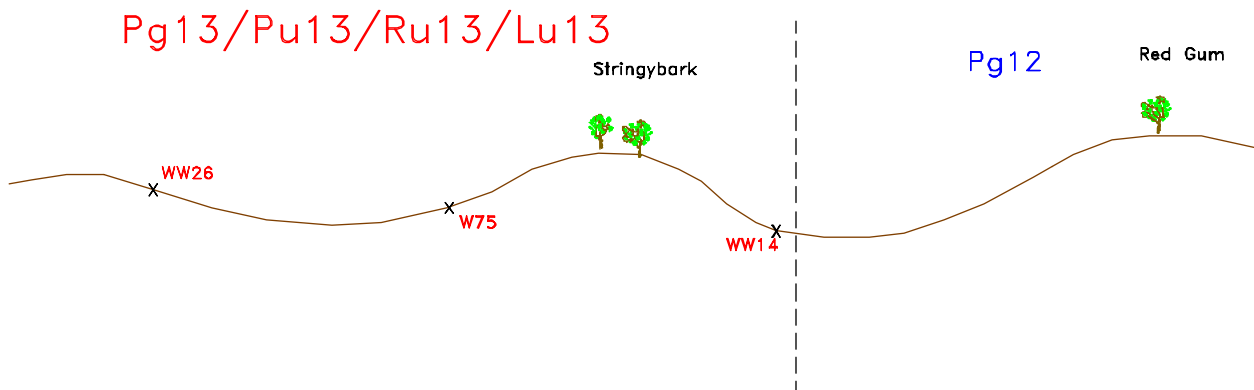


### 6.2.13 SAND PLAINS AND RISES - 13 LAND SYSTEM

Map units Pg13, Pu13, Ru13, Lu13



#### Landscape

This land system has been separated from the Red Gum Plains and Rises -12 land system (land units Pg12/Pu12) although the soils commonly have a similar 'ironstone' pan above the clay. This separation is due to the deeper depth of sand deposits above the ferruginised gravel pan. The vegetation commonly indicates distinct changes from the deeper sand to the shallow sand. As with most land systems in the shire the undulating plains and rises are divided by clay plains that are often drainage depressions. The soil types on these clay plains are often consistent with the Pg10 land unit.

The land system has been divided into four land units:

- gently undulating plain (Pg13),
- gently undulating plain (closer spaced undulations) (Pu13)
- undulating rises (Ru13) and
- undulating low hills (Lu13)

#### Native vegetation

The major tree species is Brown Stringybark, with an understorey of heath vegetation, such as Blackboys and Tea Trees.



**Plate 23** Brown Stringybark and heath understorey is common on the sandier soils

### Soil types

The common soil type on the three land units is a sandy topsoil over mottled clay. The depth of sand is variable, often deeper than 50 cm, and can be as deep as two metres in some areas. There is often a gravel layer of mainly ferruginised iron nodules, although ferruginised manganese and indurated sandstone can also occur over the mottled clay subsoil (WW26). Clay skins and slickensides may occur in the subsoil, indicating shrinking and swelling of the clay. The gravel layer is not always present, although the presence of deep deposits of hydrophobic sand over clay is consistent with the soils in these units.

Another soil type occurring in this land system is a podosol (W75). This soil often has a deep layer of sand over a 'coffee rock' layer, which is a more or less cemented horizon high in organic-aluminium and iron compounds.

### Current land use

Much of this area is designated public land, and any freehold land is generally left vegetated and used for minimal grazing. *Pinus radiata* is often grown on these sandy soils; potatoes are also grown in some areas.

### Representative soil type for land units

Although there are three different soil types described for the three land units (i.e. WW26, WW14 and W75), WW26 is the most common soil type and therefore the most appropriate soil type to represent the whole land system.



**Plate 24** Deep deposits of sand, although of variable depth, is the most distinguishing soil feature of this land system

## REPRESENTATIVE SOIL TYPE FOR THE SAND PLAINS AND RISES -13 Pg13/Pu13/Ru13/Lu13 LAND UNITS

**MAP UNIT:** Pg13, Pu13, Ru13, Lu13

**Site No.:** WW26

**Position in Landscape:** Upper slope

**Grid Ref:** 530 900 E, 5896 300 N;

**Aust. Soil Class.:** Bleached-Ferric, ? Yellow KUROSOLO (very thick sandy surface soil) (confidence level 4),

### **General Landscape Description:**

This soil represents the sandier soils south of the Little Desert. The vegetation, consisting mainly of Stringybarks, Tea Tree, Blackboys and heath understorey, is very indicative of the soil type. There is a deep deposit of wind blown material over the clay. This soil type represents the four land units covering this land system. This description is taken from a roadside cutting, therefore the topsoil is disturbed.



### **Soil Profile Morphology:**

#### **Topsoil**

**Ap**    0-10 cm       Disturbed horizon

**1A1**    10-30 cm       Greyish brown (2.5Y5/2) *sand* (organic) weak to massive structure, weak consistence when dry. pH 5.7.

**1A2** 30-75 cm Light yellowish brown (2.5Y6/3) *sand*, conspicuously bleached, a few faint orange and brown mottles, structureless, weak consistence when dry. pH 5.2.

**Subsoil**

**1Bs** 75-90 cm Brownish yellow (10YR6/6) *sand*, distinct orange mottles are common, ferruginised iron and indurated sandstone are abundant. pH 5.5.

**1B2** 90-130 cm Brownish yellow (10YR6/6) *light medium clay*, many prominent coarse red and orange mottles are common, strong polyhedral structure (peds 5-10 mm breaking to 2-5 mm), clay skins on the ped faces. pH 5.5.

**1B3** 130+ cm Partially weathered sandstone and clay, very coarse red, prominent mottles are abundant, clay skins on the clay ped faces. Horizon heading towards BC.



**Soil Profile Characteristics:**

Horizon	pH	Salinity	Sodicity	Dispersion	Internal Drainage	Hydrophobicity
<b>Surface (A1 horizon)</b>	moderately acid	very low	-	-		severe
<b>Subsoil (B21 horizon)</b>	strongly acid	very low	-	nil	imperfectly drained <sup>#</sup>	

# most impeding horizon of the profile that will affect plant growth

**Key Profile Features:**

- Deep sandy topsoil
- Hydrophobic topsoil
- Strong texture contrast between topsoil and subsoil
- Bleached A2 horizon
- Mottled subsoil
- Ferric ‘ironstone’ pan
- Acidic topsoil
- Acidic subsoil
- Weathered sandstone occurring at depth

### Soil Restrictions and Management Prescriptions

<b>Feature</b>	<b>Result</b>	<b>Management Prescription</b>
Deep sandy profile	Poor plant available water holding capacity. Poor nutrient holding capacity. Increased risk of wind erosion. Potential for hydrophobicity.	<i>Dryland cropping</i> - grow appropriate species (eg drought tolerant species), minimum tillage and stubble retention, improve organic matter through maintenance of vegetative cover and growing green manure crops. Establish wind protection barriers. <i>Horticulture</i> - grow appropriate species. Improve organic matter through maintenance of vegetative cover and growing green manure crops. Establish wind protection barriers. Increase frequency of fertiliser (e.g. side dressings) and irrigations.
Sandy topsoil	Poor plant available water holding capacity. Poor nutrient holding capacity. Increased risk of wind erosion. Potential for hydrophobicity.	<i>Dryland cropping</i> - minimum tillage and stubble retention, improve organic matter through maintenance of vegetative cover and growing green manure crops. Establish wind protection barriers. <i>Horticulture</i> - improve organic matter through maintenance of vegetative cover and growing green manure crops. Establish wind protection barriers. Increase frequency of fertiliser (e.g. side dressings) and irrigations.
Hydrophobic topsoil	Poor infiltration of water into the soil. Increased risk of water erosion. Poor seed germination.	Maintenance of surface vegetative cover. Claying.
Strong textural contrast between topsoil and subsoil (duplex)	Strong texture and structure difference between the topsoil and the subsoil. Can result in impeded internal drainage and restricted root growth	Improve organic matter through maintenance of vegetative cover and growing green manure crops. Reduce tillage. Mounding for orchards. Bed formation for vegetables. Optimise plant growth through regular balanced fertiliser programme. Consider sub-surface drainage (if appropriate).

Bleached A <sub>2</sub> horizon	<p>Indication of waterlogged condition (impeded internal drainage) within the topsoil.</p> <p>Poor soil structure (often massive).</p> <p>Low organic matter, water holding capacity and nutrition within the horizon.</p>	<p><i>Dryland cropping</i> - include deep rooted crops in the rotation, minimum tillage and stubble retention. Apply gypsum if the topsoil is sodic. Optimise plant growth through a regular and balanced fertiliser programme.</p> <p><i>Horticulture</i> - improve organic matter through maintaining optimum plant growth and growing green manure crops between the rows. Minimum tillage and surface vegetative cover. Apply gypsum if the topsoil is sodic. Optimise plant growth through a regular and balanced fertiliser programme. Install subsoil drainage (if appropriate).</p>
Mottled subsoil	<p>Indication of periodic waterlogging, particularly if grey and yellow mottles predominate.</p>	<p>Consider sub-surface drainage (if appropriate).</p> <p>Apply gypsum if subsoil is sodic and close to the surface.</p>
Ferric pan	<p>Restricted root penetration into the subsoil.</p> <p>Indication of period waterlogging.</p>	<p>Select shallow rooted species.</p> <p>Improve topsoil by increasing organic matter and nutrition.</p> <p>Ripping may assist if pan is continuous and close to the surface, include gypsum if subsoil is sodic.</p> <p>Consider subsoil drainage (if appropriate).</p>
Acidic topsoil	<p>Potential nutrient imbalance.</p> <p>Unsuitable for acid intolerant plants.</p>	<p>Apply lime.</p>
Acidic subsoil	<p>Potential nutrient imbalance.</p> <p>Unsuitable for acid intolerant plants.</p>	<p>Grow acid tolerant species or varieties.</p>

## Land Suitability Rating Table

LAND USE	SUITABILITY CLASS	MAJOR LIMITING COMPONENT
Wheat	2	Climate, landscape, soil
Canola	2	Climate, landscape, soil
Chickpeas	3	Climate, soil
Lentils	3	Climate, soil
White clover seed	2	Climate, landscape, soil
Lucerne for seed production	3	Soil
Viticulture	3	Soil
Apples	2	Climate, soil
Potatoes	2	Climate, landscape, soil
Carrots	2	Landscape, soil
Onions	2	Climate, landscape, soil
Sweet corn	3	Soil
Radiata Pine	2	Climate, landscape, soil
Blue Gum	2	Climate, landscape, soil

## Land Suitability Assessment and Primary Limitations

<i>Wheat</i>	<i>Climate</i>	2*	Moderate to high frost risk, moderate to high rainfall
	<i>Landscape</i>	2	Wind erosion hazard
	<i>Soil</i>	2	Slightly impeded internal drainage, hydrophobicity
<i>Canola</i>	<i>Climate</i>	2#	Moderate to high frost risk, slightly high rainfall
	<i>Landscape</i>	2	Wind erosion hazard
	<i>Soil</i>	2	Slightly impeded internal drainage, hydrophobicity, slightly acid subsoil pH
<i>Chickpeas</i>	<i>Climate</i>	3	High rainfall
	<i>Landscape</i>	2	Wind erosion hazard
	<i>Soil</i>	3	Sandy topsoil, impeded internal drainage
<i>Lentils</i>	<i>Climate</i>	3	High rainfall
	<i>Landscape</i>	2	Wind erosion hazard
	<i>Soil</i>	3	Sandy topsoil, impeded internal drainage

<b><i>White clover seed</i></b>	<i>Climate</i>	2+	Moderate to high rainfall, moderate frost risk
	<i>Landscape</i>	2	Wind erosion hazard
	<i>Soil</i>	2	Slightly impeded internal drainage, hydrophobicity
<b><i>Lucerne for seed production</i></b>	<i>Climate</i>	2	Moderate frost risk
	<i>Landscape</i>	2	Wind erosion hazard
	<i>Soil</i>	3	Impeded internal drainage
<b><i>Viticulture</i></b>	<i>Climate</i>	2#	Moderate to high frost risk
	<i>Landscape</i>	1	No major limitation
	<i>Soil</i>	3	Impeded soil drainage
<b><i>Apples</i></b>	<i>Climate</i>	2#	Moderate to high frost risk, slightly high mean maximum January temperature
	<i>Landscape</i>	1	No major limitation
	<i>Soil</i>	2	Slightly acid subsoil pH, slightly impeded internal drainage, hydrophobicity
<b><i>Potatoes</i></b>	<i>Climate</i>	2	Slightly high mean maximum January temperature
	<i>Landscape</i>	2	Wind erosion hazard
	<i>Soil</i>	2	Slightly impeded internal drainage, hydrophobicity
<b><i>Carrots</i></b>	<i>Climate</i>	1	No major limitation
	<i>Landscape</i>	2	Wind erosion hazard
	<i>Soil</i>	2	Slightly impeded internal drainage, hydrophobicity
<b><i>Onions</i></b>	<i>Climate</i>	2	Moderate frost risk
	<i>Landscape</i>	2	Wind erosion hazard
	<i>Soil</i>	2	Slightly impeded internal drainage, hydrophobicity, sandy topsoil texture
<b><i>Sweet corn</i></b>	<i>Climate</i>	2	Slightly low mean monthly temperature (October - March)
	<i>Landscape</i>	2	Wind erosion hazard
	<i>Soil</i>	3	Sandy topsoil
<b><i>Radiata Pine</i></b>	<i>Climate</i>	2**	Moderate to low rainfall, slightly high mean maximum January temperature
	<i>Landscape</i>	2	Wind erosion hazard
	<i>Soil</i>	2	Slightly impeded internal drainage, hydrophobicity



<b>Blue Gum</b>	<i>Climate</i>	2**	Moderate to low rainfall, slightly high mean maximum January temperature
	<i>Landscape</i>	2	Wind erosion hazard
	<i>Soil</i>	2	Slightly impeded internal drainage, hydrophobicity

\* Some areas may be higher frost risk and rainfall

# Some areas may be higher frost risk

+ Some areas may have higher rainfall

\*\* Some areas may have lower rainfall

**ASSOCIATED SOIL TYPE FOR THE SAND PLAINS AND RISES -13 -  
Pg13/Pu13/Ru13/Lu13 LAND UNITS**

**MAP UNIT:** Pg13, Pu13, Ru13, Lu13

**Site Number:** WW14

**Position in Landscape:** Lower slope

**Grid Ref:** 523 441 E, 5905 133 N;

**Aust. Soil Class.:** Vertic Mottled-Mesonatric, Grey SODOSOL

**Northcote Factual Key:** Dy5.43 **Great Soil Group:** solodic

**General Landscape Description:**

This soil is found close to areas of deeper sand and shows the soil type on the transition away from the deep sandy soils. The crests and upper slopes above this unit commonly have deep sands (often greater than 1.5 metres on the crests). Dry heath vegetation associated with this map unit, such as Stringbarks, Blackboys, and Tea Trees, are indicative of the deeper sands.



**Soil Profile Morphology:**

**Topsoil**

**A1** 0-10 cm Very dark greyish brown (10YR3/2) *sand (organic)*; weak consistence when dry. pH 5.8. Abrupt transition to:

**A2** 10-35 cm Pink (7.5YR7/4) *sand*; conspicuously bleached sand, structureless, weak consistence when dry. A few subrounded ferruginised iron-stone gravels. pH 6.5. Thin (2-5mm) capping directly above the clay, with a very strong consistence when dry. Sharp transition to:

**Subsoil**

**B21** 35-70 cm Pale brown (10YR6/3) changing at depth to yellowish brown (10YR5/6) *medium clay*; coarse distinct red, light grey and yellowish brown mottles are abundant, moderate blocky structure, (peds 20-50 mm), breaking to moderate polyhedral structure (peds 10-20 mm) and in patches strong polyhedral structure, (peds 5-10 mm), strong consistence when dry. pH 6.4. Dispersive when worked. Clear transition to:

**B22** 70-120 cm Yellowish brown (10YR5/6) *medium clay*; with dark stains down prism faces, moderate to strong prismatic structure (peds 50-100 mm), breaking to moderate blocky structure (peds 20-50 mm); strong consistence when slightly moist. Pockets of clayey sand. pH 8.2. Gradual transition to:



**B23** 120-150 cm Yellow (10YR7/8) *medium clay*; strong lenticular structure in patches, firm to very firm consistence when moderately moist. pH 8.8. Gradual transition to:

**B31** 150-170 cm Brownish yellow (10YR6/6) *sandy clay* (with patches of grey); firm consistence when moderately moist. pH 8.6. Gradual transition to:

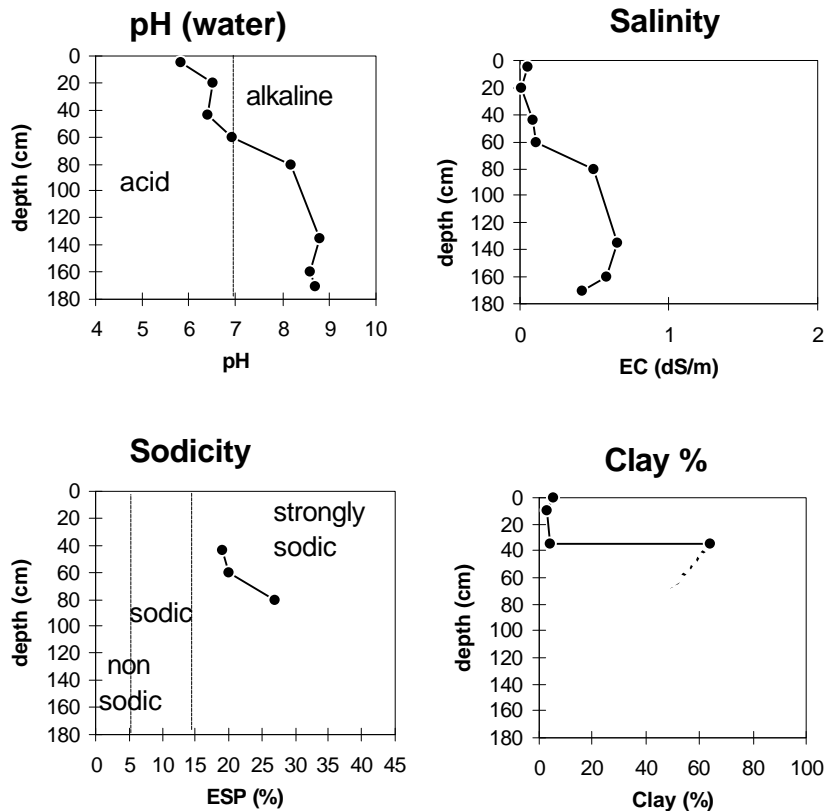
**B32** 170-200+ Pinkish grey (7.5YR6/2) *sandy clay loam*; veins of bluish grey (5B6/1) clay, and red flecks of quartz sand, firm consistence when moderately moist. pH 8.7.

### Soil Profile Characteristics:

Horizon	pH	Salinity	Sodicity	Dispersion	Internal Drainage	Hydrophobicity
<b>Surface (A1 horizon)</b>	moderately acid	very low	non-sodic	-		medium
<b>Subsoil (B21 horizon)</b>	slightly acid	very low	strongly sodic	nil <sup>1</sup>	imperfectly drained <sup>#</sup>	
<b>Deeper subsoil (at 1 metre)</b>	moderately alkaline	low-medium	strongly sodic	strong <sup>1</sup>		

1 complete dispersion after remoulding

# most impeding horizon of the profile that will affect plant growth



### Key Profile Features:

- Sandy topsoil
- Hydrophobic topsoil
- Strong texture contrast between topsoil and subsoil
- Bleached A2 horizon
- Sodic subsoil
- Mottled subsoil
- Subsoil disperses following cultivation when wet
- Acidic topsoil
- Alkaline subsoil at depth
- Vertic properties (ie lenticular structure) in deeper subsoils
- Plant Available Water Capacity (PAWC) is considered to be medium (estimated at 120 mm) for this site profile based on an Effective Rooting Depth (ERD) of 70 cm. Rooting depth will be restricted by subsoil conditions, such as; strongly sodic (Exchangeable Sodium Percentage >20%), high soluble salt levels (Chloride >0.1%), poor structure (eg. massive or very coarse, columnar or prismatic), very high carbonate (lime) content (not applicable to all plant species) or hard rock.

## Soil Restrictions and Management Prescriptions

<b>Feature</b>	<b>Result</b>	<b>Management Prescription</b>
Sandy topsoil	Poor plant available water holding capacity. Poor nutrient holding capacity. Increased risk of wind erosion. Potential for hydrophobicity.	<i>Dryland cropping</i> - minimum tillage and stubble retention, improve organic matter through maintenance of vegetative cover and growing green manure crops. Establish wind protection barriers. <i>Horticulture</i> - improve organic matter through maintenance of vegetative cover and growing green manure crops. Establish wind protection barriers. Increase frequency of fertiliser (eg side dressings) and irrigations.
Hydrophobic topsoil	Poor infiltration of water into the soil. Increased risk of water erosion. Poor seed germination.	Maintenance of surface vegetative cover. Claying.
Strong textural contrast between topsoil and subsoil (duplex)	Strong texture and structure difference between the topsoil and the subsoil. Can result in impeded internal drainage and restricted root growth	Improve organic matter through maintenance of vegetative cover and growing green manure crops. Reduce tillage. Mounding for orchards. Optimise plant growth through regular balanced fertiliser programme. Consider sub-surface drainage (if appropriate).
Bleached A <sub>2</sub> horizon	Indication of waterlogged condition (impeded internal drainage) within the topsoil. Poor soil structure (often massive). Low organic matter, water holding capacity and nutrition within the horizon.	<i>Dryland cropping</i> - include deep rooted crops in the rotation, minimum tillage and stubble retention. Apply gypsum if the topsoil is sodic. Optimise plant growth through a regular and balanced fertiliser programme. <i>Horticulture</i> - improve organic matter through maintaining optimum plant growth and growing green manure crops between the rows. Minimum tillage and surface vegetative cover. Apply gypsum if the topsoil is sodic. Optimise plant growth through a regular and balanced fertiliser programme. Install subsoil drainage (if appropriate).

Sodic clay subsoil	Poor water and air movement into the subsoil resulting in waterlogging (impeded internal drainage). Poor root growth into the subsoil reducing the volume of the soil able to be exploited.	Gypsum applications if the subsoil is close to the surface and topsoil textures are light. <i>Dryland cropping</i> - include deep rooted crops in the rotation, minimum tillage and stubble retention. <i>Horticulture</i> - deep ripping with gypsum, install tile drainage (if appropriate).
Mottled subsoil	Indication of periodic waterlogging, particularly if grey and yellow mottles predominate.	Consider sub-surface drainage (if appropriate). Apply gypsum if subsoil is sodic and close to the surface.
Dispersion when reworked	Indication of soil sodicity. Soil structure collapses following tillage and wetting Results in poor soil structure that reduces water movement and plant root growth (see sodic subsoil) Increases water erosion hazard.	Do not cultivate wet soil (cultivate when moist.) Apply gypsum if growing high value crops.
Acidic topsoil	Potential nutrient imbalance. Unsuitable for acid intolerant plants.	Apply lime.

### Land Suitability Rating Table

LAND USE	SUITABILITY CLASS	MAJOR LIMITING COMPONENT
<b>Wheat</b>	2	Climate, landscape, soil
<b>Canola</b>	2	Climate, landscape, soil
<b>Chickpeas</b>	3	Climate, soil
<b>Lentils</b>	3	Climate, soil
<b>White clover seed</b>	2	Climate, landscape, soil
<b>Lucerne for seed production</b>	3	Soil
<b>Viticulture</b>	3	Soil
<b>Apples</b>	2	Climate, landscape, soil

<b>Potatoes</b>	3	Landscape, soil
<b>Carrots</b>	3	Landscape, soil
<b>Onions</b>	3	Landscape
<b>Sweet corn</b>	3	Soil
<b>Radiata Pine</b>	2	Climate, landscape, soil
<b>Blue Gum</b>	2	Climate, landscape, soil

### **Land Suitability Assessment and Primary Limitations**

<b><i>Wheat</i></b>	<i>Climate</i>	2*	Moderate to high frost risk, moderate to high rainfall
	<i>Landscape</i>	2	Gully erosion hazard
	<i>Soil</i>	2	Clay subsoil, slightly impeded internal drainage, hydrophobicity
<b><i>Canola</i></b>	<i>Climate</i>	2#	Moderate to high frost risk, slightly high rainfall
	<i>Landscape</i>	2	Gully erosion hazard
	<i>Soil</i>	2	Slightly impeded internal drainage, hydrophobicity
<b><i>Chickpeas</i></b>	<i>Climate</i>	3	High rainfall
	<i>Landscape</i>	2	Gully erosion hazard, wind erosion hazard
	<i>Soil</i>	3	Sandy topsoil, impeded internal drainage
<b><i>Lentils</i></b>	<i>Climate</i>	3	High rainfall
	<i>Landscape</i>	2	Gully erosion hazard, wind erosion
	<i>Soil</i>	3	Sandy topsoil, impeded internal drainage
<b><i>White clover seed</i></b>	<i>Climate</i>	2+	Moderate frost risk, moderate to high rainfall
	<i>Landscape</i>	2	Gully erosion hazard
	<i>Soil</i>	2	Slightly impeded internal drainage, hydrophobicity
<b><i>Lucerne for seed production</i></b>	<i>Climate</i>	2	Moderate frost risk
	<i>Landscape</i>	2	Gully erosion hazard
	<i>Soil</i>	3	Impeded internal drainage
<b><i>Viticulture</i></b>	<i>Climate</i>	2#	Moderate to high frost risk
	<i>Landscape</i>	2	Gully erosion hazard
	<i>Soil</i>	3	Impeded internal drainage
<b><i>Apples</i></b>	<i>Climate</i>	2#	Moderate to high frost risk, slightly high mean maximum January temperature
	<i>Landscape</i>	2	Gully erosion hazard
	<i>Soil</i>	2	Slightly impeded internal drainage, hydrophobicity

<b>Potatoes</b>	<i>Climate</i>	2	Slightly high mean maximum January temperature
	<i>Landscape</i>	3	Gully erosion hazard
	<i>Soil</i>	3	Impeded internal drainage
<b>Carrots</b>	<i>Climate</i>	1	No major limitation
	<i>Landscape</i>	3	Gully erosion hazard
	<i>Soil</i>	3	Impeded internal drainage
<b>Onions</b>	<i>Climate</i>	2	Moderate frost risk
	<i>Landscape</i>	3	Gully erosion hazard
	<i>Soil</i>	2	Sandy topsoil, slightly impeded internal drainage, hydrophobicity
<b>Sweet corn</b>	<i>Climate</i>	2	Slightly low mean monthly temperature (October - March)
	<i>Landscape</i>	2	Gully erosion hazard
	<i>Soil</i>	3	Sandy topsoil
<b>Radiata Pine</b>	<i>Climate</i>	2**	Moderate to low rainfall, slightly high mean maximum January temperature
	<i>Landscape</i>	2	Gully erosion hazard
	<i>Soil</i>	2	Slightly impeded internal drainage
<b>Blue Gum</b>	<i>Climate</i>	2**	Moderate to low rainfall, slightly high mean maximum January temperature
	<i>Landscape</i>	2	Gully erosion hazard
	<i>Soil</i>	2	Slightly impeded internal drainage

\* Some areas may be higher frost risk and rainfall

# Some areas may be higher frost risk

+ Some areas may have higher rainfall

\*\* Some areas may have lower rainfall



**ASSOCIATED SOIL TYPE FOR THE SAND PLAINS AND RISES -13 -  
Pg13/Pu13/Ru13/Lu13 LAND UNITS**

**MAP UNIT:** Pg13, Pu13, Ru13, Lu13

**Site No.:** W75

**Position in landscape:** Lower slope  
*Aust. Soil Class.:* Aeric PODOSOL

**Geo. Ref:** 505 300 E, 5878 400 N;  
*Great Soil Group:* podzol

**General Landscape Description:**

This unit occurs on the sandier soils south of the Little Desert and is found in association with WW26 (regarded as the dominant soil type). The vegetation is indicative of the sandier soils consisting of Brown Stringybark, and heath species.

**Soil Profile Morphology:**

**Topsoil**

**A1**    0-65 cm            Structureless organic sand, pH 5.3. Gradual to diffuse transition to:

**A2**    65-90 cm            Grey (10YR6/1) structureless sand bleached when dry.    pH 5.9.  
Clear to abrupt transition to:

**Subsoil**

**Bhs**    90-115 cm            Dark grey (10YR4/1) 'Coffee rock' with organic-aluminium and iron compounds a few ferruginised iron nodules.    pH 5.7.

**B21**    115-135 cm            Yellowish brown (10YR5/8) light clay (fine sandy) very pale brown mottles are abundant.    pH 6.4.

**B22**    135-150 cm            Yellowish brown (10YR5/8) light clay (fine sandy) with pale mottles.    pH 6.5.

**B3**    150 cm +                Weathered white and yellow Kaolinitic clay

<b>Horizon</b>	<b>pH</b>	<b>Salinity</b>	<b>Sodicity</b>	<b>Dispersion</b>	<b>Internal Drainage</b>	<b>Hydro-phobicity</b>
<b>Surface (A1 horizon)</b>	moderately acid	low	-	-	moderately well drained	severe
<b>Subsoil (B21 horizon)</b>	slightly acid	low	-	-		
<b>Deeper subsoil</b>	moderately acid	-	-	complete		

### **Key Profile Features:**

- Deep sandy topsoil
- Hydrophobic topsoil
- Bleached A<sub>2</sub> horizon
- Deep sand over clay
- Acidic topsoil
- Coffee Rock (B<sub>hs</sub>) horizon
- Weathered Kaolinitic clay at depth

### **Soil Restrictions and Management Prescriptions**

<b>Feature</b>	<b>Result</b>	<b>Management Prescription</b>
Deep sandy profile	Poor plant available water holding capacity. Poor nutrient holding capacity. Increased risk of wind erosion. Potential for hydrophobicity.	<i>Horticulture</i> - grow appropriate species. Improve organic matter through maintenance of vegetative cover and growing green manure crops. Establish wind protection barriers. Increase frequency of fertiliser (eg side dressings) and irrigations.
Hydrophobic topsoil	Poor infiltration of water into the soil. Increased risk of water erosion. Poor seed germination.	Maintenance of surface vegetative cover. Claying.
Bleached A <sub>2</sub> horizon	Indication of waterlogged condition (impeded internal drainage) within the topsoil. Poor soil structure (often massive). Low organic matter, water holding capacity and nutrition within the horizon.	<i>Horticulture</i> - improve organic matter through maintaining optimum plant growth and growing green manure crops between the rows. Minimum tillage and surface vegetative cover. Apply gypsum if the topsoil is sodic. Optimise plant growth through a regular and balanced fertiliser programme.
Acidic topsoil	Potential nutrient imbalance. Unsuitable for acid intolerant plants.	Apply lime.

### Land Suitability Rating Table

LAND USE	SUITABILITY CLASS	MAJOR LIMITING COMPONENT
<b>Wheat</b>	3	Soil
<b>Canola</b>	3	Soil
<b>Chickpeas</b>	3	Climate, soil
<b>Lentils</b>	3	Climate, soil
<b>White clover seed</b>	2	Climate, landscape, soil
<b>Lucerne for seed production</b>	2	Climate, landscape, soil
<b>Viticulture</b>	3	Soil
<b>Apples</b>	3	Soil
<b>Potatoes</b>	2	Climate, landscape, soil
<b>Carrots</b>	2	Landscape, soil
<b>Onions</b>	2	Climate, landscape, soil
<b>Sweet corn</b>	3	Soil
<b>Radiata Pine</b>	2	Climate, landscape, soil
<b>Blue Gum</b>	2	Climate, landscape, soil

### Land Suitability Assessment and Primary Limitations

<i>Wheat</i>	<i>Climate</i>	2*	Moderate to high frost risk, moderate to high rainfall
	<i>Landscape</i>	2	Wind erosion hazard
	<i>Soil</i>	3	Deep sand profile
<i>Canola</i>	<i>Climate</i>	2#	Moderate to high frost risk, slightly high rainfall
	<i>Landscape</i>	2	Wind erosion hazard
	<i>Soil</i>	3	Deep sand profile
<i>Chickpeas</i>	<i>Climate</i>	3	High rainfall
	<i>Landscape</i>	2	Wind erosion hazard
	<i>Soil</i>	3	Sandy topsoil
<i>Lentils</i>	<i>Climate</i>	3	High rainfall
	<i>Landscape</i>	2	Wind erosion hazard
	<i>Soil</i>	3	Sandy topsoil
<i>White clover seed</i>	<i>Climate</i>	2+	Moderate to high rainfall, moderate frost risk
	<i>Landscape</i>	2	Wind erosion hazard
	<i>Soil</i>	2	Hydrophobicity
<i>Lucerne for seed production</i>	<i>Climate</i>	2	Moderate frost risk

	<i>Landscape</i>	2	Wind erosion hazard
	<i>Soil</i>	2 <sup>+</sup>	Slightly impeded internal drainage, hydrophobicity
<b><i>Viticulture</i></b>	<i>Climate</i>	2#	Moderate to high frost risk
	<i>Landscape</i>	1	No major limitation
	<i>Soil</i>	3	Deep sand profile
<b><i>Apples</i></b>	<i>Climate</i>	2#	Moderate to high frost risk, slightly high mean maximum January temperature
	<i>Landscape</i>	1	No major limitation
	<i>Soil</i>	3	Deep sand profile
<b><i>Potatoes</i></b>	<i>Climate</i>	2	Slightly high mean maximum January temperature
	<i>Landscape</i>	2	Wind erosion hazard
	<i>Soil</i>	2	Slightly impeded internal drainage, hydrophobicity
<b><i>Carrots</i></b>	<i>Climate</i>	1	No major limitation
	<i>Landscape</i>	2	Wind erosion hazard
	<i>Soil</i>	2	Slightly impeded internal drainage, hydrophobicity
<b><i>Onions</i></b>	<i>Climate</i>	2	Moderate frost risk
	<i>Landscape</i>	2	Wind erosion hazard
	<i>Soil</i>	2	Sandy topsoil texture, slightly impeded internal drainage, hydrophobicity
<b><i>Sweet Corn</i></b>	<i>Climate</i>	2	Slightly low mean monthly temperature (October - March)
	<i>Landscape</i>	2	Wind erosion hazard
	<i>Soil</i>	3	Sandy topsoil
<b><i>Radiata Pine</i></b>	<i>Climate</i>	2**	Moderate to low rainfall, slightly high mean monthly January temperature
	<i>Landscape</i>	2	Wind erosion hazard
	<i>Soil</i>	2 <sup>++</sup>	Depth to bedrock, hydrophobicity
<b><i>Blue Gum</i></b>	<i>Climate</i>	2**	Moderate to low rainfall, slightly high mean monthly January temperature
	<i>Landscape</i>	2	Wind erosion hazard
	<i>Soil</i>	2 <sup>++</sup>	Depth to bedrock, hydrophobicity

\* Some areas may be higher frost risk and rainfall

# Some areas may be higher frost risk

+ Some areas may have higher rainfall

\*\* Some areas may have lower rainfall

++ Root growth will be restricted where coffee rock occurs within 60 cm of the surface