

Final Report

# Year 1 Site Monitoring and Compliance Report: 75-135 Bolinda Rd, Campbellfield, Victoria., Victoria

Prepared for

**Forte Group Pty Ltd**

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**Ecology and Heritage Partners Pty Ltd**

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## 1 EXECUTIVE SUMMARY

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Ecology and Heritage Partners Pty Ltd were commissioned by Forte Group Pty Ltd to prepare a Conservation Management Plan for the nationally threatened Growling Grass Frog *Litoria raniformis* (GGF) for the proposed commercial development at 75-135 Bolinda Road Campbellfield, Victoria (EPBC 2020/8748) (Figure 1).

The proposed action includes clearance and redevelopment across the site with the exception of the central quarry void and the habitat corridor proposed to be created on the southern boundary of the study area. Based on the proposed action, all areas of high-quality breeding and foraging habitat will be retained. The intention of the Growling Grass Frog Conservation Management Plan (GGFCMP) (Ecology and Heritage Partners 2023) is to detail the Management strategy to mitigate the loss of an area of low quality and degraded terrestrial Growling Grass Frog habitat around the rim of the quarry void covering approximately 1.5 hectares.

This report details the results of the Year 1 monitoring, including the status of one matter of National Environmental Significance (MNES) that occurs within the site, Growling Grass Frog.

### Offset Sites

To mitigate against the potential impacts (i.e. impact to terrestrial habitat and isolation) to the resident GGF population, habitat creation and improvement is being undertaken within the study area in four distinct offset areas (Figure 2). The creation of dedicated GGF waterbodies within the proposed dispersal corridor and the improvement of terrestrial habitat within the quarry void will provide additional breeding and foraging habitat for the species (once complete), and improve habitat connectivity and frog dispersal within the property to allow for a future link from the study area to Merri Creek (i.e. across the Council owned land). Habitat improvements within and directly surrounding the quarry wetland have provided additional foraging and refuge habitat, and provide refuge habitat in the form of rock beaching around the banks of the quarry wetland.

### Growling Grass Frog

Created waterbodies and habitat within the quarry void have been secured under an on-title Section 173 Agreement [Planning and Environment Act 1987] and will be protected from the surrounding industrial land uses. The site will be managed for the purposes of conservation of GGF through the control of pest animals and environmental weeds, in accordance with the relevant Responsible Authority to ensure the land is secured and managed appropriately in perpetuity. Additionally, a Section 69 agreement will be submitted under the *Victorian Planning and Environment Act 1987*, in accordance with condition 11 of the approval.

The ongoing survival of the extant GGF population will be established by maintaining and enhancing wetland hydroperiods and fringing and aquatic vegetation cover within the proposed movement corridor. Appropriate population and habitat monitoring is a key element to assess the impact of the development and/or monitor the suitability of the site's management regime.

### Conclusion and Recommendations

Year 1 monitoring indicated that a healthy population of GGF are persisting within the waterbody at offset area 1 (Table 3), along with multiple tadpoles and metamorphs of varying stages of development, confirming that the waterbody is being utilised by the species for breeding purposes (Plate 1). The overall quality of GGF habitat within the quarry void is improving, with weed control efforts effectively removing the majority of

woody weeds and Artichoke Thistle *Cynara cardunculus* L. Rubbish removal and litter control has been moderately effective, with some litter still present, or being blown in to the quarry void from adjacent areas. The works undertaken throughout Year 1 were as outlined by the GGFCMP, and additional recommendations from the Year 0 Annual Report, in compliance with the EPBC Act approval conditions. As per the GGFCMP, there have been no trigger thresholds for corrective work triggered. Management and monitoring is required to ensure that the offset site maintains optimal habitats for the species to ensure that the vegetation and habitat for GGF continues to improve. The following works should be incorporated into Year 2 management and monitoring in addition to GGFCMP management requirements (Ecology and Heritage Partners 2023: Table 5):

- Regularly consult an experienced zoologist for maintenance issues that could impact on the GGF population and associated habitat;
- Ongoing habitat and GGF monitoring as per the approved GGFCMP (Ecology and Heritage Partners 2023;)
- Undertake routine monitoring to investigate the success of aquatic and terrestrial plant establishment and weed densities;
- Replace any failed plantings;
- Control any weeds invading terrestrial habitat by hand, or spot treatment methods with frog sensitive herbicides;
- Regular inspection of the fencing is required to ensure its effectiveness;
- The control of pest animals such as foxes and cats will be undertaken in accordance with local government laws and relevant legislation;
- Hygiene Protocol (Murray et.al. 2011) to be used to guide best practice Chytrid management;
- Installation of permanent frog exclusion fencing around offset area 4 prior to the completion of construction;
- Construction of the water delivery system;
- The habitat corridor to be constructed as per the GGFCMP to allow frogs to naturally colonise the wetlands during the species active season;
- Complete and submit the application for the Section 69 Agreement to DEECA;
- Revise mitigation and monitoring measures in agreement with responsible authorities, if necessary; and,
- Monitor the level of any public disturbance in and around GGF habitat and manage accordingly (e.g. fencing repairs and signage).

## 2 INTRODUCTION

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### 2.1 Background

Ecology and Heritage Partners Pty Ltd were commissioned by Forte Group Pty Ltd to prepare a Growling Grass Frog Conservation Management Plan (GGFCMP) for the nationally threatened Growling Grass Frog *Litoria raniformis* (GGF) for the proposed commercial development at 75-135 Bolinda Road Campbellfield, Victoria (EPBC 2020/8748). To mitigate against the potential impacts (i.e. impact to terrestrial habitat and isolation) to the resident GGF population, habitat creation and improvement will be undertaken within the study area in four distinct offset areas (Figure 2).

As part of the implementation of the GGFCMP, appropriate population and habitat monitoring schedules must be implemented to assess the impact of the development and/or monitor the suitability of the site's management regime (Ecology and Heritage Partners 2022). Section 3.7 of the GGFCMP states:

*“water quality monitoring is to be established within the quarry wetland prior to the commencement of construction and at a second site within the movement corridor immediately following the completion of the constructed wetlands. Trigger values are to be established and based on pre-construction water quality within the quarry wetland.”*

Table 1 shows the results of the habitat assessments and baseline water quality recorded within the offset area 1 (site 1). The purpose of this report is to document the management practices implemented within the offset areas, as required under the approved GGFCMP (Ecology and Heritage Partners 2023).

### 2.2 Objectives

The overall objective is to protect and improve the quality and extent of native vegetation and significant ecological values present within the offset site, and in accordance with EPBC 2020/8748 and associated GGFCMP. The GGFCMP outlines management actions to meet this objective through the protection, enhancement, and ongoing management of GGF habitat. The GGFCMP also outlines monitoring requirements to ensure that the species is not adversely affected during works and following development of the site. Specifically, the GGFCMP aims to:

- Determine what management actions are required to complete the proposed development without negatively impacting the resident GGF population;
- Provide a map showing the extent of current GGF habitat within the study area;
- Demonstrate measures taken to avoid and minimise impacts during the project planning stage;
- Provide detailed management measures to further minimise impacts on the GGF population during development works;
- Provide detailed management and habitat design measures which provides for the construction, maintenance and enhancement of a permanent breeding site for GGF including:
  - Pre-development: habitat enhancement requirements, including development design considerations; details of design, construction and location of additional habitat;

- During development: management requirements for protecting existing habitat from sedimentation and pollution and direct disturbance that may result from development activities; providing advice and recommendations on other habitat protection requirements, such as establishment of ‘no-go’ zones and clearly marked fencing; and,
- Post-development: management requirements, including vegetation, water quality, protection of habitat from current and potential future threats (such as foxes, feral and domestic cats and Eastern Gambusia).
- Outline monitoring, maintenance and reporting requirements post development; and,
- Provide the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) with sufficient information to continue their assessment of the referred activity, and ultimately progress the implementation of the management plan during development works.

## 2.3 Offset Site Security

Condition 10 of the EPBC Act approval specifies that:

*“Prior to commencement of the action the Offset Area must be secured through a section 173 or section 69 agreement under the Victorian Planning and Environment Act 1987, or alternatively through a Trust for Nature covenant under the Victorian Conservation Trust Act 1972.”*

A section 173 Agreement entered by the proponent and approved by Council on 8 July 2022. A Section 69 will be prepared and submitted, as per condition 11 of the EPBC Act approval which specifies that:

*“If the action is secured through a section 173 agreement under the Victorian Planning and Environment Act 1987 prior to the commencement of the action, the approval holder must register on the relevant title/s a section 69 agreement under the Victorian Planning and Environment Act 1987 or a Trust for Nature covenant under the Victorian Conservation Trust Act 1972, within 24 months of the date of this approval decision. The Section 173 agreement, if applied, must remain in place until another form of protection identified in this condition is registered on the relevant title/s.”*

### 3 MONITORING METHODS

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Baseline data to determine the condition and extent of GGF habitat, as well as the current population status within the offset site was recorded by EHP in 2021/22 and 2022/23 survey seasons. The data collected during the biodiversity assessment and subsequent targeted surveys was used to inform the GGFCMP (Ecology and Heritage Partners 2023). As per the approved GGFCMP, ecological and population monitoring is undertaken annually during the development and for the first 10 years following the completion of construction, as per the approved GGFCMP.

Surveys were conducted during the species' active season (October - March), in weather conditions considered optimal for detection (i.e. warm and humid, overnight temperature not less than 14°C) and when the species was known to be active elsewhere in the region (Table 2). The survey effort consisted of spotlighting (using a hand-held 30-watt 12-volt spotlight) in and around each of the sites searching for frogs in open water; floating, emergent and fringing vegetation; and under logs and other refuge. The following habitat features were recorded as part of the assessment:

- Waterbody type;
- Visual water quality;
- Flow and depth;
- Overall habitat quality;
- Cover of fringing, emergent, floating and submerged vegetation;
- Availability and suitability of shelter and over-wintering sites;
- Presence of introduced fish, particularly Eastern Gambusia and Goldfish;
- Presence of pollutants, rubbish and other threatening processes;
- Photographic reference at marked locations so that comparisons of habitat conditions can be made over time;
- Landscape connectivity; and
- In situ water quality using a calibrated Horiba™ multiprobe measuring; dissolved oxygen, pH, electrical conductivity, temperature and total dissolved solids.

Several diurnal surveys were undertaken during fauna salvage and site meetings to record the type and cover of fringing, emergent, submerged and floating aquatic vegetation, and other refugia. Dip netting was undertaken within the waterbody to target tadpoles and predatory fish. Each nocturnal survey involved spotlighting surveys, call identification, and active searching for adults and metamorphs. More specifically;

- An initial period of five minutes was spent listening to any calling frogs (all species) in and adjacent to habitats;
- The advertisement call was broadcast to elicit a response from any adult males present;
- Surveyors used "Olight" LED hand-held spotlights (up to 1020 lumens/8.4 volts) to locate any calling males on floating vegetation in the waterbody and around the perimeter of waterbodies; and,



- Surveyors actively searched ground-level habitat including surface rocks, underneath hard litter, and at the base of vegetation for frogs.

During the habitat assessments, attributes of the land traversed on foot between sites was also noted for the presence (or otherwise) of suitable dispersal and/or foraging habitat. Results of the habitat and water quality assessment is provided below (Table 1).



**Plate 1.** GGF observed on top of jute matting in offset area 1 (site 1) (Ecology and Heritage Partners Pty Ltd 23/02/2023).



**Plate 2.** The north west area of offset area where backfilling and piling undertaken (Ecology and Heritage Partners Pty Ltd 26/09/2023).



**Plate 3.** Access track to offset area (Ecology and Heritage Partners Pty Ltd 26/09/2022).



**Plate 2.** Offset area with fringing and floating vegetation (Ecology and Heritage Partners Pty Ltd 23/03/2022).

## 4 RESULTS

### 4.1 Construction and Proposed Impacts

Construction of Stage 1 is underway, with approved impacts to areas of GGF habitat within and surrounding the northern sections of the quarry void largely complete at the time of this report. The north west area of the quarry void has been partially impacted (as per the approval), with some backfilling and piling undertaken to stabilise this area (Plate 2). The access track through the quarry void has been reinstated, and will be used to access the area for future monitoring and habitat maintenance activities (Plate 3).

Construction of the proposed movement corridor has not yet been commenced due to changes in the construction schedule for stages 2 and 3. Condition 3.f of the approval states that the approval holder must:

*“ensure the habitat enrichment activities at Offset Area 2 and Offset Area 3 are completed within 24 months of the date of this approval decision.”*

Due to unforeseen delays in the construction of stage 1 and 2, the proponent plans to request an extension to complete the construction of offset area 2 and 3.

### 4.2 Growling Grass Frog Monitoring

The habitat assessment identified that high quality habitat for GGF is present within the study area by means of a large waterbody at the base of the quarry void. The waterbody provides a large, open and permanent area of water that supports varying levels of fringing and emergent aquatic vegetation (Plate 5). A healthy population of GGF were observed within the waterbody at offset area 1 (Table 3), along with multiple tadpoles and metamorphs of varying stages of development, confirming that the waterbody is being utilised by the species for breeding purposes (Plate 6).

Sites 2-4 were found to have varying habitat quality, with Summerset Drain (sites 2 and 3) containing very poor quality water which smelled strongly of petrol or diesel at the time of the survey (Plate 4). A report was submitted to the Environment Protection Authority by phone following this observation.

**Table 1.** Habitat assessment results from February 2023.

Site	Waterbody type	Water quality (visual)	Water quality (in situ)	Flow	Capacity full (%)
Site 1 (Within study area)	Offset Area 1	Very Good	Temp: 25.39°C PH: 8.45 EC: 7.68 mS/cm DO: 12.65 mg/L TDS: 5.24 g/L	Still	100+
Site 2	Somerset Road Drain, Pond 1	Moderate	Temp: 21.38°C PH: 8.37 EC: 3.37 mS/cm DO: 12.9 mg/L TDS: 2.16 g/L	Moderate	80

Site	Waterbody type	Water quality (visual)	Water quality (in situ)	Flow	Capacity full (%)
Site 3	Somerset Road Drain, Pond 2	Poor	Temp: 22.62°C PH: 8.39 EC: 3.47 mS/cm DO: 9.42 mg/L TDS: 2.22 g/L	Still	80
Site 4	Merri Creek, East of Somerset Road Drain	Poor	Temp: 23.5°C PH: 8.24 EC: 3.77 mS/cm DO: 12.8 mg/L TDS: 2.41 g/L	Still	80

Sites 2-4 were found to have varying habitat quality, with Summerset Drain (sites 2 and 3) containing poor to moderate quality water.



**Plate 5.** Site 2 where strong fuel fumes were detected (Ecology and Heritage Partners Pty Ltd 11/03/2020).



**Plate 6.** GGF observed within offset area 1 and rubbish within the site (Ecology and Heritage Partners Pty Ltd 11/03/2020).

#### 4.2.1 Hydrology and Water Quality

The approved GGFCMP states that conductivity should not increase beyond the approximate limit for the species of 10000  $\mu\text{S}/\text{cm}$  (Heard and Scroggie 2008). The following trigger values have been set to identify any potential reduction in water quality if conditions deteriorate from the baseline (pre-construction) water quality conditions.

- If turbidity is >20% of the background condition;
- If electrical Conductivity is >1% of the background condition;
- If Dissolved Oxygen Concentration is <1% of the background condition;
- If pH  $\pm 0.5$  pH unit from background condition; and,
- All other water quality parameters (including any nutrients or heavy metals) have not substantially exceeded background conditions (i.e. no statistically significant difference ( $\alpha > 0.05$ )).

Given water quality observed during monitoring has not exceeded the levels above, no corrective action is required at this stage (Table 1).

Water levels within site 1 appear to have risen significantly since the installation of rock beaching and habitat enrichment activities. A water level gauge has been installed in the north of the waterbody which will be used to evaluate ongoing water level fluctuations. The proposed wetlands within the movement corridor will incorporate a water delivery system to direct water from within the quarry void into the wetlands to ensure water levels are suitable for the species during dry periods (e.g. during drought). The approved GGFCMP states that as a precaution, the total amount extracted from the quarry wetland will not exceed 20,000 litres/week, as the recharge rate from the underground aquifer are not known. The management plan also states that trigger values to cease pumping will be established based on pre-construction water levels to ensure the wetland habitat remains suitable for GGF. Given the water level appears to have risen by approximately one metre since the project was approved, and water level gauges have been installed following the subsequent increase in water level, it is not known exactly how much the water level increased prior to the gauge being installed. However, trigger values to stop pumping should be set at 1.5 meters below the baseline water level.

**Table 2:** Details and weather conditions of the nocturnal GGF surveys

Date	Survey Times	Air temp (°C) Start	Humidity (%)	Wind (0-4)	Post rain	GGF active elsewhere on the survey night
16/02/2023	21:53-23:05	26.7 °C	43%	0	No	Western Treatment Plant
23/02/2023	21:10-23:50	26.4 °C	47%	0	No	Western Treatment Plant

**Table 3:** Survey results and site observations

Date	Site	GGF Observed	GGF Calling	Tadpoles Observed	Site Notes
16/02/2023	Site 1 (Within study area)	172	No	4 Tadpoles, 9 Metamorphs	GGF and tadpoles observed, predominantly juveniles and newly emerged metamorphs (3.5-5cm) showing evidence of successful breeding activity within the quarry wetland. Water quality very good with low turbidity and large numbers and diversity of aquatic invertebrates. Litter observed within and around the waterbody. Floating vegetation almost exclusively algae, with some areas of fringing vegetation in the form of phragmites and environmental weeds such as Kikuyu Grass <i>Cenchrus clandestinus</i> . Biomass reduction evident outside offset area 1 following slashing and weed control being undertaken. GGF seen sheltering within jute matting and basking on placed rocks and gravel maintenance tracks. No fish observed.
23/02/2023	Site 1	165	No	No Tadpoles, 6 Metamorphs	GGF and Metamorphs observed, predominately smaller (5cm) and likely from this years cohort. Several larger frogs also observed (10cm). Metamorphs found to be coming out onto land. Buff Banded Rail <i>Gallirallus philippensis</i> observed praying on GGF.
23/02/2023	Site 2	14	No	No	GGF found both basking on concrete slabs on edges of stormwater drain as well as within water. Water more turbid than site 1 with litter also found within the waterbody. Floating vegetation exclusively algae, with some fringing vegetation in the form of phragmites. No fish observed.

Date	Site	GGF Observed	GGF Calling	Tadpoles Observed	Site Notes
23/02/2023	Site 3	13	No	No	GGF found sitting within the creek on top of algae and floating rubbish. Creek found to be of poorer quality with fringing phragmites.
23/02/2023	Site 4	4	No	No	Creek barely flowing with a lot of litter present, likely as a result of recent significant rainfall and stormwater flow. Phragmite reeds found to be pulled out upstream and dumped on banks of river from recent rainfall events, therefore choking the river banks and making it difficult to traverse.

\*Please note that site 1 is within the study area

Ongoing population and habitat monitoring must be conducted in accordance with the detailed GGFCMP (Ecology and Heritage Partners 2023) to assess any impacts associated with proposed development and to ensure habitat conditions within the study area remain suitable for the species. Monitoring at the quarry waterbody and through the dispersal corridor will be conducted during the species' active period between September and March following the initial disturbance event, and then once annually (in the active season) for the life of the Conservation Management Plan.

### 4.3 Fauna Salvage and Relocation

GGF salvage and relocation was conducted on a total of seventeen separate days, from 13 April 2022, to 29 June 2022, as per condition 3.e of the approval. Salvage was conducted during construction of rock beaching around the perimeter of the quarry wetland, and during scalping prior to installation of jute matting (Plate 7 – 10). The salvage and relocation measures were undertaken both immediately prior to and during the development works, as required. Salvage measures were undertaken by a qualified zoologist experienced with these operations. Salvage involved a suitably qualified Zoologist actively searching soil, vegetation and other ground debris (i.e. checking under boulders, vegetation and debris) for frogs immediately prior to, and during habitat improvement works. Salvage and relocation was undertaken using the following methods;

#### 4.3.1 Capture

- Frogs were captured by suitably qualified and experienced zoologists, who are capable of purposeful capture that does not result in unnecessary stress, energy expenditure or injury to the fauna.
- Zoologists changed to a new pair of disposable latex gloves between each frog capture in accordance with the Hygiene Protocol (Murray *et.al.* 2011) (section 5.1). Gloved hands were dipped in the local water in the immediate area so that loss of skin secretions is minimised when frogs are picked up.

#### 4.3.2 Handling

- Frogs and tadpoles were only handled by suitably qualified and experienced zoologists, and were handled as little as possible to avoid inadvertent removal of skin secretions which can predispose them to infection.
- Zoologists changed to a new pair of disposable latex gloves between the handling of each frog and tadpole, in accordance with the Hygiene Protocol (Murray *et.al.* 2011) (section 5.1). Gloved hands were dipped in the local water in the immediate area so that loss of skin secretions is minimised when frogs are handled.

#### 4.3.3 *Holding*

- Frogs were placed into new and clean plastic sample bags, with a 'one bag – one frog' policy, in accordance with the Hygiene Protocol (Murray *et.al.* 2011) (Attachment D) (Plate 9 & 10). Containers were not reused.
- All frogs captured were be assessed for signs of injury or illness, particularly for signs of Chytrid Fungus infection, in accordance with the Hygiene Protocol (Murray *et.al.* 2011) (section 5.1).

#### 4.3.4 *Transporting*

- The transportation of frogs only required ferrying of individuals in their sample containers on foot across Offset Area 1.

#### 4.3.5 *Releasing*

- Frogs were be released into Offset Area 1 immediately into favourable micro-habitats that afford protection from exposure and predation. Frogs were be released into areas with suitable existing rock, debris and/or dense vegetation provided adequate refuge, around the perimeter of the waterbody.
- All frogs were visually monitored after release to ensure that they do not show signs of stress or vulnerability.



**Plate 7.** Vegetation and suitable habitat present within offset area 1 (site 1) (Ecology and Heritage Partners Pty Ltd 28/06/2022).



**Plate 8.** Rock beaching and habitat improvement works underway in offset area 1 (site 1) (Ecology and Heritage Partners Pty Ltd 26/04/2022).



**Plate 9.** GGF salvaged during habitat improvement works (Ecology and Heritage Partners Pty Ltd 27/04/2022).



**Plate 10.** Several GGF salvaged during habitat improvement works, stored as per GGFCMP requirements (Ecology and Heritage Partners Pty Ltd 27/04/2022).

**Table 4:** A summary of year 1/2 salvage activities and dates is presented below.

Date	Activity
13/04/2022	GGF salvage and relocation
20/04/2022	GGF salvage and relocation
21/04/2022	GGF salvage and relocation
26/04/2022	GGF salvage and relocation
27/04/2022	GGF salvage and relocation
28/04/2022	GGF salvage and relocation
29/04/2022	GGF salvage and relocation

Date	Activity
12/05/2022	Site monitoring
13/05/2022	GGF salvage and relocation
01/06/2022	GGF salvage and relocation
15/06/2022	GGF salvage and relocation
16/06/2022	GGF salvage and relocation
17/06/2022	GGF salvage and relocation
22/06/2022	GGF salvage and relocation
23/06/2022	GGF salvage and relocation
24/06/2022	GGF salvage and relocation
28/06/2022	GGF salvage and relocation
29/06/2022	GGF salvage and relocation
14/02/2023	GGF and habitat monitoring
16/02/2023	GGF monitoring
23/02/2023	GGF monitoring
30/08/2023	Site meeting and habitat monitoring
26/09/2023	Site meeting and habitat monitoring
30/10/2023	GGF monitoring

A total of 57 GGF were collected and safely relocated during fauna salvage operations. All individuals appeared healthy, and no GGF were seen to be killed or injured during the works. The highest density of GGF were collected from the northern slopes of the quarry void within offset area 1, in jute matting zones prior to jute matting being installed.

#### 4.4 Habitat Monitoring

The degradation of GGF habitats can occur through a wide range of active and passive processes. Typical processes contributing to habitat degradation include:

- Lack of adequate maintenance;
- Ongoing erosion and sedimentation;
- Chemical and/or hard rubbish influx following flood events;
- Increased weed encroachment into areas of indigenous or planted terrestrial and aquatic vegetation



- Vegetation trampling, removal and/or dieback; and,
- Low water levels and/or poor water quality.

Significantly degraded habitat is unlikely to support GGF, reducing the dispersal and breeding opportunities which would normally be facilitated by areas of non-degraded habitat. As per the approved GGFCMP, any evidence of habitat degradation must be noted as part of the monitoring program.

#### **4.4.1 Inductions**

A suitably qualified and experienced zoologist was on site on 13 April 2022 to conduct site inductions for persons engaged to work on site throughout the duration of the development. Present during the induction was the site supervisor, several members of the team at Australian Ecosystems, representatives from Forte Group Pty Ltd and members of the monitoring team from Ecology and Heritage Partners. The induction included the following:

- Information regarding the environmental values within and surrounding the quarry void, including the significance of the site, Merri Creek and the local region for GGF;
- Diagnostic, ecological and behavioural information relating to GGF;
- The legislative context of the proposed action;
- An outline of the Duty of Care of all persons on site to avoid and minimise the occurrence and extent of potential impacts to the environment and GGF;
- All no-go zones and sensitive habitat areas for GGF;
- The key objectives and measures outlined in this CMP; and,
- The provision of an information pamphlet (Attachment A) summarising key points.

#### **4.4.2 Sediment/ Frog Exclusion Fencing**

Frog exclusion fencing was installed around offset area 1 in November 2022. Following the results of the GGF salvage in April 2022, where several individual GGF were observed over wintering within vegetation outside offset area 1, it was deemed inappropriate to install frog exclusion fencing around the water body until a migration phase was completed to allow any GGF outside offset area 1 to migrate down the hill into the waterbody during their active season, thus avoiding individuals being fenced out of the offset area.

Fencing was monitored during subsequent targeted surveys and habitat monitoring, and deemed to be effective. Frog exclusion fencing is serving a dual purpose of sediment fencing, and was observed to be effectively excluding sediment laden runoff from entering offset area 1.

#### **4.4.3 Safety Fencing and Signage and Washdown Bays**

Safety fencing has been installed around the perimeter of the quarry void. Temporary exclusion fencing is deemed to be an appropriate approach and was in place during all monitoring and site meeting, following the commencement of construction in stage 1 of the project.

A washdown bay was in place at the entrance to the site, which was identified with appropriate signage (Plate 11).



**Plate 11.** Washdown bay at site entrance (Ecology and Heritage Partners Pty Ltd 26/10/2023).



**Plate 12.** Hard rubbish observed within offset area (Ecology and Heritage Partners Pty Ltd 30/08/2023).



**Plate 13.** Tube stock disturbed by EGK (Ecology and Heritage Partners Pty Ltd 26/10/2022).



**Plate 14.** Biomass reduction as a result of hand weeding, knapsack spraying and brush cutting (Ecology and Heritage Partners Pty Ltd 26/10/2022).

#### 4.4.4 Rubbish Removal

Some hard rubbish was still present within the quarry void during monitoring events (Plate 12), however the prevalence of litter and hard rubbish appeared to be reduced following rubbish removal by Australian Ecosystems. As rubbish continues to be an issue within the offset area due to it being blown in from surrounding areas, ongoing rubbish removal and monitoring will be required, as per the approved GGFCMP.

#### 4.4.5 Supplementary Plantings

Additional tube stock was planted in June and August 2023 within the jute matting zones in the offset site (Plate 13). Supplementary plantings had varying success, with resident Eastern Grey Kangaroos *Macropus giganteus* (EGK) evidently feeding on and disturbing the plants. Australian Ecosystems continued to hand weed and brush cut within and around these supplementary planting zones to increase survivorship. EGK have since been eliminated from the site following an approved Authority to Control Wildlife permit being issued. Therefore, impacts to the GGF habitat and supplementary planting by EGK are likely to be minimised moving forward.

#### 4.4.6 Weed Control

Australian Ecosystems undertook monthly hand weeding, knapsack spraying and brush cutting to reduce the overall cover of biomass (Plate 14). Pest plant monitoring was undertaken monthly by Australian Ecosystems. Daily works records were completed following each visit, with the primary objective to reduce overall weed cover and biomass within the offset area. Slashing using handheld brush cutters and herbicide application were the main management techniques. Weed spraying was only undertaken outside offset area 1, above the frog fencing. In November 2023 Australian Ecosystems undertook chainsaw felling of larger trees within offset area 1, as per the requirements of the approved GGFCMP. Removal of trees from around the quarry wetland will reduce shading the water body, as such reducing the risk of Chytrid fungus incidence.

#### 4.4.7 Pest Animal Control

During habitat monitoring within the quarry void in October 2023, several Red fox *Vulpus vulpus* were observed within the quarry void. This was reported the following day to the site manager, and it is understood that Australian Ecosystems returned the following week to destroy a Fox den within the site.

No Eastern Gambusia *Gambusia holbrooki* or any other fish species were observed within the quarry wetland during targeted surveys and dip netting.



**Plate 15.** Rock beaching within the offset area (Ecology and Heritage Partners Pty Ltd 15/06/2022).



**Plate 16.** Rock beaching within the offset area (Ecology and Heritage Partners Pty Ltd 15/06/2022).

## 4.5 Schedule of Management Actions

The following section relates to the management actions and targets summarised in Table 1 of the GGFCMP prepared for the offset site (Ecology and Heritage Partners 2023).

- **Table 5.** Schedule of management actions

Year	Objective	Timing of activity	Standard to be achieved	Status
1 and ongoing	<b>Staged development.</b> Development of the Bolinda Road Commercial Development will be undertaken in nine stages to protect and enhance existing habitat until the dispersal corridor has been constructed.	Throughout construction	Habitat enhancement activities associated with Offset Area 1 within the quarry void will commence during the first stage of the development.	Commenced. Ongoing supplementary planting.
			Temporary frog exclusion fencing and signage will be installed around the parameter of Offset Area 1 prior to the commencement of stage 1 (see figure 3 and 3a).	Complete.
			The habitat corridor will be constructed from Stage 2 onwards to allow frogs to naturally colonise the wetlands during the species active season.	Incomplete. To be commenced following request for a 15-month extension (from 24-months to 39-months for condition 1f of the approval) - Completion of habitat enrichment of Offset areas 2 and 3).
			Frog Exclusion fencing will be installed along the entire northern boundary of the dispersal corridor (i.e. along the northern boundary of Offset Areas 2 and 3) prior to the commencement of Stage 2 to prevent GGF from entering the development area during and after construction.	Incomplete

Year	Objective	Timing of activity	Standard to be achieved	Status
			Construction of the water delivery system will commence from Stage 2 onwards and be completed prior to the conclusion of earthworks and landscaping of wetlands within dispersal corridor, to allow water to be released into constructed wetlands if necessary.	Incomplete
			Permanent frog exclusion fencing will be installed around the perimeter of offset area 4 (i.e. around the edge of the development area) (Appendix 1) and along the entire northern boundary of the dispersal corridor prior to the completion of construction.	Incomplete. Designs approved and currently being fabricated.
			Temporary frog fencing in all areas will be decommissioned once permanent frog exclusion fencing and all construction activities within the dispersal corridor have been completed.	Incomplete
1 and ongoing	<b>Salvage and Relocation</b> The salvage and relocation of GGF individuals from within the Offset Area 1 prior to habitat improvement activities	Both immediately prior to and during the development works, as required	Salvage and relocation will be undertaken as follows: <ol style="list-style-type: none"> <li>1. The salvage and relocation of GGF individuals from within the Offset Area 1 will be undertaken prior to habitat improvement activities.</li> <li>2. Temporary refuge habitat in the form of sheets of tin currently remains in place within Offset Area 1.</li> <li>3. If it is found that the tin is located in an area where rock beaching is to be incorporated under the Land Management Plan (Appendix 1), the tin must be relocated within Offset Area 1.</li> <li>4. Salvage and relocation procedures must be initiated to reduce the occurrence of death, injury or displacement of individuals.</li> <li>5. All areas where rock beaching is to be incorporated must be identified using clearly visible timber stakes and/or bunting prior to works being carried out.</li> <li>6. The area will be searched by a suitably qualified Zoologist and appropriate salvage and relocation protocols initiated.</li> <li>7. If a suitably qualified zoologist is not present during a stage of development where GGF is located on site, contractors are required to temporarily halt works in that area, contact a zoologist and follow procedures outlined in section 3.8.7.</li> </ol>	Complete (section 4.2)

Year	Objective	Timing of activity	Standard to be achieved	Status
1 and ongoing	<p><b>Establish no-go zones and temporary exclusion fencing.</b></p> <p>Preserve existing habitat and subsequently the habitat corridor and no go areas during construction.</p>	Prior to the commencement of Stage 2 and prior to construction of the habitat corridor	Fencing will be installed along the entire northern boundary of the dispersal corridor (i.e. along the northern boundary of Offset Areas 2 and 3) prior to the commencement of Stage 2 to prevent GGF from entering the development area during and after construction.	Incomplete, ongoing
		Prior to completion of construction	Permanent frog exclusion fencing will be installed around the perimeter of the quarry void (i.e. around the edge of the development area) (Appendix 1) and along the entire northern boundary of the dispersal corridor prior to the completion of construction.	
		Following completion of permanent exclusion fencing	Temporary frog fencing in all areas will be decommissioned once permanent frog exclusion fencing and all construction activities within the dispersal corridor have been completed.	
		Monthly	Fencing and “no go” zones inspected monthly for damage or evidence of dumping/activity.	
		As required	All no-go zones and sensitive habitat areas for GGF clearly signed and discussed during on site inductions.	Complete, ongoing.
1 and ongoing	<p><b>Creation of Dedicated GGF Wetlands.</b></p> <p>The creation of dedicated GGF waterbodies within the proposed movement corridor and the improvement of terrestrial habitat within the quarry void will provide additional breeding and foraging habitat for the species and improve habitat connectivity and frog dispersal.</p>	Following establishment of no-go zone and exclusion fencing	<p>The habitat corridor will be constructed during the early stages (i.e. from Stage 2 onwards) of the development to allow frogs to naturally colonise the wetlands during the species active season.</p> <p>Design feature of constructed wetlands:</p> <ol style="list-style-type: none"> <li>1. Wetlands will be designed to permanently contain water and will be filled from treated stormwater runoff from rooftops within the development.</li> <li>2. Depth gauges will be installed in all ponds, and wetland depth will be monitored monthly for the first two years following construction.</li> <li>3. Supplied with the best feasible water quality consistent with Melbourne Water standard stormwater treatment practice.</li> <li>4. Able to be filled from the adjacent waterbody within the quarry void when required (section 3.5).</li> </ol>	Incomplete

Year	Objective	Timing of activity	Standard to be achieved	Status
			<ol style="list-style-type: none"> <li>5. Able to sustain appropriate vegetation to provide habitat (see below).</li> <li>6. Will be clay-lined to retain water with a loamy or sand-substrate topsoil.</li> <li>7. Include rock mattresses, covering minimum 20% of the bank area, as alternative refuge and overwintering sites around the pond margins (Plate 15 &amp; 16, Figure 3 and 3a) (Attachment F).</li> <li>8. Trees and/or large shrubs must not be planted within 20 metres of the banks of GGF wetlands as this may shade out ponds, thus potentially rendering them unsuitable for the species.</li> <li>9. Designed, constructed and managed so that they predominantly comprise open water, low water turbidity, be still, and have low nitrate, phosphate, and salinity levels.</li> </ol>	
1 and ongoing	<p><b>Revegetation and habitat enhancement of Offset Areas.</b></p> <p>The existing GGF habitat within the quarry void (Offset area 1) and the area within the dispersal corridor (Offset areas 2 and 3) will be enhanced through the provision of appropriate revegetation and habitat enhancement.</p>	<p>During stage 1 in Offset area 1.</p> <p>Following earthworks and landscaping of wetlands within dispersal corridor (Offset area 2 and 3)</p>	<p>While the existing GGF habitat within the quarry void will not be impacted by the development, these areas will be enhanced through the provision of supplementary terrestrial habitat (rock, logs and other ground debris) and aquatic habitat (supplementary aquatic vegetation). Habitat enhancement activities associated with Offset Area 1 within the quarry void will commence during the first stage of the development.</p> <ol style="list-style-type: none"> <li>1. To achieve these habitat requirements, in each GGF wetland there will be three distinct zones.</li> <li>2. Timing of works- works will be undertaken between April and August inclusively and ideally planting should occur in late winter/ early spring, providing there is adequate rainfall.</li> <li>3. All works must be subject to disease control in accordance with the measures contained in Section 4.1 and the Hygiene Protocols for the Control of Diseases in Australian Frogs (Murray et.al. 2011) (Attachment D).</li> <li>4. Protective netting will be installed, where required, to prevent damage to aquatic plants by waterfowl.</li> <li>5. Trees and/or large shrubs must not be planted within 20 meters of the banks of GGF wetlands.</li> <li>6. A minimum topsoil depth of 150 mm within all pond planting areas.</li> </ol>	Complete, ongoing.

Year	Objective	Timing of activity	Standard to be achieved	Status
			<p>7. The planting area will contain floristically diverse and structurally similar vegetation, planted at a nominal density of <u>six individuals per square meter</u> with the provision for areas of bare ground between plantings.</p> <p>8. Recommended species for wetland planting known to be present in GGF habitats are provided in Attachment C.</p> <p>9. There must be no alteration to existing aquatic vegetation, or introduction of additional predatory species within the quarry void where existing breeding habitat is present.</p> <p>The following species must not be introduced into Offset Area 2 and 3 or included in the list of suitable species to be planted in order to avoid the risk of constructed wetlands becoming choked with vegetation;</p> <p>Narrowleaf Cumbungi <i>Typha domingensis</i></p> <p>Broadleaf Cumbungi <i>Typha orientalis</i></p> <p>Lesser Reed-mace <i>Typha latifolia</i></p> <p>Common Reed <i>Phragmites australis</i></p> <p>Tall Spike-rush <i>Eleocharis sphacelata</i></p>	
1 and ongoing	<p><b>Chemical/petroleum spill and hard rubbish dumping.</b></p> <p>Protect existing and constructed GGF habitat from contamination.</p>	Both immediately prior to and during the development works, as required	<ol style="list-style-type: none"> <li>1. Chemical and fuel storage area to be established as far from GGF habitat as practical.</li> <li>2. Equipment to be regularly serviced and inspected daily.</li> <li>3. Personnel to undergo adequate training in equipment usage.</li> <li>4. Engage a specialist contractor, as required, to clean up contaminants such as oil spills, etc.</li> <li>5. Inspection of all drainage points leading to the water bodies for chemical spills, leaks, and rectify where necessary.</li> <li>6. Once-off intensive hard litter removal (and if required between normal maintenance schedules).</li> <li>7. Several 'Spill Response Kits' will be maintained on site in areas where chemicals are stored and in construction areas. Appropriate training will be provided on how to use the kits if a spillage occurs on site.</li> </ol>	Complete, ongoing.



Year	Objective	Timing of activity	Standard to be achieved	Status
1 and ongoing	<p><b>Chytrid management.</b></p> <p>Chytrid fungus is a major threat to amphibian populations in Australia. Hygiene Protocol will be used to guide best practice Chytrid management.</p>	During habitat enhancement, construction of habitat corridor, management of offset areas and throughout construction.	<ol style="list-style-type: none"> <li>1. All footwear and equipment (e.g. nets, buckets, callipers, headlamps, waders), will be thoroughly cleaned and disinfected before entering and exiting the quarry, and between sites including between the site of salvage and No-Go-Area.</li> <li>2. Any equipment used to handle frogs and tadpoles will be cleaned and disinfected between each use.</li> <li>3. The tyres of all vehicles will be cleaned and disinfected before entering and exiting the construction area of the movement corridor (if required).</li> <li>4. The tyres/tread and other parts of machinery and plant (e.g. the excavator bucket; pumps) involved in the habitat construction and associated activities, will be cleaned and disinfected before entering the construction area of the movement corridor.</li> <li>5. A new pair of disposable latex gloves will be used between each frog and tadpole. Gloved hands will be dipped in the local water in the immediate area so that loss of skin secretions is minimised when frogs are picked up.</li> <li>6. Frogs will be placed into new and clean plastic sample bags, with a 'one bag- one frog' policy. Bags will not, under any circumstances, be reused.</li> <li>7. Disinfection methods will follow the procedures outlined in the Hygiene Protocol.</li> </ol>	Ongoing
		During salvage and relocation.	Follow handling guidelines for salvage and relocation (see section 6.1 and Attachments B, D).	
		Ongoing	Sterilise footwear before entering offset areas.	
1 and ongoing	<p><b>Manage artificial lighting and noise.</b></p> <p>Artificial light and noise will be kept to a minimum to reduce impacts to GGFs.</p>	During construction activities	<ol style="list-style-type: none"> <li>1. Construction activities will comply with the Hume City Council Building and Works Code of Practice (Hume City Council 2013).</li> <li>2. Building or other works that may produce noise can only be carried out between the hours 7.00 am and 6.00 pm on weekdays, 9.00 am and 5.00 pm on Saturdays, and 12.00 noon and 4.00 pm on Sundays.</li> <li>3. Sources of artificial light from the surrounding development will be directed away from the quarry void and movement corridor.</li> </ol>	Ongoing
		Design and installation phase	<ol style="list-style-type: none"> <li>1. No additional lighting directed towards the wetland within the quarry void or along the dispersal corridor.</li> <li>2. Shields will be placed on lights to reduce lateral light spill.</li> </ol>	

Year	Objective	Timing of activity	Standard to be achieved	Status
			<ol style="list-style-type: none"> <li>If necessary embedded lights will be used on walkways adjacent to the dispersal corridor.</li> <li>Use of high intensity lights in white or blue range (&lt;50 nm wavelengths) will be avoided.</li> </ol>	
1 and ongoing	<p><b>Monitor and control pest fauna species.</b></p> <p>If Eastern Gambusia is observed within Offset Area 2, protocols outlined in Section 3.6 will be implemented.</p> <p>Feral Animal Control measures will be implemented in the study area to reduce the population size of foxes.</p>	<p>Both immediately prior to and during the development works, as required</p> <p>During dispersal corridor construction</p> <p>Monitor fish in autumn and September.</p> <p>Opportunistic and ongoing</p>	<ol style="list-style-type: none"> <li>Assessment of feral predators within Offset Area 1 and 4 prior to the commencement of construction.</li> <li>If evidence of foxes is found, appropriate control measure to be implemented immediately.</li> <li>Destroying any dens discovered on site.</li> <li>The newly constructed wetlands will be hydrologically independent from Merri Creek.</li> <li>The wetlands will contain a drainage outlet at the lowest point of the waterbody for removing some or all water from the system.</li> <li>Monitoring of created habitats will be undertaken every six months for the first two years during the development, and annually for the first ten years following the completion of construction of the GGF habitat areas (Offset areas 1, 2 and 3).</li> <li>Wetlands will be drained (i.e. via a valve) and allowed to completely dry out should Eastern Gambusia be detected.</li> <li>Wetlands will only be drained outside of the GGF active season (i.e. not to be drained in Spring and Summer).</li> <li>Wetlands will be re-filled naturally once the wetlands have completely dried and after it is confirmed that Eastern Gambusia (or other predatory fish) is not present.</li> <li>If water levels within the wetlands have not reached a minimum of 0.5m after one month, wetlands will be filled using the water delivery system.</li> <li>Destroy any fox dens found on site.</li> </ol>	Complete, ongoing.
1 and ongoing	<p><b>Monitor and managed vegetation in habitat corridor.</b></p> <p>Once constructed, habitat in the offset areas will need to be</p>	<p>Twice annually (autumn and spring) in years 1 and 2. Annually for the first ten years</p>	<ol style="list-style-type: none"> <li>Monitoring of created habitats will be undertaken every six months for the first two years during the development, and annually for the first ten years following the completion of construction of the GGF habitat areas (Offset areas 1, 2 and 3).</li> <li>Monitoring of vegetation will be conducted in autumn and spring.</li> </ol>	Incomplete. To be undertaken once habitat corridor is constructed.

Year	Objective	Timing of activity	Standard to be achieved	Status
	maintained through ongoing revegetation or slashing. Maintenance of the retained habitat area is to be undertaken as the need is identified through monitoring.	following the completion of construction.	<ol style="list-style-type: none"> <li>3. Replace any failed plantings.</li> <li>4. Increase planting density by planting additional vegetation, or conversely, removal of wetland vegetation (if it is smothering the waterbody); as required.</li> <li>5. Control any weeds invading terrestrial habitat by hand, or spot treatment methods with frog sensitive herbicides.</li> <li>6. Building material and other unwanted materials (e.g. plastic, polystyrene) will be removed from wetlands/waterways and ponds.</li> <li>7. Identify and remove barriers to frog dispersal.</li> <li>8. Where relevant gross pollutant traps and/or sediment filters will be checked and, if necessary, subsequently cleaned, particularly after heavy rain or storm events.</li> </ol>	
		As required, based on conditions.	<ol style="list-style-type: none"> <li>1. Increasing the intensity of feral animal controls.</li> <li>2. Additional refuge sites such as rocks, logs and dense low-lying vegetation will be added if it is considered, during site monitoring, that the area of shelter is insufficient.</li> <li>3. Routine maintenance of grassed areas within the reserve area around the periphery of the waterbodies.</li> <li>4. Monitor the level of any public disturbance in and around GGF habitat and manage accordingly (e.g. fencing repairs and signage).</li> <li>5. Revise mitigation and monitoring measures in agreement with responsible authorities, if necessary.</li> </ol>	
1 and ongoing	<p><b>Pest plant monitoring and control.</b></p> <p>It is important to ensure that any weed control works using herbicides are both targeted (i.e. spot spraying) and undertaken at the right time of the year. Where possible, weeds will be controlled by</p>	Monitoring quarterly for two years, then biannually.	Monitoring of created habitats will be undertaken every six months for the first two years during the development, and annually for the first ten years following the completion of construction of the GGF habitat areas (Offset areas 1, 2 and 3).	Incomplete. To be undertaken once habitat corridor is constructed.
		Ongoing pest plant controls as required	<ol style="list-style-type: none"> <li>1. Where possible, weeds will be controlled by hand or with the use of implements.</li> <li>2. Where herbicide application is necessary, waterway sensitive products such as Roundup Bioactive®, Weedmaster Duo® or Weedmaster 360® must be employed, without the addition of surfactant;</li> </ol>	

Year	Objective	Timing of activity	Standard to be achieved	Status
	hand or with the use of implements.		3. When used in riparian areas, will be directly sponged or wicked onto weeds to minimise off target damage. 4. Herbicides must not be used within 10 meters of wetlands during the breeding season (October-March). 5. Any weed control works must be completed in a manner that minimises soil disturbance. 6. Pest plants that reproduce sexually (by seed) must be controlled before seeds ripen. The following species must not be introduced into Offset Area 2 and 3 or included in the list of suitable species to be planted in order to avoid the risk of constructed wetlands becoming choked with vegetation; Narrowleaf Cumbungi <i>Typha domingensis</i> Broadleaf Cumbungi <i>Typha orientalis</i> Lesser Reed-mace <i>Typha latifolia</i> Common Reed <i>Phragmites australis</i> Tall Spike-rush <i>Eleocharis sphacelate</i> If these species are observed within Offset Area 1 and 2 during habitat monitoring a nominated principal contact of Forte Group Pty Ltd must be notified, and a wetland revegetation specialist contractor must be engaged to remove these species so that wetlands remain clear and support open water. A suitably qualified zoologist must be notified prior to removal so that appropriate salvage and relocation activities can be assessed and implemented.	
1 and ongoing	<b>Water quality monitoring.</b> A monitoring program has been designed to identify any potential reduction in water quality if conditions deteriorate from the baseline	Both immediately prior to and during the development works, as required	1. A water quality monitoring site will be established within the quarry wetland prior to the commencement construction and at a second site within the movement corridor immediately following the completion of the constructed wetlands. 2. Trigger values will be established and based on pre-construction water quality within the quarry wetland. Given that there is no long-term water quality data for the quarry wetland the following trigger values will be used; <ul style="list-style-type: none"> <li>• If turbidity is &gt;20% of the background condition;</li> </ul>	Complete. Ongoing.

Year	Objective	Timing of activity	Standard to be achieved	Status
	(pre-construction) water quality conditions.		<ul style="list-style-type: none"> <li>If electrical Conductivity is &gt;1% of the background condition;</li> <li>If Dissolved Oxygen Concentration is &lt;1% of the background condition;</li> <li>If pH <math>\pm</math>0.5pH unit from background condition; and,</li> <li>All other water quality parameters (including any nutrients or heavy metals) have not substantially exceeded background conditions (i.e. no statistically significant difference (<math>\alpha &gt; 0.05</math>)).</li> </ul> <p>3. Water quality monitoring will be conducted on a monthly basis as soon as approvals are granted, prior to commencement of construction, to establish background conditions and appropriate trigger values at allocated sites.</p> <p>4. If water quality results exceed trigger values appropriate measures will be implemented and correction actions (e.g. release of high-quality water from the Water Delivery System) will be taken to ensure the water quality is suitable for GGF.</p> <p>Weekly monitoring will be undertaken until the water quality conditions return to background conditions or within SEPP Waters of Victoria (WoV) objectives (EPA 2003).</p>	
1 to 10	<p><b>GGF Population Monitoring</b></p> <p>Surveys will be conducted to assess the impact of the development and/or monitor the suitability of a site's management regime.</p>	Annually during the development and for the first 10 years following the completion of construction	<p>Each monitoring event will comprise diurnal and nocturnal surveys. If, at the end of the annual surveys will be conducted to assess the impact of the development and/or monitor the suitability of a site's management regime monitoring the results indicate a decline in the GGF population or degradation of GGF habitat, the CMP will be re-evaluated and adapted accordingly.</p> <ol style="list-style-type: none"> <li>At least seven nights of surveys will be conducted; at least four in the early part of the active season (to collect data when calling and mobility is high) and three later in the season (when reproductive output is greatest i.e. tadpoles, metamorphs).</li> <li>Tadpole surveys will be undertaken annually for the first four years post-development, then in years 6, 8 and 10.</li> <li>Monitoring of created habitats will be undertaken every six months for the first two years during the development, and annually for the first ten years following the completion of construction of the GGF habitat areas (Offset areas 1, 2 and 3).</li> </ol>	Complete. Ongoing.
2 and ongoing	<p><b>Management of Constructed Wetland Hydroperiod</b></p> <p>Water levels will be actively maintained and checked monthly over the species</p>	Following completion of construction of dispersal corridor and ongoing	<p>Design features and active management to be implemented:</p> <ol style="list-style-type: none"> <li>Rainwater runoff supplied from the rooftops of buildings and structures within the development will be the primary water source for the constructed wetlands.</li> </ol>	Incomplete. Depth gauges installed within quarry wetland.

Year	Objective	Timing of activity	Standard to be achieved	Status
	breeding season (October to March).		<ol style="list-style-type: none"> <li>2. The wetlands will contain a drainage outlet at the lowest point of the waterbody for removing some or all water from the system.</li> <li>3. Water levels will be actively maintained and checked monthly over the species breeding season (October to March).</li> <li>4. Depth gauges will be installed in all ponds, and wetland depth will be monitored monthly for the first two years following construction.</li> <li>5. Water levels will not be allowed to fall below 0.5 metres and will be checked every two months if water levels are shown to be relatively stable over cooler months (April-September).</li> <li>6. Water will be release from the water delivery system if levels fall below 0.5 metres within the constructed wetlands during the species active breeding season (Spring and Summer) and will be regularly filled in order to retain water over the entire breeding season.</li> <li>7. A secondary underground drainage network will be installed via Onslow Avenue to a legal point of discharge.</li> <li>8. Major event flows will be safely conveyed through the constructed wetlands, with flows greater than the capacity of the underground drainage conveyed through the secondary underground drainage network to a legal point of discharge.</li> </ol>	
2 and ongoing	<p><b>Management of Quarry Wetland Hydroperiod</b></p> <p>Water levels will be actively maintained and checked monthly over the species breeding season (October to March).</p>	Following completion of construction of dispersal corridor and ongoing	<p>Design features and active management to be implemented:</p> <ol style="list-style-type: none"> <li>1. A water delivery system will direct water from within the quarry void into the constructed wetlands to ensure water levels are suitable for the species during dry periods (e.g. during drought).</li> <li>2. The design of this system will incorporate a holding tank to be filled with water from the quarry wetland and discharged into Pond 1 within the constructed dispersal corridor.</li> <li>3. The proposed location of the pumping station and underground tank are shown on Figure 3a, with an above ground high density polyethylene pipe incorporated to avoid disturbance of the existing habitat within the quarry void.</li> <li>4. The pipe will be capped, and a perforated section of pipe will be submerged in the waterbody at the end of the pipe to avoid any frogs or tadpoles being injured by pumping activities.</li> </ol>	Incomplete.

Year	Objective	Timing of activity	Standard to be achieved	Status
			<ol style="list-style-type: none"> <li>5. The total amount extracted from the quarry wetland will not exceed 20,000 litres/week and will only occur a maximum of once every two weeks to allow groundwater to recharge the waterbody.</li> <li>6. Pumping will only occur at a maximum flow rate of 20 Litres per minute.</li> <li>7. Water quality and levels within the quarry void will be regularly monitored as part of the monitoring program outlined in the Section 3.9.1.</li> <li>8. A depth gauge will be installed in the quarry wetland, and trigger values to cease pumping will be established based on pre-construction water levels to ensure the wetland habitat remains suitable for GGF.</li> <li>9. If water levels within the quarry wetland fall to 1m below pre-construction levels pumping must cease, and levels must be monitored weekly until conditions return to within 0.5m of pre-construction levels, when pumping activities can recommence if necessary.</li> </ol>	
1 to 10	<p><b>Annual Monitoring Reporting and Review.</b></p> <p>A summary of the results of all monitoring procedures, habitat creation (i.e. wetlands) and any maintenance activities will be provided to DAWE on an annual basis throughout the 10-year implementation of the CMP.</p>	Annual reporting as required	<ol style="list-style-type: none"> <li>1. The annual audit will outline the progress of the CMP implementation and identify any key issues and management responses.</li> <li>2. Management actions may need to be amended or updated if new information becomes available, or if management actions are considered inappropriate or inadequate for the long-term persistence of GGF within the site.</li> <li>3. New information may become available through ongoing monitoring procedures or following review of ongoing reporting submitted to DAWE. Recommendations based on this information will be provided to the responsible land manager.</li> <li>4. In addition to revisions triggered by adaptive management, additional changes to this CMP may be required following the EPBC Act assessment and approval process.</li> </ol> <p>Any proposed amendments or deviations to the actions and requirements of this CMP must be approved by DAWE, and the plan must be updated with any approved changes.</p>	Ongoing.

## 5 CONCLUSION AND RECOMENDATIONS

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Year 1 monitoring was undertaken as outlined in the GGFCMP and based on recommendations from the Year 0 Monitoring Report to ensure compliance with the EPBC Act approval conditions. The overall quality of GGF habitat (outside construction areas) is improving, however ongoing management and monitoring is required to ensure that the offset site maintains optimal habitats for GGF.

The control of pest plants within offset areas is a major requirement for management, as habitat within the site is under continual pressure from the invasion of introduced grasses and weeds (e.g. Artichoke Thistle *Cynara cardunculus* and African Boxthorn *Lycium ferocissimum*). Excessive weed growth can smother and reduce the quality of frog habitat for breeding and foraging. In order to control and/or eradicate these weed species, particularly within the habitat improvement areas adjacent to the waterbody, several on-going techniques should be used, including physical removal, brush cutting and herbicide application. Herbicide must only be applied to weeds by using the spot-spraying technique, in order to prevent off-target issues.

Large numbers of GGF and tadpoles were observed during monitoring, predominantly juveniles and newly emerged metamorphs (3.5-5cm) showing evidence of successful breeding activity within the quarry wetland. Water quality was very good with low turbidity and large numbers and diversity of aquatic invertebrates. Floating vegetation is almost exclusively algae, with some areas of fringing vegetation in the form of phragmites and environmental weeds such as Kikuyu Grass. Biomass reduction was evident outside offset area 1 following slashing and weed control being undertaken. GGF were also seen sheltering within jute matting and basking on placed rocks and gravel maintenance tracks (Plate 1).

Maintenance of the retained habitat area is to continue as the need is identified through monitoring, with particular focus on the maintenance of aquatic vegetation diversity and structure, and terrestrial habitats. Ongoing rubbish removal will be required due to the ongoing presence of rubbish being blown in from surrounding areas. Further monitoring for rubbish and pest animals will be required, and corrective actions implemented if necessary, as per the requirements of the GGFCMP.

Given the water level within the quarry wetland appears to have risen by approximately one metre since the project was approved, and water level gauges have been installed following the subsequent increase in water level, it is not known exactly how much the water level increased prior to the gauge being installed. However, trigger values to stop pumping through the water delivery system (yet to be construction) should be set at 1.5 meters below the baseline water level.

Weed control throughout Year 1 has been effective at reducing the overall cover of weeds throughout the offset site, however, works should continue to reduce the overall cover of high threat weeds and annual grasses to below the accepted thresholds covered in the GGFCMP (Ecology and Heritage Partners 2023). Additionally, works should focus on preventing high threat weeds from setting seed and remove new recruits where possible, such as African Boxthorn which was identified within the site. However, it is acknowledged that pressure from windblown seed is a factor in reducing the overall cover of weeds within the offset site.

To ensure that GGF habitat continues to improve, the following works should be incorporated into Year 2 land management and monitoring in accordance with and addition to GGFCMP management requirements (Ecology and Heritage Partners 2023: Table 4):



- Regularly consult an experienced zoologist for maintenance issues that could impact on the GGF population and associated habitat;
- Ongoing habitat and GGF monitoring as per the approved GGFCMP (Ecology and Heritage Partners 2023;)
- Undertake routine monitoring to investigate the success of aquatic and terrestrial plant establishment and weed densities;
- Replace any failed plantings;
- Control any weeds invading terrestrial habitat by hand, or spot treatment methods with frog sensitive herbicides;
- Regular inspection of the fencing is required to ensure its effectiveness;
- The control of pest animals such as foxes and cats will be undertaken in accordance with local government laws and relevant legislation;
- Hygiene Protocol (Murray et.al. 2011) to be used to guide best practice Chytrid management;
- Installation of permanent frog exclusion fencing around offset area 4 prior to the completion of construction;
- Construction of the water delivery system;
- The habitat corridor to be constructed as per the GGFCMP to allow frogs to naturally colonise the wetlands during the species active season;
- Complete and submit the application for the Section 69 Agreement to DEECA;
- Revise mitigation and monitoring measures in agreement with responsible authorities, if necessary; and,
- Monitor the level of any public disturbance in and around GGF habitat and manage accordingly (e.g. fencing repairs and signage).

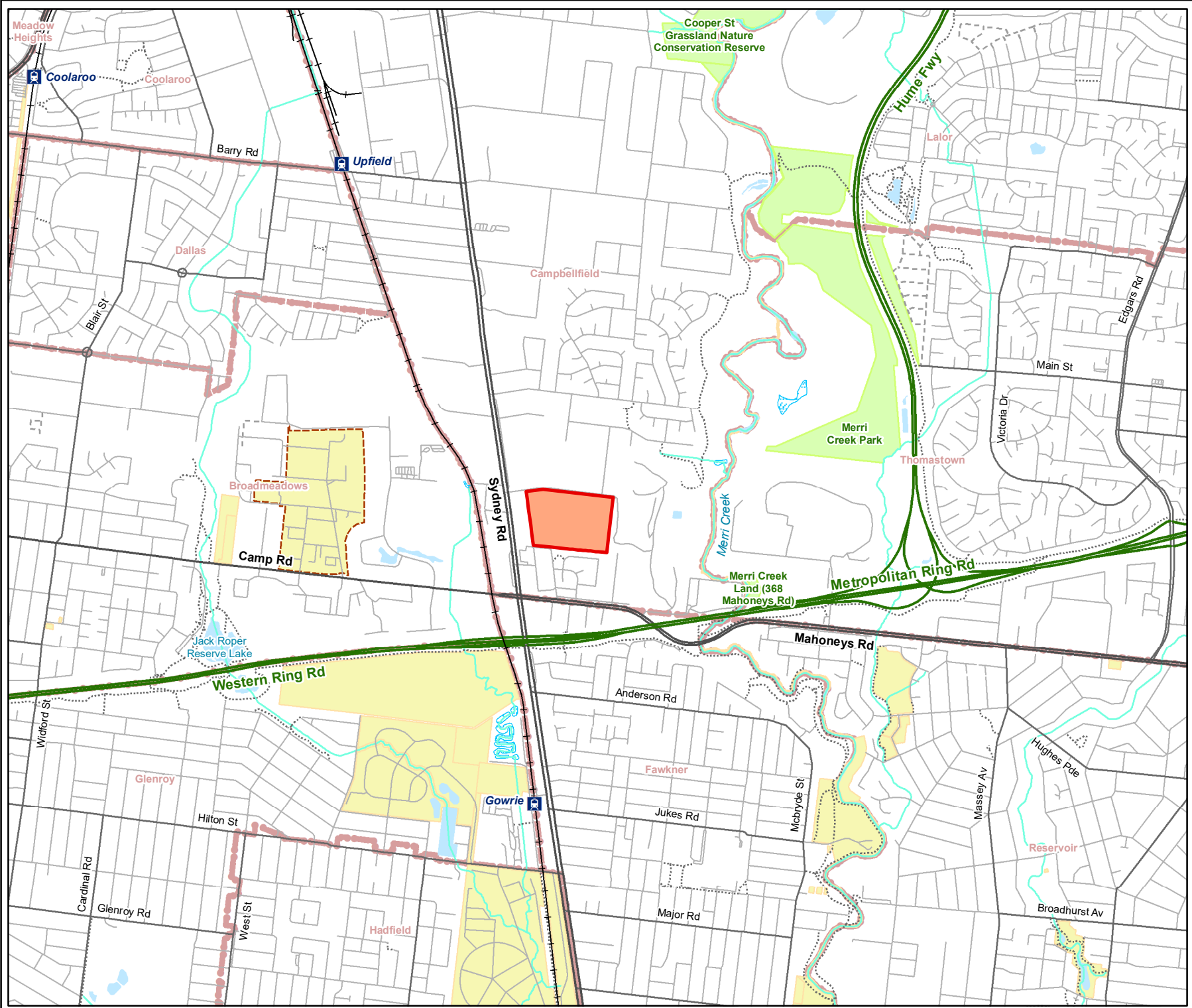
## REFERENCES

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- Ecology and Heritage Partners 2023. Growling Grass Frog *Litoria raniformis* Conservation Management Plan for the Proposed Commercial Development at 75-135 Bolinda Road Campbellfield, Victoria (EPBC 2020/8748). Report prepared for Forte Group Pty Ltd.
- Heard, G., Robertson, P. and Scroggie, M.P. 2008. Microhabitat preferences of the endangered Growling Grass Frog *Litoria raniformis* in southern Victoria. *Australian Zoologist* **34(3)**: 414-425.

## FIGURES

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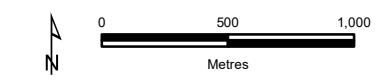


- Legend**
- Study Area
  - Railway
  - Freeway
  - Major Road
  - Collector Road
  - Minor Road
  - Proposed Road
  - Walking Track
  - Minor Watercourse
  - Permanent Waterbody
  - Wetland/Swamp
  - Parks and Reserves
  - Commonwealth Land
  - Crown Land
  - Localities



**Figure 1**  
Location of the study area

75 Bolinda Road, Campbellfield

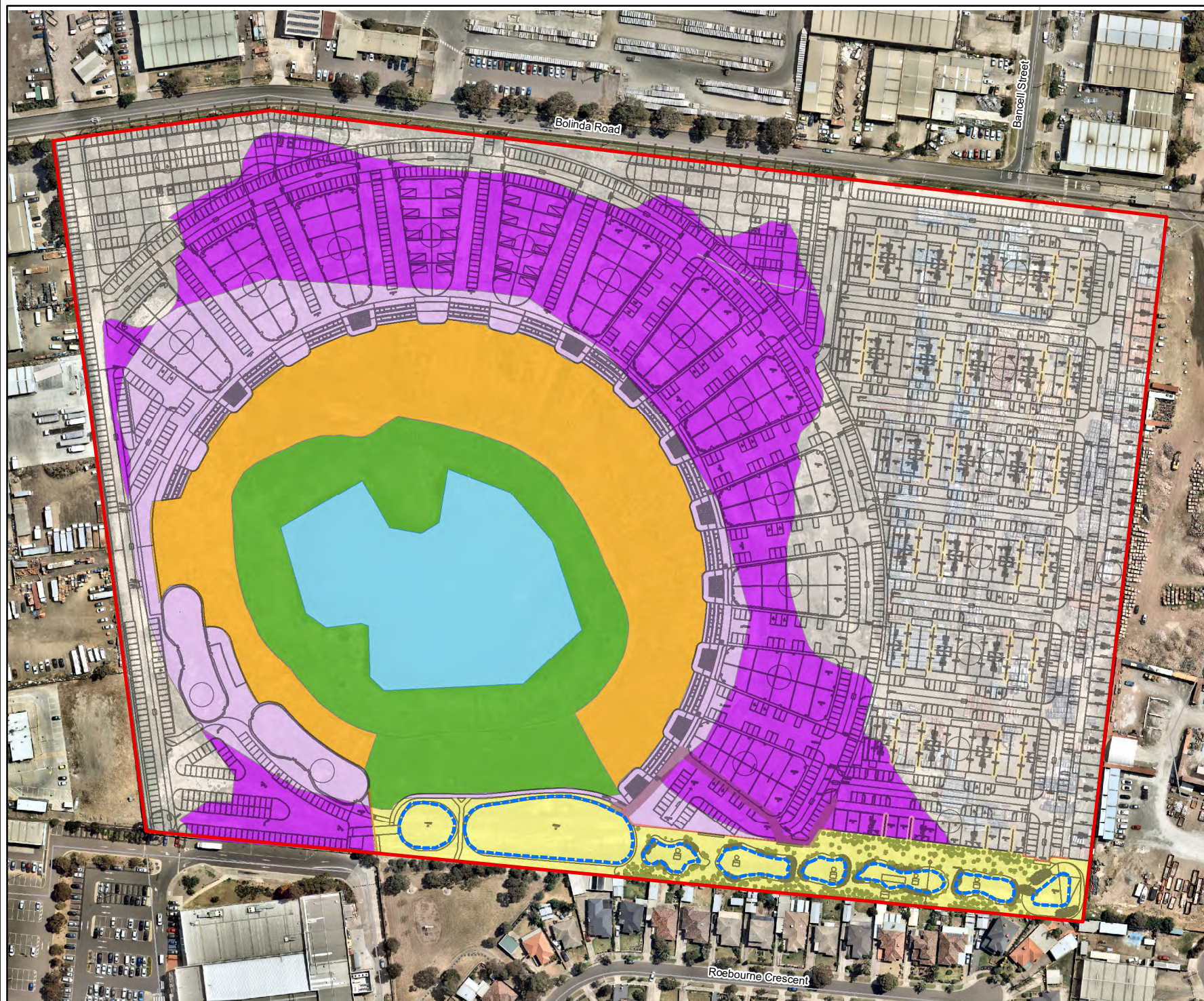


Map Scale: 1:30,000 @ A4  
Coordinate System: GDA2020 MGA Zone 55



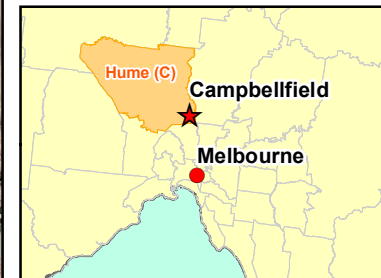
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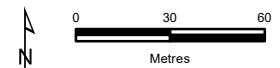


**Legend**

- Study Area
- Waterbody
- GGF habitat score 5 within quarry void (retained) (Offset Area 1)
- GGF habitat score 3 within corridor (retained) (Offset Areas 2 and 3\*)
- GGF habitat score 3 within quarry void (retained) (Offset Area 4)
- GGF habitat score 3 (impacted)
- GGF habitat score 2 (impacted)
- \*Extent of Offset Area 2 (constructed wetlands) within Offset Area 3



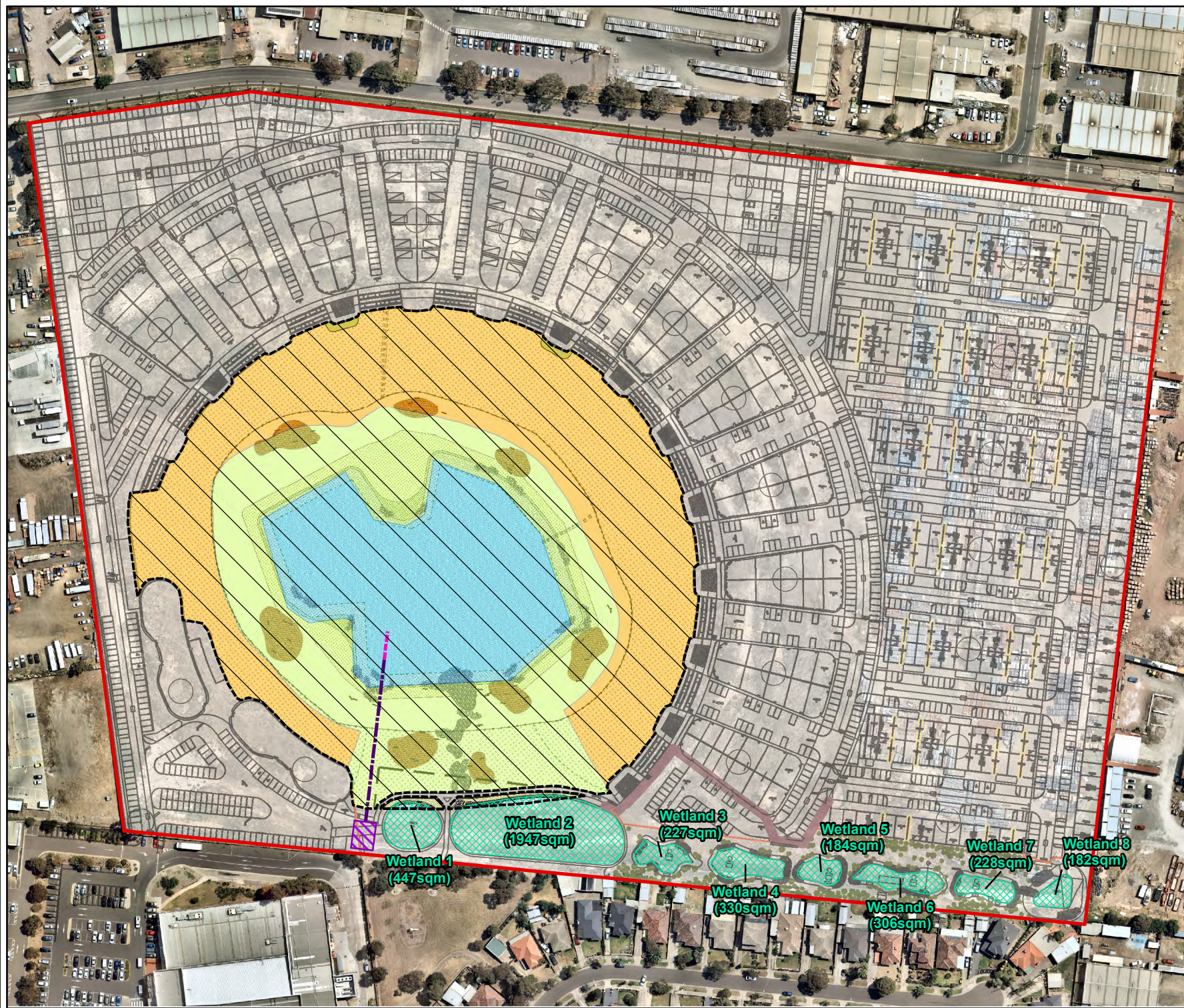
**Figure 2**  
**Proposed Offset Areas**  
 75 Bolinda Road,  
 Campbellfield



Map Scale: 1:2,400 @ A4  
 Coordinate System: GDA2020 MGA Zone 55



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**Legend**

- Study Area
- No-go zone
- Offset Area 1 - Waterbody
- Offset Area 1 - Terrestrial
- Habitat Enrichment Offset Area 4
- Proposed Constructed Wetland
- Proposed pump station and underground holding tank
- Above ground High Density Polyethylene (HDPE) pipe
- Perforated pipe for frog and tadpole exclusion



**Figure 3**  
**Conservation Management Plan**  
 75 Bolinda Road,  
 Campbellfield

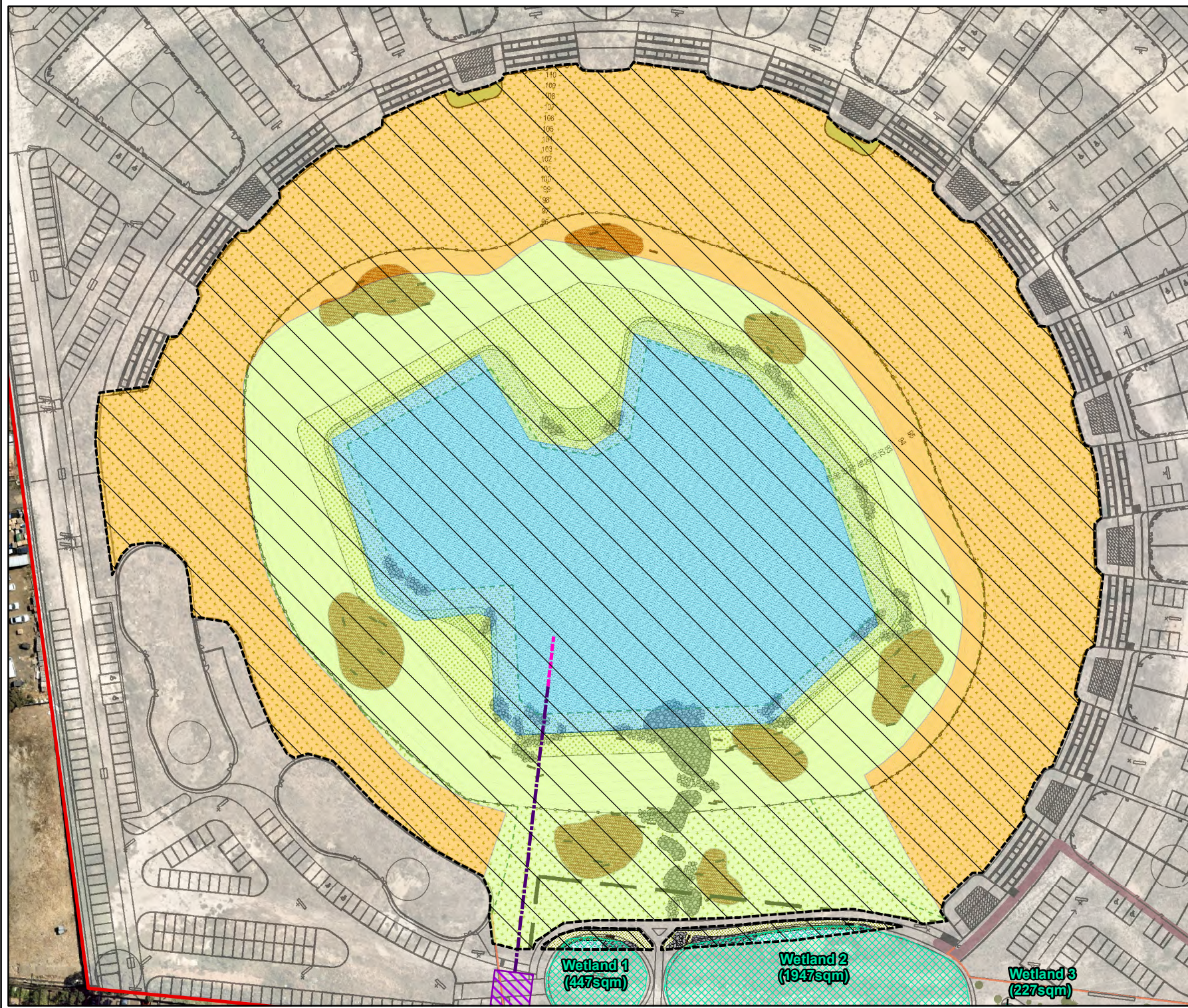


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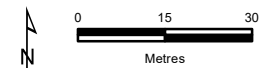


**Legend**

- Study Area
- No-go zone
- Offset Area 1 - Waterbody
- Offset Area 1 - Terrestrial
- Habitat Enrichment Offset Area 4
- Proposed Constructed Wetland
- Proposed pump station and underground holding tank
- Above ground High Density Polyethylene (HDPE) pipe
- Perforated pipe for frog and tadpole exclusion



**Figure 3a**  
**Conservation Management Plan**  
 75 Bolinda Road,  
 Campbellfield



Map Scale: 1:1,300 @ A4  
 Coordinate System: GDA2020 MGA Zone 55



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13138 Fig02a GGF CMP\_G20 6/12/2021 Melsley