

4. Groundwater Flow Systems

4.1 The GFS map

The map of the distribution of groundwater flow systems (GFS) is shown in Figure 12. The groundwater flow systems are summarised in Table 6 including the rationale for the choice of each GFS and the prioritisation.

The prioritisation is based on the extent and effect of salinity occurrence within the GFS. The high priority GFSs are:

- GFS 4 (Tertiary sediments – Rosedale area): contributes to salinity in the Rosedale area;
- GFS 5 (Tertiary sediments – general): contributes to salinity in the Inverloch and Seaton-Dawson areas and north of Yarram;
- GFS 8 (Quaternary sediments - Lower Bengworden region): contributes to salinity in the Bengworden region;
- GFS 9 (Quaternary sediments in the Macalister Irrigation District): contributes to salinity in the Macalister Irrigation District and adjacent dryland areas;
- GFS 10 (Quaternary sediments – lower permeability soils): contributes to salinity in the Heyfield, Lake Coleman and Bengworden areas;
- GFS 11 (Quaternary sediments – higher permeability soils): contributes to salinity in the Yarram, Lake Reeve, and Merrimans Creek areas;
- GFS 12 (Recent alluvial sediments): contributes salinity along the flood plains of the Latrobe, Macalister, Thomson and Avon Rivers

■ **Table 6: GFS summary table**

GFS No.	GFS Name	GFS Definition				Aquifer Type	Rock/ Sediment type	Landform	Groundwater flow scale	Rationale for choice of GFS	Priority
		Location constraint	Geology constraint	Slope constraint	Soil constraint						
1	Palaeozoic Bedrock	None	All Paleozoic Rocks	None	None	Fractured Rock	Sediments, metasediments and intrusives	Highlands	Local (possibly with some intermediate influence)	GFS defined to separate bedrock fractured rock aquifer from unconsolidated sediments. Paleozoic rocks are differentiated from Mesozoic fractured rock aquifers because of their different weathering profile resulting in different potential recharge, discharge and salt store characteristics	Low
2	Mesozoic Bedrock	None	All Cretaceous Rocks	None	None	Fractured Rock	Sediments and metasediments	Strzelecki Ranges	Local (possibly with some intermediate influence)	GFS defined to separate bedrock fractured rock aquifer from unconsolidated sediments. Mesozoic rocks are differentiated from Paleozoic fractured rock aquifers because of their different weathering profile resulting in different potential recharge, discharge and salt store characteristics	Low
3	Tertiary Basalts	None	Tvo	None	None	Fractured Rock	Basalts	Strzelecki Ranges and Moe Basin	Local (possibly with some intermediate influence)	Tertiary basalts likely to have connection to deeper Latrobe Group Aquifer	Low
4	Tertiary sediments – Rosedale area including Sale to Moe	North of the Strzelecki Ranges and south of Latrobe River	All Tertiary sediments except Tvo and Tml	None	None	Unconsolidated sediments	Sand, gravels, clays	Low hills and plains	Intermediate	Tertiary sediments have different hydraulic characteristics than other unconsolidated sediment aquifers with possible connection to deeper Boisdale Aquifer. GFS workshop identified a longer flow path for the Tertiary sediments in the Rosedale compared to the rest of the region	High
5	Tertiary sediments – general	South and east of Strzelecki Ranges and north of Latrobe	All Tertiary sediments except Tvo and Tml	None	None	Unconsolidated sediments	Sand, gravels, clays	Low hills and plains	Local	Tertiary sediments have different hydraulic characteristics than other unconsolidated sediment aquifers with possible connection to deeper Boisdale Aquifer.	High

GFS No.	GFS Name	GFS Definition				Aquifer Type	Rock/Sediment type	Landform	Groundwater flow scale	Rationale for choice of GFS	Priority
		Location constraint	Geology constraint	Slope constraint	Soil constraint						
		River								GFS workshop identified a shorter flow path for the Tertiary sediments in the Inverloch, Yarram and Yallourn areas compared to the Rosedale area	
6	Tertiary sediments - high slope (Latrobe Gp recharge area)	None	All Tertiary sediments except Tvo and Tml	> 5 degrees		Unconsolidated sediments	Sand, gravels, clays		Local but recharge area for deep Latrobe Gp Aquifer	GFS defines the recharge area for the deeper Latrobe Group Aquifer. Although the Latrobe Group Aquifer is not likely to be connected to the water table, there is a potential conflict between the management options for this area from a salinity perspective (ie reduce recharge) and a groundwater management perspective (ie maintain or increase recharge).	Low
7	Quaternary sediments - Upper Bengworden region	North of Paynesville-Perry Bridge line and east of Avon River	Qpd	None	None	Unconsolidated sediments	Sands, gravels and clays	Quaternary dunes overlying Tertiary valleys	Local Flow Systems	SKM (2002) showed that the dunes in the Upper Bengworden area have clay cores and are not likely to be connected to the intermediate scale Quaternary Sands aquifer. These dunes are likely to exhibit local flow systems	Mod
8	Quaternary sediments - Lower Bengworden region	South of Paynesville-Perry Bridge line, east of Avon River and north of Gippsland Lakes	Qpd	None	None	Unconsolidated sediments	Sands, gravels and clays	Quaternary dunes overlying Tertiary valleys	Intermediate to Local Flow Systems	SKM (2002) showed that the dunes in the Lower Bengworden area do not have clay cores and are likely to be connected to the intermediate scale Quaternary Sands aquifer. These dunes are likely to exhibit intermediate to local flow systems	High
9	Quaternary sediments - MID	North of Latrobe River and west of Avon River	Qpa	None	None	Unconsolidated sediments	Sands, gravels and clays	Plains	Intermediate Flow Systems with strong influence of shallow semi-confined gravel aquifer	The water table in the Macalister Irrigation District and surrounds is known to be controlled by a semi-confined gravel alluvial aquifer between 10 and 20 metres deep. The proximity of this area to the source bedrock areas for the alluvial sediments means that it is a high energy depositional area with large gravels and sands being deposited but not seen	High

GFS No.	GFS Name	GFS Definition				Aquifer Type	Rock/Sediment type	Landform	Groundwater flow scale	Rationale for choice of GFS	Priority
		Location constraint	Geology constraint	Slope constraint	Soil constraint						
										elsewhere in the region	
10	Quaternary sediments – general (lower permeability soils)	South of Latrobe River and south of Gippsland Lakes for Qpa, otherwise no area restrictions	All Quaternary sediments except for Qrd, Qrm, Qra and Qpd. (Qpa only for south of Gippsland Lakes and Latrobe River).	None	Very low and low permeability soils	Unconsolidated sediments	Sands, gravels and clays	Plains and dunes	Intermediate	GFS workshop identified a difference in the likely management options for the lower permeability soils relative to the higher permeability soils.	High
11	Quaternary sediments – general (higher permeability soils)	South of Latrobe River and south of Gippsland Lakes for Qpa, otherwise no area restrictions	All Quaternary sediments except for Qrd, Qrm, Qra and Qpd. (Qpa only for south of Gippsland Lakes and Latrobe River)	None	Moderate to high permeability soils	Unconsolidated sediments	Sands, gravels and clays	Plains and dunes	Intermediate	GFS workshop identified a difference in the likely management options for the lower permeability soils relative to the higher permeability soils.	High
12	Recent Alluvials	None	Qrm and Qra	None	None	Unconsolidated sediments	Sands, gravels and clays	Swamps and flood plains	Local but receives flow from intermediate GFSs 4, 9 and 10	Drilling around the Macalister Irrigation District has shown that the alluvials associated with the present day rivers do not have the well developed basal gravel aquifer as the adjacent older Quaternary alluvials (see GFS 9). These recent alluvial deposits are likely to have their own unique groundwater characteristics	High
13	Quaternary sediments – coastal dunes	None	Qrd	None	None	Unconsolidated sediments	Sands, gravels and clays	Coastal dunes	Local	Coastal dune systems are likely to discharge directly to the sea via local flow systems and, therefore, are distinguished from other Quaternary deposits	Low

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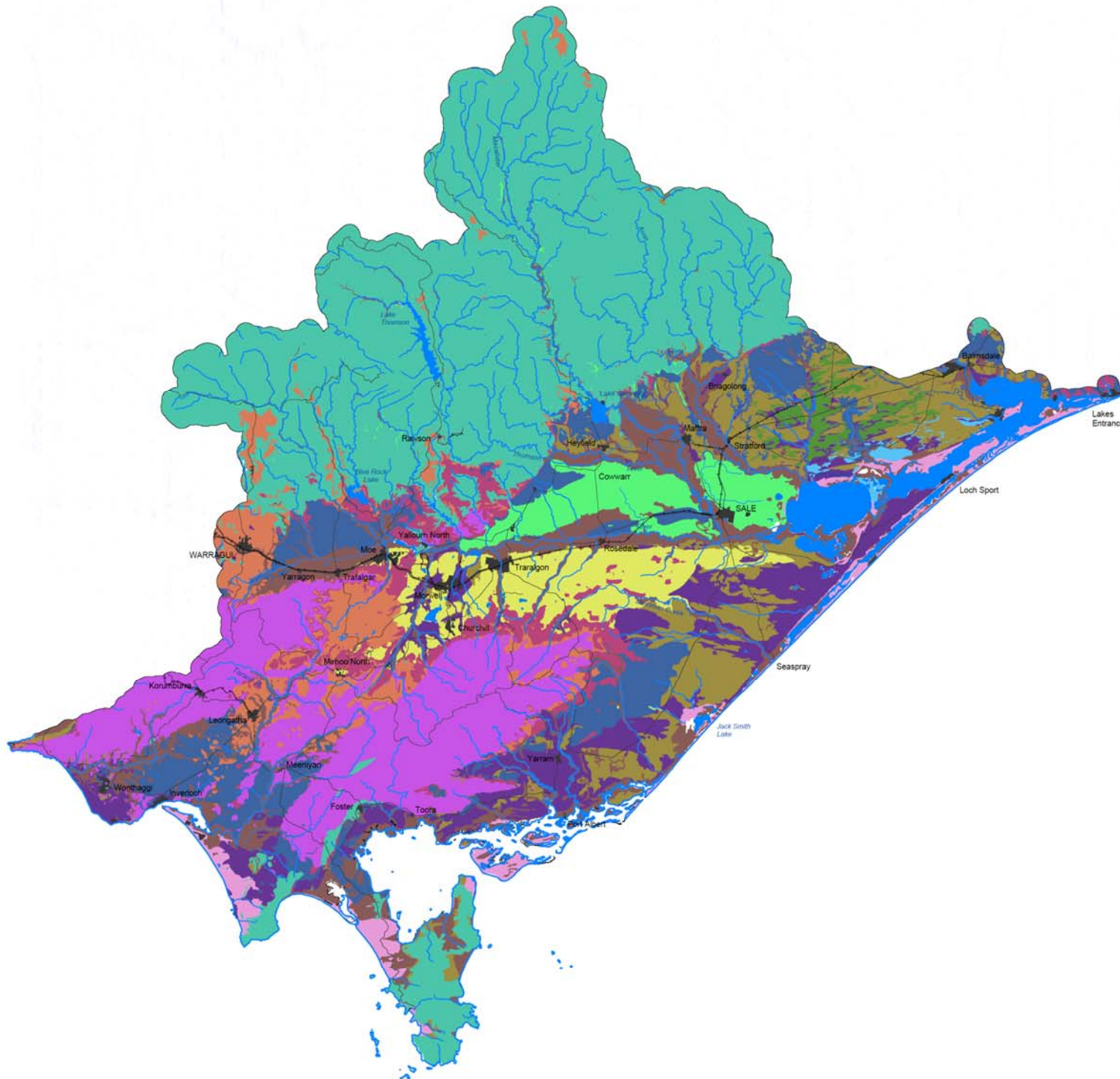
West Gippsland shallow groundwater flow systems

GROUNDWATER FLOW SYSTEMS



Groundwater Flow Systems

- GFS01 - Palaeozoic bedrock
- GFS02 - Mesozoic bedrock
- GFS03 - Tertiary basalts
- GFS04 - Tertiary sediments - Rosedale area including Sale to Moe
- GFS05 - Tertiary sediments - general
- GFS06 - Tertiary sediments - high slope (Latrobe Gp recharge area)
- GFS07 - Quaternary sediments - Upper Bengworden region
- GFS08 - Quaternary sediments - Lower Bengworden region
- GFS09 - Quaternary sediments - MID
- GFS10 - Quaternary sediments - general (lower permeability soils)
- GFS11 - Quaternary sediments - general (higher permeability soils)
- GFS12 - Recent alluvials
- GFS13 - Quaternary sediments - coastal dunes



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Figure 12