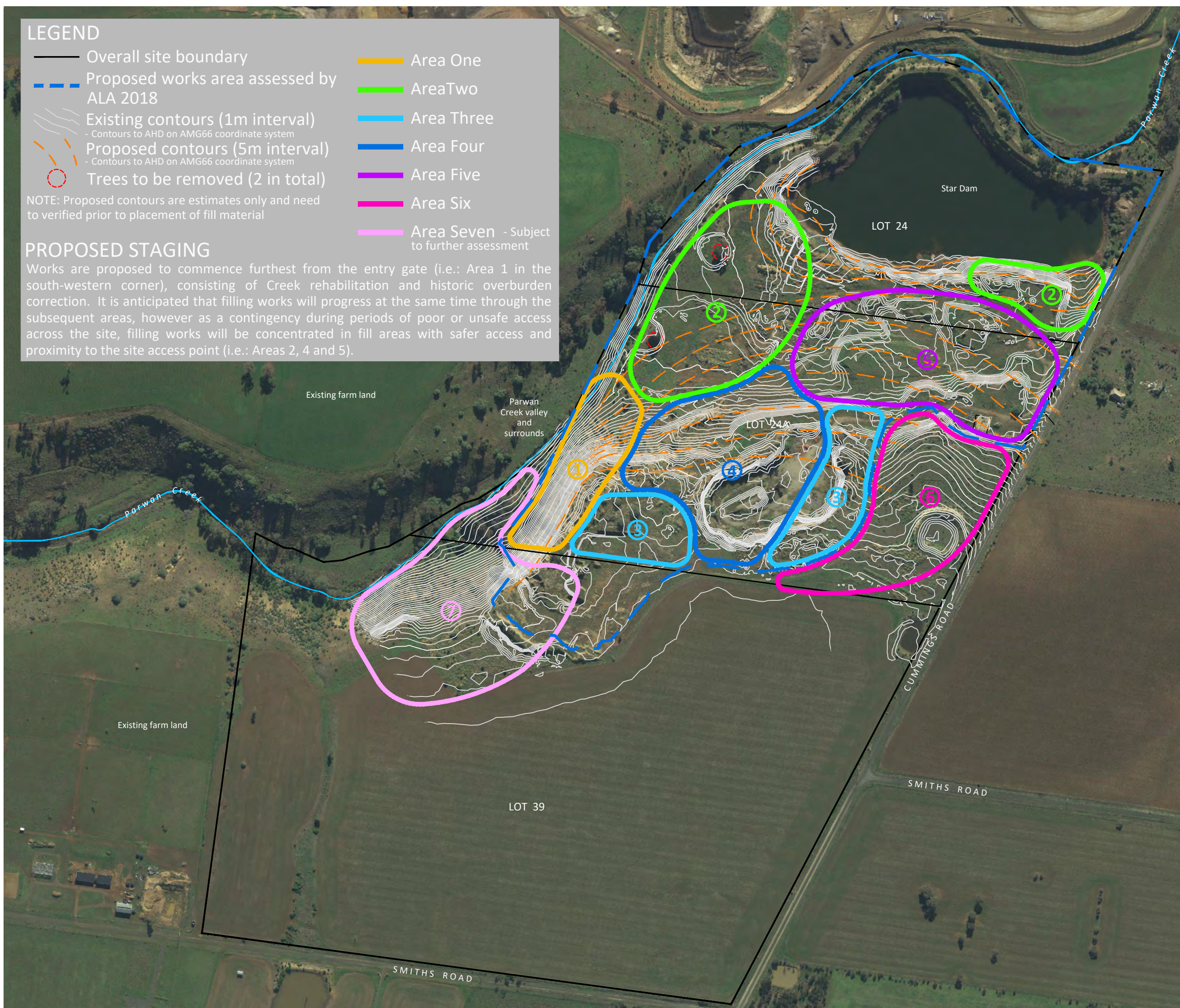






## Existing Contours (1m interval), Proposed Contours (5m interval) and Areas of Works



## 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 material 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. Weed treatment and weed management is a priority action for soil stabilisation and habitat generation.

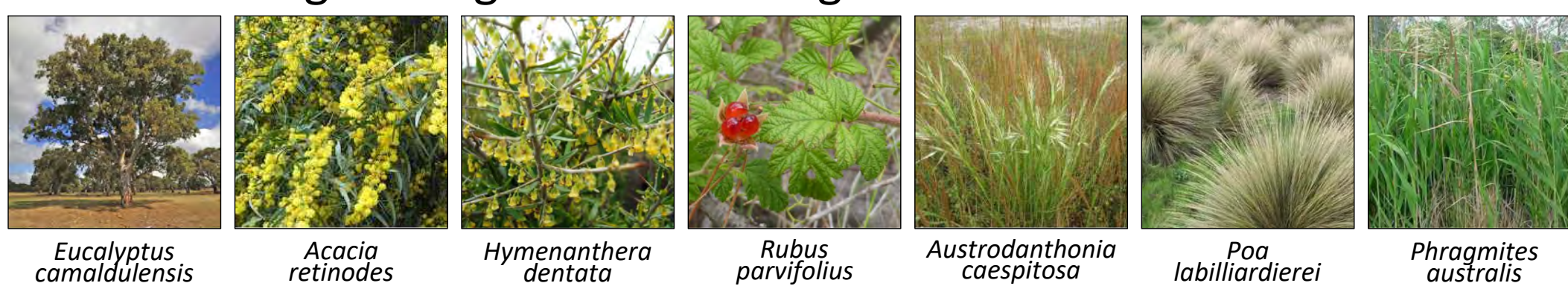
### Creeklime Revegetation Plant Schedule

VICTORIAN VOLCANIC PLAIN BIOREGION ECOLOGICAL VEGETATION CLASSES						
CREEKLIME GRASSY WOODLAND (EVC 68)						
AREA: 22,000m <sup>2</sup>						
BOTANIC NAME	COMMON NAME	SIZE (MATURITY)	RECOMMEND POT SIZE	% COVER	PLANTING DENSITY	QUANTITY
<b>TREES</b>						
15% (3,300m <sup>2</sup> )						
<i>Acacia melanoxylon</i>	Blackwood	12-15 x 5	150mm	40%	n/a	25
<i>Eucalyptus camaldulensis</i>	River Red-gum	30 x 15	150mm	60%	n/a	20
<b>SHRUBS</b>						
15% (3,300m <sup>2</sup> )						
<i>Acacia retinodes</i>	Wirilda	4-6 x 4	Tubestock	100%	0.2 per 1m <sup>2</sup>	660
<b>GRASSES</b>						
65% (14,300m <sup>2</sup> )						
<i>Austrodanthonia caespitosa</i>	Common Wallaby-grass	1 x 1	Tubestock	35%	1 per 1m <sup>2</sup>	5,005
<i>Austrodanthonia racemosa var. racemosa</i>	Stiped Wallaby-grass	1 x 1	Tubestock	35%	1 per 1m <sup>2</sup>	5,005
<i>Poa labillardierei</i>	Common Tussock-grass	1 x 1	Tubestock	20%	1 per 1m <sup>2</sup>	2,860
<i>Phragmites australis</i>	Common Reed	1 x 1	Tubestock	10%	1 per 1m <sup>2</sup>	1,430
<b>GROUNDCOVERS / CLIMBERS</b>						
5% (1,100m <sup>2</sup> )						
<i>Glycine cladestina</i>	Twining Glycine	climber	Tubestock	33%	2 per 1m <sup>2</sup>	726
<i>Microlaena stipoides var. stipoides</i>	Weeping Grass	0.1 x prostrate	Seed	33%	4 per 1m <sup>2</sup>	1,452
<i>Oxalis perennans</i>	Grassland Wood-sorrel	0.2 x prostrate	Tubestock	33%	4 per 1m <sup>2</sup>	1,452

### Creeklime Revegetation Plant Schedule

VICTORIAN VOLCANIC PLAIN BIOREGION ECOLOGICAL VEGETATION CLASSES						
CREEKLIME GRASSY WOODLAND (EVC 68) AND PLAINS GRASSY WOODLAND						
AREA: 33,000m <sup>2</sup>						
BOTANIC NAME	COMMON NAME	SIZE (MATURITY)	RECOMMEND POT SIZE	% COVER	PLANTING DENSITY	QUANTITY
<b>TREES</b>						
15% (4,950m <sup>2</sup> )						
<i>Acacia melanoxylon</i>	Blackwood	12-15 x 5	150mm	40%	n/a	24
<i>Eucalyptus camaldulensis</i>	River Red-gum	30 x 15	150mm	60%	n/a	35
<b>SHRUBS</b>						
15% (4,950m <sup>2</sup> )						
<i>Acacia retinodes</i>	Wirilda	4-6 x 4	Tubestock	40%	0.2 per 1m <sup>2</sup>	396
<i>Enchylaena tomentosa var. tomentosa</i>	Ruby Saltbush	0.5-1.0 x 1.0	Tubestock	10%	1 per 1m <sup>2</sup>	495
<i>Hymenathera dentata</i>	Tree Violet	4-6 x 3-4	Tubestock	40%	0.2 per 1m <sup>2</sup>	396
<i>Rubus parvifolius</i>	Small-leaf Bramble	1 x 1	Tubestock	10%	1 per 1m <sup>2</sup>	495
<b>GRASSES</b>						
65% (21,450m <sup>2</sup> )						
<i>Austrodanthonia caespitosa</i>	Common Wallaby-grass	1 x 1	Tubestock	35%	1 per 1m <sup>2</sup>	7,508
<i>Austrodanthonia racemosa var. racemosa</i>	Stiped Wallaby-grass	1 x 1	Tubestock	35%	1 per 1m <sup>2</sup>	7,508
<i>Poa labillardierei</i>	Common Tussock-grass	1 x 1	Tubestock	20%	1 per 1m <sup>2</sup>	4,290
<i>Phragmites australis</i>	Common Reed	1 x 1	Tubestock	10%	1 per 1m <sup>2</sup>	2,145
<b>GROUNDCOVERS / CLIMBERS</b>						
5% (1,650m <sup>2</sup> )						
<i>Microlaena stipoides var. stipoides</i>	Weeping Grass	0.1 x prostrate	Seed	100%	4 per 1m <sup>2</sup>	6,600

### Creeklime Revegetation Planting Palette



## Soil Additives and Soil Conditioning

The imported soils for the planting zones (top metre of fill material) 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.

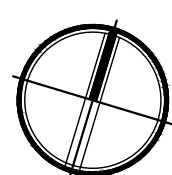


REVISION	DATE	DESCRIPTION	BY
-	04.08.2020	Works Plan prepared	AJD
A	13.10.2020	Client review - minor amendments	AJD
B	04.02.2022	Amendment to study area boundary	AJD

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SCALE: 1:4000  
PAPER SIZE: A1

REFERENCE: 200510  
DATE: 04.02.2022  
REVISION: B SHEET: 2 of 3



0 50 100 150 200 metres  
Scale 1:4000 @ A1

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## Star Dam and Creation of Growling 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 Growling 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. A Growling Grass Frog Survey Report was undertaken by Water Technology (2020) and found the subject site had the opportunity to provide habitat and refuge for the nationally threatened species. Growling 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 Growling 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, an island, 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.

## Growling 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.

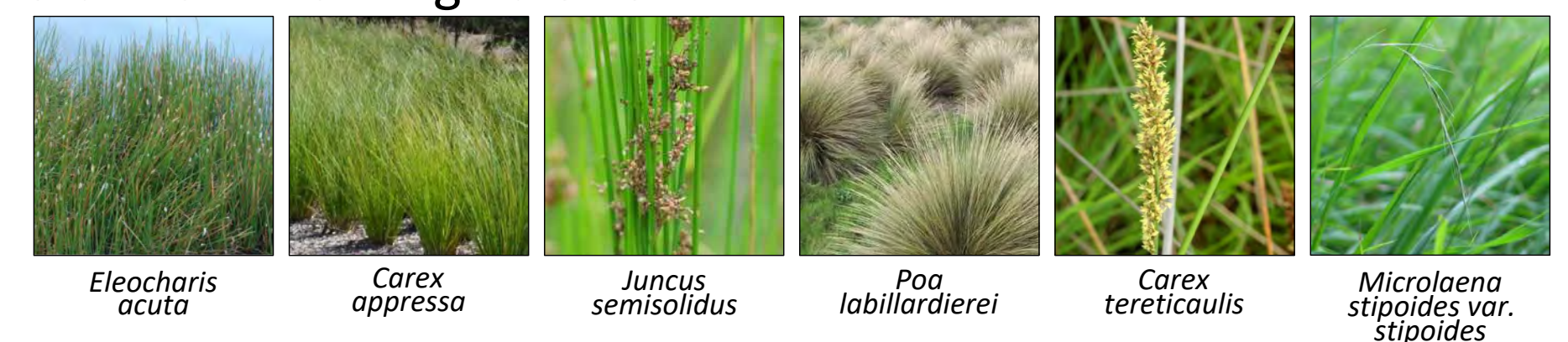
## Growling Grass Frog Habitat Vegetation

MELBOURNE WATER CONSTRUCTED WETLAND SYSTEMS - DESIGN GUIDELINES				
PERMANENT WATER BODY - BASALTIC SOILS				
AREA: 45,400m <sup>2</sup>				
BOTANIC NAME	COMMON NAME	PLANTING DENSITY	RECOMMEND POT SIZE	% COVER OF ZONE
<b>SUBMERGED MARSH - 0.4-0.9m BELOW NORMAL TOP WATER LEVEL</b>				
<i>Potamogeton ochreatus</i>	Blunt Pondweed	2 per 1m <sup>2</sup>	Tubestock	50%
<i>Vallisneria americana</i>	Eel-grass	2 per 1m <sup>2</sup>	Tubestock	50%
<b>DEEP MARSH - 0.2-0.4m BELOW NORMAL TOP WATER LEVEL</b>				
<i>Eleocharis sphacelata</i>	Tall Spike-rush	4 per 1m <sup>2</sup>	Tubestock	25%
<i>Schoenoplectus tabernaemontani</i>	River Club-rush	4 per 1m <sup>2</sup>	Tubestock	25%
<i>Triglochin procerum</i>	Water Ribbons	4 per 1m <sup>2</sup>	Tubestock	25%
<i>Vallisneria americana</i>	Small-leaf Bramble	4 per 1m <sup>2</sup>	Tubestock	25%
<b>SHALLOW MARSH - 0-0.2m BELOW NORMAL TOP WATER LEVEL</b>				
<i>Baumea articulata</i>	Jointed Twig-rush	4 per 1m <sup>2</sup>	Tubestock	25%
<i>Bolboschoenus medianus</i>	Marsh Club-rush	4 per 1m <sup>2</sup>	Tubestock	25%
<i>Juncus semisolidus</i>	Rush	4 per 1m <sup>2</sup>	Tubestock	25%
<i>Schoenoplectus pungens</i>	Sharp Club-rush	4 per 1m <sup>2</sup>	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 <sup>2</sup>				
BOTANIC NAME	COMMON NAME	PLANTING DENSITY	RECOMMEND POT SIZE	% COVER OF ZONE
<b>EPHEMERAL MARSH - ABOVE NORMAL WATER LEVEL, TEMPORALLY INUNDATED DURING HIGH FLOWS</b>				
<i>Carex tereticaulis</i>	Basket Sedge	6 per 1m <sup>2</sup>	Seed	33%
<i>Eleocharis acuta</i>	Common Spike-sedge	6 per 1m <sup>2</sup>	Seed	33%
<i>Poa labillardierei</i>	Common Tussock-grass	6 per 1m <sup>2</sup>	Seed	33%
<b>EPHEMERAL WETLAND - ABOVE NORMAL WATER LEVEL, FREQUENTLY INUNDATED</b>				
<i>Carex appressa</i>	Tall Sedge	6 per 1m <sup>2</sup>	Tubestock	33%
<i>Juncus semisolidus</i>	Rush	6 per 1m <sup>2</sup>	Tubestock	33%
<i>Poa labillardierei</i>	Common Tussock-grass	6 per 1m <sup>2</sup>	Tubestock	33%
<b>WETLAND MARGIN</b>				
<i>Carex appressa</i>	Tall Sedge	6 per 1m <sup>2</sup>	Tubestock	25%
<i>Carex tereticaulis</i>	Basket Sedge	6 per 1m <sup>2</sup>	Tubestock	25%
<i>Juncus semisolidus</i>	Rush	6 per 1m <sup>2</sup>	Tubestock	25%
<i>Microlaena stipoides var. stipoides</i>	Weeping Grass	6 per 1m <sup>2</sup>	Tubestock	25%

## Star Dam Planting Palette

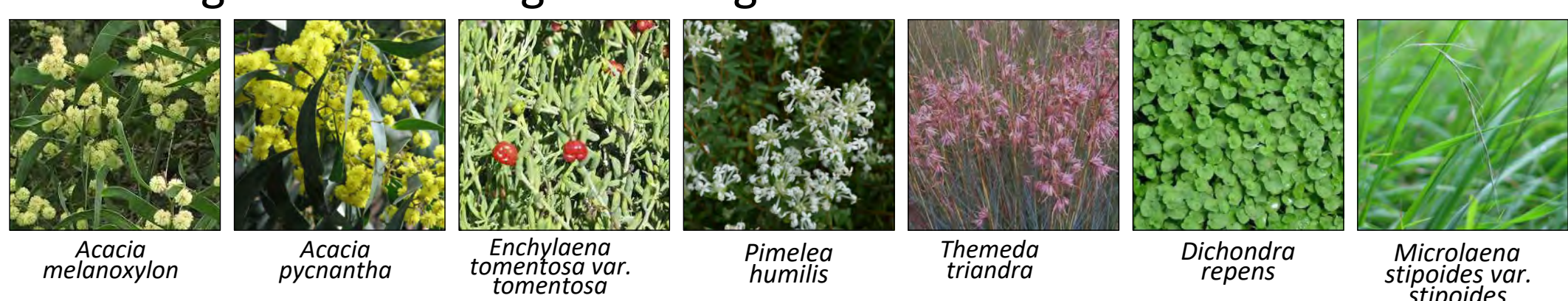


## Cummings Road Frontage Plant Schedule

Buffer planting is proposed to the Cummings Road frontage 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: 5,825m <sup>2</sup>						
BOTANIC NAME	COMMON NAME	SIZE (MATURITY)	RECOMMEND POT SIZE	% COVER	PLANTING DENSITY	QUANTITY
<b>TREES</b>						
15% (875m <sup>2</sup> )						
<i>Acacia melanoxylon</i>	Blackwood	12-15 x 5	150mm	30%	n/a	6
<i>Acacia pycnantha</i>	Golden Wattle	4-8 x 4	150mm	30%	n/a	6
<i>Eucalyptus camaldulensis</i>	River Red-gum	30 x 15	150mm	40%	n/a	8
<b>SHRUBS</b>						
25% (1,455m <sup>2</sup> )						
<i>Acacia paradoxa</i>	Hedge Wattle	2-3 x 3-4	Tubestock	40%	0.3 per 1m <sup>2</sup>	194
<i>Enchylaena tomentosa var. tomentosa</i>	Ruby Saltbush	0.5-1.0 x 1.0	Tubestock	10%	1 per 1m <sup>2</sup>	145
<i>Hymenathera dentata</i>	Tree Violet	4-6 x 3-4	Tubestock	40%	0.2 per 1m <sup>2</sup>	116
<i>Pimelea humilis</i>	Common Rice-flower	0.3 - 0.6 x 0.5	Tubestock	10%	2 per 1m <sup>2</sup>	290
<b>GRASSES</b>						
50% (2,915m <sup>2</sup> )						
<i>Austrodanthonia caespitosa</i>	Common Wallaby-grass	1 x 1	Tubestock	15%	1 per 1m <sup>2</sup>	437
<i>Poa labillardierei</i>	Common Tussock-grass	1 x 1	Tubestock	35%	1 per 1m <sup>2</sup>	1,020
<i>Themeda triandra</i>	Kangaroo Grass	1 x 1	Tubestock	50%	1 per 1m <sup>2</sup>	1,457
<b>GROUNDCOVERS / CLIMBERS</b>						
10% (580m <sup>2</sup> )						
<i>Dichondra repens</i>	Kidney Weed	prostrate	Viro-tubes	50%	4 per 1m <sup>2</sup>	1,160
<i>Microlaena stipoides var. stipoides</i>	Weeping Grass	0.1 x prostrate	Viro-tubes	50%	4 per 1m <sup>2</sup>	1,160

## Cummings Road Frontage Planting Palette



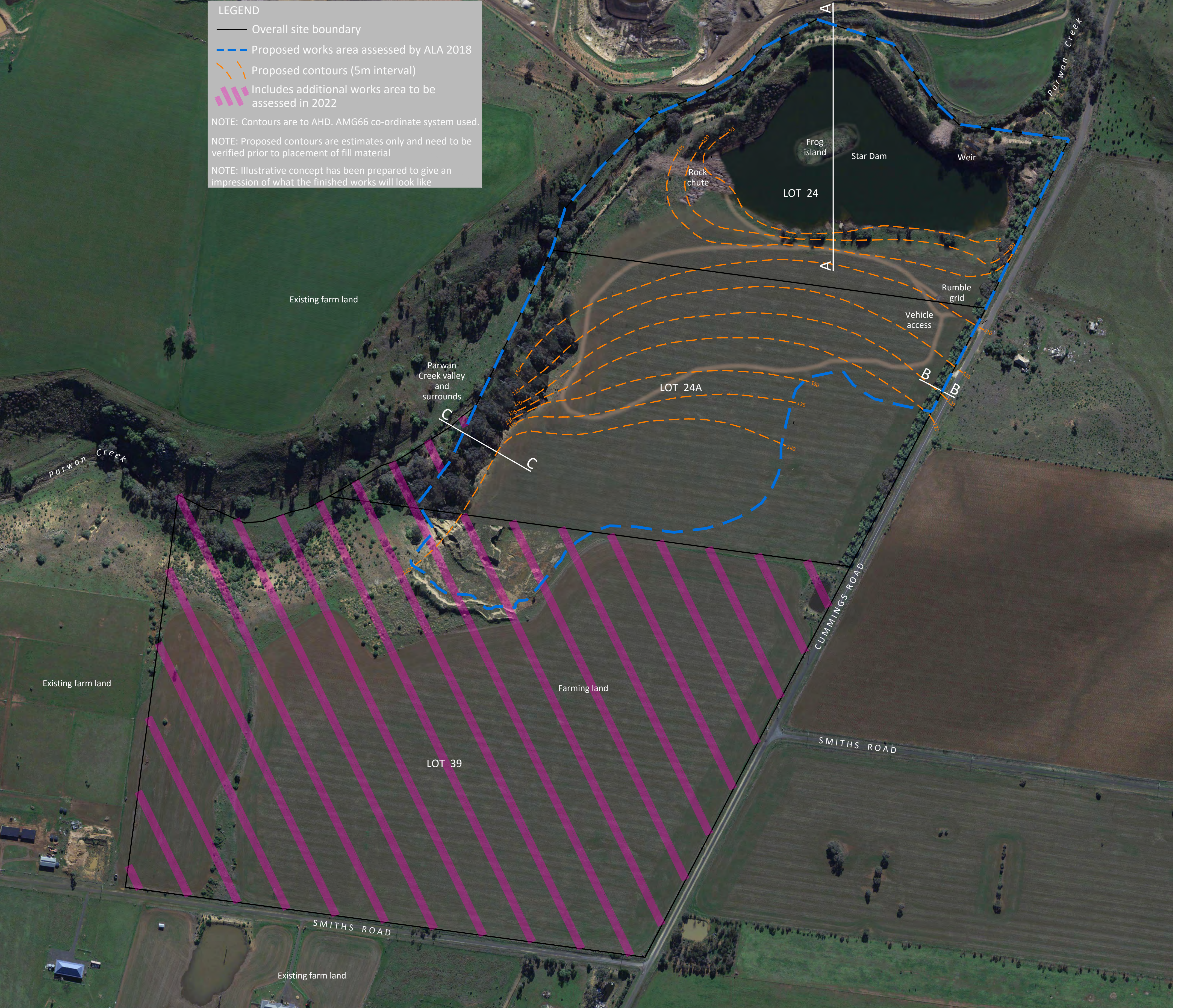
TOWN PLANNING ISSUE  
NOT TO BE USED AS WORKING DRAWING

CLIENT: Shinboner Nominees Pty Ltd  
ADDRESS: 181 Cummings Road, Maddingley  
MUNICIPALITY: Moorabool Shire Council

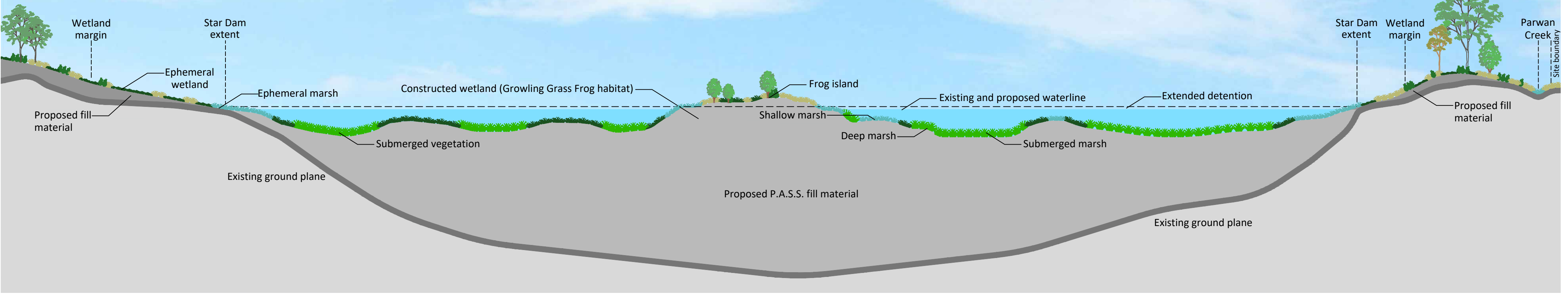
# Proposed Works Plan



# Illustrative Concept Aerial



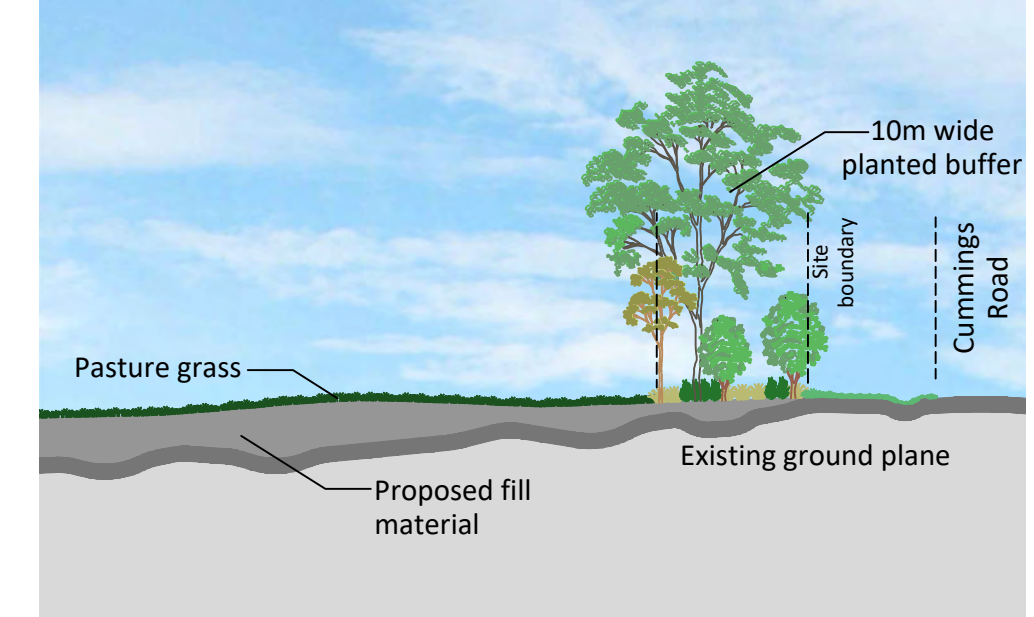
Section AA - Star Dam Remediation Works and Creation of Habitat 1:500



## Ongoing Management of the Land

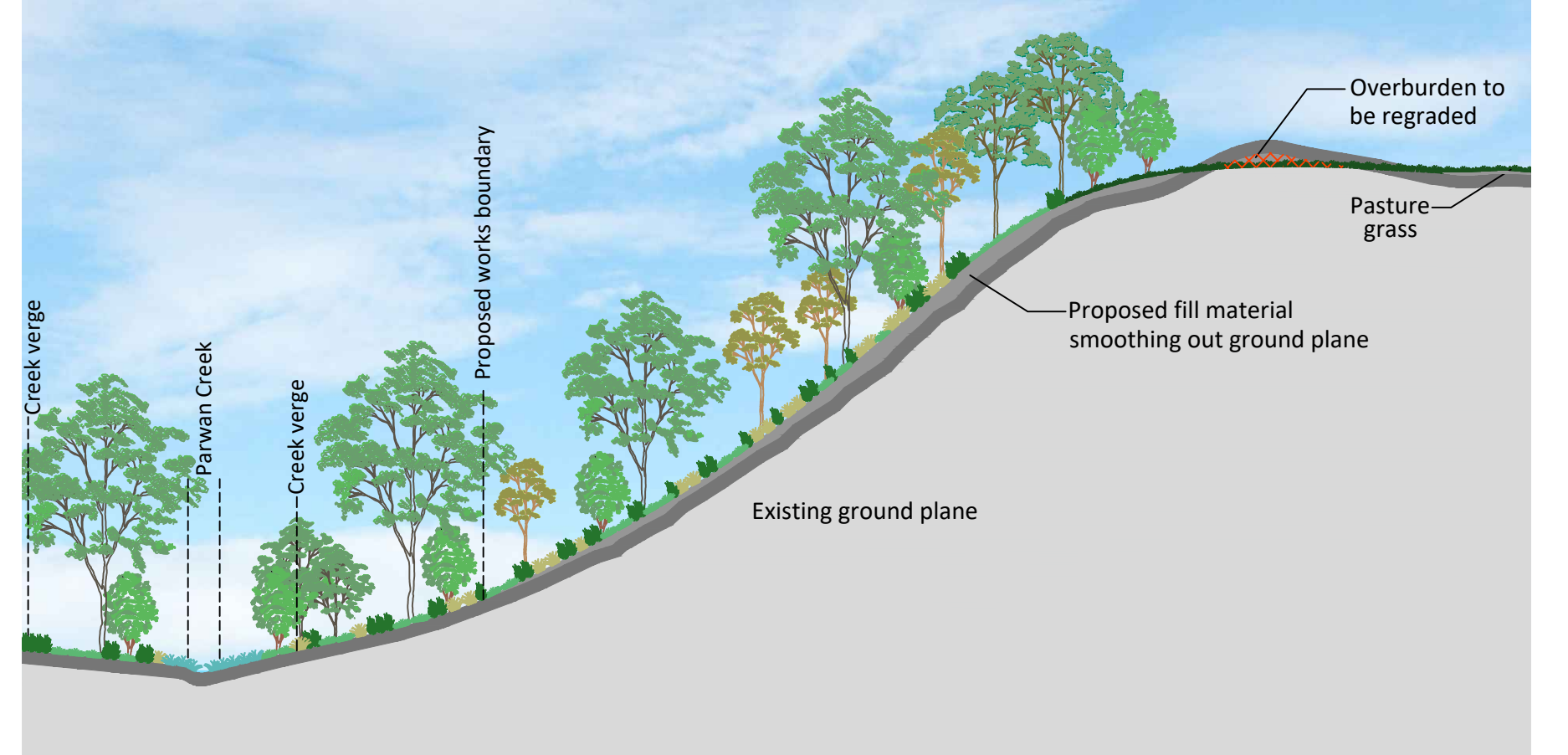
The site was initially purchased for pastoral use with the land grazed and cropped prior to the 1950's. This activity still occurs on the southern third of the site and is not affected by this proposal. The landscape in this location is more stable, generally devoid of the pest plant species evident 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.

Section BB 1:500



TOWN PLANNING ISSUE  
NOT TO BE USED AS WORKING DRAWING

Section CC 1:500



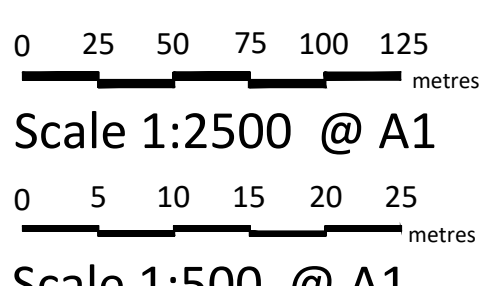
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REVISION	DATE	DESCRIPTION	BY
-	04.08.2020	Works Plan prepared	AJD
A	13.10.2020	Client review - minor amendments	AJD
B	04.02.2022	Amendment to study area boundary	AJD

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SCALE: **1:2500/1:500**  
PAPER SIZE: **A1**

REFERENCE: **200510**  
DATE: **04.02.2022**  
REVISION: **B** SHEET: **3 of 3**



CLIENT: **Shinboner Nominees Pty Ltd**  
ADDRESS: **181 Cummings Road, Maddingley**  
MUNICIPALITY: **Moorabool Shire Council**

# Proposed Works Plan