Annual Compliance Report

17 October 2022 to 16 October 2023 EPBC 2013/7057
Spring Mountain Mixed Use Master Planned Community Development, Spring Mountain, Queensland

Prepared for Lendlease Communities (Springfield) Pty Limited
9 January 2024

Job No. 7243 E

Document Control

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Prepared by
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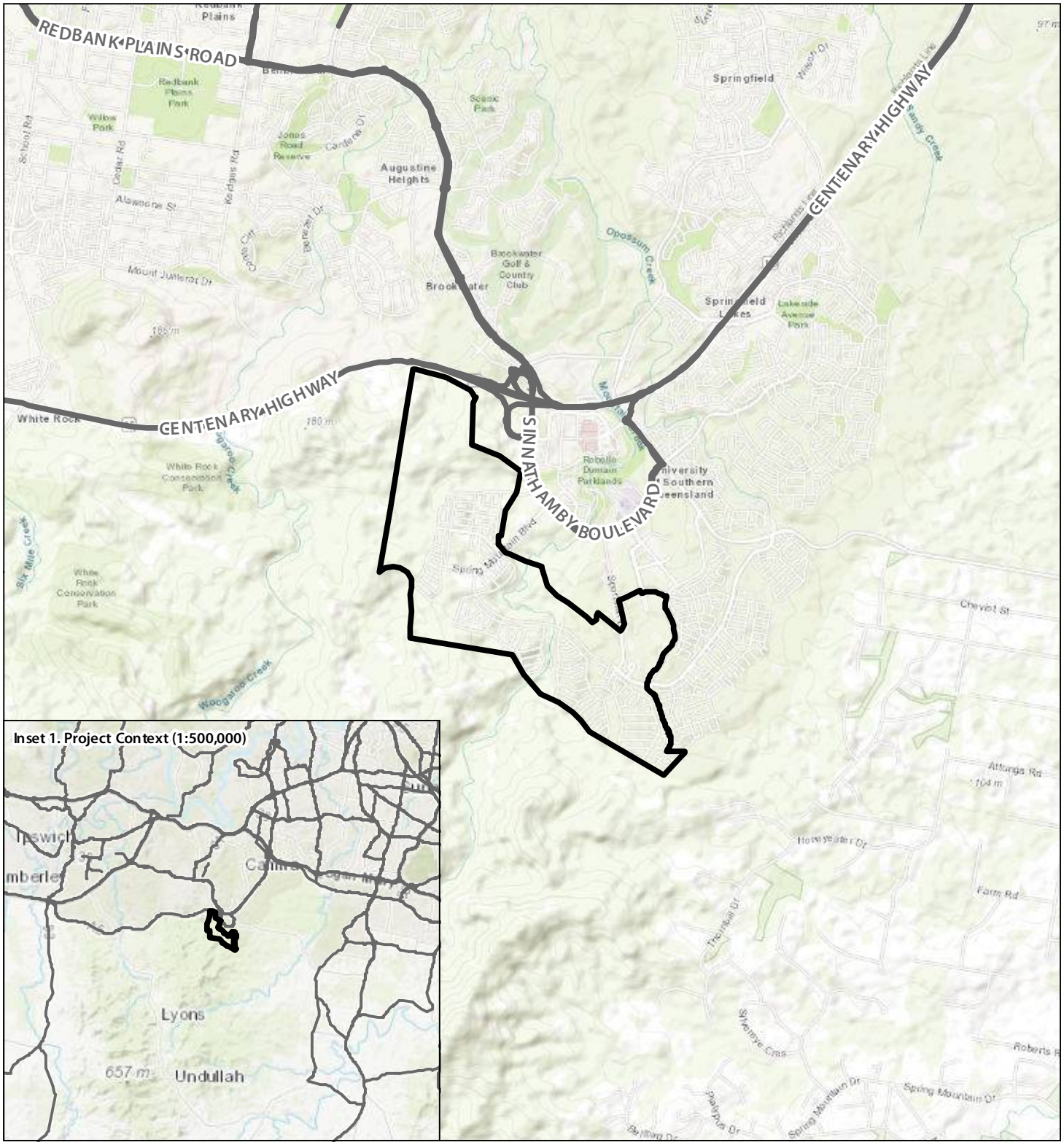
1. Introduction

The Environmental Management Division of **Saunders Havill Group** was engaged by **Lendlease Communities (Springfield) Pty Limited** (Lendlease) to prepare this Annual Compliance Report for the Spring Mountain Mixed Use Master Planned Community Development at Spring Mountain, Queensland. This report provides an assessment of project compliance with the approval granted under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (ref EPBC 2013/7057), and is specifically required by condition 13 of the approval granted on 23 December 2015 (refer **Appendix A**).

The project area covers approximately 387 hectares (ha) and is located within 1 kilometre (km) of Springfield Central (refer to project context map at **Figure 1**). Within the project area, an impact to 255 ha of Matters of National Environmental Significance (MNES) habitat being koala and grey-headed flying-fox foraging habitat was permitted under the approval conditions. Furthermore, due to the potential presence of *Plectranthus habrophyllus* in pockets throughout the project area, any impacts on these plants must be compensated by planting in the on-site conservation area. The non-administrative approval conditions are related to the management of impacts and offsets for these three MNES.

1.1. Approval details

Commonwealth reference	EPBC 2013/7057
Approval holder	Lend Lease Communities (Springfield) Pty Limited
ACN	087 876 864
Approval date	23 December 2015
Expiry date of approval	31 December 2040
Approved action	To construct a mixed-use development (including residential, commercial and community development and associated infrastructure) on a 387 ha site at Spring Mountain, Queensland
Controlling provision	Approved – listed threatened species and communities (sections 18 & 18A)
Project commencement	17 October 2016
Reporting period	Year Seven (7) — 17 October 2022 to 16 October 2023
Address	Grande Avenue, Spring Mountain
Local government area	Ipswich City Council



Legend

Project area

Figure 1

Project Context

Lend Lease Communities (Springfield) Pty Ltd

File ref. 7243 E Figure 1 ACR7 Project Context A_
Date 15/11/2023
Project Springfield Rise, EPBC 2013/7057

0 1 2 km

N

Scale (A4): 1:50,000 [GDA 1994 MGA Z56]

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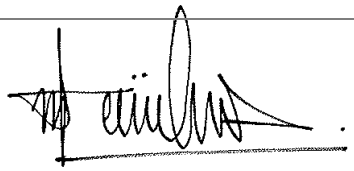
1.2. Declaration of accuracy

In making this declaration, I am aware that sections 490 and 491 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) make it an offence in certain circumstances to knowingly provide false or misleading information or documents. The offence is punishable on conviction by imprisonment or a fine, or both. I declare that all the information and documentation supporting this compliance report is true and correct in every particular. I am authorised to bind the approval holder to this declaration and that I have no knowledge of that authorisation being revoked at the time of making this declaration.

Signed	
Full name	Murray Saunders
Position	Director
Organisation	Saunders Havill Group ABN 24 144 972 949
Date	9 January 2024

1.3. Description of activities

Construction activities at Springfield Rise, the estate name of the Spring Mountain mixed use master planned community, commenced on 17 October 2016 and the estate was officially launched to the public in March 2017. Throughout the seven (7) years of operation, the estate continues to be managed across several villages (*i.e.,* stages) which are at various phases of construction and completion. Villages 6, 8 and 13 were the first established, followed by further delivery of Villages 10, 11, 12, 14, 15 and 17 with several thousand residents now residing in these locales. Civil construction works are currently underway within Village 18, with further works to be undertaken in remaining Villages 7, 9 and 16 in future years. The Springfield Rise masterplan is presented in **Figure 2**.

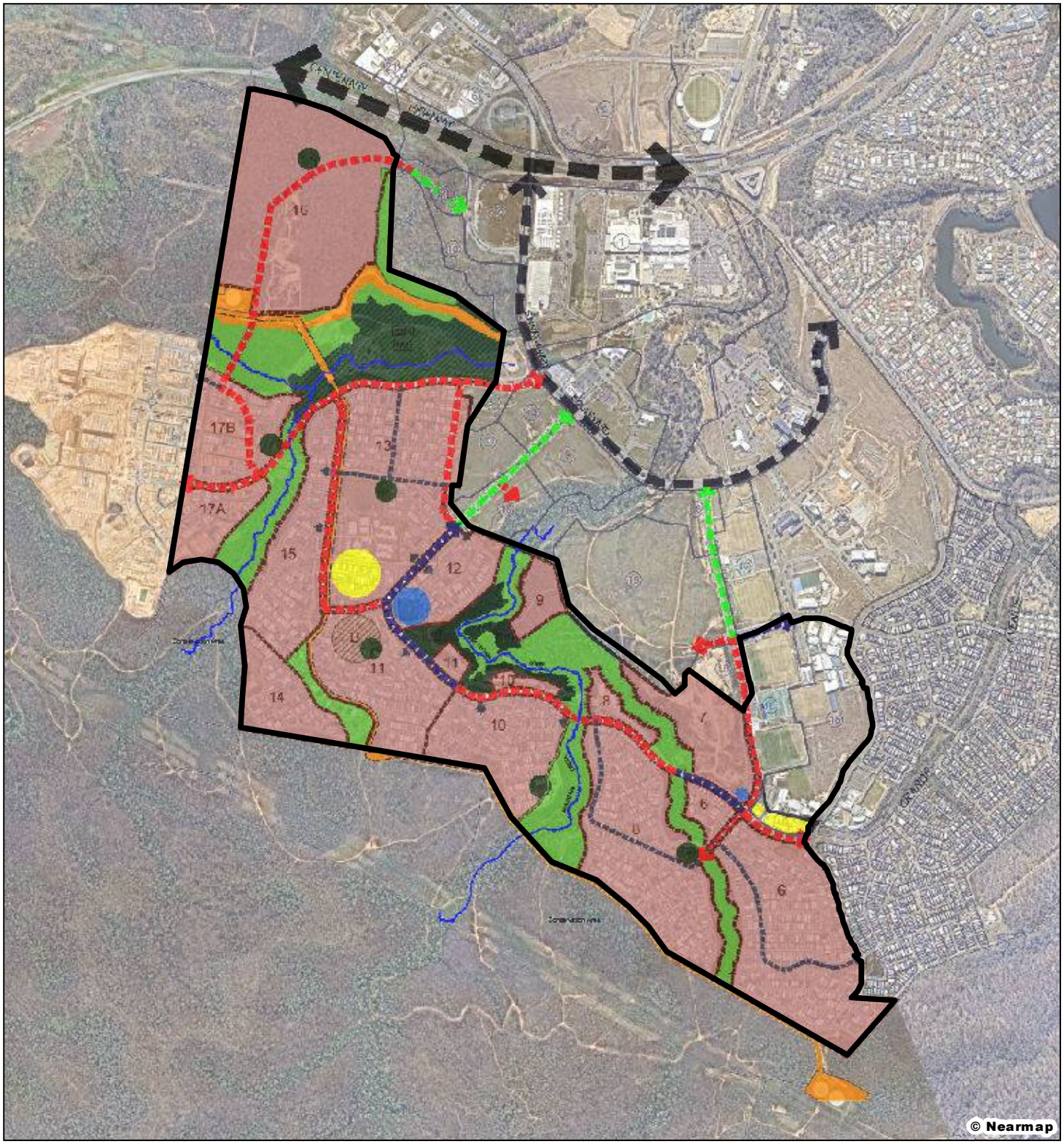
During Year 7, additional roads became operational across the project area, and rehabilitation and compensatory works continued throughout the period. While mention of previous years findings are discussed within this report, more detail can be found in the corresponding Annual Compliance Report (ACR) on the Lendlease – Springfield Rise webpage. This report is reflective of the data collected during the October 2022 to October 2023 period.

During this reporting period the following activities were initiated and/or completed during Year 7 of the project:

- Continuation of the Springfield Rise Community Grants Program;
- Community activities (supported, initiated or coordinated by Lendlease):
    - Community movie night

  - Establishment of a community garden
  - Annual Pest Fishing Classic
  - Silver Jubilee Park opening festival
  - NAIDOC Week 2023
- Spring Mountain Offset Area works:
  - Weed management activities as per the certified Voluntary Declaration under the Queensland *Vegetation Management Act 1999*;
  - Conservation area surveys including;
    - Weed surveys,
    - SAT surveys, and
    - Motion detection camera surveys,
  - Inspection of nest boxes within the conservation area; and
  - Fencing / access restriction assessments
- Estate area works:
  - Site preparation;
  - Pre-clearance surveys and reports;
  - Temporary management infrastructure (e.g. vegetation and fauna fencing, signage);
  - Vegetation clearing in selected villages;
  - Earthworks;
  - Infrastructure installation — sewer, water, power, etc.;
  - Creating new land titles;
  - Land release in Village 18;
  - Widespread landscaping works to support the estate;
  - Protection and weed removal measures at the *Plectranthus habrophyllus* locations;
  - Weed removal and replanting of environmental corridors; and
  - Ongoing management of erosion and sediment control (ESC) issues.

ESC issues associated with the project were identified towards the end of the 2019-2020 reporting period and although not viewed as a non-compliance with the EPBC Approval, the matter continues to be addressed with rectification works in consultation with Ipswich City Council. The rectification works were affected by the early 2022 floods, yet, continue to be implemented whilst Lendlease rehabilitation works continue in the broader area.



Legend

- Project area

Layout Plan

- Residential Development Area
- Existing School
- Infrastructure (Existing)
- District Park
- Major District Park
- Linear Creekline Open Space
- Centenary Highway
- Sinnathamby Boulevard
- Town Centre Road Type 2A Modified
- Major Collector Dual Lane Street
- Major Collector Street Access
- Collector Street
- Village Boundary

Figure 2

Springfield Rise
Village Layout

Lend Lease
Communities
(Springfield) Pty Ltd

File ref. 7243 E Figure 2 ACR7 Springfield Layout A
Date 15/11/2023
Project Springfield Rise, EPBC 2013/7057

0 200 400 600 800 1,000 m

N

Scale (A4): 1:21,000 [GDA 1994 MGA Z56]

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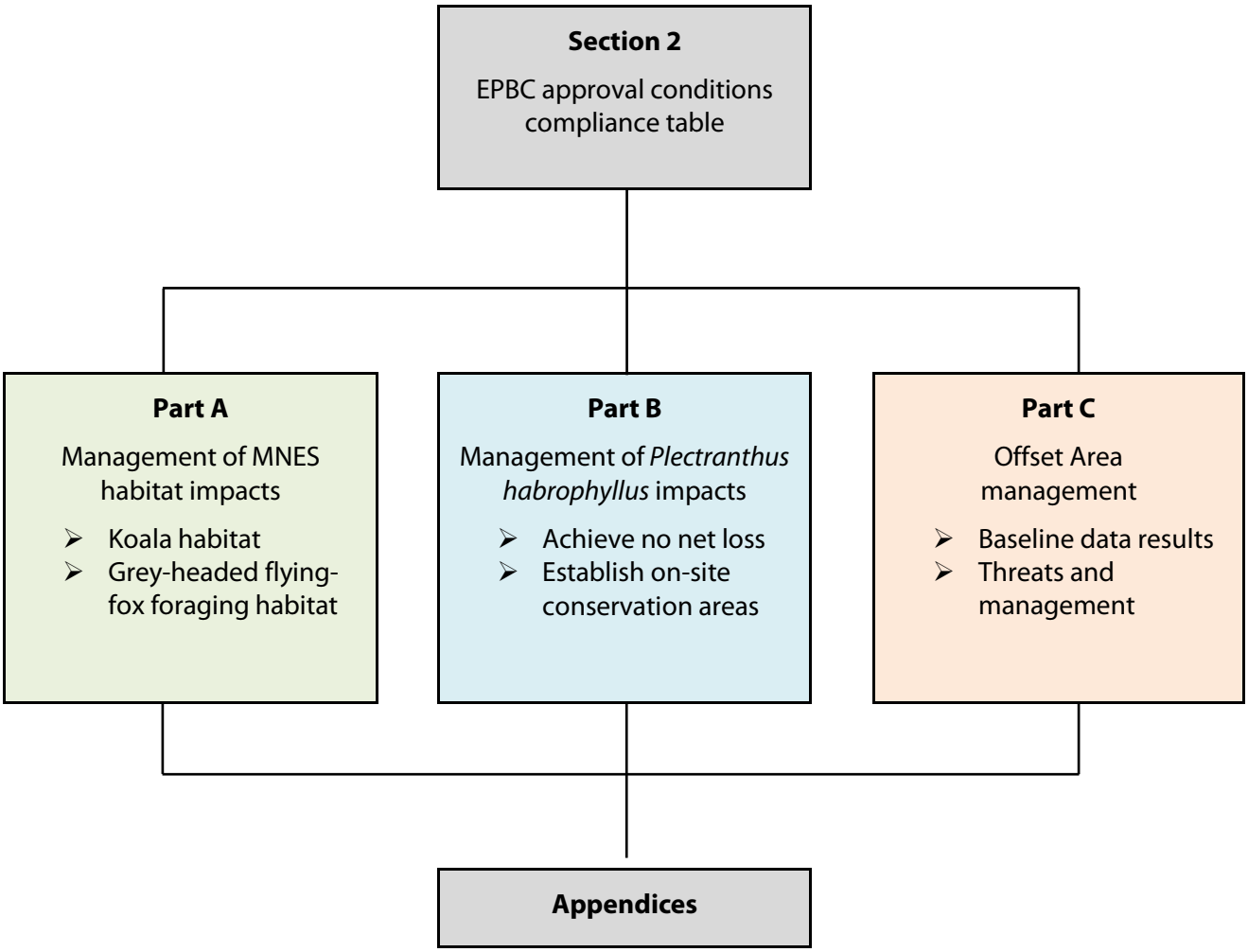
1.4. Report structure

The approval includes ten site-specific approval conditions and a further twelve administrative approval conditions. Site-specific conditions have been categorised into:

1. Impact management
2. *Plectranthus habrophyllus* management
3. Offset Area management (habitat for the koala and grey-headed flying-fox)

The approval conditions include a number of 'outcomes based' conditions and Parts A, B and C of this report detail how the implemented management actions will achieve, or are achieving, the outcomes. This includes details of the management strategies and any adaptions that occur during the term of the approval. The compliance table is presented in **Section 2** followed by Parts A, B and C, and Appendices as illustrated below.



2. EPBC approval conditions compliance table

The EPBC approval conditions for the Springfield Rise residential estate are replicated in **Table 1** with a designation on compliance or non-compliance if the condition was applicable during the reporting period, and evidence and comments as necessary. A copy of the EPBC approval and conditions is provided in **Appendix A**.

Table 1: EPBC approval conditions compliance table

Condition number / reference	Condition	Is the project compliant with this condition?	Evidence / comments
1	The approval holder must not clear more than 255 hectares of MNES habitat.	Compliant	The approval conditions define MNES habitat as koala habitat and grey-headed flying-fox foraging habitat. A total of approximately 243.1 ha of MNES habitat has been cleared since the commencement of the action through until 17 November 2023.
2	To minimise adverse impacts to koalas from vegetation clearing and construction activities there must be no koala injury or mortality as a result of vegetation clearing and construction activities at the project site.	Compliant	A suitably qualified and experienced fauna spotter catcher was present on-site during vegetation clearing and construction activities which had the potential to impact wildlife clearing. There were no koala injury or mortality as a result of vegetation clearing and construction activities at the project site.
3	To minimise adverse impacts to koalas from vehicle strike and in order to maintain safe koala movement opportunities through the project site the approval holder must: a. implement the measures specified in Table 3-3 of the Fauna Management Plan prior to operation, and maintain these measures for the life of the approval; b. ensure koala road crossings are placed in the locations specified at Figure 3-1 of the Fauna Management Plan prior to operation, and maintain these measures for the life of the approval;	Compliant	The management measures in Table 3-3 are listed below with comments on the status of implementation following each measure. Some measures were under construction or not yet certified as being practically complete by Ipswich City Council, and the below details relate to operational measures only. • primary road network posted speed limit no greater than 60 kilometres per hour (km/h) and all other components of the road network posted speed limit no greater than 50 km/h. *The current constructed and operational road network has been signed 50 km/h or 60km/h in accordance with the road type designation.*

Condition number / reference	Condition	Is the project compliant with this condition?	Evidence / comments
	c. implement measures sufficient to identify any koala injury and mortality at the project site; and d. if koala injury or mortality occurs, then revise management measures in consultation with a suitably qualified person to reduce the likelihood of adverse impacts to koalas; and inform the Department, either as part of annual compliance reporting required under condition 13 or as a separate notification in writing.		• design and construct dedicated road crossing treatments where roads transect retained habitat areas including – - Bridging structures make provision for dry land passage through the retention of either the embankments of watercourses beneath a bridge, or elevated portions of road bridging dry land wherever possible. Where this is not achievable, the bridging structure will incorporate a dedicated Koala "boardwalk" between each end of the bridge - Where culverts are required for "at grade" crossings, the design will accommodate minimum portal dimensions, fauna movement "furniture" treatments, and targeted rehabilitation of entrance areas (+ retreat/refuge poles as required). - Where grade separated crossings are not implemented, treatments associated with "at grade" crossings should include "slow zones" which limit traffic speeds and raise driver awareness (including speed reduction or other traffic calming devices, awareness signs and other awareness heightening treatments such as the use of cat's eye road reflectors). - Directional (exclusion) fencing is to be considered in conjunction with grade separated crossings (underpasses) where roads intersect with retained habitat areas. *Fauna movement 'furniture' treatments and targeted rehabilitation of entrances including refuge poles has been adapted and included in culvert design.* • Roadside vegetation management measures are to be undertaken at key locations (e.g. dedicated "at grade" and grade separated crossing locations) to increase the visibility of Koalas entering the roadway. *Where road crossing treatments have been installed, vegetation management measures have been implemented (**Appendix B**). Remaining road crossing treatments are currently under construction and the associated vegetation*

Condition number / reference	Condition	Is the project compliant with this condition?	Evidence / comments
			management measures will be completed as part of practical completion works for the road area. • Implement measures to improve driver awareness, and thereby minimise the incidence of fauna-vehicle collisions, including: a) The installation of general signage to signal the presence of Koalas within the site will be undertaken at all primary (strategic) road entry points to the site. b) More specific signage treatments will be installed to signal areas within the site where there is an increased likelihood of encountering Koalas on the road. Circumstances where such signage will be installed, including (but not limited to) any section of road or residential street which intersects with a retained habitat area. c) "Cat's eye" reflectors to be installed in conjunction with the specific signage treatment zones. *Driver awareness measures were installed as part of completing roads across the project at locations agreed with Ipswich City Council. Signage will be installed along roads traversing retained habitat areas once construction is complete for future works.* *Example of driver awareness signage and markings:* 

Condition number / reference	Condition	Is the project compliant with this condition?	Evidence / comments
			• Annual monitoring event to assess Koala usage and an integrity audit of structures to be implemented for each of five years - to be initiated at the beginning of the "off-maintenance" period for each crossing treatment. *For operational road crossings, annual monitoring events are recurring. The October survey event revealed a variety of fauna utilise the dry passage fauna however there were no instances of koalas observed at that point in time. Remaining road crossing treatments still under construction have not entered the off-maintenance/practical completion period and therefore monitoring has not commenced.* *The following photos illustrate some of the species observed in October 2023 at the functional dry passage culvert locations.*  *Lace Monitor*

Condition number / reference	Condition	Is the project compliant with this condition?	Evidence / comments
			 *Swamp Wallaby*  *Kangaroo*

Condition number / reference	Condition	Is the project compliant with this condition?	Evidence / comments
			 *Echidna* Works that have the potential to impact fauna (e.g. clearing) are completed under the supervision of a fauna spotter catcher. During the reporting period, there were nil known instances of koala injury or mortality associated with project construction. Therefore, no revisions to management measures in response to project works were necessary.
4	To minimise adverse impacts to koalas from domestic dog attack and to exclude koalas from entering residential areas within the project site, the approval holder must: a. implement measures to prevent domestic dog attacks on koalas, including limiting the movement of domestic dogs, creating dog exclusion zones and signage as specified at section 3.4 of the Fauna Management Plan; and b. ensure koala exclusion fencing is constructed and located as specified at section 3.4 of the Fauna Management Plan prior to operation, and maintained for the life of the approval.	Compliant	Residential allotments with frontage to retained koala habitat are issued with the Lendlease *Key Design Outcome Fence Requirement* notice which stipulates the fencing requirements for particular allotments (**Appendix C**). Additionally, Lendlease continue to install koala exclusion fencing on particular allotments as shown in **Appendix D**. As new residents move to the estate, they receive campaign material explaining the importance of dog control between the hours of 6pm and 6am and general management approaches to reduce the potential for dog and koala interactions. Landscaping and signage associated with retained habitat areas is installed by agreement with asset owner Ipswich City Council (future and actual). Some greenspaces for public use are not yet constructed or remain under construction.

Condition number / reference	Condition	Is the project compliant with this condition?	Evidence / comments
			Signage will be installed as part of completing the construction works associated with these spaces. Koala exclusion fencing was observed in areas that construction has been completed.
5	To minimise adverse impacts to *Plectranthus habrophyllus*, there must be no net loss of *P. habrophyllus* at the project site as a result of the proposed action, as defined by the following milestones: a. by six months after the commencement of the action and annually for three years thereafter, there must be 0% cover of weeds of national significance in the on-site conservation areas and buffer areas; b. by one year after the commencement of construction there must be 80% survival of planted *P. habrophyllus*; c. by three years after the commencement of construction, there must be an increase in the number of mature *P. habrophyllus* in the on-site conservation areas that is greater than the number of *P. habrophyllus* removed during construction; and d. by three years after the commencement of construction, there must be evidence of recruitment from planted *P. habrophyllus* individuals.	5 a) Compliant 5 b) Not applicable 5 c) Not applicable 5 d) Not applicable	Site pre-clearance surveys did not identify *Plectranthus habrophyllus* in the construction activities area (refer to **Section 4**). Consequently, nil specimens of *P. habrophyllus* were adversely impacted and there were nil plantings of the species. **5 a)** The first and only on-site conservation area was identified and confirmed on 24 October 2017. Subsequently, a buffer area of 20 m was established and weed removal works occurred within six months (by 24 April 2018). Follow-up weed removal work was completed in October 2018, and an annual inspection in March 2019 confirmed nil weeds in the on-site conservation area. The scheduled March 2020 inspection could not proceed due to site and work restrictions resulting from COVID-19. The next inspection confirmed the *P. habrophyllus* specimens remained *in situ* throughout year four (4). An inspection was completed in February 2021 to confirm weeds of national significance are absent from the conservation area. In addition, surveys were taken to identify if species of *Plectranthus* that were observed to be recruiting on-site are *Plectranthus habrophyllus*. Four samples were sent to the QLD Herbarium to confirm identification, with all species sampled were confirmed as *Plectranthus (Coleus) habrophyllus* (refer details of the current condition provided in **Part B** of this report). The Year 7 inspection conducted in October 2023 confirmed WONS cover within the on-site conservation area is effectively 0%.

Condition number / reference	Condition	Is the project compliant with this condition?	Evidence / comments
			5 b) There were nil *P. habrophyllus* removed for the purposes of construction during the reporting period and therefore no net loss. This condition is not applicable. **5 c) and 5 d)** The seven-year anniversary of the commencement of construction is 17 October 2022. No *P. habrophyllus* specimens have been removed as a result of construction, and therefore no specimens have been planted. This condition is not applicable. Following continual weed management and site inspection in April 2021, works to satisfy Condition 5 are considered complete (refer **Part B**).
6	The approval holder must undertake a monitoring program. The monitoring program must be planned and undertaken so that the data gathered is adequate to: inform adaptive management; and demonstrate whether milestones and outcomes described in conditions 2, 5 and 8 have been met. The monitoring program must: a. include daily surveys for injured or dead koalas during vegetation clearing and construction activities; b. include pre-clearance surveys of all areas that will be cleared to establish the number of mature *P. habrophyllus* that will be lost as a result of the proposed action; c. establish quadrats within each of the on-site conservation areas where *P. habrophyllus* has been planted and at control sites that contain remnant *P. habrophyllus* populations where supplemental planting has not occurred; and d. be undertaken by a suitably qualified person.	Compliant	Civil contractor Shadforth maintains a permanent office at the estate to oversee construction work. Shadforth also hold a copy of all environmental approval documents which are made available to site contractors and visitors. As part of Shadforth's contract with Lendlease, a weekly report is provided to the latter which details incidents and issues, and also communicates general comments or concerns relating to the construction project. Furthermore, the site induction material informs contractors and visitors of the Fauna Management Plan obligations including the requirement to notify Shadforth of any incident pertaining to fauna including koalas. All vegetation clearing activities were completed with a fauna spotter catcher in attendance and as detailed in the standard pre and post clearing reports (refer example provided in **Appendix E**). The presence of a fauna spotter catcher during clearing works is a requirement under this approval and State and Local government approvals. With these controls in place, Lendlease has not become aware of any injured or dead koalas as a consequence of vegetation clearing and construction activities.

Condition number / reference	Condition	Is the project compliant with this condition?	Evidence / comments
			Pre-clearance surveys were completed for all work areas and none identified *P. habrophyllus* in the impact area for the reporting period (refer **Part B**).
7	To compensate for the loss of koala habitat and grey-headed flying-fox foraging habitat the approval holder must: a. secure, prior to the commencement of the action, the offset containing 293 hectares of MNES habitat within the Offset Area at Annex 1; b. provide the Department with the offset attributes, shapefile and map(s) clearly defining the location and boundaries of each offset, within 2 weeks of lodgement of the offset with the Titles Office; and c. ensure the Agreement is registered on the title on which each offset is located, and provide the Department with evidence of lodgement with the Titles Office, within 2 weeks of lodgement. Provide a copy of the signed agreement within 2 weeks of receipt from the Titles Office. The approval holder must ensure any proposal for alternative offsets is agreed to in writing with the Department. Note: Offsets for different species may overlap where they share the same habitat requirements.	Compliant	A voluntary declaration under the *Vegetation Management Act 1999* was certified by DNRM over the Offset Area on 10 October 2016, which was prior to the commencement of the action on 17 October 2017. A copy of the correspondence from DNRM confirming the certification of the Offset Area is provided in former ACR reports. The certification area is greater than the Offset Area due to agreements between the approval holder and third parties to manage other conservation areas adjacent to the Offset Area. These other areas also comprise koala habitat and grey-headed flying-fox foraging habitat. The certification includes maps that define the location and boundaries of the Offset Area. A shapefile of the Offset Area containing 293 hectares of MNES habitat was provided to the Department on 10 October 2016. After certifying the voluntary declaration, DNRM register the dealing on the land title as part of their internal processes. This process is triggered once the certification is granted. A copy of the Offset Area land titles with the registered voluntary declaration listed under administrative advices have been provided in previous ACR reports. DNRM lodged the administrative advice/dealing on 11 October 2016. There has been no proposal for alternative offsets during the relevant period.
8	To compensate for impacts to koala habitat and grey-headed flying-fox foraging habitat the approval holder must achieve the following outcomes as compared to baseline offset habitat quality and extent, unless agreed in writing with the Department: a. by 20 years after the commencement of construction, there must be a gain in habitat quality across 90% of the offset.	Not applicable	Habitat quality data was collected in order to establish a baseline during 2017 (year one (1)). This data, and data collected throughout the subsequent 19 years, will be used to assess habitat quality improvements across the Offset Area. The baseline and subsequent data is presented in **Part C** of this report.

Condition number / reference	Condition	Is the project compliant with this condition?	Evidence / comments
9	To mitigate impacts on koala and *P. habrophyllus*, the approval holder must develop a fire management strategy for the project site and the offset, incorporating advice from a suitably qualified person regarding the impacts of the fire management strategy on koala and *P. habrophyllus*.	Compliant	Fire management strategies in the residential villages are completed in accordance with the Ipswich City Council approval conditions. Copies of the Bushfire Assessment Reports and their detail developed fire management strategies have been previously provided as part of relevant years ACR. Offset Area fire management is under the direction of Ipswich City Council which takes action within the Offset Area in conjunction with the larger network of natural area estates in the local government area. A copy of the *White Rock – Spring Mountain Fire Management Strategic Plan and Risk Dashboard*—where the Offset Area is located—is provided in **Appendix F** (this document remains current). The establishment of fuel reduction zones had been initiated in late October 2018. The first annual conservation inspection was completed on 8 August 2019, where discussions on fire management, existing fuel loads and planned fuel reduction burns were had with Ipswich City Council representatives. Planned burns by Ipswich City Council were not completed within the reporting period.
10	The approval holder must adaptively manage koala habitat, grey-headed flying-fox foraging habitat and *P. habrophyllus* to achieve the outcomes described in conditions 1-9. This must include: a. developing and implementing a strategy (or strategies) to achieve the outcomes and milestones outlined in conditions 1-9, in consultation with a suitably qualified person (noting that the plan does not require approval by the Minister and is not an 'action management plan' under the EPBC Act); b. documented process of adaptive management and continual improvement, including using data from monitoring and experimentation trials to inform adaptive management; and	Compliant	Adaptive management in previous reporting periods is documented in previous ACRs. Offset Area management continued to concentrate on weed management, maintaining and establishing access trails and revegetation activities. Weed removal and revegetation activities are managed under a multi-million dollar contract. As with any large-scale weed removal and revegetation project, works are timed to take advantage of seasonal variations and avoid the duplication of work that typically results from poorly timed site works. Given the size of the conservation area, it was necessary to divide the area into smaller progress areas for weed management early on in the project, and this approach has continued. The entire conservation area has now undergone weed management/treatment and are at various stages of treatment.

Condition number / reference	Condition	Is the project compliant with this condition?	Evidence / comments
	c. where there is a reasonable risk (or evidence) that outcomes or milestones are not likely to be achieved: revising management measures in consultation with a suitably qualified person; increasing the level of effort to achieve the outcomes; and informing the Department, either as part of annual compliance reporting required under condition 13 or as a separate notification in writing.		A program for the installation of nest boxes over the larger conservation management area commenced with the construction and installation of fifty-eight (58) in total. A variety of nest boxes were installed, including bat, antechinus, possum and sugar glider nest boxes. Eleven (11) *Trichosurus vulpecula* (Brushtail Possum) were observed utilising the next boxes. The proponent has committed to the installation, maintenance and monitoring of these nest boxes as they provide habitat for displaced fauna. A copy of the Nest Box Monitoring and Maintenance Report (October 2023) is provided in **Appendix G**. Based on the achieved milestones and ongoing capture of information, the strategy to achieve the requirements of Conditions 1-9 is presented in **Part C** of this report. This strategy will be amended as required as part of the ACR to reflect the progress towards achieving the objectives and milestones in the approval conditions.
Administrative conditions			
11	Within 7 days after the commencement of the action, the approval holder must advise the Department in writing of the actual date of commencement of the action.	Not applicable	The action commenced and notification provided to the Department prior to this reporting period.
12	The approval holder must maintain accurate records substantiating all activities associated with or relevant to the conditions of approval, including measures taken to implement the management plan, report or strategy required by this approval, and make them available upon request to the Department. Such records may be subject to audit by the Department or an independent auditor in accordance with section 458 of the EPBC Act, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the	Compliant	Lendlease and Saunders Havill Group jointly maintain records of activities pertaining to the approval and conditions. A request to make them available to the Department did not occur during the reporting period.

Condition number / reference	Condition	Is the project compliant with this condition?	Evidence / comments
	Department's website. The results of audits may also be publicised through the general media.		
13	Within three months of every 12 month anniversary of the commencement of the action, the approval holder must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of any management plans as specified in the conditions. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to the Department at the same time as the compliance report is published, until agreed in writing with the Department.	Compliant	The anniversary of the commencement of the action is 17 October and this ACR must be published on the Lendlease website no later than 16 January 2024 or if the day falls on a weekend, then the next business day. When the ACR is published, DCCEEW will be notified along with evidence of the publication. The ACR for the period ending 16 October 2022 was published on the Lendlease website on 13 January 2023. Notice of this publication was provided to the Department on this same day.
14	The approval holder must notify the Department in writing of any non - compliance with conditions as soon as practicable and within no more than 2 business days of becoming aware of the non - compliance.	Compliant	A non-compliance with the approval conditions was not identified during the reporting period.
15	Upon the direction of the Minister, the approval holder must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the Minister. The independent auditor must be approved by the Minister prior to the commencement of the audit. Audit criteria must be agreed to by the Minister and the audit report must address the criteria to the satisfaction of the Minister.	Not applicable	A direction from the Minister was not received during the reporting period.
16	The approval holder may choose to revise a management plan, program or strategy approved by the Minister under conditions 1 - 9 without submitting it for approval under section 143A of the EPBC Act, if the taking of the action in accordance with the revised plan,	Not applicable	The approval holder did not choose to revise a management plan, program or strategy approved by the Minister during the reporting period.

Condition number / reference	Condition	Is the project compliant with this condition?	Evidence / comments
	program or strategy would not be likely to have a new or increased impact. If the approval holder makes this choice they must: a. notify the Department in writing that the approved plan, program or strategy has been revised and provide the Department with an electronic copy of the revised plan, program or strategy; d. implement the revised plan, program or strategy from the date that the plan, program or strategy is submitted to the Department; and e. for the life of this approval, maintain a record of the reasons the approval holder considers that taking the action in accordance with the revised plan, program or strategy would not be likely to have a new or increased impact.		
17	The approval holder may revoke their choice under condition 16 at any time by notice to the Department. If the approval holder revokes the choice to implement a revised plan, program or strategy, without approval under section 143A of the Act, the plan, program or strategy approved by the Minister must be implemented.	Not applicable	The approval holder did not choose to revise a management plan, program or strategy approved by the Minister during the reporting period.
18	Condition 16 does not apply if the revisions to the approved plan, program or strategy include changes to environmental offsets provided under the plan, program or strategy in relation to a matter protected by a controlling provision for the action, unless otherwise agreed in writing by the Minister. This does not otherwise limit the circumstances in which the taking of the action in accordance with a revised plan, program or strategy would, or would not, be likely to have new or increased impacts.	Not applicable	The approval holder did not choose to revise a management plan, program or strategy approved by the Minister during the reporting period.
19	If the Minister gives a notice to the approval holder that the Minister is satisfied that the taking of the action in accordance with the	Not applicable	The approval holder did not choose to revise a management plan, program or strategy approved by the Minister during the reporting period.

Condition number / reference	Condition	Is the project compliant with this condition?	Evidence / comments
	revised plan, program or strategy would be likely to have a new or increased impact, then: a. Condition 16 does not apply, or ceases to apply, in relation to the revised plan, program or strategy; and b. The approval holder must implement the plan, program or strategy approved by the Minister. To avoid any doubt, this condition does not affect any operation of conditions 16, 17 and 18 in the period before the day the notice is given. At the time of giving the notice the Minister may also notify that for a specified period of time that condition 16 does not apply for one or more specified plans, programs or strategies required under the approval.		
20	Conditions 16, 17, 18 and 19 are not intended to limit the operation of section 143A of the EPBC Act which allows the approval holder to submit a revised plan, program or strategy to the Minister for approval.	Not applicable	The approval holder did not choose to revise a management plan, program or strategy approved by the Minister during the reporting period.
21	If, at any time after five years from the date of this approval, the approval holder has not substantially commenced the action, then the approval holder must not substantially commence the action without the written agreement of the Minister.	Not applicable	The approval holder commenced construction on 17 October 2016.
22	Unless otherwise agreed to in writing by the Minister, the approval holder must publish all management plans, reports or strategies referred to in these conditions of approval on their website. Each management plan, report or strategy must be published on the website within 1 month of being approved by the Minister or being submitted under condition 1 - 9.	Compliant	The applicable management plans, reports and strategies are published on the Lendlease Springfield Rise website: https://communities.lendlease.com/queensland/springfield-rise/living-in-springfield-rise/sustainability-and-environment/.

3. Part A – MNES habitat impact management

Approvals relating to impacts on ecological matters were collated from Commonwealth, State and Local governments for the project and included several overarching environmental management plans. Each contractor was provided a copy of the approval documents, however, the size of the project warranted the preparation of consolidated document packages that stipulated environmental management requirements pertinent to each stage of construction. This resulted in the preparation of Site Based Management Plans which detailed measures for vegetation management (clearing and protection), protection of MNES fauna (koala and grey-headed flying-fox) and other native wildlife, maintenance of safe wildlife movement opportunities, fauna habitat rehabilitation, threatened flora management and pest management. The Site Based Management Plans are available on the Lendlease Springfield Rise website: *https://communities.lendlease.com/queensland/springfield-rise/living-in-springfield-rise/sustainability-and-environment/*.

As part of managing the smaller work areas of the project, a second supporting document was developed: Springfield Rise — Environmental Pre-Start Checklist (refer **Figure 3**). This checklist was integral to ensuring construction proceeded within the demarcated limits, suitable fencing was installed across the work area and the necessary checks for threatened fauna were completed prior to the clearing of any vegetation. The flow diagram below illustrates the key steps in this process. After completing the checklist and all required parties sign-off, vegetation clearance activities may proceed under the supervision of a fauna spotter catcher. An example of a completed checklist is provided in **Appendix H**.

Key steps to commencing impact work at each Village

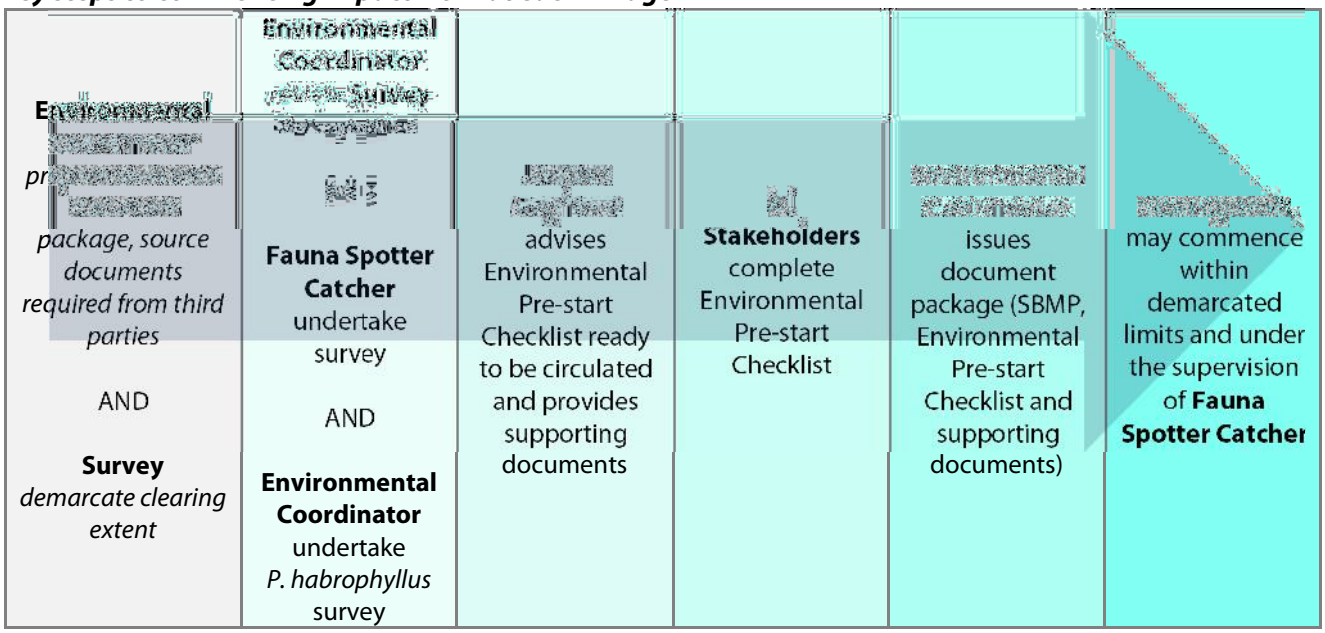


Figure 3: Environmental Pre-start Checklist template example

Springfield Rise
Environmental Pre-Start Checklist

Project Area:		Date:			
Contractor:		Construction Stage/ Activity:			
Date work is to start:					
Date work is to cease:		Compliance			
#	Control Measure	Yes	No	N/A	Comments
1	Is the works extent within the EPBC 2013/7057 referral area?				
2	Are clearing extents marked out and fenced? (N.B. Fencing is required as per ICC permits unless instructed otherwise by Council, Fauna Spotter or Environmental Coordinator)				
2	Has the fencing of clearing extents demarcation been inspected by the Environmental Coordinator?				
3	Has sign off been provided by the Environmental Coordinator for demarcation areas?				
4	Has certification for pre-clearance flora been provided? (N.B. Exemptions/permits for protected plants under the NCA must be obtained by EHP where works occur in a High Risk Area). Please provide date and reference.				
5	Have pre-clearance checks surveys for *Plectranthus habrophyllus* been completed over the clearing area?				
6	Are *Plectranthus habrophyllus* 'no-go' zones identified within the clearing area been demarcated, fenced, signed and inspected by the Environmental Coordinator and Contractor?				
7	Will works involve clearing within a Fisheries mapped waterway for waterway barrier works? If so, are works compliant with applicable self-assessable codes and / or permits?				
8	Will works involve clearing within a watercourse defined under the Water Act 2000? If so, are works compliant with applicable exemptions and / or permits?				

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Springfield Rise
Environmental Pre-Start Checklist

8	Has the appointed Fauna Spotter completed pre-clearance surveys and reports?			
9	Has the appointed Fauna Spotter identified any sensitive areas for consideration in clearing methods? Please provide a summary.			
10	Have all contractors, subcontractors and associated personnel been instructed on environmental procedures and controls?			
11	Has a Council pre-start been completed?			

NOTE: if the answer to any question above is NO then the clearing activity will not proceed.

Compliance Awareness

All works are to be undertaken in accordance with the *<<Project area>>* Environmental Pre-Start Package which includes the '*<<Project area>>*' and this *<<Project area>>* Environmental Pre-Start Checklist and attachments.

Signing below demonstrates acknowledgement of the environmental pre-start procedures and requirements listed in the checklist above and associated attachments.

Name	Company	Position	Signature	Date
		Client Representative		
		Site Contractor		
		Clearing Contractor		
		Fauna Spotter Catcher		
		Project Engineer		
		Environmental Coordinator		

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3.1. Adaptive management

The Environmental Pre-Start Checklist and Site Based Management Plan support an adaptive management framework for vegetation clearance activities. During the first year of construction a change to the on-ground procedure for demarcating and confirming the vegetation clearance area became necessary. The change was the result of the survey contractor demarcating a clearing area that differed slightly to that stipulated in the Site Based Management Plan prepared by the environmental coordinator. The error was an artefact of contractors utilising different software to manage spatial data. To avoid this error reoccurring, after the survey contractor demarcates the vegetation clearance area, the environmental coordinator attends site to confirm the demarcated area is as per the Site Based Management Plan.

During the second year of works, the identification of a sick koala in the clearing area occurred. The koala's health was unrelated to vegetation clearing or construction activities, however the management plans in place for such occurrences did not include a procedure to manage this type of event. Action taken at the time included stopping work and establishing an exclusion area around the koala. Following this, a site meeting was held to discuss the procedure forward. In conjunction with consultation with a representative from the Ipswich Koala Protection Society, it was decided to trap the koala (using approved methods) and transport the koala to Moggill Koala Hospital. This work was completed by the project fauna spotter catcher. As a result of this, management plans associated with pre-clearance survey and reporting include a procedure for this scenario.

Since the revision discussed above, the Environmental Pre-Start Checklist and Site Based Management Plan have not required further revisions.

3.2. Review of impacts

The removal of vegetation from the development area impacted MNES habitat which is defined under the approval conditions as koala habitat and grey-headed flying-fox foraging habitat. As of 17th November 2023, a total of 243.1 ha of MNES habitat was impacted. The approval conditions permit an impact of 255 ha of MNES habitat therefore the approval holder has complied with the approved limit (condition 1).

The Site Based Management Plan and Environmental Pre-Start Checklist ensure procedures are in place to control impacts on MNES habitat and prevent injuries to wildlife during construction works. A fauna spotter catcher has been present throughout clearing works and the post-works reporting indicates the implementation of the current management system is successful as nil Koala injuries or mortalities resulting from vegetation clearing or construction activities have occurred.

As villages throughout the estate become operational, the measures relating to ongoing fauna management will be established. These include culverts for fauna movement, vehicle speed control signage, driver awareness signage and fencing controls to prevent koala and domestic dog interactions. Many of these became operational in year three (3) (*i.e.*, certified as meeting practical completion by Ipswich City Council), inspection photos from this year of these fauna measures are presented in **Appendix B**. This includes 'furniture' for fauna movement through culverts, fauna exclusion fencing to prevent fauna crossing highly frequented roads, and suitable fencing bounding residence to prevent dog-Koala interactions.

4. Part B – *Coleus habrophyllus* Impact Management

4.1. Background

During the assessment and approval phase, consultant Yurrah undertook a detailed analysis (desktop and ground-truthing) of potential *Plectranthus habrophyllus* (*P. habrophyllus)* habitat throughout the referral area. It should be noted that phylogenetic analyses conducted in 2019 separated *P. habrophyllus* into the genus *Coleus*. This species will henceforth be referred to as *Coleus habrophyllus* (*C. habrophyllus*) in this document and in all subsequent documents. Specimens and habitat were found to occur in small pockets as shown in the referral documentation.

C. habrophyllus has similar attributes to other *Plectranthus/Coleus sp.* including the non-threatened *P. suaveolens* and *P. parviflorus (*also known as *Coleus australis)*. In order to clarify how to distinguish *C. habrophyllus* from the non-threatened *Plectranthus/Coleus sp.* during pre-clearance surveys, Saunders Havill Group liaised with the Queensland Herbarium to ensure a conclusive understanding of the differences between the species was held. Pre-clearance surveys during most of the year one (1) reporting period used this knowledge to determine if *C. habrophyllus* would be impacted and subsequently, no specimens were located in either the impact or on-site conservation areas. During the subsequent years of monitoring several samples have been collected and sent to the Queensland Herbarium for identification, with the results being a mixture of both *C. habrophyllus* and *P. parviflorus.*

As part of completing the Environmental Pre-Start Checklist for each stage, proposed impact locations were surveyed prior to any clearing work to determine if the plant was present and if so, how many individuals would be removed. The latter information was required as part of complying with Condition 5 which stipulates there must be an increase in the number of mature *C. habrophyllus* in the on-site conservation areas that is greater than the number removed during construction.

4.2. Weeds of National Significance (WONS) monitoring and treatment

Weed removal work in these areas was completed within six months of their establishment—by April 2018 (year two (2)) —and repeated in early October 2018 (year two (2)) to address regenerating *Lantana camara* (Lantana). The weed treatment, specifically targeting weeds of national significance (WONS) was conducted by Evolve Environmental Solutions within the on-site conservation area.

The inspection of the on-site conservation area was conducted by Ecologists from Saunders Havill Group on 20th October 2023. This inspection confirmed WONS cover within the on-site conservation area was effectively 0%, for comparison between the previous six years of annual compliance reporting, please see preceding reports. Additionally, the inspection confirmed the cover of *C. habrophyllus* within the conservation area is high, indicating further natural recruitment has occurred following the continued treatment and

management of WONS. Numerous juvenile *C. habrophyllus* specimens were identified within the on-site conservation area (refer **Photo set 1**).

Photo set 1: *C. habrophyllus* specimens located within the conservation area.

4.3. Population Density Assessment

As time and the development has progressed, as have the number and density of the population within the conservation area. Due to the increased number of observed *C. habrophyllus* individuals an assessment to determine the species density within the conservation area was performed on 15 July 2021 by Ecologists from Saunders Havill Group. Due to the high number of the species observed, a density-based population assessment was used as it was not feasible to count every specimen. The assessment was carried out in accordance with the Queensland *Flora Survey Guidelines – Protected*. During this assessment, a small cluster of *C. habrophyllus* specimens was identified approximately 10 m west of the existing demarcated conservation area. As a result, the buffer area was extended from 20m to reflect the on-ground extent of the *C. habrophyllus* population.

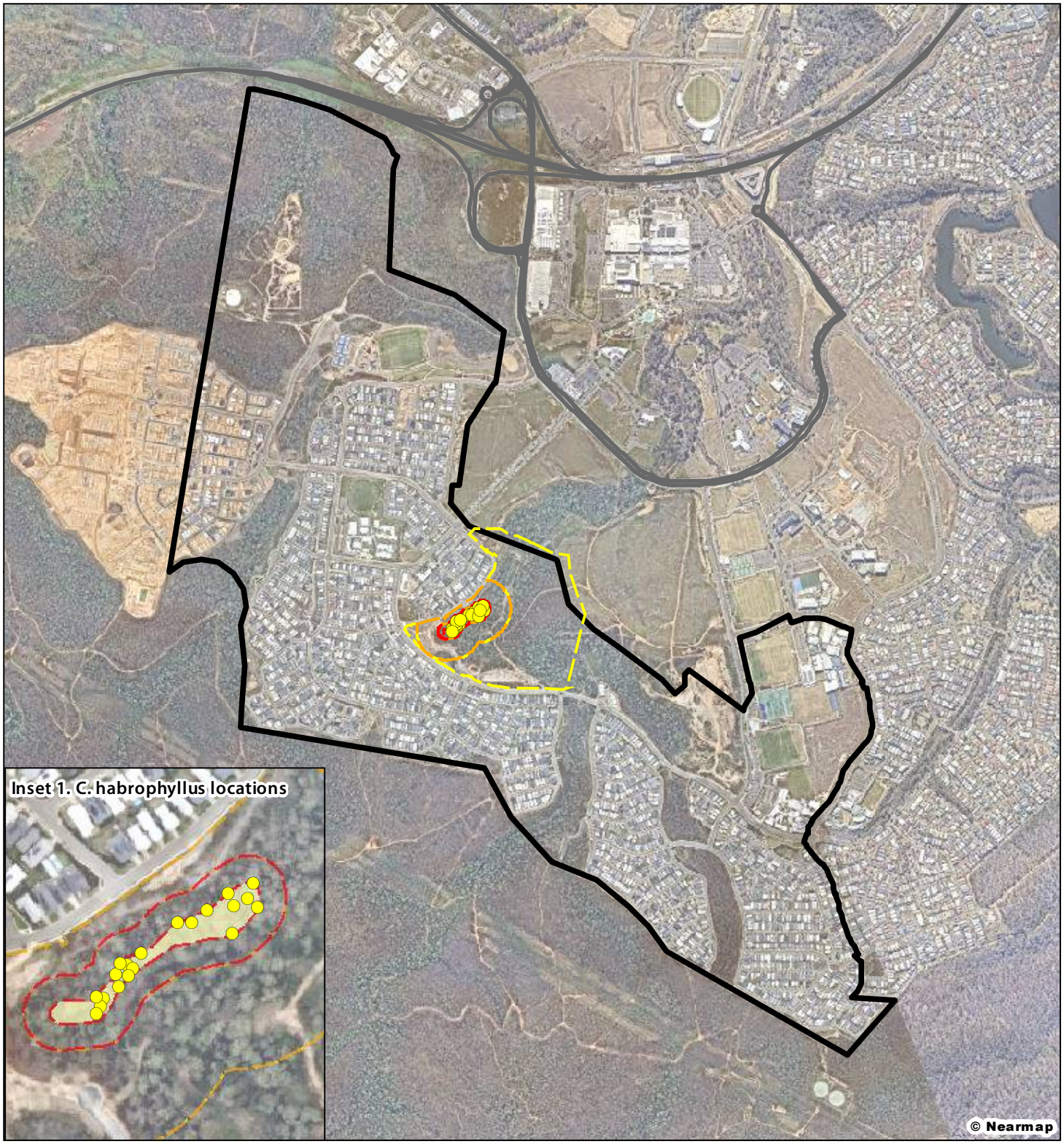
Ecologists from Saunders Havill Group inspected the site of *C. habrophyllus* known presence annually (20th October 2023) as close as possible to anniversary of the development commencement date. This year of reporting found all previously identified plants in the on-site conservation area remain protected following weed treatment and management, for preceding yearly results please see earlier ACR's. **Figure 4** represents the specimens identified as *C. habrophyllus* during the seven-year monitoring program.

While on-site monitoring the population of *C. habrophyllus* it was noted that as part of an expansion of the park facilities at Mountain Park the development has cleared land approximately 50 meters from the closest identified individual in the population.

There remains potential for other environmental corridors throughout the project site to contain *C. habrophyllus* specimens. As construction expands across the site, additional surveys for the species will take place and on-site conservation areas established where *C. habrophyllus* specimens are confirmed in retained habitat areas.

4.4. Annual Monitoring Summary

The population findings from the October 2022 to October 2023 surveys are described as on track to achieve milestones, which is evident through the evidence of absent WONS species. The population of *C. habrophyllus* are continuing to survive throughout the conservation area.



Legend

- Project area
- Road
- C. habrohpyllus
- Confirmed locations of Coleus habrophyllus specimens
- Zone A
- Zone B
- Zone C

Figure 4

Location of In situ *C.habrophyllus*

Lend Lease Communities (Springfield) Pty Ltd

File ref. 7243 E Figure 4 ACR7 In situ C habrophyllus A_
Date 15/11/2023
Project Springfield Rise, EPBC 2013/7057

0 200 400 600 800 1,000 m

N

Scale (A4): 1:21,000 [GDA 1994 MGA Z56]

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Layer Source: © State of Queensland 2023

5. Part C – Offset area management

The 293 ha offset under Condition 7 of the approval comprises seven land parcels that provide koala and grey-headed flying-fox foraging habitat (refer **Appendix A** and **Figure 5**). The offset parcels (listed below) surround the project area and form part of the regional biodiversity corridors. The Offset Area was legally secured on 10 October 2016 prior to the commencement of construction on 17 October 2016 using the Voluntary Declaration process administered under the *Vegetation Management Act 1999*.

The Offset Area land parcels are:

1. part 740/SP179412
2. 747/SP189043
3. 748/SP189044
4. part 751/SP189053
5. 752/SP189053
6. part 753/SP189054
7. 745/SP242282

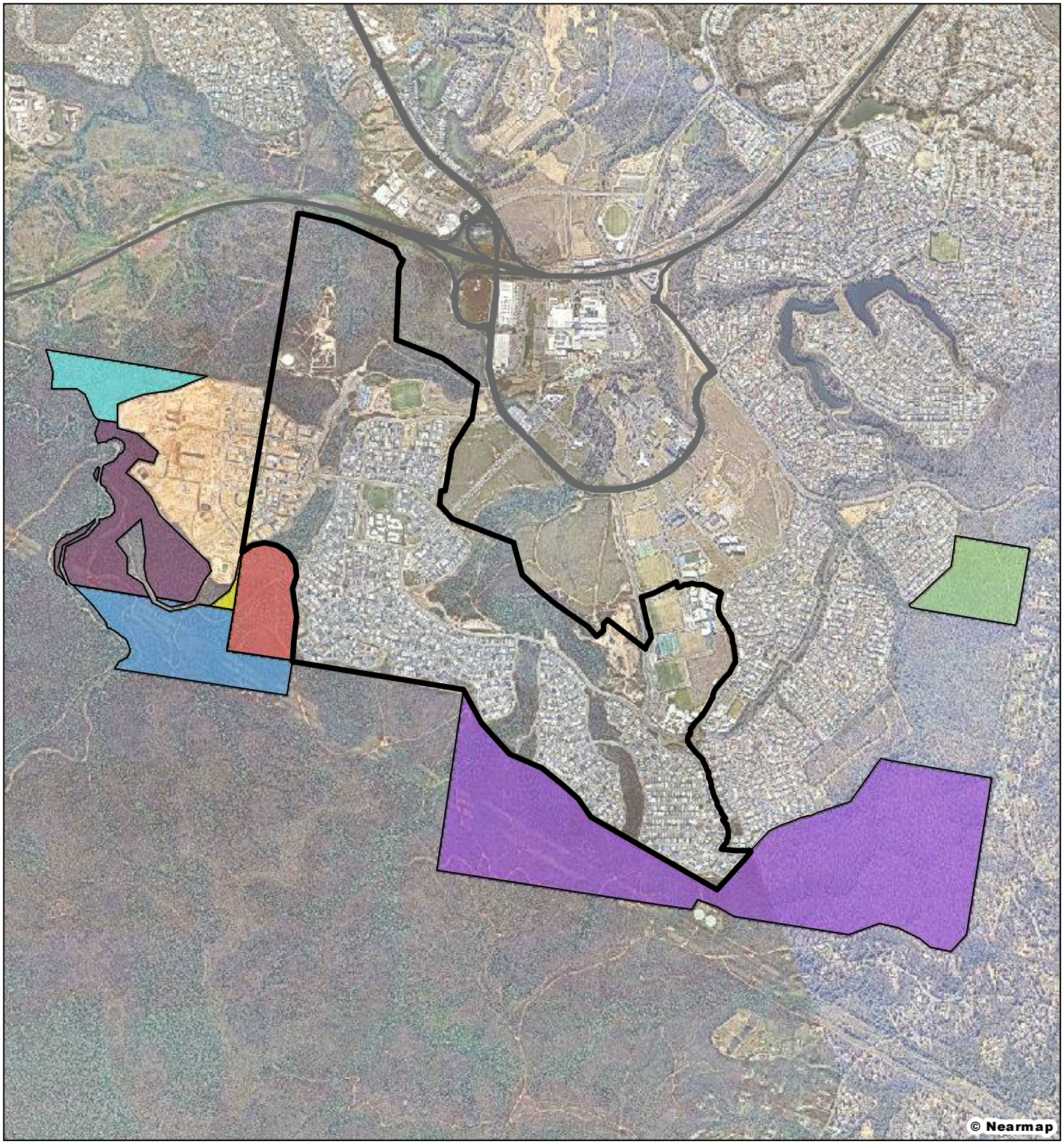
The primary objective to managing the Offset Area is to achieve a gain in habitat quality across 90% of the offset before 17 October 2036. The approval conditions define this as:

An improvement in the quality and extent of koala habitat and grey-headed flying-fox foraging habitat in comparison to baseline environmental conditions at the offset compared with an unmanaged control site.

The current quality and extent are influenced by several factors including the presence of weeds and pest animals, and vegetation attributes (e.g. species diversity, ecological dominant layer). To arrive at a baseline metric, habitat quality assessments were completed across the Offset Area and at a control site south of the Offset Area during the first year of the action. The assessment was completed using the *Guide to Determining Terrestrial Habitat Quality* published by the Queensland Department of Environment and Heritage Protection (2017). The current version of this guide was published February 2020 by the Department of Environment and Science. A comparison between the baseline habitat quality score and habitat quality score during the year five (5) reporting period are summarised in **Table 2**.

Table 2: Habitat quality 2016/2017 – 2020/2021

Location	Baseline habitat quality score	Year Five (5) habitat quality score
Offset Area	7.44	7.68
Control site	6.92	7.15



Legend

- Project area
- Road

Offset area lot/plan

- 740/SP179412
- 745/SP242282
- 747/SP189043
- 748/SP189044
- 751/SP189053
- 752/SP189053
- 753/SP189054

Figure 5

Legally Secured Offset Area

Lend Lease Communities (Springfield) Pty Ltd

File ref. 7243 E Figure 5 ACR7 Offset Area A_
Date 15/11/2023
Project Springfield Rise, EPBC 2013/7057

0 200 400 600 800 1,000 m

Scale (A4): 1:30,000 [GDA 1994 MGA Z56]

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Layer Source: © State of Queensland 2023

5.1. SAT survey

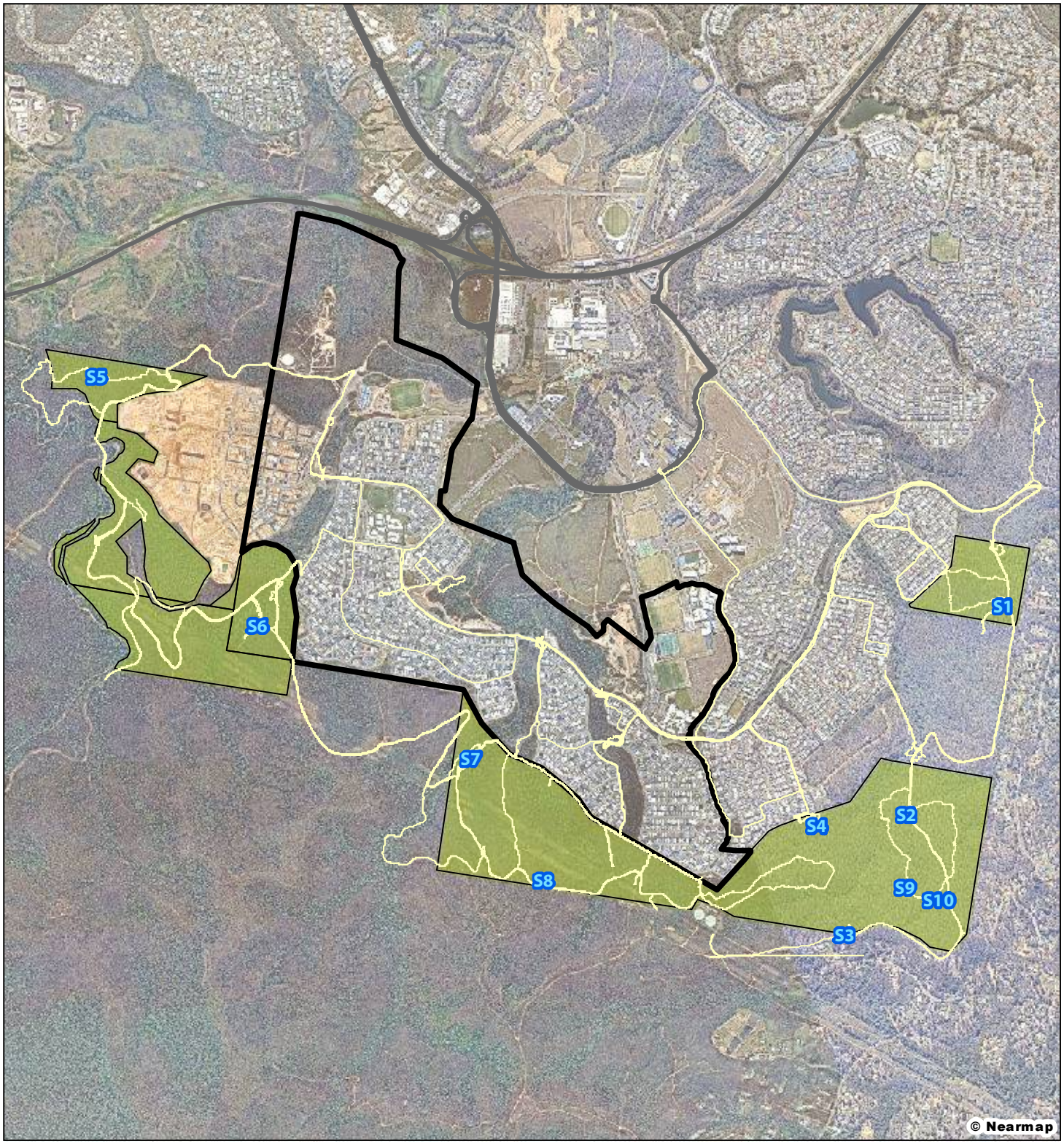
Spot Assessment Technique (SAT) surveys have been undertaken across the conservation area in accordance with the methodology developed by the Australian Koala Foundation (as per Phillips & Callaghan 2011). The SAT method is an assessment of Koala activity involving a search for any Koalas and signs of Koala usage. The SAT involves identifying a non-juvenile tree of any species within the site that is either observed to have a Koala or scats or is known to be a food tree or otherwise important for Koalas and recording any evidence of Koala usage of that tree including presence, identifiable scratches, or scats. The nearest non-juvenile tree is then identified, and the same data recorded. The next closest non-juvenile tree to the first tree is then assessed and so on until 30 trees have been surveyed. The number of trees showing evidence of Koala activity is expressed as a percentage of the total number of trees sampled to indicate the frequency of Koala usage. Assessment of each tree involves a systematic search for Koala scats beneath the tree within one metre radius of the trunk. After approximately two-person minutes of searching for scats, the base of the trunk is observed for scratches and the crown for Koala (refer Phillips & Callaghan, 2011).

A total of 89 SAT surveys have been completed over the site over the past seven years using a combination of methods to determine location. For a more details on previous year's survey refer to the corresponding ACR available on the Lendlease – Springfield Rise webpage. Results covering SAT surveys from the beginning of development can be found in **Appendix I.**

Table 3: Year Seven (7) SAT Results

Survey Year	SAT site no.	Evidence of koala use (%)	Koala use (high/medium/low)
7	**1**	16.67	Low
7	**2**	0	Low
7	**3**	3.33	Low
7	**4**	0	Low
7	**5**	0	Low
7	**6**	0	Low
7	**7**	10.00	Low
7	**8**	6.67	Low
7	**9**	6.67	Low
7	**10**	20	Medium

The SATs conducted in the seventh year of compliance monitoring are presented in **Table 3**. The locations of the ten (10) SATs conducted during the current monitoring year were randomly selected (refer **Figure 6)**.



Legend

- Project area
- Road
- Offset Area
- ACR Year 7 Track Log
- S ACR Year 7 SAT Survey Locations

Figure 6

SAT Survey Locations

Lend Lease Communities (Springfield) Pty Ltd

File ref. 7243 E Figure 6 ACR7 SAT Surveys A_
Date 15/11/2023
Project Springfield Rise, EPBC 2013/7057

0 200 400 600 800 1,000 m

N

Scale (A4): 1:30,000 [GDA 1994 MGA Z56]

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5.2. Nest Boxes

Year four (4) of the development marked the initiation of the nest box monitoring program across the conservation area with the installation of twenty-seven units, and the following year an additional thirty-one nest boxes were installed. All fifty-eight (58) boxes were constructed by the Springfield Camira Men's Shed inc.

The results for Year 7 of the compliance reporting and therefore year two (2) and three (3) of the nest box programs are displayed in **Appendix G.** The annual inspection was completed on 18th and 19th October 2023, of the fifty-eight nest boxes installed, majority were found to be in good condition, of which eleven (11) were housing *Trichosurus vulpecula* (Brushtail possum) individuals. However, seventeen (17) nest boxes were found to contain the following: three (3) with spider webs, eight (8) with ants, one (1) with an external caterpillar nest, and five (5) with insect mud nests. Two (2) nest boxes were recorded on angles, potentially decreasing accessibility and one (1) looked to have an internal screw exposed.

5.3. Threats

There are several environmental threats that may interfere with the approval holder's efforts towards achieving the milestone and these were assessed alongside opportunities to counteract or control each with active management measures.

These threats are:

1. Weeds — specifically weeds of national significance such as *Lantana sp.*
2. Pest animal management — wild dogs and other predatory species are known to occur within the region
3. Erosion — restorative actions will rectify the historical and recent impacts
4. Unlawful access — prevent unauthorised access during the management period

To support the future achievement of the gain in habitat quality milestone for benefit of the grey-headed flying-fox and koala, several management actions are underway to address the threats. These actions are discussed in the following subsections and detailed in **Table 4**. This table will be reviewed annually as part of completing the Annual Compliance Report and the status/results of actions discussed accordingly.

5.3.1 Weed management

An extensive survey of dominant weeds throughout the Offset Area was completed in year one (1) and identified *Lantana camara* (*L. camara*) as the dominant weed species. This survey informed a weed management works package for persons undertaking the weed eradication work (refer **Appendix J**). Weed removal will provide an opportunity for koala habitat and grey-headed flying-fox foraging habitat to establish in these areas and therefore expanding the available habitat for these species. Habitat quality is expected to improve considerably in these areas which currently provide very little value wherever *L. camara* is a dominant species in the landscape.

Weed species were concentrated along drainage lines throughout the Offset Area and surveys post treatment works have determined the success of the initial weed management works, and if additional treatments are

necessary. Surveys are usually completed concurrent with the weed eradication program which commenced in August 2018 and has a 120-month maintenance period between the practical completion and off maintenance of works. While assessing the seventh year of compliance monitoring Saunders Havill Group was informed that minimal weed management and rehabilitation plans were undertaken across the site due to contractor staffing issues. For former weed survey and revegetation results, refer to corresponding ACR available on the Lendlease – Springfield Rise webpage.

The overall management objective is to reduce the presence of weeds of national significance to 5% of the total 293 ha Offset Area. Weed meanders were conducted across the Offset Area during the Year 7 reporting period to determine the extent of weeds across the area (refer **Figure 7**). These surveys found the weed management actions across the offset area are on target to achieving the overall management objective, reducing weeds of national significance to 5% of the total 293 ha offset area. Subsequent follow-up and maintenance works programmed across various parts of the Offset Area will ensure this is improved and maintained.

Planting of native vegetation to assist natural regeneration was undertaken in areas where weeds had a stronghold and once treated, revegetation was employed to provide bank stability and assist the establishment of koala and grey-headed flying-fox habitat. A total of 3,120 seedlings were planted in the Offset Area (Area 2) during the year four (4), and ~1,400 were planted during year two (2). Surveys to assess the two (2) rehabilitation areas were conducted in year five (5), and results from this reporting period can be found in the year five (5) ACR.

Due to the minimal weed management and rehabilitation that had occurred on-site during the current reporting period, rehabilitation areas were not reported on in this ACR. The proponent will continue to work with the offset area management contractor to maintain and improve areas of weed management and report on the progress in the next ACR. The measure required for continued management include:

- Removal and maintenance of regenerating WONS, and
- maximising surface roughness to slow runoff, which reduces erosion and provides more time for plants to absorb water.

5.3.2 Pest animal management

Periodic inspections and third party publications have confirmed wild dogs are a threat in the Offset Area. The airborne thermal camera survey also confirmed their presence. Other threats include red foxes, feral pigs and cane toads. Managing pest animals in the Offset Area and greater locality is a combined effort with the landowner, Ipswich City Council.

Camera traps were installed across the subject site to detect the presence of feral dogs and other vertebrate pest species (refer **Figure 8**). The pest species detected via the camera traps were *Vulpes vulpes* (Red Fox), domesticated cat (*Felis catus)* and wild dog (*Canis lupus familiaris*) within the Offset Area. Previously, the approval holder has identified the scope of works required to address the dog presence. However, discussions with the landowner, Ipswich City Council, have determined that pest management through the trapping, baiting and shooting would not be appropriate across the Offset Area for the following key reasons:

1. Health and safety concerns given the proximity to residential areas; and
2. Trapping and removal of individuals will allow for others to move into the Offset Area.

Pest management is coordinated across the local government area by council in conjunction with adjacent councils. Although supplementary pest animal management is not supported by Ipswich City Council, the approval holder will continue to monitor the presence of pest animals within the Offset Area for the duration of the project.

5.3.3 Erosion

Several parts of the Offset Area are heavily eroded for a multitude of reasons:

- historical unlawful access and use of the Offset Area by 4WD vehicles, trail bikes and all-terrain vehicles (ATV); and
- historical management of the area as part of a larger network of land did not focus solely on addressing erosion in the Offset Area.

Consequently, as part of weed eradication and general management works, the approval holder has continued to address areas of significant erosion and establishing tracks for maintenance and access purposes. As part of erosion remediation work, native vegetation that will benefit the grey-heading flying-fox and koala is planted in areas to assist.

As noted previously within this report, ESC issues were identified within the latter stages of a previous reporting period (17 October 2019 – 16 October 2020). Although not viewed as a non-compliance with the EPBC Approval, the matter continues to be monitored and managed throughout the current reporting period. Upon the survey conducted during the Year 7 ACR, all tracks which are required to be maintained were found to be accessible (refer **Photo set 2**). There was no evidence found that would suggest areas of significant erosion.

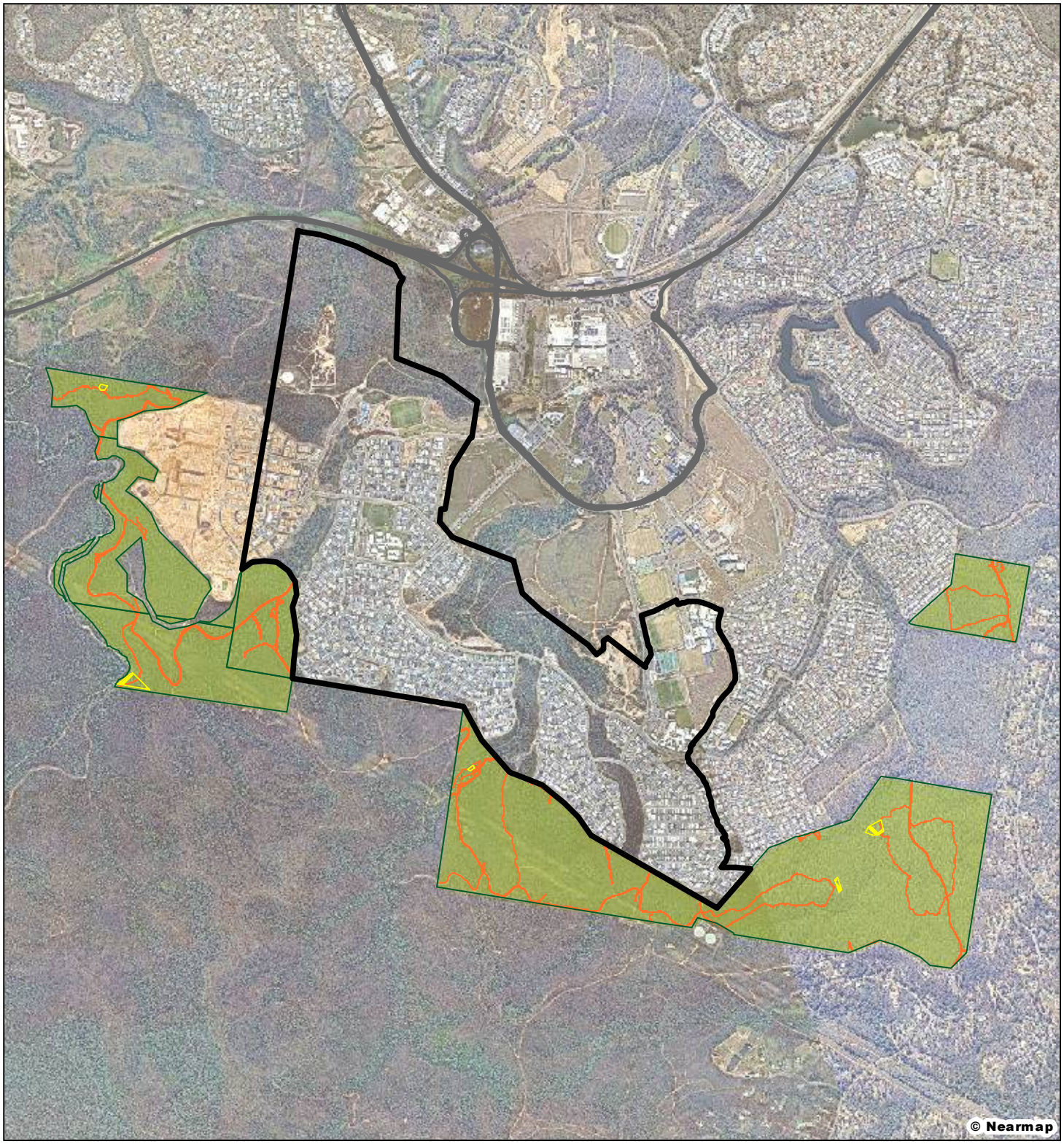
Photo set 2: Access tracks through the Offset Area.

5.3.4 Unlawful access

The Offset Area has been accessed unlawfully in the past by people utilising the area for recreational purposes (e.g. 4WD, trail bikes and ATV). Preventing access is difficult when a presence in the area is not ongoing, however, since the approval holder commenced construction, undesired access to the Offset Area has become easier to prevent due to the works area adjoining the Offset Area. Many fences and gates that prevent access are keyed and therefore secure, and the civil contractor's daily presence deters trespassers onto the adjoining Offset Area. Nonetheless, unlawful access will continue to be monitored and action implemented where necessary.

During the reporting period a review of the current security was undertaken to ensure fencing, gates and other physical deterrents were adequate to prevent access by unauthorised vehicles. The review determined that the existing security measures implemented by the approval holder were sufficient in deterring unauthorised access. Although, one trail access point uses sandstone block to prevent unlawful vehicles. These sandstone blocks were slightly moved and will need to be rectified. Efforts had been made to discourage the public from entering the site by the installation of flagging and 'Danger' signage, upon inspection the fencing had been removed (securement point 1). At two additional entry point the pedestrian gate was found to be unlocked and open to public use (securement point 3 and 4). Although efforts have been made to secure the offset site and deter trespassers through the installation of keyed access points and fencing, the reviews indicate that the issue is ongoing. However as stated above, incidences significantly reduced as a result of construction works and presence of contractors within the project and Offset Areas.

Long-term management of the Offset Area will require diligent monitoring of access points (i.e., gates) and fences to ensure trespassers do not gain access and negate the approval holder's efforts towards improving the Offset Area. While the civil contractor maintains an on-site presence, reviews of Offset Area security will occur in conjunction with other Offset Area management actions. Specific issues regarding trespassing and access will continue to be resolved in consultation with Ipswich City Council as they occur.



Legend

- Project area
- Road
- Weed meander
- Lantana patches in offset area
- Offset Area

Figure 7

Vegetation data collection sites

Lend Lease Communities (Springfield) Pty Ltd

File ref. 7243 E Figure 7 ACR7 Veg Collection Sites A_
Date 15/11/2023
Project Springfield Rise, EPBC 2013/7057

0 200 400 600 800 1,000 m

N

Scale (A4): 1:30,000 [GDA 1994 MGA Z56]

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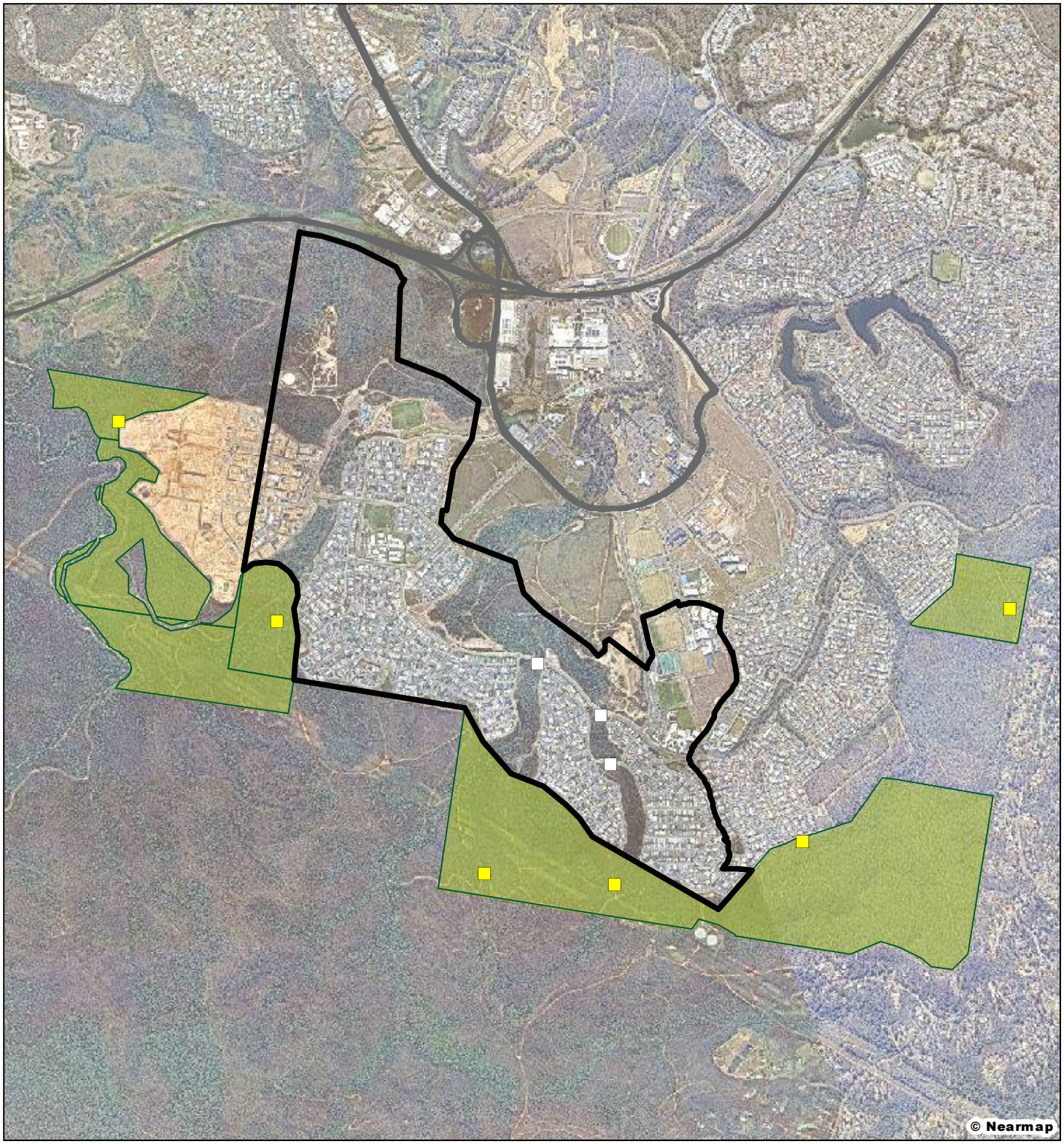

Legend

- Project area
- Road
- Offset Area
- Camera location (conservation area)
- Camera location (no bait)

Figure 8

Fauna data collection sites

Lend Lease Communities (Springfield) Pty Ltd

File ref. 7243 E Figure 8 ACR7 Fauna Collection Sites A_
Date 15/11/2023
Project Springfield Rise, EPBC 2013/7057

0 200 400 600 800 1,000 m

N

Scale (A4): 1:30,000 [GDA 1994 MGA Z56]

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Layer Source: © State of Queensland 2023

Table 4: Offset area management actions summary

Current threat / quality improvement restoration	Base case	Improvement proposed	Achievement criteria	Measured by	Timeframes	Reporting	Funded by:
1. Removal of Weeds of National Significance (WONS — namely *Lantana sp.*)	17% of the 293 ha Offset Area has been assessed as containing *Lantana sp.* of varying infestations (approx. 50 ha effected by weeds).	Reduction and management of WONS through the Offset Area	Decrease and maintain WONS cover in the offset area to 5% or less (12% improvement to area of offset = 35 ha of land)	Weed Survey Extent Mapping – repeated annually / measured against base line study already completed.	WONS reduced through the offset area to 5% by 3 years post the commencement of the Action. WONS maintained at 5% or below for 10 years post the Commencement of Construction.	Weed Survey Extent Mapping results included in the ACR for the project. In 2018, weed management works commenced and continued throughout each subsequent reporting period (refer **Appendix J**). Given the size of the offset area, it was divided into smaller progress areas for weed management. Each of these areas has now been subject to weed management and are at various stages of treatment. A weed extent survey and mapping was undertaken during this reporting period.	All weed management to be funded by the Approval Holder using licensed and registered contractors.

Current threat / quality improvement restoration	Base case	Improvement proposed	Achievement criteria	Measured by	Timeframes	Reporting	Funded by:
						The surveys confirmed the management actions have reduced total coverage of WONS throughout the offset area to below the 5% threshold. Randomised and targeted searches of previous known infestation areas were completed during the ACR surveys. Results found that there is some regrowth of *L. camara* plants scattered across the conservation area, however main infestations are restricted to waterways and slopes up from waterways. Weed removal is recommended to	

Current threat / quality improvement restoration	Base case	Improvement proposed	Achievement criteria	Measured by	Timeframes	Reporting	Funded by:
						reduce the *L. camara* across the offset site to ensure WONs coverage will remain at less than 5% for future surveys.	
2. Pest Management — Wild (& Unwanted) Dog usage of Offset Area	1. Site survey observed Wild Dog species and located fresh Wild Dog prints across the Offset Area. 2. Ipswich City Council White Rock – *Spring Mountain Conservation Estate – Tier 2 Management Plan* lists Wild Dogs, Red Foxes, Feral Pigs and Cane Toads as significant pest issues. This conservation estate land is contiguous with	Monitor pest species (namely Wild Dogs) to ensure no increase of presence/density.	No increase of pest species throughout the 293 ha Offset Area.	Camera trapping and thermal imagery surveys as required.	Pest species are to be monitored for the life of the offset (20 years).	Camera trapping and thermal imagery surveys as required were conducted and results reported in the relevant ACR section. The survey completed during the current reporting period recorded several pest species on camera including Red Fox (*Vulpes vulpes*), domesticated cat (*Felis catus)* and wild dog (*Canis lupus familiaris*).	Monitoring surveys to be funded by the Approval Holder.

Current threat / quality improvement restoration	Base case	Improvement proposed	Achievement criteria	Measured by	Timeframes	Reporting	Funded by:
	the Offset Area (*i.e.,* no dividing fence). 3. *2011 Environmental Impact Assessment* (Aurecon) for the adjoining Department of Defence bushland property to the east of the Offset Area located wild dogs as part of site surveys. 4. Wild Dogs and Foxes were recorded on the Spring Mountain project as listed in the *November 2013 Austecology MNES vertebrate Fauna Assessment*. This						

Current threat / quality improvement restoration	Base case	Improvement proposed	Achievement criteria	Measured by	Timeframes	Reporting	Funded by:
	land is contiguous with the Offset Area.						
3. Koala Habitat and Grey-headed Flying Fox Foraging Habitat Replanting and Regeneration	At existing major erosion points and areas of extensive weed removal, revegetation — inclusive of MNES habitat trees — will be reinstated. Low-level vegetation values within the powerline easement which connects habitat areas.	Increases in koala habitat and grey-headed flying-fox foraging habitat resources (food and shelter trees). Improve vegetation values within the powerline easement in accordance with planting protocols for such infrastructure.	Reinstated existing degraded areas, and those created through mass weed removal with revegetation, inclusive of suitable habitat species.	Number of MNES habitat trees replanted within the offset area = equal or greater than 1,500 trees. *(Estimated 20-25% of land infested with Lantana sp. — 50.1 ha, sporadically requiring patch and broad areas of revegetation. Assume MNES habitat tree density of 150 trees per hectare = total 1,503-1,880 trees.)* Biennial surveys of koala and grey-headed flying-fox presence. Methods employed may include SAT surveys,	All tree planting complete on or before 3 years post commencement of construction (*i.e.,* 17 October 2019). *(Timeframe to allow for weed management measures to occur prior to tree planting.)*	Tree installation reporting within the ACR period for which it occurs. The year three (3) ACR confirms the total tree milestone was achieved during year three (3). Success of tree planting and survival rates reported on annually for life of the offset (20 years). *(Note 1,500 trees is the minimum outcome therefore additional trees have been planted to account for stock failure or other losses. Where determined by the*	Replanting to be completed by a registered and experienced contractor at the cost of the Approval Holder.

Current threat / quality improvement restoration	Base case	Improvement proposed	Achievement criteria	Measured by	Timeframes	Reporting	Funded by:
				drone survey, general/ad hoc observations and meander surveys. Easement area comprises a vegetated corridor that supports adjoining habitat values.		*ACR, additional trees will be planted.)* Relevant ACR period to present results of biennial surveys that assess the presence of koala and grey-headed flying-fox. SAT surveys have been completed annually thus far, with the exception of Year 6 ACR. A total of 89 SAT surveys have been conducted over the seven years (**Appendix I**). Evidence of koala usage in the form of scats was low at all locations except for three; one having medium usage and two, one of the high recordings was recorded in year two (2), and the	

Current threat / quality improvement restoration	Base case	Improvement proposed	Achievement criteria	Measured by	Timeframes	Reporting	Funded by:
						remaining two were recorded in year three (3). The area where high usage was recorded has undergone rehabilitation in August 2018. A koala was observed within the conservation area during Year six (6) ACR.	
4. Reduce unlawful access and use of the Offset Area by 4WD, trail bikes and all-terrain vehicles (ATV)	Historically the Offset Area included a number of unlawful access tracks and entry points resulting in degraded and eroded sections throughout the Offset Area. Six locations around the periphery of the offset land have been identified as being historically	Reduce unlawful access and use by 4WD, trail bikes and ATV.	Installation of new or substantial upgrades and extensions to barrier fencing at identified locations of unlawful entry. Maintenance of access point during the offset management period to confirm success of securement works.	Evidence of securement (e.g. photographs) provided during ACR. Annual review of installed and upgraded security measures for measurement of success (observation evidence of tyre tracks and damage	Two securement points completed every two years. All six securement points constructed and operational with six years of the commencement of the action. Infrastructure to be in place for the life of the offset (20 years).	Evidence of barrier installation, monitoring and success provided as part of relevant period ACR. A review of Offset Area security was undertaken as part of contractor works in Year 7. Locked gates have been installed across the site,	The Approval Holder will continue to monitor and maintain barrier and access point infrastructure.

Current threat / quality improvement restoration	Base case	Improvement proposed	Achievement criteria	Measured by	Timeframes	Reporting	Funded by:
	used to unlawfully access the Offset Area.		Alteration and further upgrades to security points where demonstrated to be unsuccessful.	circumventing barrier structures) Reporting on any adaptive alterations to security not shown to be successful (e.g. extension of fencing where new tracks show access occurring around the fence).		preventing unlawful access throughout the conservation area. Evidence of tampering at three securement points; one with sandstone blocks allowing vehicle access and two pedestrian gates left unlocked, all of which will need to be fixed to prevent unlawful access. Although efforts have been made to secure the offset site and deter trespassers through the installation of keyed access points and fencing, the reviews indicate that the issue is ongoing.	

Current threat / quality improvement restoration	Base case	Improvement proposed	Achievement criteria	Measured by	Timeframes	Reporting	Funded by:
5. Overall improvement of the quality of the Offset Area to 9/10.	Offset quality value of 7-8/10 under the *Guide to Determining Terrestrial Habitat Quality* – Queensland Department of Environment and Heritage Protection. Value score is derived from eight transects completed throughout the Offset Area. Reference area transect also completed — score 6.92/10.	Achieve a 2 point gain in the quality of MNES habitat .	By measure of achieving a 9/10 average score at the transect locations from surveys completed in accordance with the *Guide to Determining Terrestrial Habitat Quality* – Queensland Department of Environment and Heritage Protection.	Data collected from the transect locations at 5 year intervals for the life of the offset (20 years). If the quality is assessed as not improving at the first five year interval, this will trigger a review of management measures to determine suitable actions that can be implemented to achieve the 9/10 objective.	Achieve a 2 point gain in MNES habitat quality at the year 20 ACR. Demonstrate an improvement of Offset Area quality, subject to external factors (e.g. fire), at each five year interval.	Transect data to be presented in a report completed in accordance with *Guide to Determining Terrestrial Habitat Quality* – Queensland Department of Environment and Heritage Protection and to form part of the ACR for the relevant period. Transects were undertaken in the Year five (5) reporting period and showed an increase in MNES habitat quality from baseline. The project is considered on track to achieve the target for MNES habitat quality.	The Approval Holder will fund the transect data collection and reporting.

Current threat / quality improvement restoration	Base case	Improvement proposed	Achievement criteria	Measured by	Timeframes	Reporting	Funded by:
						Habitat transects were not completed as a part of this ACR Survey.	

6. Appendices

Appendix A

EPBC approval and conditions granted 23 December 2015

Appendix B

Dry Passage Culvert Audit 2023

Appendix C

Lendlease Key Design Outcome Fence Requirement Notice

Appendix D

Lendlease Fencing Detail

Appendix E

Fauna Spotter Catcher Post-works reporting Example

Appendix F

White Rock – Spring Mountain Fire Management Strategic Plan and Risk Dashboard

Appendix G

Nest Box Monitoring and Maintenance Report

Appendix H

Village 17 Environmental Pre-start Checklist

Appendix I

SAT Results – Year one (1) to Year Seven (7)

Appendix J

Weed Management Plans

Appendix A

EPBC approval and conditions granted 23 December 2015

Australian Government
Department of the Environment

Approval

Spring Mountain Mixed Use Master Planned Community Development, Queensland (EPBC 2013/7057)

This decision is made under sections 130(1) and 133 of the *Environment Protection and Biodiversity Conservation Act 1999*.

Proposed action

Person to whom the approval is granted	Lend Lease Communities (Springfield) Pty Limited
Proponent's ACN (if applicable)	ACN 087 876 864
Proposed action	To construct a mixed use development (including residential, commercial and community developments and associated infrastructure) on a 387ha site at Spring Mountain, Queensland [See EPBC Act referral 2013/7057].

Approval decision

Controlling Provision	Decision
Listed threatened species and communities (sections 18 & 18A)	Approved

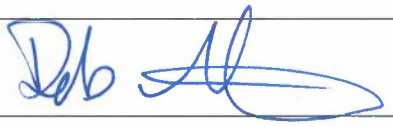
Conditions of approval

This approval is subject to the conditions specified below.

Expiry date of approval

This approval has effect until 31 December 2040.

Decision-maker

Name and position	Deb Callister Acting First Assistant Secretary Environment Standards Division
Signature	
Date of decision	23 December 2015

CONDITIONS

1. The approval holder must not clear more than 255 hectares of **MNES habitat**.

2. To minimise adverse impacts to **koalas** from **vegetation clearing and construction activities** there must be no **koala** injury or mortality as a result of **vegetation clearing and construction activities** at the **project site.**

3. To minimise adverse impacts to **koalas** from vehicle strike and in order to maintain safe **koala** movement opportunities through the **project site** the approval holder must:

    a. implement the measures specified in Table 3-3 of the **Fauna Management Plan** prior to **operation,** and maintain these measures for the life of the approval;

    b. ensure **koala road crossings** are placed in the locations specified at Figure 3-1 of the **Fauna Management Plan** prior to **operation,** and maintain these measures for the life of the approval;

    c. implement measures sufficient to identify any **koala** injury and mortality at the **project site**; and

    d. if **koala** injury or mortality occurs, then revise management measures in consultation with a **suitably qualified person** to reduce the likelihood of adverse impacts to **koalas**; and inform the **Department**, either as part of annual compliance reporting required under condition 13 or as a separate notification in writing.

4. To minimise adverse impacts to **koalas** from domestic dog attack and to exclude **koalas** from entering residential areas within the **project site,** the approval holder must:

    a. implement measures to prevent domestic dog attacks on **koalas**, including limiting the movement of domestic dogs, creating dog exclusion zones and **signage** as specified at section 3.4 of the **Fauna Management Plan**; and

    b. ensure **koala exclusion fencing** is constructed and located as specified at section 3.4 of the **Fauna Management Plan** prior to **operation,** and maintained for the life of the approval.

5. To minimise adverse impacts to ***Plectranthus habrophyllus***, there must be no net loss of ***P. habrophyllus*** at the **project site** as a result of the proposed action, as defined by the following milestones:

    a. by six months after the **commencement of the action** and annually for three years thereafter, there must be 0% cover of **weeds of national significance** in the **on-site conservation areas** and **buffer areas**;

    b. by one year after the **commencement of construction** there must be 80% survival of planted ***P. habrophyllus***;

    c. by three years after the **commencement of construction**, there must be an increase in the number of mature ***P. habrophyllus*** in the **on-site conservation areas** that is greater than the number of ***P. habrophyllus*** removed during **construction**; and

    d. by three years after the **commencement of construction**, there must be evidence of recruitment from planted ***P. habrophyllus*** individuals.

6. The approval holder must undertake a monitoring program. The monitoring program must be planned and undertaken so that the data gathered is adequate to: inform adaptive management; and demonstrate whether milestones and outcomes described in conditions 2, 5 and 8 have been met. The monitoring program must:

    a. include daily surveys for injured or dead koalas during **vegetation clearing and construction activities**;

    b. include pre-clearance surveys of all areas that will be cleared to establish the number of mature ***P. habrophyllus*** that will be lost as a result of the proposed action;

    c. establish quadrats within each of the **on-site conservation areas** where ***P. habrophyllus*** has been planted and at **control sites** that contain remnant ***P. habrophyllus*** populations where supplemental planting has not occurred; and

    d. be undertaken by a **suitably qualified person**.

7. To compensate for the loss of **koala habitat** and **grey-headed flying-fox foraging habitat** the approval holder must:

    a. **secure**, prior to the **commencement of the action**, the **offset** containing 293 hectares of **MNES habitat** within the offset area at **Annex 1**;

    b. provide the Department with the **offset attributes**, **shapefile** and map(s) clearly defining the location and boundaries of each offset, within 2 weeks of lodgement of the offset with the **Titles Office**; and

    c. ensure the **Agreement** is registered on the title on which each offset is located, and provide the Department with evidence of lodgement with the **Titles Office**, within 2 weeks of lodgement. Provide a copy of the signed **agreement** within 2 weeks of receipt from the **Titles Office**.

    The approval holder must ensure any proposal for alternative offsets is agreed to in writing with the **Department**.

    Note: Offsets for different species may overlap where they share the same habitat requirements.

8. To compensate for impacts to **koala habitat and grey-headed flying-fox foraging habitat** the approval holder must achieve the following outcomes as compared to baseline **offset** habitat quality and extent, unless agreed in writing with the **Department**:

    a. by 20 years after the **commencement of construction**, there must be a **gain in habitat quality** across 90% of the **offset**.

9. To mitigate impacts on **koala** and ***P. habrophyllus***, the approval holder must develop a fire management strategy for the **project site** and the **offset,** incorporating advice from a **suitably qualified person** regarding the impacts of the fire management strategy on **koala** and ***P. habrophyllus.***

10. The approval holder must adaptively manage **koala habitat, grey-headed flying-fox foraging habitat** and ***P. habrophyllus*** to achieve the outcomes described in conditions 1-9. This must include:

a. developing and implementing a strategy (or strategies) to achieve the outcomes and milestones outlined in conditions 1-9, in consultation with a **suitably qualified person** (noting that the plan does not require approval by the **Minister** and is not an 'action management plan' under the **EPBC Act**);

b. a documented process of adaptive management and continual improvement, including using data from monitoring and experimentation trials to inform adaptive management; and

c. where there is a reasonable risk (or evidence) that outcomes or milestones are not likely to be achieved: revising management measures in consultation with a **suitably qualified person**; increasing the level of effort to achieve the outcomes; and informing the **Department**, either as part of annual compliance reporting required under condition 13 or as a separate notification in writing.

Administrative conditions

11. Within 7 days after the **commencement of the action**, the approval holder must advise the **Department** in writing of the actual date of **commencement of the action**.

12. The approval holder must maintain accurate records substantiating all activities associated with or relevant to the conditions of approval, including measures taken to implement the management plan, report or strategy required by this approval, and make them available upon request to the **Department**. Such records may be subject to audit by the **Department** or an independent auditor in accordance with section 458 of the **EPBC Act**, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the **Department's** website. The results of audits may also be publicised through the general media.

13. Within three months of every 12 month anniversary of the **commencement of the action**, the approval holder must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of any management plans as specified in the conditions. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to the **Department** at the same time as the compliance report is published, until agreed in writing with the **Department**.

14. The approval holder must notify the **Department** in writing of any non - compliance with conditions as soon as practicable and within no more than 2 business days of becoming aware of the non - compliance.

15. Upon the direction of the **Minister**, the approval holder must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the **Minister**. The independent auditor must be approved by the **Minister** prior to the commencement of the audit. Audit criteria must be agreed to by the **Minister** and the audit report must address the criteria to the satisfaction of the **Minister**.

16. The approval holder may choose to revise a management plan, program or strategy approved by the **Minister** under conditions 1 - 9 without submitting it for approval under section 143A of the EPBC Act, if the taking of the action in accordance with the revised plan, program or strategy would not be likely to have a **new or increased impact**. If the approval holder makes this choice they must:

a. notify the **Department** in writing that the approved plan, program or strategy has been revised and provide the **Department** with an electronic copy of the revised plan, program or strategy;

b. implement the revised plan, program or strategy from the date that the plan, program or strategy is submitted to the **Department**; and

c. for the life of this approval, maintain a record of the reasons the approval holder considers that taking the action in accordance with the revised plan, program or strategy would not be likely to have a **new or increased impact**.

17. The approval holder may revoke their choice under condition 16 at any time by notice to the **Department**. If the approval holder revokes the choice to implement a revised plan, program or strategy, without approval under section 143A of the Act, the plan, program or strategy approved by the **Minister** must be implemented.

18. Condition 16 does not apply if the revisions to the approved plan, program or strategy include changes to environmental offsets provided under the plan, program or strategy in relation to a matter protected by a controlling provision for the action, unless otherwise agreed in writing by the **Minister**. This does not otherwise limit the circumstances in which the taking of the action in accordance with a revised plan, program or strategy would, or would not, be likely to have **new or increased impacts**.

19. If the **Minister** gives a notice to the approval holder that the **Minister** is satisfied that the taking of the action in accordance with the revised plan, program or strategy would be likely to have a **new or increased impact**, then:

    a. Condition 16 does not apply, or ceases to apply, in relation to the revised plan, program or strategy; and

    b. The approval holder must implement the plan, program or strategy approved by the **Minister**.

    To avoid any doubt, this condition does not affect any operation of conditions 16, 17 and 18 in the period before the day the notice is given.

    At the time of giving the notice the **Minister** may also notify that for a specified period of time that condition 16 does not apply for one or more specified plans, programs or strategies required under the approval.

20. Conditions 16, 17, 18 and 19 are not intended to limit the operation of section 143A of the **EPBC Act** which allows the approval holder to submit a revised plan, program or strategy to the **Minister** for approval.

21. If, at any time after five years from the date of this approval, the approval holder has not **substantially commenced the action**, then the approval holder must not **substantially commence the action** without the written agreement of the **Minister**.

22. Unless otherwise agreed to in writing by the **Minister**, the approval holder must publish all management plans, reports or strategies referred to in these conditions of approval on their website. Each management plan, report or strategy must be published on the website within 1 month of being approved by the **Minister** or being submitted under condition 1 – 9.

DEFINITIONS

Agreement - the executed agreement between the approval holder and the relevant landowner, to secure the land for long-term protection.

Buffer areas means 20 metre buffers around areas containing remnant or planted ***P. habrophyllus***.

Commencement of the action means the date **construction** is first undertaken, excluding fences and signage, associated with the proposed action.

Construction includes any preparatory works required to be undertaken including clearing vegetation, the erection of any onsite temporary structures and the use of heavy duty equipment for the purpose of breaking the ground for buildings or infrastructure including any works for the creation of vegetation buffers.

Control sites means sites to be monitored concurrently with a **project site** or **offset** site, to provide evidence of the relative impacts or improvements as a result of the proposed action.

Department means the Australian Government Department or any other agency administering the **EPBC Act** from time to time.

EPBC Act means the *Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)*.

EPBC Act Environment Offsets Policy (October 2012) is the Policy guiding the use of offsets under the *Environment Protection and Biodiversity Conservation Act 1999*, published by the then Department of Sustainability, Environment, Water, Population and Communities, October 2012.

Fauna Management Plan means the document titled *Saunders Havill Group's Spring Mountain Fauna Management Plan 17 July 2015* (FMP).

Gain in habitat quality means an improvement in the quality and extent of **koala habitat** and **grey-headed flying-fox foraging habitat** in comparison to baseline environmental conditions at the **offset** and compared with an unmanaged control site.

Grey-headed flying-fox means the native species *Pteropus poliocephalus*, protected under the **EPBC Act**.

Grey-headed flying-fox foraging habitat means the known native food trees, including eucalypts (genera *Eucalyptus*, *Corymbia* and *Angophora*), melaleucas and banksias that are the primary food for the species.

Koala means the native species *Phascolarctos cinereus* (combined populations of Qld, NSW and the ACT), protected under the **EPBC Act**.

Koala habitat means any forest or woodland containing species that are known **koala** food trees or shrubland with emergent food trees. This can include remnant and non – remnant vegetation in natural, agricultural, urban and peri-urban environments and is defined by the vegetation community present and the vegetation structure; **koalas** do not necessarily have to be present.

Koala exclusion fencing is fencing constructed and located to prevent access by **koalas** to residences within the **project site**.

Koala road crossings are road crossings, including underpasses, which are specifically designed to facilitate the movement of **koalas**.

Minister means the Minister administering the EPBC Act and includes a delegate of the Minister.

MNES means matters of national environmental significance.

MNES habitat means **koala habitat** and **grey-headed flying-fox foraging habitat**.

New or increased impact means a new or increased impact on any matter protected by the controlling provisions for the action, when compared to the plan, program or strategy that has been approved by the **Minister**.

Offset attributes means a '.xls' file capturing relevant attributes of the **offset** site, including the EPBC reference ID number, the physical address of the **offset** site, coordinates of the boundary points in decimal degrees, the **EPBC Act** protected matters that the **offset** compensates for, any additional **EPBC Act** protected matters that are benefiting from the **offset**, and the size of the **offset** in hectares.

On-site conservation areas means areas containing remnant or planted ***P. habrophyllus*** that are managed primarily for conservation.

Operation means the date of commencement of functioning as a residential development.

Plectranthus habrophyllus or ***P. habrophyllus*** means the native species protected under the **EPBC Act**.

Project site is the area defined as 'referral area' in the map at **Annex 2**.

Secure means long-term protection under a legal mechanism that is either establishing a covenant on the title as a voluntary declaration under the *Vegetation Management Act 1999* (Qld), or establishing a Nature Refuge under the *Nature Conservation Act 1992* (Qld).

Shapefile means an ESRI Shapefile containing '.shp', '.shx' and '.dbf' files and other files capturing attributes including at least the EPBC reference ID number and EPBC protected matters present at the relevant site. Attributes should also be captured in '.xls' format.

Signage is appropriately located signs designed to raise awareness of the presence of **Koalas** within the **project site** or mitigate against impacts to **Koalas**.

Substantially commence (d) the action means commencement of clearing the land and construction of infrastructure (i.e. sewerage, power, water, stormwater) associated with the action. This does not include preparatory works.

Suitably qualified person means a person with qualifications in environmental science, ecology or biology from a recognised institute and a minimum of 5 years field experience in flora and fauna management, or as agreed in writing by the **Department**.

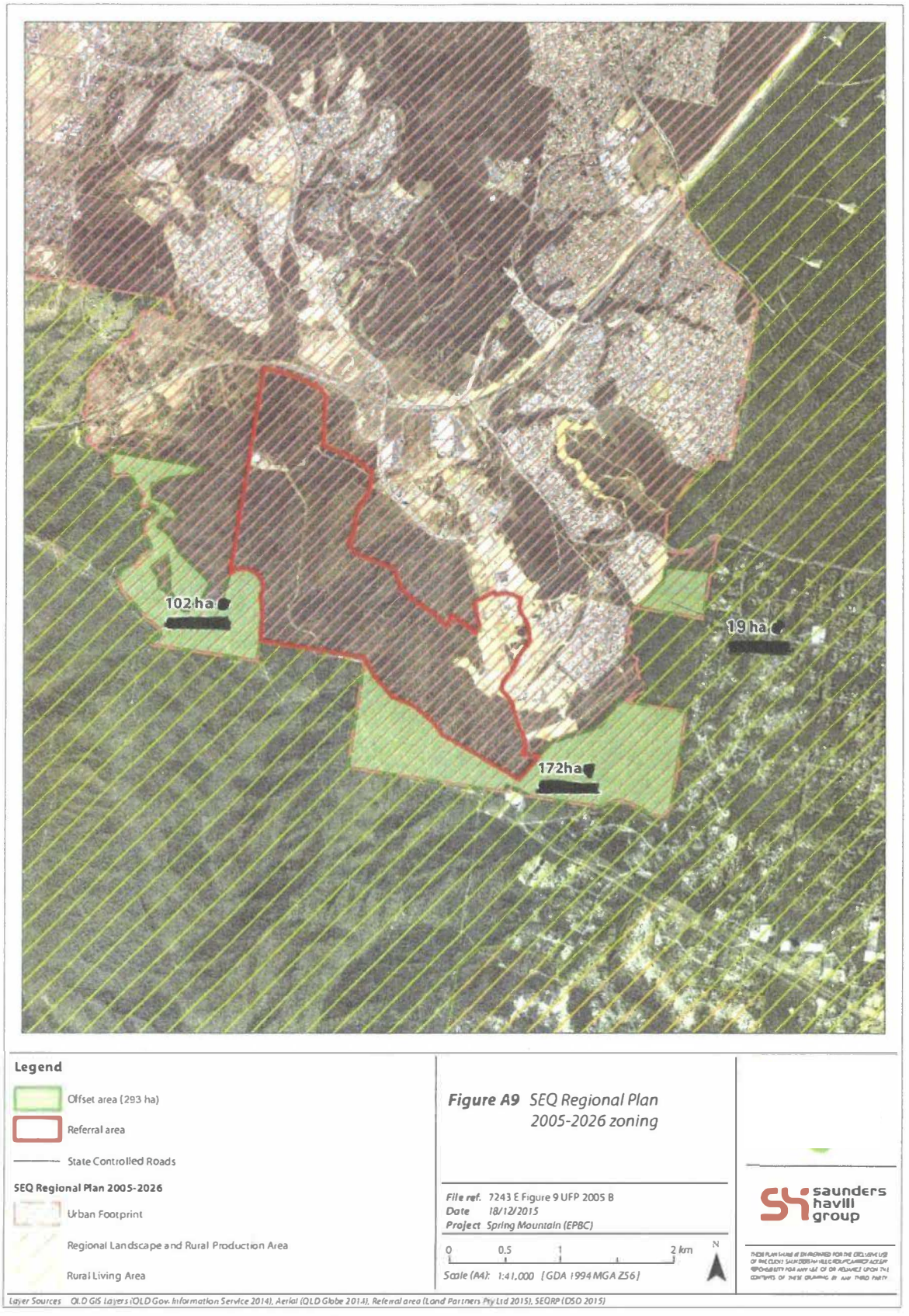
Titles Office means the relevant authority responsible for registering the land title transaction.

Vegetation clearing and construction activities means any activities that destroy, modify or remove vegetation within the **project site**, and those activities required during the construction of infrastructure for the duration of the approval.

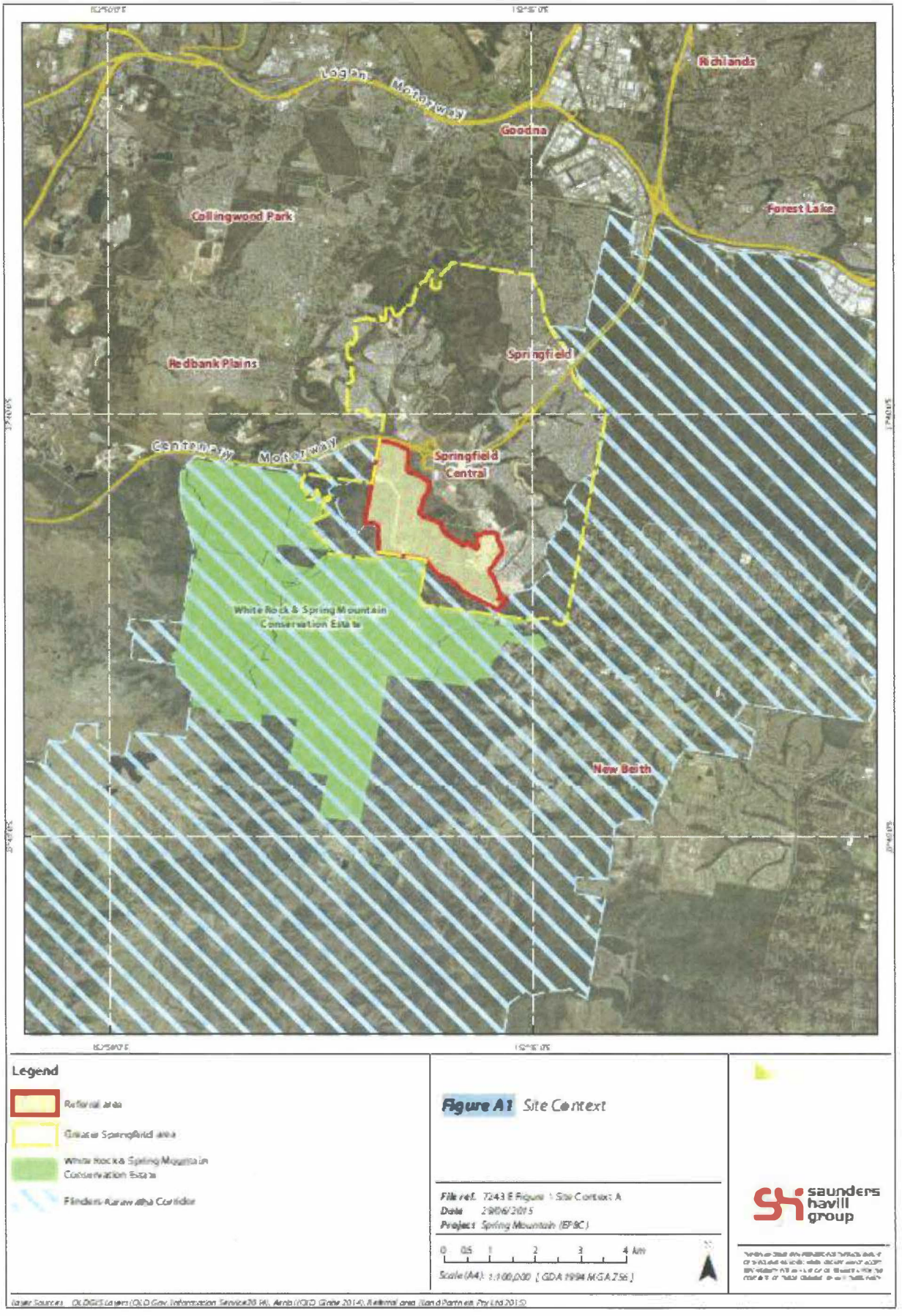
Weeds of national significance means the thirty two weeds that have been agreed by Australian governments, based on an assessment process that prioritised these weeds based

on their invasiveness, potential for spread and environmental, social and economic impacts, available at: http://www.weeds.org.au/docs/WoNS/.

Annex 1


102 ha
19 ha
172ha
Legend
Offset area (293 ha)
Referral area
State Controlled Roads
SEQ Regional Plan 2005-2026
Urban Footprint
Regional Landscape and Rural Production Area
Rural Living Area
Figure A9 SEQ Regional Plan 2005-2026 zoning
File ref. 7243 E Figure 9 UFP 2005 B
Date 18/12/2015
Project Spring Mountain (EPBC)
0 0.5 1 2 km
N
Scale (A4): 1:41,000 (GDA 1994 MGA Z56)
saunders havill group
Layer Sources QLD GIS Layers (QLD Gov. Information Service 2014), Aerial (QLD Globe 2014), Referral area (Land Partners Pty Ltd 2015), SEQRP (DSO 2015)

Annex 2


Logan Motorway
Goodna
Richlands
Collingwood Park
Forest Lake
Redbank Plains
Springfield
Centenary Motorway
Springfield Central
White Rock & Spring Mountain Conservation Estate
New Beith
Legend
Referral area
Greater Springfield area
White Rock & Spring Mountain Conservation Estate
Flinders-Karawatha Corridor
Figure A1 Site Context
File ref. 7243 E Figure 1 Site Context A
Date 29/06/2015
Project Spring Mountain (EPBC)
0 0.5 1 2 3 4 km
Scale (A4): 1:100,000 [GDA 1994 MGA Z56]
saunders havill group

Appendix B

Dry Passage Culvert Audit 2023

Dry Passage Culverts Inspection Photos - October 2023

Non-Functional Dry Passage Culverts

V17 – Culvert 1

V17 – Culvert 2

Functional Dry Passage Culverts

Grande Avenue (Western) – Southern End POV

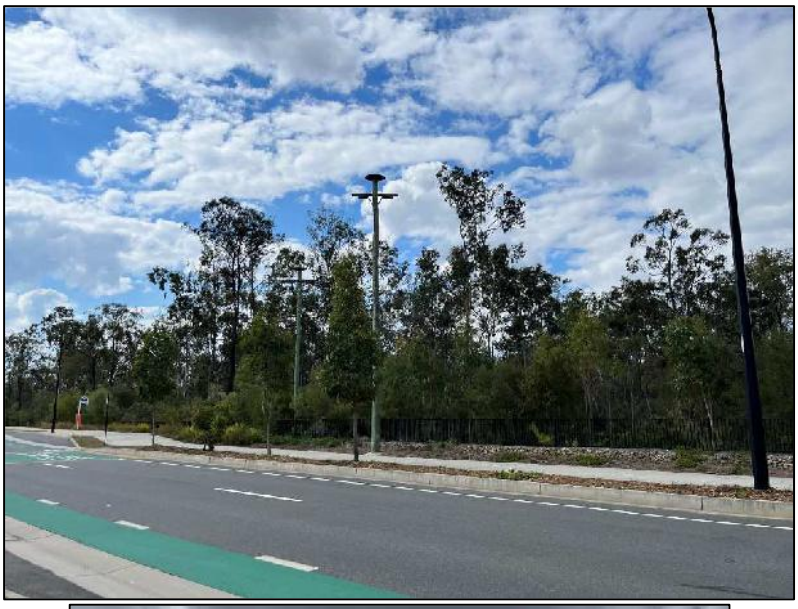
Grande Avenue (Western) – Northern End POV

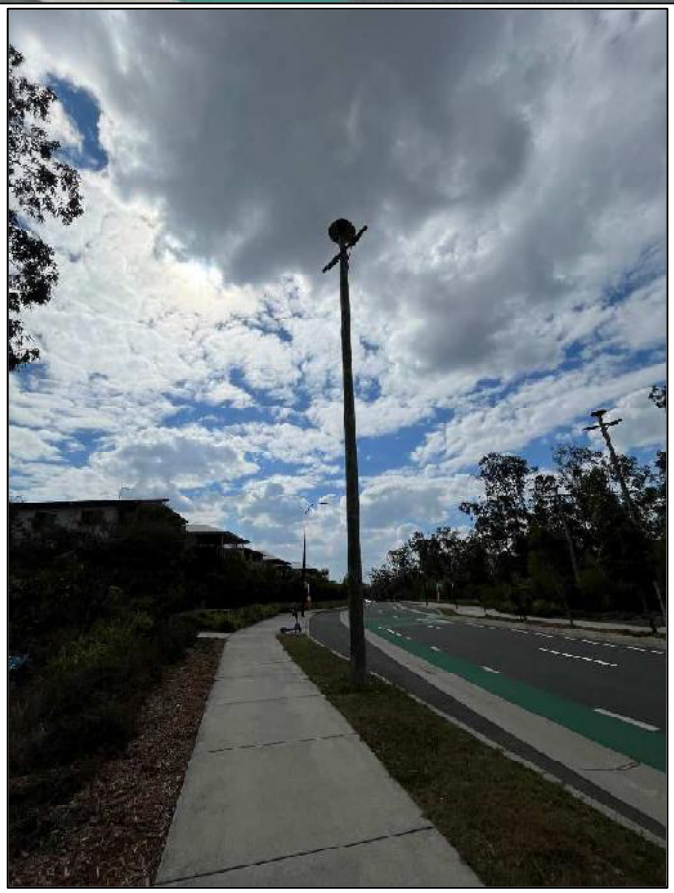
Grande Avenue (Western) – Glider Poles

Grande Avenue (Eastern) – Southern End POV

Grand Avenue (Eastern) – Northern End POV

Grande Avenue (Western) – Glider Poles





Woodline Drive – Northern End POV

Woodline Drive – Southern End POV

Woodland Drive – Glider Poles

Appendix C

Lendlease Key Design Outcome Fence Requirement Notice

KEY DESIGN OUTCOME

Fence Requirement

Village 14 Stage 1: Lot 3525

The following requirements set out further items you must consider when designing and siting your home on your block. These requirements are additional to the Springfield Rise Home Design Guidelines. You must comply with the Springfield Rise Home Design Guidelines and this Key Design Outcome.

Springfield Rise at Spring Mountain is subject to a Federal Government environmental approval. This approval has certain conditions that must be complied with. As part of the Federal Approval, the specified lots in this key design outcome are located at the interface of a conservation and/or linear space area and suburban residential area, and as such, these lots must incorporate koala exclusion type fencing to avoid koalas entering into your property.

Requirements

1. Front boundary fencing to the front alignment of the specified lots is prohibited. NB. Where on a corner lot, fencing is allowed to the secondary frontage if it meets the requirements as specified in 2.
2. Fencing must be installed between the house and the side boundary. Any fencing and/or gates to house and side boundary fencing is to be constructed of the following:
    - Solid powder-coated metal sheet fencing; or
    - Any other solid, non-climbable fence/gate materials as approved by Lendlease.

Please sign below to indicate that you have read this document, understand the requirements and will comply with this document as required by the conditions of your contract.

Lot: _____

Name: _____	Name: _____
Signature: _____	Signature: _____
Date: _____	Date: _____

KEY DESIGN OUTCOME

Fence Requirement

Village 14 Stage 2: Lots 3526-3531, 3541-3547, 3498-3499

The following requirements set out further items you must consider when designing and siting your home on your block. These requirements are additional to the Springfield Rise Home Design Guidelines. You must comply with the Springfield Rise Home Design Guidelines and this Key Design Outcome.

Springfield Rise at Spring Mountain is subject to a Federal Government environmental approval. This approval has certain conditions that must be complied with. As part of the Federal Approval, the specified lots in this key design outcome are located at the interface of a conservation and/or linear space area and suburban residential area, and as such, these lots must incorporate koala exclusion type fencing to avoid koalas entering into your property.

Requirements

1. Front boundary fencing to the front alignment of the specified lots is prohibited. NB. Where on a corner lot, fencing is allowed to the secondary frontage if it meets the requirements as specified in 2.
2. Fencing must be installed between the house and the side boundary. Any fencing and/or gates to house and side boundary fencing is to be constructed of the following:
    - Solid powder-coated metal sheet fencing; or
    - Any other solid, non-climbable fence/gate materials as approved by Lendlease.

Please sign below to indicate that you have read this document, understand the requirements and will comply with this document as required by the conditions of your contract.

Lot: _____

Name: _____	Name: _____
Signature: _____	Signature: _____
Date: _____	Date: _____

KEY DESIGN OUTCOME

Fence Requirement

Village 14 Stage 3: Lots 3472, 3497

The following requirements set out further items you must consider when designing and siting your home on your block. These requirements are additional to the Springfield Rise Home Design Guidelines. You must comply with the Springfield Rise Home Design Guidelines and this Key Design Outcome.

Springfield Rise at Spring Mountain is subject to a Federal Government environmental approval. This approval has certain conditions that must be complied with. As part of the Federal Approval, the specified lots in this key design outcome are located at the interface of a conservation and/or linear space area and suburban residential area, and as such, these lots must incorporate koala exclusion type fencing to avoid koalas entering into your property.

Requirements

1. Front boundary fencing to the front alignment of the specified lots is prohibited. NB. Where on a corner lot, fencing is allowed to the secondary frontage if it meets the requirements as specified in 2.
2. Fencing must be installed between the house and the side boundary. Any fencing and/or gates to house and side boundary fencing is to be constructed of the following:
    - Solid powder-coated metal sheet fencing; or
    - Any other solid, non-climbable fence/gate materials as approved by Lendlease.

Please sign below to indicate that you have read this document, understand the requirements and will comply with this document as required by the conditions of your contract.

Lot: _____

Name: _____	Name: _____
Signature: _____	Signature: _____
Date: _____	Date: _____

KEY DESIGN OUTCOME

Koala Fence Requirement

Village 14 Stage 4: Lots 3440, 3548-3558

The following requirements set out further items you must consider when designing and siting your home on your block. These requirements are additional to the Springfield Rise Home Design Guidelines. You must comply with the Springfield Rise Home Design Guidelines and this Key Design Outcome.

Springfield Rise at Spring Mountain is subject to a Federal Government environmental approval. This approval has certain conditions that must be complied with. As part of the Federal Approval, the specified lots in this key design outcome are located at the interface of a conservation and/or linear space area and suburban residential area, and as such, these lots must incorporate koala exclusion type fencing to avoid koalas entering into your property.

Requirements

1. Front boundary fencing to the front alignment of the specified lots is prohibited. NB. Where on a corner lot, fencing is allowed to the secondary frontage if it meets the requirements as specified in 2.
2. Fencing must be installed between the house and the side boundary. Any fencing and/or gates to house and side boundary fencing is to be constructed of the following:
    - Solid powder-coated metal sheet fencing; or
    - Any other solid, non-climbable fence/gate materials as approved by Lendlease.

Please sign below to indicate that you have read this document, understand the requirements and will comply with this document as required by the conditions of your contract.

Lot: _____

Name: _____ Name: _____

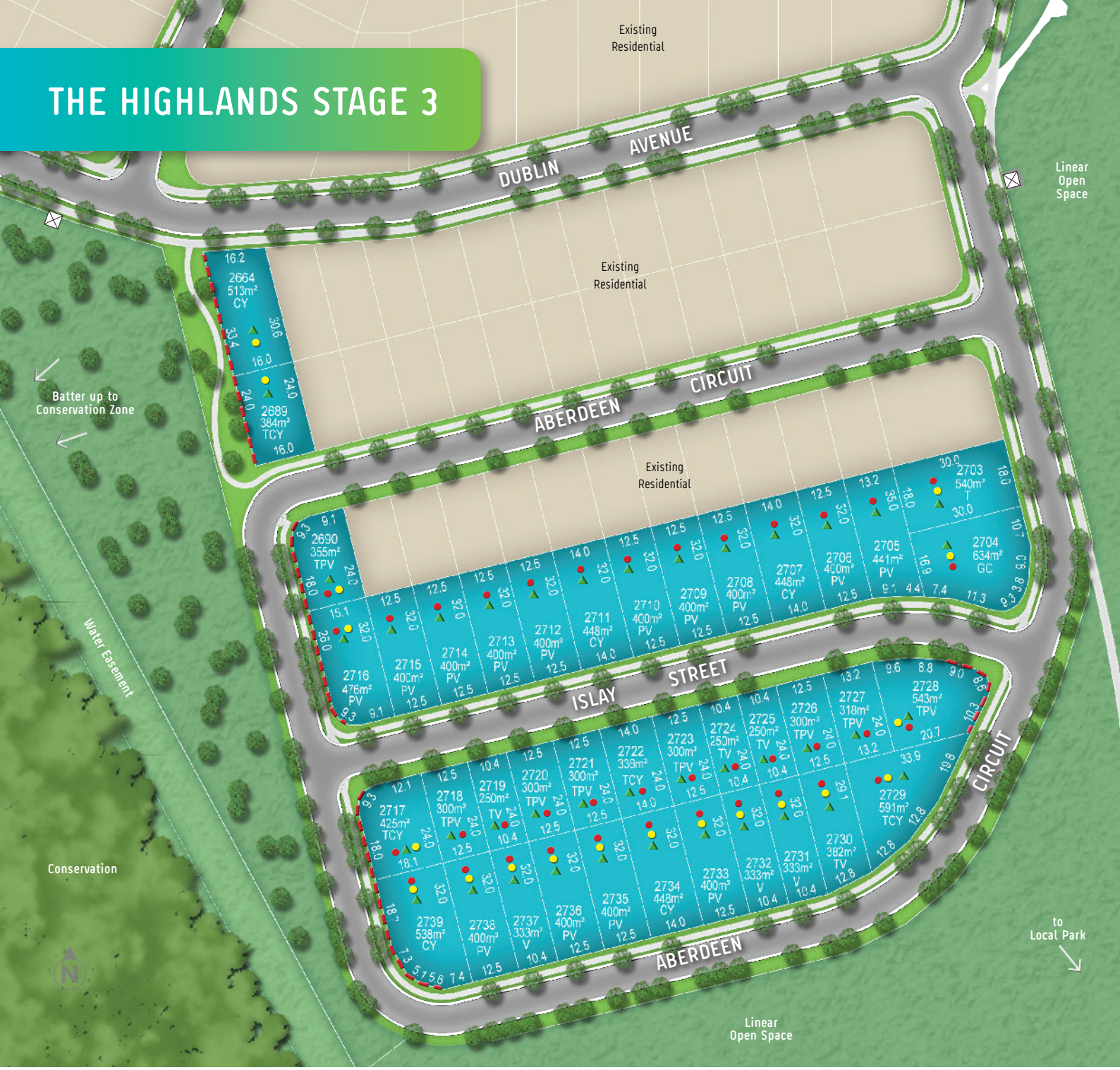
Signature: _____ Signature: _____

Date: _____ Date: _____

Appendix D

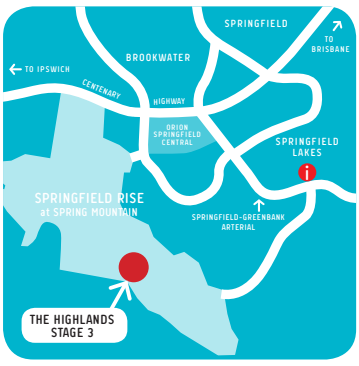
Lendlease Fencing Detail

THE HIGHLANDS STAGE 3



Disclaimer: We have taken care to ensure that these plans have been prepared from all currently available information. However, allotment dimensions, easements and public utility service infrastructure locations could change before final approval is given by the Local and State government authorities. The purchaser should therefore make his or her own enquiries before entering into any contract. The measurements of each block indicate block boundary lengths and widths and are rounded down to the nearest tenth of a metre. Published by Lend Lease Realty Pty Ltd ACN 007 708 572. August 2018

Locality



Legend

- Pedestrian / Cycle Pathways
- Street Trees (Indicative Location Only)
- Engineered Fill
- Bushfire Construction Requirement (AS3959-2009)
- Key Design Outcome - Koala Fencing Requirement
- Colourbond fencing by Lendlease (Woodland Grey)
- Proposed Pad Mount Transformer

Block Types

T	Traditional Block
CY	Courtyard Block
TCY	Town Courtyard Block
PV	Premium Villa
TPV	Town Premium Villa Block
TV	Town VIlla Block
GC	Gallery Collection Block

belong at Springfield Rise at Spring Mountain

springfieldrise.com.au 1800 223 050

SPRINGFIELD RISE AT SPRING MOUNTAIN **FAST FACTS**

Education

- Close to childcare centres
- Choice of 10 private and public primary schools (with a primary school planned for Springfield Rise at Spring Mountain)
- Choice of 6 private and public high schools
- TAFE Queensland South West
- University of Southern Queensland within walking and cycling distance

Recreation & Open Space

- 13 proposed local parks
- 3 proposed district parks
- 12 proposed sporting fields
- 2.5km of wildlife corridors
- Proposed hard courts, playgrounds and clubhouse
- Walk to Robelle Domain Parklands which includes 11km of boardwalks, sporting fields, playgrounds, water play and Southbank style swimming lagoon
- Direct access to hiking and mountain biking trails in surrounding conservation parks.

Shopping & Lifestyle

- Adjacent to Orion Springfield Central's shops, cinemas, cafes, restaurants and business precincts
- Local village shopping centre, plus easy access to existing neighbourhood centres (Spring Lake Metro, Spring Lake Village and Springfield Fair)
- Close to Bunnings within Springfield Central
- Five minutes drive to Brookwater Golf and Country Club with proposed future international resort and spa
- Just 15 minutes drive to Mt Ommaney Shopping Centre and DFO at Jindalee.

Location

- In the heart of the Greater Springfield Precinct between the city-like amenity of Springfield Central and the beauty of White Rock-Spring Mountain Conservation Estate
- Within the City of Ipswich
- 15 minutes drive from the Ipswich CBD
- 30 minutes drive from Brisbane CBD
- 50 minutes drive from the Gold Coast.

Living Options

Springfield Rise at Spring Mountain will offer a large choice of living options with block sizes from 240m² to 640m² and with house and land packages to suit every lifestyle and budget.

THE HIGHLANDS

Discover life at The Highlands, the latest address in Springfield Rise at Spring Mountain. You won't be disappointed by its many features. Bordered by the White Rock – Spring Mountain Conservation Estate to the south, and adjoining one of Spring Mountain's large district parks to the north, you'll be spoilt for choice on your daily walks and cycles. Enjoy the view from the top – the elevation of The Highlands will mean that some lots will offer city views. Plus you'll enjoy the convenience of schools, shops, child care centres and other parks already nearby.

Make your move to The Highlands. You'll wonder why you waited this long to call Springfield Rise at Spring Mountain home.

Springfield Rise at Spring Mountain
Sales and Information Centre
84-90 Russell Luhrs Way
Spring Mountain Qld 4300

belong at Springfield Rise at Spring Mountain

springfieldrise.com.au 1800 223 050

Appendix E

Fauna Spotter Catcher Post-works reporting Example

BEMROSE
WILDLIFE MANAGEMENT SERVICES

2021

Site: Village 13 – District Park/Sports precinct,

Stormwater infrastructure. Springfield.

Date of service: June/July 2021. Dewatering October 2021.

Fauna Management and Consultancy
Onsite Fauna and habitat management compliance.
RDS Group of Companies.
Post Clearance compliance report.

Dean Bemrose.

Bemrose Wildlife Management Services.

June/July 2021. Dewatering October 2021

Village 13 Sports Oval and additional works.

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TABLE OF CONTENTS

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1.0

SCOPE OF WORKS

Bemrose Wildlife Management Services (Queensland Government Rehabilitation Permit number WA0021286) was engaged by the RDS Group of Companies via the principal client LendLease to conduct the onsite fauna management and habitat management compliance Fauna/Koala Spotter scope of works service at the authorised developmental site in conjunction with the onsite vegetation and habitat management scope of works program; specifically pertaining to the reconfiguration of the site for the purposes of a greater Sports complex within the Village 13 precinct with additional supervision of stormwater works adjacent to the primary site. Primarily the scope of works entailing fauna management within this scope of works site was to conduct fauna and habitat inspections, onsite consultancy and management at all times of vegetation dismantling and the capture and relocation of fauna assets into analogue green zones. Prior to vegetation removal, the site was traversed to witness the TPZ demarcation. All lines of TPZ and EPZ establishment was observed and did offer compliance as per all referenced documentation that was provided, and stipulations enforced.

Traversing the site, grid transect mechanisms were activated in order to cover the land that was required and authorised to be reclaimed for the greater growth of social infrastructure for Springfield Rise at Spring Mountain. Large areas of the primary scope of works site had been previously disturbed and vegetation assets removed prior to the mobilisation of this work Civil works effort. Floristic assets and morphological transitions (flowering) did not occur in significant levels for the ecological assessment of the site to alter. *Acacia* species were the dominant understory regrowth. No fauna (Avian, Mammalian or Reptilian) breeding places of low or high ecological values were identified or disturbed during vegetation removal throughout the entire program. Habitat values that were salvaged were re-installed within the greater EPZ footprint to act as refugia assets. No scheduled species under the EPBC Act or Nature Conservation Act that are listed as CREVNT or CREVCD was observed on any of the days of service. This applied to the greater terrestrial based vegetation removal program within the scope of works site known as V13 Springfield Rise.

The extent of the fauna management program was inclusive of the dewatering supervision and subsequent solid dead stag removal from within the water way that is located within the scope of works footprint. No access or egress points were located within any of the dead stags, reducing the potential for encountering Australian Wood Duck breeding chambers or any alternate Avian species or fauna species in general to be zero potential. Maximum egress points were available via the dewatering phase in order to enable self-relocation of amphibians, semi-aquatic fauna and any sedentary and mobile fauna assets. The water body was consistently checked for fauna assets during this program with no semi -aquatic fauna (Turtles) being located. Twenty-six frog species were captured and relocated during the dewatering phase and general vegetation removal phase from within this specific

©

area. Amphibian species that were detected and relocated were scheduled under the pertinent regulations and legislative frameworks as Least Concern. Striped Rocket Frog, Dainty Green Tree Frog, Eastern Dwarf Tree Frog and Australian Green Tree Frog. Suitable analogue habitat was sourced as a relocation point. Cane Toads were also observed throughout the site. It is critical to mention no amphibian species scheduled as CREVNT were located or aural when utilising a mechanism – amphibian aural point survey effort under the Nature Conservation (Animals) Regulation 2020. No fauna as listed as CREVCD under the Commonwealth Environment Protection and Biodiversity Act 1999 were observed or audible.

Pseudo-riparian zones established along the shorelines were checked and cleared comprehensively during the program, Macropod and Avian tracks were observed along the entire transect. Bullrushes and endemic and native floristic variances of differing structure and trophic levels were evident and known to provide refugia and habitat values for several fauna species (focus – amphibian and semi-aquatic fauna). A fauna recovery plan was actioned during this phase and relayed to the client (RDS/Lendlease). The Saunders Havill Group site delegate (Jordan Bachmann – Senior Environmental Planner) was informed of the program via verbal communications.

Monitoring of any formation that may have been conducive to burrow breeding places (Rainbow Bee-eater, Striated Pardelote) was checked and cleared, resulting in no breeding places being identified. Special Least Concern Platypus was not a viable species to be inhabiting this scope of works footprint. During this phase and all phases associated with this site, RDS consistently provided information as to the progressive site works that could potentially have ecological impacts for fauna management principles to be observed and adhered to.

Introduced animal anecdotal evidence that was definitively observed. Red Fox and Domestic Cat spoor was identified traversing the riparian areas of the water body. No Red Fox den sites were located. No actual visual observations did occur. Red Fox and feral cats are commonly observed within the greater Springfield district. The scope of works is within the Ipswich City Council shire. Engagement of specialist companies inclusive of The Saunders Havill Group and Cardno enabled detailed information data sets pertinent to this scope of works program. The RDS Group of Companies has delineated the categorical extent demarcation lines for vegetation management. As the existing site has been previously cleared and in correlation to the remaining regrowth floristic variances the impact to the area in reference to the ecological significance was minor. It is essential to note that the rear perimeters (adjacent to the clearance lines) will not be impacted and did provide suitable analogue relocation habitat values.

Two sites formed this greater project extent, with compliance offered for all areas. The first being the general V13 Sports precinct and secondary ancillary site where a stormwater vein system was installed. The stormwater site was considered of lower value in specific

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reference to the primary constriction of scheduled and declared weed tree species (*Leucaena)* located throughout the site. No fauna was observed within this area that required to be captured and relocated. No breeding places were observed to be active and no historical breeding places were located. A significant section of this site was slashed grass enabling comprehensive line of sight fauna and habitat pre-clearance daily inspections. The established primarily ephemeral waterway running through this site is not to be impacted significantly. No fauna assemblages of high-level ecological significance was observed. Adjacent vegetation assets outside of the scheduled scope of works program are to remain providing habitat features essential to and correlated with survivorship potentials. No EVNT fauna was observed. No Koala/s were observed nor any active anecdotal evidence.

Wren and Finch species were observed (Suburb Blue Fairy Wren) during this phase of operation, however the assemblages were not impacted and were able to continue normal behaviours. These Avian species do require strategically close habitat values in order to maintain survivorship characteristics. Therefore, the zones demarked within the EPZ/TPZ were critical vegetation assets. Both areas were traversed on foot with a delegate of the RDS Group of Companies. All protocols were adhered to.

An Ecological site desktop review inclusive of an authorised Vegetation Management Plan/Fauna Management Plan was constructed and forwarded to the Client and Bemrose Wildlife. This pertinent document was constructed by the Saunders and Havill Group. The VMP/FMP has detailed the constructed TPZ/EPZ in addition to stipulations cross governed by Bemrose Wildlife in specific mention to the sequential vegetation management action plan. During the fauna and habitat management program the TPZ's (numbered tree asset species) was itemised and followed.

Natural assets within these zones were scheduled Non-Juvenile Koala Habitat Trees. No anecdotal Koala climbing scratches were observed within these zones. No Physical observations of Koala was observed. During vegetation management works a Koala Spotter supervised this site in accordance with State protocols regarding Koala management. No hollow bearing natural assets were observed within the bulk of the vegetation communities.

No additional clearance parameters other than that authorised was actioned within the biodiversity overlay framework adopted for this project. Remnant floristic species within the framework does conform with endemic and native floristic species known to be established within the environ/s; *Acacia, Angophora, Corymbia, Eucalyptus* and *Lophostemon*. Floristic species within the schedule are a strong floristic asset as they are known fauna (Koala habitat and food trees) and are essential for a continued functioning ecological system.

No low or high level ecologically significant species or breeding places were observed inclusive of RAMSAR fauna species during the fauna and habitat management program that

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are within the proposed scope of works envelope. No additional fauna species or fauna assemblages were observed. No EVNT fauna was observed nor was there any anecdotal evidence to suggest recent or historical evidence of Koala or Glider activity. If a Koala was to be observed, full and actionable Koala management programs would have been activated. The direct client managing the works (RDS Group of Companies) is hyper-vigilant in maintaining the greater habitat and ecological core values to this project whilst maintaining a strong professional standard with the principal client (Lendlease). Lendlease has engaged several Environmental, professional and experienced companies to ascertain the levels of ecological core values, environmental impacts and resolution action plans, planning regimes and implementation plans and desktop and onsite field reviews. No breeding places of low or high risk was observed within the floristic communities. EWP activation was not utilised on this site. Strict adherence to fauna management and habitat controls were enforced.

Potential ecological enhancements installed into the greater area is a strong function and mechanism that could be utilised to maintain a level of species richness for endemic fauna species within this regional ecosystem post works. Installations of habitat boxes are based on a ratio of one to three naturally occurring habitat hollows (potential organic breeding places - reclaimed) if located within the scope of works site or adjacent areas could be advantageous. It is essential to note hollow bearing natural assets were identified in a low level. *Acacia* and *Eucalyptus* species are known forage for Glider species. Phyto morphologically the floristic divergence and age of the vegetation inclusive that are scheduled under the developmental approval phase did not have significant observable hollow bearing natural assets. Habitat boxes would be advantageous within the Ecological Protection Zones and any alternate offset green zone for the re-establishment of fauna abundance within the greater area providing natural ecosystem enrichment, it could also act as a significant interpretation and extension tool for the greater residential communities. Historically, the areas regional ecosystem values were high in Open Eucalypt Forest systems inclusive of strong populations of Avian, Mammalian and Reptilian species.

The area of proposed selective vegetation clearance was traversed via a senior Koala Spotter/Fauna consultant to categorically observe the clearance lines that were installed under the strict governance of the State Governmental overlays in correlation with the strict D.E.S and Developmental Approval conditions. Under the program's approval 'Development application that was properly made, clearing was allowable under the provisions offered by the Nature Conservation (Koala) Conservation Plan 2017. Assessable information and direction of the program activation is adhered to under Ipswich City Council.

The program under the ICC directives did not stipulate the inclusion of a fauna load reduction trapping program assessment for this phase. Open egress pathways and the assessment of the area did not warrant this survey effort to be activated.

©

The property is within Koala District A, therefore the sequential clearance conditions prescribed in the Koala Conservation Plan are pertinent to this scope of works. The program has been scrutinised as the general area of proposed clearance is limited to the scope of works site, which has been previously cleared. It is categorised as within areas of the bioregion that is essential and within a core Koala area mapping zone. Environs within the greater area at the time of inspection and scheduled works is consistent with analogue habitat features within this R.E, inclusive of EVNT (Koala inclusive) fauna. The loss of selective habitat within the scope of works site is not considered highly disruptive to endemic fauna at this time. This is a formed opinion based on the floristic variations on site. No significant disturbances to fauna in specific relation to the potential effects of increase to the aggregated distribution of fauna into adjacent vegetated areas correlated with a potential in advancing the possibilities of aggregation of risk and an aggregative response of predator activity is anticipated. The site was confirmed to be a heavily fragmented site with large open areas and limited NJKHT's.

During the transect walkthrough phases of the onsite works schedule, no high-level fauna of listed significance was observed and no ecological values of significance that would suspend the site clearance works in specific regard to the fauna/Koala spotter and consultancy perspective. Comprehensive check and clear grid transect lines did occur on the days of service, activating the fulfilment of the fauna and habitat clearance compliance at the scope of works site known as V13 Springfield Sports precinct. No Koala's were located at any stage. No clearance other than that certified did occur during the onsite works program. Toolbox pre-clearance talks did occur to inform those onsite pertinent to the program of the program implementation.

No levels of floristic or structural variations or levels of high ecological significance was observed. Potential Koala home and food trees were existent on the property in general, however no indicators of recent active utilisation of the native and endemic floristic varieties within the proposed clearance area was observed.

All levels of due diligence were afforded by the site owner. Inspections of the site involved observations of habitat trees and the terrestrial stratum levels. No habitat trees contained hollow bearing natural assets.

Vegetation will be lowered in the direction stipulated by the fauna consultant and design plan in order to afford maximum safe egress pathways for fauna that is deemed not be required to be captured.

©

2.0

PROJECT DESCRIPTION

The site is not a remnant vegetation site within the relevant Regional Ecosystem values. No determinations of significance were evaluated by the listed companies. Several declared invasive weed species were located throughout the project. No significant ecological factors have been flagged.

Floristic variances within the scope of works were inclusive of *Eucalyptus* and *Corymbia* non-juvenile Koala habitat trees and *Acacia* species commonly observed within this regional ecosystem framework in addition to commonly planted and observed landscape/garden varieties and assemblages. Weed intrusions were observed at varying locations within the project. *Lantana* and Singapore Daisy was observed throughout the site.

Dewatering of dams (water bodies) onsite were inspected and recovery plans have been actioned to assess the semi-aquatic and aquatic fauna assets. Site observations during the inspection level did not indicate fauna assemblages. Exotic and declared invasive Red-eared Slider Turtles (if observed and captured) in accordance with Legislative conditions be euthanised via Veterinarian processes. No Red-eared Sliders were observed. Appropriate PPE and collection equipment will be utilised during dewatering phases.

The principal contractor on behalf Lendlease has forwarded the pertinent information to formulate a concise action and implementation fauna and habitat management plan for this site. The level of vegetation removal is confined to the actual property and has been assessed. This action was for the delineation and categorical transparency of vegetation to be removed and is acknowledged by Bemrose Wildlife Management Services and is in accordance with the specified due diligence compliance framework stipulated by the governing authority.

A line of sight was afforded generally, with some areas with a greater density then others. Observations of herpeto-fauna, terrestrial Avian species and terrestrial mammals was the focus of the fauna and habitat management program. A low to medium load of vegetative felled leaf and debris, which is natural for this class of Regional Ecosystem was observed. Minor terrestrial based refugia is present on the site and was checked and searched accordingly when the works are authorised. Minor shrubbery – or low-level vegetation is present on site, dominated by *Acacia* regrowth and *Melaleuca*.

All stratum levels of flora within the site was managed according to the regulations. Control mechanisms for the site in determining the vegetation clearance zones were activated under the appropriate D.A. The onsite management inspection and onsite protocols that were activated was to conduct a walk through to categorically determine the vegetation assets that are approved to be managed.

©

All vegetation removal works were monitored and supervised by a suitably qualified and experienced Koala Spotter – Bemrose Wildlife Management Services. All actions and instructions will be adhered to corresponding to the stipulations.

Reclaimed and salvageable habitat hollows extracted from arboreal assets were re-incorporated onto the terrestrial base. Observed terrestrial based fauna and habitat assets will be translocated into the EPZ's.

As with sites that do have NJKHT's within the scope correlated to the Koala habitat mapping zones, Koala's are possible, however no Koala was observed during the inspection.

3.0

FAUNA AND HABITAT PROJECT DESCRIPTION

The immediate site offered viability for Koala inhabitation (Greater Springfield area) in correlation with the alternate areas especially with the proximity to strong analogue habitat. The greater Shire and the greater region are renown to have robust and remnant Koala populations extending to historical records decades old. There is a divergence of Koala food and home trees within the greater site.

The habitat that was present on the site does potentially conform with accessible Koala habitat or connectivity corridors. As a precautionary principle, relevant and con-current observational management techniques actioned were 360°Basal to Canopy (inclusive of Canopy over-lapping) the remaining grids predominately contained narrow gauge individual NJKHTs. Koala focused searches, with the aim of locating Koala, Koala scat and or evidence of climbing scratches did occur during the scheduled clearance. Grid and randomized transect search techniques were additionally utilized inclusive of Dique et al Koala search methodologies and S.P.O.T mechanisms. Non-Juvenile Koala Habitat trees on this site have been assessed and approved for removal via State and Shire regulations and compliance systems. As no scheduled or listed species of higher significance were observed correspondingly no specific FMP or SMP documents were constructed.

During the phase of site inspection to the dates of vegetation clearance works no transitional variance of vegetation structure and floristic variations is anticipated to be observed. No terrestrial based Masked-Lapwing breeding sites (Avian species) was identified during the fauna management phase to have terrestrial based nests or chicks. No alternate ground nesting Avian species – Quail – were observed.

No at-risk Special Least concern Platypus was affected or observed in any area. No Echidna or Pardalote or migratory Avian species were observed. Earthen embankments are not expected to be significantly disturbed during this phase, therefore the impact to Striated Pardelote, Australasian Bee eaters should be mute. No Arboreal termitaria was observed.

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Therefore, field experience indicates the probability of encountering arboreal mammals or herpeto-fauna that commonly utilise or excavate arboreal termitaria should remain at a low-probability level. Lace Monitor are known to utilise termitaria assets to lay the clutch of eggs, with the resident termites cementing the access/egress points. The juvenile Lace Monitors then self-extricate. It is essential to note that the proposed schedule is to take effect during Winter, when theoretically breeding activity phases should not be active.

No indicators of potential terrestrial based Mammalian fauna, for example Bandicoot species was observed – suitable grasses or habitat was observed, however. No fauna derived habitat burrows were identified, or Bandicoot derived grass nests observed. A static watch and observe technique was activated to determine activity or active presence during the clearance phase. No breeding chambers activity was recorded. No alternate breeding sites were identified. Arboreal mammalian indictors pertaining to Glider and Possum species were not identified within the immediate scheduled vegetation clearance zone. No herpeto-fauna was identified – inclusive of sedentary or highly transient species was observed at any location during the transects. Action and Implementation plans are in effect to capture and relocate fauna. The proposed clearance methodology does allow maximum line of sight to successfully manage the objective. No Antechinus hides or alternate endemic or native small mammal hides, or nests were observed. As the seasonal variation is extending into the Winter months the level of fauna activity observed should correspond to low levels.

Observations of Common Garden skinks were observed, relocating into habitat garden areas not scheduled for vegetation clearance, therefore considered safe. No commonly encountered S.E. Qld Bearded Dragon, S.E Qld Water Dragon or S.E Qld Blue-tongue species were observed. Staff managing this site (Bemrose Wildlife and Skerman Civil) are hyper-vigilant and pro-fauna preservation. Therefore, the commitment in preserving habitat and fauna is very high.

It was determined that the bulk of the vegetation is at an age whereby phyto-morphologically, the potential for suitable hollow bearing natural assets was correspondingly a low volume – Nil recovered. This assumption was proven during the pre-clearance program. Inhabitation by Glider, Phascogale, Possum, Micro-bat, Herpeto-fauna and or Psittaciformes (Parrot species) is possible, however not probable.

©

4.0

LEGISLATIVE FRAMEWORK

This report acknowledges the principles and values regarding the Koala-sensitive Design Guideline. A guide to Koala-sensitive design measures for planning and development activities prepared by: Koala Conservation Unit, Department of Environment and Heritage Protection © State of Queensland (Department of Environment and Heritage Protection) 2012. All Koala based guidelines and Policy frameworks were adhered to, inclusive of counts pertaining to Non-Juvenile Koala Habitat Trees that were required to be removed.

Acknowledgement is accepted, pertaining to the Queensland Animal Care and Protection Act 2001 which provides legislative protection to animals generally, and the relevant Legislature: Queensland Nature Conservation Act 1992, the Queensland Vegetation Management Act 1999, and the Federal Environmental Protection and Biodiversity Conservation Act 1999, inclusive of the legislature piece: Nature Conservation (Koala) Conservation Plan 2017 were referred to.

5.0

KOALA SPOTTER SCOPE OF WORKS

A Non-Juvenile Koala Habitat Tree is an individual tree that is greater than 300mm diameter at 1.3 meters above ground level and 4 meters above ground level. Any NJKHT over the height of 4 meters will be checked and cleared utilising high-powered binoculars. This was activated regardless of if the tree is singular or bifurcated. Minor continuous over-lapping potential NJKHT canopy cover was located within a grid transect.

Koala/s as a precautionary principle potentially inhabit this site as potential habitat trees and home trees are potentially existent. Koala Doe's and Bucks during the month of the scope of works vegetation clearance if observed may have semi-independent joeys on their backs, therefore observations and high-level actions are a potential for this site. Winter is not a known behavioural breeding activity period for Koala within South-east Queensland, however due to the heightened risk and highly mobile activities of Koala and the welfare of the Doe and joey and mobilised Koala searching for mates, extended 'no entry Koala zones may be activated. Protocol check and clear implementation was enforced to ascertain the observable condition of the animal. Should any trace of Chlamydia or Koala retro virus be observed immediate Koala management capture and Veterinarian support be activated. The positive outcome for this phase is the high-level ecological systems adjacent to the scope of works site with a greater number and values of suitable NJKHT's that can provide egress potentials.

If a Koala is demonstrating facets of myopathy in general, actions to re-mobilise the plant machinery to an area that is a suitable distance away from the Koala will also be activated if the site area allows this protocol. Contact points for Koala rescue and Veterinarian support has been sourced if required.

It is a fundamental role of the Koala Spotter to maintain and traverse linear transects where vegetation removal is scheduled and to stay onsite until vegetation checks had been completed by an accredited Fauna/Koala Spotter. These actions are to determine and enact fauna mitigation strategies to maximise fauna survivorship whilst minimizing potential myopathy concerns. Habitat retention and assessment is a component of this program in order to maximise potential fauna habitat.

The role of the Fauna/Koala manager (Spotter) for this site, requires onsite management, controlled under the general VMP for the site for observable fauna, anecdotal evidence, analogue habitat assessment and correlated consultancy and direction about the potential on-site fauna that may be encountered and the subsequent fauna management. Fauna management actions are comprehensively scheduled in direct correlation to fauna species observed and habitat anecdotal evidence acquired.

No Koala observations in observance of the regulatory legal protection offered by the Queensland government and Commonwealth government were recorded within this scope of works site. No anecdotal evidence to indicate present activity was observed on any vegetation, specifically on any NJKHT. Techniques utilised to investigate Koala presence entailed a 360° basal to upper canopy of all NJKHT's and scat search around the basal regions and drip line of the canopies. Over-hanging canopy searches did occur to ensure no Koala activity. Continual Koala searches did occur during vegetation transect clearance.

No significant native trees, specifically pertaining to Non-juvenile Koala Habitat trees (*Angophora, Corymbia, Eucalyptus, Melaleuca*) were in abundant flower or seed.

This report pertains to the activities that were and are scheduled to be conducted lawfully at the scope of works site. Fauna management is required for compliance and to supervise vegetation removal (not delineate where clearance lines have been established prior to works commencing) as approved within the Developmental Approval phase issued by the governing Council and approved by the QPWS and DES. A Koala Spotter /Fauna Consultant with over ten years of experience will be monitoring this site.

Comprehensive check and clear protocols were enacted to ensure all potential hollows are lowered safely and with maximum control mechanisms activated. No fauna was observed within any structure at the time of inspection. No EVNT colonial breeders, inclusive of micro-bat, arboreal mammal (Glider species), nor any Avian species was observed within any NJKHT's.

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6.0

GENERAL SITE OBSERVATIONS – FAUNA AND HABITAT

The site offered a low to medium level of R.E (Regional Ecosystem) vegetation communities observed throughout S.E.Qld. Vegetation species are evident and were checked and cleared for fauna inclusive of terrestrial Herpeto-fauna and small mammal species. The structural variation of the habitat on site varies in specific reference to the and *Acacia* and *Eucalypt* species. The *Acacia* and garden floristic varieties onsite are established and mature, were in flower. *Acacia* when in flower provide an energy source for endemic and native fauna throughout this ecosystem.

Least concern Avian species were observed egressing from the transects and transitioning into alternate habitat values.

Ephemeral water bodies can pool and run-off attributing to potential assemblages of small to medium amphibians within the classed EVNT ranges and scheduled classes of abundance. Aspect and design of the program should negate any pooling of water. No acid frogs, Wallum frogs or Tusked frog species were observed via visual searches nor was audible resonance heard.

Arboreal termitaria was not observed to be excavated. Therefore, no Kingfisher species were observed in breeding chambers. Extensive and comprehensive pre-clearance monitoring of any potential breeding chamber site did occur. No alternate inhabitation by Parrot species, Kingfisher species, or Lace Monitor was observed. Any tree that was lowered with a termitaria construction was checked and cleared as a precaution. No medium to large Herpeto-fauna or egg chambers was observed.

No migratory Avian species or sedentary Avian species was observed to be breeding or utilising naturally occurring assets as breeding chambers or roosts. Inclusive of RAMSAR Avian species. No earthen banks were scheduled to be affected or disturbed significantly during this phase. No earthen banks were active. Works were authorised to proceed, with a strict purpose to minimise disturbance impacts to any zone where active Straited Pardelote or Australasian Rainbow Bee-eater zones are possible during vegetation management and supervision. It is recorded that no earthen banks are located onsite. No Special Least Concern Low or High-risk Species Management Plan/s were activated.

Maximum precautionary human safety was observed on-site as the potential for observing potentially venomous snakes is evident. Specifically, Eastern Brown, Red-Bellied Black, Yellow-faced Whip and was possible. During the broader program inclusive of the inspection, any potential ground hollow and sedge/tussock grass clumping was checked and cleared. Extreme caution and precautionary fauna management principles were also

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enacted in order to maximise human and animal safety. All areas were subsequently probed utilizing specialized PPE.

The area did not appear at the time of fauna management to contain a significant active biodiversity level to be critically significant or halt the minor works from progressing.

7.0

CONCLUSIONS

Information pertaining to the site and the pro-active influence of the site owners, governing authorities has activated for the greater conservation and protection of fauna that inhabits the general scope of works footprint. Entailed within the information was the commitment to habitat preservation and protection where feasible.

Working positive communication relationships have been activated on this site.

Strong observational techniques were activated to ensure the health and behavioural parameters of fauna management will be adhered to when felling was scheduled.

The aim of the on-site fauna management is to minimize any event that would potentially injure or displace mammals, herpeto-fauna or Avian species. For this to be achieved a pre-clearance toolbox talk was activated for all those involved with this process to be fully aware of the protocols and actions that were required to be achieved for a successful program to occur. Actions such as a high level of positive communication is necessary.

Concise actions were afforded on this site due to the interaction of all those on site and the methodology enacted; subsequently the vegetation clearance schedule was managed by an experienced, fauna value conscience operator.

All on-site management guidelines and protocols have been enacted to ensure minimal myopathy events, whilst ensuring the highest level of survivorship potential for all fauna potentially inhabiting the site on the days of the scope of works and for the immediate habitat values of the site. It should be noted that all care and due diligence regarding the habitat values and immediate fauna ethical values has been observed by all staff on ground allowing a highly vigilant and successful fauna management program.

At all times of the vegetation clearance program a strong level of positive communication will be maintained by the Contractor, onsite Fauna Manager and the Vegetation felling crews in order to maintain the integrity of the site and potential habitat retention possibilities.

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Slow and controlled tree felling techniques and specialist management are authorized to be utilised by the vegetation clearance contractor under the direction of the RDS Group of Companies and Bemrose Wildlife Management Services to successfully lower potential habitat trees on site. All protocols have been adhered to by the site owners and RDS in order to satisfy the approval requirements. RDS have engaged a registered Rehabilitation permit holder to complete this program and to provide certification. The management and instructions given by Bemrose Wildlife Management Services and RDS will be adhered to during the fauna management program along the designated and approved sections of the scope of works site for a successful fauna management program.

Kind regards,

Dean Bemrose.

Diplomawildernessreservesandwildlifemanagement.

Rehabilitation Permit. WA0021286. EHP. DES. QPWS.

Bemrose Wildlife Management Services.

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DISCLAIMER

This report has been prepared by Dean Bemrose Trading as Bemrose Wildlife Management Services in accordance with the terms and conditions as detailed in the quotation and agreed to by both parties upon offer and acceptance of an order for services as per that quotation.

The survey results are accurate at the time that the onsite compliance scope of works was completed. However, no responsibility or liability is taken for any actions or works occurring at the site post the completion of the on-site compliance survey or fauna consultancy scope of works. The information as detailed in the report is for the sole use of the contracted parties and not for reproduction, reliance or supply to any other party without express consent of Bemrose Wildlife Management Services.

To the extent that it can be shown that the survey results and report was not accurate at the time of the on-site survey, this company's liability shall be strictly restricted to re-performance of the on-site survey and supply of an update report. Should you have any queries regarding this report or require additional copies please contact Dean Bemrose at Bemrose Wildlife Management Services.

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Categorical surveyed demarcation vegetation clearance perimeter fauna friendly fencing was witnessed offering onsite fauna management compliance.

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Low numbers of NJKHT's were scheduled for removal during this phase. Open egress areas are evident throughout the site.

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TPZ were established.

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Water bodies were comprehensively checked and cleared.

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Aquatic vegetation assets will be checked and cleared.

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Stags within the water way did not contain hollow bearing natural assets.

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Appendix F

White Rock – Spring Mountain Fire Management Strategic Plan and Risk Dashboard

Attachment 8: White Rock – Spring Mountain
Fire Management Strategic Plan and Risk Dashboard

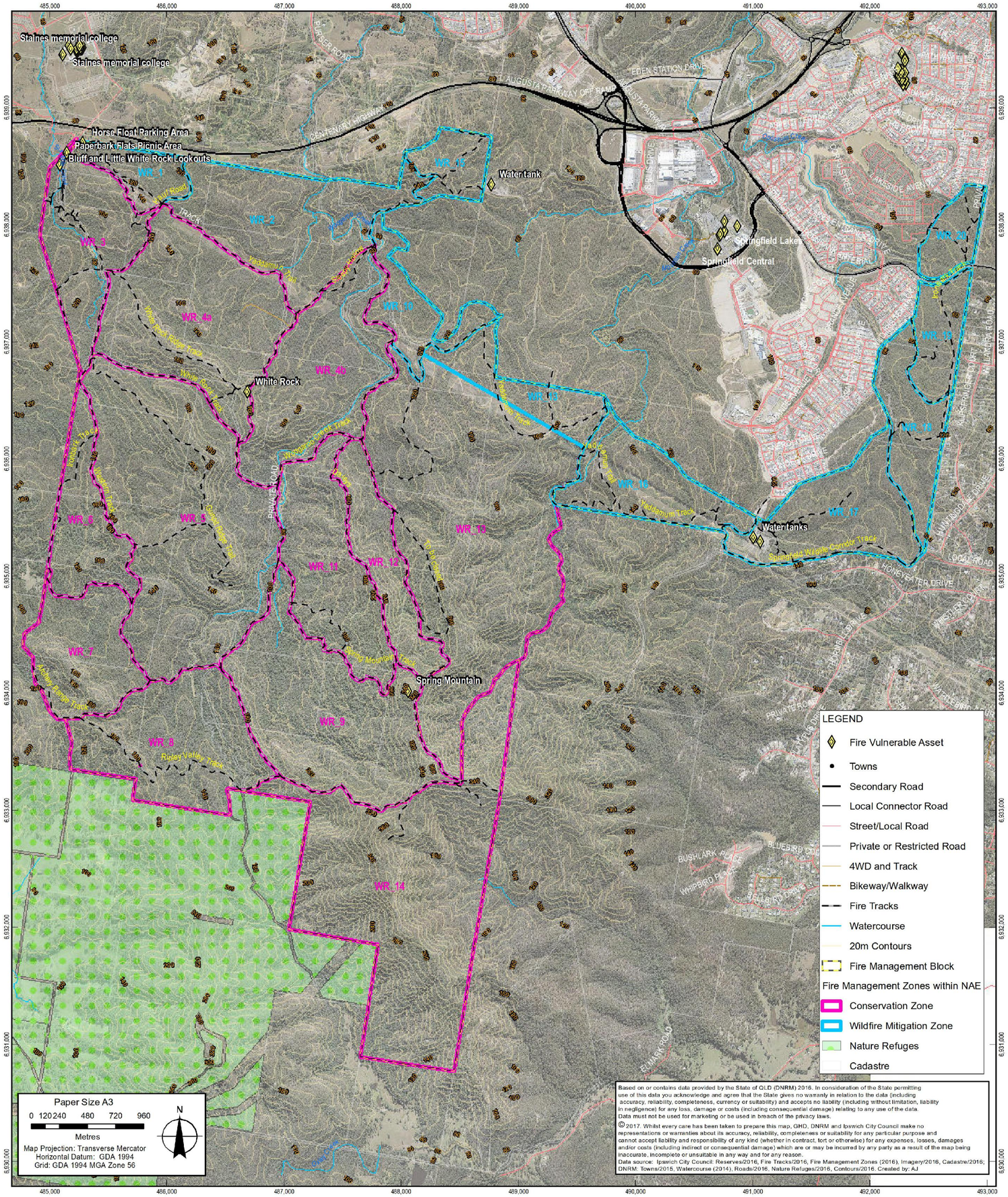
Background

	Bushfire Vulnerability Factor	Column

Approach

Risk Summary

WR_1		*Low*	*Moderate*	*Moderate*	*Low*	*Low*	*N/A*	*Very High*	*High*	*Moderate*		*High [intolerable]*		*Medium [tolerable]*		*Low [acceptable]*
WR_2		*Low*	*High*	*Moderate*	*N/A*	*Low*	*N/A*	*Very High*	*Very High*	*Moderate*		*High [intolerable]*		*Medium [tolerable]*		*Low [acceptable]*
WR_3		*Low*	*High*	*Moderate*	*N/A*	*Moderate*	*N/A*	*Very High*	*Very High*	*Moderate*		*High [intolerable]*		*Medium [tolerable]*		*Low [acceptable]*
WR_4a		*Low*	*High*	*High*	*N/A*	*High*	*N/A*	*Very High*	*Very High*	*High*		*High [intolerable]*		*Medium [tolerable]*		*Low [acceptable]*
WR_4b		*Low*	*High*	*High*	*N/A*	*High*	*N/A*	*Very High*	*Very High*	*High*		*High [intolerable]*		*Medium [tolerable]*		*Low [acceptable]*
WR_5		*Low*	*High*	*High*	*N/A*	*N/A*	*N/A*	*Low*	*Very High*	*Very High*		*Medium [tolerable]*		*Low [acceptable]*		*Low [acceptable]*
WR_6		*Low*	*High*	*High*	*N/A*	*N/A*	*N/A*	*Low*	*Very High*	*Very High*		*Medium [tolerable]*		*Low [acceptable]*		*Low [acceptable]*



[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	*Unmitigated risk*	[illegible]	*Residual Risk after ICC actions*	[illegible]	*Residual Risk after shared responsibility actions*
WR_7	[illegible]	*Low*	*High*	*High*	*N/A*	*N/A*	*N/A*	*Low*	*Very High*	*Very High*	[illegible]	[illegible]	*Medium [tolerable]*	[illegible]	*Medium [tolerable]*	[illegible]	*Low [acceptable]*
WR_8	[illegible]	*Low*	*High*	*High*	*N/A*	*High*	*N/A*	*Low*	*Very High*	*Very High*	[illegible]	[illegible]	*Medium [tolerable]*	[illegible]	*Medium [tolerable]*	[illegible]	*Low [acceptable]*
WR_9	[illegible]	*Low*	*High*	*Very High*	*N/A*	*N/A*	*N/A*	*Low*	*Very High*	*Very High*	[illegible]	[illegible]	*Medium [tolerable]*	[illegible]	*Low [acceptable]*	[illegible]	*Low [acceptable]*
WR_10	[illegible]	*Low*	*High*	*High*	*N/A*	*N/A*	*N/A*	*Very High*	*Very High*	*Very High*	[illegible]	[illegible]	*High [intolerable]*	[illegible]	*Medium [tolerable]*	[illegible]	*Low [acceptable]*
WR_11	[illegible]	*Low*	*High*	*Very High*	*N/A*	*N/A*	*N/A*	*Low*	*Very High*	*Very High*	[illegible]	[illegible]	*Medium [tolerable]*	[illegible]	*Low [acceptable]*	[illegible]	*Low [acceptable]*
WR_12	[illegible]	*Low*	*High*	*Very High*	*N/A*	*N/A*	*N/A*	*Low*	*Very High*	*Very High*	[illegible]	[illegible]	*Medium [tolerable]*	[illegible]	*Low [acceptable]*	[illegible]	*Low [acceptable]*
WR_13	[illegible]	*Low*	*High*	*Very High*	*N/A*	*N/A*	*N/A*	*Very High*	*Very High*	*Very High*	[illegible]	[illegible]	*High [intolerable]*	[illegible]	*Medium [tolerable]*	[illegible]	*Low [acceptable]*
WR_14	[illegible]	*Low*	*High*	*Very High*	*N/A*	*Very High*	*N/A*	*Very High*	*Very High*	*Very High*	[illegible]	[illegible]	*High [intolerable]*	[illegible]	*Medium [tolerable]*	[illegible]	*Low [acceptable]*
WR_15	[illegible]	*Low*	*High*	*Very High*	*N/A*	*High*	*N/A*	*High*	*Very High*	*High*	[illegible]	[illegible]	*High [intolerable]*	[illegible]	*Medium [tolerable]*	[illegible]	*Low [acceptable]*
WR_16	[illegible]	*Low*	*High*	*High*	*Low*	*High*	*N/A*	*Very High*	*Very High*	*High*	22	[illegible]	*High [intolerable]*	[illegible]	*Medium [tolerable]*	[illegible]	*Low [acceptable]*
WR_17	[illegible]	*Low*	*High*	*High*	*Very High*	*High*	*Low*	*Very High*	*High*	*High*	[illegible]	[illegible]	*High [intolerable]*	[illegible]	*High [Intolerable]*	[illegible]	*Medium [tolerable]*
WR_18	[illegible]	*Low*	*High*	*High*	*Very High*	*High*	*Low*	*Low*	*High*	*High*	22	[illegible]	*High [intolerable]*	[illegible]	*High [Intolerable]*	[illegible]	*Medium [tolerable]*
WR_19	[illegible]	*Low*	*High*	*High*	*Very High*	*High*	*Low*	*Low*	*High*	*High*	22	[illegible]	*High [intolerable]*	[illegible]	*High [Intolerable]*	[illegible]	*Medium [tolerable]*
WR_20	[illegible]	*Low*	*High*	*High*	*Very High*	*High*	*Low*	*Low*	*High*	*High*	22	[illegible]	*High [intolerable]*	[illegible]	*High [Intolerable]*	[illegible]	*Medium [tolerable]*

Appendix G

Nest Box Monitoring and Maintenance Report

Nest Box Monitoring and Maintenance Report

(No. 4, October 2023)

Spring Mountain Conservation Area

Prepared for Lendlease Communities (Springfield) Pty Ltd.
9 January 2024

Job Number: 7243

saunders havill group

Document Control

Document: Nest Box Monitoring and Maintenance Report for Spring Mountain Conservation Area (No. 4), prepared by Saunders Havill Group for Lendlease Communities (Springfield) Pty Ltd, dated November 2023.

Document Issue

Issue	Date	Prepared By	Checked By
Draft A	17.11.2023	KR	KFB

Prepared by
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Acronyms and Abbreviations

EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
FMP	Fauna Management Plan
ICC	Ipswich City Council
NCA	*Nature Conservation Act 1992* (Qld)
RE	Regional Ecosystem
SEQ	South East Queensland
SHG	Saunders Havill Group

1. Introduction

Saunders Havill Group (SHG) was engaged by Lendlease Communities (Springfield) Pty Ltd to prepare this Nest Box Maintenance and Monitoring Report for the nest boxes installed in accordance with the Fauna Management Plan (FMP) (SHG, 2015) associated with the Spring Mountain Estate residential development, located at Sinnathamby Boulevard, Springfield. The development is a master planned residential community with ancillary commercial and retail purposes with designated open space and conservation areas.

The Spring Mountain Estate was referred under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and declared a 'controlled action' (EPBC 2013/7057). The FMP was prepared in accordance with the EPBC Preliminary Documentation submissions and the *Environmental Management Plan Guidelines* (Department of Environment, 2014). The FMP provides technical detail on the management issues and strategies for all fauna, including specific nest box maintenance and management requirements, prior to, during and post-vegetation clearing and construction activities.

1.1. Property Summary

Key site details are provided in **Table 1** below.

Table 1: Property Summary

Address	Grande Avenue, Spring Mountain
RPD	753 SP189054 751 SP189053 748 SP189044 747 SP189043 745 SP242282 740 SP179412 705 SP151175 11 S31533
Area	293 hectares (for Lend Lease offset requirements)
Local Government Area	Ipswich City Council (ICC)
Zone	Conservation

1.2. Context

Of the 396 hectare (ha) conservation area, a 293 ha portion has been set aside for Lendlease to fulfil their offset requirements for the Spring Mountain Estate project. Lendlease have the written permission and agreements in place with Springfield Land Corporation (now Springfield City Group) to utilise areas of the existing Conservation Land as it is considered an "advanced offset" under the EPBC Act Environmental Offset Policy for resolutions of impacts created in the Spring Mountain project.

The Offset site (aka Conservation area) adjoins the White Rock-Spring Mountain Conservation Estate as part of the Flinders–Karawatha Bioregional Corridor, providing additional bushland along the edge of these regionally significant habitat areas. The offset is characterised by remnant vegetation made up of Least Concern and Of Concern Regional Ecosystems.

Contextually, the offset area provides the only available public conservation land to form a protected corridor connecting the northern and southern portions. The remaining width of the Flinders-Karawatha Bioregional Corridor is occupied by residential land uses.

1.3. Objectives

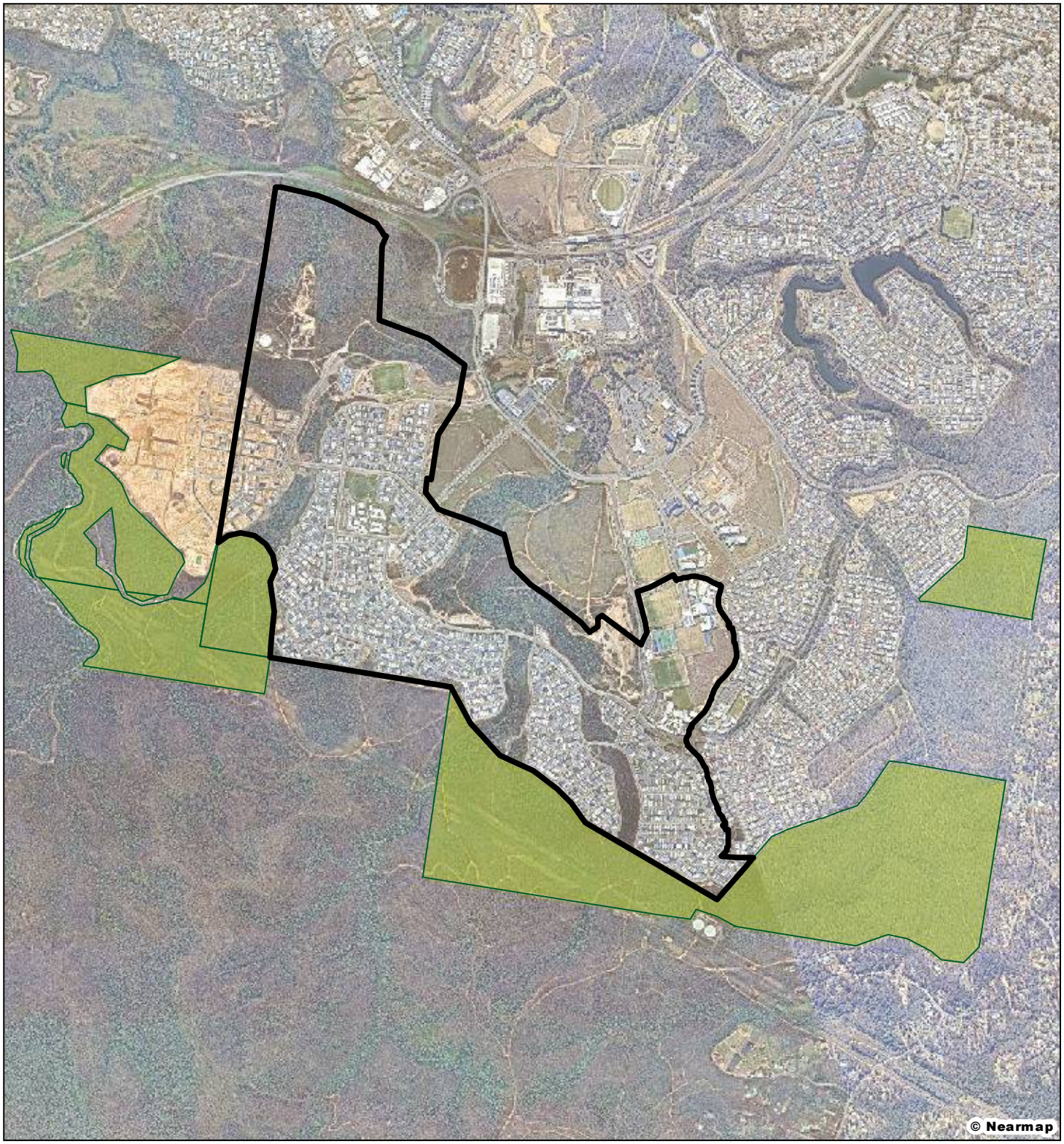
The purpose of this report is to detail the continued monitoring and maintenance activities of replacement hollows (i.e. nest boxes) associated within the development of Spring Mountain Estate. To compensate for potential loss of fauna habitat and features, nest boxes have been installed within the conservation area surrounding the Spring Mountain Estate.

This report aims to detail the monitoring and maintenance of the existing nest boxes installed within the conservation area. Further, this report will provide corrective actions and recommendations where necessary.

This report is designed to be a "dynamic document" which can be continuously updated with every subsequent nest box monitoring and maintenance inspection. The document has been prepared for issue to ICC upon request and will be included within the annual compliance reporting for the EPBC Approval (EPBC 2013/7057).

This report should be read in conjunction with the following documents:

- Annual EPBC Approval Compliance Report;
- FMP, prepared by SHG (2015); and
- Offset Management Plan, prepared by SHG (2015).



Legend

- Project area
- Offset Area

Figure 1

Site Aerial

Lend Lease Communities (Springfield) Pty Ltd

File ref. 7243 E Figure 1 ACR7 NB Site Aerial A
Date 15/11/2023
Project Springfield Rise, EPBC 2013/7057

0 200 400 600 800 1,000 m

N

Scale (A4): 1:28,500 [GDA 1994 MGA Z56]

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Layer Source: © State of Queensland 2023

2. Nest Box Summary

Natural tree hollows form an important part of many South East Queensland (SEQ) ecosystems. There are at least 134 fauna species in SEQ that are dependent on hollows for survival— including protection from weather and predators and a safe place to eat, sleep and raise young. Natural hollows can take between 80 to 350+ years to develop and form a range of sizes and shapes overtime that suit the requirements of different fauna species. Therefore, the removal of hollow-bearing trees is considered only as a last option.

In circumstances where clearing of hollow-bearing trees cannot be avoided, the installation of nest boxes can provide a functional alternative to natural tree hollows. The lifespan of a nest box is relatively short (usually up to 15 years) compared to natural hollows, and may be complimented by bushland regeneration, to ensure long-term provision of hollow habitat.

Nest box design and installation is highly specialised to suit individual fauna species requirements, and requires: prior knowledge of hollow-dependent fauna at the development and receiving areas; and nest box specifications for target fauna species. Ongoing monitoring and maintenance is also essential to ensure nest boxes are achieving beneficial outcomes for fauna, particularly threatened species.

The environmental values identified within the site are essential to determining the types and optimal installation locations for nest boxes. A brief overview of these values and resulting nest box choice is discussed within the *Nest Box Monitoring and Maintenance Report No. 1* prepared by SHG, dated December 2020.

There are currently nil regulatory guidelines in Queensland for the implementation, monitoring and maintenance of nest boxes. The information in this strategy is based on best knowledge and practices provided on ICC, Moreton Bay Regional Council, Redlands City Council online services and *Nest boxes for wildlife, a practical guide* by Alan and Stacey Franks (2015). The information is intended as a guide and is subject to alteration by the qualified nest box installer.

2.1. Scientific Permits

Fauna surveys were conducted under the following permits held by Saunders Havill Group:

- Scientific Purposes Permit **WA0022007** granted under Section 12(f) of *Nature Conservation (Administration) Regulation 2017*
- Department of Agriculture and Fisheries Ethics clearance **CA 2020/02/1355**
- Scientific User Registration **SUR000451**

2.2. Existing Nest boxes

Twenty-seven (27) nest boxes were installed within the Conservation Area on 30 March 2020, including twelve (12) large (possum sized) and fifteen (15) small (parrot sized). The construction and installation of these nest boxes was detailed in the *Nest Box Monitoring and Maintenance Report No. 1* prepared by SHG, dated December 2020.

A further thirty-one (31) nest boxes were installed within the Conservation Area in November 2021, with a variety of nest box sizes including five (5) bat boxes, fifteen (15) antechinus boxes, four (4) possum boxes and seven (7) sugar glider boxes (refer to **Table 2**).

Table 2: Nest Box Locations

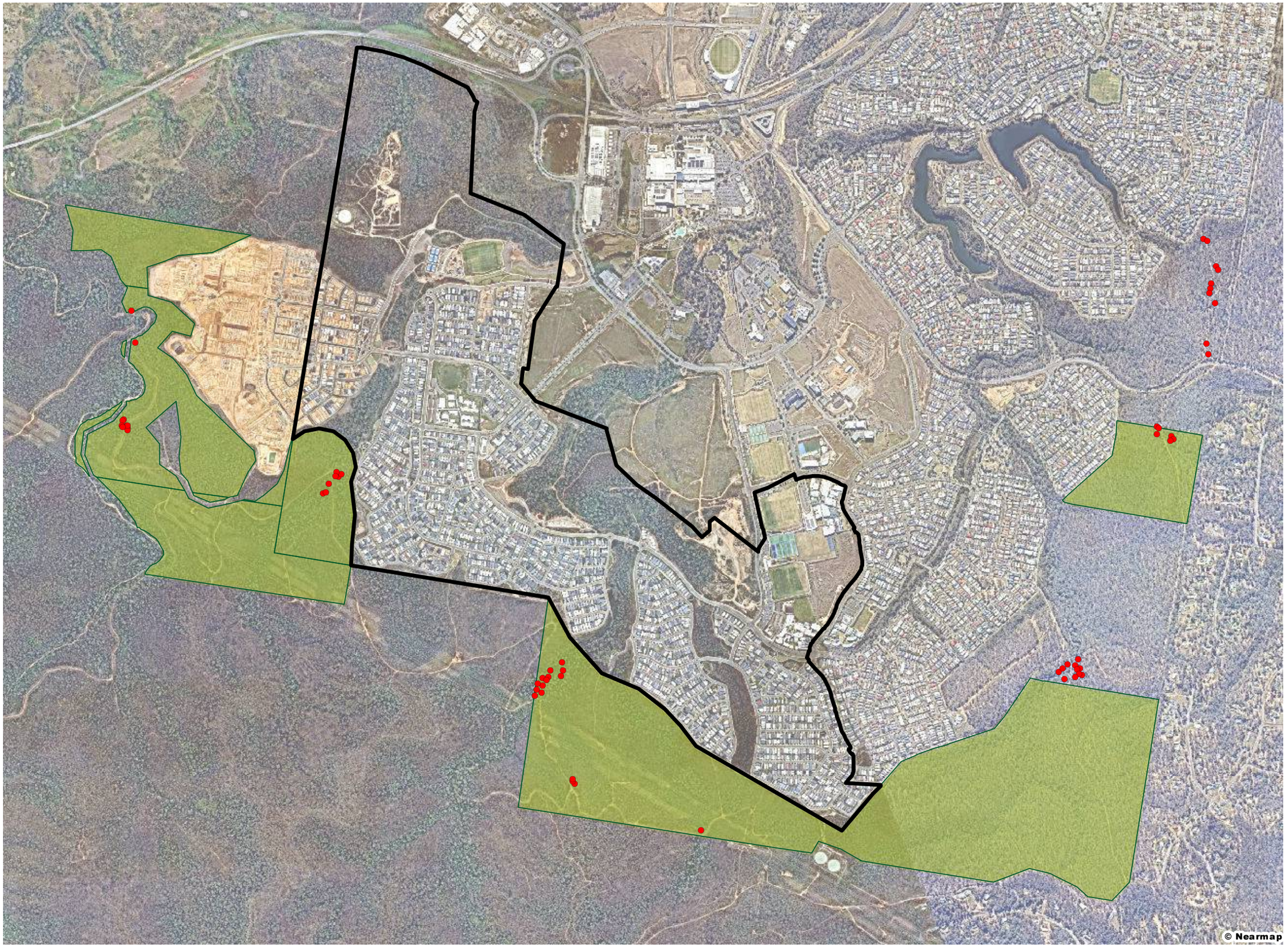
Box ID	Box Size	Longitude	Latitude
1	Large	27°40'47.96"S	152°55'37.52"E
2	Small	27°40'48.33"S	152°55'38.10"E
3	Small	27°40'52.14"S	152°55'39.59"E
4	Small	27°40'52.71"S	152°55'39.97"E
5	Small	27°40'54.83"S	152°55'38.82"E
6	Small	27°40'55.63"S	152°55'38.72"E
7	Small	27°40'56.28"S	152°55'38.53"E
8	Large	27°40'57.75"S	152°55'39.52"E
9	Small	27°41'4.03"S	152°55'37.97"E
10	Large	27°41'5.67"S	152°55'38.37"E
11	Small	27°41'16.61"S	152°55'29.47"E
12	Large	27°41'16.94"S	152°55'29.84"E
13	Small	27°41'17.90"S	152°55'29.53"E
14	Large	27°41'18.09"S	152°55'31.97"E
15	Large	27°41'18.66"S	152°55'32.22"E
16	Large	27°41'18.89"S	152°55'31.74"E
17	Large	27°41'53.24"S	152°55'15.34"E
18	Small	27°41'52.28"S	152°55'15.93"E
19	Large	27°41'53.72"S	152°55'16.20"E
20	Small	27°41'53.83"S	152°55'15.82"E
21	Large	27°41'54.66"S	152°55'16.57"E
22	Small	27°41'54.50"S	152°55'16.15"E
23	Small	27°41'55.00"S	152°55'15.41"E
24	Large	27°41'55.32"S	152°55'13.60"E
25	Large	27°41'54.25"S	152°55'12.52"E
26	Small	27°41'53.69"S	152°55'13.27"E
27	Small	27°41'53.08"S	152°55'14.11"E

Second Round			
28	Bat	27° 42' 18.44" S	152° 54' 11.10" E
29	Antechinus	27° 42' 11.28" S	152° 53' 49.41" E
30	Possum	27° 42' 10.82" S	152° 53' 49.03" E
31	Sugar glider	27° 42' 10.52" S	152° 53' 49.11" E
32	Sugar glider	27° 41' 57.35" S	152° 53' 43.77" E
33	Antechinus	27° 41' 56.22" S	152° 53' 43.98" E
34	Possum	27° 41' 55.41" S	152° 53' 44.55" E
35	Bat	27° 41' 54.94" S	152° 53' 45.02" E
36	Sugar glider	27° 41' 54.73" S	152° 53' 47.10" E
37	Antechinus	27° 41' 53.85" S	152° 53' 47.41" E
38	Antechinus	27° 41' 52.75" S	152° 53' 47.20" E
39	Antechinus*	27° 41' 53.89" S	152° 53' 45.33" E
40	Sugar glider	27° 41' 55.04" S	152° 53' 43.86" E
41	Antechinus	27° 41' 55.72" S	152° 53' 42.87" E
42	Possum	27° 41' 56.79" S	152° 53' 42.92" E
43	Sugar glider	27° 41' 57.89" S	152° 53' 42.05" E
44	Antechinus	27° 41' 25.33" S	152° 53' 7.20" E
45	Bat	27° 41' 26.81" S	152° 53' 6.28" E
46	Antechinus	27° 41' 26.67" S	152° 53' 6.82" E
47	Sugar glider	27° 41' 24.23" S	152° 53' 8.88" E
48	Possum	27° 41' 23.88" S	152° 53' 9.37" E
49	Antechinus	27° 41' 23.61" S	152° 53' 8.62" E
50	Antechinus	27° 41' 24.12" S	152° 53' 8.39" E
51	Bat	27° 41′ 16.43″ S	152° 52′ 32.53″ E
52	Antechinus	27° 41′ 16.87″ S	152° 52′ 32.70″ E
53	Antechinus	27° 41′ 17.19″ S	152° 52′ 32.77″ E
54	Antechinus	27° 41′ 16.39″ S	152° 52′ 32.65 E
55	Bat	27° 41' 15.57" S	152° 52' 32.04" E
56	Antechinus	27° 41' 15.64" S	152° 52' 31.82" E
57	Sugar glider	27° 41' 16.46" S	152° 52' 31.72" E
58	Antechinus	27° 41' 16.74" S	152° 52' 31.82" E

NB Antechinus boxes were recorded as such at time of installation, however the nest box specification at the October 2022 inspection resembled a Glider box.

The proponent has committed to the installation, maintenance and monitoring of these nest boxes to ensure adequate provision of habitat for any displaced fauna. Further, a Nest Box Strategy has been prepared by SHG to provide guidance on future nest boxes to be installed within the conservation area in accordance with FMP, prepared by SHG (2015). This strategy was prepared to provide a functional alternative to natural hollows, once located within the Spring Mountain Estate, and to enhance wildlife habitat in the adjoining Spring Mountain Conservation Area.

1. Nest Box Locations



Notes:
This plan was prepared as a desktop assessment tool. The information on this plan is not suitable for any other purpose. Property dimensions, areas, numbers of lots and contours and other physical features shown have been compiled from existing information and may not have been verified by field survey. These may need verification if the development application is approved and development proceeds, and may change when a full survey is undertaken or in order to comply with development approval conditions. No reliance should be placed on the information on this plan for detailed design or for any financial dealings involving the land. Saunders Havill Group therefore disclaims any liability for any loss or damage whatsoever or howsoever incurred, arising from any party using or relying upon this plan for any purpose other than as a document prepared for the sole purpose of accompanying a development application and which may be subject to alteration beyond the control of the Saunders Havill Group. Unless a development approval states otherwise, this is not an approved plan.

Layer Sources
© State of Queensland (Department of Resources) 2023.
Updated data available at
http://qldspatial.information.qld.gov.au/catalogue/

*This note is an integral part of this plan/data. Reproduction of this plan or any part of it without this note being included in full will render the information shown on such reproduction invalid and not suitable for use.

Legend

- Project area
- Offset Area
- Nest box location

Issue	Date	Description	Drawn	Checked
A	15/11/2023	Preliminary	TF	KM

0 100 200 300 400 500 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:18,000 @ A3

saunders havill group

Lend Lease Communities (Springfield) Pty Ltd

Springfield Rise - EPBC 2013/7057

Address / RPD: Springfield, Qld

15/11/2023 | 7243.E.01 ACR7 Nestbox Locations A

2.3. Monitoring and Reporting

Following nest box installation, a single page memo or email outlining installed nest box types and location coordinates is to be provided to the Proponent and Environmental Coordinator (information contained within this report). This information will be forwarded to ICC and included within the annual EPBC Approval compliance reporting.

Monitoring is to be undertaken six (6) months post installation, and then annually for ten (10) years from the date of installation. Inspections will identify the following:

- fauna use including target and/or non-target species
- rectification procedures for introduced species. N B. Native predators should not be removed from boxes unless they are endangering a threatened fauna species
- any damage or dieback, or risk to the nest box
- maintenance required.

A monitoring and maintenance pro forma provided in **Appendix A**, or a similar checklist, should be completed during each inspection.

Following each inspection, a report is to be issued within 21 days by the consulting ecologist and issued to the Proponent and Environmental Coordinator. This report will detail the results of the inspection and outline any further measures to improve beneficial outcomes of the strategy for fauna (e.g. eradication of pest species, minor repairs or replacement).

2.4. Monitoring Methodology

The previous occupancy audit inspections were completed utilising the pole-mounted camera monitoring approach to inspect the contents of each box. A visual examination of the exterior of each box was also completed to detect signs of fauna occupancy such as scratch or chew marks. Each inspection was kept to a brief time window to minimise disturbance.

This audit inspection was completed using a wireless nest box inspection camera unit developed by StarWeb. The unit includes an LED illuminator that is wildlife eye safe and is ideal for minimising disturbance. The unit was secured to an extendable aluminium pole with reach of up to 4.5 metres (refer **Photo 1**).

Nest boxes 28, 35, 45, 51 and 55 are designed for Microbat species and were not able to be inspected with the camera unit due to the entry hole being located at the base of the box. Using binoculars, a visual inspection of the box opening located at the base of the box was completed to determine occupancy.

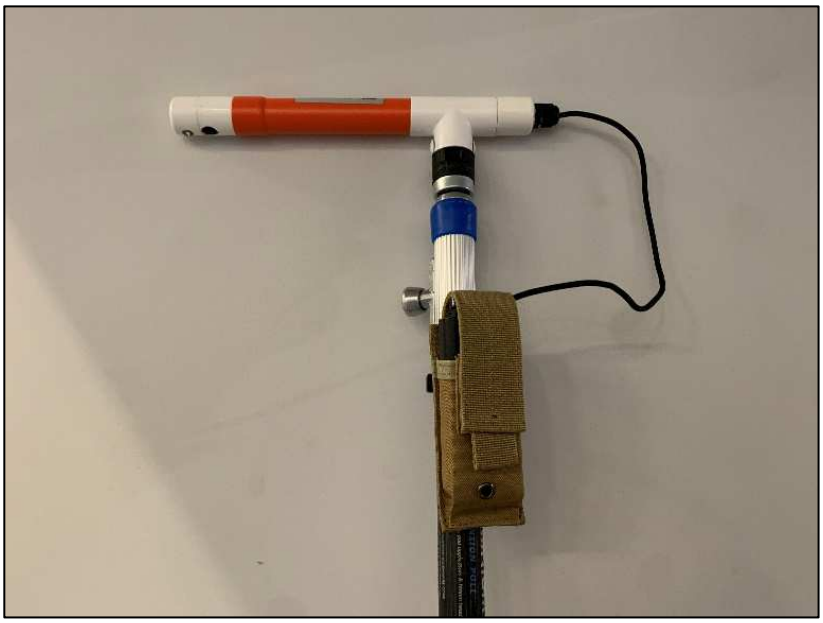


Photo 1: StarWeb Inspection Camera.

2.5. Maintenance Requirements

Maintenance requirements are to be identified during regular inspections and reported to the relevant stakeholders (refer to **Section 2.4**). Damaged boxes are to be repaired or replaced within four weeks of monitoring activities and details of all maintenance work should be submitted to the Proponent and Environmental Coordinator following works. Installed nest boxes will be maintained for a minimum 12 months and/or the remaining life of the committed maintenance period (i.e. 10 years), whichever is greater. The assessment of nest box condition will be described using the condition descriptors below provided within **Table 3**.

Table 3: Nest Box Condition Categories

Condition	Description
Good	Exterior shows no signs of damage or weathering. No maintenance, repair or replacement is required.
Fair	Exterior shows no signs of damage. Nest box may require maintenance for the removal of blockages or cleaning. Nest box does not need repair or replacement.
Poor	Obvious signs of damage and dilapidation. Nest box requires repair or replacement.

2.6. Roles and Responsibilities

This section details the key roles and responsibilities for the works.

2.6.1 Proponent

Lend Lease Communities (Springfield) Ltd is the Proponent for the works.

2.6.2 Environmental Coordinator

SHG is the Environmental Coordinator for the project and is responsible for the development of this report and documentation for overarching environmental management. SHG will be responsible for managing non-compliance by appointed contractors and sub-contractors, including establishing additional management procedures and determining if notification to ICC or the Proponent should be made.

2.6.3 Nest Box Contractor

The Nest Box Contractor is appointed by the Proponent and Environmental Coordinator for the commissioning of, installation, maintenance and monitoring of the nest boxes over the life of the maintenance period. The Nest Box Contractor is required to notify the Proponent and Environmental Coordinator of nest box locations once installed and provide a copy of the reporting schedule and pro forma after each monitoring and maintenance inspection as required under the maintenance, monitoring and reporting schedule (refer **Section 3.3**).

2.7. Maintenance, Monitoring and Reporting Schedule

The nest box strategy phases and roles and responsibilities discussed above have been summarised within the schedule (refer **Table 4**).

Table 4: Maintenance, Monitoring and Reporting Schedule

Management Item	Responsibility	Deliverable	Timing	Notify	Reporting Schedule
Installation					
Record GPS locations of installed nest box and provide coordinates to the Environmental Coordinator and Proponent.	Nest Box Contractor	Memo or email	Within 14 days of installation	Proponent / Environmental Coordinator	Post installation detailing location and monitoring schedule to be forwarded to ICC upon request and included within annual EPBC Approval compliance reporting (Dec/Jan)
Maintenance and Monitoring					
Nest boxes are to be monitored for 10 years. Monitoring activities will capture the following details: • Tree condition (i.e. dieback or risk to nest box) • Box condition and/or maintenance required • Fauna use (target and/or non-target species) • Rectification procedures for introduced species • Other notable observations Nest boxes are to be maintained for 10 years. Maintenance activities include, but are not limited to, the following: • Repairs or replacement to damaged nest boxes • The removal of invasive species • The removal of obstructions	Nest Box Contractor	Monitoring pro forma	6 months post installation, then annually until the end of year 10	Proponent / Environmental Coordinator	Annual - EPBC Approval compliance reporting (Dec/Jan) and forwarded to ICC upon request
Reporting Schedule and Pro forma					
A reporting schedule and pro forma must be completed to report all nest box maintenance and monitoring activities throughout the monitoring and maintenance period. A copy of the reporting schedule and pro forma must be provided to the Environmental Coordinator and Proponent.	Nest Box Contractor	Monitoring pro forma	Annually until the end of year 10	Proponent / Environmental Coordinator	Annual - EPBC Approval compliance reporting (Dec/Jan) and forwarded to ICC upon request

3. Monitoring Results Summary

An inspection of each nest box was conducted by two (2) ecologists from SHG on 18 and 19 October 2023. The inspection recorded the following details of each nest box:

- GPS location,
- Size,
- Condition,
- Occupancy, and
- Maintenance or corrective actions required.

The nest box monitoring pro forma was utilised for the monitoring and the data sheets are provided within **Appendix A**.

The monitoring event in October 2023 revealed that all installed 58 nest boxes appear in good structural condition. However, seventeen (17) nest boxes were occupied by insects, three (3) with spider-webs, eight (8) with ants, one (1) with an external caterpillar nest, and five (5) with insect mud nests. Two (2) nest boxes were recorded on angles, and another two (2) were identified as having a high amount of nesting material potentially decreasing accessibility and one (1) looked to have an internal screw exposed.

Two (2) of the boxes were unable to be assessed for occupation, as they have been positioned too high to safely access by the SHG ecologists alone. However, any external signs of use or notable observations were recorded.

Eleven (11) *Trichosurus vulpecula* (Brushtail Possum) were observed utilising the nest boxes while no other species were recorded. Nesting materials in the form of leaf litter, saw shavings and feathers were present in thirty-two (32) nest boxes.

A summary of the monitoring results is provided in **Table 5**.

Table 5: Monitoring Results Summary October 2023

Box ID	Box Size	Date Installed	Species observed/ signs of use	Pests	Box Condition	Maintenance / Corrective Actions Required
1	Large	2020.03.30	*Trichosurus vulpecula* Brushtail Possum Leaf litter present	-	Good	-
2	Small	2020.03.30	Leaf litter present	Caterpillar nest present on underside	Good	-
3	Small	2020.03.30	Saw shavings present	-	Good	-

Box ID	Box Size	Date Installed	Species observed/ signs of use	Pests	Box Condition	Maintenance / Corrective Actions Required
4	Small	2020.03.30	Leaf litter present	-	Good	-
5	Small	2020.03.30	Saw shavings present	-	Good	-
6	Small	2020.03.30	Mud nest present	Insects	Good	-
7	Small	2020.03.30	No nesting material	-	Good	-
8	Large	2020.03.30	*Trichosurus vulpecula* Brushtail Possum	-	Good	-
9	Small	2020.03.30	No nesting material	-	Good	-
10	Large	2020.03.30	No nesting material	-	Good	-
11	Small	2020.03.30	Leaf litter present	-	Good	-
12	Large	2020.03.30	*Trichosurus vulpecula* Brushtail Possum	-	Good	-
13	Small	2020.03.30	*Trichosurus vulpecula* Brushtail Possum	-	Good	-
14	Large	2020.03.30	*Trichosurus vulpecula* Brushtail Possum Nest box on angle	-	Good	Reposition
15	Large	2020.03.30	*Trichosurus vulpecula* Brushtail Possum	-	Good	-
16	Large	2020.03.30	*Trichosurus vulpecula* Brushtail Possum Nest box on angle	-	Good	Reposition
17	Large	2020.03.30	Leaf litter present	-	Good	-
18	Small	2020.03.30	Leaf litter present	-	Good	-
19	Large	2020.03.30	*Trichosurus vulpecula* Brushtail Possum	-	Good	-
20	Small	2020.03.30	Unreachable	-	Good	-
21	Large	2020.03.30	*Trichosurus vulpecula* Brushtail Possum	-	Good	-

Box ID	Box Size	Date Installed	Species observed/ signs of use	Pests	Box Condition	Maintenance / Corrective Actions Required
22	Small	2020.03.30	Exposed screw internally Leaf litter present	-	Good	-
23	Small	2020.03.30	Leaf litter present	-	Good	-
24	Large	2020.03.30	*Trichosurus vulpecula* Brushtail Possum	-	Good	-
25	Large	2020.03.30	*Trichosurus vulpecula* Brushtail Possum	-	Good	-
26	Small	2020.03.30	Leaf litter present	-	Good	-
27	Small	2020.03.30	Leaf litter present	-	Good	-
28	Bat	2022.11.15	No nesting material	-	Good	-
29	Antechinus	2022.11.15	Leaf litter and nesting material present (blue feathers)	-	Good	-
30	Possum	2022.11.15	Leaf litter present Spider webs on entrance	Spider	Good	-
31	Sugar glider	2022.11.15	Leaf litter present	-	Good	-
32	Sugar glider	2022.11.15	Leaf litter present	-	Good	-
33	Antechinus	2022.11.15	Leaf litter present	-	Good	-
34	Possum	2022.11.15	Leaf litter present	-	Good	-
35	Bat	2022.11.15	Spider webs and insect nests present internally	Spider & insects	Good	-
36	Sugar glider	2022.11.15	Ant infestation	Ants	Good	-
37	Antechinus	2022.11.15	Leaf litter present Ants nesting internally	Ants	Good	-
38	Antechinus	2022.11.15	Ant infestation	Ants	Good	-
39	Antechinus	2022.11.15	Leaf litter present	Ants	Good	-
40	Sugar glider	2022.11.15	Leaf litter present Mud nest internally	Insects	Good	-

Box ID	Box Size	Date Installed	Species observed/ signs of use	Pests	Box Condition	Maintenance / Corrective Actions Required
41	Antechinus	2022.11.15	Leaf litter present Ant infestation	Ants	Good	-
42	Possum	2022.11.15	Leaf litter present Mud nest internally	-	Good	-
43	Sugar glider	2022.11.15	Leaf litter present	-	Good	-
44	Antechinus	2022.11.15	Ant infestation	Ants	Good	-
45	Bat	2022.11.15	Mud nest internally	Insects	Good	-
46	Antechinus	2022.11.15	Ants nesting in box	Ants	Good	-
47	Sugar glider	2022.11.15	Leaf litter present Ants present	Ants	Good	-
48	Possum	2022.11.15	Leaf litter present	-	Good	-
49	Antechinus	2022.11.15	No nesting material	-	Good	-
50	Antechinus	2022.11.15	Leaf litter present Mud nest internally	Insects	Good	-
51	Bat	2022.11.15	Spider webs present	Spider	Good	-
52	Antechinus	2022.11.15	Leaf litter present	-	Good	-
53	Antechinus	2022.11.15	Leaf litter present	-	Good	-
54	Antechinus	2022.11.15	Leaf litter and nesting material present (feathers)	-	Good	Remove some nesting material
55	Bat	2022.11.15	No nesting material	-	Good	-
56	Antechinus	2022.11.15	Nesting material present filling the nest box	-	Good	Remove some nesting material
57	Sugar glider	2022.11.15	Leaf Litter present	-	Good	-
58	Antechinus	2022.11.15	Unreachable	-	Good	-

3.1. Corrective Actions and Recommendations

As discussed above, four (4) nest boxes require corrective actions, where two (2) require potential repositioning (# 14, and # 26) and two (2) requires nesting material to be removed (# 54, and # 56). From this inspection the nest boxes are to be adjusted or secured, to restore functionality.

It is recommended that nest boxes requiring attention are seen to prior to September 2024 (i.e Spring).

As a result of inspection findings the nest box monitoring pro forma has been updated to increase recording of observations.

4. Site Contacts

Role	Contact Details
Proponent	Lend Lease Communities (Springfield) Pty Ltd (07) 3027 3000
Environmental Coordinator	Amy Westman Saunders Havill Group Ph. (07) 3251 9480
Council	Ipswich City Council 45 Roderick Street, Ipswich, QLD 4305 Ph. (07) 3810 6666
Nest Box Contractor	Evolve Environmental Solutions John White (07) 3124 7200
Veterinarian (in closest proximity to application site)	Springfield Lakes Pet and Vet 1 Springfield Lakes Boulevard, Springfield Lakes, 4300 Mon, Wed & Fri: 7:00am – 6:00pm, Tues & Thurs: 7.00am – 7.00pm, Sat: 7:00am – 3:00pm Ph. (07) 3818 4119 *After Hours Contact: Animals Emergency Service, Cnr Lexington & Logan Rd, Underwood* *Ph. (07) 3423 1888*
Queensland Parks and Wildlife Services	South East 60 Mount Nebo Road, The Gap QLD 4061 Ph. (07) 35122300
Department of Environment and Science	For wildlife incidents and licensing and permits: Ph. 1300 130 372
RSPCA Queensland	For reporting injured, sick or orphaned wildlife: Ph. 1300 ANIMAL (1300 264 625)

5. Summary

This report details the continued monitoring of the nest boxes installed in March 2020 with further nest boxes installed November 2021 in the Spring Mountain Conservation Area. A total of 58 nest boxes were installed and the monitoring event in October 2023 revealed that:

- two (2) nest boxes (# 14, and # 26) requiring further attention to reorientate/secure the units; and
- two (2) nest box (# 54, and # 56) requires nesting material to be removed to allow fauna to utilise the site.

It is recommended that nest boxes requiring attention are seen to prior to September 2024.

The next monitoring inspection is scheduled for October 2024.

6. Appendices

Appendix A

Monitoring Data Sheets (October 2022)

Appendix A

Monitoring Data Sheets (October 2023)

Nest Box Monitoring Sheet 1	
Observer: KM & KH	
Date: 18-19/10/23	Location: Springfield Conservation Area
Time: 8am – 3pm	Weather Conditions: Sunny & Windy

Box ID	Box Size	Date Installed	Species observed/ signs of use	Pests	Box Condition	Maintenance/Corrective Actions Required
1	Large	2020.03.30	*Trichosurus vulpecula* Brushtail Possum Leaf litter	-	Good	
2	Small	2020.03.30	Leaf litter	Caterpillar nest present on underside of nest box	Good	
3	Small	2020.03.30	Saw shavings	-	Good	
4	Small	2020.03.30	Leaf litter	-	Good	
5	Small	2020.03.30	Saw shavings	-	Good	
6	Small	2020.03.30	Mud nest present	Insects	Good	
7	Small	2020.03.30	No nesting material	-	Good	
8	Large	2020.03.30	*Trichosurus vulpecula* Brushtail Possum	-	Good	
9	Small	2020.03.30	No nesting material	-	Good	
10	Large	2020.03.30	No nesting material	-	Good	
11	Small	2020.03.30	Leaf litter	-	Good	
12	Large	2020.03.30	*Trichosurus vulpecula* Brushtail Possum	-	Good	
13	Small	2020.03.30	*Trichosurus vulpecula* Brushtail Possum	-	Good	
14	Large	2020.03.30	*Trichosurus vulpecula* Brushtail Possum Nest box on angle	-	Good	Reposition
15	Large	2020.03.30	*Trichosurus vulpecula* Brushtail Possum	-	Good	
16	Large	2020.03.30	*Trichosurus vulpecula* Brushtail Possum Nest box on angle	-	Good	Reposition
17	Large	2020.03.30	Leaf litter	-	Good	
18	Small	2020.03.30	Leaf litter	-	Good	

Box ID	Box Size	Date Installed	Species observed/ signs of use	Pests	Box Condition	Maintenance/Corrective Actions Required
19	Large	2020.03.30	*Trichosurus vulpecula* Brushtail Possum	-	Good	
20	Small	2020.03.30	Unreachable	-	Good	
21	Large	2020.03.30	*Trichosurus vulpecula* Brushtail Possum	-	Good	
22	Small	2020.03.30	Leaf litter Exposed screw internally	-	Good	
23	Small	2020.03.30	Leaf litter	-	Good	
24	Large	2020.03.30	*Trichosurus vulpecula* Brushtail Possum	-	Good	
25	Large	2020.03.30	*Trichosurus vulpecula* Brushtail Possum	-	Good	
26	Small	2020.03.30	Leaf litter	-	Good	
27	Small	2020.03.30	Leaf litter	-	Good	
28	Bat	2022.11.15	No nesting material	-	Good	
29	Antechinus	2022.11.15	Leaf litter and nesting material present (feathers)	-	Good	
30	Possum	2022.11.15	Leaf litter Spider webs on entrance	Spider	Good	
31	Sugar glider	2022.11.15	Leaf litter	-	Good	
32	Sugar glider	2022.11.15	Leaf litter	-	Good	
33	Antechinus	2022.11.15	Leaf litter	-	Good	
34	Possum	2022.11.15	Leaf litter	-	Good	
35	Bat	2022.11.15	Spider webs and insect nests	Spider & insects	Good	
36	Sugar glider	2022.11.15	Ant infestation	Ants	Good	
37	Antechinus	2022.11.15	Leaf litter Ants present	Ants	Good	
38	Antechinus	2022.11.15	Leaf litter Ant infestation	Ants	Good	
39	Antechinus	2022.11.15	Leaf litter	Ants	Good	

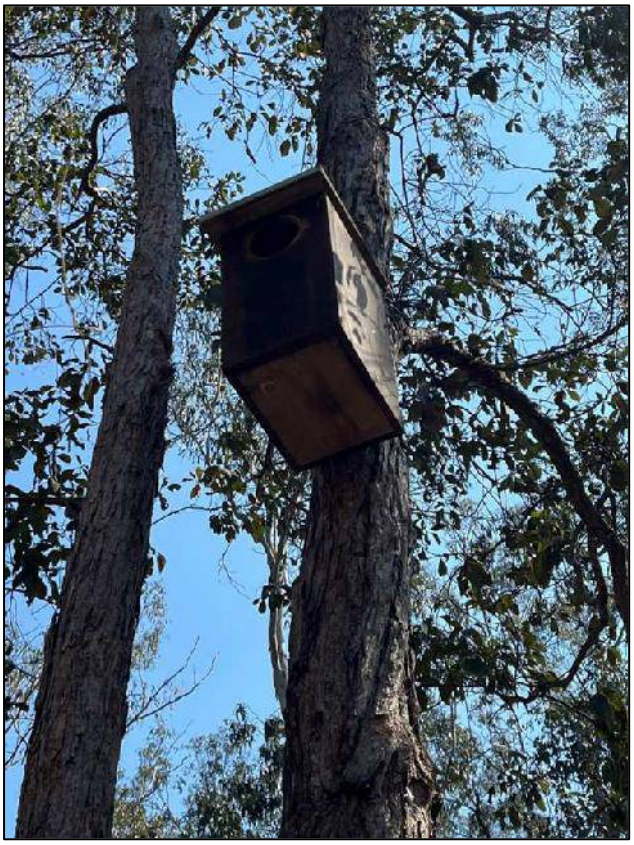
Box ID	Box Size	Date Installed	Species observed/ signs of use	Pests	Box Condition	Maintenance/Corrective Actions Required
40	Sugar glider	2022.11.15	Leaf litter Insect mud nest internally	Insects	Good	
41	Antechinus	2022.11.15	Leaf litter Ant infestation	Ants	Good	
42	Possum	2022.11.15	Leaf litter Insect mud nest internally	-	Good	
43	Sugar glider	2022.11.15	Leaf litter	-	Good	
44	Antechinus	2022.11.15	Ant infestation	Ants	Good	
45	Bat	2022.11.15	Insect mud nest internally	Insects	Good	
46	Antechinus	2022.11.15	Ant nest	Ants	Good	
47	Sugar glider	2022.11.15	Leaf litter	Ants	Good	
48	Possum	2022.11.15	Leaf litter	-	Good	
49	Antechinus	2022.11.15	No nesting material	-	Good	
50	Antechinus	2022.11.15	Leaf litter Insect mud nest internally	Insects	Good	
51	Bat	2022.11.15	Spider webs	Spider	Good	
52	Antechinus	2022.11.15	Leaf litter	-	Good	
53	Antechinus	2022.11.15	Leaf litter	-	Good	
54	Antechinus	2022.11.15	Leaf litter Nesting material (feathers)	-	Good	
55	Bat	2022.11.15	No nesting material	-	Good	
56	Antechinus	2022.11.15	Nesting material filling the nest box	-	Good	Remove some nesting material
57	Sugar glider	2022.11.15	Leaf Litter	-	Good	
58	Antechinus	2022.11.15	Unreachable	-	Good	

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 1**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Leaf litter present.

Photos



Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 2**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Leaf litter present. Caterpillar nest present on underside of box.

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 3**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Saw shavings present.

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 4**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Leaf litter present.

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 5**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Saw shavings present.

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 6**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box		✓	
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Insect mud nest present within nest box. No nesting material present covering the floor of the box

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 7**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box		✓	
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

No nesting material present covering the floor of the box.

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 8**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Brushtail Possum.

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 9**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box		✓	
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

No nesting material present.

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 10**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box		✓	
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

No nesting material present.

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 11**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Leaf litter present.

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 12**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Brushtail Possum.

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 13**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Brushtail Possum.

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 14**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward		✓	Reposition
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Brushtail Possum.

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 15**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Brushtail Possum.

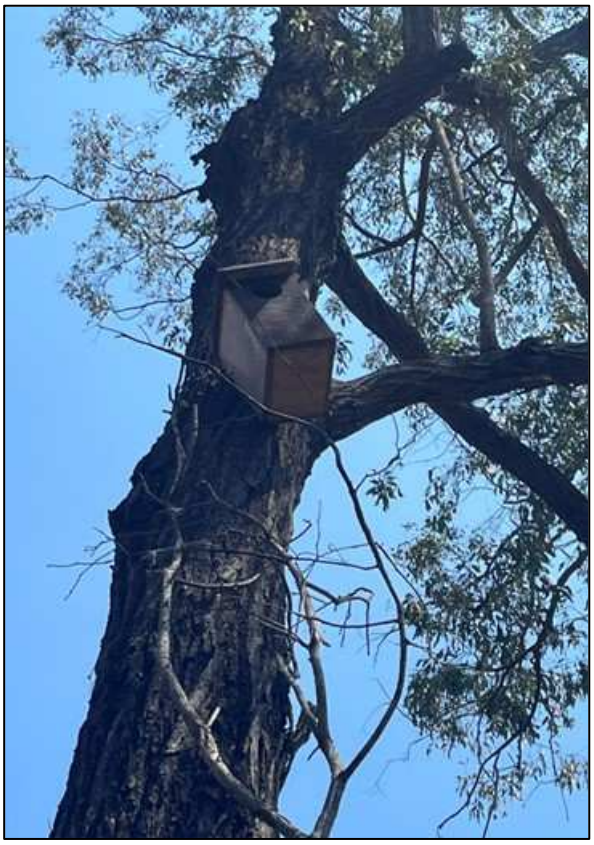
Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 16**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward		✓	Reposition
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Brushtail Possum.

Photos



Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 17**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Leaf litter present.

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 18**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Leaf litter present.

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 19**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Brushtail Possum. No leaf litter present.

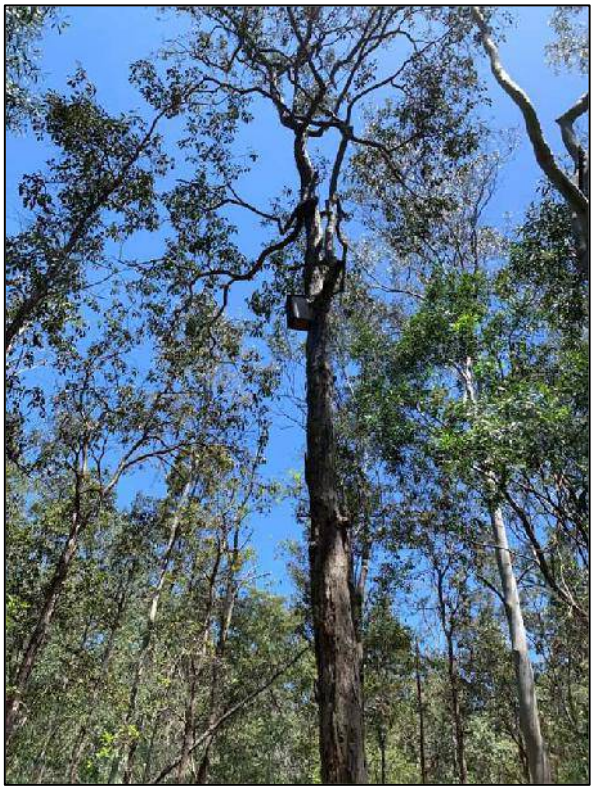
Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 20**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	n/a		
10. All soiled materials like old shavings, membrane, egg shells have been removed	n/a		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Unreachable due to erosion at base of tree. Box appears in good condition from outside.

Photos



Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 21**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Brushtail Possum.

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 22**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Leaf litter present. Internally exposed screw.

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 23**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Leaf litter present.

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 24**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Brushtail Possum.

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 25**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Brushtail Possum.

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 26**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Leaf litter present.

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 27**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Leaf litter present.

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 28 – Bat box**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	n/a		
10. All soiled materials like old shavings, membrane, egg shells have been removed	n/a		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		
Other Comments			

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 29**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box		✓	
10. All soiled materials like old shavings, membrane, egg shells have been removed		✓	
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Leaf litter present. Loose feathers present.

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 30**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Leaf litter present. Spider-webs on entrance.

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 31**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Leaf litter present.

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 32**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Leaf litter present.

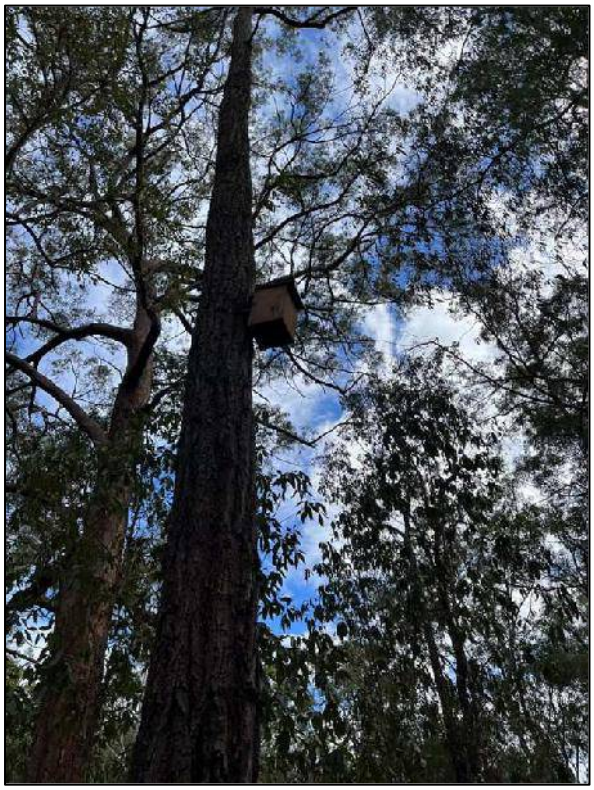
Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 33**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Leaf litter present.

Photos

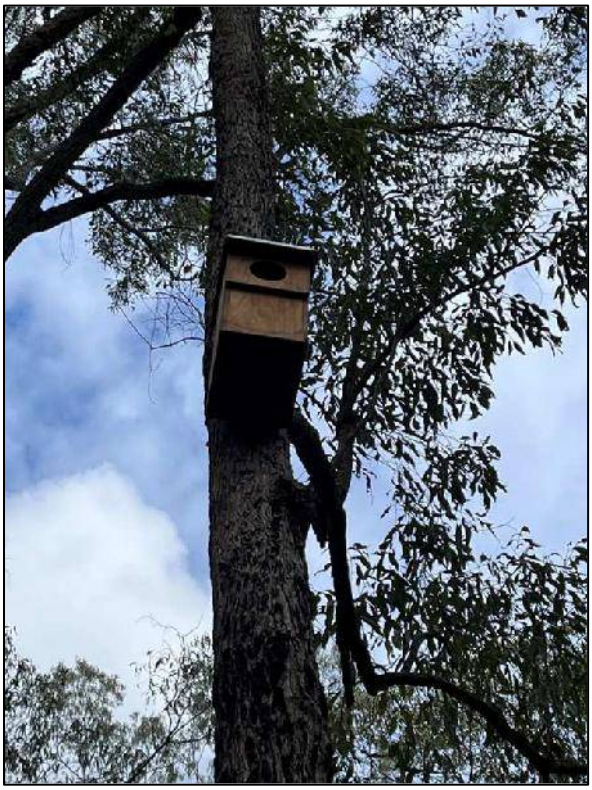


Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 34**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Leaf litter present.

Photos

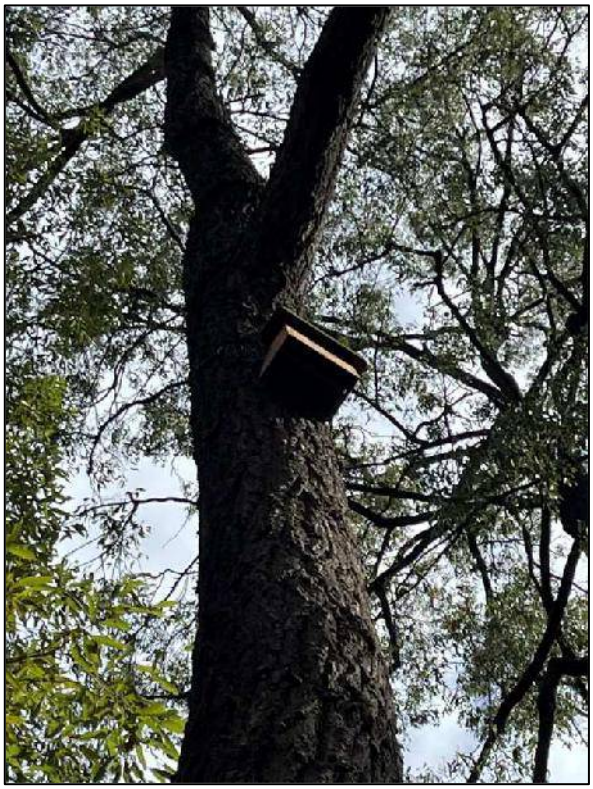


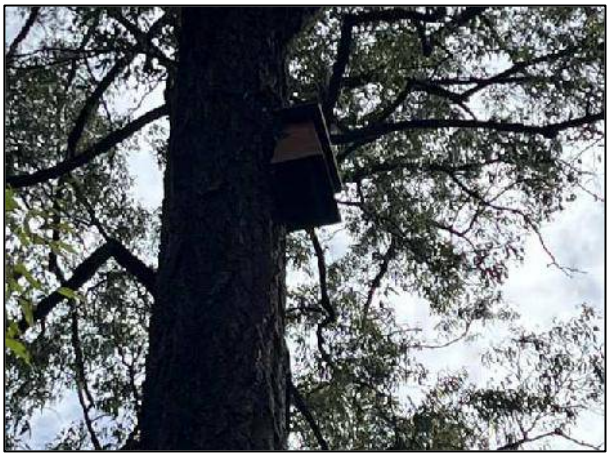
Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 35 – Bat box**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	n/a		
10. All soiled materials like old shavings, membrane, egg shells have been removed	n/a		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

No nesting material present. Spider-webs and insect nests present.

Photos



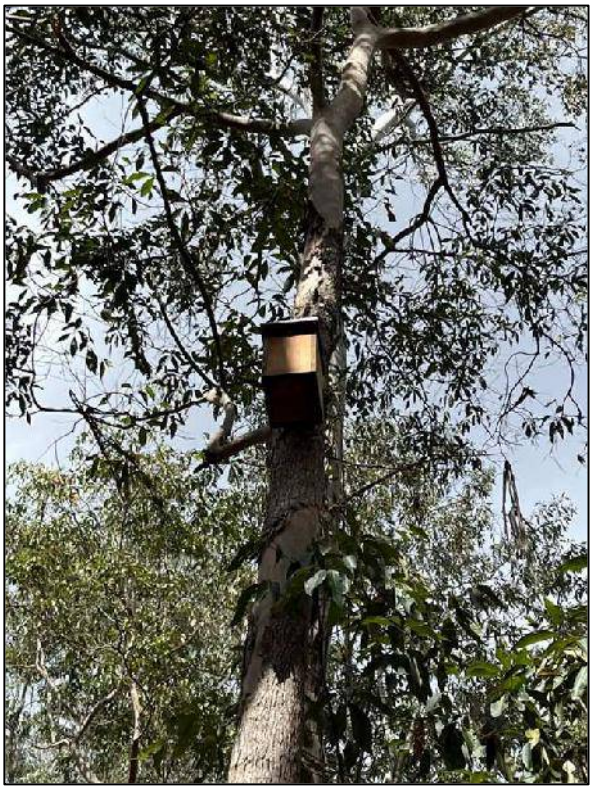


Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 36**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box		✓	
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Ant infestation.

Photos

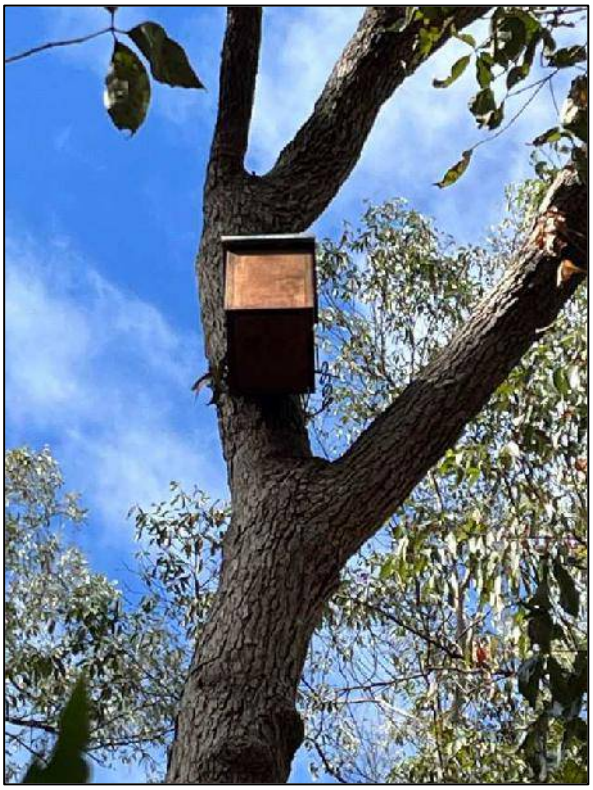


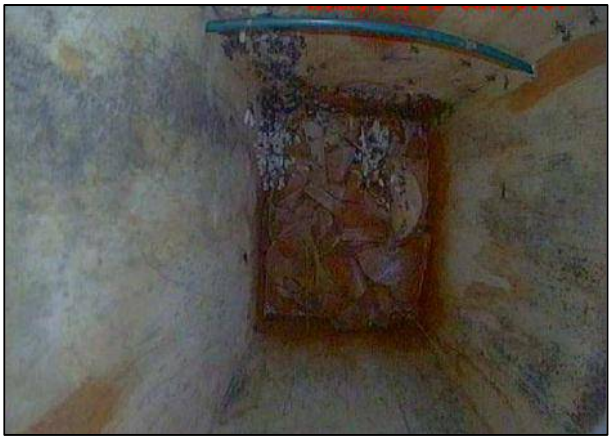
Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 37**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Leaf litter present. Nesting ants.

Photos



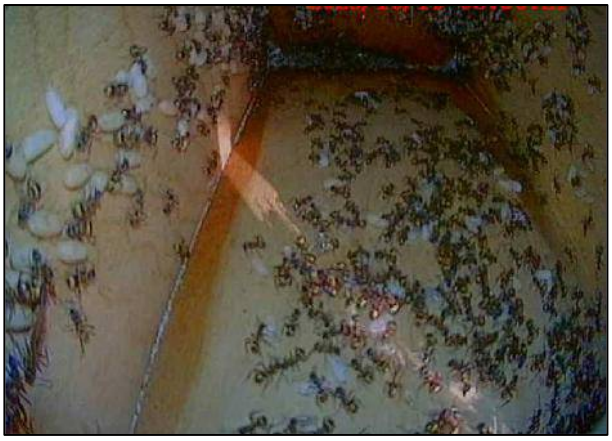


Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 38**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box		✓	
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Ant infestation.

Photos



Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 39**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Leaf litter present. Ants present.

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 40**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Leaf litter present. Insect mud nest present.

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 41**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Leaf litter present. Ant infestation.

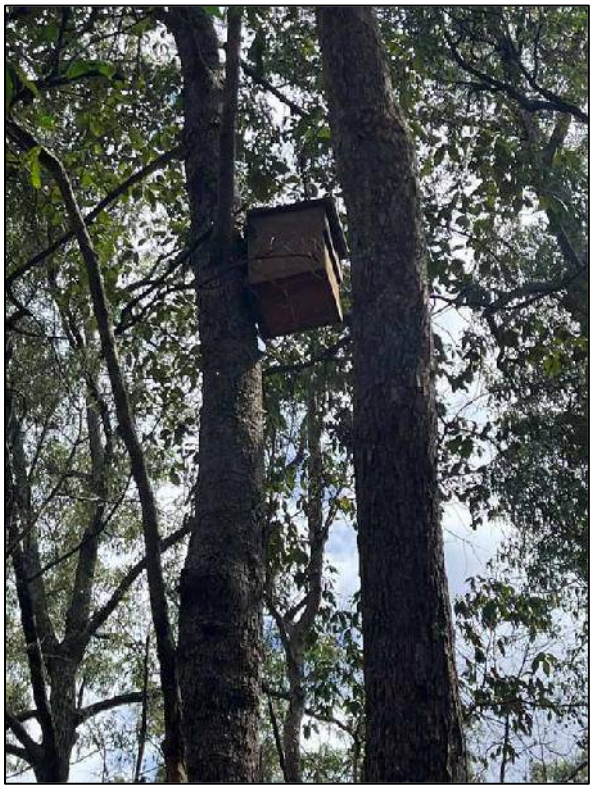
Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 42**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Leaf litter present. Insect mud nest present.

Photos



Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 43**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Leaf litter present.

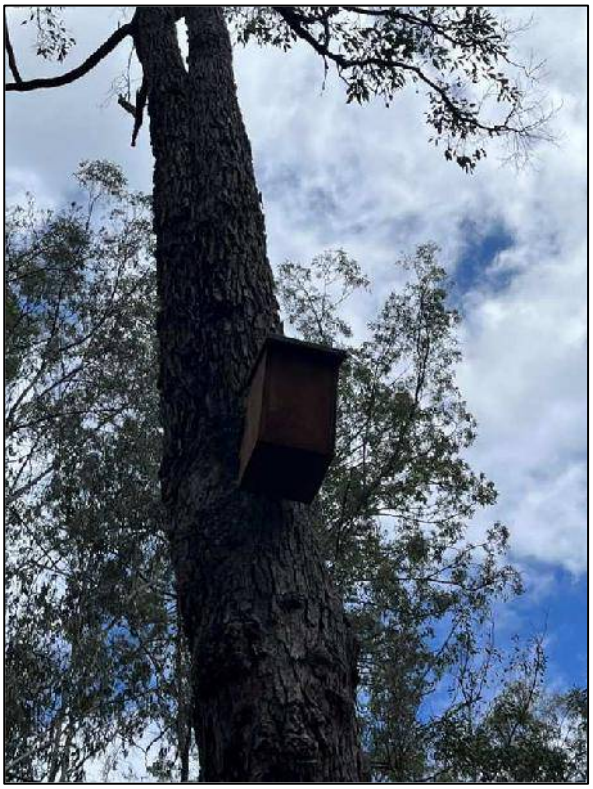
Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 44**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box		✓	
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Ant infestation.

Photos



Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 45 – Bat box**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	n/a		
10. All soiled materials like old shavings, membrane, egg shells have been removed	n/a		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Insect mud nest present.

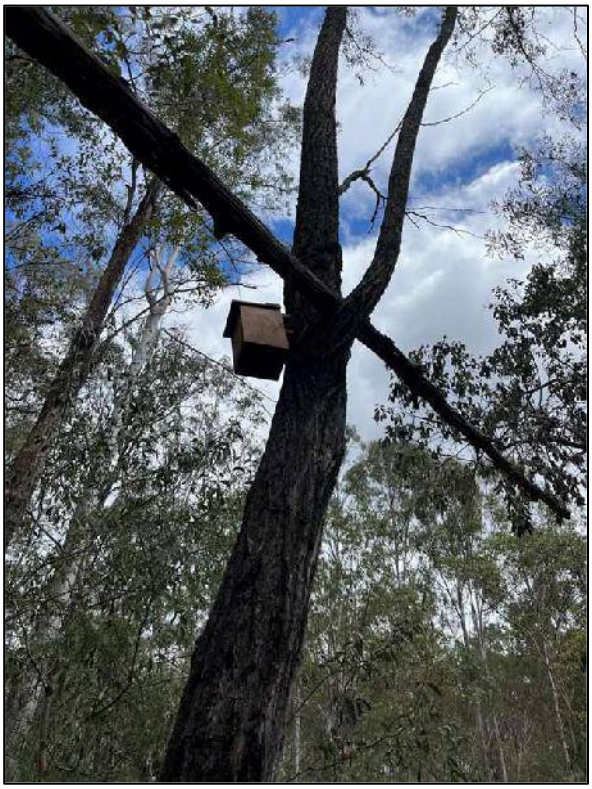
Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 46**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box		✓	
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Nesting ants.

Photos



Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 47**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Leaf litter present. Ants present.

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 48**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

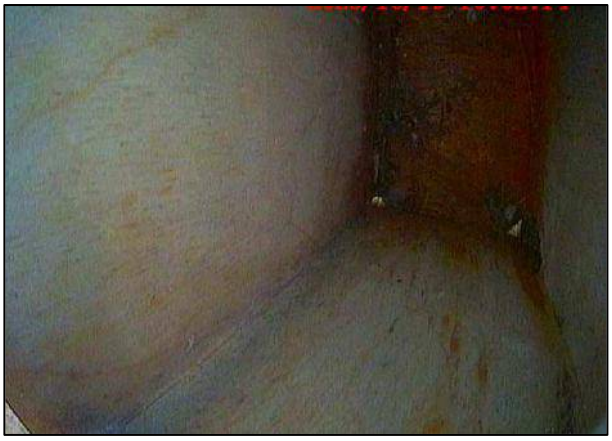
Other Comments

Leaf litter present.

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 49**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box		✓	
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		
Other Comments			

Photos

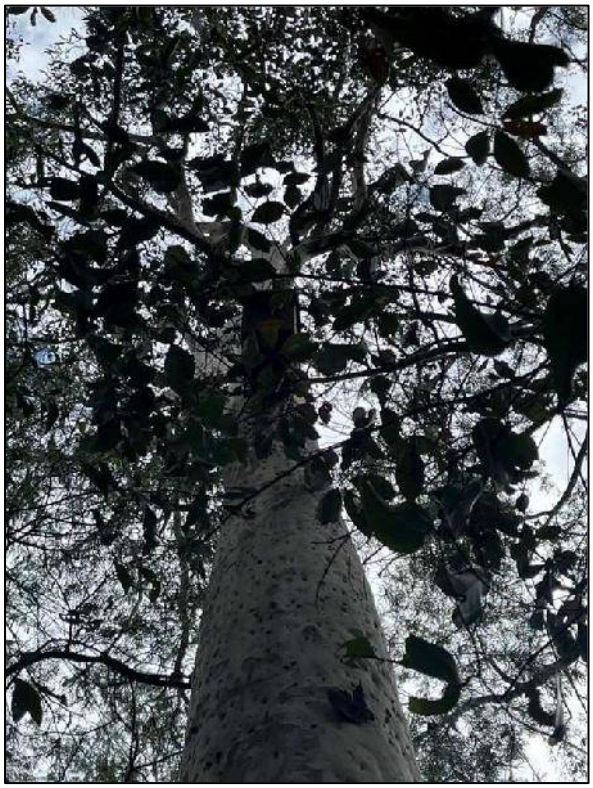


Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 50**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Insect mud nest present. Leaf litter present.

Photos

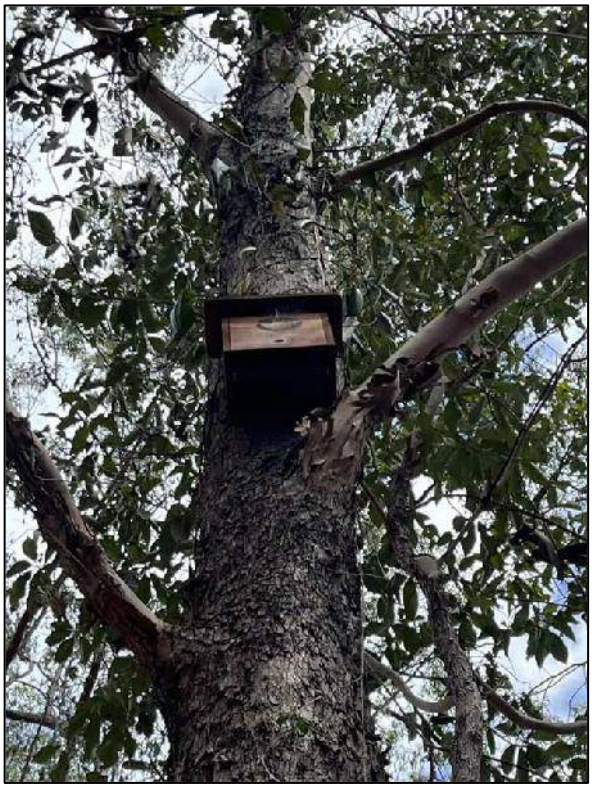


Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 51 – Bat box**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	n/a		
10. All soiled materials like old shavings, membrane, egg shells have been removed	n/a		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Spider-web present

Photos



Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 52**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Leaf litter present.

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 53**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Leaf litter present.

Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 54**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box		✓	
10. All soiled materials like old shavings, membrane, egg shells have been removed		✓	
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

High amount of nesting material present.

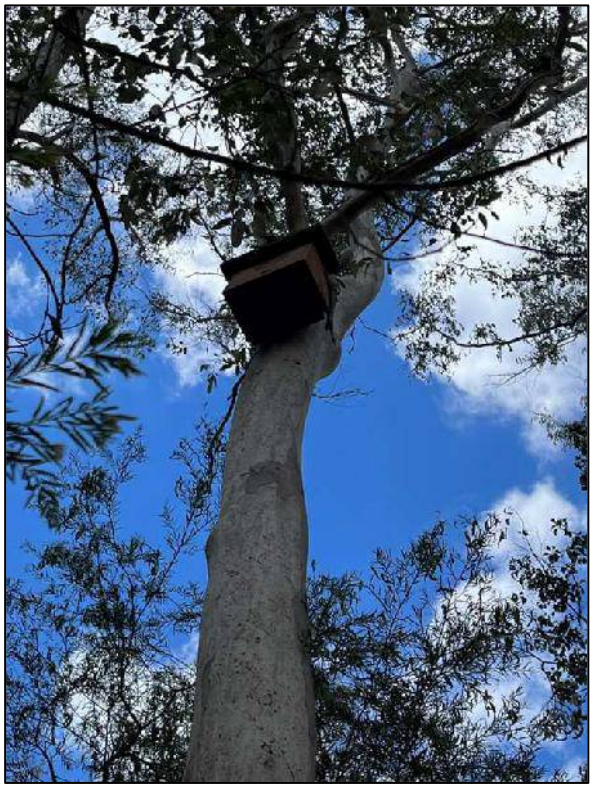
Photos

Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 55 – Bat box**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	n/a		
10. All soiled materials like old shavings, membrane, egg shells have been removed	n/a		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

No nesting material present.

Photos

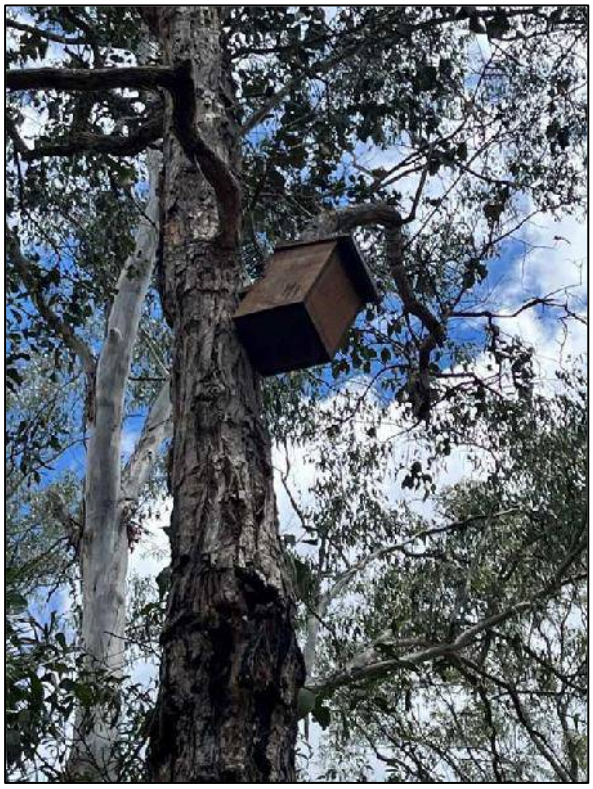


Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 56**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box		✓	
10. All soiled materials like old shavings, membrane, egg shells have been removed		✓	
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

High amount of nesting material present.

Photos

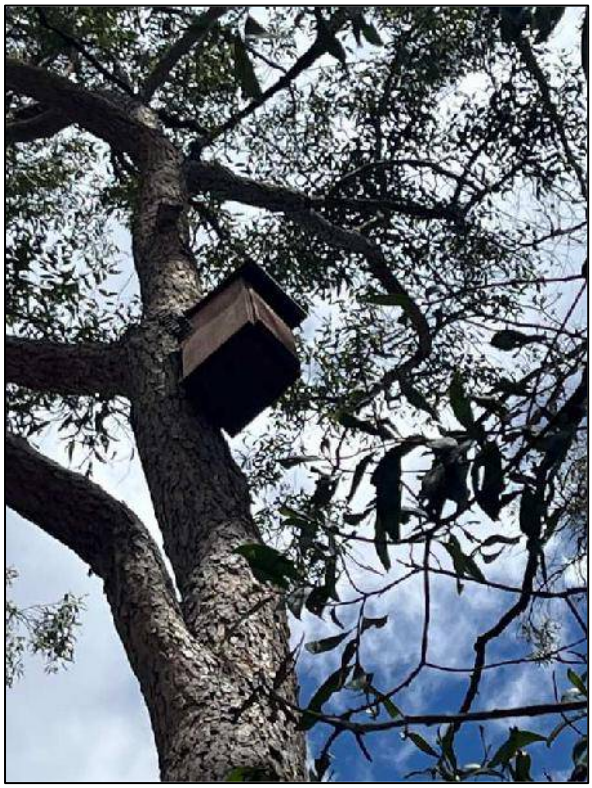


Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 57**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	✓		
10. All soiled materials like old shavings, membrane, egg shells have been removed	✓		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Leaf litter present.

Photos

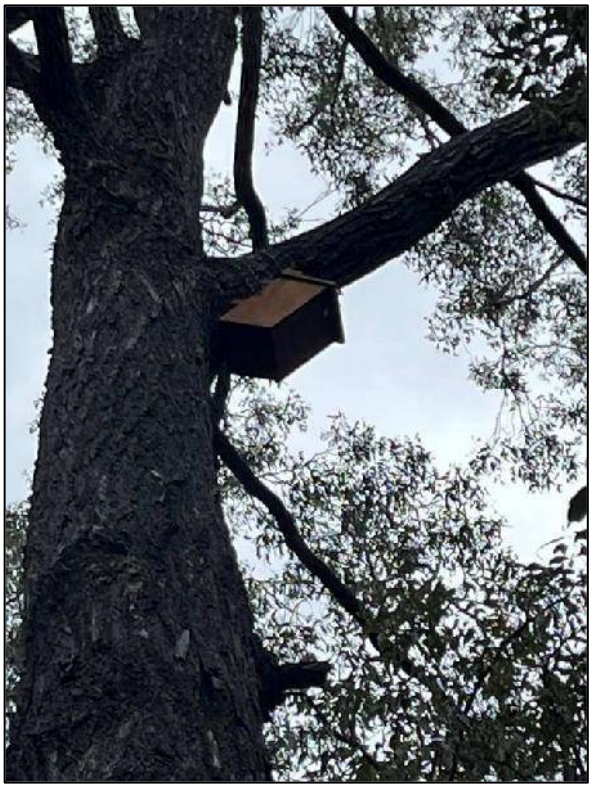


Nest Box Monitoring Sheet 2			
Maintenance Checklist of Nest Box ID: **Box 58 – Bat box**	Correct	Incorrect	Other
1. Box is not occupied by pest species	✓		
2. Box is not vandalised or missing	✓		
3. Box is securely attached with slight lean forward	✓		
4. Box is located at optimal height	✓		
5. Box is not damaged or rotten	✓		
6. The foot holds/ladder in interior of box for young is intact	✓		
7. There are no blockages in drainage holes	✓		
8. Entrance hole is free from obstruction and not damaged or worn	✓		
9. Nesting materials have been replaced to cover floor of box	n/a		
10. All soiled materials like old shavings, membrane, egg shells have been removed	n/a		
11. Box is aligned away from prevailing winds, rain and excessive heat	✓		

Other Comments

Unreachable due to erosion at base of tree. Box appears in good condition from outside.

Photos



Appendix H

Village 17 Environmental Pre-start Checklist

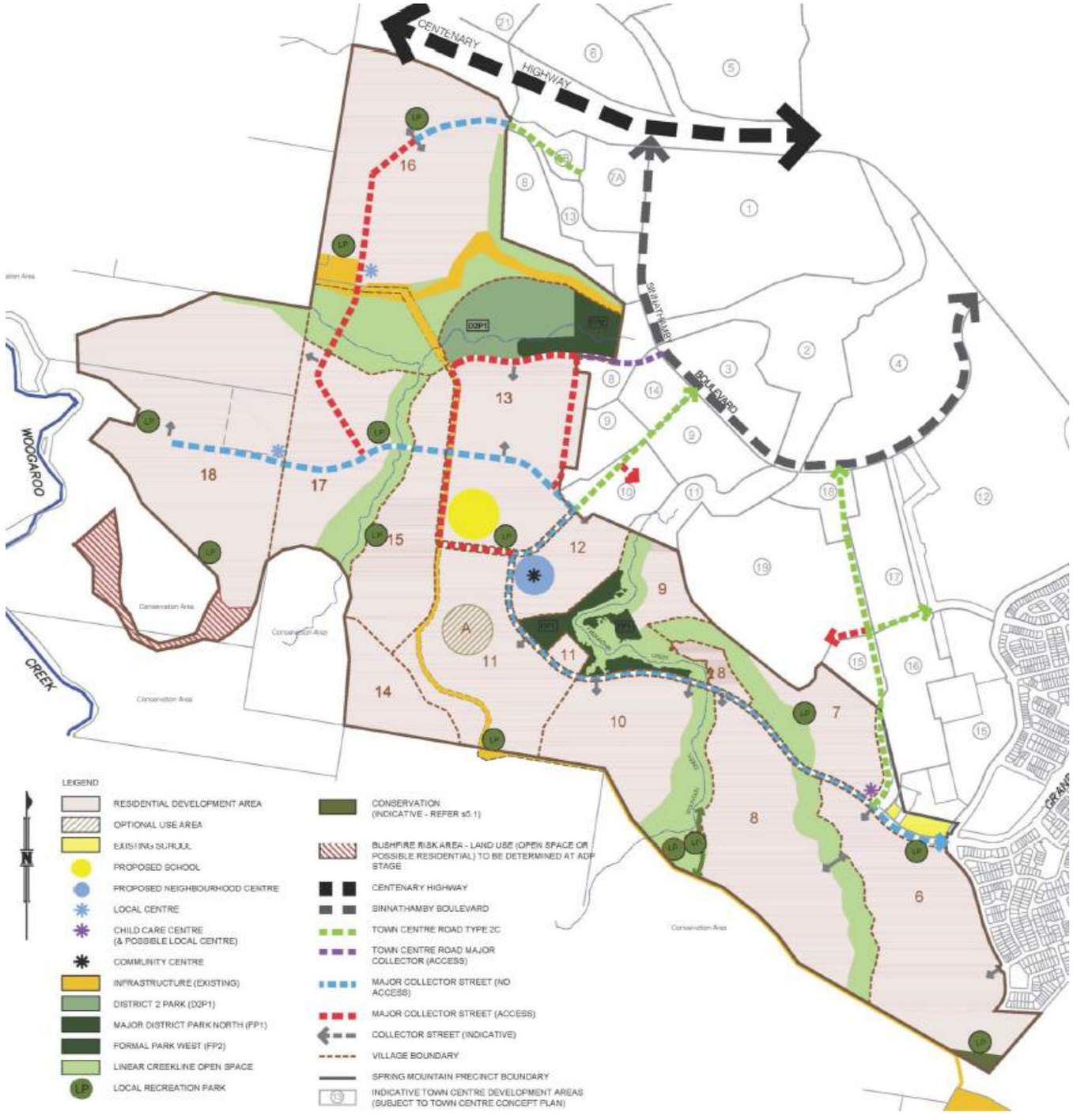
LENDLEASE COMMUNITIES

SPRINGFIELD RISE - VILLAGE 17

SITE BASED MANAGEMENT PLAN - GRANDE AVENUE

saunders havill group

01 CONTENTS



02 INTRODUCTION

Introduction

This phase specific Site Based Management Plan (SBMP) has been prepared for works associated with the Village 17 (V17) precinct at Springfield Rise, Spring Mountain and incorporates the management intent, objectives and specifications detailed within the overarching environmental management plans prepared for the development.

The aim of this SMBP is to set out and guide the implementation of effective measures to ameliorate any impacts, and to ensure and manage the long term sustainability of the project and its natural environment, specifically for Matters of National Environmental Significance (MNES) listed species known to occur within the Spring Mountain project site namely:

- Phascolarctos cinereus (Koala)
- Pteropus poliocephalus (Grey-headed Flying-fox)
- Plectranthus habrophyllus

The document has been developed in accordance with the Spring Mountain SMBP, prepared by Yurrah, as an updated and re-issued phase specific management plan.

The purpose of this SBMP is to provide a single, consolidated management document which incorporates requirements of numerous ecological management plans prepared for Spring Mountain. From these documents, this SBMP extracts management objectives, implementation requirements, performance indicators and monitoring and auditing actions relevant to the specific the V17 works.

Environmental Pre-Start Checklist

This Site Based Management Plan has been prepared to create an on-site working document with easy to find references to management measures without the comprehensive details of the assessment and approval. Core to contractors working under this SBMP is completion of the Spring Mountain Pre-Start Environmental Checklist. Completion and sign off of this checklist, inclusive of attachments should will warrant compliance with this SBMP and broader approval parameters.

Details on this SBMP can be found within the following documents:

- Site Based Management Plan for Spring Mountain Community, prepared by Yurrah (July 2015)
- Threatened Flora Management Plan for Spring Mountain, prepared by Yurrah (July 2015)
- Fauna Management Plan for Spring Mountain, prepared by Saunders Havill Group (July 2015)
- Code of practice for Welfare of Animals effected by Land Clearing and Other Habitat Impacts, and Wildlife/ Spotter Catchers (Draft) prepared by Wildlife Warriors and Voiceless (2009)
- Offsets Management Plan prepared for Spring Mountain, prepared by Saunders Havill Group (July 2015)
- Bushfire Management Plan for Spring Mountain, prepared by Cardno (2016)

This SBMP should also be read in conjunction with all V17 approvals and conditions including approved civil, landscape, vegetation management and rehabilitation plans and specifications.

This SBMP has also been prepared to meet compliance and auditing requirements of the Spring Mountain Commonwealth Department of the Environment and Energy (DEE) approval under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC) (Ref: 2013/7057), specifically Conditions 3-6.

This SBMP outlines construction measures specific to the V17 works to manage of impacts to native flora and fauna.

<u>Construction</u>

- Vegetation Management (Clearing & Protection)
- Protection of MNES Fauna (Koala and Grey-headed Flying Fox) and Native Wildlife
- Maintenance of Safe Wildlife Movement Opportunities
- Fauna Habitat Rehabilitation
- Threatened Flora Management
- Pest Management
- Fire Management
- Education and Awareness

Image capture from Qld Globe (2019)

03 SITE DESCRIPTION

Site Description

Village 17 is located in the western portion of Springfield Rise and is encompasssed by linear open space of Town Centre Gully West to the north-east , and the Conservation Land adjoining the southern boundary. Its western boundary adjoins Village 18. Village 17 has a developement area of approximately 20.5 ha.

Natural Features

The village comprises undulating land typically falling towards the linear open sapce to the east with ridges from the west and south west into the site forming peaks in the adjoining Village 18 creating a central gully formation.

Layout

Village 17 will be developed for typical residenital development, predominately comprising of a range of low rise (1-2 storey) detatched dwelling forms. It is prposed that an overally density of 15-18 dw/ha will be achieved.

Village 17 is intended to be developed for residneital development access via a grid based netowrk of local access streest linking with the major collector networks that traverse the village to the west (to Village 18) and north (to Village 16). Access for dtetched dwellings is not available to the major collector into Village 18.

Village 17 accommodates for 1 Local Recreation Park in the easytern potion of the village adjoining the linear open space to be provided between Conservation Land and the linear open space provided as part of Village 16. The Local Recretion Park may be located proximate to the inersection of the major collector access into the village with the linear open space which will create an entre feature into the western portions of the precinct.

Interface with Linear Open Space

The interface with the Linear Open Space is ot be provided as per the PSP3 unless otherwise approved. It is to take into regard potential bushfire mitigation strategies.

Interface with Conservation Land

The interface with the Conservation Land will require regard to potential bushfire mitigation strategies.

Photo: Grey-headed Flying-fox (listed as Vulnerable under EPBC Act (Cth))

Photo: Plectranthus habrophyllus (listed as Endangered under EPBC Act (Cth))

Photo: Koala (listed as Vulnerable under EPBC Act (Cth) and NCA (Qld))

Extract: **Spring Mountain Estate Preicnct Plan** *- V17 at Springfield Rise*

04 ECOLOGICAL VALUES - SUMMARY

Ecological Values

Numerous ecological surveys were undertaken over the site as part broader concept planning for the Spring Mountain project. In addition, pre-clearance flora and fauna surveys for V17 were undertaken by Saunders Havill Group and Queensland Fauna Consultants, respectively. The following comments summarise the ecological values of the V17 site:

- The majority of the V17 site is mapped as containing vegetation comprised of composite Of Concern RE12.9-10.2/12.9-10.7/12.9-10.19. A small portion is mapped as Least Concern RE12.9-10.17a along the waterway.
- The V17 site adjoins the 293ha of Springfield Conservation Land to the west. This land has been legally secured on title under a Voluntary Decrationation for the purpose of Conservation. In collaboration with Lendlease Communities and Ipswich City Council, the Consevration Land is undergoing weed and pest management and assited regeneration to improve the ecological value of the land which forms part of the Flinders - Karawatha Bioregional Corridor. The land will provide significant values for protected and local flora and fuana species.
- Vegetation throughout the V17 site is dominated by Eucalypt and Corymbia species with weeds largely confined to the shrub and ground layers.
- Gully lines were infested with weeds, particularly Lantana camara (Lantana) up to 2m in height. The V17 area ajoins Tully Gully to the east which is mapped as a green (low risk) waterway for waterway barrier works by Fisheries however is not a regulated watercourse for thepurposes of the Water Act. Infesstations of Lantana and evidence of scour and sedimentation were noted.
- The ridelines and slopes within the V17 works extent are contained to a mix of Corymbia and Eucalypt species with patches of dense understorey of Acacia species. Rock outcrops were observed along were targeted during the field survey due to these areas being preferred habitat for a a number of the listed flora species including Plectanthus habrophyllus and Masdenia coronata (Slender Milkvine).
- No State or Commonwealth threatened flora or fauna species were identified within the V17 as part of and pre-clear surveys.

Regional Ecosystem Descriptions

Least Concern RE 12.9-10.2

Description	*Corymbia citriodora subsp. variegata open forest or woodland usually with Eucalyptus crebra. Other species such as Eucalyptus tereticornis, Eucalyptus moluccana, Eucalyptus acmenoides and Eucalyptus siderophloia may be present in scattered patches or in low densities. Understorey can be grassy or shrubby. Shrubby understorey of Lophostemon confertus (whipstick form) often present in northern parts of bioregion. Occurs on Cainozoic and Mesozoic sediments.*

Of Concern RE 12.9-10.7

Description	*Eucalyptus crebra +/- Eucalyptus tereticornis, Corymbia tessellaris, Angophora leiocarpa, Eucalyptus melanophloia woodland. Occurs on Cainozoic and Mesozoic sediments.*

Least Concern RE 12.9-10.19

Description	*Eucalyptus fibrosa subsp. fibrosa woodland +/- Corymbia citriodora subsp. variegata, E. acmenoides or E. portuensis, Angophora leiocarpa, E. major. Understorey often sparse.*

Least Concern RE 12.9 -10.17a

Description	*Lophostemon confertus or Lophostemon suaveolens dominated open forest usually with emergent Eucalyptus and/or Corymbia species. Occurs in gullies and southern slopes on Cainozoic and Mesozoic sediments.*

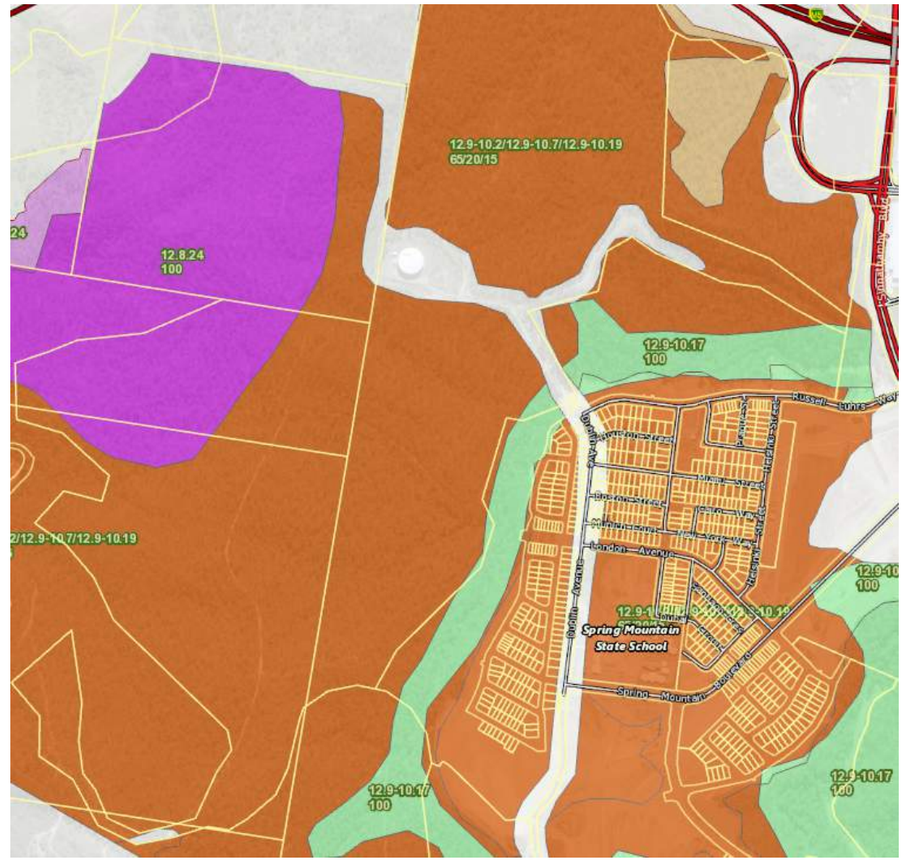


Photo: *Image Captuure Qld Globe (2019) Regional ecosystems mapping.*

Photo: *Ridgelines continaing large Corymbia and Eycalypt species*

Photo: *Gully infested with Lantana camara.*

Photo: *Tracks and disturbed areas.*

05 ENVIRONMENTAL MANAGEMENT

Management – General

This SMBP sequences through details on a number of site specific outcomes for fauna, vegetation management and operational controls associated with V17. Logically, the document works through construction processes and has been prepared as a sub-plan to the SBMP for Spring Mountain prepared by Yurrah.

Environmental Training

This SBMP is to be issued to all site contractors (and sub-contractors) and kept within site construction offices. Elements of compliance with the document will form part of the responsibility of the Principle Site Contractor. Training on the management measures outcomes in this SBMP will occur as part of the broader site environmental management and workplace health and safety procedures. This will include the following steps:

1. Copy of the SBMP made available to all site contractors (and sub-contractors)
2. Outline of the SBMP and its requirement relative to the site and / or particular scope of a contract forming part of the site induction requires contractors to read, acknowledge and sign the document prior to commencement of site works.
3. Requirements of the SBMP to be incorporated into workplace checklists, work method statements and toolbox talks.
4. Weekly review and report on compliance with the SBMP by the Principle Contractor.

Spring Mountain Risk Management Process

Adaptive Management

Adaptive management refers to a way of managing natural resources where management actions are regularly revised and, if necessary, modified based on monitored changes in environmental condition and/or changes in base knowledge which underpins the original management approach. This SBMP has been based on, as far as practical, the current state of knowledge of the species ecology and best practice habitat management approaches. When new facts emerge from future research, they should be immediately integrated into the plan so it remains consistent with the current state of knowledge (and best practice).

Statutory Requirements

Activities associated with this SBMP will comply with the relevant provisions of legislation and regulations and policies of the following:

- ***Environment Protection and Biodiversity Conservation Act 1999*** *(Cth)* with regard to species listed under the provisions of this Act;
- ***Nature Conservation Act 1992*** *(Qld)* with regard to species listed under the provisions of this Act;
- ***Biosecurity Act 2014*** with regard to weeds and pests; and
- The requirements of the Commonwealth, State and /or Local Government decision notices including any relevant "conditions of approval".

Roles and Responsibilities

Proponent	**Lendlease Communities Pty Ltd**	**Lendlease Communities Pty Ltd** Contact: Graeme Knox
Contractor	Appointed party or company that performs the construction works on site and included all employees of the Contractor and sub-contractors.	**Shadforth Civil** Contact: Tony Hopper
Site Supervisor	Appointed party contracted by the Proponent to oversee daily site operations and site management.	**Arcadias** Contact: Christo Louw
Environmental Representative	Appointed party contracted by the Proponent to oversee environmental compliance.	**Saunders Havill Group** Contact: Murray Saunders
Fauna/Spotter Catcher	Appointed Contractor employed to implement fauna welfare responsibilities with vegetation clearing operations. The Fauna Spotter Catcher is a person who holds a rehabilitation permit with an extended authority issued by **EHP** specifying the gilder may take, keep or use an animal whose habitat is about to be destroyed by a human activity.	**Queensland Fauna Consulting** Contact: Bryan Robinson
Koala Spotter	Appointed Contractor employed to implement Koala welfare responsibilities associated with vegetation clearing operations. The Koala Spotter is a person who holds a tertiary qualification in Biology or Zoology, or who is demonstrably experienced in the identification and location of Koalas in their natural habitat and has an authorisation from **EHP** to conduct such activities. For example, demonstrably experienced may include a Koala keeper employed by a licensed wildlife exhibitor (i.e. zoo) may be capable of demonstrating competence in locating Koalas.	**Queensland Fauna Consulting** Contact: Bryan Robinson
Council	**Ipswich City Council (ICC)**	**Ipswich City Council (ICC)** Contact: Tim Foote

06 PRE-CLEARANCE - VEGETATION MANAGEMENT

P1– Vegetation Management (General)

Vegetation clearing must be undertaken in accordance with approved plans to ensure protection of areas of ecological significance and agreed retained linear open space corridors. Habitat trees where marked for retention must not be damaged as a result of tree clearing and or are to be removed at the specification and control of the appointed Fauna Spotter.

Table 1 describes the relevant management requirements to address this issue.

<u>Objective</u>

1. To identify clearing in the plans and specification, trees to be retained and trees to be cleared. Areas of retention should be clearly marked and fenced.
2. To ensure that all contractors understand the requirements of protection and retention and install protective devices to ensure no additional clearing occurs.
3. To ensure that the work program is such as to minimise the time between when clearing occurs and the cleared ground is stabilised.
4. To ensure that cleared material is mulches or wood-chipped as appropriate for recycling
5. To protect linear open space from construction damage and run-off.

<u>Management Strategy</u>

- Clearing to be undertaken in accordance with measures outlined in the EPBC Management Plans.
- Install stormwater management devices as per approved ESCP

<u>Performance Indicators</u>

- Integrity of protective devices.
- Existing vegetation and trees retained in good health, with no scars from earthworks machinery and no erosion and sediment deposited within linear open space/retention areas.

Clearing activities should be undertaken in accordance with the with all management plan requirements and associated approval conditions. This SMBP shows the clearing extent associated with V17 at Springfield Rise.

Photo: Control clearing of vegetation

Photo: Erosion control to cleared batter

Photo: Tree protection and erosion fence

<u>Table 1: P1: Vegetation Management (Clearing and Protection)</u>

Issue	Vegetation Management – Clearing and Protection	Responsible Person	Timing
Implementation Requirements	Ensure protective devices are installed and maintained in functional condition.	Contractor	During Clearing & Construction
	Monitor and report on the success, protection and retention, and integrity of protective devices such as fences and sediment fences through		
Monitoring	Weekly inspection and log.	Contractor	During Clearing & Construction
Reporting	Monthly (until operation).	Contractor	During Clearing & Construction
Corrective Action	Repair, replace or reinstate protective devices.	Contractor	During Clearing & Construction
	Appropriate treat any damage to trees or vegetation marked for retention as required.	Contractor	During Clearing & Construction

06 PRE-CLEARANCE - VEGETATION MANAGEMENT

07 PRE-CLEARANCE - FAUNA MANAGEMENT

P2 – Protection of MNES Fauna (Koala and Grey-headed Flying Fox) and Native Wildlife (Vegetation Clearing)

Clearing of native vegetation has the potential to result in direct injury or death to fauna. Clearing of vegetation for the purposes of preparing development areas also has the potential to result in incidental damage to adjacent habitats to be retained.

Development protocols to respond to injured wildlife must be prepared prior to vegetation clearing operations. It is expected that some of these protocols are likely to be applicable to responses required for all injured fauna (including Koala) and must be included within the Animal Welfare Plan (AWP) to be prepared by the appointed fauna spotter catcher.

Table 2 describes the relevant management requirements to address the protection of terrestrial fauna, specifically Koala, during vegetation clearing and

Objective

1. To minimise and mitigate adverse direct and indirect effects of vegetation clearing on terrestrial including Koala and Grey-headed Flying-fox, during clearing and construction.
2. Prevent mortality or injury to terrestrial wildlife, specifically Koala.

Management Strategy

- Prevent damage and/or disturbance to native vegetation and associated habitats outside clearing areas.
- Clearing and construction operations are employed to maximise animal welfare and reduce fauna mortality.
- Informal all personnel of site environmental responsibility.
- Reuse hollows and large rocks for habitat in retained habitat areas/linear open space.
- Safe fauna movement opportunities are provided within linear open space to prevent fauna moving through construction areas.
- Direct clearing activities from open area to less open areas allowing fauna to natural seek shelter in conservation land and linear open space/retained habitat
- Provision of permanent and temporary fencing in accordance with the V17 SBMP
- Undertake works in accordance with the V17 SBMP & direction of the apporinted fauna spotter catcher.

Performance Indicators

- Prevent fauna mortality and disturbance to terrestrial fauna.
- No injury or death of Koala.
- No damage to linear open space/retained habitat.
- No disturbance to native vegetation outside permitted clearing footprints.

Fauna Management

Lendlease Communities Pty Ltd commits to the use of leading practice methods and processes for the role of Wildlife Spotter Catchers in the engagement of any contractors for native vegetation clearing works. The standards and requirements outlined in this Specification Note are acknowledged as above minimum requirements in most Local Government areas and are applicable despite lessor requirements listed within individual project approval packages.

As a minimum specification Wildlife Spotter Catchers will retain the following Queensland State Government Permits:

1. Animal Ethics
2. Scientific Purposes Permit
3. Scientific User Registration
4. Damage Mitigation Permit
5. Rehabilitation Permit

Wherever practical all clearing works will be coordinated in general accordance with applicable site based components of the DRAFT Code of Practice for the welfare of animals affected by land-clearing and other habitat impacts prepared by the Australia Zoo Wildlife Warriors and Voiceless (and or any contemporary Industry based final version of this Draft Code). This includes mandatory controls on the timing and sequencing of clearing works integrated with a regimented series of fauna management protocols implemented by registered Fauna Spotter / Catchers. The following procedural stages listed in the Draft Code are to be applied to clearing works on all Lendlease Communities Pty Ltd projects:

Action 1 – Engagement Wildlife Spotter Catcher

Action requires that the developer (and or the developer's representative through the principal contractor) engage a Wildlife Spotter Catcher with full registrations and licences provided in accordance with the Queensland Government's National Parks and Wildlife Services. A Registered Wildlife Spotter Catcher engaged shall have the minimum permits listed in this specification.

Action 2 – Wildlife Spotter Catcher to Prepare a Wildlife Protection and Management Plan (WPMP)

The WPMP should be submitted to the Queensland Department of Environment and Science (DES) or relevant authority and or stakeholder. The WPMP should include the following information:

- Description of the project with reference to impacts on wildlife or wildlife habitat;
- Pre development plan of the site showing habitat areas, features, corridors, riparian habitats and adjacent areas;
- Results of any fauna surveys including pre-clearance surveys; and
- A wildlife and habitat impact assessment based on the proposed development works.

Action 3 – Prepare a Wildlife and Habitat Impact Mitigation Plan

Following completion and endorsement of the WPMP the Wildlife Spotter Catcher should prepare a more specific Wildlife and Habitat Impact Mitigation Plan, which will include details on:

- Measures required to be completed to minimise wildlife and habitat impacts during operational works;
- Wildlife capture and removal plan;
- Contingency plan for wildlife requiring euthanasia, other veterinary procedures or captive care;
- Wildlife storage and housing plan;
- Wildlife release and disposal plan; and
- Post works measures to minimise impacts on wildlife.

Prior to the commencement of any construction works, a pre-start meeting is to be held between the project manager, site fore-person, plant operators and applicable Local and State Government representatives. At the pre-start meeting, the Wildlife Spotter Catcher is to outline the clearing process and the requirements of the WPMP.

Action 4 – Wildlife Spotter Catcher Role at Pre-Start Meeting

Prior to the commencement of any construction works, a pre-start meeting is to be held between the project manager, site fore-person, plant operators and applicable Local and State Government representatives. At the pre-start meeting, the Wildlife Spotter Catcher is to outline the clearing process and the requirements of the WPMP.

Action 5 – During Construction

The Wildlife Spotter Catcher is to be on-site during all phases of construction which involve potential impacts on wildlife or habitat (unless otherwise specified by the appointed Wildlife Spotter Catcher. This will enable to the Wildlife Spotter Catcher to make any necessary adjustments to the approved Clearing Management Plans and WPMP to cater for any specific issues encountered during the clearing works.

Action 6 – Post Works Reporting

During the course of all site works, including the pre-clearance surveys, the Wildlife Spotter Catcher is to keep an accurate record of all animals encountered, captured, incidents and disposals for each stage of the project. The records should form part of the Wildlife Management Report to be issued under licence requirements to the State Government. The Wildlife Management Report should consist of the following 3 sections, where they are applicable to the project:

1. *Wildlife Habitat Management Plan* – Aspects of the planning, design, construction and ongoing operation of the project in which risks to wildlife have been identified. This plan should also include recommendations and outline the type, frequency and timeframes for monitoring

2. *Wildlife Capture and Disposal Plan* – Should contain the following details for each captured animals:
   a. Species
   b. Identification name or number
   c. Sex (M, F or unknown)
   d. Approximate Age or Age Class (neonate, juvenile, sub-adult, adult)
   e. Time and date of capture
   f. Method of capture
   g. Exact point of capture (GPS coordinates)
   h. State of health
   i. Incidents associated with capture likely to affect health
   j. Veterinary intervention or treatments
   k. Time held in captivity
   l. Disposal method (euthanasia, translocation, re-release)
   m. Date and time of disposal
   n. Detailed of disposal (GPS points of release)
   o. For released animals, location relative to point of capture

3. *Animal Injury and Euthanasia Report* –similar details for the Wildlife Capture and Disposal Plan should be included in this report.

07 PRE-CLEARANCE - FAUNA MANAGEMENT

Koala Management & Welfare

While clearing activities aim to protect and minimise impacts to all terrestrial fauna, specific management measure for Koala are required as part of the EPBC approval and have been specified within the Fauna Management Plan, prepared by Saunders Havill Group which should be read in conjunction with the plan.

- Koalas on site are protected
- Koala habitats are protected, maintained and their integrity enhanced.
- The abilities for Koalas to move into, within and out of the sit e is maintained.
- All persons involved in construction and operation of the development are aware of the site values, their potential to impact on Koalas and their habitats, and their responsibilities in regard to procedures and strategies within approved management plans.

Koala Signage

Significant Tree Protection Fencing

Fauna Spotter During Tree Clearing

Fauna Spotters Retrieving Fauna

Fauna Exclusion Fencing

Fauna Signage

Fauna Exclusion Fencing

Construction fencing detail

Table 2: P2 – Protection of MNES Fauna and Native Wildlife (Vegetation Clearing)

Table 2: P2 – Protection of MNES Fauna and Native Wildlife (Vegetation Clearing)

Issue	P2 - Protection of MNES Fauna and Native Wildlife	Responsible Person	Timing
Implementation Requirements	No vegetation removal shall occur until relevant approvals have been obtained All permit conditions will be followed	Proponent	Prior to Clearing
	To prevent damage and / or disturbance to native vegetation and associated habitats outside clearing areas: a. Clearing boundaries will be delineated on all drawings and in the field to define the authorised clearing extent. b. Installation of vegetation clearance markers (e.g. high visibility poly-web fencing) prior to the commencement of vegetation clearance to identify and protect remnant vegetation for retention. c. Along the interface between clearing precincts and open space / Environmental Corridors, trees are to be felled towards the clearing precinct to avoid damage to these areas. d. Clearing vegetation is to be stockpiled so as not to impede damage to drainage channels.	Contractor	Prior to Clearing & During Clearing
	No clearing of vegetation is to commence without the presence of an **EHP** approved Fauna Spotter Catcher, or where clearing includes non-juvenile Koala habitat trees, a Koala Spotter. a. An appointed Site Superintendent will be responsible for ensuring that all trees scheduled for removal will be checked on the day of their removal for the presence of fauna by an **EHP** approved Fauna Spotter Catcher / Koala Spotter as vegetation characteristics dictate. b. The **EHP** approved Fauna Spotter will check and clear vegetation prior to its felling and, if required, will relocate native wildlife (other than Koala) into appropriate habitat areas within the site which are to be retained. In the case of a Koala being present, translocation of the individual/s must occur in accordance with requirements for Koala. c. Hollow-bearing (habitat) trees are to be identified in the field and by plan prior to commencement of clearing operations. These shall be marked and dismantled using a cherry picker and a suitably qualified arborist and Fauna Spotter Catcher. If fauna is present, the tree will either be left standing overnight to allow the animal to leave via their own volition, or will be encouraged from the tree by shaking or other methods deemed suitable by the fauna spotter. Where no signs of fauna are identified, machinery operators will be instructed to fell trees in a manner directed by the fauna spotter to minimise potential risk to fauna.	Fauna Spotter Catcher	Prior to Clearing
	All construction personnel shall attend environmental training as part of the site induction process prior to entering the work site. As part of this training, all personnel will be instructed on their obligations in regard to vegetation clearing protocols and to protect native fauna. Areas identified for vegetation clearance are to be clearly defined and detailed in site inductions.	Contractor	Prior to Clearing
	Conduct vegetation clearing in sequential stages for sites with an area of more than 3 hectares. Vegetation clearing is to conform with the following: d. The direction of clearing should be away from threatening processes or hostile environments, and towards the clearing precinct to avoid damage to adjacent retained habitat links, ensuring that: i. Fauna are not required to cross roads or move through developed areas or disturbed areas. Such as residential areas or areas that require movement of greater than 100m over cleared ground to reach suitable habitat; ii. Fauna area not left occupying an "island" of habitat between hostile environments, such as a road and a cleared area, unless there are no other more suitable habitat areas in which to direct fauna, and iii. Fauna can safely leave the site of clearing and relocate to adjacent habitat.	Contractor	During Clearing

Table 2: P2 – Protection of MNES Fauna and Native Wildlife (Vegetation Clearing)

Issue	P2 - Protection of MNES Fauna and Native Wildlife	Responsible Person	Timing
	e. Cleared vegetation is to be stockpiled so as not to impede fauna movement. f. Where vegetation to be cleared includes non-juvenile Koala habitat trees, implement sequential clearing as per the requirements for Koala.		
	Companion animals (e.g. dogs) are to be banned from all construction areas.	Contractor	At all times
	Vehicle access within retained habitat/linear open space will be limited and appropriately signed.	Contractor	Prior to Clearing & During Clearing
	Conduct vegetation clearing in accordance with Section 4 of the Spring Mountain FMP (prepared by **Saunders Havill Group** dated July 2015) which outlines specific implementation requirements for Koala including clearing in sequential stages for sites. For a site more than 6ha vegetation clearing is to conform with the following: a. Is carried out in a way the ensures Koalas on the area being cleared have enough time to move out of the clearing with without human intervention and involves i. Ensuring not more than 3ha or 3% of the sites area (whichever is greater) in any one stage ii. Ensuring that between each stage and the next there is at least one period of 12 hours at starts at 6pm on a day and ends at 6am on the following day, during which no trees are cleared on the site b. Is implanted in a way that ensures, while clearing is being carried out, appropriate habitat links are maintained within the clearing site and between the site and its adjacent areas allowing Koalas living on the site to move out of the site c. Ensures that no tree in which a Koala is present, or a tree with a crown overlapping a tree in which a Koala is present, is cleared until the tree is vacated by the Koala. d. Ensures that vegetation clearing is directed away from threatening processes, or hostile environments, and towards any retained vegetation or habitat links, ensuring that: i. Koalas are not pressured, through loss of habitat, to cross roads or move through developed or disturbed areas, such as residential areas or areas that require movement of greater than 100m over cleared ground to reach suitable habitat; ii. Koalas are not left occupying an "island" of habitat between hostile environments, such as road and cleared areas, unless there are no other more suitable habitat areas in which direct Koalas; and iii. Koalas can safely leave the site of clearing and relocate to adjacent habitat. e. The Koala spotter is responsible for ensuring, throughout the duration of clearing operations, that no tree in which a Koala is present, or a tree identified as being a risk to Koalas if felled, should not be felled, damaged or interfered with until the Koala has moved from the felling site of its own volitation. f. Where a Koala is present in a tree scheduled for removal, the tree will be marked with distinctive flagging tape (and other advisory means as required) and machinery operators will be briefed on the location of such trees and it will be clearly confirmed with operators that the subject tree(s) are to remain undisturbed until the Koala has moved of its own volition (where the strategy is to allow the Koala to move of its own accord, overnight). On the following day, such trees are to be checked again prior to their removal and, if necessary, the procedure is to be repeated until the Koala has moved g. A Koala spotter is not to be involved in the clearing of vegetation while they are responsible for identify Koalas on site.	Contractor / Fauna Spotter Catcher/ Koala Spotter	During Clearing

07 PRE-CLEARANCE - FAUNA MANAGEMENT

Table 2: P2 – Protection of MNES Fauna and Native Wildlife (Vegetation Clearing)

Issue	P2 - Protection of MNES Fauna and Native Wildlife	Responsible Person	Timing
	A requirement that a permit to interfere with wildlife from **EHP** will be mandatory for the wildlife handing activities as will the appropriate Animal Ethics Permit from **DAF**. Construction personnel shall not attempt to handle any wildlife. a. Fauna / Koala handling and relocation activities must only be undertaken by those identified on a current site-specific Damage Mitigation Permit (Removal and Relocation of Wildlife) from **EHP**. b. Koala Spotter/Fauna Spotter Catchers are required to relocate injured wildlife to the nearest designated veterinary clinic of wildlife hospital. Full contacts will be provided within the AWP. c. A register of fauna incidents / interactions is to be maintained daily during clearing operations.	Fauna Spotter Catcher/Koala Spotter	During Clearing & Construction
	The timing of vegetation clearance should be selected in order to minimise impacts (direct and indirect) to affected fauna habitats during optimum breeding period.	Contractor	During Clearing
	Avoid clearing of vegetation between the hours of 6pm and 6am.	Contractor	During Clearing
Monitoring	For each day of native vegetation clearing operations, a daily audit log is to be completed by the Contractor either prior to, or on completion of daily operations. Audit of key requirements, e.g. clearing contained within designated limits, integrity of clearing boundary devices, no damage to vegetation outside clearing boundary, Fauna Spotter Catcher present.	Contractor	During Clearing
Reporting	Animal Welfare Plan is prepared prior to clearing operations by the appointed Fauna Spotter Catcher.	Proponent / Fauna Spotter	Prior to Clearing
	Weekly report by the Fauna Spotter Catcher/ Koala Spotter to the Contractor on the clearing of any native vegetation and any animals encountered, injured or relocated is to be submitted.	Contractor	During Clearing
	Monthly report by the Contractor the Site Superintendent on native vegetation operations, including compliance, non-compliance incidents (fauna injury and responses) and corrective actions, outcomes of Fauna Spotter Catcher activities.	Contractor	During Clearing & Construction
	Bi-annual report by the Site Superintendent to the Proponent. Report to consider incident patterns, if any, and provide recommended solutions and a description of the corrective actions taken.	Contractor	During Clearing & Construction
	Annual site audit by the Environmental Representative and report to the Proponent	Environmental Representative	During Clearing & Construction
Corrective Action	In the event that monitoring identifies practices inconsistent with the strategies developed for this FMP, the Contractor shall take the necessary corrective steps and note them in the monthly report to be reviewed by the Site Superintendent.	Contractor	During Clearing & Construction
	In the event that monitoring identifies practices inconsistent with the strategies developed for this SBMP, the Contractor shall take the necessary corrective steps and note them in the monthly report to be reviewed by the Site Superintendent	Contractor	During Clearing & Construction

08 FAUNA MANAGEMENT - CONSTRUCTION

P3 – Maintenance of Safe Wildlife Movement Opportunities (Site Preparation Operations)

The following suite of best practice measures will be employed throughout the site to minimise fauna habitat fragmentation, facilitated fauna movement and reduce related injury and mortality. Management requirements are considered in the context of:

- Site preparation operations (i.e. during vegetation clearing and earthworks phases); and
- Design treatments and strategies for the built phase of the development

Table 3 describes the relevant management requirements in regard to site preparation operations. The following should be read in conjunction with the requirements for Koala design treatments and strategies for the built phase of the development.

Retention and rehabilitation of the 293ha of offset land for Conservation to the south, will occur as a result of the Spring Mountain development to maintain fauna movement and connectivity within and between the development site.

Objective

1. To avoid the impact of habitat fragmentation by roads and maintain safe movement opportunities for native wildlife (including Koala and Grey-headed Flying-fox) between linear open space.
2. To maintain fauna movement opportunities within retained habitat areas and minimise fauna movement opportunities through site preparations.

Management Strategy

- Develop a track plan for retained habitat areas/linear open space which allows fauna movement to be maintained
- Restrict access to retained habitat areas/linear open space for environmental management only.
- Reduce road speeds
- Increase driver awareness and education

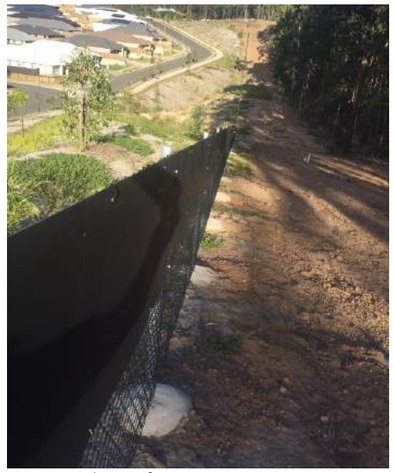
Performance Indicators

- Minimal fauna mortality.

Temporary Fencing

Prior to the commencement of vegetation clearing a temporary fauna exclusion fence will be erected around the area of clearing and works and be maintained until the completion of major civil works. The purpose of the fence is to minimise any native fauna (including koala) from entering into the clearing and or post clearing construction zone during a time when potential risks of impact are at their highest.

The fencing proposed is a "floppy-top" temporary fauna exclusion fencing as per the details and photos shown on this drawing sheet. This fencing type is preferred as it continues to allow any fauna within the impact zone to exit, however prevents new or re-entry once the fence is erected. The fencing type can also be erected along random alignments and relocated to new areas as the clearing areas expand in future clearing and development events. This fencing type has been successfully used as a temporary barrier on other koala related projects within the vicinity of major roads and housing areas.



Fauna exclusion fencing

Table 3: P3 – Maintenance of Safe Fauna Movement Opportunities – Site Preparation Operations

Table 3: P3 – Maintenance of Safe Fauna Movement Opportunities – Site Preparation Operations

Issue	P2 – Maintenance of Safe Fauna Movement Opportunities – Site Preparation Operations (Roads and Vehicle Interactions)	Responsible Person	Timing
Implementation Requirements	A site access plan is to be developed for the Environmental Corridors.	Proponent	Prior to Clearing
	Site protocols are to be established which restrict authorised area access to the approved track network identified with the plan.	Contractor	Prior to Clearing
	All construction personnel shall attend environmental training as part of the site induction process prior to entering the work site. As part of this training, all personnel will be instructed on their obligations in regard to vehicle movement restrictions and construction speed limits.	Contractor	Prior to Clearing
	Erect temporary exclusion fencing around the area of clearing and works and be maintained until the completion of major civil works.	Contractor	Prior to Clearing
	Vehicle movements outside designated operational areas (other than for land management purposes) will be prohibited.	Contractor	During Clearing & Construction
	Road speeds throughout construction areas and through retained habitat areas will be restricted to 50km/hr.	Contractor	During Clearing & Construction
	Strategic use of awareness signage is to be implemented along the interface between operational areas and Environmental Corridors and access restriction signage at all track entry points to Environmental Corridors during construction works.	Contractor	During Clearing & Construction
	Proposed construction access roads will be subject to design treatments to ensure safe fauna crossing opportunities. Construction of an elevated portion (or portions) in the form of bridging structures (culverts) in associated with guide fencing will be incorporated to ensure the provision of safe crossing opportunities.	Contractor	During Clearing & Construction
Monitoring	Weekly inspection and log.	Contractor	During Clearing
Reporting	Monthly report by the Contractor to the Site Superintendent in regard to development / maintenance of structures implemented to facilitate fauna movement, review of fauna / vehicle incident patters, if any, and provide recommended solutions, an a description of corrective actions taken.	Contractor	During Clearing & Construction
	Bi-annual audit report by the Site Superintendent to the Proponent. Report to include compliance with site access restrictions, integrity of structure implemented to facilitate fauna movement, review of fauna/ vehicle incident patterns, if any, and provide recommended solutions, and a description of corrective actions taken.	Contractor	During Clearing
	Annual site audit by Environmental Representative and report to the Proponent.	Environmental Representative	During Clearing & Construction
Corrective Action	In the event that monitoring identifies practices inconsistent with the strategies developed for this SBMP, the contractor shall take the necessary corrective steps and note them in the monthly report to be reviewed by the Site Superintendent.	Contractor	During Clearing & Construction

09 THREATENED FLORA MANAGEMENT

P5 – Threatened Flora Management

Plectranthus habrophyllus, a herb listed as Endangered under the EPBC Act, has been recorded at several locations across the Spring Mountain project site. Core populations have been identifed within Core Conservation areas by Yurrah. The majority of these locations are associated with waterways within linear open space and the habitat is to be protected.

Pre-clearance Survey

In accordance with the EPBC approved Threatened Flora Management Plan, prepared by Yurrah, pre-clearance surveys for each development precinct must occur by a suitable qualified person prior to the commencement of clearing. Any additional individuals must be recorded and translocated where necessary.

Translocation

Where plants are located within the development footprint of near the edge of the footprint, and are at risk of impact, these plants will be translocated to establish a new population in suitable habitat within the proposed Linear Open Space. The habitat for both translocated individuals and in situ individuals will be protected within a Core Conservation Area.

As an added habitat protection measures, Buffer Areas, with an offset width of 20m, will be established around Core Conservation Areas. No Go Zones must be marked out by the 20m buffer around know populations within Core Conservation areas. No work apart from conservation management activities is to be permitted within Core Conservation Areas.

Clearing and Construction

Plectranthus habrophyllus is to be protected from impacts of construction. Stormwater Management Plans, Bushfre Management Plans and Weed Management are to address threatened fora management.

Table 5 describes the relevant management requirements to address this issue.

Objective

1. To encourage the locally resident populations of threatened flora species to increase at a natural rate to a desired level on site.

Management Strategy

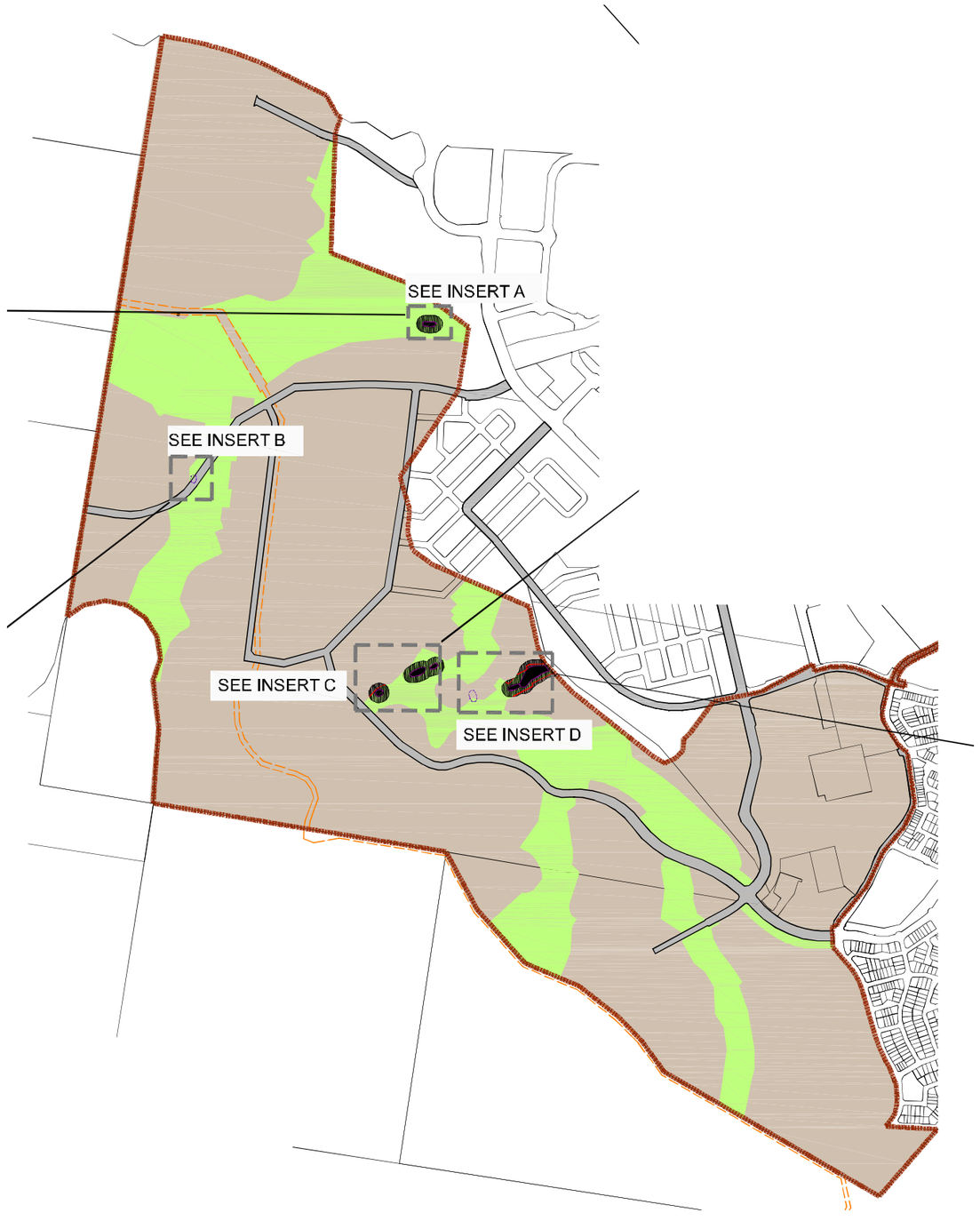
- Threatened flora habitat to be protected through the approved Threatened Flora Management Plan
- Recognise and protect all linear open space through management of interface between linear open space and development for bushfire, weeds and access issues.
- Establish Core Conservation Areas and Buffer Areas at threatened flora locations to target management activities.
- Design a network for fire-trails to defined spatial blocks to prevent damage caused by uncontrolled fire and allow access for maintenance.
- Awareness and education of threatened flora presence.
- Ensure all responsible persons are aware of the significance of this issue and are fully aware of any likely impacts of scheduled works.

Performance Indicators

- 0% weed cover in Core Conservation Areas and Buffers
- No evidence of damage from stormwater run-off construction
- Recruitment of threatened flora seedlings in Core Conservation Area
- No damage from uncontrolled access
- Condition of protective fencing remains undamaged.

It is noted that no potential patches of Plectanthus habrophyllus were identified by Yarrah (2015) within or adjacent to the V17 clearing area. Pre-clearance surveys for Plectanthus habrophyulls were undertaken by Saunders Havill Group for the V17 clearing area and a 20m buffer. No Plectranthus habrophyllus was recored as aprt of pre-clearance surveys.

Photo: Plectranthus habrophyllus (listed as Endangered under the EPBC Act (Cth))



09 THREATENED FLORA MANAGEMENT

Table 5: P5 – Threatened Flora Management

Table 5: P5 – Threatened Flora Management

Issue	P4 Threatened Flora Management	Responsible Person	Timing
Implementation Requirements	Core Conservation Areas located within 20m of land proposed for uses other than conservation, identified as areas for additional interface management including: 1. A detailed survey of threatened plant locations by a registered surveyor. 2. Where interfacing with residential, a fence with a minimum 50% transparency to be erected along interface boundary. Signage to be erected identifying area as 'Significant Ecological Area' and 'Dumping of Rubbish Prohibited' and where further information can be obtained. 3. Where interfacing with road verge or park landscaping, design and plant selection considers and avoids any potential impact upon the threatened flora species. Landscape plant species selected will be non-invasive, existing trees to be retained where possible to maintain microclimate, and clear edge formed that discourages access. Mulch to be preferably sourced from the site and is to be weed free.	Proponent	Design /Prior to Clearing &
	Undertake pre- clearing surveys. 1. Once the line of clearing (including construction of parks, pedestrian tracks and fire trails) is marked out by a registered surveyor, an additional survey for threatened species is to be undertaken within the clearing area, and Linear Open Space within 10m of the clearing line. 2. Additional individuals, or groups of individuals located to be recorded with a GPS, given a unique ID number, and flagged with marking tape. Where necessary individuals will be translocated in accordance with protocols in the Threatened Flora Management Plan. 3. The boundary of the Core Conservation Areas will be adjusted as necessary (if not within construction footprint), to include any additional individuals located during of the pre-clearing survey.	Proponent	Prior to Clearing
	Establish No Go Zones. 1. Core Conservation Areas less than 20m from of the clearing and construction footprint will be identified on construction drawings and through signage on site as 'No Go Zones'. Their associated Buffer Areas will be identified as 'Proceed with Caution Zones'. 2. Work within the Buffer Area will require supervision by the Project Ecologist. 3. No work apart from conservation management activities is to be permitted within the Core Conservation Areas.	Contractor	Prior to Clearing
	Erect exclusion fencing and signage. 1. Where Linear Open Space has not been fenced as part of general vegetation protection, temporary fencing must be installed around the Core Conservation Area, where practical, and necessary (i.e. steep terrain may form natural barrier). The temporary fence shall be a minimum of star pickets with 3 strand wire and high visibility mesh attached to the top wire (with minimum gap of 500mm along the bottom) and erected prior to clearing. 2. The required alignment and extent of the fencing is to be undertaken in consultation by the project ecologist and inspected before the start of clearing. 3. Signage is to be attached to fencing clearly identifying the site as a significant ecological area and a 'No Go Zone', and no entry permitted unless approval given by Proponent. Mapping will be produced identifying location of threatened flora and alignment of protective fencing during detailed design for each Phase of the Spring Mountain	Contractor	Prior to Clearing

09 THREATENED FLORA MANAGEMENT

Table 5: P5 – Threatened Flora Management

Issue	P4 Threatened Flora Management	Responsible Person	Timing
	Stormwater Management controls to be installed through implementation of an Approved Stormwater Management Plan for Spring Mountain. 1. The Stormwater Management Plan will outline management required to ensure water quality and quantity flowing into Core Conservation Areas and all areas of proposed conservation are at predevelopment levels. 2. All stormwater management devices are to be installed and inspected prior to clearing and construction. Stormwater management devices to be regularly checked and maintained to ensure they perform their intended function.	Contractor	Prior to Clearing
	Induct all site workers and visitors in the presence and significance of threatened species on site, and on the management measures being implemented at the present time. All personal associated undertaking works within a Buffer Area are to be made aware of the presence of threatened plants, and are to be educated on protective measures in place, prior to entering area. No personnel to enter Core Conservation Area without approval.	Contractor	Prior to Clearing
	Fire trails will be installed in accordance with the Final Bushfire Management Plan with locked gates and structures to prevent access to vehicles, other than emergency and maintenance vehicles, into all Linear Open Space areas.	Contractor	During Clearing
Monitoring	Core Conservation Areas and Buffers will be monitored on a 3 monthly basis for the first year, and annual thereafter for 2 years subject to satisfactory performance including: ▪ Provide general photographic descriptive record ▪ Establish permanent sample quadrats located in each management block, according to an agreed sample strategy ▪ Confirm the absence of environmental weeds ▪ Measure species richness of the ground layer. ▪ Measure abundance of flowing threatened species. ▪ Measure abundance of threatened species seedlings ▪ General observations.	Contractor	During Construction / Operation
Reporting	Every 3 months by the Environmental Representative to the Proponent for the first year, every 6 months in the second year and once in the third year/	Environmental Representative	During Clearing & Construction
	Annually by the Proponent to the DoE including non-conformances, corrective actions and assessment of monitoring results.	Proponent	During Clearing
Corrective Action	In the event that monitoring identifies practices inconsistent with the strategies developed for this SBMP, the contractor shall take the necessary corrective steps and note them in the monthly report to be reviewed by the Site Superintendent.	Contractor	During Clearing & Construction

10 FLORA AND FAUNA CHECKLIST

Pre-Clearance Checklist:

This Site Based Management Plan (V17) contains only a small portion of information included within existing assessment management plans for Spring Mountain. Subsequently, the volume of requirements remains complex and overlapping. To ensure compliance with approval requirements and provide a record trail for reporting to the Commonwealth Department of the Environment and Energy the following pre-clearance checklist is to be completed with each phase of works.

The checklist is to be completed by the principal contractor and requires sign off by the Environmental Coordinator and Fauna Spotter. To complete the checklist a number of items need to be issued from various parties to the principal contractor (eg confirmation of pre-clearance surveys).

The pre-clearance checklist is established in a format which enables direct annual reporting to the Department of the Environment and Energy and will include a number of attachments.

Springfield RISE
At Spring Mountain

Springfield Rise - Environmental Pre-Start Checklist

Project Area: Village 6					**Date:**
Contractor: Shadforths					**Construction Stage/ Activity:** Early works bulk earthworks
Date work is to start:					
Date work is to cease:					**Compliance**
#	**Control Measure**	**Yes**	**No**	**N/A**	**Comments**
1	Are clearing extents marked out and fenced? (N.B. Fencing is required as per ICC permits unless instructed otherwise by Council, Fauna Spotter or Environmental Coordinator)	✓			Completed by Wolter Consulting on DATE
2	Has the fencing of clearing extents demarcation been inspected by the Environmental Coordinator?	✓			Completed by SHG on DATE
3	Has sign off been provided by the Environmental Coordinator for demarcation areas?	✓			See Attachment 1
4	Has certification for pre-clearance flora been provided? (N.B. Exemptions/permits for protected plants under the NCA must be obtained by EHP where works occur in a High Risk Area). Please provide date and reference.	✓			See Attachment 2. **EHP Reference: AR082999 22 January 2016**
5	Have pre-clearance checks surveys for *Plectanthus habrophyllus* been completed over the clearing area?	✓			Completed by SHG on 8 July 2015. See Attachment 3.
6	Are there 'no-go' zones identified within the clearing area?		✓		
7	If yes, have 'no-go' zones been demarcated, fenced, signed and inspected by the Environmental Coordinator and Contractor?			✓	
8	Has the appointed Fauna Spotter completed pre-clearance surveys and reports?				
9	Has the appointed Fauna Spotter identified any				


saunders havill group


From: FNUM
Sent: Friday, 22 January 2016 3:27 PM
To: Keira Grundy
Subject: RE: AR082999 Exempt Clearing Email Lot 33 on SP269195

Dear Mr Ian Murray,

Applicant: Land Lease Communities (Springfield) Pty Ltd
Exempt clearing notification (protected plants)
Where clearing is to be conducted –
Street Address: Smoothwattle Boulevard, Springfield
Lot/Plan: Lot 22 on SP234042 and Lot 33 on SP269195
EHP Reference: AR082999

Thank you for your email. Please retain this email as acknowledgement of receipt of a protected plant exemption notification submitted under section 262A of the Nature Conservation (Wildlife Management) Regulation 2006. Clearing of a protected plant under this section must be conducted within two years after the flora survey report was submitted to the Department of Environment and Heritage Protection.

It is strongly recommended for audit purposes that you keep this email together with the relevant flora survey trigger map, flora survey report and any other documentation relating to the clearing in question.

Please visit www.ehp.qld.gov.au for information about available online services.

Kind regards
Katrina

Katrina Thiedeman
Administration Officer
Customer Service Team | Regulatory Capability and Customer Service
Department of Environment and Heritage Protection

Queensland Government


QFC

October 2015

Fauna Management and Spotter/Catcher Services Report

Woodlinks Village Stage 1
Collingwood Drive, Collingwood Park
Report prepared for Gary Deeley Constructions Pty Ltd


DOCUMENT REGISTER & TRANSMITTAL RECORD

ARCADIS


Ipswich City Council

SpringField Land Corporation (No 2) Pty Ltd
C/- Caroline CDMS Pty Ltd
PO Box 4480
SPRINGFIELD QLD 4300

11 December 2015

SUSTAINABLE PLANNING ACT 2009

DEVELOPMENT APPLICATION DECISION NOTICE

Application Details

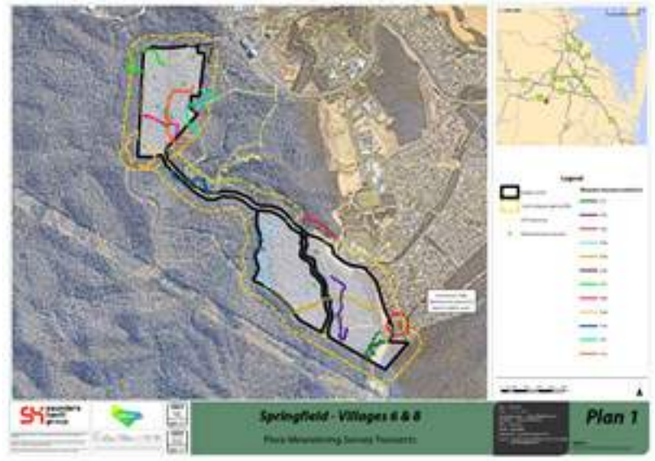
Application No:	6147/2015/ADP
Real Property Description:	Lot 22 SP 234042 PAR STAPYLTON
Property Location:	7001 Smoothwattle Boulevard, SPRING MOUNTAIN, QLD, 4306
Decision Date:	3 December 2015
Decision:	This application is approved subject to the conditions listed below
Decision Authority:	Engineering and Environment Manager

1. Decision Details

Development	Approval Type	Decision	Relevant Period
Bulk Earthworks (Section 2.6)	Development Permit	Approved subject to the conditions set out in Attachment A - Assessment Manager Conditions	Two (2) years

2. Preliminary Approval Affecting the Planning Scheme

Not applicable to this decision.



Appendix I

SAT Results – Year one (1) to Year Seven (7)

Survey Year	SAT site no.	Evidence of koala use (%)	Koala use (high/medium/low)
1	**1**	10.00	Low
1	**2**	13.33	Low
1	**3**	10.00	Low
1	**4**	6.67	Low
1	**5**	6.67	Low
1	**6**	6.67	Low
1	**7**	3.33	Low
2	**1**	0.00	Low
2	**2**	0.00	Low
2	**3**	0.00	Low
2	**4**	0.00	Low
2	**5**	0.00	Low
2	**6**	6.67	Low
2	**7**	0.00	Low
2	**8**	3.33	Low
2	**9**	0.00	Low
2	**10**	0.00	Low
2	**11**	0.00	Low
2	**12**	0.00	Low
2	**13**	3.33	Low
2	**14**	13.33	Low
2	**15**	3.33	Low
2	**16**	0.00	Low
2	**17**	0.00	Low
2	**18**	13.33	Low
2	**19**	3.33	Low
2	**20**	3.33	Low
2	**21**	0.00	Low
2	**22**	0.00	Low
2	**23**	0.00	Low
2	**24**	43.33	High
2	**25**	10.00	Low
2	**26**	3.33	Low
2	**27**	0.00	Low
2	**28**	3.33	Low
2	**29**	0.00	Low

Survey Year	SAT site no.	Evidence of koala use (%)	Koala use (high/medium/low)
2	**30**	3.33	Low
3	**1**	3.33	Low
3	**2**	6.67	Low
3	**3**	13.33	Low
3	**4**	3.33	Low
3	**5**	0	Low
3	**6**	0	Low
3	**7**	13.33	Low
3	**8**	13.33	Low
3	**9**	20	Low
3	**10**	6.67	Low
3	**11**	0	Low
3	**12**	10	Low
3	**13**	33.33	High
3	**14**	0	Low
3	**15**	6.67	Low
3	**16**	10	Low
3	**17**	6.67	Low
3	**18**	0	Low
3	**19**	0	Low
3	**20**	13.33	Low
3	**21**	0	Low
3	**22**	0	Low
3	**23**	0	Low
3	**24**	0	Low
3	**25**	0	Low
3	**26**	3.33	Low
3	**27**	23.33	Medium
3	**28**	3.33	Low
3	**29**	20	Low
4	**1**	0	Low
4	**2**	3.33	Low

Survey Year	SAT site no.	Evidence of koala use (%)	Koala use (high/medium/low)
4	**3**	13.33	Low
4	**4**	0	Low
5	**1**	3.33	Low
5	**2**	10.00	Low
5	**3**	10.00	Low
5	**4**	0	Low
5	**5**	0	Low
5	**6**	6.67	Low
5	**7**	3.33	Low
5	**8**	0	Low
5	**9**	3.33	Low
7	**1**	16.67	Low
7	**2**	0	Low
7	**3**	3.33	Low
7	**4**	0	Low
7	**5**	0	Low
7	**6**	0	Low
7	**7**	10.00	Low
7	**8**	6.67	Low
7	**9**	6.67	Low
7	**10**	20	Medium

Appendix J

Weed Management Plans

Spring Mountain Precinct

AREA 2 WEED MANAGEMENT

ISSUE A 13.11.2017
PRELIMINARY ISSUE

DRAWING SCHEDULE

Dwg No.	Drawing Title	Issue	Date
7243 L 201	Weed Management Plan - Cover Sheet	A	13/11/2017
7243 L 202	Weed Management Plan - Introduction	A	13/11/2017
7243 L 203	Weed Management Plan - Sheet 1	A	13/11/2017
7243 L 204	Weed Management Plan - Sheet 2	A	13/11/2017
7243 L 205	Weed Management Plan - Sheet 3	A	13/11/2017
7243 L 206	Weed Management Plan - Sheet 4	A	13/11/2017
7243 L 207	Weed Management Plan - Sheet 5	A	13/11/2017
7243 L 208	Weed Management Plan - Sheet 6	A	13/11/2017
7243 L 209	Weed Management Plan - Sheet 7	A	13/11/2017
7243 L 210	Weed Management Plan - Sheet 8	A	13/11/2017
7243 L 211	Weed Management Plan - Sheet 9	A	13/11/2017
7243 L 212	Weed Management Plan - Sheet 10	A	13/11/2017
7243 L 213	Weed Management Plan - Technical Notes	A	13/11/2017
7243 L 214	Weed Management Plan - Treatment Techniques	A	13/11/2017
7243 L 215	Weed Management Plan - Treatment Techniques	A	13/11/2017
7243 L 216	Weed Management Plan - Treatment Techniques	A	13/11/2017
7243 L 217	Weed Management Plan - Monitoring & Reporting	A	13/11/2017

saunders havill group
surveying town planning urban design environmental management landscape architecture

Saunders Havill Group Pty Ltd ABN 24 144 972 949
Brisbane Emerald Gladstone
head office 9 Thompson St Bowen Hills Q 4006
phone 1300 123 SHG web www.saundershavill.com

40 YEARS 1975-2015

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These plans have been prepared for the exclusive use of the client. Saunders Havill Group do not accept responsibility for any use of or reliance upon the contents of these drawings by any third party. Confirm all dimensions on site and clarify any discrepancies prior to construction.

APPROVED COMPANY ISO9001 Quality Management Systems QMS Certification Services
APPROVED COMPANY ISO14001 Environmental Management Systems QMS Certification Services

AMENDMENTS:

Issue	Date	Description	Checked
A	13/11/2017	Preliminary Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: AS NOTED

landscape architecture

DRAWING: Area 2 Weed Management Plan Cover Sheet

DATE: November 17 | CHECKED: MS
CLIENT REF.: 7243 | DRAWN: TL
DRAWING No.: 7243 L 201 WMP A

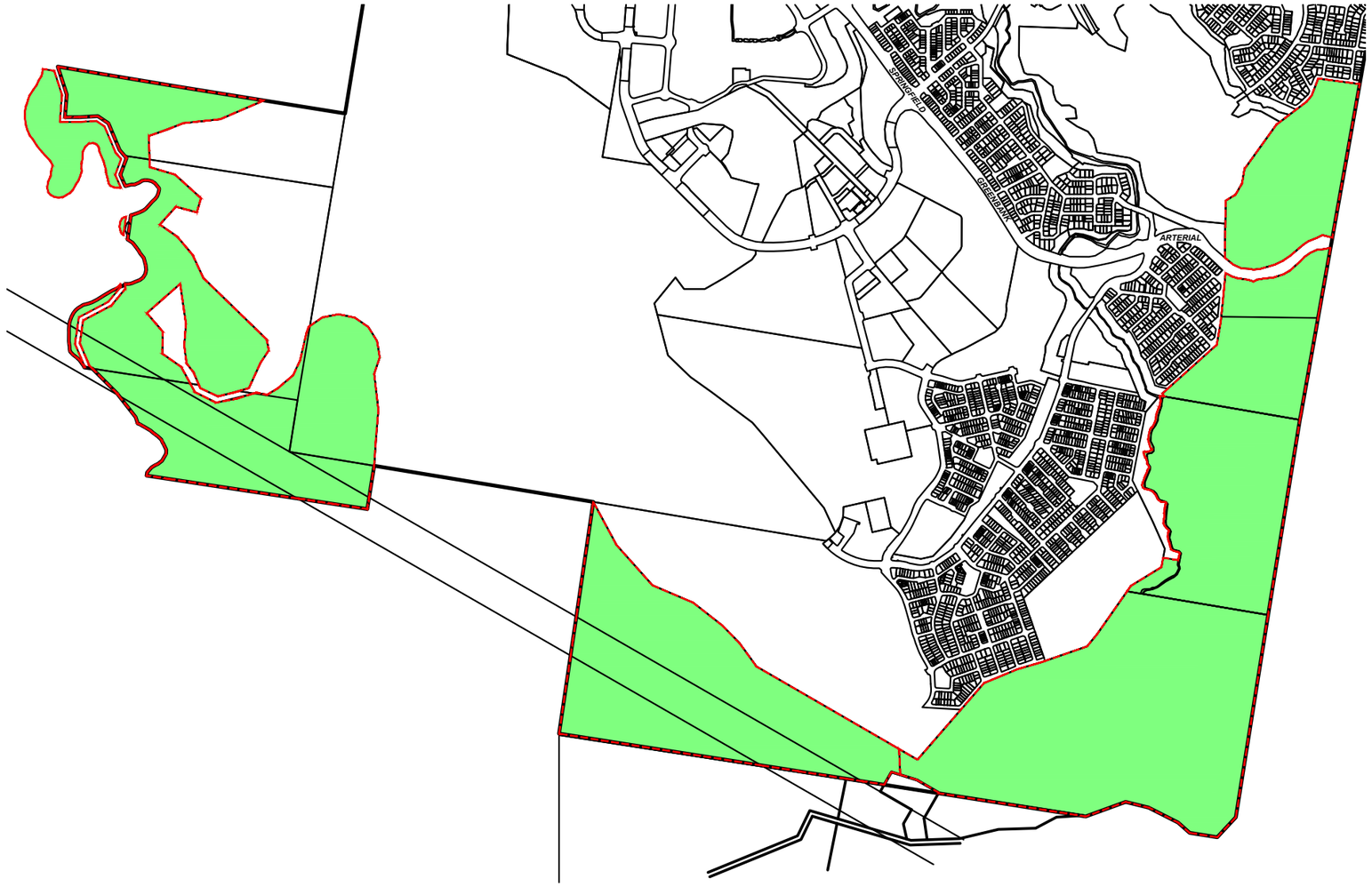
Spring Mountain Precinct

AREA 2 MANAGEMENT PLAN - WEED TREATMENT & REHABILITATION

INTRODUCTION

NOTES

This Weed Management Plan



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AMENDMENTS:

Issue	Date	Description	Checked
A	13/11/2017	Preliminary Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: AS NOTED

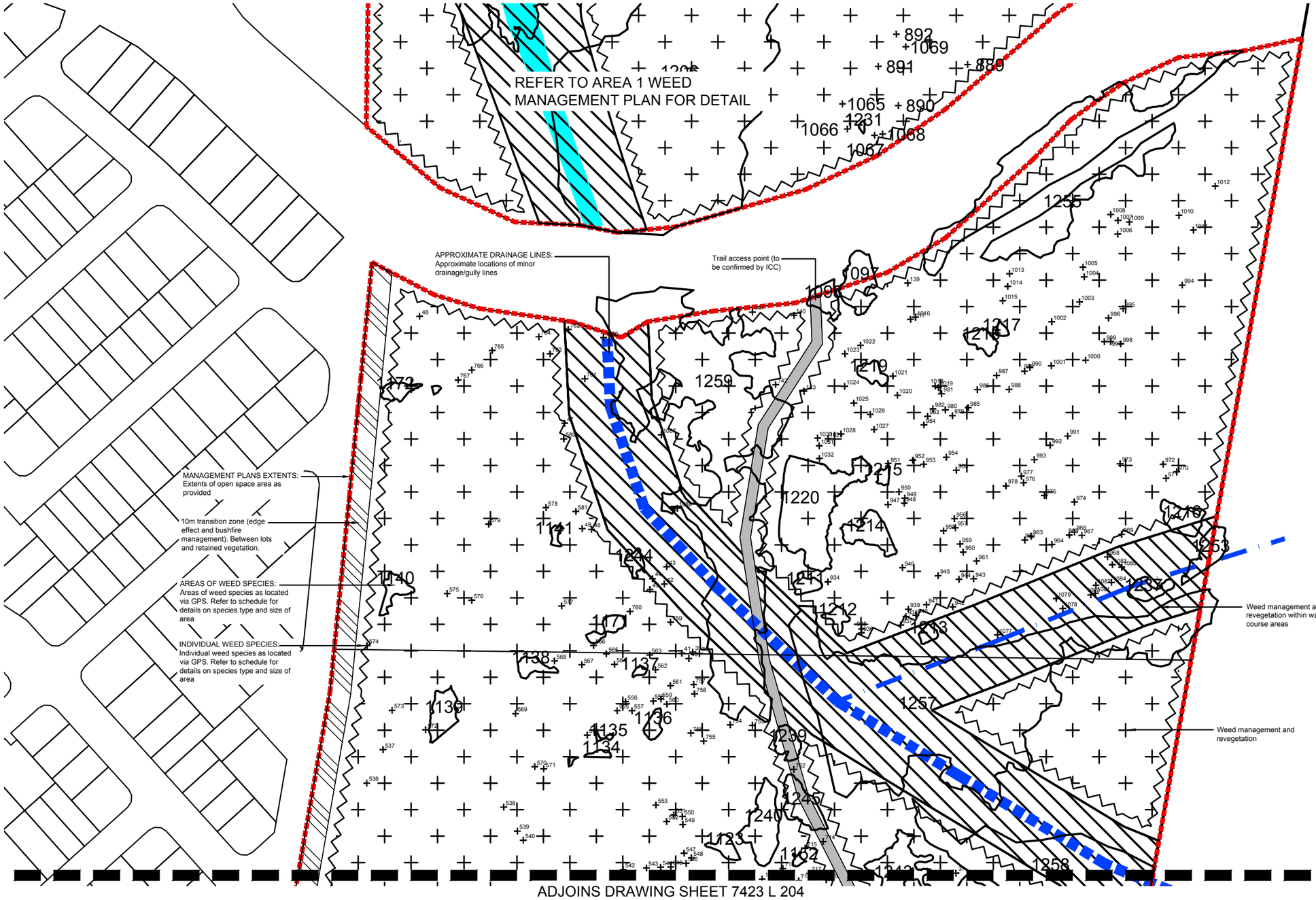
landscape architecture

DRAWING: Area 2 Weed Management Plan Weed Management Notes

DATE:	November 17	CHECKED:	MS
CLIENT REF.:	7243	DRAWN:	TL
DRAWING No.:	7243 L 202 WMP A		

Spring Mountain Precinct

AREA 2 WEED MANAGEMENT PLAN



LEGEND

- Extent of management plan area
- Existing fire trail / maintenance access. As provided by ICC in GIS & Refer to Council's Management Plan
- Approximate minor drainage lines. Minor drainage / gully lines
- Approximate mapped major drainage lines
- Extent of existing lake area
- Weed management and revegetation
- Weed management and revegetation within water course areas
- Individual weed species located via GPS
- Area of weed species located via GPS
- 10m transition zone (Edge effect & bushfire management). Between lots and retained vegetation
- Trail access point (To be confirmed by ICC)

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AMENDMENTS:

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A	13/11/2017	Preliminary Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: 1:1000@A1 1:2000@A3 0 10 20 50m

landscape architecture

DRAWING: Area 2 Management Plan Weed Management - Sheet 1

DATE: November 17	CHECKED: MS
CLIENT REF.: 7243	DRAWN: TL
DRAWING No.: 7243 L 203 WMP A	

Spring Mountain Precinct

AREA 2 WEED MANAGEMENT PLAN

ADJOINS DRAWING SHEET 7423 L 203

REFER TO AREA 1 WEED MANAGEMENT PLAN FOR DETAIL

APPROXIMATE DRAINAGE LINES: Approximate locations of minor drainage/gully lines

Trail access point (to be confirmed by ICC)

MANAGEMENT PLANS EXTENTS: Extents of open space area as provided

10m transition zone (edge effect and bushfire management). Between lots and retained vegetation.

AREAS OF WEED SPECIES: Areas of weed species as located via GPS. Refer to schedule for details on species type and size of area

INDIVIDUAL WEED SPECIES: Individual weed species as located via GPS. Refer to schedule for details on species type and size of area

Weed management and revegetation within water course areas

Weed management and revegetation

ADJOINS DRAWING SHEET 7423 L 205

LEGEND

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A	13/11/2017	Preliminary Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: 1:1000@A1 1:2000@A3 0 10 20 50m

landscape architecture

DRAWING: Area 2 Management Plan Weed Management - Sheet 2

DATE: November 17 CHECKED: MS

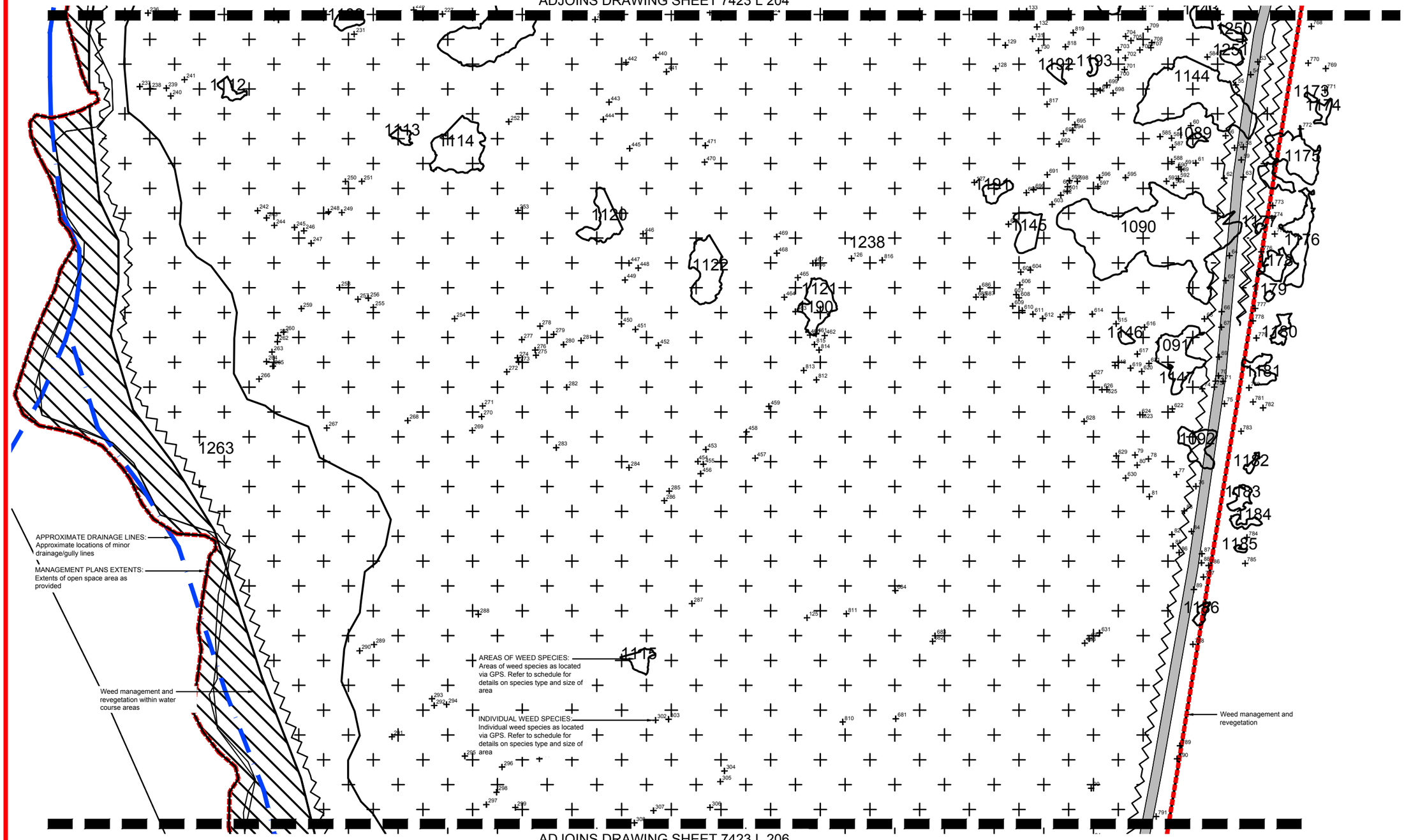
CLIENT REF.: 7243 DRAWN: TL

DRAWING No.: 7243 L 204 WMP A

Spring Mountain Precinct

AREA 2 WEED MANAGEMENT PLAN

ADJOINS DRAWING SHEET 7423 L 204



ADJOINS DRAWING SHEET 7423 L 206

LEGEND

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- Existing fire trail / maintenance access. As provided by ICC in GIS & Refer to Council's Management Plan
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AMENDMENTS:

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A	13/11/2017	Preliminary Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: 1:1000@A1 1:2000@A3 0 10 20 50m

landscape architecture

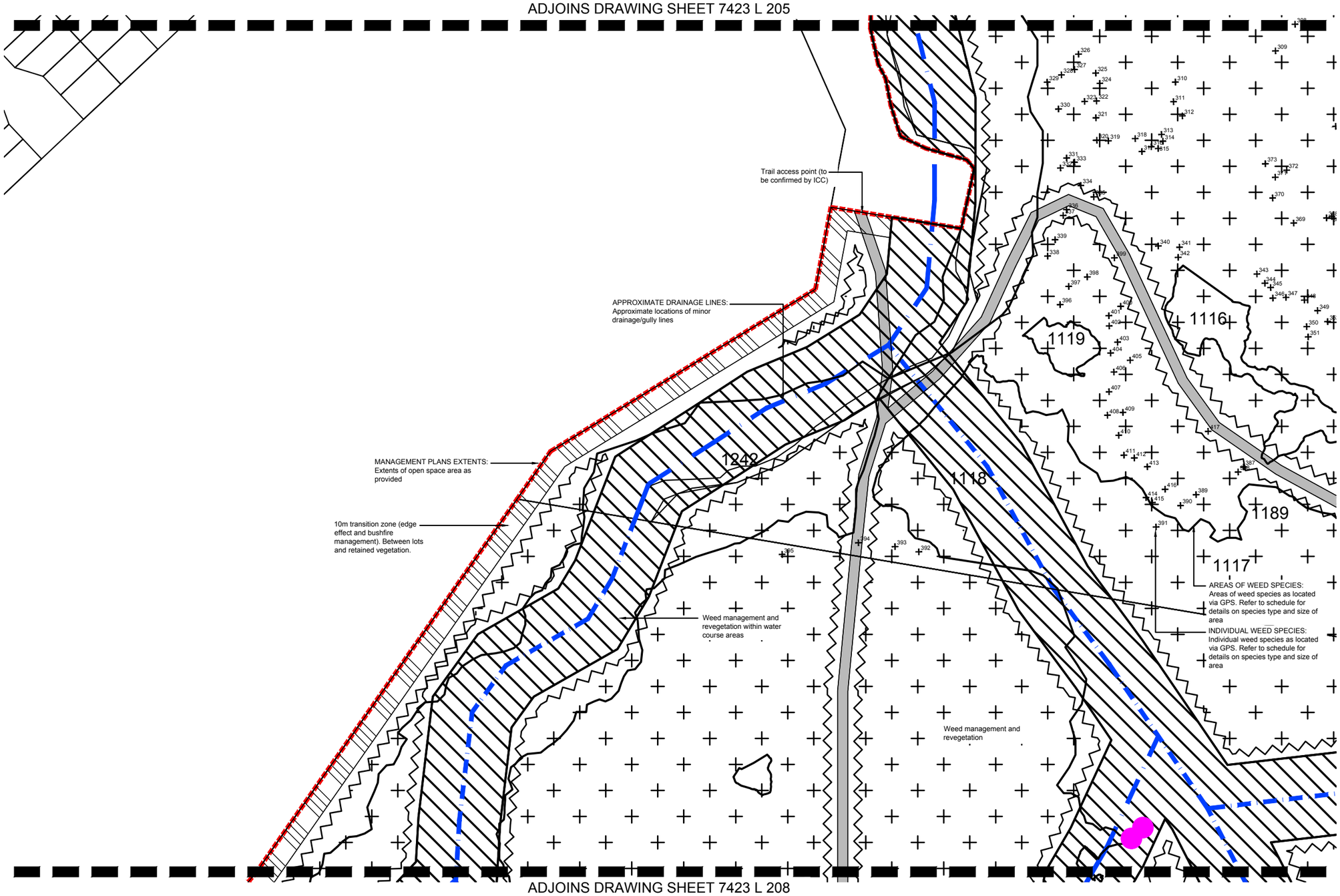
DRAWING: Area 2 Management Plan Weed Management - Sheet 3

DATE: November 17	CHECKED: MS
CLIENT REF.: 7243	DRAWN: TL
DRAWING No.: 7243 L 205 WMP A	

Spring Mountain Precinct

AREA 2 WEED MANAGEMENT PLAN

ADJOINS DRAWING SHEET 7423 L 205



ADJOINS DRAWING SHEET 7423 L 208

LEGEND

- Extent of management plan area
- Existing fire trail / maintenance access. As provided by ICC in GIS & Refer to Council's Management Plan
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AMENDMENTS:

Issue	Date	Description	Checked
A	13/11/2017	Preliminary Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: 1:1000@A1 1:2000@A3 0 10 20 50m

landscape architecture

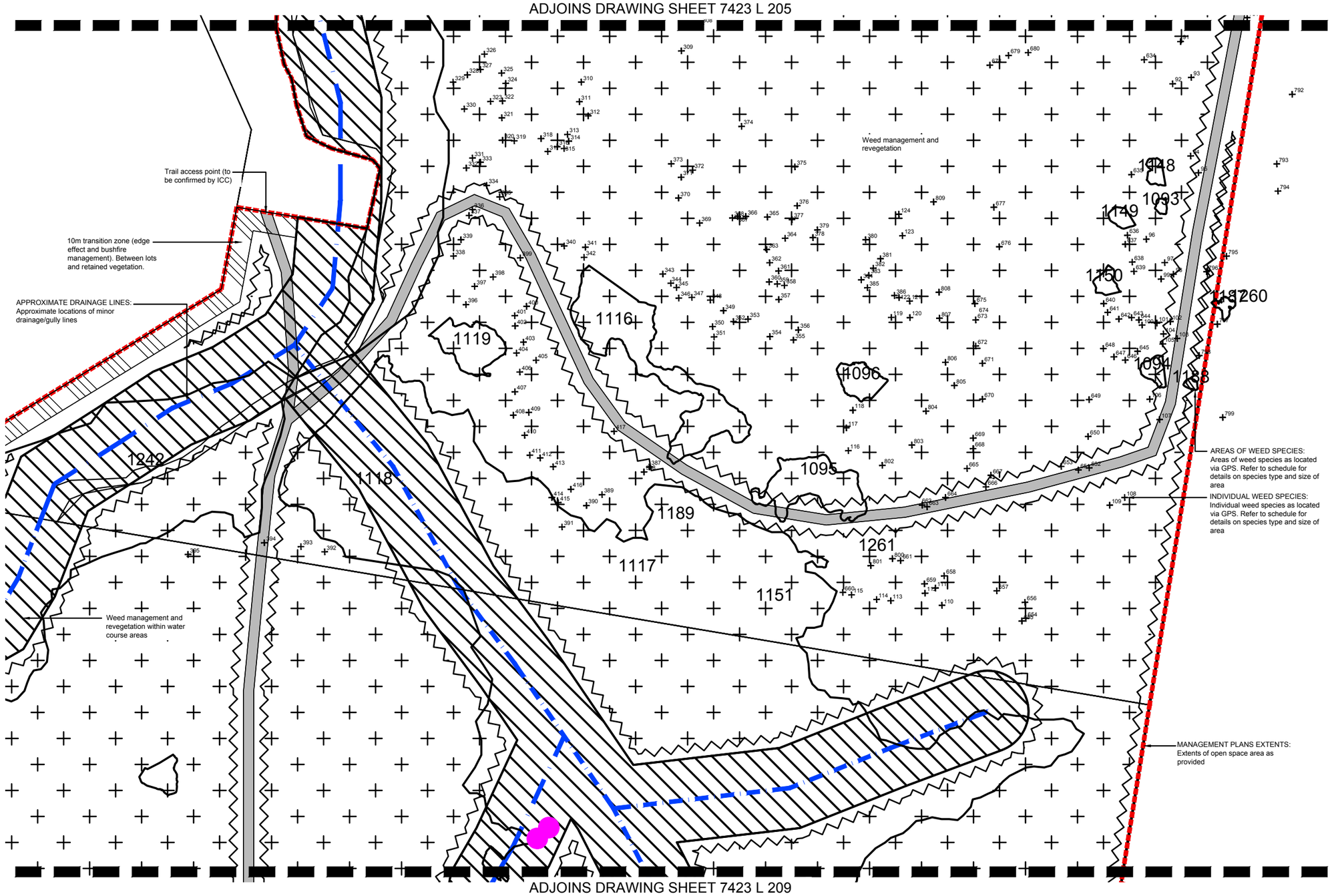
DRAWING: Area 2 Management Plan Weed Management - Sheet 4

DATE: November 17	CHECKED: MS
CLIENT REF.: 7243	DRAWN: TL
DRAWING No.: 7243 L 206 WMP A	

Spring Mountain Precinct

AREA 2 WEED MANAGEMENT PLAN

ADJOINS DRAWING SHEET 7423 L 205



ADJOINS DRAWING SHEET 7423 L 209

LEGEND

- Extent of management plan area
- Existing fire trail / maintenance access. As provided by ICC in GIS & Refer to Council's Management Plan
- Approximate minor drainage lines. Minor drainage / gully lines
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A	13/11/2017	Preliminary Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: 1:1000@A1 1:2000@A3 0 10 20 50m

landscape architecture

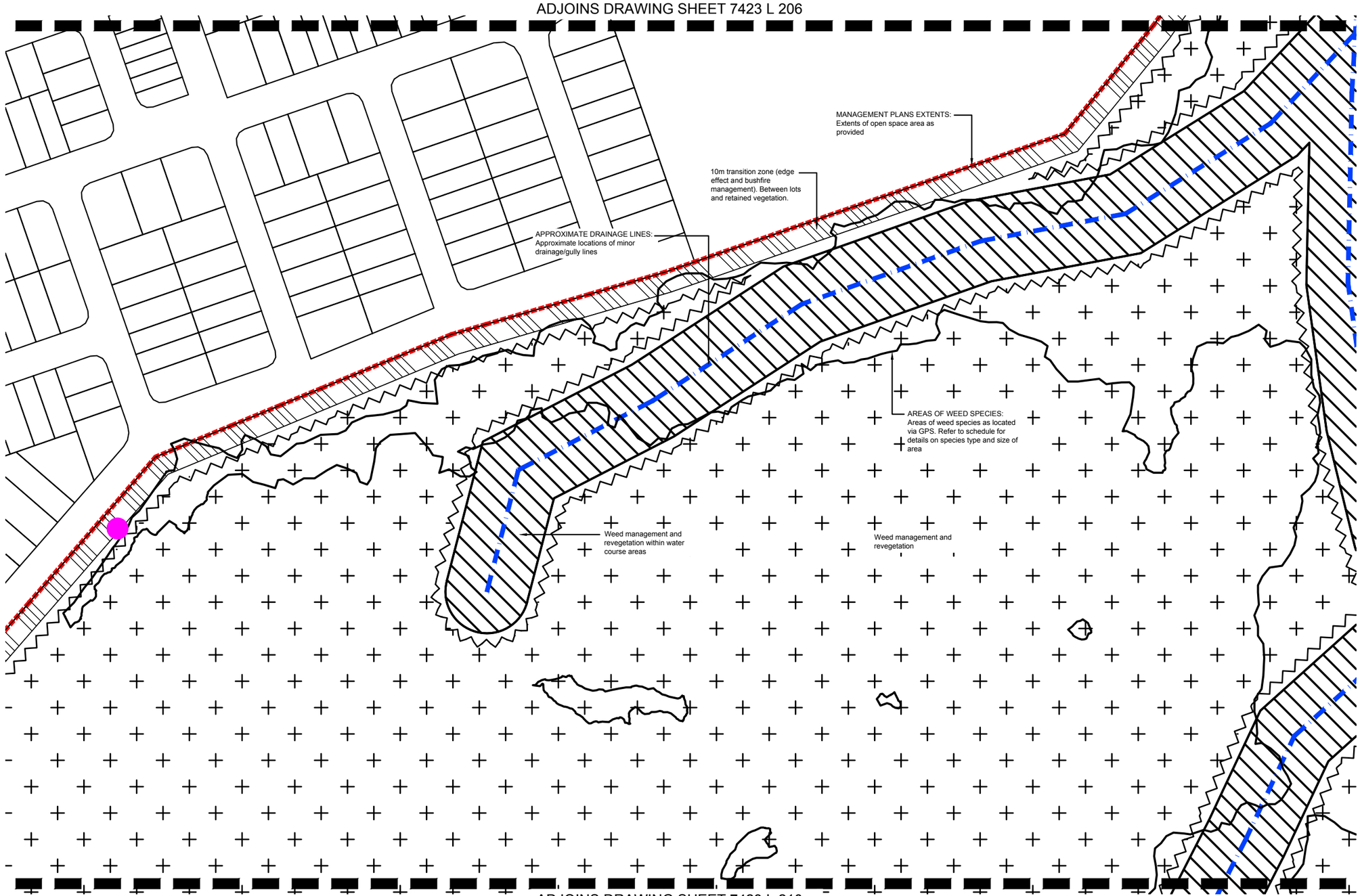
DRAWING: Area 2 Management Plan Weed Management - Sheet 5

DATE: November 17	CHECKED: MS
CLIENT REF.: 7243	DRAWN: TL
DRAWING No.: 7243 L 207 WMP A	

Spring Mountain Precinct

AREA 2 WEED MANAGEMENT PLAN

ADJOINS DRAWING SHEET 7423 L 206



ADJOINS DRAWING SHEET 7423 L 210

LEGEND

- Extent of management plan area
- Existing fire trail / maintenance access. As provided by ICC in GIS & Refer to Council's Management Plan
- Approximate minor drainage lines. Minor drainage / gully lines
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- Weed management and revegetation within water course areas
- Individual weed species located via GPS (1036+)
- Area of weed species located via GPS (1226+, 1200)
- 10m transition zone (Edge effect & bushfire management). Between lots and retained vegetation
- Trail access point (To be confirmed by ICC) (824+)

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CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: 1:1000@A1 1:2000@A3 0 10 20 50m

landscape architecture

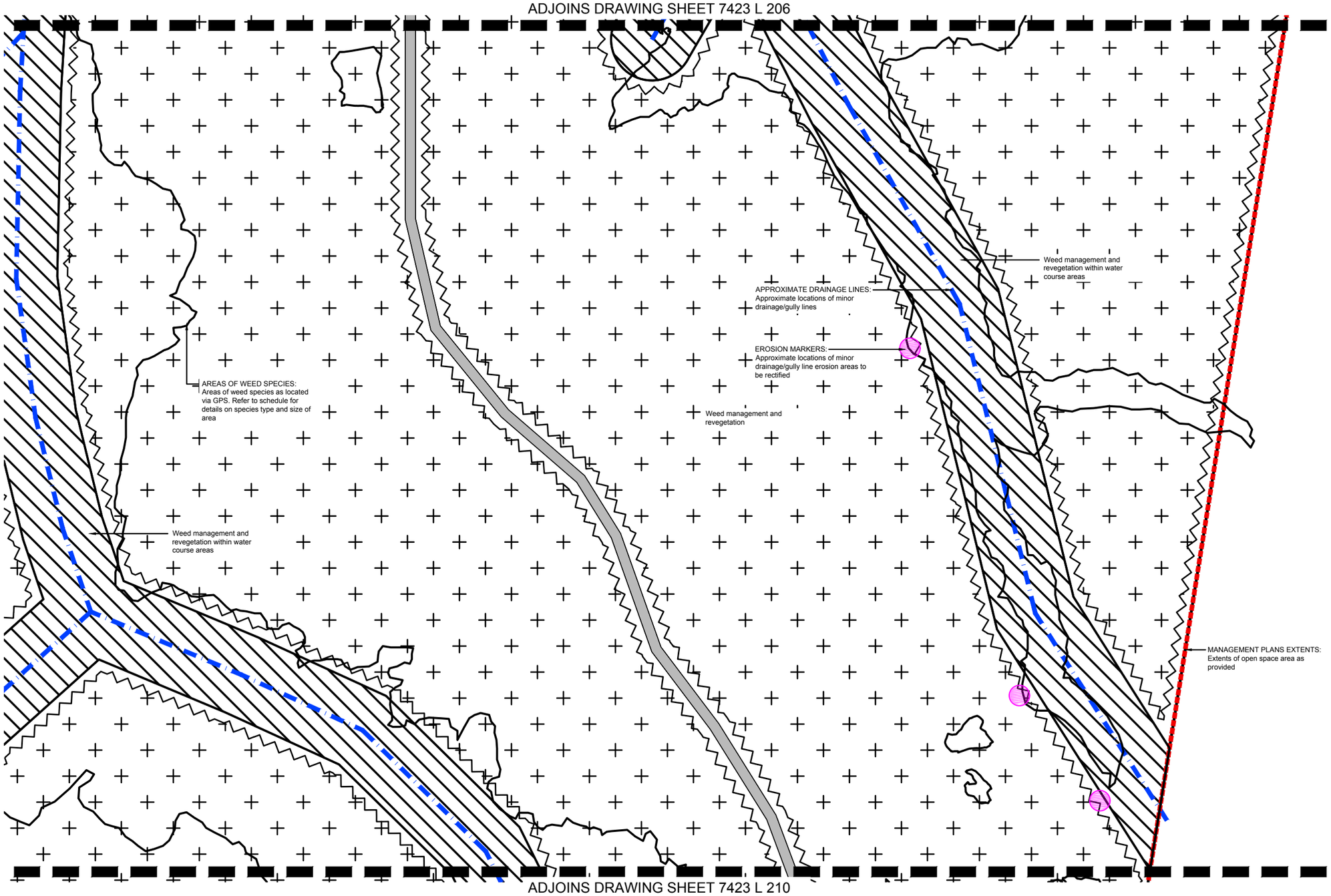
DRAWING: Area 2 Management Plan Weed Management - Sheet 6

DATE: November 17	CHECKED: MS
CLIENT REF.: 7243	DRAWN: TL
DRAWING No.: 7243 L 208 WMP A	

Spring Mountain Precinct

AREA 2 WEED MANAGEMENT PLAN

ADJOINS DRAWING SHEET 7423 L 206



ADJOINS DRAWING SHEET 7423 L 210

LEGEND

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AMENDMENTS:

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A	13/11/2017	Preliminary Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: 1:1000@A1 1:2000@A3 0 10 20 50m

landscape architecture

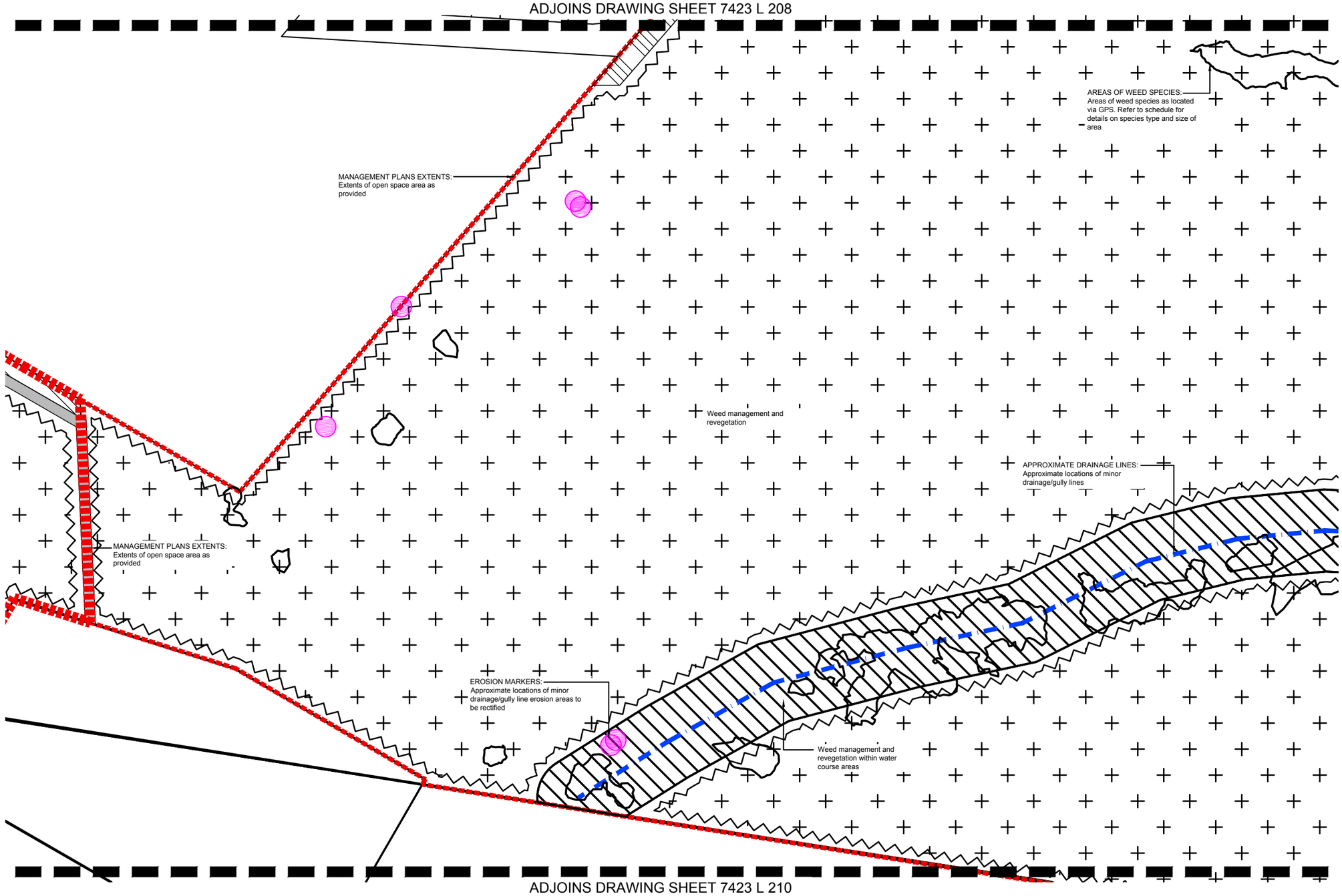
DRAWING: Area 2 Management Plan Weed Management - Sheet 7

DATE: November 17	CHECKED: MS
CLIENT REF.: 7243	DRAWN: TL
DRAWING No.: 7243 L 209 WMP A	

Spring Mountain Precinct

AREA 2 WEED MANAGEMENT PLAN

ADJOINS DRAWING SHEET 7423 L 208



ADJOINS DRAWING SHEET 7423 L 210

LEGEND

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CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: 1:1000@A1 1:2000@A3 0 10 20 50m

landscape architecture

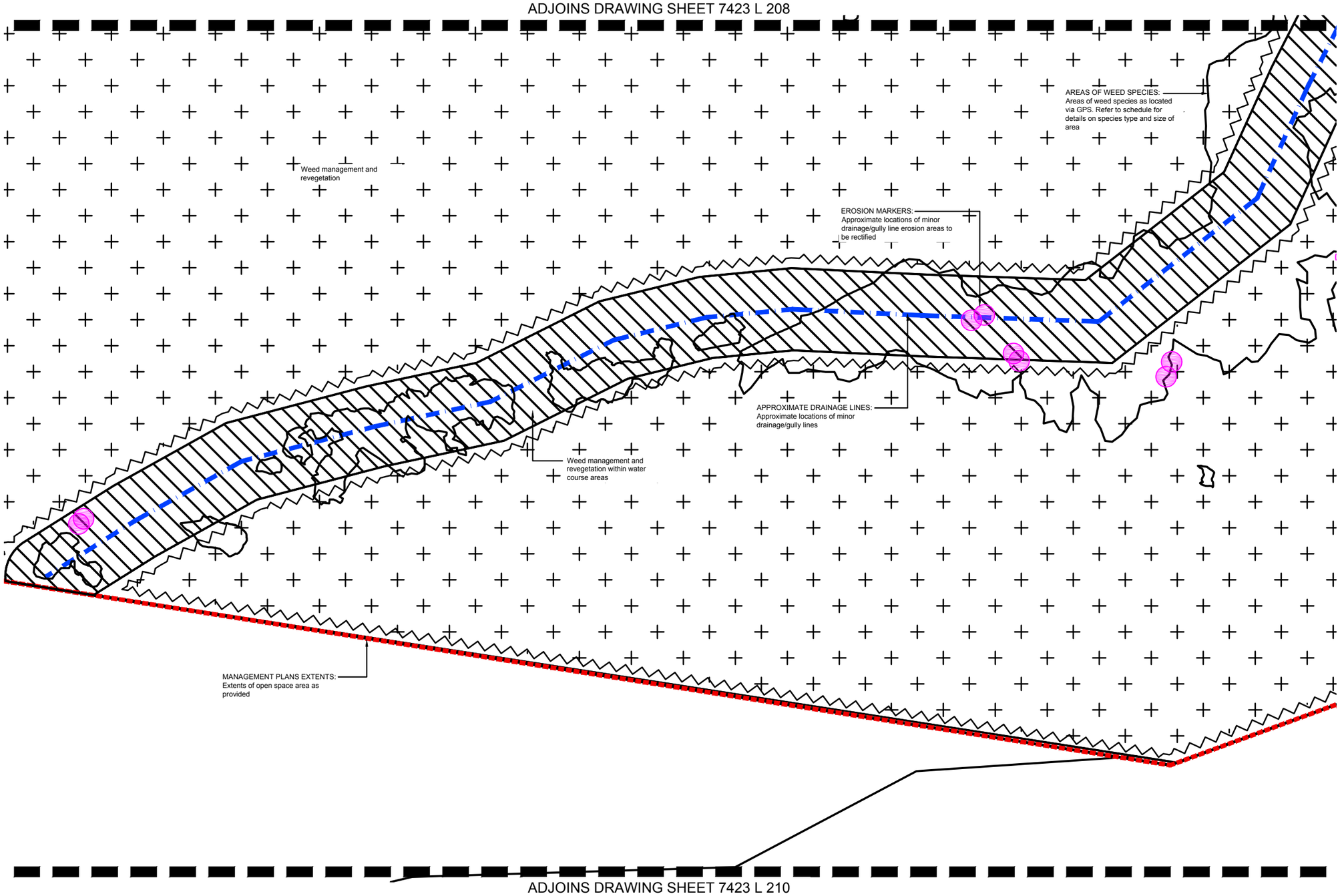
DRAWING: Area 2 Management Plan Weed Management - Sheet 8

DATE: November 17	CHECKED: MS
CLIENT REF.: 7243	DRAWN: TL
DRAWING No.: 7243 L 210 WMP A	

Spring Mountain Precinct

AREA 2 WEED MANAGEMENT PLAN

ADJOINS DRAWING SHEET 7423 L 208



ADJOINS DRAWING SHEET 7423 L 210

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CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: 1:1000@A1 1:2000@A3 (0 10 20 50m)

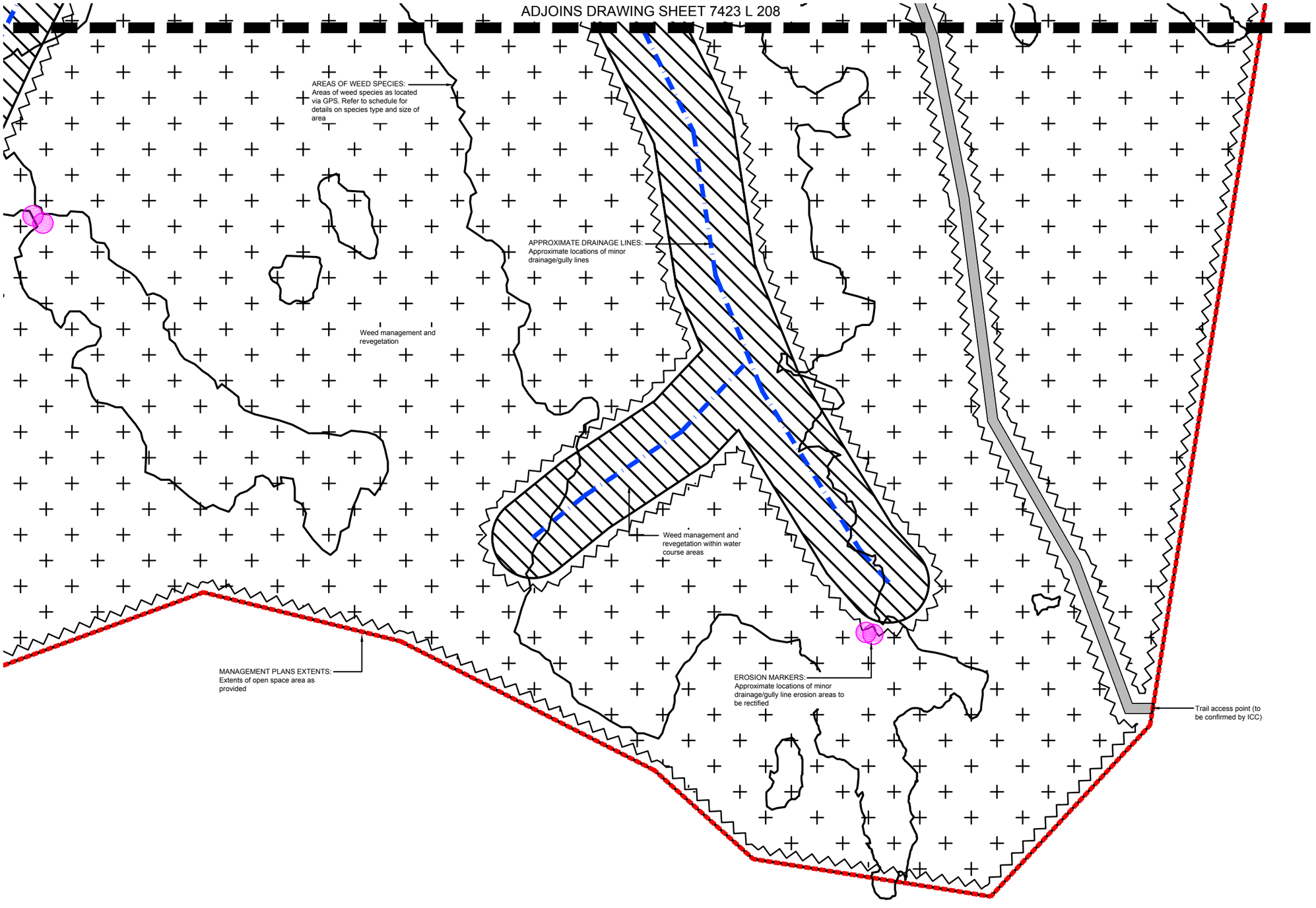
landscape architecture

DRAWING: Area 2 Management Plan Weed Management - Sheet 9

DATE: November 17	CHECKED: MS
CLIENT REF.: 7243	DRAWN: TL
DRAWING No.: 7243 L 211 WMP A	

Spring Mountain Precinct

AREA 2 WEED MANAGEMENT PLAN



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PROJECT: Spring Mountain Precinct

SCALE: 1:1000@A1 1:2000@A3 0 10 20 50m

landscape architecture

DRAWING: Area 2 Management Plan Weed Management - Sheet 9

DATE: November 17	CHECKED: MS
CLIENT REF.: 7243	DRAWN: TL
DRAWING No.: 7243 L 211 WMP A	

Spring Mountain Precinct

AREA 2 MANAGEMENT PLAN - TECHNICAL NOTES - GENERAL

NOTES

This Weed Management Plan links specific weed removal and management measures with spatial areas within the declared area included with this application. This Weed Management Plan covers the 173.66ha Area 2 portion of land previous dedicated by Springfield Land Corporation (SLC) to Ipswich City Council (ICC). The main objectives and action items for pest plants are detailed in Table 1 shown on this plan, with the objectives and actions for ecological restoration are detailed in Table 2.

WEED CONTROL PROGRAM TIMING

The primary stage of manual weed removal, treatment and disposal for the parkland dedication is programmed when all existing weeds are removed with secondary and maintenance weeding occurring for another 18 months (18 month program post on-maintenance).

Primary Weed Removal Stage - Consists of the initial weed removal / treatment of site weeds via the methods detailed within the South East Queensland Ecological Restoration Guidelines. Essentially involves the manual removal, stock piling and disposal and initial usage of prescribed herbicides. Additional notes below include:

- Implemented weed control method according to this plan.
- Weed trees located within 20M zone of the existing trail network are to be removed where trunk is cut down to ground level and vegetative matter removed.
- Program timing; primary weed removal phase is considered to be completed when all existing weeds within the stage for the declared area have been removed or treated. Both the secondary phase and the primary phase of weed removal can occur concurrently in different stage areas over time.
- A key map is to be provided logging the progress of areas from primary to secondary phases of weed removal and areas of rehabilitation as part of the reporting progress.

Secondary or Follow-up Weeding - for all areas will involve the quarterly inspection of areas having undergone Primary Weed Removal and treatment of infestations or outbreak as required. Additional notes below include:

- Implemented weed control method according to this plan.
- Weed trees located within 20M zone of the existing trail network are to be removed where trunk is cut down to ground level and vegetative matter removed.
- Program timing; primary weed removal phase is considered to be completed when all existing weeds within the declared area have been removed initially. Both the secondary phase and the primary phase of weed removal can occur concurrently in different work areas over time.
- A key map is to be provided logging the progress of areas from primary to secondary phases of weed removal and areas of rehabilitation as part of the reporting progress.

Maintenance Weeding Phase - final stage of weeding which occurs in areas where the majority of weeds have been removed and treated. Maintenance weeding continues to remove additional outbreaks but also allows for the fostering of natural regeneration and regrowth seedlings. Additional notes below include:

- Implemented weed control method according to this plan.
- Weed trees located within 20M zone of the existing trail network are to be removed where trunk is cut down to ground level and vegetative matter removed.
- Program timing; primary weed removal phase is considered to be completed when all existing weeds within the designated Park have been removed initially. Both the secondary phase and the primary phase of weed removal can occur concurrently in different work areas over time.
- A key map is to be provided logging the progress of areas from primary to secondary phases of weed removal and areas of rehabilitation as part of the reporting progress.

Revegetation occurs in two (2) distinct zones throughout the management area. Refer to Drawing sheets for a full description of proposed plant species, sizes, densities and numbers.

NATURAL REGENERATION

Applies:

- To relatively large, intact and weed-free areas of native vegetation.
- Where the native plants are healthy and capable of regenerating without human intervention.
- When native plant seed is stored in the soil or will be able to reach the site from nearby natural areas, by birds or other animals, wind or water.
- Where the plant community has a high potential for recovery after any short-lived disturbance, such as a fire or cyclonic winds.
- When preventative action is all that is required to avert on-going disturbance, e.g. erection of fencing to prevent intrusion from cattle.

Planting in such sites can work against the aims of restoration by interfering with natural regeneration.

The re-establishing plant community will be similar in structure, composition and diversity to the original vegetation.

ASSISTED NATURAL REGENERATION

Applies:

- To natural areas where the native plant community is largely healthy and functioning.
- When native plant seed is still stored in the soil or will be able to reach the site from nearby natural areas, by birds or other animals, wind or water.
- Where the natural regeneration processes (seedling germination, root suckering etc.) are being inhibited by external factors, such as weed invasion, soil compaction, cattle grazing, mechanical slashing etc.
- When limited human intervention, such as weed removal, minor amelioration of soil conditions, erection of fencing, cessation of slashing, etc. will be enough to trigger the recovery processes through natural regeneration.
- When major component is weed control.

Planting in such sites can work against the aims of restoration by interfering with natural regeneration.

The re-establishing plant community will be similar in structure, composition and diversity to the original vegetation.

TABLE 1: OBJECTIVES AND ACTION ITEMS FOR PEST PLANTS

Threats	Opportunities	Management action	Timeframe	Responsibility
Objective: Protect, manage and enhance the diversity of native flora species and vegetation communities within the estate by controlling pest plants.				
Insufficient monitoring of pest plants	Increased knowledge of pest plant abundance and distribution within the estate	Continue to develop and update the management plan for the estate to identify pest plants present and to recommend and prioritise control and monitoring actions	Annually	Saunders Havill Group (SHG)
Establish-ment of large infestations of pest plants Insufficient resourcing of pest plant control measures	Pest plants are controlled effectively and in a way that ensures native vegetation regeneration	Include treating pest plants within the open space area to improve visitors experience to the estate	Ongoing	Contractor
Increased abundance of pest plants due to fire	Increased knowledge of pest plant responses to fire	Conduct follow up pest plant treatment after any fires within the estate	As required	Contractor
Lack of education of visitors and local residents as to the adverse impacts pest plants have on the natural environ-ment	Improved public understanding and support for pest plant control	Provide material for public awareness (ie interpretative signage)	As required	Contractor

TABLE 2: OBJECTIVES AND ACTION ITEMS FOR ECOLOGICAL RESTORATION

Threats	Opportunities	Management action	Timeframe	Responsibility
Objective: Protect, manage and enhance the significant habitat values and ecological processes found within the estate, so as to contribute positively to the conservation values of the local and regional area				
Degraded vegetation communities have adverse impacts on other values within the estate, including native flora and fauna species, fire issues and aesthectics	Restore degraded native vegetation communities and minimise impacts associated with pest plants and animals and their control on native flora and fauna, cultural heritage sites, and landscapes within the estate	Prepare and issue a management plan to: - clearly prioritise actions and zones (eg. focus on declared and environmental pest plants and mapped biodiversity zones) - Divide the site into sub-zones which can be managed in a systematic and structured way - Align with the fire management plan as burns could provide ecological and economical efficiencies; reducing fuel loads at the same time as acting as a pest plant control - Lantana (especially) should be managed to reduce the fuel load, as this is a major fire hazard Incorporate training (eg. for relevant community groups) - Write the plan for the target audience working on the estate (eg. bushcare groups working in particular zones)	Prior to commence-ment	Contractor
Pest plant infestations from high use areas may impact on adjacent ecological values	Improve the flora values within the open space area	As part of the site rehabilitation planning for the open space, a planting list of locally occurring plant species for use in rehabilitation is to be provided to enhance population viability where appropriate and possible. Include threatened and locally significant species in plantings.	Ongoing	Contractor
Trail creation, soil compaction and increased erosion	Restore natural habitats to increase the resilience of the estate	Refer to management plans for further detail	As required	Contractor
Pest plant introduction and spread	Deceased abundance of pest plants	Refer to management plans for further detail	As required	Contractor
Disturbance from pest animals	Deceased abundance of pest animals	Refer to management plans for further detail	As required	Contractor
Insufficient resourcing of restoration measures	Improved public understanding of and support	Refer to management plans for further detail	As required	Contractor
Insufficient data on the effectiveness of ecological restoration programs	The populations and diversity of near threatened, threatened or locally significant plant species are protected and enhanced	Refer to management plans for further detail	As required	Contractor

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40 YEARS 1975-2015

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APPROVED COMPANY ISO9001 Quality Management Systems QMS Certification Services
APPROVED COMPANY ISO14001 Environmental Management Systems QMS Certification Services

AMENDMENTS:

Issue	Date	Description	Checked
A	13/11/2017	Preliminary Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: AS NOTED

landscape architecture

DRAWING: Area 2 Weed Management Plan Technical Notes - General

DATE: April 17	CHECKED: MS
CLIENT REF.: 7243	DRAWN: TL
DRAWING No.: 7243 L 213 WMP A	

Spring Mountain Precinct

AREA 2 MANAGEMENT PLAN - WEED TREATMENT & REMOVAL STRATEGY

NOTE:
Species highlighted have been identified within the 'Springfield Wildlife Corridor Management Requirements' list which have specified removal and/or treatment techniques for Class 1 or 2 weeds. Environmental weeds and weeds of National Significance (WONS) Class 3 are to be:

- Remove dumped garden weeds from urban interface. Liaise with ICC Supervisor regarding ongoing Compliance issues.
- Lantana controlled within 20m of track edges (ie walking, shared and service).
- Strategic treatment of gully infestations staged from head of gullies downstream utilising cut stump method and chopping lantana into small (150mm) pieces. Areas to be determined by consultation with ICC.
- Assisted natural regeneration following removal including direct seeding utilising endemic seed from site. Follow up weed control by spot spraying emerging weeds in cleared areas or hand removal.

QUEENSLAND HERBARIUM INVASIVE NATURALISED PLANTS IN SOUTH EAST QUEENSLAND

Rank	Family	Scientific and common names	Subregion	Rec No	Score	Life form & Source	Non Chemical Control	Chemical Control
1	Verbenaceae	Lantana camara var camara (lantana)	10	455	5	S/O	Seedlings: Hand pull	Seedlings: GS&P (G1.5); Shrubs: blanket spray G100 or cut down and spray regrowth G100 or splatter gun using 1 part G to 9 parts water - apply only when plant is growing, not dormant (ref 1).
2	Asteraceae	Baccharis halimifolia (groundsel bush)	10	168	4.8	S/O	Cut stump prior to flowering	Shrubs: GS&P or F/I (G1); Seedlings: GS&P (G1.5) or spray C200 (ref 1)
3	Crassulaceae	Bryophyllum delagoense (mother of millions)	8	98	4.9	H/O	Hand removed and bagged or larger infestations sprayed	Plantlets: spray G200 + MV or VM (ref 1).
4	Bignoniaceae	Macfadyena unguis-cati (cat's claw creeper)	5	36	4.9	V/O	Tubers: crown or dig up, bag and remove.	Regrowth and tuberlings: spray C100 + MM or F100 (ref 1).
	Basellaceae	Anredera cordifolia (madeira vine)	8	16	4.9	V/O	Small Vines & Tubers: Hand pull. Bag and dispose.	Ascending Stems: S&P (G/U); Tubers: gouge, scrape and paint (G/U). Ground infestations: spray C200 or G200 + MM (ref 1).
6	Asparagaceae	Asparagus aethiopicus (ornamental asparagus, asparagus fern)	7	26	4.9	V/O	dig out roots and dispose of at local council landfill site. remove entire crown and underground stem to prevent regrowth	triclopyr (200 g/L) @ 35 mL per 1 L diesel/kerosene
7	Ulmaceae	Celtis sinensis (Chinese celtis)	8	19	4.9	T/O	remove when small. Hand pull or dig out small seedlings. combine slashing, burning and controlled grazing for large infestations.	Stem injection, glyphosate (360 g/L) @ Undiluted at 1 mL per 2 cm of hole or cut
8	Lauraceae	Cinnamomum camphora (camphor laurel)	7	25	4.8	T/O	Seedlings: Hand pull	Saplings: GS&P (G1.5); Trees: F/I (G1 or G1.5) or C&P (G1.5 or G/U for stems up to 8 cm diameter); Seedlings: spray G200 or G200 + MM
9	Anacardiaceae	Schinus terebinthifolius (Brazilian pepper tree)	6	49	4.8	T/O	Seedlings: Hand pull	Saplings: GS&P (G1.5); Trees: F/I (G1.5), Seedlings: spray G200 (ref 1).
	Salviniaceae	Salvinia molesta (salvinia)	8	57	4.9	H/F	Mechanical removal of small infestations: Salvinia weevil (Biological control)	Aquatic areas: calcium dodecylbenzene sulphonate (AI ~100) @ 1 part to 19 parts kerosene, diquat (reglone) 60-120L/Ha or 4L/100L water, diquat (weed) 60-120L/Ha or 4L/100L water, diquat (reglone) 5-20L/Ha or 400ml-1.20mL Agral / 100L water (see ref 2.
11	Cabombaceae	Cabomba caroliniana (Cabomba, fanwort)	4	12	4.9	Ha/F	Mechanical removal of small infestations	2, 4-D N-Butyl Ester (Rubber Vine Spray) @ 12.9 /Ml water (see ref 2. for application guide).
12	Asteraceae	Chrysanthemoides monilifera subsp. rotundata (bitou bush)	3	23	4.9	S/O/A	N/A	Stems: GS&P or F/I (G1.5). Bushes: spray or cut down and spray regrowth C100 or MV (ref 1)
13	Pontederiaceae	Eichhornia crassipes (water hyacinth)	4	8	4.9	Ha/D/I	Mechanical removal of small infestations	Waterways: 2, 4-D acid (AI 300) @ 1:200 with water, Aquatic Areas: glyphosate @1.1.3L/100L water (see ref 2. for application guide).
14	Acanthaceae	Hygrophila costata (Glush weed)	3	7	5	Ha/I	Hand pull small infestations. Can be controlled by planting competitive native species	Glyphosate known to be effective. Species known to occur in waterways so EPA should be contacted before spraying (ref 4)
	Oleaceae	Ligustrum lucidum (tree privet)	5	9	4.8	T/O	Seedlings: Hand pull	Saplings: GS&P or C&P (G1.5), Trees: F/I (G1 or G1.5) or C&P G/U for stems up to 8cm diameter; Seedlings: spray MV or C200 + MM if other weeds such as Lantana or Camphor Laurel are present. Hand pull and/or spray G200 + MM (ref 1).
16	Asteraceae	Sphagneticola trilobata (Singapore daisy)	6	34	4.6	H/D	Hand pull	
17	Asteraceae	Ageratina adenophora (crofton weed)	6	38	4.6	H/D	Hand pull and hang to dry.	Spray MM or G200 or G200 + MV if other weeds such as Lantana or Camphor Laurel are present (ref 1).
18	Verbenaceae	Lantana montevidensis (Creeping lantana)	8	62	4.8	S/O	Fire and/or mechanical control	Spray (march to may): glyphosate 1L/100L water, metsulfuron methyl 12g/100L water, metsulfuron methyl + glyphosate 173g/100L water, Basal bark (anytime): triclopyr 1L/60L Diesel, picloram + triclopyr @ 1L/60L Diesel, Glyphosate, next application: Splatt
19	Fabaceae	Neonotonia wightii (glycine)	5	16	4.7	H/A	N/A	Vines: GS&P (1:1.5) or spray G100 + MM or MM (ref 1).
	Poaceae	Panicum maximum (green panic and guinea grass)	8	78	4.6	H/A	Hand or mechanical removal of small infestations	Spray: glyphosate @ 13mL/1L water (ref 2.)
21	Oleaceae	Ligustrum sinense (Chinese privet)	4	11	4.6	T/O	Seedlings: Hand pull	Saplings: GS&P or C&P (G1.5); Trees: F/I (G1.5); Seedlings: spray MM or C200 + MM if other weeds such as Lantana or Camphor Laurel are present (ref 1).
22	Ochnaceae	Ochna serrulata (ochna)	7	33	4.5	S/O	N/A	Stems: GS&P or S&P or F/I (G1.5); Seedlings and Regrowth: spray G200 + MM or MM. final basal bark 100 or G200 + MM (ref 1).
23	Asparagaceae	Asparagus aethiopicus cv Sprenger (asparagus ground fern)	5	35	4.5	H/O	dig out unwanted plants and dispose of at the appropriate council landfill. remove the entire crown of plant to prevent regrowth	Spot spray - metsulfuronmethyl (600 g/L) @ 10 g per 100 L water plus wetting agent or 100 g/ha plus wetting agent. Cut stump, spot spray. Appy neat Diesel
24	Poaceae	Spordobolus pyramidalis and S. natalensis (giant rat's tail grasses)	8	72	4.8	H/U?	Seed heads cut and bagged. remaining leaves sprayed	Small infestations: spray glyphosate @ 15mL/L water, fluroxypyr @ 2mL/L water + ionic wetter @ 1mL/Lwater. Dense infestations: blanket spraying glyphosate 3L/ha, fluroxypyr 2L/ha (ref 2).
	Asteraceae	Ageratina riparia (mistflower)	5	38	4.6	H/O	Hand pull and hang to dry.	Spray G100 or MM (ref 1).
26	Asclepiadaceae	Araujia sericifera (moth vine)	9	38	4.4	V/O	Seedlings & Vines: Hand pull. Bag and remove fruit.	Vines: GS&P (G1.5), Seedlings: spray G200 or G200 + MM or MM (ref 1).
27	Crassulaceae	Bryophyllum daigremontianum x B. delagoense (hybrid mother-of-millions)	6	15	4.5	H/O	Hand pull and dispose	Plantlets: spray G200 + MM or MM (ref 1).
28	Convolvulaceae	Ipomoea cairica (mile-a-minute)	7	56	4.4	V/O	Vines & Runners: hand pull, roll up and hand up to dry.	Vines and Runners: GS&P (G1.5). Larger Stems, Roots and Nodes: spray G100 + MM (ref 1)
29	Sapindaceae	Cardiospermum grandiflorum (balloon vine)	7	31	4.4	V/O	Seedlings & Small Vines: Hand Pull	Stems: GS&P (G1.5); Seedlings or Small vines: spray G200 or G200 + MM (ref 1).
30	Asclepiadaceae	Cryptostegia grandiflora (rubber vine)	6	19	4.4	V/O	Scarification or medium-density infestations: Where possible, repeated slashing close to ground level is recommended	Foliar spray - Follow-up basal bark/cut stump/foliar spray as necessary with Triclopyr + picloram (Grazon DS, Grass up, etc.) @ 0.35–0.5 L /100 L water
31	Phytolaccaceae	Rivina humilis (baby pepper)	8	61	4.3	H/O	Hand pull and hang to dry.	Spray G100 (ref 1).
32	Poaceae	Sporobolus africanus (Parramatta grass)	8	48	4.5	H/U	Hand or mechanical removal of small infestations	Small infestations: spray glyphosate @ 15ml/1L water, fluproanate @ 2mL/L water + ionic wetter @ 1ml/L water. Dense infestations: blanket spraying glyphosate 3L/ha, fluproanate 2L/ha (ref 2).
33	Poaceae	Sporobolus fertilis (giant Parramatta grass)	9	27	4.5	H/U	Hand or mechanical removal of small infestations	Small infestations: spray glyphosate @ 15ml/1L water, fluproanate @ 2mL/L water + ionic wetter @ 1mL/Lwater. Dense infestations: blanket spraying glyphosate 3L/ha, fluproanate 2L/ha (ref 2).
34	Poaceae	Eragrostis curvula (African lovegrass)	7	29	4.3	H/U	Chipped out before they flower. When chipping out the plant ensure that the tussock crowns are removed, as this will prevent regrowth. If in seed, the stems must be cut and bagged first	Glyphosate (360 g/l) (e.g. Weedmaster® Duo) @ 10 ml/1 L water
35	Asteraceae	Gymnocoronis spilanthoides (Senegal tea)	3	4	4.7	Ha/F	place plant material in a sealed plastic bag, leave in sunlight to rot then burn or dispose of at a council-approved land fill tip	Glyphosate and metsulfuron-methy @ 15ml/L/L water
36	Amaranthaceae	Alternanthera philoxeroides (alligator weed)	12	3	5	Ha/U	physical removal of plant should not be attempted	Terrestrial plants use Metsulfuron methyl (Brushoff) + 1mL/L non-ionic wetter @ 80g/ha + 1mL/L non-ionic wetter or 10g/100L water + 1mL/L non-ionic wetter. Fine-leaved floating plants Glyphosate (Roundup Biactive®) 10 ml /l
37	Passifloraceae	Passiflora suberosa (corky passionflower)	8	166	4.2	V/O	N/A	Stems: GS&P; Seedlings & Regrowth: spray G200 or G200 + MM (ref 1).
38	Poaceae	Melinis minutiflora (molasses grass)	5	17	4.5	H/A	Grazing or mowing	Spray: Fluaz fop-P 212g/L @ 2l/Ha, Glyphosate 360g/l @ 1L/100L water (ref 2).
39	Aristolochiaceae	Aristolochia elegans (Dutchman's pipe)	8	30	4.3	V/O	Stems: Hand pull. Fruit: Bag and remove.	Stems: GS&P (G1.5). Seedlings: spray G200 or G200 + MM or MM (ref 1).
40	Convolvulaceae	Ipomoea indica (blue morning glory)	5	24	4.3	V/O	Vines and Runners: hand pull, roll up and hang to dry.	Vines and Runners: GS&P (G1.5); Larger Stems, Roots and Nodes: spray G100 + MM or F100 (ref 1).
41	Mimosaceae	Leucaena leucocephala (leucaena)	6	14	4.3	ST/A	Small plants: Hand pull or mechanical removal	Herbicide Control - Basal Bark application: triclopyr 240g/L + picloram 120g/L @ 1L/60L diesel; C&P: triclopyr 240g/l + picloram 120g/L @ 1L per 60l diesel; spray triclopyr 300g/l + picloram 120g/L @ 250ml per 100l water. Combination of chemical and mechanical
42	Poaceae	Urochiana mutica (para grass)	6	18	4.4	Ha/A	Grazing	Herbicide Control - Foliar application (Knapsack): glyphosate 360g/l @ 200mL/10L water; Foliar: glyphosate 360g/l @ 5l/Ha; Handgun: glyphosate 360g/L @ 1.8L/100L water (ref 2).
43	Hydrocharitaceae	Egeria densa (egeria waterweed)	2	7	4.4	Ha/I	Hand pulling, cutting and digging with machines effective.	N/A
44	Pinaceae	Pinus elliottii (slash pine)	4	22	4.3	T/A	Seedlings: Hand pull; Saplings and Trees: cut close to ground or ring-bark	Saplings and Trees: F/I (G1.5) ensuring thick bark is penetrated (ref 1).
45	Caesalpiniaceae	Senna pendula var. glabrata (Easter cassia)	7	33	4.2	S/T/O	Seedlings: Hand pull	Shrubs: GS&P or F/I (G1.5); Seedlings: spray C200 or G200 + MM or MM; collect and bag seeds (ref 1).
46	Poaceae	Chloris gayana (Rhodes grass)	9	55	4.3	H/A	Hand pulling and removal and digging of larger clumps	Spray: glyphosate @ 1l/100L water
47	Crassulaceae	Bryophyllum pinnatum (resurrection plant)	6	17	4.2	H/O	Hand pull and dispose	Plantlets: spray C200 + MM or MM (ref 1).
48	Asteraceae	Parthenium hysterophorus (parthenium weed)	6	14	4.2	H/U	Hand pulling of small areas is not recommended	Spot spray 2,4-D amine 600 g/L @ 0.4 L/100 L
49	Caprifoliaceae	Lonicera japonica (Japanese honeysuckle)	3	6	4.3	V/O	Vines and Runners: hand pull, roll up and hang to dry.	Vines and Runners: GS&P (G1.5). Larger Stems, Roots and Nodes: spray G100 + MM or MM (ref 1).
50	Acanthaceae	Thunbergia alata (black eyed susan)	5	22	4.2	H/O	N/A	GS&P (G1.5); spray C200 or G200 + MM (ref 1).
51	Fabaceae	Macroptilium atropurpureum (siratro)	8	30	4.2	V/A	N/A	Vines: GS&P (1:1.5) or spray G100 + MM or MM (ref 1).
52	Rosaceae	Rubus ellipticus (yellowberry)	4	25	4.1	S/O	slashing hinders growth, giving some control if plants are slashed before they seed	Grazon DS picloram/triclopyr 1:200 parts water + wetting agent
53	Colchicaceae	Gloriosa superba (glory lily)	3	25	4.1	V/O	N/A	Young Shoots: spray G200 or G200 + MM. Best results in Oct-Nov and by using 'Pulse' as surfactant (ref 1).
54	Verbenaceae	Phyla canescens (lippia, Carpetgrass couch)	3	4	4.2	Ha/O	a combined approach of different control methods including chemical and mechanical with land management practices is most effective.	Foliar spray 600 g/L Dichlorprop @ 5 mL/ 1 L water or 2,4-D amine (500 g/L) + 1% crop oil @ 2. 4 L/Ha + 1% crop oil
55	Solanaceae	Solanum sealorthianum (Brazilian nightshade)	8	75	4	V/O	Hand pull	Spray G100 (ref 1).
56	Araceae	Pistia stratiotes (water lettuce)	3	8	4.1	Ha/D/I	Mechanical removal of small infestations	Glyphosate 360g/L @ 1-1.3L/100L water or 6.0L/Ha, diquat 200g/L @ 4L/100L water or 50-100L/Ha (see ref 2. for application guide).
57	Asparagaceae	Asparagus plumosus (asparagus fern)	4	8	4.1	V/O	Rhizomes: crown and hang to dry.	Rhizomes: gouge and paint (G1.5). Stems: wind up and spray or cut high and low and spray regrowth G200 or G200 + MM (ref 1).

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AMENDMENTS:

Issue	Date	Description	Checked
A	13/11/2017	Preliminary Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: AS NOTED

landscape architecture

DRAWING: Area 2 Weed Management Plan Weed Management Techniques

DATE: November 17 | CHECKED: MS

CLIENT REF.: 7243 | DRAWN: TL

DRAWING No.: 7243 L 214 WMP A

Spring Mountain Precinct

AREA 2 MANAGEMENT PLAN - WEED TREATMENT & REMOVAL STRATEGY

58	Commelinaceae	Tradescantia fluminensis (Qld use T. albiflora) (wandering jew)	5	9	4.1	H/O	N/A	Spray F150 (as per label) or G200 or G200 + MM; Collect and bag or roll and rake carefully. Dispose (ref 1).
59	Solanaceae	Cestrum parqui (green cestrum)	6	36	3.9	S/O	Seedlings: Hand pull	Stems: CS&P (G1.5) or spray G100 (ref 1).
60	Caesalpiniaceae	Senna septemtrionalis (arsenic bush, was S. floribunda)	6	25	4	S/O	Seedlings: Hand pull	Shrubs: CS&P or F/I (G1.5); Seedlings: spray G200 or G200 + MM or MM; collect and bag seeds (ref 1).
61	Solanaceae	Solanum mauritianum (wild tobacco tree)	8	30	4	S/O	Seedlings: Hand pull	Shrubs: CS&P (G1.5) or F/I (G1:1.5); Seedlings: spray G200 (ref 1).
62	Apocynaceae	Catharanthus roseus (pink periwinkle)	5	22	4	S/O	Hand pull	Spray G100 (ref 1).
63	Passifloraceae	Passiflora subpeltata (white passion flower)	10	60	3.9	V/O	Stems: Hand pull	Stems: CS&P; Seedlings & Regrowth: spray G200 or G200 + MM (ref 1).
64	Fabaceae	Desmodium uncinatum (silverleaf desmodium)	5	14	4	H/A	Hand pull or crown and dispose	CS&P tuberous roots (G1.5); spray G200 or G200 + MM or MM; collect and bag seeds (ref 1).
65	Poaceae	Melinis repens (red Natal grass)	10	134	4.1	H/A	Grazing or mowing	Spray: Fluazifop-P 212g/L @ 2L/Ha, Glyphosate 360g/L @ 1L/100L water (ref 2).
66	Nymphaeaceae	Nymphaea caerulea subsp. zanzibarensis (blue lotus)	4	17	4	Ha/CF	Hand pull small infestations	Spray with or Diquat Glyphosate. Occurs in waterways, thus EPA should be notified before any herbicide use (ref 5).
67	Onagraceae	Oenothera drummondii subsp. drummondii (beach evening primrose)	3	17	4	H/O	Hand pull	Spray G100 (ref 1).
68	Tiliaceae	Triumfetta rhomboidea (Chinese burr)	7	44	4	H/O	Hand pull	Spray G100 (ref 1).
69	Haloragaceae	Myriophyllum aquaticum (parrot's feather)	3	15	4	Ha/F	N/A	Spray: glyphosate 360g/L @ 100mL/10L water (ref 1).
70	Passifloraceae	Passiflora foetida (stinking passion flower)	7	50	3.9	V/O	Hand Pull	CS&P (G1.5); spray G200 or G200 + MM (ref 1).
71	Asteraceae	Verbesina encelioides (crownbeard)	7	34	4	H/O	Vines: Hand pull and remove; Runners: Roll up and hang to dry	Stems: S&P (GU); Regrowth and seedlings: spray G200 or G200 + MM (ref 1).
72	Poaceae	Paspalum mandiocanum (broad leaf paspalum)	3	6	4	H/A	N/A	Spray G200 - resistant to weaker strength (ref 1).
73	Poaceae	Paspalum dilatatum (paspalum grass)	10	30	3.9	H/A	Hand pull or dig up	Spray G100 (ref 1)
74	Ruppiaceae	Ruppia maritima (sea tassel)	2	8	4	Ha/F	Hand pull or dig up	Spray G100 (ref 1)
75	Arecaceae	Syagrus romanzoffiana (queen palm)	4?	10	3.9	T/O	Seedlings: Hand pull or crown; Trees: cut below growing point	Trees: F/I (G1.5); Seedlings: spray G200 + MM (ref 1)
76	Poaceae	Hymenachne amplexicaulis cv. Olive (hymenachne)	1?	1	4	Ha/A	a combined approach of different control methods including mechanical, chemical and biological with land management practices is most effective	360 g/L Glyphosate (includes Roundup Biactive & Weedmaster Duo) – 1 L/100L water or 10 L/ha delivered by boom
77	Asteraceae	Senecio tamoides (Canary creeper)	3	8	4	V/O	Vines: Hand pull and remove; Runners: Roll up and hang to dry.	Stems: S&P (GU); Regrowth and seedlings: spray G200 or G200 + MM (ref 1).
78	Poaceae	Cenchrus ciliaris (buffel grass)	4	15	4.1	H/A	Hand or mechanical removal of young plants	Herbicide Control - Glyphosate 7mL/L water, Dichlobenil 600g/100m2; Fluazifop 50-100mL/10L water (ref 2).
79	Acanthaceae	Thunbergia grandiflora (thunbergia, blue thunbergia)	2	3	5?	V/O	N/A	CS&P (G1.5); spray G200 (ref 1).
80	Cactaceae	Opuntia tomentosa (velvet tree pear)	8	46	3.9	S/O	Hand removed, stem injected, or over sprayed with garlon	Spray; Basal Bark application; Injection: Triclopyr: .8L/60L diesel. Picloram + Triclopyr: 1L/60L diesel. Amitrole: 1mL/3cm (ref 3)
81	Euphorbiaceae	Ricinus communis (castor oil plant)	7	20	3.9	S/O	Seedlings: Hand pull	Shrubs: S: CS&P or F/I (G1.5); Seedlings: spray G200 (ref 1).
82	Asteraceae	Senecio madagascariensis (fire weed)	6	28	3.8	H/O	Hand pulled and bagged	Stems: S&P (GU); Regrowth and seedlings: spray G200 or G200 + MM (ref 1).
83	Cyperaceae	Cyperus involucratus (African sedge)	6	15	3.8	Ha/CF	Each has to be dug out with a spade and the entire plant turned over, exposing the root system while making sure all aerial parts of the plant are completely covered.	Aquatic areas - Glyphosate-ipa; Land – commercial/industrial, rights of way - Glyphosate-ipa, glyphosate-mas, imazapyr
84	Asteraceae	Tithonia diversifolia (Mexican sunflower)	5	11	3.9	H/O	N/A	Stems: CS&P (G1.5) or cut and spray regrowth and seedlings (G100 or MM) (ref 1).
85	Poaceae	Setaria sphacelata (South African pigeon grass)	9	41	3.8	H/A	Hand pull or dig up	Spray G100 (ref 1)
86	Asclepiadaceae	Gomphocarpus physocarpus (balloon cotton bush)	10	132	3.7	S/OU	Slash in winter and burn cuttings. Wanderer Butterfly can also be used.	Spray: glyphosate @ 1:1000 with water, in spring before seeding (ref 3).
87	Poaceae	Digitaria didactyla (Queensland blue couch)	9	70	3.7	H/A	Hand pull or cultivation	Spot Spray: glyphosate or 2,2-DPA (ref 3)
88	Caesalpiniaceae	Gleditsia triacanthos (honey locust)	7	12	3.8	T/O	For the control of dense infestations on grazing land, burning followed by spot spraying is an economical control method	pastures non agricultural land fluroxypyr (Starane 200®) @ 1.5 L 75ml/100 L diesel
89	Poaceae	Paspalum notatum (bahia grass)	4	10	3.8	H/A	Hand pull or dig up	Spray G100 (ref 1)
90	Cactaceae	Opuntia monacantha (drooping tree pear, syn. O. vulgaris)	2	3	4	S/O	Hand removed, stem injected, or over sprayed with garlon	Spray; Basal Bark application; Injection: Triclopyr: .8L/60L diesel. Picloram + Triclopyr: 1L/60L diesel. Amitrole: 1mL/3cm (ref 3).
91	Poaceae	Paspalum conjugatum (paspalum grass)	7	38	3.8	H/A	Cut below crown.	Spot Spray: glyphosate or 2,2 DPA (ref 3)
92	Malpighiaceae	Hiptage benghalensis (hiptage)	3	5	4	S V/O	Hand pull small infestations.	Seedlings: Foliar spray of dicamba, fluroxypyr, and triclopyr/picloram. Larger plants cut stump application of fluroxypyr and triclopyr/picloram with diesel, glyphosate with water and picloram undiluted (ref 7).
93	Solanaceae	Solanum torvum (devil's fig)	6	39	3.9	S/O	Seedlings: Hand pull	Shrubs: CS&P (G1.5) or F/I (G1:1.5); Seedlings: spray G200 (ref 1).
94	Caesalpiniaceae	Caesalpinia decapetala (thorny poinciana)	4	20	3.9	S V/O	Seed-heads: Bag and remove.	Stems: CS&P (G1.5); Seedlings: spray G200 or G200 + MM or MM (ref 1).
95	Poaceae	Pennisetum alopecuroides (swamp foxtail)	7	29	3.8	H/O	Hand Pull	Spot Spray: glyphosate or 2,2 DPA (ref 3)
96	Verbenaceae	Duranta erecta (duranta)	6	14	3.6	ST/O	Shrubs: CS&P (1:1.5)	Spray G100 (ref 1)
97	Brassicaceae	Nasturtium officinale (Qld use Rorippa nasturtium-aquaticum) (watercress)	7	19	3.7	Ha/FO	Manually grub and destroy.	Spray G100 and replace with local species (ref 1).
98	Polygonaceae	Acetosa sagittata (rambling dock)	4	18	3.7	V/U	Tubers: Dig up, bag and remove.	Tubers: Spray G200 or G200 + MM or MM (ref 1).
99	Poaceae	Cynodon dactylon (couch Bahama grass introduced cultivars)	10	45	3.6	H/OA	Hand pull small infestations, removing all roots or smother with mulch.	Spray: glyphosate @ 200mL/15L water. Follow up spray (ref 3)
100	Bignoniaceae	Tecoma stans (yellow bells)	4	16	3.6	ST/O	N/A	Stems: CS&P (G1.5) or spray G200. Seeds: collect, bag and remove (ref 1)
101	Rosaceae	Rhaphiolepis indica (Indian hawthorn)	3	10	3.5	ST/O	Seedlings: Hand pull	Saplings: CS&P (G1.5); Trees: F/I (G1.5); Seedlings: spray G200 or G200 + MM or MM (ref 1).
102	Mimosaceae	Mimosa pudica (common sensitive plant)	4	12	3.7	S/A	N/A	Pastures - Fluroxypyr/Starane 200 @ 1.5 L/ha. Between cropping applications (conservation tillage) Dicamba/Banvel 200 @ 0.8 1.4 L/ha
103	Commelinaceae	Callisia fragrans (purple succulent)	3	9	3.9	H/O	N/A	Spray F100 or G200 or G200 + MM; Collect and bag or roll and rake carefully. Dispose (ref 1).
104	Scrophulariaceae	Paulownia tomentosa (paulownia)	3	5	4	T/AO	Seedlings: Hand pull	Saplings: CS&P (G1.5); Trees: F/I (G1.5); Seedlings: spray G200 (ref 1)
105	Commelinaceae	Tradescantia zebrina (zebrina)	3	12	3.7	H/O	N/A	Spray F100 or G200 or G200 + MM; Collect and bag or roll and rake carefully. Dispose (ref 1).
106	Acanthaceae	Ruellia malacosperma (ruellia)	5	16	3.8	H/O	N/A	Spray G200 + MM (ref 1).
107	Poaceae	Pennisetum clandestinum (kikuyu grass)	4	12	3.8	H/A	Hand Pull	Spot Spray: glyphosate or 2,2 DPA (ref 3)
108	Liliaceae	Lilium formosanum (Taiwan lily)	5	10	3.8	H/O	Hand pull or crown and dispose	Spray G100 + MM or MM (ref 1).
109	Asteraceae	Sigesbeckia orientalis (Indian weed)	10	148	3.6	H/U	Hand pull or cultivation.	Spray with 2,4 D amine or sodium, pr MCPA + dicamba (ref 3).
110	Asteraceae	Bidens pilosa (cobbler's pegs)	10	110	3.5	H/U	Hand pull or cultivation.	Spray with 2,4-D amine or sodium, pr MCPA + dicamba (ref 3).
111	Cactaceae	Opuntia stricta (common prickly pear)	7	67	3.6	S/O	Hand removed, stem injected, or over sprayed with garlon	Spray; Basal Bark application; Injection: Triclopyr: .8L/60L diesel. Picloram + Triclopyr: 1L/60L diesel. Amitrole: 1mL/3cm (ref 3).
112	Poaceae	Eleusine indica (crowsfoot grass)	8	55	3.5	H/A	Pull and chip. Replant with native couch	Spray: glyphosate or 2,2-DPA (ref 3)
113	Poaceae	Axonopus compressus (broad leaved carpet grass)	5	23	3.6	H/AO	Cut stems from roos.	Spot spray with Glyphosate (ref 3).
114	Lamiaceae	Salvia coccinea (red salvia)	9	46	4	H/O	remove small areas by hand or machine	Aquatic areas (drains, channels, margins of streams, lakes and dams) - calcium dodecylbenzene sulphonate (AF 100) @ 1 part in 19 parts kerosene
115	Asteraceae	Ageratum houstonianum (blue billygoat weed)	8	81	3.8	H/UO	N/A	Spray G100 or hand pull and spray regrowth G100 (ref 1).
116	Myrtaceae	Psidium guajava and P. guineense (yellow guava and West Indes guava)	4	7	3.7	ST/AO	N/A	Shrubs: CS&P or F/I (G1.5) or spray G200 + MM or MM. Trial basal bark F100 or G200 + MM (ref 1).
117	Rosaceae	Rubus bellobatus (kittatinny blackberry)	5	22	3.5	S/O	slashing hinders growth, giving some control if plants are slashed before they seed	Grazon DS picloram/triclopyr 1:200 parts water + wetting agent
118	Myrtaceae	Eugenia uniflora (Brazilian cherry)	4	19	3.5	ST/O	N/A	Stems: C&P or F/I (G1.5); Bushes: spray or cut down and spray regrowth G100 or MM (ref 1)
119	Oleaceae	Olea europaea (olive)	2	6	4?	T/A	Seedlings: Hand pull	Saplings: CS&P (G1.5); Trees: F/I (G1.5); Seedlings: spray G200 or G200 + MM (ref 1).
120	Poaceae	Brachiaria decumbens (signal grass)	4	14	3.5	H/A	Grazing	Herbicide Control - Foliar application (Knapsack): glyphosate 360g/L @ 200mL/15L water; Foliar: glyphosate 360g/L @ 9L/Ha; Handgun: glyphosate 360g/L @ 1.3L/100L water (ref 2)
121	Fabaceae	Stylosanthes scabra (shrubby stylo)	4	4	4.3?	H/A	N/A	Vines: CS&P (1:1.5) or spray G100 + MM or MM (ref 1).
122	Commelinaceae	Commelina benghalensis (hairy wandering jew)	4	7	3.5	H/O	Collect and Bag	Spray G200 or G200 + MM (ref 1)
123	Poaceae	Pennisetum purpureum (elephant grass)	2	9	3.5	H/O	Grazing or mechanical removal	N/A (ref 2).
124	Zingiberaceae	Hedychium coronarium (wild ginger)	2	2	3.5	H/O	Small Plants: Hand pull and dispose	Small Plants: spray G200 or G200 + MM. Large Plants: cut and spray regrowth. If rhizomes are at ground level, cut stem and gouge rhizome - fill hole with G1.5 with injector kit or similar (ref 1).
125	Phytolaccaceae	Phytolacca octandra (inkweed)	10	50	3.4	H/O	Hand pull or crown	CS&P (G1.5) or C&P (G1.5); spray G100 (ref 1).
126	Asclepiadaceae	Asclepias curassavica (red cotton bush)	9	43	3.4	S/O	Hand pull, Slash	Slash and/or spray G100 (ref 1).
127	Solanaceae	Lycium ferocissimum (African boxthorn)	1?	5	4.4?	S/O	N/A	Stems: C&P (G1.5); Regrowth: spray G200 + MM (ref 1).
128	Mimosaceae	Prosopis pallida (algaroba)	2	2	4	ST/O	When using mechanical control methods, it is important to remove the bud zone of the root system (about 30 cm below the ground surface). If this is not removed, re shooting can occur.	Basal bark - triclopyr + picloram Access® @ 1L/60L diesel. Cut stump - triclopyr + picloram Access® @ 1L/60L diesel. Overall spray - triclopyr + picloram Grazon DS® @ 350ml/100l water plus a wetting agent if plant is growing actively
129	Juncaceae	Juncus articulatus (jointed rush)	1	2	4	Ha/FO	Hand pull.	Spot spray with Glyphosate, 2,2-DPA or MCPA + dicamba (ref 3).
130	Cactaceae	Opuntia aurantiaca (tiger pear)	1	2	4	S/O	Hand removed, stem injected, or over sprayed with garlon	Spray; Basal Bark application; Injection: Triclopyr: .8L/60L diesel. Picloram + Triclopyr: 1L/60L diesel. Amitrole: 1mL/3cm (ref 3)
131	Poaceae	Arundo donax (giant reed)	1	4	3.8	H/O	Physical removal of small infestations.	Spot spray or cut stump and spray with Glyphosate (ref 5).
132	Cactaceae	Opuntia imbricata (rope pear)	1	1	4	T/O	Biological controls available. cactoblastis cactorum successful. Mechanical control difficult. Fire can be used.	Spray; Basal Bark application; Injection: Triclopyr: .8L/60L diesel. Picloram + Triclopyr: 1L/60L diesel. Amitrole: 1mL/3cm (ref 3).
133	Bignoniaceae	Pyrostegia venusta (flame vine)	1	1	4	V/O	N/A	CS&P (G1.5); spray G200 (ref 1).
134	Poaceae	Cortaderia selloana (pampas grass)	2	1	3.7	H/O	Small Plants: dig out by hand or machine	Stems: C&P (G1.5) or cut back and slash and spray regrowth G100 (ref 1).
135	Solanaceae	Solanum hispidum (giant devil's fig)	5	23	3.8	S/O	Hand pull	Spray G100 (ref 1).
136	Agavaceae	Furcraea foetida (Cuban hemp)	3	4	4.3?	S/OA	Dig out by hand or machine	CS& P near ground or spray MM (ref 1).
137	Agavaceae	Furcraea selloa (hemp)	1	2	4?	S/OA	Dig out by hand or machine	CS& P near ground or spray MM (ref 1)
138	Agavaceae	Agave americana (century plant)	4	9	3.7	S/OA	Dig out by hand or machine	CS& P near ground or spray MM (ref 1).

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surveying | town planning | urban design | environmental management | landscape architecture

40 YEARS 1975-2015

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APPROVED COMPANY ISO9001 Quality Management Systems

APPROVED COMPANY ISO14001 Environmental Management Systems

AMENDMENTS:

Issue	Date	Description	Checked
A	13/11/2017	Preliminary Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: AS NOTED

landscape architecture

DRAWING: Area 2 Management Plan Weed Management Techniques

DATE: November 17 | CHECKED: MS

CLIENT REF.: 7243 | DRAWN: TL

DRAWING No.: 7243 L 215 WMP A

AREA 2 MANAGEMENT PLAN - WEED TREATMENT & REMOVAL STRATEGY

139	Rutaceae	Murraya paniculata cv. Exotica (murraya)	6	26	3.6	S/O	Seedlings: Hand pull	Shrubs: CS&P or F/I (G1.5); Seedlings: spray G200 (ref 1)
140	Rosaceae	Rubus discolor (R. fruticosus complex, a blackberry)	4	10	3.7	S/C/A	Slashing hinders growth, giving some control if plants are slashed before they seed	Grazon DS picloram/triclopyr 1:200 parts water + wetting agent. A variety of herbicides may be used to control this species including (ref 5).
141	Brassicaceae	Cakile edentula (American sea rocket)	4	24	3.7	H/O	Manually grub and destroy.	Spray G100 and replace with local species (ref 1).
142	Balsaminaceae	Impatiens walleriana (busiam)	2	6	3.7	H/O	N/A	Spray G100 (ref 1).
143	Agavaceae	Agave sisalana (sisal)	2	4	3.7	S/C/A	Dig out by hand or machine	CS& P near ground or spray MM (ref 1).
144	Agavaceae	Agave vivipara var. vivipara (sisal)	2	3	3.7	S/C/A	Dig out by hand or machine	CS& P near ground or spray MM (ref 1).
145	Rosaceae	Prunus munsoniana (wild goose plum)	7	31	3.7	S/T/A	Seedlings: Hand pull	Shrubs: CS&P or F/I (G1.5); Seedlings: spray G200 (ref 1).
146	Poaceae	Echinochloa crus-galli (barnyard grass)	6	34	3.7	H/A	Hand pull or dig out small infestations.	Spot spraying with Glyphosate or 2,2 DPA (ref 3).
147	Asteraceae	Solidago canadensis var. scabra (Canadian goldenrod)	7	15	4?	H/O	Hand pull and hang to dry	Spray MM or G200 or G200 + MM if other weeds such as Lantana or Camphor Laurel are present (ref 1).
148	Fabaceae	Pueraria lobata (kudzu)	5	4	3.8	V,S/C	Slash. Diminish by spading site.	CS&P (G1.5); spray G200 or MM (ref 1).
149	Alismataceae	Sagittaria graminea var. platyphylla (sagittaria arrowhead)	5	7	3.8	Ha/FO	Physical removal of small infestations.	Spot Spray with Glyphosate (at 1.0L 100L water (ref 5).
150	Nymphaeaceae	Nymphaea mexicana (yellow waterlily)	2	4	3.7	Ha/CF	Hand pull small infestations	Spray with or Diquat. Glyphosate. Occurs in waterways, thus EPA should be notified before any herbicide use (ref 5).
151	Poaceae	Phyllostachys aurea (fishpole bamboo)	1	2	3.7	S/C	N/A	Stems: cut and fill segment (G1.5); Regrowth: spray G100 (ref 1)
152	Euphorbiaceae	Jatropha gossypiifolia (cotton leaf physic nut, bellyache bush)	1	1	3.7	S/C	Hand pull	Spray G100 (ref 1).
153	Malvaceae	Sida rhombifolia (Paddy's lucerne)	9	69	3.6	S/U	Hand pull or dig out.	Spray with 2,4-D amine or fluroxypyr (ref 3).
154	Poaceae	Themeda quadrivalvis (grader grass)	8	25	3.6	H/A	Hand pull or dig out small infestations.	Spot spraying with Glyphosate or 2,2-DPA (ref 3).
155	Poaceae	Andropogon virginicus (whisky grass)	8	14	3.6	H/A	Hand pull or dig out small infestations.	Spot spraying with Glyphosate or 2,2-DPA (ref 3).
156	Bignoniaceae	Jacaranda mimosifolia (jacaranda)	4	12	3.4	T/O	Seedlings: Hand pull	Saplings: CS&P (G1.5); Trees: F/I (G1.5); Seedlings: spray G200 (ref 1).
157	Acanthaceae	Justicia betonica (squirrmtail)	2	4	4	S/C	Hand pull small infestations. Can be controled by planting competitive native species.	Glyphosate known to be effective. Species known to occur in waterways, DERM should be contacted before spraying in waterways (ref 4).
158	Mimosaceae	Acacia baileyana (Bolivian wattle)	1	1	4	T/O	Mechanical or chain removal.	Basal Bark or cut stump application. Triclopyr 600g/L at 1.0L 120L diesel. Triclopyr + Picloram 240 g/l + 120 g/l at 1.0L 60L diesel. Picloram 45 g/kg undiluted (ref 5).
159	Simaroubaceae	Ailanthus altissima (tree of heaven)	12	3	3.6	T/O	Seedlings: Hand pull	Seedlings: CS&P (G1.5); Trees: F/I (G1.5); Seedlings: spray G200 or MM (ref 1).
160	Poaceae	Echinochloa colona (awnless barnyard grass)	9	44	3.3	H/A	Hand or mechanical removal of small infestations	Spray: glyphosate @ 13ml/1L water (ref 2.)
161	Cyperaceae	Cyperus brevifolius (Mullumbimby couch)	6	53	3.4	H/O	Each has to be dug out with a spade and the entire plant turned over, exposing the root system while making sure all aerial parts of the plant are completely covered.	Aquatic areas - Glyphosate-ipa Land - commercial/industrial, rights of way - Glyphosate-ipa, glyphosate-mas, imazapyr
162	Moraceae	Morus alba (white mulberry)	3	10	3.4	T/O	N/A	Trees: F/I (G1.5), stack cut branches above the ground to dry; Saplings: CS&P (G1.5); Seedlings: spray G200 (ref 1).
163	Araceae	Colocasia esculenta (taro)	3	4	3.4	H/A/O	Hand pull.	Cut at base and apply glyphosate or metsulfuron methyl. Plant often occurs in waterways so consult DERM prior to application (ref 5).
164	Cannaceae	Canna indica (canna lily)	3	9	3.8	H/O	Dig out entire plant	Cut/Slash and spray regrowth G200 or G200 + MM. Collect and bag seeds. Resistant to herbicide (ref 1).
165	Buddlejaceae	Buddleja madagascariensis (buddleja)	5	6	3.4	S,V/O	N/A	Stems: CS&P (1.1.5). Vines: spray or cut down and spray regrowth G200 (ref 1).
166	Bignoniaceae	Tecoma capensis (Cape honeysuckle)	3	8	4	S/T/O	N/A	Stems: CS&P (G1.5) or spray G200. Seeds: collect, bag and remove (ref 1)
167	Cactaceae	Hamsia martinii (hamsia cactus)	27	4	4	S/O	The use of the biological mealy bug agent is recommended	Triclopyr + picloram at 1.0l 60l diesel. Dichlorprop 600 g/l at 1.0L/60L water, metsulfuron methyl 600 g/l at 2.0L/100L water (ref 5).
168	Acanthaceae	Thunbergia laurifolia (laurel clock vine)	1	1	4	V/O	N/A	CS&P (G1.5); spray G200 (ref 1).
169	Fabaceae	Erythrina crista-galli (cockspur coral tree)	27	4	3.5	T/O	N/A	F/I (G1.5) or C&P stumps. Cut and stack branches above ground to dry to prevent resprouting. F/I sprouted branches (G1.5) or spray regrowth G200 + MM or MM, Tral Tordon (ref 1).
170	Sapindaceae	Koelreuteria elegans (Chinese rain tree)	17	1	3.67	T/O	Seedlings: Hand pull	Trees: F/I (G1.5) or C&P stumps (G1.5); Saplings: CS&P (G1); stack cut branches above ground to dry; Seedlings: spray (G200) (ref 1).
171	Zingiberaceae	Hedychium gardnerianum (ginger lily)	17	3	3.6	T/O	Small Plants: Hand pull and dispose	Small Plants: spray G200 or G200 + MM. Large Plants: cut and spray regrowth. If rhizomes are at ground level, cut stem and gauge rhizome - fill hole with G1.5 with injector kit or similar (ref 1).
172	Acanthaceae	Hypoestes phyllostachya (polka dot plant)	3	5	3.5	T/O	Hand pull or crown and dispose	Spray G200 or G200 + MM (ref 1).
173	Caprifoliaceae	Sambucus canadensis (American elder)	3	7	3.4	S/T/O	Vines and Runners: hand pull, roll up and hang to dry.	Vines and Runners: CS&P (G1.5); Larger Stems, Roots and Nodes: spray G100 + MM or MM (ref 1).
174	Asteraceae	Conyza sumatrensis (tall fleabane)	9	45	3.3	F/T/	Hand or mechanical removal of small infestations	Seedlings: Atrazine or Chlorosulfuron in combination with competitive native species; Plants: Glyphosate and Tordon 75-D mix. Glyphosate ration depends on other weeds present (ref 2).
175	Fabaceae	Tipuana tipu (tipuana)	2	5	3.4	T/O	Seedlings: Hand pull	Saplings: CS&P (G1.5) Trees: F/I (G1.5). Seedlings: spray G200 (ref 1).
176	Asteraceae	Tagetes minuta (stinking roger)	8	32	3.3	F/U	Hand pull and hang to dry	Spray MM or G200 or G200 + MM if other weeds such as Lantana or Camphor Laurel are present (ref 1).
177	Caesalpiniaceae	Chamaecrista rotundifolia (round-leaf cassia)	8	14	3.3	S/T/A	Seedlings: Hand pull	Shrubs: CS&P or F/I (G1.5); Seedlings: spray G200 or G200 + MM or MM; collect and bag seeds (ref 1)
178	Poaceae	Cenchrus echinatus (Mossman river grass)	8	40	3.3	H/A	Hand or mechanical removal of young plants	Herbicide Control - Glyphosate 7ml/1L water. Dichlobenil 600g/100m2. Fluazifop 50-100mL/10L water (ref 2).
179	Asteraceae	Conyza canadensis (Canadian fleabane)	10	55	3.3	F/U	Hand or mechanical removal of small infestations	Seedlings: Atrazine or Chlorosulfuron in combination with competitive native species; Plants: Glyphosate and Tordon 75-D mix. Glyphosate ration depends on other weeds present (ref 2).
180	Euphorbiaceae	Euphorbia cyathophora (painted spurge)	8	20	3.3	H/O	Hand pull	Spray G100 (ref 1)
181	Poaceae	Setaria palmifolia (palm leaf setaria)	5	13	3.3	H/O	Hand pull or dig up	Spray G100 (ref 1)
182	Euphorbiaceae	Euphorbia heterophylla (milk weed)	5	12	3.4	H/O?	Hand pull	Spray G100 (ref 1).
183	Fabaceae	Desmodium intortum (green leaf desmodium)	4	11	3.3	F/A	Hand pull or crown and dispose	CS&P tuberous roots (G1.5); spray G200 or G200 + MM or MM; collect and bag seeds. Monitor regrowth over 2 - 3 years (ref 1).
184	Poaceae	Pennisetum setaceum (fountain grass)	3	11	3.3	H/O	Hand Pull	Spot Spray. glyphosate or 2,2 DPA (ref 3).
185	Asteraceae	Conyza bonariensis (flax leaf fleabane)	7	38	3.3	F/U	Hand or mechanical removal of small infestations	Seedlings: Atrazine or Chlorosulfuron in combination with competitive native species; Plants: Glyphosate and Tordon 75-D mix. Glyphosate ration depends on other weeds present (ref 2).
186	Solanaceae	Solanum enanthum (a tobacco bush)	7	19	3.2	S/O	Hand pull	Spray G100 (ref 1).
187	Poaceae	Stenotaphrum secundatum (buffalo grass)	8	23	3.2	H/A/O	Hand or mechanical removal of small infestations	Spray: glyphosate @ 13ml/1L water (ref 2.)
188	Apocynaceae	Cascabela thevetia (syn. Thevetia peruviana) (yellow oleander)	5	9	3.1	S/T/O	Hand pull small infestations. Slashing can be used but should be followed up by herbicide application	Basal bark application of fluroxypyr (35ml/1L Diesel); Stem injection Glyphosate (1L/2L Water). Cut stump application of fluroxypyr (1L/5L Diesel; Foliar Spray of fluroxypyr 1:120 for larger plants, 1:200 for seedlings (ref 2).
189	Rubiaceae	Coffea arabica (coffee)	5	7	3.2	S/T/A	Saplings: Hand pull	Shrubs: F/I (G1) between flower and fruit set; Saplings: CS&P (G1); Seedlings: spray G200 or G200 + MM (ref 1).
190	Bignoniaceae	Spathodea campanulata (African tulip tree)	12	1	3.4	T/O	N/A	Saplings: CS&P (G1.5); Trees: F/I (G1.5); Seedlings: spray G200 (ref 1).
191	Fabaceae	Macroptilomia axillare (perennial horse gram)	4	12	3.1	V,H/A	N/A	Vines: CS&P (1.1.5) or spray G100 + MM or MM (ref 1).
192	Bignoniaceae	Watsonia meriana var bulbillifera (bulbil watsonia)	2	3	3.1	H/O	Dig up, bag and remove	Spray G200 + MM (ref 1)
193	Passifloraceae	Passiflora edulis (passion fruit)	8	12	3.2	V/A/O	Hand Pull	CS&P (G1.5), spray G200 or G200 + MM (ref 1).
194	Asteraceae	Zinnia peruviana (wild zinnia)	6	33	3.1	H/O	Seedlings: Hand pull	Shrubs: CS&P or F/I (G1); Seedlings: CS&P (G1.5) or spray G200 (ref 1).
195	Dracaenaceae	Sansevieria trifasciata (sansevieria)	27	7	3.1	H/O	Hand pull or dig up	Spray G100 + MM (ref 1).
196	Poaceae	Digitaria eriantha (pangola grass)	5	20	3.1	H/A	Hand pull or cultivation	Spot Spray. glyphosate or 2,2-DPA (ref 3)
197	Rosaceae	Eriobotrya japonica (loquat)	3	5	3.1	T/O	Seedlings: Hand pull	Saplings: CS&P (G1.5), Trees: F/I (G1.5); Seedlings: spray G200 or G200 + MM or MM (ref 1).
198	Cactaceae	Acanthocereus tetragonus (sword pear)	1	1	3.3	S/O	Biological controls available. cactoblastis cactorum successful. Mechanical control difficult. Fire can be used	Spray; Basal Bark application; Injection. Triclopyr, 1L/6L diesel. Picloram + Triclopyr 1L/6L diesel. Armure. 1mL/3cm (ref 3).
199	Mimosaceae	Acacia nilotica subsp. indica (prickly acacia)	3	3	4.4?	T/A	Mechanical or chain removal.	Basal Bark or cut stump application. Triclopyr 600g/L at 1.0L/120L diesel. Triclopyr + Picloram 240 g/l + 120 g/l at 1.0L/60L diesel. Picloram 45 g/kg undiluted (ref 5).
200	Mimosaceae	Acacia farnesiana (mimosa bush)	5	15	3.1	T/A	Mechanical removal of small plants	Basal Bark or cut stump application of Triclopyr + Picloram 240 g/l + 120 g/l at 1.0L/60L diesel. Foliar application of Clopyralid 300g/L at 500mL/1L water (ref 5)

Explanatory notes:
Sub-region: Number of the ten sub-regions of the Southeast Queensland bioregion (Young and Dillewaard 1999) within which species recorded
Rec no.: Total number of records for species within study area, Queensland herbarium CORVEG and HERBRECS data.
Scores: Based on panel data of invasiveness, 5 (highest) to 3 (moderate) ? indicate doubtful scores
Life forms: T=tree (woody plant >5m), S1=small tree (2-5m), S=shrub (woody <2m), H=herb (grasses & forbes), Ha=aquatic herbs.
Source: A=agriculture, O=ornamental and landscaping, F=fish aquarium, U=unintentional introduction and/or contaminant.

Abbreviations: Control Methods
CS&P = cut scrape and paint
S&P = scrape and paint
C&P = cut and paint
F/I = fill or inject stem

Abbreviations: Herbicide
G = Glyphosate, eg. Roundup Biactive, Weedmaster Duo
MM = Metsulfuron methyl, eg. Brushoff
F = Fluroxypyr, eg. Starane

Abbreviations: Herbicide Dilution Rates for High Concentration Applications
GU = Glyphosate undiluted
G1 = 1 part water to 1 part glyphosate
G1.5 = 1.5 parts water to 1 part glyphosate
G4 = 4 parts water to 1 part glyphosate

Abbreviations: Herbicide Spray Concentrations
G100 = 100mL glyphosate per 10L of water + surfactant, eg 20mL LI 700 per 10L
G200 = 200mL glyphosate per 10L of water + surfactant, eg 50mL LI 700 per 10L
G100 + MM = 100mL glyphosate + 1.5g metsulfuron methyl per 10L of water + wetting agent, eg. 2mL Agral per 10L water
G200 + MM = 200mL glyphosate + 1.5g metsulfuron methyl per 10L of water + wetting agent, eg. 2mL Agral per 10L water
MM = 1.5g metsulfuron methyl per 10L water + wetting agent, eg. 2mL Agral per 10L water
F100 = 100mL fluroxypyr per 10L water
F150 = 150mL fluroxypyr per 10L water

Other Abbreviations
= Locally non-indigenous native species

Ref. 1 Big Scrub Rainforest Landcare Group (2008), "Common Weeds of Subtropical Rainforests of Eastern Australia. A practical manual on their
Ref. 2 Department of Primary Industries and Fisheries (QLD), "Weeds and pest animals and ants"
Ref. 3 Holland et al. (1996), "Suburban Weeds", DPI QLD.
Ref 4 Port Stephens Council (NSW), "Weed Busters"
Ref 5 Department of Primary Industries (NSW), "Noxious and Environmental Weed Handbook, 3rd Edition".
Ref 6 Department of Environment and Conservation, "Florabase", (DEC- WA)
Ref 7 Vitelli, J.S. and Madigan, B.A. and Van Haaren, P.E. and Setter, S. and Logan, P. (2008) Control of the invasive liana, Hiptage benghalensis. Weed Biology and Management, 9 (1). pp. 54-62.

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40 YEARS 1975-2015

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APPROVED COMPANY ISO9001 Quality Management Systems
APPROVED COMPANY ISO14001 Environmental Management Systems

AMENDMENTS:

Issue	Date	Description	Checked
A	13/11/2017	Preliminary Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: AS NOTED

landscape architecture

DRAWING: Area 2 Management Plan Weed Management Techniques

DATE:	November 17	CHECKED:	MS
CLIENT REF.:	7243	DRAWN:	TL
DRAWING No.:	7243 L 216 WMP A		

Spring Mountain Precinct

AREA 2 MANAGEMENT PLAN - MONITORING & REPORTING

MONITORING & REPORTING

MONITORING AND REPORTING PROCEDURES

Monitoring and maintenance of the weed management and vegetation, both adjacent to proposed works and within the management area, is a vital component to the success of this management plan set.
An ongoing maintenance schedule, detailing the monitoring program, management intervals, methodologies, and corrective actions for contractors undertaking rehabilitation works within the ecological area is provided below. It is the responsibility of the rehabilitation landscape contractor to ensure the ongoing maintenance and monitoring schedule is actioned. Monitoring of the parkland weed management and revegetation works allows for:

- A review of the pre-established performance indicators for measuring the success of the weed removal and control;
- Ensure the level of protection for existing identified native vegetation inclusive of that which has naturally regenerated;
- Review the rate of spread or contraction of weed infestation within the control program;
- Monitor the rate of assisted regeneration and revegetation of desirable native species promoted in areas where weeds have been removed; and
- Identification of new weed threats or other factors which may be effecting areas designated for ecological rehabilitation.

Monitoring is required for weed eradication, revegetation and assisted regeneration.

MAINTENANCE ACTIONS AND METHODOLOGIES

Tree Retention - Construction Phase
- Ecologist / Arborist to assess tree exclusion zones are adhered to;
- Trees assessed for signs of stress or die back; and
- Implementation of VMP if retained tree roots Critical Root Zone (CRZ) is impacted upon.

Initial Establishment - Rehabilitation Planting
Initial 12 week establishment period applies to all rehabilitation planting works. During this period weekly maintenance is to occur that involves the following:
- Watering;
- Ongoing weed control;
- Fertilising; and
- Replacement of dead or damaged stock.

Ongoing Maintenance - Rehabilitation Planting
After this period, it is recommended that the ecological planting site be maintained on a monthly basis over a 5 year period to ensure that the planting has been successful. The following is to occur:
- Conduct weed spraying, plant watering, plant replacement of losses as necessary to maintain >95% survival rate;
- All other areas of non-use / limited access or steep terrain areas are to be hydro seeded to maintain a minimum 90% ground cover;
- All planting species will be disease free and supplied from an accredited nursery supplier;
- Assess condition of sediment control devices and replace if necessary; and
- Removal of excess sediment from erosion control devices as required.

MONITORING TIME FRAMES

For weed removal and revegetation three (3) Council determined timeframes form the anchor of the monitoring process. These include:

Council Pre-Start - *On-site meeting prior to the initial commencement of work within each stage of weed management. Will involve Consultant, Contractor and Council to work through weed treatment areas and clarify works approved and appointed.*

On-Maintenance - *At the completion of the Primary Weed Removal Stage and Secondary weeding an On-Maintenance meeting will be held with Council to inspect the works on-site in relation to the approved plans and previously agreed on-maintenance criteria.*

Off-Maintenance - *At the completion of all site weeding works and the agreed maintenance timeframe a final inspection will be held by Council to determine if works have been completed to the required level for Council hand over.*

REPORTING

Reporting to **Ipswich City Council** will occur on a yearly interval during the total period. Council will physically attend the Pre-Start, On-maintenance and Off-maintenance meetings. For this project it is recommended reporting include a short memo styled report responding to agreed criteria. As part of the monitoring a number of pre-determined transect and quadrant sampling sites have been allocated. At these locations a number of baseline studies have been completed and will be repeated post weed removal and maintenance to measure the success of the programmed works. It is also recommended this include a visual diary of imagery from selected locations at each inspection (Including the pre-start and monthly inspections). The imagery for the each period will be included with the report to Council.

In addition to the photo monitoring the biannual report to Council should include sufficient information on:
- Date, time and whether conditions at time of inspection
- Changes in weed extent populations (spreading / contracting)
- Changes in weed densities
- Health of existing vegetation protected by NRM provisions
- Rate of success for revegetation plantings
- Growth and PFC rate of assisted regeneration areas
- Occurrences of new weed infestations or species outbreaks
- Comments on any indirect changes to the area as a result of weed management (ie erosion / change in weed footprints / death to natives)
- Annual reporting is required to be sent to the Department of the Environment (DOE).

NOTES

MONITORING PARAMETERS

The monitoring should address the following issues:
- Maintained health and vigour of retained Remnant Trees adjacent to the corridor;
- Plant growth, percentage cover and survival rates;
- Plant losses through herbivores, disease, vandalism, storm damage or other factors;
- Weed re-growth and control measures;
- Plant replacement;
- Maintenance watering regime; and
- Erosion prevention.

It is also essential to keep an accurate photo record of the retained trees and progress of the rehabilitation planting by setting fixed photo monitoring points across the site. Photos should be taken by a digital camera and recorded in the project file by date and discrete photo monitoring point number. Photo monitoring point locations should be clearly marked on site and mapped by a surveyor or by GPS.

Corrective Actions
If trees adjacent to the sewer alignment disturbance are dying or impacted upon:
- Monitor construction activity;
- Educated construction team on tree retention measures;
- Review and / or respond to tree retention mitigation measures ie. exclusion zones;
- Review VMP for particular trees;
- Remove if necessary unsafe tree;
- Compensation by planting;
- If soil erosion is still occurring in planting zones the following is to occur:
- Review rehabilitation techniques conducted by contractor;
- Assess the potential for disturbance to occur;
- Assess other potential sources or causes of disturbances to occur; and
- Maintain planting regimes to a minimum of 95% survival rate.

If weed infestations occur in planting zones or in disturbed construction area, the following is to occur:
- Review weed removal and weed management techniques conducted by contractor;
- Assess the appropriate use and amounts of herbicides are being used;
- Assess the potential for weeds to occur;and
- Assess other potential sources or causes of weeds to occur.

If there is poor regeneration of plants occurring in ecological areas, the following is to occur:
- Review planting and direct seeding management techniques conducted by contractor;
- Assess the appropriate use and amounts of herbicides are being used in planting areas;
- Assess the potential for weeds to occur in ecological areas; and
- Assess other potential sources or causes of weeds or limited re-growth of native plants to occur, ie. plant pests and disease monitoring.

RESOURCES / ROLES & RESPONSIBILITIES

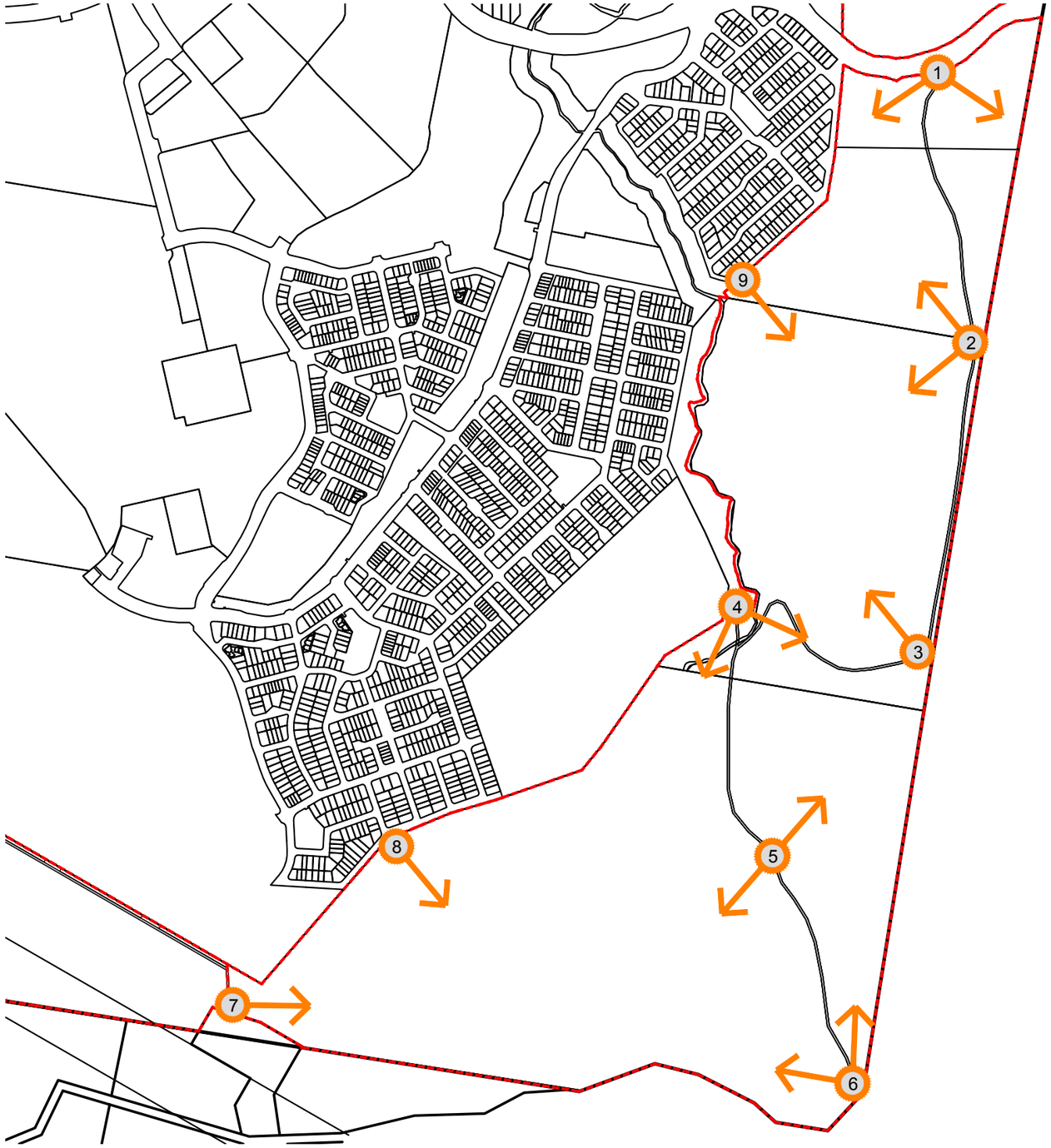
All resources required to implement this plan will be provided by the proponent (Lendlease). The following roles are applicable:

PROPONENT
- Ensure all consultants, contractors, sub contractors or others utilizing the area are aware of the Weed Management Plan.
- Appoint appropriate consultants and contractors to undertake works as prescribed on the drawings and conditioned by **Ipswich City Council**.
- Cover the costs of all necessary resources to ensure works are completed as per the approved documents.

CONSULTANTS
- Brief the proponent on their requirements in implementing and maintaining works as per the Weed Management Plan.
- Attend pre start, on maintenance and off maintenance meetings.
- Undertake monitoring and reporting to **Ipswich City Council** as set up by this document.
- Be available to respond to technical queries or departures to the approved documentation when on-site conditions require changes.
- Liaise with Council throughout all stages of approval, initial works and maintenance of works.

COUNCIL
- Provide technical expertise via commentary on the approval of documentation.
- Attend pre-start, on and off maintenance inspections.
- Undertake random inspections through the Secondary weed management and Maintenance weed management phases.
- Accept and review biannual reports as dictated in this document.

CONTRACTOR
- Complete works in strict accordance with the documentation.
- Recommend changes to the documentation when specific experience or on-site conditions require so.
- Attend pre-start, on and off maintenance inspections.



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APPROVED COMPANY ISO14001 Environmental Management Systems

AMENDMENTS:

Issue	Date	Description	Checked
A	13/11/2017	Preliminary Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: 1:2000@A1 1:4000@A3 0 20 100m

landscape architecture

DRAWING: Area 2 Weed Management Plan Monitoring & Reporting

DATE: November 17 | CHECKED: MS
CLIENT REF.: 7243 | DRAWN: TL
DRAWING No.: 7243 L 217 WMP A

Spring Mountain Precinct

AREA 3 WEED MANAGEMENT

ISSUE A 13.11.2017
PRELIMINARY ISSUE

DRAWING SCHEDULE

Dwg No.	Drawing Title	Issue	Date
7243 L 301	Weed Management Plan - Cover Sheet	A	13/11/2017
7243 L 302	Weed Management Plan - Introduction	A	13/11/2017
7243 L 303	Weed Management Plan - Sheet 1	A	13/11/2017
7243 L 304	Weed Management Plan - Sheet 2	A	13/11/2017
7243 L 305	Weed Management Plan - Sheet 3	A	13/11/2017
7243 L 306	Weed Management Plan - Sheet 4	A	13/11/2017
7243 L 307	Weed Management Plan - Sheet 5	A	13/11/2017
7243 L 308	Weed Management Plan - Sheet 6	A	13/11/2017
7243 L 309	Weed Management Plan - Technical Notes	A	13/11/2017
7243 L 310	Weed Management Plan - Treatment Techniques	A	13/11/2017
7243 L 311	Weed Management Plan - Treatment Techniques	A	13/11/2017
7243 L 312	Weed Management Plan - Treatment Techniques	A	13/11/2017
7243 L 313	Weed Management Plan - Monitoring & Reporting	A	13/11/2017

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Issue	Date	Description	Checked
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CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: AS NOTED

landscape architecture

DRAWING: Area 3 Weed Management Plan Cover Sheet

DATE: November 17 | CHECKED: MS
CLIENT REF.: 7243 | DRAWN: TL
DRAWING No.: 7243 L 301 WMP A

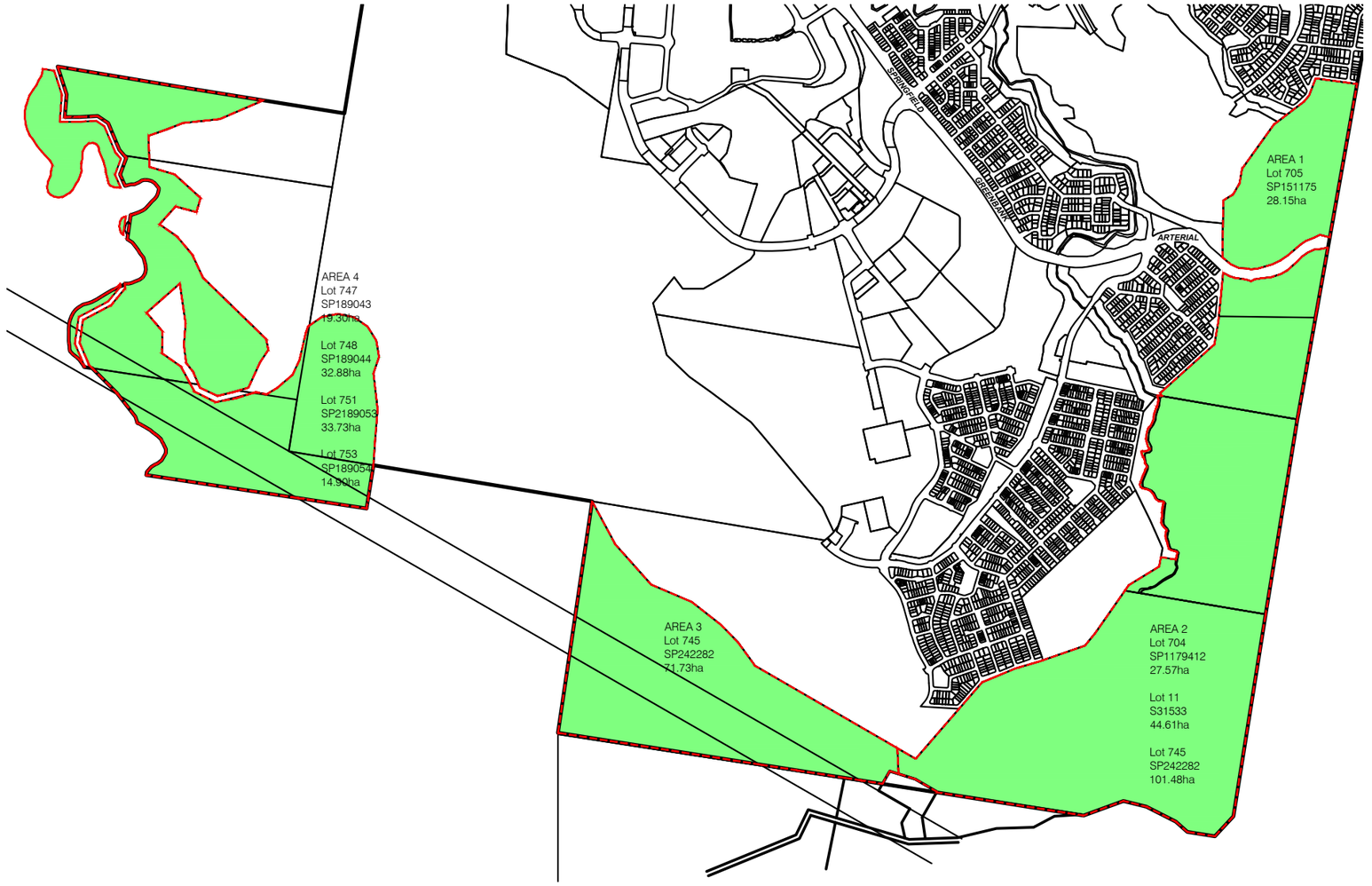
Spring Mountain Precinct

AREA 3 MANAGEMENT PLAN - WEED TREATMENT & REHABILITATION

INTRODUCTION

NOTES

This Weed Management Plan



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CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: AS NOTED

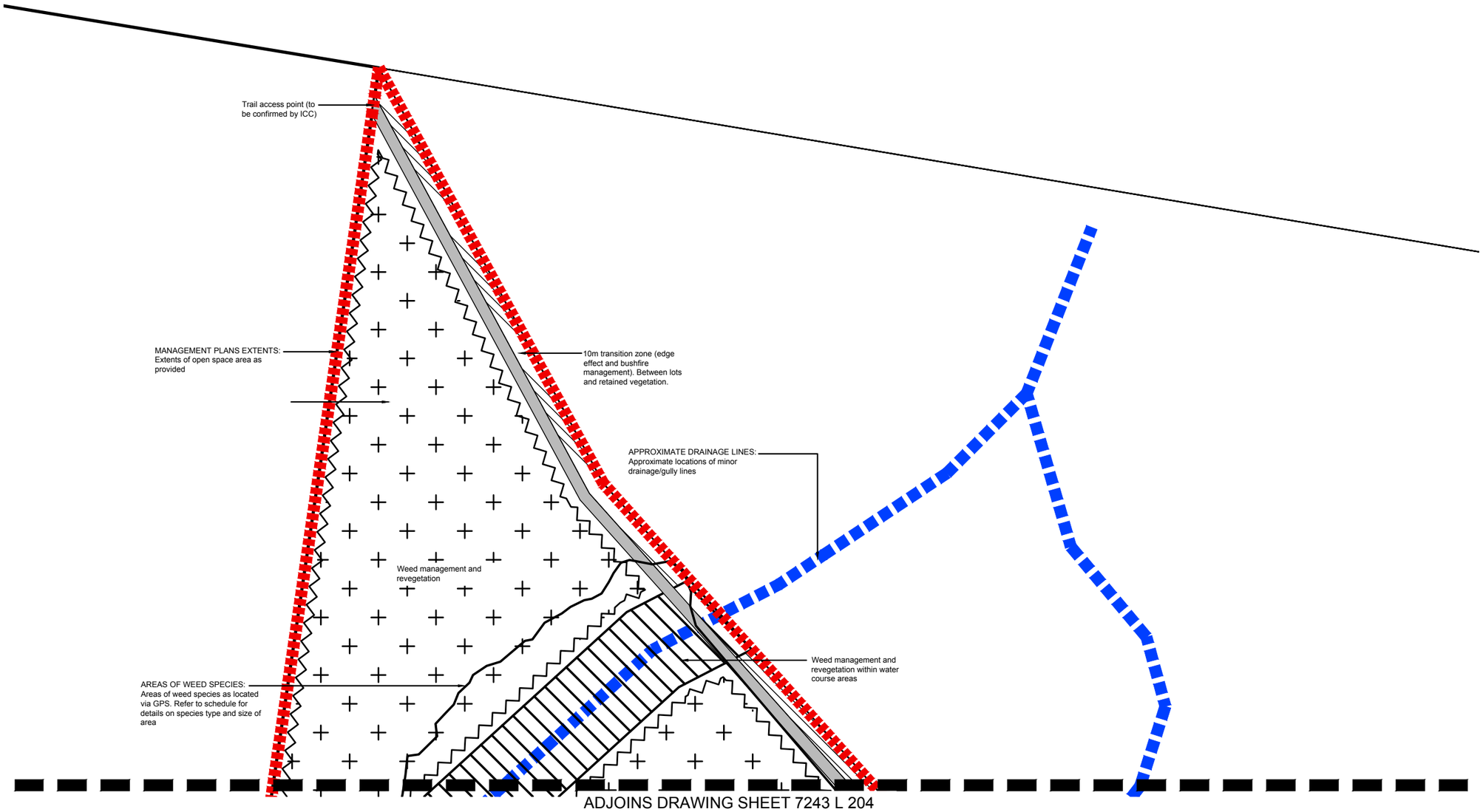
landscape architecture

DRAWING: Area 3 Weed Management Plan Weed Management Notes

DATE:	November 17	CHECKED:	MS
CLIENT REF.:	7243	DRAWN:	TL
DRAWING No.:	7243 L 302 WMP A		

Spring Mountain Precinct

AREA 3 WEED MANAGEMENT PLAN



LEGEND

- Extent of management plan area
- Existing fire trail / maintenance access. As provided by ICC in GIS & Refer to Council's Management Plan
- Approximate minor drainage lines. Minor drainage / gully lines
- Approximate mapped major drainage lines
- Extent of existing lake area
- Weed management and revegetation
- Weed management and revegetation within water course areas
- Individual weed species located via GPS
- Area of weed species located via GPS
- 10m transition zone (Edge effect & bushfire management). Between lots and retained vegetation
- Trail access point (To be confirmed by ICC)

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AMENDMENTS:

Issue	Date	Description	Checked
A	13/11/2017	Preliminary Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: 1:1000@A1 1:2000@A3 0 10 20 50m

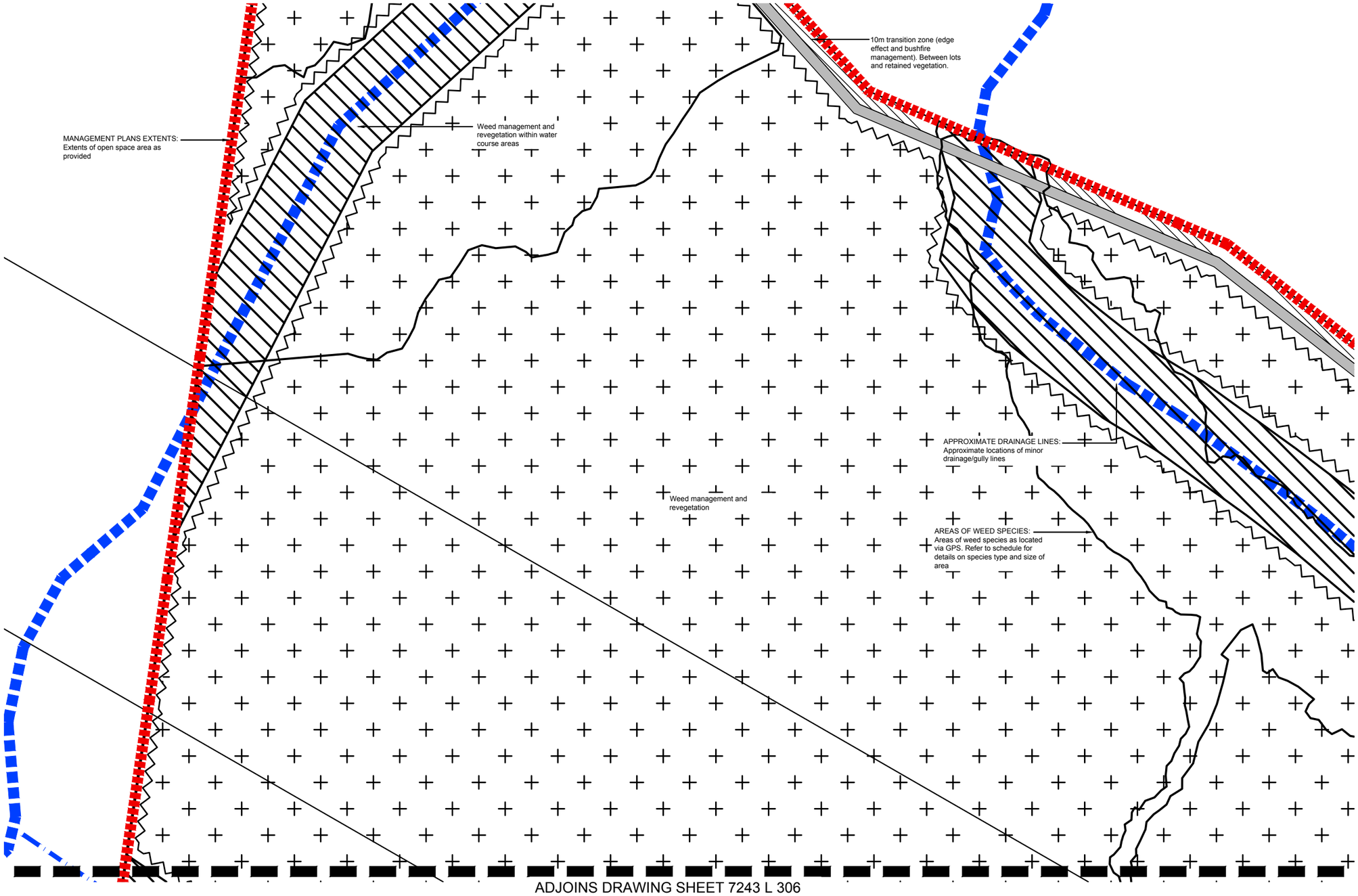
landscape architecture

DRAWING: Area 3 Management Plan Weed Management - Sheet 1

DATE: November 17	CHECKED: MS
CLIENT REF.: 7243	DRAWN: TL
DRAWING No.: 7243 L 303 WMP A	

Spring Mountain Precinct

AREA 3 WEED MANAGEMENT PLAN



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PROJECT: Spring Mountain Precinct

SCALE: 1:1000@A1 1:2000@A3 0 10 20 50m

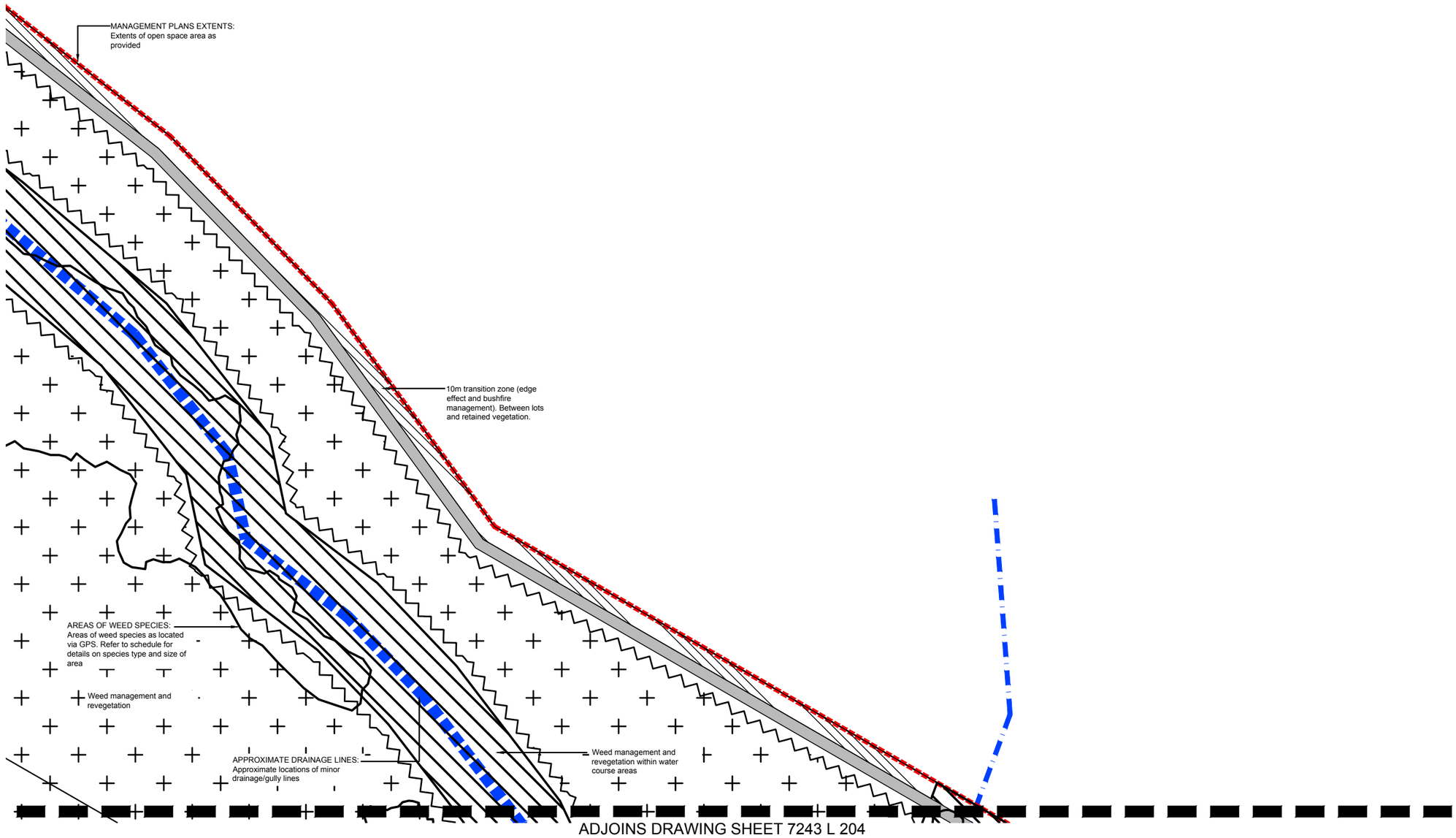
landscape architecture

DRAWING: Area 3 Management Plan Weed Management - Sheet 2

DATE: November 17	CHECKED: MS
CLIENT REF.: 7243	DRAWN: TL
DRAWING No.: 7243 L 304 WMP A	

Spring Mountain Precinct

AREA 3 WEED MANAGEMENT PLAN



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SCALE: 1:1000@A1 1:2000@A3 0 10 20 50m

landscape architecture

DRAWING: Area 3 Management Plan Weed Management - Sheet 3

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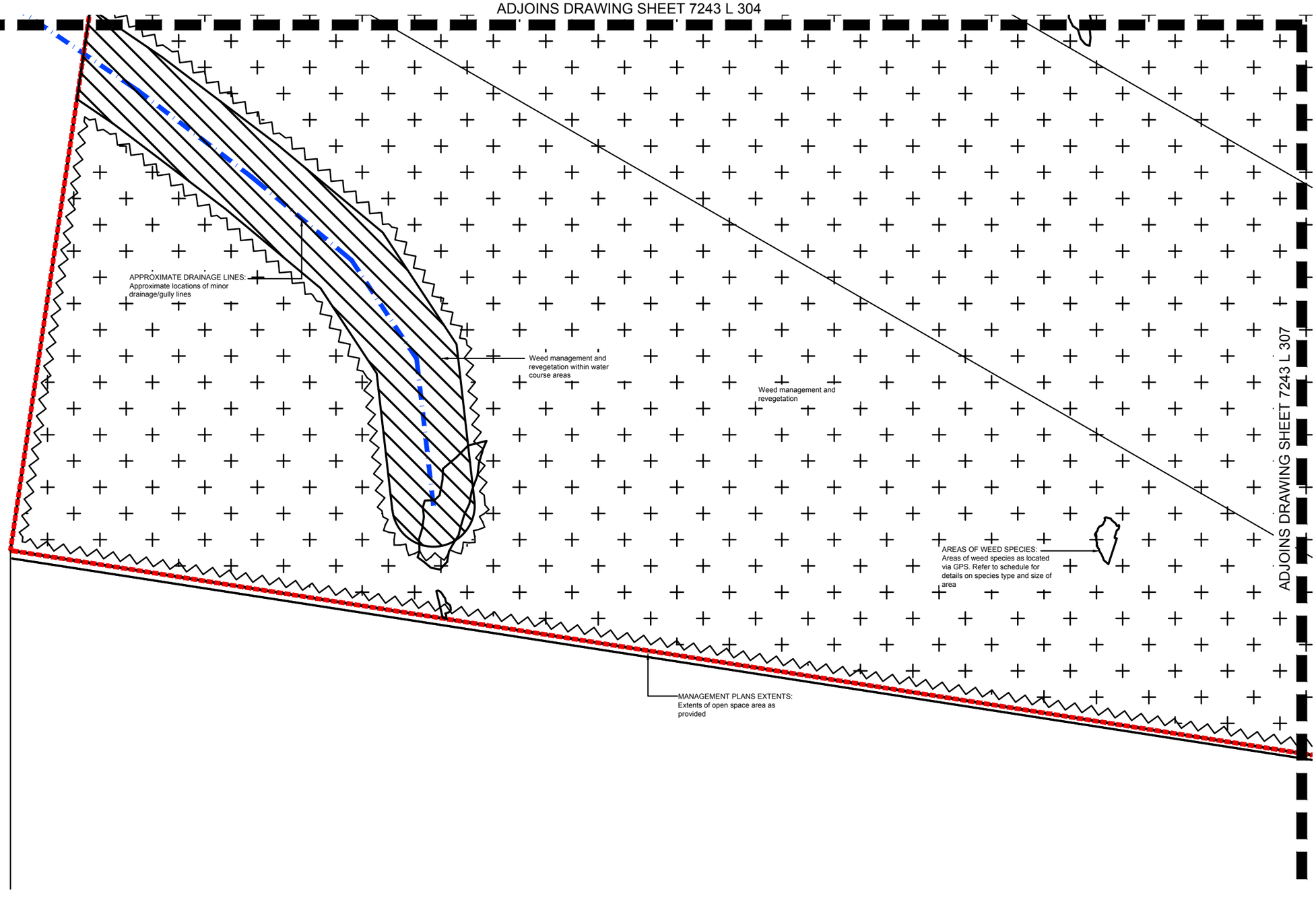
CLIENT REF.: 7243	DRAWN: TL
DRAWING No.: 7243 L 305 WMP A	

Spring Mountain Precinct

AREA 3 WEED MANAGEMENT PLAN



LEGEND

- Extent of management plan area
- Existing fire trail / maintenance access. As provided by ICC in GIS & Refer to Council's Management Plan
- Approximate minor drainage lines. Minor drainage / gully lines
- Approximate mapped major drainage lines
- Extent of existing lake area
- Weed management and revegetation
- Weed management and revegetation within water course areas
- Individual weed species located via GPS (1036)
- Area of weed species located via GPS (1226, 1200)
- 10m transition zone (Edge effect & bushfire management). Between lots and retained vegetation
- Trail access point (To be confirmed by ICC) (824)

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40 YEARS 1975-2015

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APPROVED COMPANY ISO9001 Quality Management Systems
APPROVED COMPANY ISO14001 Environmental Management Systems

AMENDMENTS:

Issue	Date	Description	Checked
A	13/11/2017	Preliminary Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: 1:1000@A1 1:2000@A3 (0 10 20 50m)

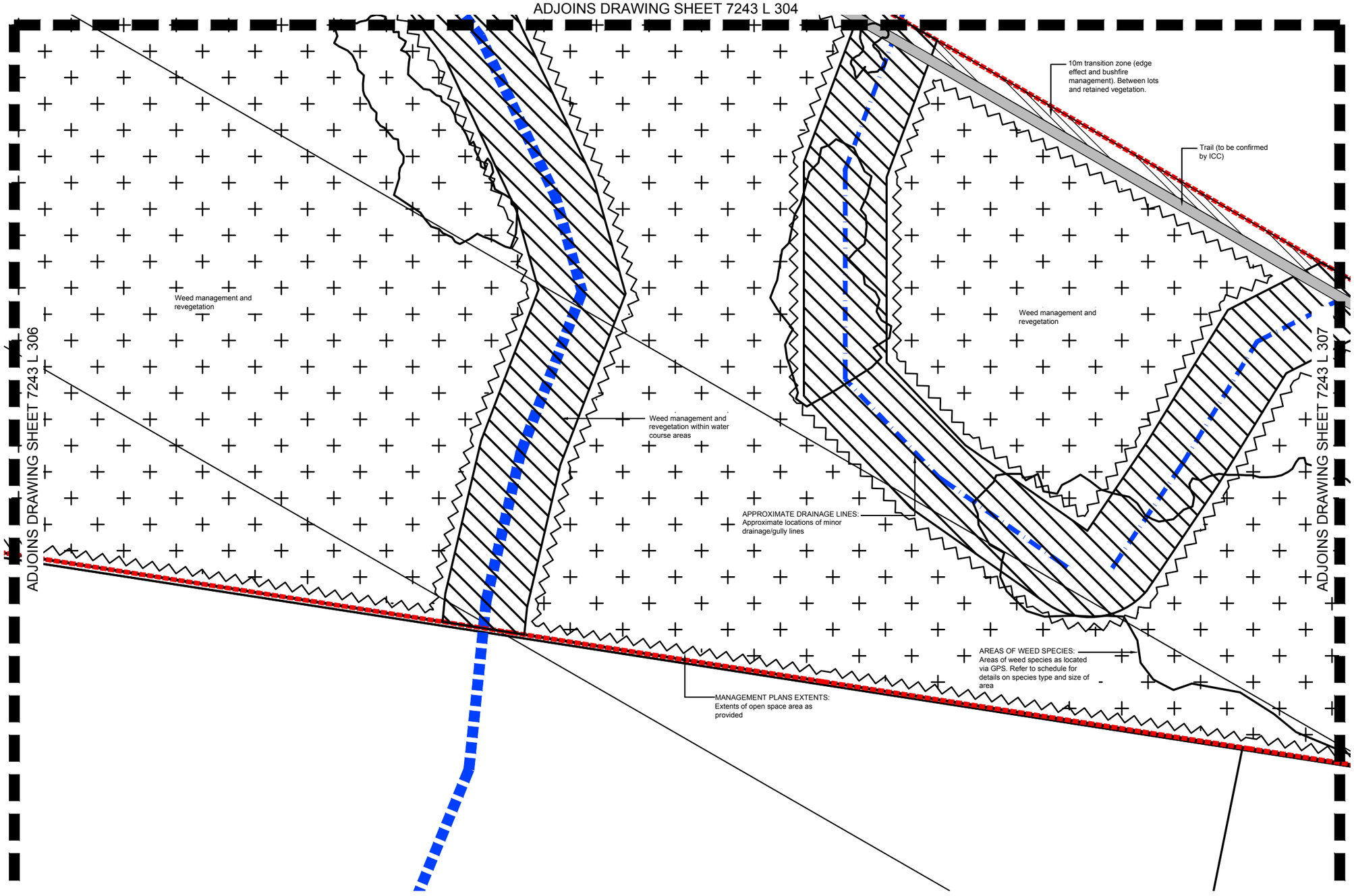
landscape architecture

DRAWING: Area 3 Management Plan Weed Management - Sheet 4

DATE: November 17	CHECKED: MS
CLIENT REF.: 7243	DRAWN: TL
DRAWING No.: 7243 L 306 WMP A	

Spring Mountain Precinct

AREA 3 WEED MANAGEMENT PLAN



LEGEND

- Extent of management plan area
- Existing fire trail / maintenance access. As provided by ICC in GIS & Refer to Council's Management Plan
- Approximate minor drainage lines. Minor drainage / gully lines
- Approximate mapped major drainage lines
- Extent of existing lake area
- Weed management and revegetation
- Weed management and revegetation within water course areas
- Individual weed species located via GPS (1036)
- Area of weed species located via GPS (1226, 1200, 824)
- 10m transition zone (Edge effect & bushfire management). Between lots and retained vegetation
- Trail access point (To be confirmed by ICC)

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AMENDMENTS:

Issue	Date	Description	Checked
A	13/11/2017	Preliminary Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: 1:1000@A1 1:2000@A3 0 10 20 50m

landscape architecture

DRAWING: Area 3 Management Plan Weed Management - Sheet 5

DATE: November 17	CHECKED: MS
CLIENT REF.: 7243	DRAWN: TL
DRAWING No.: 7243 L 307 WMP A	

Spring Mountain Precinct

AREA 3 WEED MANAGEMENT PLAN

ADJOINS DRAWING SHEET 7243 L 304

ADJOINS DRAWING SHEET 7243 L 307

10m transition zone (edge effect and bushfire management). Between lots and retained vegetation.

Trail access point (to be confirmed by ICC)

Weed management and revegetation

Weed management and revegetation

APPROXIMATE DRAINAGE LINES: Approximate locations of minor drainage/gully lines

Weed management and revegetation within water course areas

AREAS OF WEED SPECIES: Areas of weed species as located via GPS. Refer to schedule for details on species type and size of area

MANAGEMENT PLANS EXTENTS: Extents of open space area as provided

REFER TO AREA 2 WEED MANAGEMENT PLAN FOR DETAIL

Trail access point (to be confirmed by ICC)

LEGEND

- Extent of management plan area
- Existing fire trail / maintenance access. As provided by ICC in GIS & Refer to Council's Management Plan
- Approximate minor drainage lines. Minor drainage / gully lines
- Approximate mapped major drainage lines
- Extent of existing lake area
- Weed management and revegetation
- Weed management and revegetation within water course areas
- Individual weed species located via GPS (1036)
- Area of weed species located via GPS (1226, 1200, 847)
- 10m transition zone (Edge effect & bushfire management). Between lots and retained vegetation
- Trail access point (To be confirmed by ICC) (824)

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APPROVED COMPANY ISO14001 Environmental Management Systems

AMENDMENTS:

Issue	Date	Description	Checked
A	13/11/2017	Preliminary Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: 1:1000@A1 1:2000@A3 (0 10 20 50m)

landscape architecture

DRAWING: Area 3 Management Plan Weed Management - Sheet 6

DATE: November 17 | CHECKED: MS

CLIENT REF.: 7243 | DRAWN: TL

DRAWING No.: 7243 L 308 WMP A

Spring Mountain Precinct

AREA 3 MANAGEMENT PLAN - TECHNICAL NOTES - GENERAL

NOTES

This Weed Management Plan links specific weed removal and management measures with spatial areas within the declared area included with this application. This Weed Management Plan covers the 71.73ha Area 3 portion of land previous dedicated by Springfield Land Corporation (SLC) to Ipswich City Council (ICC). The main objectives and action items for pest plants are detailed in Table 1 shown on this plan, with the objectives and actions for ecological restoration are detailed in Table 2.

WEED CONTROL PROGRAM TIMING

The primary stage of manual weed removal, treatment and disposal for the parkland dedication is programmed when all existing weeds are removed with secondary and maintenance weeding occurring for another 18 months (18 month program post on-maintenance).

Primary Weed Removal Stage - Consists of the initial weed removal / treatment of site weeds via the methods detailed within the South East Queensland Ecological Restoration Guidelines. Essentially involves the manual removal, stock piling and disposal and initial usage of prescribed herbicides. Additional notes below include:

- Implemented weed control method according to this plan.
- Weed trees located within 20M zone of the existing trail network are to be removed where trunk is cut down to ground level and vegetative matter removed.
- Program timing; primary weed removal phase is considered to be completed when all existing weeds within the stage for the declared area have been removed or treated. Both the secondary phase and the primary phase of weed removal can occur concurrently in different stage areas over time.
- A key map is to be provided logging the progress of areas from primary to secondary phases of weed removal and areas of rehabilitation as part of the reporting progress.

Secondary or Follow-up Weeding - for all areas will involve the quarterly inspection of areas having undergone Primary Weed Removal and treatment of infestations or outbreak as required. Additional notes below include:

- Implemented weed control method according to this plan.
- Weed trees located within 20M zone of the existing trail network are to be removed where trunk is cut down to ground level and vegetative matter removed.
- Program timing; primary weed removal phase is considered to be completed when all existing weeds within the declared area have been removed initially. Both the secondary phase and the primary phase of weed removal can occur concurrently in different work areas over time.
- A key map is to be provided logging the progress of areas from primary to secondary phases of weed removal and areas of rehabilitation as part of the reporting progress.

Maintenance Weeding Phase - final stage of weeding which occurs in areas where the majority of weeds have been removed and treated. Maintenance weeding continues to remove additional outbreaks but also allows for the fostering of natural regeneration and regrowth seedlings. Additional notes below include:

- Implemented weed control method according to this plan.
- Weed trees located within 20M zone of the existing trail network are to be removed where trunk is cut down to ground level and vegetative matter removed.
- Program timing; primary weed removal phase is considered to be completed when all existing weeds within the designated Park have been removed initially. Both the secondary phase and the primary phase of weed removal can occur concurrently in different work areas over time.
- A key map is to be provided logging the progress of areas from primary to secondary phases of weed removal and areas of rehabilitation as part of the reporting progress.

Revegetation occurs in two (2) distinct zones throughout the management area. Refer to Drawing sheets for a full description of proposed plant species, sizes, densities and numbers.

NATURAL REGENERATION

Applies:

- To relatively large, intact and weed-free areas of native vegetation.
- Where the native plants are healthy and capable of regenerating without human intervention.
- When native plant seed is stored in the soil or will be able to reach the site from nearby natural areas, by birds or other animals, wind or water.
- Where the plant community has a high potential for recovery after any short-lived disturbance, such as a fire or cyclonic winds.
- When preventative action is all that is required to avert on-going disturbance, e.g. erection of fencing to prevent intrusion from cattle.

Planting in such sites can work against the aims of restoration by interfering with natural regeneration.

The re-establishing plant community will be similar in structure, composition and diversity to the original vegetation.

ASSISTED NATURAL REGENERATION

Applies:

- To natural areas where the native plant community is largely healthy and functioning.
- When native plant seed is still stored in the soil or will be able to reach the site from nearby natural areas, by birds or other animals, wind or water.
- Where the natural regeneration processes (seedling germination, root suckering etc.) are being inhibited by external factors, such as weed invasion, soil compaction, cattle grazing, mechanical slashing etc.
- When limited human intervention, such as weed removal, minor amelioration of soil conditions, erection of fencing, cessation of slashing, etc. will be enough to trigger the recovery processes through natural regeneration.
- When major component is weed control.

Planting in such sites can work against the aims of restoration by interfering with natural regeneration.

The re-establishing plant community will be similar in structure, composition and diversity to the original vegetation.

TABLE 1: OBJECTIVES AND ACTION ITEMS FOR PEST PLANTS

Threats	Opportunities	Management action	Timeframe	Responsibility
Objective: Protect, manage and enhance the diversity of native flora species and vegetation communities within the estate by controlling pest plants.				
Insufficient monitoring of pest plants	Increased knowledge of pest plant abundance and distribution within the estate	Continue to develop and update the management plan for the estate to identify pest plants present and to recommend and prioritise control and monitoring actions	Annually	Saunders Havill Group (SHG)
Establish-ment of large infestations of pest plants Insufficient resourcing of pest plant control measures	Pest plants are controlled effectively and in a way that ensures native vegetation regeneration	Include treating pest plants within the open space area to improve visitors experience to the estate	Ongoing	Contractor
Increased abundance of pest plants due to fire	Increased knowledge of pest plant responses to fire	Conduct follow up pest plant treatment after any fires within the estate	As required	Contractor
Lack of education of visitors and local residents as to the adverse impacts pest plants have on the natural environ-ment	Improved public understanding and support for pest plant control	Provide material for public awareness (ie interpretative signage)	As required	Contractor

TABLE 2: OBJECTIVES AND ACTION ITEMS FOR ECOLOGICAL RESTORATION

Threats	Opportunities	Management action	Timeframe	Responsibility
Objective: Protect, manage and enhance the significant habitat values and ecological processes found within the estate, so as to contribute positively to the conservation values of the local and regional area				
Degraded vegetation communities have adverse impacts on other values within the estate, including native flora and fauna species, fire issues and aesthectics	Restore degraded native vegetation communities and minimise impacts associated with pest plants and animals and their control on native flora and fauna, cultural heritage sites, and landscapes within the estate	Prepare and issue a management plan to: - clearly prioritise actions and zones (eg. focus on declared and environmental pest plants and mapped biodiversity zones) - Divide the site into sub-zones which can be managed in a systematic and structured way - Align with the fire management plan as burns could provide ecological and economical efficiencies; reducing fuel loads at the same time as acting as a pest plant control - Lantana (especially) should be managed to reduce the fuel load, as this is a major fire hazard Incorporate training (eg. for relevant community groups) - Write the plan for the target audience working on the estate (eg. bushcare groups working in particular zones)	Prior to commence-ment	Contractor
Pest plant infestations from high use areas may impact on adjacent ecological values	Improve the flora values within the open space area	As part of the site rehabilitation planning for the open space, a planting list of locally occurring plant species for use in rehabilitation is to be provided to enhance population viability where appropriate and possible. Include threatened and locally significant species in plantings.	Ongoing	Contractor
Trail creation, soil compaction and increased erosion	Restore natural habitats to increase the resilience of the estate	Refer to management plans for further detail	As required	Contractor
Pest plant introduction and spread	Deceased abundance of pest plants	Refer to management plans for further detail	As required	Contractor
Disturbance from pest animals	Deceased abundance of pest animals	Refer to management plans for further detail	As required	Contractor
Insufficient resourcing of restoration measures	Improved public understanding of and support	Refer to management plans for further detail	As required	Contractor
Insufficient data on the effectiveness of ecological restoration programs	The populations and diversity of near threatened, threatened or locally significant plant species are protected and enhanced	Refer to management plans for further detail	As required	Contractor

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AMENDMENTS:

Issue	Date	Description	Checked
A	13/11/2017	Preliminary Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: AS NOTED

landscape architecture

DRAWING: Area 3 Weed Management Plan Technical Notes - General

DATE: April 17	CHECKED: MS
CLIENT REF.: 7243	DRAWN: TL
DRAWING No.: 7243 L 309 WMP A	

Spring Mountain Precinct

AREA 3 MANAGEMENT PLAN - WEED TREATMENT & REMOVAL STRATEGY

NOTE:
Species highlighted have been identified within the 'Springfield Wildlife Corridor Management Requirements' list which have specified removal and/or treatment techniques for Class 1 or 2 weeds. Environmental weeds and weeds of National Significance (WONS) Class 3 are to be:

- Remove dumped garden weeds from urban interface. Liaise with ICC Supervisor regarding ongoing Compliance issues.
- Lantana controlled within 20m of track edges (ie walking, shared and service).
- Strategic treatment of gully infestations staged from head of gullies downstream utilising cut stump method and chopping lantana into small (150mm) pieces. Areas to be determined by consultation with ICC.
- Assisted natural regeneration following removal including direct seeding utilising endemic seed from site. Follow up weed control by spot spraying emerging weeds in cleared areas or hand removal.

QUEENSLAND HERBARIUM INVASIVE NATURALISED PLANTS IN SOUTH EAST QUEENSLAND

Rank	Family	Scientific and common names	Subregion	Rec No	Score	Life form & Source	Non-Chemical Control	Chemical Control
1	Verbenaceae	Lantana camara var. camara (lantana)	10	455	5	S/O	Seedlings: Hand pull	Seedlings: CS&P (G1.5); Shrubs: blanket spray G100 or cut down and spray regrowth G100 or splatter gun using 1 part G to 9 parts water - apply only when plant is growing, not dormant (ref 1).
2	Asteraceae	Baccharis halimifolia (groundsel bush)	10	168	4.8	S/O	Cut stump prior to flowering	Shrubs: CS&P or F/I (G1); Seedlings: CS&P (G1.5) or spray G200 (ref 1).
3	Crassulaceae	Bryophyllum delagoense (mother of millions)	8	38	4.9	H/O	Hand removed and bagged or larger infestations sprayed	Plantlets: spray G200 + MM or MM (ref 1).
4	Bignoniaceae	Macfadyena unguis-cati (cat's claw creeper)	5	36	4.9	V/O	Tubers: crown or dig up, bag and remove.	Regrowth and tuberlings: spray G100 + MM or F100 (ref 1).
	Basellaceae	Anredera cordifolia (madeira vine)	8	16	4.9	V/O	Small Vines & Tubers: Hand pull. Bag and dispose.	Ascending Stems: S&P (GU); Tubers: gouge, scrape and paint (GU); Ground infestations: spray G200 or G200 + MM (ref 1).
6	Asparagaceae	Asparagus africanus (ornamental asparagus, asparagus fern)	7	26	4.9	V/O	dig out roots and dispose of at local council landfill site. remove entire crown and underground stem to prevent regrowth	fluroxypyr (200 g/L) @ 35 mL per 1 L diesel/kerosene
7	Ulmaceae	Celtis sinensis (Chinese celtis)	8	19	4.9	T/O	remove when small : hand pull or dig out small seedlings. combine dozing, burning and controlled grazing for large infestations.	Stem injection, glyphosate (360 g/L) @ Undiluted at 1 mL per 2 cm of hole or cut
8	Lauraceae	Cinnamomum camphora (camphor laurel)	7	25	4.8	T/O	Seedlings: Hand pull	Saplings; CS&P (G1.5); Trees: F/I (G1 or G1.5) or C&P (G1.5 or GU for stems up to 8 diameter); Seedlings: spray G200 or G200 + MM
9	Anacardiaceae	Schinus terebinthifolius (broad-leaf pepper tree)	6	49	4.8	T/O	Seedlings: Hand pull	Saplings: CS&P (G1.5); Trees: F/I (G1.5); Seedlings: spray G200 (ref 1).
	Salviniaceae	Salvinia molesta (salvinia)	8	57	4.9	Ha/F	Mechanical removal of small infestations; Salvinia weevil (Biological control)	Aquatic areas: calcium dodecylbenzene sulphanate (AF-100) @ 1 part to 19 parts kerosene, diquat (vegetrol) 50-100L/ha or 4L/100L water; diquat (watrol) 50-100L/Ha or 4L/100L water; diquat (reglone) 5-10L/Ha or 400mL + 150mL Agral / 100L water (see ref 2.
11	Cabombaceae	Cabomba caroliniana (cabomba, fanwort)	4	12	4.9	Ha/F	Mechanical removal of small infestations	2, 4-D N-Butyl Ester (Rubber Vine Spray) @ 12.5L/ML water (see ref 2. for application guide).
12	Asteraceae	Chrysanthemoides monilifera subsp. rotundata (bitou bush)	3	23	4.9	S/OA	N/A	Stems: CS&P or F/I (G1.5); Bushes: spray or cut down and spray regrowth G100 or MM (ref 1).
13	Pontederiaceae	Eichhornia crassipes (water hyacinth)	4	8	4.9	Ha/OF	Mechanical removal of small infestations	Waterways: 2, 4-D acid ('AF 300') @ 1:200 with water; Aquatic Areas: glyphosate @1-1.3L/100L water (see ref 2. for application guide).
14	Acanthaceae	Hygrophila costata (Glush weed)	3	7	5	Ha/F	Hand pull smal infestations. Can be controlled by planting competitive native species.	Glyphosate known to be effective Species known to occur in waterways so EPA should be contacted before spraying (ref 4).
	Oleaceae	Ligustrum lucidum (tree privet)	5	9	4.8	T/O	Seedlings: Hand pull	Saplings: CS&P or C&P (G1.5); Trees: F/I (G1 or G1.5) or C&P GU for stems up to 8cm diameter; Seedlings: spray MM or G200 + MM if other weeds such as Lantana or Camphor Laurel are present
16	Asteraceae	Sphagneticola trilobata (Singapore daisy)	6	34	4.6	H/O	Hand pull	Hand pull and/or spray G200 + MM (ref 1).
17	Asteraceae	Ageratina adenophora (crofton weed)	6	38	4.6	H/O	Hand pull and hang to dry.	Spray MM or G200 or G200 + MM if other weeds such as Lantana or Camphor Laurel are present (ref 1).
18	Verbenaceae	Lantana montevidensis (creeping lantana)	8	62	4.8	S/O	Fire and/or mechanical control	Spray (march to may): glyphosate 1L/100L water; metsulfuron methyl 10g/100L water; metsulfuron methyls + glyphosate 173g/100L water; Basal bark (anytime): triclopyr 1L/60L Diesel, picloram + triclopyr @ 1L/60L Diesel, Glyphosate, neat application; Splatt
19	Fabaceae	Neonotonia wightii (glycine)	5	16	4.7	H/A	N/A	Vines: CS&P (1:1.5) or spray G100 + MM or MM (ref 1).
	Poaceae	Panicum maximum (green panic and guinea grass)	8	78	4.6	H/A	Hand or mechanical removal of small infestations	Spray: glyphosate @ 13mL/1L water (ref 2.)
21	Oleaceae	Ligustrum sinense (Chinese privet)	4	11	4.6	T/O	Seedlings: Hand pull	Saplings: CS&P or C&P (G1.5); Trees: F/I (G1.5); Seedlings: spray MM or G200 + MM if other weeds such as Lantana or Camphor Laurel are present (ref 1).
22	Ochnaceae	Ochna serrulata (ochna)	7	33	4.5	S/O	N/A	Stems: CS&P or S&P or F/I (G1.5); Seedlings and Regrowth: spray G200 + MM or MM. Trial basal bark F100 or G200 + MM (ref 1).
23	Asparagaceae	Asparagus aethiopicus cv. Sprengeri (asparagus ground fern)	5	35	4.5	H/O	dig out unwanted plants and dispose of at the appropriate council landfill. remove the entire crown of underground stem of plant to prevent regrowth	Spot spray - metsulfuronmethyl (600 g/L) @ 10 g per 100 L water plus wetting agent or 100 g/ha plus wetting agent. Cut stump, spot spray, Apply neat Diesel
24	Poaceae	Sporobolus pyramidalis and S. natalensis (giant rat's tail grasses)	8	72	4.8	H/U?	Seed heads cut and bagged, remaining leaves sprayed	Small infestations: spray glyphosate @ 15mL/L water, flupropanate @ 2mL/L water + ionic wetter @ 1mL/Lwater. Dense infestations: blanket spraying glyphosate 3L/ha, flupropanate 2L/ha (ref 2).
	Asteraceae	Ageratina riparia (mistflower)	5	38	4.6	H/O	Hand pull and hang to dry.	Spray G100 or MM (ref 1).
26	Asclepiadaceae	Araujia sericifera (mothvine)	9	38	4.4	V/O	Seedlings & Vines: Hand pull. Bag and remove fruit.	Vines: CS&P (G1.5); Seedlings: spray G200 or G200 + MM or MM (ref 1).
27	Crassulaceae	Bryophyllum daigremontianum x B. delagoense (hybrid mother-of millions)	6	15	4.5	H/O	Hand pull and dispose	Plantlets: spray G200 + MM or MM (ref 1).
28	Convolvulaceae	Ipomoea cairica (mile-a-minute)	7	56	4.4	V/O	Vines & Runners: hand pull, roll up and hand up to dry.	Vines and Runners: CS&P (G1.5); Larger Stems, Roots and Nodes: spray G100 + MM (ref 1).
29	Sapindaceae	Cardiospermum grandiflorum (balloon vine)	7	31	4.4	V/O	Seedlings & Small Vines: Hand Pull	Stems: CS&P (G1.5); Seedlings or Small vines: spray G200 or G200 + MM (ref 1).
30	Asclepiadaceae	Cryptostegia grandiflora (rubber vine)	6	19	4.4	V/O	Scattereded or medium-density infestations: Where possible, repeated slashing close to ground level is recommended.	Foliar spray - Follow-up basal bark/cut stump/foliar spray as necessary with Triclopyr + picloram (Grazon DS, Grass-up, etc.) @ 0.35–0.5 L /100 L water
31	Phytolaccaceae	Rivina humilis (baby pepper)	8	61	4.3	H/O	Hand pull and hang to dry.	Spray G100 (ref 1).
32	Poaceae	Sporobolus africanus (Parramatta grass)	8	48	4.5	H/U	Hand or mechanical removal of small infestations	Small infestations: spray glyphosate @ 15mL/L water, flupropanate @ 2mL/L water + ionic wetter @ 1mL/Lwater; Dense infestations: blanket spraying glyphosate 3L/ha, flupropanate 2L/ha (ref 2).
33	Poaceae	Sporobolus fertilis (giant Parramatta grass)	9	27	4.5	H/U	Hand or mechanical removal of small infestations	Small infestations: spray glyphosate @ 15mL/L water, flupropanate @ 2mL/L water + ionic wetter @ 1mL/Lwater; Dense infestations: blanket spraying glyphosate 3L/ha, flupropanate 2L/ha (ref 2).
34	Poaceae	Eragrostis curvula (African lovegrass)	7	29	4.3	H/U	Chipped out before they flower. When chipping out the plant ensure that the tussock crowns are removed, as this will prevent regrowth. If in seed, the stems must be cut and bagged first.	Glyphosate (360 g/L) (e.g. Weedmaster® Duo) @ 10 ml/1 L water
35	Asteraceae	Gymnocoronis spilanthoides (Senegal tea)	3	4	4.7	Ha/F	place plant material in a sealed plastic bag, leave in sunlight to rot then burn or dispose of at a council-approved land fill tip	Glyphosate and metsulfuron-methyl @ 15mL/L water
36	Amaranthaceae	Alternanthera philoxeroides (alligator weed)	1?	3	5	Ha/U	physical removal of plant should not be attempted	Terrestrial plants use Metsulfuron methyl (Brushoff®) + 1mL/L non-ionic wetter @ 80g/ha + 1mL/L non-ionic wetter or 10g/100L water + 1mL/L non-ionic wetter. Free floating plants Glyphosate (Roundup Biactive®) 10 mL/L
37	Passifloraceae	Passiflora suberosa (cork passionflower)	8	166	4.2	V/O	N/A	Stems: CS&P; Seedlings & Regrowth: spray G200 or G200 + MM (ref 1).
38	Poaceae	Melinis minutiflora (molasses grass)	5	17	4.5	H/A	Grazing or mowing	Spray: Fluazifop-P 212g/L @ 2L/Ha. Glyphosate 360g/L @ 1L/100L water (ref 2).
39	Aristolochiaceae	Aristolochia elegans (Dutchman's pipe)	8	30	4.3	V/O	Stems: Hand pull; Fruit: Bag and remove.	Stems: CS&P (G1.5); Seedlings: spray G200 or G200 + MM or MM (ref 1).
40	Convolvulaceae	Ipomoea indica (blue morning glory)	5	24	4.3	V/O	Vines and Runners: hand pull, roll up and hang to dry.	Vines and Runners: CS&P (G1.5); Larger Stems, Roots and Nodes: spray G100 + MM or F100 (ref 1).
41	Mimosaceae	Leucaena leucocephala (leucaena)	6	14	4.3	ST/A	Small plants: Hand pull or mechanical removal	Herbicide Control - Basal Bark application: triclopyr 240g/L + picloram 120g/L @ 1L/60L diesel; C&P: triclopyr 240g/L + picloram 120g/L @ 1L per 60L diesel; spray triclopyr 300g/l + picloram 120g/L @ 350mL per 100L water. Combination of chemical and mecha
42	Poaceae	Brachiaria mutica (para grass)	6	18	4.4	Ha/A	Grazing	Herbicide Control - Foliar application (Knapsack): glyphosate 360g/L @ 200mL/15L water; Foliar: glyphosate 360g/L @ 9L/Ha; Handgun: glyphosate 360g/L @ 1.3L/100L water (ref 2).
43	Hydrocharitaceae	Egeria densa (egeria waterweed)	2	7	4.4	Ha/F	hand pulling, cutting and digging with machines effective	N/A
44	Pinaceae	Pinus elliottii (slash pine)	4	22	4.3	T/A	Seedlings: Hand pull; Saplings and Trees: cut close to ground or ring-bark	Saplings and Trees: F/I (G1.5) ensuring thick bark is penetrated (ref 1).
45	Caesalpiniaceae	Senna pendula var. glabrata (Easter cassia)	7	33	4.2	ST/O	Seedlings: Hand pull	Shrubs: CS&P or F/I (G1.5); Seedlings: spray G200 or G200 + MM or MM; collect and bag seeds (ref 1).
46	Poaceae	Chloris gayana (Rhodes grass)	9	55	4.3	H/A	Hand pulling and removal and digging of larger clumps	Spray: glyphosate @ 1l/100L water
47	Crassulaceae	Bryophyllum pinnatum (resurrection plant)	6	17	4.2	H/O	Hand pull and dispose	Plantlets: spray G200 + MM or MM (ref 1).
48	Asteraceae	Parthenium hysterophorus (parthenium weed)	6	14	4.2	H/U	hand pulling of small areas is not recommended	Spot spray 2,4-D amine 500 g/L @ 0.4 L/100 L
49	Caprifoliaceae	Lonicera japonica (Japanese honeysuckle)	3	6	4.3	V/O	Vines and Runners: hand pull, roll up and hang to dry.	Vines and Runners: CS&P (G1.5); Larger Stems, Roots and Nodes: spray G100 + MM or MM (ref 1).
50	Acanthaceae	Thunbergia alata (black eyed susan)	5	22	4.2	H/O	N/A	CS&P (G1.5); spray G200 or G200 + MM (ref 1).
51	Fabaceae	Macroptilium atropurpureum (siratro)	8	39	4.2	V/A	N/A	Vines: CS&P (1:1.5) or spray G100 + MM or MM (ref 1).
52	Rosaceae	Rubus ellipticus (yellowberry)	4	26	4.1	S/O	slashing hinders growth, giving some control if plants are slashed before they seed	Grazon DS picloram/triclopyr 1:200 parts water + wetting agent
53	Colchicaceae	Gloriosa superba (glory lily)	3	26	4.1	V/O	N/A	Young Shoots: spray G200 or G200 + MM. Best results in Oct-Nov and by using 'Pulse' as surfucant (ref 1).
54	Verbenaceae	Phyla canescens (lippia, Condamine couch)	3	4	4.2	Ha/O	a combined approach of different control methods including chemical and mechanical with land management practices is most effective	Foliar spray 600 g/L Dichlorprop @ 5 ml /1 L water or 2,4-D amine (500 g/L) + 1% crop oil @ 2–4 L/ha + 1% crop oil
55	Solanaceae	Solanum seaforthianum (Brazilian nightshade)	8	78	4	V/O	Hand pull	Spray G100 (ref 1).
56	Araceae	Pistia stratiotes (water lettuce)	3	8	4.1	Ha/OF	Mechanical removal of small infestations	Glyphosate 360g/L @ 1-1.3L/100L water or 6.9L/Ha; diquat 20g/L @ 4L/100L water or 50-100L/Ha (see ref 2. for application guide).
57	Asparagaceae	Asparagus plumosus (asparagus fern)	4	8	4.1	V/O	Rhizomes: crown and hang to dry.	Rhizomes: gouge and paint (G1.5); Stems: wind up and spray or cut high and low and spray regrowth G200 or G200 + MM (ref 1)

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40 YEARS 1975-2015

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AMENDMENTS:

Issue	Date	Description	Checked
A	13/11/2017	Preliminary Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: AS NOTED

landscape architecture

DRAWING: Area 3 Weed Management Plan Weed Management Techniques

DATE: November 17 | CHECKED: MS

CLIENT REF.: 7243 | DRAWN: TL

DRAWING No.: 7243 L 310 WMP A

AREA 3 MANAGEMENT PLAN - WEED TREATMENT & REMOVAL STRATEGY

58	Commelinaceae	Tradescantia fluminensis (Qld use T. albiflora) (wandering jew)	5	9	4.1	H/O	N/A	Spray F150 (as per label) or G200 or G200 + MM; Collect and bag or roll and rake carefully. Dispose (ref 1).
59	Solanaceae	Cestrum parqui (green cestrum)	6	36	3.9	S/O	Seedlings: Hand pull	Stems: CS&P (G1.5) or spray G100 (ref 1).
60	Caesalpiniaceae	Senna septemtrionalis (arsenic bush, was S. floribunda)	6	25	4	S/O	Seedlings: Hand pull	Shrubs: CS&P or F/I (G1.5); Seedlings: spray G200 or G200 + MM or MM; collect and bag seeds (ref 1).
61	Solanaceae	Solanum mauritianum (wild tobacco tree)	8	30	4	S/O	Seedlings: Hand pull	Shrubs: CS&P (G1.5) or F/I (G1:1.5); Seedlings: spray G200 (ref 1).
62	Apocynaceae	Catharanthus roseus (pink periwinkle)	5	22	4	S/O	Hand pull	Spray G100 (ref 1).
63	Passifloraceae	Passiflora subpeltata (white passion flower)	10	60	3.9	V/O	Stems: Hand pull	Stems: CS&P; Seedlings & Regrowth: spray G200 or G200 + MM (ref 1).
64	Fabaceae	Desmodium uncinatum (silverleaf desmodium)	5	14	4	H/A	Hand pull or crown and dispose	CS&P tuberous roots (G1.5); spray G200 or G200 + MM or MM; collect and bag seeds (ref 1).
65	Poaceae	Melinis repens (red Natal grass)	10	134	4.1	H/A	Grazing or mowing	Spray: Fluazifop-P 212g/L @ 2L/Ha, Glyphosate 360g/L @ 1L/100L water (ref 2).
66	Nymphaeaceae	Nymphaea caerulea subsp. zanzibarensis (blue lotus)	4	17	4	Ha/OF	Hand pull small infestations.	Spray with or Diquat. Glyphosate. Occurs in waterways, thus EPA should be notified before any herbicide use (ref 5).
67	Onagraceae	Oenothera drummondii subsp. drummondii (beach evening primrose)	3	17	4	H/O	Hand pull	Spray G100 (ref 1).
68	Tiliaceae	Triumfetta rhomboidea (Chinese burr)	7	44	4	H/U	Hand pull	Spray G100 (ref 1).
69	Haloragaceae	Myriophyllum aquaticum (parrot's feather)	3	15	4	Ha/F	N/A	Spray: glyphosate 360g/L @ 100mL/10L water (ref 1).
70	Passifloraceae	Passiflora foetida (stinking passion flower)	7	50	3.9	V/O	Hand Pull	CS&P (G1.5); spray G200 or G200 + MM (ref 1).
71	Asteraceae	Verbesina encelioides (crownbeard)	7	34	4	H/U	Vines: Hand pull and remove; Runners: Roll up and hang to dry.	Stems: S&P (GU); Regrowth and seedlings: spray G200 or G200 + MM (ref 1).
72	Poaceae	Paspalum mandiocanum (broad leaf paspalum)	3	6	4	H/A	N/A	Spray G200 - resistant to weaker strength (ref 1).
73	Poaceae	Paspalum dilatatum (paspalum grass)	10	30	3.9	H/A	Hand pull or dig up	Spray G100 (ref 1).
74	Ruppiaceae	Ruppia maritima (sea tassel)	2	8	4	Ha/F	Hand pull or dig up	Spray G100 (ref 1).
75	Arecaceae	Syagrus romanzoffiana (queen palm)	4?	10	3.9	T/O	Seedlings: Hand pull or crown; Trees: cut below growing point	Trees: F/I (G1.5); Seedlings: spray G200 + MM (ref 1).
76	Poaceae	Hymenachne amplexicaulis cv. Olive (hymenachne)	1?	1	4	Ha/A	a combined approach of different control methods including mechanical, chemical and biological with land management practices is most effective	360 g/L Glyphosate (includes Roundup Biactive & Weedmaster Duo) – 1 L/100L water or 10 L/ha delivered by boom
77	Asteraceae	Senecio tamoides (Canary creeper)	3	8	4	V/O	Vines: Hand pull and remove; Runners: Roll up and hang to dry.	Stems: S&P (GU); Regrowth and seedlings: spray G200 or G200 + MM (ref 1).
78	Poaceae	Cenchrus ciliaris (buffel grass)	4	15	4.1	H/A	Hand or mechanical removal of young plants	Herbicide Control - Glyphosate 7mL/L water; Dichlobenil 600g/100m2; Fluazifop 50-100mL/10L water (ref 2).
79	Acanthaceae	Thunbergia grandiflora (thunbergia, blue thunbergia)	2	3	5?	V/O	N/A	CS&P (G1.5); spray G200 (ref 1).
80	Cactaceae	Opuntia tomentosa (velvet tree pear)	8	46	3.9	S/O	Hand removed, stem injected, or over sprayed with garlon	Spray; Basal Bark application; Injection: Triclopyr: .8L/60L diesel. Picloram + Triclopyr: 1L/60L diesel. Amitrole: 1mL/3cm (ref 3).
81	Euphorbiaceae	Ricinus communis (castor oil plant)	7	20	3.9	S/O	Seedlings: Hand pull	Shrubs: S: CS&P or F/I (G1.5); Seedlings: spray G200 (ref 1).
82	Asteraceae	Senecio madagascariensis (fire weed)	6	28	3.8	H/U	Hand pulled and bagged	Stems: S&P (GU); Regrowth and seedlings: spray G200 or G200 + MM (ref 1).
83	Cyperaceae	Cyperus involucratus (African sedge)	6	15	3.8	Ha/OF	Each has to be dug out with a spade and the entire plant turned over, exposing the root system while making sure all aerial parts of the plant are completely covered.	Aquatic areas - Glyphosate-ipa Land—commercial/industrial, rights of way - Glyphosate-ipa, glyphosate-mas, imazapyr
84	Asteraceae	Tithonia diversifolia (Mexican sunflower)	5	11	3.9	H/O	N/A	Stems: CS&P (G1.5) or cut and spray regrowth and seedlings (G100 or MM) (ref 1).
85	Poaceae	Setaria sphacelata (South African pigeon grass)	9	41	3.8	H/A	Hand pull or dig up	Spray G100 (ref 1).
86	Asclepiadaceae	Gomphocarpus physocarpus (balloon cotton bush)	10	132	3.7	S/O/U	Slash in winter and burn cuttings. Wanderer Butterfly can also be used.	Spray: glyphosate @ 1:1000 with water, in spring before seeding (ref 3).
87	Poaceae	Digitaria didactyla (Queensland blue couch)	9	70	3.7	H/A	Hand pull or cultivation.	Spot Spray: glyphosate or 2,2-DPA (ref 3).
88	Caesalpiniaceae	Gleditsia triacanthos (honey locust)	7	12	3.8	T/O	For the control of dense infestations on grazing land, burning followed by spot spraying is an economical control method.	pastures non-agricultural land fluroxypyr1 (Starane 200®) @ 1.5 L - 75ml/100 L diesel
89	Poaceae	Paspalum notatum (bahia grass)	4	10	3.8	H/A	Hand pull or dig up	Spray G100 (ref 1).
90	Cactaceae	Opuntia monacantha (drooping tree pear, syn. O. vulgaris)	2	3	4	S/O	Hand removed, stem injected, or over sprayed with garlon	Spray; Basal Bark application; Injection: Triclopyr: .8L/60L diesel. Picloram + Triclopyr: 1L/60L diesel. Amitrole: 1mL/3cm (ref 3).
91	Poaceae	Paspalum conjugatum (paspalum grass)	7	38	3.8	H/A	Cut below crown.	Spot Spray: glyphosate or 2,2-DPA (ref 3).
92	Malpighiaceae	Hiptage benghalensis (hiptage)	3	5	4	S,V,O	Hand pull small infestations.	Seedlings: Foliar spray of dicamba, fluroxypyr, and triclopyr/picloram. Larger plants cut stump application of fluroxypyr and triclopyr/picloram with diesel, glyphosate with water and picloram undiluted (ref 7).
93	Solanaceae	Solanum torvum (devil's fig)	6	39	3.9	S/O	Seedlings: Hand pull	Shrubs: CS&P (G1.5) or F/I (G1:1.5); Seedlings: spray G200 (ref 1).
94	Caesalpiniaceae	Caesalpinia decapetala (thorny poinciana)	4	20	3.9	S,V,O	Seed-heads: Bag and remove.	Stems: CS&P (G1.5); Seedlings: spray G200 or G200 + MM or MM (ref 1).
95	Poaceae	Pennisetum alopecuroides (swamp foxtail)	7	29	3.8	H/O	Hand Pull	Spot Spray: glyphosate or 2,2-DPA (ref 3).
96	Verbenaceae	Duranta erecta (duranta)	6	14	3.6	ST/O	Shrubs: CS&P (1:1.5)	Spray G100 (ref 1).
97	Brassicaceae	Nasturtium officinale (Qld use Rorippa nasturtium-aquaticum) (watercress)	7	19	3.7	Ha/F/U	Manually grub and destroy.	Spray G100 and replace with local species (ref 1).
98	Polygonaceae	Acetosa sagittata (rambling dock)	4	18	3.7	V/U	Tubers: Dig up, bag and remove.	Tubers: Spray G200 or G200 + MM or MM (ref 1).
99	Poaceae	Cynodon dactylon (couch, Bahama grass introduced cultivars)	10	45	3.6	H/O/A	Hand pull small infestations, removing all roots or smother with mulch.	Spray: glyphosate @ 200mL/15L water. Follow up spray (ref 3).
100	Bignoniaceae	Tecoma stans (yellow bells)	4	16	3.6	ST/O	N/A	Stems: CS&P (G1.5) or spray G200; Seeds: collect, bag and remove (ref 1).
101	Rosaceae	Rhaphiolepis indica (Indian hawthorn)	3	10	3.5	ST/O	Seedlings: Hand pull	Saplings: CS&P (G1.5); Trees: F/I (G1.5); Seedlings: spray G200 or G200 + MM or MM (ref 1).
102	Mimosaceae	Mimosa pudica (common sensitive plant)	4	12	3.7	S/A	N/A	Pastures - Fluroxypyr/Starane 200 @ 1.5 L/ha. Between cropping applications (conservation tillage) - Dicamba/Banvel 200 @ 0.8-1.4 L/ha
103	Commelinaceae	Callisia fragrans (purple succulent)	3	9	3.9	H/O	N/A	Spray: F100 or G200 or G200 + MM; Collect and bag or roll and rake carefully. Dispose (ref 1).
104	Scrophulariaceae	Paulownia tomentosa (paulownia)	3	5	4	T/A/O	Seedlings: Hand pull	Saplings: CS&P (G1.5); Trees: F/I (G1.5); Seedlings: spray G200 (ref 1).
105	Commelinaceae	Tradescantia zebrina (zebrina)	3	12	3.7	H/O	N/A	Spray: F100 or G200 or G200 + MM; Collect and bag or roll and rake carefully. Dispose (ref 1).
106	Acanthaceae	Ruellia malacosperma (ruellia)	5	16	3.8	H/O	N/A	Spray: G200 + MM (ref 1).
107	Poaceae	Pennisetum clandestinum (kikuyu grass)	4	12	3.8	H/A	Hand Pull	Spot Spray: glyphosate or 2,2-DPA (ref 3)
108	Liliaceae	Lilium formosanum (Taiwan lily)	5	10	3.8	H/O	Hand pull or crown and dispose.	Spray G100 + MM or MM (ref 1).
109	Asteraceae	Sigesbeckia orientalis (Indian weed)	10	148	3.6	H/U	Hand pull or cultivation.	Spray with 2,4-D amine or sodium, pr MCPA + dicamba (ref 3).
110	Asteraceae	Bidens pilosa (cobbler's pegs)	10	110	3.5	H/U	Hand pull or cultivation.	Spray with 2,4-D amine or sodium, pr MCPA + dicamba (ref 3).
111	Cactaceae	Opuntia stricta (common prickly pear)	7	67	3.6	S/O	Hand removed, stem injected, or over sprayed with garlon	Spray; Basal Bark application; Injection: Triclopyr: .8L/60L diesel. Picloram + Triclopyr: 1L/60L diesel. Amitrole: 1mL/3cm (ref 3).
112	Poaceae	Eleusine indica (crowsfoot grass)	8	55	3.5	H/A	Pull and chip. Replant with native couch.	Spray: glyphosate or 2,2-DPA (ref 3).
113	Poaceae	Axonopus compressus (broad leaved carpet grass)	5	23	3.6	H/A/O	Cut stems from roos.	Spot spray with Glyphosate (ref 3).
114	Lamiaceae	Salvia coccinea (red salvia)	9	46	4	H/O	remove small areas by hand or machine	Aquatic areas (drains, channels, margins of streams, lakes and dams) - calcium dodecylbenzene sulphonate (AF-100) @ 1 part in 19 parts kerosene.
115	Asteraceae	Ageratum houstonianum (blue billygoat weed)	8	81	3.8	H/UO	N/A	Spray G100 or hand pull and spray regrowth G100 (ref 1).
116	Myrtaceae	Psidium guajava and P. guineense (yellow guava and West Indes guava)	4	7	3.7	ST/AO	N/A	Shrubs: CS&P or F/I (G1.5) or spray G200 + MM or MM. Trial basal bark F100 or G200 + MM (ref 1).
117	Rosaceae	Rubus bellobatus (kittatinny blackberry)	5	22	3.5	S/O	slashing hinders growth, giving some control if plants are slashed before they seed	Grazon DS picloram/triclopyr 1:200 parts water + wetting agent
118	Myrtaceae	Eugenia uniflora (Brazilian cherry)	4	19	3.5	ST/O	N/A	Stems: C&P or F/I (G1.5); Bushes: spray or cut down and spray regrowth G100 or MM (ref 1).
119	Oleaceae	Olea europaea (olive)	2	6	4?	T/A	Seedlings: Hand pull	Saplings: CS&P (G1.5); Trees: F/I (G1.5); Seedlings: spray G200 or G200 + MM (ref 1).
120	Poaceae	Brachiaria decumbens (signal grass)	4	14	3.5	H/A	Grazing	Herbicide Control - Foliar application (Knapsack): glyphosate 360g/L @ 200mL/15L water; Foliar: glyphosate 360g/L @ 9L/Ha; Handgun: glyphosate 360g/L @ 1.3L/100L water (ref 2).
121	Fabaceae	Stylosanthes scabra (shrubby stylo)	4	4	4.3?	H/A	N/A	Vines: CS&P (1:1.5) or spray G100 + MM or MM (ref 1).
122	Commelinaceae	Commelina benghalensis (hairy wandering jew)	4	7	3.5	H/O	Collect and Bag	Spray G200 or G200 + MM (ref 1).
123	Poaceae	Pennisetum purpureum (elephant grass)	2	9	3.5	H/O	Grazing or mechanical removal	N/A (ref 2).
124	Zingiberaceae	Hedychium coronarium (wild ginger)	2	2	3.5	H/O	Small Plants: Hand pull and dispose	Small Plants: spray G200 or G200 + MM; Large Plants: cut and spray regrowth. If rhizomes are at ground level, cut stem and gouge rhizome - fill hole with G1.5 with injector kit or similar (ref 1).
125	Phytolaccaceae	Phytolacca octandra (inkweed)	10	50	3.4	H/O	Hand pull or crown	CS&P (G1.5) or C&P (G1.5); spray G100 (ref 1).
126	Asclepiadaceae	Asclepias curassavica (red cotton bush)	9	43	3.4	S/O	Hand pull; Slash	Slash and/or spray G100 (ref 1).
127	Solanaceae	Lycium ferocissimum (African boxthorn)	1?	5	4.4?	S/O	N/A	Stems: C&P (G1.5); Regrowth: spray G200 + MM (ref 1).
128	Mimosaceae	Prosopis pallida (algaroba)	2	2	4	ST/O	When using mechanical control methods, it is important to remove the bud zone of the root system (about 30 cm below the ground surface). If this is not removed, re-shooting can occur.	Basal bark - triclopyr + picloram Access® @ 1L/60L diesel. Cut stump - triclopyr + picloram Access® @ 1L/60L diesel. Overall spray - triclopyr + picloram Grazon DS® @ 350ml/100L water plus a wetting agent if plant is growing actively
129	Juncaceae	Juncus articulatus (jointed rush)	1	2	4	Ha/FO	Hand pull.	Spot spray with Glyphosate, 2,2-DPA or MCPA + dicamba (ref 3).
130	Cactaceae	Opuntia aurantiaca (tiger pear)	1	2	4	S/O	Hand removed, stem injected, or over sprayed with garlon	Spray; Basal Bark application; Injection: Triclopyr: .8L/60L diesel. Picloram + Triclopyr: 1L/60L diesel. Amitrole: 1mL/3cm (ref 3).
131	Poaceae	Arundo donax (giant reed)	1	4	3.8	H/O	Physical removal of small infestations	Spot spray or cut stump and spray with Glyphosate (ref 5).
132	Cactaceae	Opuntia imbricata (rope pear)	1	1	4	H/O	Biological controls available: cactoblastis cactorum successful. Mechanical control difficult. Fire can be used.	Spray; Basal Bark application; Injection: Triclopyr: .8L/60L diesel. Picloram + Triclopyr: 1L/60L diesel. Amitrole: 1mL/3cm (ref 3).
133	Bignoniaceae	Pyrostegia venusta (flame vine)	1	1	4	V/O	N/A	CS&P (G1.5); spray G200 (ref 1).
134	Poaceae	Cortaderia selloana (pampas grass)	2	1	3.7	H/O	Small Plants: dig out by hand or machine	Stems: C&P (G1.5) or cut back and slash and spray regrowth G100 (ref 1).
135	Solanaceae	Solanum hispidum (giant devil's fig)	5	23	3.6	S/O	Hand pull	Spray G100 (ref 1).
136	Agavaceae	Furcraea foetida (Cuban hemp)	3	4	4.3?	S/OA	Dig out by hand or machine	CS& P near ground or spray MM (ref 1).
137	Agavaceae	Furcraea selloa (hemp)	1	2	4?	S/OA	Dig out by hand or machine	CS& P near ground or spray MM (ref 1).
138	Agavaceae	Agave americana (century plant)	4	9	3.7	S/OA	Dig out by hand or machine	CS& P near ground or spray MM (ref 1).

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40 YEARS 1975-2015

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AMENDMENTS:

Issue	Date	Description	Checked
A	13/11/2017	Preliminary Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: AS NOTED

landscape architecture

DRAWING: Area 3 Management Plan Weed Management Techniques

DATE:	November 17	CHECKED:	MS
CLIENT REF.:	7243	DRAWN:	TL
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AREA 3 MANAGEMENT PLAN - WEED TREATMENT & REMOVAL STRATEGY

139	Rutaceae	Murraya paniculata c.v. Exotica (murraya)	6	26	3.6	S/O	Seedlings: Hand pull	Shrubs: CS&P or F/I (G1.5); Seedlings: spray G200 (ref 1).
140	Rosaceae	Rubus discolor (R. fruticosus complex, a blakberry)	4	10	3.7	S/OA	slashing hinders growth, giving some control if plants are slashed before they seed	Grazon DS picloram/triclopyr 1:200 parts water + wetting agent. A variety of herbicides may be used to control this species including (ref 5).
141	Brassicaceae	Cakile edentula (American sea rocket)	4	24	3.7	H/U	Manually grub and destroy.	Spray G100 and replace with local species (ref 1).
142	Balsaminaceae	Impatiens walleriana (balsam)	2	6	3.7	H/O	N/A	Spray G100 (ref 1).
143	Agavaceae	Agave sisalana (sisal)	2	4	3.7	S/OA	Dig out by hand or machine	CS& P near ground or spray MM (ref 1).
144	Agavaceae	Agave vivipara var. vivipara (sisal)	2	3	3.7	S/OA	Dig out by hand or machine	CS& P near ground or spray MM (ref 1).
145	Rosaceae	Prunus munsoniana (wild goose plum)	7	31	3.7	ST/A	Seedlings: Hand pull	Shrubs: CS&P or F/I (G1.5); Seedlings: spray G200 (ref 1).
146	Poaceae	Echinochloa crus-galli (barnyard grass)	6	34	3.7	H/A	Hand pull or dig out small infestations.	Spot spraying with Glyphosate or 2,2-DPA (ref 3).
147	Asteraceae	Solidago canadensis var. scabra (Canadian goldenrod)	7	15	4?	H/O	Hand pull and hang to dry.	Spray MM or G200 or G200 + MM if other weeds such as Lantana or Camphor Laurel are present (ref 1).
148	Fabaceae	Pueraria lobata (kudzu)	3	4	3.8	V,S/O	Slash. Diminish by shading site	CS&P (G1.5); spray G200 or MM (ref 1).
149	Alismataceae	Sagittaria graminea var. platyphylla (sagittaria arrowhead)	3	7	3.5	Ha/FO	Physical removal of small infestations.	Spot Spray with Glyphosate at 1.0L:100L water (ref 5).
150	Nymphaeaceae	Nymphaea mexicana (yellow waterlily)	2	4	3.7	Ha/OF	Hand pull small infestations.	Spray with or Diquat Glyphosate. Occurs in waterways, thus EPA should be notified before any herbicide use (ref 5).
151	Poaceae	Phyllostachys aurea (fishpole bamboo)	1	2	3.7	S/O	N/A	Stems: cut and fill segment (G1.5). Regrowth: spray G100 (ref 1).
152	Euphorbiaceae	Jatropha gossypiifolia (cotton-leaf physic nut, bellyache bush)	1	1	3.7	S/O	Hand pull	Spray G100 (ref 1).
153	Malvaceae	Sida rhombifolia (Paddy's lucerne)	9	69	3.6	S/U	Hand pull or dig out.	Spray with 2,4-D amine or fluoxypyr (ref 3).
154	Poaceae	Themeda quadrivalvis (grader grass)	8	25	3.6	H/A	Hand pull or dig out small infestations.	Spot spraying with Glyphosate or 2,2-DPA (ref 3).
155	Poaceae	Andropogon virginicus (whisky grass)	6	14	3.6	H/A	Hand pull or dig out small infestations.	Spot spraying with Glyphosate or 2,2-DPA (ref 3).
156	Bignoniaceae	Jacaranda mimosifolia (jacaranda)	4	12	3.4	T/O	Seedlings: Hand pull	Saplings: CS&P (G1.5); Trees: F/I (G1.5); Seedlings: spray G200 (ref 1).
157	Acanthaceae	Justicia betonica (squirreltail)	2	4	4	S/O	Hand pull small infestations. Can be controlled by planting competitive native species.	Glyphosate known to be effective Species known to occur in waterways. DERM should be contacted before spraying in waterways (ref 4).
158	Mimosaceae	Acacia boliviana (Bolivian wattle)	1	1	4	T/O	Mechanical or chain removal.	Basal Bark or cut stump application. Triclopyr 600g/L at 1.0L:120L diesel. Triclopyr + Picloram 240 g/l + 120 g/l at 1.0L:60L diesel. Picloram 45 g/kg undiluted (ref 5).
159	Simaroubaceae	Ailanthus altissima (tree of heaven)	17	3	3.5	T/O	Seedlings: Hand pull	Seedlings: CS&P (G1.5); Trees: F/I (G1.5); Seedlings: spray G200 or MM (ref 1).
160	Poaceae	Echinochloa colona (awnless barnyard grass)	9	44	3.3	H/A	Hand or mechanical removal of small infestations	Spray: glyphosate @ 13mL/1L water (ref 2.)
161	Cyperaceae	Cyperus brevifolius (Mullumbimby couch)	8	53	3.4	H/O	Each has to be dug out with a spade and the entire plant turned over, exposing the root system while making sure all aerial parts of the plant are completely covered.	Aquatic areas - Glyphosate-ipa Land—commercial/industrial, rights of way - Glyphosate-ipa, glyphosate-mas, imazapyr
162	Moraceae	Morus alba (white mulberry)	3	10	3.4	T/O	N/A	Trees: F/I (G1.5); stack cut branches above the ground to dry; Saplings: CS&P (G1.5); Seedlings: spray G200 (ref 1).
163	Arecaceae	Colocasia esculenta (taro)	3	4	3.4	H/AO	Hand pull.	Cut at base and apply glyphosate or metsulfuron methyl. Plant often occurs in waterways so consult DERM prior to application (ref 6).
164	Cannaceae	Canna indica (canna lily)	3	9	3.3	H/O	Dig out entire plant	Cut/Slash and spay regrowth G200 or G200 + MM; Collect and bad seeds. Resistant to herbicide (ref 1).
165	Buddlejaceae	Buddleja madagascariensis (buddleja)	5	6	3.4	S,V/O	N/A	Stems: CS&P (1:1.5); Vines: spray or cut down and spray regrowth G200 (ref 1).
166	Bignoniaceae	Tecoma capensis (Cape honeysuckle)	3	8	4	ST/O	N/A	Stems: CS&P (G1.5) or spray G200; Seeds: collect, bag and remove (ref 1).
167	Cactaceae	Harrisia martinii (harrisia cactus)	2?	4	4	S/O	The use of the biological mealy-bug agent is recommended	Triclopyr + picloram at 1.0L:60L diesel. Dichlorprop 600 g/l at 1.0L/60L water, metsulfuron methyl 600 g/l at 2.0L:100L water Ref 5).
168	Acanthaceae	Thunbergia laurifolia (laurel clock vine)	1	1	4	V/O	N/A	CS&P (G1.5); spray G200 (ref 1).
169	Fabaceae	Erythrina crista-galli (cockspur coral tree)	2?	4	3.5	T/O	N/A	F/I (G1.5) or C&P stumps. Cut and stack branches above ground to dry to prevent resprouting. F/I sprouted branches (G1.5) or spray regrowth G200 + MM or MM. Trial Tordon (ref 1).
170	Sapindaceae	Koelreuteria elegans (Chinese rain tree)	1?	1	3.6?	T/O	Seedlings: Hand pull	Trees: F/I (G1.5) or C&P stumps (G1.5); Saplings: CS&P (G1); stack cut branches above ground to dry; Seedlings: spray (G200) (ref 1).
171	Zingiberaceae	Hedychium gardnerianum (ginger lily)	1?	3	3.6	H/O	Small Plants: Hand pull and dispose	Small Plants: spray G200 or G200 + MM; Large Plants: cut and spray regrowth. If rhizomes are at ground level, cut stem and gouge rhizome - fill hole with G1.5 with injector kit or similar (ref 1).
172	Acanthaceae	Hypoestes phyllostachya (polka-dot plant)	3	5	3.5	H/O	Hand pull or crown and dispose	Spray G200 or G200 + MM (ref 1).
173	Caprifoliaceae	Sambucus canadensis (American elder)	3	7	3.4	ST/O	Vines and Runners: hand pull, roll up and hang to dry.	Vines and Runners: CS&P (G1.5); Larger Stems, Roots and Nodes: spray G100 + MM or MM (ref 1).
174	Asteraceae	Conyza sumatrensis (tall fleabane)	9	45	3.3	H/U	Hand or mechanical removal of small infestations	Seedlings: Altrazine or Chlorosulfuron in combination with competitive native species; Plants: Glyphosate and Tordon 75-D mix. Glyphosate ration depends on other weeds present (ref 2).
175	Fabaceae	Tipuana tipu (tipuana)	2	5	3.4	T/O	Seedlings: Hand pull	Saplings: CS&P (G1.5); Trees: F/I (G1.5); Seedlings: spray G200 (ref 1).
176	Asteraceae	Tagetes minuta (stinking roger)	8	32	3.3	H/U	Hand pull and hang to dry.	Spray MM or G200 or G200 + MM if other weeds such as Lantana or Camphor Laurel are present (ref 1).
177	Caesalpiniaceae	Chamaecrista rotundifolia (round-leaf cassia)	6	14	3.3	ST/A	Seedlings: Hand pull	Shrubs: CS&P or F/I (G1.5); Seedlings: spray G200 or G200 + MM or MM; collect and bag seeds (ref 1).
178	Poaceae	Cenchrus echinatus (Mossman river grass)	8	43	3.3	H/A	Hand or mechanical removal of young plants	Herbicide Control - Glyphosate 7mL/L water; Dichlobenil 600g/100m2; Fluazifop 50-100mL/10L water (ref 2).
179	Asteraceae	Conyza canadensis (Canadian fleabane)	10	55	3.3	H/U	Hand or mechanical removal of small infestations	Seedlings: Altrazine or Chlorosulfuron in combination with competitive native species; Plants: Glyphosate and Tordon 75-D mix. Glyphosate ration depends on other weeds present (ref 2).
180	Euphorbiaceae	Euphorbia cyathophora (painted spuge)	8	20	3.3	H/O	Hand pull	Spray G100 (ref 1).
181	Poaceae	Setaria palmifolia (palm leaf setaria)	5	13	3.3	H/O	Hand pull or dig up	Spray G100 (ref 1).
182	Euphorbiaceae	Euphorbia heterophylla (milk weed)	5	12	3.4	H/O?	Hand pull	Spray G100 (ref 1).
183	Fabaceae	Desmodium intortum (greenleaf desmodium)	4	11	3.3	H/A	Hand pull or crown and dispose	CS&P tuberous roots (G1.5); spray G200 or G200 + MM or MM; collect and bag seeds. Monitor regrowth over 2 - 3 years (ref 1).
184	Poaceae	Pennisetum setaceum (fountain grass)	3	11	3.3	H/O	Hand Pull	Spot Spray: glyphosate or 2,2-DPA (ref 3).
185	Asteraceae	Conyza bonariensis (flax-leaf fleabane)	7	38	3.3	H/U	Hand or mechanical removal of small infestations	Seedlings: Altrazine or Chlorosulfuron in combination with competitive native species; Plants: Glyphosate and Tordon 75-D mix. Glyphosate ration depends on other weeds present (ref 2).
186	Solanaceae	Solanum erianthum (a tobacco bush)	7	19	3.2	S/O	Hand pull	Spray G100 (ref 1).
187	Poaceae	Stenotaphrum secundatum (buffalo grass)	3	23	3.2	H/AO	Hand or mechanical removal of small infestations	Spray: glyphosate @ 13mL/1L water (ref 2.)
188	Apocynaceae	Cascabela thevetia (syn. Thevetia peruviana) (yellow oleander)	5	9	3.1	ST/O	Hand pull small infesttions. Slashing can be used but should be followed up by herbicide application.	Basal bark application of fluroxypyr (35mL:1L Diesel); Stem injection Glyphosate (1L:2L Water); Cut stump application of fluroxypyr (1L:55L Diesel; Foliar Spray of fluroxypyr 1:100 for larger plants. 1:200 for seedlings (ref 2).
189	Rubiaceae	Coffea arabica (coffee)	3	7	3.2	ST/A	Saplings: Hand pull	Shrubs: F/I (G1) between flower and fruit set; Saplings: CS&P (G1); Seedlings: spray G200 or G200 + MM (ref 1).
190	Bignoniaceae	Spathodea campanulata (African tulip tree)	1?	1	3.4	T/O	N/A	Saplings: CS&P (G1.5); Trees: F/I (G1.5); Seedlings: spray G200 (ref 1).
191	Fabaceae	Macrotyloma axillare (perennial horse gram)	4	12	3.1	V,H/A	N/A	Vines: CS&P (1:1.5) or spray G100 + MM or MM (ref 1).
192	Iridaceae	Watsonia meriana var. bulbillifera (bulbil watsonia)	2	3	3.1	H/O	Dig up, bag and remove	Spray G200 + MM (ref 1).
193	Passifloraceae	Passiflora edulis (passion fruit)	6	12	3.2	V/AO	Hand Pull	CS&P (G1.5); spray G200 or G200 + MM (ref 1).
194	Asteraceae	Zinnia peruviana (wild zinnia)	6	33	3.1	H/O	Seedlings: Hand pull	Shrubs: CS&P or F/I (G1); Seedlings: CS&P (G1.5) or spray G200 (ref 1).
195	Dracaenaceae	Sansevieria trifasciata (sansevieria)	27	7	3.1	H/O	Hand pull or dig up	Spray G100 + MM (ref 1).
196	Poaceae	Digitaria eriantha (pangola grass)	5	20	3.1	H/A	Hand pull or cultivation	Spot Spray: glyphosate or 2,2-DPA (ref 3).
197	Rosaceae	Eriobotrya japonica (loquat)	3	5	3.1	T/O	Seedlings: Hand pull	Saplings: CS&P (G1.5); Trees: F/I (G1.5); Seedlings: spray G200 or G200 + MM or MM (ref 1).
198	Cactaceae	Acanthocereus tetragonus (sword pear)	1	1	3.3	S/O	Biological controls available: cactoblastis cactorum successful. Mechanical control difficult. Fire can be used.	Spray; Basal Bark application; Injection: Triclopyr: .8L/60L diesel. Picloram + Triclopyr: 1L/60L diesel. Amitrole: 1mL/3cm (ref 3).
199	Mimosaceae	Acacia nilotica subsp. indica (prickly acacia)	3	3	4.47	T/A	Mechanical or chain removal.	Basal Bark or cut stump application. Triclopyr 600g/L at 1.0L:120L diesel, Triclopyr + Picloram 240 g/l + 120 g/l at 1.0L:60L diesel, Picloram 45 g/kg undiluted (ref 5).
200	Mimosaceae	Acacia farnesiana (mimosa bush)	6	15	3.1	T/A	Mechanical removal of small plants.	Basal Bark or cut stump application of Triclopyr + Picloram 240 g/l + 120 g/l at 1.0L:60L diesel. Foliar application of Clopyralid 300g/L at 500mL:1L water ref 5).

Explanatory notes.
Sub-region: Number of the ten sub-regions of the Southeast Queensland bioregion (Young and Dillewaard 1999) within which species recorded.
Rec no.: Total number of records for species within study area. Queensland Herbarium CORVEG and HERBRECS data.
Scores: Based on panel data of invasiveness, 5 (highest) to 3 (moderate). ? indicate doubtful scores.
Life forms: T-tree (woody plant >5m), ST-small tree (2-5m), S-shrub (woody <2m), H-herb (grasses & forbes), Ha-aquatic herbs.
Source: A-agriculture, O-ornamental and landscaping, F-fish aquarium, U-unintentional introduction and/or contaminant.

Abbreviations: Control Methods
CS&P = cut scrape and paint
S&P = scrape and paint
C&P = cut and paint
F/I = frill or inject stem

Abbreviations: Herbicides
G = Glyphosate, eg. Roundup Biactive, Weedmaster Duo
MM = Metsulfuron methyl, eg. Brushoff
F = Fluroxypyr, eg. Starane

Abbreviations: Herbicide Dilution Rates for High Concentration Applications
GU = Glyphosate undiluted
G1 = 1 part water to 1 part glyhphosate
G1.5 = 1.5 parts water to 1 part glyphosate
G4 = 4 parts water to 1 part glyphosate

Abbreviations: Herbicide Spray Concentrations
G100 = 100mL glyphosate per 10L of water + surfactant, eg 20mL LI 700 per 10L
G200 = 200mL glyphosate per 10L of water + surfactant, eg 50mL LI 700 per 10L
G100 + MM = 100mL glyphosate + 1.5g metsulfuron methyl per 10L of water + wetting agent, eg. 2mL Agral per 10L water
G200 + MM = 200mL glyphosate + 1.5g metsulfuron methyl per 10L of water + wetting agent, eg. 2mL Agral per 10L water
MM = 1.5g metsulfuron methyl per 10L water + wetting agent, eg. 2mL Agral per 10L water
F100 = 100mL fluroxypyr per 10L water
F150 = 150mL fluroxypyr per 10L water

Other Abbreviations
= Locally non-indigenous native species

Ref. 1. Big Scrub Rainforest Landcare Group (2008), 'Common Weeds of Subtropical Rainforests of Eastern Australia: A practical manual on their
Ref. 2. Department of Primary Industries and Fisheries (QLD), 'Weeds and pest animals and ants'.
Ref. 3. Holland et al. (1996), 'Suburban Weeds', DPI QLD.
Ref 4. Port Stephens Council (NSW), 'Weed Busters'.
Ref 5. Department of Primary Industries (NSW), 'Noxious and Environmental Weed Handbook, 3rd Edition'.
Ref 6. Department of Environment and Conservation, 'Florabase', (DEC- WA)
Ref 7. Vitelli, J.S. and Madigan, B.A. and Van Haaren, P.E. and Setter, S. and Logan, P. (2009) Control of the invasive liana, Hiptage benghalensis. Weed Biology and Management, 9 (1). pp. 54-62.

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40 YEARS 1975-2015

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APPROVED COMPANY ISO9001 Quality Management Systems
APPROVED COMPANY ISO14001 Environmental Management Systems

AMENDMENTS:

Issue	Date	Description	Checked
A	13/11/2017	Preliminary Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: AS NOTED

landscape architecture

DRAWING: Area 3 Management Plan Weed Management Techniques

DATE: November 17 | CHECKED: MS

CLIENT REF.: 7243 | DRAWN: TL

DRAWING No.: 7243 L 312 WMP A

Spring Mountain Precinct

AREA 3 MANAGEMENT PLAN - MONITORING & REPORTING

MONITORING & REPORTING

MONITORING AND REPORTING PROCEDURES

Monitoring and maintenance of the weed management and vegetation, both adjacent to proposed works and within the management area, is a vital component to the success of this management plan set.
An ongoing maintenance schedule, detailing the monitoring program, management intervals, methodologies, and corrective actions for contractors undertaking rehabilitation works within the ecological area is provided below. It is the responsibility of the rehabilitation landscape contractor to ensure the ongoing maintenance and monitoring schedule is actioned. Monitoring of the parkland weed management and revegetation works allows for:

- A review of the pre-established performance indicators for measuring the success of the weed removal and control;
- Ensure the level of protection for existing identified native vegetation inclusive of that which has naturally regenerated;
- Review the rate of spread or contraction of weed infestation within the control program;
- Monitor the rate of assisted regeneration and revegetation of desirable native species promoted in areas where weeds have been removed; and
- Identification of new weed threats or other factors which may be effecting areas designated for ecological rehabilitation.

Monitoring is required for weed eradication, revegetation and assisted regeneration.

MAINTENANCE ACTIONS AND METHODOLOGIES

Tree Retention - Construction Phase
- Ecologist / Arborist to assess tree exclusion zones are adhered to;
- Trees assessed for signs of stress or die back; and
- Implementation of VMP if retained tree roots Critical Root Zone (CRZ) is impacted upon.

Initial Establishment - Rehabilitation Planting
Initial 12 week establishment period applies to all rehabilitation planting works. During this period weekly maintenance is to occur that involves the following:
- Watering;
- Ongoing weed control;
- Fertilising; and
- Replacement of dead or damaged stock.

Ongoing Maintenance - Rehabilitation Planting
After this period, it is recommended that the ecological planting site be maintained on a monthly basis over a 5 year period to ensure that the planting has been successful. The following is to occur:
- Conduct weed spraying, plant watering, plant replacement of losses as necessary to maintain >95% survival rate;
- All other areas of non-use / limited access or steep terrain areas are to be hydro seeded to maintain a minimum 90% ground cover;
- All planting species will be disease free and supplied from an accredited nursery supplier;
- Assess condition of sediment control devices and replace if necessary; and
- Removal of excess sediment from erosion control devices as required.

MONITORING TIME FRAMES

For weed removal and revegetation three (3) Council determined timeframes form the anchor of the monitoring process. These include:

Council Pre-Start - *On-site meeting prior to the initial commencement of work within each stage of weed management. Will involve Consultant, Contractor and Council to work through weed treatment areas and clarify works approved and appointed.*

On-Maintenance - *At the completion of the Primary Weed Removal Stage and Secondary weeding an On-Maintenance meeting will be held with Council to inspect the works on-site in relation to the approved plans and previously agreed on-maintenance criteria.*

Off-Maintenance - *At the completion of all site weeding works and the agreed maintenance timeframe a final inspection will be held by Council to determine if works have been completed to the required level for Council hand over.*

REPORTING

Reporting to **Ipswich City Council** will occur on a yearly interval during the total period. Council will physically attend the Pre-Start, On-maintenance and Off-maintenance meetings. For this project it is recommended reporting include a short memo styled report responding to agreed criteria. As part of the monitoring a number of pre-determined transect and quadrant sampling sites have been allocated. At these locations a number of baseline studies have been completed and will be repeated post weed removal and maintenance to measure the success of the programmed works. It is also recommended this include a visual diary of imagery from selected locations at each inspection (Including the pre-start and monthly inspections). The imagery for the each period will be included with the report to Council.

In addition to the photo monitoring the biannual report to Council should include sufficient information on:
- Date, time and whether conditions at time of inspection
- Changes in weed extent populations (spreading / contracting)
- Changes in weed densities
- Health of existing vegetation protected by NRM provisions
- Rate of success for revegetation plantings
- Growth and PFC rate of assisted regeneration areas
- Occurrences of new weed infestations or species outbreaks
- Comments on any indirect changes to the area as a result of weed management (ie erosion / change in weed footprints / death to natives)
- Annual reporting is required to be sent to the Department of the Environment (DOE).

NOTES

MONITORING PARAMETERS

The monitoring should address the following issues:
- Maintained health and vigour of retained Remnant Trees adjacent to the corridor;
- Plant growth, percentage cover and survival rates;
- Plant losses through herbivores, disease, vandalism, storm damage or other factors;
- Weed re-growth and control measures;
- Plant replacement;
- Maintenance watering regime; and
- Erosion prevention.

It is also essential to keep an accurate photo record of the retained trees and progress of the rehabilitation planting by setting fixed photo monitoring points across the site. Photos should be taken by a digital camera and recorded in the project file by date and discrete photo monitoring point number. Photo monitoring point locations should be clearly marked on site and mapped by a surveyor or by GPS.

Corrective Actions
If trees adjacent to the sewer alignment disturbance are dying or impacted upon:
- Monitor construction activity;
- Educated construction team on tree retention measures;
- Review and / or respond to tree retention mitigation measures ie. exclusion zones;
- Review VMP for particular trees;
- Remove if necessary unsafe tree;
- Compensation by planting;
- If soil erosion is still occurring in planting zones the following is to occur:
- Review rehabilitation techniques conducted by contractor;
- Assess the potential for disturbance to occur;
- Assess other potential sources or causes of disturbances to occur; and
- Maintain planting regimes to a minimum of 95% survival rate.

If weed infestations occur in planting zones or in disturbed construction area, the following is to occur:
- Review weed removal and weed management techniques conducted by contractor;
- Assess the appropriate use and amounts of herbicides are being used;
- Assess the potential for weeds to occur;and
- Assess other potential sources or causes of weeds to occur.

If there is poor regeneration of plants occurring in ecological areas, the following is to occur:
- Review planting and direct seeding management techniques conducted by contractor;
- Assess the appropriate use and amounts of herbicides are being used in planting areas;
- Assess the potential for weeds to occur in ecological areas; and
- Assess other potential sources or causes of weeds or limited re-growth of native plants to occur, ie. plant pests and disease monitoring.

RESOURCES / ROLES & RESPONSIBILITIES

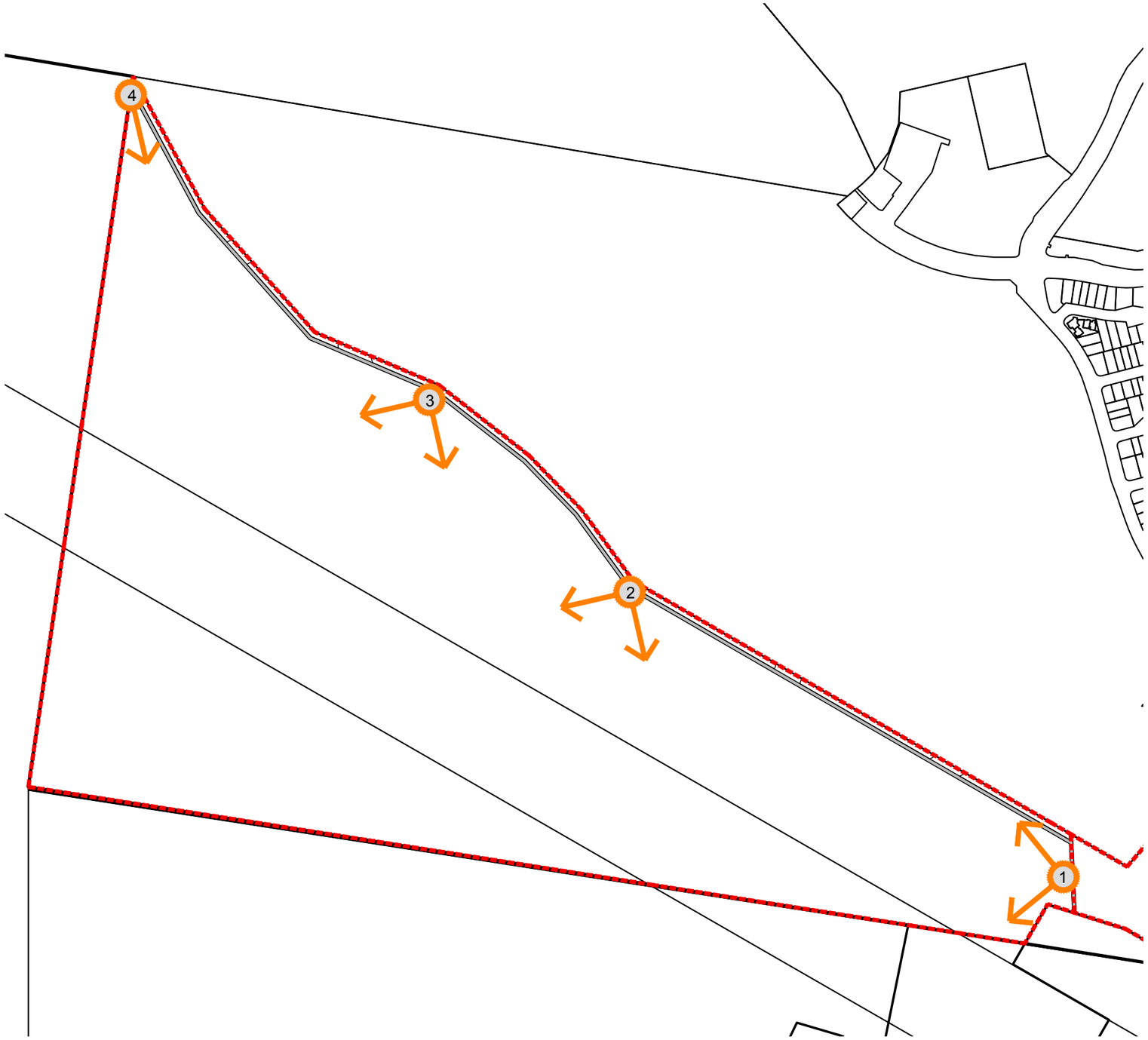
All resources required to implement this plan will be provided by the proponent (Lendlease). The following roles are applicable:

PROPONENT
- Ensure all consultants, contractors, sub contractors or others utilizing the area are aware of the Weed Management Plan.
- Appoint appropriate consultants and contractors to undertake works as prescribed on the drawings and conditioned by **Ipswich City Council**.
- Cover the costs of all necessary resources to ensure works are completed as per the approved documents.

CONSULTANTS
- Brief the proponent on their requirements in implementing and maintaining works as per the Weed Management Plan.
- Attend pre start, on maintenance and off maintenance meetings.
- Undertake monitoring and reporting to **Ipswich City Council** as set up by this document.
- Be available to respond to technical queries or departures to the approved documentation when on-site conditions require changes.
- Liaise with Council throughout all stages of approval, initial works and maintenance of works.

COUNCIL
- Provide technical expertise via commentary on the approval of documentation.
- Attend pre-start, on and off maintenance inspections.
- Undertake random inspections through the Secondary weed management and Maintenance weed management phases.
- Accept and review biannual reports as dictated in this document.

CONTRACTOR
- Complete works in strict accordance with the documentation.
- Recommend changes to the documentation when specific experience or on-site conditions require so.
- Attend pre-start, on and off maintenance inspections.



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APPROVED COMPANY ISO14001 Environmental Management Systems QMS Certification Services

AMENDMENTS:

Issue	Date	Description	Checked
A	13/11/2017	Preliminary Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: NOT TO SCALE

landscape architecture

DRAWING: Area 3 Weed Management Plan Monitoring & Reporting

DATE:	November 17	CHECKED:	MS
CLIENT REF.:	7243	DRAWN:	TL
DRAWING No.:	7243 L 313 WMP A		

Spring Mountain Precinct

AREA 4 WEED MANAGEMENT

ISSUE A 13.11.2017
PRELIMINARY ISSUE

DRAWING SCHEDULE

Dwg No.	Drawing Title	Issue	Date
7243 L 401	Weed Management Plan - Cover Sheet	A	13/11/2017
7243 L 402	Weed Management Plan - Introduction	A	13/11/2017
7243 L 403	Weed Management Plan - Sheet 1	A	13/11/2017
7243 L 404	Weed Management Plan - Sheet 2	A	13/11/2017
7243 L 405	Weed Management Plan - Sheet 3	A	13/11/2017
7243 L 406	Weed Management Plan - Sheet 4	A	13/11/2017
7243 L 407	Weed Management Plan - Sheet 5	A	13/11/2017
7243 L 408	Weed Management Plan - Sheet 6	A	13/11/2017
7243 L 409	Weed Management Plan - Sheet 7	A	13/11/2017
7243 L 410	Weed Management Plan - Sheet 8	A	13/11/2017
7243 L 411	Weed Management Plan - Sheet 9	A	13/11/2017
7243 L 412	Weed Management Plan - Sheet 10	A	13/11/2017
7243 L 413	Weed Management Plan - Technical Notes	A	13/11/2017
7243 L 414	Weed Management Plan - Treatment Techniques	A	13/11/2017
7243 L 415	Weed Management Plan - Treatment Techniques	A	13/11/2017
7243 L 416	Weed Management Plan - Treatment Techniques	A	13/11/2017
7243 L 417	Weed Management Plan - Monitoring & Reporting	A	13/11/2017

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AMENDMENTS:

Issue	Date	Description	Checked
A	13/11/2017	Preliminary Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: AS NOTED

landscape architecture

DRAWING: Area 4 Weed Management Plan Cover Sheet

DATE:	November 17	CHECKED:	MS
CLIENT REF.:	7243	DRAWN:	TL
DRAWING No.:	7243 L 401 WMP A		

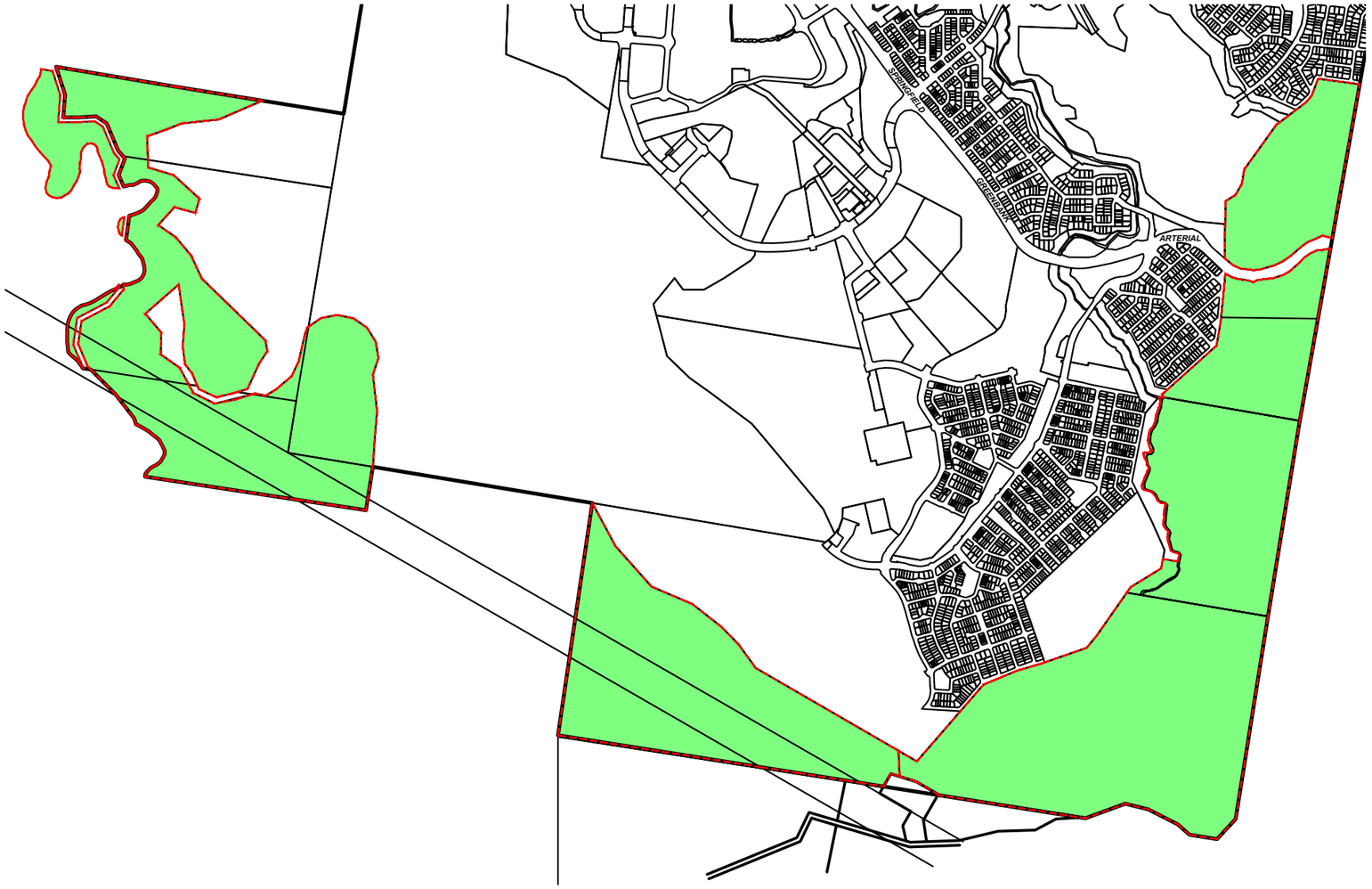
Spring Mountain Precinct

AREA 4 MANAGEMENT PLAN - WEED TREATMENT & REHABILITATION

INTRODUCTION

This Weed Management Plan

NOTES



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AMENDMENTS:

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CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: AS NOTED

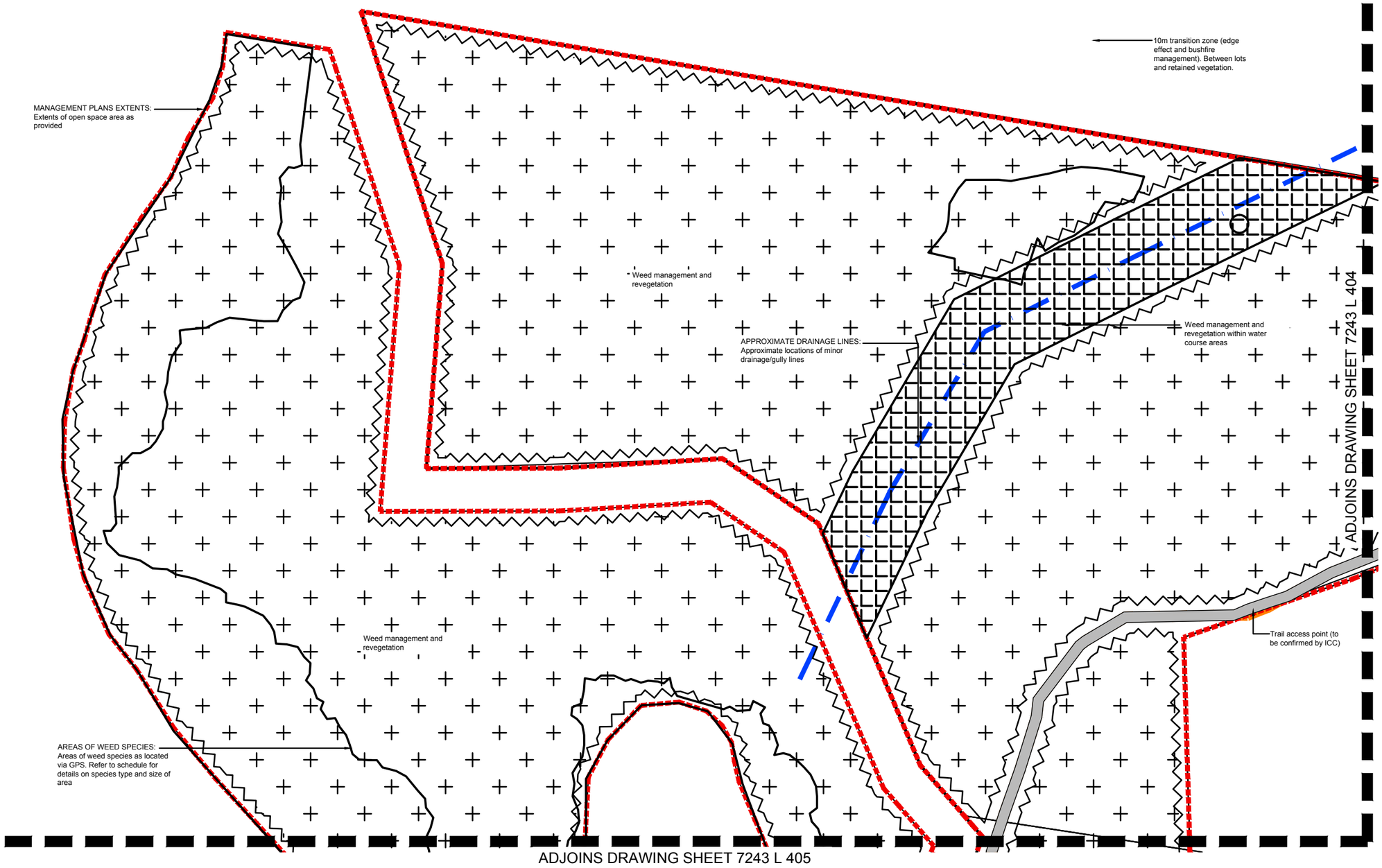
landscape architecture

DRAWING: Area 4 Weed Management Plan Weed Management Notes

DATE:	November 17	CHECKED:	MS
CLIENT REF.:	7243	DRAWN:	TL
DRAWING No.:	7243 L 402 WMP A		

Spring Mountain Precinct

AREA 4 WEED MANAGEMENT PLAN



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CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: 1:1000@A1 1:2000@A3 0 10 20 50m

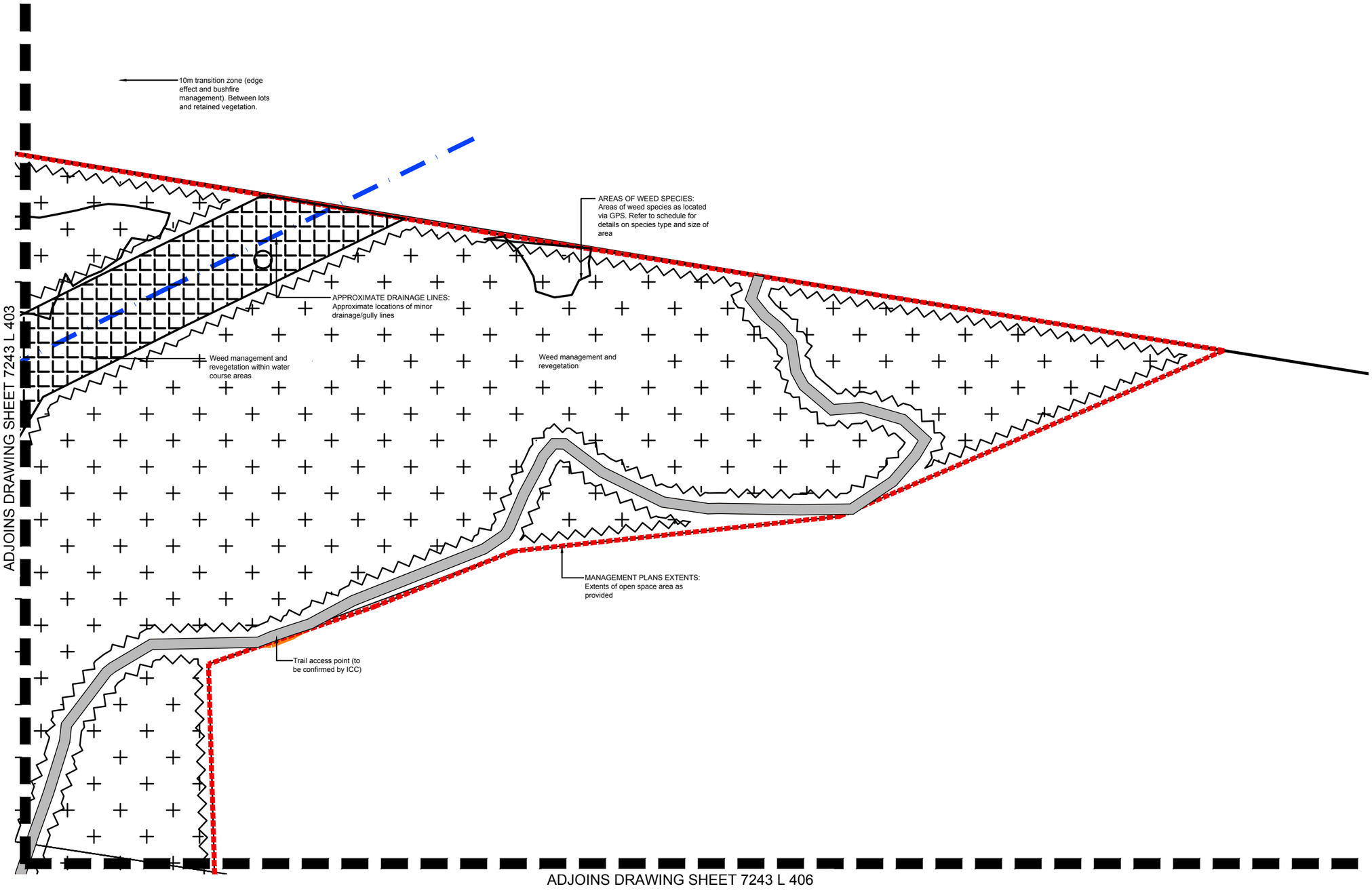
landscape architecture

DRAWING: Area 4 Management Plan Weed Management - Sheet 1

DATE: November 17	CHECKED: MS
CLIENT REF.: 7243	DRAWN: TL
DRAWING No.: 7243 L 403 WMP A	

Spring Mountain Precinct

AREA 4 WEED MANAGEMENT PLAN



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CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: 1:1000@A1 1:2000@A3 (0 10 20 50m)

landscape architecture

DRAWING: Area 4 Management Plan Weed Management - Sheet 2

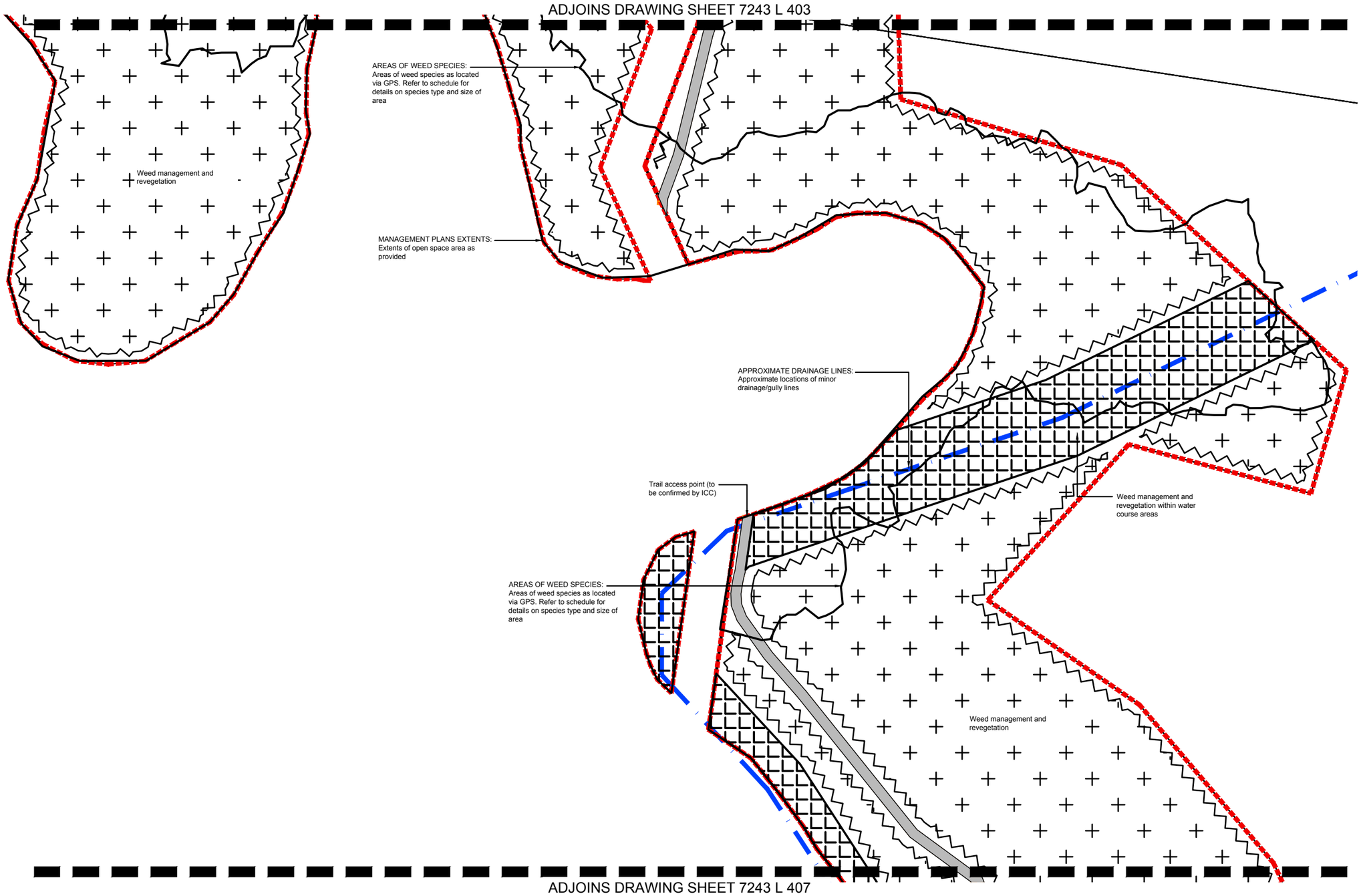
DATE: November 17 | CHECKED: MS

CLIENT REF.: 7243 | DRAWN: TL

DRAWING No.: 7243 L 404 WMP A

Spring Mountain Precinct

AREA 4 WEED MANAGEMENT PLAN



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CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: 1:1000@A1 1:2000@A3 (0 10 20 50m)

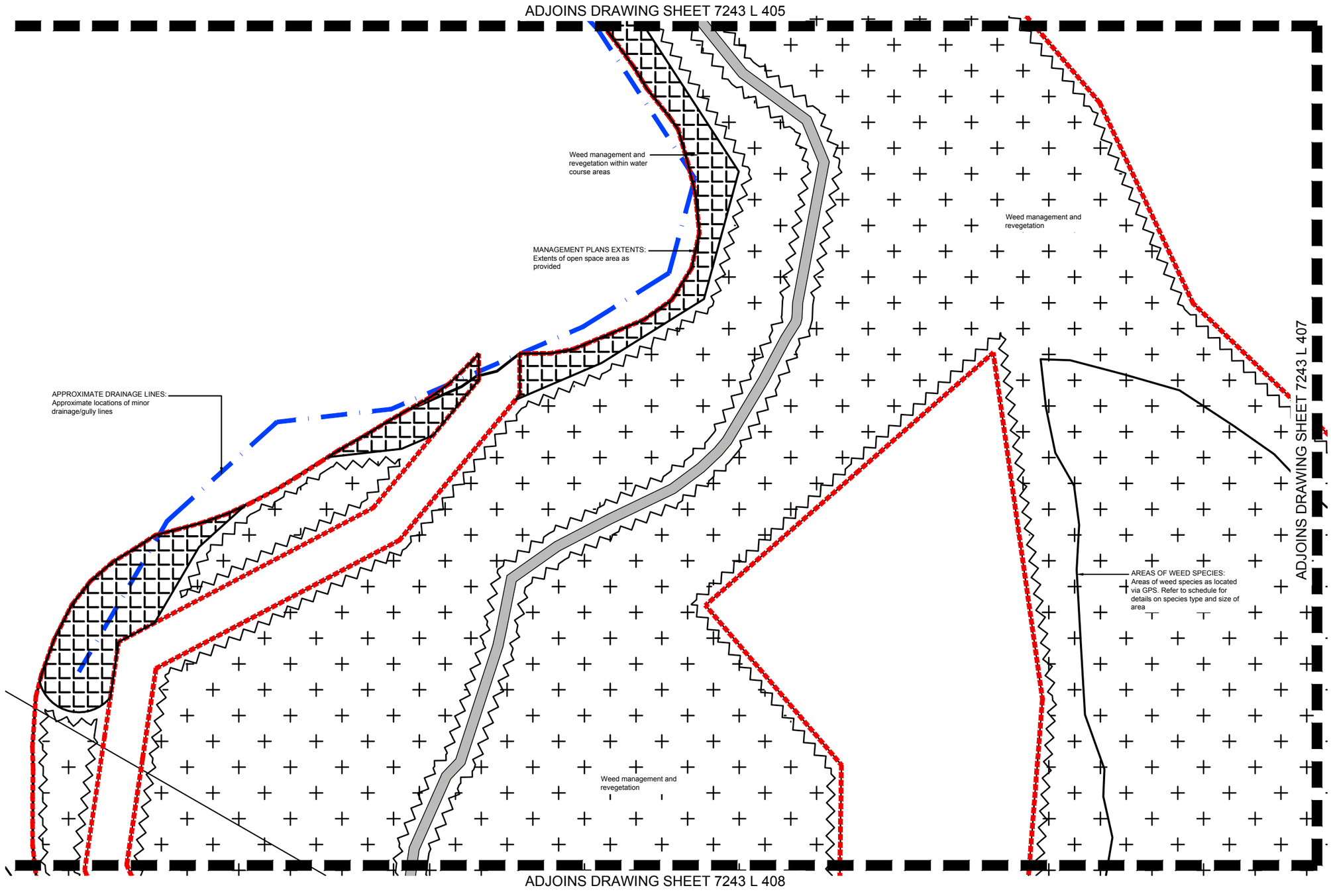
landscape architecture

DRAWING: Area 4 Management Plan Weed Management - Sheet 3

DATE: November 17	CHECKED: MS
CLIENT REF.: 7243	DRAWN: TL
DRAWING No.: 7243 L 405 WMP A	

Spring Mountain Precinct

AREA 4 WEED MANAGEMENT PLAN



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PROJECT: Spring Mountain Precinct

SCALE: 1:1000@A1 1:2000@A3 0 10 20 50m

landscape architecture

DRAWING: Area 4 Management Plan Weed Management - Sheet 4

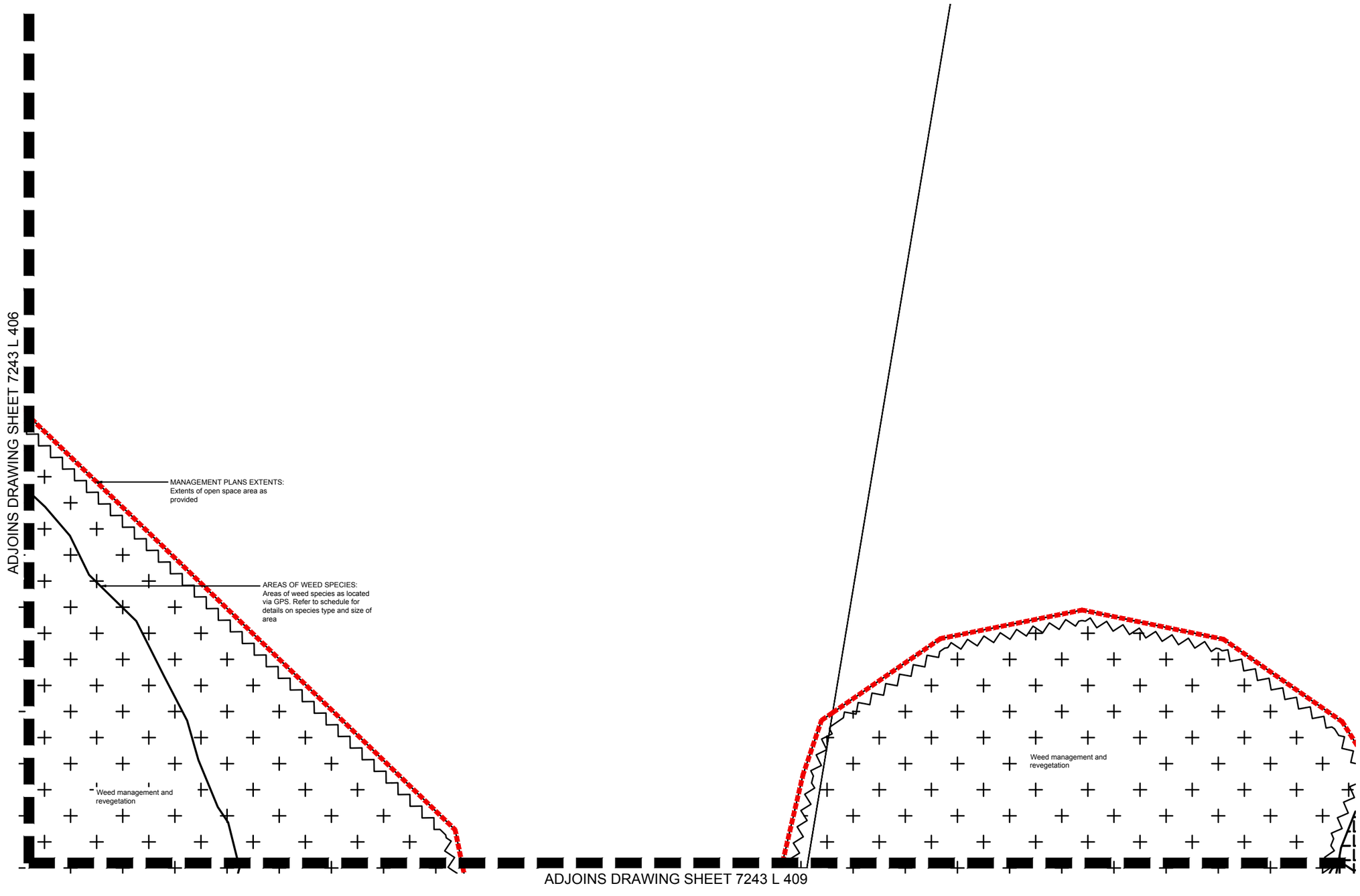
DATE: November 17 CHECKED: MS

CLIENT REF.: 7243 DRAWN: TL

DRAWING No.: 7243 L 406 WMP A

Spring Mountain Precinct

AREA 4 WEED MANAGEMENT PLAN



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PROJECT: Spring Mountain Precinct

SCALE: 1:1000@A1 1:2000@A3 0 10 20 50m

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DRAWING: Area 4 Management Plan Weed Management - Sheet 5

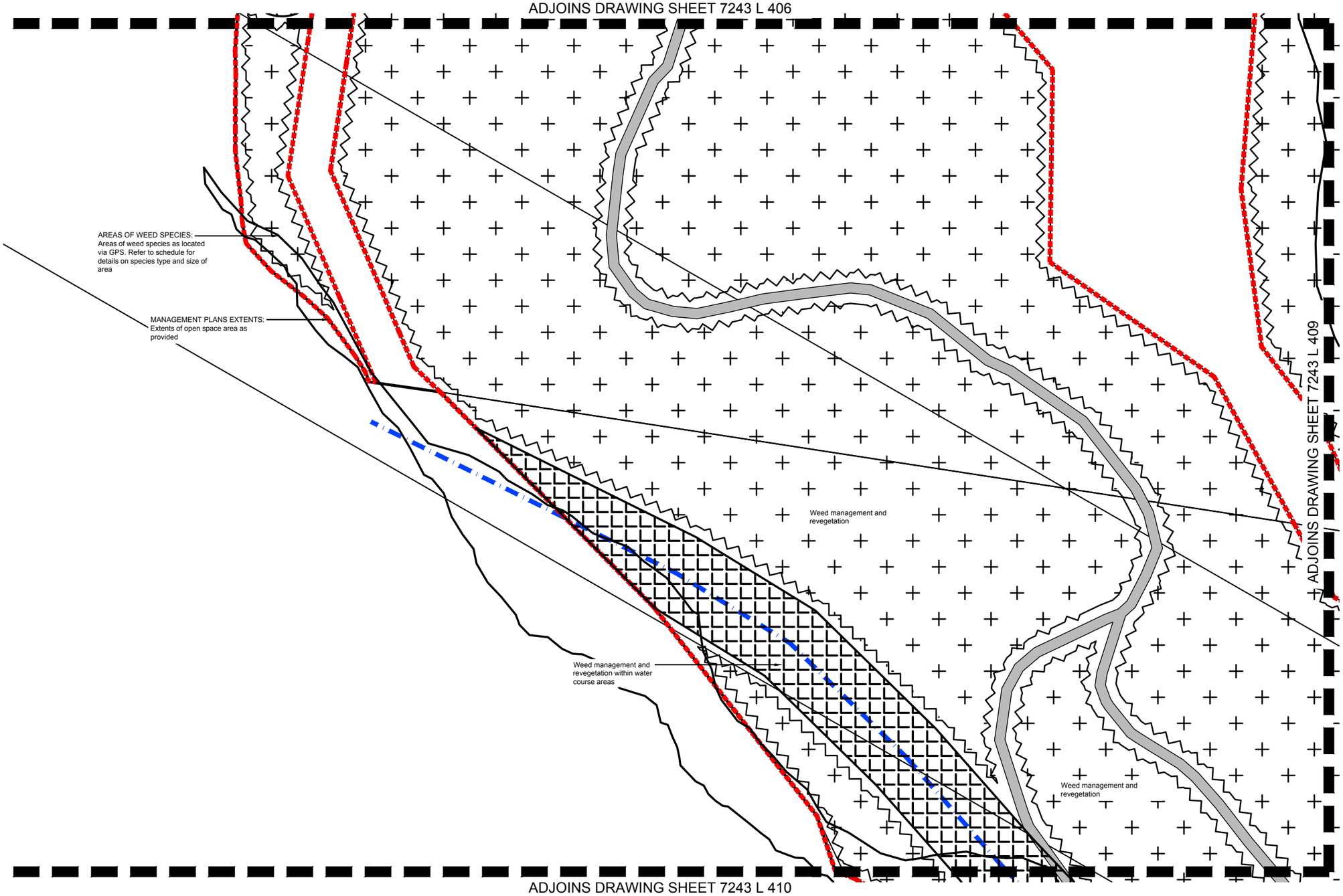
DATE: November 17 CHECKED: MS

CLIENT REF.: 7243 DRAWN: TL

DRAWING No.: 7243 L 407 WMP A

Spring Mountain Precinct

AREA 4 WEED MANAGEMENT PLAN



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PROJECT: Spring Mountain Precinct

SCALE: 1:1000@A1 1:2000@A3 0 10 20 50m

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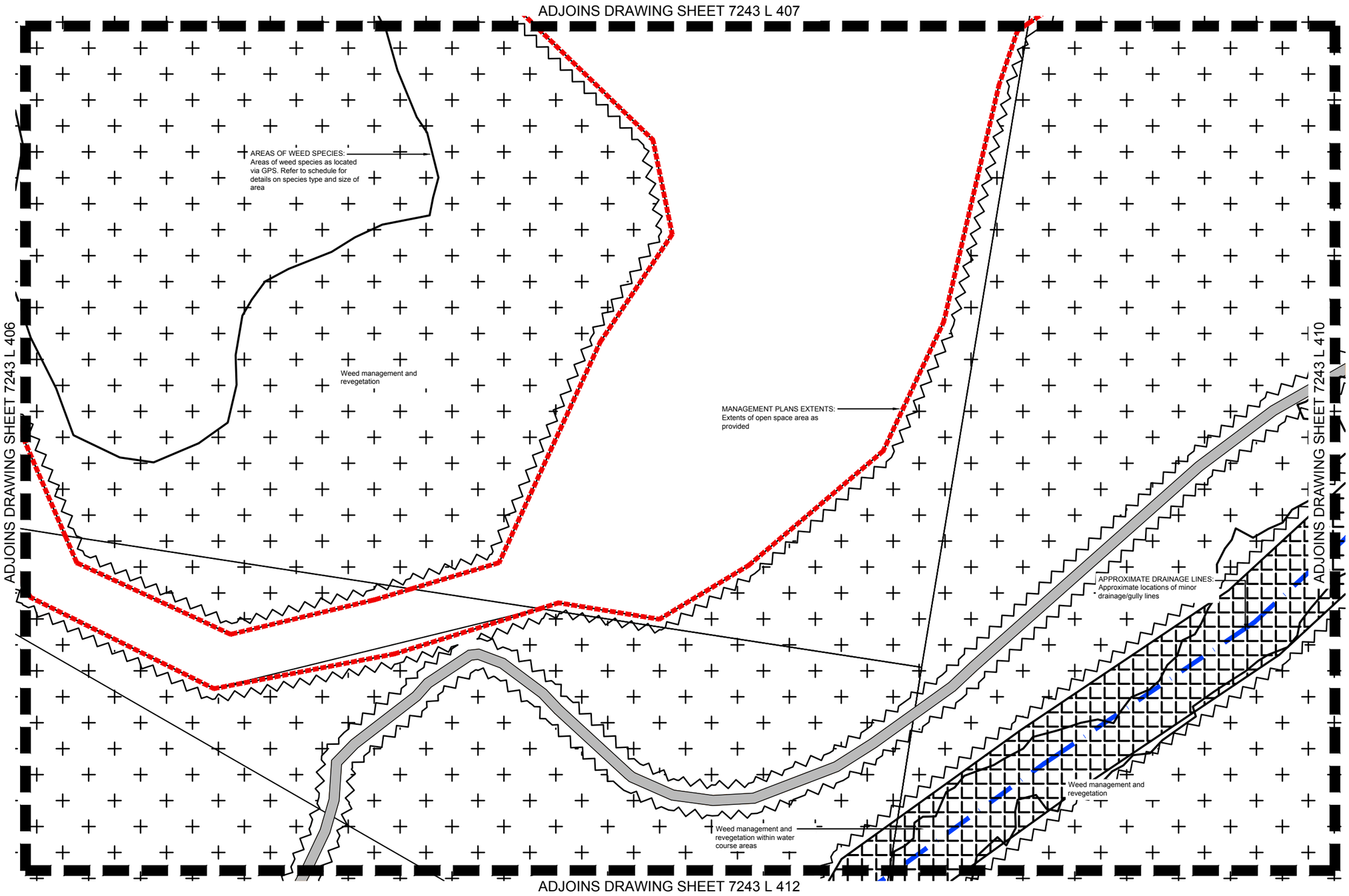
DRAWING: Area 4 Management Plan Weed Management - Sheet 6

DATE: November 17	CHECKED: MS
CLIENT REF.: 7243	DRAWN: TL
DRAWING No.: 7243 L 408 WMP A	

Spring Mountain Precinct

AREA 4 WEED MANAGEMENT PLAN



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CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: 1:1000@A1 1:2000@A3 0 10 20 50m

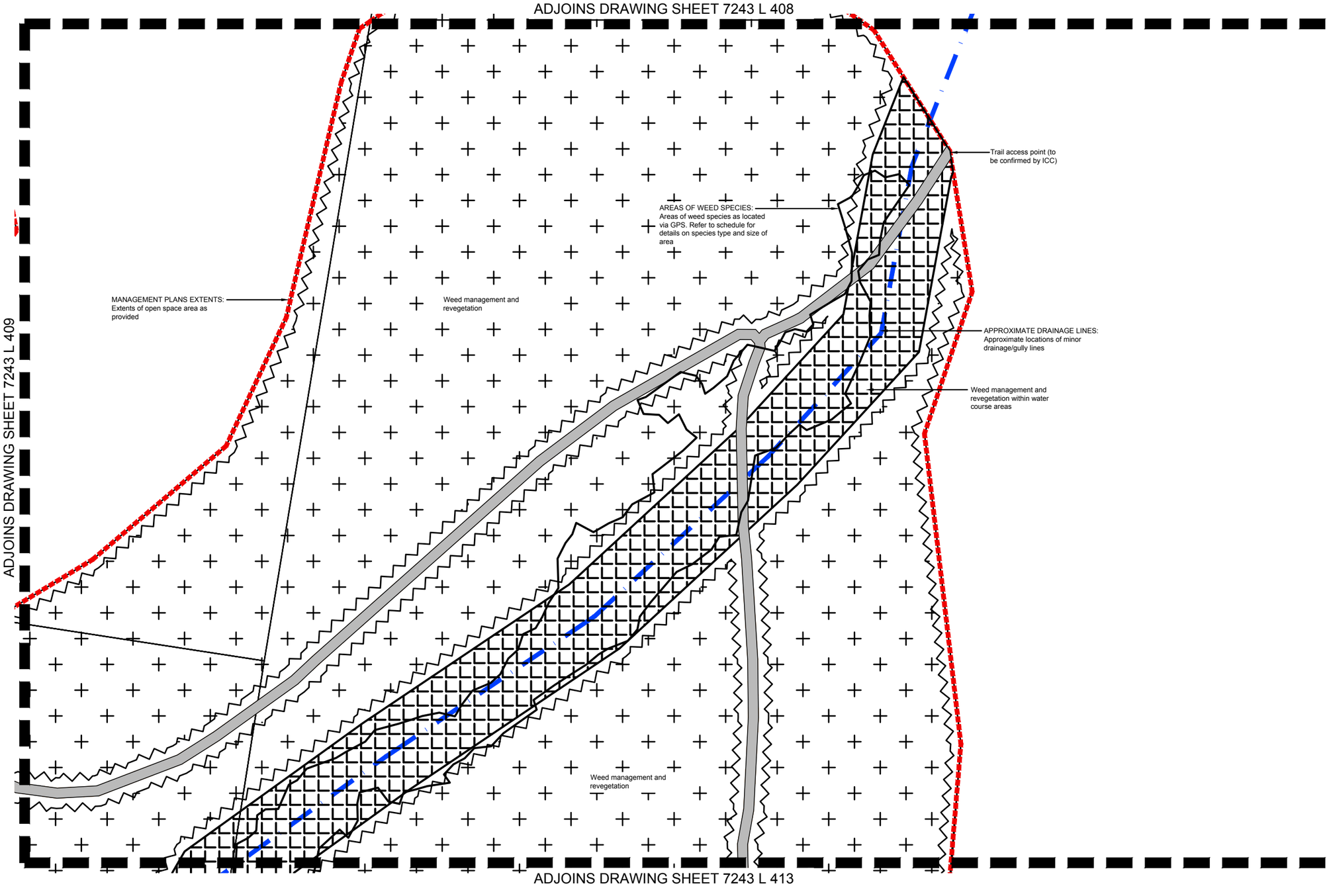
landscape architecture

DRAWING: Area 4 Management Plan Weed Management - Sheet 7

DATE: November 17	CHECKED: MS
CLIENT REF.: 7243	DRAWN: TL
DRAWING No.: 7243 L 409 WMP A	

Spring Mountain Precinct

AREA 4 WEED MANAGEMENT PLAN



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PROJECT: Spring Mountain Precinct

SCALE: 1:1000@A1 1:2000@A3 (0 10 20 50m)

landscape architecture

DRAWING: Area 4 Management Plan Weed Management - Sheet 8

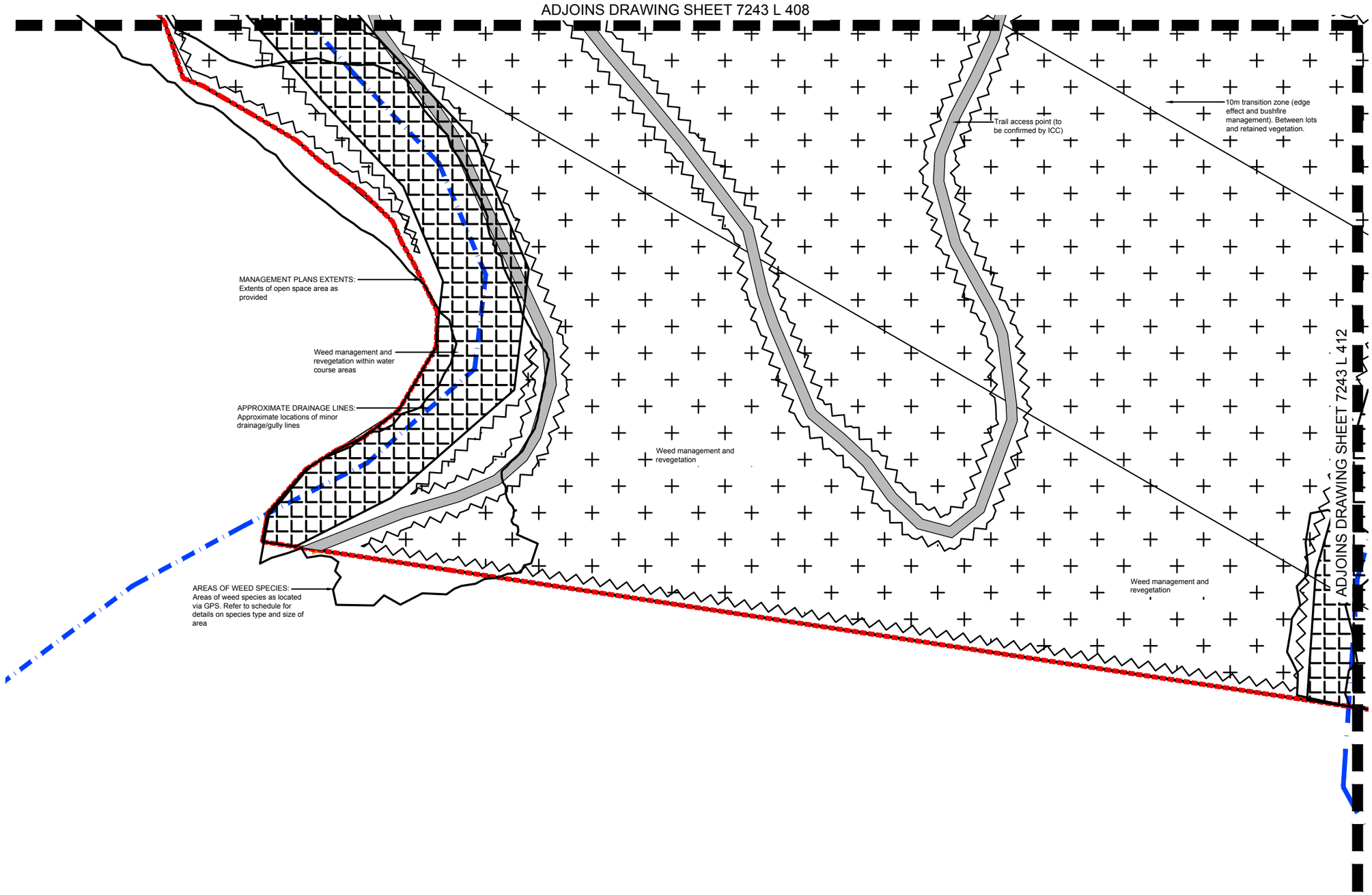
DATE: November 17 | CHECKED: MS

CLIENT REF.: 7243 | DRAWN: TL

DRAWING No.: 7243 L 410 WMP A

Spring Mountain Precinct

AREA 4 WEED MANAGEMENT PLAN



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PROJECT: Spring Mountain Precinct

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landscape architecture

DRAWING: Area 4 Management Plan Weed Management - Sheet 9

DATE: November 17 CHECKED: MS

CLIENT REF.: 7243 DRAWN: TL

DRAWING No.: 7243 L 411 WMP A

Spring Mountain Precinct

AREA 4 WEED MANAGEMENT PLAN

ADJOINS DRAWING SHEET 7243 L 409

ADJOINS DRAWING SHEET 7243 L 411

AREAS OF WEED SPECIES: Areas of weed species as located via GPS. Refer to schedule for details on species type and size of area

Weed management and revegetation within water course areas

APPROXIMATE DRAINAGE LINES: Approximate locations of minor drainage/gully lines

MANAGEMENT PLANS EXTENTS: Extents of open space area as provided

Weed management and revegetation

Trail access point (to be confirmed by ICC)

LEGEND

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landscape architecture

DRAWING: Area 4 Management Plan Weed Management - Sheet 10

DATE: November 17 | CHECKED: MS

CLIENT REF.: 7243 | DRAWN: TL

DRAWING No.: 7243 L 412 WMP A

Spring Mountain Precinct

AREA 4 MANAGEMENT PLAN - TECHNICAL NOTES - GENERAL

NOTES

This Weed Management Plan links specific weed removal and management measures with spatial areas within the declared area included with this application. This Weed Management Plan covers the 100.81ha Area 4 portion of land previous dedicated by Springfield Land Corporation (SLC) to Ipswich City Council (ICC). The main objectives and action items for pest plants are detailed in Table 1 shown on this plan, with the objectives and actions for ecological restoration are detailed in Table 2.

WEED CONTROL PROGRAM TIMING

The primary stage of manual weed removal, treatment and disposal for the parkland dedication is programmed when all existing weeds are removed with secondary and maintenance weeding occurring for another 18 months (18 month program post on-maintenance).

Primary Weed Removal Stage - Consists of the initial weed removal / treatment of site weeds via the methods detailed within the South East Queensland Ecological Restoration Guidelines. Essentially involves the manual removal, stock piling and disposal and initial usage of prescribed herbicides. Additional notes below include:

- Implemented weed control method according to this plan.
- Weed trees located within 20M zone of the existing trail network are to be removed where trunk is cut down to ground level and vegetative matter removed.
- Program timing; primary weed removal phase is considered to be completed when all existing weeds within the stage for the declared area have been removed or treated. Both the secondary phase and the primary phase of weed removal can occur concurrently in different stage areas over time.
- A key map is to be provided logging the progress of areas from primary to secondary phases of weed removal and areas of rehabilitation as part of the reporting progress.

Secondary or Follow-up Weeding - for all areas will involve the quarterly inspection of areas having undergone Primary Weed Removal and treatment of infestations or outbreak as required. Additional notes below include:

- Implemented weed control method according to this plan.
- Weed trees located within 20M zone of the existing trail network are to be removed where trunk is cut down to ground level and vegetative matter removed.
- Program timing; primary weed removal phase is considered to be completed when all existing weeds within the declared area have been removed initially. Both the secondary phase and the primary phase of weed removal can occur concurrently in different work areas over time.
- A key map is to be provided logging the progress of areas from primary to secondary phases of weed removal and areas of rehabilitation as part of the reporting progress.

Maintenance Weeding Phase - final stage of weeding which occurs in areas where the majority of weeds have been removed and treated. Maintenance weeding continues to remove additional outbreaks but also allows for the fostering of natural regeneration and regrowth seedlings. Additional notes below include:

- Implemented weed control method according to this plan.
- Weed trees located within 20M zone of the existing trail network are to be removed where trunk is cut down to ground level and vegetative matter removed.
- Program timing; primary weed removal phase is considered to be completed when all existing weeds within the designated Park have been removed initially. Both the secondary phase and the primary phase of weed removal can occur concurrently in different work areas over time.
- A key map is to be provided logging the progress of areas from primary to secondary phases of weed removal and areas of rehabilitation as part of the reporting progress.

Revegetation occurs in two (2) distinct zones throughout the management area. Refer to Drawing sheets for a full description of proposed plant species, sizes, densities and numbers.

NATURAL REGENERATION

Applies:

- To relatively large, intact and weed-free areas of native vegetation.
- Where the native plants are healthy and capable of regenerating without human intervention.
- When native plant seed is stored in the soil or will be able to reach the site from nearby natural areas, by birds or other animals, wind or water.
- Where the plant community has a high potential for recovery after any short-lived disturbance, such as a fire or cyclonic winds.
- When preventative action is all that is required to avert on-going disturbance, e.g. erection of fencing to prevent intrusion from cattle.

Planting in such sites can work against the aims of restoration by interfering with natural regeneration.

The re-establishing plant community will be similar in structure, composition and diversity to the original vegetation.

ASSISTED NATURAL REGENERATION

Applies:

- To natural areas where the native plant community is largely healthy and functioning.
- When native plant seed is still stored in the soil or will be able to reach the site from nearby natural areas, by birds or other animals, wind or water.
- Where the natural regeneration processes (seedling germination, root suckering etc.) are being inhibited by external factors, such as weed invasion, soil compaction, cattle grazing, mechanical slashing etc.
- When limited human intervention, such as weed removal, minor amelioration of soil conditions, erection of fencing, cessation of slashing, etc. will be enough to trigger the recovery processes through natural regeneration.
- When major component is weed control.

Planting in such sites can work against the aims of restoration by interfering with natural regeneration.

The re-establishing plant community will be similar in structure, composition and diversity to the original vegetation.

TABLE 1: OBJECTIVES AND ACTION ITEMS FOR PEST PLANTS

Threats	Opportunities	Management action	Timeframe	Responsibility
Objective: Protect, manage and enhance the diversity of native flora species and vegetation communities within the estate by controlling pest plants.				
Insufficient monitoring of pest plants	Increased knowledge of pest plant abundance and distribution within the estate	Continue to develop and update the management plan for the estate to identify pest plants present and to recommend and prioritise control and monitoring actions	Annually	Saunders Havill Group (SHG)
Establish-ment of large infestations of pest plants Insufficient resourcing of pest plant control measures	Pest plants are controlled effectively and in a way that ensures native vegetation regeneration	Include treating pest plants within the open space area to improve visitors experience to the estate	Ongoing	Contractor
Increased abundance of pest plants due to fire	Increased knowledge of pest plant responses to fire	Conduct follow up pest plant treatment after any fires within the estate	As required	Contractor
Lack of education of visitors and local residents as to the adverse impacts pest plants have on the natural environ-ment	Improved public understanding and support for pest plant control	Provide material for public awareness (ie interpretative signage)	As required	Contractor

TABLE 2: OBJECTIVES AND ACTION ITEMS FOR ECOLOGICAL RESTORATION

Threats	Opportunities	Management action	Timeframe	Responsibility
Objective: Protect, manage and enhance the significant habitat values and ecological processes found within the estate, so as to contribute positively to the conservation values of the local and regional area				
Degraded vegetation communities have adverse impacts on other values within the estate, including native flora and fauna species, fire issues and aesthectics	Restore degraded native vegetation communities and minimise impacts associated with pest plants and animals and their control on native flora and fauna, cultural heritage sites, and landscapes within the estate	Prepare and issue a management plan to: - clearly prioritise actions and zones (eg. focus on declared and environmental pest plants and mapped biodiversity zones) - Divide the site into sub-zones which can be managed in a systematic and structured way - Align with the fire management plan as burns could provide ecological and economical efficiencies; reducing fuel loads at the same time as acting as a pest plant control - Lantana (especially) should be managed to reduce the fuel load, as this is a major fire hazard Incorporate training (eg. for relevant community groups) - Write the plan for the target audience working on the estate (eg. bushcare groups working in particular zones)	Prior to commence-ment	Contractor
Pest plant infestations from high use areas may impact on adjacent ecological values	Improve the flora values within the open space area	As part of the site rehabilitation planning for the open space, a planting list of locally occurring plant species for use in rehabilitation is to be provided to enhance population viability where appropriate and possible. Include threatened and locally significant species in plantings.	Ongoing	Contractor
Trail creation, soil compaction and increased erosion	Restore natural habitats to increase the resilience of the estate	Refer to management plans for further detail	As required	Contractor
Pest plant introduction and spread	Deceased abundance of pest plants	Refer to management plans for further detail	As required	Contractor
Disturbance from pest animals	Deceased abundance of pest animals	Refer to management plans for further detail	As required	Contractor
Insufficient resourcing of restoration measures	Improved public understanding of and support	Refer to management plans for further detail	As required	Contractor
Insufficient data on the effectiveness of ecological restoration programs	The populations and diversity of near threatened, threatened or locally significant plant species are protected and enhanced	Refer to management plans for further detail	As required	Contractor

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40 YEARS 1975-2015

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APPROVED COMPANY ISO14001 Environmental Management Systems QMS Certification Services

AMENDMENTS:

Issue	Date	Description	Checked
A	13/11/2017	Preliminary Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: AS NOTED

landscape architecture

DRAWING: Area 4 Weed Management Plan Technical Notes - General

DATE: April 17	CHECKED: MS
CLIENT REF.: 7243	DRAWN: TL

DRAWING No.: 7243 L 413 WMP A

Spring Mountain Precinct

AREA 4 MANAGEMENT PLAN - WEED TREATMENT & REMOVAL STRATEGY

NOTE:
Species highlighted have been identified within the 'Springfield Wildlife Corridor Management Requirements' list which have specified removal and/or treatment techniques for Class 1 or 2 weeds. Environmental weeds and weeds of National Significance (WONS) Class 3 are to be:

- Remove dumped garden weeds from urban interface. Liaise with ICC Supervisor regarding ongoing Compliance issues.
- Lantana controlled within 20m of track edges (ie walking, shared and service).
- Strategic treatment of gully infestations staged from head of gullies downstream utilising cut stump method and chopping lantana into small (150mm) pieces. Areas to be determined by consultation with ICC.
- Assisted natural regeneration following removal including direct seeding utilising endemic seed from site. Follow up weed control by spot spraying emerging weeds in cleared areas or land removal.

QUEENSLAND HERBARIUM INVASIVE NATURALISED PLANTS IN SOUTH EAST QUEENSLAND

Rank	Family	Scientific and common names	Subregion	Rec No	Score	Life form & Source	Non Chemical Control	Chemical Control
1	Verbenaceae	Lantana camara var camara (lantana)	10	455	5	S/O	Seedlings: Hand pull	Seedlings: GS&P (G1.5); Shrubs: blanket spray G100 or cut down and spray regrowth G100 or splatter gun using 1 part G to 9 parts water - apply only when plant is growing, not dormant (ref 1).
2	Asteraceae	Baccharis halimifolia (groundsel bush)	10	168	4.8	S/O	Cut stump prior to flowering	Shrubs: GS&P or F/I (G1); Seedlings: GS&P (G1.5) or spray C200 (ref 1)
3	Crassulaceae	Bryophyllum delagoense (mother of millions)	8	98	4.9	H/O	Hand removed and bagged or larger infestations sprayed	Plantlets: spray G200 + MV or VM (ref 1).
4	Bignoniaceae	Macfadyena unguis-cati (cat's claw creeper)	5	36	4.9	V/O	Tubers: crown or dig up, bag and remove.	Regrowth and tuberlings: spray C100 + MM or F100 (ref 1).
	Basellaceae	Anredera cordifolia (madeira vine)	8	16	4.9	V/O	Small Vines & Tubers. Hand pull. Bag and dispose.	Ascending Stems: S&P (G/U); Tubers: gouge, scrape and paint (G/U). Ground infestations: spray C200 or G200 + MM (ref 1).
6	Asparagaceae	Asparagus aricanus (ornamental asparagus, asparagus fern)	7	26	4.9	V/O	dig out roots and dispose of at local council landfill site. remove entire crown and underground stem to prevent regrowth	triclopyr (200 g/L) @ 35 mL per 1 L diesel/kerosene
7	Ulmaceae	Celtis sinensis (Chinese celtis)	8	19	4.9	T/O	remove when small. Hand pull or dig out small seedlings. combined dozing, burning and controlled grazing for large infestations.	Stem injection, glyphosate (360 g/L) @ Undiluted at 1 mL per 2 cm of hole or cut
8	Lauraceae	Cinnamomum camphora (camphor laurel)	7	25	4.8	T/O	Seedlings: Hand pull	Saplings: GS&P (G1.5); Trees: F/I (G1 or G1.5) or C&P (G1.5 or G/U for stems up to 8 cm diameter); Seedlings: spray G200 or G200 + MM
9	Anacardiaceae	Schinus terebinthifolius (broad-leaf pepper tree)	6	49	4.8	T/O	Seedlings: Hand pull	Saplings: GS&P (G1.5); Trees: F/I (G1.5), Seedlings: spray G200 (ref 1).
	Salviniaceae	Salvinia molesta (salvinia)	8	57	4.9	Fw/F	Mechanical removal of small infestations: Salvinia weevil (Biological control)	Aquatic areas: calcium dodecylbenzene sulphonate (AI ~100) @ 1 part to 19 parts kerosene, diquat (reglone) 60-120L/Ha or 4L/100L water, diquat (weed) 60-120L/Ha or 4L/100L water; diquat (reglone) 5-20L/Ha or 400ml-1.0ml Agral / 100L water (see ref 2.
11	Cabombaceae	Cabomba caroliniana (Cabomba, fanwort)	4	12	4.9	Fw/F	Mechanical removal of small infestations	2, 4-D N-Butyl Ester (Rubber Vine Spray) @ 12.9 /Ml water (see ref 2. for application guide).
12	Asteraceae	Chrysanthemoides monilifera subsp. rotundata (bitou bush)	3	23	4.9	S/O/A	N/A	Stems: GS&P or F/I (G1.5). Bushes: spray or cut down and spray regrowth C100 or MV (ref 1)
13	Pontederiaceae	Eichhornia crassipes (water hyacinth)	4	8	4.9	Fw/D/I	Mechanical removal of small infestations	Waterways: 2, 4-D acid (AI 300) @ 1:200 with water, Aquatic Areas: glyphosate @ 1.13L/100L water (see ref 2. for application guide).
14	Acanthaceae	Hygrophila costata (Glush weed)	3	7	5	T/F	Hand pull small infestations. Can be controlled by planting competitive native species	Glyphosate known to be effective. Species known to occur in waterways so EPA should be contacted before spraying (ref 4)
	Oleaceae	Ligustrum lucidum (tree privet)	5	9	4.8	T/O	Seedlings: Hand pull	Saplings: GS&P or C&P (G1.5), Trees: F/I (G1 or G1.5) or C&P GU for stems up to 8cm diameter; Seedlings: spray MV or C200 + MM if other weeds such as Lantana or Camphor Laurel are present. Hand pull and/or spray G200 + MM (ref 1).
16	Asteraceae	Sphagneticola trilobata (Singapore daisy)	6	34	4.6	H/O	Hand pull	
17	Asteraceae	Ageratina adenophora (crofton weed)	6	38	4.6	H/O	Hand pull and hang to dry.	Spray MM or G200 or G200 + MV if other weeds such as Lantana or Camphor Laurel are present (ref 1).
18	Verbenaceae	Lantana montevidensis (creeping lantana)	8	62	4.8	S/O	Fire and/or mechanical control	Spray (march to may): glyphosate 1L/100L water, metsulfuron methyl 12g/100L water; metsulfuron methyls + glyphosate 173g/100L water; Basal bark (anytime): triclopyr 1L/60L Diesel, picloram + triclopyr @ 1L/60L Diesel, Glyphosate, next application: Splatt
19	Fabaceae	Neonotonia wightii (glycine)	5	16	4.7	H/A	N/A	Vines: CS&P (1:1.5) or spray C200 + MM or MM (ref 1).
	Poaceae	Panicum maximum (green panic and guinea grass)	8	78	4.6	H/A	Hand or mechanical removal of small infestations	Spray: glyphosate @ 13mL/1L water (ref 2.)
21	Oleaceae	Ligustrum sinense (chinese privet)	4	11	4.6	T/O	Seedlings: Hand pull	Saplings: GS&P or C&P (G1.5); Trees: F/I (G1.5); Seedlings: spray MM or C200 + MM if other weeds such as Lantana or Camphor Laurel are present (ref 1).
22	Ochnaceae	Ochna serrulata (ochna)	7	33	4.5	S/O	N/A	Stems: GS&P or S&P or F/I (G1.5); Seedlings and Regrowth: spray G200 + MM or MM. final basal bark 100 or G200 + MM (ref 1).
23	Asparagaceae	Asparagus aethiopicus cv Sprenger (asparagus ground fern)	5	35	4.5	H/O	dig out unwanted plants and dispose of at the appropriate council landfill. remove the entire crown of underground stem of plant to prevent regrowth	Spot spray - metsulfuronmethyl (600 g/L) @ 10 g per 100 L water plus wetting agent or 100 g/ha plus wetting agent. Cut stump, spot spray, Appy neat Diesel
24	Poaceae	Spordobolus pyramidalis and S. natalensis (giant rat's tail grasses)	8	72	4.8	H/U?	Seed heads cut and bagged. remaining leaves sprayed	Small infestations: spray glyphosate @ 15mL/L water, fluroxypyr @ 2mL/L water + ionic wetter @ 1mL/Lwater. Dense infestations: blanket spraying glyphosate 3L/ha, fluroxypyr 2L/ha (ref 2).
	Asteraceae	Ageratina riparia (mistflower)	5	38	4.6	H/O	Hand pull and hang to dry.	Spray G100 or MM (ref 1).
26	Asclepiadaceae	Araujia sericifera (moth vine)	9	38	4.4	V/O	Seedlings & Vines: Hand pull. Bag and remove fruit.	Vines: CS&P (G1.5), Seedlings: spray G200 or G200 + MM or MM (ref 1).
27	Crassulaceae	Bryophyllum daigremontianum x B. delagoense (hybrid mother-of-millions)	6	15	4.5	H/O	Hand pull and dispose	Plantlets: spray G200 + MM or MM (ref 1)
28	Convolvulaceae	Ipomoea cairica (mile-a-minute)	7	56	4.4	V/O	Vines & Runners: hand pull, roll up and hand up to dry.	Vines and Runners: CS&P (G1.5). Larger Stems, Roots and Nodes: spray G100 + MM (ref 1)
29	Sapindaceae	Cardiospermum grandiflorum (balloon vine)	7	31	4.4	V/O	Seedlings & Small Vines: Hand Pull	Stems: CS&P (G1.5); Seedlings or Small vines: spray G200 or G200 + MM (ref 1).
30	Asclepiadaceae	Cryptostegia grandiflora (rubber vine)	6	19	4.4	V/O	Scattered or medium-density infestations: Where possible, repeated slashing close to ground level is recommended	Foliar spray - Follow-up basal bark/cut stump/foliar spray as necessary with Triclopyr + picloram (Grazon DS, Grass up, etc.) @ 0.35–0.5 L /100 L water
31	Phytolaccaceae	Rivina humilis (baby pepper)	8	61	4.3	H/O	Hand pull and hang to dry.	Spray G100 (ref 1).
32	Poaceae	Sporobolus africanus (Parramatta grass)	8	48	4.5	H/U	Hand or mechanical removal of small infestations	Small infestations: spray glyphosate @ 15ml/L water, fluropanate @ 2mL/L water + ionic wetter @ 1ml/L water. Dense infestations: blanket spraying glyphosate 3L/ha, fluropanate 2L/ha (ref 2).
33	Poaceae	Sporobolus fertilis (giant Parramatta grass)	9	27	4.5	H/U	Hand or mechanical removal of small infestations	Small infestations: spray glyphosate @ 15ml/L water, fluropanate @ 2mL/L water + ionic wetter @ 1mL/Lwater. Dense infestations: blanket spraying glyphosate 3L/ha, fluropanate 2L/ha (ref 2).
34	Poaceae	Eragrostis curvula (African lovegrass)	7	29	4.3	H/U	Chipped out before they flower. When chipping out the plant ensure that the tussock crowns are removed, as this will prevent regrowth. If in seed, the stems must be cut and bagged first	Glyphosate (360 g/l) (e.g. Weedmaster® Duo) @ 10 ml/1 L water
35	Asteraceae	Gymnocoronis spilanthoides (Senegal tea)	3	4	4.7	Fw/F	place plant material in a sealed plastic bag, leave in sunlight to rot then burn or dispose of at a council-approved land fill tip	Glyphosate and metsulfuron-methy @ 15ml/L/L water
36	Amaranthaceae	Alternanthera philoxeroides (alligator weed)	12	3	5	Fw/U	physical removal of plant should not be attempted	Terrestrial plants use Metsulfuron methyl (Brushoff) + 1mL/L non-ionic wetter @ 80g/ha + 1mL/L non-ionic wetter or 10g/100L water + 1mL/L non-ionic wetter. Fine floating plants Glyphosate (Roundup Biactive®) 10 ml /l
37	Passifloraceae	Passiflora suberosa (corky passionflower)	8	166	4.2	V/O	N/A	Stems: CS&P; Seedlings & Regrowth: spray G200 or G200 + MM (ref 1).
38	Poaceae	Melinis minutiflora (molasses grass)	5	17	4.5	H/A	Grazing or mowing	Spray: Fluaz fop-P 212g/L @ 2l/Ha, Glyphosate 360g/l @ 1L/100L water (ref 2).
39	Aristolochiaceae	Aristolochia elegans (Dutchman's pipe)	8	30	4.3	V/O	Stems: Hand pull. Fruit: Bag and remove.	Stems: CS&P (G1.5). Seedlings: spray G200 or G200 + MM or MM (ref 1).
40	Convolvulaceae	Ipomoea indica (blue morning glory)	5	24	4.3	V/O	Vines and Runners: hand pull, roll up and hang to dry.	Vines and Runners: CS&P (G1.5); Larger Stems, Roots and Nodes: spray G100 + MM or F100 (ref 1).
41	Myrtaceae	Leucalena leucocephala (leucaena)	6	14	4.3	ST/A	Small plants: Hand pull or mechanical removal	Herbicide Control - Basal Bark application: triclopyr 240g/L + picloram 120g/L @ 1L/60L diesel; Cut: triclopyr 240g/l + picloram 120g/L @ 1L per 60l diesel; spray triclopyr 300g/l + picloram 120g/L @ 250ml per 100l water. Combination of chemical and mech'l
42	Poaceae	Urochiana mutica (para grass)	6	18	4.4	H/A	Grazing	Herbicide Control - Foliar application (Knapsack): glyphosate 360g/l @ 200mL/10L water; Foliar: glyphosate 360g/l @ 5l/Ha; Handgun: glyphosate 360g/L @ 1.3L/100L water (ref 2).
43	Hydrocharitaceae	Egeria densa (egeria waterweed)	2	7	4.4	H/F	Hand pulling, cutting and digging with machines effective.	N/A
44	Pinaceae	Pinus elliottii (slash pine)	4	22	4.3	T/A	Seedlings: Hand pull; Saplings and Trees: cut close to ground or ring-bark	Saplings and Trees: F/I (G1.5) ensuring thick bark is penetrated (ref 1).
45	Caesalpiniaceae	Senna pendula var. glabrata (Easter cassia)	7	33	4.2	S/T/O	Seedlings: Hand pull	Shrubs: CS&P or F/I (G1.5); Seedlings: spray C200 or G200 + MM or MM; collect and bag seeds (ref 1).
46	Poaceae	Chloris gayana (Rhodes grass)	9	55	4.3	H/A	Hand pulling and removal and digging of larger clumps	Spray: glyphosate @ 1l/100L water
47	Crassulaceae	Bryophyllum pinnatum (resurrection plant)	6	17	4.2	H/O	Hand pull and dispose	Plantlets: spray C200 + MM or MM (ref 1).
48	Asteraceae	Parthenium hysterophorus (parthenium weed)	6	14	4.2	H/U	Hand pulling of small areas is not recommended	Spot spray 2,4-D amine 600 g/L @ 0.4 L/100 L
49	Caprifoliaceae	Lonicera japonica (Japanese honeysuckle)	3	6	4.3	V/O	Vines and Runners: hand pull, roll up and hang to dry.	Vines and Runners: CS&P (G1.5). Larger Stems, Roots and Nodes: spray G100 + MM or MM (ref 1).
50	Acanthaceae	Thunbergia alata (black eyed susan)	5	22	4.2	H/O	N/A	CS&P (G1.5); spray C200 or G200 + MM (ref 1).
51	Fabaceae	Macroptilium atropurpureum (siratro)	8	30	4.2	V/A	N/A	Vines: CS&P (1:1.5) or spray G100 + MM or MM (ref 1).
52	Rosaceae	Rubus ellipticus (yellowberry)	4	25	4.1	S/O	slashing hinders growth, giving some control if plants are slashed before they seed	Grazon DS picloram/triclopyr 1:200 parts water + wetting agent
53	Colchicaceae	Gloriosa superba (glory lily)	3	25	4.1	V/O	N/A	Young Shoots: spray G200 or G200 + MM. Best results in Oct-Nov and by using 'Pulse' as surfactant (ref 1).
54	Verbenaceae	Phyla canescens (lippia, Carpetgrass couch)	3	4	4.2	Fw/O	a combined approach of different control methods including chemical and mechanical with land management practices is most effective.	Foliar spray 600 g/L Dichlorprop @ 5 ml/ 1 L water or 2,4-D amine (500 g/L) + 1% crop oil @ 2. 4 L/Ha + 1% crop oil
55	Solanaceae	Solanum seaforthianum (Brazilian nightshade)	8	75	4	V/O	Hand pull	Spray G100 (ref 1).
56	Araceae	Pistia stratiotes (water lettuce)	3	8	4.1	Fw/D/I	Mechanical removal of small infestations	Glyphosate 360g/L @ 1-1.3L/100L water or 6.0L/Ha, diquat 200g/L @ 4L/100L water or 50-100L/Ha (see ref 2. for application guide)
57	Asparagaceae	Asparagus plumosus (asparagus fern)	4	8	4.1	V/O	Rhizomes: crown and hang to dry.	Rhizomes: gouge and paint (G1.5). Stems: wind up and spray or cut high and low and spray regrowth G200 or G200 + MM (ref 1).

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AMENDMENTS:

Issue	Date	Description	Checked
A	13/11/2017	Preliminary Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: AS NOTED

landscape architecture

DRAWING: Area 4 Weed Management Plan Weed Management Techniques

DATE: November 17 | CHECKED: MS

CLIENT REF.: 7243 | DRAWN: TL

DRAWING No.: 7243 L 414 WMP A

Spring Mountain Precinct

AREA 4 MANAGEMENT PLAN - WEED TREATMENT & REMOVAL STRATEGY

58	Commelinaceae	Tradescantia fluminensis (Qld use T. albiflora) (wandering jew)	5	9	4.1	H/O	N/A	Spray F150 (as per label) or G200 or G200 + MM; Collect and bag or roll and rake carefully. Dispose (ref 1).
59	Solanaceae	Cestrum parqui (green cestrum)	6	36	3.9	S/O	Seedlings: Hand pull	Stems: CS&P (G1.5) or spray G100 (ref 1).
60	Caesalpiniaceae	Senna septentrionalis (arsenic bush, was S floribunda)	6	25	4	S/O	Seedlings: Hand pull	Shrubs: CS&P or F/I (G1.5); Seedlings: spray G200 or G200 + MM or MM; collect and bag seeds (ref 1).
61	Solanaceae	Solanum mauritianum (wild tobacco tree)	8	30	4	S/O	Seedlings: Hand pull	Shrubs: CS&P (G1.5) or F/I (G1:1.5); Seedlings: spray G200 (ref 1)
62	Apocynaceae	Catharanthus roseus (pink periwinkle)	5	22	4	S/O	Hand pull	Spray G100 (ref 1).
63	Passifloraceae	Passiflora subpeltata (white passion flower)	10	60	3.9	V/O	Stems: Hand pull	Stems: CS&P; Seedlings & Regrowth: spray G200 or G200 + MM (ref 1).
64	Fabaceae	Desmodium uncinatum (silverleaf desmodium)	5	14	4	H/A	Hand pull or crown and dispose	CS&P tuberous roots (G1.5); spray G200 or G200 + MM or MM; collect and bag seeds (ref 1)
65	Poaceae	Melinis repens (red Natal grass)	10	134	4.1	H/A	Grazing or mowing	Spray. Fluazifop-P 212g/L @ 2L/Ha, Glyphosate 360g/L @ 1L/100L water (ref 2).
66	Nymphaeaceae	Nymphaea caerulea subsp. zanzibarensis (blue lotus)	4	17	4	Ha/OF	Hand pull small infestations	Spray with or Diquat Glyphosate. Occurs in waterways, thus EPA should be notified before any herbicide use (ref 5).
67	Onagraceae	Oenothera drummondii subsp. drummondii (beach evening primrose)	3	17	4	H/O	Hand pull	Spray G100 (ref 1).
68	Tiliaceae	Triumfetta rhomboidea (Chinese burr)	7	44	4	H/U	Hand pull	Spray G100 (ref 1).
69	Haloragaceae	Myriophyllum aquaticum (parrot's feather)	3	15	4	Ha/F	N/A	Spray. glyphosate 360g/L @ 100mL/10L water (ref 1).
70	Passifloraceae	Passiflora foetida (stinking passion flower)	7	50	3.9	V/O	Hand Pull	CS&P (G1.5); spray G200 or G200 + MM (ref 1).
71	Asteraceae	Verbesina encelioides (crownbeard)	7	34	4	H/U	Vines: Hand pull and remove; Runners. Roll up and hang to dry	Stems: S&P (GU); Regrowth and seedlings: spray G200 or G200 + MM (ref 1).
72	Poaceae	Paspalum mandiocanum (broad leaf paspalum)	3	6	4	H/A	N/A	Spray G200 - resistant to weaker strength (ref 1).
73	Poaceae	Paspalum dilatatum (paspalum grass)	10	30	3.9	H/A	Hand pull or dig up	Spray G100 (ref 1)
74	Ruppiaceae	Ruppia maritima (sea tassel)	2	8	4	Ha/F	Hand pull or dig up	Spray G100 (ref 1)
75	Arecaceae	Syagrus romanzoffiana (queen palm)	4?	10	3.9	T/O	Seedlings: Hand pull or crown; Trees: cut below growing point	Trees: F/I (G1.5); Seedlings: spray G200 + MM (ref 1)
76	Poaceae	Hymenachne amplexicaulis cv. Olive (hymenachne)	1?	1	4	Ha/A	a combined approach of different control methods including mechanical, chemical and biological with land management practices is most effective	360 g/L Glyphosate (includes Roundup Biactive & Weedmaster Duo) – 1 L/100L water or 10 L/ha delivered by boom
77	Asteraceae	Senecio tamoides (Canary creeper)	3	8	4	V/O	Vines: Hand pull and remove; Runners. Roll up and hang to dry.	Stems: S&P (GU); Regrowth and seedlings: spray G200 or G200 + MM (ref 1).
78	Poaceae	Cenchrus ciliaris (buffel grass)	4	15	4.1	H/A	Hand or mechanical removal of young plants	Herbicide Control - Glyphosate 7mL/L water, Dichlobenil 600g/100m2; Fluazifop 50-100mL/10L water (ref 2).
79	Acanthaceae	Thunbergia grandiflora (thunbergia, blue thunbergia)	2	3	5?	V/O	N/A	CS&P (G1.5); spray G200 (ref 1).
80	Cactaceae	Opuntia tomentosa (velvet tree pear)	8	46	3.9	S/O	Hand removed, stem injected, or over sprayed with garlon	Spray; Basal Bark application; Injection: Triclopyr .8L/60L diesel. Picloram + Triclopyr: 1L/60L diesel. Amitrole: 1mL/3cm (ref 3)
81	Euphorbiaceae	Ricinus communis (castor oil plant)	7	20	3.9	S/O	Seedlings: Hand pull	Shrubs: S: CS&P or F/I (G1.5); Seedlings: spray G200 (ref 1).
82	Asteraceae	Senecio madagascariensis (fire weed)	6	28	3.8	H/U	Hand pulled and bagged	Stems: S&P (GU); Regrowth and seedlings: spray G200 or G200 + MM (ref 1).
83	Cyperaceae	Cyperus involucratus (African sedge)	6	15	3.8	Ha/OF	Each has to be dug out with a spade and the entire plant turned over, exposing the root system while making sure all aerial parts of the plant are completely covered.	Aquatic areas - Glyphosate-ipa Land - commercial/industrial, rights of way - Glyphosate-ipa, glyphosate-mas, imazapyr
84	Asteraceae	Tithonia diversifolia (Mexican sunflower)	5	11	3.9	H/O	N/A	Stems: CS&P (G1.5) or cut and spray regrowth and seedlings (G100 or MM) (ref 1).
85	Poaceae	Setaria sphacelata (South African pigeon grass)	9	41	3.8	H/A	Hand pull or dig up	Spray G100 (ref 1).
86	Asclepiadaceae	Gomphocarpus physocarpus (balloon cotton bush)	10	132	3.7	S/OU	Slash in winter and burn cuttings. Wanderer Butterfly can also be used	Spray: glyphosate @ 1:100 with water, in spring before seeding (ref 3).
87	Poaceae	Digitaria didactyla (Queensland blue couch)	9	70	3.7	H/A	Hand pull or cultivation	Spot Spray: glyphosate or 2,2-DPA (ref 3)
88	Caesalpiniaceae	Gleditsia triacanthos (honey locust)	7	12	3.8	T/O	For the control of dense infestations on grazing land, burning followed by spot spraying is an economical control method	pastures non agricultural land fluroxypyr (Starane 200®) @ 1.5 L 75ml/100 L diesel
89	Poaceae	Paspalum notatum (bahia grass)	4	10	3.8	H/A	Hand pull or dig up	Spray G100 (ref 1)
90	Cactaceae	Opuntia monacantha (drooping tree pear, syn. O. vulgaris)	2	3	4	S/O	Hand removed stem injected, or over sprayed with garlon	Spray; Basal Bark application; Injection: Triclopyr .8L/60L diesel. Picloram + Triclopyr: 1L/60L diesel. Amitrole: 1mL/3cm (ref 3).
91	Poaceae	Paspalum conjugatum (paspalum grass)	7	38	3.8	H/A	Cut below crown.	Spot Spray: glyphosate or 2,2 DPA (ref 3)
92	Malpighiaceae	Hiptage benghalensis (hiptage)	3	5	4	S V/O	Hand pull small infestations.	Seedlings: Foliar spray of dicamba, fluroxypyr, and triclopyr/picloram. Larger plants cut stump application of fluroxypyr and triclopyr/picloram with diesel, glyphosate with water and picloram undiluted (ref 7).
93	Solanaceae	Solanum torvum (devil's fig)	6	39	3.9	S/O	Seedlings: Hand pull	Shrubs: CS&P (G1.5) or F/I (G1:1.5), Seedlings: spray G200 (ref 1).
94	Caesalpiniaceae	Caesalpinia decapetala (thorny poinciana)	4	20	3.9	S V/O	Seed-heads: Bag and remove.	Stems: CS&P (G1.5), Seedlings: spray G200 or G200 + MM or MM (ref 1).
95	Poaceae	Pennisetum alopecuroides (swamp foxtail)	7	29	3.8	H/O	Hand Pull	Spot Spray: glyphosate or 2,2 DPA (ref 3)
96	Verbenaceae	Duranta erecta (duranta)	6	14	3.6	ST/O	Shrubs: CS&P (1:1.5)	Spray G100 (ref 1)
97	Brassicaceae	Nasturtium officinale (Qld use Rorippa nasturtium-aquaticum) (watercress)	7	19	3.7	Ha/FU	Manually grub and destroy.	Spray G100 and replace with local species (ref 1).
98	Polygonaceae	Acetosa sagittata (rambling dock)	4	18	3.7	V/U	Tubers: Dig up, bag and remove.	Tubers: Spray G200 or G200 + MM or MM (ref 1).
99	Poaceae	Cynodon dactylon (couch Bahama grass introduced cultivars)	10	45	3.6	H/OA	Hand pull small infestations, removing all roots or smother with mulch.	Spray: glyphosate @ 200mL/15L water. Follow up spray (ref 3)
100	Bignoniaceae	Tecoma stans (yellow bells)	4	16	3.6	ST/O	N/A	Stems: CS&P (G1.5) or spray G200. Seeds: collect, bag and remove (ref 1)
101	Rosaceae	Rhaphiolepis indica (Indian hawthorn)	3	10	3.5	ST/O	Seedlings: Hand pull	Saplings: CS&P (G1.5); Trees: F/I (G1.5); Seedlings: spray G200 or G200 + MM or MM (ref 1).
102	Mimosaceae	Mimosa pudica (common sensitive plant)	4	12	3.7	S/A	N/A	Pastures - Fluroxypyr/Starane 200 @ 1.5 L/ha. Between cropping applications (conservation tillage) Dicamba/Banvel 200 @ 0.8 1.4 L/ha
103	Commelinaceae	Callisia fragrans (purple succulent)	3	9	3.9	H/O	N/A	Spray F100 or G200 or G200 – MM; Collect and bag or roll and rake carefully. Dispose (ref 1)
104	Scrophulariaceae	Paulownia tomentosa (paulownia)	3	5	4	T/AO	Seedlings: Hand pull	Saplings: CS&P (G1.5); Trees: F/I (G1.5); Seedlings: spray G200 (ref 1)
105	Commelinaceae	Tradescantia zebrina (zebrina)	3	12	3.7	H/O	N/A	Spray F100 or G200 or G200 – MM; Collect and bag or roll and rake carefully. Dispose (ref 1).
106	Acanthaceae	Ruellia malacosperma (ruellia)	5	16	3.8	H/O	N/A	Spray G200 + MM (ref 1).
107	Poaceae	Pennisetum clandestinum (kikuyu grass)	4	12	3.8	H/A	Hand Pull	Spot Spray: glyphosate or 2,2 DPA (ref 3)
108	Liliaceae	Lilium formosanum (Taiwan lily)	5	10	3.8	H/O	Hand pull or crown and dispose	Spray G100 + MM or MM (ref 1).
109	Asteraceae	Sigesbeckia orientalis (Indian weed)	10	148	3.6	H/U	Hand pull or cultivation.	Spray with 2,4 D amine or sodium, pr MCPA + dicamba (ref 3).
110	Asteraceae	Bidens pilosa (cobbler's pegs)	10	110	3.5	H/U	Hand pull or cultivation.	Spray with 2,4-D amine or sodium, pr MCPA + dicamba (ref 3).
111	Cactaceae	Opuntia stricta (common prickly pear)	7	67	3.6	S/O	Hand removed stem injected, or over sprayed with garlon	Spray; Basal Bark application; Injection: Triclopyr .8L/60L diesel. Picloram + Triclopyr: 1L/60L diesel. Amitrole: 1mL/3cm (ref 3).
112	Poaceae	Eleusine indica (crowsfoot grass)	8	55	3.5	H/A	Pull and chip. Replant with native couch	Spray: glyphosate or 2,2-DPA (ref 3)
113	Poaceae	Axonopus compressus (broad leaved carpet grass)	5	23	3.6	H/AO	Cut stems from roos.	Spot spray with Glyphosate (ref 3).
114	Lamiaceae	Salvia coccinea (red salvia)	9	46	4	H/O	remove small areas by hand or machine	Aquatic areas (drains, channels, margins of streams, lakes and dams) - calcium dodecylbenzene sulphonate (AF 100) @ 1 part in 19 parts kerosene
115	Asteraceae	Ageratum houstonianum (blue billygoat weed)	8	81	3.8	H/UO	N/A	Spray G100 or hand pull and spray regrowth G100 (ref 1).
116	Myrtaceae	Psidium guajava and P guineense (yellow guava and West Indies guava)	4	7	3.7	ST/AO	N/A	Shrubs: CS&P or F/I (G1.5) or spray G200 + MM or MM. Trial basal bark F100 or G200 + MM (ref 1).
117	Rosaceae	Rubus bellobatus (kittatinny blackberry)	5	22	3.5	S/O	slashing hinders growth, giving some control if plants are slashed before they seed	Grazon DS picloram/triclopyr 1:200 parts water + wetting agent
118	Myrtaceae	Eugenia uniflora (Brazilian cherry)	4	19	3.5	ST/O	N/A	Stems: C&P or F/I (G1.5); Bushes: spray or cut down and spray regrowth G100 or MM (ref 1)
119	Oleaceae	Olea europaea (olive)	2	6	4?	T/A	Seedlings: Hand pull	Saplings: CS&P (G1.5); Trees: F/I (G1.5); Seedlings: spray G200 or G200 + MM (ref 1).
120	Poaceae	Brachiaria decumbens (signal grass)	4	14	3.5	H/A	Grazing	Herbicide Control - Foliar application (Knapsack): glyphosate 360g/L @ 200mL/15L water; Foliar: glyphosate 360g/L @ 9L/Ha; Handgun: glyphosate 360g/L @ 1.3L/100L water (ref 2)
121	Fabaceae	Stylosanthes scabra (shrubby stylo)	4	4	4.3?	H/A	N/A	Vines: CS&P (1:1.5) or spray G100 + MM or MM (ref 1).
122	Commelinaceae	Commelina benghalensis (hairy wandering jew)	4	7	3.5	H/O	Collect and Bag	Spray G200 or G200 + MM (ref 1)
123	Poaceae	Pennisetum purpureum (elephant grass)	2	9	3.5	H/O	Grazing or mechanical removal	N/A (ref 2).
124	Zingiberaceae	Hedychium coronarium (wild ginger)	2	2	3.5	H/O	Small Plants: Hand pull and dispose	Small Plants: spray G200 or G200 + MM. Large Plants: cut and spray regrowth. If rhizomes are at ground level, cut stem and gouge rhizome - fill hole with G1.5 with injector kit or similar (ref 1).
125	Phytolaccaceae	Phytolacca octandra (inkweed)	10	50	3.4	H/O	Hand pull or crown	CS&P (G1.5) or C&P (G1.5); spray G100 (ref 1).
126	Asclepiadaceae	Asclepias curassavica (red cotton bush)	9	43	3.4	S/O	Hand pull. Slash	Slash and/or spray G100 (ref 1).
127	Solanaceae	Lycium ferocissimum (African boxthorn)	17	5	4.4?	S/O	N/A	Stems: C&P (G1.5); Regrowth: spray G200 + MM (ref 1).
128	Mimosaceae	Prosopis pallida (algaroba)	2	2	4	ST/O	When using mechanical control methods, it is important to remove the bud zone of the root system (about 30 cm below the ground surface). If this is not removed, re shooting can occur.	Basal bark - triclopyr + picloram Access® @ 1L/60L diesel. Cut stump - triclopyr + picloram Access® @ 1L/60L diesel. Overall spray - triclopyr + picloram Grazon DS® @ 350ml/100L water plus a wetting agent if plant is growing actively
129	Juncaceae	Juncus articulatus (jointed rush)	1	2	4	Ha/FO	Hand pull.	Spot spray with Glyphosate, 2,2-DPA or MCPA + dicamba (ref 3).
130	Cactaceae	Opuntia aurantiaca (tiger pear)	1	2	4	S/O	Hand removed, stem injected, or over sprayed with garlon	Spray; Basal Bark application; Injection: Triclopyr .8L/60L diesel. Picloram + Triclopyr. 1L/60L diesel. Amitrole: 1mL/3cm (ref 3)
131	Poaceae	Arundo donax (giant reed)	1	4	3.8	H/O	Physical removal of small infestations.	Spot spray or cut stump and spray with Glyphosate (ref 5).
132	Cactaceae	Opuntia imbricata (rope pear)	1	1	4	T/O	Biological controls available. cactoblastis cactorum successful. Mechanical control difficult. Fire can be used.	Spray; Basal Bark application; Injection: Triclopyr .8L/60L diesel. Picloram + Triclopyr: 1L/60L diesel. Amitrole: 1mL/3cm (ref 3).
133	Bignoniaceae	Pyrostegia venusta (flame vine)	1	1	4	V/O	N/A	CS&P (G1.5); spray G200 (ref 1).
134	Poaceae	Cortaderia selloana (pampas grass)	2	1	3.7	H/O	Small Plants: dig out by hand or machine	Stems: C&P (G1.5) or cut back and slash and spray regrowth G100 (ref 1).
135	Solanaceae	Solanum hispidum (giant devil's fig)	5	23	3.6	S/O	Hand pull	Spray G100 (ref 1).
136	Agavaceae	Furcraea foetida (Cuban hemp)	3	4	4.3?	S/OA	Dig out by hand or machine	CS& P near ground or spray MM (ref 1).
137	Agavaceae	Furcraea selloa (hemp)	1	2	4?	S/OA	Dig out by hand or machine	CS& P near ground or spray MM (ref 1)
138	Agavaceae	Agave americana (century plant)	4	9	3.7	S/OA	Dig out by hand or machine	CS& P near ground or spray MM (ref 1).

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■ surveying ■ town planning ■ urban design ■ environmental management ■ landscape architecture

40 YEARS 1975-2015

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APPROVED COMPANY ISO9001 Quality Management Systems

APPROVED COMPANY ISO14001 Environmental Management Systems

AMENDMENTS:

Issue	Date	Description	Checked
A	13/11/2017	Preliminary Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: AS NOTED

landscape architecture

DRAWING: Area 4 Management Plan Weed Management Techniques

DATE: November 17 | CHECKED: MS

CLIENT REF.: 7243 | DRAWN: TL

DRAWING No.: 7243 L 415 WMP A

AREA 4 MANAGEMENT PLAN - WEED TREATMENT & REMOVAL STRATEGY

139	Rutaceae	Murraya paniculata cv. Exotica (murraya)	6	26	3.6	S/O	Seedlings: Hand pull	Shrubs: CS&P or F/I (G1.5); Seedlings: spray G200 (ref 1)
140	Rosaceae	Rubus discolor (R. fruticosus complex, a blackberry)	4	10	3.7	S/C/A	Slashing hinders growth, giving some control if plants are slashed before they seed	Grazon DS picloram/triclopyr 1:200 parts water + wetting agent. A variety of herbicides may be used to control this species including (ref 5).
141	Brassicaceae	Cakile edentula (American sea rocket)	4	24	3.7	H/O	Manually grub and destroy.	Spray G100 and replace with local species (ref 1).
142	Balsaminaceae	Impatiens walleriana (busiam)	2	6	3.7	H/O	N/A	Spray G100 (ref 1).
143	Agavaceae	Agave sisalana (sisal)	2	4	3.7	S/C/A	Dig out by hand or machine	CS& P near ground or spray MM (ref 1).
144	Agavaceae	Agave vivpara var. vivpara (sisal)	2	3	3.7	S/C/A	Dig out by hand or machine	CS& P near ground or spray MM (ref 1).
145	Rosaceae	Prunus munsoniana (wild goose plum)	7	31	3.7	S/T/A	Seedlings: Hand pull	Shrubs: CS&P or F/I (G1.5); Seedlings: spray G200 (ref 1).
146	Poaceae	Echinochloa crus-galli (barnyard grass)	6	34	3.7	H/A	Hand pull or dig out small infestations.	Spot spraying with Glyphosate or 2,2 DPA (ref 3).
147	Asteraceae	Solidago canadensis var. scabra (Canadian goldenrod)	7	15	4?	H/O	Hand pull and hang to dry	Spray MM or G200 or G200 + MM if other weeds such as Lantana or Camphor Laurel are present (ref 1).
148	Fabaceae	Pueraria lobata (kudzu)	5	4	3.8	V,S/C	Slash. Diminish by shading site.	CS&P (G1.5); spray G200 or MM (ref 1).
149	Alismataceae	Sagittaria graminea var. platyphylla (sagittaria arrowhead)	5	7	3.8	Ha/FO	Physical removal of small infestations.	Spot Spray with Glyphosate (al 1.0L 100L water (ref 5).
150	Nymphaeaceae	Nymphaea mexicana (yellow waterlily)	2	4	3.7	Ha/CF	Hand pull small infestations	Spray with or Diquat. Glyphosate. Occurs in waterways, thus EPA should be notified before any herbicide use (ref 5).
151	Poaceae	Phyllostachys aurea (fishpole bamboo)	1	2	3.7	S/C	N/A	Stems: cut and fill segment (G1.5); Regrowth: spray G100 (ref 1)
152	Euphorbiaceae	Jatropha gossypiifolia (cotton leaf physic nut, bellyache bush)	1	1	3.7	S/C	Hand pull	Spray G100 (ref 1).
153	Malvaceae	Sida rhombifolia (Paddy's lucerne)	9	69	3.6	S/U	Hand pull or dig out.	Spray with 2,4-D amine or fluroxypyr (ref 3).
154	Poaceae	Themeda quadrivalvis (grader grass)	8	25	3.6	H/A	Hand pull or dig out small infestations.	Spot spraying with Glyphosate or 2,2-DPA (ref 3).
155	Poaceae	Andropogon virginicus (whisky grass)	8	14	3.6	H/A	Hand pull or dig out small infestations.	Spot spraying with Glyphosate or 2,2-DPA (ref 3).
156	Bignoniaceae	Jacaranda mimosifolia (jacaranda)	4	12	3.4	T/O	Seedlings: Hand pull	Saplings: CS&P (G1.5); Trees: F/I (G1.5); Seedlings: spray G200 (ref 1).
157	Acanthaceae	Justicia betonica (squirrmtail)	2	4	4	S/C	Hand pull small infestations. Can be controled by planting competitive native species.	Glyphosate known to be effective. Species known to occur in waterways, DERM should be contacted before spraying in waterways (ref 4).
158	Mimosaceae	Acacia baileyana (Bolivian wattle)	1	1	4	T/O	Mechanical or chain removal.	Basal Bark or cut stump application. Triclopyr 600g/L at 1.0L 120L diesel. Triclopyr + Picloram 240 g/l + 120 g/l at 1.0L 60L diesel. Picloram 45 g/kg undiluted (ref 5).
159	Simaroubaceae	Ailanthus altissima (tree of heaven)	12	3	3.6	T/O	Seedlings: Hand pull	Seedlings: CS&P (G1.5); Trees: F/I (G1.5); Seedlings: spray G200 or MM (ref 1).
160	Poaceae	Echinochloa colona (awnless barnyard grass)	9	44	3.3	H/A	Hand or mechanical removal of small infestations	Spray: glyphosate @ 13ml/1L water (ref 2.)
161	Cyperaceae	Cyperus brevifolius (Mullumbimby couch)	6	53	3.4	H/O	Each has to be dug out with a spade and the entire plant turned over, exposing the root system while making sure all aerial parts of the plant are completely covered.	Aquatic areas - Glyphosate-ipa Land - commercial/industrial, rights of way - Glyphosate-pa, glyphosate-mas, imazapyr
162	Moraceae	Morus alba (white mulberry)	3	10	3.4	T/O	N/A	Trees: F/I (G1.5), stack cut branches above the ground to dry; Saplings: CS&P (G1.5); Seedlings: spray G200 (ref 1).
163	Araceae	Colocasia esculenta (taro)	3	4	3.4	H/A/O	Hand pull.	Cut at base and apply glyphosate or metsulfuron methyl. Plant often occurs in waterways so consult DERM prior to application (ref 5).
164	Cannaceae	Canna indica (canna lily)	3	9	3.8	H/O	Dig out entire plant	Cut/Slash and spray regrowth G200 or G200 + MM. Collect and bag seeds. Resistant to herbicide (ref 1).
165	Buddlejaceae	Buddleja madagascariensis (buddleja)	5	6	3.4	S,V/O	N/A	Stems: CS&P (1.1.5). Vines: spray or cut down and spray regrowth G200 (ref 1).
166	Bignoniaceae	Tecoma capensis (Cape honeysuckle)	3	8	4	S/T/O	N/A	Stems: CS&P (G1.5) or Spray G200. Seeds: collect, bag and remove (ref 1)
167	Cactaceae	Hamsia martinii (hamsia cactus)	27	4	4	S/O	The use of the biological mealy bug agent is recommended	Triclopyr + picloram at 1.0l 60l diesel. Dichlorprop 600 g/l at 1.0L/60L water, metsulfuron methyl 600 g/l at 2.0L/100L water (ref 5).
168	Acanthaceae	Thunbergia laurifolia (laurel clock vine)	1	1	4	V/O	N/A	CS&P (G1.5); spray G200 (ref 1).
169	Fabaceae	Erythrina crista-galli (cockspur coral tree)	27	4	3.5	T/O	N/A	F/I (G1.5) or C&P stumps. Cut and stack branches above ground to dry to prevent resprouting. F/I sprouted branches (G1.5) or spray regrowth G200 + MM or MM. Trial Tordon (ref 1).
170	Sapindaceae	Koelreuteria elegans (Chinese rain tree)	17	1	3.67	T/O	Seedlings: Hand pull	Trees: F/I (G1.5) or C&P stumps (G1.5); Saplings: CS&P (G1); stack cut branches above ground to dry; Seedlings: spray (G200) (ref 1).
171	Zingiberaceae	Hedychium gardnerianum (ginger lily)	17	3	3.6	T/O	Small Plants: Hand pull and dispose	Small Plants: spray G200 or G200 + MM. Large Plants: cut and spray regrowth. If rhizomes are at ground level, cut stem and gauge rhizome - fill hole with G1.5 with injector kit or similar (ref 1).
172	Acanthaceae	Hypoestes phyllostachya (polka dot plant)	3	5	3.5	T/O	Hand pull or crown and dispose	Spray G200 or G200 + MM (ref 1).
173	Caprifoliaceae	Sambucus canadensis (American elder)	3	7	3.4	S/T/O	Vines and Runners: hand pull, roll up and hang to dry.	Vines and Runners: CS&P (G1.5); Larger Stems, Roots and Nodes: spray G100 + MM or MM (ref 1).
174	Asteraceae	Conyza sumatrensis (tall fleabane)	9	45	3.3	F/U	Hand or mechanical removal of small infestations	Seedlings: Atrazine or Chlorosulfuron in combination with competitive native species; Plants: Glyphosate and Tordon 75-D mix. Glyphosate ration depends on other weeds present (ref 2).
175	Fabaceae	Tipuana tipu (tipuana)	2	5	3.4	T/O	Seedlings: Hand pull	Saplings: CS&P (G1.5) Trees: F/I (G1.5). Seedlings: spray G200 (ref 1).
176	Asteraceae	Tagetes minuta (stinking roger)	8	32	3.3	F/U	Hand pull and hang to dry	Spray MM or G200 or G200 + MM if other weeds such as Lantana or Camphor Laurel are present (ref 1).
177	Caesalpiniaceae	Chamaecrista rotundifolia (round-leaf cassia)	8	14	3.3	S/T/A	Seedlings: Hand pull	Shrubs: CS&P or F/I (G1.5); Seedlings: spray G200 or G200 + MM or MM; collect and bag seeds (ref 1)
178	Poaceae	Cenchrus echinatus (Mossman river grass)	8	40	3.3	H/A	Hand or mechanical removal of young plants	Herbicide Control - Glyphosate 7ml/1L water. Dichlobenil 600g/100m2. Fluazifop 50-100mL/10L water (ref 2).
179	Asteraceae	Conyza canadensis (Canadian fleabane)	10	55	3.3	F/U	Hand or mechanical removal of small infestations	Seedlings: Atrazine or Chlorosulfuron in combination with competitive native species; Plants: Glyphosate and Tordon 75-D mix. Glyphosate ration depends on other weeds present (ref 2).
180	Euphorbiaceae	Euphorbia cyathophora (painted spurge)	8	20	3.3	H/O	Hand pull	Spray G100 (ref 1)
181	Poaceae	Setaria palmifolia (palm leaf setaria)	5	13	3.3	H/O	Hand pull or dig up	Spray G100 (ref 1)
182	Euphorbiaceae	Euphorbia heterophylla (milk weed)	5	12	3.4	H/O?	Hand pull	Spray G100 (ref 1).
183	Fabaceae	Desmodium intortum (green leaf desmodium)	4	11	3.3	H/A	Hand pull or crown and dispose	CS&P tuberous roots (G1.5); spray G200 or G200 + MM or MM; collect and bag seeds. Monitor regrowth over 2 - 3 years (ref 1).
184	Poaceae	Pennisetum setaceum (fountain grass)	3	11	3.3	H/O	Hand Pull	Spot Spray. glyphosate or 2,2 DPA (ref 3).
185	Asteraceae	Conyza bonariensis (flax leaf fleabane)	7	38	3.3	F/U	Hand or mechanical removal of small infestations	Seedlings: Atrazine or Chlorosulfuron in combination with competitive native species; Plants: Glyphosate and Tordon 75-D mix. Glyphosate ration depends on other weeds present (ref 2).
186	Solanaceae	Solanum enanthum (a tobacco bush)	7	19	3.2	S/O	Hand pull	Spray G100 (ref 1).
187	Poaceae	Stenotaphrum secundatum (buffalo grass)	8	23	3.2	H/A/O	Hand or mechanical removal of small infestations	Spray: glyphosate @ 13ml/1L water (ref 2.)
188	Apocynaceae	Cascabela thevetia (syn. Thevetia peruviana) (yellow oleander)	5	9	3.1	S/T/O	Hand pull small infestations. Slashing can be used but should be followed up by herbicide application	Basal bark application of fluroxypyr (35ml/1L Diesel); Stem injection Glyphosate (1L/2L Water). Cut stump application of fluroxypyr (1L/5L Diesel; Foliar Spray of fluroxypyr 1:120 for larger plants, 1:200 for seedlings (ref 2).
189	Rubiaceae	Coffea arabica (coffee)	5	7	3.2	S/T/A	Saplings: Hand pull	Shrubs: F/I (G1) between flower and fruit set; Saplings: CS&P (G1); Seedlings: spray G200 or G200 + MM (ref 1).
190	Bignoniaceae	Spathodea campanulata (African tulip tree)	12	1	3.4	T/O	N/A	Saplings: CS&P (G1.5); Trees: F/I (G1.5); Seedlings: spray G200 (ref 1).
191	Fabaceae	Macroptilomia axillare (perennial horse gram)	4	12	3.1	V,H/A	N/A	Vines: CS&P (1.1.5) or spray G100 + MM or MM (ref 1).
192	Bignoniaceae	Watsonia meriana var bulbillifera (bulbil watsonia)	2	3	3.1	H/O	Dig up, bag and remove	Spray C200 + MM (ref 1)
193	Passifloraceae	Passiflora edulis (passion fruit)	8	12	3.2	V/A/O	Hand Pull	CS&P (G1.5), spray G200 or G200 + MM (ref 1).
194	Asteraceae	Zinnia peruviana (wild zinnia)	6	33	3.1	H/O	Seedlings: Hand pull	Shrubs: CS&P or F/I (G1); Seedlings: CS&P (G1.5) or spray G200 (ref 1).
195	Dracaenaceae	Sansevieria trifasciata (sansevieria)	27	7	3.1	H/O	Hand pull or dig up	Spray G100 + MM (ref 1).
196	Poaceae	Digitaria eriantha (pangola grass)	5	20	3.1	H/A	Hand pull or cultivation	Spot Spray. glyphosate or 2,2-DPA (ref 3)
197	Rosaceae	Eriobotrya japonica (loquat)	3	5	3.1	T/O	Seedlings: Hand pull	Saplings: CS&P (G1.5), Trees: F/I (G1.5); Seedlings: spray G200 or G200 + MM or MM (ref 1).
198	Cactaceae	Acanthocereus tetragonus (sword pear)	1	1	3.3	S/O	Biological controls available. cactoblastis cactorum successful. Mechanical control difficult. Fire can be used	Spray; Basal Bark application; Injection. Triclopyr, 1L/62L diesel. Picloram + Triclopyr 1L/62L diesel. Armure. 1mL/3cm (ref 3).
199	Mimosaceae	Acacia nilotica subsp. indica (prickly acacia)	3	3	4.4?	T/A	Mechanical or chain removal.	Basal Bark or cut stump application. Triclopyr 600g/L at 1.0L/120L diesel. Triclopyr + Picloram 240 g/l + 120 g/l at 1.0L/60L diesel. Picloram 45 g/kg undiluted (ref 5).
200	Mimosaceae	Acacia farnesiana (mimosa bush)	6	15	3.1	T/A	Mechanical removal of small plants	Basal Bark or cut stump application of Triclopyr + Picloram 240 g/l + 120 g/l at 1.0L/60L diesel. Foliar application of Clopyralid 300g/L at 500mL/1L water (ref 5)

Explanatory notes:
Sub-region: Number of the ten sub-regions of the Southeast Queensland bioregion (Young and Dillewaard 1999) within which species recorded
Rec no.: Total number of records for species within study area, Queensland herbarium CORVEG and HERBRECS data.
Scores: Based on panel data of invasiveness, 5 (highest) to 3 (moderate). ? indicate doubtful scores
Life forms: T-tree (woody plant >5m), S1-small tree (2-5m), S-shrub (woody <2m), H-herb (grasses & forbes), Ha-aquatic herbs.
Source: A-agriculture, O-ornamental and landscaping, F-fish aquarium, U-unintentional introduction and/or contaminant.

Abbreviations: Control Methods
CS&P = cut scrape and paint
S&P = scrape and paint
C&P = cut and paint
F/I = fill or inject stem

Abbreviations: Herbicide
G = Glyphosate, eg. Roundup Bioactive, Weedmaster Duo
MM = Metsulfuron methyl, eg. Brushoff
F = Fluroxypyr, eg. Starane

Abbreviations: Herbicide Dilution Rates for High Concentration Applications
GU = Glyphosate undiluted
G1 = 1 part water to 1 part glyphosate
G1.5 = 1.5 parts water to 1 part glyphosate
G4 = 4 parts water to 1 part glyphosate

Abbreviations: Herbicide Spray Concentrations
G100 = 100mL glyphosate per 10L of water + surfactant, eg 20mL LI 700 per 10L
G200 = 200mL glyphosate per 10L of water + surfactant, eg 50mL LI 700 per 10L
G100 + MM = 100mL glyphosate + 1.5g metsulfuron methyl per 10L of water + wetting agent, eg. 2mL Agral per 10L water
G200 + MM = 200mL glyphosate + 1.5g metsulfuron methyl per 10L of water + wetting agent, eg. 2mL Agral per 10L water
MM = 1.5g metsulfuron methyl per 10L water + wetting agent, eg. 2mL Agral per 10L water
F100 = 100mL fluroxypyr per 10L water
F150 = 150mL fluroxypyr per 10L water

Other Abbreviations
= Locally non-indigenous native species

Ref. 1 Big Scrub Rainforest Landcare Group (2008), "Common Weeds of Subtropical Rainforests of Eastern Australia. A practical manual on their
Ref. 2 Department of Primary Industries and Fisheries (QLD), "Weeds and pest animals and ants"
Ref. 3 Holland et al. (1996), "Suburban Weeds", DPI QLD.
Ref 4 Port Stephens Council (NSW), "Weed Busters"
Ref 5 Department of Primary Industries (NSW), "Noxious and Environmental Weed Handbook, 3rd Edition".
Ref 6 Department of Environment and Conservation, "Florabase", (DEC- WA)
Ref 7 Vitelli, J.S. and Madigan, B.A. and Van Haaren, P.E. and Setter, S. and Logan, P. (2008) Control of the invasive liana, Hiptage benghalensis. Weed Biology and Management, 9 (1). pp. 54-62.

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40 YEARS 1975-2015

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APPROVED COMPANY ISO9001 Quality Management Systems
APPROVED COMPANY ISO14001 Environmental Management Systems

AMENDMENTS:

Issue	Date	Description	Checked
A	13/11/2017	Preliminary Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: AS NOTED

landscape architecture

DRAWING: Area 4 Management Plan Weed Management Techniques

DATE: November 17 | CHECKED: MS
CLIENT REF.: 7243 | DRAWN: TL
DRAWING No.: 7243 L 416 WMP A

Spring Mountain Precinct

AREA 4 MANAGEMENT PLAN - MONITORING & REPORTING

MONITORING & REPORTING

MONITORING AND REPORTING PROCEDURES

Monitoring and maintenance of the weed management and vegetation, both adjacent to proposed works and within the management area, is a vital component to the success of this management plan set.
An ongoing maintenance schedule, detailing the monitoring program, management intervals, methodologies, and corrective actions for contractors undertaking rehabilitation works within the ecological area is provided below. It is the responsibility of the rehabilitation landscape contractor to ensure the ongoing maintenance and monitoring schedule is actioned. Monitoring of the parkland weed management and revegetation works allows for:

- A review of the pre-established performance indicators for measuring the success of the weed removal and control;
- Ensure the level of protection for existing identified native vegetation inclusive of that which has naturally regenerated;
- Review the rate of spread or contraction of weed infestation within the control program;
- Monitor the rate of assisted regeneration and revegetation of desirable native species promoted in areas where weeds have been removed; and
- Identification of new weed threats or other factors which may be effecting areas designated for ecological rehabilitation.

Monitoring is required for weed eradication, revegetation and assisted regeneration.

MAINTENANCE ACTIONS AND METHODOLOGIES

Tree Retention - Construction Phase
- Ecologist / Arborist to assess tree exclusion zones are adhered to;
- Trees assessed for signs of stress or die back; and
- Implementation of VMP if retained tree roots Critical Root Zone (CRZ) is impacted upon.

Initial Establishment - Rehabilitation Planting
Initial 12 week establishment period applies to all rehabilitation planting works. During this period weekly maintenance is to occur that involves the following:
- Watering;
- Ongoing weed control;
- Fertilising; and
- Replacement of dead or damaged stock.

Ongoing Maintenance - Rehabilitation Planting
After this period, it is recommended that the ecological planting site be maintained on a monthly basis over a 5 year period to ensure that the planting has been successful. The following is to occur:
- Conduct weed spraying, plant watering, plant replacement of losses as necessary to maintain >95% survival rate;
- All other areas of non-use / limited access or steep terrain areas are to be hydro seeded to maintain a minimum 90% ground cover;
- All planting species will be disease free and supplied from an accredited nursery supplier;
- Assess condition of sediment control devices and replace if necessary; and
- Removal of excess sediment from erosion control devices as required.

MONITORING TIME FRAMES

For weed removal and revegetation three (3) Council determined timeframes form the anchor of the monitoring process. These include:

Council Pre-Start - *On-site meeting prior to the initial commencement of work within each stage of weed management. Will involve Consultant, Contractor and Council to work through weed treatment areas and clarify works approved and appointed.*

On-Maintenance - *At the completion of the Primary Weed Removal Stage and Secondary weeding an On-Maintenance meeting will be held with Council to inspect the works on-site in relation to the approved plans and previously agreed on-maintenance criteria.*

Off-Maintenance - *At the completion of all site weeding works and the agreed maintenance timeframe a final inspection will be held by Council to determine if works have been completed to the required level for Council hand over.*

REPORTING

Reporting to **Ipswich City Council** will occur on a yearly interval during the total period. Council will physically attend the Pre-Start, On-maintenance and Off-maintenance meetings. For this project it is recommended reporting include a short memo styled report responding to agreed criteria. As part of the monitoring a number of pre-determined transect and quadrant sampling sites have been allocated. At these locations a number of baseline studies have been completed and will be repeated post weed removal and maintenance to measure the success of the programmed works. It is also recommended this include a visual diary of imagery from selected locations at each inspection (Including the pre-start and monthly inspections). The imagery for the each period will be included with the report to Council.

In addition to the photo monitoring the biannual report to Council should include sufficient information on:
- Date, time and whether conditions at time of inspection
- Changes in weed extent populations (spreading / contracting)
- Changes in weed densities
- Health of existing vegetation protected by NRM provisions
- Rate of success for revegetation plantings
- Growth and PFC rate of assisted regeneration areas
- Occurrences of new weed infestations or species outbreaks
- Comments on any indirect changes to the area as a result of weed management (ie erosion / change in weed footprints / death to natives)
- Annual reporting is required to be sent to the Department of the Environment (DOE).

NOTES

MONITORING PARAMETERS

The monitoring should address the following issues:
- Maintained health and vigour of retained Remnant Trees adjacent to the corridor;
- Plant growth, percentage cover and survival rates;
- Plant losses through herbivores, disease, vandalism, storm damage or other factors;
- Weed re-growth and control measures;
- Plant replacement;
- Maintenance watering regime; and
- Erosion prevention.

It is also essential to keep an accurate photo record of the retained trees and progress of the rehabilitation planting by setting fixed photo monitoring points across the site. Photos should be taken by a digital camera and recorded in the project file by date and discrete photo monitoring point number. Photo monitoring point locations should be clearly marked on site and mapped by a surveyor or by GPS.

Corrective Actions
If trees adjacent to the sewer alignment disturbance are dying or impacted upon:
- Monitor construction activity;
- Educated construction team on tree retention measures;
- Review and / or respond to tree retention mitigation measures ie. exclusion zones;
- Review VMP for particular trees;
- Remove if necessary unsafe tree;
- Compensation by planting;
- If soil erosion is still occurring in planting zones the following is to occur:
- Review rehabilitation techniques conducted by contractor;
- Assess the potential for disturbance to occur;
- Assess other potential sources or causes of disturbances to occur; and
- Maintain planting regimes to a minimum of 95% survival rate.

If weed infestations occur in planting zones or in disturbed construction area, the following is to occur:
- Review weed removal and weed management techniques conducted by contractor;
- Assess the appropriate use and amounts of herbicides are being used;
- Assess the potential for weeds to occur;and
- Assess other potential sources or causes of weeds to occur.

If there is poor regeneration of plants occurring in ecological areas, the following is to occur:
- Review planting and direct seeding management techniques conducted by contractor;
- Assess the appropriate use and amounts of herbicides are being used in planting areas;
- Assess the potential for weeds to occur in ecological areas; and
- Assess other potential sources or causes of weeds or limited re-growth of native plants to occur, ie. plant pests and disease monitoring.

RESOURCES / ROLES & RESPONSIBILITIES

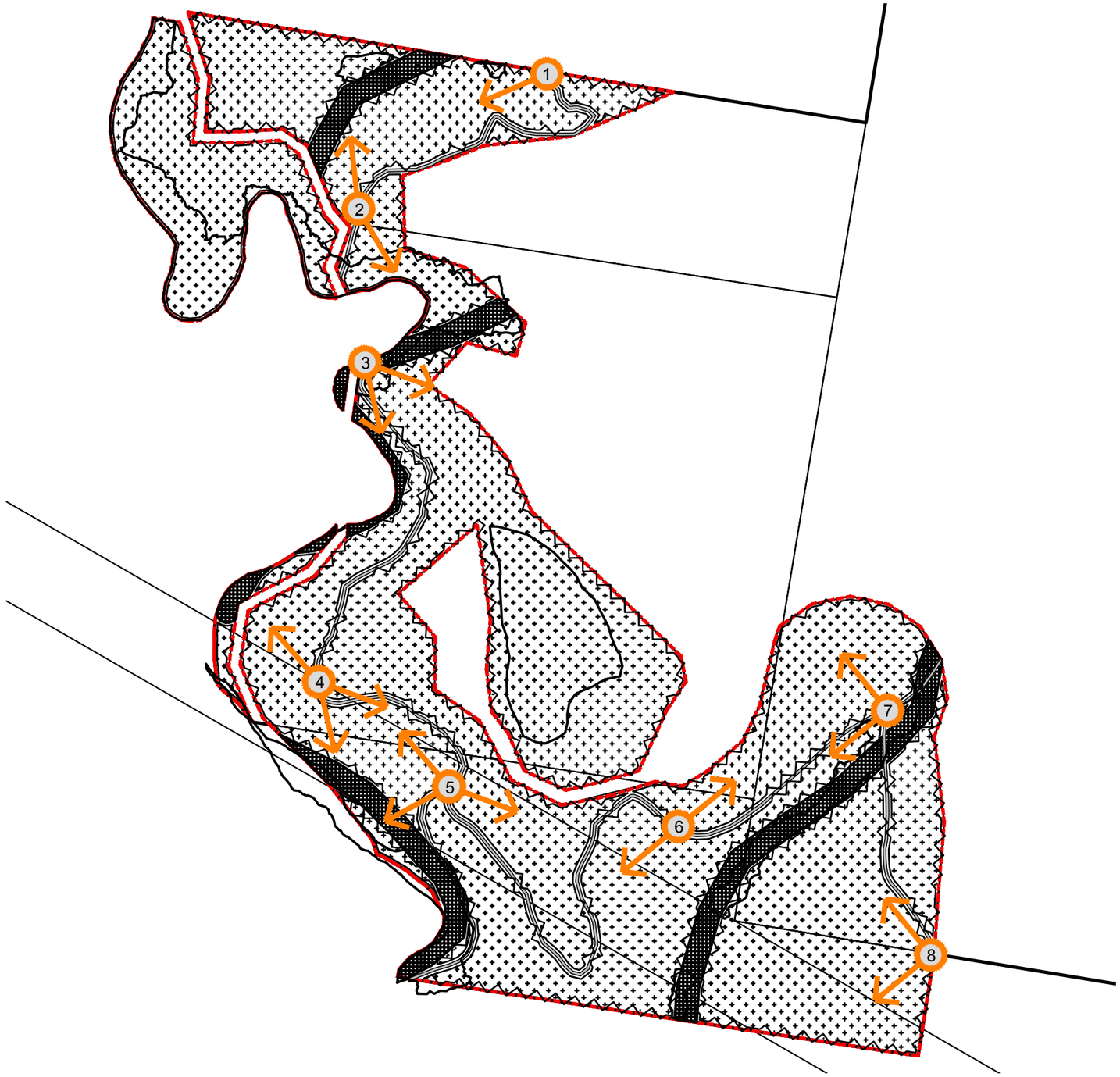
All resources required to implement this plan will be provided by the proponent (Lendlease). The following roles are applicable:

PROPONENT
- Ensure all consultants, contractors, sub contractors or others utilizing the area are aware of the Weed Management Plan.
- Appoint appropriate consultants and contractors to undertake works as prescribed on the drawings and conditioned by **Ipswich City Council**.
- Cover the costs of all necessary resources to ensure works are completed as per the approved documents.

CONSULTANTS
- Brief the proponent on their requirements in implementing and maintaining works as per the Weed Management Plan.
- Attend pre start, on maintenance and off maintenance meetings.
- Undertake monitoring and reporting to **Ipswich City Council** as set up by this document.
- Be available to respond to technical queries or departures to the approved documentation when on-site conditions require changes.
- Liaise with Council throughout all stages of approval, initial works and maintenance of works.

COUNCIL
- Provide technical expertise via commentary on the approval of documentation.
- Attend pre-start, on and off maintenance inspections.
- Undertake random inspections through the Secondary weed management and Maintenance weed management phases.
- Accept and review biannual reports as dictated in this document.

CONTRACTOR
- Complete works in strict accordance with the documentation.
- Recommend changes to the documentation when specific experience or on-site conditions require so.
- Attend pre-start, on and off maintenance inspections.



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AMENDMENTS:

Issue	Date	Description	Checked
A	13/11/2017	Preliminary Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: NOT TO SCALE

landscape architecture

DRAWING: Area 4 Weed Management Plan Monitoring & Reporting

DATE: November 17 | CHECKED: MS
CLIENT REF.: 7243 | DRAWN: TL
DRAWING No.: 7243 L 417 WMP A