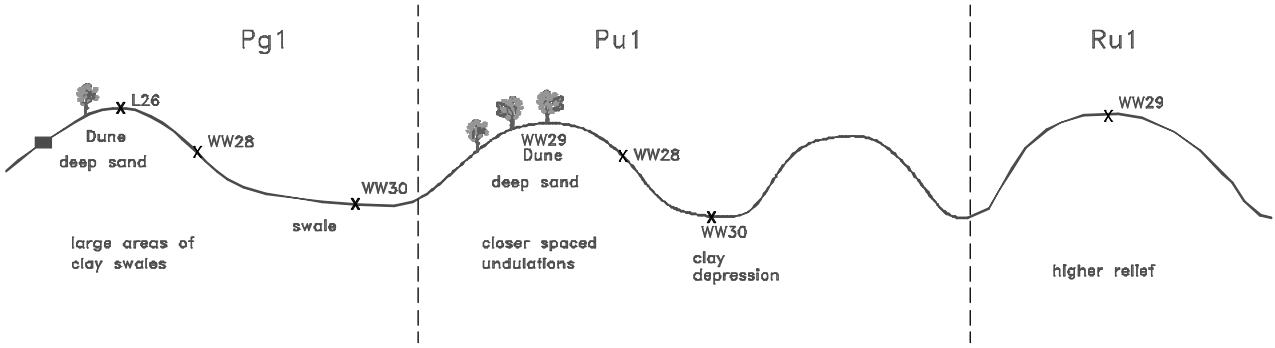
6.2.1 BIG DESERT - 1 LAND SYSTEM
Map units Pg1, Pu1, Ru1



Landscape
This land system consists mostly of undulating plains with east-west aligned dunes, with some areas containing NNW-SSE dunes and irregular dunes.

The land system has been divided and mapped into three land units:
gently undulating plains - (Pg1),
gently undulating plains (closer spaced undulations) - (Pu1) and
gently undulating rises (closer spaced undulations) - (Ru1).

The soil types are similar on all the land units, and have been mapped according to differences in the landscape.

The gently undulating plains land unit (Pg1) is a complex of gently inclined slopes off low dunes leading to large areas of flat swales or depressions. The gently undulating plains (closer spaced undulations) (Pu1) has a higher number of closely aligned sand rises compared to the Pg1 land unit. The gently undulating rises (closer spaced undulations) (Ru1) is similar to the Pu1 land unit except the landscape is generally of higher relief.

Plate 4 The gently undulating plains unit (Pg1) consists of low rises (background) and large swales between the rises (foreground).

Native Vegetation
The native vegetation consists mostly of Mallee eucalypts, including Broombush, Banksia, Tea Tree and heath understorey species. Some of this system has been extensively cleared for agricultural purposes.

Soil Types
The soil type on all land units is predominantly deep yellow sand on the dunes, with an argic (thin bands of heavier textured soil throughout the sand) horizon (WW29), or deep yellow sand with minimal clay development above the weathered sandstone (WW28) on broader crest or slopes off the dunes. Lower slopes and swales (WW30) can have more clay development than the dunes due to more water accumulation on the lower slopes.

The sandy topsoil is normally hydrophobic, or repels water when dry, and is a major problem in the summer months and the first autumn rains. The rainwater does not initially penetrate through the soil profile, thus making the water unavailable to deep rooted plants, and sheet erosion of the topsoil can result.

The practice of claying the sand rises and slopes is becoming common and, as a result, allows a more diverse range of crops and pasture species.

Plate 5 Some areas can have more clay development on the swales between the east-west dunes (WW30). This soil type is commonly used for 'claying' the sandy rises to reduce the amount of water repellence.

In some areas, particularly in the east of the shire and on plains, more developed sodosols can occur. They commonly have a sandy topsoil with a conspicuously bleached sand layer overlying columns of clay, with a bleached capping on top (solodised solonetz). A small percentage of wind blown calcium carbonate can occur in the clay. Some ferruginised iron nodules may be found between the clay layer and the lower layer of Parilla sand (L26).

Current Land Use
As the deep sandy soils have a low water holding capacity, grazing is the common land use. Evening primrose is grown for grazing and to take advantage of the sandy soil.

Where claying of the rises and slopes has occurred some crops and pasture species have been sown that would otherwise not tolerate the low water-holding capacity of the deep sands.

Where groundwater is available some irrigation may occur.

More varied land use, such as pistachio nuts, does occur on the clayier soils just south of the Big Desert Wilderness Park.

Plate 6 Evening Primrose is grown on the sandier soils

Representative soil type of land units

Although assessments of land suitability have been conducted for a range of land elements, i.e. dunes, slopes and swales of the three land units (Pg1, Pu1, Ru1), with each element having a different soil type, only one soil type was identified as the most common to represent each unit.

For the gently undulating plain (Pg1) unit, the soil of the swale (WW30) has been defined as the most representative soil type. For the gently undulating plain (closer spaced undulations) (Pu1), the soil of the gentle slope off the dune (WW28) is representative, and for the gently undulating rises (closer spaced undulations) (Ru1), the dune soil (WW29) is the most appropriate soil type.

REPRESENTATIVE SOIL TYPE FOR THE BIG DESERT - 1 - Pg1 LAND UNIT

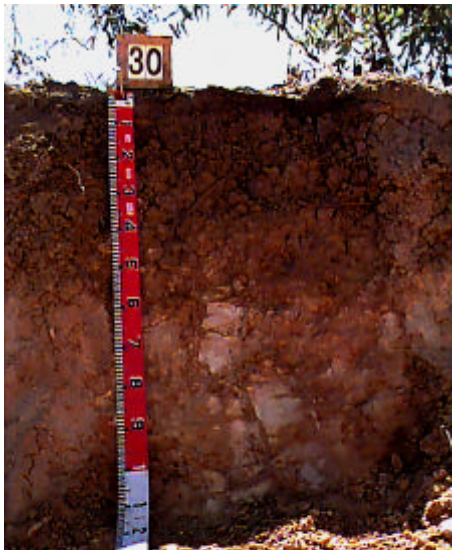
MAP UNIT: Pg1 **Site No.:** WW30

Position in Landscape: Swale / depression **Grid Ref:** 509 200 E, 6017 300 N
Aust. Soil Class.: Grey CHROMOSOL or SODOSOL

General Landscape Description:

The landscape consists predominantly of large areas of flat swales or depressions (WW30) between the dunes or rises (WW28, WW29 & L26). The swales are considered the most common land element on the gently undulating plains (Pg1), therefore this soil type is used to represent this land unit on the map. The soils on the swales have variable clay depths and variable depths to clays.

Soil Profile Morphology:



Topsoil
A1 0-10 cm Dark greyish brown (10YR4/2) *organic sandy loam*, weak subangular blocky structure, (peds 10-20 mm), firm consistence when dry. pH 6.7.

Subsoil
B21 10-30 cm Greyish brown (10YR5/2) *medium clay*, faint brownish yellow mottles are common, strong polyhedral structure, (peds 5-10 mm), strong consistence when dry. pH 7.2.

B22 30-50 cm Brownish yellow (10YR6/6) *medium heavy clay*, a few distinct orange mottles, strong polyhedral structure, (peds 10-50 mm). pH 8.7.

C 50-100+ cm Pale mottled sandy material.

Soil Profile Characteristics:

Horizon	pH	Salinity	Sodicity	Dispersion	Internal Drainage	Hydro-phobicity
Surface (A1 horizon)	slightly acid	low	sodic	-		nil
Subsoil (B21 horizon)	slightly alkaline	medium	strongly sodic	complete	moderately well drained[#] [*]	
Deeper subsoil (at 1 metre)	strongly alkaline	high	-	-		

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

* some areas may be imperfectly drained

Key Profile Features:

- Strong textural contrast between the topsoil and subsoil (duplex)
- Shallow topsoil depth
- Sodic topsoil and subsoil
- Dipsersive subsoil
- Variable clay depth and depth to clay

Soil Restrictions and Management Prescriptions

Feature	Result	Management Prescription
Strong textural contrast between topsoil and subsoil (duplex)	Strong textural and structural difference between the topsoil and 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 and vineyards. Optimise plant growth through regular balanced fertiliser programme. Consider sub-surface drainage (if appropriate).
Shallow topsoil depth	Reduced water and nutrient holding capacity. Reduced root growth. Potential for waterlogging.	Improve organic matter through maintenance of vegetative cover and growing green manure crops. Reduce tillage to protect against water and wind erosion. Mounding for orchards and vineyards. Optimise plant growth through a regular and balanced fertiliser programme. Consider sub-surface 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. Very difficult to cultivate particularly if topsoil is shallow.	Gypsum applications if the subsoil is close to the surface and topsoil textures are light. *Dryland cropping* - include deep rooted crops in the rotation, minimum tillage and stubble retention. *Horticulture* - deep ripping with gypsum, install tile drainage (if appropriate).
Dispersion (dry soil)	Indication of soil sodicity. Soil structure collapses following wetting resulting in poor soil structure that reduces water movement and plant root growth (see sodic subsoil). Increases water erosion hazard.	*Dryland cropping* - apply gypsum, include deep rooted crops in the rotation, minimum tillage and stubble retention. *Horticulture* - apply gypsum, maintain optimum plant growth in between the rows. Minimum tillage and surface vegetative cover.

Land Suitability Rating Table

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

Land Suitability Assessment and Primary Limitations

Wheat	*Climate*	2*	High frost risk across most of the land unit
	Landscape	1	No major limitation
	Soil	2	Shallow topsoil depth
Canola	*Climate*	2*	High frost risk across most of the land unit
	Landscape	1	No major limitation
	Soil	2	Shallow topsoil depth
Chickpeas	*Climate*	2*	High frost risk across most of the land unit
	Landscape	2	Wind erosion hazard
	Soil	2#	Sandy loam topsoil, shallow topsoil depth, slightly impeded internal drainage
Lentils	*Climate*	2*	High frost risk across most of the land unit
	Landscape	2	Wind erosion hazard
	Soil	2#	Sandy topsoil, topsoil depth, slightly impeded internal drainage
White clover seed	*Climate*	1	No major limitation
	Landscape	1	No major limitation
	Soil	2	Sandy loam topsoil texture, shallow depth of topsoil, soil salinity
Lucerne for seed production	*Climate*	2	Moderate frost risk
	Landscape	1	No major limitation
	Soil	2#	Slightly impeded internal drainage
Viticulture	*Climate*	2*	High frost risk across most of the land unit
	Landscape	1	No major limitation
	Soil	2#	Slightly impeded internal drainage
Apples	*Climate*	2	Moderate frost risk, slightly high mean maximum January temperature
	Landscape	1	No major limitation
	Soil	2	Topsoil depth, depth to weathered sandstone, slightly impeded internal drainage,
Potatoes	*Climate*	2	Slightly high mean maximum January temperature
	Landscape	2	Wind erosion hazard
	Soil	3	Shallow depth of topsoil
Carrots	*Climate*	1	No major limitation
	Landscape	1	No major limitation

	Soil	3	Shallow depth of topsoil
Onions	*Climate*	2	Moderate frost risk
	Landscape	1	No major limitation
	Soil	3	Shallow depth of topsoil
Sweet corn	*Climate*	1	No major limitation
	Landscape	1	No major limitation
	Soil	3	Shallow depth of topsoil
Radiata Pine	*Climate*	3	Low rainfall
	Landscape	1	No major limitation
	Soil	2	Shallow topsoil depth, depth to weathered sandstone, hydrophobicity
Blue Gum	*Climate*	3	Low rainfall
	Landscape	1	No major limitation
	Soil	2	Shallow topsoil depth, depth to weathered sandstone, hydrophobicity

* Some areas may be higher frost risk therefore they may be potentially unsuitable. Obtain local knowledge on frost prior to investment

\# Some areas may be imperfectly drained and therefore may be unsuitable

ASSOCIATED SOIL TYPE FOR THE BIG DESERT - 1 - Pg1 LAND UNIT

MAP UNIT: Pg1 **Site No.:** L26

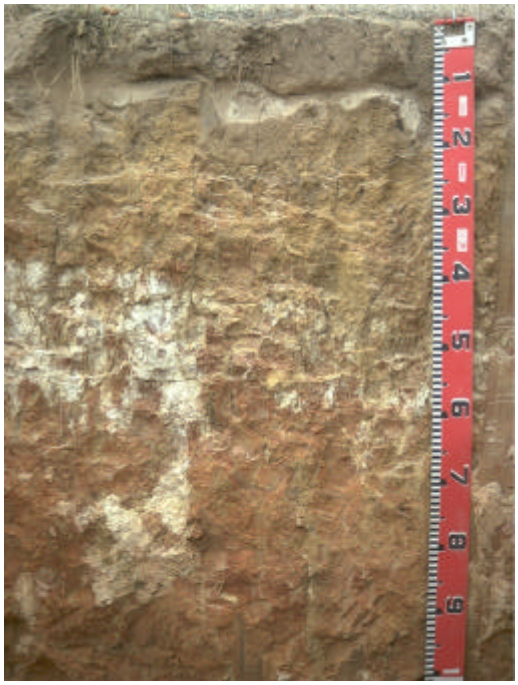
Position in Landscape: Crest

Australian Soil Classification: Calcic, Mottled-Subnatric, Yellow SODOSOL (sandy)
Northcote Factual Key: Dy 5.43 ***Great Soil Group:*** solodised solonetz

General Landscape Description:

This land unit consists of low rises (L26) and large areas of flat swales or depressions (WW30). WW30 is represented on the map as the most common land element. This soil type occurs on the crests of low dunes, although variations in the soil type, such as deep yellow sand (WW28) and soils with argic horizons (WW29), can also occur on the dunes of this land unit.

Soil Profile Morphology:



Topsoil
A1 0-10 cm Light yellowish brown (10YR6/4) *loamy sand*, weakly structured. pH 7.7.

A2 10-15 cm Light yellowish brown (10YR6/4) conspicuously bleached *fine sand*. pH 8.6. Sharp and wavy boundary change to:

Subsoil
B21 15-30 cm Light yellowish brown (10YR6/4) with brownish yellow (10YR6/6) mottled coarse *sandy clay loam*, weak to moderate coarse columnar structure with hard bleached capping; strong consistence dry. pH 8.9. Clear and wavy change to:

B22k 30-60 cm Light yellowish brown (10YR6/4) with yellowish red (5YR5/6) mottled *light medium clay (sandy)*, moderate coarse prismatic, breaking to strong coarse blocky structure, ped faces may have a discontinuous carbonate coating. pH 9.4.

B31k 60-100 cm Red (2.5YR4/8) with strong brown (7.5YR5/6) mottled *coarse sandy clay loam*, massively structured, strong consistence dry, contains few (5 %) calcareous nodules. pH 9.6.

B32 100-150 cm Light yellowish brown (10YR6/4) with yellowish red (5YR5/6) mottled *medium clay (sandy)*, moderate medium blocky structure, contains very few (< 2%) hard carbonate nodules. pH 9.8.

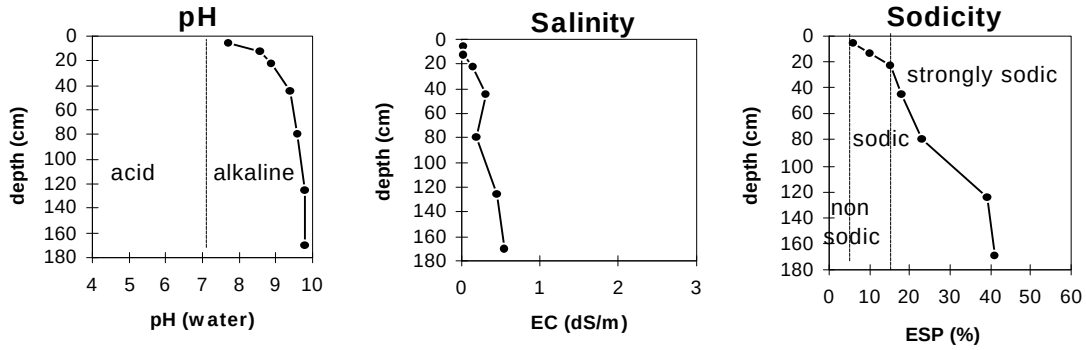
B33 150+ cm Yellowish red (5YR5/6) with light yellowish brown (10YR6/4) mottled *medium clay* (sandy). pH 9.8.

Soil Profile Characteristics:

Horizon	pH	Salinity	Sodicity	Dispersion	Internal Drainage	Hydro-phobicity
Surface (A1 horizon)	slightly alkaline	very low	non-sodic	nil		moderate*
Subsoil (B21 horizon)	strongly alkaline	very low	strongly sodic	strong	imperfectly drained#	
Deeper subsoil (at 1 metre)	extremely alkaline	low-medium	strongly sodic	strong		

* estimate

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



Key Profile Features:

- Strong textural contrast between topsoil and subsoil (duplex).
- Hydrophobic topsoil
- Coarse columnar structure with hard bleached capping at top of B horizon.
- Sodic subsoil
- Dispersive subsoil when dry
- Thin conspicuously bleached A2 horizon
- Alkaline subsoil

Soil Restrictions and Management Prescriptions

Feature	Result	Management Prescription
Strong textural contrast between topsoil and subsoil (duplex)	Strong textural and structural 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).
Hydrophobic topsoil	Poor infiltration of water into the soil. Increased risk of water erosion. Poor seed germination.	Maintenance of surface vegetative cover. Claying.
Columnar or prismatic subsoil structure	Indication of 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. Very difficult to cultivate, particularly if topsoil is shallow.	Apply gypsum if the subsoil is close to the surface and topsoil textures are light. *Dryland cropping* - include deep rooted crops in the rotation, minimum tillage and stubble retention. *Horticulture* - deep ripping with gypsum, install tile drainage (if appropriate). These soils are difficult to manage, not suitable for high levels of production unless substantial modification can be achieved.
Sodic clay subsoil	Poor water and air movement into the subsoil resulting in waterlogging	Gypsum applications if the subsoil is close to the surface and topsoil textures are light. *Dryland cropping* - include deep

	(impeded internal drainage). Poor root growth into the subsoil reducing the volume of the soil able to be exploited.	rooted crops in the rotation, minimum tillage and stubble retention. *Horticulture* - deep ripping with gypsum, install tile drainage (if appropriate).
Dispersion (dry soil)	Indication of soil sodicity. Soil structure collapses following wetting resulting in poor soil structure that reduces water movement and plant root growth (see sodic subsoil). Increases water erosion hazard.	*Dryland cropping* - apply gypsum, include deep rooted crops in the rotation, minimum tillage and stubble retention. *Horticulture* - apply gypsum, maintain optimum plant growth in between the rows. Minimum tillage and surface vegetative cover.
Bleached A_2 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.	*Dryland cropping* - 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. *Horticulture* - 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).
Alkaline subsoil	Potential nutrient imbalance. Unsuitable for alkaline intolerant plants. May indicate subsoil sodicity.	Grow shallow rooted species. Grow alkaline tolerant plants.

Land Suitability Rating Table

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

Land Suitability Assessment and Primary Limitations

Wheat	*Climate*	2*	High frost risk throughout most of the land unit
	Landscape	2	Wind erosion hazard
	Soil	2	Shallow depth of topsoil, slightly alkaline subsoil pH, slightly impeded internal drainage, hydrophobicity
Canola	*Climate*	2*	High frost risk throughout most of the land unit
	Landscape	2	Wind erosion hazard
	Soil	2	Shallow depth of topsoil, slightly alkaline subsoil pH, impeded internal drainage, hydrophobicity
Chickpeas	*Climate*	2*	High frost risk throughout most of the land unit
	Landscape	2	Wind erosion hazard
	Soil	3	Sandy topsoil texture, impeded internal drainage
Lentils	*Climate*	2*	High frost risk throughout most of the land unit
	Landscape	2	Wind erosion hazard
	Soil	3	Sandy topsoil texture, impeded internal drainage
White clover seed	*Climate*	1	No major limitation
	Landscape	2	Wind erosion hazard
	Soil	3	Soil salinity

Lucerne for seed production	*Climate*	2	Moderate frost risk
	Landscape	2	Wind erosion hazard
	Soil	3	Impeded internal drainage
Viticulture	*Climate*	2*	High frost risk throughout most of the land unit
	Landscape	1	No major limitation
	Soil	3	Impeded internal drainage
Apples	*Climate*	2*	High frost risk throughout most of the land unit, slightly high mean maximum January temperature
	Landscape	1	No major limitations
	Soil	2	Shallow depth of topsoil, slightly alkaline pH, minor soil salinity, slightly impeded internal drainage, hydrophobicity
Potatoes	*Climate*	2	Slightly high mean maximum January temperature
	Landscape	2	Wind erosion hazard
	Soil	3	Shallow depth of topsoil, impeded internal drainage
Carrots	*Climate*	1	No major limitation
	Landscape	2	Wind erosion hazard
	Soil	3	Shallow depth of topsoil, impeded internal drainage
Onions	*Climate*	2	Moderate frost risk
	Landscape	2	Wind erosion hazard
	Soil	3	Soil salinity, impeded internal drainage
Sweet corn	*Climate*	1	No major limitation
	Landscape	2	Wind erosion hazard
	Soil	3	Sandy topsoil texture, impeded internal drainage
Radiata Pine	*Climate*	3	Low rainfall
	Landscape	2	Wind erosion hazard
	Soil	3	Alkaline pH
Blue Gum	*Climate*	3	Low rainfall
	Landscape	2	Wind erosion hazard
	Soil	3	Alkaline pH

* Some areas may have higher frost risk therefore they may be potentially unsuitable. Obtain local knowledge on frost prior to investment

REPRESENTATIVE SOIL TYPE FOR THE BIG DESERT - 1 - Pu1 LAND UNIT

MAP UNIT: Pu1 **Site No.:** WW28

Position in Landscape: Upper slope **Grid Ref:** 512900 E, 6001300 N
Aust. Soil Class.: Yellow CHROMOSOL or SODOSOL (thick sandy surface horizon)

General Landscape Description:

This land unit has closer spaced undulations and therefore have smaller swales between the dunes compared with the gently undulating plains (Pg1) land unit. Deep yellowish sands are common on the slopes and dunes of this land unit; this soil type has been used to represent this land unit on the map. Variations occur on the dunes where there can be argic horizons (WW29) or yellow sodosols (L26). The slopes and swales in this landscape can have soils with less sand and more clay formation (WW30).

Soil Profile Morphology:

Topsoil
A11 0-15 cm Grey (10YR5/1) *sand*, structureless. pH 6.6.

A12 15-35 cm Light brownish grey (10YR6/2) *sand*, structureless. pH 7.2.

A13 35-80 cm Light yellowish brown (10YR6/4) *sand*, structureless. pH 8.2.

Subsoil

B2 80-90 cm Light yellowish brown (10YR6/4) *sandy clay*, reddish yellow and red mottles, clay tends to occur as clay skins in pockets such as root channels. pH 8.1.

C 90-120 cm + Weathered sandstone

Soil Profile Characteristics:

Horizon	pH	Salinity	Sodicity	Dispersion	Internal Drainage	Hydro-phobicity
Surface (A1 horizon)	slightly acid	very low	-	-	moderately well drained	low
Subsoil (B21 horizon)	moderately alkaline	very low	-	-		

Key Profile Features:

- Very deep sandy topsoil
- Hydrophobic topsoil
- Weakly developed clayey subsoil

Soil Restrictions and Management Prescriptions

Feature	Result	Management Prescription
Deep sandy profile	Poor plant available water holding capacity. Poor nutrient holding capacity. Increased risk of wind erosion. Potential for hydrophobicity.	*Horticulture* - 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.
Hydrophobic topsoil	Poor infiltration of water into the soil. Increased risk of water erosion. Poor seed germination.	Maintenance of surface vegetative cover. Claying.

Land Suitability Rating Table

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

Land Suitability Assessment and Primary Limitations

Wheat	*Climate*	2	Moderate frost risk
	Landscape	2	Wind erosion hazard
	Soil	3	Deep sandy profile
Canola	*Climate*	2	Moderate frost risk
	Landscape	2	Wind erosion hazard
	Soil	3	Deep sandy profile
Chickpeas	*Climate*	2	Moderate frost risk
	Landscape	2	Wind erosion hazard
	Soil	3	Deep sandy profile
Lentils	*Climate*	2	Moderate frost risk
	Landscape	2	Wind erosion hazard
	Soil	3	Deep sandy profile
White clover seed	*Climate*	1	No major limitation
	Landscape	2	Wind erosion hazard
	Soil	3	Deep sandy profile
Lucerne for seed production	*Climate*	1	No major limitation
	Landscape	1	No major limitation

	Soil	2	Slightly impeded internal drainage, hydrophobicity
Viticulture	*Climate*	2	Moderate frost risk
	Landscape	1	No major limitation
	Soil	3	Deep sandy profile
Apples	*Climate*	2	Moderate frost risk and slightly high mean maximum January temperature
	Landscape	1	No major limitation
	Soil	3	Deep sandy profile
Potatoes	*Climate*	2	Slightly high mean maximum January temperature
	Landscape	2	Wind erosion hazard
	Soil	2	Slightly impeded internal drainage, hydrophobicity
Carrots	*Climate*	1	No major limitation
	Landscape	2	Wind erosion hazard
	Soil	2	Slightly impeded drainage, hydrophobicity
Onions	*Climate*	2	Moderate frost risk
	Landscape	2	Wind erosion hazard
	Soil	2	Deep sand, slightly alkaline pH, slightly impeded internal drainage, hydrophobicity
Sweet corn	*Climate*	1	No major limitation
	Landscape	2	Wind erosion hazard
	Soil	3	Deep sandy profile
Radiata Pine	*Climate*	3	Low rainfall
	Landscape	2	Wind erosion
	Soil	3	Depth to weathered sandstone
Blue Gum	*Climate*	3	Low rainfall
	Landscape	2	Wind erosion hazard
	Soil	3	Depth to weathered sandstone

REPRESENTATIVE SOIL TYPE FOR THE BIG DESERT - 1 - Ru1 LAND UNIT

MAP UNIT: Ru1 **Site No.:** WW29

Position of Landscape: Dune **Grid. Ref:** 509000 E, 6001900 N
Aust. Soil Class.: Basic Argic, Orthic TENOSOL; (very thick sandy surface)

General Landscape Description:

The landscape of the gently undulating rises (closer spaced undulations) land unit (Ru1) consists of a large number of dunes and rises and associated slopes leading to clay soils on the swales (WW30). This soil type is the most appropriate soil type to represent this land unit on the map, although other soil types, such as deep yellow sands (WW28) and yellow sodosols (L26), occur on the dunes and slopes.

Soil Profile Morphology:

Topsoil
A 0-100 cm Light yellowish brown (10YR6/4) *sand*, with fine argic layers (sandy loam), 2-5 mm thick. pH 6.9.

Subsoil
B 100-200 cm Brownish yellow (10YR6/6) *sand*, light grey and red mottles, argic lines (clayey sand to sandy loam texture). pH 6.5.

Soil Profile Characteristics:

Horizon	pH	Salinity	Sodicity	Dispersion	Internal Drainage	Hydro-phobicity
Surface (A1 horizon)	slightly acid	very low	-	-	well drained	moderate*
Subsoil (B21 horizon)	slightly acid	very low	-	-		

* estimate

Key Profile Features:

- Deep sandy profile
- Hydrophobic topsoil
- Argic bands

Soil Restrictions and Management Considerations

Feature	Result	Management Prescription
Deep sandy profile	Poor plant available water holding capacity. Poor nutrient holding capacity. Increased risk of wind erosion. Potential for hydrophobicity.	*Horticulture* - 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.
Hydrophobic topsoil	Poor infiltration of water into the soil. Increased risk of water erosion. Poor seed germination.	Maintenance of surface vegetative cover. Claying.

Land Suitability Rating Table

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

Land Suitability Assessment and Primary Limitations

Wheat	*Climate*	2	Moderate frost risk
	Landform	2	Wind erosion hazard
	Soil	3	Deep sandy profile
Canola	*Climate*	2	Moderate frost risk
	Landform	2	Wind erosion hazard
	Soil	3	Deep sandy profile
Chickpeas	*Climate*	2	Moderate frost risk
	Landform	2	Wind erosion hazard
	Soil	3	Deep sandy profile
Lentils	*Climate*	2	Moderate frost risk
	Landform	2	Wind erosion hazard
	Soil	3	Deep sandy profile
White clover seed	*Climate*	1	No major limitation
	Landform	2	Wind erosion hazard
	Soil	3	Deep sandy profile
Lucerne for seed production	*Climate*	1	No major limitation
	Landform	2	Wind erosion hazard
	Soil	2	Hydrophobicity

Viticulture	*Climate*	2	Moderate frost risk
	Landform	1	No major limitation
	Soil	3	Deep sandy profile
Apples	*Climate*	2	Moderate frost risk, slightly high mean maximum January temperature
	Landform	1	No major limitation
	Soil	3	Deep sandy profile
Potatoes	*Climate*	2	Slightly high mean maximum January temperature
	Landform	2	Wind erosion hazard
	Soil	2	Hydrophobicity
Carrots	*Climate*	1	No major limitation
	Landform	2	Wind erosion hazard
	Soil	2	Hydrophobicity
Onions	*Climate*	2	Moderate frost risk
	Landform	2	Wind erosion hazard
	Soil	2	Deep sandy profile, slightly alkaline pH, hydrophobicity
Sweet corn	*Climate*	1	No major limitation
	Landform	2	Wind erosion hazard
	Soil	3	Deep sandy profile
Radiata Pine	*Climate*	3	Low rainfall
	Landform	2	Wind erosion hazard
	Soil	2	Sandy subsoil, depth to weathered sandstone, hydrophobicity
Blue Gum	*Climate*	3	Low rainfall
	Landform	2	Wind erosion hazard
	Soil	2	Sandy subsoil, depth to weathered sandstone, hydrophobicity