

MCH McHugh Land System

A plateau surface area, much of which is poorly drained, which includes a few sluggishly drained upper drainage depressions. It is bordered by a very highly dissected plateau area to the south, a dissected plateau area to the east, stony slopes and gullies to the north, and a wetter dissected plateau area to the west.

The system is named after Gordon McHugh, who performed soil surveys in dense scrub on the western part of Kangaroo Island, on land subsequently opened up as farmland under the Soldier Settlement Scheme following World War II. He next oversaw the clearing of much of the Soldier Settlement Scheme area, leaving many wide corridors of native vegetation, especially along creek lines. His careful and considered clearing was far ahead of thinking in South Australia at the time, when native vegetation was little valued. These corridors not only provide shelter for livestock, crops and pastures, but help retain the flora, fauna and essential character of these areas – characters that are so much admired by visitors from around the world today. Gordon went on to become a soldier settler, farming a property adjacent to McHugh's Road, which is in the very east of this system.

Area: 176.2 km²

Annual rainfall: 640 – 810 mm average

Geology: This system is dominated by Pliocene age ferricrete regolith and Pliocene-Quaternary age ironstone colluvium. These consist of loamy topsoil underlain by deeply weathered clayey sediments. The deep clayey sediments consist of a mottled zone overlying a grey pallid zone. Underlying this at depth are Cambrian age Kanmantoo group meta-sandstones. Ironstone gravel occurs as a layer above the clayey subsoil, and/or as a layer in the upper subsoil in areas affected by colluvial/alluvial processes. Some areas have a ferricrete layer (sheet or boulder laterite) above the clayey sediments. In drainage depressions/flats the ironstone can be mostly absent, having been 'dissolved' by continual sub-surface water flow. Very minor areas occur where soils with quartz and meta-sandstone fragments have formed on the underlying meta-sandstone rock.

Topography: This system is a poorly drained plateau surface. It consists of slight rises and wetter lower-lying plateau surface areas. Wet drainage depressions/flats occur, mostly at the very heads of drainage depressions which lie outside this system. A few upper drainage/creek lines are included in this system; these drain westward into the Eleanor River. A few slopes along these creek lines reach 20%, however, most slopes are less than 4%, and are typically 1% or less. A lagoonal depression (Edwards Lagoon) with lunettes on the north and eastern side occurs at the wetter western end of this system.

Elevation: From about 150 m in the south-east of the system, to 260 m in the west of the system around Edwards Lagoon.

Relief: Mostly less than 10 m

Main soils:

J2a	<u>Colluvial ironstone soil</u>
J2b	<u>Ironstone soil</u>
J3	<u>Shallow to moderate depth soil on ferricrete</u>
F2-F1-G5	<u>Texture contrast soil</u>



Main features: Arable to semi-arable plateau surfaces. Topsoils are dominantly loamy. The main soils are loamy over clay with ironstone gravel.

Relatively impermeable clayey subsoils and level topography limit infiltration and drainage, resulting in much wetness and waterlogging. Ironstone limits fertility by 'fixing' phosphorous. Those soils underlain by ferricrete are limited by stoniness and low water holding capacity. Many soils are strongly acidic, and can have aluminium levels which are toxic to plants (topsoils are often marginally toxic and lower subsoils are often highly toxic). Quite minor areas of saline seepage occur in some upper drainage lines.

Soil Landscape Unit summary: McHugh Land System (MCH)

SLU	% of area	Main features #
FUE FUEg FUB	3.2 1.1 0.3	<p>Non-arable wet drainage flats, sometimes with drainage lines, on the plateau surface, usually at the very head of drainage depressions, with ironstone gravelly and some 'non-ironstone gravelly' texture contrast soils. Vegetation is usually dominated by cup gums, swamp wattles, banksia shrubs, bullocks, and low stringybark gums; with reeds in cleared paddock areas. Patches of dead stringbark gums occur – which may indicate rising salinity levels.</p> <p>Main soils: <u>colluvial ironstone soil J2a</u> (<i>Ferric Brown Sodosol-Chromosol-Kurosol</i>). Often with some <u>texture contrast soil F2-F1</u> (<i>Brown Sodosol-Chromsol</i>).</p> <p>FUE – drainage flat (slopes <1%, 1-2e, 5w, 2-1s) FUEg – drainage flat with drainage lines (slopes 0-2%, 2-3e, 5w, 2-1s) FUB – sloping drainage area (1-4%, 2-3e, 5w)</p> <p>Summary: the main issue is wetness.</p>
FRZ FRZw FRBw	4.2 35.9 0.2	<p>Arable to semi-arable lower-lying, and a few mid-level areas on the plateau surface, often quite wet, with ironstone soils. The taller vegetation is usually composed of low to lowish stringybark gums, cup gums, pink gums(?), swamp wattles, bullocks, and banksia shrubs – cup gums dominate in the wetter patches. A few patches of dead stringybark gums occur – which may indicate rising salinity levels.</p> <p>Main soils: <u>colluvial ironstone soil J2a</u> (<i>Ferric Brown Chromosol-Sodosol-Kurosol</i>); with <u>ironstone soil J2b</u> (<i>Ferric Brown Chromosol-Kurosol</i>). Minor to limited areas of <u>shallow to moderate depth soil over ferricrete</u> can occur (J3).</p> <p>FRZ – lower-lying to mid-level plateau surfaces (slopes <1%, 1e, 3-4w). FRZw – wet and lower-lying plateau surfaces (slopes <1%, 1e, 4w). FRBw – slopes (1-3.5%, 2e, 4-3w)</p> <p>Summary: the main issues are wetness/waterlogging, and infertility due to ironstone (phosphorous 'fixation') and wetness.</p>
FVC	0.7	<p>Arable to semi-arable slopes with ironstone soils and soils formed in weathered rock.</p> <p>Main soils: <u>ironstone soil J2b</u> (<i>Ferric Brown Chromosol-Kurosol</i>); with <u>colluvial ironstone soil J2a</u> (<i>Ferric Brown Chromosol-Sodosol-Kurosol</i>). With stony texture contrast soil K4 (<i>stony Brown Chromosol-Sodosol</i>).</p> <p>FVC – slopes (3-8%, 3e, 2r)</p> <p>Summary: the main issues are infertility due to ironstone (phosphorous 'fixation') and waterlogging.</p>
FXZ FXZw FXB	38.7 2.7 2.7	<p>Arable to semi-arable low rises, raised areas, slopes, and a few lower-lying areas on the plateau surface with ironstone soils, many underlain by ferricrete (sheet or boulder laterite). Vegetation is dominated by good-sized stringybark trees.</p> <p>Main soils: <u>ironstone soil J2b</u> (<i>Ferric Brown Chromosol-Kurosol</i>) and <u>colluvial ironstone soil J2a</u> (<i>Ferric Brown Chromosol-Sodosol-Kurosol</i>). With areas of <u>shallow to moderate depth soil over ferricrete J3</u> (<i>Petroferric Tenosol</i>).</p>



		<p>FXZ – low rises and raised areas on the plateau surface (slopes 0-2%, 1-2e, 3w). FXZw – lower-lying to mid-level plateau surface areas (slopes 0-1%, 1e, 4-3w) FXB – slopes (1-4%, 2e, 3w)</p> <p>Summary: the main issues are infertility due to ironstone (phosphorous 'fixation'), shallow soils limiting waterholding capacity, and waterlogging.</p>
FxZ FxB	5.1 0.9	<p>Semi-arable to non-arable low rises and slopes with soils underlain by ferricrete (sheet or boulder laterite) and other ironstone soils. Main soils: <u>Shallow to moderate depth soil over ferricrete</u> J3 (<i>Petroferric Tenosol</i>). With <u>ironstone soil</u> J2b (<i>Ferric Brown Chromosol-Kurosol</i>) and <u>colluvial ironstone soil</u> J2a (<i>Ferric Brown Chromosol-Sodosol-Kurosol</i>).</p> <p>FxZ – plateau surface (slopes 0-2%, 1-2e, 3w) FxB – slopes (1-4%, 2e, 3w)</p> <p>Summary: the main issues are shallow soils limiting waterholding capacity, stoniness, infertility due to ironstone (phosphorous 'fixation'), and waterlogging.</p>
HZE	3.7	<p>Non-arable drainage depressions. Main soils: <u>texture contrast soil</u> F2-F1 (<i>Brown Sodosol</i>). Minor to common areas occur of <u>colluvial ironstone soil</u> J2a (<i>Ferric Brown Sodosol-Chromosol-Kurosol</i>) and stony texture contrast soil K4 (<i>stony Brown Chromosol-Sodosol</i>) on steeper slopes.</p> <p>HZE – upper creek areas: with drainage flats, creek lines and creek slopes (slopes 0-20% (mostly 0-5%), 3e, 7-5w)</p> <p>Summary: non-arable due to wetness and frequency of inundation.</p>
XnA	0.3	<p>Drained and arable lagoonal depression. Main soils: <u>texture contrast soil</u> F2 (<i>Brown-Grey Sodosol</i>). Possibly with some clay loamy to clayey soils M4 (<i>Brown-Grey Dermosol</i>) where topsoils have been blown away.</p> <p>XnA – drained lagoonal depression (4w). Edwards Lagoon.</p> <p>Summary: the main issues are wetness/waterlogging and fertility maintenance.</p>
Xz-	0.3	<p>Non-arable sandy lunettes and swamps. Lunettes cover approximately 30% of this area. Main soils: deep bleached sandy soils on lunettes H3-I1 (<i>sandy Tenosol-Podosol</i>). Bleached sandy <u>texture contrast soil</u> G5 (<i>Brown-Grey Sodosol</i>) and probably some podsolized sandy soils underlain by ironstone and/or clay I2 (<i>Podosol</i>) on swamps and flats.</p> <p>Xz- - low sandy lunettes (<5m) and swamps (5-4w). Around Edwards Lagoon.</p> <p>Summary: wetness, infertility, and wind erosion risk are factors here.</p>

Classes in the 'Soil Landscape Unit summary' table (eg. 2-1e, 3w, 2y, etc) describe the predominant soil and land conditions, and their range, found in Soil Landscape Units. The number '1' reflects minimal limitation, while increasing numbers reflect increasing limitation. Letters correspond to the type of attribute:

a - wind erosion e - water erosion f - flooding g - gullyng
r - surface rockiness s - salinity w - waterlogging y - exposure



Detailed soil profile descriptions:**Main soils:**

- J2a** Colluvial ironstone soil (*Ferric Brown Chromosol-Sodosol-Kurosol*). Medium thickness to very thick sandy loam to loam topsoil, usually with a sub-surface layer with ironstone nodules ironstone gravel; over a transitional upper subsoil of yellow-brown to yellow sandy clay loam to light clay with ironstone gravel; over olive-brown to yellow-brown clayey subsoil with red, olive, and grey mottles. The lower subsoil can be grey at very wet sites. The transitional upper subsoil layer can be bleached and/or sodic. pHs are acidic to strongly acidic. Especially found in lower-lying areas on the plateau surface.
- J2b** Ironstone soil (*Ferric Brown Chromosol-Kurosol*). Thick to very thick sandy loam (occasionally loamy sand or loam) topsoil with ironstone gravel; over olive-brown to yellow-brown mottled clayey subsoil. Bleached sub-surface layers occasionally occur. The lower subsoil is highly mottled with red, grey, and yellow-brown colours. Soil pHs are acidic to strongly acidic, with the lower subsoil being strongly acidic. Quartz fragments occur in a few soils, especially on upper slopes. Found especially on slight rises on plateau surfaces.
- J3** Shallow to moderate depth soil on ferricrete (*Petroferric Tenosol*). Sandy loam to loam surface soil, over a sub-surface layer of yellow to yellow-brown sandy loam to loamy sand which can be bleached and usually contains ironstone gravel; overlying a layer of ferricrete (sheet or boulder laterite) at shallow to moderate depth. The ferricrete overlies deeply weathered clayey sediments. Sometimes a subsoil layer of yellow-brown sandy clay loam to light clay with ironstone gravel, which can be bleached, occurs above the ferricrete layer. pHs are acidic to strongly acidic. Especially on low rises on the plateau surface.
- F2-F1-G5** Texture contrast soil (*Brown Sodosol-Chromosol*). Medium thickness to thick sandy loam to loam topsoil (occasionally loamy sand), often with a bleached sub-surface layer; over yellow-brown to olive mottled clayey subsoil. The subsoil clay is usually sodic; and can be grey in colour at the wetter sites. There can be an upper subsoil transitional layer of clay loam to light clay between the topsoil and subsoil proper; this layer is often sodic and bleached. Some ironstone nodules, or occasionally quartz fragments, can occur in the profile. pHs are acidic to strongly acidic. Found in drainage depressions/flats and lagoonal depressions.

Further information: [DEWNR Soil and Land Program](#)

