environmental management

saunders havill group

Spring Mountain Estate

V-Dec Management Plan

Sinnathamby Boulevard, Springfield Central

Lendlease Communities Australia Pty Ltd

EPBC Ref: 2013/7057
SHG Ref: 7243
May 2016

surveying town planning urban design environmental management landscape architecture

Document Control

Title	Spring Mountain Estate V-Dec Management Plan
Address	Sinnathamby Boulevard, Springfield Central
Client:	**Lendlease Communities Australia Pty Ltd**
Job Number	**7243**

Document Issue

Issue	Date	Prepared By	Checked By
Internal Draft	07.01.2016	Keira Grundy	Murray Saunders
Client Draft	19.02.2016	Keira Grundy	Murray Saunders
ICC Draft	25.05.2016	Keira Grundy	Murray Saunders
Formal NRM Application	24.08.2016	Keira Grundy	Murray Saunders
Approved	07.10.2016	Keira Grundy	Murray Saunders

Disclaimer

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Reports and/or Plans by Others

Reports and/or plans by others may be included within this Management Plan to support the document.

Executive Summary

This V-Dec Management Plan has been prepared to accompany an application to have a portion of Conservation Land owned by **Ipswich City Council** (ICC) known as the Springfield Wildlife Corridor declared as a Voluntary Declaration (V-Dec) under the *Vegetation Management Act 1999*. This plan forms one of the mandatory supporting requirements for the V-Dec Application and primarily outlines weed removal and maintenance and improvement works to occur over the declared area as agreed with I**CC** (the land owner and applicant).

The Spring Mountain Estate project was deemed a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on the 18th of December 2013 (EPBC 2013/7057) due to impacts on *listed threatened species and communities* (Section 18 & 18A). The project was assessed by Preliminary Documentation and approved with conditions on the 23rd of December 2015. To compensate for the loss of Koala and Grey-headed Flying-fox habitat, 293ha of MNES habitat (shown in Annex 1 of the approval included as **Appendix B**) is required as an environmental offset. Specifically, Condition 7 of the approval requires the offset to be to be legally secured and Condition 8 requires the proponent to demonstrate a gain in habitat quality across the offset area.

Securing of the offset must occur prior to the commencement of the action (i.e. operational works and/or vegetation clearing) by putting in place a legal mechanisms available through Queensland legislation to secure the land. The chosen mechanism is a Voluntary Declaration (V-Dec). To enhance the habitat quality of the offset for MNES, vegetation management and rehabilitation works are proposed to be carried out by **Lendlease Communities Australia** (Lendlease). These have been coordinated in accordance with **ICC's** Works Parks and Recreation Department and primarily include weed eradication and long term weed control, assisted revegetation and rehabilitation, and monitoring and reporting.

The extent of land to be legally secured by **Lendlease** for offset is 293ha. This V-Dec Management Plan seeks a declaration over 396ha in line with titled dedicated by the former land owner, **Springfield Land Corporation**.

The Voluntary Declaration Area incorporates the entire extent of the following cadastral allotments (Lot 11 on S31533, Lot 705 on SP151175, Lot 740 on SP179412, Lot 745 on SP242282, Lot 747 on SP189043, Lot 751 on SP189053, Lot 752 on SP189053, Lot 753 on SP189054 and Lot 748 on SP189044). Within these allotments two registered easements occur providing a range of use rights to **Powerlink** and **Seqwater**. This V-Dec Management Plan and the separately proposed Property Map of Assessable Vegetation (PMAV) maintain these rights completely. This is achieved by ensuring the specific easement areas are not listed as Category A under the PMAV, rather remain mapped as Category X. Secondly, the specific easement dealing numbers and documents referenced in this management plan will continue as current.

This V-Dec Management Plan has been prepared to meet components of Conditions 7 and 8 of the EPBC Approval (2013/7057) and provides details of management intent and management outcomes for the offset area which have been developed in accordance with the template management plan for Voluntary Declarations published by the **Department of Natural Resources and Mines**.

Table of Contents

Figures

Tables

I. Introduction

The *Environmental Management Division* of **Saunders Havill Group** (SHG) was engaged by **Lendlease Communities Australia Pty Ltd** (Lendlease) to prepare a V-Dec Management Plan for land adjoining Spring Mountain Estate, located at Sinnathamby Boulevard, Springfield Central.

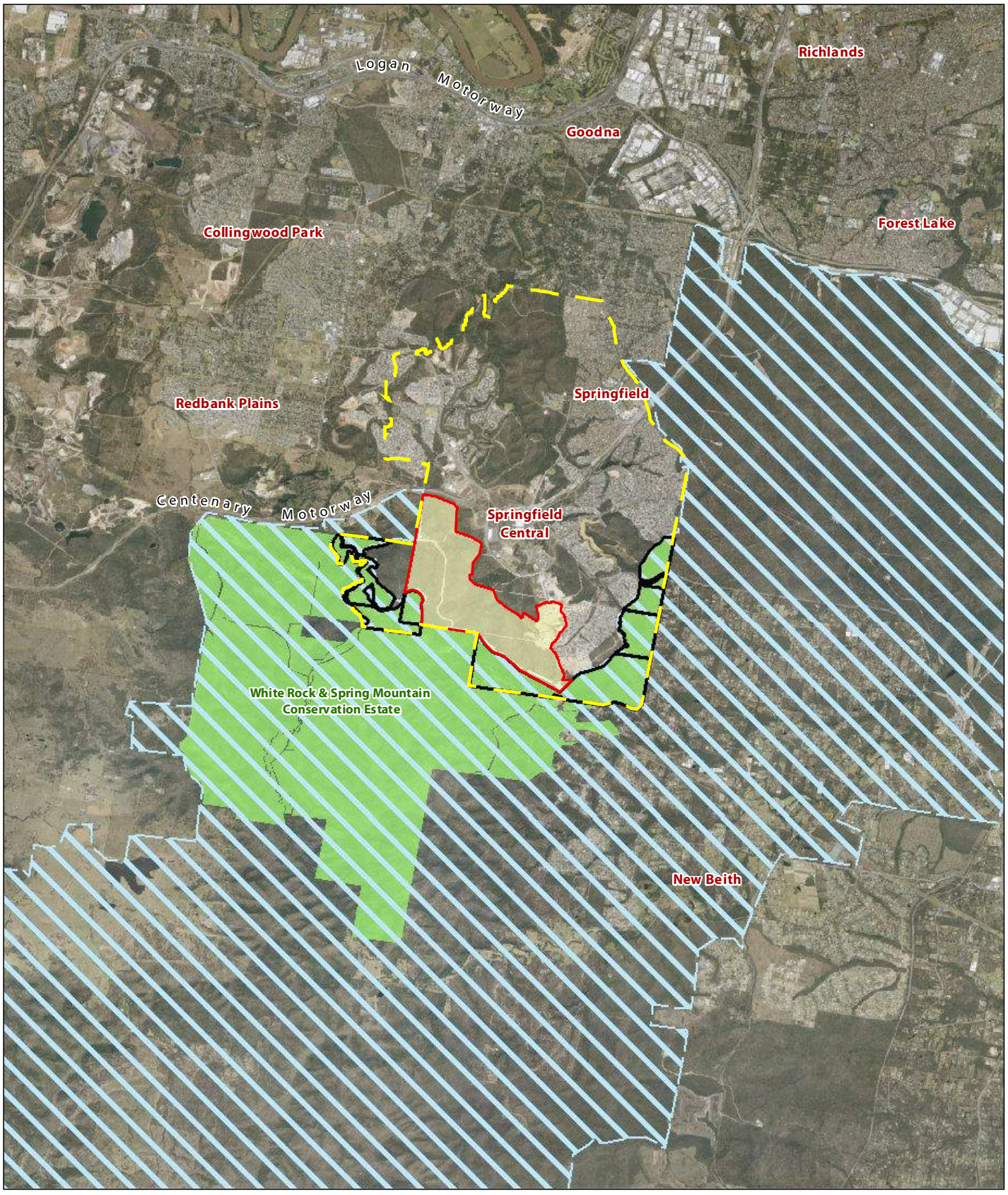
Spring Mountain Estate was referred under the *Environment Protection and Biodiversity Conservation Act* (EPBC Act) on the 19th November 2013 and subsequently declared a "Controlled Action" pursuant to section 18 and 18A (*listed threatened species and communities*) (EPBC Act reference 2013/7057). The trigger for the controlling provision was due to potential impacts on the Koala (*Phascolarctos cinereus*) and Grey-headed Flying-fox (*Pteropus poliocephalus*), which are both listed as Vulnerable under the EPBC Act.

Under the Commonwealth **Department of the Environment's** (DoE) Preliminary Documentation requests, an offset proposal to compensate for the impacts of clearing 269.5 hectares of habitat critical to the survival of the Koala and 255 hectares of critical habitat for the Grey-headed Flying-fox was prepared in consultation with the DoE. The offset proposal specified using 293ha of the 396ha of remnant vegetation adjoining Flinders–Karawatha Bioregional Corridor which had been previously dedicated by **Springfield Land Corporation** (SLC) to **Ipswich City Council** (ICC) to offset impacts associated with development within the entire approved Springfield Structure Plan (refer **Figure 1**). The impacts compensated for included the development of Spring Mountain Estate.

On the 23rd December 2015, Spring Mountain Estate was approved by the DoE subject to conditions (refer **Appendix B**). Specifically, Condition 7 of the approval requires the approval holder to secure 293ha of MNES habitat for Koala and Grey-headed Flying-fox within the agreed offset proposal site (shown as Annex 1 in the approval included as **Appendix B**) via a legal binding mechanisms available through Queensland legislation; being either by a Covent on Title, Voluntary Declaration or Nature Refuge. The chosen mechanism in this instance is a V-Dec. In addition, Condition 8 of the approval requires the approval holder to achieve a gain in habitat quality across the offset compared to baseline offset habitat quality and extent.

This V-Dec Management Plan has been prepared to provide details of overarching management intent, actions and outcomes to satisfy the requirements of Condition 7 and Condition 8 of the EPBC Approval and the request for a V-Dec under the *Vegetation Management Act 1999* (VMA). This V-Dec Management Plan has been prepared in accordance with the template management plan for voluntary declarations published by the **Department of Natural Resources and Mines** (NRM). Supporting information is provided in **Appendix A**.

The Voluntary Declaration Area incorporates the entire extent of the following cadastral allotments (Lot 11 on S31533, Lot 705 on SP151175, Lot 740 on SP179412, Lot 745 on SP242282, Lot 747 on SP189043, Lot 751 on SP189053, Lot 752 on SP189053, Lot 753 on SP189054 and Lot 748 on SP189044). Within these allotments two registered easements occur providing a range of use rights to **Powerlink** and **Seqwater**. This V-Dec Management Plan and the separately occurring Property Map of Assessable Vegetation (PMAV) maintain these rights completely. This is achieved by ensuring the specific easement areas are not listed as Category A under the PMAV, rather remain mapped as Category X. Secondly, the specific easement dealing numbers and documents as referenced in this management plan will continue as current.



Legend

- Spring Mountain Project Area
- Greater Springfield area
- White Rock & Spring Mountain Conservation Estate
- Flinders-Karawatha Corridor
- Declared area DCDB

Figure 1 *Site Context*

File ref. 7243 E Figure 1 Site Context D
Date *24/08/2016*
Project *Spring Mountain (EPBC)*

0 0.5 1 2 3 4 *km*

Scale (A4): 1:100,000 [GDA 1994 MGA Z56]

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2014), Aerial (QLD Globe 2014), Referral area (Land Partners Pty Ltd 2015)

The main **objective** of the offset is:

To create a self-sustaining ecosystem that provides habitat critical to the survival of the Koala and Grey-headed Flying-fox within a publically owned, locally significant, conservation area within the Flinders–Karawatha Bioregional Corridor.

1.1. Property and Ownership Details:

V-Dec Proponent	Lendlease Communities Australia Pty Ltd
V-Dec Applicant	Ipswich City Council
Name of registered owners:	Ipswich City Council (registered owners)
Postal address:	C/- Saunders Havill 9 Thompson Street Bowen Hills QLD 4006
Phone: **Email:**	(07)3251 9400 murraysaunders@saundershavill.com
Size of declared area:	396 ha
Local Government Area:	Ipswich City Council
RPD	Lot 748 on SP189044 Lot 753 on SP189054 Lot 752 on SP189053 Lot 751 on SP189053 Lot 747 on SP189043 Lot 745 on SP242282 Lot 740 on SP179412 Lot 705 on SP151175 Lot 11 on S31533
Tenure	Freehold
EPBC reference	2013/7057

1.2. Description of declared area

The 396 ha V-Dec area is comprised of Lot 11 on S31533, Lot 705 on SP151175, Lot 740 on SP179412, Lot 745 on SP242282, Lot 747 on SP189043, Lot 751 on SP189053, Lot 752 on SP189053, Lot 753 on SP189054 and Lot 748 on SP189044 and located adjacent to the Spring Mountain Estate project site off Centenary Highway and Springfield Greenbank Arterial, Springfield. The V-Dec area which will be declared under section 19F(1)(a) of the *Vegetation Management Act 1999* is shown on the *Declared Area Plan* (refer **Appendix C**) attached to this management plan.

1.3. Registered Interests

Written consent for the declaration has been obtained from all persons and companies who have a registered interest in the area (refer to **Section 4.4**). Registered interests include mortgages, leases, subleases, covenants, profit á prendes, easements and building management statements, that have been registered on title under the *Land Act 1994* or the *Land Title Act 1994*. Persons with a registered interest in the declared area are:

Type	Interest Holder	Lot Number	Easement Details
Easement	Powerlink	751 SP189053	▪ 602589417 (D972698), dated 07/07/1999 ▪ 703230867, dated 17/03/1999
		748 SP189044	▪ 602038460 (D972700), dated 07/07/1999 ▪ 703230867, dated 17/03/1999
		745 SP242282	▪ 601668680 (D972706), dated 07/07/1999 ▪ 601668682 (L886473X), dated 08/07/1999
		747 SP189043	▪ 601668679 (D972702), dated 07/07/1999
Easement	Seqwater	745 SP242282	▪ 711922895, dated 19/08/2013 ▪ 712158705, dated 19/08/2013

1.3.1 Existing Infrastructure Rights

Management intent for the V-Dec area is to enhance habitat quality for MNES while maintaining existing conservation values and use rights for registered interests. The existing interests and rights of **Powerlink** and **Seqwater** will not be affected by the making of the V-Dec, specifically:

- The proposed Property Vegetation Management Map (PMAV) (refer **Appendix D**) shows existing easements to remain as Category X which ensures rehabilitation and vegetation management outcomes do not apply to the easement corridors and access tracks. (N.B. Weed removal of declared species will occur through easement areas)
- Registered interests will continue to be able to exercise their rights under any laws or approvals to access and carry out works in the easement.
- Any planned activities that may be carried out (by persons other than registered interests (i.e. **Powerlink** and **Seqwater** and their contractors) within an easement, or that may affect easement holder's access requirements, will require written consent by the easement holder before undertaking those activities.
- Registered interests will be consulted and be required to provide consent to any current bushfire management plans and land maintenance practices, and any future changes to these plans which may affect registered easements or access tracks.
- **ICC** will obtain consent from registered interests prior to making any amendments to the V-Dec Management Plan which may affect the exercise of easement holder's rights and interests within their easement corridors or existing access tracks.

- **ICC** will obtain consent from registered interests for agreeing to any replacement PMAV that changes the vegetation category of the easement corridor.
- **ICC** will obtain consent from registered interests before agreeing to a code for the clearing of vegetation within the V-Dec area that will apply to the easement corridor or the access tracks.
- **ICC** will continue to allow the use of, and maintain, access tracks used by easement holders or provide suitable alternatives with consent of registered interests**.**

2. Flora Values

The Queensland Government's Regional Ecosystem map shows the site contains areas of Category X (non-remnant) and Category B (remnant) vegetation containing Endangered, Of Concern and Least Concern regional ecosystems. Specifically, RE12.8.24 (Endangered), RE12.9-10.7a (Of Concern), RE12.9-10.2 (Least Concern), RE12.9-10.17 (Least Concern) and RE12.9-10.19 (Least Concern). These Regional Ecosystems are shown in **Figure 2** and described below:

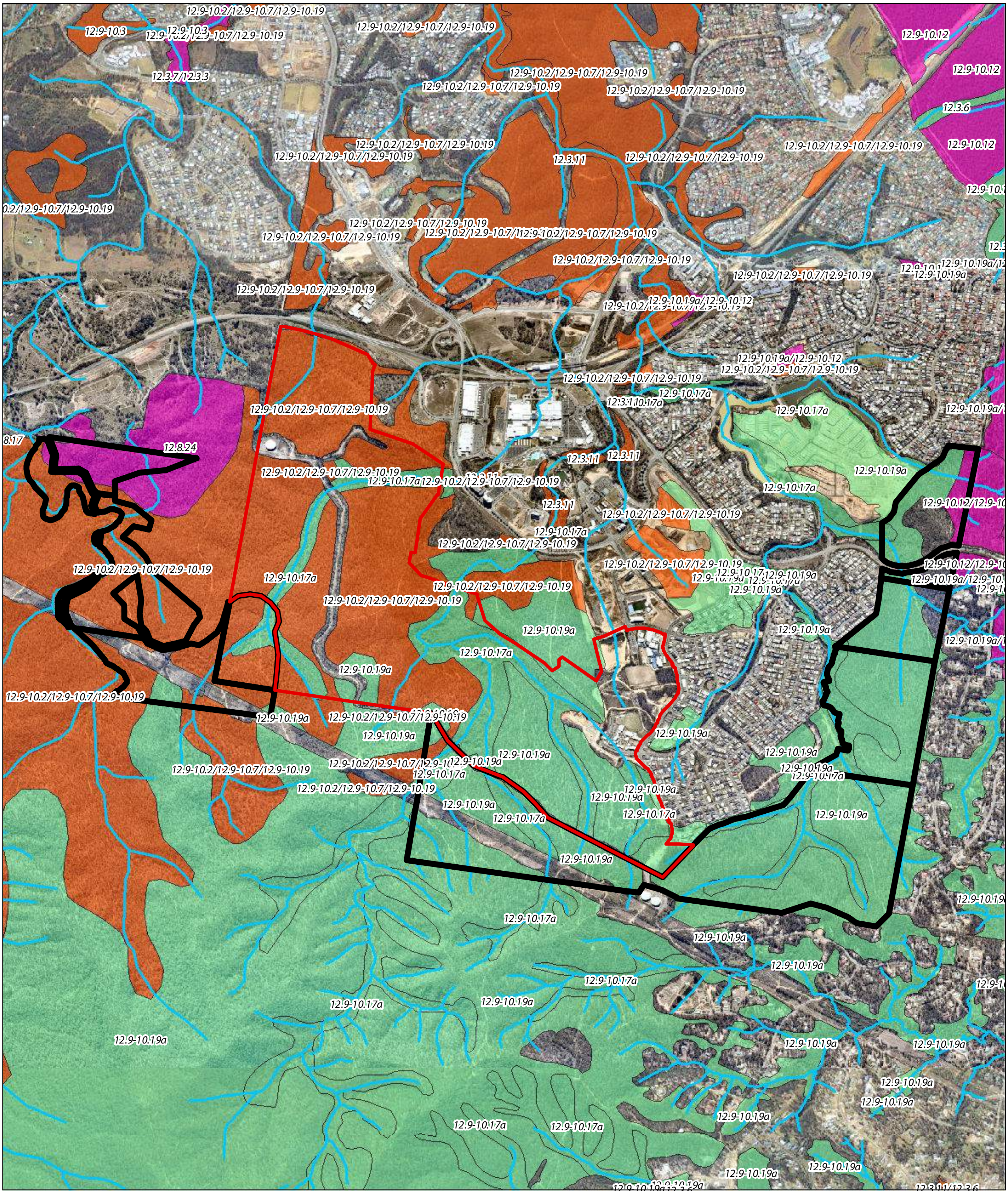
Re12.9-10.2 (Least Concern)
Corymbia citriodora subsp. variegata open forest or woodland usually with *Eucalyptus crebra*. Other species such as *Eucalyptus tereticornis* and *Corymbia intermedia* may be present in scattered patches or in low densities. Understorey can be grassy or shrubby. Shrubby understorey of *Lophostemon confertus* (whipstick form) often present in northern parts of bioregion. Occurs on Cainozoic and Mesozoic sediments.

RE 12.9-10.17 (Least Concern)
Open-forest complex generally with a variety of stringybarks, grey gums, ironbarks and in some areas spotted gum. Canopy trees include *Eucalyptus siderophloia, E. propinqua or E. major, E. acmenoides or E. portuensis, E. carnea and/or E. microcorys and/or Corymbia citriodora subsp. variegata*. Other species that may be present locally include *Corymbia intermedia, C. trachyphloia, Eucalyptus tereticornis, E. biturbinata, E. moluccana, E. longirostrata, E. fibrosa subsp. fibrosa* and *Angophora leiocarpa. Lophostemon confertus or Whipstick Lophostemon confertus* often present in gullies and as a sub canopy or understorey tree. Mixed understorey of grasses, shrubs and ferns. Hills and ranges of Cainozoic and Mesozoic sediments.
12.9-10.17a: *Lophostemon confertus* dominated open forest. Occurs in gullies and southern slopes on Cainozoic and Mesozoic sediments

RE 12.9-10.19 (Least Concern)
Open-forest of *Eucalyptus fibrosa subsp. fibrosa +/- Corymbia citriodora subsp. variegata, E. acmenoides or E. portuensis, Angophora leiocarpa, E. major open-forest.* Understorey often sparse. Localised occurrences of *Eucalyptus sideroxylon.* Occurs on Cainozoic and Mesozoic sediments.
12.9-10.19a: *Corymbia henryi +/- Eucalyptus fibrosa subsp. fibrosa, Corymbia citriodora subsp. variegata, E. siderophloia, E. crebr*a open forest. Occurs in coastal areas on Cainozoic and Mesozoic sediments

RE 12.9-10.7 (Of Concern)
Eucalyptus crebra +/- E. tereticornis, Corymbia tessellaris, Angophora leiocarpa, E. melanophloia woodland. Occurs on Cainozoic and Mesozoic sediments.
12.9-10.7a: *Eucalyptus siderophloia, Corymbia intermedia +/- E. tereticornis* and *Lophostemon confertus* open forest. Occurs on Cainozoic and Mesozoic sediments in near coastal areas.

RE12.8.24 (Endangered)
Corymbia citriodora subsp. variegata, Eucalyptus crebra +/- E. moluccana open forest. Occurs on Cainozoic igneous rocks especially lower slopes of rhyolite and trachyte hills (e.g. Moogerah Peaks).



Legend

Spring Mountain referral area

Declared area

Watercourse v1.3

Essential Habitat

Regional Ecosystem v8

Category A or B area containing endangered regional ecosystems

Category A or B area containing of concern regional ecosystems

Category A or B area that is a least concern regional ecosystem

Figure 2 *QLD Regulated Vegetation Management - Supporting Map (Regional Ecosystems)*

File ref. *7243 E Figure 3 QLD Regional Ecosystems C*
Date *30/05/2016*
Project *Spring Mountain (EPBC)*

0 200 400 600 800 1,000 *m*

Scale (A4): 1:36,000 [GDA 1994 MGA Z56]

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2016), Aerial (Nearmap 2016),

3. Management Intent

The overarching management intent for the V-Dec area is the removal of weeds and protection of native vegetation within the Flinders-Karawatha Bioregional Corridor to prevent the loss of biodiversity and maintain ecological processes. The successful implementation of proposed management mechanisms will assist with the creation of a self-sustaining, continuous area of high quality Koala and Grey-headed Flying-fox habitat, facilitating their persistence within the local landscape. This will help to achieve **ICC's** vision to create a locally significant conservation area within the Flinders–Karawatha Bioregional Corridor.

The intent is to secure the area by a V-Dec under the *Vegetation Management Act 1999* (VMA), which allows landowners to protect areas of native vegetation otherwise not protected by the VMA, with the exception of registered easements. Revegetated regrowth areas will be managed to achieve 'remnant status' and in particular to exhibit the structural and floristic characteristics of Endangered RE12.8.24, Of Concern RE12.9-10-10.2/12.9-10.7/12.9-10.19 and Least Concern RE 12.9-10.19a and RE12.9-10.17a in their undisturbed state. Areas of remnant vegetation will be managed to enhance and sustain their ecological conditions and local environmental values to reduce their exposure to threatening processes including weed invasion, pollution, clearing and disturbance.

3.1. Criteria for Declaration

The V-Dec area satisfies criteria for declaration under the Guide to Voluntary Declarations under the VMA. The V-Dec area is considered an:

- Area of high nature conservation value, specifically:
  (d) an area that makes a significant contribution to the conservation of biodiversity

3.2. Management Outcomes

The management outcome for the declared area is that the vegetation within the declared area meets the criteria, thresholds and descriptions outlined in the definition of remnant vegetation in the VMA. Additionally, that the entire declaration area is controlled and managed for the removal and suppression of declared weed species. Management outcomes are consistent with the requirements *EPBC Act Environmental Offsets Policy* and generally in accordance with management outcomes of the *Queensland Environmental Offsets Policy 2014*, specifically in terms of:

- Size of the offset area
- Location
- Regional Ecosystem Type
- Habitat Values
- Condition
- Landscape Features, including connectivity
- Biodiversity Values
- Environmental Values

The management outcome does not apply to existing easement corridors and access tracks used to access these easement corridors .

3.3. Activities to achieve the management outcome

The following activities will occur in the declared area. These are primarily limited to weed removal, pest management and supplementary rehabilitation works as agreed with **ICC**, the landowner of the declared area.

1. With the exception of registered easements and access tracks, clearing of native vegetation may only occur in accordance with an exemption defined by Schedule 24 of the *Sustainable Planning Regulation 2009* or a development approval under the *Sustainable Planning Act 2009*.
2. All reasonable measures must be taken to minimise the introduction, establishment and spread of non-native plants. Where non-native plants already occur in the area, all reasonable measures must be taken to remove and control the non-native plants.
3. All reasonable measures must be taken to remove weeds of national environmental significance as declared by the Commonwealth.
4. All reasonable measures must be taken towards undertaking natural and assisted regeneration.
5. All reasonable measure must be taken towards implementing erosion and sediment control.

N.B. Refer to **Appendix E** for the 'V-Dec Management Plan – Weed Management' which provides specific details and management activities.

3.4. Ongoing Activities

The V-Dec area is currently zoned and maintained by **ICC** as part of the Conservation network. Existing restrictions (e.g. no dogs or motorbikes) which apply in this area remain unchanged by this V-Dec. Ongoing activities anticipated to continue within the V-Dec area include:

- All lawful use rights of Powerlink within the extent of the easement area and access tracks.
- All lawful use rights of Seqwater within the extent of the easement area.
- Public access for passive recreation purposes including:
  - Bushwalking
  - Mountain biking
  - Horse riding
  - Bird and fauna watching
- Maintenance of bushfire access and tracks in accordance with **ICC** approved management plans.
- Track and trail access and construction.
- Nature based recreation style embellishments (i.e. signage, seating, shelters etc.)

3.5. Term

The term of this plan is 10 years to achieve the management outcome. As per conditions of the EPBC approval (refer **Appendix B**), the currency period for management of the declaration area is 20 years from the date of Spring Mountain Estate initial construction.

It is noted that an agreement is in place between **ICC** and **Lendlease** detailing the estimated 10 year maintenance term to achieve the outcomes of this V-Dec Management Plan (refer **Section 4**). **Lendlease** will undertake maintenance works until the management outcomes are considered by **NRM** to be achieved. Post achievement, the the V-Dec area will be transferred to **ICC** as part of their larger conservation land holdings. Council will continue to undertake long term management and maintenance of the land in perpetuity. .

4. Management

4.I. Management Actions – Timing of Delivery

It is intended that the V-Dec Area will be managed in perpetuity. In accordance with EPBC approval the currency period for the management proponent within the offset area is 20 years from the commencement of Spring Mountain Estate. The V-Dec Area will undergo significant, active management works by **Lendlease** for the first 10 years from commencement which will include monitoring and adaptive management. After this time and with all agreed works completed, Council will assume responsibilities for maintenance of the broader V-Dec Area.

The following table (**Table 1**) identifies the actions which will be undertaken for the V-Dec Area, by whom and when.

Table 1: Schedule of Management Actions

Management Action	How the action will be carried out	Where the action will be carried out	When the action will be carried out	Who will be carrying out the action
Vegetation Clearing	Vegetation clearing on the V-Dec Area is restricted to: a. that is necessary for the removal of non-native weeds or declared plants, b. establishing and maintaining boundary fencing, c. establishing and maintaining fire breaks, d. establishing and maintaining nature based recreational trails/tracks; e. establishing and maintaining easements, and f. ensuring public safety. Where vegetation clearing is sought for any other purpose, not specified in the V-Dec Management Plan, the landowner or person proposing to undertaken the clearing must contact the relevant department administering the VMA.	Where required	As required	Lendlease for the first 10 years, Council thereafter
Fire	Fire is to be, where possible, excluded from the V-Dec Area by: a. maintaining firebreaks relative to the V-Dec Area; and b. firebreaks are to be co-located with existing roads, fence lines and tracks, where possible. Only fire control works in accordance with an approved bushfire management plan can occur within the V-Dec Area.	Where required	As required	Council (in consultations with Lendlease for the first 10 years)
Pest and Animal Management	Minimise the introduction of pest animals and control of existing population of pest animals within the V-Dec Area. Monitor for the presence of feral cats, dogs and foxes, in accordance with ICC's pest control requirements for the Springfield Wildlife Corridor.	Where required	As required	Council (in consultations with Lendlease for the first 10 years)
Weeds	Keep the introduction, establishment and spread of non-native weeds including restricted invasive plants under the *Biosecurity Act 2014* to ensure that the non-native weeds do not cover more than 10 % of the V-Dec Area. Control existing infestations of non-native weeds including restricted invasive plants under the *Biosecurity Act 2014* to ensure that the non-native weeds do not cover more than 10 % of the V-Dec Area.	In accordance with the V-dec Weed Management Plan	In accordance with the V-dec Weed Management Plan	Lendlease for the first 10 years, Council thereafter

4.2. Funding

All upfront costs associated with the weed management and revegetation of the V-Dec area will be the responsibility of the proponent (**Lendlease Communities Australia Pty Ltd**). Detailed weed management plans endorsed by Council are included in **Attachment E**. As part of this agreement between **Lendlease** and **ICC**, timeframes and criteria for the works to be considered complete are outlined. If at any stage the success of the weed management and revegetation works do not achieve the criteria outlined in **Attachment E** then the works remain the responsibility of **Lendlease**.

Lendlease is committed to providing ongoing funding for weed management and rehabilitation as set out in this V-Dec Management Plan.

Post achievement of the commitments in this V-Dec Management Plan the maintenance of the V-Dec area will be transferred to **ICC** as part of their larger conservation land holdings.

4.3. Monitoring and Reporting Procedures

The objective on this V-Dec Management Plan is to maintain and enhance the Koala and Grey-headed Flying-fox habitat values through the declaration area. As agreed with **ICC** this to be primarily achieved through weed management works. As such, monitoring and reporting will be undertaken to confirm if this objective has been or is going to be achieved. This includes both short term and long term criteria to measure success. The V-Dec area, which is already functioning as Koala and Grey-headed Flying-fox habitat, is to be managed through weed removal and native regeneration. Monitoring of weed management and regeneration works allows for:

- A review of the pre-established performance indicators for measuring the success of the weed removal and control;
- Ensure 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 affecting areas designated for rehabilitation.

4.3.1 Benchmarks

The weed management and rehabilitation works aim to improve the flora and fauna values of the V-Dec area through weed removal and promoting native species growth. The following breakdown of works are proposed:

a) Existing Vegetation Areas:
   - Primary weed removal completed
   - Secondary weed removal completed
   - Minimum 90% weed removal from existing vegetation
   - 10% or less weeds present on-site
   - Any additional revegetation required has 85% success rate

b) Revegetation Areas
   - All required planting completed
   - Evidence of ongoing weed management
   - Maximum of 10% plant failures at time of inspection
   - Plants established and free of weeds

4.3.2 Monitoring Timeframes

As per the schedule provided in **Table 1**, initial monitoring and reporting of weed removal and revegetation / regeneration works will be undertaken monthly within the works area. Monthly monitoring is to be completed by **Lendlease** for the first 18 months post weed management works. This will determine whether weed removal and regeneration targets are met. Quarterly joint inspections of the weed management areas are to be held between **ICC** and **Lendlease**.

Once the rehabilitated areas have been established, monitoring will continue regularly until final changeover to Council management. The purpose of this monitoring will be to identify:

- Whether weed invasion has been controlled
- Whether the number of individuals within the vegetation community is being sustained or increased by natural recruitment
- Whether adequate levels of biodiversity (genetic variation) are maintained through generations of flora.
- Occurrence and utilisation by native fauna to assess ecosystem restoration.

4.3.3 Reporting

In accordance with EPBC approval requirements, throughout the monitoring of rehabilitation works, results will be recorded as part of a progress report and be made available via **Lendlease** project website within 10 business days of the monitoring event. This will allow for an assessment of whether the rehabilitation works are achieving set objectives and targets and will trigger corrective actions should results fall short of targets.

4.3.4 Contingency Measures

The following potential risks to the successful implementation of the V-Dec Management Plan have been identified:

- Failure of successful regeneration of juvenile / planted specimens
- Failure of weed management

Should the initial weed removal and revegetation works fail to achieve the objectives for the V-Dec area, monitoring and reporting procedures will facilitate the identification of the cause of failure, whether that be due to flooding, drought, poor soil quality, inadequacy of weed removal techniques, impacts from human disturbance or other causative events. Once the causative event of failure is identified, corrective actions can be imposed to implement new procedures, techniques or management measures.

Potential contingency measures include:

- Use of different plant species or using higher ratios of successful species;
- Implementation of more aggressive weed removal and management techniques;
- Utilising a variety of water sources during drought;
- Replanting where damage has occurred as a result of unexpected events such as flooding and fire;

- Erection of fences or signs where failure has occurred as a result of human disturbance; and
- Maximising surface roughness to slow runoff, which reduces erosion and provides more time for plants to absorb water.

As noted previously, **Lendlease** has provided a commitment to the ongoing funding of rehabilitation works until management handover to Council. In addition, rehabilitation works must be established to an acceptable standard before Council will take on management of V-Dec area. The process of accepting the completed works requires regular monitoring and acceptance by Council that objectives have been achieved. The onus to manage and maintain the V-Dec area lies on the proponent and must be achieved in order to comply with Commonwealth Government approval conditions.

4.4. Consent Agreement

Department of Natural Resources and Mines

Signature: _____

Name:
Position: Natural Resource Management Officer
Date: / / 2016

Owner: Ipswich City Council

Signature: _____

Name:
Date: / / 2016

Easement Owner: Powerlink

Signature: _____

Name:
Date: / / 2016

Easement Owner: Seqwater

Signature: _____

Name:
Date: / / 2016

Appendices

Appendix A

V-Dec Supporting Information Details

Appendix B

EPBC Approval and Conditions

Appendix C

Declared Area Plan

Appendix D

Property Map of Assessable Vegetation

Appendix E

V-Dec Weed Management Plan

Appendix A

V-Dec Supporting Information Details

Section 1 Case details

Name of applicant	Ian Murray
Company (if applicable)	Lendlease Communities Australia Pty Ltd
Lot/plan associated with development	Lot 22 on SP234042 Lot 33 on SP269190
DLGIP case number (e.g. SDA-0815-123456)	N/A

Section 3 Contact details for offset delivery

Name	John Kibble
Company (if applicable)	Lendlease Communities Pty Ltd
Postal Address	GPO Box 2777 Brisbane QLD 4001
Phone	0408 558 808
Fax	
Email address	john.kibble@lendlease.com

Section 4 Environmental offset site particulars

4.1 Offset site property and ownership details

If the offset will be delivered on more than one lot, please duplicate the table below.

Lot on plan details (property description)	Lot 11 on S31533, Lot 705 on SP151175, Lot 740 on SP179412, Lot 745 on SP242282, Lot 747 on SP189043, Lot 751 on SP189053, Lot 752 on SP189053, Lot 753 on SP189054 and Lot 748 on SP189044
Street address	Sinnathamby Boulevard, Springfield 4300
Name of Registered Owner(s)/ Licensee/s or Trustee/s	Ipswich City Council
Tenure Type*	☒ Estate in Fee Simple (freehold) ☐ Leasehold (agriculture and grazing) ☐ Other: _____
Property Name (if applicable)	Part of ICC's Springfield Wildlife Corridor
Area of Property (ha)	396ha
Local Government Area	Ipswich City Council
Sub-region/Bioregion	Bioregion 12 – South East Queensland

* For requests on State land (or non-freehold) tenures, the views of the State Land Asset Management unit of DNRM may be sought to ensure the proposal is consistent with the purpose of the tenure. For example, on agricultural and grazing leases the proposal would need to allow a level of agriculture or grazing to occur over the area to be consistent with the tenure, in accordance with the *Land Act 1994*. Please contact DNRM for further information.

4.2 Registered Interests*

Parcel (lot and plan)	Are there any Registered Interests on the lot?	Type of Registered Interest	*Registered interest holder's name and contact details*
751 SP189053; 748 SP189044; 745 SP242282; 747 SP189043	☒ Yes ☐ No	Easement	Powerlink 33 Harold St Virginia QLD 4014
745 SP242282	☒ Yes ☐ No	Easement	Seqwater PO Box 16146, City East QLD 4002

*Registered interests are mortgages, leases, subleases, covenants, profit á prendes, easements and building management statements, that have been registered on title under the *Land Act 1994* or the *Land Title Act 1994*. Please contact DNRM if you are unsure if there are any registered interests on your property.

Section 5 Legal security

How will the offset area be legally secured?	☒ Voluntary Declaration for an area of high nature conservation value under the *Vegetation Management Act 1999* *Note that if a Voluntary Declaration is proposed for securing the offset, this offset delivery plan meets the requirements and will be accepted as a declared area management plan. ☐ Environmental offset protection area under the *Environmental Offsets Act 2014* ☐ Under the *Nature Conservation Act 1992* ☐ Other:_____
Why is it considered the best method for securing the offset area?	Provides for management and protection in accordance with Commonwealth approval conditions for Spring Mountain Estate (EPBC Ref: 2013/7057) and allows for registered easement holder's rights and interests to be maintained.
When will the offset area be legally secured? What is the timeframe for securing the offset area? Note that the offset must be legally secured for the duration of the impact.	As per EPBC approval conditions, the currency period for management of the declaration is 20 years from the date of commencement of Spring Mountain Estate. Management obligations have a term of 10 years as per the V-Dec Management Plan.
Why is this timeframe for securing the offset area considered reasonable? Are there any registered interests or other parties that need to be in agreement? Are there any other approvals that need to be given? (e.g. if the application is for a reconfiguration then securing the area may need to wait until an approval is given by the assessment manager)	A high level of tenure security exists on the allotment though mapped remnant, partial exclusion of the land from the regional plan urban footprint and Council zoning of Conservation. The 20 year timeframe of the V-Dec enables the proponent to invest in significant weed management and conservation improvement works over first 10 years in accordance with the V-Dec Management Plan. Further, the V-Dec provides the legal certainty to support this investment and conservation use through the complete removal of urban footprint designations and transitioning of protection in perpetuity.
What is the expected timeframe for the management outcomes of the offset delivery plan to be achieved?	Management will include primary, secondary and maintenance stages which will be completed over 10 years until handover to Council, under which ongoing maintenance will continue as part of the broader conservation estate.

Section 6 Offset site delivery information

Describe the existing land use of the land on which the environmental offset will be undertaken.	Conservation / nature based recreation. The land adjoins a water tower, maintenance tracks and is traversed by easements registered by Seqwater and Powerlink. A number of lawful uses and access occurs in parts of the land.
Describe any impacts that land use (existing use and as a result of any development approval) may have on the delivery of the offset.	Nil. Easement holder rights and access tracks will be maintained. As part of broader agreement between Lendlease and ICC, low scale nature based recreation will be better managed and unlawful access and uses will be controlled.
Is the environmental offset staged?	☐ Yes ☒ No If yes, please complete offset delivery form EOD6 (Staged Offset Details). This form can be found at http://www.qld.gov.au/environment/pollution/management/offsets/

Section 7 Description of the offset site

The description of the environmental offset site should include, but is not limited to, the following information. This information is required to meet the offsets policy and to secure the offset area through a voluntary declaration under the *Vegetation Management Act 1999*. Please contact DNRM if you require assistance providing this information.

Area (hectares) of environmental offset site
396ha
Brief description of the landscape features e.g. topography, geology, soils, landzone
The Queensland Government's Regional Ecosystem map shows the site contains Endangered, Of Concern and Least Concern regional ecosystems. Specifically, RE12.8.24 (Endangered), RE12.9-10.7a (Of Concern), RE12.9-10.2 (Least Concern), RE12.9-10.17 (Least Concern) and RE12.9-10.19 (Least Concern). The V-Dec area contains steep slopes with elevations of 120m along ridgelines to 80m in gullies. Soils consists of 'sublabile to quartozose sandstone, siltstone, shale, thin coal seams'. The land zone is described as 9 and 10. A number of first order drainage features commence within or traverse the offset area.
Pre-clearing regional ecosystem (if known) for offset sites containing non-remnant vegetation

Pre-clear mapping identifies the V-Dec area as containing composite Endangered RE12.9-10.12/12.9-10.15, Of Concern RE12.9-10.2/12.9-10.7/12.9-10.19 and Least Concern RE12.9-10.19a
Brief description of any existing vegetation – e.g. species, densities, and heights (including pest plants)
Flora field surveys showed that canopy trees in areas within close proximity to the gully lines (waterways and drainage lines) are regularly composed of *Eucalyptus tereticornis* (Forest Red Gum) and/or *Eucalyptus microcorys* (Tallowwood), with *Eucalyptus siderophloia (Grey Ironbark)*, *Eucalyptus crebra* (Narrow leaved Ironbark), *Eucalyptus moluccana* (Gum-topped Box), *Eucalyptus seeana* (Narrow leaved Red Gum) and *Lophostemon suaveolens* (Swamp Box). Overall, the ridgelines and mid to upper slope areas showed greater percentages of non-eucalypt species, such as *Corymbia citriodora* (Spotted Gum), *Corymbia intermedia* (Pink Bloodwood) and *Angophora leiocarpa* (Smooth-bark Apple). Across the site, a number of weed species were identified. Gully lines in particular were areas observed to have a denser shrub layer of *Lantana camara* (Lantana).
Threatened species - if an environmental offset is required for a threatened species, does it already use/inhabit the offset area?
The V-Dec area is required to compensate for clearing of Koala and Grey-headed Flying-fox habitat as per EPBC approval conditions. Both of these species are considered to utilise the offset area.
Explain why the offset is of sufficient size and scale proportionate to the area that will be cleared
It is a requirement that the offset provide a conservation outcome for the prescribed matter that achieves at least an equivalent environmental outcome. This can be achieved by comparing the habitat quality of the offset site with that of the impact site by using the Guide to determining terrestrial habitat quality *and the* Land-based offset multiplier calculator*, both found at* http://www.qld.gov.au/environment/pollution/management/offsets/ The V-Dec area is of sufficient size and scale to meet the EPBC Environmental Offset Policy and required as per EPBC conditions.
Describe the measures that will be taken to minimise any time-lag between the impact and delivery of the offset site?
e.g. does your offset site contain regrowth vegetation? Does the threatened species already use, or exist in, the area? The V-Dec area will remain as Conservation land and continue to provide habitat for threatened species, in particular Koala and Grey-headed Flying-fox. Significant management works by the proponent will occur over a 10 year term in accordance with the V-Dec Management Plan. No major long term impacts are predicted as the land already provides a base level of habitat. The purpose of this offset is to improve this habitat quality over the development area. Any primary works in the offset area are programmed to be achieved in the first 10 years. The impact of the development

occurs over a 20 year period. As a result, the full benefit of the offset should be realised at the halfway mark of the impact.

Section 8 Offset site management plan

Describe how the environmental offset site will be managed to achieve a conservation outcome/s. To ensure the environmental offset site is capable of delivering a conservation outcome for the impacted prescribed environmental matter, ensure that the offset site contains the relevant characteristics listed in section 2.3.1.6 of the Queensland Environmental Offset Policy.

What is the specific purpose and desired outcomes of the offset site and its management?
☐ The Category X/C/R areas that form part of the offset area will be managed so that within X years they will have the height, density and species expected of the regional ecosystem and meets remnant status and will be shown as Category B on the Regulated Vegetation Management Map. ☒ The Category B areas that form part of the offset area will be managed to achieve a conservation outcome in accordance with the management activities of this plan. ☐ Offset area will be mapped as Category A on the Regulated Vegetation Management Map to ensure visibility of offset area and associated management plan to future property owners. ☐ The management activities associated with the offset area will continue until all the vegetation reaches remnant status and can be mapped as essential habitat for the Koala and Grey-headed Flying-fox. ☐ Other:_____
List the benefits the offset delivery plan will have on the prescribed environmental matter e.g. if an environmental offset is required for a fauna species, describe how the environmental offset site will benefit the species. This ensures that a conservation outcome/s for each prescribed environmental matter will be achieved.
The benefits of this V-Dec area to the Koala and Grey-headed Flying-fox will be: • *Creating and protecting a habitat corridor for these species in the Flinders-Karawatha Bioregional Corridor* • *Increase in quality of vegetation through removal and control of weeds, rehabilitation of drainage lines and enhancement of regrowth areas* • *Adaptive management during monitoring and maintenance period*

Describe the land management practices that will be used to achieve the conservation outcome/s. Include details of the location and area of each management practice as necessary (i.e. property scale, paddock, part of watercourse). Ensure these locations are identified on an attached map.						
The V-Dec Management Plan proposed activities that will support the natural regeneration and restoration of biodiversity values including weed management (particularly removal of dominate weed infestations and along drainage lines), erosion and sediment control, adaptive management and maintenance.						
1. Management actions						
Issue	Management action	How will it be carried out	Location	Timing	Who will be doing the activity	Comments
Primary Weed Removal	Initial weed removal / treatment of site weeds involving manual removal, stock piling and disposal, and initial usage of prescribed herbicides.	In accordance with methods detailed in the South East Queensland Ecological Restoration Guidelines	In accordance with Spring Mountain V-Dec Area Management Plan	At the commencement of Spring Mountain (Quarterly)	Contractor – appointed by Lendlease	Initial control of dominant weed infestations. Impacts on watercourses will be managed and mitigated.
Secondary (Follow Up) Weed Removal	Follow up weed removal involving quarterly inspection of areas having undergone Primary Weed Removal and treatment of infestations or outbrakes as required.	In accordance with methods detailed in the South East Queensland Ecological Restoration Guidelines	In accordance with Spring Mountain V-Dec Area Management Plan	Quarterly	Contractor – appointed by Lendlease	Follow up control of weeds. Impacts on watercourses will be managed and mitigated.

Maintenance Weeding	Final stage of weeding which occurs in areas where the majority of weeds have been removed and treated and continues to remove additional outbreaks while fostering for natural regeneration and regrowth seedlings.	In accordance with methods detailed in the South East Queensland Ecological Restoration Guidelines	In accordance with Spring Mountain V-Dec Area Management Plan	Annually	Contractor – appointed by Lendlease	At completion of site weeding works and agreed maintenance timeframe of 10 years.

2. *Restrictions*

Restriction	Details	Comments
Vegetation Clearing	*Vegetation clearing on the V-Dec area is restricted to:* • With the exception of registered easements, clearing of native vegetation may only occur in accordance with an exemption defined by Schedule 24 of the *Sustainable Planning Regulation 2009* or a development approval under the *Sustainable Planning Act 2009* including maintenance of access tracks and public access for nature based recreation • All reasonable measures must be taken to minimise the introduction, establishment and spread of non-native plants. Where non-native plants already occur in the area, all reasonable measures must be taken to control the non-native plant. • All reasonable measures must be taken to weeds of national environmental significance as declared by the Commonwealth.	

	• All reasonable measures must be taken towards natural and assisted regeneration. • All reasonable measure must be taken towards erosion and sediment control. • Ensure public safety		
Fauna	▪ Activities in the V-Dec area will not damage, destroy, mark, move, dig up or otherwise interfere with active nests, burrows, roots, caves or other structures used by native animals.		
Fire	▪ Fire is managed in accordance with the Council's bushfire management plan		
Waterways	▪ The bed and banks of waterways are not modified unless associated with the requirements of a permit and an approved management plan (refer to Spring Mountain V-Dec Area Management Plan)		
What are the risks of the offset failing to achieve the conservation outcome and how will these be managed?			
Risk	Level of risk *(Extreme, High, Moderate or Low)*	Proposed actions to minimise risk	Proposed remedial actions if risk occurs
Failure of successful regeneration of juvenile / planted specimens Failure of weed management	Low.	Should the initial weed removal and revegetation works fail to achieve the objectives for the offset area, monitoring and reporting procedures will facilitate the identification of the cause of failure, whether that be due to flooding, drought, poor soil quality, inadequacy of weed removal techniques, impacts from human disturbance or other causative events.	Once the causative event of failure is identified, corrective actions can be imposed to implement new procedures, techniques or management measures

Describe how will the conservation outcome/s will be measured and monitored? i.e. how will you know when you have achieved the desired outcomes.
Insert general description of monitoring and reporting activities e.g. regular reporting, photo monitoring, surveying, field measurements, recording management activities etc. This can include periodic assessment in accordance with the Guide to determining terrestrial habitat quality *to determine gains in quality.* Management will occur over 10 years. Secondary weed management will be undertaken quarterly and adaptive management and monitoring will occur in conjunction with Council until works are completed to the required level of Council handover. Reporting will include a short memo style report responding to agreed criteria including: ▪ Date, time and weather conditions at the time of inspection ▪ Changes in weed extent populations (spreading/contracting) ▪ Changes in weed densities ▪ Health of existing weed vegetation protected by NRM provisions ▪ Rate and success of revegetation plantings ▪ Growths of PFC rates 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 (i.e. erosion/change in weed footprints/death to natives, and ▪ A visual diary of imagery from selected locations at each inspection (including the pre-state and quarterly inspections). ▪ A plan and descriptions of terrestrial habitat guideline monitoring
Reporting
The V-Dec Area monitoring report will include: • Name and contact details of landholder/management body • DLGIP and DNRM case numbers • Lot/plan and address • An overview of the progress of the management area in achieving the management outcomes • Details of the management activities undertaken • How any risk or threats have impacted the area and activities undertaken to manage these

- Photo monitoring details (photos from identified sites should be included in the report)
- Other monitoring outputs e.g., transect details, Biocondition results, survey details etc.
- If offset is for essential habitat for a species, species presence/absence should be noted
- Any amendments to the management activities/schedule, restrictions or monitoring and reporting requirements
- Other

Reports are due to DNRM and ICC by 30 June and will be provided ☐ annually or ☒ biannually

It is noted that in accordance with the EPBC development permit Lendlease are required to undertake and publish reports on the offset area.

Appendix B

Spring Mountain EPBC Act Approval (EPBC 2013/7057)

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)	

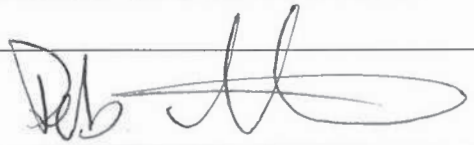
Conditions of approval

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**.

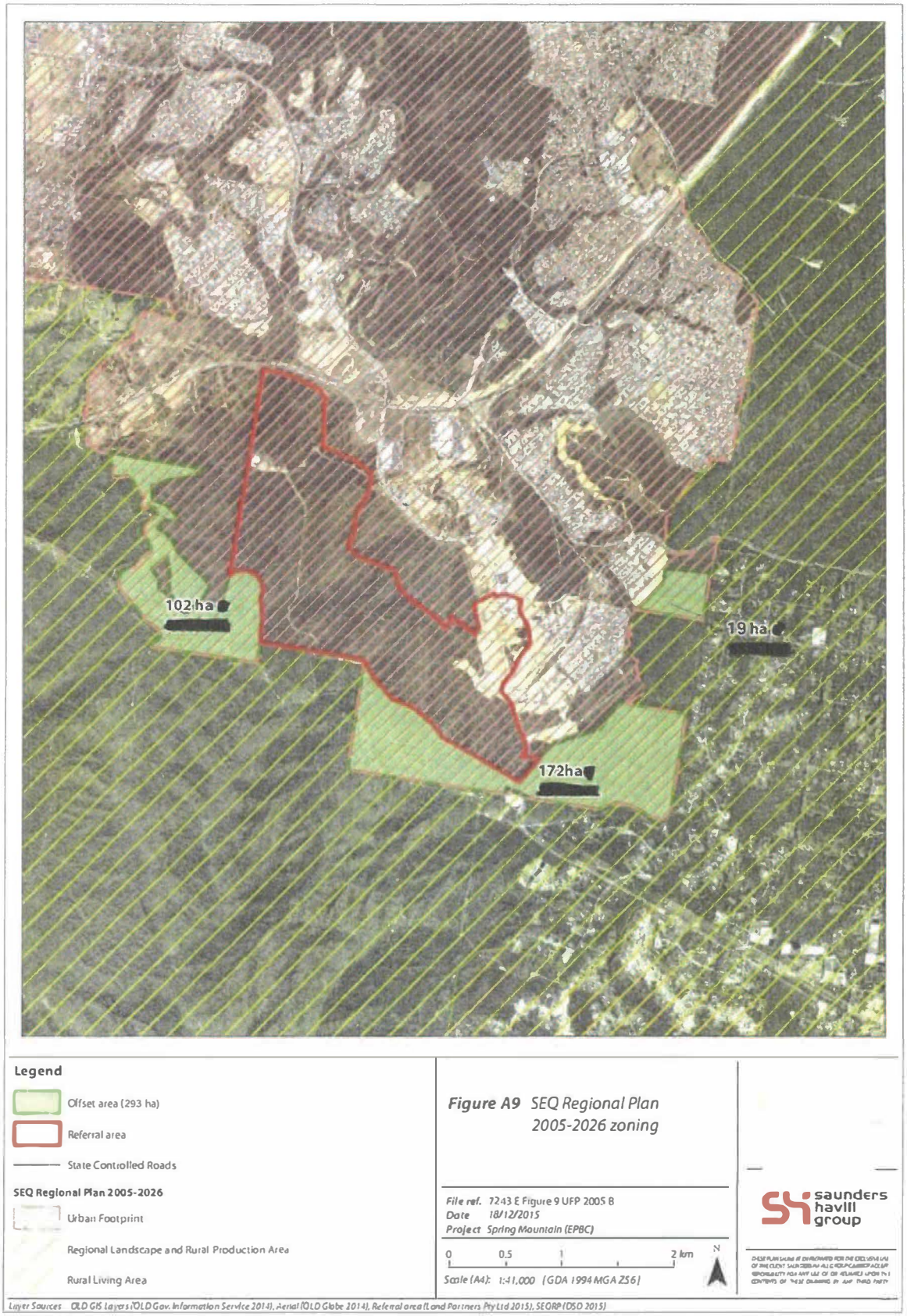
Titles Office means the relevant authority responsible for registering the land title transaction.

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
Scale (A4): 1:41,000 (GDA 1994 MGA Z56)
N
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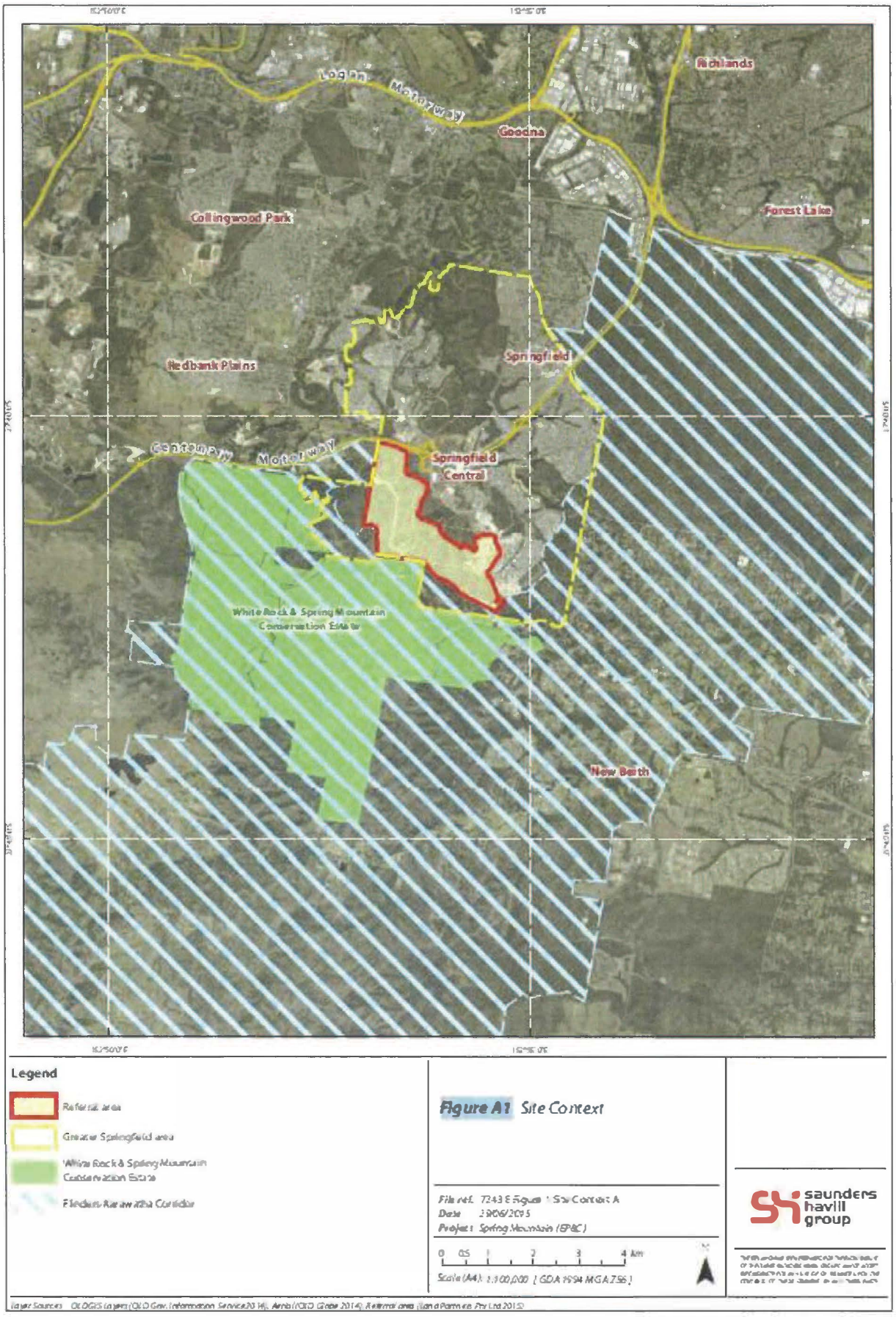
Layer Sources OLD GIS Layers (OLD Gov. Information Service 2014), Aerial (OLD Globe 2014), Referral area (Land Partners Pty Ltd 2015), SEQRP (DSD 2015)

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 Railway Corridor
Figure A1 Site Context
File ref. 7243 E Figure 1 Site Context A
Date 19/06/2015
Project Spring Mountain (EPBC)
0 0.5 1 2 3 4 km
Scale (A4): 1:100,000 [GDA 1994 MGA Z56]
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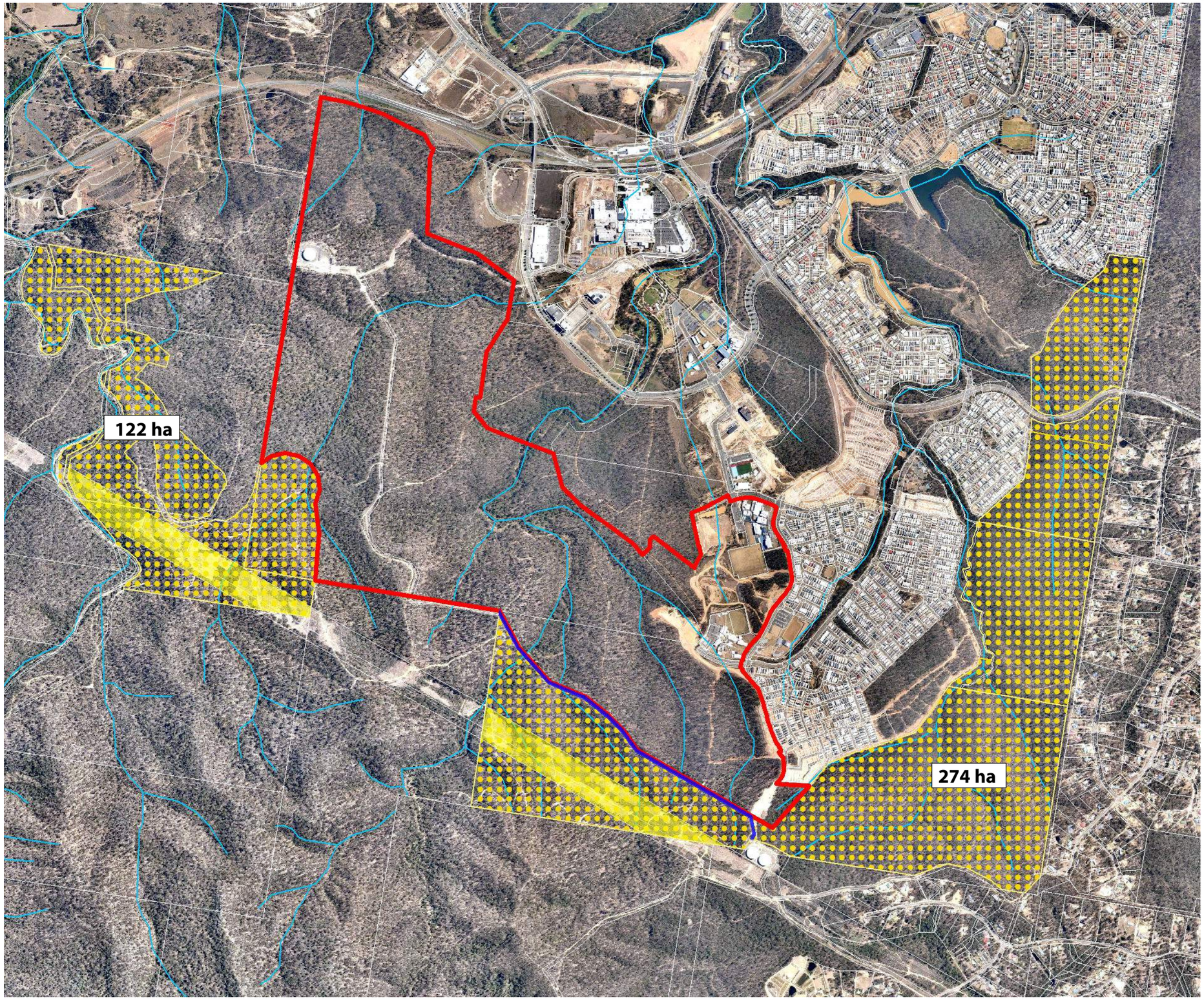
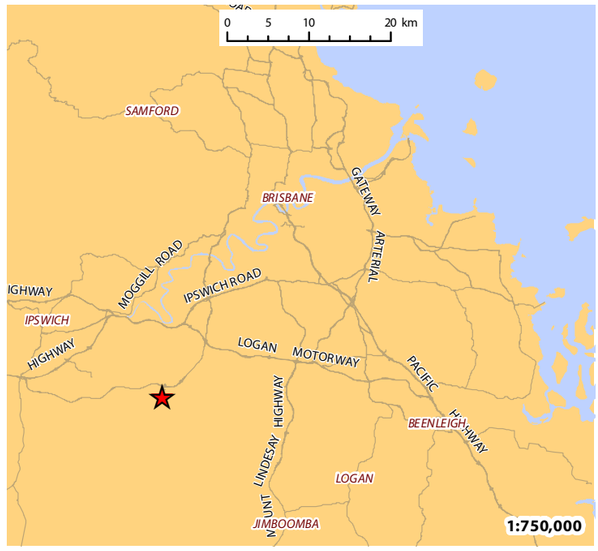
Appendix C

Declared Area Plan





Legend

- Spring Mountain project area
- Qld DCDB
- QLD watercourse mapping (VM)
- Declared Areas
- SEQ Water Easement
- Powerlink Easement

N

0 100 200 400 600 800 1,000 m

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ISSUES:

Issue	Date	Description	Drawn	Checked
B	07/01/2016	Client Draft	AL	KG
C	19/02/2016	Easement Rev	AL	KG
D	30/05/2016	Declared area revision	TC	KG

APPROVED COMPANY ISO 9001 Quality Management System QMS

APPROVED COMPANY ISO 14001 Environmental Management System QMS

Spring Mountain

Declared Area Plan

Date | 30/05/2016
Scale | 1:20,000 @ A3
Data Information:
Universal Transverse Mercator
GDA 1994 MGA Zone 56
Client | Lend Lease
Project | Spring Mountain EPBC
Address/RPD | Springfield
Source | DCBD (DNRM, 2013), Aerial (QLD Globe, 2013)

Plan A

SHG File
7243 E 04 Offset areas D

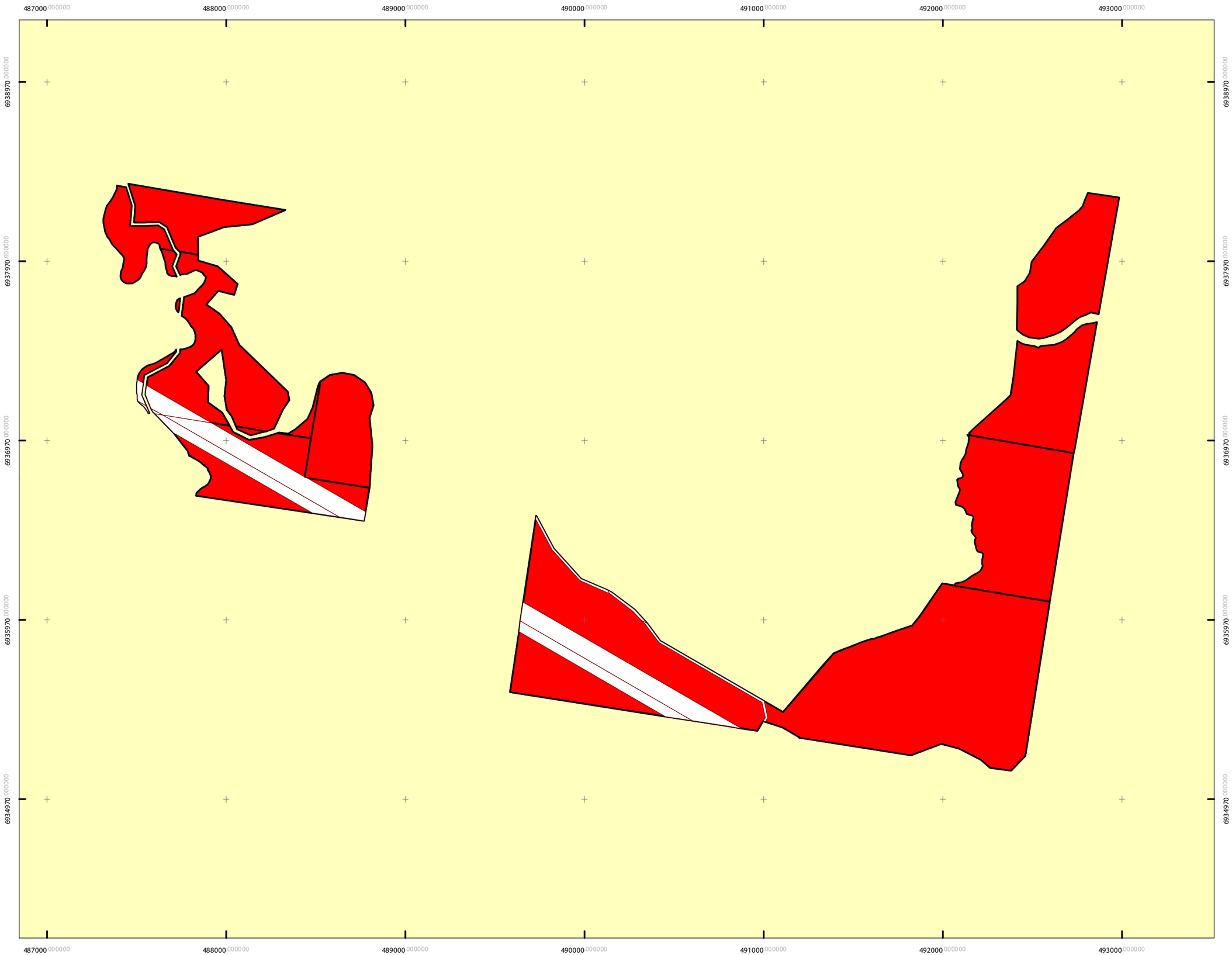
Appendix D

Property Map of Assessable Vegetation

Property Map of Assessable Vegetation

Lot on Plan
748 on SP189044
753 on SP189054
752 on SP189053
751 on SP189053
747 on SP189043
745 on SP242282
740 on SP179412
705 on SP151175
11 on S31533

Notes: Property boundaries provided by Dept. of Natural Resourses and Mines.



Legend

- Subject Lot(s)
- Area to which the PMAV does not apply

Vegetation Category Area

- Category A area
- Category X area

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N

0 200 400 600 800 m

Scale (A4): 1:20,000 *[GDA 1994 MGA Z56]*

File ref. 7522 E 01 Offset Area PMAV A
Date *30/05/2016*
Project *Springfield (Spring Mountain)*

Appendix E

V-Dec Area Weed Management Plan

Spring Mountain Precinct

V-DEC MANAGEMENT PLAN - WEED MANAGEMENT

INTRODUCTION

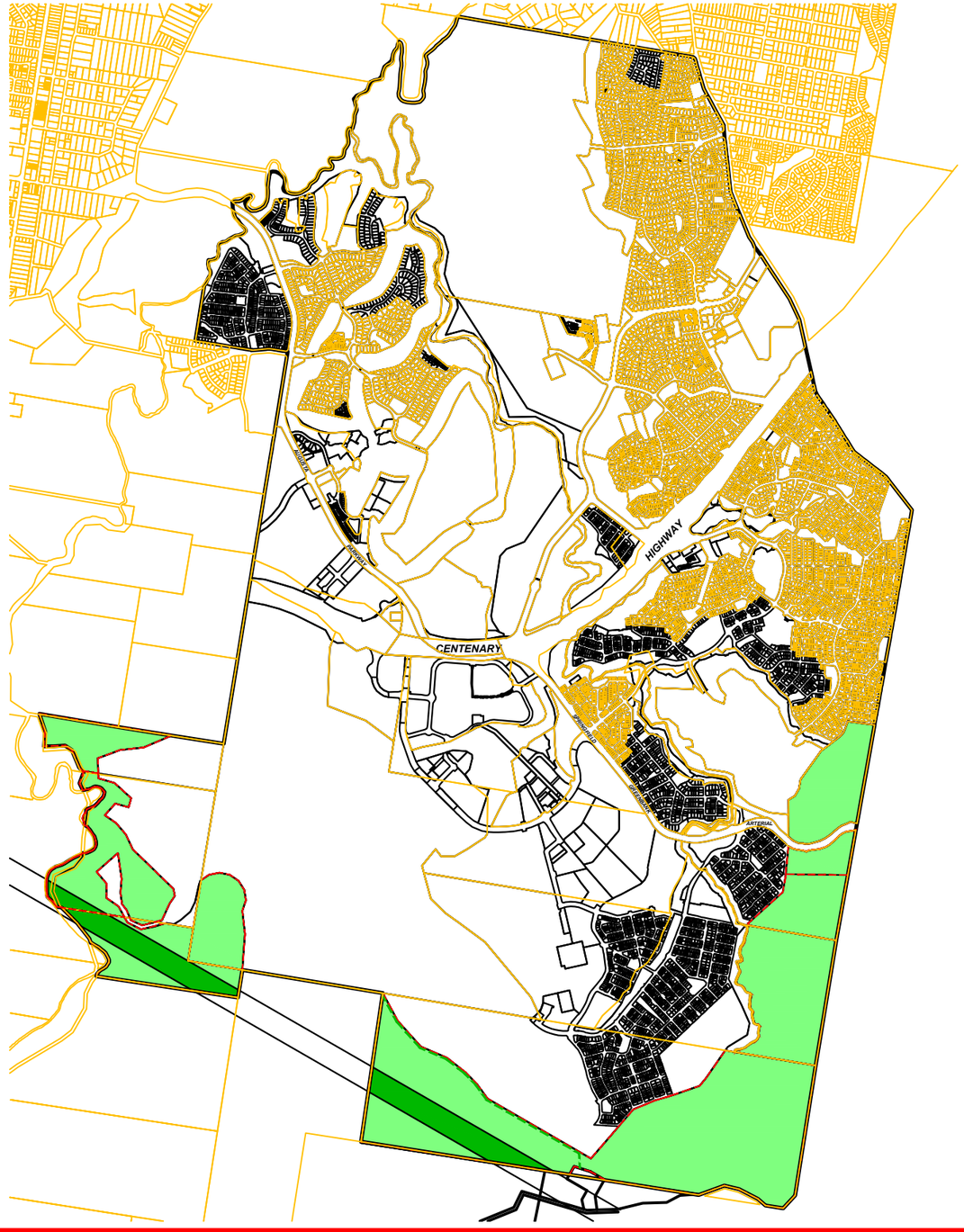
This Voluntary Declaration (V-DEC) Management Plan has been prepared to outline specific weed management works to accompany an application for the registration of a Voluntary Declaration over Council owned conservation land at Spring Mountain. The land is located adjoining the Lend Lease Communities Pty Ltd Spring Mountain Precinct Development within Greater Springfield. The conservation land to which the V-Dec application applies was dedicated to Ipswich City Council (ICC) by Springfield Land Corporation (SLC) between 2006 and 2011. As part of the negotiation and approval of an *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for the adjoining Lend Lease Spring Mountain Precinct project the proponent is required to undertake improvement works within the Council owned Conservation Land. The same approval also seeks the land is "legally secured" via the registration of a Voluntary Declaration on title.

To complete this registration the V-Dec requires consent from the land owner (Ipswich City Council) and registered interests (Powerlink and SEQ Water). As part of the process a management plan which outlines the improvement works proposed must also be prepared and submitted. A number of rolling meetings have been held with ICC Parks and Environment Staff. ICC already retain a management plan for the conservation land which covers a range of improvement works and activities. As agreed with ICC the primary purpose of this V-Dec Management Plan is to bring forward weed management works within the designated area. This plan series provides details on proposed weed management.

ISSUE D 24.08.2016
EDITS TO DNRM SUBMISSION ISSUE

DRAWING SCHEDULE

Dwg No.	Drawing Title	Issue	Date
7243 E 01	Cover Sheet	D	24/08/2016
7243 L 02	Weed Management Plan - Notes	D	24/08/2016
7243 L 03	Weed Management Plan - Weed Techniques	D	24/08/2016
7243 L 04	Weed Management Plan - Weed Techniques	D	24/08/2016
7243 L 05	Weed Management Plan - Weed Techniques	D	24/08/2016
7243 L 06	Weed Management Plan - Sheet 1	D	24/08/2016
7243 L 07	Weed Management Plan - Sheet 2	D	24/08/2016
7243 L 08	Weed Management Plan - Sheet 3	D	24/08/2016
7243 L 09	Weed Management Plan - Sheet 4	D	24/08/2016
7243 L 10	Weed Management Plan - Sheet 5	D	24/08/2016
7243 L 11	Weed Management Plan - Sheet 6	D	24/08/2016
7243 L 12	Weed Management Plan - Sheet 7	D	24/08/2016
7243 L 13	Weed Management Plan - Sheet 8	D	24/08/2016



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surveying town planning urban design environmental management landscape architecture

40 YEARS 1975-2015

AMENDMENTS:

Issue	Date	Description	Checked
A	28/04/2015	Preliminary Issue	MS
B	22/02/2016	Submission Issue	MS
C	25/05/2016	DNRM Submission Issue	MS
D	24/08/2016	Edits to DNRM Submission Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: AS NOTED

landscape architecture

DRAWING: V-DEC Management Plan Cover Sheet

DATE: August 16 | CHECKED: MS

CLIENT REF.: 7243 | DRAWN: TL

DRAWING No.: 7243 L 01 RP D

Spring Mountain Precinct

V-DEC MANAGEMENT PLAN - WEED TREATMENT & REHABILITATION

NOTES

This Voluntary Declaration (V-DEC) Management Plan links specific weed removal and management measures with spatial areas within the declared area included with the voluntary declaration application. This V-DEC management plan covers the 396ha of land previous dedicated by Springfield Land Corporation (SLC) to Ipswich City Council (ICC). This is inclusive of the 293ha area forming the basis of an environmental offset for Lendlease.

WEED CONTROL PROGRAM TIMING

The primary stage of manual weed removal, treatment and disposal for the V-DEC area is to commence upon the registering of the V-Dec document. Weed removal and maintenance is to occur in 4 staged areas and continue over a 10 year period.

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.

NOTES

MONITORING AND REPORTING PROCEDURES

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.

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 six (6) month 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 six (6) month 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
- Occurences 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).

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 V-DEC 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

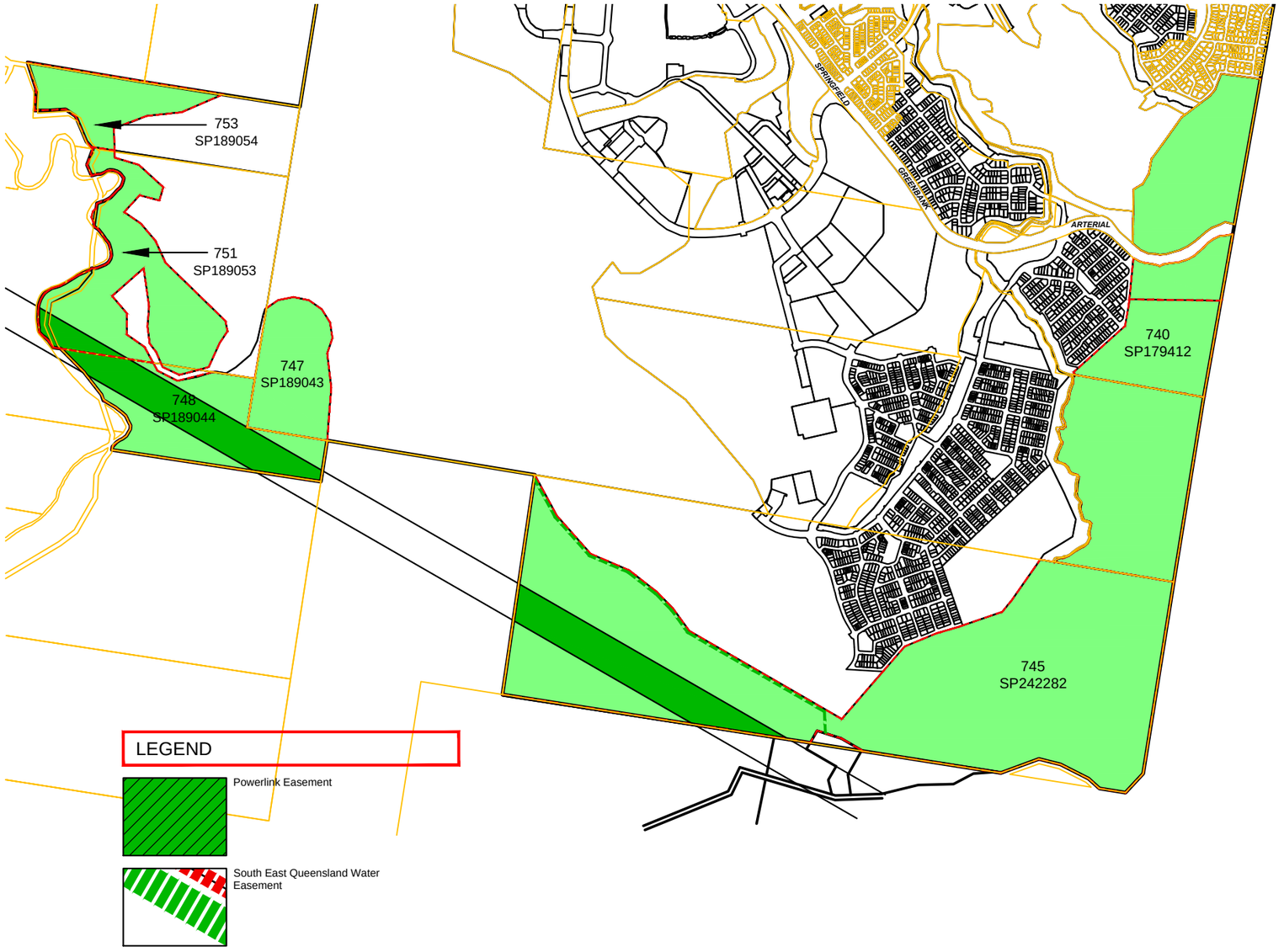
- Brief the proponent on their requirements in implementing and maintaining works as per the V-DEC Management Plan.
- Attend pre start, on maintenance and off maintenance meetings.
- Undertake monitoring and reporting to **Ipswich City Council** as set up by this document.
- Be available to respond to 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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40 YEARS 1975-2015

AMENDMENTS:

Issue	Date	Description	Checked
A	28/04/2015	Preliminary Issue	MS
B	22/02/2016	Submission Issue	MS
C	25/05/2016	DNRM Submission Issue	MS
D	24/08/2016	Edits to DNRM Submission Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: AS NOTED

landscape architecture

DRAWING: V-DEC Management Plan Weed Management Notes

DATE: August 16 | CHECKED: MS

CLIENT REF.: 7243 | DRAWN: TL

DRAWING No.: 7243 L 02 RP D

V-DEC MANAGEMENT PLAN - WEED TREATMENT & REMOVAL STRATEGY

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	Seedlings: Hand pull	Shrubs: CS&P or F/I (G1); Seedlings: CS&P (G1.5) or spray G200 (ref 1).
3	Crassulaceae	Bryophyllum delagoense (mother of millions)	6	38	4.9	H/O	Hand pull and dispose.	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: C&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; Splatter Gun: glyphosate 1L/9L water, metsulfuron methyl 2g/L water (ref 2).
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?	Hand or mechanical removal of small infestations	Small infestations: spray glyphosate @ 15mL/L water, fluproanate @ 2mL/L water + ionic wetter @ 1mL/Lwater; Dense Infestations: blanket spraying glyphosate 3L/ha, fluproanate 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, fluproanate @ 2mL/L water + ionic wetter @ 1mL/Lwater; 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/L 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-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 Bioactive®) 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 F150 (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	Hydrocharitacea e	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 DicNorprop @ 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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surveying town planning urban design environmental management landscape architecture

40 YEARS 1975-2015

AMENDMENTS:

Issue	Date	Description	Checked
A	28/04/2015	Preliminary Issue	MS
B	22/02/2016	Submission Issue	MS
C	25/05/2016	DNRM Submission Issue	MS
D	24/08/2016	Edits to DNRM Submission Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: AS NOTED

landscape architecture

DRAWING: V-DEC Management Plan Weed Management Techniques

DATE: August 16 | CHECKED: MS
CLIENT REF.: 7243 | DRAWN: TL
DRAWING No.: 7243 L 03 RP D

V-DEC 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	Passifora 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	Passifora 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 enceliioides (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)	47	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)	17	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	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).
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	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).
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 @ 1:1000 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 fluroxpyr1 (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	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).
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	Pasturers - 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	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).
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	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).
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

AMENDMENTS:

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D	24/08/2016	Edits to DNRM Submission Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: AS NOTED

landscape architecture

DRAWING: V-DEC Management Plan Weed Management Techniques

DATE: August 16 | CHECKED: MS
CLIENT REF.: 7243 | DRAWN: TL
DRAWING No.: 7243 L 04 RP D

Spring Mountain Precinct

V-DEC 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 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 smal 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)	1?	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 Chlorosulturon 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 Chlorosulturon 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 Chlorosulturon 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 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 1:100 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 trifisciata (sansevieria)	2?	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	4.4?	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), 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 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. (2009) Control of the invasive liana, Hiptage benghalensis. Weed Biology and Management, 9 (1). pp. 54-62.

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DRAWING: V-DEC Management Plan Weed Management Techniques

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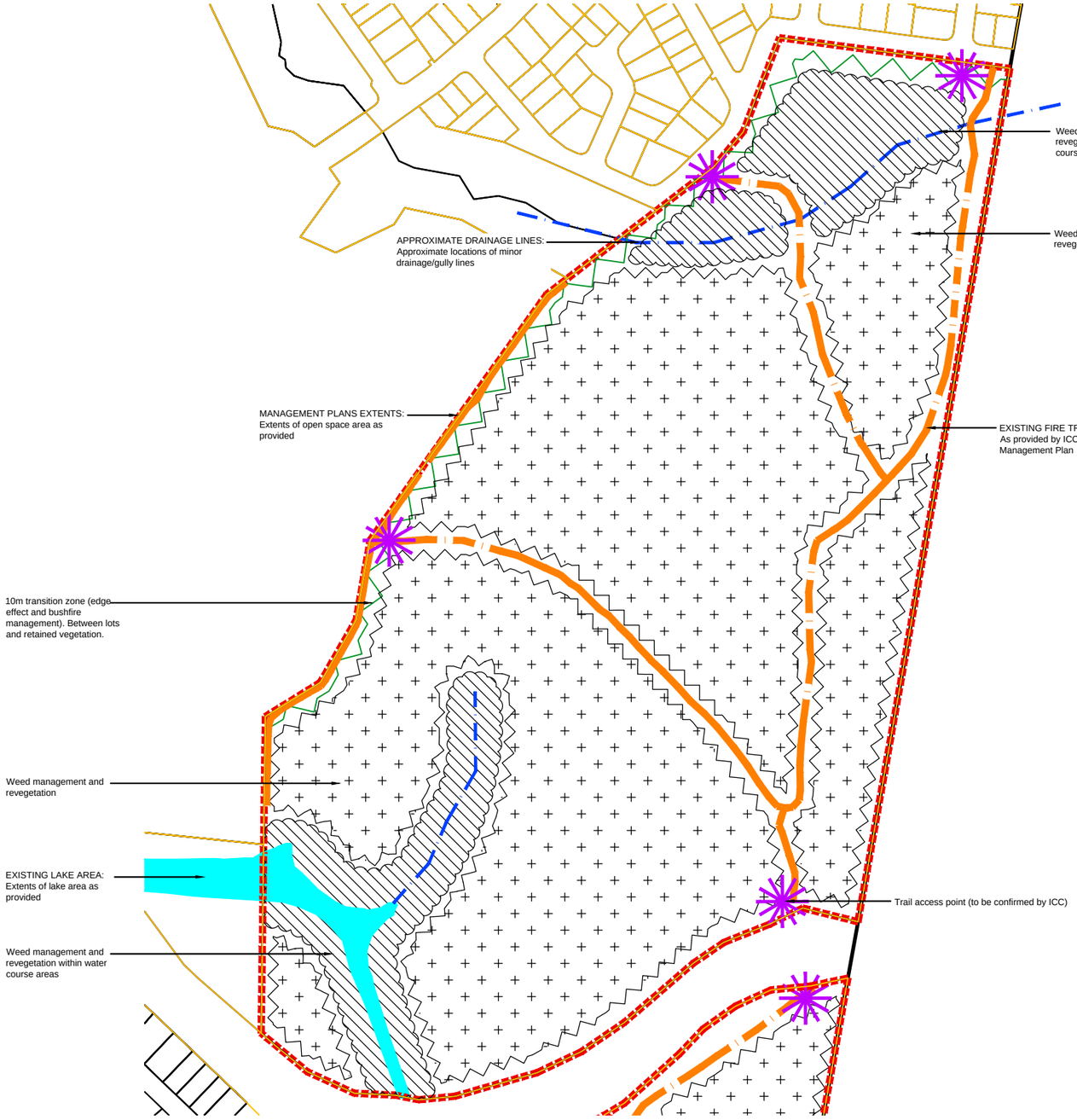
CLIENT REF.: 7243 | DRAWN: TL
DRAWING No.: 7243 L 05 RP D

Spring Mountain Precinct

V-DEC MANAGEMENT PLAN - LOT 705 on SP151175



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
- 10m transition zone (Edge effect & bushfire management). Between lots and retained vegetation
- Trail access point (To be confirmed by ICC)

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CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: AS NOTED

landscape architecture

DRAWING: V-DEC Management Plan Lot 75 on SP151175

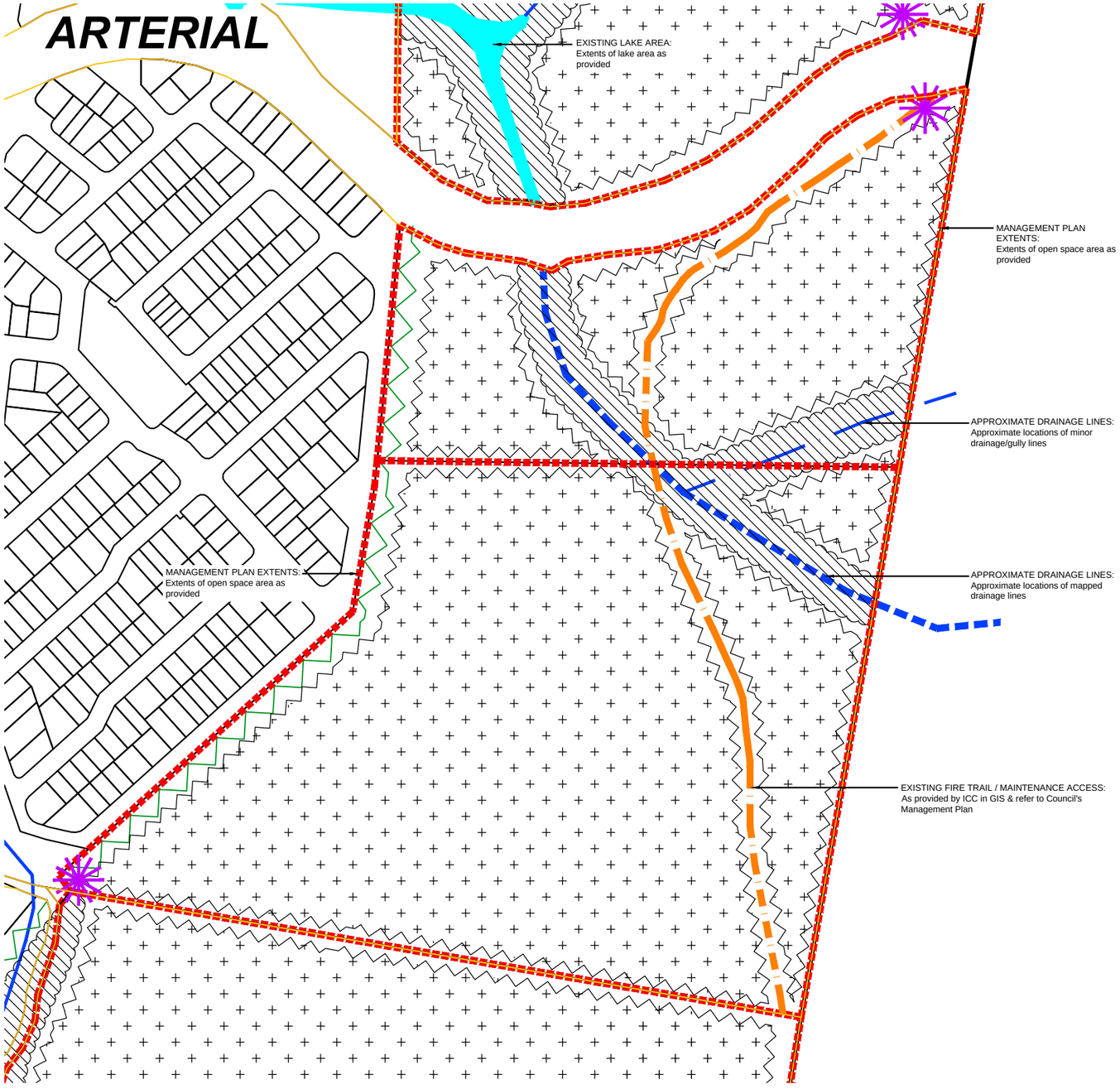
DATE: August 16 | CHECKED: MS

CLIENT REF.: 7243 | DRAWN: TL

DRAWING No.: 7243 L 06 RP D

Spring Mountain Precinct

V-DEC MANAGEMENT PLAN - LOT 740 on SP179412



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
- Trail access point (To be advised/confirmed by ICC)
- Weed management and revegetation
- Weed management (Edge effect buffer within water management). Between lots and retained vegetation
- Trail access point (To be confirmed by ICC)

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PROJECT: Spring Mountain Precinct

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

landscape architecture

DRAWING: V-DEC Management Plan Lot 740 on SP179412

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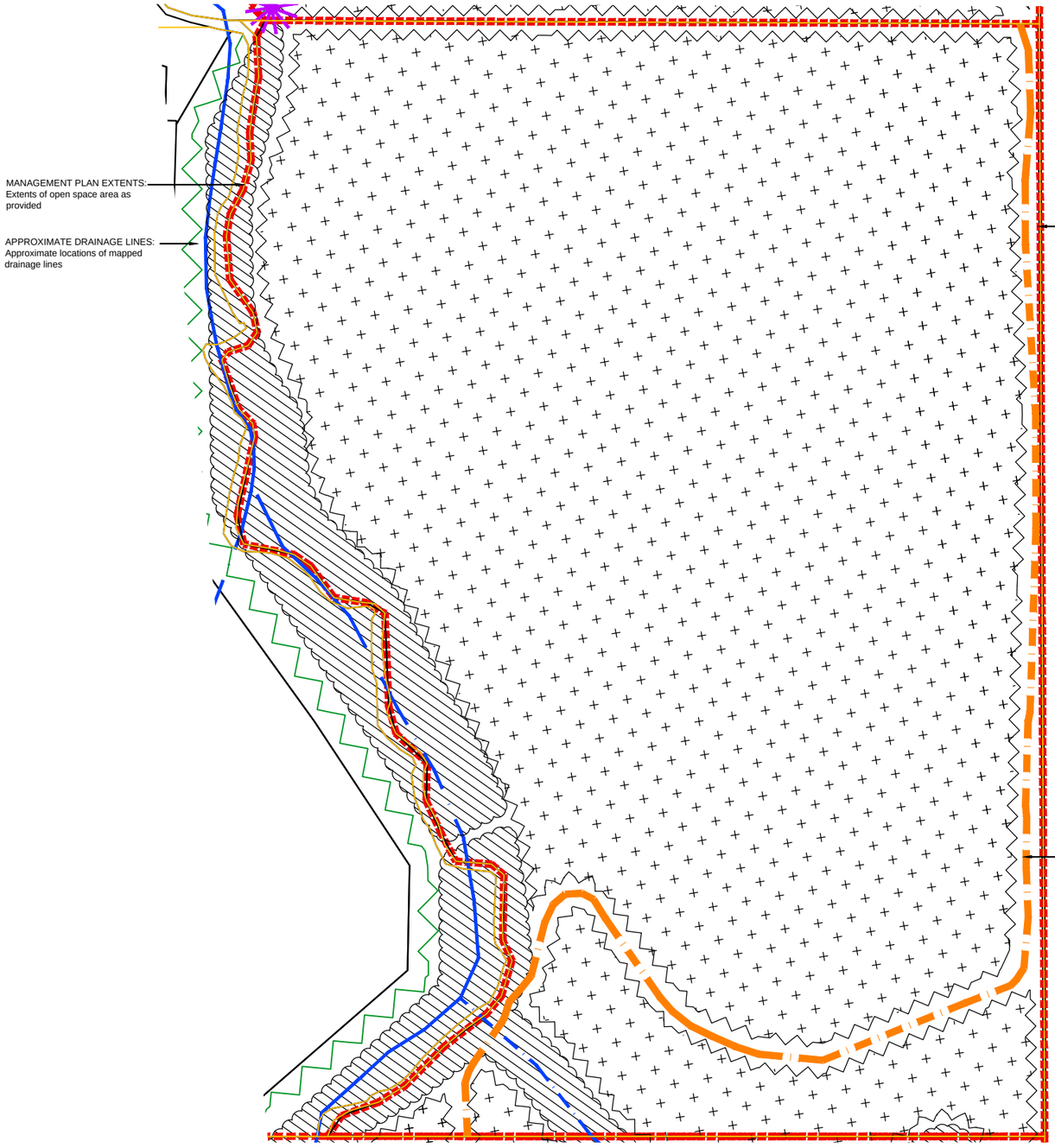
CLIENT REF.: 7243 | DRAWN: TL

DRAWING No.: 7243 L 07 RP D

Spring Mountain Precinct

V-DEC MANAGEMENT PLAN - LOT II on S31533



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
- New maintenance tracks throughout revegetation areas. Not part of this management plan. Refer ICC requirements
- Trail access point (To be confirmed by ICC)

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CLIENT:

PROJECT: Spring Mountain Precinct

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

landscape architecture

DRAWING: V-DEC Management Plan Lot 11 on S31533

DATE: August 16 | CHECKED: MS

CLIENT REF.: 7243 | DRAWN: TL

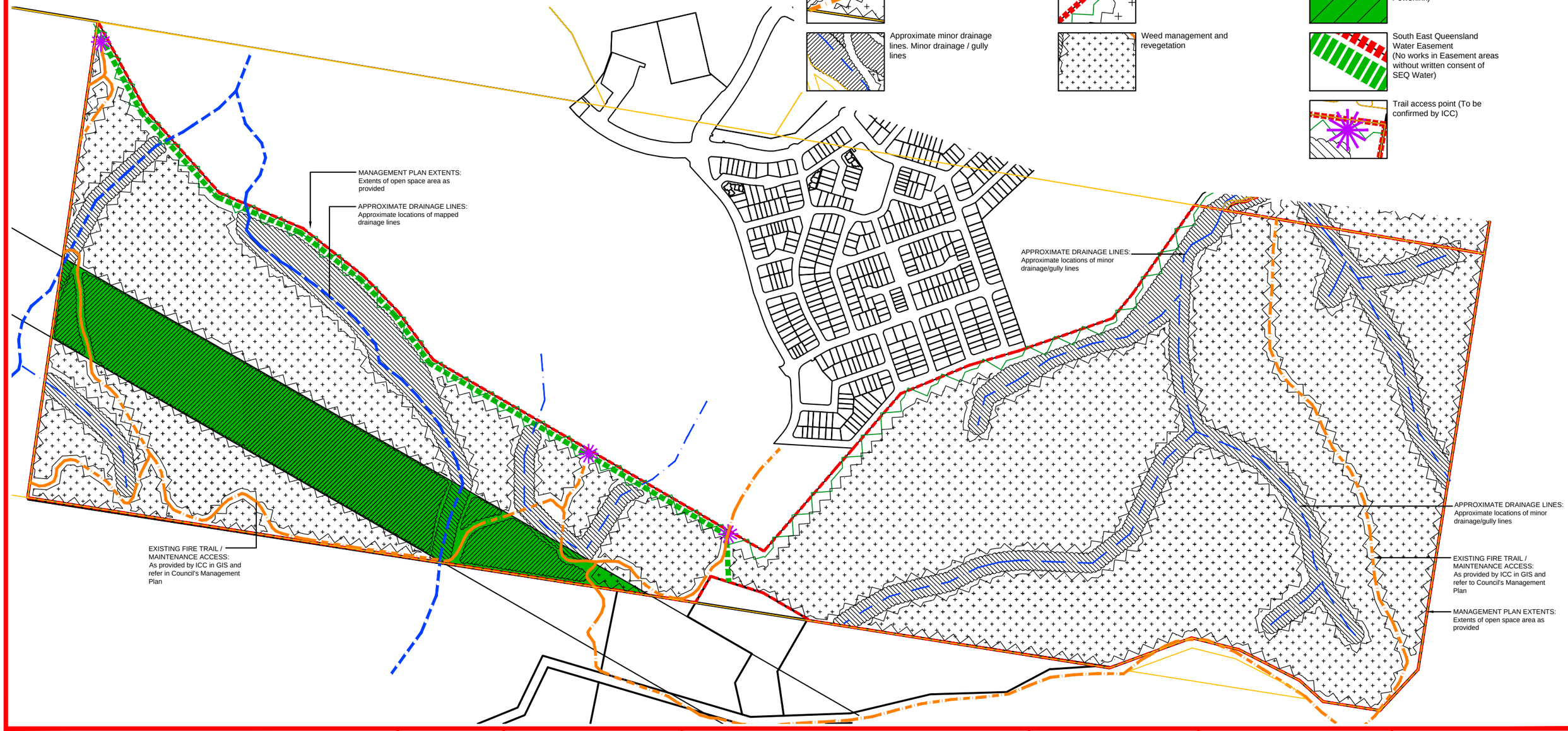
DRAWING No.: 7243 L 08 RP D

Spring Mountain Precinct

V-DEC MANAGEMENT PLAN - LOT 745 on SP242282

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
- Trail access point (To be advised/confirmed by ICC)
- Weed management and revegetation
- Weed management and revegetation within water course areas
- Powerlink Easement (No works in Easement areas without written consent of Powerlink)
- South East Queensland Water Easement (No works in Easement areas without written consent of SEQ Water)
- Trail access point (To be confirmed by ICC)



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40 YEARS 1975-2015

AMENDMENTS:

Issue	Date	Description	Checked
A	28/04/2015	Preliminary Issue	MS
B	22/02/2016	Submission Issue	MS
C	25/05/2016	DNRM Submission Issue	MS
D	24/08/2016	Edits to DNRM Submission Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: 1:4000@A1 1:8000@A3 0 50 100 200m

landscape architecture

DRAWING: V-DEC Management Plan Lot 745 on SP242282

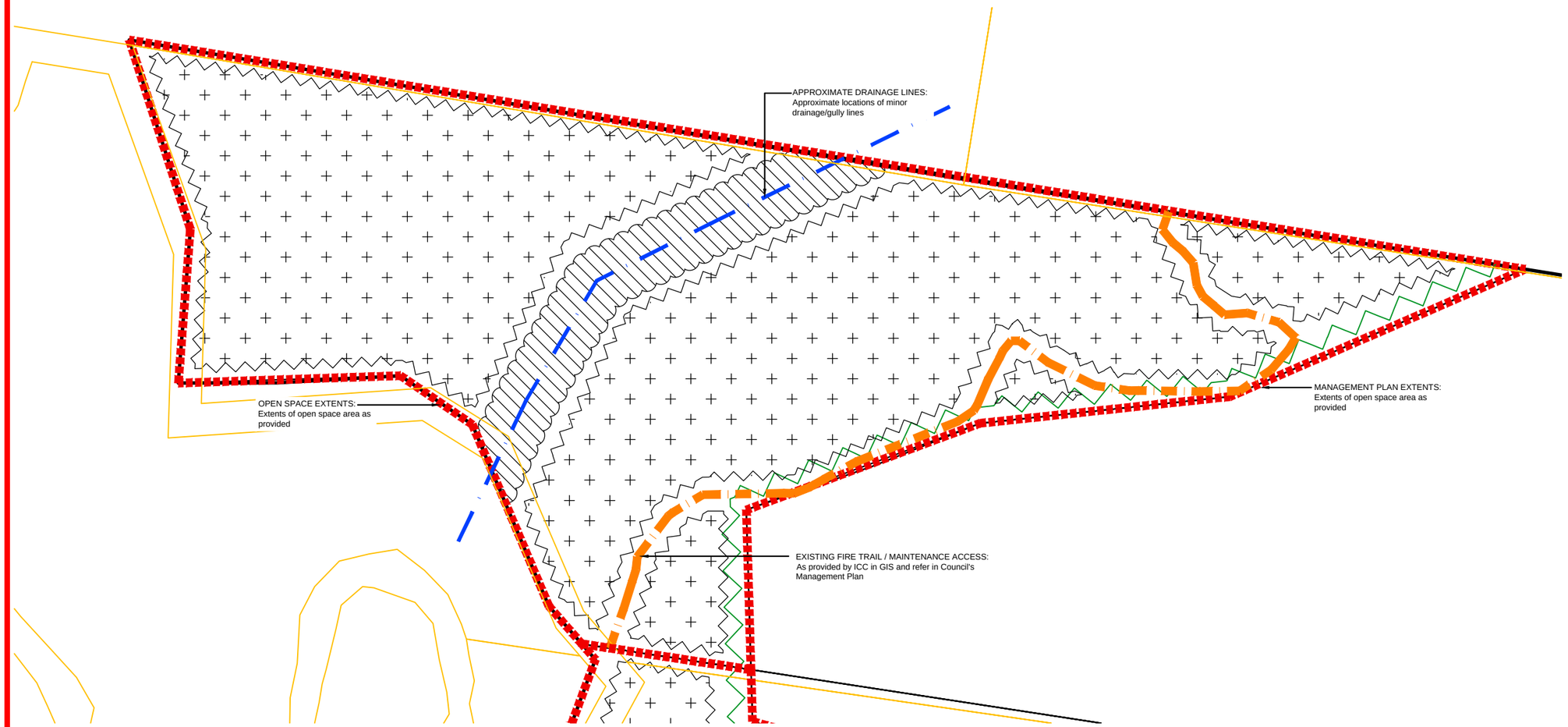
DATE: August 16 | CHECKED: MS

CLIENT REF.: 7243 | DRAWN: TL

DRAWING No.: 7243 L 09 RP D

Spring Mountain Precinct

V-DEC MANAGEMENT PLAN - LOT 753 on SP189054



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
- Future fauna management road solution
- Weed management and revegetation
- Weed management and revegetation within water course areas
- 10m transition zone (Edge effect & bushfire management). Between lots and retained vegetation
- Trail access point (To be confirmed by ICC)

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D	24/08/2016	Edits to DNRM Submission Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: 1:1500@A1 1:3000@A3 (0 20 80m)

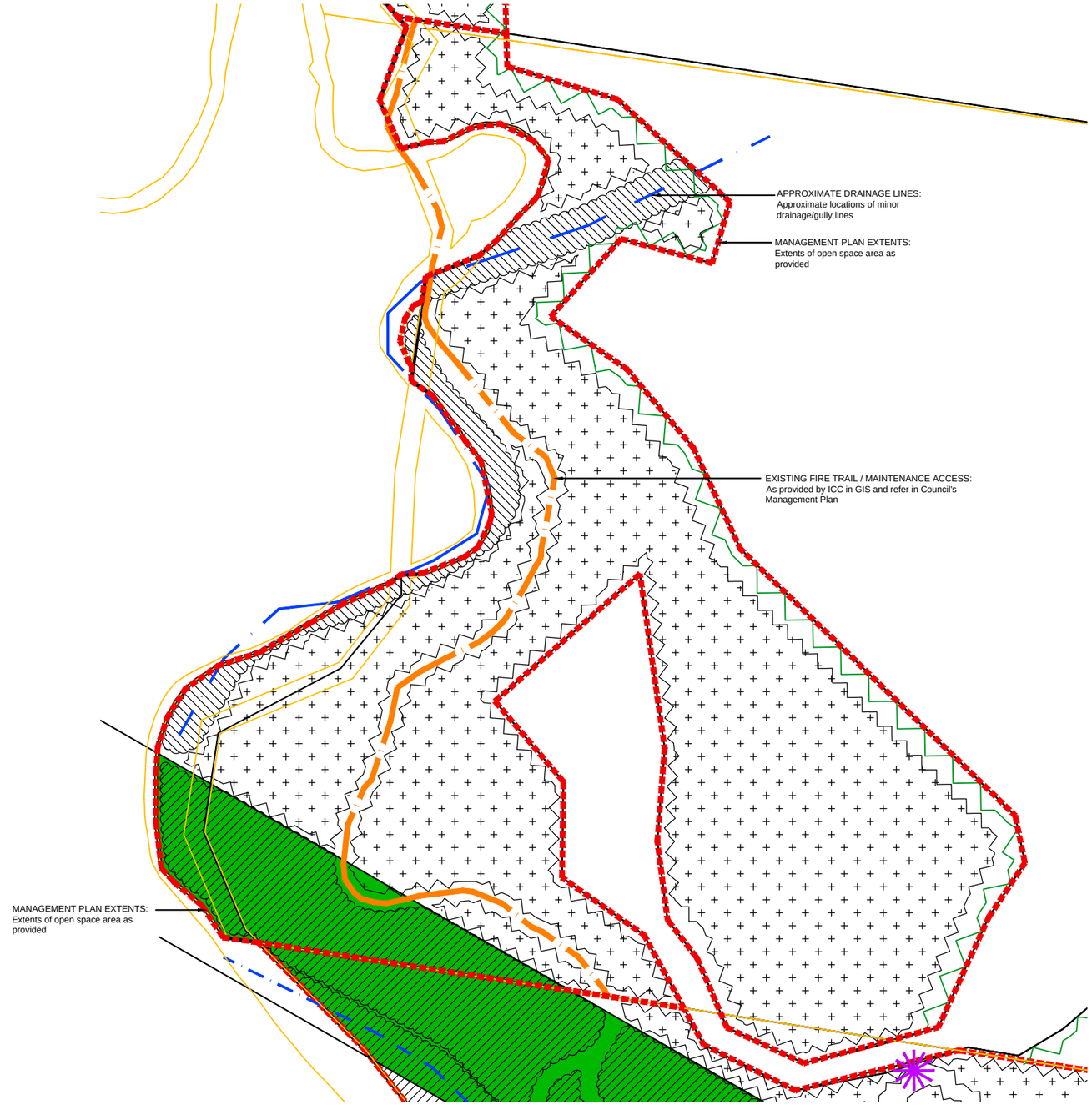
landscape architecture

DRAWING: V-DEC Management Plan Lot 753 on SP189054

DATE:	August 16	CHECKED:	MS
CLIENT REF.:	7243	DRAWN:	TL
DRAWING No.:	7243 L 10 RP D		

Spring Mountain Precinct

V-DEC MANAGEMENT PLAN - LOT 751 on SP189053



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
- 10m transition zone (Edge effect & bushfire management). Between lots and retained vegetation
- Powerlink Easement (No works in Easement areas without written consent of Powerlink)
- Trail access point (To be confirmed by ICC)

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D	24/08/2016	Edits to DNRM Submission Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: 1:2500@A1 1:5000@A3 0 20 40 120m

landscape architecture

DRAWING: V-DEC Management Plan Lot 751 on SP189053

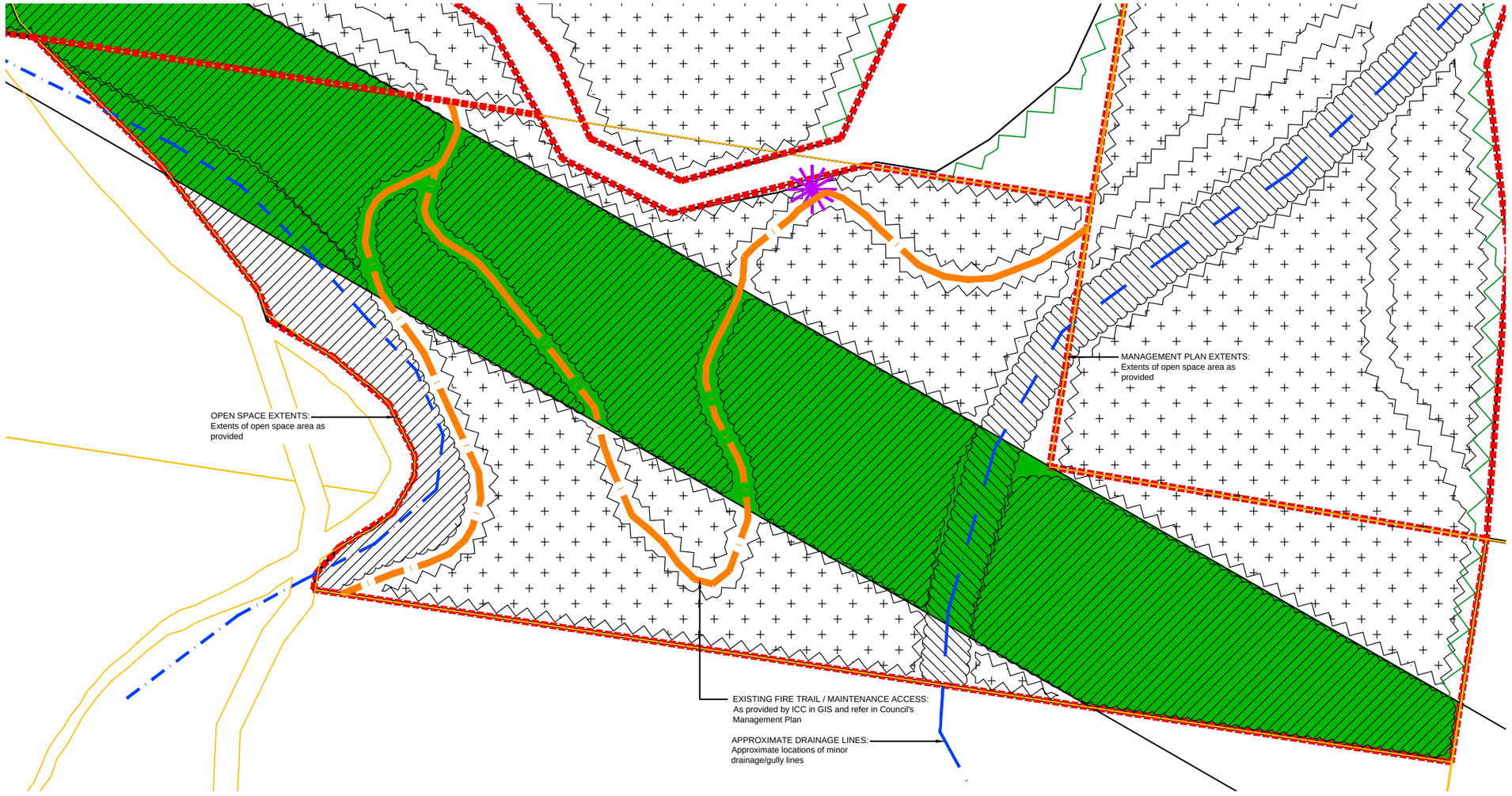
DATE: August 16 | CHECKED: MS

CLIENT REF.: 7243 | DRAWN: TL

DRAWING No.: 7243 L 11 RP D

Spring Mountain Precinct

V-DEC MANAGEMENT PLAN - LOT 748 on SP189044



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
- 10m transition zone (Edge effect & bushfire management). Between lots and retained vegetation
- Powerlink Easement (No works in Easement areas without written consent of Powerlink)
- Trail access point (To be confirmed by ICC)

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D	24/08/2016	Edits to DNRM Submission Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

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

landscape architecture

DRAWING: V-DEC Management Plan Lot 748 on SP189044

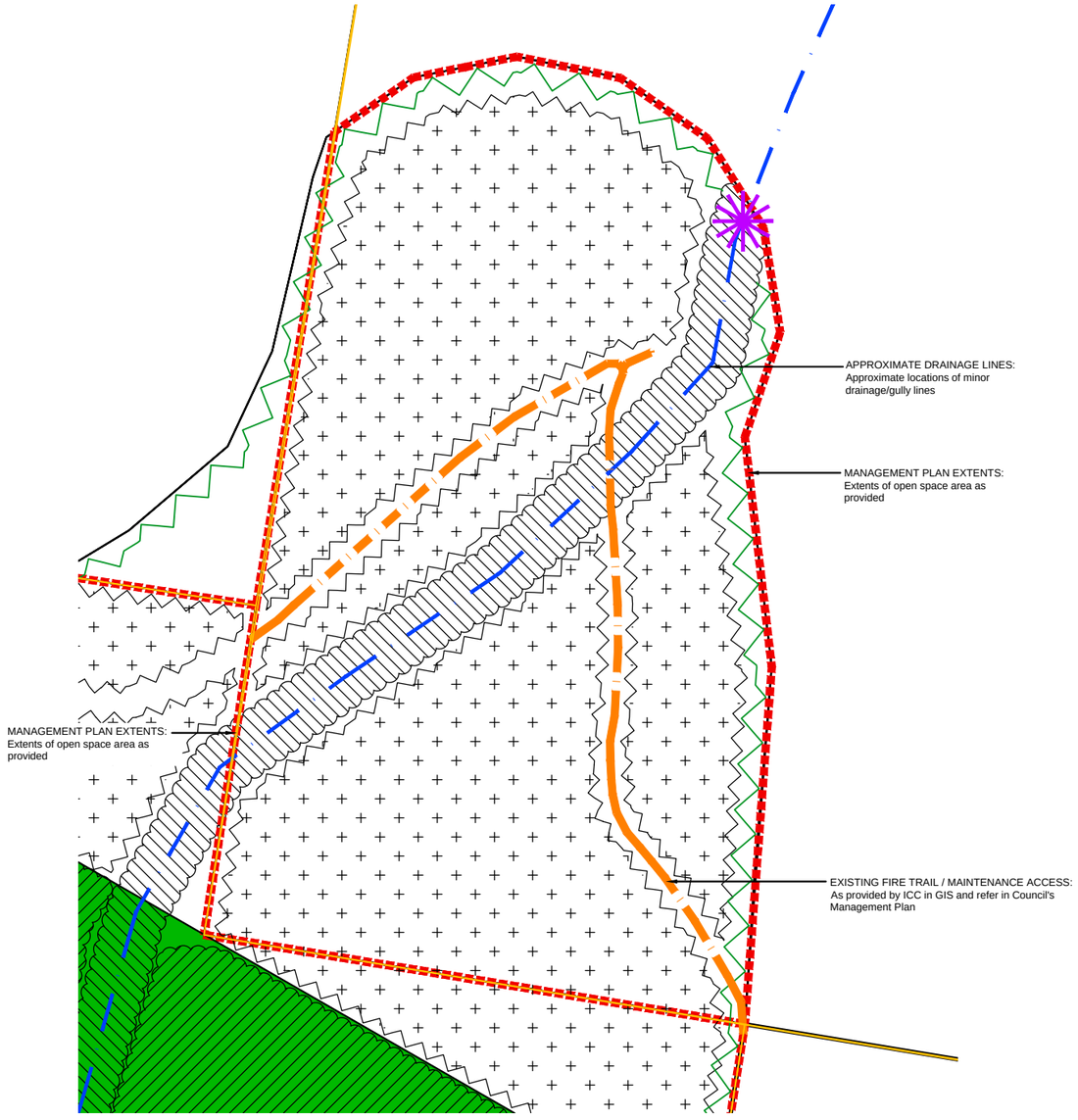
DATE: August 16 | CHECKED: MS

CLIENT REF.: 7243 | DRAWN: TL

DRAWING No.: 7243 L 12 RP D

Spring Mountain Precinct

V-DEC MANAGEMENT PLAN - LOT 747 on SP189043



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
- 10m transition zone (Edge effect & bushfire management). Between lots and retained vegetation
- Powerlink Easement (No works in Easement areas without written consent of Powerlink)
- Trail access point (To be confirmed by ICC)

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D	24/08/2016	Edits to DNRM Submission Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

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

landscape architecture

DRAWING: V-DEC Management Plan Lot 747 on SP189043

DATE: August 16 | CHECKED: MS

CLIENT REF.: 7243 | DRAWN: TL

DRAWING No.: 7243 L 13 RP D