7.33 White Hills land system (WH)

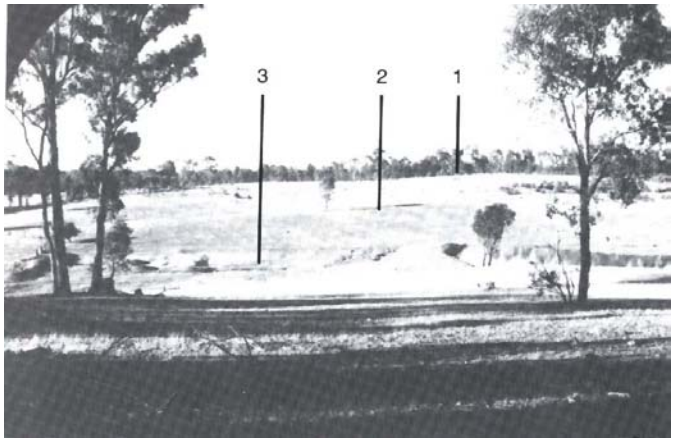
Gentle crests and slopes occur on remnants of Tertiary quartz river gravels to the east of Bendigo.

The surface soils on the crests have been extensively disturbed by scraping for gravel. A few undisturbed areas support an unusual abundance and variety of native wildflowers, notably the native orchids. These survive despite the low fertility of the soils and the low water-storage capacity in the gravelly topsoils. Cemented gravel hardpans underlie the soils on the crests. Where the gravel deposits are thin, the soils and vegetation are similar to those of adjacent areas on Ordovician sediments.

Native vegetation on the gravelly crests consists of a shrubby low woodland or open forest of *E. macrorhyncha, E. polyanthemos* and *E. goniocalyx.* A taller open forest dominated by *E. microcarpa* occupies the slopes.

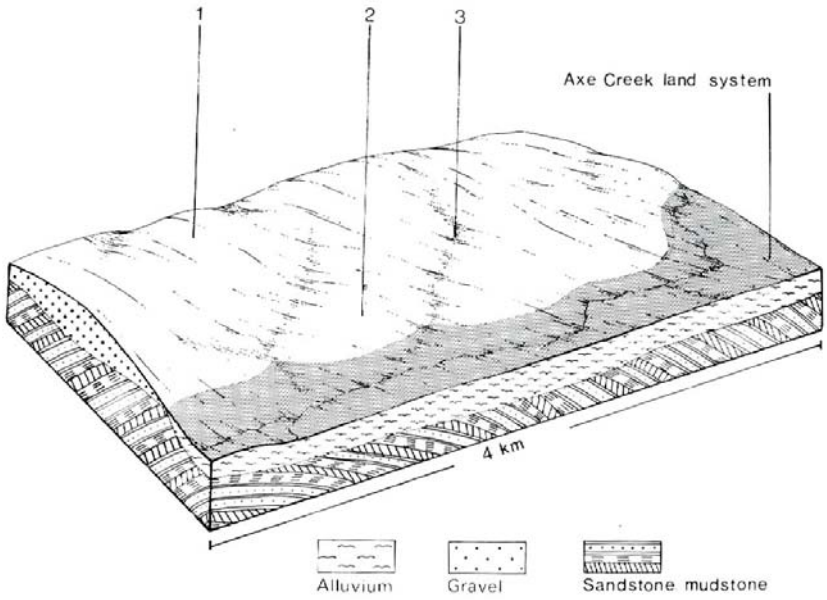
The land is used mainly for urban and semi-rural purposes. It has a low agricultural potential.

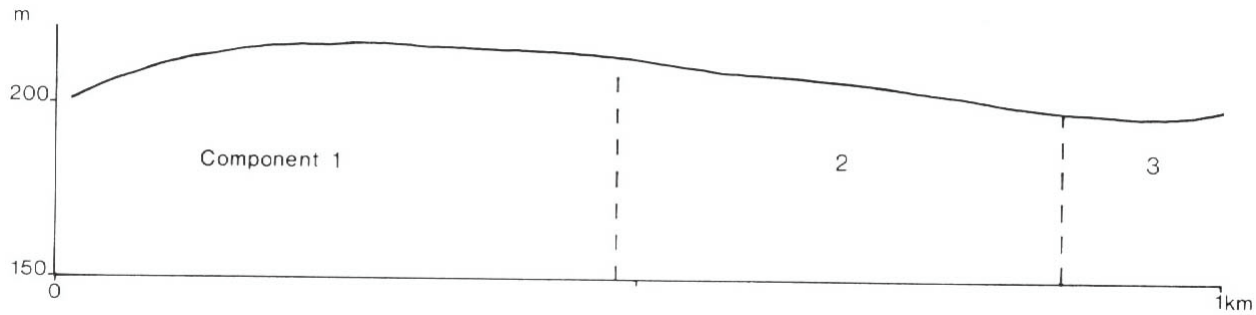
The Tertiary river-gravel deposits of Bendigo have been intensively mined for alluvial gold.



The gentle landscape has a simple arrangement of components

Areas retaining the native vegetation are popular for residential bush blocks.





WHITE HILIS LAND SYSTEM (WH) Area 19 km^2 0.5% of catchment

CLIMATE			
Rainfall, mean (mm)	Annual, 500-600; lowest December (30-35), highest June (55-60)		
Temperature, mean (°C)	Annual, 14.5; lowest July (6), highest January (22)		
Seasonal growth limitations	Temperature less than 10°C (av.): mid May-mid August Rainfall less than potential evapotranspiration: September-mid April		
GEOLOGY			
Age, rock type	Tertiary, river deposits-gravel, sand and clay		
PHYSIOGRAPHY			
Landform pattern	Gently undulating plain		
Elevation range (m)	160-220		
Relative relief (m)	10		
Drainage pattern	Dendritic		
Channel spacing	Sparse		
LAND COMPONENT			
Number	1	2	3
Percentage of land system	50	45	5
PHYSIOGRAPHY			
Landform element	Broad crest; flat to gently sloping	Gentle slope, with occasional steeper gradient adjacent to crest	Minor drainage depression
Slope; modal, range	1,0-3	3,2-25	1,1-2
Site drainage	Well drained	Well drained	Somewhat poorly drained
SOIL			
Parent material	Gravel, sand and clay	Gravel, sand and clay (often only a thin veneer over bedrock)	Alluvium and colluvium
Description	Shallow sandy soils with rounded quartz gravel, often underlain by a cemented horizon	Whole coloured or mottled red duplex soils, usually with A2 horizons that are bleached and gravelly; minor shallow sandy or gravelly soils	Mottled yellowish grey duplex soils with bleached A2 horizons and quartz gravel occurring throughout
Classification	Uc1; minor Dr3	Dr3.22, Dr2.41, Dr3.41; minor Dy5.41, Uc1	Dy3.41
Surface texture	Loamy sand, sandy loam; often gravelly	Sandy loam	Sandy loam
Depth to hardpan or bedrock (m)	0.2-0.5	1.0	1.0-1.5
Nutrient status	Very low	Low surface, low to moderate subsoil	Low surface, low to moderate subsoil
Available water capacity	Very low	Low surface, moderate subsoil	Low surface, moderate subsoil
Permeability	Rapid surface, very slow if hardpan present	Rapid surface, slow subsoil	Moderate surface, slow subsoil
Exposed rock/stone	0	0	0
Sampled site number		1102,1118	1103
NATIVE VEGETATION			
Structure	Woodland I / Open forest I	Open forest I / II	Woodland 11 / Open forest II
Characteristic species (+ indicates predominant species)	*E. polyanthemos+, E. macrorhyncha+, E.goniocalyx*	*E. microcarpa+, E. leucoxylon, E. polyanthemos, E. macrorhyncha*	*E. microcarpa+, E. polyanthemos,. E.melliodora, E. camaldulensis* (minor occurrences)
PRESENT LAND USE	Limited grazing of native grasses, nature conservation; gravel mining and scraping; residential use	Limited grazing of native grasses; residential use; nature conservation	Limited grazing of native grasses
OBSERVED SOIL DETERIORATION	Minor sheet erosion common, usually associated with gravel-stripping and roading	Minor sheet erosion common, usually associated with gravel-stripping and roading	Minor gully erosion and sedimentation

SUSCEPTIBILITY OF LAND TO PROCESSES OF SOIL DETERIORATION – White Hills

Compt.	Process	Susceptibility	Critical land factors	Off-site effects	Comments
1	sheet and rill erosion	low to moderate	• gentle slopes	• sedimentation	the high permeability of the topsoils once wetted reduces the overland flow and erosion hazard
	leaching of nutrients	high	• high soil permeability • low cation exchange capacity • low percentage base saturation	• -	added fertilizers are readily leached
	wind erosion	low to moderate	• weakly structured sandy topsoil	• sedimentation	gravel in the topsoil reduces the hazard
2	sheet and rill erosion	low to moderate	• gentle slopes • hydrophobic topsoils • clayey subsoil of low permeability	• sedimentation • increased run-on	-
	wind erosion	low to moderate	• weakly structured sandy loam topsoil	• sedimentation	-
	compaction of topsoil	low	• sandy loam texture • low organic matter content	• increased run-on	-
	leaching of nutrients (topsoil)	high	• high topsoil permeability • low cation exchange capacity • low percentage base saturation	• -	added fertilizers are readily leached
3	gully erosion	low	• minor accumulations of alluvium	• sedimentation	-
	compaction of topsoil	low to moderate	• sandy loam texture • soil often moist • low organic matter content	• -	-

The tree pedestals indicate the depth of gravel easily removed by front-end loader.

Disturbance of the fragile vegetative ground cover usually results in increased run-off.