or 3200 litre plastic or concrete tank that allow the solids and the scum to be separated and collected from wastewater. These tanks slowly fill with these components and are required to be pumped out on a regular basis.

SGSC – South Gippsland Shire Council

SGW – South Gippsland Water Authority

Storm water

Storm water is rainwater that is collected from buildings roofs and land into a system of pipes and pits. It is then discharged to creeks, rivers, dams, bays and oceans. Much of this water is captured within catchments for potable water supplies.

Sustainable Regions

Sustainable Regions is a Federal Government program that funded the "*Wastewater in Coastal Settlements of Gippsland*" project that sought to identify the common wastewater issues and solutions in the Gippsland region, in particular, areas of sandy soils, data management and Small Town Sewerage Disposal Systems.

Vegetation

Plants including trees, shrubs, grasses, etc.

Water Sensitive Urban Design (WSUD)

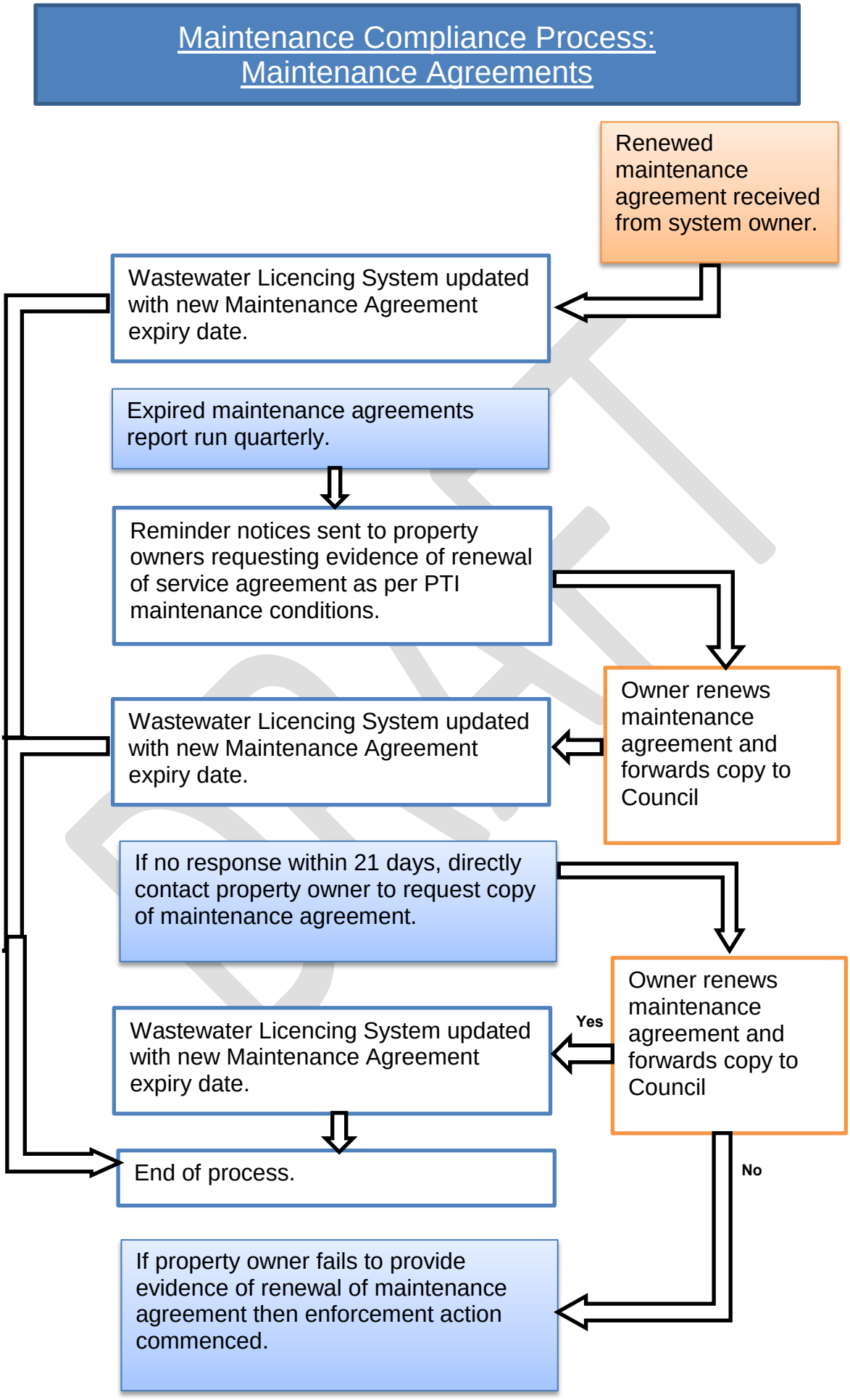
Design system to better manage storm water by minimising impervious surfaces and mitigating changes to the natural water balance. It aims to:

- manage water balance of a water catchment;
- maintain & where possible enhance water quality;
- encourage water conservation; and
- maintain water related environmental & recreational values.

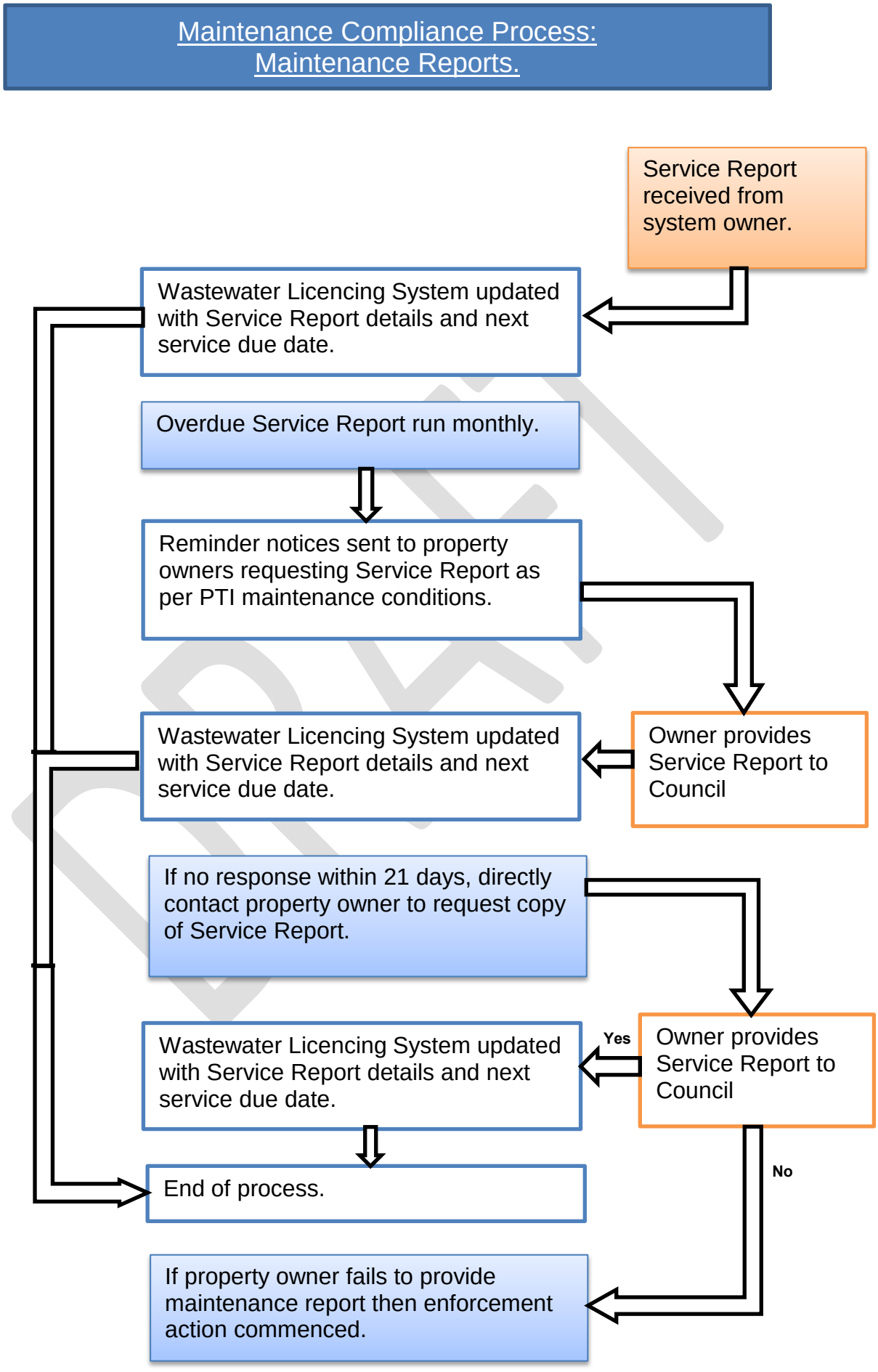
More information may be located at **http://wsud.melbournewater.com.au/**

WGCMA – West Gippsland Catchment Management Authority.

APPENDIX B – COMPLIANCE PROCESS – MAINTENANCE AGREEMENTS



APPENDIX C – COMPLIANCE PROCESS – MAINTENANCE REPORTS



APPENDIX D – REFERENCES

Australian Bureau of Statistics, Census 2011 - Venus Bay Quick Stat, **http://www.censusdata.abs.gov.au/census_services/getproduct/census/2011/quickstat/SSC21393?opendocument&navpos=220**, 2011.

Australian / New Zealand Standard, On-site domestic-wastewater management – AS/NZS 1547:2012.

Building Commission Website – **www.buildingcommission.com.au**

Bureau of Meteorology Website, **www.bom.gov.au**

Casey Services (Aust) Pty Ltd for SGW, Dumbalk Sewerage Scheme Property Audits – Final Report, July 2007.

Casey Services (Aust) Pty Ltd for SGW, Loch Property Audit Report, South Gippsland Water, February 2007,

Casey Services (Aust) Pty Ltd for SGW, Nyora Property Audit Report, South Gippsland Water, April 2007,

Casey Services (Aust) Pty Ltd for SGW, Poowong Property Audit Report, South Gippsland Water, March 2007,

Connell Wagner, **Areas Between Settlements, Coastal UDFs**, South Gippsland Shire Council, 2006

Connell Wagner, **Urban Design Framework Settlement Background Paper Tarwin Lower**, South Gippsland Shire, 2006

Connell Wagner, **Urban Design Framework Settlement Background Paper Venus Bay**, South Gippsland Shire, 2006

Connell Wagner, **Urban Design Framework Settlement Background Paper Sandy Point**, South Gippsland Shire, 2006

Department of Planning & Community Development, *Planning permit applications in open potable water supply catchment areas,* May 2009

Department of Sustainability and Environment Website, **www.dse.vic.gov.au**

Environment Protection Authority Website, **www.epa.vic.gov.au**

Environment Protection Authority, Guidelines for Environmental Management: Code of Practice – Onsite Wastewater Management (Publication 891.2), 2008.

EWS Environmental P/L, Land Capability Assessment for Onsite Wastewater Management – Township of Fish Creek, May 2008

EWS Environmental P/L, Land Capability Assessment for Onsite Wastewater Management – Township of Tarwin Lower, May 2008

Infocus Management Group P/L (for SGSC), Wastewater Management in Coastal Settlements of Gippsland Project – Part 1, Report on Wastewater Management Issues in Gippsland, 2004.

Infocus Management Group P/L (for SGSC), Wastewater Management in Coastal Settlements of Gippsland Project – Part 2, Report on Management Strategies for Domestic Wastewater in Gippsland, 2004.

Land Safe P/L, *Township Land Capability Assessment of the Prom Views Estate – Walkerville*, September 2011MAV, Domestic Wastewater Management Planning Guidelines, 2003.

Planisphere, **Loch Structure Plan**, South Gippsland Shire, 2011

Planisphere, **Nyora Structure Plan**, South Gippsland Shire, 2011

Planisphere, **Poowong Structure Plan**, South Gippsland Shire, 2011

Planisphere, *South Gippsland Eastern District Urban Design Frameworks*, South Gippsland Shire Council, 2011

South Gippsland Shire Council, *Local Environment Priority Statement, 2009.*

South Gippsland Shire Council, *Overall Settlement Plan*, 2005, **www.southgippsland.vic.gov.au**

South Gippsland Shire Council, Council Report – Un-sewered Towns Priority Assessment, 2003.

South Gippsland Water, *Water Plan II,* 2008/9 – 2011/12, **www.sgwater.com.au**

South Gippsland Water, *Water Plan III,* 2013/14 – 2017/18 (draft under development), **www.sgwater.com.au**

Wastewater Management in Coastal Settlements of Gippsland Project, Part 2: Report on Strategies for Domestic Wastewater in Gippsland, 2004.

West Gippsland Catchment Management Authority, *Regional Catchment Strategy* 2004-2009, **http://www.wgcma.vic.gov.au/publications/regional-menu.html**, 2009.

West Gippsland Catchment Management Authority, *Water Quality Action Plan,* **http://www.wgcma.vic.gov.au/publications/regional-menu.html**, 2005.