

Hornsby Quarry Soil Creation and Revegetation



Introduction

- The ecological values of the vegetation surrounding the Quarry and Old Mans Valley is being protected, enhanced and restored through an approved Vegetation Management Plan and Habitat Creation and Enhancement Program (VMP).
- Current vegetation management and habitat creation has identified and understood the existing conditions in the bushland to implement best practice ecological restoration.
- Revegetation of disturbed soils is a large component of the Quarry and Old Mans Valley restoration.
- Soil creation to support native vegetation has been undertaken during the earthwork operations.
- Council's soil trial has scientifically informed soil creation specifications.

Soil trial - background

1. Soil testing was undertaken across the site, including within bushland areas.
2. Benchmark physical and chemical properties were determined from the site soil testing as well as from both historic and scientific reference material.
3. The plant community types were classified through vegetation surveys.
4. Existing plant community types (PCTs) – Blue Gum Diatreme Forest (BGDF) and Blackbutt Gully Forest (BBGF).
5. Desire to re-use the two soils on site – Breccia soils and NorthConnex Tunnel crushed sandstone – was confirmed.
6. Soil trial was completed to understand how best to treat the two soil types to reach the required properties to support growth of the two plant community types.

Soil trial – two soil types



Soil trial - design aim

- Create a soil suitable to support growth of native vegetation



Soil resources were alkaline



Benchmarks require a more acid soil

Soil trial - design

- Two soils plus a mix of both 50/50 – sandstone, breccia, 50% sandstone/50% breccia
- Two plant community types (PCTs) – BBGF and BGDF
- Two treatments

No of plots

- 3 x soils, 2 x pH treatments, 2 x PCTs x 3 replicas, controls (3 soils x 2 PCTs) = 42 plots
- Plots = 500L pots

Number of native tubestock per PCT

- 3 x canopy species
- 5 x shrub species
- 3 x ground cover species

Soil trial – treatment application



Two Treatments:

- Sulphur (S) @ 0.35kg/m³ (blue)
- Iron sulphate (FeSO₄) @ 3kg/ m³ (yellow)



Soil trial – plot set up



Soil trial – planting



Soil trial – species selection

Blue Gum High Forest

TREES

- *Angophora floribunda*
- *Eucalyptus saligna*
- *Syncarpia glomulifera*

SHRUBS

- *Acacia floribunda*
- *Dodonea triquetra*
- *Platylobium formosum*
- *Synoum glandulosum*

GROUND COVERS/CLIMBERS

- *Adiantum aethiopicum*
- *Hibbertia scandens*
- *Tylophora barbata*



Blackbutt Gully Forest

TREES

- *Allocasuarina torulosa*
- *Eucalyptus pilularis*
- *Eucalyptus resinifera*

SHRUBS

- *Banksia serrata*
- *Breynia oblongifolia*
- *Leptospermum trinervium*
- *Leucopogon lanceolatus*

GROUND COVERS/CLIMBERS

- *Entolasia stricta*
- *Eustrephus latifolius*
- *Poa affinis*



Soil trial – field data collection



Soil trial – field data collection

Hornsby Park Soil Trial Observation Sheet

Author: OG and RC

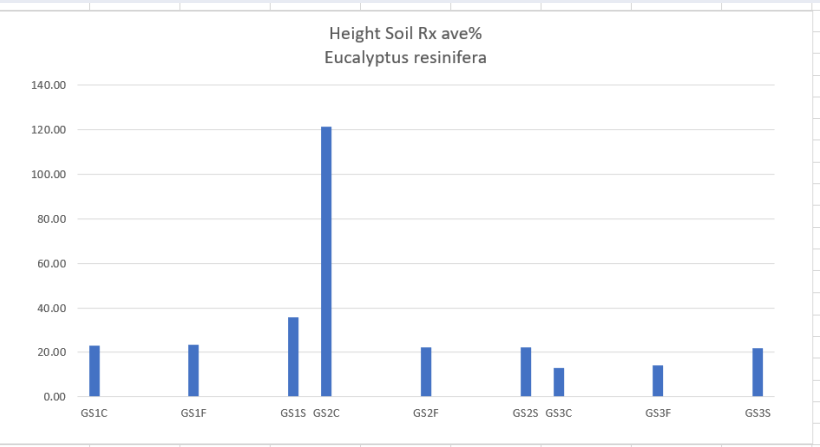
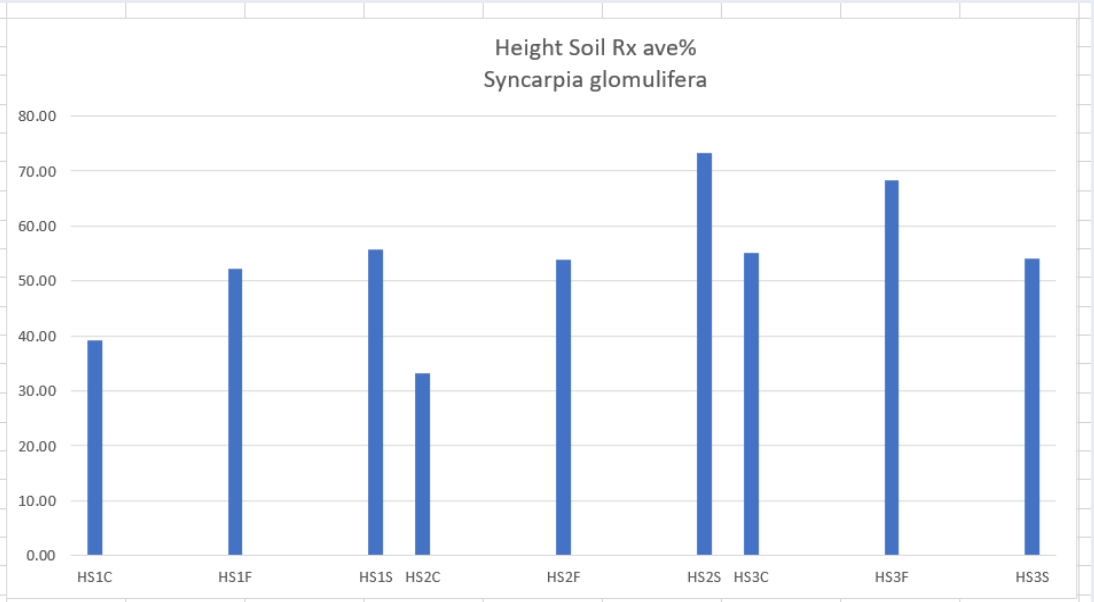
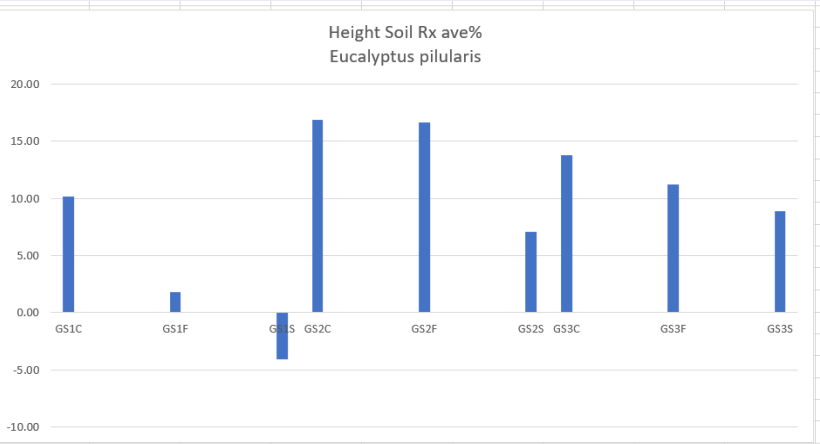
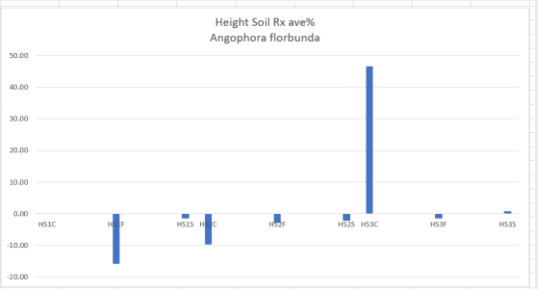
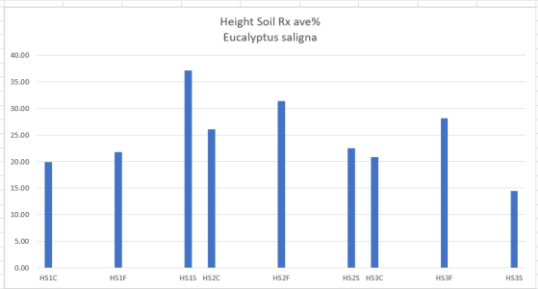
Row 1 - 1 - HS2C	No. of Plants	Vigour & Lushness	Colour	Stem Calliper	Plant Height
<i>Angophora floribunda</i>					
<i>Eucalyptus saligna</i>					
<i>Syncarpia glomulifera</i>					
<i>Acacia floribunda</i>					
<i>Dodonea triquetra</i>					
<i>Platylobium formosum</i>					
<i>Synoum glandulosum</i>					
<i>Adiantum aethiopicum</i>					
<i>Hibbertia scandens</i>					
<i>Tylophora barbata</i>					
ALL MEASUREMENTS IN mm		Vigour & Lushness	Colour (for species)		
Date:		Actively growing	5	Very green/red	5
Measurement By:		Growing	4	Pale green/red	4
Data Entry By:		Stagnant	3	Interveinal yellowing	3
		Declining	2	Yellow	2
		Dead	1	Brown	1
General Observations:					

Field data observations:

- Growth and vigour
- Colour
- Number of surviving plants
- Stem Caliper at 100mm above soil
- Plant height
- Spread (grasses and climbers)
- Number of stems (certain plants)

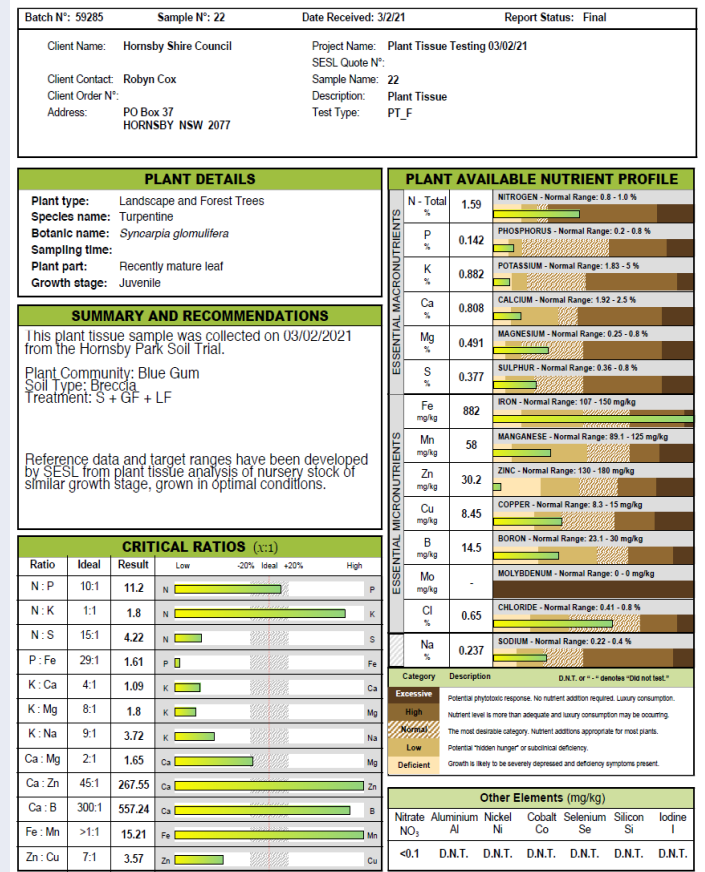
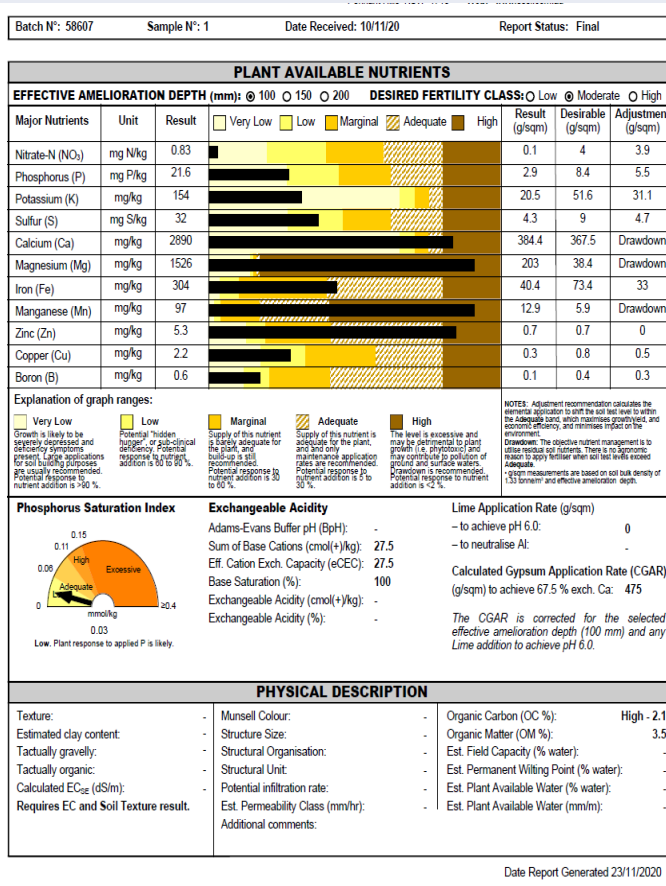
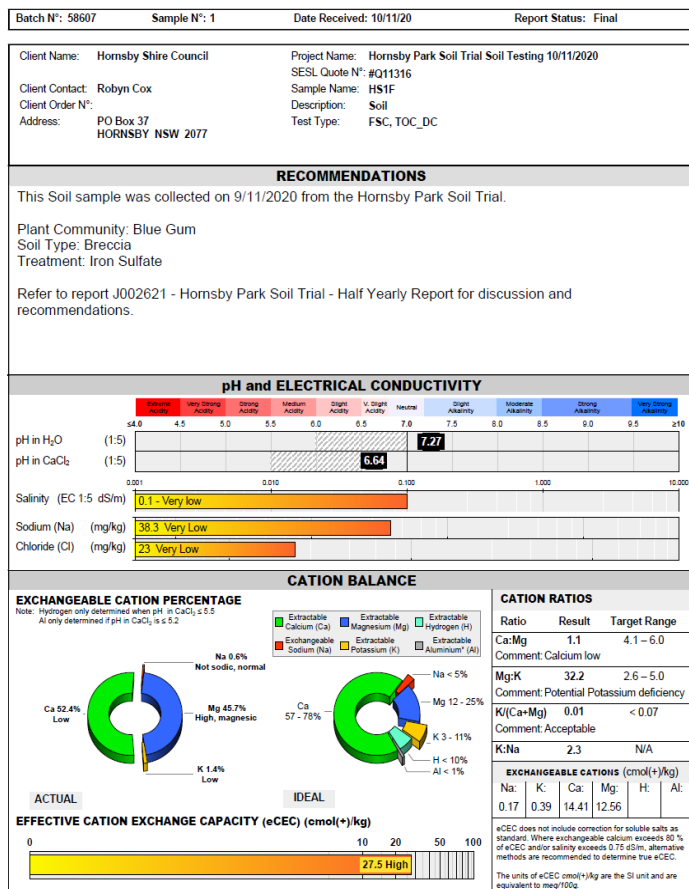


Soil trial – results (tree height)



Soil trial – results

(Laboratory soil and plant tissue culture results)

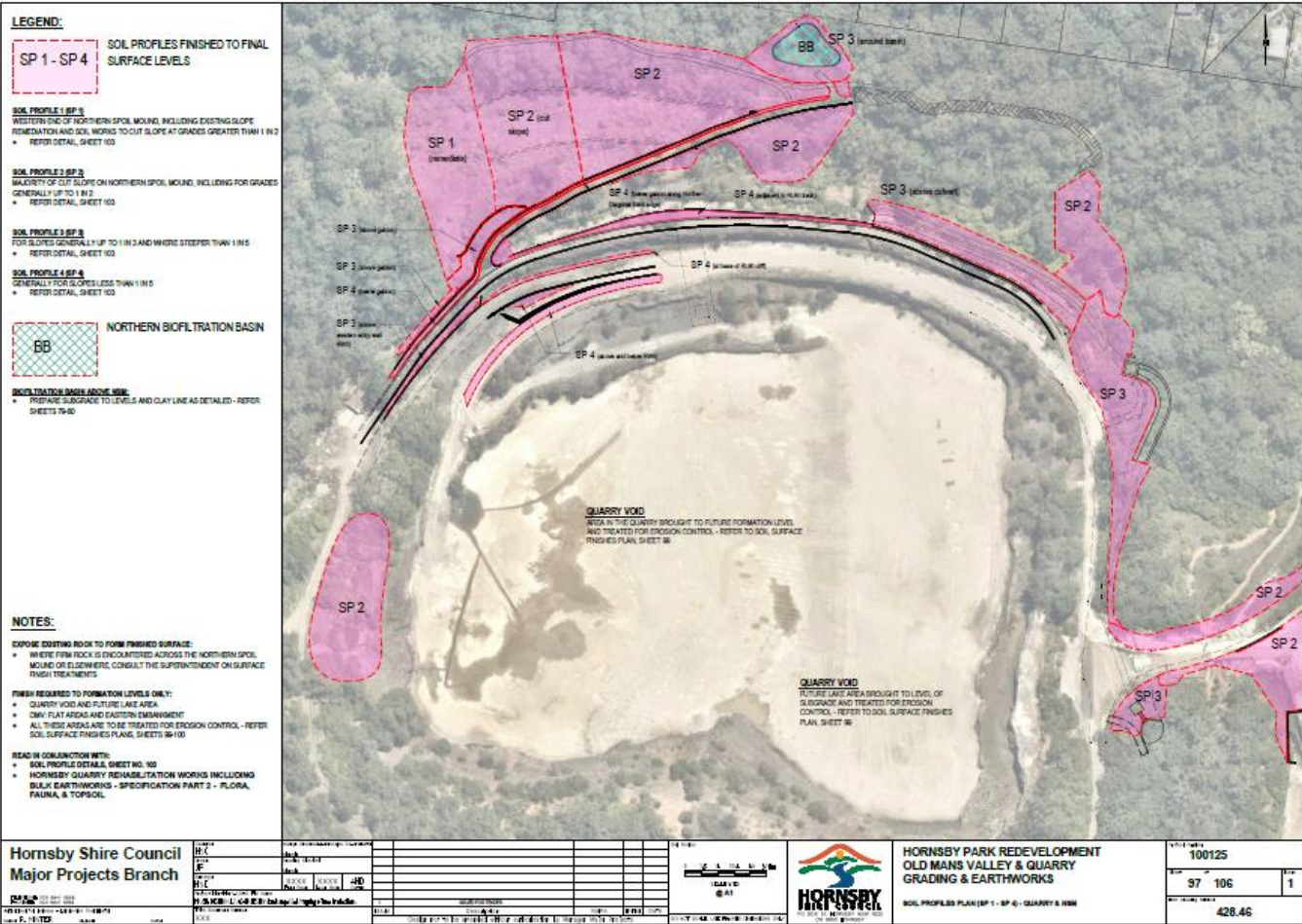


Soil trial to implementation - creating soils in the Quarry

Soil creation process:

- Site soil sampling
- Chemical and physical analysis
- Evaluation of results against benchmark soil requirements
- Determination of ameliorants supported by soil trial results
- Batch mixing of soil in situ or in piles depending upon site location within the Quarry
- Soil application according to specifications
- Additional soil sampling and analysis for confirmation prior to planting
- Any further ameliorants applied if required

Soil creation – areas to be revegetated



Soil creation – soil sampling



Plate 1. Sample 1 Location and Limit of Investigation (West)

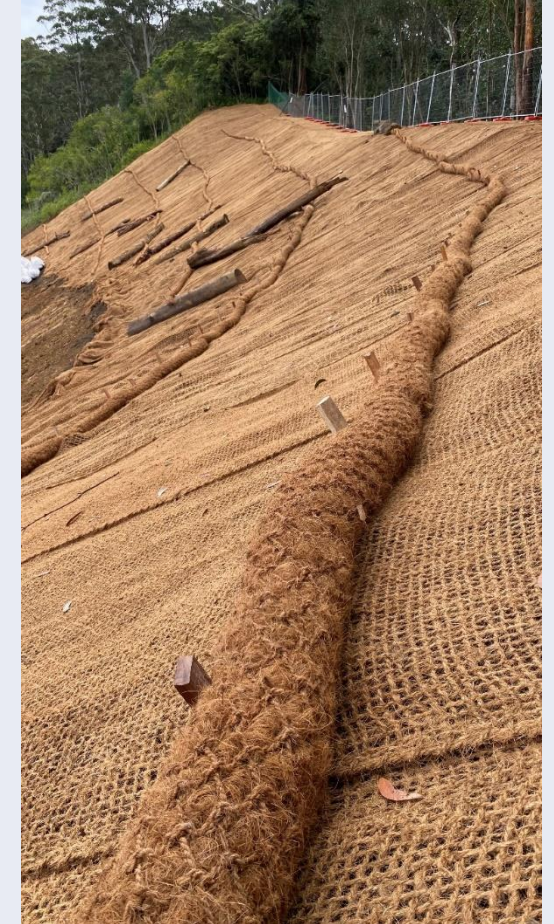


Plate 3. Sample 2 Area

Soil creation – batch mixing and soil application



Soil creation – batch mixing and application



Revegetation – seed collection



Revegetation - propagation



Revegetation - planting



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