

Locality Plan



Site Overview

181 Cummings Road in Maddingley measures approximately 70 hectares in size and is located 47 kilometres west of Melbourne. The site is bordered by Parwan Creek and the currently operating Maddingley Coal Mine to the north, rural properties to the south, Cummings Road and rural properties to the east and Parwan Creek and rural properties to the west. Historically, the northern third of the site operated as an open cut coal mine from 1950 until 1979. Once operations at the mine were ceased, the mine void was filled with water and turned into an artificial dam. A basalt quarry and sand mine were operational on the central part of the land from 1985 until 2006. The southern third of the site has been used for pastoral farming since the 1860's. Significant past alteration of the landform, the hydrology and soil composition in conjunction with vegetation clearance and severe erosion has resulted in a degraded and dilapidated site. The proposed works represent a valuable opportunity to remediate land that has been degraded for some time. The proximity of the site to Parwan Creek reiterates the need for a holistic approach to any works undertaken on the land. Erosion, weed management, pest animals, surface water runoff and ongoing land management are essential considerations to any remediation works.

The Proposal

An open, eucalypt woodland to 15m tall occupying poorly drained, fertile soils on flat or gently undulating plains would have occurred across most of the land prior to European settlement and the mining operations. The land adjacent to the Parwan Creek would have also been a eucalypt-dominated woodland to 15m tall but with a scattered shrub layer. The implementation of fill, re-grading of the ground plane and remediation of the former quarry void, mines and surrounds, and the land adjacent to the Parwan Creek will aid in soil stabilisation, reduce the quantity of run-off and sediment entering the Creek, assist with managing downstream flooding and provide habitat to local fauna including the nationally threatened Growling Grass Frog (*Litoria raniformis*). These works, in association with ongoing management, will ensure establishment of the revegetation species, reduce the presence of pest plant and animal species, provide habitat to local fauna and reduce water runoff from the site and erosion.



Site Plan



Movement of Fill Audit Process

The Star Dam site will operate under the management and systems of the Maddingley Brown Coal Landfill site, directly to the north of the site, across the Parwan Creek. Clean fill destined for the Star Dam site will have to complete a Maddingley Brown Coal Clean Fill Declaration Form and come over the weighbridge at the Maddingley Brown Coal Landfill Site. Non-conforming loads identified by weighbridge personnel are managed under the Maddingley Brown Coal Non-conforming Procedure and will not arrive at Star Dam. Conforming loads will traffic from the Maddingley Brown Coal Landfill site to the Star Dam.

Fill and Remediation Process

Conforming loads of clean fill from the Maddingley Brown Coal Landfill site will enter the Star Dam site from the existing access point on Cummings Road. To remove dirt from the tyres and underside of trucks and other vehicles, a heavy duty rumble grid will be located at this existing site access point. This will aid in keeping nearby roads free from dirt and debris and create a safer and cleaner work site. A staging plan is contained on Page 2. As the rehabilitation works progress, the layout of temporary access routes across the site will change. Trucks will enter, traverse and tip the clean fill in the appropriate working area before exiting the site over the rumble grid. Trucks will enter and exit the site at same point, at the existing northern access gate.



Image: Example of truck traversing a rumble grid. Source: Google



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AJD

SCALE:

1:2500

PAPER SIZE:

A1

REFERENCE:

200510

DATE:

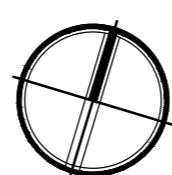
15.07.2020

REVISION:

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SHEET:

1 of 3



0 25 50 75 100 125 metres
Scale 1:2500 @ A1

CLIENT:

Maddingley Brown Coal

ADDRESS:

181 Cummings Road, Maddingley

MUNICIPALITY:

Moorabool Shire Council

TOWN PLANNING ISSUE
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Proposed Works Plan

Existing Contours (1m interval), Proposed Contours (5m interval) and Staging Plan



Parwan River and Remediation of the Adjacent Landscape

The soils adjacent to the Parwan Creek are shallow with a stiff clay subsoil admitting low water infiltration. The topsoil becomes saturated during heavy rains and, combined with historic land use including clearing and heavy grazing, is washed away. The channelling of water across the then exposed soil results in the extensive gully erosion evident on site. The best methods of stabilising soil and protecting against gully erosion includes stabilising the ground plane and reducing runoff. The regrading of the existing soil profile and the introduction of fill will aid in stabilising the site whilst revegetation with suitable indigenous species is an excellent method of reducing run off and suppressing weeds. In accordance with the Catchment and Land Protection Act (1994), noxious weed species including the present Common Prickly Pear, Serrated Tussock and African Box-thorn, must be controlled. Precision control methods that minimise off-target kills should be used in environmentally sensitive areas such as adjacent to the Parwan Creek and in proximity to Star Dam.

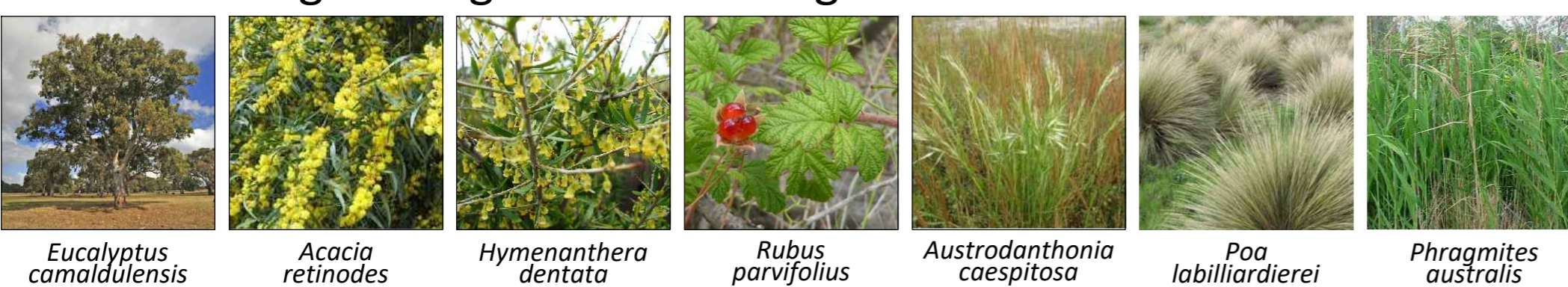
Creekline Revegetation Plant Schedule

VICTORIAN VOLCANIC PLAIN BIOREGION ECOLOGICAL VEGETATION CLASSES CREEKLINE GRASSY WOODLAND (EVC 68)						
AREA: 35,300m ²						
BOTANIC NAME	COMMON NAME	SIZE (MATURITY)	RECOMMEND POT SIZE	% COVER	PLANTING DENSITY	QUANTITY
TREES				15% (5,295m²)		
<i>Acacia melanoxylon</i>	Blackwood	12-15 x 5	Tubestock	40%	n/a	40
<i>Eucalyptus camaldulensis</i>	River Red-gum	30 x 15	Tubestock	60%	n/a	32
SHRUBS				15% (5,295m²)		
<i>Acacia retinodes</i>	Wirilda	4-6 x 4	Tubestock	100%	0.2 per 1m ²	1,059
GRASSES				65% (22,945m²)		
<i>Austrodanthonia caespitosa</i>	Common Wallaby-grass	1 x 1	Seed	35%	1 per 1m ²	8,031
<i>Austrodanthonia racemosa var. racemosa</i>	Stiped Wallaby-grass	1 x 1	Seed	35%	1 per 1m ²	8,031
<i>Poa labillardierei</i>	Common Tussock-grass	1 x 1	Seed	20%	1 per 1m ²	4,589
<i>Phragmites australis</i>	Common Reed	1 x 1	Seed	10%	1 per 1m ²	2,295
GROUNDCOVERS / CLIMBERS				5% (1,765m²)		
<i>Glycine cladestina</i>	Twining Glycine	climber	Seed	33%	2 per 1m ²	1,177
<i>Microlaena stipoides var. stipoides</i>	Weeping Grass	0.1 x prostrate	Seed	33%	4 per 1m ²	2,353
<i>Oxalis perennans</i>	Grassland Wood-sorrel	0.2 x prostrate	Seed	33%	4 per 1m ²	2,353

Creekline Verge Revegetation Plant Schedule

VICTORIAN VOLCANIC PLAIN BIOREGION ECOLOGICAL VEGETATION CLASSES CREEKLINE GRASSY WOODLAND (EVC 68) AND PLAINS GRASSY WOODLAND						
AREA: 62,000m ²						
BOTANIC NAME	COMMON NAME	SIZE (MATURITY)	RECOMMEND POT SIZE	% COVER	PLANTING DENSITY	QUANTITY
TREES				15% (9,300m²)		
<i>Acacia melanoxylon</i>	Blackwood	12-15 x 5	Tubestock	40%	n/a	45
<i>Eucalyptus camaldulensis</i>	River Red-gum	30 x 15	Tubestock	60%	n/a	65
SHRUBS				15% (9,300m²)		
<i>Acacia retinodes</i>	Wirilda	4-6 x 4	Tubestock	40%	0.2 per 1m ²	744
<i>Enchylaena tomentosa var. tomentosa</i>	Ruby Saltbush	0.5-1.0 x 1.0	Seed	10%	1 per 1m ²	930
<i>Hymenanthera dentata</i>	Tree Violet	4-6 x 3-4	Seed	40%	0.2 per 1m ²	744
<i>Rubus parvifolius</i>	Small-leaf Bramble	1 x 1	Seed	10%	1 per 1m ²	930
GRASSES				65% (40,300m²)		
<i>Austrodanthonia caespitosa</i>	Common Wallaby-grass	1 x 1	Seed	35%	1 per 1m ²	14,105
<i>Austrodanthonia racemosa var. racemosa</i>	Stiped Wallaby-grass	1 x 1	Seed	35%	1 per 1m ²	14,105
<i>Poa labillardierei</i>	Common Tussock-grass	1 x 1	Seed	20%	1 per 1m ²	8,060
<i>Phragmites australis</i>	Common Reed	1 x 1	Seed	10%	1 per 1m ²	4,030
GROUNDCOVERS / CLIMBERS				5% (3,100m²)		
<i>Microlaena stipoides var. stipoides</i>	Weeping Grass	0.1 x prostrate	Seed	100%	4 per 1m ²	12,400

Creekline Verge Revegetation Planting Palette



Soil Additives and Soil Conditioning

The imported soils for the planting zones (top metre of fill) will have additives to best match the soil drainage, aeration and moisture retention requirements of the proposed species. The species have been taken from ecological vegetation classes that group plants that would have likely occurred together prior to settlement and land clearing. These plants have similar soil requirements. Additives for inclusion are gypsum, greensand, peat, manure, sand and compost.



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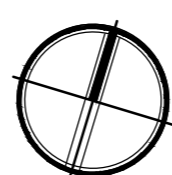
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DRAWN: AJD
SCALE: 1:4000
PAPER SIZE: A1

REFERENCE: 200510
DATE: 15.07.2020
REVISION: - SHEET: 2 of 3



0 50 100 150 200 metres
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Star Dam and Creation of Growing Grass Frog Habitat

Sites for safe management of naturally occurring Possible Acid Sulphate Soil (PASS) materials are required to support significant infrastructure projects in Victoria. A safe way of managing PASS material is to prevent exposure to air that can result in the oxidation of pyrite within the soils and formation of acid. Placing PASS material below the water table in a void such as the Star Dam is a safe management method for these materials. The nationally threatened Growing Grass Frog (*Litoria raniformis*) was once common and widespread throughout much of south-eastern Australia. Habitat loss has seen a significant decline in the populations of the species. Growing Grass Frogs require still or slow-moving water with emergent vegetation around the edges and mats of floating or submerged plants. The placement of PASS and the rehabilitation of the surrounds will produce a habitat that will be significantly enhanced for Growing Grass Frogs. Key enhancements will include a greater range of water depth to provide microclimates within the dam, more vegetation for food and cover from predators, rock banks for basking and localised water warming. In addition, the banks will be more resistant to wave erosion and support a greater range of aquatic and emergent vegetation.

Growing Grass Frog Habitat Vegetation

Tall emergent vegetation provides protection to adult frogs from predation while submerged and floating attached vegetation protects tadpoles and eggs. Rock piles, grass and shrub cover on the banks protects emerging froglets from predators.

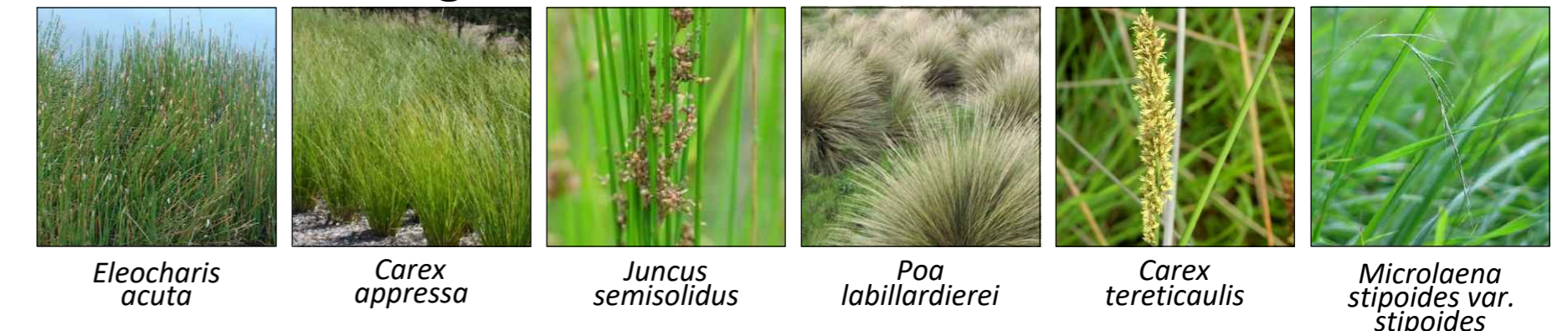
Growing Grass Frog Habitat Vegetation

MELBOURNE WATER CONSTRUCTED WETLAND SYSTEMS - DESIGN GUIDELINES PERMANENT WATER BODY - BASALTIC SOILS AREA: 45,400m ²				
BOTANIC NAME	COMMON NAME	PLANTING DENSITY	RECOMMEND POT SIZE	% COVER OF ZONE
SUBMERGED MARSH - 0.4-0.9m BELOW NORMAL TOP WATER LEVEL				
<i>Potamogeton ochreatus</i>	Blunt Pondweed	2 per 1m ²	Tubestock	50%
<i>Vallisneria americana</i>	Eel-grass	2 per 1m ²	Tubestock	50%
DEEP MARSH - 0.2-0.4m BELOW NORMAL TOP WATER LEVEL				
<i>Eleocharis sphacelata</i>	Tall Spike-rush	4 per 1m ²	Tubestock	25%
<i>Schoenoplectus tabernaemontani</i>	River Club-rush	4 per 1m ²	Tubestock	25%
<i>Triglochin procerum</i>	Water Ribbons	4 per 1m ²	Tubestock	25%
<i>Vallisneria americana</i>	Small-leaf Bramble	4 per 1m ²	Tubestock	25%
SHALLOW MARSH - 0-0.2m BELOW NORMAL TOP WATER LEVEL				
<i>Baumea articulata</i>	Jointed Twig-rush	4 per 1m ²	Tubestock	25%
<i>Bolboschoenus medianus</i>	Marsh Club-rush	4 per 1m ²	Tubestock	25%
<i>Juncus semisolidus</i>	Rush	4 per 1m ²	Tubestock	25%
<i>Schoenoplectus pungens</i>	Sharp Club-rush	4 per 1m ²	Tubestock	25%

Star Dam Wetland Margin Plant Schedule

MELBOURNE WATER CONSTRUCTED WETLAND SYSTEMS - DESIGN GUIDELINES EPHEMERAL MARSH AND WETLAND MARGIN - BASALTIC SOILS AREA: 13,400m ²				
BOTANIC NAME	COMMON NAME	PLANTING DENSITY	RECOMMEND POT SIZE	% COVER OF ZONE
EPHEMERAL MARSH - ABOVE NORMAL WATER LEVEL, TEMPORALLY INUNDATED DURING HIGH FLOWS				
<i>Carex tereticaulis</i>	Basket Sedge	6 per 1m ²	Seed	33%
<i>Eleocharis acuta</i>	Common Spike-sedge	6 per 1m ²	Seed	33%
<i>Poa labillardierei</i>	Common Tussock-gra	6 per 1m ²	Seed	33%
EPHEMERAL WETLAND - ABOVE NORMAL WATER LEVEL, FREQUENTLY INUNDATED				
<i>Carex appressa</i>	Tall Sedge	6 per 1m ²	Tubestock	33%
<i>Juncus semisolidus</i>	Rush	6 per 1m ²	Tubestock	33%
<i>Poa labillardierei</i>	Common Tussock-gra	6 per 1m ²	Tubestock	33%
WETLAND MARGIN				
<i>Carex appressa</i>	Tall Sedge	6 per 1m ²	Tubestock	25%
<i>Carex tereticaulis</i>	Basket Sedge	6 per 1m ²	Tubestock	25%
<i>Juncus semisolidus</i>	Rush	6 per 1m ²	Tubestock	25%
<i>Microlaena stipoides var. stipoides</i>	Weeping Grass	6 per 1m ²	Tubestock	25%

Star Dam Planting Palette

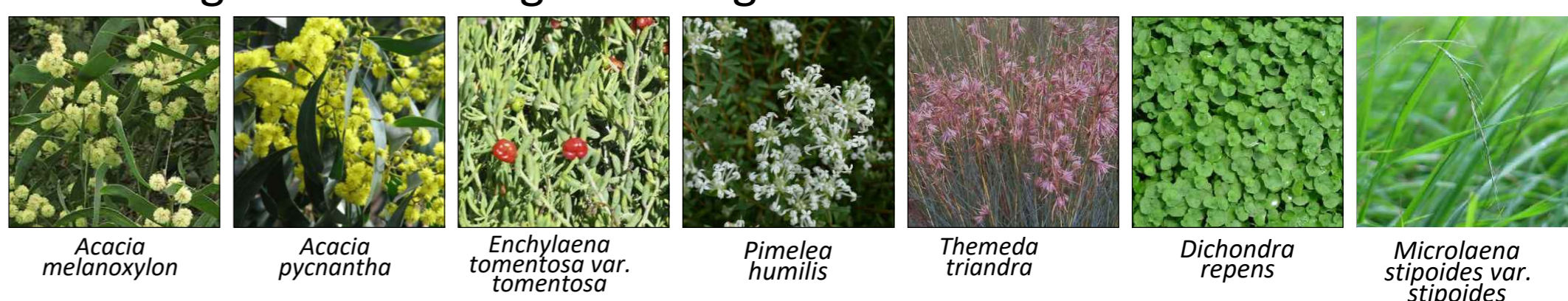


Cummings Road and Smith Street Frontage Plant Schedule

Buffer planting is proposed to the Cummings Road and Smith Street frontages of the site. Suitable plants have been selected from the Plains Grassy Woodland (#55) and Plains Grassland (#132) Ecological Vegetation Classes. This planting will provide a visual break between the road verge and the existing/proposed farming land.

VICTORIAN VOLCANIC PLAIN BIOREGION ECOLOGICAL VEGETATION CLASSES PLAINS GRASSY WOODLAND (EVC 55) & PLAINS GRASSLAND (EVC 132) AREA: 14,200m ²						
BOTANIC NAME	COMMON NAME	SIZE (MATURITY)	RECOMMEND POT SIZE	% COVER	PLANTING DENSITY	QUANTITY
TREES				15% (2,130m²)		
<i>Acacia melanoxylon</i>	Blackwood	12-15 x 5	Tubestock	30%	n/a	15
<i>Acacia pycnantha</i>	Golden Wattle	4-8 x 4	Tubestock	30%	n/a	15
<i>Eucalyptus camaldulensis</i>	River Red-gum	30 x 15	Tubestock	40%	n/a	20
SHRUBS				25% (3,550m²)		
<i>Acacia paradoxa</i>	Hedge Wattle	2-3 x 3-4	Tubestock	40%	0.3 per 1m ²	473
<i>Enchylaena tomentosa var. tomentosa</i>	Ruby Saltbush	0.5-1.0 x 1.0	Seed	10%	1 per 1m ²	355
<i>Hymenanthera dentata</i>	Tree Violet	4-6 x 3-4	Seed	40%	0.2 per 1m ²	284
<i>Pimelea humilis</i>	Common Rice-flower	0.3 - 0.6 x 0.5	Seed	10%	2 per 1m ²	710
GRASSES				50% (7,100m²)		
<i>Austrodanthonia caespitosa</i>	Common Wallaby-grass	1 x 1	Seed	15%	1 per 1m ²	1,065
<i>Poa labillardierei</i>	Common Tussock-grass	1 x 1	Seed	35%	1 per 1m ²	2,485
<i>Themeda triandra</i>	Kangaroo Grass	1 x 1	Seed	50%	1 per 1m ²	3,550
GROUNDCOVERS / CLIMBERS				10% (1,420m²)		
<i>Dichondra repens</i>	Kidney Weed	prostrate	Seed	50%	4 per 1m ²	2,840
<i>Microlaena stipoides var. stipoides</i>	Weeping Grass	0.1 x prostrate	Seed	50%	4 per 1m ²	2,840

Cummings Road Frontage Planting Palette



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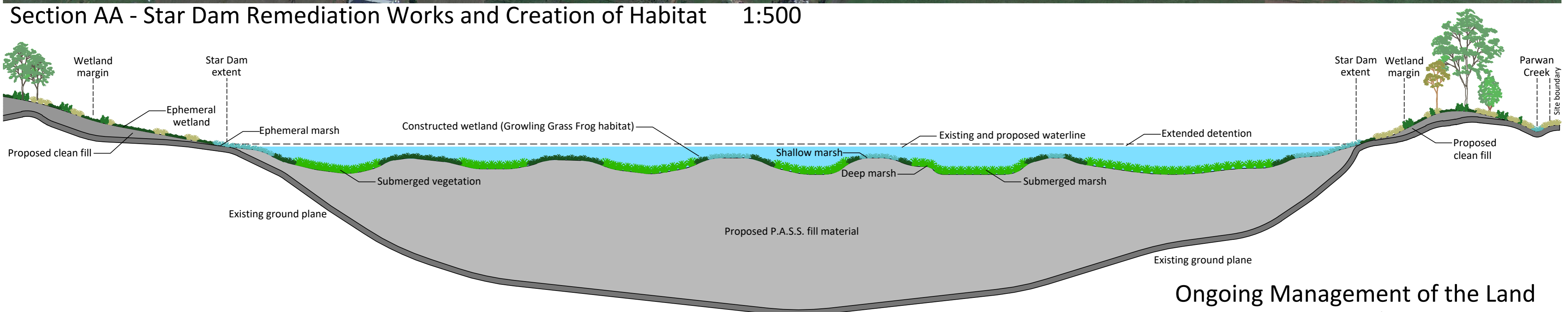
CLIENT: Maddingley Brown Coal
ADDRESS: 181 Cummings Road, Maddingley
MUNICIPALITY: Moorabool Shire Council

Proposed
Works Plan

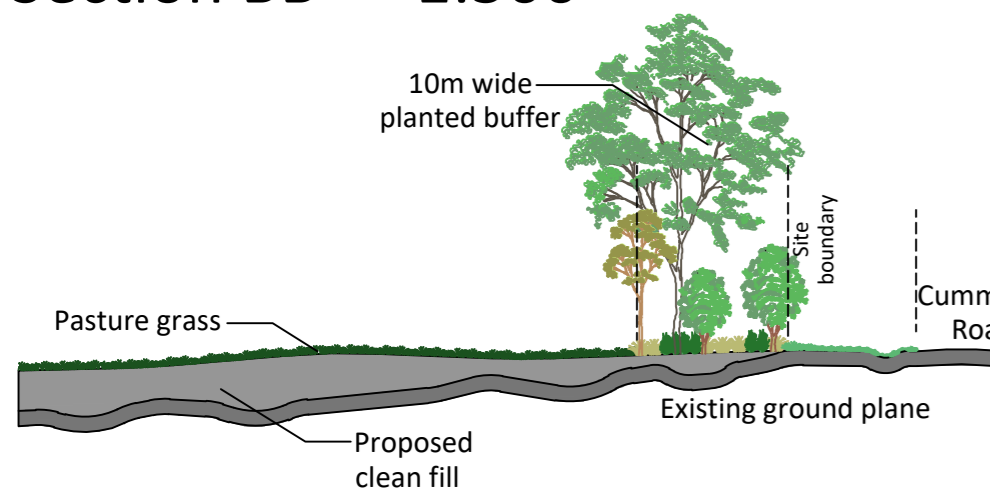
Illustrative Concept Aerial



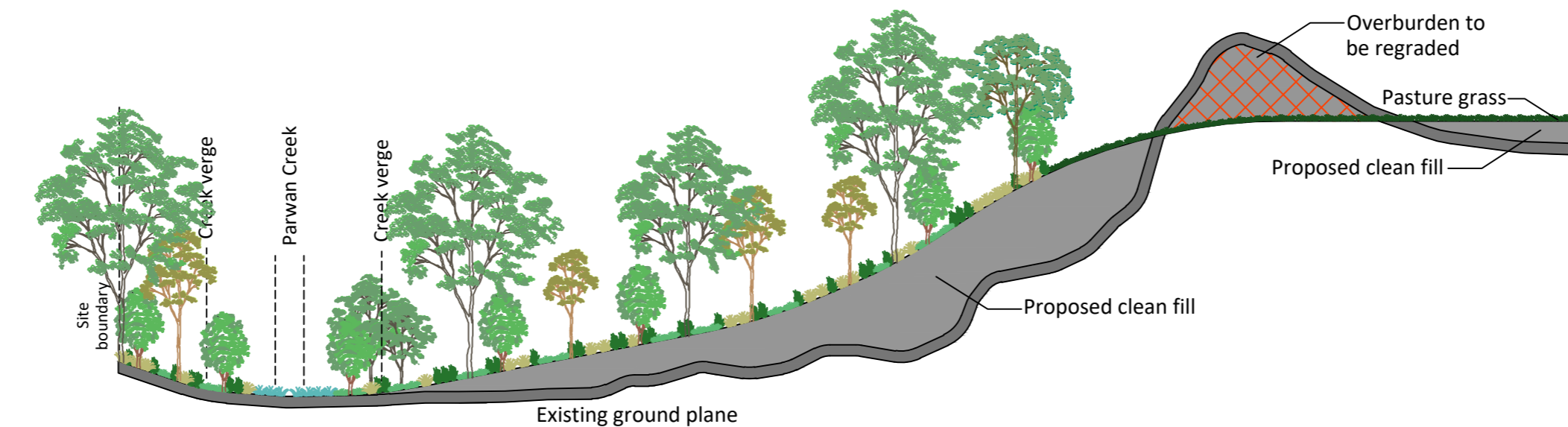
Section AA - Star Dam Remediation Works and Creation of Habitat 1:500



Section BB 1:500



Section CC 1:500



Ongoing Management of the Land

The site was initially purchased for pastoral use with the land grazed and cropped prior to the 1950's. This activity still occurs on the southern third of the site. The landscape in this location is more stable, generally devoid of the pest plant species evident elsewhere on site and there is reduced gully and tunnel erosion. The proposal for the land south of Star Dam and west of graded land adjacent to Parwan Creek is the reprofiling of degraded land to a gently undulating ground plane. As outlined on the plan, sensitive areas of the landscape (roadside verges, land adjacent to the creek, etc) will be vegetated with suitable indigenous species. The less sensitive areas of the site will be sown with pasture grasses and cropped as part of ongoing management. Access routes will be defined and managed accordingly while the management strategies outlined in the Growing Grass Frog Management Plan prepared by Zone Environmental will be in place. Protection measures will be executed during the remediation works.



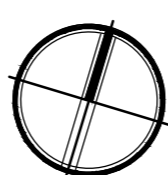
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0 25 50 75 100 125 metres
Scale 1:2500 @ A1
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Proposed Works Plan