**Project Name:** **Regional**
**Project Code:** **REG** **Site ID:** **T96** **Observation ID:** **1**
**Agency Name:** **CSIRO Division of Soils (QLD)**

## Site Information

**Desc. By:** R.F. Isbell
**Locality:** Railway cutting 8.8KM west of Pentland:0.8KM east along line:17M northof line:
**Date Desc.:** 10/02/70
**Elevation:** 180 metres
**Map Ref.:** Sheet No. : 7956 1:100000
**Rainfall:** 635
**Northing/Long.:** 145.333333333333
**Runoff:** Rapid
**Easting/Lat.:** -20.5833333333333
**Drainage:** No Data

## Geology

**ExposureType:** Undisturbed soil core
**Conf. Sub. is Parent. Mat.:** No Data
**Geol. Ref.:** Qs
**Substrate Material:** Undisturbed soil core, Unconsolidated material (unidentified)

## Land Form

**Rel/Slope Class:** Gently undulating rises 9-30m 1-3%
**Pattern Type:** Plain
**Morph. Type:** Simple-slope
**Relief:** 15 metres
**Elem. Type:** Plain
**Slope Category:** No Data
**Slope:** 0 %
**Aspect:** No Data

**Surface Soil Condition (dry):** Hardsetting, Surface crust

**Erosion:**

## Soil Classification

**Australian Soil Classification:**
Haplic Mesotrophic Red Kandosol
**ASC Confidence:**
Analytical data are incomplete but reasonable confidence.
**Mapping Unit:** N/A
**Principal Profile Form:** Gn2.11
**Great Soil Group:** Red earth

**Site Disturbance:** No effective disturbance other than grazing by hoofed animals

**Vegetation:** Low Strata - Tussock grass, 0.51-1m, Mid-dense. *Species includes - Bothriochloa ewartiana, Aristida species
Tall Strata - Tree, 6.01-12m, Sparse. *Species includes - Eucalyptus similis, Eucalyptus drepanophylla, Eucalyptus

**Surface Coarse Fragments:** No surface coarse fragments

## Profile Morphology

| | | |
|---|---|---|
| A11 | 0 - 0.05 m | Dark reddish brown (2.5YR3/3-Moist); ; Sandy clay loam (Light); Weak grade of structure, 5-10 mm, Platy; Massive grade of structure; Weak consistence; Few, fine (1-2mm) roots; Clear change to - |
| A12 | 0.05 - 0.1 m | Dark reddish brown (2.5YR3/4-Moist); ; Sandy clay loam; Weak grade of structure, 10-20 mm, Angular blocky; Massive grade of structure; Weak consistence; Few, fine (1-2mm) roots; Gradual change to - |
| B1 | 0.1 - 0.2 m | Dark red (10R3/5-Moist); ; Sandy clay loam (Heavy); Massive grade of structure; Coarse, (10 - 20) mm crack; Weak consistence; Few, fine (1-2mm) roots; Gradual change to - |
| B1 | 0.2 - 0.3 m | Dark red (10R3/6-Moist); ; Sandy clay loam (Heavy); Massive grade of structure; Earthy fabric; Common (1-5 per 100mm2) Fine (1-2mm) macropores, Weak consistence; Few, fine (1-2mm) roots; Gradual change to - |
| B21 | 0.3 - 0.45 m | Dark red (10R3/6-Moist); ; Sandy clay loam (Heavy); Massive grade of structure; Earthy fabric; Few (<1 per 100mm2) Fine (1-2mm) macropores, Weak consistence; Few cutans, <10% of ped faces or walls coated, distinct; |
| B22 | 0.45 - 0.6 m | Dark red (10R3/6-Moist); ; Light clay; Massive grade of structure; Earthy fabric; Few (<1 per 100mm2) Fine (1-2mm) macropores, Weak consistence; Few cutans, <10% of ped faces or walls coated, distinct; Few, fine (1-2mm) roots; Gradual change to - |
| B22 | 0.6 - 0.75 m | Dark red (10R3/7-Moist); ; Light clay; Massive grade of structure; Earthy fabric; Few (<1 per 100mm2) Fine (1-2mm) macropores, Weak consistence; Few cutans, <10% of ped faces or walls coated, distinct; Common (10 - 20 %), Argillaceous, , Nodules; Few, fine (1-2mm) roots; |
| B23 | 0.75 - 0.9 m | Dark red (10R3/7-Moist); ; Sandy clay loam (Heavy); Massive grade of structure; Few (<1 per 100mm2) Fine (1-2mm) macropores, Weak consistence; Few cutans, <10% of ped faces or walls coated, distinct; Common (10 - 20 %), Argillaceous, , Nodules; Few, fine (1-2mm) roots; |
| B24 | 0.9 - 1.2 m | Red (10R4/6-Moist); ; Sandy clay loam (Heavy); Massive grade of structure; Moist; Weak consistence; Few (2 - 10 %), Argillaceous, , Nodules; |

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| | | |
|---|---|---|
| B24 | 1.2 - 1.5 m | Red (10R4/6-Moist); ; Sandy clay loam (Heavy); Massive grade of structure; Moist; Weak consistence; Few (2 - 10 %), Argillaceous, , Nodules; |
| B24 | 1.5 - 1.8 m | Red (10R4/6-Moist); ; Sandy clay loam (Heavy); Massive grade of structure; Moist; Weak consistence; Very few (0 - 2 %), Argillaceous, , Nodules; |
| BC | 1.8 - 2.2 m | Red (10R4/6-Moist); ; Light clay; Massive grade of structure; Moist; Weak consistence; 2-10%, medium gravelly, 6-20mm, subangular, Quartz, coarse fragments; Gradual change to - |
| BC | 2.2 - 2.5 m | Red (10R4/6-Moist); ; Light clay; Massive grade of structure; Moist; Very weak consistence; 20-50%, coarse gravelly, 20-60mm, Sandstone, coarse fragments; |
| C | 2.5 - 2.8 m | Red (10R4/6-Moist); , 5YR81; Clay loam; Massive grade of structure; Dry; Strong consistence; 20-50%, Sandstone, coarse fragments; |
| | 2.8 - 3.1 m | Red (10R4/6-Moist); , 5YR81; Clay loam; Massive grade of structure; Strong consistence; 20-50%, Sandstone, coarse fragments; |
| C | 3.1 - 3.4 m | Red (10R4/6-Moist); , 10YR58; , 5YR41; Clay loam; Massive grade of structure; Dry; Strong consistence; |
| | 3.4 - 3.7 m | Red (10R4/6-Moist); , 10YR58; , 5YR41; Clay loam; Massive grade of structure; Strong consistence; Gradual change to - |
| | 3.7 - 4 m | Red (10R4/6-Moist); , 5YR41; , 10YR58; Clay loam; Massive grade of structure; Strong consistence; |
| | 4 - 4.3 m | Red (10R4/6-Moist); , 5YR41; , 10YR58; Clay loam; Massive grade of structure; Strong consistence; |

## Morphological Notes

## Observation Notes

250-430CM WEAKLY LATERITISED DARK PURPLE MATERIAL:

## Site Notes

PENTLAND

**Project Name:** Regional
**Project Code:** REG **Site ID:** T96 **Observation ID:** 1
**Agency Name:** CSIRO Division of Soils (QLD)

## Laboratory Test Results:

| Depth | pH | 1:5 EC | Exchangeable Cations | | | | Exchangeable Acidity | CEC | ECEC | ESP |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Ca | Mg | K | Na | | | | |
| m | | dS/m | Cmol (+)/kg | | | | | | | % |
| 0 - 0.05 | 6.1A | 0.036A | 5.3B | 2.3 | 0.64 | 0.1 | | | | |
| 0.05 - 0.1 | 6.3A | 0.027A | 3.7B | 1.5 | 0.55 | 0.1 | | | | |
| 0.1 - 0.2 | 6.3A | 0.67A | 2.5B | 1.1 | 0.33 | 0.08 | 0.12F | | 4.1F | |
| 0.2 - 0.3 | 6.2A | 0.021A | 2.3B | 1.1 | 0.3 | 0.04 | | | | |
| 0.3 - 0.45 | 6A | 0.034A | 1.9B | 1.1 | 0.23 | 0.1 | 0.12F | | 3.5F | |
| 0.45 - 0.6 | 6.1A | 0.024A | | | | | | | | |
| 0.6 - 0.75 | 6.1A | 0.44A | 1.7B | 1.48 | 0.21 | 0.1 | 0.4F | 3.21A | 3.9F | 3.12 |
| 0.75 - 0.9 | 6.2A | 0.023A | | | | | | | | |
| 0.9 - 1.2 | 6.2A | 0.024A | 1.4B | 1.4 | 0.15 | 0.09 | 0.4F | | 3.4F | |
| 1.2 - 1.5 | 6.2A | 0.023A | | | | | | | | |
| 1.5 - 1.8 | 6.4A | 0.02A | 1.2B | 2.1 | 0.07 | 0.08 | | | | |
| 1.8 - 2.2 | 6.1A | 0.023A | 1B | 2.1 | 0.05 | 0.1 | | | | |
| 2.2 - 2.5 | 5.5A | 0.02A | | | | | | | | |
| 2.5 - 2.8 | 5.4A | 0.017A | | | | | | | | |
| 2.8 - 3.1 | 5.5A | 0.017A | | | | | | | | |
| 3.1 - 3.4 | 5.6A | 0.011A | | | | | | | | |
| 3.4 - 3.7 | 5.4A | 0.017A | | | | | | | | |
| 3.7 - 4 | 5.4A | 0.02A | | | | | | | | |
| 4 - 4.3 | 5.4A | 0.017A | | | | | | | | |

| Depth | CaCO3 | Organic C | Avail. P | Total P | Total N | Total K | Bulk Density | Particle Size Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | GV | CS | FS | Silt | Clay |
| m | % | % | mg/kg | % | % | % | Mg/m3 | | | % | | |
| 0 - 0.05 | | 1.82D | 12.9B | 0.036A | 0.11A | 0.23A | | | 31D | 33 | 10 | 26 |
| 0.05 - 0.1 | | 0.73D | 4.7B | 0.028A | 0.05A | 0.22A | | | 37D | 31 | 7 | 25 |
| 0.1 - 0.2 | | 0.43D | 2.8B | 0.021A | | 0.22A | | | 33D | 30 | 6 | 31 |
| 0.2 - 0.3 | | 0.32D | | | 0.02A | | | | 32D | 28 | 6 | 34 |
| 0.3 - 0.45 | | 0.23D | | | 0.02A | | | | 31D | 23 | 5 | 41 |
| 0.45 - 0.6 | | | | | | | | | | | | |
| 0.6 - 0.75 | | 0.1D | | 0.023A | 0.01A | 0.25A | | | 26D | 19 | 5 | 50 |
| 0.75 - 0.9 | | | | | | | | | | | | |
| 0.9 - 1.2 | | | | | | | | 2 | 25D | 25 | 5 | 45 |
| 1.2 - 1.5 | | | | | | | | 4 | 24D | 24 | 6 | 45 |
| 1.5 - 1.8 | | | | 0.022A | | 0.23A | | 6 | 22D | 23 | 72 | 48 |
| 1.8 - 2.2 | | | | | | | | | | | | |
| 2.2 - 2.5 | | | | | | | | 52 | 26D | 22 | 6 | 46 |
| 2.5 - 2.8 | | | | | | | | | | | | |
| 2.8 - 3.1 | | | | | | | | 8 | 25D | 23 | 7 | 45 |
| 3.1 - 3.4 | | | | | | | | | | | | |
| 3.4 - 3.7 | | | | | | | | 7 | 28D | 22 | 7 | 43 |
| 3.7 - 4 | | | | | | | | | | | | |
| 4 - 4.3 | | | | | | | | | | | | |

| Depth | COLE | Gravimetric/Volumetric Water Contents | | | | | | K sat | K unsat |
|---|---|---|---|---|---|---|---|---|---|
| | | Sat. | 0.05 Bar | 0.1 Bar | 0.5 Bar | 1 Bar | 5 Bar | 15 Bar | |
| m | | g/g - m3/m3 | | | | | | mm/h | mm/h |
| 0 - 0.05 | | | | | | | | | |
| 0.05 - 0.1 | | | | | | | | | |
| 0.1 - 0.2 | | | | | | | | | |

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0.2 - 0.3
0.3 - 0.45
0.45 - 0.6
0.6 - 0.75
0.75 - 0.9
0.9 - 1.2
1.2 - 1.5
1.5 - 1.8
1.8 - 2.2
2.2 - 2.5
2.5 - 2.8
2.8 - 3.1
3.1 - 3.4
3.4 - 3.7
3.7 - 4
4 - 4.3

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**Laboratory Analyses Completed for this profile**

| | |
|---|---|
| 10A1 | Total sulfur - X-ray fluorescence |
| 12_HF_CU | Total element - Cu(mg/kg) - HF/HClO4 Digest |
| 12_HF_FE | Total element - Fe(%) - HF/HClO4 Digest |
| 12_HF_MN | Total element - Mn(mg/kg) - HF/HClO4 Digest |
| 12_HF_ZN | Total element - Zn(mg/kg) - HF/HClO4 Digest |
| 13C1_AL | Citrate/dithionite-extractable iron, aluminium, Manganese and Silicon |
| 13C1_FE | Citrate/dithionite-extractable iron, aluminium, Manganese and Silicon |
| 15A2_CA | Exchangeable bases (Ca2+,Mg2+,Na+,K+) - 1M ammonium chloride at pH 7.0, pretreatment for soluble salts |
| 15A2_CEC | Exchangeable bases- 1M ammonium chloride at pH 7.0, pretreatment for soluble salts |
| 15A2_K | Exchangeable bases- 1M ammonium chloride at pH 7.0, pretreatment for soluble salts |
| 15A2_MG | Exchangeable bases- 1M ammonium chloride at pH 7.0, pretreatment for soluble salts |
| 15A2_NA | Exchangeable bases- 1M ammonium chloride at pH 7.0, pretreatment for soluble salts |
| 15G_C | Exchange acidity (hydrogen and aluminium) - meq per 100g of soil - By 1M KCl exch. acidity by titration to pH 8.4 |
| 15J1 | Effective CEC |
| 17A1 | Total potassium - X-ray fluorescence |
| 3A1 | EC of 1:5 soil/water extract |
| 4A1 | pH of 1:5 soil/water suspension |
| 6A1_UC | Organic carbon (%) - Uncorrected Walkley and Black method |
| 7A2 | Total nitrogen - semimicro Kjeldahl , automated colour |
| 9A1 | Total phosphorus - X-ray fluorescence |
| 9G_BSES | Available P (mg/kg) - Acid P - 0.005M H2SO4 (BSES) |
| 9H1 | Phosphate retention |
| MIN_EC | Exchange Capacity - Minerology |
| P10_GRAV | Gravel (%) |
| P10_PB_C | Clay (%) - Plummet balance |
| P10_PB_CS | Coarse sand (%) - Plummet balance |
| P10_PB_FS | Fine sand (%) - Plummet balance |
| P10_PB_Z | Silt (%) - Plummet balance |
| XRD_C_Hm | Hematite - X-Ray Diffraction |
| XRD_C_Is | Interstratified clay minerals - X-Ray Diffraction |
| XRD_C_K2O | K2O - X-Ray Diffraction or Clay Fraction (air dry) |
| XRD_C_Ka | Kaolin - X-Ray Diffraction |
| XRD_C_Qz | Quartz - X-Ray Diffraction |