

## 10. Description of Land Capability Classes on Meander Map

The following sections describe the different classes of land which have been mapped on the Meander map. The complexity of the pattern of land capability mapped is a reflection of the complex geology, soil types and topography found on this map. A stylised cross section of part of the Meander map showing landform, geology, soil and land capability relationships is shown in Figure 8, and in Figure 11, at the end of this section.

The majority of land mapped on the Meander map is Class 4 land, in terms of area, followed by Class 5 and Class 6. The area and percentages of land on the Tamar map is shown in Tables 1 and 9.

In some areas, due to limitations of scale and the complexity of soils and landscape, and where two classes both occupy between 40% and 60% of the area, a complex unit has been mapped (e.g. 4 + 5). The first digit indicates the dominant class within the complex.

**10.1 Class 1** No areas of Class 1 land have been mapped.

**10.2 Class 2** (127 ha; 0.06 % of Meander map land area)

### ***Class 2 land on Basalt***

One area of Class 2 land on basalt has been mapped, north of Deloraine. This area is flat to gently sloping, is relatively free of stone, but has a slight climatic limitation which slightly reduces the range of crops that are grown. The majority of slopes in this area are between 0 and 5%.

The krasnozem soils have been formed on basalt flows which were extruded in Tertiary times as a result of volcanic eruptions. They are deep, well structured and free draining soils, suitable for intensive cropping use.

Typical krasnozem soil profiles have a strong granular structured, dark red or reddish brown, friable, clay loam A horizon; over a well structured, dark red brown to red brown, friable, clay B horizon; grading to reddish, friable clay with increasing amounts of weathered basalt (Nicolls, 1959).

Soil depths are commonly greater than one metre. Topsoil pH levels are moderately acid, ranging between 5.0 and 6.5 and stay more or less constant with depth (CSIRO data base). Because the soils are free draining and have a strongly developed granular structure, they are easy to work over a wide range of moisture conditions. Organic matter content is high in the surface horizons, and needs to be maintained by the use of green manure crops. This would help maintain the excellent soil structure and retain minerals essential to plant growth.

Topsoil erosion and leaching, particularly in deeply weathered basalt profiles, can result in a loss of nutrients such as calcium, potassium, sulphur, magnesium and nitrogen. These nutrient and soil losses can be combated by the use of cover crops, conservation tillage and management practices. Green manure crops can help increase organic matter contents in the surface horizons, and this is important for maintaining soil structure. Phosphorous and molybdenum retention are also common problems on krasnozem soils, and can be

combated by the application of lime and mineral fertilisers (superphosphate and molybdenum super).

Because available nutrients are held in the topsoil, it is extremely important that this layer be preserved. If lost through erosion, an important part of the nutrient supply is lost. The subsoil horizons lack a high level of available nutrients and higher levels of fertiliser application are required to maintain production, once valuable topsoil has been lost to erosion.

To preserve the excellent soil structure and the long-term potential of this land for cropping, Class 2 land on slopes above 5% should not be cropped in rotation for more than five to eight years, in a ten year cycle. The krasnozem soils are generally stable, but continuous cropping can degrade soil structure. However this can be improved with pasture phases. When under crop, minor soil conservation works such as graded drains, grassed irrigation runs and cut off drains, may be necessary to limit sheet and rill erosion. Compaction by cropping machinery also needs to be limited in order to prevent compact layers or plough pans forming which may decrease infiltration rates.

The area of Class 2 land on basalt is used for intensive cropping , in particular vegetable crops. This area experiences a higher incidence of frost than similar types of land nearer the coast which have a mild maritime climate. The risk of out of season frosts and shorter growing seasons slightly reduce the range and yields of crops that are grown in the Deloraine district. Average annual rainfalls are around 1000 mm.

Refer to Photo 6 which shows a typical example of Class 2 land on basalt, and Table 8 which summarises the major features of the land capability classes on basalt, according to slope, stoniness and climate limitations.



**Photo 6:** Class 2 land on basalt. Meander map 702 058, Mitchells Road.

CLASS	SLOPE	CROPPING VERSATILITY	CLIMATIC LIMITATION	STONINESS LIMITATION	EROSION TYPES (under cultivation)	SOIL MANAGEMENT MEASURES REQUIRED (under cultivation)	LENGTH OF CROPPING PHASE (years out of 10)	LIMITATIONS TO AGRICULTURAL USE
1	0-5%	All annual crops	Nil	Nil	Nil to slight sheet and rill	No special management practices	8-9 years	None
2	5-12%	All annual crops	Nil	Nil	Slight to moderate sheet and rill	Minor conservation works	5-8 years	None
2	0-5%	All crops except frost tender	Slight	Nil	Nil to slight sheet and rill	No special management practices	8-9 years	Climate
2	5-12%	All crops except frost tender	Slight	Nil	Slight to moderate sheet and rill	Minor conservation works	5-8 years	Climate
3	12-18%	All annual crops	Nil	Nil	Moderate sheet and rill, slight gully	Major conservation works	2-5 years	Slope
3	0-12%	Slightly restricted range of crops	Nil	Moderate	Nil to moderate sheet and rill	None to minor conservation works	2-8 years	Stoniness
3	12-18%	Restricted range of crops	Slight to moderate	Nil	Moderate sheet and rill, slight gully	Major conservation works	2-5 years	Climate, slope
3	0-12%	Restricted range of crops	Slight to moderate	Moderate	Nil to moderate sheet and rill	None to minor conservation works	2-8 years	Stoniness, climate
4	18-30%	Restricted range of crops	Nil	Nil	Severe sheet, rill and gully	Major conservation works	1-2 years	Slope
4	0-18%	Restricted range of crops	Nil	Moderate to severe	Nil to moderate sheet and rill, slight gully	None to major conservation works	2-5 years	Stoniness
4	18-30%	Restricted range of crops	Slight to moderate	Nil	Severe sheet, rill and gully	Major conservation works	1-2 years	Climate. Slope
4	0-18%	Severely restricted range of crops	Slight to moderate	Moderate to severe	Nil to moderate sheet and rill, slight gully	None to major conservation works	2-5 years	Stoniness. climate

**Table 8:** Features of land capability classes on basalt according to slope, stoniness and climatic limitations

## **10.3 Class 3 (13090 ha; 6.30 %)**

### ***Class 3 land on Basalt***

Areas of Class 3 land on basalt occur in the following localities: Bengo, Red Hills, Needles, Montana, Lemana, Deloraine, Exton, Hagley and Whitemore (west and south). Refer to Photo 7 and Table 8.

These areas are also part of the Tertiary basalt flows, and soils are similar to those described on Class 2 land (refer to 10.2). However the areas of Class 3 land are variable in terms of the range of slope angles, stone content, soil depth and soil type. These differences may be a reflection of different mineralogical composition, rates of weathering, climate or drainage properties. Stony krasnozems tend to be more common in areas inland from the coast, and some are relatively shallow. In some areas the amount and size of stone is a limitation to cultivation.

Soils are variable with areas of typical krasnozem soils as well as brown and black soils on basalt. These brown and black soils reflect poorer site drainage due to run-on and ground water seepages.

Slopes are generally steeper than those on Class 2 land, ranging up to 18%, with the result that some areas are more susceptible to water erosion under an intensive cropping regime. Therefore more intensive soil conservation works would be required than that on Class 2 land, and careful soil management practices are necessary when cropping is carried out on the steeper slopes. These measures would include cut off drains to prevent run-on, grassed waterways for irrigators, and spinner drains at frequent intervals to intercept surface water flow. The use of cover and green manure crops would maintain organic matter content and protect soils from sheet and rill erosion.

Stoniness varies throughout, and the crop rotations vary according to slope and the amount of stones present. These areas are suitable for cash cropping but because of the higher slope angles, cultivation and crop rotations should be limited and pasture phases extended, in order to maintain soil structure, prevent loss of topsoil by erosion, and to preserve the long term sustainability of this land for cropping.

The effects of climate in this area (frosts and cooler, shorter growing seasons), reduce the range and yields of crops in comparison to other areas (e.g north west coast). Rainfall ranges between 700 and 800 mm at Whitemore and Hagley, to between 1000 and 1100 mm in the north west of the map sheet, around Needles and Montana.



**Photo 7:** Class 3 land on basalt. Class 4 land on basalt in background. Meander map 792 027. Bass Highway.

### ***Class 3 land on Tertiary Sediments***

This type of land occurs in the north east of the map sheet, on the Launceston Tertiary Basin sediments. Localities are east and south of Bishopsbourne, north of Bracknell, around Oaks and Whitmore, and north and south of the Bass Highway between Hagley and Westbury - extending north to the map boundary onto the Tamar map, and south to Black Hills and Glenore.

The Cressy association soils are the only soils of the terraces in the Launceston Tertiary Basin that are suitable for intensive cropping on a regular basis. The frequency of cropping cycles would depend on slope, and the structural condition of the soil.

Many of the areas of Cressy association soils were cropped intensively last century to provide wheat and other cereals to the mainland States of Australia. This resulted in some areas suffering from soil structure decline, therefore care needs to be taken in the management of these soils, particularly in the area of improving soil structure.

This type of Class 3 land occurs on flat terraces and on slopes ranging up to approximately 12%. Although slope is not a limiting factor, internal drainage can be impeded and soil structure is not as well developed as in the krasnozems soils. These soils also require fertiliser applications.

Average annual rainfall ranges between 700 and 1000 mm. Climate, in particular frost hazard, reduces the range of autumn sown winter crops that can be grown.

In areas where the Cressy soils merge with the basalt soils, boundaries between these soil types are difficult to differentiate.

Refer to Figure 8 and Photo 8 which shows an example of this type of Class 3 land.



**Photo 8:** Class 3 land on Tertiary sediments. Meander map 879 041. Emu Plain Road.

## **10.4 Class 4 (53965 ha; 25.96 %).**

Class 4 land occurs on a wide range of parent material including Tertiary Basalt, Tertiary sediments of the Launceston Basin, Permian and Triassic sandstones and mudstones, slates and quartzites, windblown sand and alluvium and gravels.

### ***Class 4 land on Basalt***

Class 4 land on basalt occurs south west of Needles, in the Red Hills - Bengeo-Lemana-Deloraine area, Montana, east of Deloraine, south of Exton, north of Westbury, and around Black Hills.

The major limitations to cropping in these areas are slope angle, rock outcrops and/or stone content, and/or climate (Refer to Table 8 and Photo 9).

The majority of Class 4 land on basalt occurs as steep sided hills or scarps and often has rock outcrops on the steep knolls or ridges. Other areas may not be as steep, but the stone content of the soil is a limitation to cultivation. In western areas of the map sheet, climate (frost hazard and shorter growing seasons) also limits the range of crops that can be grown.

Slopes can range up to 30%. On steeper areas (18-30%) that do not have stones or rock outcrops, major soil conservation works and careful soil management practices are necessary if cultivation is carried out. Although the basalt soils have excellent structure, frequent cropping on these steeper slopes may induce high levels of soil erosion (sheet, rill and gully), and result in a deterioration in soil structure. Therefore cropping rotations should be reduced to one to two years in a ten year rotation with pasture.

On gentler slopes, more frequent cropping may be carried out as the risk of erosion is lower; however the amount of stones present may limit the types of crops and frequency of cropping rotations. Also on lower slopes, areas of seepage can occur, resulting in poorly drained soils.

Average annual rainfall ranges from 800 mm around Westbury, to around 1100 mm in the Montana-Needles area.





**Photo 9:** Class 4 land on basalt. Meander map 612 988. 'Needlesdale'.

### ***Class 4 land on Sandstones, Siltstones and Mudstones***

Class 4 land occurs on flat benches and gentle slopes of the Permian and Triassic age sandstones, siltstones and mudstones. Localities where this type of land occur are around the foothills of the Great Western Tiers, Archers and Warners Sugarloafs, Quamby Bluff, and Cluan Tiers. Specific localities are west and east of Meander, Jackeys Marsh, Golden Valley, Quamby Brook, Cluan Valley, Liffey, and Blackwood Creek and Poatina areas.

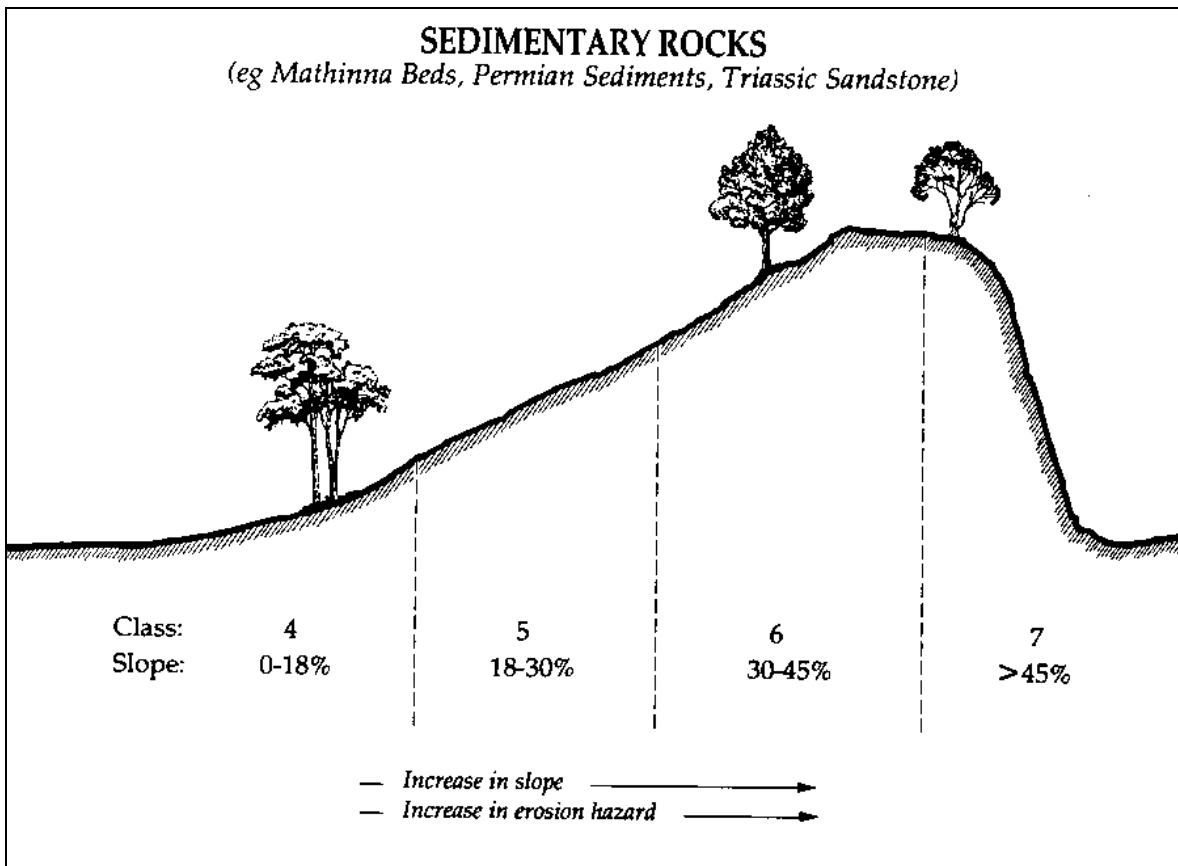
Slope angles are variable, but can range up to 18%. Average annual rainfall ranges between 800 and 1200 mm.

Soil types mapped are the yellow podzolic soils on mudstones and the podzolic soils on Permian and Triassic sandstone.

The majority of this type of land has been developed for agricultural use. However its potential for frequent cropping is limited because of low fertility, poor soil structure particularly on the sandier soils, and the potential for sheet, gully and rill erosion under cultivation. Excessive cultivation on these soils breaks down the structure of the A horizons, making them more vulnerable to erosion.

Photo 10 shows an example of this type of Class 4 land, and Figure 9 illustrates the sequence of land capability classes on these deposits.





**Figure 9:** Relationship between land capability classes on sedimentary rock types.



**Photo 10:** Classes 4 and 5 land on sandstones, siltstones and mudstones. Meander map 692 885. Jackeys Marsh Road.

### ***Class 4 land on Tertiary Sediments***

Class 4 land on Tertiary sediments has been mapped on the Woodstock, Brickendon and Brumby terraces and on low terraces cut across basalt. Class 4 land also occurs on the Cressy erosional surface (Kinburn soils) and on the recent flood plain (Canola soils) and these have been described under Class 4 land on alluvium and gravels. Refer to Figure 8 for a diagrammatic representation of the soil and landscape relationships on Tertiary sediments.

Class 4 land on the Woodstock surface occurs on flat to gently undulating slopes (0-5%). The soils of the Woodstock association are acid, leached duplex soils. They are low in soil nutrients, therefore require high fertiliser inputs. Although some cropping can be undertaken, the sandy textured topsoils are prone to water and wind erosion. The gravelly A<sub>2</sub> horizons that contain ferruginous gravel are generally not a hindrance to cultivation providing the A<sub>1</sub> horizon is of reasonable depth, and the gravels are loose and not cemented.

Woodstock association soils occur south west of Carrick (Whitemore Road), south west of Whitemore (Adelphi Road), south east of Bracknell and a small area north west of Westbury. Average annual rainfalls range between 700 and 900 mm. Photo 11 shows an example of this type of Class 4 land.

The majority of the Woodstock association soils have been mapped as a complex of Class 4 and 5 land. Areas of cemented laterite, shallow soils or dolerite outcrops may occur which are generally unsuitable for cultivation, and are therefore Class 5 land.

Soils of the Brickendon association have also been mapped as Class 4 land. Slopes are flat to gently undulating, up to around 5%. This type of Class 4 land occurs around Westbury, around Bracknell, and from Whitemore north to the Bass Highway and east to Carrick. Refer to Photo 12 for an example of this type of land.

These soils have sandy topsoils which are prone to fluvial and wind erosion. The quartz gravelly A<sub>2</sub> horizons can be abrasive on tillage and cultivation machinery. The clay subsoils may also be sodic (prone to dispersion and low permeability). Waterlogging can hinder harvesting on and working these soils during the winter. The amount of quartz gravel in the profile combined with the imperfect internal drainage and acid topsoils make these soils marginal for intensive cropping use.

Brumby association soils have also been mapped as Class 4 land. On this terrace slopes are generally flat. The sandy topsoils are weakly structured and can suffer structural decline if careful management is not undertaken. In winter surface flooding is common due to the slow rate of run-off and slow permeability of the subsoil clays. The fine textured A<sub>2</sub> horizon often becomes hardset in summer, while in winter turns to a wet structureless slurry. Winter working of these soils is not recommended as this can lead to soil structural decline, and bogging of machinery. Some low lying drainage lines on the Brumby surface may be prone to concentrations of salt.

Class 4 land on Tertiary age sediments occurs in the Dairy Plains and Stockers Plains area, along the Meander River north of Native Hop Hill, low terraces of Quamby Brook, along the Cluan Valley, Liffey River terraces, north of McRaes Hills, Whitemore Creek and Black Hills Creek terraces, and along the Meander River north east of Hagley. Average annual rainfalls range from 700 to 1100 mm.



**Photo 11:** Class 4 land on Tertiary sediments (Woodstock association soils). Meander map 965 002. East of Heazelwoods Lane.



**Photo 12:** Class 4 land on Tertiary sediments (Brickendon association soils). Meander map 959 027, Bass Highway.



### ***Class 4 land on Sandstones, Slates, Conglomerates and Quartzites***

This type of Class 4 land occurs on the lower slopes of Gardners Ridge, Beefeater Hill, Needles Ridge, Long Ridge and the area from Native Hop Hill north to Pumicestone Ridge. Photo 13 shows an example of this type of land.

Slope angles range between 5 and 15%. Although this land is of fairly low relief, the low fertility acid soils and potential erosion hazard severely limit the agricultural potential.

Soils associated with this type of land are the red and yellow podzolic soils and podzols on various metamorphic rocks, mapped on the Quamby reconnaissance soil map. The sandy topsoils are susceptible to fluvial erosion and careful management is necessary. Inputs of fertiliser are necessary to rectify the nutrient deficiencies.



**Photo 13:** Class 4 land (foreground), and Class 5 land (background) on sandstones, slates, conglomerates and quartzites. Meander map 698 998, Lake Highway. Quamby Bluff behind.

### ***Class 4 land on Dolerite***

A few small areas of Class 4 land on dolerite have been mapped at Montana and Osmaston, on podzolic and krasnozems on dolerite (Quamby reconnaissance soil map). This type of land is similar to that described under Class 5 land on dolerite, however it has few or no stones throughout the profile, and therefore is suitable for occasional cultivation.

### ***Class 4 land on Alluvium and Gravels***

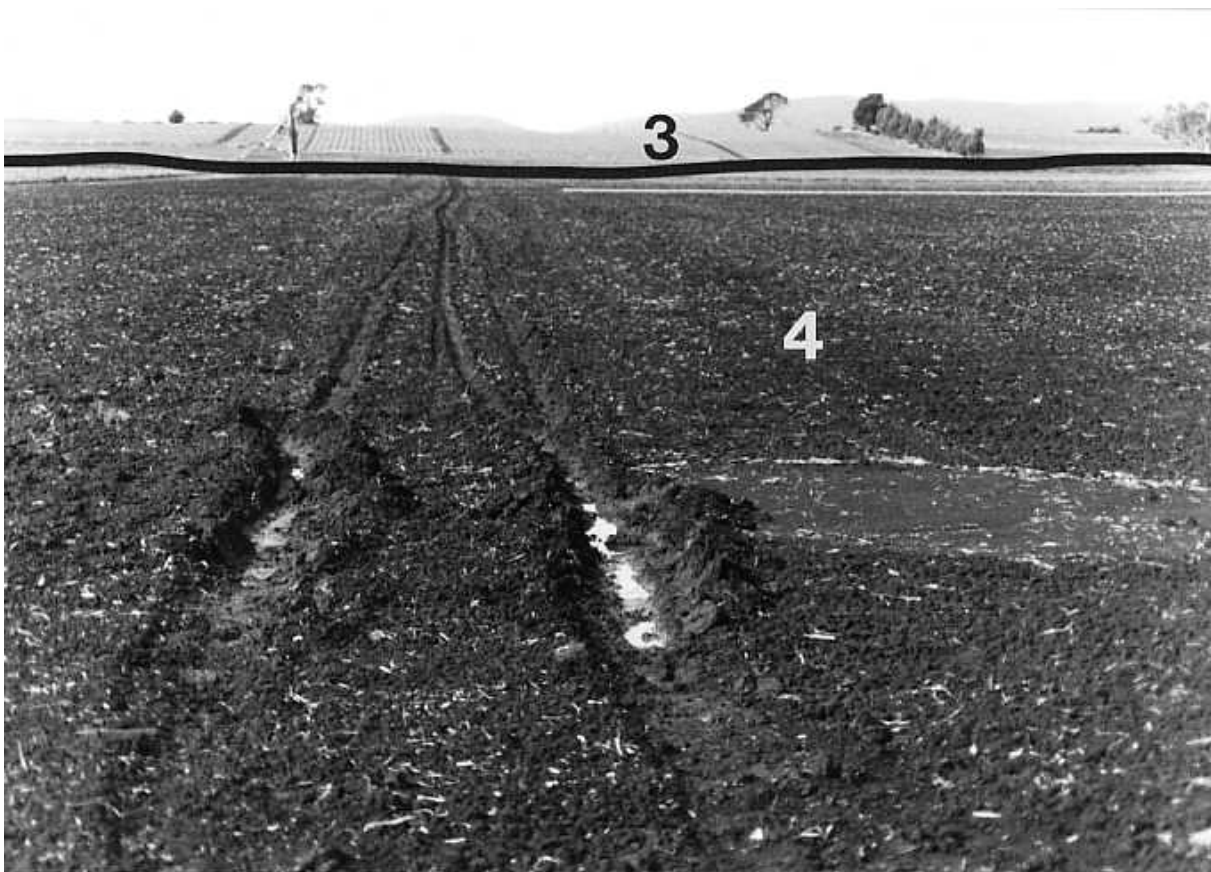
Class 4 land on alluvium occurs on flat river terraces and floodplains, and in depressions and drainage lines associated with other rock types (e.g. basalt, dolerite, Tertiary clays). Refer to Photo 14.

The principal soil types are the Canola and Kinburn associations, (as mapped on the Quamby reconnaissance soil map).

Localities where this type of Class 4 land occurs with Canola association soils are along the river and stream systems and the tributaries of the Liffey River, Meander River, Quamby Brook, Swamp Gum Rivulet, Western Creek, Leiths Creek, Woodlands Creek, Black Hills Creek, Murfetts Creek, Whitmore Creek, Brumbys Creek, Palmers Rivulet and Woodside Rivulet. On Kinburn association soils, Class 4 land occurs along depressions and drainage lines associated with the Cressy association soils (south west of Hagley, Murphys Creek).

Black earths (Canola soils) are also associated with areas of colluvium and alluvium derived from basalt and dolerite, such as the basalts south west of Needles.

Alluvial soil profiles are variable in terms of colour, depth and organic matter depending on the nature of the parent materials and deposition from flooding. Soils are poorly to imperfectly drained and depending on their position are often subject to surface flooding, particularly in winter and spring.



**Photo 14:** Class 4 land on alluvium in foreground (Canola association soils). Class 3 land on basalt in background. Meander map 930 050, Black Lane.

The major limitations affecting the potential for agricultural use are flood risk, high water tables, slow internal drainage and the short available working window between the soils being too dry and too wet for cultivation. Machinery can often become bogged on these soils when they become too wet, resulting in compaction and damage to soil structure. In areas adjacent to stream courses, stream bank erosion is a potential problem.

Cropping is limited to occasional crops such as cereals and forage crops because of the soil drainage characteristics. Drainage (where economically feasible) would substantially improve the present condition of some of the heavier clay soils, and would result in more rapid removal of surface water and allow more intensive use of these areas. Average annual rainfall on Class 4 land on alluvium, ranges between 700 and 1200 mm.

Class 4 land on gravels occurs on stony alluvial fans and terraces in the Western Creek and Blackwood Creek areas, and around Meander and Stockers Plains. These fans are made up of stony dolerite gravels and alluvium which have been derived from the slopes of the Great Western Tiers.

Although suitable for occasional crops (forage and fodder) they are too stony to cultivate regularly. Many profiles in the Blackwood Creek area have heavy clay subsoils which result in water ponding on the surface during wet periods.

Average annual rainfalls on Class 4 land on gravels range from 1000 to 1200 mm. These areas are not subject to summer drought, although winter climate and frost hazard is a limiting factor.

The majority of this type of land on gravels has been mapped as a complex of Class 4 and Class 5 land.

### ***Class 4 land on Windblown Sand***

A few isolated areas of Class 4 land occurs on windblown sands. These deposits have been blown out of the river valleys and lagoons and deposited as sand sheets or dunes on adjacent south eastern areas.

Localities occur along the Meander River north of Ashley Boy's Home, between the Meander River and Dawson Hill (north west of Westbury), along the Cluan Valley, along the Liffey River (south west of Carrick), on the southern banks of Western Lagoon, and around Meander.

Soils mapped are the Panshanger association soils (Quamby reconnaissance soil map). These soils are deep sandy soils with weak structural development, low fertility and low organic matter content. They have low water holding capacity and are therefore prone to drought. Although they have the potential for limited cropping, care must be taken because of the high wind and water erosion hazard. Techniques such as minimum tillage, shelter belts, correct timing of cultivation, stubble retention, and green manure or cover crops would be recommended when cropping these soils.

Average annual rainfall ranges between 700 and 1000 mm.

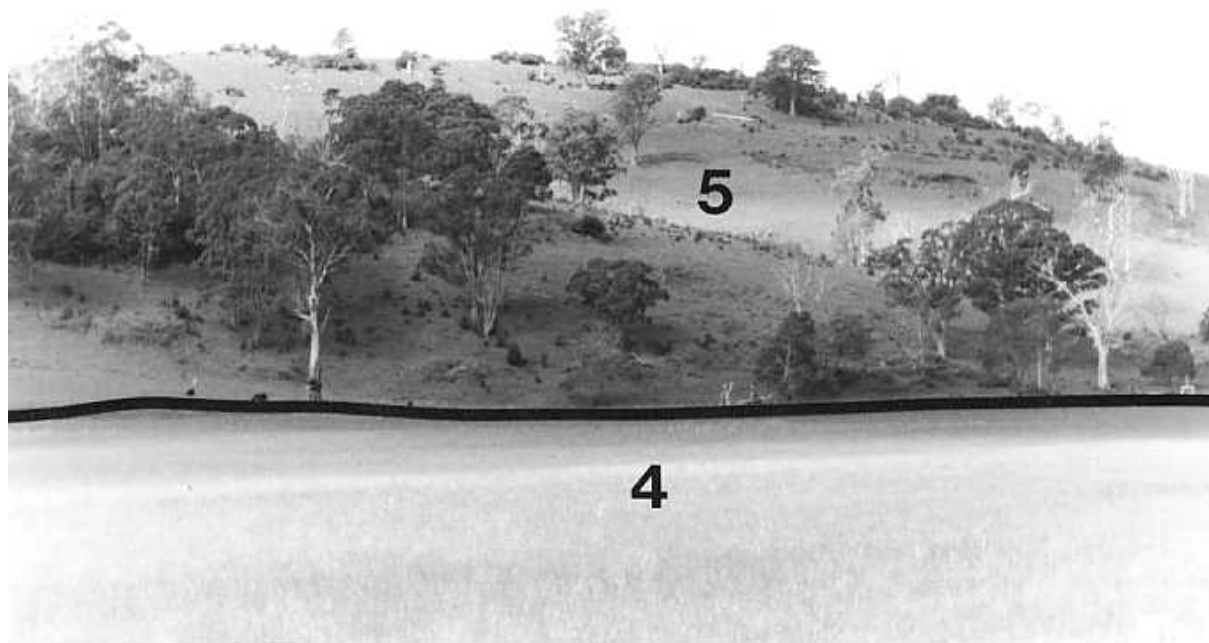


## 10.5 Class 5 (17853 ha; 8.59 %)

### ***Class 5 land on Dolerite***

Class 5 land has been mapped on dolerite and dolerite talus. Slope angles can range up to 40%. Although some slopes may be relatively gentle, the amount of dolerite boulders and presence of rock outcrops restrict cultivation and make this land suitable for grazing purposes only.

Localities where this type of land occur are at Montana, Gibsons Sugarloaf, lower slopes of Archers and Warners Sugarloaf, Quamby Bluff and Cluan Tiers, west of Osmaston, north of Cluan, Tea Hills, around Bracknell, Mountain Vale Hill, McRaes Hills, south west of Carrick, north and north west of Westbury and north of Ashley Boys Home (refer to Photo 15).



**Photo 15:** Class 5 land on dolerite. Class 4 land on alluvium and gravels in foreground  
Meander map 974 785. McRaes Hills, Blackwood Creek Road.

Soil associations are yellow brown soils on solifluction deposits from dolerite, podzolic soils on dolerite (Eastfield association) and krasnozems and lateritic krasnozems on dolerite.

Although slopes may be relatively gentle in some areas, the major limiting factor to agricultural use is the amount of dolerite stones and boulders, or outcrops of bedrock that are present.

These areas may be sown to improved pasture species by surface cultivation on the deeper soils around the boulder outcrops. Where the land has so many boulders that surface cultivation is not possible, it has been classified as Class 6 land. The internal drainage of

these soils is variable, and in winter the dense clay B horizons can restrict water movement, resulting in perched water tables.

Average annual rainfalls on this type of land range between 700 and 1400 mm. Areas that experience lower rainfalls are subject to summer drought.

Photo 15 shows an example of Class 5 land on dolerite, and Figure 10 demonstrates the relationship between land capability classes on dolerite.

Some areas have been mapped as a complex of Classes 4 and 5 land where Woodstock association soils occur with dolerite outcrops (e.g. east of Cluan).

### ***Class 5 land on Tertiary Sediments***

Class 5 land on Tertiary sediments occurs on the highest surface of the Launceston Tertiary Basin (Woodstock surface). Slopes are flat to gently undulating, up to 3%.

The Woodstock association soils are old, leached, low fertility, acid soils. The areas of Woodstock association soils have been mapped as a complex of Class 4 and 5 land. Where these soils are workable for cultivation, they have been mapped as Class 4 land. However, there are areas that have very sandy, shallow topsoils, are excessively gravelly, or contain large amounts of cemented ironstone or laterite which inhibits cultivation. These areas have been mapped as Class 5 land.

Localities of Class 5 land occur north east and south west of Whitmore (Whitmore Road and Adelphi Road), and south east of Bracknell. Rainfall ranges from 700 to 900 mm per annum.

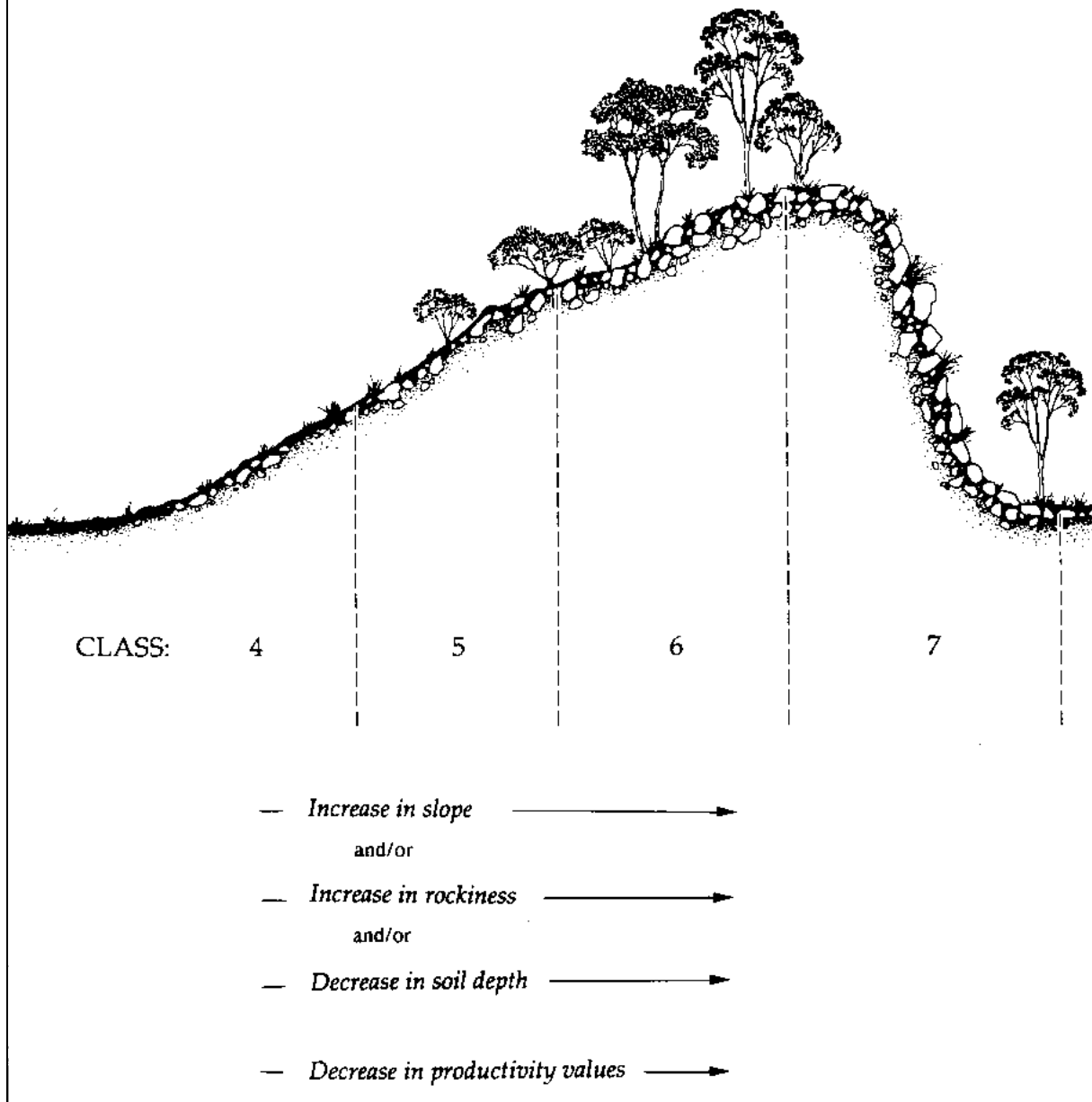
Some areas have been physically disturbed by mining of the ironstone gravels for road making.

### ***Class 5 land on Alluvium and Gravels***

Class 5 land occurs on areas of stony dolerite alluvium on outwash fans near the Great Western Tiers. Localities are at Western Creek, Dunning Road area, and Blackwood Creek area. These areas have been mapped as complexes with either Class 4 or 6 land, because of the difficulty of separating out at the scale of mapping.

Annual rainfall ranges between 1200 and 2000 mm. These areas are unsuitable for cultivation because of the amount of stones and gravel present, however the high rainfall provides excellent summer pasture growth.

# DOLERITE



**Figure 10:** Diagrammatic representation of land capability classes mapped on dolerite.

### ***Class 5 land on Basalt***

Class 5 land on basalt has been mapped north and south of Deloraine, Red Hills area, north of Montana, and south west of Needles (refer to Photo 16).

These areas are usually steeper scarp edges around the more subdued and elevated topography of the basalt flows. Although the slopes are steep, between 25 and 35%, the soils are generally more stable than those on other rock types, and can be used for grazing. These slopes can be subject to sheet and mass movement erosion, but this does not pose a major limitation to grazing use, as the well structured basalt soils tend to regrass rapidly.

Some areas also are prone to seepage which can increase the potential for landslide events, particularly on cleared, steeper slopes, in areas recently cleared from forest, or undercut by access tracks.

As well as the limitation of slope and erosion hazard, some areas also have significant amounts of rock outcrops. Average annual rainfall is around 1000 mm at Deloraine and 1100 mm at Montana.



**Photo 16:** Class 5 land on basalt. Class 3 land on basalt in foreground. Meander map 731 051, River Road.

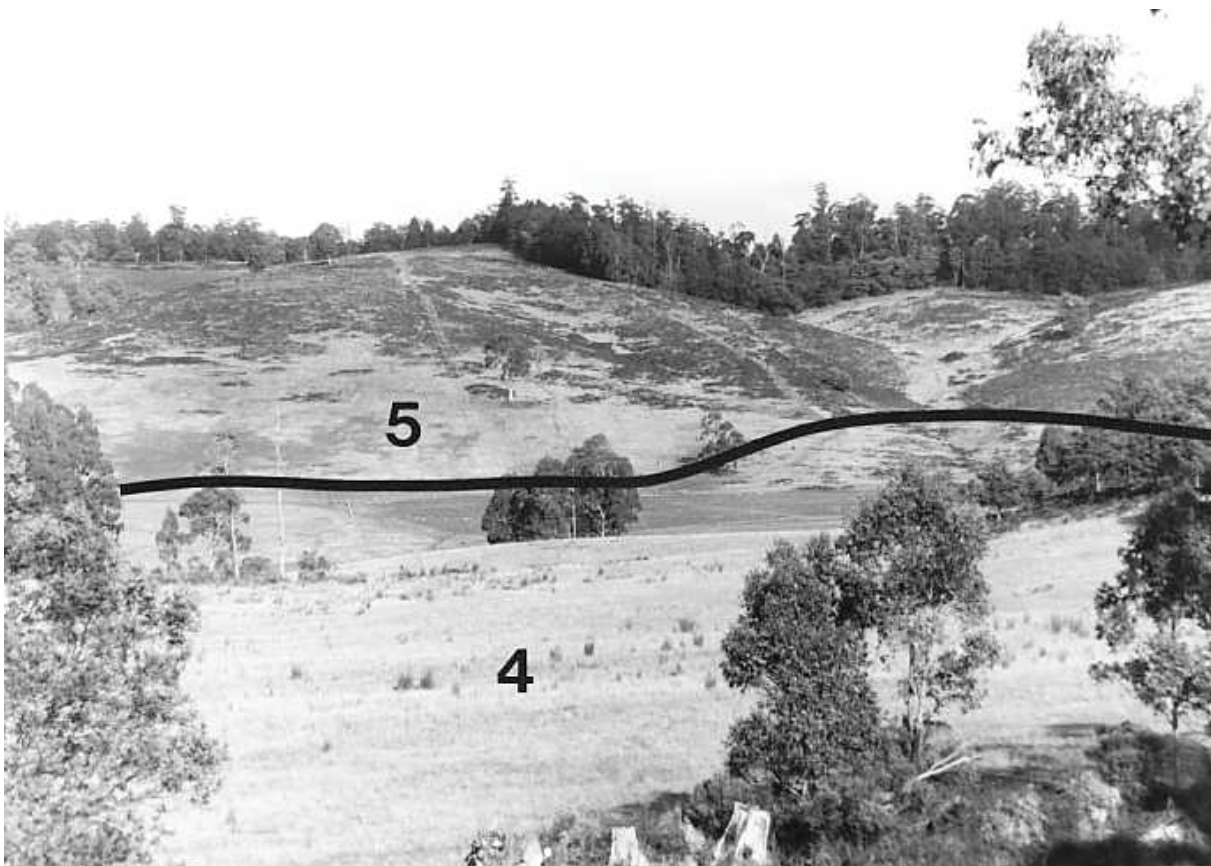
### ***Class 5 land on Sandstones, Slates and Quartzites***

This type of land occurs on the older Ordovician, Cambrian and Precambrian rocks, which occur in the north west of the map sheet extending from Quamby Brook to Magog.

Localities include Pumicestone Ridge, Native Hop Hill, Thompsons Hill, Kentish Hill, Beefeater Hill, Gardners Ridge and east and north west of Needles.

Soils are red and yellow podzolic soils and podzols on various metamorphic rocks. These soils are stony duplex and gradational soils which have sandy surface horizons overlying red-brown or yellow-brown clay. Rock fragments of quartz or quartzite are often scattered over the soil surface.

Slopes are generally between 18 and 30%. The sandy and stony nature of the soils combined with low natural fertility and erosion hazard limit this type of land to grazing purposes. Photo 17 shows an example of this type of Class 5 land.



**Photo 17:** Classes 4 and 5 land on sandstones, slates and quartzites. Meander map. 738 982, Quamby Brook Road.

### ***Class 5 land on Sandstones, Siltstones and Mudstones***

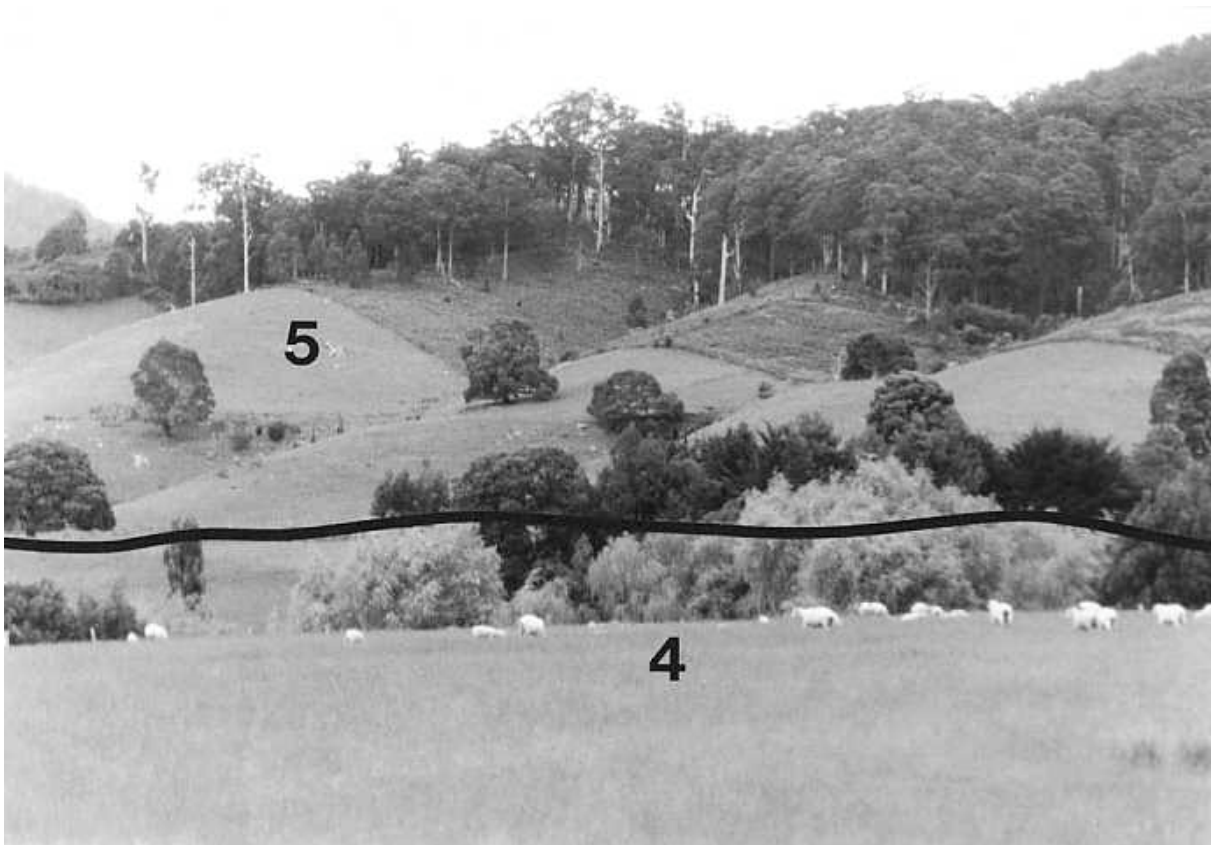
Class 5 land has also been mapped on sandstones, siltstones and mudstones of Triassic and Permian age. The majority of slopes range between 18 and 30%, which are steeper than on similar deposits mapped as Class 4 (refer to Figure 9). Some areas on gentler slopes may be cultivated for pasture establishment or renewal, but are not suitable for cropping because of the high erosion risk. The steeper slopes often occur around the edges of dolerite bodies, which has protected them from extensive erosion. Average annual rainfalls range between 900 and 2000 mm.

Localities are along the foothills of the Great Western Tiers, Archers and Warners Sugarloafs, Quamby Bluff and Cluan Tiers.

The soils formed on sandstones are infertile, strongly leached and require high fertiliser inputs to maintain good pastures for grazing. The soils formed on mudstones have better structure but still require supplementary fertiliser inputs.

Soil slip, sheet, tunnel gully and gully erosion are the dominant erosion forms. There are also several historic slump (mass movement features) associated with the Permian sediments.

Slope, erosion hazard and low fertility combine to make these areas Class 5 land. Photo 18 shows an example of this type of land.



**Photo 18:** Classes 4 and 5 land on sandstones, siltstones and mudstones. Meander map 910 789. Top Road, Blackwood Creek.



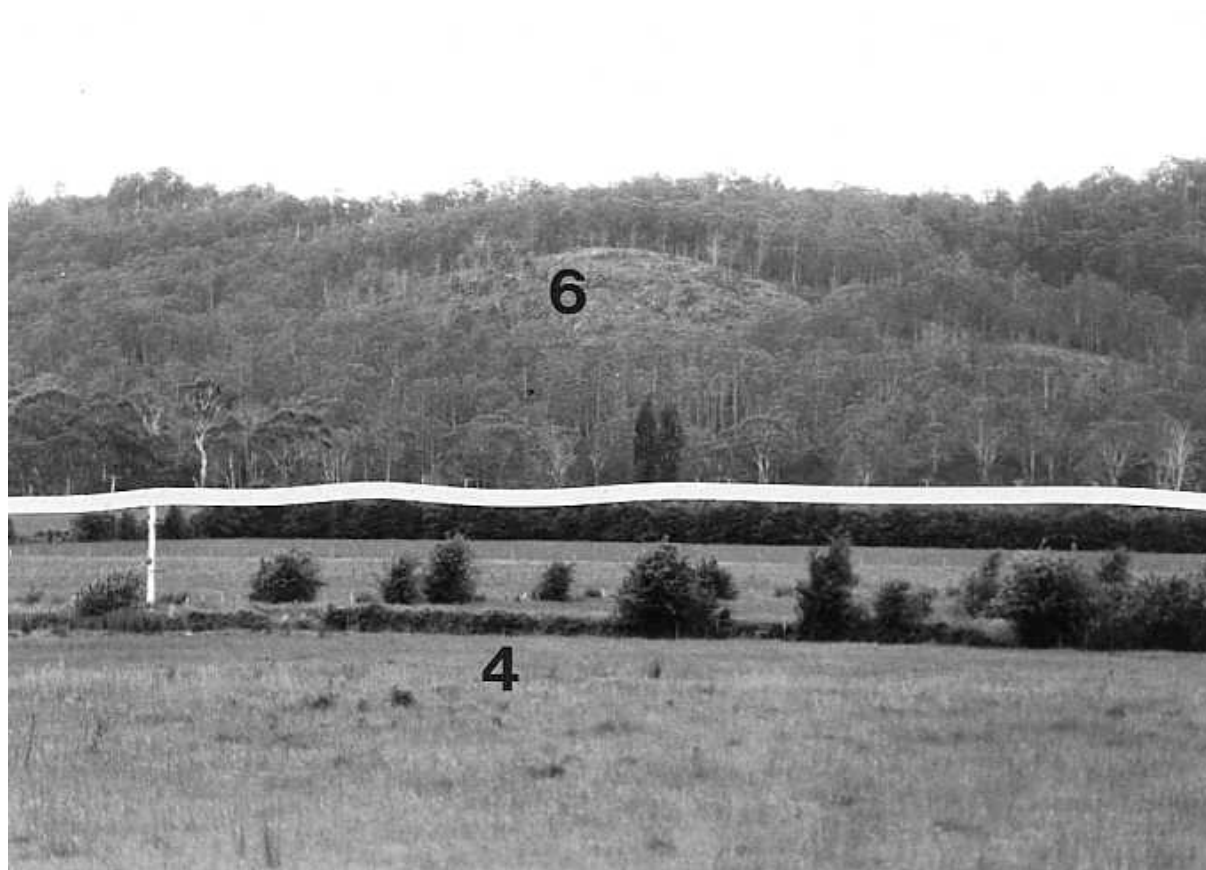
## 10.6 Class 6 (15316 ha; 7.37 %)

### ***Class 6 land on Dolerite***

Class 6 land on dolerite occurs on gentle to steep slopes on dolerite screes, hill country and plateau tops. The combination of stoniness, slope angle and/or climatic limitations, especially at higher altitudes and on the Central Plateau, make this land marginal for grazing purposes. At lower altitudes it is used extensively as run country for sheep, although in the past, areas on the Central Plateau have also been used for grazing. Because of the amount of outcrop and boulders present, improvement of native pastures is not possible by surface cultivation methods.

Localities where this type of Class 6 land occurs are along the higher parts of the Great Western Tiers scarp, Quamby Bluff, Cluan Tiers, on the Central Plateau (lower slopes of Skittleball Hill, McDowall Hill, and south of Reynolds Neck), and north of the Meander River at Porters Bridge (refer to Photo 19 and Figure 10).

Average annual rainfall ranges between 1000 and 2000 mm.



**Photo 19:** Class 6 land on dolerite. Class 4 land on alluvium in foreground. Meander map 779 032, Porters Bridge.

### ***Class 6 land on Sandstones, Mudstones and Siltstones***

Steep hill country, gorges and scarp edges have been mapped as Class 6 land on Permian and Triassic sandstones, mudstones and siltstones. These areas outcrop below the protective dolerite and dolerite talus cover of the Great Western Tiers, Quamby Bluff and Cluan Tiers.

Slope angles are generally over 30% and may be steeply dissected by streams or broken by vertical cliffs of massive sandstone.

Average annual rainfalls range between 1000 and 2000 mm.

Soils mapped on the Quamby reconnaissance soil map are yellow brown soils on solifluction deposits from sandstone, and yellow podzolic soils on Permian sediments.

### ***Class 6 land on Sandstones, Slates and Quartzites***

This type of Class 6 land has been mapped on the steepest parts of Gardners Ridge, Needles Ridge, Native Hop Hill, Beefeater Hill, Pumicestone Ridge, and at Flinty Rock.

Geology and soil types are the same as those mapped on Class 5 land on sandstones, slates and quartzites (Page 71). However slopes are steeper than those mapped on Class 5, and can range between 30 and 45%. Soils are generally shallower and stonier, with some profiles consisting predominantly of rock fragments. Average annual rainfalls range between 1000 and 1100 mm.

The steep slopes and shallow, stony, low fertility soils make this type of land marginally suitable for grazing purposes.

### ***Class 6 land on Alluvium, Organic Deposits and Gravels***

Class 6 land on alluvium has been mapped along stream beds, drainage lines and depressions associated with the basalt and dolerite country on the Central Plateau.

Peat and organic soils occur which are particularly sensitive to disturbance and erosion. Average annual rainfalls range between 800 and 1200 mm.

The severe winter climate, high water tables, acid nature of the soils and erosion hazard, combine to make these areas marginal for grazing purposes.

Class 6 land on dolerite gravels and boulders has been mapped as a complex with Class 5 in the flood plains of the Meander River, south of Meander, and on alluvial fan deposits of the Sales Rivulet and Dunning Rivulet; and as a complex with Class 7 along Warners Creek. Rainfall in this area is around 1600 mm.

### ***Class 6 land on Basalt***

Class 6 land on basalt has been mapped on the Central Plateau. Photo 20 shows an example of this type of land. The severe winter climate in this area makes the land marginal for grazing use. Summer grazing is possible however care must be taken to prevent disturbance of the soil cover and subsequent erosion in this fragile and sensitive environment.

Areas where this type of land occur are the Ellis and Barren Plains area, Skittleball Plains, Liawenee Moor and west of the Ouse River.

Average annual rainfalls are between 800 and 1200 mm.



**Photo 20:** Class 6 land on basalt. Meander map 719 534, Stone Hut Road.

## 10.7 Class 7 (6308 ha; 3.03 %)

### ***Class 7 land on Dolerite***

Class 7 land on dolerite occurs along the edge of the Great Western Tiers and Cluan Tiers, and on the Central Plateau (south of Tods, around Miena, Murderers Hill, Stone Hut Hill, Pine Hills, Skittleball Hill, Fergus Bluff, Willow Run Hill, McDowall Hill, north of Liawenee, Mount Patrick and Den Tier).

All areas are comprised of bare rock. Slopes are variable with lower angle scree slopes and boulder fields of dolerite boulders, hills of stony dolerite and precipitous bluffs of dolerite rock. Photo 21 shows a typical example of a stony boulder field.

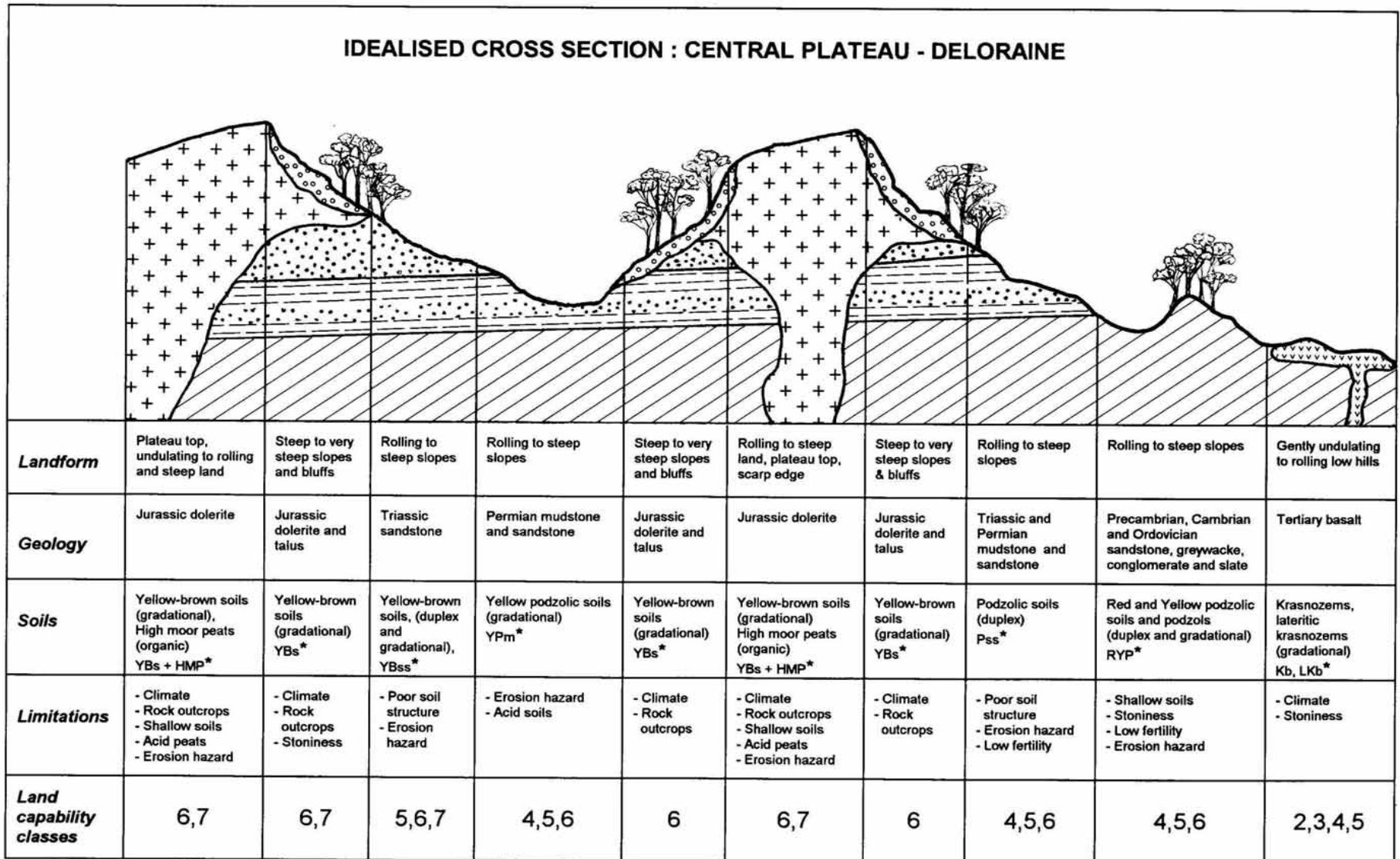
Some vegetation is supported on the boulder fields where tree roots can penetrate below the rocky surface into solifluction material below.



**Photo 21:** Class 7 land on dolerite. Meander map 979 520, Arthurs Lake Road.

### ***Class 7 land on Permian and Triassic Sandstone***

This type of land occurs as precipitous bluffs around benches of Permian and Triassic age sandstone along the edge of Cluan Tiers and the Great Western Tiers. Areas mapped are north of Liffey and around Liffey Falls State Reserve.



\*Soil association names and symbols from Quamby Reconnaissance Soil Map

**Figure 11 :** Cross section of part of the Meander map showing landform, geology, soil and land capability relationships.

## 10.8 Summary of Land Capability Classes on Meander Map.

Class	Area (ha)	% of land area on Meander map
1	0	0
2	127	0.06
3	13 090	6.30
4	53 965	25.96
5	17 853	8.59
6	15 316	7.37
7	6 308	3.03
Exclusion areas	101 218	48.69
TOTAL	207 877	100

**Table 9:** Summary of areas on Meander map.



# 11. Map Availability

An index of the land capability maps (based on the Tasmap 1:100 000 Series) is shown on the rear cover of this report.

Publications currently available in the series are:-

**PIPERS REPORT AND ACCOMPANYING MAP**

**TAMAR REPORT AND ACCOMPANYING MAP**

**MEANDER REPORT AND ACCOMPANYING MAP**

**LAND CAPABILITY HANDBOOK**

Flat Maps are also available for purchase.

Maps and reports are available for purchase from your nearest Department of Primary Industry and Fisheries Office, or can be ordered direct from:

**Department of Primary Industry and Fisheries Bookshop  
GPO Box 619F  
HOBART TAS 7001  
Ph: (002) 333064**