Aspect Industrial Estate- Flora and Fauna Management Plan

Mirvac Projects Pty Ltd

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Template 2.8.1

Contents

List of Figures

List of Tables

Abbreviations

Abbreviation	Description
All	All Site Personnel
BC Act	*Biodiversity Conservation Act 2016*
DPIE	Department of Planning, Industry and Environment
EP&A Act	*Environmental Planning and Assessment Act 1979*
FFMP	Flora and Fauna Management Plan
PM	Project Manager
SE	Site Ecologist
SS	Site Supervisor
SSD	State Significant Development

1. Introduction

1.1 Consent

SSD-10448 has received the Response to Submissions (RTS) from the Department of Planning, Industry and Environment (DPIE) for the development of the Aspect Industrial Estate (Lots 54 to 58 DP 259135) (Figure 1).

The preparation of a Flora and Fauna Management Plan (FFMP) has been requested by Penrith City Council. This FFMP has been prepared for the associated construction works for the proposed development, such that it:

- identifies measures to protect the environment
- defines roles and responsibilities during proposed works
- identifies any external approvals needed
- identifies consultation and communication needs
- describes the monitoring and reporting regime.

The FFMP has been prepared based on the findings of the Biodiversity Development Assessment Report (BDAR) (ELA 2020) and in accordance with the NSW Department of Planning, Industry and Environment (DPIE) *Code of Practice for Injured, Sick and Orphaned Protected Fauna 2011.* The FFMP will be revised and necessary approvals sought if the scope of works change.

1.2 Project Background

1.2.1 Biodiversity Values

1.2.1.1 Vegetation Communities

Two vegetation communities have been identified within the development site, which are both listed Threatened Ecological Communities (TECs) under both the *Biodiversity Conservation Act 2016* (BC Act) and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The vegetation communities present, associated Plant Community Type (PCT) and conservation listing are outlined in Table 1 below and shown in Figure 1.

Table 1: Vegetation communities within the development site

Vegetation Community	PCT ID	PCT Name	BC Act Listing	EPBC Act Listing	Area (ha)
River-flat Eucalypt Forest	835	Forest Red Gum – Rough-barked Apple grassy woodland on alluvial flats	Endangered	Critically Endangered	0.29
Cumberland Plain Woodland	849	Grey Box – Forest Red Gum grassy woodland on flats	Critically Endangered	Critically Endangered	0.84

1.2.1.2 Threatened Species

Potential habitat for a range of threatened species was identified within the development site, as outlined in Table 2.

Table 2: Potential threatened species habitat within the development site

Species	Common Name	BC listing	EPBC Listing	Potential Habitat within Development Site
Artamus cyanopterus cyanopterus	Dusky Woodswallow	E	E	Marginal foraging habitat present within the development site.
Circus assimilis	Spotted Harrier	V	-	Marginal foraging habitat present within the development site.
Daphoenositta chrysoptera	Varied Sittella	V	E	Marginal foraging habitat present within the development site.
Glossopsitta pusilla	Little Lorikeet	V	V	Marginal foraging habitat present within the development site.
Grevillea juniperina subsp. *juniperina*	Juniper-leaved Grevillea	V	-	Marginal habitat present within the development site.
Haliaeetus leucogaster	White-bellied Sea Eagle (Foraging)	V	-	Dams present within development site, which may present foraging habitat
Hieraaetus morphnoides	Little Eagle (Foraging)	V	-	Marginal foraging habitat present within the development site.
Ixobrychus flavicollis	Black Bittern	E	CE	One record within a 5 km radius of the development site, and dams present which represent marginal foraging habitat

Species	Common Name	BC listing	EPBC Listing	Potential Habitat within Development Site
Lathamus discolor	Swift Parrot (Foraging)	V	-	Marginal foraging habitat present within the development site.
Lophoictinia isura	Square-tailed Kite (Foraging)	V	-	Marginal foraging habitat present within the development site.
Marsdenia viridiflora subsp. *viridiflora - endangered population*	-	E2	-	Marginal habitat present within the development site.
Marsdenia viridiflora R. Br. subsp. *viridiflora population in the Bankstown, Blacktown, Camden, Campbelltown, Fairfield, Holroyd, Liverpool and Penrith local government areas*	-	E	-	Marginal habitat present within the development site.
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	V	-	Marginal foraging habitat present within the development site.
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat (foraging)	V	-	Marginal foraging habitat present within the development site.
Miniopterus australis	Little Bent-winged Bat (Foraging)	V	-	Marginal foraging habitat present within the development site.
Miniopterus orianae oceanensis	Large Bent-winged Bat (Foraging)	V	-	Marginal foraging habitat present within the development site.
Myotis macropus	Southern Myotis	V	-	Potential roosting habitat present within the development site. (hollow-bearing trees).
Neophema pulchella	Turquoise Parrot	V	-	Marginal foraging habitat present within the development site.
Ninox strenua	Powerful Owl (Foraging)	V	-	Marginal foraging habitat present within the development site.
Persicaria elatior	Tall Knotweed	E	V	Marginal habitat present within the development site.
Petroica boodang	Scarlet Robin	V	-	Marginal foraging habitat present within the development site.
Petroica phoenicea	Flame Robin	V	-	Marginal foraging habitat present within the development site.
Pimelea spicata	Spiked Rice-flower	E	V	Suitable habitat not present due to the highly degraded nature and maintained understorey of the development site. However, a conservative approach was taken and this species was included in the targeted survey for the BDAR. No individuals were recorded.

Species	Common Name	BC listing	EPBC Listing	Potential Habitat within Development Site
Pteropus poliocephalus	Grey-headed Flying-fox (Foraging)	V	V	Marginal foraging habitat present within the development site.
Pultenaea pedunculata	Matted Bush-pea	V	V	Suitable habitat not present due to the highly degraded nature and maintained understorey of the development site. However, a conservative approach was taken and this species was included in the targeted survey for the BDAR. No individuals were recorded.
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V	-	Marginal foraging habitat present within the development site.
Stagonopleura guttata	Diamond Firetail	V	-	Marginal foraging habitat present within the development site.
Tyto novaehollandiae	Masked Owl (Foraging)	V	-	Marginal foraging habitat present within the development site.

Only one threatened fauna species, *Myotis macropus* (Southern Myotis) was identified within the development site.

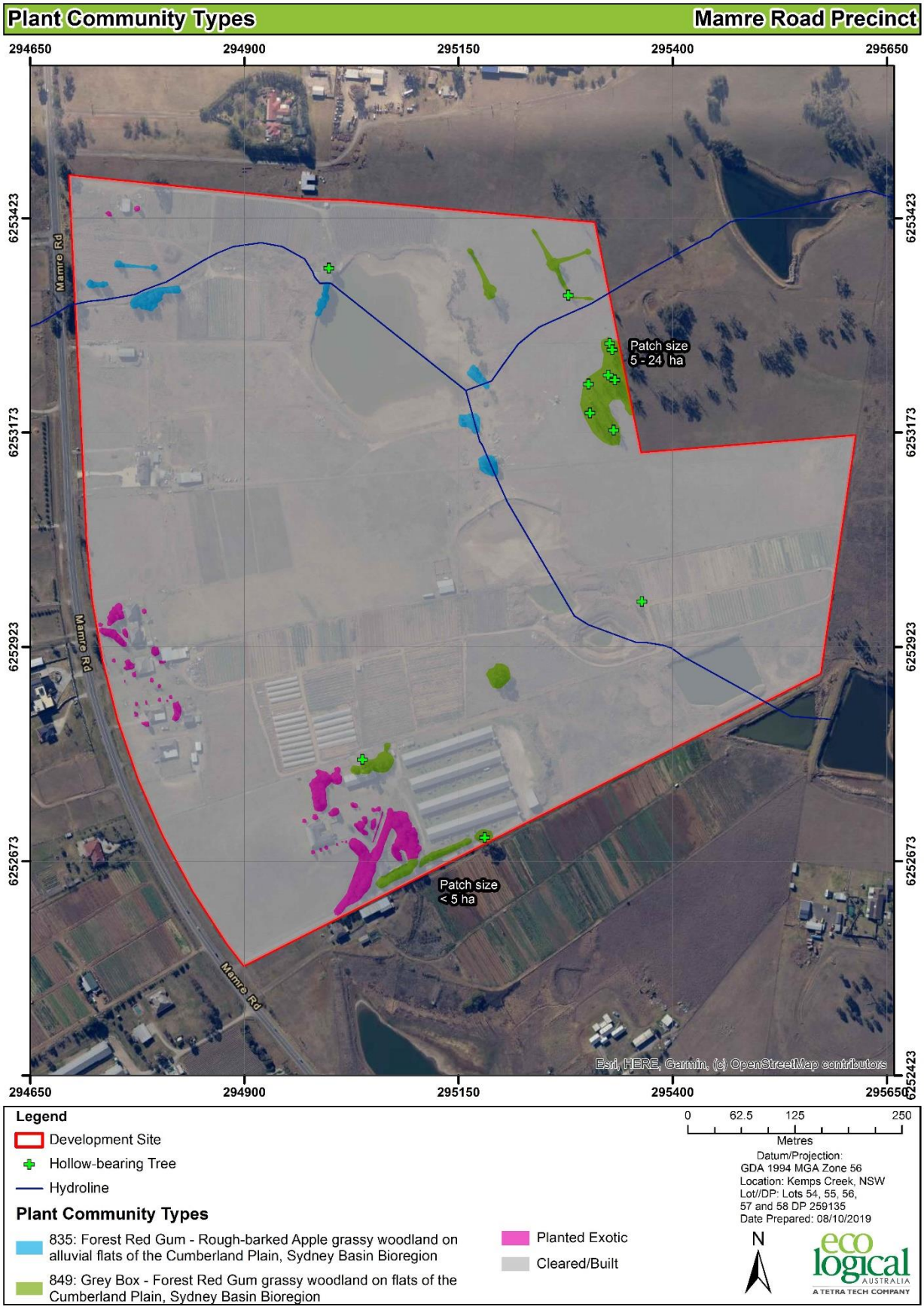

Figure 1: Plant Community Types within the development site

2. Implementation and Operation

2.1 Flora and Fauna Management Program

Safeguards to manage potential flora and fauna impacts are detailed in Table 3**,** together with who is responsible for their implementation and at what stage of works.

Person responsible for implementation: PM – Project Manager; SS – Site Supervisor; SE – Site Ecologist; SAE – Site Aquatic Ecologist; All – All Site Personnel

Table 3: Flora and Fauna Management Plan

Environmental Action	Timeframe	Monitoring	Responsible Person
OBJECTIVE: GENERAL			
All project staff and contractors will be inducted on the biodiversity sensitivities of the work site(s) and relevant safeguards prior to commencement.	Prior to works	Induction Records	PM
Work site will be delineated and 'no go' zones around the perimeter of the project site will be marked prior to commencement of works.	Prior to works	Weekly checklist, after rainfall or changed in site conditions	PM, SS
If required, Penrith City Council will be notified immediately of any complaints in relation to management of biodiversity issues.	As required	Complaint Register	SS
OBJECTIVE: REDUCE HARM TO BIODIVERSITY			
Future landscaping contractors to undertake an environmental awareness induction prior to commencement of works within the study area.	Prior to works	Induction records, weekly checklist	SS, SE
Prior to clearance of the vegetation in the development area, collectable floristic material such as native species seed stock and woody fruit of all native species will be collected for use in landscaping works within the development site. Refer to Appendix H for further information.	Prior to works	Weekly checklist	PM, SS, SE
Survey efforts identified 12 hollow-bearing trees within the development site (Figure 1). The site ecologist it to be present during removal of identified hollow-bearing trees. Hollow-bearing trees should be removed in the following manner: • Check for fauna in the zone of disturbance before clearing • Remove all non-hollow bearing vegetation prior to the removal of the habitat trees	Prior to works	Weekly checklist	PM, SS, SE

Environmental Action	Timeframe	Monitoring	Responsible Person
• After clearing, re-check to ensure no fauna have become trapped or injured during clearing operations. Any fauna found should be safely located to nearby habitat. • Leave habitat tree standing for at least one night after clearing of non-hollow bearing trees to allow any fauna the opportunity to remove themselves after site disturbance. • Before felling the habitat tree, engage a climbing arborist to sectionally lop and lower branches one at a time. • Re-check after felling the habitat tree to ensure no fauna have become trapped or injured during clearing operations. Any fauna found should be safely located to nearby habitat. • If taking the habitat tree down in stages, the non-hollow-bearing branches should be removed before the hollow-bearing branches are removed. • Take care when moving equipment near vegetation to be retained. • Rather than mulching or burning cleared vegetation, logs from the felled trees should be retained and distributed into the proposed Vegetation Management Plan area where it would not be considered a fire hazard. This would provide additional potential habitat for ground dwelling fauna such as reptiles and small mammals. If native fauna is identified during clearance surveys within the project site, the Fauna Rescue and Release Procedure found in Appendix E must be adhered to.			
A short report detailing the pre-clearance and clearance works is to be provided to Penrith City Council within 10 days of completion.	During construction	Weekly checklist	PM, SE
The identified hollow-bearing trees should be replaced with an artificial hollow or nest box after removal or removed hollows should be placed within the Vegetation Management Plan area or nearby Council reserves (if requested by Penrith City Council). This is to be done under the direction of the Site Ecologist. If further hollows are identified during pre-clearance or clearance surveys and are proposed to be removed, the replacement with artificial hollows or nest boxes will be required. Three nest boxes for every tree hollow will be required.	During construction, completion of works	Weekly checklist	SS, SE
Ensure that no plant, equipment or stockpiles are positioned under the drip line of retained along the boundary of the development site trees.	During construction	Weekly checklist	SS, All
During any hollow-bearing tree removal, an experienced wildlife handler is to be present to re-locate any displaced fauna that may be disturbed during this activity. Any injured fauna is to be appropriately cared for and released on site where appropriate. Refer to Appendix E for further details.	During construction	Weekly checklist	SS, SE

Environmental Action	Timeframe	Monitoring	Responsible Person
The site ecologist is to be present during removal of identified hollow-bearing trees to relocate any identified fauna. If fauna is found on the construction site during construction works, stop work – all native fauna is protected. Do not touch animal but wait for it to leave. If injured fauna is found, the site ecologist is to relocate to the nearest local vet or call WIRES or a rescue agency. If a threatened fauna species is identified, stop works and notify Penrith City Council. Refer to Appendix F for further guidance.	During construction	Weekly checklist	All
To reduce the spread of pathogens and diseases, ensure Arrive Clean, Leave Clean Guidelines (Department of the Environment, 2015) are adhered to: • Ensure all clothing, hats, footwear, tools, equipment, machinery and vehicles are free of mud, soil and organic matter before entering and exiting bushland • Ensure any soil, plants or other materials entering the site are certified free of weeds and pathogens. A dedicated washdown location, at the entry/exit of the site is to be determined prior to construction works. If weeds or pathogens are known to be present within the development site, Appendix G must be adhered to.	During construction	Weekly checklist	SS, All
OBJECTIVE: REDUCE HARM TO AQUATIC BIODIVERSITY			
As part of the dam dewatering process, a number of steps are required to minimise harm to aquatic biodiversity. The aquatic fauna relocation must only be performed by a person with one of the following licenses/approvals: • Section 37 *Fisheries Management Act 1994* (for fish) • Biodiversity Conservation Licence – *Biodiversity Conservation Act 2016* (for turtles, frogs, wetland birds) • Animal Research Authority (issued by the Secretary's Animal Care & Ethics Committee). The Aquatic Ecologist undertaking the aquatic fauna relocation is to notify NSW Fisheries of the activity 48 hours prior to fish relocation (unless an agreement is in place), including locations of dewatered and relocation sites (see regional office contacts https://www.dpi.nsw.gov.au/contact-us/local-office). Fisheries require permits to be carried by the licensed ecologist, who should also display a sign clearly showing licence number (if working in public areas, especially when releasing fauna to local creek). Detailed aquatic fauna handling procedures are included in Appendix F.	Prior to dewatering commencing and during works	Weekly checklist	SS, SAE
OBJECTIVE: REDUCE SPREAD OF PRIORITY WEEDS			

Environmental Action	Timeframe	Monitoring	Responsible Person
Wash down equipment and vehicles prior to and after use, to manage the introduction and spread of weed propagules.	Prior to works, during construction	Weekly checklist	All
All weeds are to be treated prior to becoming an environmental threat according to best management practices.	During construction, completion of works	Weekly checklist	SS
OBJECTIVE: REDUCE POTENTIAL NOISE IMPACTS TO NATIVE FAUNA			
If practical, avoid simultaneous operation of noisy plant within discernible range of vegetation outside of the development site.	During construction	Weekly checklist	All
Works will only occur during the following times: Monday to Friday 7:00 am to 5:00 pm, Saturday 8:00 am to 1:00 pm. Works will not operate after sunset to minimise indirect impacts to threatened fauna species in proximity.	During construction	Weekly checklist	SS
Maximise the distance between noisy plant items and nearby residential receivers and potential fauna habitat.	During construction	Weekly checklist	All
Orient equipment such as offensive noise carriers away from residential receivers and potential fauna habitat.	During construction	Weekly checklist	All
Plant used intermittently is to be throttled or shut down when not required.	During construction	Weekly checklist	All

2.2 Structure and Responsibility

The organisation chart outlined in Figure 2 identifies the reporting lines for the key contractor and sub-contractor personnel responsible for environmental management, as well as the Penrith City Council interface. Details of personnel responsibilities are outlined in Table 4. Contact details for these personnel are included in Appendix C.

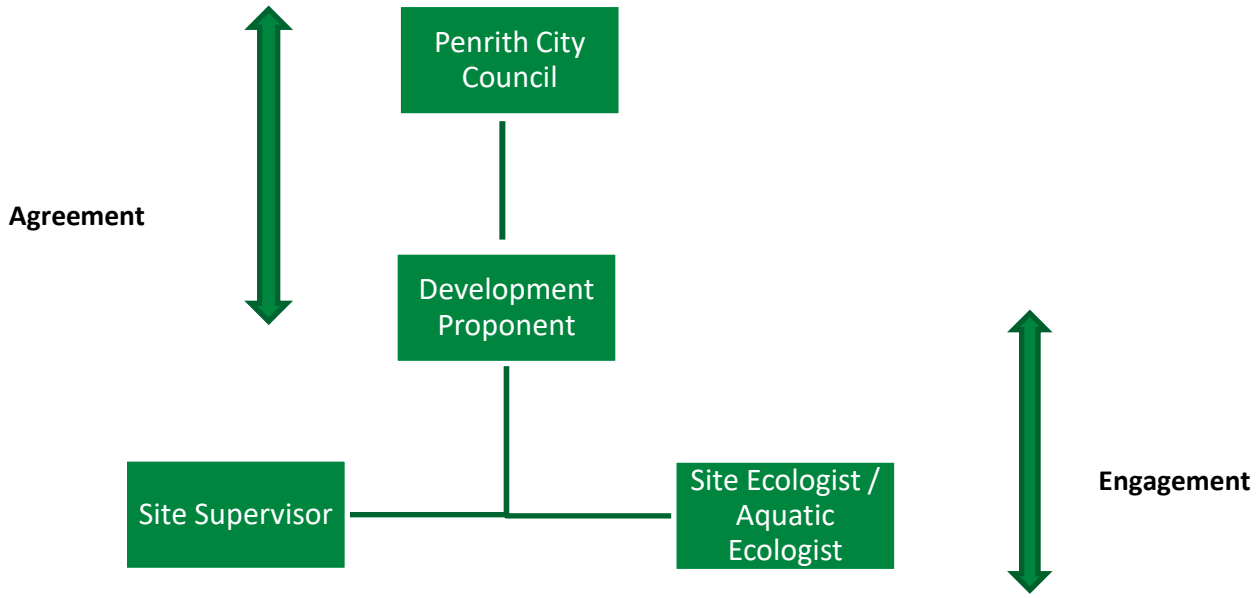

Figure 2 Project organisation chart

Table 4 Responsibilities of personnel

Role	Name, Position and Company	Responsibility
Project Manager	XXX **XXX**	• Reviews DA Conditions of Consent and FFMP. • Notifies Penrith City Council of changes to the project scope of works and updates the FFMP, if required. • Requires the contractor to adhere to the approved works. • Accountable for contractor's and subcontractor's environmental performance. • Reports any non-compliance to Penrith City Council.
Site Supervisor	XXX **Construction Contractor**	• Issues stop work orders, if required. • Records any community complaints (Appendix B) and notifies Project Manager. • Responsible for site management, FFMP compliance, including subcontractors. • Facilitates environmental induction and toolbox talks for site personnel. • Undertakes minimum of weekly environmental inspections (or after environmental conditions change). • Ensures proponent, Penrith City Council and community are notified of commencement of works. • Initiates corrective actions. • Reports FFMP non-conformances to the Project Manager. • Reports incidents. • Notifies the Project Manager if the FFMP needs revising.
Staff	**Construction Contractor** & **Ecologist Contractor**	• Comply with the FFMP. • Monitor and maintain controls. • Report breaches of the FFMP and potential / actual incidents to Site Supervisor • Report incidents. • Stop work and reports to Site Supervisor in the event of unexpected finds (e.g. native fauna). • Record any community complaints and notify the Site Supervisor (Appendix B).

Appendix A Team Induction Sign-Off Sheet

The following personnel certify the works will be carried out in accordance with the FFMP.

Name	Position / Company	Signature	Date
	Project Manager **TBC**		
	Site Supervisor / Contractor **TBC**		
	Staff **TBC**		
	Staff **TBC**		
	Staff **TBC**		
	Staff **TBC**		
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	Staff **TBC**		
	Staff **TBC**		
	Staff **TBC**		
	Site Ecologist **TBC**		

Appendix B Complaints Recording Template

Date	Received by phone / email / letter	Complaint	Name	Address	Contact	Follow-up Actions	Date Complete

Appendix C Phone and Emergency Contact List

Organisation	Name	Position	Contact Number
Project Contacts			
TBC	TBC	Project Manager	XX
TBC	TBC	Site Supervisor	XX
TBC	TBC	Site Ecologist	XX
Penrith City Council		Natural Resources Department	02 4732 7777
Emergency Contacts			
Emergency Services	-	-	000
Mount Druitt Hospital	-	-	02 9881 1555
Environment Protection Authority	-	-	131 555
SafeWork NSW	-	-	131 050
Fire and Rescue NSW	-	-	02 9265 2999
State Emergency Services (SES)			132 500
WIRES	-	-	1300 094 737
Origin Energy			132 461
Energy Australia			133 466
Transgrid System Operations			1800 027 253 / 9284 300
Police Assistance Line (PAL)			131 444
Gas – Agility			131 909
Poisons Information			131 126
Telstra			132 200
RMS			132 213

Appendix D Site Biodiversity Inspection Checklist (Weekly)

Constructor Details	Site Supervisor - Environmental Checklist	
Project Title: Aspect Industrial Estate Site Inspected: Mamre Road, Kemps Creek		
Time & Date:	Weather:	
Biodiversity		
• All collectable floristic material such as native vegetation seed stock, woody debris and bush rock has been collected for use in landscaping or relocation to nearby Council reserves.		☐
• No plant, equipment or stockpiles are positioned under the drip line of retained trees.		☐
• The Site Ecologist was present during tree removal and displaced fauna has been relocated.		☐
Aquatic Biodiversity		
• Aquatic ecologist has been notified of intention to commence dam dewatering, DPI Fisheries notified of intended dewatering works and aquatic fauna relocation location has been chosen		☐
• Erosion and sediment controls downstream of dam water irrigation areas are installed correctly		☐
• Aquatic Ecologist completed capture and relocation of aquatic fauna		☐
Priority Weeds		
• Equipment and vehicles have been washed down prior to and after use, to manage the introduction and spread of weed propagules and pathogens in accordance with Appendix G.		☐
Noise		
• Simultaneous operation of noisy plants within discernible range of a sensitive receiver has been avoided.		☐
• The distance between noisy plant items and nearby residential receivers and potential fauna habitat has been maximised.		☐
• Equipment such as offensive noise carriers have been oriented away from residential receivers and potential fauna habitat.		☐
• Plants used intermittently have been throttled or shut down when not required.		☐
Inspected by:	Signature:	
Actions:	By Who:	Date Completed:

Appendix E Fauna Rescue and Release Procedure

The following Fauna Rescue and Release Procedure has been prepared in accordance with the NSW Department of Planning, Industry and Environment *Code of Practice for Injured, Sick and Orphaned Protected Fauna 2011.*

NATIVE FAUNA ENCOUNTER

If native fauna (including threatened fauna) is encountered during pre-clearance or clearance surveys, the decision tree outlined in Table 5 should be adhered to.

Table 5: Decision tree on how to respond to a native fauna encounter

Is the animal sick, injured, likely to have been injured or an orphan?			
YES		**NO**	
Is death imminent or highly likely regardless of the care available?		Is the animal creating a nuisance for the public or in a dangerous location?	
YES	**NO**	**YES**	**NO**
Arrange for the animal to be humanely euthanised by a suitably qualified person.	Rescue the animal and arrange for a vet or experienced fauna rehabilitator to assess it.	Advise people to avoid the animal or relocate it to a suitable nearby location.	Do not intervene.

RESCUING OF NATIVE FAUNA

If rescuing of the animal is chosen to be the most suitable option, the following must be adhered to:

- Assessment of all risk to fauna from environmental hazards and from capture.
- Confirmation that the correct rescue equipment for the type and size of fauna is at hand.
- Confirmation that a sufficient number of trained personnel for that species and size are present.

TRANSPORTATION OF RESCUED NATIVE FAUNA

When transporting the rescued native fauna to a veterinary surgery or rehabilitation facility such as WIRES, the following must be adhered to:

- Ensure transport methods and container sizes are appropriate for the species, size, strength and temperament of fauna. This may include incorporating padding walls and ensuring no ingestible surfaces are present. Containers must also be designed and positioned so breathing is not restricted.
- Transportation containers are kept as an appropriate temperature for the species (note a range of 25 – 27◦C is appropriate for most species and ages;31◦C is appropriate for unfurred joeys and 21◦C is appropriate for echidnas, platypuses and frogs).
- Transportation containers are well ventilated.
- Ensure containers holding snakes and bats include a visible warning label outlining the danger.

- Ensure transportation containers are not left in the back of uncovered utility vehicles or car boots.
- During transportation, adult fauna should not be fed or watered during trips lasting less than a few hours. Dependent young may require feeding during shorter trips.
- Attain approval by a veterinarian before use of medication to facilitate transport.
- Ensure fauna transport is the sole purpose of the trip.

RELOCATION OF NATIVE FAUNA

If the encountered native fauna does not require rescuing however, is required to be located outside of the construction site, the following must be adhered to:

- A suitable environment must be identified prior to relocation, this is one that:
  - Contains appropriate habitat and adequate good resources.
  - Is occupied by members of the same species.
  - Does not place the animal at a high risk of injury.
  - Is not outside of an area which the fauna would not normally cross (i.e. brush-tail possums rarely move more than 50 m however; wombats have a radius of approximately 50 km).

Appendix F Aquatic Fauna Handling Procedures

During dam dewatering, an aquatic ecologist should be on site to handle aquatic fauna in line with the following procedures.

CAPTURE

Fish are to be collected by hand nets during the dewatering process. This is most effective when the water is <0.3 m deep. Dissolved oxygen concentration will drop rapidly as water volume decreases, especially in warm water or if lots of fish are present. Larger bodied fish should be targeted first. Wetland birds will scavenge for small fish in the shallows (e.g. Gambusia). Most small fauna will likely remain uncaptured in the dam until the water becomes very shallow (especially eels and turtles). Eels are best captured by large hand nets in water <0.3 m deep, although they burrow into mud. When the water is extremely low, turtles and fish may head towards the intake pump (placed in deepest part). This area should be monitored to intercept fauna (e.g. stand in water next to intake). Turtles will burrow into mud and may require observation and rescue the following morning but can also move themselves to suitable nearby habitat if an escape ramp is graded. For safety, at least two people are required when wading and handling heavy tubs of water/fish up banks (excavator can dig access steps/ramp).

RELOCATE

Native fish healthy enough for relocation are to be contained and transported in an aerated tub/bucket/tank to an appropriate dam/lake/waterhole/creek. NSW Fisheries advise that the host location should be large enough to accommodate additional fish, especially predatory eels. If a large number of predatory fish such as Longfin Eels are captured during the aquatic fauna relocation process, an additional release point may be required. Tubs should not be overstocked or left in direct sun for extended periods. Aeration can be provided by battery aquarium pumps or manual turbulence if only stored for a short period. Turtles can be transported in a shaded tub with a wet hessian bag placed inside for moisture and support during transport. Tadpoles and frogs can be transported in small buckets.

RELEASE

Water from the receiving waterbody should be mixed slowly over 5 - 10 minutes with the tank water to allow fish to acclimatise to the new water quality. Care should be taken when releasing fauna not to also transfer weeds or invasive species (e.g. Carp eggs and Gambusia). Animals should be transferred via hand nets, rather than directly pouring them from the tub. Eels can be released on land a few metres from edge and pointed towards the water. The number of each species are to be counted upon release and later incorporated into the summary report.

PESTS

Exotic fish (e.g. Carp, Gambusia, Goldfish, Redfin Perch, Spotted Livebearer) are to be intercepted, euthanised and disposed of in accordance with the ecologist's Animal Research Authority (issued by the Secretary's Animal Care & Ethics Committee). Exotic *Trachemys scripta* (Red-eared Slider Turtle) are to be contained humanly and Department of Planning, Industry and Environment (DPIE) immediately notified (Environment Line - 131 555). They will collect the live turtle from the ecologist. A tally of the number and species of animals euthanised would be recorded and later incorporated into the summary report.

POST-DEWATERING

An escape ramp should be graded to allow trapped fauna to escape overnight. Sediment should be left overnight to allow hidden fauna to emerge unless the ecologist confirms there are no fauna remaining (site-specific assessment). Earthworks staff should notify the appointed aquatic ecologist if stranded fish or turtles are observed post-dewatering.

REPORTING

The Aquatic Ecologist should prepare a summary report suitable for submission to Penrith Council within seven days of completing the aquatic fauna relocation works. The report would detail that the works have been completed in accordance with the Dam Dewatering Plan and would include information relating to the location of the dam dewatering works, the licences held by the staff involved in the works, the number and type of native species relocated, location of release point/s for native fauna and the number and type of exotic species dispatched.

Appendix G Introduction and Spread of Weed and Pathogens Procedure

Construction works on development sites have the potential to introduce and promote the spread of weed species. This procedure is intended to prevent or minimise the spread of priority weed species. During construction, the Project Manager and Site Supervisor should adhere to best practice methods for weed management, which include:

- Mowing or slashing areas infested with weeds before they seed. This may reduce the propagation of new plants.
- Program works from least to most weed infested areas.
- Clean machinery, vehicles and footwear before moving to a new location.
- Securely cover loads of weed-contaminated material to prevent weed plant material falling or blowing off vehicles.
- Dispose of weed-contaminated soil at an appropriate waste management facility.
- Remove weeds immediately onto suitable trucks and dispose of without stockpiling.

WEED MANAGEMENT PLAN

If the development site is highly infested, a Weed Management Plan may be warranted as a sub-plan to the Construction Environmental Management Plan, which may include:

- Identification and description of weed infested areas within the site.
- Recommendations for managing weeds.
- Weed control methods.
- Measures to prevent the spread of weeds.
- A monitoring program to measure the success of weed management.
- Communication strategies to improve contractor awareness of weeds and weed management.

Pathogens are agents such as bacterium, virus or fungus that cause disease in flora and fauna, which are be spread on footwear, vehicles or machinery. The four most common pathogens found in NSW include:

- **Phytophthora (*Phytophthora cinnamomi*):** A soil-borne fungus that attacks the roots of native plant species, causing them to rot and eventually die.
- **Chytrid fungus (*Batrachochytrium dendrobatdis*):** A waterborne fungus that affects native frog species.
- **Myrtle rust (*Uredo rangelli*):** An introduced fungus that attacks young leaves, shoot tips and stems of Myrtaceous plants (such as Bottle Brush, Tea Tree, Lilly Pilly and Turpentine), eventually killing the plant.

Construction works on development sites have the potential to promote the spread of pathogens. This procedure is intended to prevent or minimise the spread of pathogens if they have been identified within the development site. If the occurrence of pathogens is known within the locality, a test for presence through soil or water tests should fire be undertaken. If pathogens are present, during construction, the Project Manager and Site Supervisor should adhere to best practice methods for pathogens (Table 6).

Table 6: Best practice hygiene protocols to prevent the spread of pathogens

Pathogen	Best Practice Hygiene Protocols
Phytophthora	• Minimise work during excessively wet or muddy conditions. • Programming of works should always move from uninfected areas to infected areas. • Set up exclusion zones with fencing and signage to restrict access into contaminated areas. • All personnel (including visitors) to be inducted on Phytophthora management measures for the site. Provide vehicle wash down facility. • Restrict vehicles to designated tracks, trails and parking areas. • Provide parking and turn-around points on hard, well-drained surfaces. • Provide boot wash down facility. • Restrict personnel to designated tracks and trails. • Use a certified supply of plants and soil that is disease-free. • Retain all potentially affected materials within the contaminated area. • Ensure stockpiles of mulch, topsoil and fill material are separated to avoid potential contamination and spread.
Chytrid Fungus	• Minimise work during excessively wet or muddy conditions. • Programming of works should always move from uninfected areas to infected areas. • Set up exclusion zones with fencing and signage to restrict access into contaminated areas. • All personnel (including visitors) to be inducted on chytrid management measures for the site. • Provide vehicle wash down facility. • Restrict vehicles to designated tracks, trails and parking areas. • Provide parking and turn-around points on hard, well-drained surfaces. • Provide boot wash down facility. • Disinfect with cleaning products containing benzalkonium chloride or 70% methylated spirits in 30% water. • Disinfect hands or change gloves between the handling of individual frogs and between each site. • Only handle frogs when necessary. Use the 'one bag-one frog' approach. • To avoid cross contamination, generally avoid transferring water between two or more separate waterbodies.

Myrtle Rust	• To determine if Myrtle Rust is known within the locality of the development site, the following should be undertaken:
	  ○ Use of The DPI Myrtle Rust Management Zone map (www.dpi.nsw.gov.au/biosecurity/plant/myrtle-rust/zones)
	  ○ Consultation with Penrith City Council for additional rust records and risk assessments.
	  ○ Photograph potentially infected plants and send to: biosecurity@industry.nsw.gov.au for confirmation.
	• Programming of works should always move from uninfected areas to infected areas.
	• Set up exclusion zones with fencing and signage to restrict access into contaminated areas.
	• All personnel (including visitors) to be inducted on Myrtle rust management measures for the site.
	• Provide vehicle wash down facility.
	• All vehicles and machinery to be washed with Truckwash®(or equivalent).
	• Restrict vehicles to designated tracks, trails and parking areas.
	• For medium-long term projects, install a concrete wash down bay which will capture the water in a trench or bunded area.
	• Water used for wash downs must not be used for dust control.
	• Personnel working in an infected site should shower and launder clothes (especially hats) before moving to another bushland site.
	• Provide boot wash down facility.

Pathogen	Best Practice Hygiene Protocols
	• Footwear and equipment to be cleaned of soil/mud then sprayed with 70% methylated spirits in 30% water. • Use a certified supply of plants and soil that is disease-free (the Australian Nursery Industry *Myrtle Rust Management Plan* (McDonald 2011) provides best practice Myrtle rust management that is to be expected from suppliers). • Plant material should be buried on site if possible. • Do not dispose of waste at another bushland site. • Buried material sites must be mapped to prevent re-exposure, especially if located near utility easements. • If material cannot be buried advice should be sought from Penrith City Council.

Appendix H Re-Use of Floristic Material and Native Habitat Features Strategy

COLLECTION OF FLORISTIC MATERIAL

The vegetation within the development site conforms to two TECs (Cumberland Plain Woodland and River-flat Eucalypt Forest). Therefore, if requested by Penrith City Council, native seed collection may be required prior to construction to later be used in the Vegetation Management Plan area or a nearby Council reserve. If this is the case, the following should be adhered to:

- Seed should first be collected from all areas that are to be cleared as part of the project. By selecting a seed source that is from plants growing in similar environmental conditions nearby, the plants should be naturally adapted to local conditions and more likely to survive and prosper in proposed re-use areas.
- Carry out all seed collection in accordance with the Florabank Guidelines (Florabank, 2000) and Model Code of Practice (Mortlock, 1998). Experienced and licensed seed collectors should carry out the seed collection.

RELOCATION OF WOODY DEBRIS AND BUSH ROCK

Many native fauna species utilise woody debris and bush rock for shelter, basking to hide from predators, find food and avoid extreme weather. When woody debris and bush rock are required to be removed from a development site, consideration should be given to finding suitable locations for re-use of these important habitat features.

Term	Definition
Woody Debris	Trees and wood, whether living or dead, at least 100 mm in diameter and 500 mm long, including hollows.
Bush Rock	Loose rock occurring on rock or soil surfaces.

Prior to relocation of woody debris found within the development site, consultation should be undertaken with Penrith City Council and the site ecologist to determine a suitable location for re-use to ensure it does not have a negative impact on the receiving environment. For example, in areas of high-quality bushland, there may already be enough suitable hollows, fallen logs or bush rock and adding more may cause unnecessary disturbance e or create a fire hazard.

If a suitable relocation area (such as the Vegetation Management Plan area) has been agreed upon by Penrith City Council and the proponent, the Project Manager and Site Supervisor should ensure the following best practice methods are undertaken during relocation:

- Removal, stockpiling, transportation and relocation of woody debris and/or bush rock is carried out in a manner that minimises disturbance to native vegetation (including the canopy, shrubs, dead trees, fallen timber and groundcover species) or bush rock.
- The spread of any weeds or pathogens that may be in the soil is avoided when relocating woody debris and bush rock from stockpiles.

- The Site Ecologist is consulted with to provide advice on positioning woody debris and bush rock in designated relocation areas.
- Topsoil disturbance is kept to a minimum and is not heaped up against woody debris or bush rock because of the potential to provide habitat for rabbits.
- Woody debris is placed evenly across the site.
- Where woody debris is to be mulched the Project Manager and/or Site Supervisor should ensure that weeds are separated from native vegetation.

USE OF NEST BOXES

Nest boxes can be used to provide supplementary breeding habitat and shelter for hollow-dependant fauna where hollows have been removed. If requested by Penrith City Council, nest boxes may be required to be installed as a replacement for the removal of the identified hollow-bearing trees. Generally, it is recommended that three nest boxes are installed for every hollow-bearing tree removed.

If the installation of nest boxes is required, the following must be considered in consultation with the Site Ecologist:

- The target species.
- The tree hollow preferences of native hollow-dependant fauna known or likely to occur in the locality.
- The sizes, types and quantities of potential tree hollows to be removed.
- The sizes, types and quantities of tree hollows existing in adjacent areas.
- The design, materials and quantity of nest boxes required.
- Whether the nest boxes are required to fill a short-term gap in the availability of hollows (e.g. during construction) or to compensate for the long term reduced availability of hollows.
- Monitoring and maintenance of the nest boxes.

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