

Hotham-Williams River Action Plan

Boraning Detailed site plan



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Newmont
AUSTRALIA



PHCC
Working Together

Prepared for
Peel-Harvey Catchment Council

By **Urbaqua**

June 2022

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Acknowledgements

Urbaqua would like to acknowledge the following organisations for their significant contribution to this project:

1. Peel-Harvey Catchment Council.
2. Newmont Boddington.
3. Shire of Williams.
4. South32 Worsley Alumina.

Peel-Harvey Catchment Council - Hotham-Williams River Action Plan

Figure 1: Boraning Site Concept - Restoration Plan

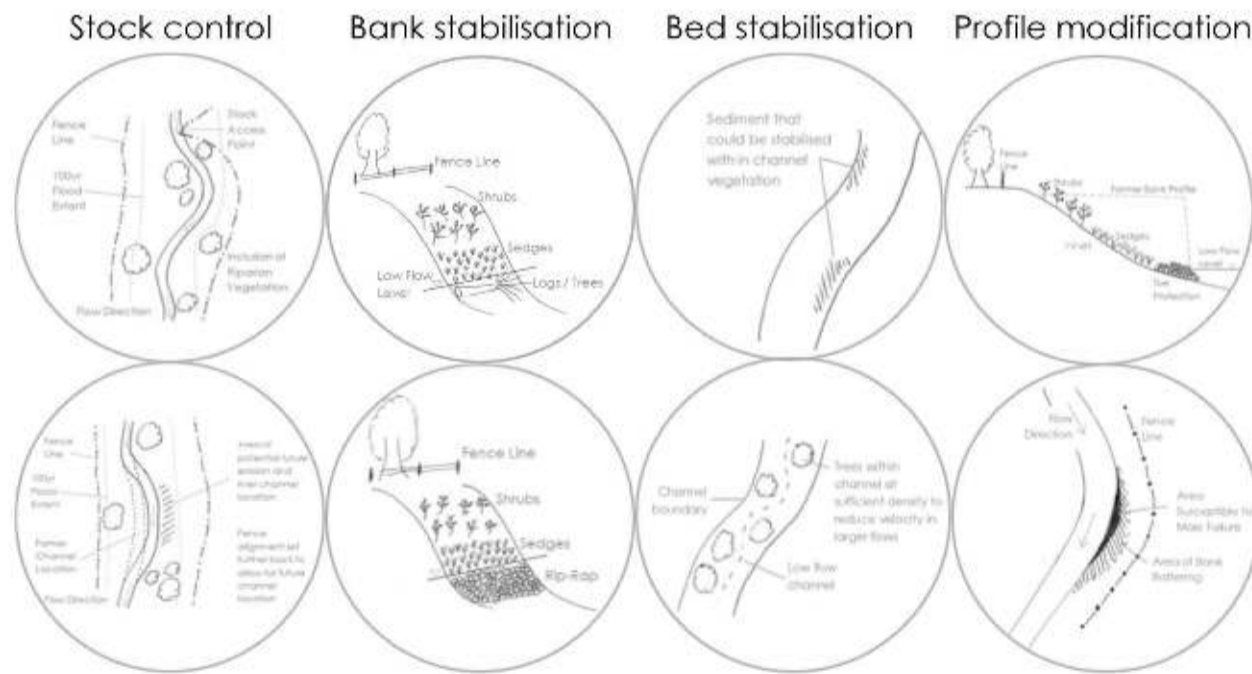
- Legend**
- Revegetation**
- Comprehensive restoration of 30m riparian buffer zone
 - Spot removal/replacement of weeds and problem exotics
- Bank stability**
- Bank stabilisation where required (may include remedial works associated with removal of couch grass)



Existing conditions:



Bank and channel interventions:



Revegetation examples:

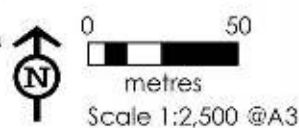


Notes:

- 1 Revegetation – comprehensive weed removal and revegetation of minimum 10m riparian buffer in these areas (30m preferred where tenure and land-use allow).
- 2 Revegetation – spot removal of weeds and problem exotics, replacement with native species where necessary.
- 3 Recommend removal of couch grass in small sections, regrading of steep banks where possible and replacement with native vegetation. Where banks cannot be regraded effectively, pinned geotextile or hessian matting may be required to stabilise during establishment.

Project activities outside of the main focal areas on public land will be in close consultation with neighbouring landholders.

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1 SITE DESCRIPTION

The Boraning site is surrounded by rural land use to the east, and the Boraning Reserve to the west, containing remnant vegetation connecting to the road reserve. The river transitions from multiple, parallel channels into a single channel with minor meanders towards the Bridge. The main channel features banks up to 2 m deep with a steep profile and a 4m wide low flow channel. Issues observed in the channel include steep banks and undercutting, as well as the deposit of sediments.

Riparian vegetation is dominated by species of Melaleuca shrubs and scattered trees (Eucalyptus sp.) resulting in limited stream shading. Ground cover is largely exotic, including turf grass (couch) that has colonised sediment deposits within the main channel.

2 CONSULTATION

Consultation with key stakeholders and the community commenced in February 2021 and has included the following:

- Presentation to Shire of Williams, with no specific feedback given.
- Information session for the local community, with no specific feedback given.

3 CONCEPT DESCRIPTION

The defining features of the site guiding recommendations for management action are:

- Lack of public access and location adjacent to Boraning Reserve.
- Difficult site access for maintenance.
- Presence of largely intact fencing on the eastern side (adjacent to the rural land).
- Large amounts of couch grass which is currently stabilising large portions of the banks.

Accordingly, the key recommendations are to undertake quite significant weed removal and bank stabilisation works (Figure 1 and Figure 2).

4 PROPOSED WORKS

The proposed works are detailed in Figure 1 and are recommended as follows.

4.1.1 River restoration

- Comprehensive weed removal in degraded areas with spot weed removal and control of exotics in other areas (see Figure 1). It should be noted that the removal of couch grass, targeting exotic species, is undertaken in sections to minimise the risk of large-scale erosion.
- Regrading of steep banks where possible and replacement with native vegetation. Where this is not possible, undertake bank stabilisation works as indicated in Figures 1 and 2. Where banks are modified but unable to achieve a 1:3 grade, some form of matting is likely to be required. This may also be required where the sediment is sandy or otherwise unstable.
- Revegetation of minimum 10m riparian corridor, extending to 30m where permitted by land tenure and land use.

Couch grass removal

Couch grass removal should be undertaken carefully targeting exotic species only and noting that native couch grass (*Sporobolus virginicus* (L.) Kunth) has been observed and should be retained when it is present.



Native Couch Grass (*Sporobolus virginicus* (L.) Kunth)

Hand removal of exotic couch grass may not be possible as all rhizomes must be removed. Small infestations may be dug out, ensuring removal of all rhizomes and stolons. However, it is difficult to eradicate without herbicides.

Herbicides, such as 1% Glyphosate, where used should be applied in late spring/summer and autumn when rhizomes are actively growing. In sensitive areas try painting runners or crowns with 50% Glyphosate. Follow-up is nearly always required. Treatment is particularly effective after fire. Read the manufacturers' labels and material safety data sheets before using herbicides. Optimum treatment is from November to February (<https://florabase.dpaw.wa.gov.au/browse/profile/283>).

Removal of exotic couch grass is recommended to be undertaken in small sections to maintain overall bank integrity and should be followed by immediate regrading of steep banks where possible and replacement with native vegetation. Where banks cannot be regraded effectively, pinned geotextile should be used to stabilise during planting and establishment.

Estimated quantities for river restoration works:

Item	Unit	Amount
Temporary fencing	Length (m)	780
Rocks (d50 = 200mm)	Volume (cum)	-
Geofabric	Area (sqm)	550
Revegetation	Area (sqm)	45,230

Notes:

1. Temporary fencing will be installed to protect sections of comprehensive revegetation.
2. Geofabrics will be installed to banks identified for bank stability measures (as per Figure 1).

4.1.2 Adjacent landowner management

PHCC works with landholders in offering advice about managing natural areas, and opportunities for access to funding when it is available.

This communication process can occur with owners of properties located next to the Boraning site, with the aim of future on-ground projects such as revegetation, weed control, and protection of existing vegetation, particularly in relation to the River ecosystem.

5 NEXT STEPS

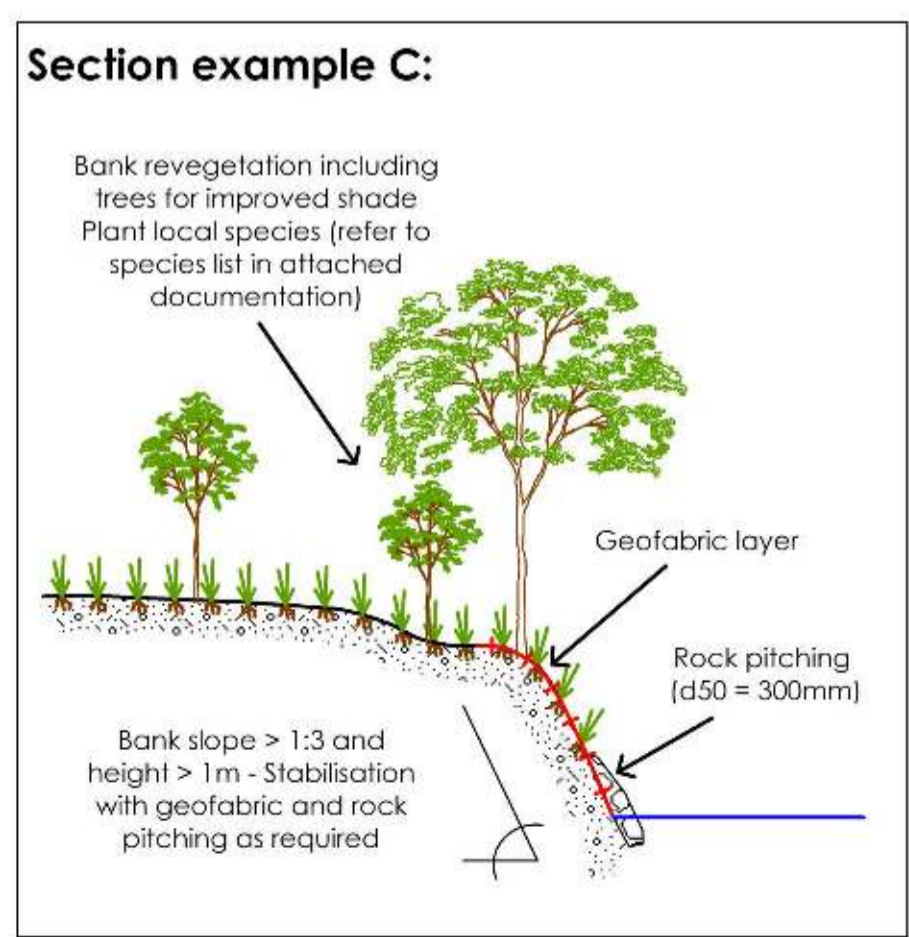
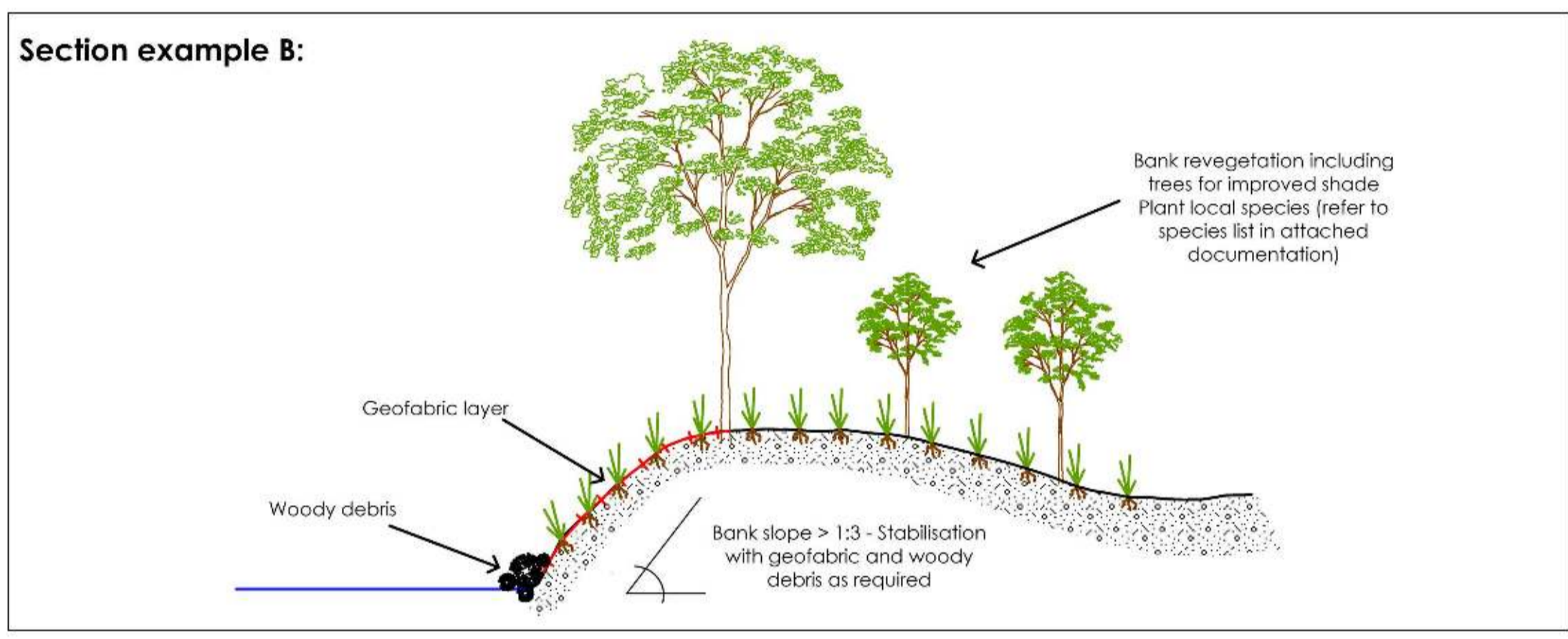
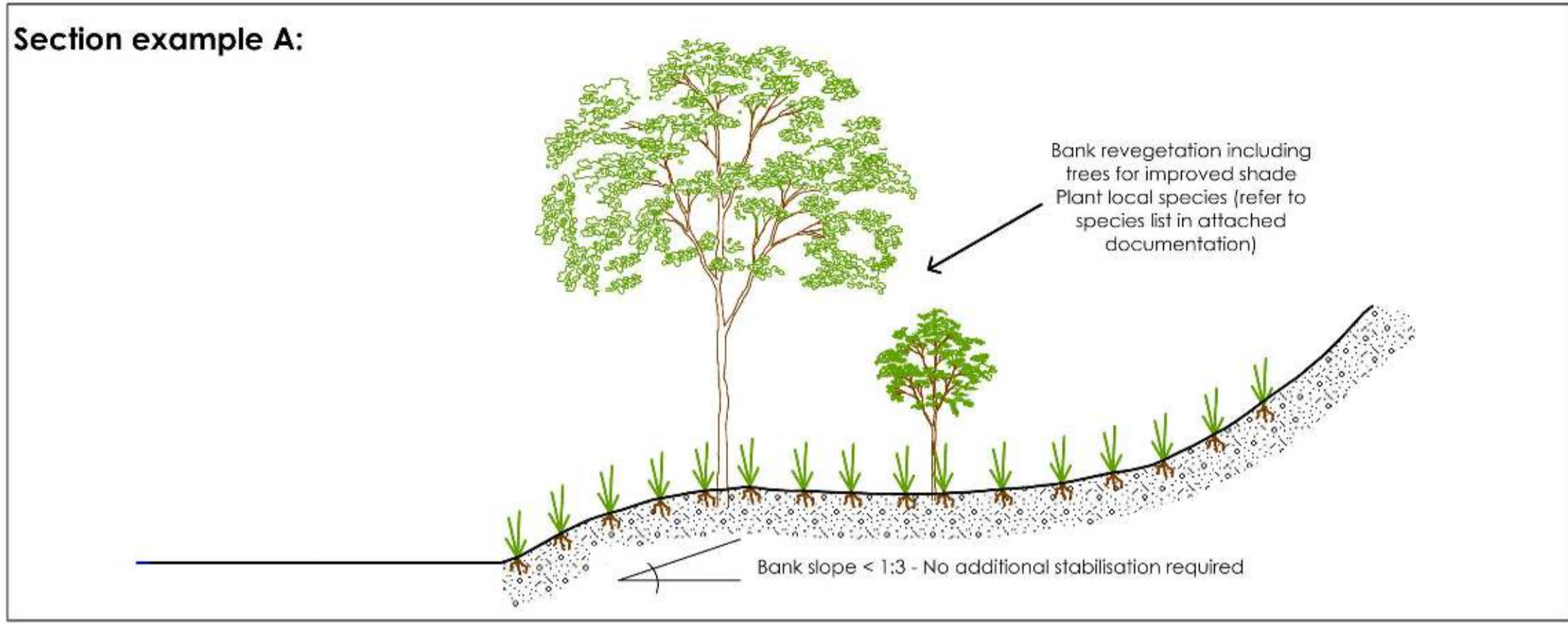
Delivery of the plan will be guided by available funding. Further detailed consideration is required to develop a staged plan for weed removal and bank regrading and/or stabilisation to mitigate the risk of erosion and sediment transport including specification of materials, quantities, and installation of bank stabilisation structures.

Other considerations for the implementation of the works include:

- Prioritisation of environmental restoration aspects of the plan, with secured funding.
- Further funding for restoration activities to be investigated and applied for with project partners.
- Aboriginal Heritage Approvals process through Department of Planning, Lands and Heritage.
- Approvals for modification of bed and banks through Department of Water and Environmental Regulation.
- Implementation of low impact activities such as revegetation, weed control and feral animal control.
- Formal partnership with representatives from the Noongar community.
- Formal partnership with Local Governments to seek funding for the parts of the plans involving public amenity.

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Figure 2: Boraning site concept - Cross section plan



- Notes:**
- Minor modification of bank shape may be required for vehicle/equipment access and/or local stabilisation.
- Geo-fabric (slopes steeper than 1:3):
 - o Install below summer water levels (under rock pitching).
 - o Install around existing vegetation where required.
 - o Laid in direction of flow at base of slopes (to 1m above summer w.l.).
 - o Roll geofabric downslope over remainder of bank.
 - o Bury at top of bank.
 - o Pin as per manufacturer requirements.
 - o Overlap geo-fabric maps by 100mm.
 - o Include slits for planting.
 - Rock pitching (on slopes steeper than 1:3 and higher than 1m):
 - o d50 size of 300mm.
 - o Hard, durable rocks that are not susceptible to weathering.
 - o Larger rocks to be installed at the base of the slopes.
 - o Smaller rocks to be used to fill gaps and form tightly packed layer.
 - o Two layers of rocks.
 - o Rock pitching grade >1:2.
 - o Rock pitching to be installed to at least 1m above summer w.l.
 - o Toe trench, up to 400mm (back filled with rocks).
 - Woody debris (tree trunks, collapsed trees) may be used instead of rock pitching depending on local conditions, access or availability of material:
 - o Pinned/anchored to (or buried into) the bank.
 - o Aligned in a downstream direction.
 - o Use only native species.

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Not to scale



Client: Peel-Harvey Catchment Council

Report	Version	Prepared by	Reviewed by	Submitted to Client	
				Copies	Date
Draft	V1	SSh	HBr	electronic	1 October 2021
Final report	V2	SSh/HBr	HBr	electronic	15 February 2022
Revised final report	V3	SSh/HBr	HBr	electronic	8 April 2022
Revised final report	V4	SSh/HBr	HBr	electronic	27 April 2022
Revised final report	V5	SSh/HBr	HBr	electronic	28 June 2022

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