HOBART
SOIL REPORT

Reconnaissance Soil Map Series of Tasmania

A Revised Edition

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Tasmania
2000

of Divisional Report 13/50 Hobart
By J. Loveday
C.S.I.R.O Division of Soils, Adelaide, 1955

Hobart Report
and accompanying 1:100 000 Hobart
Soil Reconnaissance map

DEPARTMENT of PRIMARY INDUSTRIES, WATER and ENVIRONMENT
Tasmania

Natural Heritage Trust
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ACKNOWLEDGEMENTS

This report and accompanying map are revised versions of original work by CSIRO (Loveday, 1955). We gratefully acknowledge the original work of Loveday and the CSIRO Division of Soils, Adelaide for supporting this project.

We would like to acknowledge the contribution of the following groups and individuals who have assisted with the reprinting and updating of this report and accompanying map.

We would like to especially thank Dr John Loveday for editing the draft map sheet and report.

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PREFACE

The Reconnaissance Series

Over a 27 year period (1940 - 1967), the CSIRO Division of Soils, Adelaide undertook a series of reconnaissance (small scale) soil surveys and some more detailed (large scale) soil surveys of the agricultural land in Tasmania. However, most of these reports are out of print and of limited availability, the terminology is dated and inconsistencies in map units exist across map sheets. In 1997, the Department of Primary Industries, Water and Environment (DPIWE) and the Natural Heritage Trust, put together a project to correlate and reprint the maps and reports and to extend this information and its value as a tool for sustainable land management, to a variety of potential users.

This report is part of the “Reconnaissance Soil Map of Tasmania” series which were published at a scale of 1 inch to 1 mile (1:63 360). The reconnaissance series has been expanded to include the soil maps that were not part of the original “Reconnaissance Soil Map of Tasmania” series but mapped at scales of 1 inch to 1 mile and 1 inch to 2 miles (1:126 000). These maps have been reformatted and reprinted by the DPIWE at a scale of 1:100 000 to be consistent with more recent soil mapping scales (eg South Esk 1:100 000 soil map (southern half), Doyle, 1993), the land capability mapping series and the current Tasmanian Land Tenure map series.

It is not the aim of this project to remap the areas covered by the Reconnaissance series or to change the intensity of mapping, but to correlate, standardise and enhance existing information and provide the public and DPIWE staff with more consistent, reliable and accessible soil resource information.

Correlation of the Hobart Reconnaissance Soil Map

Defining Map units

In attempting to correlate soils across the reconnaissance soil maps around the State differences in the nature of the map units have caused some problems. Map units on the initial maps investigated (Longford, Quamby and South Esk), essentially depicted broad scale “soil associations”. These associations identified and described a dominant soil and a range of minor soils which were generally associated with recognisable landscape features. For example the Eastfield Association, dominated by the Eastfield Soil Profile Class (SPC), has a range of minor soils such as the Panshanger SPC and the Bloomfield SPC which are found on rolling to steep dolerite hills.

In other parts of the State, including the Hobart sheet, the map units of the Reconnaissance Soil Maps have been generally defined on the basis of Great Soil Groups (Stace *et al*., 1968) and parent material, eg Podzolic Soils on Dolerite. In many instances a dominant or representative soil has been identified and where adequate existing data is available it is possible to define an SPC for that soil. In such cases it is sometimes possible to correlate with SPC’s defined elsewhere. However because of insufficient data for the minor soils it is not possible to define and correlate the minor soils around the state. Therefore there is a unit “Podzolics on Dolerite” and another “Eastfield Association” both of which are dominated by the Eastfield SPC but which may have different minor soils. To correlate these two units based on the dominant soil only, would be incorrect and misleading. Instead the original map unit name has been retained. Where a dominant soil has been identified, the map unit has been assigned a number, eg Podzolics on Dolerite 1 (Pd1), with the identified dominant soil outlined in the report and on the legend of the map.

In some instances sufficient data exists to determine that a particular polygon or group of polygons i.e areas which are enclosed by specific boundaries, have a different dominant soil to others of a similar map unit name. However the data is insufficient to allow the precise definition of that soil. These map units have been assigned a numerical value. (e.g Pm1 & Pm2). The distinction between these polygons and polygons where a dominant soil has been defined (eg Pd1), is apparent by the absence of a defined dominant soil in the report and on the legend of the map.

Due to resource constraints only a limited amount of time could be spent investigating these less well defined soils and map units. Hence the term “insufficient data” occurs widely throughout the legend. The correlation of the Reconnaissance Soil Maps has highlighted how little information is available for some of Tasmania’s major soils.

The Hobart Map

The Hobart Reconnaissance Soil Map adjoins the Brighton map (Spanswick & Kidd, In prep) on its northern boundary, the Sorell map (Spanswick, In prep) on its eastern boundary and the Buckland (Spanswick & Kidd, In prep) on its north eastern corner. For an index map of the 1:100 000 Reconnaissance Soil Surveys of Tasmania, see Appendix 7.

Soil Taxonomic Units

A soil taxonomic unit is a general term for a grouping of soils based on similarities of the soils within the group, and differences compared with other groups. Map units consist of defined areas of contiguous soil taxonomic units. As outlined previously the soil taxonomic units used by Loveday in this survey are Great Soil Group (Stace *et al.*, 1968). This has been replaced where possible by Soil Profile Class (SPC) as this will standardise taxonomic units across the Hobart map and be consistent with taxonomic units used within the more recent South Esk Soil Map and by other States. A SPC is a group or class of soil profiles within a map unit which have similar morphological characteristics, and may have similar chemical properties (Gunn *et al.*, 1988). The SPCs were constructed through the use of existing reports, historical soil data in the DPIWE soil database and additional field work. A key to soil horizon designations used within the SPCs is provided in Appendix 1. The lines separating horizons within the SPC reports are shown by broken and solid lines. The broken lines show a diffuse or gradual change to the next horizon whereas the solid lines show a clear or abrupt transition. If the horizon transition is unknown a larger broken line is used. The SPCs generally include land capability classifications, for a description of these classes refer to K.E. Noble (1992). Where we could not produce an SPC for a map unit, due to a lack of information, type profiles of a dominant soil, where identified by Loveday on the original map, have been added to the report wherever possible.

Map Edits

Loveday mapped some of the polygons in the eastern half of the sheet as more than one type of map unit. For example a single map unit may be labelled both "Pd" and "Pd with Bd". This is really a complex unit. However because the occurrence of Pd with Bd is in only a part of the polygon, it is not possible without significant additional field work and aerial photograph interpretation, to split this unit and other units like it. Therefore, we have left these units as is. They are identified on the paper maps and in a notes column attached to the polygon attribute table of the digital maps. This information has also been stored as a separate point coverage, however the coordinates used for the label points are only estimations taken from a visual interpretation of their location on the original published map.

The map units in this survey also include soil complexes. A soil complex consists of two or more dominant soils which occur in an intricate pattern that can't be separated at this scale of mapping without unwarranted effort.

There are two maps for this report in circulation. The map that accompanies this report has polygons coloured according to the different map units identified. The second map, which is intended solely for DPIWE in-house circulation, has map units coloured according to the Australian Soil Classification for the dominant SPC within each unit, no colour is assigned to a map unit if a SPC has not been identified.

Legend

Where possible the dominant soil of each map unit has been classified to soil order using the Australian Soil Classification (Isbell,1996). Soils have also been classified according to Great Soil Group (Stace *et al.,* 1968).

Edits to the Hobart Report

The Hobart report has been reformatted to provide a more consistent structure with other similar reports. The soil terminology used within the Hobart report has been updated to be consistent with the Australian Soil and Land Survey Field Handbook (McDonald *et al*, 1990), old imperial measurements have been converted to the metric system and sentence structure has been changed where it did not read with clarity. Edits and additional information about the soils within map units has been recorded within the main body of this report. All the changes made to the report are shown in italics.

No changes have been made to Land Use within this report. This information is out of date and is an area that has been identified as requiring further work.

Laboratory Analysed Data

CSIRO laboratory data is available for some of the dominant soils identified on this map. Readers should be aware that some of the laboratory methods used by CSIRO in the 1950s and 1960s differ from the methods used in more recent DPIWE laboratory analyse. All CSIRO sites within this report have the character "H" at the beginning of the profile number eg H68. An outline of the different analytical methods used is located in Appendix 2.

Future Work

Correlation of the soils identified on this map with others in southern Tasmania has been extremely difficult due to the lack of existing soil profile data, the complexity of geology and local climate and topography variations. Except for the soils formed on basalt and dolerite, very little is known about the soils within this map sheet. Consequently a number of areas exist where additional work to identify and classify the dominant soil would be valuable.

Alluvial Soils

The alluvial soils are important agriculturally, however very little is known about their properties or appropriate management. The soils within this unit vary considerably and it was impossible without significant additional field work and aerial photo intepretation to split the different soils of this unit. Further work is needed to differentiate the soils of this unit and provide land users and planners with more detailed information about their properties and behaviour under different land uses. More information about the alluvial soils may be found in DeRose & Musk (In prep).

Soils on Triassic Sediments

A broad range of soils have formed on the Triassic sediments. Due to a lack of data and resource constraints we have been unable to define the major soils of this unit. Lower in the landscape the Triassic soils are sodic to varying degrees, making them prone to dispersion and erosion. These soils are currently used for grazing, forestry and urban development. More work is required on these soils as their erosion risk has important land use implications.

Land Use

As mentioned previously no edits have been made to the land use section of this report. A more detailed description of land use and vegetation within the Hobart area may be found in Davies (1988), Land systems survey of southern Tasmania and DeRose & Musk (In prep), Land Capability survey of the 1:100 000 Derwent sheet.

Accuracy of Maps

Base data on the original Hobart Reconnaissance Soil Map was supplied by the Department of Lands and Survey, Hobart, in 1942. The original map used the Transverse Mercator Projection with Co-ordinates displayed in yards. Soil boundaries were delineated by stereoscopic interpretation of aerial photographs. The old paper soil maps were transferred to electronic form in the early 1990s with the Co-ordinate system converted to the Australian Map Grid, however no projection was recorded. Accuracy checks of the Hobart digital map have revealed a range of spatial errors. The coastline was incorrect and rivers and estuaries have changed position over time. However the major source of spatial error on all the Reconnaissance Soil Maps has been caused by the absence of rectification of the aerial photographs during delineation of line work. Hence, Ground Control Points (GCP) in some areas on the map sheet, eg hilltops, do not match current true ground positions.

We have not had the resources or time to address all the inaccuracies within this map sheet. Corrections have been made to the coastline only and users need to be aware that in some areas the boundaries of map units may be out by considerable distances.

Appendices

A series of appendices have been attached providing additional information relevant to this report and the accompanying soil map. Much of this information was either unavailable or not recorded with the original report by Loveday.

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Division of Soils

RECONNAISSANCE SOIL MAP OF TASMANIA

SHEET 82 - HOBART

By

John Loveday

1. INTRODUCTION

This report forms part of the "Reconnaissance Soil Map of Tasmania" series. The *original* soil map which is the main feature of this report is at a scale of *1: 63 360*. *The revised version of the map accompanying this report is at a scale of 1:100 000.* The maps are issued in this preliminary form essentially for local use. Discussion of the soils is limited to a brief explanation of the map, and further information is left to intended future publications. The survey of the *Reconnaissance series* is being intensified and the maps when finally published may be in revised form. However, in most cases, although the soil units are likely to be re-defined, major soil boundaries will be altered only slightly. As the accuracy of available base maps varies from sheet to sheet it has been necessary to indicate on each soil map the degree of reliability of the base detail.

2. PHYSICAL ENVIRONMENT

2.1 Geology & Geomorphology

The outstanding physiographic features of this area are the estuary of the River Derwent and Mt. Wellington (*1270m)* with it's associated mountains westward. The area as a whole is either hilly or mountainous with the exception of the wide valley floors in the north eastern corner of the sheet.

The most widespread rock is Jurassic dolerite. It intruded mudstones, sandstones, shales and limestones of Permian and Triassic age. There are a number of small remnants of Tertiary basalt along the Derwent Valley and in the vicinity of Kingston, Rokeby and Cambridge. River terraces and more recent alluvium are found in the valleys of the larger streams. Many slopes above about *600m* are covered by Pleistocene solifluction deposits, often consisting largely of weathered dolerite boulders.

In the Sandford and South Arm districts wind blown sand covers slopes of coastal hills, while at a number of places along this eastern coastline there are more recent sand accumulations.

2.2 Climate

Both rainfall and snowfall on the high mountainous country is considerable. The Springs, on the slopes of Mt. Wellington, records an average annual rainfall of *1440mm*. The country north and east is in a rain shadow, so that at Hobart the rainfall averages *610mm* annually and at Cambridge *530mm*. The mean annual temperature at Hobart is $12\,°C$ and the average frost free period 264 days. For non-coastal areas both the mean temperature and frost free period would be less.

2.3 Land Use

Agricultural pursuits, particularly west of the River Derwent are limited by the rugged terrain. A large percentage of the area is timbered, while a smaller proportion on the mountainous plateau above *1070m* carries high moor vegetation.

3. SOIL MAP UNITS AND SPCS

3.1 Soil on Basalt

3.1.1 Black Soils on Basalt (Blb)

On a number of small basalt remnants along the Derwent Valley, at Rokeby and at Cambridge black soils are found. They are formed on gentle and moderate slopes. The surface soil is a near black clay or clay loam frequently with a granular "self mulching" structure but sometimes more coarsely structured. There is a gradual change to the dark yellow-grey or dark brown subsoil clay and this in turn merges with decomposing basalt which occasionally has streaks of lime through it.
Some small patches of shallow red-brown soils on basalt have been mapped with these black soils.

Land Use

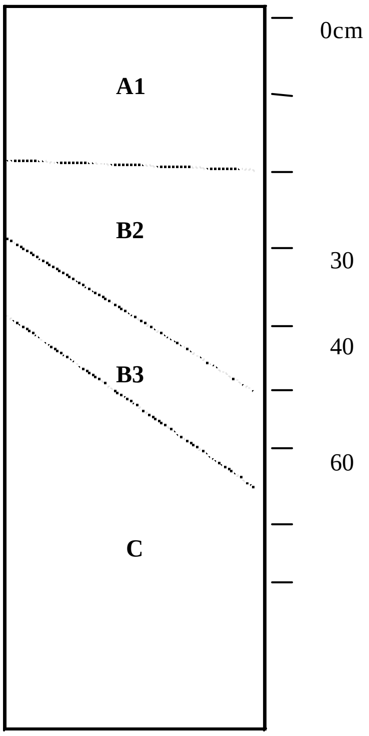
These soils are mostly under improved pasture or in several cases, orchards.

Correlation

The dominant soil of this unit (black Vertosol or melanic-vertic black Dermosol) correlates with the Sorell SPC. This unit has been renamed Black Soils on Basalt 1 (Blb1). Chemical data has been extrapolated from the Brighton and Sorell Reconnaissance Soil Maps.

Sorell Soil Profile Class

Concept	**Shallow black friable clay on upper slopes of basaltic hills**
Aust. Soil Classification	Black Vertosol or Melanic-Vertic Black Dermosol
Great Soil Group	Prairie Soil or Black Earth
Principal Profile Form	Gn, Ug
Mapping Units	Blb1 & Blb2
Geology	Tertiary Basalt
Landform	Upper part of gentle undulating low hills or hills
Vegetation	Mostly cleared or Savannah Woodland
Permeability	Very slowly to slowly permeable
Drainage	Moderate to imperfectly drained
Land Capability	Class 4



A1: Black (10YR 2/1, 2/2, 3/1; 7.5YR 3/1), light clay to clay loam, weak sub angular blocky structure breaking to fairly friable granular structure, strong to firm (moist) consistence; 2-10% coarse gravels; pH 5.8 - 7.0; gradual change to

B2: Black (10YR 2/1, 3/1, 3/2, 4/2); medium to heavy clay; angular blocky to weak coarse prismatic structure; very firm to strong consistence (moist); occasionally very few ferruginous concretions; 2-10% coarse gravels; pH 6.0 - 7.0; gradual change to

B3: Black or Brown (2.5Y 3/2, 3/3, 5Y 3/1, 3/2, 10YR 3/2); medium to heavy clay; massive structure; very firm (moist) consistence; none to few 6-20mm ferruginous concretions; 2-10% medium gravels; pH 7.0 to 7.5; gradual change to

C: Decomposing basalt marl; decomposing basalt stones occasionally coated in a calcareous skin; and/or basalt stone

A1: **Sandy Phase**
Fine sandy clay loam to sandy clay loam texture

Morphological Sites for Sorell: CSIRO H69, H77, H82, H234; CRGKH C219; LCDERW 25, 1029, 1030; SOILCO 66
Analysed Sites for Sorell: CSIRO H69, H77, H82, H234
Related soil names: Sorell clay
Previously described by: Loveday (1957), Holtz (1987), Spanswick (1999), Spanswick & Kidd a, b & c (In prep)

Soil Profile Class Grid Reference	Profile Number	Horizon	Sample Depth (cm)	pH water (1:5)	EC (d/sm)	Total P (mg/kg)	Org. Carb. (%)	Total N (%)	C/N Ratio	Ca	Mg	Na	K
Sorell	H234	A11	0-13	6.1	0.113	0.041	4.65	0.348	13	23.6	12.1	0.75	0.7
519099E	H234	A12	14-25	6.8	0.09	0.016	2.68	0.214	13				
5268759N	H234	A13	25-38	7.1	0.092		2.52	0.186	14	33.8	26.4	1.9	0.68
	H234	A14	38-47	7.4	0.101		1.65	0.133	12				
	H234	C	63-74	8.4	0.101		0.33	0.029	11	36.5	35.2	6.1	0.28

Soil Profile Class Grid Reference	Profile Number	Horizon	Sample Depth (cm)	Total Bases	BASE SAT (%)	ESP (%)	Ca/Mg Ratio	Gravel (of total) >2000 (um) (%)	Sand Coarse >200 (um) (%)	Sand Fine <200 (um) (%)	Silt (%)	Clay (%)
Sorell	H234	A11	0-13	37.15	72	1.4	1.95	5	3	32	20	38
519099E	H234	A12	14-25									
5268759N	H234	A13	25-38	62.78	89	2.7	1.28	6	2	18	13	64
	H234	A14	38-47									
	H234	C	63-74	78.08		7.8	1.04	45	28	17	11	49

Table 1 Analytical data for the Sorell SPC

Soil Profile Class Grid Referenece	**Profile Number**	**Horizon**	**Sample Depth (cm)**	**pH water (1:5)**	**EC (d/sm)**	**Total P (mg/kg)**	**Org. Carb. (%)**	**Total N (%)**	**C/N Ratio**	**Ca**	**Mg**	**Na**	**K**
Sorell	H82	A11	0-4	6.8		420	2.7	0.261	10	20.9	18.8	2.7	0.2
546353 E	H82	A12	4-15	7.1		380	2.3	0.24	10				
5263077 N	H82	A13	15-28	8.2			1.5	0.167	9	25.2	28.8	6.9	0.14
	H82	B2	30-41	8.9			1.5						
	H82	BC	46-56	9.5									
	H82	C	63-76	9.2									
Sorell	H69	A11	0-6	6.2		920	4.1	0.39	11	18.1	14.2	1.8	0.28
547711 E	H69	A12	6-16	6.3		950	3.4	0.32	11				
5263068 N	H69	A13	19-29	6.9			1.8	1.87	1	16.5	18.5	3.6	0.3
	H69	A14	29-38	7.3		770	1.4	0.154	9				
	H69	AC	38-48	7.4									

Soil Profile Class Grid Referenece	**Profile Number**	**Horizon**	**Sample Depth (cm)**	**Total Bases**	**CEC**	**BASE SAT (%)**	**ESP (%)**	**Ca/Mg Ratio**	**Gravel (of total) >2000 (um) (%)**	**Sand Coarse >200 (um) (%)**	**Sand Fine <200 (um) (%)**	**Silt (%)**	**Clay (%)**
Sorell	H82	A11	0-4	42.6	54.7	78	4.9	1.11	0	2	27	27	40
546353 E	H82	A12	4-15						0	2	25	26	38
5263077 N	H82	A13	15-28	61.04			11.3	0.88	0	2	23	19	51
	H82	B2	30-41										
	H82	BC	46-56										
	H82	C	63-76										
Sorell	H69	A11	0-6	34.38	56.18	61	3.2	1.27	1	4	30	31	28
547711 E	H69	A12	6-16						11	4	28	26	39
5263068 N	H69	A13	19-29	38.9	52.4	74	6.9	0.89	18	3	23	23	47
	H69	A14	29-38						8	4	13	19	62
	H69	AC	38-48										

Table 1 Cont

3.1.2 Red-Brown soils on Basalt (RBb)

There are several small patches of basalt in the Kingston district on which red-brown soils have developed. The slopes are moderate and in places stony. The surface soil is a dark reddish-brown friable clay loam sometimes sandy. The subsoil at about *30cm* is a reddish or red-brown clay usually friable but sometimes plastic in the moist state. It merges below with decomposing basalt. Scattered basalt stones are present in the profile.

Land Use

The natural vegetation, which on these soils was probably a sclerophyll forest, has been removed and fairly intensive mixed farming is now practised.

Correlation

The Red Brown Soils on Basalt have been mapped mainly as a complex with the Black Soil on Basalt. On the upper slopes of the basalt flows along the ridge crests the soils are a moderate to well drained stony reddish brown loam. This soil correlates with the Stoneleigh SPC which was defined as the dominant soil within this unit on the Sorell and Buckland Reconnaissance Soil Maps. However on this map sheet the Stoneleigh SPC covers only a limited area. On the mid to lower slopes of the basalt flows the dominant soil of these complexes is a grey brown or black imperfect to poorly drained mottled clay (Black Dermosol). This soil appears to be much more leached than the black soils on basalt in the north east of the state and therefore does not correlate with the Sorell SPC. In some areas these soils are very wet and have hydromorphic features. No SPC has been defined for this soil. These complexes have been renamed Grey Brown Soils on Basalt (GBb). One polygon north west of Kingston, on the slopes of Mt Wellington Plateau, maintains it's original code (RBb). Due to the inaccessibility of this area no data is available for this polygon.

3.2 Soils on Dolerite

3.2.1 Black Soils on Dolerite (Bld)

These soils attain maximum development on slopes of north easterly aspect along the western side of the River Derwent. The slopes are generally gentle to moderate, and stony in places.

The surface soil is a black clay loam or clay of granular structure, which may become deeply cracked in dry seasons. This gradually merges with a dark yellow-grey or dark brown subsoil clay overlying yellow coloured decomposing dolerite. Dolerite stones may occur throughout the profile.

Some small areas of the brown soils on dolerite described above are mapped with this group, and also soils transitional to the podzolic soil group.

Land Use

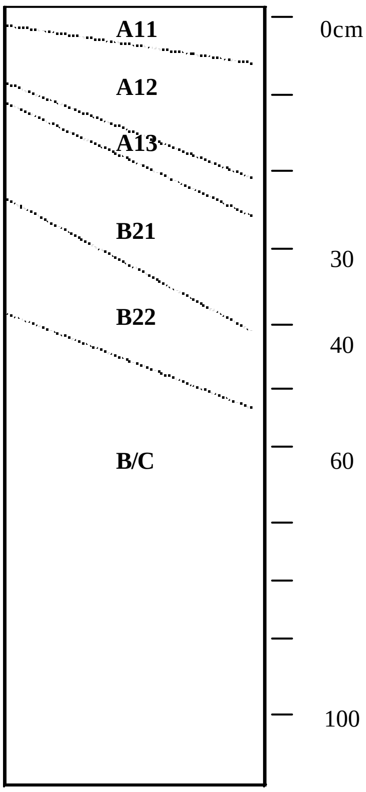
The native vegetation is a savannah woodland but this has been largely cleared. The present land use varies from rough grazing to improved pasture and horticultural production and to city and suburban building.

Correlation

The dominant soil of this unit (vertic black Dermosol) correlates with the Belmont SPC. This unit has been renamed Black Soils on Dolerite 1.

Belmont Soil Profile Class

Concept	**Black cracking minimal textural differentiation soils with a clay loam to clay surface and clay subsoil, carbonate often present in subsoil and decomposing rock. Limited to a general extent of 40km from Hobart**
Aust. Soil Classification	Vertic black Dermosol
Great Soil Group	Black Earth or Praire Soil
Principal Profile Form	U or G
Mapping Units	Bld1, Bld1-Bd1, Bld1-Pd1
Geology	Jurassic Dolerite
Landform	Steep to gentle sloping hills
Vegetation	Savannah woodland, mostly cleared
Surface Conditions	Coarse fragments common
Permeability	Slow to moderately permeable
Drainage	Moderately well drained
Land Capability	Class 4



A11: Black or very dark grey (10YR 2/1, 3/1 moist); clay loam to light clay (sometimes sandy); friable 2-5mm granular structure; moderate to weak (moist) consistence; 2-10% dolerite gravels; pH 6.0 - 6.5; diffuse boundary change to

A12: Black or very dark grey brown (10YR 2/1, 3/1moist); clay loam to heavy clay (sometimes sandy); friable 2-5mm granular structure; firm (dry) consistence; 2-10% dolerite gravels; pH 6.5 - 7.0; diffuse boundary change to

A13: Black or grey brown (10YR 2/1, 2.5Y 3/2 moist); heavy clay; moderate 20-50mm angular blocky structure; firm (moist) consistence; 2-10% dolerite gravels; pH 6.5 - 7.5; diffuse boundary change to

B21: Black to brown (10YR 2/1, 3/2 moist); heavy clay; moderate 10-20mm angular blocky structure; firm (moist) consistence; <2% dolerite gravels; pH 7.0 - 7.5; gradual boundary change to

B22: Brown to black (10YR 3/3, 3/1, 2/1 moist); light medium to medium heavy clay; moderate to strong 20-100mm blocky structure; firm (moist) consistence; 20-50% dolerite gravels; pH 6.5-7.0; gradual change to

B/C: Yellow to Brown (2.5Y 8/3, 10YR 4/3 moist); 20-50% coarse dolerite gravels; calcareous concretions may be present.

Morphological Sites: CSIRO H70, H22, H174, H173; SOILCO 31
Analysed Sites: CSIRO H70, H22, H174, H173
Related soil names: Belmont Clay loam, Black soils on dolerite
Previously described by: Loveday (1957), Spanswick (1999), Spanswick & Kidd a, b & c (In prep)

Soil Profile Class Grid Reference	**Profile Number**	**Horizon**	**Sample Depth (cm)**	**pH water (1:5)**	**EC (d/sm)**	**Total P (mg/kg)**	**Org. Carb. (%)**	**Total N (%)**	**C/N Ratio**	**Ca**	**Mg**	**Na**	**K**
Belmont	H174	A11	0-2	6.3	0.179	0.039	10.9	0.798	14	40.8	4.5	0.26	2.3
529121 E	H174	A12	2-9	6.5	0.107	0.025	7.4	0.483	15	39.5	4.3	0.24	1.7
5272267 N	H174	A13	9-23	6.9	0.086	0.013	2.8	0.204	14	38.4	7.1	0.52	1.1
	H174	B21	23-38	7.1	0.077		1.5	0.114	13				
	H174	B22	38-51	7.6	0.077	0.009	1.1	0.091	12	45.7	12.6	1.3	0.2
	H174	B23	51-63	8.0	0.077		0.71	0.069	10				
	H174	B/C	63-71	8.2	0.077		0.5	0.052	10	41.6	7.4	0.15	1.4
	H174	C	71-81	8.3	0.098		0.39	0.034	11				
Belmont	H70	A11	0-8	6.2		0.017	4.9	0.44	11	18	8.25	1	0.98
547711 E	H70	A12	8-18	6.6			3.9	0.34	11				
5263068 N	H70	A13	18-25	6.8		0.018	2.8	0.228	12				
	H70	A14	28-42	7.6			1.49	0.168		21.1	19.1	5.3	0.25
	H70	AC1	42-51	8.4		0.018							
	H70	AC2	51-61	8.7									
	H70	C	66-81	8.9		0.2				14.2	12	6.9	0.17

Soil Profile Class Grid Reference	**Profile Number**	**Horizon**	**Sample Depth (cm)**	**BASE SAT (%)**	**ESP (%)**	**Ca/Mg Ratio**	**Gravel (of total) >2000 (um) (%)**	**Sand Coarse >200 (um) (%)**	**Sand Fine <200 (um) (%)**	**Silt (%)**	**Clay (%)**
Belmont	H174	A11	0-2	72	0.4	9.07	0	9	28	17	28
529121 E	H174	A12	2-9	76	0.4	9.19	3	10	31	16	31
5272267 N	H174	A13	9-23	86	0.9	5.41	6	7	27	11	53
	H174	B21	23-38								
	H174	B22	38-51	93	2.0	3.63	13	6	23	8	65
	H174	B23	51-63								
	H174	B/C	63-71		2.8	5.62	40	29	21	11	41
	H174	C	71-81								
Belmont	H70	A11	0-8	64	2.3	2.18	3	18	31	21	26
547711 E	H70	A12	8-18				18	19	31	20	24
5263068 N	H70	A13	18-25				25	25	28	16	28
	H70	A14	28-42	90	10.5	1.1	7	18	21	10	47
	H70	AC1	42-51				15	17	16	3	44
	H70	AC2	51-61				29	20	11	4	40
	H70	C	66-81		20.7	1.18	53	47	19	13	15

Table 2 Analytical data for Belmont SPC

Soil Profile Class Grid Reference	**Profile Number**	**Horizon**	**Sample Depth (cm)**	**pH water (1:5)**	**EC (d/sm)**	**Total P (mg/kg)**	**Org. Carb. (%)**	**Total N (%)**	**C/N Ratio**	**Ca**	**Mg**	**Na**	**K**
Belmont	H173	A11	0-2	6.3	0.092	0.2	8.3	0.539	15	24.9	12.7	0.38	0.99
519902 E	H173	A12	2-10	6.5	0.08	0.13	5.8	0.39	15	23.8	14	0.57	0.36
5271375 N	H173	A13	10-18	6.7	0.071		4.1	0.316	13				
	H173	A14	18-29	7.2	0.08	0.13	2.6	0.202	13	27.5	20.6	1.4	0.3
	H173	A15	29-41	7.6	0.08	0.007	1.7	0.14	12	28.9	25.2	1.7	0.28
	H173	AC1	41-48	8.0	0.11		1.4	0.11	12				
	H173	AC2	48-58	8.2	0.131		1.3	0.11	12	28.4	27.9	2	0.29
	H173	C1K	58-66										
	H173	C2K	66-76	8.9	0.369		0.98	0.038	26				
	H173	C3k	76-81	9.0	0.313								
Belmont	H22	A11	0-13	6.8		100	4.3	0.381	11	28.5	17.2	0.94	0.32
528567 E	H22	A12	13-25	7.2		70	3.3	0.202	16	33.1	18.4	1.37	0.16
5248360 N	H22	A13g	25-48	7.7		50	1.26	0.095	13	27	22.7	1.8	0.09
	H22	A3g	51-61	8.4			0.52	0.035	15				
	H22	Ck	61-89	8.8			0.2	0.022	9	32.2	28.2	3.9	0.09
	H22	Rw	89-109	8.7									

Soil Profile Class Grid Reference	**Profile Number**	**Horizon**	**Sample Depth (cm)**	**BASE SAT (%)**	**ESP (%)**	**Ca/Mg Ratio**	**Gravel (of total) >2000 (um) (%)**	**Sand Coarse >250 (um) (%)**	**Sand Fine <250 (um) (%)**	**Silt (%)**	**Clay (%)**
Belmont	H173	A11	0-2	69	0.7	1.96	0	5	28	20	34
519902 E	H173	A12	2-10	75	1.1	1.70	0	6	31	18	36
5271375 N	H173	A13	10-18								
	H173	A14	18-29	86	2.4	1.33	5	6	26	10	60
	H173	A15	29-41	92	2.8	1.15	7	7	22	6	65
	H173	AC1	41-48								
	H173	AC2	48-58		3.4	1.02	12	10	21	5	63
	H173	C1K	58-66								
	H173	C2K	66-76								
	H173	C3k	76-81								
Belmont	H22	A11	0-13	80	1.6	1.66	1	7	34	15	40
528567 E	H22	A12	13-25	88	2.3	1.80	2	5	29	11	50
5248360 N	H22	A13g	25-48	93	3.2	1.19	0	9	25	11	57
	H22	A3g	51-61				1	11	22	13	49
	H22	Ck	61-89		6.10	1.14	0	23	22	23	30
	H22	Rw	89-109				18	34	21	16	19

Table 2 Cont

3.2.2 Podzolic Soils on Dolerite (Pd)

These soils are found in that part of the sheet west of the River Derwent where rainfall exceeds about *630mm*, and below an altitude of about *610m* above which solifluction deposits are common. Slopes vary from gentle to steep and are usually rather stony. The surface soil is a grey-brown sandy loam or fine sandy loam overlying a bleached subsurface which may contain some ferruginous gravel.

There is a sharp change to a weakly mottled, light yellow-grey and yellow-brown subsoil clay which at depth gradually merges into decomposing dolerite. The subsoil varies from a rather dense and, in the moist state, sticky clay, to a more open friable clay. Dolerite stones occur throughout the profile.

Small patches of brown soils, some of which are shallow and stony, are mapped with this group. Also included are small areas of soils transitional to the black soil group described below.

Land Use

The natural vegetation is a sclerophyll forest with a ground flora of native grasses, tussocks and heath plants, and provides rough grazing for sheep. However where slopes are not too steep and stony these soils are capable of development for improved pastures.

Correlation

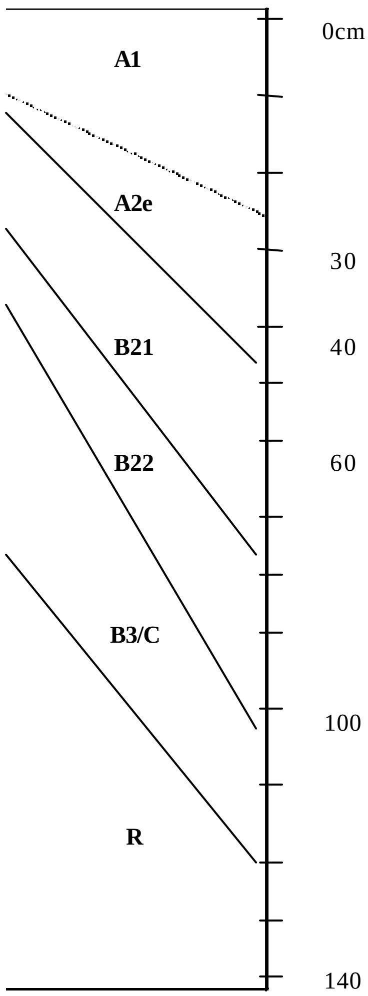
The dominant soil of this unit correlates with the Eastfield SPC. This unit has been renamed Podzolics Soil on Dolerite 1. The podzolic soils on dolerite as outlined by Dimmock (1957) occur on dolerite hills at elevations up to 600m where annual rainfall is greater than 630mm. Nicolls (1957) found that the rainfall cut off for these soils is generally less then 1020mm. On the steep colluvial dolerite slopes, shallow stony texture contrast soils without an A2 are common (eutrophic grey Kurosol). As slope angle decreases the soils become deeper and less stony with a bleached A2 horizon dominated by ferruginous gravels becoming evident. This soil is the most common soil within this unit and correlates with the Eastfield SPC described on the surrounding map sheets. It is a grey brown podzolic (grey or brown sodic Chromosol). Included within this unit in the high rainfall areas of the south west are strongly acidic texture contrast soils (bleached eutrophic grey Kurosols) and friable gradational soils (acidic dystrophic red Ferrosols).

As noted by Dimmock transitional soils to the brown soils on dolerite and the black soils on dolerite are also found within this unit. They occur in the drier areas of the unit at elevations generally below 600m.

Eastfield Soil Profile Class

Concept — **Brown, mottled, texture contrast soils with dolerite fragments throughout, loamy topsoils, sandy sub-surface, with ironstone, and clayey subsoils developed on dolerite hills**.

Aust. Soil Classification	Brown or Grey Chromosols and Sodosols
Great Soil Group	Grey-Brown Podzolics & Soloths
Principal Profile Form	Db, Dd
Mapping Units	Ea, Ea-Bo, Ea-Bm, Pd1, Pd2
Geology	Jurassic Dolerite
Landform	Moderate to steeply undulating hills
Permeability	Slowly permeable
Drainage	Imperfectly drained
Land Capability	Class 5 or 6



A1: Grey to black (10YR 2/1, 3/1, 3/2, 4/1, 4/2, 5/2); sandy loam to loam massive or weak structure, 2-10mm, subangular blocky structure, very weak to weak (moist) consistence, very few, 2-6mm, ferruginous concretions, variable amounts of dolerite stones and boulders; pH 5.5 - 7.0; clear to gradual change to

A2e: Conspicuously bleached (10YR 4/2, 5/1, 5/2, 6/2 (moist)); fine loamy sand to fine sandy loam or silty sandy loam; single grain or massive structure; very weak to weak (moist) consistence; common to abundant, <2-6mm, ferruginous concretions, variable amounts of dolerite gravels, stones or boulders; pH 5.5- 7.0; sharp to abrupt change to

B21: Mottled; brown (10YR 3/4, 4/3, 4/4, 4/6, 5/4); medium to heavy clay; massive to weak or moderate, 50-200mm angular blocky, firm to very firm (moist) consistence; few slickensides; clay skins common; cracks present; very few to few, 2-6mm, ferruginous nodules; variable amounts of dolerite fragments, stones or boulders; pH 6.5 - 7.0; abrupt to clear change to

B22: Mottled brown (2.5Y 4/4, 4/6, 10YR ¾, 4/3, 4/4, 4/6, 5/4, 7.5YR 4/4, 5/6, 4/6, 5YR 3/3); heavy clay; massive to weak or moderate, 50-100mm, angular blocky structure; firm to strong (moist) consistence; very few to few, 2-6mm, ferruginous nodules; variable amounts of dolerite stones and boulders; slickensides and clay skins common; pH 6.5 - 7.5; sharp to clear change to

B3/C: Occasionally mottled; brown (2.5Y 5/4, 5/3, 4/3, 4/4); light to medium clay; strong (moist) consistence; occasionally calcareous soft segregations present; variable amounts of dolerite stones or boulders; slickensides common; pH 7.0-7.5

R: Jurassic dolerite

Morphological Sites for Sorell: CSIRO H86, H78, H24, H163, H125, H237, H161:LRRBD L6, 34, 93, 126; SOILCO 70
Analysed Sites for Sorell: CSIRO H86, H78, H24, H163 H125, H237, H161: LRRBD L12, 43
Related soil names: Eastfield Series, Eastfield Sand, Type I, Eastfield SPC, Podzolic on dolerite
Previously described by: Stephens et al (1942), Loveday (1957), Doyle (1993), Spanswick & Zund (1999a & 1999b), Spanswick (In prep), Spanswick & Kidd a, b & c (In prep)

Soil Profile Class Grid Reference	**Profile Number**	**Horizon**	**Sample Depth (cm)**	**pH water (1:5)**	**Total P (mg/kg)**	**Org. Carb. (%)**	**Total N (%)**	**C/N Ratio**	**Ca**	**Mg**	**Na**	**K**
Eastfield	H125	A1	0-6	5.2	0.002	1.7	0.092	18	1.8	1.6	0.21	0.12
527312E	H125	A21	6-10	5.3	0.001	1	0.076	13	1.1	1.5	0.27	0.07
5247131N	H125	A22	10-13	5.5			0.061					
	H125	B21g	17-25	5.6	0.002	0.89	0.049	18	6.5	10.5	1.02	0.05
	H125	B22g	25-41	5.6								
	H125	B23	41-53	5.6					3.8	6.2	1.7	0.06
	H125	B24	61-76	6.7								
	H125	B25	94-107	7.7					7.6	8.9	3.5	0.09

Soil Profile Class Grid Reference	**Profile Number**	**Horizon**	**Sample Depth (cm)**	**Total Bases**	**BASE SAT (%)**	**ESP (%)**	**Ca/Mg Ratio**	**Gravel (of total) >2000 (um) (%)**	**Sand Coarse >200 (um) (%)**	**Sand Fine <200 (um) (%)**	**Silt (%)**	**Clay (%)**
Eastfield	H125	A1	0-6	3.73	33	1.9	1.13	1	9	65	14	8
527312E	H125	A21	6-10	2.94	32	2.9	0.73	1	9	65	15	9
5247131N	H125	A22	10-13					15	16	58	14	10
	H125	B21g	17-25	18.07	68	3.8	0.62	4	12	49	9	31
	H125	B22g	25-41					3	14	42	8	35
	H125	B23	41-53	11.76	63	9.1	0.61	13	18	39	9	33
	H125	B24	61-76					50	45	28	15	9
	H125	B25	94-107	20.09	93	16.1	0.85	60	54	25	11	8

Table 3 Analytical data for the Eastfield SPC

Soil Profile Class Grid Reference	**Profile Number**	**Horizon**	**Sample Depth (cm)**	**pH water (1:5)**	**EC (d/sm)**	**Total P (mg/kg)**	**Org. Carb. (%)**	**Total N (%)**	**C/N Ratio**	**Ca**	**Mg**	**Na**	**K**
Eastfield	H161	A1	1-5	5.7	0.049	0.005	2.84	0.107	27	4.6	2.4	0.32	0.18
526979E	H161	A21	8-13	5.9	0.032	0.003	1.22	0.048	25	2.4	1.4	0.16	0.11
5247287N	H161	A22	13-17	6.2	0.032		0.76	0.034	22	2.2	1.5	0.09	0.08
	H161	B2	19-28	6.5	0.032	0.002	0.76	0.041	19	8.7	7.8	0.47	0.05
	H161	BC	28-37	6.9	0.065		0.36	0.02	18				
	H161	C	56-71+	7.6	0.049		0.07	0.007	10	9.7	9.5	1.4	0.08

Soil Profile Class Grid Reference	**Profile Number**	**Horizon**	**Sample Depth (cm)**	**Total Bases**	**CEC**	**BASE SAT (%)**	**ESP (%)**	**Ca/Mg Ratio**	**Gravel (of total) >2000 (um) (%)**	**Sand Coarse >250 (um) (%)**	**Sand Fine <250 (um) (%)**	**Silt (%)**	**Clay (%)**
Eastfield	H161	A1	1-5	7.5		47	2	1.92	11	24	53	12	9
526979E	H161	A21	8-13	4.07		49	1.9	1.71	11	23	59	12	7
5247287N	H161	A22	13-17	3.87		60	1.4	1.47	15	20	59	12	8
	H161	B2	19-28	17.02		78	2.2	1.12	23	23	37	10	31
	H161	BC	28-37										
	H161	C	56-71+	20.68		98	6.6	1.02	85	64	22	7	5

Table 3 Cont

3.2.3 Brown Soils on Dolerite (Bd)

These soils are developed in the drier northerly and easterly parts of the sheet. They occur on slopes varying from gentle to steep which are often rather stony.

The most extensive soil is one which has a brown to dark brown friable loam or clay loam surface overlying a brown or red-brown fairly friable clay subsoil. Decomposing dolerite is usually found at moderate depths and dolerite floaters occur throughout the profile. Lime is occasionally found in the decomposing dolerite. In down slope situations the brown soil may give way to the black soils on dolerite described below. Also mapped with this group are some soils transitional to the podzolic soil group described above, and several small areas of gritty brown soils.

Land Use

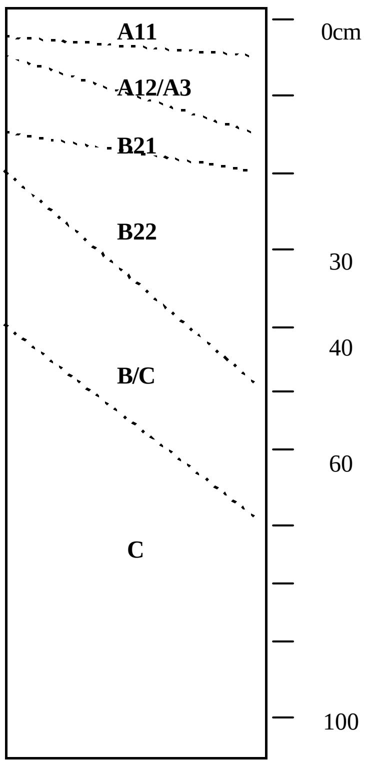
The natural vegetation is a savannah woodland, and is commonly used for rough grazing of sheep. However much improvement of pastures should be possible where slopes are not too steep and stony.

Correlation

The dominant soil of this unit (eutrophic red to brown Dermosols or Ferrosols) has been defined and is called the Tea Tree SPC. This unit has been renamed Brown Soils on Dolerite 1.

Tea Tree Soil Profile Class

Concept	**Shallow moderately structured gradational to weakly duplex red brown soils formed on dolerite.**
Aust. Soil Classification	Eutrophic red or brown Dermosols or Ferrosols
Great Soil Group	Non calcic Brown soils
Principal Profile Form	G or D
Mapping Units	Bd1,
Geology	Jurassic Dolerite
Landform	Moderate to steep slopes
Surface Conditions	Many coarse fragments
Permeability	Moderate permeability
Drainage	Moderately well drained
Land Capability	Class 4 or 5



A11: Black to red (7.5YR 3/2, 5YR 2/3, 2/2); loam to clay loam; weak granular structure; weak (moist) consistence; 2-10% dolerite stones; pH 6.0 - 6.5;

A12/A3: Brown to red (7.5YR 3/2, 5YR 2/2, 3/3); clay loam; weak granular structure; weak (moist) consistence; 10-20% dolerite stones; pH 6.0 - 6.5; gradual boundary change to

B21: Red (5YR 3/3, 4/5, ¾); heavy clay; weak fine to medium (10-50mm) angular blocky, sometimes moderate granular structure; moderate (moist) consistence; 2-20% dolerite gravels; pH 6.5 - 7.5; diffuse boundary to;

B22: Sometimes mottled; red (5YR 3/3, 2.5YR 2/4); heavy clay; weak to moderate (20-50mm) prismatic or angular blocky structure, moderate to strong (moist) consistence; 10-20% dolerite gravels; pH 7.0 - 8.0; diffuse boundary to

B/C: Mottled: red (5YR 3/3, 2.5YR 3/6, 4/2) mottles (5YR 3/3, 5/8, 4/6, 10YR 5/6, 7.5 YR 5/8); heavy clay; massive to weak (20-50mm) angular blocky; moderate (moist) consistence; 10-50% dolerite gravels; pH 7.5 - 8.0; diffuse boundary to

C: Mottled: red to brown (5YR 3/3, 10YR 5/6, 10YR 5/8, 10YR 8/1); massive structure; pH 8.0

Morphological Sites: CSIRO H245, H114, H167
Analysed Sites: CSIRO H245, H114, H167
Related soil names: Bd
Previously described by: Spanswick & Kidd a & b (In prep)

Soil Profile Class Grid Reference	**Profile Number**	**Horizon**	**Sample Depth (cm)**	**pH water (1:5)**	**EC (d/sm)**	**Total P (mg/kg)**	**Avail P (mg/kg)**	**Avail K (mg/kg)**	**Org. Carb. (%)**	**Total N (%)**	**C/N Ratio**	**Ca**	**Mg**	**Na**	**K**
Tea Tree	H245	A1	0-5	6.0	0.068	0.032			5.06	0.396	13	13.4	3.6	0.31	2.1
536760E	H245	A3	5-15	6.4	0.054	0.028			3.36	0.292	12	13.5	3.9	0.33	2
5254340N	H245	B21	15-29	6.8	0.048	0.016			1.94	0.158	12	15.4	5.9	0.3	1.8
	H245	B22	29-41	7.2	0.048				1.48	0.126	12	15.7	7	0.34	2
	H245	BC1	41-56	7.5	0.039							15.9	7.7	0.36	2
	H245	BC2	56-71	7.8	0.033							13.4	6.9	0.34	1.4
	H245	C	71-91	8.1	0.021							11.6	8	0.42	0.46

Soil Profile Class Grid Reference	**Profile Number**	**Horizon**	**Sample Depth (cm)**	**Total Bases**	**CEC**	**BASE SAT (%)**	**ESP (%)**	**Ca/Mg Ratio**	**Gravel (of total) >2000 (um) (%)**	**Sand Coarse >200 (um) (%)**	**Sand Fine <200 (um) (%)**	**Silt (%)**	**Clay (%)**
Tea Tree	H245	A1	0-5	19.41		53	0.8	3.72	10	15	36	18	22
536760E	H245	A3	5-15	19.73		58	1.0	3.46	9	16	37	20	21
5254340N	H245	B21	15-29	23.4		75	1.0	2.61	3	11	34	16	37
	H245	B22	29-41	25.04		80	1.1	2.24	9	12	27	15	45
	H245	BC1	41-56	25.96		84	1.2	2.06	4	19	25	15	40
	H245	BC2	56-71	21.94		86	1.3	1.97	17	31	24	17	25
	H245	C	71-91	20.48			2.1	1.45	20	44	24	16	15

Table 4 Analytical data for Tea Tree SPC

3.3 Soils on Mudstone

3.3.1 Podzolic Soils on Mudstone (Pm)

Grey soils formed from mudstone are found scattered throughout the area. Slopes of the mudstone hills vary from gentle to steep, and outcrops of rock occur occasionally. Many of the soils are shallow, and angular fragments of rock are found throughout most profiles. The surface horizon, darkened somewhat by organic matter, overlies a bleached sub-surface. The texture is most commonly sandy loam but may vary from loamy sand to fine sandy or silty clay loam. These horizons occasionally rest directly on rock, but more frequently there is a subsoil of grey-brown or yellow-grey sometimes weakly mottled clay.

Sandy profiles and profiles with bright coloured sub-soils are associated with interbedded layers of sandstone and shales. Soils with deep yellow-brown clay subsoils are found in the Lucaston district on a variety of mudstone of restricted occurrence.

Land Use

The mudstone soils inherit a low nutritional status from their parent rock and generally appear unattractive for development. On a few slopes where deeper soils have been able to accumulate orchards and pastures have been established but more often the natural vegetation of sclerophyll forest with a rather sparse ground cover is still present.

Correlation

The soils in this unit have generally formed on Permian sediments of the Fern Tree group. The Fern Tree group is dominated by quartz siltstones with some interbedding of Risdon Sandstone. In the west of the sheet the Permian lithology becomes much more complex. Mudstone, shale, conglomerate and limestone are frequently found interbedded with the quartz siltstone and Ridson sandstone (Leaman, 1975).

The Permian lithologies form rolling hills up to elevations of 700m, with rainfall ranging from 550 to 1200mm. The dominant soil in the drier eastern areas of the map is generally a dystrophic brown or grey Kurosol. This soil correlates with the shallow stony grey brown podzolic soils described by Loveday (1955) and the Forcett SPC defined on the Buckland, Sorell and Brighton Reconnaissance Soil Maps. In the west of the sheet below the Derwent River, rainfall increases with rising elevation. Unfortunately very little is known about the soils within this area as the steep terrain has made much of this area inaccessible. However the limited data available suggests that the soils are mottled dystrophic grey or brown Kandosols, and to a lesser degree podzols (Podosols).

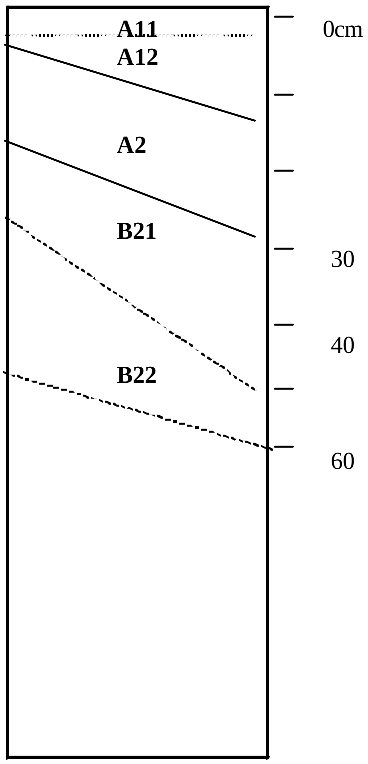
In the landsystems map, Davies split the Permian sediments along the 750mm rainfall isohyet. During the course of field investigation for this area it became evident that differences in soil type could also be identifies along a similar line. Consequently, the original Pm map unit has been divided along the approximate line of this isohyet.

Pm1 *- The geology of this unit is dominated by quartz siltstone with rainfall < 750mm. The dominant soil within this unit has been identified and is called the* ***Forcett SPC****.*

Pm2 *- The geology of this unit is a complex interbedding of Permian siltstone, mudstone, sandstone, conglomerate and shale. Rainfall in this unit is greater than 750mm. No SPC has been defined for this unit.*

Forcett Soil Profile Class

Concept	**Shallow stony acidic soils, with a brown to grey weakly structured surface over a bleached, hardsetting subsurface over a weak to moderate structured clay subsoil.**
Aust. Soil Classification	Dystropic brown or grey Kurosol
Great Soil Group	Grey brown podzolics or soloth
Principal Profile Form	Dy , Db
Mapping Units	Pm1, Pm2
Geology	Permian sandy mudstones interbedded with sandstones
Landform	Colluvial slopes
Vegetation	Dry Sclerophyll forest, *E. amygdalina*, *E. risdoni*, *E. tasmanica*, *E. viminalis* & in moister situations *E. obliqua*
Surface Conditions	Hard setting and stony
Permeability	Slow to very slow
Drainage	Poor to imperfect



A11: Grey (10YR 2/2, 3/1, 4/2) moist; fine sandy loam; weak fine 2-5mm granular structure; very weak (dry) consistence; 10-20% angular mudstone gravels; pH 4.5 - 5.5; diffuse boundary to

A12: Grey (10YR 3/1, 2/2, 4/2) moist; fine sandy loam; weak fine 2-5mm granular structure; very weak (dry) consistence; 10-50% angular mudstone gravels; 0.05 dSm-1; pH 4.5 - 5.5; clear boundary change to

A2: May be bleached; grey (10YR 6/1, 6/3, 4/2) moist; fine sandy loam; massive structure; firm (dry) consistence; 20-50% angular mudstone gravels; 0.05 dSm-1; pH 4.5 - 5.5; abrupt boundary to

B21: Mottled; brown (10YR 5/1,5/2, 2/2, 4/3) moist; yellowish brown (10YR 5/8, 5/6, 6/3) mottles; fine sandy medium clay; massive to weak 20-50mm subangular blocky; firm (moist) consistence; 20-90% angular mudstone gravels; dispersive; 0.07 dSm-1; pH 4.5 - 5.5; diffuse boundary to

B22: Mottled: brown (10YR 2/2, 5/3, 4/2, 5/8, 5/1) moist; yellowish brown (10YR 5/8, 5/6, 6/3, 2.5Y 5/3) mottles; fine sandy medium to heavy clay; massive to moderate 20-50mm subangular blocky; firm (moist) consistence; 20-90% coarse mudstone fragments; dispersive; 0.08 dSm-1; pH 5.0 - 5.5

Morphological Sites for Sorell: CSIRO H154, H221, H199, H225; SOILCO 33
Analysed Sites for Sorell: CSIRO H154, H199, H221, H225
Related soil names: Podzolics on Mudstone
Previously described by: Loveday (1957), Spanswick (1999), Spanswick & Kidd a, b & c (In prep)

Soil Profile Class Grid Reference	**Profile Number**	**Horizon**	**Sample Depth (cm)**	**pH water (1:5)**	**EC (d/sm)**	**Total P (mg/kg)**	**Org. Carb. (%)**	**Total N (%)**	**C/N Ratio**	**Ca**	**Mg**	**Na**	**K**
Forcett	H221	A11	0-5	4.6	0.054	0.009	6.65	0.281	24	2.5	1.9	0.39	0.56
531135E	H221	A12	5-8	4.6	0.065	0.007	4.8	0.2	24	1.1	1.8	0.36	0.44
5264389N	H221	A1A2	8-15	4.8	0.057		3.45	0.14	25				
	H221	A2	18-33	5.0	0.048		0.88	0.036	24	0.33	0.92	0.36	0.26
	H221	B2	41-56	5.2	0.054		0.91	0.055	17	0.4	4.7	0.78	0.53

Soil Profile Class Grid Reference	**Profile Number**	**Horizon**	**Sample Depth (cm)**	**Total Bases**	**BASE SAT (%)**	**ESP (%)**	**Ca/Mg Ratio**	**Gravel (of total) >2000 (um) (%)**	**Sand Coarse >200 (um) (%)**	**Sand Fine <200 (um) (%)**	**Silt (%)**	**Clay (%)**
Forcett	H221	A11	0-5	5.35	14	1.1	1.32	19	3	27	44	13
531135E	H221	A12	5-8	3.7	12	1.2	0.61	25	3	27	50	13
5264389N	H221	A1A2	8-15									
	H221	A2	18-33	1.84	14	2.7	0.36	26	3	22	55	20
	H221	B2	41-56	6.41	22	2.6	0.09	21	2	7	28	62

Table 5 Analytical data for Forcettte SPC

3.4 Soils on Sandstone

3.4.1 Podzols and Podzolic Soils on Sandstone (Pss)

Areas of sandstone occur scatted throughout, but the podzols on sandstone are developed particularly in the southern parts of the sheet, ie., in the higher rainfall areas. The podzolic soils, on the other hand, are found more frequently in the drier northerly and north easterly parts. Slopes vary from gentle to steep and there are occasional out-crops of rock and more rarely cliffs.

The general characteristics of the podzols on sandstone are as for the cover-sand group, with the exception that the sub-soil texture beneath the hardpan is clayey sand to sandy clay rather than sand as in the cover-sand group.

The podzolic soils on sandstone have a grey to grey-brown loamy sand surface over a bleached sub-surface. The subsoil is usually a weakly mottled yellow, grey or brown sandy clay overlying decomposing sandstone. There is no black organic pan as in the podzols.

Land Use

Although small areas of sandstone soils have been cleared for orchards and pastures the majority still carry a sclerophyll forest vegetation. Where slopes are not too steep these soils should be capable of development.

Correlation

The Triassic lithologies like the Permian lithologies are complex. A broad range of soils were found within this unit. The Triassic soils include brown soils (Kandosols or Dermosols), yellow-brown and grey-brown podzolics (Kurosols) and yellow brown to deep grey quartz podzols (Podosols). The podzolic soils are generally associated with thickly bedded coarse-medium siliceous sandstone while brown soils are associated with the finer textured feldspathic sandstone on valley margins. Podzols are often found in higher elevations and rainfall. Due to limited data we were unable to define the dominant soil of this unit. For more information about the soils within this unit refer to DeRose et al. (In prep).

3.5 Soil on Cover Sands

3.5.1 Podzols on Cover-sands (Pcs)

In the Sandford and South Arm districts coastal sand has blown to cover slopes of hills and in places has built up dunes which are now stabilised. There are occasional outcrops of the underlying rocks and towards the margins the sand sheet may be very thin.

The most extensive soil mapped in this group is a podzol which has a dark grey sand surface over a bleached subsurface to about *60cm*. The subsoil may consist of a light yellow sand but frequently there is a soft or weakly cemented black or dark brown sand with a yellow-brown underlayer passing to a light yellow sand below. In poorly drained swales ground water podzols may be found. Surface and subsurface features are similar to those above, but in the subsoil a hardpan *5-15cm* thick, black on top with yellow-brown under-layers has developed. The horizons both above and below the hardpan may be saturated with water depending on the season. Where the sand sheet is thin there may be a clay or sandy clay subsoil formed from the underlying rocks.

Land Use

These sandy areas have characteristic open sclerophyll forest with heath vegetation. Some areas have been cleared particularly for orchards, and with suitable fertilising much of the remainder could be developed.

Correlation

Very little work was undertaken within this unit. However these soils are generally similar across all the southern coastal soil maps. The soils of this unit are generally deep quartz podzols (Podosols). No SPC is available for this unit.

3.6 Soils on Limestone

3.6.1 Brown soils on Limestone (Bl)

One relatively small area of these soils occurs on the slopes above Granton. The surface soil is a dark greyish-brown loam to sandy loam over a brown or reddish-brown clay loam or clay subsoil. Below about *45cm* fragments of limestone occur in the clay which gradually merges with decomposing limestone.

Land Use

The vegetation is a savannah woodland and has been partly cleared to provide rough grazing for sheep.

Correlation

No work was undertaken within this unit due to it's limited extent. However work by DeRose et al (In prep) found that the soils developed on limestone near Granton were generally well drained brown Calcaresols.

3.7 Undifferentiated Alluvial Soils

3.7.1 Soils of Alluvial Deposits (A)

This group includes a wide variety of soils formed on present day flood plains, various terrace remnants up to *45m* above present stream level, and alluvial fan formations around the coastline. The alluvial deposits may vary from sands to clays and gravels, often showing stratification.

Many of the soils are dark coloured, of clay texture and with mottling in the subsoil. Some have lime accumulations in the deep subsoil.
Others have a grey or grey-brown sandy loam surface over a bleached subsurface and a dense mottled clay subsoil. Yet other soils have a dark grey-brown sandy loam to clay loam surface overlying directly a clay subsoil, usually weakly mottled grey-brown, reddish-brown or yellow-brown. In all these soils waterworn gravels may be present, sometimes in considerable amounts.

Land Use

These soils are important agriculturally. There are but few areas not already developed either for improved pastures, market gardens or orchards.

Correlation

A detailed survey exists for the area between Huonville and Grove (Taylor et al, 1935). The soil map of the Huonville district provides the best indication of soils in this area. The valley formed from the erosion of uncapped Permian sandstone and siltstones faulting. The recent quaternary alluvium along Mountain River is mainly derived from the Permian sandstones. For information about the alluvial soils in the Coal River Valley refer to Holtz (1987).

3.8 Soil of Recent Sands and Shell Beds

3.8.1 Soils of Recent Sands and Shell Beds

There are several areas of recent sand accumulations in the Ralph's Bay and South Arm areas. The actively accumulating sand dunes adjacent to the shoreline contain many shell fragments but inland where the sand is stabilised by vegetation it becomes less calcareous and weak profile differentiation is evident. The surface horizon is darkened by organic matter and the subsurface shows incipient bleaching.

In several places there are narrow necks of land, consisting on the seaward side of sand dune accumulations and behind these on the enclosed bay or lagoon side low lying flats with sandy soils containing many shells and shell fragments. There are also saline swampy areas with samphire vegetation.

Land Use

Areas of stabilised sand are suited to the growth of pines but little can be expected from the saline flats and unstabilised dunes.

Correlation

No work was undertaken within this unit due to its limited extent and restricted agricultural use. This unit also occupies small areas of the east coast on the Buckland and Sorell maps.

3.9 Soils on Solifluction deposits

3.9.1 Yellow-Brown Soils on Solifluction Deposits (YBs)

Above an altitude of approximately *610m* it is common to find solifluction deposits overlying the country rock on slopes varying from gentle to steep. The deposits are largely dolerite boulders, stratified weathered material and rock fragments.

The soils vary depending on the situation but all are stony particularly in the surface layers and most are of bright yellow-brown colour throughout. The texture is commonly clay loam or clay, often gritty and sometimes sandy. At high altitudes there is usually a layer of peat overlying the stones of the surface, while at depth in the yellow-brown subsoil there may be a thin, contorted and strongly cemented iron pan. At lower altitudes under forest vegetation the surface is darkened considerably by organic matter and the yellow-brown material beneath is more open and friable than under the peat vegetation.

Large areas are included with the high moor peats and bare rock exposures marked as inaccessible mountainous country on the map.

Land Use

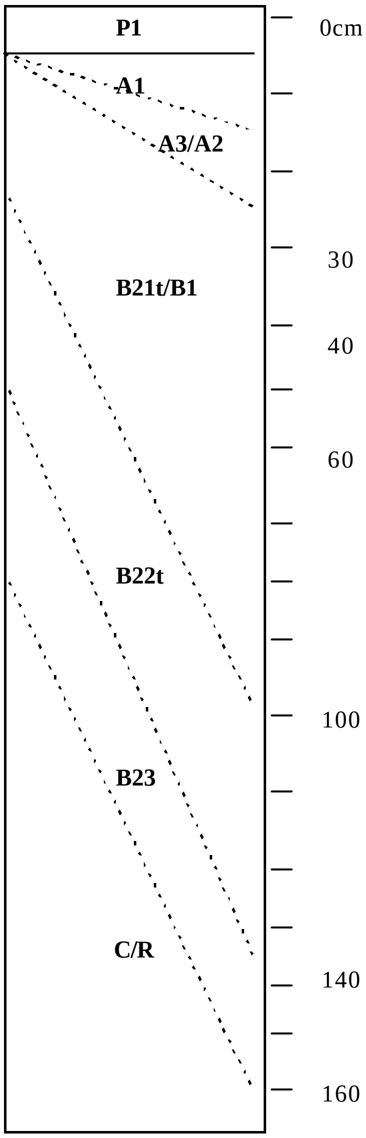
At moderate altitudes these soils carry dense eucalypt forests which provide much timber suitable for milling. Except in marginal areas in the Collinvale district agricultural pursuits have not been attempted for the soils are generally too stony. These soils are mapped separately only where access by road is possible.

Correlation

The soils of this unit generally correlate with the Miscellaneous Soils Mapping Unit 1 first described by Doyle (1993). A broad SPC has been defined for the Yellow Brown Soils, however variation from the SPC can be expected with profiles having thicker peaty top soils and yellower subsoils in areas of restricted drainage. These soils are generally eutrophic red Ferrosols or brown Dermosols.

Yellow Brown Soils on Solifluction Deposits Soil Profile Class

Concept	**Stony/bouldery soils with gritty sandy loam surface soils and brown, clayey, structured subsoil developed on dolerite solifluction deposits.**
Aust. Soil Classification	Eutrophic Red Ferrosols & Brown Dermosols
Great Soil Group	Red - Yellow Podzolic ,Krasnozem soil
Principal Profile Form	Gn
Mapping Units	M1, Lw, M1-Lf, M1-Qu, Ybs1
Geology	Jurassic or Quaternary dolerite solifluction deposits
Landform	Upper slopes, crests and simple slopes of moderate to very steep hillslopes on the Western Tiers and Plateau.
Vegetation	Wet sclerophyll forest - Eucalyptus delegatensis
Permeability	Moderate to highly permeable
Drainage	Well drained
Land Capability	Class 6 or 7



P1: Fibric peat

A1: Black (5YR 2/1; 7.5YR 4/4, 5/6); sandy loam - heavy loam; moderate <2-5mm granular structure; very weak (moist) consistence, 20-50% dolerite gravels and cobbles; pH 5.5-6.0; clear smooth change to

A3/A2: Black or red (5YR 3/2, 3/3); loamy sand to clay loam; weak to moderate, 2-5mm, granular parting to <2mm granular structure; very weak (moist);consistence; 20-90% dolerite gravels; pH 5.5-6.0; clear wavy change to

B21t/B1: Brown or red (7.5YR 4/4,4/6, 5YR 4/6, 2.5YR 4/6,3/6) clay loam to fine sandy clay; moderate 2-5mm granular or subangular blocky structure; weak (moist) consistence; 50-90% dolerite gravels and cobbles; clay skins common; pH 6.0-6.5; gradual smooth change to

B22t: Red or brown (5YR 4/4, 4/6, 7.5YR 4/4, 4/6); sandy clay loam - heavy clay loam; massive to moderate 5-20mm angular blocky structure; weak (moist) consistence; 2-20% maganiferous soft segregations; 50-90% dolerite gravel on cobbles; common to many clay skins; pH 5.5 - 6.0; gradual smooth change to

B23: Red to brown (5YR 4/6, 4/4, 7.5YR 4/4, 4/6); light clay to heavy clay loam; massive to moderate 10-20mm angular blocky parting to 2-10mm angular blocky structure; weak (moist) consistency; <2-50% dolerite gravels and cobbles; clay skins common to many; pH 5.5 - 6.0; diffuse change to

C/R: Light clay; 50-90% dolerite gravels on bedrock or boulders

Morphological Sites: LRRBD L155, L153, L154, H182
Analysed Sites: LRRBD L153, L154, H182
Related soil names: Holloway (Ho), Excalibur (Ex), Yellow Brown Soils on Solifluction deposits
Previously described by: Laffan (1995), Leamy (1961), Doyle (1993), Spanswick & Zund (1999b), Spanswick & Kidd a & b (In press)

Soil Profile Class Grid Reference	Profile Number	Horizon	Sample Depth (cm)	pH water (1:5)	EC (d/sm)	Total P (mg/kg)	Org. Carb. (%)	Total N (%)	C/N Ratio	Ca	Mg	Na	K
Yellow Brown Soil on solifluction Deposits SPC	H182	0	0-2	4.7	0.202	0.039	30.2	0.6	50	12.9	4.2	0.31	1.3
	H182	A1	2-15	5.2	0.051	0.034	5.58	0.112	50	0.78	0.37	0.09	0.22
	H182	B11	15-33	5.2	0.042		5.41	0.162	33				
	H182	B12	33-46	5.1	0.027		2.97	0.103	29	0.16	0.19	0.1	0.08
	H182	B21	46-51	5.2	0.033			0.039					
	H182	B22	51-63	5.1	0.027								
	H182	B23	63-79	4.9	0.021					0.1	0.18	0.1	0.6
	H182	B24	79-94	5.0	0.018								
	H182	B25	94-109	4.9	0.03								
	H182	B26	145-155	5.0	0.021								

Soil Profile Class Grid Reference	Profile Number	Horizon	Sample Depth (cm)	Total Bases	BASE SAT (%)	ESP (%)	Ca/Mg Ratio	Gravel (of total) >2000 (um) (%)	Sand Coarse >200 (um) (%)	Sand Fine <200 (um) (%)	Silt (%)	Clay (%)
Yellow Brown Soil on solifluction Deposits SPC	H182	0	0-2	18.71	19	0.3	3.07	1	9	23	12	13
	H182	A1	2-15	1.46	4	0.3	2.11	10	12	30	14	29
	H182	B11	15-33									
	H182	B12	33-46	0.53	2	0.3	0.84	27	17	28	14	26
	H182	B21	46-51									
	H182	B22	51-63									
	H182	B23	63-79	0.44	2	0.5	0.56	31	21	34	21	20
	H182	B24	79-94									
	H182	B25	94-109									
	H182	B26	145-155									

Table 6 Analytical data for the Yellow Brown Soils on Solifluction Deposits SPC

3.10 Soils of Organic Deposits

3.10.1 High Moor Peats (HMP)

On the mountainous plateau above *1010m*, high moor peats are developed under characteristic vegetation. The peats are found mostly on gentle slopes. Many dolerite boulders protrude at the surface. The peat is black or dark brown and fibrous at the surface. The underlayers are well humified and greasy to the feel. The depth of the peat layer is usually between *15 and 40cm*, rarely as much as *60cm* and it usually overlies a layer of dolerite stones. Beneath this the yellow-brown solifluction material described above is often found.

Land Use

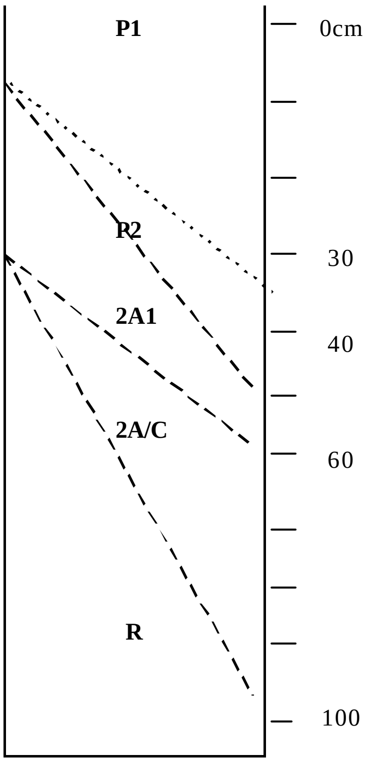
No agricultural use is made of the peat areas. They are not mapped separately but are included with yellow-brown solifluction soils and bare rock exposures.

Correlation

The High Moor Peats (acidic fibric or hemic Organosols) on the original map sheet were mapped with Yellow Brown Soils on Solifluction Deposits as one large polygon on the Mt Wellington-Mt Marian plateau. This unit correlates with the Liawenee Association (Lw) first described by Spanswick & Zund (1999). An SPC has been defined for both soils. For a description of the Yellow Brown Soil SPC refer to section 3.9.1.

High Moor Peat Soil Profile Class

Concept	**Shallow, black peat and alpine humus soils underlaid by clay or dolerite fragments on bedrock and formed within depressions on the Central Plateau**
Aust. Soil Classification	Acidic Fibric or Hemic Organosols
Great Soil Group	Acid Peat
Principal Profile Form	O
Mapping Units	M3, M1-M3, Ybs
Geology	Quaternary marsh and swamp deposits
Landform	Closed depressions or swamps on a plateau
Surface Condition	self mulching
Permeability	slowly permeable
Drainage	Very poorly to poorly drained
Land Capability	Class 6 or 7



P1: Black (10YR 2/1,2/2, 5/3); fibric peat; massive structure; abundant live roots; pH 4.5 -5.5; diffuse change to

P2: Black (10YR 2/1,2/2, 5/3) ; hemic or sapric peat; massive structure; common live roots; pH 4.5 - 5.5.

2A1: Black (10YR 2/1,3/1, 5/3); sapric or fibric loam to clay loam; massive structure; pH 5.0 -5.5

2A/C: Occasionally mottled,; black or grey (10YR 3/2, 2.5Y 4/2); 50-90% dolerite gravels; pH 5.5 - 6.0

R: >90% dolerite boulders on bedrock

Morphological Sites: CSIRO H21, H23, H110, H238
Analysed Sites: As for morphological sites
Related soil names: High Moor Peats, Unnamed soils of Miscellaneous Soils Mapping unit, Organic soils on alluvium
Previously described by: Spanswick & Zund (1999b), Spanawick & Kidd a & b (In prep), Doyle (1993), Leamy (1961)

Soil Profile Class Grid Reference	**Profile Number**	**Horizon**	**Sample Depth (cm)**	**pH water (1:5)**	**EC (d/sm)**	**Total P (mg/kg)**	**Avail P (mg/kg)**	**Avail K (mg/kg)**	**Org. Carb. (%)**	**Total N (%)**	**C/N Ratio**	**Ca**	**Mg**	**Na**	**K**
HMP	H21	P1	0-8	5.6		0.122			21.4	1.44	15				
517697E	H21	P21	8-20	5.7		0.089			14.1	1.07	13	2.4	2.1	1.05	1.2
5252105N	H21	P22	23-36	5.5					15.4	1.1	14				
	H21	A3	46-56	5.6					8.9	0.52	17				
	H21	B1g	61-71	5.4					3.3	0.231	14				
	H21	B2g	71-96+	6.0		0.046			0.9	0.055	16	0.2	0.1	0.08	0.22

Soil Profile Class Grid Reference	**Profile Number**	**Horizon**	**Sample Depth (cm)**	**Total Bases**	**CEC**	**BASE SAT (%)**	**ESP (%)**	**Ca/Mg Ratio**	**Gravel (of total) >2000 (um) (%)**	**Sand Coarse >200 (um) (%)**	**Sand Fine <200 (um) (%)**	**Silt (%)**	**Clay (%)**
HMP	H21	P1	0-8										
517697E	H21	P21	8-20			101	15.7	1.14					
5252105N	H21	P22	23-36										
	H21	A3	46-56										
	H21	B1g	61-71										
	H21	B2g	71-96			2	0.3	2.0	2	24	33	16	24

Table 7 Analytical data for the High Moor Peats SPC

3.11 Lateritic Soils

3.11.1 Lateritic Soils (L)

One small patch of lateritic soils occurs in the north-east corner of the area on a very gently sloping bench protruding from the valley wall. The bench is dissected by a number of small streams crossing it. On undissected portions of the bench massive pieces of concretionary laterite are exposed around tree butts.

The surface soil is brownish-grey and sandy and the subsurface weakly bleached. The subsoil at about *15cm* is a predominantly yellow-brown clay which contains scattered fragments of laterite. At depth there is light grey and yellow-brown mottling.

On the dissected slopes the soils are more variable having loam or clay loam surface soils over yellow-brown or mottled clay subsoils. There is considerable concretionary laterite in fragments ranging from a *few cm to a meter or so in diameter* scattered on these slopes.

Land Use

The natural vegetation is a poor eucalypt wood-land. Some clearing and pasture improvement is being attempted and with appropriate management it should be successful.

Correlation

No work was undertaken within this unit.

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Appendix 1

List of Key Soil Horizon Designations Used in SPC's

Horizons (some of which may be subdivided eg, A11 and A12)

A1 Topsoil, zone of maximum biological activity, usually dark in colour.

A2 Grey, generally sandy, sometimes bleached, eluvial horizon (less clay, organic matter and sesquioxides than horizons above and below).

A3 Transitional horizon between A and B horizon and more similar to A than B horizon.

B1 Transitional horizon between A and B horizon and more similar to B than A horizon.

B2 Main subsoil horizon, either:-

1) illuvial clay, humus or sesquioxide accumulations or

2) maximum pedological development such as structure or colour.

B3 Transitional horizon between B2 and C horizon and having significant amount of clay to still be classed as part of the solum.

BC As above.

C Weathered parent material and partially weathered rock from which the soil has formed.

D Buried horizon which is unlike the pedological organisation of the overlying horizons.

R Bedrock.

P1 Primarily undecomposed organic matter (peat).

P2 Primarily decomposed organic matter (peat).

Horizon Suffixes Used

e conspicuously bleached horizon, for example A2e.

g Gleyed horizon caused by very poor drainage.

h accumulation of humified, well decomposed organic matter.

j sporadically bleached horizon, for example, A2j.

k accumulation of carbonate.

t accumulation of silicate clay (illuviation).

w weakly developed B horizon, ie, colour or structured B horizon, little or no illuviation.

For full horizon definitions refer to MacDonald *et al.* (1990). This figure has been modified from Doyle (1993), p 118.

Appendix 2

Analytical Methods for CSIRO sites

The following analytical methodology, taken from Graley (1961), is assumed to be similar for the sites analysed by CSIRO Division of Soils on this map.

The methods of analyses used were essentially those of Piper (1947) but with the following modifications:

pH was determined using a glass electrode and the system described by Raupach (1954).

Phosphorus is reported as “total” P dissolved by four hours boiling with concentrated hydrochloric acid. It was determined by a colorimetric method using butanol to extract the ammonium phosphomolybdate prior to its reduction with stannous chloride to the blue complex.

“Free” ferric oxide was determined using a modification by Haldane (1956) of Jeffries’ method.

Particle size distribution was determined on a number of samples by the International pipette method and on others by the rapid plummet balance method (Marshall, 1956) after dispersion of the soil using “calgon” (Hutton, 1955). Use of the pipette method is indicated in the tabulated data by quoting the results of the silt and clay fractions to one decimal place and of the plummet method to the nearest whole number. Coarse and fine sands are quoted to the nearest whole number for both methods.

Exchangeable metal cations were extracted by leaching with normal ammonium chloride and the leachate examined by titration with E.D.T.A for calcium and magnesium (Bond and Tucker, 1954 and Hutton, 1954) and by the “Eel” flame photometer for potassium and sodium (Stace and Hutton, 1958).

Exchangeable hydrogen has been determined by both the paranitro phenol (to pH 7.0) and meta-nitrophenol (to pH 8.4) methods of Piper (1942) but the total exchangeable cations recorded are the sum of the metal ions and exchangeable hydrogen to pH 8.4.

Values are reported for fractionation of the coarse and fine sands from certain samples. These were determined by sieving through five inch sieves with hand shaking for twenty minutes.

Analytical methods for DPIWE sites

Soil pH and electrical conductivity were measured in a 1:5 soil:water ratio.

Clay mineralogy was determined by the Tasmanian Department of Mineral Resources using X-ray diffraction.

Exchangeable Aluminium and Acidity was measured using method 15G1 described by Rayment and Higginson (1992).

Organic Carbon was measured using the Walkley and Black method described in Rayment and Higginson (1992).

Available phosphorus was measured using method 9B2 described by Rayment and Higginson (1992) based on Murphy and Riley (1962).

Air-dry moisture content has been expressed as a percentage based on method 2A1 described by Rayment and Higginson (1992).

Total nitrogen was measured using an auto analyser following method 7A2 in Rayment and Higginson (1992).

Copper, Zinc, Manganese and Iron was measured using method 12A1 described in Rayment and Higginson (1992).

Exchangeable Calcium, Magnesium, Sodium and Potassium was measured by ammonium chloride at pH 7.0 using method 15B3 in Rayment and Higginson (1992).

Appendix 3

Rating table for analytical properties

General analytical properties

	Very low	Low	Medium	High	Very High
Organic Carbon (%)	<1	1-2	2-4	4-8	>8
Total Nitrogen (%)	<0.1	0.1-0.2	0.2-0.4	>0.4	
Total Phosphorus (mg/kg)	<100	100-200	200-500	500-1000	>1000
CEC (meq/100g soil)	<6	6-12	12-25	25-50	>50
Base Saturation (%)	<20	20-40	40-60	>60	

Note: Organic matter content can be estimated by multiplying organic carbon contents by 1.724.

Colwell Extractable Phosphorus and Potassium

Light soils (sandy loams)	Low	Medium	High
P (mg/kg)	<10	10-35	>35
K (mg/kg)	<100	100-200	>200
Heavy soils (clays)	Low	Medium	High
P (mg/kg)	<30	30-80	>80
K(mg/kg)	<150	150-300	>300

Salinity

	None	Slight	Moderate	High	Very High
(dSm-1)	<0.2	0.2-0.7	0.7-1.2	1.2-3.0	>3.0

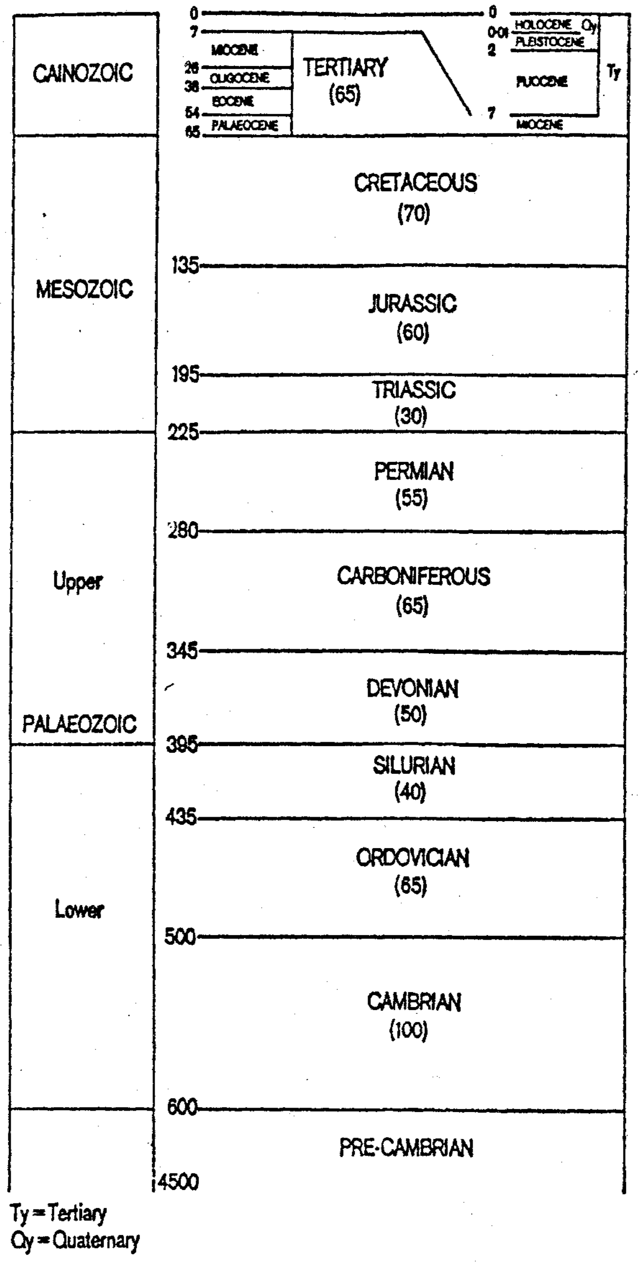
Soil Acidity

	Slightly	Moderately	Strongly	Extremely
pH range	6.5-6.0	5.9-5.3	5.2-4.5	<4.5

This table has been taken from Doyle (1993) p115

Appendix 4

Geological Timeline



Taken from Brooks J.R.V., and Whitten D.G.A., (1972) Dictionary of Geology . Published by Penguin, England.

Appendix 5

Additional Relevant Information

Detailed Maps

Stephens C.G. *et al* (1935) The Apple Growing Soils of Tasmania. CSIRO Division of Soils Melbourne.

Nicolls, K.D (1957b), Soil Formation on Dolerite in Tasmania. *In Dolerite a Symposium,* University of Tasmania, Geology Department, Convenor S.W. Carey.

Geology Maps

Leaman, D.E (1976) Tasmanian Department of mines Geological Atlas 1:50 000 series Hobart.

Appendix 6

List of Reports in the Reconnaissance 1:100 000 Soil Map Series

Cowie, J.D. (1959), Reconnaissance soil map of Tasmania. Sheet 68, **Oatlands**. Div. Rep. Div Soils CSIRO Aust. 4/59**;** Scale 1:63 360

Doyle, R.B. (1993), Soils of the **South Esk** Sheet Tasmania (southern half) Reconnaissance Soil Map. DPIF Soil Survey Series of Tasmania No 1. Scale 1:100 000

Dimmock, G.M. (1956), Reconnaissance soil map of Tasmania **Flinders Island**. Div. Rep. Div. Soils CSIRO Aust. 8/56**;** Scale 1: 63 360

Dimmock, G.M. (1960), Soil reconnaissance of the area between the **Tomahawk and Ringarooma Rivers**, N.E Tasmania. Tech memo. Div. Soils CSIRO Aust. 7/60**;** Scale 1:63 360

Dimmock, G.M. (1961), Reconnaissance soil map of Tasmania. Sheet 74, **Ellendale**. Div. Rep. Div. Soils CSIRO Aust. 5/61**;** Scale 1:63 360

Dimmock, G.M. (1964), **Beaconsfield** Soil Survey. CSIRO (unpublished)**;** Scale 1: 100 000

Hubble, G.D. (1951), Reconnaissance survey of the **Coastal Heath Country, N.W** Tasmania. Div. Rep. Div. Soils CSIRO Aust. 10/51 **;** Scale 1:126 720

Leamy, M.L. (1961), Reconnaissance soil map of Tasmania, Sheet 61. **Interlaken**. Div. Rep. Div. Soils CSIRO Aust. 6/61**;** Scale 1:63 360

Loveday, J. (1955), Reconnaissance soil map of Tasmania, sheets 22 and 28 - **Table Cape and Burnie**. Div. Rep. Div. Soils CSIRO Aust. 14/55**;** Scale 1:126 720

Nicolls, K.D. (1955), Soils, geomorphology and climate of an area between the **Lagoon and Arthur Rivers**, West Coast of Tasmania Div. Rep. Div. Soils CSIRO Aust. 7/55**;** Scale 1:126 720

Nicolls, K.D. (1957), Reconnaissance of the soils around **Georgetown**, Tasmania. Tech. Memo Div Soils CSIRO Aust 3/57**;** Scale 1: 126 720

Spanswick S.B. and Zund P. (1999a), Revised **Longford** Reconnaissance Soil Map of Tasmania. Department of Primary Industry Water and Environment, Tasmania. Scale 1:100 000.

Spanswick S.B. and Zund P. (1999b), Revised **Quamby** Reconnaissance Soil Map of Tasmania. Department of Primary Industry Water and Environment, Tasmania. Scale 1:100 000.

Spanswick S.B.. (In prep), Revised **Sorell** Reconnaissance Soil Map of Tasmania. Department of Primary Industry Water and Environment, Tasmania. In press. Scale 1:100 000.

Spanswick S.B. and Kidd D.B. (In prep), Revised **Buckland** Reconnaissance Soil Map of Tasmania. Department of Primary Industry Water and Environment, Tasmania. In press. Scale 1:100 000.

Spanswick S.B. and Kidd D.B. (In prep), Revised **Brighton** Reconnaissance Soil Map of Tasmania. Department of Primary Industry Water and Environment, Tasmania. In press. Scale 1:100 000.

Stephens, C.G. and Hosking, J.S. (1932), A soil survey of **King Island**. Bull. No 70 CSIRO Aust**;** Scale 1:126 720.

Appendix 7

Index Map of the 1:100 000 Reconnaissance Soil Surveys of Tasmania