Eastern Creek Business Hub

Vegetation Management Plan

Prepared for
Western Sydney Parklands Trust

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Abbreviations

Abbreviation	Description
APZ	Asset Protection Zone
AW	Alluvial Woodland
BC Act	NSW *Biodiversity Conservation Act 2016*
BCAM	Biodiversity Certification Assessment Methodology
BCC	Blacktown City Council
CMP	Construction Management Plan
CPW	Cumberland Plain Woodland and Shale-Gravel Transition Forest
DA	Development Application
DC	Development Consent
DPE	Department of Planning and Environment
DPI	Department of Primary Industries
EA	Environmental Assessment
ECA	Eastern Conservation Area
ELA	Eco Logical Australia Pty Ltd
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPBC Act	Commonwealth *Environment Protection & Biodiversity Conservation Act 1999*
OEH	NSW Office of Environment and Heritage
OEMP	Operational Environmental Management Plan
OSD	Onsite Stormwater Detention
RFEF	River-flat Eucalypt Forest
SPW	Shale Plains Woodland, a component of Cumberland Plain Woodland
SSD	State Significant Development
VMP	Vegetation Management Plan
WCMS	Water Cycle Management Strategy
WoNS	Weed of National Significance
WSP	Western Sydney Parklands
WSPT	Western Sydney Parklands Trust
WSUD	Water sensitive urban design

1 Introduction

This Vegetation Management Plan (VMP) has been prepared by Eco Logical Australia Pty Ltd (ELA) on behalf of Western Sydney Parklands Trust (WSPT) for the protection, restoration and rehabilitation of Cumberland Plain Woodlands and Shale-Gravel Transition Forest ecological community (CPW - also termed native vegetation herein) associated within the proposed development of the Eastern Creek Retail Centre, Eastern Creek.

1.1 Background

The subject site is part of the Western Sydney Parklands, managed by the Western Sydney Parklands Trust (WSPT). WSPT have been managing bushland in the Parklands since 2009 and continue to manage the broad scale restoration of Cumberland Plain Woodland and other western Sydney ecological communities. This plan aims to satisfy the requirements of the Australian Government's Environmental Management Plan Guidelines, 2014 while overarchingly meeting the requirements and strategies of the Western Sydney Parklands Trust under the *Western Sydney Parklands Act 2006* (NSW), the *Western Sydney Parklands Plan of Management 2020*, which provides the approach to managing and developing all the parklands, and the *Western Sydney Parklands Biodiversity Strategy 2012 – 2020*, which is the focus for the Trust to meet its function under Section 12(2)(a) of the Act "to conserve, restore and enhance the natural environment of the Parklands" . WSPT has over 1,000 hectares of natural bushland assets and has a target to expand to 2,000 hectares through regeneration and revegetation.

This site is part of WSPT's long term project of biodiversity restoration works and this VMP will be incorporated into ongoing bushland management contracts and WSPT's long term management program.

1.1.1 Development scope and approvals history

The proposed development will provide a new retail centre comprising 52,800m² gross floor area including 'bulky goods premises'; 'large format retail premises', 'supermarket premises' and 'specialty shops/business premises'.

The development is listed as a State Significant Development under Part 4 (Division 4.1) of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act). The Minister for Planning approved this State Significant Development (SSD) on the 7th of January 2015.

A Section 96s Modification of Development Consent was approved by a delegate of the Minister for Planning on the 28th of April 2016.

The proposed development was determined to be a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) due to its impacts on the listed critically endangered Cumberland Plain Woodlands and Shale-Gravel Transition Forest ecological community. The development was approved by the Commonwealth Minister's delegate on 18 May 2015, subject to conditions.

1.1.2 Previous reports

This VMP has been prepared upon the basis of reports prepared for the EPBC Act assessment, the SSD application and the Section 96s modification, including:

- *Ecological Assessment* (EA) *for the Eastern Creek Business Hub SSD* (ELA 2012)

- *Bushfire Protection Assessment – Subdivision & Early Works, Eastern Creek Business Hubs* (ELA 2012)
- *Eastern Creek, EPBC Assessment Report* (EPBC 2012/6617) (ELA 2014)
- *Easter Creek, Operation Environmental Management Plan (OEMP)* (ELA 2016)
- *Eastern Creek Construction Management Plan* (J. Wyndham Prince 2012a)
- *Eastern Creek, Water Cycle Management Strategy* (WCMS) *Report Incorporating Water Sensitive Urban Design Techniques* (J. Wyndham Prince 2012b)
- *Modification Request, Secretary's Environmental Assessment Report Section 96(2)* (DPI 2016)
- *Eastern Creek Business Hub Addendum to Ecological Assessments in support of s96 Application* (ELA 2015)

The VMP is also based off plans drawn after the DA by Henry and Hymas (2016) included herein as **Appendix A**.

1.1.3 Conditions of consent

This VMP has been prepared to meet both the Commonwealth and the State approval conditions identified below:

Condition B10: Vegetation Management Plan (VMP) under the Modification Request (s96) approval under the NSW *Environmental Planning & Assessment Act 1979* from 28th of April 2016, states:

> *Prior to the commencement of works, a VMP shall be provided to the Certifying Authority addressing the restoration and rehabilitation of the conservation areas including:*
>
> - *The eastern part of the site;*
> - *The existing man-made drainage channel 01 to basin 1 including endemic riparian native plants*
> - *Outside the development area including endemic native plants and additional Cumberland Plains Woodland; and*
> - *The retained woodland in the developable areas of the site.*
>
> *The VMP shall be in accordance with the criteria identified in the Vegetation Management Plan Guidelines, prepared by the Department of Water and Energy (February 2008) (note now outdated). The VMP is to be prepared by a suitably qualified person and should address but not be limited to the following:*
>
> a) *Provide details of vegetation to be retained and measures to protect vegetation during the construction and operation phases of the development;*
> b) *Identify areas to be rehabilitated and details of the vegetation species, composition, planting layout and densities of plants to revegetate these areas;*
> c) *Outline ongoing management arrangements, including but not limited to responsibilities, funding and long term maintenance; and*
> d) *Provide details of monitoring and timing of revegetation works within the retained vegetation and the areas to be revegetated.*
>
> *The plan is to span the entire project duration from pre-construction through to construction and post construction.*

Condition 2 of the Commonwealth approval under the (EPBC Act) dated the 18th of May 2015, states:

> *To protect the remaining CPW on the project site, the approved holder must prepare and submit a management plan for the Minister's approval. The approval holder must not commence the action*

unless the Minister has approved the management plan. The approved management plan must be implemented prior to the commencement of the action. The plan must include actions to:

a) protect the remaining CPW from indirect impacts as a result of the action;
b) rehabilitate and restore remaining CPW on site; and
c) produce conservation outcomes to the benefit of CPW on the project site and the adjoining bushland.

Note: The management play may be included within a broader Western Sydney Parklands Trust plan of management.

1.2 Objectives of the VMP

The overarching objective of the VMP is to protect, rehabilitate and restore the native vegetation of the study area. The conservation of native vegetation in the VMP areas is to be undertaken in perpetuity, this VMP encompasses the pre-construction, construction and post construction stages, expected to be undertaken over a period of ten years or until performance criteria outlined in this VMP are met. Once performance criteria outlined in this VMP are met, the site will remain under management of the broader WSPT plan of management, including its Biodiversity Strategy, which will provide ongoing protection and management of the area.

Objectives are detailed in **Table 1**.

Table 1: VMP objectives

Objectives (environmental outcomes)	Approach
Improve ecological health and integrity	Control woody weeds and noxious weeds Revegetate with appropriate native species in keeping with the CPW ecological community Maintenance of weed control and gradual reduction to >40% of weed and exotic plant cover in 10 years Rectify poor drainage and hydrology to prevent further tree deaths Management of threats
Maintain and enhance habitat values	Protect existing native vegetation Weed control and gradual reduction to >10% of weed and exotic plant cover Increase native plant cover Management of threats
Stabilise creek bed and banks and maintain water quality	Minimise impacts of construction activities Ensure water quality is maintained Minimise the loss of native plant cover Utilise native vegetation planting to assist in stabilisation Management of threats

1.3 Implementation of works

WSPT have been managing bushlands on the Cumberland Plain since 2009, with extensive experience in the management of contractors undertaking bush regeneration and ecological restoration works. VMP

implementation works will be undertaken within the WSPT wider program of bush regeneration / restoration works across the parklands. This VMP directs the first stage over works, with on-going works to be included within the WSPT program of CPW restoration and revegetation works within the parklands.

The implementation of this VMP and ongoing management is to be undertaken by experienced bush regeneration practitioners. Practitioners are to have team leaders / site supervisors having a minimum TAFE Certificate III in Land Management and membership of the Association of Australian Bush Regenerators (or having the necessary prerequisite qualifications and experience for membership).

The person managing the project will have a minimum of five years' experience in managing natural areas, have a relevant university degree or have access to such a qualified and experienced person for advice and guidance to ensure the implementation proceeds according to this VMP.

The responsibility for ensuring this VMP is implemented will be on WSPT. Roles and responsibilities for sub-contractors have been identified in the OEMP (ELA 2014) (refer Section 4 herein).

1.4 Responsibility

This section provides an overview of roles and responsibility with respect to the VMP (Table 2).

Table 2: Responsibilty for VMP works

Role	Responsibility
Western Sydney Parklands Trust Project Manager / Owner	• Overall responsibility for environmental management of the site • Communication of environmental features and VMP no-go areas to all contractors during procurement, induction, construction and maintenance • Review VMP monitoring and reporting • Responsible for rik management • Consult impacted community members prior to works • Manage and report complaints • Consult impacted community members prior to works (where applicable) • Respond to and report incidents
Principal Contractor Project Manager for construction	• Responsibility for environmental management of the site, as it relates to the construction of the stormwater infrastructure • Communication environmental features and mitigation measures to all sub-contractors during procurement, induction and works phase • Supervise sub-contractors to ensure implementation if in accordance with the VMP • Consult impacted community members prior to works • Manage staff and sub-contractors • Manage and report complaints • Respond to and report incidents
All contractor and sub-contractors	• All staff and sub-contractors are to complete site induction • Responsibility for carrying out works in accordance with this VMP • Monitoring and reporting of VMP implementation • Manage and report complaints to the Principal Contractor • Respond to and report incidents.

2 Description of the environment

2.1 Location

The site is bounded by the M7 Motorway to the East, the Great Western Highway to the South, Rooty Hill Road South to the West and Church Street to the North. The site lies within the suburb of Eastern Creek, in Blacktown Local Government Area. The site is part of the Rooty Hill Precinct, forming part of Western Sydney Parklands, which totals over 5,000 hectares of land at present.

The VMP area includes all vegetated areas to be managed under this VMP (Error! Reference source not found.).

2.2 Site description and previous land use

The VMP area, an area of 17.6 ha is largely flat and includes several remnant bushland areas, large open grasslands – the constructed drainage channel forms part of the development area, the eastern portion of the channel is existing and remains untouched. The two 'access roads' in the eastern portion of the site are maintenance tracks and can be assumed to be part of the VMP area not the development area. The majority of the open grassland areas have been utilised for grazing purposes and are heavily disturbed resulting to the prevalence of exotic pasture grasses and herbaceous weeds.

A high pressure gas main associated with the Jemena Gas Trunk Receiving Station in the south eastern corner of the site, traverses the site (**Figure 3**). The easement above the pipeline is managed by Jemena. Note that canopy trees in all adjacent VMP areas will require on-going management to ensure no branches encroach into the easement.

Two un-formed roads, Beggs Road and Belmore Road, are present. An application for closure of the Beggs and Belmore Roads easements has been submitted to *NSW Trade and Investment Crown Lands*.

2.3 Drainage and hydrology

As described in the Water Cycle Management Plan (J. Wyndham Prince 2012), the VMP area is generally low relief with a gradual grade from west to east. No naturally occurring waterways or drainage channels are retained onsite.

An existing man-made drainage channel which traverses the site from east to west, partially conveys flows from the upstream catchment under Rooty Hill Road South, across the VMP area and out via a culvert underneath the M7 via a culvert, eventually discharging into Eastern Creek. In larger events, flows will exceed the capacity of the culvert and surcharge across Rooty Hill Road South and the site (J. Wyndham Prince 2012). To the north, a smaller portion of the upstream catchment, discharges across the site, via no formalised channel, eventually discharging via the northern culvert underneath the M7. The existing hydrology onsite as mapped by J. Wyndham Prince is included in **Appendix B**.

Due to the impact on the hydrology of the site from the construction of the M7 and the cycleway, the eastern edge of the area includes several lower lying boggy areas, receiving runoff from the impermeable surfaces of the cycleway and the M7 motorway, as a result of impacted hydrology resulting from the installation of the M7.

At the time of the site inspection (4 May 2016) these areas contained standing water and were typically distinguished from surrounding pasture areas as they contained water tolerant species such as *Persicaria* spp. It was noted in the EA (ELA 2012) that several canopy trees have died as a result of the poor

drainage in these areas, these stags were evident on the day of the site inspection. The altered hydrology onsite has therefore impacted on the CPW in the north eastern portion of the site (Zone 1a).

2.4 Vegetation communities

Field studies undertaken by ELA in the preparation of the EA (ELA 2012) identified two native vegetation communities within the VMP area (**Figure 2**):

- Shale Plains Woodland (SPW), a component of Cumberland Plain Woodland (CPW)
- Alluvial Woodland (AW), a component of River-Flat Eucalyptus Forest (RFEF).

CPW is listed a 'Critically Endangered Ecological Community' under both the NSW *Biodiversity Conservation Act 2016* (NSW) (BC Act), replacing the former *Threatened Species Act 1995* and the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act).

RFEF is listed as an 'Endangered Ecological Community' under the TSC Act.

Not all of the CPW identified onsite meets EPBC criteria for Cumberland Plain Woodland (ELA 2012), those areas that do are identified in **Figure 2**. Areas that don't meet the EPBC criteria meet the TSC criteria for CPW. Vegetation management zones identified in this VMP have incorporated the original vegetation mapping (ELA 2012) and more recent observations of the condition of vegetation in the study area (ELA 4 May 2016). The more recent observations were utilised to ensure that the management techniques specified in this VMP were best suited to the condition of the vegetation present.

2.5 Weed species

The *Biosecurity Act 2015* (NSW) and regulations provide specific legal requirements for state level priority weeds (**Table 3**). Under the Act all plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.

Specific legal requirements apply to State determined priorities under the *Greater Sydney Regional Strategic Weed Management Plan 2017-2022*. Weeds listed as 'other weeds of regional concern' under the plan warrant resources for local control or management programs and are a priority to keep out of the region. Inclusion in this list may assist Local Control Authorities and/or land managers to prioritise action in certain circumstances where it can be demonstrated the weed poses a threat to the environment, human health, agriculture etc.

Of the 39 weeds recoded onsite in the EA (ELA 2012), nine species are listed as state level weeds and as Weeds of National Significance (WoNS), with a further three listed as weeds of regional concern, as presented in **Table 3**.

Table 3: Priority weeds, identifying Weeds of National Significance (WoNS)

Scientific name	Common name	*Biosecurity Act 2015*	WoNS
State level priority weeds (whole of state)			
Alternanthera philoxeroides	Alligator Weed	Containment	Yes
Anredera cordifolia	Madeira vine	Asset Protection	Yes
Asparagus aethiopicus	Ground asparagus	Asset Protection	Yes

Scientific name	Common name	*Biosecurity Act 2015*	WoNS
State level priority weeds (whole of state)			
Asparagus asparagoides	Bridal Creeper	Asset Protection	Yes
Lantana camara	Lantana	Asset Protection	Yes
Lycium ferocissimum	African Boxthorn	Asset Protection	Yes
Opuntia stricta	Common Prickly Pear	Asset Protection	Yes
Rubus fruticosus agg. spp.	Blackberry	Asset Protection	Yes
Senecio madagascariensis	Fireweed	Asset Protection	Yes
Other weeds of regional concern			
Cortaderia selloana	Pampas Grass	Asset Protection	-
Hypericum perforatum	St John Wort		-
Ligustrum sinense	Narrow-leaf Privet		-

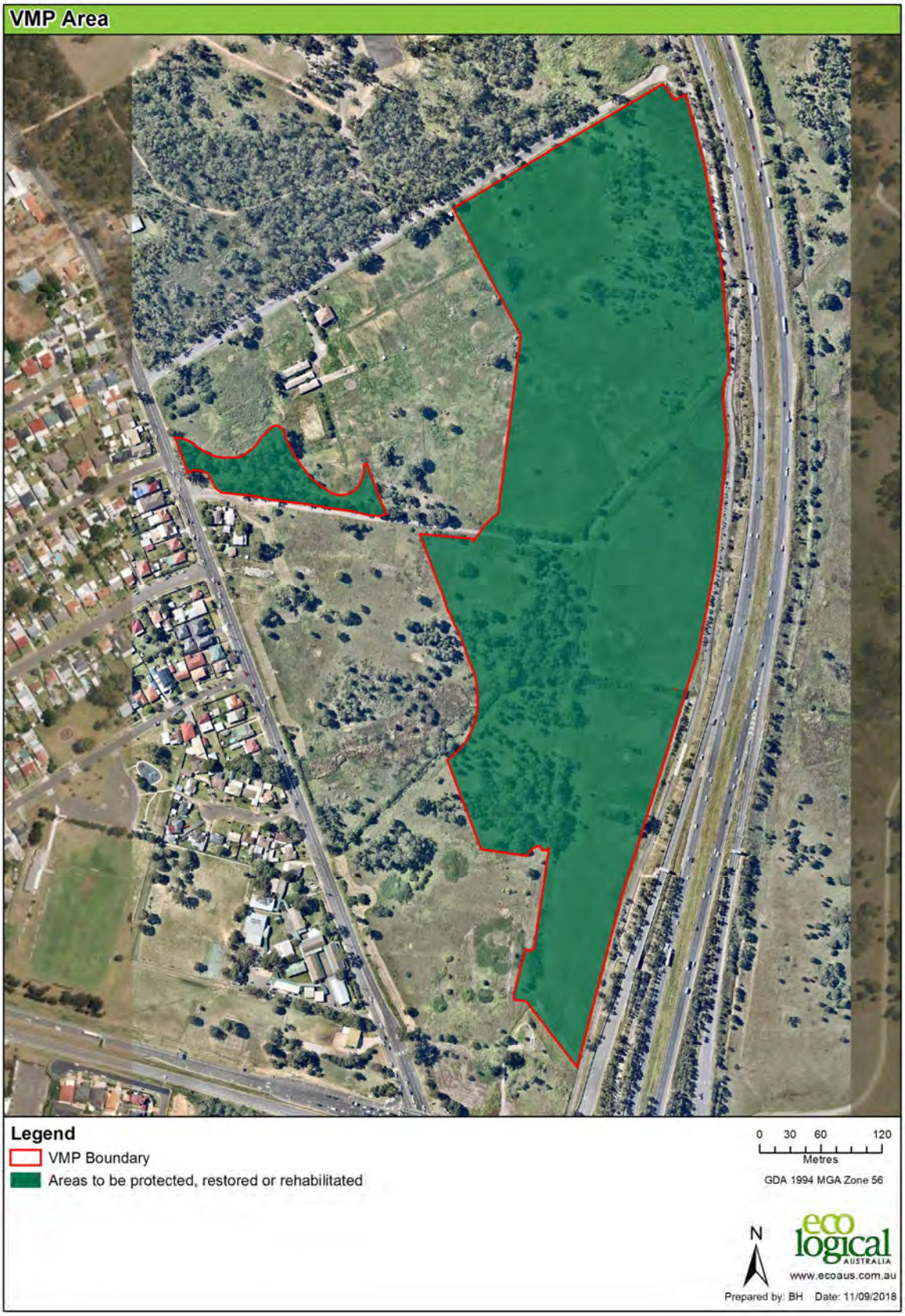

Figure 1 - VMP Area

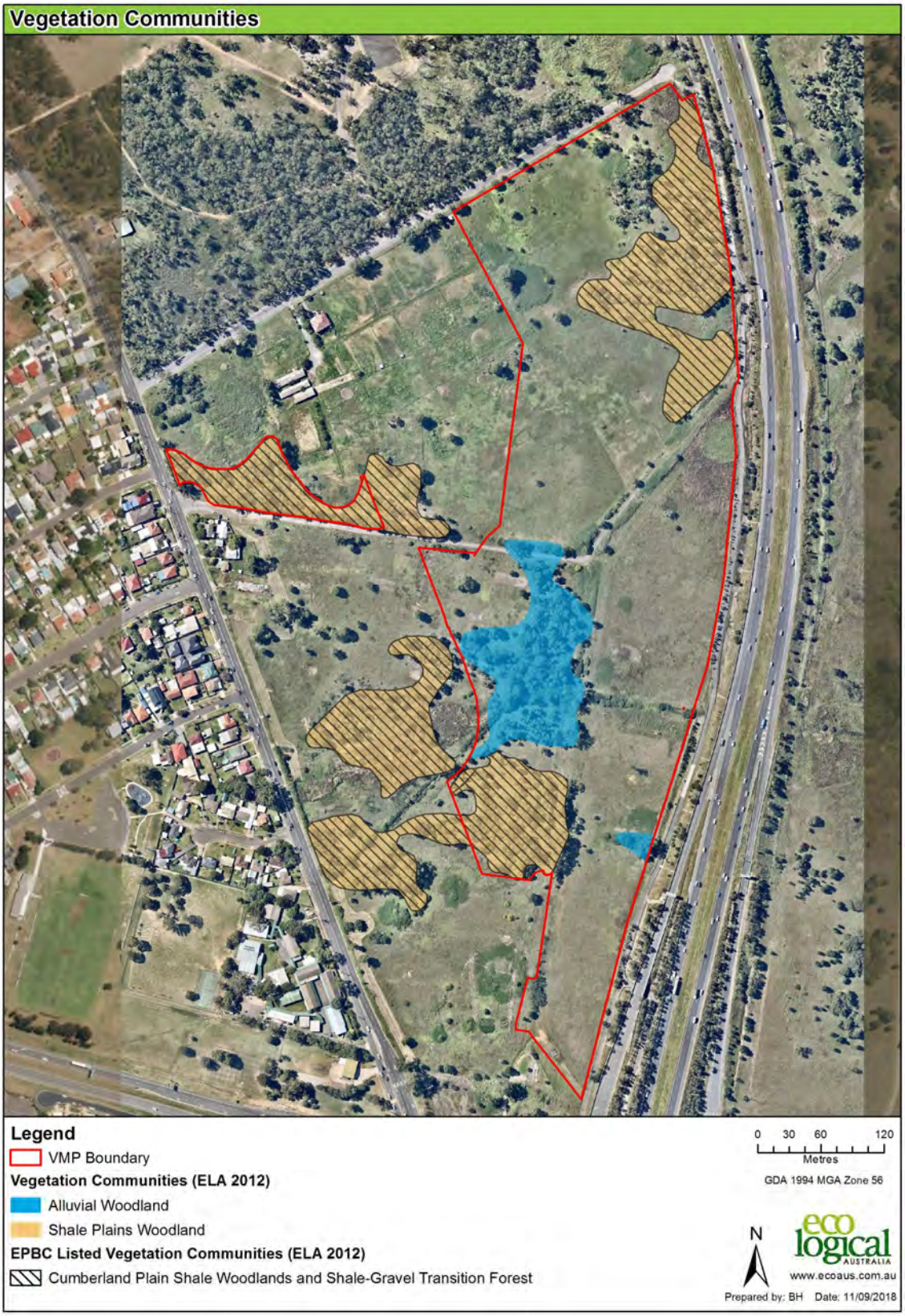

Figure 2: Ecological communities

3 Existing and potential future impacts to CPW

3.1 Existing impacts to CPW

As identified in the EA (ELA 2012) & EPBC Act assessment report (ELA 2014), the existing CPW onsite is generally found to be in a stressed state. A total of 63 flora species were identified, of which 35 were native and 28 were exotic or introduced. The CPW is highly fragmented in its current form, aerial photos from 1943 show the site was largely cleared and as such the CPW onsite is largely comprised of regrowth. Overall the CPW onsite scored a BCAM score of 4/10, as a result of:

- Psyllid induced Grey Box dieback
- Periods of drought followed by heavy rains and subsequent waterlogging
- Historic landuse – clearing and grazing
- Proliferation of priority / exotic weeds
- Fragmentation of habitat
- Environmental stochasticity
- Compaction and erosion of topsoil
- Vicinity to residential development and infrastructure
- Increased accumulation of sediment and nutrient within drainage depressions
- Limited mature vegetation, primarily regrowth only on site

3.2 Potential direct and indirect impacts on CPW resulting from proposed development

3.2.1 Direct impacts

Direct impacts on vegetation cover and loss of CPW and habitat has been evaluated in the EPBC Assessment Report (ELA 2014), and include the complete loss of up to, but no more than, 2.1 ha of CPW.

3.2.2 Indirect impacts

Indirect impacts of the development as identified in the EPBC assessment report (ELA 2014) on the retained CPW include:

- Weed invasion
- Noise pollution and vibration
- Light pollution
- Edge effects, including
    - Runoff from construction containing nutrients, sediments and other pollutants
    - Inappropriate water, sewer and stormwater management leading to erosion
    - Unauthorised access into conservation areas machinery from construction
    - Introduction and spread of weeds and exotic species
    - Unauthorised access into conservation areas increased disturbance from pedestrian access
    - Spread of litter and rubbish

4 Management of construction impacts

4.1 Responsibility

The responsibility for ensuring this VMP is implemented will be on WSPT. Roles and responsibilities for sub-contractors have been identified in the OEMP (ELA 2014).

4.2 Management of construction impacts

Construction management actions to be undertaken by the successful civil construction company under the direction of WSPT are provided below.

4.2.1 Edge effects

The management of edge effects will focus on buffering retained / remaining areas of native vegetation (classified as Zone 1 in **Figure 3**) from construction impacts. This will include:

- Fencing off retained areas of native vegetation during construction, to ensure no impacts from machinery
- Sediment and erosion control
- Installation of WSUD designs to reduce flooding
- Weed control
- Revegetation activities will focus on lining isolated vegetation stands, including planting a dense buffer around retained CPW areas with Bladey Grass (*Imperata cylindrica*), Tall Sedge (*Carex appressa)* or similar robust species from the CPW ecological community.

4.2.2 Fencing

Temporary construction fencing

WPST and its contractors shall be responsible for the installation of all temporary construction fencing to ensure construction activities do not impact onto conservation areas. Temporary construction fencing is to adhered to *AS4970 – 2009 Protection of trees on development sites*. Temporary fencing to be comprised of temporary stakes and high vis. Orange 'para webbing' or similar to clearly identify the boundary between construction activities and vegetation management works and around trees to be retained in the construction area. The aim of this is to prevent any damage to native vegetation in the VMP area from construction activities and excludes all construction machinery, activities, materials and staff from the VMP area. The developer shall also be responsible for the removal of all construction fencing after construction works are completed.

Permanent fencing & signage

As identified in the EPBC Act assessment report (ELA 2014), once temporary fencing is removed, permanent fencing will be immediately established around the perimeter of the VMP area to stop illegal access and dumping. Fencing of internal zones such as the gas easement will not be required. Perimeter fencing will allow access for WSPT parkland manager and sub-contractors and emergency vehicles only. The fencing style will at a minimum consist of rural style fencing and gates, consisting of treated timber posts set into concrete flooring and star picket posts with 3 or 4 strands of galvanised wire running between as indicated in the WSP Design Manual. Signage will state that the VMP areas are restricted access and only authorise personnel are permitted entry.

All fencing will be monitored and maintained as required to ensure it controls access to vehicles, grazing animals and the general public. Monitoring would occur when the VMP is being implemented. Broken

fence pailings, wires or holes in the fence that would allow unauthorised persons into the VMP area would require maintenance.

4.2.3 Sediment and erosion control

Sediment and erosion control will be implemented as per the CMP (J. Wyndham Prince 2012a), the OEMP (ELA 2016) and as per the *Managing Urban Stormwater – Soils and Construction Volume 1 2004* (Landcom) 'The Blue Book'.

4.2.4 WSUD design and stormwater asset management

It is expected that the installation and management of water management infrastructure be created as per the WCMS and modifications included in 96s approval. Bulk earth work plans have been included, which show earthworks required for stormwater infrastructure as **Appendix A** (Henry & Hymas 2016).

Water sensitive urban design (WSUD) features have been incorporated into the development including:

- Vegetated swales incorporated into general landscape
- Vegetated filter strips located within open areas / parks adjacent to and upslope of riparian corridors
- Gross Pollutant Traps (GTP's) strategically located at outlet of stormwater drainage systems
- Bio-retention (filtration) basins
- Rehabilitation of natural drainage channels incorporating stormwater treatment measures

The WCMS (J. Wyndham Prince, 2012b) identifies that post development, the installation of WSUD designs including retention and bio retention basins would largely ameliorate the impacts from the development on the stormwater entering into the VMP area and downstream into Eastern Creek, and would ensure:

- 90% reduction of average annual gross pollutant load (>5mm)
- 85% reduction of average annual Total Suspended Solids (TTS) load
- 65% reduction of average annual load of Total Phosphorus (TP)
- 45% reduction of average annual load of Total Nitrogen (TN)
- 90% reduction of average annual Total Hydorcarbons load

Previous development and construction of the M7 motorway has affected the water flow within the locality which has caused water logging in some isolated areas. These drainage measures are designed to alleviate the water logging and redirect overland flows through/under the M7. These measures would significantly reduce the amount of standing water onsite and contribute to ameliorating poor drainage issues. These measures would improve drainage onsite generally by improving the holding capacity of existing channels and formalising drainage channels through the ECA area. Coupled with the planting of specific tolerant species in areas that would be subjected to increased water flow (basins, swales and channels) these measures would mitigate the impacts of water inundation.

The installation of these basins is expected to occur within the initial establishment period of works, with revegetation immediately following creation, as identified in **Table 5**. The expected construction timeframe of the Northern Basin will be completed with opening of Lot 2 (estimated Jan 2020), with Southern Basin completed concurrently.

All WSUD basins, swales and channels within the VMP area will be revegetated with native sedges and rushes, to form native wetlands as per specifications included in **Section 5.3.**

Note that the existing man made channel running through the site would be retained, and as such the *Erythrina crista-galli* (Coral Tree) will need to be appropriately treated once removed, with no mulch to be retained onsite.

4.2.5 Weed control & revegetation

Weed control and revegetation is detailed further in **Section 5**.

4.3 Other management actions

Other management actions that do not form part of the VMP, but that are expected to support the objectives of the VMP areas are identified below.

4.3.1 Bushfire risk management / APZ vegetation management

Asset Protection Zones (APZ) are excluded from the VMP area, and no management of the VMP area for bushfire risk is required Bushfire Protection Assessment (ELA, 2012).

4.3.2 Community education and involvement

Community and school students involvement in bushland management will be incorporated in WSPT's programs as part of any wider Parklands programs, which provide a forum for the community to actively participate in caring for their local bushland.

4.3.3 Psyllid die back

Eucalyptus moluccana (Grey Box) die back has been previously experienced onsite and throughout the greater western Sydney area as a result of Psyllid infestations. Improvement of the condition onsite for Grey Box and other CPW canopy species including improvements to drainage, weed control are expected to improve the onsite condition for these trees. To ensure the native canopy is not lost in any future die back events, Grey Box is to make up no more than 35% of planting mix as per the WSPT Biodiversity Strategy.

4.3.4 Earthworks and habitat management

When clearing areas of existing vegetation within the development footprint, all earthworks and tree removal must be undertaken by an experienced contractor and as per the Operational Environmental Management Plan (OEMP) (ELA 2016). All native timber is to be retained onsite, with mulch stockpiled for use within conservation areas, all viable seed collected and all timber cut into logs to be utilised as habitat for native fauna. All nest boxes are to be installed into Zone 1.

4.3.5 Pest control

Control of *Vulpes vulpes* (European Red Fox), *Oryctolagus cuniculus* (European Rabbit) and domestic cats, will be undertaken by WSPT if/where required. These species have been previously recorded in WSP (WSP 2013), but not specifically on site. Control measures would be undertaken as needed by WSPT/contractors and would be in accordance with the WSPT Biodiversity Strategy in consultation with Local Land Services (LLS). WSP would employ contractors to specifically control the European Rabbit to prevent damage to new groundcover plantings or regrowth. Foxes are not considered a concern to the implementation of the VMP given the major threat presented by foxes is predation of native fauna.

5 Vegetation management zones and works

Three vegetation management zones have been identified based upon works required (**Figure 3**):

- Zone 1: Regeneration (restoration)
- Zone 2: Revegetation
- Zone 3: Revegetation - wetlands

Zone 1 includes the areas specified in Annexure 1 of the EPBC approval notice as “CPW to be conserved” and “CPW to be restored”.

All CPW regeneration, revegetation and maintenance works are to be undertaken as per best practice techniques including the *Cumberland Plain: Best Practice guidelines for the management and restoration of Bushland* (Department of Conservation 2005) and the *National standards for the practice of ecological restoration in Australia* (Society of Ecological Restoration, 2017).

Further description of these areas and works required is provided below.

5.1 Zone 1: Regeneration (restoration)

Zone 1, an area of 5.2 ha comprises all of the remaining bushland remnants within the VMP area, to be regenerated to RFEF and CPW ecological communities. Weed levels are moderate to low within these areas. The zone has been sub-divided into five zones, which have been further described in greater detail below:

5.1.1 EPBC and BC listed vegetation

Undertaking works in these areas will satisfy the EPBC Act and BC approval conditions:

Zone 1a

Behind Beggs Rd verge, Zone 1a comprises a 0.7 ha of CPW remnant in poor to moderate condition. Zone 1a lies outside of the eastern conservation area. Native canopy is present, with limited amounts of native species in the shrub and groundcover layers.

Noxious, woody, vine and herbaceous weeds are present including African Boxthorn, *Anredera cordifolia* (Madeira vine), *Araujia sericifera* (Moth vine), *Bidens pilosa* (Cobblers pegs), Bridal Veil Creeper, *Chloris gayana* (Rhodes grass), Climbing asparagus, *C. dactylon*, *Eriobotrya japonica* (Loquat), *Grevillea robusta* (Silky oak), Ground asparagus, *Ligustrum lucidum* (Large leaved privet), *L. sinense* (Small leaved privet), *Ochna serrulata* (Mickey mouse plant), *Pennisetum clandestinum* (Kikuyu grass) and Prickly pear. Weeds originally comprised approximately 50% of the groundcover in this zone (ELA 2012). However, recently weed cover has increased.

Zone 1b

Zone 1b comprises a 1.46 ha remnant patch of CPW in poor to moderate condition. Native canopy trees are present, native mid-storey species and native groundcovers.

Weeds in this area are present mainly in the lower strata layers including but not limited to Blackberry, Bridal veil creeper, Cobblers pegs, Paspalum, Pigeon grass, Purpletop. Weeds comprised < 50% of the groundcover in this zone (ELA 2012).

Zone 1c

Zone 1c, comprises a 2.17 ha CPW remnant, largely in good condition. Native canopy trees are young appearing to be recovering from an unknown disturbance event, *Bursaria spinosa* is present in the mid-storey and native grasses are present, including *Brunoniella australis*, *Dichondra repens, Microlaena stipoides* and *Themeda australis.*

The main weeds within the area are brambly woody weeds, climbers, exotic grasses and herbaceous groundcovers including *Asparagus plumosus* (Climbing asparagus), *Cynodon dactylon* (Couch), *Setaria* spp. (Pigeon grass), *Sida rhombifolia* (Paddy's Lucerne), *Paspalum dilatatum* (Paspalum), *Verbena bonariensis* (Purpletop), *Solanum pseudocapsicum* (Winter Cherry), *Eragrostis curvula* (African Love Grass), *Rubus fruticosus* agg. spp. (Blackberry) and *Rosa rubiginosa* (Sweet Briar). Weeds comprised > 50% of the groundcover in this zone (ELA 2012).

Some old fencing is present throughout the area.

5.1.2 BC listed CPW & RFEF:

Undertaking works in these areas will complete BC conditions, EPBC conditions do not apply to these areas:

Zone 1d

Zone 1d comprises a 1.23 ha RFEF in moderate / good condition. Native canopy trees are present including *Melaleuca sp.* and includes native mid-storey species and native groundcovers.

Weeds in this area are present mainly in the lower strata layers including but not limited to Blackberry, Bridal veil creeper, Cobblers pegs, Paspalum, Pigeon grass, Purpletop. The man-made drainage channel running through the zone is dominated by *Erythrina crista galli* (Cockspur coral tree) and *Cardiospermum grandiflorum* (Balloon vine).

Zone 1e

Zone 1e comprises a 0.12 ha 'island' remnant of RFEF, surrounded by pasture areas (Zone 2). The zone is in good condition with *Melaleuca decora, Eucalyptus eugenioides* in the canopy, *Bursaria spinosa* in the mid-storey and *Microlaena stipoides* as groundcover. The zone is threatened by weed invasion from pasture areas, from weeds such as Kikuyu, Paspalum and Rhodes grass.

5.1.3 Weed control

Weed control will be required to enable native species to regenerate. The site currently retains approximately eight (8) noxious weed species, along with a further thirty-one (31) exotic species known to occur on site at time of survey. The majority of noxious weeds (Lantana, Blackberry and Pampas) were recorded in the exotic pasture zones, while one species (African Boxthorn) was recorded in the patch of Alluvial Woodland in the middle o the site. Weed control measures have been based on the type of weeds present and their abundance in each zone. In general works in these areas will include:

- Priority weed control, particularly of Blackberry in the spring /summer months
- Primary weed control of all woody and vine weeds, drilling and filling Coral trees along the man-made drainage channel
- Implementation of a regular program of works targeting exotic groundcovers

The principles of weed control / bush regeneration and techniques to trigger natural regeneration are to be in accordance with the Bradley Method and as described in Buchanan (2000) and the National Trust's *Bush Regenerator's Handbook* (Brodie 2012). Weed control actions and timeframes will be undertaken as part of the wider site management regime. New and emerging weed control techniques may be used if they are showing success in other parts of the parklands.

5.1.4 In-fill and buffer planting

After initial weed control activities, these areas are expected to naturally regenerate with native species and this is expected to take a very long period of time (at least 10 years). However as they have been degraded for a long period of time it is expected that many species, in particular from the shrub and ground layers will not naturally regenerate. Therefore, these will be introduced back into the area either as niche or direct seeding or in-fill plantings.

At the completion of primary and secondary weed control, i.e. at the end of Year 3, WSPT and the bush regeneration contractor will assess the need for revegetation to ensure the site is progressing to the long term site average BioMetric benchmarks. Required plantings will be installed in the shoulder months (Spring and Autumn) of Year 4 & Year 5 and target gaps in diversity and cover of species such that the zone will achieve an average site score of BioMetric Benchmark 2 (refer Table 4).

Around the areas of remaining CPW, where adjoining areas of disturbance such as the gas easement or development works, at the completion of development and removal of construction fencing and sediment control fencing, dense *Imperata cylindrica* (Bladey grass) (or similar robust and dense growing species from the CPW ecological community) is to be planted to provide a vegetative buffer to the CPW as a "make good" following the removal of the development controls. The vegetative buffer would assist in mitigating any indirect impacts (such as weed invasion) that may occur as a result of the development or management of neighbouring easements.

All plantings will be matched to the corresponding ecological community as identified in **Figure 2**, from the planting list contained in **Appendix C**. If practitioners wish to change species from this list, they need to provide a justifiable and scientifically based explanation for doing so to the WSPT for its consideration and approval. For areas subject to the EPBC approval (zones 1a, 1b and 1c), species will not deviate from what is acceptable for the *Cumberland Plain Woodlands and Shale-Gravel Transition Forest* ecological community.

5.2 Zone 2: Revegetation

Zone 2, an area of 10.02 ha comprises the areas of site that will require revegetation, including proposed batters, the gas line easement and areas currently dominated by pasture grass, with few native shrubs or trees present. These areas will complete BC conditions only.

These areas are currently largely comprised of exotic pasture grasses and are in very poor condition, with very few native species present. Exotic grass weeds include *C. dactylon*, *C. gayana, E. curvula, P. clandestinum* and *P. dilatatum* and annual and perennial herbaceous weeds including *B. pilosa, S. rhombifolia, Senecio madagascariensis* and *V. bonariensis.*

The gas line easement is largely devoid of native trees and shrubs, which have been and will continue to be cleared of shrub and tree vegetation by external contractors.

5.2.1 Revegetation and weed control

Priority weeds will be controlled in this zone, particularly Blackberry which is to be treated when actively growing in spring /summer. Exotic grasses and annual and perennial herbaceous weeds will be controlled prior to seed set. To be achieved by slashing, spraying or a combination of both techniques. Weed control techniques will be utilised in conjunction with revegetation strategy (below) to improve the zone from pasture to Cumberland Plain ecological communities. All weed control activities will be undertaken as per Brodie (2012) and Buchanan (1990).

Given the low resilience in this zone, revegetation will be required. Several potential weed control and revegetation techniques will be undertaken within this area, and it shall be left to the bush regeneration contactor in consultation with WSPT, and as directed by the WSPT *Biodiversity Strategy*, to determine the technique or techniques to be used based on the conditions at the time of works.

The revegetation strategy decided upon, will work towards achieving a sustainable level of native vegetation, as measured using the BioMetric benchmarks (**Table 4**) for the relevant vegetation type. Revegetation efforts will also focus on the connection of isolated vegetation islands (Zone 1). This will be undertaken by planting in dense nodes or corridors to facilitate connectivity for native fauna and flora, which will be undertaken over a number of consecutive years, in order to progressively increase the converage of native vegetation onsite.

A range of methodologies are emerging for successful revegetation on the Cumberland Plain and contractors are developing their own specific expertise and techniques. No one technique is prescribed in this VMP, however best practice will be applied as noted above. Three potential methodologies have been identified as below:

1. Direct seeding with an integrated mulch matrix product
2. Tubestock planting of trees, shrubs and groundcovers
3. Tubestock planting of trees and shrubs only

This last approach may be undertaken to shade out exotic pasture species and change the habitat to promote native groundcover regeneration. This is a longer term strategy (i.e. 10 years) and also assumes that there is sufficient native seed present in the soil profile to respond to the changing conditions. Allowance will be made for supplementing native seed if this is not the case. If sufficient native seed is not present in the soil profile, planting would be supplemented by tubestock planting (as per (2) above) and/or introduction of native seed from commercial sources.

Prior to revegetation site preparation works will be required, as identified below:

1. Direct seeding with an integrated mulch matrix product would require:
    a. Scraping the top 100 mm of soil and pasture weeds
    Note. These techniques require earth moving machinery.
2. Tubestock planting of trees, shrubs and groundcovers would require:
    a. Scraping or spraying all pasture grasses and weeds
    b. Mulching the planting areas with at least 100 mm of native mulch
3. Tubestock planting of trees and shrubs would require:
    a. Clearance of pasture areas by slashing and spraying, plants to be installed as either individual plantings or as clumps of plantings

Prior to revegetation, the relevant practitioner is to visually assess the soil. If soil is comprised of heavy clay, it is recommended that for methods 1 and 2, after scraping / spraying, the soil is ripped and tilled, with addition of gypsum as required to break up the clay and to allow the roots to penetrate. Whilst, best practice guidelines for recovering CPW do not identify ripping for the recovery of CPW, ELA's and WSPT extensive experience in the Cumberland Plain have identified that soil improvement actions including ripping, in heavily degraded areas, as in areas dominated exclusively by exotic pasture is crucial in the success of CPW restoration programs.

All areas will need to be revegetated with species from the appropriate vegetation community being emulated as shown in **Appendix C.**

5.2.2 Gas line easement

The gas line easement will be weeded principally via spot spraying to ensure the exotic species within the area do not become a source of weed invasion into other areas and to facilitate native grass regeneration to achieve a CPW Derived Native Grassland (DNG) condition. As required, native grass regeneration / recruitment will be enhanced with broadcasting seeding onto bare areas. No soil disturbance is recommended in this area, any soil disturbance in the gas line easement would require a '*Dial before you dig*' search.

5.3 Zone 3: Revegetation - wetlands

Zone 3, an area of 1.92 ha comprises the areas to be constructed and revegetated to native wetland including the channel base within constructed creek swales and the base of the OSD (onsite stormwater detention) / Bioretention basins. These areas will complete BC conditions only.

5.3.1 Site preparation and erosion control

The civil contractor will be responsible for ensuring that the final landforms are to design and of a soft friable top soil or alternative substrate suitable for planting into.

This zone will be covered in heavy weight jute matt (>850g/m2) in swales and areas of high erosion potential. Within the bio retention basin, jute matting is not to be used as it interferes with filtration. Jute matt is to have a minimum 150mm overlap with overlaps facing downstream.

5.3.2 Revegetation & weed control

These areas will be revegetated with native sedges and rushes, reminiscent of the Freshwater Wetlands vegetation community as identified in **Appendix C.**

Planting is to occur immediately after the construction of these areas, requiring a high level of maintenance within the first two to three years post planting.

Figure 3: Vegetation management zones

6 Project staging and performance criteria

6.1 Timeframes and staging

The VMP area is to be managed for conservation purposes in perpetuity. The VMP covers a 10 year period, divided into an establishment period for the first three years, followed by maintenance. Construction is expected to be undertaken in stages as identified in the EPBC assessment report (ELA 2014).

Once the VMP is approved, the Trust's current bush regeneration practitioner will incorporate a program of works into the Trust's existing Bushland Management contract to meet the performance criteria listed below. The program of works will be guided by the development works at the site, the term of the Trust's Bushland Management contract, the methodology chosen by the contractor in consultation with the Trust and this ten year VMP.

An indicative timeframe for the first five years has been shown in **Table 5**, further management would largely concentrate on maintenance weed control and monitoring at identified periods, and taking corrective/adaptive management actions as necessary (for example re-establish any unsuccessful revegetation attempts).

6.2 Performance criteria

The performance criteria to be achieved by end of the establishment period and by the end of maintenance period of this ten year VMP works are identified in **Table 6** and **Table 7**. The maintenance period provides for bi-annual targets to allow for native resilience and provide flexibility in the on-ground approach. Adaptive management techniques will be used to ensure that longer term maintenance targets can be delivered in a manner that meets the overarching strategy outcomes, while accounting for the likely changes to the vegetation in the site once drainage affected areas are managed (namely the ECA).

If monitoring indicates that the VMP tasks are not resulting in achievement of the performance criteria, the task program or methodology will be revised to ensure achievement of these performance criteria.

6.2.1 Biometric benchmarks

Native Vegetation Integrity Benchmarks (or Biometric benchmarks) have been developed by OEH for the composition, structure and function of vegetation communities, based upon the best-on-offer condition for the same vegetation type in the contemporary landscape.

Biometric benchmarks for the two ecological communities identified onsite are identified in **Table 4**.

WPST are committed to achieving Biometric benchmark 2 conditions, i.e. achievement of between 50% - 100% of the benchmarks for all of their precincts within their Biodiversity Strategy. Further commitments to achieving biometric benchmarks for this site are identified in **Table 6**.

Table 4: Biometric benchmark

PCT	Vegetation Community	Vegetation species richness*			Vegetation cover (%)*		
		Canopy	Shrub	Groundcover	Canopy	Shrub	Groundcover
849	Shale Plains Woodland	5	8	34	52%	18%	77%
835	River Flat Eucalypt Forest	4	8	20	21%	21%	78%

* *Based on monthly average following average rainfall year. Note: groundcovers include grasses and forbs but does not include ferns or other vegetation types within the groundstorey strata.*

Table 5: Indicative schedule of VMP works (first five years)

Zone	Treatment	Establishment												Maintenance							
		Year 1				Year 2				Year 3				Year 4				Year 5			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
All zones	Install construction fencing																				
	Install sediment and erosion control																				
	Install permanent fencing																				
	Seed collection																				
	Habitat enhancement																				
	Progress reporting																				
	Monitoring and reporting	BL																			
Zone 1: Regen	Primary weed control																				
	Secondary weed control																				
	Revegetation assessment																				
	Infill planting *as required*																				
	Maintenance weed control																				
Zone 2: Revege.	Priority weed control																				
	Site preparation																				
	Revegetation*																				
	Irrigation																				
	Revegetation maintenance																				

Zone	Treatment	Establishment												Maintenance							
		Year 1				Year 2				Year 3				Year 4				Year 5			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Zone 3: Revege - Wetlands	Construction																				
	Site preparation & jute matting																				
	Revegetation																				
	Irrigation																				
	Revegetation maintenance																				

**following revegetation in Zone 3 to ensure all major earthworks are off site*

Table 6: Performance criteria – establishment

Treatment Zones	Establishment		
	Year 1	Year 2	Year 3
All	Commencement or completion of all tasks outlined in the VMP Management of priority weeds as per statutory regulations. No Blackberry patches over 4 m² Revegetation is to be undertaken with a minimum of 60% of the benchmark levels for species diversity provided in **Appendix C** At one year post planting, a minimum of 80% survival rate of all vegetation strata planted in each zone (e.g. tree, shrub and groundcover) Any localised plant failure within planting areas are addressed with no area larger than 2 m x 2 metres without surviving plants at one year post planting; Maintenance replanting is to replace plants with the same growth form (i.e. tree for tree etc.) and must not decrease species diversity. Any new species to be planted must be from the community being emulated and of local provenance or of provenance for climate change adaptation if required. Monitoring and reporting undertaken in accordance with **Section 7**		
	100% initial treatment of woody and exotic weed species.	Woody weeds and exotic vines to be less than 10% cover, not allowed to set seed and no establishment of new species	Woody weeds and exotic vines to be less than 5% cover, not allowed to set seed and no establishment of new species
	Exotic ground covers 70% of original extent	Exotic ground covers 65% of original extent	Exotic ground covers 60% of original extent
	Native vegetation cover no less than 40% of biometric benchmark	Native vegetation cover no less than 50% of biometric benchmark	Native vegetation cover no less than 60% of biometric benchmark

Table 7: Performance criteria - maintenance

Treatment Zones	Maintenance*			
	Year 4	Year 6	Year 8	Year 10
All	Commencement or completion of all tasks outlined in the VMP Management of priority weeds as per statutory regulations. No Blackberry patches over 4 m² Revegetation is to be undertaken with a minimum of 60% of the benchmark levels for species diversity provided in **Appendix C** At one year post planting, a minimum of 80% survival rate of all vegetation strata planted in each zone (e.g. tree, shrub and groundcover) Any localised plant failure within planting areas are addressed with no area larger than 2 m x 2 metres without surviving plants at one year post planting; Maintenance replanting is to replace plants with the same growth form (i.e. tree for tree etc.) and must not decrease species diversity. Any new species to be planted must be from the community being emulated and of local provenance or of provenance for climate change adaptation if required. A demonstrated increase in native cover and diversity and a demonstrated decrease in exotic cover and diversity by the end of the maintenance period Monitoring and reporting undertaken in accordance with **Section 7**			
	Woody weeds and exotic vines to be less than 2% cover, not allowed to set seed and no establishment of new species	Woody weeds and exotic vines to be less than 2% cover, not allowed to set seed and no establishment of new species	Woody weeds and exotic vines to be less than 2% cover, not allowed to set seed and no establishment of new species	No woody weeds or exotic vines present and no establishment of new species
	Exotic ground covers 55% of original extent	Exotic ground covers 50% of original extent	Exotic ground covers 45% of original extent	Exotic ground covers 40% of original extent
	Native vegetation cover no less than 65% of biometric benchmark	Native vegetation cover no less than 70% of biometric benchmark	Native vegetation cover no less than 75% of biometric benchmark	Native vegetation cover and species diversity no less than 80% of biometric benchmark

**bi-annually to coincide with vegetation monitoring periods*

7 Monitoring and reporting

Monitoring and reporting is to be incorporated into the Trust's wider program of restoration and revegetation which is to be undertaken in perpetuity. Information gained through the monitoring and reporting process will identify works that have and have not been successful, and the reasons for their success or failure.

The aim of monitoring is to measure the effectiveness of the VMP actions being undertaken to achieve the desired objectives It will identify non-conformance and provide the land manager with the ability to implement corrective actions. Information derived from the results of monitoring will also be used in adaptive management (i.e. learning from past experience to inform future priorities and work plans). For example, as annual grass weeds are removed, herbaceous and perennial weeds may establish.

Finally, monitoring and reporting will help determine and quantify the costs related to weed management and the cost effectiveness of the VMP works.

7.1 Monitoring

Monitoring will be undertaken by vegetation surveys and photo monitoring. Monitoring will be undertaken prior to works being commenced to establish a benchmark for performance, and then will formally occur yearly through the establishment period (Year 1 to 3) then bi-annually until the VMP is fully implemented (Years 4 - 10). More frequent monitoring for years 1 to 3 is not recommended because the implementation of the management actions take time to take effect, and bi-annual monitoring would not reflect any changes in the community or results of implementing the VMP. Monitoring through contractual management and to assist adaptive management is to occur during summer (from November) approximately two weeks after a substantial rain event (25mm min). Monitoring will be undertaken and results will be included in reporting of the wider Western Sydney Parklands Biodiversity Monitoring Program.

Vegetation surveys recording native and weed species richness and abundances will be undertaken within permanent plots within the work site at regular intervals during the contract period to track the progress of works and trigger any necessary changes in management technique where required.

Module 1 of the NSW Native Vegetation Interim Type Standards methodology will be used.

Photo monitoring points will be set-up using a permanent reference point to provide a visual reference of changes in the vegetation. Additional photo monitoring is to occur prior to and on completion of any major intervention or activity such as primary weed clearing or revegetation as a record of work undertaken.

The vegetation survey data will be stored in the VIS Flora Survey database which is available on-line as a module of the new NSW Wildlife Atlas. In addition to the above, bush regeneration site supervisors are required to have traversed all reaches of the site annually and include any erosion points, weed infestations or other management issues.

The monitoring reports would be appended to the annual compliance report submitted each year.

7.2 Progress reports

Progress reports on the implementation of this VMP will be developed in accordance with Module 1 of the NSW Native Vegetation Interim Type Standards and would be published on an annual basis until the

completion of the project. Progress reports are provided by the contractor responsible for implementing the VMP. This reporting includes the implementation of the monitoring actions specified in **Section 7.1**. In addition to a description of the works (revegetation and revegetation activities) that have been undertaken, the progress report is to address the following:

- What VMP activities have been successfully completed?
- What are the outcomes of the management activities?
- What measures, if any, were required as adaptive management?
- What outstanding and or new issues need to be addressed and how they will be addressed?
- What is next year's annual program, including any adaptive management actions?

7.3 Adaptive management

As this is a long term project that will be implemented over a number of years, an adaptive management approach will be implemented that enables the successful practitioner to learn from and respond to successful and unsuccessful techniques used on the site. In its simplest form this may include the substitution of species identified in the planting table or for undertaking advanced direct seeding techniques in place of manual planting techniques for revegetation.

Practitioners have the flexibility to implement different techniques to those specified here providing that the objectives and the performance criteria are met within the ten year timeframe.

In accordance with Condition 9 of the Commonwealth approval, if WSPT or contractors wish to carry out any activity otherwise than in accordance with this management plan once approved by the Minister, then WSPT must submit to the Department for the Minister's written approval, including a revised version of the management plan. The varied activity (major departure) shall not commence until the Minister has approved the revised plan unless the revised plan would result in an equivalent or improved environmental outcome over time.

7.4 Corrective actions and VMP review

If monitoring indicates that performance criteria are not being met then WSPT as the approval holder will be required to ensure that corrective actions are taken to ensure that the performance criteria can be met. Any variance to performance criteria would be seen as a major departure from the Ministers approval of this plan and would require revision of approval as noted above.

At the conclusion of the ten year VMP period, this VMP will be reviewed, and management approach will be incorporated into ongoing bushland management contracts and WSPT's long term management program.

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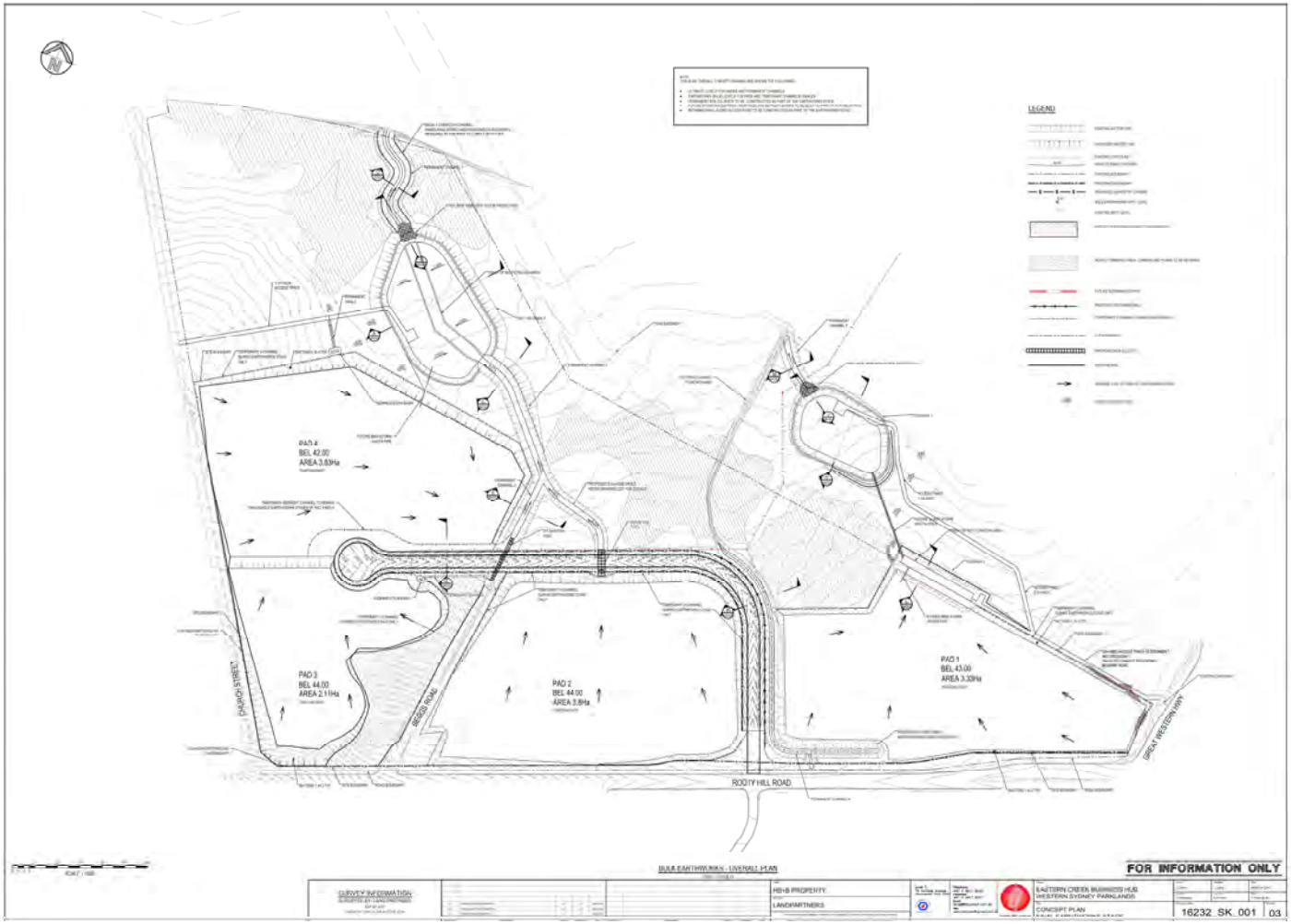
Appendix A Bulk earthworks plan (Henry & Hymas 2016)



Appendix B : Existing drainage onsite (J. Wyndham Prince 2012)

Appendix C Planting list

Type	Scientific name	Common name	Vegetation Communities		
			FW	AW	SPW
Tree Canopy Species (>6m)	*Angophora floribunda*	Rough-barked Apple		X	X
	Angophora subvelutina	Broad-leaved Apple		X	X
	Casuarina cunninghamiana subsp. *Cunninghamiana*	River Oak		X	
	Casuarina glauca	Swamp Oak		X	
	Eucalyptus amplifolia	Cabbage Gum		X	X
	Eucalyptus crebra	Narrow-leaved ironbark			X
	*Eucalyptus moluccana**	Grey Box		X	X
	Eucalyptus tereticornis	Forest Red Gum		X	X
Small Trees / Shrub Species (1.5-6m)	*Acacia implexa*	Lightwood			X
	Acacia floribunda	White Sally		X	
	Acacia parramattensis	Parramatta Wattle		X	
	Acmena smithii	Lilly Pilly		X	
	Backhousia myrtifolia	Grey Myrtle		X	
	Breynia oblongifolia	Coffee Bush		X	
	Bursaria spinosa	Blackthorn		X	X
	Daviesia ulicifolia	Gorse bitter pea			X
	Dodonaea viscosa subsp. cuneata	Wedge-leaf Hop-bush			X
	Indigofera australis	Australian Indigo		X	X
	Melaleuca decora	-		X	
	Melaleuca styphelioides	Prickly-leaved Tea Tree		X	
	Ozothamnus diosmifolius	Rice Flower		X	
	Trema tomentosa var. aspera	Native Peach		X	
Sedges, Rushes, Reeds & Grasses	*Aristida ramosa*	Purple Wiregrass			X
	Aristida vagans	Threeawn Speargrass			X
	Baumea articulata	Jointed Twig-rush	X		

Type	Scientific name	Common name	Vegetation Communities		
			FW	AW	SPW
	Bolboschoenus caldwellii	Salt Club-rush	X	X	
	Bolboschoenus fluviatilis	Marsh Club-rush	X	X	
	Carex appressa	Tall sedge	X	X	
	Chloris truncata	Windmill Grass			X
	Cymbopogon refractus	Barbed-wire Grass		X	X
	Cyperus gracilis	Slender Flat-sedge			X
	Dianella longifolia	Blueberry Lily			X
	Dichelachne micrantha	Shorthair Plumegrass		X	X
	Echinopogon caespitosus var. caespitosus	Tufted Hedgehog Grass		X	X
	Echinopogon ovatus	Forest Hedgehog Grass		X	X
	Juncus usitatus	Common Rush	X		X
	Lomandra filiformis	-			X
	Lomandra multiflora subsp. multiflora	-			X
	Lomandra longifolia	Spiny-head Mat-rush		X	
	Microlaena stipoides var. stipoides	Weeping Meadow Grass		X	X
	Persicaria decipiens	Slender knotweed	X		
	Poa labillardieri var. labillardieri	Tussock Grass			X
	Themeda australis	Kangaroo Grass		X	X
	Schoenoplectus mucronatus	-	X		
Groundcover Species (~0-1.5m) & Vines/Scramblers	*Brunoniella australis*	Blue Trumpet			X
	Centella asiatica	Indian Pennywort		X	X
	Clematis glycinoides	Old Man's Beard		X	X
	Commelina cyanea	Creeping Christian		X	X
	Desmodium varians	Slender Tick-trefoil		X	X
	Dichondra repens	Kidney Weed		X	X
	Einadia hastata	Berry Saltbush		X	X

Type	Scientific name	Common name	Vegetation Communities		
			FW	AW	SPW
	Einadia polygonoides	-		X	X
	Einadia trigonos	Fishweed		X	X
	Geranium solanderi	Native Geranium		X	X
	Glycine clandestina	Twining Glycine		X	X
	Hardenbergia violacea	Purple Coral Pea		X	X
	Pratia purpurascens	Whiteroot		X	X
	Plectranthus parviflorus	Cockspur flower		X	X
	Veronica plebeia	Creeping Speedwell		X	X
	Wahlenbergia gracilis	Sprawling Bluebell		X	X

**E. moluccana is to make up no more than 35% of canopy planting mix, as per the WSPT Biodiversity Strategy 2012 – 2020, to ensure buffering against species specific impacts such as the Grey Box Pysllid infestation*

ecological AUSTRALIA

ISO 14001 Environmental Management

AS/NZS 4801:2001 Occupational Health and Safety Management

ISO 9001 Quality Management

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