

SECTION 2: RESULTS

Explanatory Notes

This section presents the survey results in three distinct forms.

Land Resource Data Maps

The base maps used are the standard 1:100,000 topographic sheets (as supplied by the Royal Australian Survey Corps), which present contour, road and drainage information. Superimposed on these maps by way of a clear overlay are the map units, delineated from aerial photographic interpretation and field investigation. Identification is by an alpha-numeric character and decoding key is shown on each facing page. Further descriptions may be found within the Glossary and Landform Unit Inventory.

Landform Unit Inventory

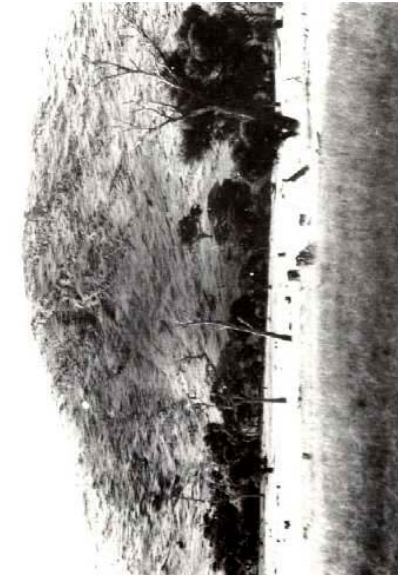
Each map unit description commences with the specific soil type number. Twenty-seven different soil types were identified. To identify map unit characteristics, the reader should firstly select the particular soil number then follow through the table to the relevant topographic situation. These are described under a series of features in a tabulated form. The section also incorporates a series of photographs depicting particular landforms throughout the survey area. Some cross sectional diagrams have been included to highlight the topographic differences together with approximate surface geological boundaries.

Land Capability Assessment

The third part of the result section comprises an overview of land capability assessment for the project area; and a selection of photographs highlighting land use and land degradation in certain parts of the study area. A requirement of the survey was to provide broad interpretations of the soil/landform information to assist land use planning. This section details the capability ratings and factors which limit the ability of the map unit to support a specific land use. It should be remembered that capability assessment is area specific and although a map unit may be designated a rating, some areas within may exhibit quite a different capability class. (Appendix 2 presents the land capability tables used in assessment and a description of symbols used to detail the particular limiting factors.)

Landform Unit Inventory

Soil Type No.	Physiography		Geology		Land Degradation			Soil						
	Landform	Location	Elevation ASL (m)	Drainage Pattern	Code	Age	Lithology	Run-off	Flood Risk	Waterlogging Class	Erosion Type – severity	Salinity Status	Description	Depth (cm)
1	DT (Dissected Terrain) (H) Hill LH (Low Hill) ULH (Undulating Low Hills)	Mt Dryden, west of Lake Lonsdale (DT); Thin belt east of Grampians (H, LH); Within western Black Range (ULH)	180-380	Convergent - Undirectional	E	Cambrian	Chert, Shale and albitized basic lavas.	Moderate; Rapid (DT)	Nil	Nil	Moderate sheeting; Severe sheeting (DT)	Nil	Complex of red, brown and yellow gradational earths (rough and smooth ped). With minor red and mottled yellow duplex soils.	20 to 150; Shallow to non-existent (DT)
2	H (Hill) LH (Low Hill) UH (Undulating Hills) FH (Foot Hill) GS (Gentle slope) VGS (Very Gentle Slope) HR (High Rise) LR (Low Rise) Cr (Crest) DT (Dissected Terrain) MS (Moderate Slope) SS (Steep Slope)	Large expanse of land to the east of the Grampians. Portion of Western Black Range.	200-750	Tributary; Non-directional; Undirectional	Oi	Lower Ordovician	Sandstone, sub-graywacke, mudstone and dolomitic shale. Minor metamorphics.	Slow (GS, VGS); Rapid (HR, LR, Fs, FH, ULH, UH, LH);	Nil (Low VGS)	Nil	High sheet (Cr, DT, MS, SS) Moderate sheet (H, LH, UH, ULH, FH, FS, HR, LR); Low sheet (GS, VGS); Moderate to high gully (DT, SS, MS)	Nil	Structured red and yellow, smooth ped gradational earth with bleached A ₂ horizons common. Often a gravel pan overlies the B horizon. Sandy pedal yellow and brown duplex soils, some with mottled B horizons. Minor skeletal soils (DT, SS).	60 to 120; Shallow to non-existent (DT, SS)
3	DC (Drainage complex)	Within the large expanse of land to the east of the Grampians	200-250	NA	Qra, Qs off Oi	Pleistocene and Recent Quaternary	Clay, silt, sand and gravel; recent swamp deposits, river alluvium.	NA	Very High	Ponding	Moderate stream bed	Nil	Structured yellow and brown gradational earths, with smooth ped fabric. Minor instances of stratified and sandy pedal duplex soils. Some soils have major gravel and sand inclusions	>120



Moderately sloping hills (E-Oi) with prominent bands of rock outcrop occur in the north east around Navarre. The foreground is part of the flat Quaternary alluvial plains of the Shepparton formation (Qs).

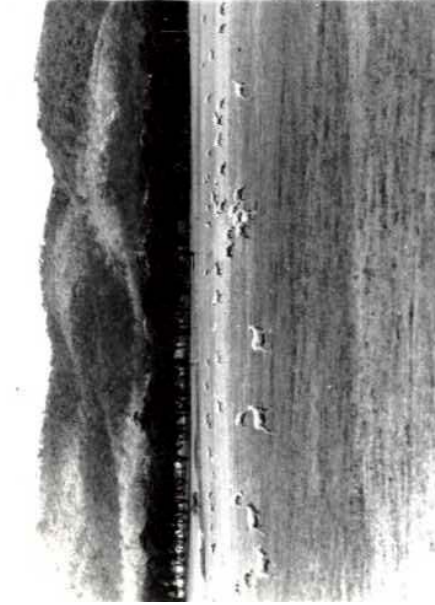


Stony slopes of the Pyrenees Ranges (Oi), on the Landsborough-Crowlands Road. Areas have been heavily grazed with minor sheeting exposing the stony surfaces.



A typical shallow, broad gully with a gravel and/or sandy base on the Landsborough/Navarre Road.

Classification	Soil Texture		Structure		USG	Permeability		Shrink-Swell (Subsoil)	Gravel %	Stone %	Soil Dispersibility		Slaking Tendency		Drainage	Present Land Use
	Surface	Subsoil	Surface	Subsoil		Surface	Subsoil				Surface	Subsoil				
	Surface	Subsoil	Surface	Subsoil		Surface	Subsoil				Surface	Subsoil				
Gn4.3; Gn3.2 Gn4.8 Gn3.7 Dy4.1 Dr4.1	Loam to clay loam	Medium to heavy clay with grit	Moderate crumb	Strong sub-angular blocky	CL	Fair to good	Poor	Low	To 30%	25% to 100% (DT)	Nil	Slight	Nil	Rapid	Moderately well to imperfect	Grazing and conservation
Gn3.1 Gn3.2 Gn3.7 Gn3.9 Dy4.1 Dy4.4 Dy5.1 Dy5.4	Sandy clay loam and clay loam often with gravel and grit. Minor sandy loam.	Medium clay, silty clay, often with grit.	Massive to weak subangular blocky. Minor single gain.	Moderate to strong subangular blocky. Medium to coarse.	GC-CL SP/CL GP/CL	Good	Fair to Poor	Low to Moderate	10-50%. Some minor gravel pans.	Generally <5% Stone up to 100% (DT, SS)	Nil	Nil Minor areas low	Nil	Moderate to rapid	Imperfectly drained	Grazing, conservation and recreation.
Gn3.2 Gn3.5	Sandy loam, clay loam and loam	Medium clay with silt	Massive, minor crumb	Moderate subangular blocky	CL SP/CL SW/CL GC	Good	Fair	Low to Moderate	Variable, site specific, generally <5%	Minor <2%	Nil	Nil	Nil	Slow	Moderately well drained	Associated with grazing.



Forested hilly terrain (Oi) overlooking grazed recent alluvial flats.

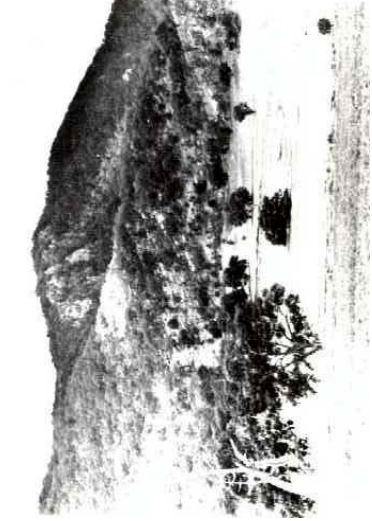


The city of Stawell with a population of approximately 7 000 is the largest township in the study area and was established on flat to undulating terrain on Ordovician sedimentary materials (Oi).



Western Mining Corporation open cut gold mine at Stawell. The pit basement is already 10 m below sea level.

Soil Type No.	Physiography			Geology		Land Degradation			Soil					
	Landform	Location	Elevation ASL (m)	Drainage Pattern	Code	Age	Lithology	Run-off	Flood Risk	Waterlogging Class	Erosion Type – severity	Salinity Status	Description	Depth (cm)
4	H (Hill) UH (Undulating Hills) ULH (Undulating Low Hills) FH (Foot Hill) GS (Gentle Slope) HR (High Rise) LR (Low Rise) Cr (Crest) DT (Dissected Terrain) MS (Moderate Slope) SS (Steep Slope) UT (Undulating Terrain)	Within the Grampians complex; Eastern Black Range near Stawell; east of Ararat about Mts Cole and Langi Ghiran	200-880	Non-directional Convergent	Cgm, Cgv, Dgr, Dgd	Post lower Carboniferous; Devonian	Granite and Granodiorite Intrusive Igneous (some colluvium included)	Normally slow; Moderately rapid in Cr and SS	Nil	Nil	Moderate to high sheet erosion; severe on Cr and SS	Nil	Pedal mottled yellow duplex soil; gradational soils with sandy surfaces. Yellow smooth ped earths.	0 to 120
5	CP (Covered Plain) DC (Drainage Complex)	Within the Grampians; Eastern Black Range; East of Ararat near Mts Cole and Langi Ghiran	220-260	Undirectional	Qra of Dgd	Recent and Pleistocene Quaternary	Colluvial wash, river alluvium, sand, silt and clay	NA	Very High	Ponding	Moderate stream bed erosion	Nil	Site specific, pale yellow uniform coarse, apedal siliceous sands. Minor sandy pedal yellow duplex soils.	>120
6	UH (Undulating Hills) LH (Low Hills) FH (Foot Hill)	Areas adjacent to the western and southern boundaries of the Rocklands Reservoir.	200-300	Convergent, Undirectional	Dvj	Upper Devonian	Rocklands Rhyolite, Rhyodacite and Pyroclastics	Slow to moderate	Very low	Very low seasonal to Nil	Low to slight sheeting	High to severe	Friable, mottled, brown and yellow duplex soils; which often incorporates a conspicuous bleached A ₂ horizon; profiles overlie decomposing Rhyolite; layer of ferruginised backshot and gravel occurs immediately under the A ₂ horizon.	80 to 100
7	Dc (Drainage Complex)	Mainly south of Rocklands Reservoir	2230-300	NA	Dvj	Upper Devonian	Rocklands, Rhyolite, Rhyodacite and Pyroclastics; gravel and stone beds from surrounding geology.	NA	Very high	Seasonally waterlogged	Severe gully and stream bed	Severe	Complex of brown to grey, smooth ped gradational earths; with sands and/or gravel beds and/or a lateritic pan, over a grey, smooth ped gradational earth.	Variable.



The hilly to mountainous granitic terrain (Cgv) of Ben Nevis, with its associated footslopes and Quaternary high level river terraces in the foreground (Qpa)

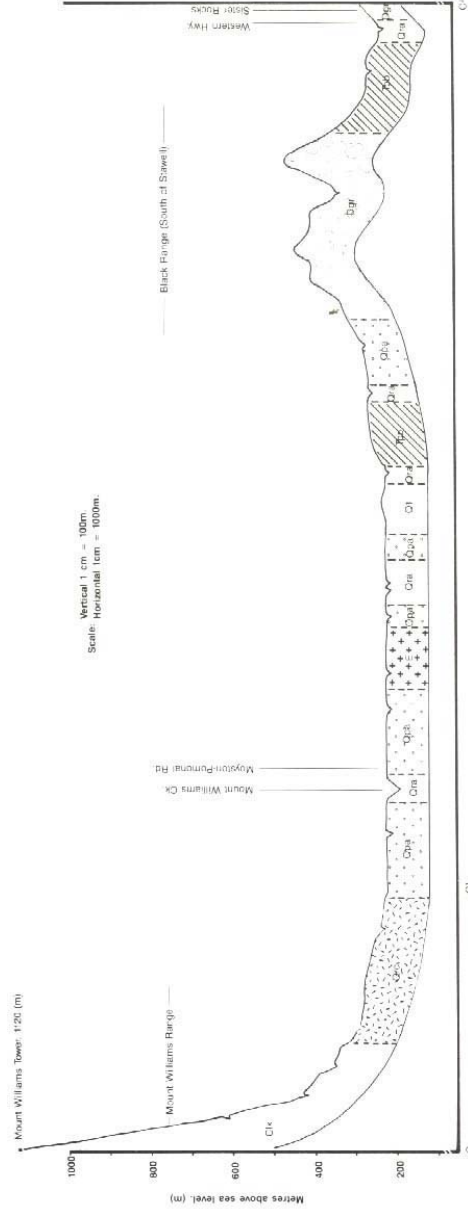


Granite hill slope on the Wartook-Zumstein Road. The are is typified by a eucalyptus woodland with rounded boulders and rock outcrop common.



A typical steep sided road cutting in granite near Zumstein Park on the western side of the Grampians National Park.

Classification	Soil		USG	Permeability		Shrink-Swell (Subsoil)	Gravel %	Stone %	Soil		Drainage		Present Land Use		
	Texture Surface	Subsoil		Surface	Subsoil				Surface	Subsoil	Surface	Subsoil		Surface	Subsoil
Dy5.1 Gm3.7 Minor Gm3.1	Clayey sand to sandy loam	Gritty light clay, minor clayey sands	CL, SW/CL, GC	Good	Fair to poor	Low	Upwards to 50%	20% on SS, Cr. Minor boulders and stones on other units.	Nil	Nil	Nil	Moderately well to imperfect drainage. Excessively well on sand units.	Grazing, conservation and recreation.		
Uc5.1, Uc1, Dy4.1	Sand	Clayey sand	SP, SC	Very good	Very good	Low	<5%	Minor <2%	Nil	Nil	Rapid	Excessively well drained	Conservation and recreation.		
Db4.4, Db3.4, Db4.1, Db3.1	Gritty clay loam	Medium clay with grit	CL	Poor	Very poor	Moderate	Pan below A ₂ horizon	Minor stone at depth	Slight	Nil	Nil to slow	Imperfect	Conservation, recreation, with minor grazing.		
Gm3.1 Gm4.2 Stratified complex	Sand to gritty clay loam	Heavy clay	SP/CL, SP/GW, GC	Fair	Very poor	Low	Numerous gravel layers	Basement Rhyolite rock and river wash stones off Tertiary geology	Slight	Slight	Nil	Poor to very poor	NA		



CROSS SECTION "C" FOR MAPS 6 and 7.
Cross Section "C" for Maps 6 & 7



South of the Rocklands Reservoir the overlying Tertiary alluvial material has been eroded to expose the earlier Rhyolites (Dvj) deposits.

Soil Type No.	Physiography			Geology			Land Degradation			Soil				
	Landform	Location	Elevation ASL (m)	Drainage Pattern	Code	Age	Lithology	Run-off	Flood Risk	Waterlogging Class	Erosion Type – severity	Salinity Status	Description	Depth (cm)
8	H (Hill) FH (Foot Hill) FS (Foot Slope) Cr (Crest) DT (Dissected Terrain) MS (Moderate Slope) SS (Steep Slope)	Areas associated with the Grampians and the Western Black Range.	200-900	Non directional, divergent, variable.	Clk	Lower Carboniferous Late Pleistocene and Recent Clk (FS) Quaternary	Quartzose sandstone, minor mudstone, sands and clay. Colluvial sands, scree and outwash deposits.	Moderate to very rapid.	Nil	Nil	High gully erosion with low sheeting in foot slopes.	Nil	Complex: Pedal yellow and yellowish brown duplex soils. Sandy pedal yellow and brown duplex soils (sometimes with bleached A ₂ horizons) Friable red duplex soils Skeletal soils	Typically <40 cm but may extend to 200 cm. (FS, >120)
9	ULH (Undulating Low Hills) FH (Foot Hill) FS, FS' (Foot Slope) F, F' (Fan) MS, MS' (Moderate Slope) LR (Low Rise) HR (High Rise) Cr' (Crest) PP (Penplain) OD (Open Depression)	Areas associated with the Grampians and the Western Black Range.	150-520	Variable	Clk	Lower Carboniferous Late Pleistocene and Recent Qrc Qra Qs Tpp minor	Quartzose sandstone, siltstone, minor mudstone, sand and clay. Alluvial and colluvial sands, scree and outwash deposits. Sedimentary fluvial deposits of clay, silt sand and gravel. Shallow marine cross bedded sand, sandstone and silt. Lateritic weathering.	Very slow to slow	Typically Nil. Low to moderate on PP, to high in OD	Low seasonal in ULH, PP and LR. Temporarily ponded in OD. Nil elsewhere.	Typically low to moderate sheet with some gully on MS and FS.	Nil with moderate to high in areas of PP.	Sandy pedal yellow and yellowish brown duplex soils, with rare bleached A ₂ horizons and some mottled subsoils. Occasional gravel pans and skeletal soils. PP. Sandy Pedal black and dark grey soils, friable brown duplex soils. A ₂ horizons if present, may be bleached.	<30 to >120
10	L (levee) FP (Flat Plain) FS (Foot Slope)	Small isolated areas around Wartook, and northern most section of the Glenelg River.	210-230	Non tributary	Qra of Clk	Recent and late Pleistocene Quaternary	Stream alluvium, low level terrace and recent swamp deposits of sand, silt, clay and gravel.	Very slow	Moderate to high (FP) Nil (L, FS)	Seasonally waterlogged	High sheet	Nil	Site specific, pale yellow to light grey uniformly coarse, apedal siliceous sands. Very minor sandy pedal yellow duplexes.	>120



A typical roadside cutting within the steeply sloping Zumstein-Halls Gap area (Clk). Banks are usually broken and often unstable.



Mt Zero and Mt Staplinton in the northern Grampians (Clk). Olive plantations covering the lower colluvial (Qrc) slopes.

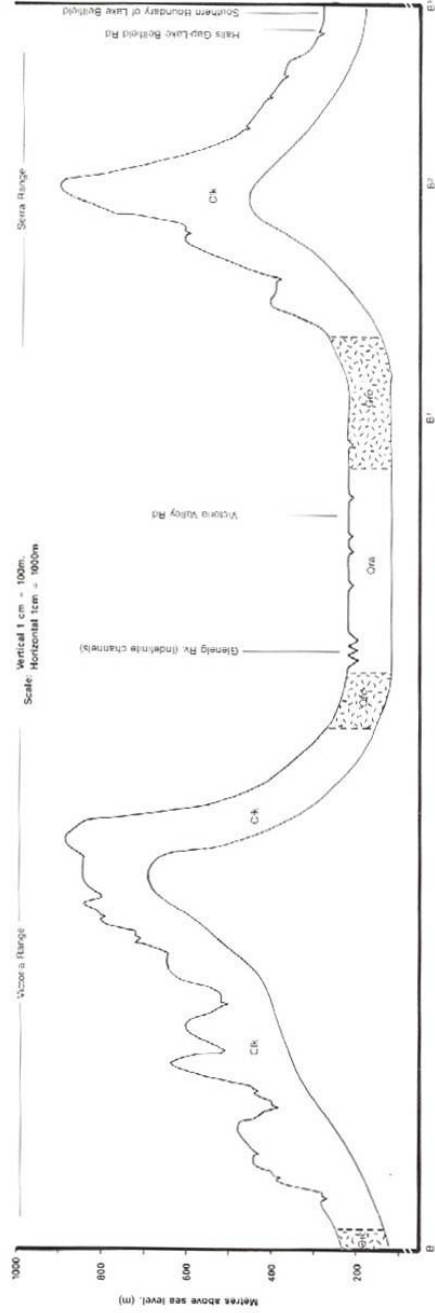


Dissected terrain (Clk) found within the Grampians National Park. Rocky steep to precipitous slopes with well vegetated lower slopes are typical of the area.

Classification	Soil Texture		Structure		USG	Permeability		Shrink-Swell (Subsoil)	Gravel %	Stone %	Soil Dispersibility		Drainage	Present Land Use
	Surface	Subsoil	Surface	Subsoil		Surface	Subsoil				Surface	Subsoil		
	Slaking Tendency	Surface	Subsoil											
(1&2) Dy4.1 Dy4.4 Dy5.1 Dy5.4 (3) Dr4 (4) NA	Sandy loam, minor sands	Sandy clay	Massive to weak subangular blocky	Weak subangular blocky	CL SO/SC- CL	Fair	Fair	Low to Moderate	To 80% typified in steeper terrain (DT, MS, SS)	To 80% typified in steeper terrain (DT, MS, SS)	Nil	Slight	Moderately well to imperfect.	Recreation, conservation
Dy4.1 Dy4.4 Dy5.4	Sands, loamy sands to clayey sands.	Sandy clay	Single grained (A ₂ massive)	Strong medium angular blocky	SP- SC/CL SW SP/CL	Good	Fair	Low to Moderate	To 50% Gravel pan below A ₂ (FS) Rare	Minor to 80%	Nil (A ₂ slight)	Moderate to rapid (A ₂ slow)	Well	Recreation, conservation, orchards and grazing. Grazing and minor cropping (PP)
Dd3.2 Dd3.4 Db3.2 Db3.4	Sands and loamy sands. A ₂ clayey sand.	Heavy silty clay	Single grained to massive.	Strong coarse angular blocky	SP- SC/CL- ML	Good to very good	Poor to very poor	Low to Moderate	Nil	Nil	Nil	Rapid	Moderately well to imperfect	Grazing and minor cropping (PP)
Uc5.1 Uc1 Dy4.1	Sand, on rare occasions clayey sand.	Clayey sand. Duplex soils show light clay at depth.	Single grained.	Massive to weak subangular blocky.	SP SP/SC	Very good	Duplexes show a poor rating.	Low	<2%	Very rare <1%	Nil	Rapid	Excessively well drained	Recreation, conservation and minor grazing.



Gully occurring on sandy secondary roads of the gentle to moderate sloping terrain (Qrc) around the Wartook Reservoir.



CROSS SECTION "B" FOR MAPS 3, 4 and 6
Cross Section "B" for maps 3, 4 and 6

Soil Type No.	Physiography			Geology			Land Degradation				Soil			
	Landform	Location	Elevation ASL (m)	Drainage Pattern	Code	Age	Lithology	Run-off	Flood Risk	Waterlogging Class	Erosion Type – severity	Salinity Status	Description	Depth (cm)
11	Dc (Drainage Complex)	Running off the Grampians	180-600	Tributary, distributary and convergent.	Qrc Qra Minor Clk	Recent Quaternary, late Pleistocene and lower Carboniferous.	Alluvial sands and outwash deposits arising from the Carboniferous sandstone mountains.	Moderately rapid	Low to Mod.	Seasonally waterlogged	Moderate stream-bed	Nil	Moderately deep sandy apedal and pale yellowish brown to dark brown gradational and duplex soils, with bleached A ₂ horizons common. Some areas show deep uniform coarse textured sands.	100
12	LH (Low Hills) ULH (Undulating Low Hills) UH (Undulating Hills) FH (Foot Hill) FS (Foot Slope) LR (Low Rise) HR (High Rise) UT (Undulating Terrain) OD (Open Depression)	Found north-west of Landsborough north of Stawell, south of Stawell and on north-west side of Grampians.	180-360	Convergent, tributary and undirectional.	Tp, Tpn, Tpp	Tertiary Pliocene and Miocene	Gravel, sand, sandstone, silty and clay, often ferruginous, calcareous and lateritic in part. Sand, clay, scree and outwash deposits.	Slow to moderately rapid.	Nil to Mod.	Nil to seasonally waterlogged.	Low to moderate sheet (Latter for FS)	Generally Nil. Minor near Lake Lonsdale.	Complex of: Firm, siliceous bleached uniform sands, sometimes with coloured B horizons. Friable red and brown duplex and gradational soils. Often various depth of type (1) will overlie type (2) (FS).	>120
13	LH (Low Hill) ULH (Undulating Low Hill) FS (Foot Slope) VGS (Very Gentle Slope) LR (Low Rise) HR (High Rise) PP (Peneplain) OD (Open Depression) UT (Undulating Terrain)	Large expanse of areas found west of the Grampians. Extending from the south of the Rocklands Reservoir to the north as far as Toolondo Reservoir.	170-250	Convergent, non-directional and tributary	Tpd	Tertiary Pliocene	Ferruginous sandstone, sand and clay. Marine sedimentary.	OD Slow PP Slow to UT mod LH ULH LR Mod HR to very FS rapid VGS	High (OD) Low to Mod (UT) Nil (others)	Ponding (OD) Nil to temporarily ponded (PP, UT) Moderate sheet (others)	Very slight sheet (OD) Moderate to high wind sheeting (PP, UT) Moderate sheet (others)	Low to moderate	Mottled yellow and yellowish brown duplex soils with friable surfaces and well structured subsoils. Minor brown gradational rough and smooth ped earths. Bleached A ₂ horizons are common and in the dry state are hard.	>120
14	DC (Drainage Complex)	Found north east of Rocklands Reservoir and 5 km south, south-east of Brimpaen.	200-220	NA	Tpd	Tertiary Pliocene	Ferruginous sandstone, sand and clay. Marine sedimentary	NA	Very high	Seasonally waterlogged	Moderate gully and stream-bed	Low to moderate	Well structured greyish brown gradational earths with rough ped fabrics. Minor mottling at depth.	>120



The Fyans Creek valley floor looking north from Lake Bellfield. The photograph shows the Bellfield Settlement on the (Qra) creek terraces and seasonally waterlogged alluvial flats.

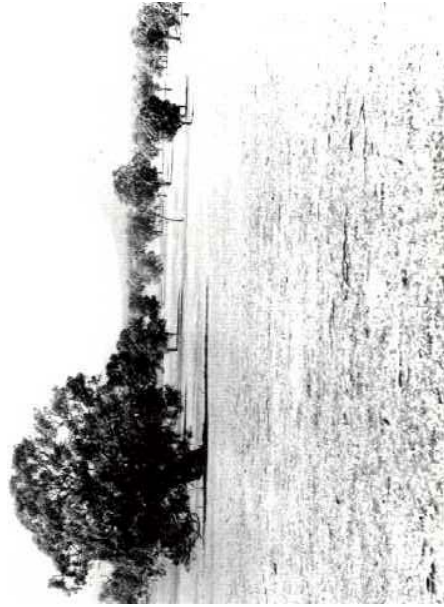


Typical drainage line within the Grampians (Qra of Clk) close to Paddy Castle. Waterways have stable, well vegetated, steep banks and sandy or rocky floors.

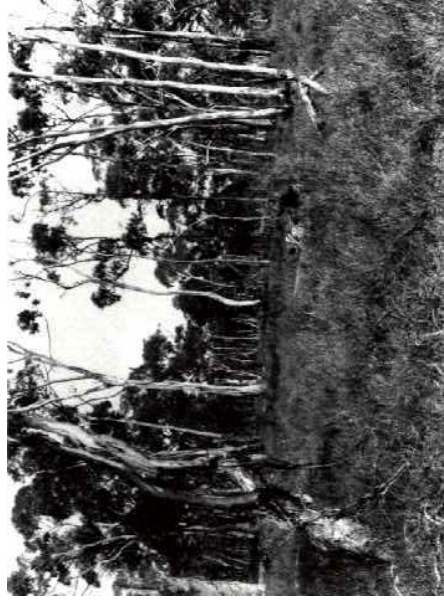


Extensive streambank erosion and acute tunnelling in the Seven Mile Creek on the Navarre-Green Creek Road. Distinct soil horization exists within the Tertiary and Quaternary soils of the area.

Classification	Soil Texture		Structure		USG	Permeability		Shrink-Swell (Subsoil)	Gravel %	Stone %	Soil Dispersibility		Slaking Tendency		Drainage	Present Land Use
	Surface	Subsoil	Surface	Subsoil		Surface	Subsoil				Surface	Subsoil				
Dy4.1 Dy5.4 Gn3.1 Gn3.9 Uc5.1	Sand to sandy loam	Sandy clay to medium clay with sand	Single grained to massive	Massive to strong angular blocky	SP/CL SP/ML Some SP	Good	Poor to very poor	Low to moderate	<10%	<10%	Nil	Slight	NA	Moderate	Moderately well to perfect	Conservation and transmitting
UC1.2 UC2.1 Gn3.7 Dy4.1 Dy5.4 Gn4 Gn3.7	Sand Sandy loam	Sandy clay to light clay with sand Light to medium clay with silt	Singled grained Crumb	Moderate angular blocky Strong sub-angular blocky coarse	SP/GC CL CL	Very good Good	Poor	Low to moderate	10 to 30% rounded 5 to 10%	To 1%	Nil	Slight	Nil	Moderate to rapid	Moderately well to imperfect Moderately well to imperfect	Conservation, grazing and agriculture. Grazing and conservation
Gn4.5	Clay loam	Heavy clay often with silt	Massive to weak crumb	Moderate, coarse angular blocky	CL	Good to fair	Poor	Low to moderate	Nil	Nil	Nil	Nil	Nil	Moderate	Imperfectly drained	Transmitting



The Tertiary Dorodong sand (Tpd) form extensive areas of flat to undulating, well vegetated country west of the Gramscians.



Open terrain, where the Dorodong sands (Tpd) have been cleared and sown to improved pasture. Minor salting occurs in some drainage situations.



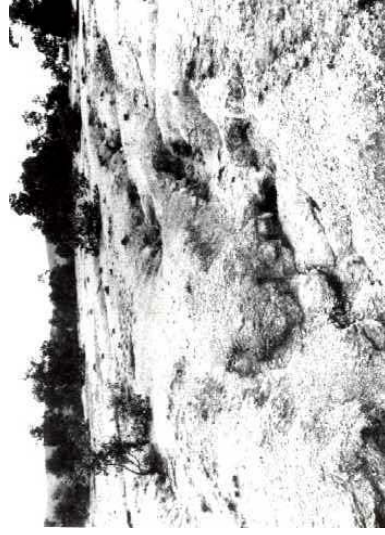
Soil Type No.	Physiography			Geology		Land Degradation			Soil					
	Landform	Location	Elevation ASL (m)	Drainage Pattern	Code	Age	Lithology	Run-off	Flood Risk	Waterlogging Class	Erosion Type – severity	Salinity Status	Description	Depth (cm)
15	LH (Low Hills) ULH (Undulating Low Hills) UH (Undulating Hills) LR (Low Rise) GS (Gentle Slope) VGS (Very Gentle Slope) UT (Undulating Terrain)	Areas around the Rocklands Reservoir	200-280	Unidirectional and tributary	Tp1	Tertiary Pliocene to Pleistocene Quaternary	Colluvial, laterite on rocks of various ages	Slow to moderate	Low	Very low seasonal	Low to moderate sheet with low to slight gully	Low to moderate	Complex of sandy and friable pedal (mottled) yellow duplex soils with bleached A ₂ horizons common. Soil similar to those found on Qs geologies.	Variable >120
16	Dc (Drainage Complex)	South-east of Rocklands Reservoir	210-260	Tributary and convergent	Tp1	Tertiary Pliocene to Pleistocene Quaternary	Colluvial, laterite on rocks of various ages	Moderate to rapid	High	Seasonal waterlogging	Moderate to high stream bed	Low to moderate	Black rough ped gradational earths which show slightly acid reaction trends and faint mottling in deep subsoils. Minor black smooth ped gradational earths.	>120
17	LR (Low Rise) ULH (Undulating Low Hills)	Fund west of Moyston	240-280	NA	Qm	Tertiary Pliocene and Pleistocene Quaternary	Olivine and Iddignisite Basalt, Limburgite, Scoria and minor tuff.	Slow to moderate	Low to Mod	Nil to temporarily ponded in some instances.	Slight sheet	Minor in lower areas	Pedal mottled yellow duplex soils with bleached A ₂ horizons common. (ii) In lower situations – non-cracking mottled crumbly clays and non-cracking dense sometimes mottled pedal clays, both which lack A ₂ horizons.	>120
18	FS (Foot Slope) FH (Foot Hill) UH (Undulating Hills) ULH (Undulating Low Hills) UT (Undulating Terrain) FP (Flat Plain) HR (High Rise) LR (Low Rise) L (Levee)	Areas east and adjacent to Grampians, also west and adjacent to Pyrenees Range	200-360	Convergent and non-tributary	Qpa	Recent and Pleistocene Quaternary	High level river terraces, older alluvium and flood plain deposits, abandoned swamps and ridges, silt, sand, gravel and clay.	Slow to moderate	Nil Low to high in some areas (L, FP)	Seasonally waterlogged (FP) Nil others	Low to moderate sheet and gully	Low to moderate around Lake Lonsdale and north-east of Ararat	Complex and site specific. Generally incorporates one or more of the following: Bleached uniform sands with coloured B horizons. Bleached uniform sands with a pan. A ₂ horizon common. Sandy pedal mottled yellow duplex soils. Friable pedal mottled yellow duplex soils. Stratified soils with sands over grey clays and clay loams over sands.	>120



Fiat to undulating grazing land south of the Rocklands Reservoir on Tertiary sediments (Tp1)



Eroded stream channel on well grazed undulating Tertiary sediments (Tp1), south of the Rocklands Reservoir



Extensive sheet and gully erosion found on the low rises of the early Quaternary gravel and sand (Qpa) deposits north west of Ben Nevis.

Classification	Soil				USG	Permeability		Shrink-Swell (Subsoil)	Gravel %	Stone %	Soil		Drainage	Present Land Use
	Texture Surface	Subsoil	Structure Surface	Subsoil		Surface	Subsoil				Slaking/Tendency			
											Surface	Subsoil		
Dy5.4 Dy5.1 some Dy4	Sandy loam to sandy clay loam. Some sands.	Medium clay to heavy clay. Some clays incorporating sand.	Massive to weak sub-angular blocky. Some single grained.	Moderate to strong subangular blocky.	SP/CL, CL	Good to poor	Poor	Low	To 10%	Nil	Slight to nil	Nil	Moderately well to imperfect	Grazing, conservation and minor cropping.
Gn4.4 some Gn3.4	Clay loam with silt to silty clay loam. Minor fine sand.	Medium clay	Fine granular to moderate, medium crumb	Moderate fine subangular blocky	CL	Poor	Poor	Low	Some buckshot gravels on drainage floor	Minor	Nil	Nil	Moderately well to imperfect	Transmitting
Dy5	Clay loam with some sand	Medium to heavy clay with silt	Massive to fine medium crumb	Moderate to strong coarse subangular blocky.	CL	Poor	Very poor	Moderate	Minor buckshot gravels in surface of dy5	Very minor basalt floaters	Nil	Nil to slight	Moderate	Grazing
Uf6.2 Uf6.4	Silty light clay	Silty medium clay	Moderate coarse subangular blocky	Moderate coarse subangular blocky										
(i) Uc2.2	(i) Sand and loamy sand	Sand or clayey sand.	Single grained or massive.	Single grained or massive	SP, SW	Very good	Very good	Low	<5%	Minor	Nil	Nil	Excessively well drained	Grazing and conservation
(ii) Uc2.3	(ii) Sand and loamy sand	Sand or clayey sand	Single grained or massive	Single grained or massive	SP, SW	Very good	Very good	Low	Minor gravel pans	Minor	Nil	Nil	Excessively well drained	
(iii) Dy5	(iii) Loamy sand to sandy loam	Medium to heavy clay with sand and silt	Massive to moderate crumb	Moderate to strong subangular blocky	SP/CL SC SM	Very good	Fair to poor	Moderate		Minor	Nil	Nil	Imperfect	
(iv) Dy4.8 Dy5	(iv) Loam and clay loam	Medium to heavy clay with silt.	Massive to moderate crumb	Moderate to strong subangular blocky	CL	Fair to good	Poor	Moderate		Minor	Nil	Slight	Imperfect	
(v) NA	(v) Sand to light clay	Medium clay, clay loam and sand	Variable	NA	NA	NA	NA	NA		Minor	Nil	NA	NA	



Grazing on the high level river terraces and colluvial slopes (Qpa) beneath the Pyrenees Range around Elmhurst.

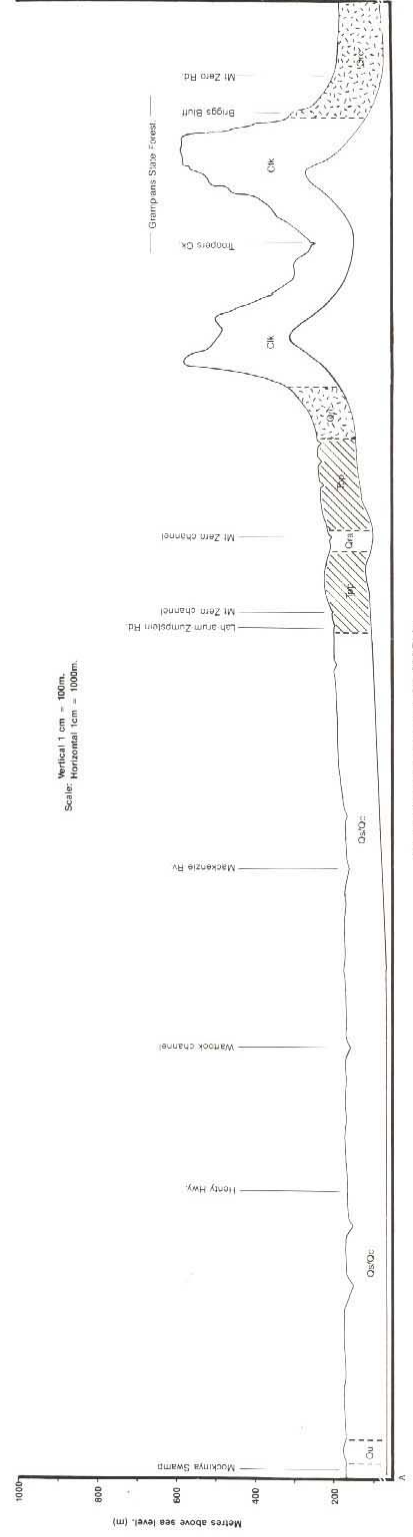


Dead and dying trees north of Lake Lonsdale, the result of sheeting and salting on alluvial terrain (Qra), off the high level Quaternary deposits (Qpa)



Sheeting, gullying and minor salting occurs in the lower drainage situations of the Quaternary terrace materials (Qpa) west of Elmhurst.

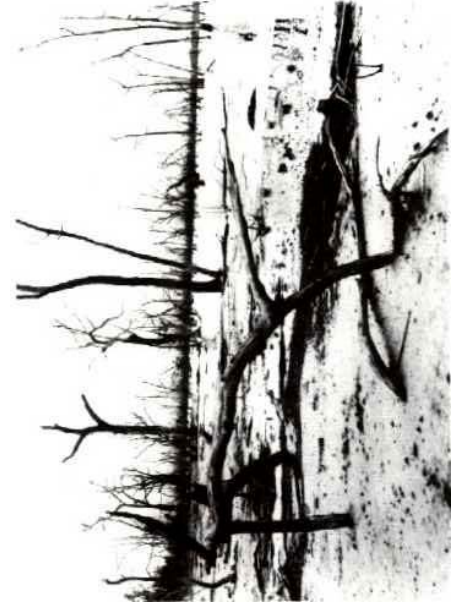
Classification	Soil		USG	Permeability		Shrink-Swell (Subsoil)	Gravel %	Stone %	Soil		Drainage	Present Land Use		
	Texture Surface	Subsoil		Structure Surface	Subsoil				Dispersibility Surface	Subsoil			Slaking Tendency Surface	Subsoil
Gn4.8	Sandy loam to sandy clay loam	Sandy clay to heavy clay.	Single grained and some moderate crumb.	Moderate to strong subangular blocky	Fair	Poor	Low	Nil	Nil	Nil	Poorly drained	Recreation, grazing, conservation & minor cropping.		
Dy5	Sandy loam to loamy sand	Silty clay	Massive	Strong medium subangular blocky	Good	Poor	Low	Nil	Nil	Nil	Imperfect to moderately well			
Gn3.4 Gn3.9 Gn4.4 Gn4.6	Silty clay loam and silty loams	Silty clays, some with sand.	Strong friable crumb to medium subangular blocky.	Strong medium subangular blocky	Very poor to poor	Very poor to poor	Low	Nil	Nil	Nil	Poor to permanently waterlogged.	Transmitting		
Dy4 Uc5	Sand to loamy sand, minor sandy clay	Sand to loamy sand, minor sandy clay	Single grained, massive and weak subangular blocky.	Single grained, massive and weak subangular blocky.	Variable	Variable	Low to moderate	Variable to minor						
Uf5, Uf6, Ug5, Functionally some areas of rare Dg3 and Gn3	Silty light clay, silty clay and some areas of sand, loamy sand and sandy loam surfaces.	Medium clay with silt and heavy silty clay.	Strong medium angular blocky. Sandy surfaces show single grained, massive to weak crumb units.	Strong coarse angular blocky.	Very poor	Very poor	Moderate to high	Nil	Nil	Mod.	Very poor	Recreation, grazing and minor cropping.		
Uc1/Uf5, Ug5 functional duplex soils	Sand	Sandy to heavy clay (site specific)	Single grained	Single grained to massive, or strong coarse angular blocky	Very good	Very poor	High	Nil	Nil	Nil	Surface excessively well	Recreation		



CROSS SECTION "A" FOR MAP 2.

Cross section "A" for Map 2

Soil Type No.	Physiography			Geology			Land Degradation			Soil				
	Landform	Location	Elevation ASL (m)	Drainage Pattern	Code	Age	Lithology	Run-off	Flood Risk	Waterlogging Class	Erosion Type – severity	Salinity Status	Description	Depth (cm)
22	Lu (Lunette)	Abutting swamps in the peneplains north-west of the Grampians	160	NA	Qu	Late Pleistocene, Recent Quaternary	Aeolian lunette deposits, clay, silt, sand and some gypsaceous inclusions.	Nil	Nil	Nil	Severe Sheet	Nil	Deep brown and red uniform coarse textured uniform sands and earthy sands with slight pedological development	>120
23	LH (Low Hill) UH (Undulating Hills) FS (Foot Slope) GS (Gentle Slope) LR (Low Rise) HR (High Rise) UT (Undulating Terrain) FP (Flat Plain) D (Dunes) OD (Open Depression)	Areas in the peneplains around the north of the Western Black Range (D). Units adjacent to the Rocklands Reservoir.	160-280	Generally not applicable.	Qrd, Q1	Pleistocene and Recent Quaternary	Aeolian siliceous sand sheets and dunes	Nil to slow. Minor moderate (UT)	Nil. Mod in some (UT)	Nil to minor seasonal waterlogging.	Low to high sheet (D)	Low to moderate	Complex of: Weak to firm (pale and pale yellow) uniform sands with a sporadic bleached A ₂ horizon. Layered grey to yellow brown sands. Minor sandy pedal mottled duplex soils with bleached A ₂ horizon and yellow brown mottling. Uniformly coarse textured apedal, very pale brown to white (isolated red) sands and clayey sands.	>120
24	DC (Drainage Complex)	South-west of Rocklands Reservoir.	200-240	Convergent	Qrd	Pleistocene and Recent Quaternary	Aeolian siliceous sand sheets and dunes.	Slow – moderate to rapid	High	Seasonal waterlogging	Low to moderate stream-bed	Moderate	Uniform fine textured, stratified, pale yellow and pale brown (to white), siliceous sands with organic surfaces common. Minor duplex soils with deep subsoils showing a sandy clay texture.	>120

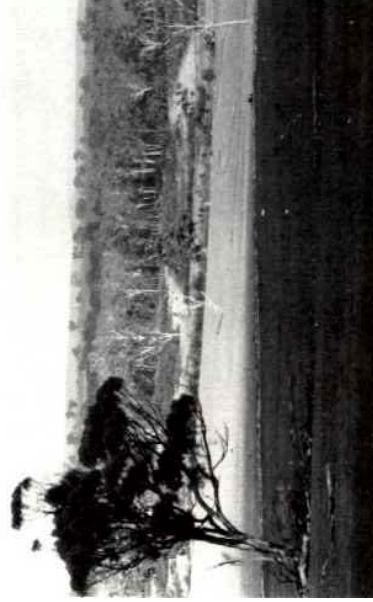


Wet, low lying, sal affected sandy terrain (Qrd), adjacent to the southern side of the Rocklands Reservoir.

Classification	Soil Texture		Structure		USG	Permeability		Shrink-Swell (Subsoil)	Gravel %	Stone %	Soil Dispersibility		Slaking/Tendency		Drainage	Present Land Use
	Surface	Subsoil	Surface	Subsoil		Surface	Subsoil				Surface	Subsoil				
Uc5.1 Uc5.2	Sand and loamy sand	Clayey sand	Single grained to massive	Massive	SW	Very good	Good	Low	Nil	Nil	Nil	Rapid	Rapid	Excessively well	Minor grazing	
Uc1 Uc1.2 Uc3 Uc5 minor Dy5	Sand, loamy sand, minor clayey sand	Sand, clayey sand, minor light clay and medium clay.	Single grained to massive	SP, SP/SC, SP/CL	Very good	Very good to poor	Nil	Nil	Nil	Nil	Nil	Rapid	Rapid	Moderately to excessively well	Recreation, conservation and grazing.	
(iv) Sand		Clayey sand	Single grained to massive	SW	Very good	Very good	Low									
Uc1, minor Dy4	Sand	Sandy and clayey sand	Single grained	Single grained, Very minor massive	SW	Very good	Very good	Low	Nil	Nil	Nil	Rapid	Rapid	Moderately to excessively well	Transmitting.	



Broad drainage areas on Malagane sands (Qrd), which are showing signs of salt intrusion from the adjacent Tertiary country (Tpd).



Low undulating Tertiary terrain (Tpd) with the background low rise showing the effects of clearing and sheet erosion, near Wartook



Scrubby open woodland on flat often waterlogged sandy terrain (Qrd), south of Glenisla.

Soil Type No.	Physiography		Geology		Land Degradation				Soil					
	Landform	Location	Elevation ASL (m)	Drainage Pattern	Code	Age	Lithology	Run-off	Flood Risk	Waterlogging Class	Erosion Type – severity	Salinity Status	Description	Depth (cm)
25	CP (Covered Plain)	On the west side and adjacent to the Grampians	180-210	Convergent, interrupted and undirectional	Qs, Qra	Pleistocene and Recent Quaternary	Sedimentary fluvial and swamp deposits of clay, silt, sand and gravel, arising from McKenzie River. Granodiorite (Cgm), Grampians. Quartzose Sandstone (Clk), and Tertiary Pliocene ferruginous sandstone, sand and grit (Tpd)	Slow to very slow	Very high	Permanently waterlogged and ponded	High gully and stream bank	Very slight	Variable and site specific, alluvial soils, brownish uniform sands, sandy pedal yellow and yellowish brown duplex soils. Friable brown duplex soils.	>120
26	CP (Covered Plain) S (Swamp)	Situated between Rocklands Reservoir and Grampians.	200	Undirectional and non-directional	Qra	Recent Quaternary	River alluvium and recent swamp deposits.	Nil to very slow	Very high	Ponding	Moderate stream-bed	Low	Complex and site specific. Apedal yellow and yellow brown duplex soils, common instances of stratified pale yellow and pale brown uniform sands (with dark grey surfacées) over a mottled uniform fine textured massive clay subsoil.	>120
27	L (Levee) LR (Low Rise) HR (High Rise) FS (Foot Slope) OD (Open Depression) DC (Drainage Complex)	Areas in the north between the Grampians and Pyrenees Ranges.	160-220	Tributary and convergent	Qs	Pleistocene Quaternary Tertiary	Clay, sand, silt and gravel	Low to moderate	Low High (OD, DC)	Very low. Seasonal waterlogging to ponding (OD, DC)	Low sheet Low stream-bed and gully	Low	Complex of (i) brown and yellow sometimes mottled, strongly structured, smooth ped, gradational earths with unbleached A ₂ horizons. Soils may show friable hydrophobic surface. (i) uniformly fine textured strongly structured non seasonally cracking, brown to light olive brown plastic uniform clays. (OD, OC)	>120



Sandy swamp areas (Qra), situated on the Henty Highway north of Cherrypool and extending south/west into the Grampians (Clk), some influence may arise from the Sisters and Green Hill formation (Cgr). River red gums predominate.

Classification	Soil Texture		Structure		USG	Permeability		Shrink-Swell (Subsoil)	Gravel %	Stone %	Soil Dispersibility		Slaking/Tendency		Drainage	Present Land Use
	Surface	Subsoil	Surface	Subsoil		Surface	Subsoil				Surface	Subsoil				
Uc5 Dy5, Dy5 Db3	Sand to loamy sand, minor sandy clay	Sand, loamy sand, sandy clay loam and sandy clay	Single grained and massive	Single grained, massive and weak subangular blocky	Variable SC, CL, ML and SM	Very good	Poor	Low to moderate	Minor	Nil	Nil	Nil	Nil	Permanently waterlogged	Recreation and conservation	
Uc/Uf (Dy4, Dy5)	Sand	Light clay	Single grained	Massive	SP/CL	Very good	Poor	Low to moderate	Nil	Nil	Nil	Nil	Nil	Permanently waterlogged	Conservation	
Gn3.2 Gn3.5 Gn3.7	Clay loam to light clay	Heavy clay	Friable crumb	Strong angular blocky	CL	Poor	Very poor	Moderate	Nil	Nil	Nil	Nil	Moderate to rapid	Poor	Grazing and cropping	
Uf5	Heavy clay	Heavy clay	Strong angular blocky	Strong angular blocky	ML, CL	Very poor	Very poor	Moderate	Nil	Nil	Nil	Nil	Nil	Poor	Grazing and cropping	



River red gums at Sheet of Water, Grampians National Park

Land Capability Assessment

Soil Type No.	Land Form	Cropping Hazard	Grazing Hazard	Secondary Roads	Septic Tanks	Building Foundations	Earthen Dams	Shallow Excavations	Urban Subdivisions	Rural Subdivision
1	DT	5 (G, Ss, Dr)	4/5 (G)	5 (G, Dr)	5 (G)	5 (G)	5 (G, Dr)	5 (G, Dr, Ss)	5	5
	H	4/5 (G, Ss, Dr)	2-3/4 (G, Ss)	3 (G, Su)	3 (Wp)	1-3 (G, Dr)	3-5 (Ss, Dr)	3-4 (G, Ss, Dr)	3/4	3/4
	LH	5 (Ss, Dr)	3/4 (Ss)	3 (Su)	3 (Wp)	1-3 (G, Dr)	3-5 (Ss, Dr)	3-4 (G, Ss, Dr)	3	3
	ULH	5 (Ss, Dr)	3/4 (Ss)	3 (Su)	3 (Wp)	1-3 (G, Dr)	3-5 (Ss, Dr)	3-4 (G, Ss, Dr)	3	3
2	H	4/5 (G, Ss)	3/5 (Ss)	3 (G)	4 (G)	1-4 (G)	4/5 (Dr)	4 (G, Ss)	3/4	3/4
	LH	2-4 (G, Ss)	3/5 (Ss)	3 (G)	3 (Wp)	1-3 (G)	4/5 (Dr)	4 (G, Ss)	3/4	3/4
	UH	4/5 (G, Ss)	3/5 (Ss)	3 (G)	3 (Wp)	1-4 (G)	4/5 (Dr)	4 (G, Ss)	3/4	3/4
	ULH	2-4 (G, Ss)	3/5 (Ss)	3 (Wd)	3 (Wp)	1-3 (G)	4/5 (Dr)	4 (G, Ss)	3/4	3/4
	FH	5 (G)	3/5 (Ss)	3 (G)	3 (Wp)	1-4 (G)	4/5 (Dr)	4 (G, Ss)	3/4	3/4
	FS	4/5 (Ss)	3/5 (Ss)	3 (G)	3 (Wp)	3 (G)	4/5 (Dr)	4 (G, Ss)	3/4	3/4
	GS	4/5 (Ss)	3/5 (Ss)	3 (Wd)	3 (Wp)	1-3 (G)	4/5 (Dr)	4 (G, Ss)	3/4	3/4
	VGS	4/5 (Ss)	3/5 (Ss)	3 (Wd)	3 (Wp)	1/2 (G)	4/5 (Dr)	4 (G, Wg, Ss)	3/4	3/4
	HR	4/5 (Ss)	3/5 (Ss)	3 (Su)	3 (Wp)	1-3 (G)	4/5 (Dr)	4 (G, Ss)	3/4	3/4
	LR	4/5 (Ss)	3/5 (Ss)	3 (Su)	3 (Wp)	1-3 (G)	4/5 (Dr)	4 (G, Ss)	3/4	3/4
	Cr	4/5 (Ss)	3/5 (Ss)	3 (Su)	3 (Wp)	1	4/5 (Dr)	4 (G, Ss)	3/4	3/4
	DT	5 (G, Dr)	4/5 (G, Ss)	5 (G)	5 (G)	5 (G)	5 (G, Dr)	5 (G)	5	5
	MS	4/5 (G, Dr)	3/5 (Ss)	4 (G)	5 (G)	5 (G)	5 (G, Dr)	5 (G)	5	5
SS	5 (G)	4/5 (G, Ss)	5 (G)	5 (G)	5 (G)	5 (G, Dr)	5 (G)	5	5	
3	DC	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5	5
4	H	4/5 (G, Ro)	2-4 (G, Ro)	3 (G) 1-5 (Dr)	1/2 (Wp)	1-3 (G)	4 (Ro Rb Dr)	4/5 (Ro Rb Dr)	4/5	4/5
	UH	4/5 (G, Ro)	2-4 (G, Ro)	3 (G) 1-5 (Dr)	1/2 (Wp)	1-3 (G)	4 (Ro Rb Dr)	4/5 (Ro Rb Dr)	4/5	4/5
	ULH	3/5 (G, Ro)	3/4 (Ro)	2/3 (G) 1-5 (Dr)	1/2 (Wp)	1-3 (G)	4 (Ro Rb Dr)	4/5 (Ro Rb Dr)	4/5	4/5
	FH	5 (G, Ro)	3/4 (Ro)	2/3 (G) 1-5 (Dr)	1/2 (Wp)	1-3 (G)	4 (Ro Rb Dr)	4/5 (Ro Rb Dr)	4/5	4/5
	FS	4/5 (Ro)	3/4 (Ro)	2/3 (G) 1-5 (Dr)	1/2 (Wp)	2 (G)	4 (Ro Rb Dr)	4/5 (Ro Rb Dr)	4/5	4/5
	GS	4/5 (Ro)	3/4 (Ro)	3 (G) 1-5 (Dr)	1/2 (Wp)	1-3 (G)	4 (Ro Rb Dr)	4/5 (Ro Rb Dr)	4/5	4/5
	HR	4/5 (Ro)	3/4 (Ro)	3 (G) 1-5 (Dr)	1/2 (Wp)	1-3 (G)	4 (Ro Rb Dr)	4/5 (Ro Rb Dr)	4/5	4/5
	LR	4/5 (Ro)	3/4 (Ro)	3 (G) 1-5 (Dr)	1/2 (Wp)	1-3 (G)	4 (Ro Rb Dr)	4/5 (Ro Rb Dr)	4/5	4/5
	Cr	4/5 (Ro)	3/4 (Ro)	2/3 (Dr)	1/2 (Wp)	1	4 (Ro Rb Dr)	4/5 (Ro Rb Dr)	4/5	4/5
	DT	5 (G, Ro)	4/5 (G, Ro)	5 (G)	5 (G)	5 (G)	5 (G Dr)	5 (G Dr)	5	5
	MS	4/5 (G, Ro)	2/4 (G, Ro)	5 (G)	5 (G)	5 (G)	5 (G Dr)	5 (G Dr)	5	5
	SS	5 (G, Ro)	4/5 (G, Ro)	5 (G)	5 (G)	5 (G)	5 (G Dr)	5 (G Dr)	5	5
	UT	4/5 (Ro)	3/4 (Ro)	3 (G) 1-5 (Dr)	1/2 (Wp)	2/3 (G)	4 (Ro Rb Dr)	4/5 (Ro Rb Dr)	5	5
5	CP	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5	5
	DC	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5	5
6	UH	4/5 (G)	2/3 (G)	3 (Su)	3 (Wp)	1-3 (G)	4 (Dr)	4 (Dr)	4	4
	LH	2-4 (G)	2 (Dr)	3 (Su)	3 (Wp)	1-3 (G)	4 (Dr)	4 (Dr)	4	4
	FH	5 (G)	2 (G)	3 (SU)	3 (Wp)	1-3 (G)	4 (Dr)	4 (Dr)	4	4
7	DC	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5	5
8	H	4/5 (G, Ss, Dr)	2-5 (Dr Ss St)	3/4 (Dr)	3 (Wp)	3/4 (Dr)	5 (Ss Dr)	5 (Dr)	5	5
	FH	5 (G, Ss, Dr)	3-5 (Dr Ss St)	3 (Dr)	3 (Wp)	3/4 (Dr)	5 (Ss Dr)	5 (Dr)	5	5
	FS	5 (Ss, Dr)	3-5 (Dr Ss St)	3/4 (Dr)	3 (Wp)	3/4 (Dr)	5 (Ss Dr)	5 (Dr)	5	5
	Cr	5 (Ss, Dr)	3-5 (Dr Ss St)	3/4 (Dr)	3 (Wp)	3/4 (Dr)	5 (Ss Dr)	5 (Dr)	5	5
	DT	5 (G, Ss, Dr)	4/5 (G Dr Ss)	5 (G)	5 (G)	5 (G)	5 (G Dr)	5 (G Dr)	5	5
	MS	4/5 (G, Ss, Dr)	3-5 (Dr Ss St)	4/5 (G)	5 (G)	5 (G)	5 (G Dr)	5 (G Dr)	5	5
	SS	5 (G, Ss, Dr)	4/5 (G Dr Ss)	5 (G)	5 (G)	5 (G)	5 (G Dr)	5 (G Dr)	5	5
9	ULH	2-4/5 (G Ss)	5 (Ss)	2 (G)	4 (Dr) 3 (Wp)	2/3 (Dr) 1-3 (G)	4/5 (Dr Ss)	3-5 (Dr Ss)	3-5	4/5
	FH	5 (G Ss)	5 (Ss)	2 (G)	4 (Dr) 3 (Wp)	2/3 (Dr) 1-3 (G)	4/5 (Dr Ss)	3-5 (Dr Ss)	3-5	4/5
	FS	5 (Ss)	5 (Ss)	2 (G)	4 (Dr) 3 (Wp)	2/3 (Dr) 1-3 (G)	4/5 (Dr Ss)	3-5 (Dr Ss)	3-5	4/5
	FS'	5 (Ss)	5 (Ss)	3 (Su)	4 (Dr) 3 (Wp)	3 (G)	4/5 (Dr Ss)	3-5 (Dr Ss)	3-5	4/5
	F	5 (Ss)	5 (Ss)	2 (G)	4 (Dr) 3 (Wp)	2/3 (Dr) 1-3 (G)	4/5 (Dr Ss)	3-5 (Dr Ss)	3-5	4/5
	F'	5 (Ss)	5 (Ss)	3 (Su)	4 (Dr) 3 (Wp)	3 (G)	4/5 (Dr Ss)	3-5 (Dr Ss)	3-5	4/5
	MS	4/5 (G Ss)	5 (Ss)	4 (G)	5 (G)	5 (G)	5 (G)	3-5 (Dr Ss G)	5	5
	MS'	4/5 (G Ss)	5 (Ss)	4 (G)	5 (G)	5 (G)	4/5 (G)	3-5 (Dr Ss G)	5	5
	LR	5 (Ss)	5 (Ss)	2 (G)	4 (Dr) 3 (Wp)	2/3 (Dr) 1-3 (G)	4/5 (Dr)	3-5 (Dr Ss)	3-5	4/5
	HR	5 (Ss)	5 (Ss)	2 (G)	4 (Dr) 3 (Wp)	2/3 (Dr) 1-3 (G)	5 (Dr Ss)	3-5 (Dr Ss)	3-5	4/5
	Cr'	5 (Ss)	5 (Ss)	3 (Su)	4 (Dr) 3 (Wp)	2 (Su)	5 (Dr Ss)	3-5 (Dr Ss)	3-5	4/5
	PP	5 (Ss)	5 (Ss)	3 (Wg)	3/4 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5	5
	OD	5 (Ss Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5	5
10	L	3 (St)	5 (St)	1	1	1	5 (Su)	4 (Su)	4	4
	FP	3 (Fi St)	3/4 (Wg)	4 (Fi)	5 (Fi)	5 (Fi)	5 (Su Fi)	5 (Fi)	5	5
	FS	3 (St)	3/4 (G Su)	1	3 (G)	3 (G)	5 (Su)	4 (Su)	3/4	3/4
11	DC	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5	5
12	LH	2-4 (G Ss)	3-5 (Ss St)	3 (Su)	2/3 (Wg)	1-3 (G)	2/3 (Su G)	1-3 (G)	3	3
	ULH	2-4 (G Ss)	3-5 (Ss St)	3 (Su)	2/3 (Wg)	1-3 (G)	2/3 (Su G)	1-3 (G)	3	3
	UH	4/5 (G Ss)	3-5 (Ss St)	3 (Su)	2/3 (Wg)	1-3 (G)	2/3 (Su G)	1-3 (G)	3	3
	FH	5 (G Ss)	3-5 (Ss St)	3 (Su)	2/3 (Wg)	1-3 (G)	2/3 (Su G)	1-3 (G)	3	3
	FS	4/5 (Ss)	3-5 (Ss St)	3 (Su)	2/3 (Wg)	3/4 (G)	2/3 (Su G)	1-3 (G)	3	3
	LR	4/5 (Ss)	3-5 (Ss St)	3 (Su)	2/3 (Wg)	1-3 (G)	2/3 (Su G)	1-3 (G)	3	3
	HR	4/5 (Ss)	3-5 (Ss St)	3 (Su)	2/3 (Wg)	1-3 (G)	2/3 (Su G)	1-3 (G)	3	3
	UT	4/5 (Ss)	3-5 (Ss St)	3 (Su)	2/3 (Wg)	1-3 (G)	2/3 (Su G)	1-3 (G)	3	3
	OD	4/5 (Ss Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5	5



Cropping: An area north of Eversley showing cereal cropping on Quaternary terraces (Qpa)



Grazing: Improved pastures west of Moyston being grazed by cattle.



Secondary Road: Brimpaen-Halls Gap Road, located on lower colluvial slopes (Qrc), off the Grampians formation (Clk)

Soil Type No.	Land Form	Cropping Hazard	Grazing Hazard	Secondary Roads	Septic Tanks	Building Foundations	Earthen Dams	Shallow Excavations	Urban Subdivisions	Rural Subdivision
13	LH	2-4 (G)	2 (Ss)	3 (Su)	2 (Wp)	1-3 (G)	1/2 (Su, G)	1-3 (G)	3	3
	ULH	2-4 (G)	2 (Ss)	3 (Su)	2 (Wp)	1-3 (G)	1/2 (Su, G)	1-3 (G)	3	3
	FS	3 (G Ss)	2 (Ss)	3 (Su)	2 (Wp)	3/4 (G)	1/2 (Su, G)	1-3 (G)	3	3
	VGS	3 (Ss)	2 (Ss)	3 (Su)	2 (Wp)	2 (Su)	1/2 (Su, G)	1/2 (G)	3	3
	LR	3 (Ss)	2 (Ss)	3 (Su)	2 (Wp)	1-3 (G)	1/2 (Su, G)	1-3 (G)	3	3
	HR	3 (Ss)	2 (Ss)	3 (Su)	2 (Wp)	1-3 (G)	1/2 (Su, G)	1-3 (G)	3	3
	PP	3 (Ss)	3 (Wd)	3/4 (Wg)	3/4 (Fi)	5 (Fi)	4 (Fi)	4/5 (Fi)	5	5
	OD	5 (Fi Wg)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5	5
UT	3 (Ss)	2 (Ss)	3/4 (Wg)	3/4 (Fi)	5 (Fi)	1/2 (Su, G)	1-3 (G)	5	5	
14	DC	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5	5
15	LH	2-4 (G)	1/2(Ss) 1-5 (St)	3 (Su)	2-4 (Wp)	1-3 (G)	1/2 (Su G Wp)	1-3 (G) 4 (Su)	3/4	3/4
	ULH	2-4 (G)	1/2(Ss) 1-5 (St)	3 (Su)	2-4 (Wp)	1-3 (G)	1/2 (Su G Wp)	1-3 (G) 4 (Su)	3/4	3/4
	UH	4/5 (G)	2/3 (G) 1-5 (St)	3 (Su)	2-4 (Wp)	1-3 (G)	1/2 (Su G Wp)	1-3 (G) 4 (Su)	3/4	3/4
	LR	3 (Ss St)	1/2(Ss) 1-5 (St)	3 (Su)	2-4 (Wp)	1-3 (G)	1/2 (Su G Wp)	1-3 (G) 4 (Su)	3/4	3/4
	GS	3/4 (G)	1/2(Ss) 1-5 (St)	3 (Su)	2-4 (Wp)	3 (G)	1/2 (Su G Wp)	1-3 (G) 4 (Su)	3/4	3/4
	VGS	3 (Ss St)	1/2(Ss) 1-5 (St)	3 (Su)	2-4 (Wp)	2 (G)	2 (Su Wp)	2 (G) 4 (Su)	3/4	3/4
	UT	5 (Ss St)	1/2(Ss) 1-5 (St)	3/4 (Wg)	2-4 (Wp)	3/4 (G)	1/2 (Su Wp)	1-3 (G) 4 (Su)	3/4	3/4
16	DC	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5	5
17	LR	3 (St)	1 (Ss G)	2/3 (Su)	4 (Wp)	4 (Fi)	3 (Sl)	4 (Fi)	4	4
	ULH	3 (St)	1 (Ss G)	2/3 (Su)	4 (Wp)	4 (Fi)	3 (Sl)	4 (Fi)	4	4
18	FS	1-3 (St)	1-5 (St)	1, 2/3 (Su)	1, 2 (Wd)	3/4 (G)	2-5 (Su Wp)	4 (Su)	3/4	3/4
	FH	5 (G)	1-5 (St)	1, 2/3 (Su)	1, 2 (Wd)	1-3 (G)	2-5 (Su Wp)	4 (Su)	3/4	3/4
	UH	4/5 (G)	2/3 (G) 1-5 (St)	1, 2/3 (Su)	1, 2 (Wd)	1-3 (G)	2-5 (Su Wp)	4 (Su)	3/4	3/4
	ULH	2-4 (G)	1-5 (St)	1, 2/3 (Su)	1, 2 (Wd)	1-3 (G)	2-5 (Su Wp)	4 (Su)	3/4	3/4
	UT	1-3 (St)	3 (Wd) 1-5 (St)	5 (Fi)	4 (Fi)	1-3 (G)	2-5 (Su Wp)	4 (Su)	5	5
	FP	3/4 (Fi)	4/5 (Fi)	5 (Fi)	4 (Fi)	5 (Fi)	2-5 (Su Wp Fi)	4 (Su) 5 (Fi)	5	5
	HR	1-3 (St)	1-5 (St)	1, 2/3 (Su)	1, 2 (Wd)	1-3 (G)	2-5 (Su Wp)	4 (Su)	3/4	3/4
	LR	1-3 (St)	1-5 (St)	1, 2/3 (Su)	3 (Wg)	1-3 (G)	2-5 (Su Wp)	4 (Su)	3/4	3/4
	L	3/4 (Fi)	4/5 (Fi)	1, 2/3 (Su)	5 (Fi)	5 (Fi)	2-5 (Su Wp Fi)	4 (Su) 5 (Fi)	5	5
19	FP	3/4 (Fi)	3 (Wd) 1-5 (St)	3/4 (Wd Fi)	5 (Fi)	2/5 (Wd Fi)	4/5 (Fi)	3-5 (Fi)	4/5	5
	PP	3/4 (Fi)	3 (Wd) 1-5 (St)	3/4 (Wd Fi)	5 (Fi)	2/5 (Wd Fi)	4/5 (Fi)	3-5 (Fi)	4/5	5
	PP'	3/4 (Fi)	3 (Wd) 1-5 (St)	3/4 (Wd Fi)	5 (Fi)	2/5 (Wd Fi)	4/5 (Fi)	3-5 (Fi)	4/5	5
	OD	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5	5
	DC	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5	5
20	AP	3/5 (Fi)	3 (Wd)	5 (Wg Wd Fi)	5 (Fi)	3-5 (Fi)	4/5 (Sl Fi)	5 (Fi)	5	5
	FP	3/5 (Fi)	3 (Wd)	5 (Wg Wd Fi)	5 (Fi)	3-5 (Fi)	4/5 (Sl Fi)	5 (Fi)	5	5
	S	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	3-5 (Fi)	5 (Fi)	5 (Fi)	5	5
21	L	3 (G St)	1 (G) 5 (Fi)	3 (Su G)	1	1-3 (G) 2 (Su)	5 (Su)	4/5 (SU Fi)	4/5	4/5
22	Lu	2/3 (St)	2/3 (G) 1-5 (St)	3 (Su G)	1	1/3 (G)	5 (Su)	3 (Su)	3	3
23	LH	2-4 (G)	1 (G) 2-5 (St)	3 (Su)	1	1-3 (G)	2-5 (Sl Su)	1-3 (G)	3	3
	UH	4/5 (G)	2/3 G 2-5 (St)	3 (Su)	1	1-3 (G)	2-5 (Sl Su)	1-3 (G)	3	3
	FS	3 (St)	1 (G) 2-5 (St)	3 (Su)	1	1-3 (G)	2-5 (Sl Su)	1-3 (G)	3	3
	GS	3 (St)	1 (G) 2-5 (St)	3 (Su)	1	1-3 (G)	2-5 (Sl Su)	1-3 (G)	3	3
	LR	3 (St)	1 (G) 2-5 (St)	3 (Su)	1	1-3 (G)	2-5 (Sl Su)	1-3 (G)	3	3
	HR	3 (St)	1 (G) 2-5 (St)	3 (Su)	1	1-3 (G)	2-5 (Sl Su)	1-3 (G)	3	3
	UT	1-3 (Fi St)	3 (Wd) 2-5 (St)	3 (Su)	4 (Fi)	2/4 (Fi Wd)	2-5 (Sl Su)	1-3 (G Fi)	3	4
	FP	3 (St)	3 (Wd) 2-5 (St)	3 (Su)	1	3 (Wd)	2-5 (Sl Su)	3 (Fi)	3	3
	D	3 (St) 3-5 (G)	2/3 (G) 1-5 (St)	3 (Su)	1	1-3 (G)	2-5 (Sl Su)	1-2 (G)	3	3
	OD	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	2-5 (Fi Sl Su)	5 (Fi)	5	5
24	DC	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5	5
25	CP	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5	5
26	CP	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5	5
	S	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5	5
27	L	2/3 (St G)	1 (G)	2 (G Su)	4/5 (Wp)	2/3 (G Su)	2, 3 (G Su)	3 (G)	3	4/5
	LR	2/3 (St G)	1 (G)	2 (G Su)	4/5 (Wp)	2/3 (G Su)	2, 3 (G Su)	3 (G)	3	4/5
	HR	2/3 (St G)	1 (G)	2 (G Su)	4/5 (Wp)	2/3 (G Su)	2, 3 (G Su)	3 (G)	3	4/5
	FS	2/3 (St G)	1 (G)	2 (G Su)	4/5 (Wp)	2/3 (G Su)	2, 3 (G Su)	3 (G)	3	4/5
	OD	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi Wd)	5 (Fi)	5 (Fi)	5 (Fi)	5	5
	DC	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5 (Fi)	5	5



Shallow excavation: Minor gravel stripping from the lower rocky colluvial slopes (Qrc), of the well vegetated Sedimentary sandstone formations (Clk)



Urban development: The City of Stawell, the largest urban centres within the study area.



Rural development: Modern cottage living on the undulating terrain north of Wartook, 30km from Horsham