Impact Management Plan
Melaleuca irbyana

432-520 Greenbank Road, Greenbank
Prepared for Mirvac Queensland Pty Ltd
3 July 2018

Job No. 7598

Document Control

Document: Impact Management Plan for 432-520 Greenbank Road, prepared by Saunders Havill Group for Mirvac Queensland Pty Ltd.

Document Issue

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Prepared by

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Reports and plans by others may be included in this document.

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Abbreviations and Acronyms

DES Department of Environment and Science (Qld) (formally EHP)
EDQ Economic Development Queensland (Qld)
EHP Former Department of Environment and Heritage Protection (Qld) (now DES)
EVNT Endangered, Vulnerable or Near Threatened (as defined by the NCA)
NCA *Nature Conservation Act 1992* (Qld)
NCWR Nature Conservation (Wildlife) Regulation 2006
PDA Priority Development Area (herein referencing the Greater Flagstone Priority Development Area)
SHG Sunders Havill Group

1. Introduction

Saunders Havill Group (SHG) was engaged by Mirvac Queensland Pty Ltd (Mirvac) to prepare an Impact Management Plan (IMP) for *Melaleuca irbyana* (Swamp Tee Tree) specimens located within the Greenbank project area located at 432-520 Greenbank Road, Greenbank.

The Greenbank project was referred to the Commonwealth Department of the Environment and Energy (DEE) on behalf of Mirvac by SHG and deemed a Controlled Action for potential impacts on the Koala and Grey-headed Flying-fox under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) to be assessed on Preliminary Documentation. Of note, Area 1 was approved by the DEE to be excised from the referral area. The Preliminary Documentation for the assessment of the project is nearing completion.

The Greenbank project has received preliminary approval under the Greater Flagstone Urban Development Area Development Scheme 2011 (PDA Development Scheme) by Economic Development Queensland (EDQ) who are the administering authority for development in the Greater Flagstone Priority Development Area (PDA).

As part of a protected plants flora trigger survey in accordance with the Protected Plants Guidelines, specimens of *M. irbyana*, listed as Endangered under the *Nature Conservation Act 1992* (NCA), were recorded within the Greenbank project area. This IMP has been prepared to support a clearing permit (protected plants) application to the Department of Environment and Science (DES) in accordance with Section 3.2 of the *Nature Conservation (Wildlife Management) Regulation 2006 – Protected Plants Assessment Guidelines*.

The IMP has been prepared in accordance with Section 3.2.1 of the *Protected Plants Assessment Guidelines,* as follows:

> **3.2.1 Impact management plan**
>
> An impact management plan must include the following sections:
>
> - attempts to avoid and minimise impact
> - nature of impact
> - management of impact
> - justification of impact management
> - survival of plant in the wild

Contextually, the site is located 30 kilometres (km) south of Brisbane and 10 km west of Logan Village, within the western suburb of Greenbank. The site is bound by Greenbank and Teviot Roads to the west and is predominately surrounded by rural residential development. Wearing Park immediately adjoins the site to the east and Greenbank Shopping Centre and Community Centre are located opposite the site, on the western side of Teviot Road. The site is located approximately 1.5 km southeast of Greenbank Military Training Camp and 500 metres east of the Brisbane – Sydney Railway Line. An infrastructure easement traverses the site parallel to the northern boundary. The site remains one of the last large rural properties in the immediate landscape predominately comprised of rural residential development. Refer to Figure 1 for the site context and Figure 2 for the site aerial.

The proposed clearing works will be undertaken over parts of the 412 hectare (ha) site to facilitate a master planned development and will be subject to future operational works approvals from EDQ. It is noted that a NCA Protected Plants Flora Survey has been undertaken and exemption obtained from the DES, formally the Department of Environment and Heritage Protection (EHP), for clearing over Area 1 to the west (Lot 2 & Lot 3 on SP297192 and along the boundary fence

line to support existing operational works approvals (Ref: APP0007102, APP0007278, respectively). No EVNT species were recorded within these clearing areas.

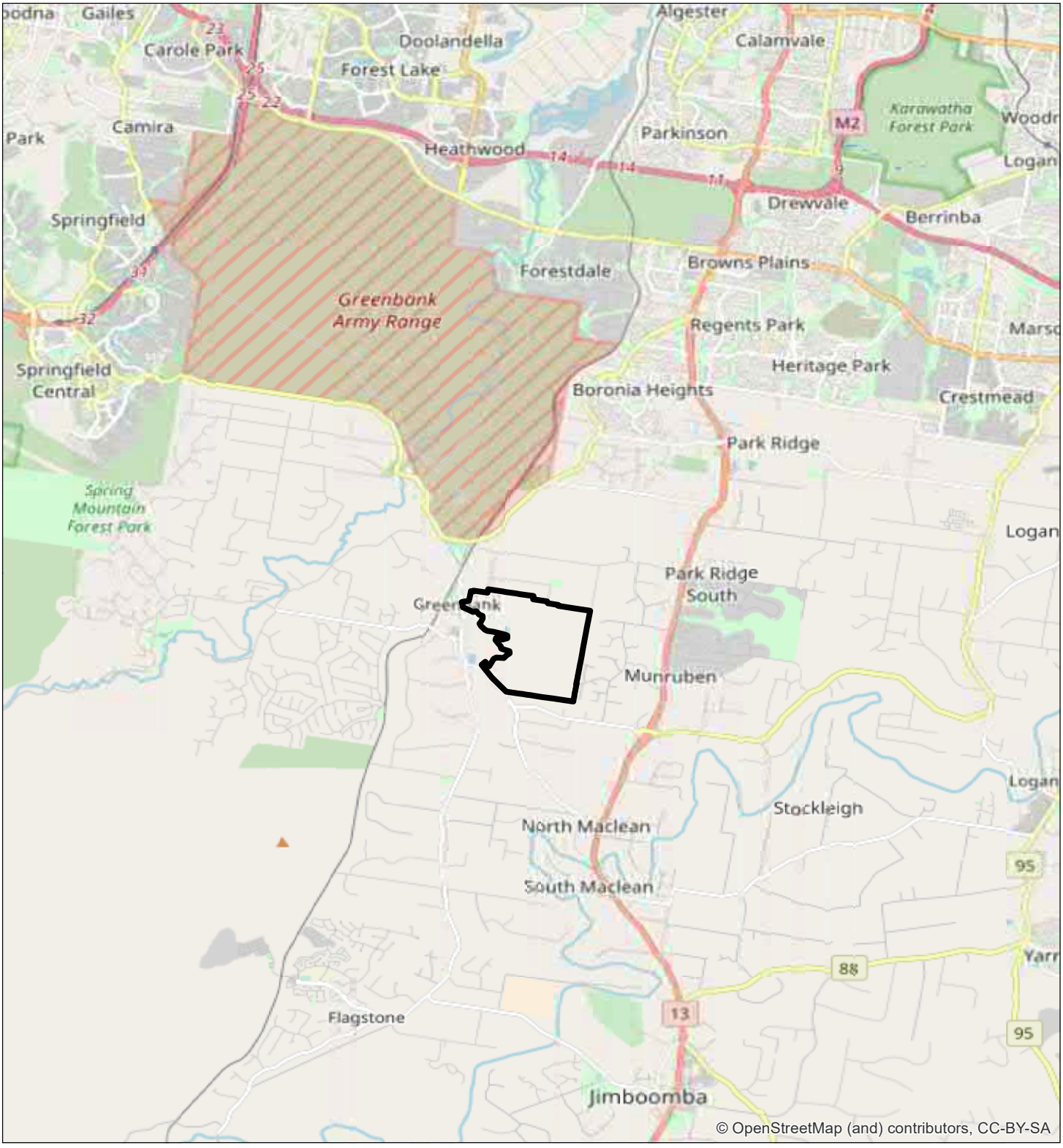
Flora surveys were conducted where clearing is proposed, including within areas mapped as 'High risk' under the Protect Plants Flora Survey Trigger Map High Risk (refer Figure 3) and as per the Flora Survey Guidelines – Protected Plants.

1.1. Property Summary

Key site details are provided in Table 1 below.

Table 1: Property Summary

Address	423-520 Greenbank Road, Greenbank
RPD	Lot 1 on SP297192
Local Government Area	Logan City
Administering Authority	Economic Development Queensland
Priority Development Area	Greater Flagstone PDA
Planning Scheme	Greater Flagstone PDA Development Scheme
Area Classification / Zone	Urban Living
Existing Land Use	Rural



Legend

Site DCDB

Figure 1

Site Context

File ref. 7598 E Figure 1 NCA 2 Site Context B
Date *19/02/2018*
Project *Greater Flagstone Project, Greenbank (1/SP297192)*

0 1,000 2,000 3,000 4,000 *m*

N

Scale (A4): 1:125,000 [GDA 1994 MGA Z56]

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2017)

Legend

Project Site DCDB

Qld DCDB

Figure 2

Site Aerial

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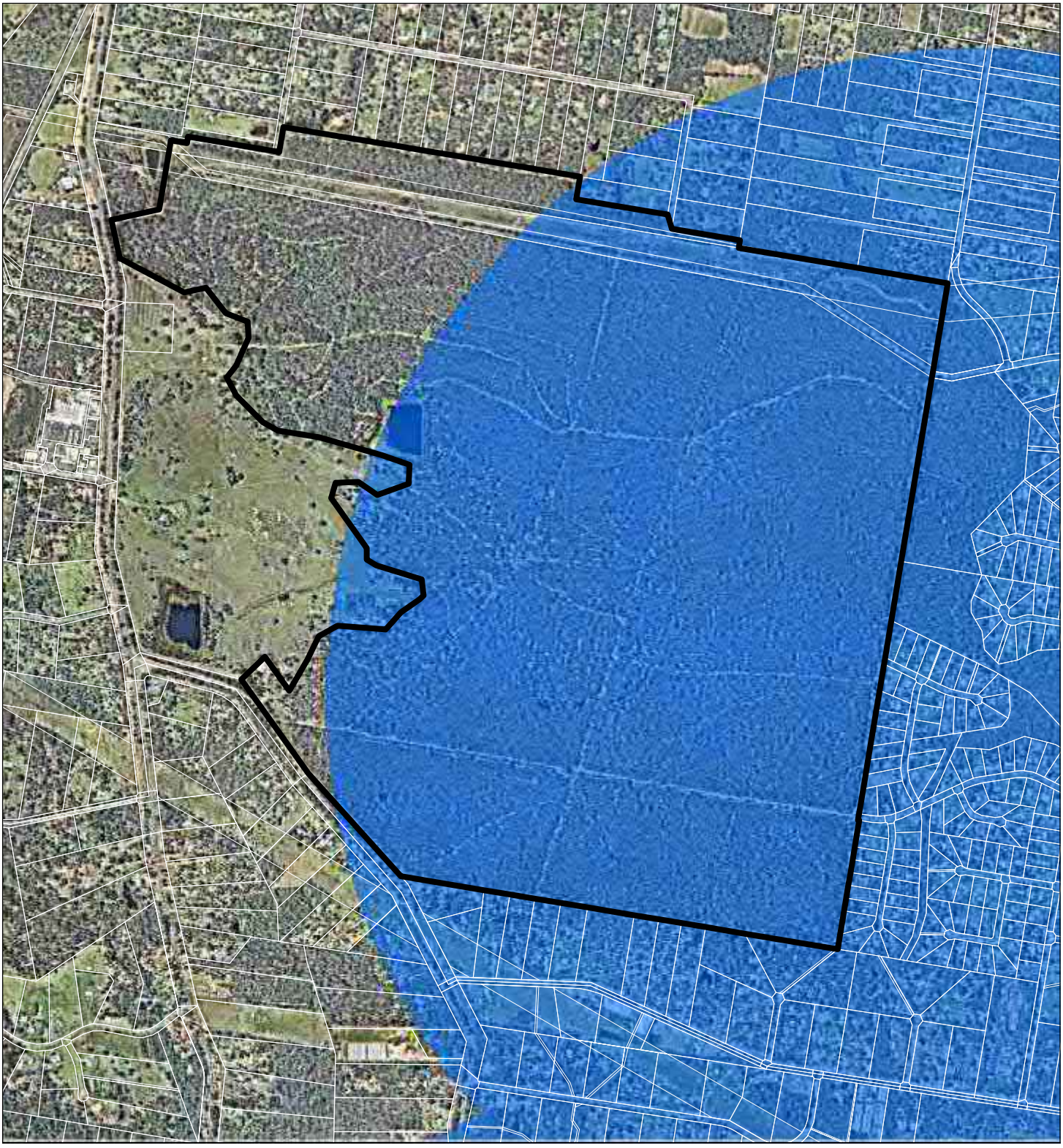
File ref. 7598 E Figure 2 NCA 2 Site Aerial B
Date *19/02/2018*
Project *Greater Flagstone Project, Greenbank (1/SP297192)*

0 100 200 400 600 800 *m*

N

Scale (A4): 1:17,000 [GDA 1994 MGA Z56]

Layer Sources QLD GIS Layers (QLD Gov. Information Service 2017), Aerial (Nearmap 2017)



Legend

- Project Site DCDB
- Qld DCDB
- Flora survey trigger area

Figure 3

NCA - Protected Plants Flora Survey Trigger Mapping

File ref. 7598 E Figure 3 NCA 2 Protected Plants B
Date *19/02/2018*
Project *Greater Flagstone Project, Greenbank (1/SP297192)*

0 100 200 400 600 800 *m*

N

Scale (A4): 1:17,000 [GDA 1994 MGA Z56]

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saunders havill group

Layer Sources QLD GIS Layers (QLD Gov. Information Service 2017), aerial (Nearmap 2017)

1.2. Nature Conservation Act 1992

The *Nature Conservation Act 1992* (NCA) classifies and protects significant areas (Protected Areas) and protects threatened plant and animal species. The Nature Conservation (Wildlife) Regulation 2006 (NCWR) lists plant and animal species presumed extinct, endangered, vulnerable, near threatened, least concern, international or prohibited.

The Queensland Government has adopted a regulatory framework that captures activities that pose a high risk to plant biodiversity. Under the framework, when a non-exempt clearing activity is proposed within a 'High Risk' area, the proponent of that activity is required to complete a flora survey prior to commencement of clearing. The Protected Plants Flora Survey Trigger Map shows 'High Risk' areas for protected plants and is used to help determine flora survey and clearing permit requirements for a particular location.

A search of the Protected Plants Flora Survey Trigger Mapping indicated proposed clearing areas within the subject site are overlayed as 'High Risk' and so are subject to flora survey requirements (refer Figure 3).

Prior to flora surveys, the schedules of the NCWR were considered in this report using a Wildlife Online Database Search with a 10 km radius from the site. Three (3) flora species listed under the NCWR were identified as having the potential to occur on site and are presented in Table 1. Refer to Appendix A for full search results.

Table 2: Wildlife Online Search Results–Flora

Scientific Name	Common Name	NCA Status
Marsdenia coronata	Slender Milkvine	Vulnerable
Plectranthus habrophyllus	-	Endangered
Melaleuca irbyana	-	Endangered

2. Nature of the Impact

2.1. Background

The only EVNT species located within the Greenbank project area was *Melaleuca irbyana* (Swamp Tea Tree). The profile of this species is detailed below in Section 2.2.

2.2. Protected Plant Profile

Melaleuca irbyana, a member of the Myrtaceae family, is listed as a threatened species under Schedule 2 of the *Nature Conservation (Wildlife) Regulation 2006* (NCWR) and is classified as "endangered". *Melaleuca irbyana* is also included as part of Endangered Regional Ecosystems (RE) 12.3.18, 12.3.19, 12.9-10.11 and 12.9-10.27 under the *Vegetation Management Act 1999* (VMA). This vegetation community is also listed as a Critically Endangered when present as a Threatened Ecological Community under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC).

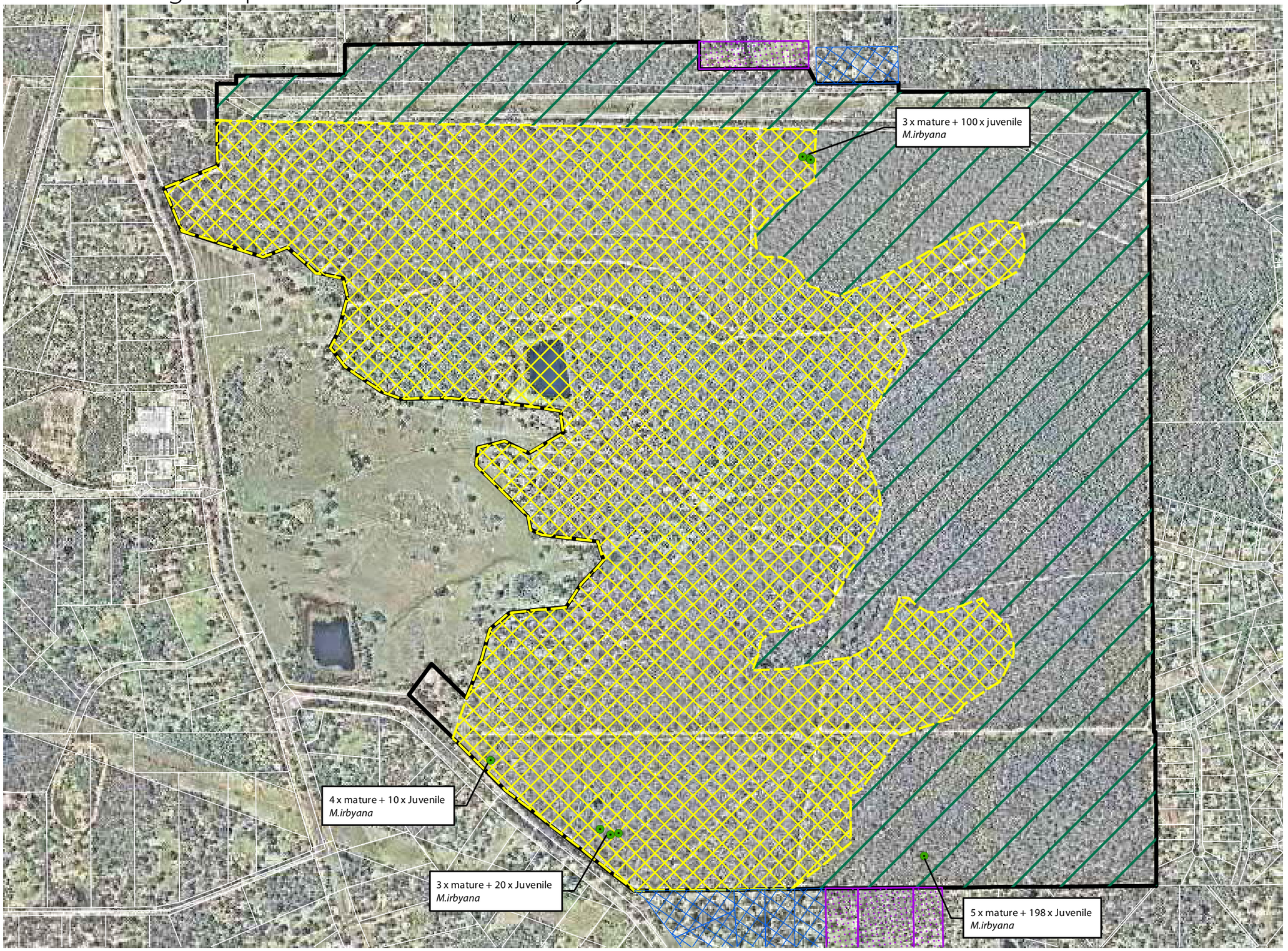
M. irbyana forms communities that occur in two (2) structural forms: the more common form consists of a dominant eucalypt canopy with an understorey containing *M. irbya*na thickets 8-12 metres in height; the less common form is an open forest or thicket of *M. irbyana* with emergent eucalypt trees. The understorey is sparse and can comprise of grasses, sedges, and herbs with a few shrubs, vines and possibly orchids present. There are fairly clear descriptions of *M. irbyana* communities, however, there are no clear indications of the point at which an individual tree or small number of trees are considered to be part of a community. An individual tree may still contribute reproductively to a community, or may have the potential to regenerate and in time create a community.

Logan City Council defines an *M. irbyana* community as, "*where Melaleuca irbyana occur in a patch size of 0.25 hectares or greater, or where a patch of Melaleuca irbyana less than 0.25 hectares adjoins a second patch and the sum of the patches is greater than 0.25 hectares*". This definition has been determined using methodology from the *Melaleuca irbyana* (Swamp Tea-tree) Community 1:25,000 Scale Mapping Project (Ryan, 2010).

2.3. *Melaleuca irbyana* On-site

The entire site was traversed as part of previous and contemporary NCA searches. While *Melaleuca irbyana* were not previously recorded in the Clearing Impact Area associated with Area 1 and the Perimeter Clearing works extents, surveys conducted as part of this reporting, over the balance of the site, recorded the species in four (4) separate locations. Refer to Plan 1 for *Melaleuca irbyana* onsite locations.

1. Clearing Impact - *Melaleuca irbyana*



NOTES
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Layer Sources: QLD GIS Layers (QLD Gov. Information Service 2016), Aerial (Qld Gov. and Google 2016)

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LEGEND

- Project DCDB
- Development footprint
- Conservation area
- NCA flora survey trigger area
- No Access under NCA Exemption (AP0007102)
- Surveyed under NCA Exemption (AP0007102)
- Mature *Melaleuca irbyana* specimen

Note: Juvenile *Melaleuca irbyana* are specimens less than 2 metres tall

Issue	Date	Description	Drawn	Checked
A	5/03/2018	Preliminary	TC	AD
B	11/06/2018	Updated impact area	TC	AD

Transverse Mercator | GDA 1994 | Zone 56 | 1:10,000 @A3

0 50 100 200 300 400 m

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Everleigh

ADDRESS/RPD: Teviot Road, Greenbank (1/SP297192) 11/06/2018 7598 E 01 NCA 2 Impact Plan B

Location 1:

Location 1 is situated in the northern aspect of the site, adjacent to the power easement. This patch is located within mapped composite 'Of Concern' Regional Ecosystem RE12.9-10.2/12.9-10.7 as confirmed via PMAV 2016/002969 certified on the 11th of May 2017. Refer to Plan 1 for *Melaleuca irbyana* on site locations and Table 3 for a description of the Regional Ecosystems). This patch of *Melaleuca irbyana* (Swamp Tea-tree) consisted of three (3) established specimens and one-hundred (100) juveniles. This patch of *Melaleuca irbyana* was surrounded by vegetation dominated by *Acacia spp., Allocasuarina littoralis* (Black She-oak) and *Alphitonia excelsa* (Soap Tree) regrowth with *Corymbia citriodora* (Spotted Gum) dominated canopy.

Photo Plate 1: Location 1

Location 2:

Location 2 is situated towards the south-western property boundary, adjacent to Greenbank Road. This patch is located within mapped non-remnant vegetation as confirmed via PMAV 2016/002969 certified on the 11th of May 2017. This *Melaleuca irbyana* (Swamp Tea-tree) patch consisted of three (3) established specimens and twenty (20) juveniles. This patch of *Melaleuca irbyana* was found within a regrowth vegetation community, with surrounding vegetation dominated by *Allocasuarina littoralis* (Black She-oak) and *Acacia spp*. regrowth.

Photo Plate 2: Location 2

Location 3:

Location 3 is situated towards the south-western property boundary, adjacent to Greenbank Road and approximately 380 m west of Location 2. This patch is located within mapped non-remnant vegetation as confirmed via PMAV 2016/002969 certified on the 11th of May 2017. This patch of *Melaleuca irbyana* (Swamp Tea-tree) consisted of four (4) established specimens and ten (10) juveniles. The patch of *Melaleuca irbyana* was found within a regrowth vegetation community, with surrounding vegetation dominated by *Acacia spp., Allocasuarina littoralis* (Black She-oak) and *Alphitonia excelsa* (Soap Tree) regrowth.

Photo Plate 3: Location 3

Location 4:

Location 4 is situated towards the southern property boundary, approximately 800 m east of Location 2. This patch is located within mapped composite 'Of Concern' Regional Ecosystem RE12.9-10.2/12.9-10.7 as confirmed via PMAV 2016/002969 certified on the 11th of May 2017. These Regional Ecosystems are described in Table 3 below. This patch consists of five (5) established specimens and one hundred and ninety-eight (198) juveniles. This patch of *Melaleuca irbyana* was surrounded by vegetation dominated by *Acacia spp., Allocasuarina littoralis* (Black She-oak) and *Alphitonia excelsa* (Soap Tree) regrowth with *Corymbia citriodora* (Spotted Gum) dominated canopy.

Photo Plate 4: Location 4

Table 3: Regional Ecosystems Descriptions

Status	Code	Description
Endangered	12.9-10.12	Corymbia intermedia, Angophora leiocarpa, Eucalyptus seeana +/- E. siderophloia, E. tereticornis, E. racemosa subsp. racemosa, C. citriodora subsp. variegata woodland to open forest. Lophostemon suaveolens is often present as a sub-canopy or understorey tree. Occasional Melaleuca quinquenervia on lower slopes. Does not include areas dominated by Eucalyptus racemosa subsp. racemosa. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 9g).
Of Concern	12.9-10.7:	Eucalyptus crebra +/- E. tereticornis, Corymbia tessellaris, Angophora leiocarpa, E. melanophloia woodland. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 13c).
Of Concern	12.3.11	Eucalyptus tereticornis +/- E. siderophloia and Corymbia intermedia open forest to woodland. Corymbia tessellaris, Lophostemon suaveolens and Melaleuca quinquenervia frequently occur and often form a low tree layer. Other species present in scattered patches or low densities include Angophora leiocarpa, E. exserta, E. grandis, C. trachyphloia, C. citriodora subsp. variegata, E. latisinensis, E. tindaliae, E. racemosa and Melaleuca sieberi. E. seeana may be present south of Landsborough and Livistona decora may occur in scattered patches or low densities in the Glenbar SF and Wongi SF areas. Occurs on Quaternary alluvial plains and drainage lines along coastal lowlands. Rainfall usually exceeds 1000mm/y. (BVG1M: 16c)
Least Concern	12.3.6:	Melaleuca quinquenervia +/- Eucalyptus tereticornis, Lophostemon suaveolens, Corymbia intermedia open forest to woodland with a grassy ground layer dominated by species such as Imperata cylindrica. Eucalyptus tereticornis may be present as an emergent layer. Occurs on Quaternary floodplains and fringing drainage lines in coastal areas. (BVG1M: 22a)
Least Concern	12.9-10.2:	Corymbia citriodora subsp. variegata open forest or woodland usually with Eucalyptus crebra. Other species such as Eucalyptus tereticornis, E. moluccana, E. acmenoides and E. siderophloia may be present in scattered patches or in low densities. Understorey can be grassy or shrubby. Shrubby understorey of Lophostemon confertus (whipstick form) often present in northern parts of bioregion. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 10b).

Based on the information provided in **Section 2.2**, the specimens located on site are not consistent with a *Melaleuca irbyana* community due to the patches predominately containing juvenile individuals with very few mature specimens. Importantly, these patches are not associated with Endangered Regional Ecosystems. Locations 1 and 4 were confirmed via a certified PMAV to be located within composite 'Of Concern' Regional Ecosystem RE12.9-10.2/12.9-10.7 while locations 2 and 3 were located within non-remnant areas.

While Location 1 contains a substantial amount of juvenile species, overall, the significance of these patches is considered less than if they formed part of a broader existing community. The habitat value they currently provide is considered relatively limited, with no obvious noteworthy habitat for flora or fauna observed at the time of survey.

2.4. Avoidance and Minimisation of Impact

The proposed works are for the development of Greenbank master planned development in the Greater Flagstone PDA. Preliminary approval for the context plan and master plan has been issued by EDQ. These plans were informed by detailed analysis of the site by specialist consultants, including a detailed ecological analysis by SHG. Subsequently, areas for development shown are concentrated to areas of least constraint. Areas of highest ecological value have been identified for retention as conservation.

The proposed works will include the creation of residential allotments, a proposed school site, new roads, park and conservation areas and corridors. Minimisation of overall clearing impacts are evident through location of the proposed development, located outside Endangered remnant vegetation and waterway corridors. Rehabilitation of conservation areas and waterways is proposed as part of the development.

The proposed earthworks to facilitate the development footprint will require the removal of three (3) relatively small patches of predominately juvenile *Melaleuca irbyana* specimens, and ongoing property boundary maintenance within 100 m of a fourth patch. These specimens are located within Of Concern and non-remnant regrowth areas (refer Plan 1).

As per the EDQ endorsed Natural Environment Site Strategy, extensive conservation of greater than 89 hectares of proposed Conservation Parkland adjoining Norris Creek and Wearing Park is proposed as part of the development. In accordance with best practice management, restoration and rehabilitation works will seek to stabilise and reverse the negative effects of ongoing habitat fragmentation. The intent is for managed areas of rehabilitation and restoration to rectify canopy gaps and restore bare or denuded areas to provide additional habitat and refugia within the lower strata to maintain connectivity with external approval corridors and improve terrestrial corridor viability. Rehabilitation works within the conservation area and waterway corridors will include weed management and replanting with native species consistent with mapped Regional Ecosystems to augment ecological values and enhance connectivity.

Melaleuca irbyana grows in flat areas that are periodically waterlogged, in eucalypt forest, mixed forest and *Melaleuca* woodland with a sparse and grassy understorey. The species prefers poorly draining, heavy clay soils (Byrnes 1984; Barlow 1987). The proposed conservation land rehabilitation works will include establishing a *Melaleuca irbyana* thicket within remnant woodland forest to the north of the central waterway. This land is relatively low lying and adjoins an ephemeral waterway that contains permanent billabongs. The proposal *Melaleuca irbyana* planting site is therefore considered ideal for the species, which is dependent on specific groundwater and / or surface water hydrology. Impacts to *Melaleuca irbyana* have been minimised to the greatest practical extent and include establishing a *Melaleuca irbyana* community, on the project site, within future conservation land and managing potential impacts from ongoing works that will occur within 100 m of a retained patch.

2.5. Survival of the Plant in the Wild

Based on the current disturbed nature of the site and the locations of the *Melaleuca irbyana* specimens along property boundaries, it is not anticipated that the removal of three (3) relatively small patches of predominately juvenile *Melaleuca irbyana* specimens will significantly hinder the future success of the species in the area. Importantly, the fourth patch is to be preserved within the conservation area and proposed rehabilitation works seek to establish a *Melaleuca irbyana* community on the site allowing the community to be protected in perpetuity.

3. Offset Assessment

The *Protected Plants Assessment Guideline* states that an offset compensates for residual impacts after impact management requirements of the guideline have been met. The specimens located are not considered to constitute ecological communities (as described in Section 2.2.), and therefore the viability of *Melaleuca irbyana* local populations are not considered to be impacted by this proposal.

The proposed earthworks to facilitate the development footprint will require the removal of three (3) relatively small patches of predominately juvenile *Melaleuca irbyana* specimens. In consideration of the extensive rehabilitation works proposed within the onsite conservation land, including the establishment of an *Melaleuca irbyana* thicket, the proposed rehabilitation works will ensure a net gain in *Melaleuca irbyana* across the site. IN light of rehabilitation efforts, the removal of small patches of *Melaleuca irbyana* specimens is not considered to impose a Significant Residual Impact, as defined under the DES policy, and therefore offsets are not considered applicable in this case.

3.1. Rehabilitation works

It is considered that the proposed rehabilitation works will mitigate the impact to the extent that the impact on the Matter of State Environmental Significance (MSES) would not be considered significant.

To demonstrate this mitigation of impact, a response to the four (4) points of consideration within Section 1.2 of the *Significant Residual Impact Guideline* is provided below.

- **The extent and duration of impact on the matter and its sensitivity to disturbance.**

  The impact on the matter is the removal of three (3) relatively small patches of predominately juvenile *Melaleuca irbyana* specimens from former paddock areas that have already been subject to high disturbance from cattle grazing and historical clearing. A fourth patch will be retained with ongoing adjoining works within 100 m limited to the maintenance of the nearby property boundary. The sites are described in detail in Section 2.3, shown in Plan 1 and summarised below:

  - Location 1: 3 x mature s + 100 juvenile specimens, located within the north-east along a drainage feature
  - Location 2: 4 x mature + 10 juvenile specimens, located along the southern boundary
  - Location 3: 3 mature +20 juvenile specimens, located along the southern boundary
  - Location 4: 5 mature + 198 juvenile specimens, located along the southern boundary in the south-west

- **Timeframe for rehabilitation relative to the impact occurring and the ability of the matter to maintain its viability during this timeframe.**

  The rehabilitation proposed is the planting of six hundred and twenty-five (625, equates to 140 cleared specimens at 4:1 plus an additional 65 specimens over 5,000 m^2 at 1 per 8 m^2) advanced tube stock specimens of *M. irbyana* within a relatively isolated portion of the central waterway corridor of the conservation zone (refer Plans 2 to 4). Although it is expected that these plantings will take approximately four (4) years to reach the size of the impacted matter, they will be planted in a thicket to replicate as close to natural conditions for a *M. irbyana* ecological community as possible and maintained as part of the extensive rehabilitation works for the conservation zone. The area of planting of this thicket adjoins the central waterway corridor and is not within 100 m of future development areas. This location has been chosen to avoid human disturbance and as far away as possible from conflicting uses.

It is noted that the rehabilitated creek corridor will be handed over to Logan City Council following the on-maintenance period. Further, the fourth patch of *M. irbyana* that is to be retained within the conservation area will be subject to regular compatible weed suppression and monitored for persistence as part of site maintenance due to its proximity to ongoing property boundary maintenance works within 100 m.

- **Likely success of rehabilitation works to return the impacted matter to its original condition, and;**

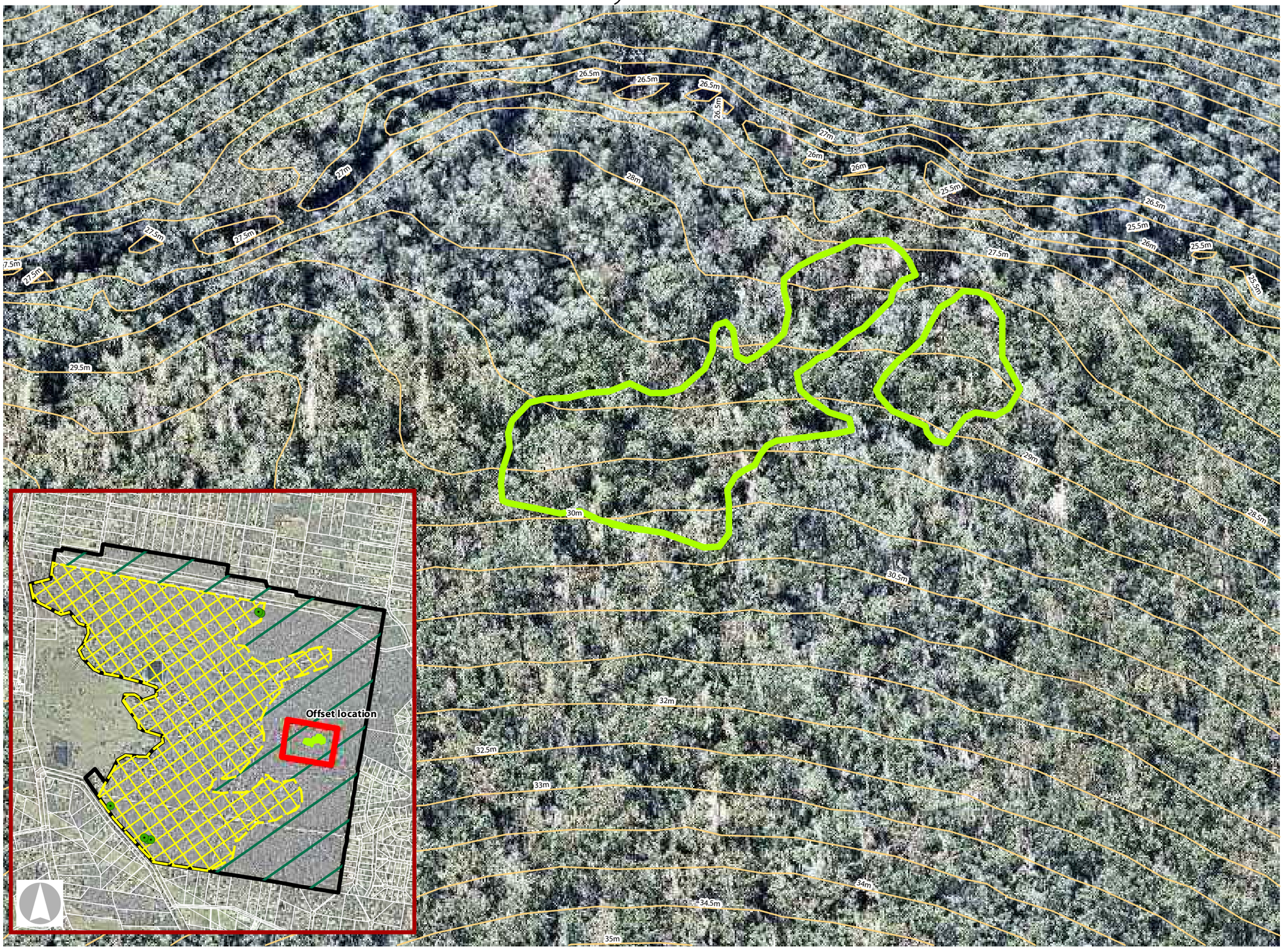
  It is important to note that the Regional Ecosystems within and adjoining the creek corridor reflect those where the *M. irbyana* patches are currently located on-site. The proposed rehabilitation area was chosen after detailed ecological survey of site attributes, including the prevailing low-lying topography, proximity to the creek, and canopy gaps with limited existing understorey (refer Plans 2 & 4). Thus, the planting of *M. irbyana* in the creek corridor has a high likelihood of success given the suitable landscape and habitat. Given that the impact is the removal of a 140 single individual specimens of *M. irbyana* which are almost entirely juveniles, the planting of six hundred and twenty-five (625) specimens of *M. irbyana* as a thicket within the conservation zone to be rehabilitated will far exceed the original condition of the impacted matter at an offset ratio of greater than 4:1.

- **The time-lag effect—between impact and rehabilitation successfully delivering the original condition for the matter—on the matter's viability.**

  As mentioned previously, the removal of three small patches of *M. irbyana* is not considered to significantly impact upon the viability of local populations nor remove significant habitat values. Although there will be a time-lag between the removal of the predominantly juvenile *M. irbyana* specimens and the maturity of the tube stock of *M. irbyana* to be planted. Overall, the rehabilitation proposed is considered a far superior ecological outcome for viability of local populations.

  The extent and number of *M. irbyana* to be planted is intended to establish a self-sustaining thicket of *M. irbyana* in a safe and secluded buffer environment that is capable of mitigating the proposed impacts. It is acknowledged that any future unavoidable loss of *M. irbyana* from the development area will be assessed by DES on a case by case basis.

2. Offset Assessment - *Melaleuca irbyana*



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LEGEND

- Project DCDB
- Development footprint
- Conservation area
- Mature *Melaleuca irbyana* specimen to be impacted by clearing works
- Melaleuca Irbyana planting/rehab site (Approx. 5,000m²)
- Contours (0.5m)

Note: Juvenile *Melaleuca irbyana* are specimens less than 2 metres tall

Issue	Date	Description	Drawn	Checked
A	11/06/2018	Preliminary	TC	AD

Transverse Mercator | GDA 1994 | Zone 56 | 1:1,095 @A3

0 5 10 20 30 40 m

saunders havill group

mirvac

Everleigh

ADDRESS/RPD: Teviot Road, Greenbank (1/SP297192) 11/06/2018 7598 E 02 NCA 2 Offset Plan A

3. Melaleuca Irbyana - Rehabilitation/Planting Site Notes

INTRODUCTION

Saunders Havill Group (SHG) was engaged by MIRVAC to prepare an Impact Management Plan (IMP) for the clearing of 140 *Melaleuca irbyana* (Swamp Tree Tree) specimens. The replacement plants will be located within the approved conservation area of the Everleigh project (herein referred to as 'the site'). The clearing works, current and future will facilitate the creation of residential lots, a school and internal roads for the site's ultimate development layout.

The rehabilitation proposal for the clearing of 140 *Melaleuca Irbyana* is the planting of four (4) advanced tube stock specimens of *Melaleuca Irbyana* per tree cleared. A total of 625 (560+65 additional) *Melaleuca Irbyana* will be planted as a result. The planting area is proposed within the site's conservation zone (refer Plan 2) and will cover 5,000 m^2. The specific location of the planting area was determined onsite by Ecologists from SHG. The percentage of exiting canopy cover and the land zone features were taken into consideration when determining the optimal location for planting. Although it is expected that these plantings will take approximately four (4) years to reach the size of the impacted matter, they will be planted in a thicket to replicate as close to natural conditions for a *Melaleuca Irbyana* ecological community as possible and maintained as part of the rehabilitation works for the conservation zones. The area of planting of this thicket is centralised within the conservation zone and adjacent the waterway corridor, as stipulated by the EDQ approved NESS, and not within 100m of future development areas.

This Rehabilitation Plan is drafted to identify and manage the site disturbances for the planting of the 625 *Melaleuca Irbyana* specimens within a 5,000m^2. The planting will involve low impact weed removal and the retention of any existing native vegetation in the immediate area.

SITE PREPARATION

Once the planting locations have been determined not to impact existing native vegetation, the location is to be spot sprayed prior to soil cultivation. Herbicides must be applied by appropriately qualified/supervised persons in accordance with the Agricultural Chemicals and Distribution Control Act 1966 at rates identified on registered product labels, or on an Australian Pesticides and Veterinary Medicines Authority (APVMA) issued off-label permit where applicable. Refer to South East Queensland Ecological Restoration Framework for additional guidance.

The planting will provide a net benefit of greater than 4 to 1 in an area protected under the NESS.
Rehabilitation treatment is to generally include the following points:

- A number of weeds are recorded for removal within shrub & ground layer
- Weed removal and management will utilise low impact methods
- Planting of the 625 specimens will be planted at approximately 1 per 8m^2 to form a *Melaleuca Irbyana* thicket.

Ecologists from SHG have assessed the site's vegetation. Broadly, it was determined that the assisted natural regenerate approach will be used on site. This approach is described below:

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 control, minor amelioration of soil conditions, erection of fencing, cessation of slashing, etc. will be enough to trigger the recovery processes through natural regeneration
- When the main management issue is weed infestation and/or current land use practices

Role of planting:

- Planting in such areas should be limited to where species cannot return to site without direct intervention.

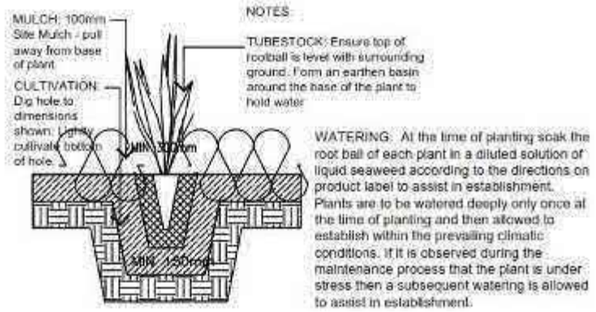
Goal vegetation community:

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

MULCH

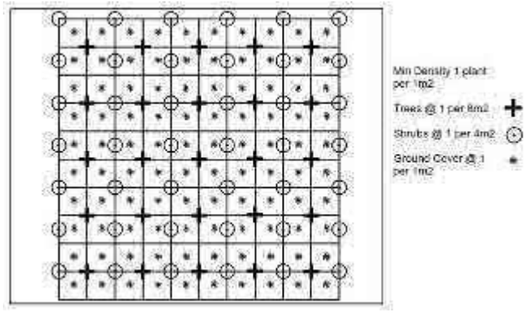
Areas to be blanket mulched to a minimum depth of 100mm leaving a 50mm gap surrounding the trunk of planted stock. Areas which are too steep or where overland flows may occur, a combination of mulch and Jute mat and or suitably anchored natural fibre weed mat installed to manufactures specifications have been specified.

Each individual planting location should be spot cultivated to at least 2 times the depth and twice the width of the plant stock size. Refer detail for more specifications:



PLANTING

Planting locations shall be generally set out in accordance with a typical random grid pattern as shown on this drawing sheet below with the *Melaleuca Irbyana* to be planted at 1 per 8m^2.



All stock shall be advanced tube stock specimens of *Melaleuca Irbyana*, well formed, and hardened off to suit final revegetation location, nursery stock. The root system should be well formed without being tube bound or large roots extruding from the tube container. The environmental coordinator has the right to inspect and reject stock prior to planting.

INSTALLATION

The following outlines the preferred installation methodology for revegetation works within the rehabilitation areas. It has been designed to maximise plant establishment success rates and minimise plant mortality. Revegetation works shall be either undertaken or directly supervised by an experienced and qualified bush regenerator. All works shall be in accordance with the provisions of this sheet, local government policies and Australian Standards. Plant installation methods shall include:

- Plants are to be vigorous, well established, hardened off, consistent with species or variety, free from disease and insect pests, with large root systems and no evidence of having been restricted or damaged.
- Plants are to be planted immediately after delivery to the planting site. If not possible, they should be stored in the shade and watered sufficiently during the day.
- Planting is to be undertaken in accordance with the planting grid contained within this drawing sheet.
- Excavate planting medium to a depth suitable for the installation of tube or pot specimens. In areas where planting substrate is deemed to be very poor (compacted, nutrient depauperate, hydrophobic etc.) and above areas of potential frequent inundation and water flow, topsoil may be used or the ground mechanically ripped where access is feasible.
- Pre-water plant hole, if soil is dry, to decrease root stress upon planting and assess the infiltration of water through the soil
- Incorporate into the planting substrate the appropriate quantity of prepared water crystals or other suitable hydrating product such as Hortex 'Rainsaver' or 'Moisturaid'.
- Place plant into hole and backfill ensuring that the plant is upright and the stem is not covered in any less than 10mm or any more than 20mm of planting medium
- Plants are to be watered thoroughly immediately after planting (ensure deep irrigation) and thereafter as required during the construction phase of the development depending on climatic conditions. Creation of a concave hollow around the base of each plant will aid water infiltration to the plant roots.
- A complete, slow release fertiliser is recommended, and is to be administered appropriately during planting. Top dressing with slow release fertiliser is preferred to avoid toxic levels of fertiliser accumulating in the plant hole around the plant roots.
- To ensure successful establishment, all planting surfaces must be covered in:
    - 100mm layer of high quality weed-free composted chip mulch (site mulch) - Note: to avoid possible stem rot in some 'drier' species ensure mulch is 'dished' and not covering plant stem by more than 200mm
    - suitable individual anchored natural fibre weed mat; or
    - As presented within other section, where available mulch material will be sourced from cleared vegetation material if adequately seasoned.
- A long term slow release fertiliser, such as Nutricote or similar product should be used for all plantings after initial plant establishment.
- Seedlings and saplings are to be encouraged and maintained throughout the establishment period.

MAINTENANCE & MONITORING

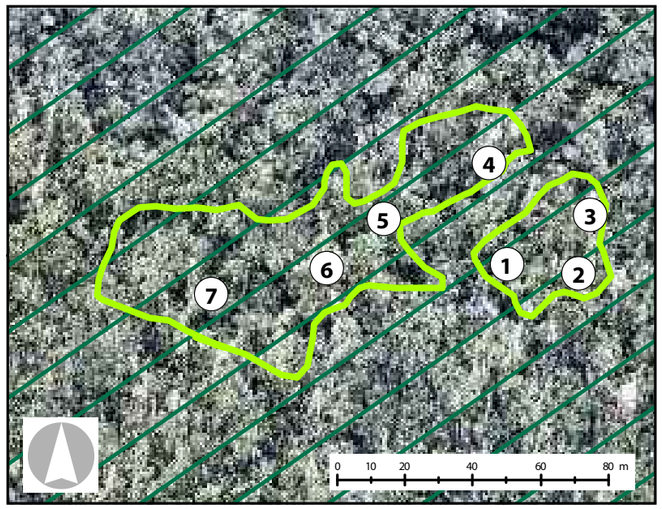
MAINTENANCE SCHEDULE

Maintenance schedule for revegetation areas of the proposed development as specified on the Landscape Plans

ESTABLISHMENT	*Establishment is to occur at the completion of the primary and secondary weed removal phases and any rehabilitation planting. During this period any failed stock are to be replaced and/ or defects identified then reparations are to be made to site works.*
1. Watering	Watering shall be carried out to ensure establishment of revegetation.
	At the time of planting soak the root ball of each plant in a diluted solution of liquid seaweed according to the directions on product label to assist in establishment.
	Plants are to be watered deeply only once at the time of planting and then allowed to establish within the prevailing climatic conditions. If it's observed during the maintenance process that the plant is under stress then a subsequent watering is allowed
2.Weed Removal	Weeds evident during the Establishment period but should be removed as part of a monthly weed management program. Best Practice weed management techniques should be employed for weed removal amongst revegetation areas.
	Where grass seeding or turf establishes within planted areas it should be treated with approved herbicide for waterways.
MAINTENANCE	*(Weeks 13- 2 years)*
1. Watering	No specified watering regime is provided during the maintenance period. The intent is for the area to become self sufficient in utilising natural rain patterns and run off. Watering should occur during extended dry periods to ensure continued establishment
2. Weed Removal	Weeds should be tended to on a monthly program. Treatment techniques vary within the landscape planted areas versus revegetation and retention areas.
3. Management	Throughout the establishment and maintenance periods areas where planting stock has not achieved a 90% success survival additional planting shall be installed.
4. Erosion Control	Prior to the commencement of works and to remain throughout the establishment and maintenance period an erosion and sediment control measures shall be employed over the rehabilitaion area of the site.

Issue	Date	Description	Drawn	Checked
A	3/07/2018	Preliminary	TC	MS

4. Melaleuca Irbyana - Rehabilitation/Planting Site Photos



LEGEND

- Project DCDB
- Development footprint
- Conservation area
- Mature *Melaleuca irbyana* specimen to be impacted by clearing works
- Melaleuca Irbyana planting/rehab site (Approx. 5,000m²)
- Contours (0.5m)

Note: Juvenile *Melaleuca irbyana* are specimens less than 2 metres tall

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

Layer Sources: QLD GIS Layers (QLD Gov. Information Service 2016), Aerial (Nearmap 2018)

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

Issue	Date	Description	Drawn	Checked
A	11/06/2018	Preliminary	TC	AD

Transverse Mercator | GDA 1994 | Zone 56 | 1:1,095 @A3

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Everleigh

4. Summary and Conclusion

Saunders Havill Group has been engaged by Mirvac Queensland Pty Ltd to complete an Impact Management Plan (IMP) for *Melaleuca irbyana* located within the extent of works for the Everleigh Greenbank project. This IMP is intended to support a clearing permit (protected plants) application to the Department of Environment and Science (DES) in accordance with the *Nature Conservation (Wildlife Management) Regulation 2006 - Protected Plants Assessment Guidelines*.

Earthworks associated with the development will necessitate the removal of three (3) relatively small patches of predominantly juvenile *M. irbyana* and the retention of a fourth within the conservation area but within 100 m of ongoing property boundary maintenance. The Protected Plants Assessment Guideline states that an offset compensates for residual impacts after impact management requirements of the guideline have been met. Activities are not anticipated to adversely impact on the viability of any localised *M. irbyana* ecological communities, and the removal of three small *M. irbyana* patches is not considered to impose a Significant Residual Impact as defined under the DES policy in consideration of proposed rehabilitation works within the central creek corridor of the conservation zone. Therefore, offsets are not considered applicable in this case. It is important to note that investment in the conservation zone rehabilitation works proposed, i.e. revegetation and weed removal and the establishment of 625 tube stock *M. irbyana* plantings, is considered to provide a superior ecological outcome relative to the removal of a single specimen at an offset ratio greater than 4:1.

5. Appendices

Appendix A

Wildlife Online Search

Nature Conservation Act 1992

Appendix A

Wildlife Online Search

Nature Conservation Act 1992

Queensland Government

Wildlife Online Extract

Search Criteria: Species List for a Specified Point
Species: All
Type: All
Status: Rare and threatened species
Records: All
Date: All
Latitude: -27.7401
Longitude: 152.9975
Distance: 10
Email: keiragrundy@saundershavill.com
Date submitted: Wednesday 14 Feb 2018 16:50:28
Date extracted: Wednesday 14 Feb 2018 17:00:02

The number of records retrieved = 13

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	amphibians	Limnodynastidae	*Adelotus brevis*	tusked frog		V		3
animals	amphibians	Myobatrachidae	*Crinia tinnula*	wallum froglet		V		3/3
animals	birds	Cacatuidae	*Calyptorhynchus lathami lathami*	glossy black-cockatoo (eastern)		V		3
animals	birds	Falconidae	*Falco hypoleucos*	grey falcon		V		1
animals	birds	Psittacidae	*Lathamus discolor*	swift parrot		E	CE	1
animals	birds	Strigidae	*Ninox strenua*	powerful owl		V		5
animals	mammals	Dasyuridae	*Dasyurus maculatus maculatus*	spotted-tailed quoll (southern subspecies)		V	E	15
animals	mammals	Macropodidae	*Petrogale penicillata*	brush-tailed rock-wallaby		V	V	2
animals	mammals	Phascolarctidae	*Phascolarctos cinereus*	koala		V	V	515
animals	mammals	Pseudocheiridae	*Petauroides volans volans*	southern greater glider		V	V	12/2
plants	higher dicots	Apocynaceae	*Marsdenia coronata*	slender milkvine		V		2/2
plants	higher dicots	Lamiaceae	*Plectranthus habrophyllus*			E	E	6/6
plants	higher dicots	Myrtaceae	*Melaleuca irbyana*			E		7/6

CODES

I - Y indicates that the taxon is introduced to Queensland and has naturalised.

Q - Indicates the Queensland conservation status of each taxon under the *Nature Conservation Act 1992.* The codes are Extinct in the Wild (PE), Endangered (E), Vulnerable (V), Near Threatened (NT), Least Concern (C) or Not Protected ( ).

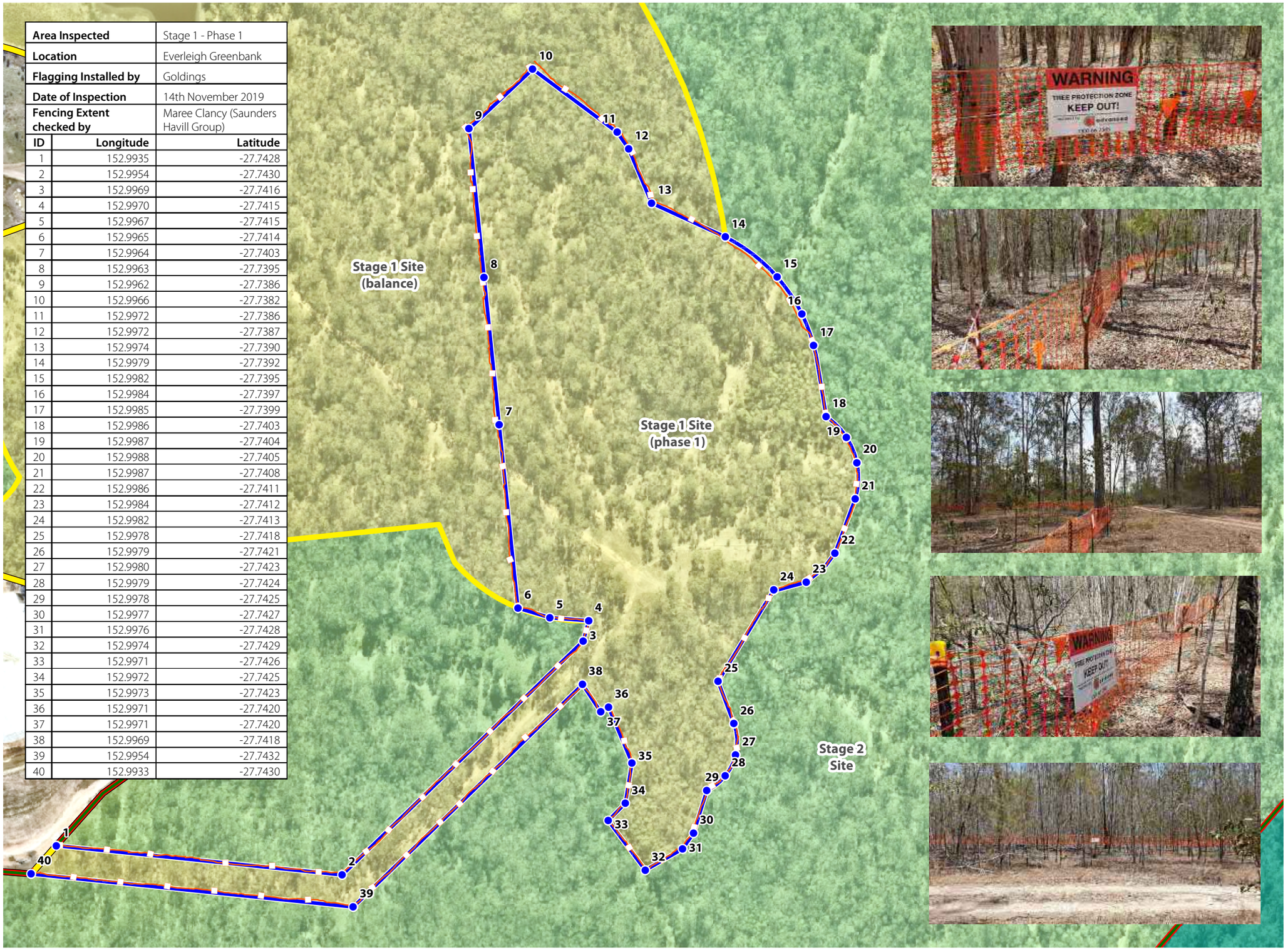
A - Indicates the Australian conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act 1999.* The values of EPBC are Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Extinct in the Wild (XW) and Vulnerable (V).

Records – The first number indicates the total number of records of the taxon for the record option selected (i.e. All, Confirmed or Specimens).
This number is output as 99999 if it equals or exceeds this value. The second number located after the / indicates the number of specimen records for the taxon.
This number is output as 999 if it equals or exceeds this value.

ATTACHMENT 6 - Demarcation Fencing

Area Inspected	Stage 1 - Phase 1
Location	Everleigh Greenbank
Flagging Installed by	Goldings
Date of Inspection	14th November 2019
Fencing Extent checked by	Maree Clancy (Saunders Havill Group)

ID	Longitude	Latitude
1	152.9935	-27.7428
2	152.9954	-27.7430
3	152.9969	-27.7416
4	152.9970	-27.7415
5	152.9967	-27.7415
6	152.9965	-27.7414
7	152.9964	-27.7403
8	152.9963	-27.7395
9	152.9962	-27.7386
10	152.9966	-27.7382
11	152.9972	-27.7386
12	152.9972	-27.7387
13	152.9974	-27.7390
14	152.9979	-27.7392
15	152.9982	-27.7395
16	152.9984	-27.7397
17	152.9985	-27.7399
18	152.9986	-27.7403
19	152.9987	-27.7404
20	152.9988	-27.7405
21	152.9987	-27.7408
22	152.9986	-27.7411
23	152.9984	-27.7412
24	152.9982	-27.7413
25	152.9978	-27.7418
26	152.9979	-27.7421
27	152.9980	-27.7423
28	152.9979	-27.7424
29	152.9978	-27.7425
30	152.9977	-27.7427
31	152.9976	-27.7428
32	152.9974	-27.7429
33	152.9971	-27.7426
34	152.9972	-27.7425
35	152.9973	-27.7423
36	152.9971	-27.7420
37	152.9971	-27.7420
38	152.9969	-27.7418
39	152.9954	-27.7432
40	152.9933	-27.7430



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Layer Sources
Qld State Cadastre and Mapping layers © State of Queensland (Department of Natural Resources and Mines) 2019. Updated data available at http://qldspatial.information.qld.gov.au/catalogue//
Aerial Imagery © Nearmap, 2019

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

Legend

- Impact area
- Stage 1 site (29 ha)
- Stage 1 Phase 1 fence location (Survey data)
- Stage 1 Phase 1 fence demarcation (GPS log <1m)
- Stage 2 site (201 ha)
- Onsite conservation (180 ha)

Issue	Date	Description	Drawn	Checked
A	14/11/2019	Preliminary	MC	KG

0 10 20 40 60 80 100 m

1:2,500 @ A3

Transverse Mercator | GDA 1994 | Zone 56 |

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Everleigh

ADDRESS/RPD: Greenbank Road, Greenbank *14/11/2019* *7598_E_06_School_ph1_demarc_fence_A*

Wildlife Protection and Management Plan (WPMP)

Everleigh State Primary School –Phase 1, Teviot Road, Greenbank

Tomewin Wildlife Consultancy
November 2019

Table of Contents

1. Introduction

1.1 Project Background

Tomewin Wildlife Consultancy (TWC) was commissioned by Golding Contractors on behalf of Mirvac Property Group ('the Proponent') to produce a pre-clearing fauna management report in accordance with the 'Queensland Code of Practice for the Welfare of Wild Animals Affected by Land-Clearing and Other Habitat Impacts and Wildlife Spotter / Catchers (Draft), prepared by Hanger, J. and Nottidge, B. 2009' ('the Code') for proposed clearing works associated with Everleigh(proposed school site). This report also encompasses the provisions of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and Queensland *Nature Conservation Act 1992* (NCA) and 'Fauna Management Plan for Everleigh (proposed School Site)– 432-520 Greenbank Road, Greenbank,(Issue A), prepared by Saunders Havill Group for Mirvac Queensland Pty Ltd.

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The objective of this report is to summarise the existing fauna values present and detail mitigation and management strategies applicable to fauna species likely to be present within clearing areas or retained habitat within the balance of the site. Targeted searches for EPBC Act and NCA listed species including, Koala and Grey-headed Flying-fox, were made.

1.2 Site Location and Description

The site specific including proposed clearing zone and large farm dam is located to the east of Teviot Road within the Greenbank locality with the specific project being tree clearance and dam de-watering for residential estate construction. The site is prior rural land-use area of minor slope containing wattle/Eucalypt re-growth and larger early mature to mature eucalypts, located adjacent to recent residential development with assessment of fauna value detailed below.

Figure 1 – Extent of Phase 1 Clearing

1.3 Permits and licences

TWC is a specialist Fauna spotter-catcher consultancy approved under the Queensland Department of Environment and Science (DES) and retain a Rehabilitation Permit(unrestricted species / schedules) no: **WA0014500** valid from 18.2.1019 to 17.2.2022.

Tomewin Wildlife Consultancy has a staff of three with two spotter-catchers having a minimum of ten years' experience. All staff has undergone extensive in-house training of core skills including development process awareness, clearing process awareness wildlife identification and handling. Tomewin Wildlife Consultancy has had lengthy experience on a range of large scale projects particularly addressing of Koalas and arboreal fauna associated with habitat trees.

Project experience has involved both long distance narrow easement and broad hectare clearing of green field development sites. Recent works includes responsibility for fauna management in the Moreton Bay Rail project and in large scale clearing of areas within the Coomera area.

2. Survey Methodology

The following survey techniques applied were utilized to confirm the actual and anticipated wildlife present on site.

2.1 Specific methodology for Koalas

- Observation of vegetation for Koalas, current feed values and prior indications of feed usage, ground searches for scats trace specifically in relation to Koalas.

2.2 Aquatic survey

- Site inspection to determine habitat connectivity.
- Binocular search of vegetation for raptor nests, potential hollow trees, water bird colonies and observation of dams to locate presence of water birds turtles, fish swirls on water surface.

2.3 Current fauna activity

- Consideration of time of year, actual and anticipated wildlife and prior spotter-catcher duties to determine fauna value.

- Diurnal survey including observation of tree canopy for current fauna values including active bird nests, visibly hollow bearing trees hollows or potentially hollow bearing trees. and prior accessed termite mounds
- Observation of site to locate and identify actual wildlife present.

3. Results

Survey occurred on the 14/11/2019 during late spring early summer being an activity period of the yearly breeding cycle for all faunal groups currently reduced by an extended dry spell.

3.1 Terrestrial habitat features

The site with impoverished compacted soils from prior rural land-use is of minor slope with no significant rock exposure sparse understory vegetation or fallen timber contains limited terrestrial shelter value.

3.2 Arboreal habitat features

- The site contains a sparse wattle/Eucalypt re-growth substrata and larger early mature to mature eucalyptus canopy
- juvenile to early mature eucalyptus trees *Eucalyptus tereticornis, Corymbia maculata, Eucalyptus crebna* noted as Koala feed species.
-
- No significant visibly hollow-bearing trees noted. A large number of termite arboretums (18) with prior access holes noted during survey; the absence of other habitat trees increases the potential of fauna utilization
- Potential hidden hollows within complex branching or dead scaffolds associated with largest trees noted. Three inactive stick nest structures were located.

3.3 Aquatic habitat features

- The major dam is located at the head of a minor drainage line.
- Observation of the dam confirmed presence of turtles (8 sighted with dead turtle shell noted on dam edge) with potential of additional animals due to the depth and water-holding capacity of the dam.
- No water bird or flying fox colonies or estuarine raptor nests located during survey.
- The extended dry spell has reduced the large dam current water storage capacity to an approximate third of potential storage with complete die-off of aquatic water's edge vegetation with associated loss of feed values.
-

3.4 Actual & / or Anticipated fauna species List

Fauna	**Scientific name**	**Method of Detection**	**Conservation status**
Grey Kangaroo	*Macropus giganteus*	scats	
Koala	*Phascolarctus cinereus*	Anticipated	Vulnerable
Grey-headed Flying-fox	*Pteropus poliocephalus*	anticipated	Vulnerable
Sugar Glider	*Petaurus breviceps*	Trace	
Bearded Dragon	*Pogona barbata*	observed	
Barred-sided Skink	*Eulampus tenuis*	Anticipated	
Green tree Snake	*Dendrelaphis punctulata*	Anticipated	
Kookaburra	*Dacelo novaeguineae*	observed	
Dollarbird	*Eurystomus orientalis*	observed	
Sacred Kingfisher	*Todiramphus sancta*	observed	
Scaly-breasted Lorikeet	*Trichoglossus chlorolepidotus*	observed	
Red-backed Wren	*Malurus melanocephalus*	observed	
Insect bats		Anticipated	
Common territorial birds	Magpie, noisy miner, butcher bird, kookaburra, crow	observed	

Swamp Wallaby	*Wallabia bicolor*	scats	
Buff banded Rail	*Gallirallus philippensis*	observed	
Freshwater eel	*Anguilla reinhardtii*	observed	
Long necked Turtle	*Chelodina longicollis*	observed	
Brisbane Turtle	*Emydura macquarii*	observed	
Goanna	*Varanus varius*	Anticipated	
Graceful Tree frog	*Litoria gracilenta*	call	
Dusky Moorhen	*Gallinula tenebrosa*	observed	
Pacific Black Duck	*Anas superciliosa*	observed	
White faced Heron	*Egretta novaehollandiae*	observed	
White Ibis	*Threskiornis molucca*	observed	
Red Bellied Black Snake	*Pseudoechis porphyriacus*	Anticipated	
Mosquito fish	*Gambesia sps*	observed	

3.5 Threatened Species

Results of a using the EPBC Act Protected Matters Search Tool and NCA Wildlife Online Search, identified the potential for conservation significant fauna species to occur within proximity of the site.

Scientific name	**Common Name**	**Habitat**	**EPBC Status**	**NCA status**
Daysurus maculatus maculatus	Spotted Tail Quoll	The Spot-tailed Quoll has a preference for mature wet forest requiring complex habitat features for den sites and a large home range for predatory foraging.	Endangered	Vulnerable
Delma torquata	Collared Delma	The Collared Delma is a terrestrial legless lizard requiring rocky terrain and a woodland /groundcover habitat to forage	Vulnerable	Vulnerable
Lathamus discolor	Swift Parrot	The Parrot has been previously recorded feeding in *Eucalyptus Crebna* and *Eucalyptus tereticornis*	Endangered	Endangered
Phascolarctus cinereus	Koala	The Koala occurs within the general area with the site specific containing feed trees *Corymbia maculata, Eucalytus tereticornis, Eucalyptus crebna.*	Vulnerable	Vulnerable
Pteropus poliocephalus	Grey headed Flying fox	The flying fox generally roosts in large camps proximal to watercourses foraging within melaleuca swamps, eucalyptus forests to rainforests	Vulnerable	

3.5.1 Koala

Pre clearing surveys identified the presence of mature Koala fodder species within the works extent including, *Corymbia maculata, Eucalytus tereticornis, Eucalyptus crebna. State Planning Policy 2017* (SPP) mapping also identified the site is mapped as containing areas of low value and medium value Rehabilitation Habitat for the Koala.

3.5.2 Grey Headed Flying Fox

Pre clearing surveys identified the presence of mature Eucalyptus species that may provide forage value for Grey Headed Flying Fox within the works extent including, *Corymbia maculata, Eucalytus tereticornis, Eucalyptus crebna.*

4. Wildlife Habitat Impact Assessment

The development of the Everleigh Estate will have a direct impact on fauna habitat features observed by the pre-clearance survey. It is also important to consider direct impacts associated with existing and future residential developmental areas.

Impacts to fauna as a result of vegetation clearance will include the following:

- Loss of trees for foraging, roosting and nesting;
- Loss of hollow-bearing trees for nesting and refuge;
- Loss of habitat and foraging areas for terrestrial species;
- Loss of overall habitat; and
- Potential loss of abundance of some local species.

Other impacts may include:

- Injury or death during felling of trees;
- Injury or death from machinery; and
- Alteration of nesting, foraging and general activities due to disturbance.

The Everleigh School- Phase 1 development has been designed to provide broad face dispersal options for terrestrial and arboreal fauna that may occur onsite .

Overall the site contains low value refugial opportunities for arboreal and terrestrial fauna species. The species expected within the site are likely to reflect common fauna for the region, with the exception of the Koala which is listed at both the Commonwealth and State level and the Grey-head Flying Fox protected at the Commonwealth level. Specific methodologies for this species will be detailed within the Wildlife and Habitat Impact Mitigation Plan (WHIMP). A number of conclusions and recommendations will be presented in the WHIMP, to ensure facilitate minimal impact to fauna during the vegetation clearing.

It is recommended that all identified fauna habitats onsite be inspected by Department of Environment and Science approved Fauna Spotter prior to vegetation clearing and all vegetation removal activities be supervised during the clearing process (as per the FMP). Fauna captured will be relocated to adjacent habitat. The directives given by Fauna Spotter Catchers should embrace a "best practice" in accordance with 'the Code' and must include implementation of proven specific management techniques for identified habitat types and compliance with legislation relevant to the activity.

It is recommended that in the event any nests which contain chicks are identified during clearing be left until fledged, and those that are in a construction phase should be dismantled to prevent further nesting activity.

Wildlife Habitat and Impact Mitigation Plan

Everleigh School Site - Phase 1 Clearing, Teviot Road, Greenbank

Tomewin Wildlife Consultancy

14/11/2019

Table of Contents

1. Introduction

1.1 Project Background

Tomewin Wildlife Consultancy (TWC) was commissioned by Golding Contractors on behalf of Mirvac Property Group ('the Proponent') to produce a pre-clearing fauna management report in accordance with the 'Queensland Code of Practice for the Welfare of Wild Animals Affected by Land-Clearing and Other Habitat Impacts and Wildlife Spotter / Catchers (Draft), prepared by Hanger, J. and Nottidge, B. 2009' ('the Code') for proposed clearing works associated with Everleigh(proposed school site). This report also encompasses the provisions of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and Queensland *Nature Conservation Act 1992* (NCA) and 'Fauna Management Plan for Everleigh (proposed School Site)– 432-520 Greenbank Road, Greenbank,(Issue A), prepared by Saunders Havill Group for Mirvac Queensland Pty Ltd..

The objective of this report is to summarize the existing fauna values present and detail mitigation and management strategies applicable to fauna species likely to be during pre-clearing works areas or within specific habitat areas to be retained within the site. Targeted searches for EPBC Act and NCA listed species including, Koala and Grey-headed Flying-fox, were made.

1.2 Site Location and Description

The site specific including proposed clearing zone and large farm dam is located to the east of Teviot Road within the Greenbank locality with the specific project being tree clearance and dam de-watering for residential estate construction. The site is prior rural land-use area of minor slope containing wattle/Eucalypt re-growth and larger early mature to mature eucalypts, located adjacent to recent residential development with assessment of fauna value detailed below.

Figure 1 – Extent of Phase 1 Clearing

1.3 Permits and licences

TWC is a specialist Fauna spotter-catcher consultancy approved under a QLD Rehabilitation Permit(unrestricted species / schedules) no: **WA0014500** valid from 18.2.1019 to 17.2.2022.

Tomewin Wildlife Consultancy has a staff of three with two spotter-catchers having a minimum of ten years' experience. All staff has undergone extensive in-house training of core skills including development process awareness, clearing process awareness wildlife identification and handling. Additional completed training courses are listed below. Tomewin Wildlife Consultancy has had lengthy experience on a range of large scale projects particularly addressing of Koalas and arboreal fauna associated with habitat trees.

Project experience has involved both long distance narrow easement and broad hectare clearing of green field development sites. Recent works includes responsibility for fauna management in the Moreton Bay Rail project and in large scale clearing of areas within the Coomera area.

Qualifications and experience required to complete the task	**Personnel, Duties and Responsibilities (Supervisory staff and others)**
Rehabilitation permit, Registered with D.E.H	Frank Court

General safety induction card	Frank Court, Brendan Lackey, Adam Baker, Evan Court
Clearing processes awareness – internal training	Frank Court, Brendan Lackey, Adam Baker, Evan Court
Development processes awareness– internal training	Frank Court, Brendan Lackey, Adam Baker, Evan Court
Prior experience in Australian fauna – 4 years minimum	Frank Court, Brendan Lackey, Adam baker, Evan Court
Prior experience in clearing processes– 4 years minimum	Adam baker Frank Court, Brendan Lackey,
Chainsaw operation ticket	Frank Court, Brendan Lackey , Adam Baker, Evan Court
Fell small trees	Frank Court, Evan Court
EWP operators ticket	Frank Court
Working safely at heights ticket	Frank Court, Brendan Lackey, Adam baker, Evan Court
Certificate 3 in Arboriculture	Evan Court
Electrical Awareness	Frank Court, Brendan Lackey,
Operate a 4wd vehicle in the field	Frank Court, Brendan Lackey
Canoe & water safety > 2 Meters	Frank Court, Brendan Lackey, Evan Court
Lyssa Virus vaccination	Frank Court,
Safe venomous course snake Handling	Frank Court,

2. Mitigation and Management Measures

2.1 Fauna Spotter

An Department of Environment and Science (DES) accredited Fauna Spotter Catcher must be present during all vegetation clearing activities. Inspection of fauna habitats and features identified during the pre-clearance survey must be inspected by the Fauna Spotter Catcher prior to clearing

2.2 Fauna Fencing

Temporary fencing has already been installed around the perimeter of the project and will aid in minimizing the movement of large fauna including highly mobile macropods onto roads and into adjacent estates.

2.3 Felling procedures

The following actions will effectively reduce potential fauna mortality due to removal of vegetation and construction techniques as part of the proposed development.

- It is intended that, in regard to the clearing process and associated staff, the spotter-catcher shall confirm that the tree felling operation shall occur in a manner set out below that allows safe dispersal or capture of fauna, O.H.S. issues notwithstanding.

- One Fauna spotter-catcher per clearing machine will be required for all clearing; tree-felling, raking/staking and shearing processes.

- All static fauna valued ground features and trees will be clearly identified with high visibility tape or marker spray paint.

- The clearing of the under-story prior to felling of canopy trees, will occur after a final inspection to confirm absence of current or anticipated fauna activity. Removal of canopy trees prior to addressing static fauna values reduces the potential of secondary injury to arboreal fauna dispersing into trees to be removed.

- Hollow-bearing trees will be excluded from clearing processes for a period of 24 hours to allow for fauna to disperse due to disturbance and provide for greater observation opportunities to locate potential fauna shelter

- Addressing of static fauna values, specifically the hollow-bearing trees or termite mounds where wildlife may occur. Techniques applicable to this stage of spotter-catcher duties vary due to the site specifics regarding topography, structure and stature of trees and OHS limitations.

- Habitat trees with potential to provide shelter for arboreal fauna will require sympathetic direction and de-accelerated felling technique to be applied successfully to reduce ground impact.

- Hollow-bearing trees will be accessed and examined with torch, chainsaw, buffer rags with all fauna located during spotter-catcher duties to be assessed for injury, maturity prior to being placed in a cotton capture bag.

- Hollow-bearing trees will be excluded from processing for a period of 24 hrs to allow natural dispersal of small fauna unlikely to be located.

- Where required, WHS limitations notwithstanding, the usage of an certificate 3 in arboriculture tree climber or elevated working platform will occur to access Hollow-bearing trees with significant species or numbers of breeding birds prior to clearing and further processing.

- Captured fauna will be held in suitable ambient conditions prior to release within

normal activity times for the animal concerned. All fauna captured will be released in adjacent bushland, containing suitable habitat, outside the clearing zone and within 500 m of the proposed clearing zone.

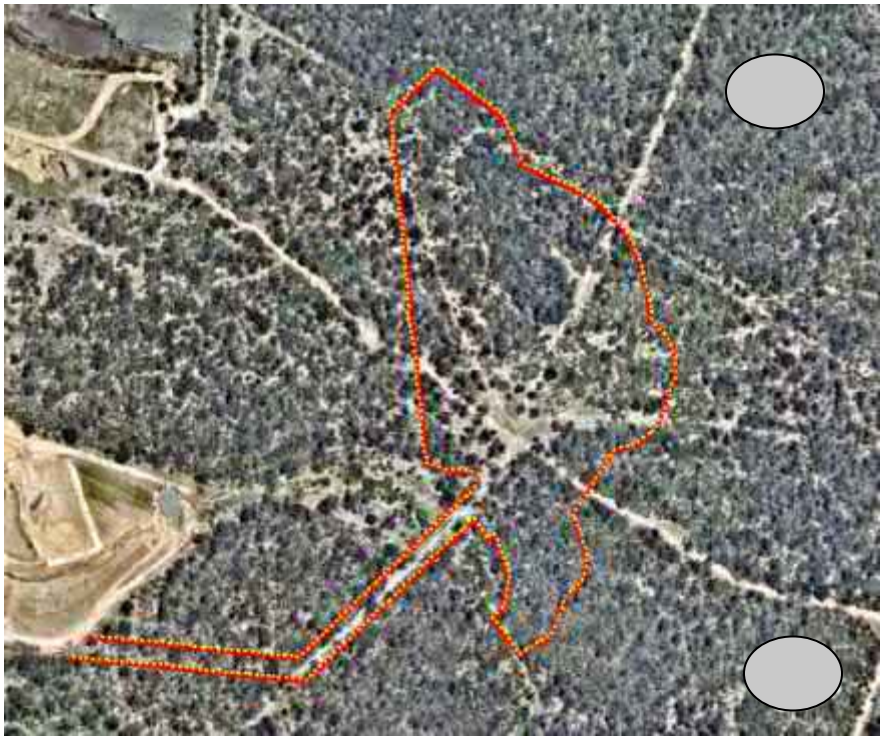


Figure 2 – Location of captured fauna

2.4 Aquatic Fauna

The site contains a large farm dam requiring de-watering as part of the development process. The following recommendations are made to mitigate impacts to potentially occupant fauna:
The spotter-catcher responsible will act in accordance with the Dam De-watering Fauna Management Plan, Teviot Road Greenbank, preapred by Saunders Havill Group (October 2017)

- It is intended that, in regard to the clearing process and associated staff, the spotter-catcher shall confirm that the dam drainage operation shall occur in a manner set out below that allows safe dispersal or capture of fauna, O.H.S. issues notwithstanding.

- The de-watering and de-silting of the pond will be monitored to confirm presence/ absence of turtles, eels; where located turtles, eels will be captured and released in local water-bodies.

- The outflow from de-watering actions must be directed into a fine sieve net to

remove exotic fish species from entering natural water bodies.

- Where located turtles, eels and fish will be addressed as an aquatic fauna recovery action. This will include capture with enviro hand nets (soft plastic/silicone coarse to fine diameter weave dependant on species) and drag nets placed in water filled containers. The proposed action will include ground search of mud after the draining of the water-body to locate sheltering turtles and eels.

- Checking of water's edge tall, dense grass for a representative population of small frogs listed will occur with captured frogs to be released in down stream proximal wetland to the site.

- Captured endemic aquatic fauna will be held in water-holding boxes kept in suitable ambient conditions prior to release within release sites designated by the Dam De-watering Fauna Management Plan, Teviot Road Greenbank, preapred by Saunders Havill Group (October 2017)
  .

2.5 Terrestrial and Arboreal Fauna

Overall the site contains low value refugial opportunities for arboreal and terrestrial fauna species due to prior land-use impacts on habitat values. The species expected within the site are likely to primarily reflect common fauna assemblages for the region however provisions are proposed directly for common fauna and species of conservation significance. It is advised that all identified fauna habitats onsite be inspected by a Department of Environment and Science (DES) approved Fauna Spotter prior to vegetation clearing and all vegetation removal activities be supervised during the clearing process. Terrestrial load reduction activities will be conducted ahead of the clearing front where possible. Fauna captured will be relocated to adjacent habitat consistent with the life history requirements of the species requiring translocation.

- Terrestrial trapping, prior to and within a proposed daily clearing area using Elliot A traps and cage traps, will occur. Located fauna will be retained in cotton capture bags prior to release.

- There will be specific ground searches for terrestrial fauna prior to clearing and observation of the clearing process and if located temporary shelter areas to be allocated to minimise stress and provide dispersal options will occur.

- There will be observation of the clearing process for dispersing Kangaroos and Wallabies potentially on site and where required temporary shelter areas to be allocated to minimise stress will occur.

- Where possible, hollow branches containing sugar glider colonies will be removed

intact, to be placed in retained trees outside and adjacent to the proposed clearing zone.

- Hollow-bearing trees and trees where fauna dispersal has been noted will be excluded from processing for a period of 24 hrs to allow natural dispersal of fauna and minimise potential fauna impacts.

2.6 Threatened Species (Specific Provisions)

The potential presence of significant fauna; that is fauna scheduled as Endangered, Vulnerable, Near threatened (EVNT) in the *Queensland Nature Conservation Act 1992* or listed as threatened species under the *Commonwealth Environmental Protection & Biodiversity Act 1999* not listed in this report will be considered by the wildlife spotter-catcher during clearing processes. If and where an EVNT species is located onsite an immediate cessation of clearing process and an exclusion zone defined by high visibility tape will occur. Relevant authorities, the designated environmental management consultants and DES Wildlife Officer will be notified to confirm issues and where required arrange a site inspection prior to commencement of clearing process.

2.6.1 Koala

Due the high component of Koala feed species present, in accordance with the *Nature Conservation (Koala)) Conservation Plan 2017*, the below actions will be directed to allow Koala dispersal without human intervention.

- A Koala spotter will be required to conduct pre-clearing inspection of trees and scat-checks of cleared understory areas to confirm the location of koalas prior to felling. The Koala spotter will confirm the position located Koalas and perform designated health checks and as part of daily duties.

- It is intended that the direction of the clearing process will occur in accordance with the approved Saunders Havill *Vegetation Management Plan, Proposed School Development, prepared by Saunders Havill Group, (September 2019)*
- . It is the intention of the FSC to direct the clearing process from the edge of the existing pasture / treeline vegetation systems to the nearest edge of suitable retained habitat to encourage Koala dispersal out of clearing zones and avoid land-locking of Koalas within the clearing zone.

- Within areas of forest structure, it is intended that a maximum clearing rate of three hectares per day will occur.

- During the clearing process, there will a differentiation between *complete cover trees* and *See-through trees* where *Complete cover trees* will be retained until the spotter-catcher responsible is certain of absence of Koalas prior to the tree being felled.
  A *Complete cover tree* is defined as a tree with luxuriant foliage that does not allow confirmation of absence of Koalas without a full 360 degree viewing and if

required extended viewing during peripheral clearing operations to detect movement.
A *See-through tree* is defined as sparsely foliated tree where a 360 degree viewing confirms the absence of Koalas.

- Where located, Koalas in trees will be clearly identified by high visibility tape or paint and site foreman and clearing crew will be informed to confirm presence of animal in clearing area.
- The Environmental Coordinator will be informed via phone call and email within 1 hour of the following:
    - Sighting of a Koala within the Clearing Area
    - Sighting of a koala which appears sick or injured
    - Incidences resulting in a koala being in imminent danger
    - Incidences resulting in koala injury *or fatality*
    - *The lawful capture of a koala*

- When located, Clearing Exclusion and Dispersal zones around the active Koala tree will be set out where no activity can occur for the day's duration to confirm animal safety and allow dispersal.

- Exclusion zones from current clearing processes will be set at two tree heights distance including proximal under-story vegetation from the located Koala. All felling of trees will directed 180 degrees away from the located Koala to minimise noise disturbance in the peripheral area.

- Dispersal zones in addition to Exclusion zones will be set where late observation location of koalas may isolate them from the retained habitat zone. A sequence of trees 10m to 20m apart will be retained for an interim period to provide voluntary dispersal options. Where preliminary clearing of under-story vegetation has occurred and causes potential terrestrial impediment to dispersal, raking processes to assist egress under FSC supervision will occur

- Koala response to peripheral human activity will be monitored by Koala spotter-catcher to confirm acceptable disturbance and if required, cessation of clearing process. A four point monitoring protocol utilized for Koalas within the clearing zone is as follows.

0 - Koala sleeping in perch; normal behaviour
1 - Koala awake, alert, resting position in perch – acceptable disturbance
2 - Koala awake, alert to shifting position in same perch – acceptable disturbance
3 - Koala moving perch position within tree - unacceptable disturbance, increased exclusion zone
4 – Koala exhibiting panicked behaviour, vocalizations - unacceptable disturbance, immediate cessation of clearing process within general area of Koala.

Where observations of Koala by senior FSC / permit holder indicates poor health or injury the designated environmental authority and the Environmental Coordinator will be notified to confirm issues and where required seek approval to capture/relocate the Koala to suitable veterinary care designated below.

2.6.2 Grey Headed Flying Fox

There is a potential that Grey headed flying fox may utilize the site feed values as part of it movements including temporary roosting.

- Specific searches for flying fox colonies that may have moved into the area will occur on a daily basis within the designated clearing zone.

- When located, Clearing Exclusion and Dispersal zones around the active flying fox roost tree will be set out where no activity can occur for the day's duration to confirm animal safety and allow dispersal.

3. Wildlife Capture and Removal plan

Relocation of native fauna is a strategy that may be required during the course of developmental works to up-hold the project's required nature conservation, animal welfare and human safety objectives. In all circumstance where native fauna are required to be relocated it must be done so, or under the direct supervision of, a suitably licensed fauna spotter/catcher.

Suitable release sites for fauna take into account a number of considerations, depending on the ecology of the animal. These considerations include:

- Adequate food supply and presence of prey species;
- Adequate housing and nesting habitat such as tree hollows, dense vegetation, suitable areas to burrow;
- Similar vegetation type, eg. Similar tree species, density, and location to water;
- Appropriate social group, eg. Releasing all gliders from one family group into the same area;
- Releasing territorial animals as close as practical to their home range (within 1km or less), but far enough away that they won't re-disperse to the clearing zone;
- Habitat corridors that are of suitable size, and connect to other suitable habitat for further dispersal to avoid overpopulation of the release site., and;
- Time of day: Nocturnal release for nocturnally active animals .Additionally, if aquatic animals are required to be captured in the event of a dewatering, potential release locations will consider the following factors:
- Recent rainfall and observed flow velocity of waterways or river;

- Composition of riparian vegetation (with preference for presence of native flora species and dense/overhanging vegetation);
- Diversity of habitats available (i.e. riffles/pools);
- Presence of invasive species (i.e. Carp or Gambusia);
- Potential availability of food resources (i.e. for Turtles); and
- Evidence of overpopulation of relevant species.

4. Wildlife Contingency Plan

In the event sick, injured or orphaned protected animals are encountered during the course of the project they shall be administered to in accordance with the *Code of Practice Care of Sick, Injured or Orphaned Protected Animals in Queensland* under the *Nature Conservation Act 1992*. The stages in which injuries or illness are described under the code are as follows:

- **Critical:** Injuries or illnesses that are life-threatening; for example, an animal that has been struck by a car and has serious head injuries.
- **Serious:** Injuries or illnesses that might reasonably be expected to cause moderate pain (but are not immediately life-threatening), and the animal is not showing obvious signs of distress or pain, or significantly reduced mental activity; for example an animal with a closed fracture but no other apparent injuries and that is alert and responsive.
- **Mild:** The injuries or illness of an animal appear to cause little discomfort, pain or function loss and are not life-threatening (even without immediate vet treatment); for example superficial cuts, superficial bruising or orphaned animals suffering from mild dehydration.

Designated veterinarian care will be

- The Blooming Vet, 15 Pub Lane, GreenBank QLD 4124 Ph: 0732976666
- RSPCA Wildlife Hospital, Wacol Ph 1300264625

5. Wildlife Housing and Care Plan

For wildlife requiring storage, temporary housing and transportation to release sites and/or to a wildlife carer or veterinarian, guidelines set out in the Code and TWC's Animal Ethics Permit will be followed. Dependent on the species of animal and condition of the animal, temporary storage and housing of animals will be as follows:

- **Calico bags**: Calico bags will be used to temporarily house fauna such as snakes, lizards and small mammals (including microbats), Bags will range in size from 200mm x 200mm to 600mm x 1800mm. Bag selection will vary according to the size of animals to be placed in them. In the case of snakes a "hoop bag" may be used to facilitate capture. The hoop is approximately 500mm in diameter attached to a handle. The bag is placed around the hoop ensuring a greater area in which to pass the snake through into the bag

- **Plastic holding tubs/containers/animal crate**: Plastic holding tubs/containers/crates will be used to temporarily house fauna such as snakes, lizards, frogs, small mammals and birds (Plastic holding tubs/containers/crates will range in size from 150mm x 150mm x 120mm to 500mmx 400mm x 400mm. Plastic holding tubs/containers/crates selection will vary according to the size and number of animals to be placed in them. In addition to this, material is used to line the tub/crate to ensure the animals won't lose its footing. This may include folded towels on the bottom of the crate or a fitted pad. These items are washed between each use to reduce the spread of disease/parasites.

Section 9 of the Code relates to how transportation of wildlife should be undertaken. The following will be adhered to when transporting wildlife to the vet and/or carer:

- Additional pain or distress of the animal is to be avoided;
- Wildlife should only be transported when necessary;
- Transport containers must be appropriate for the species (size, strength and behaviour of species being moved;
- Transport containers must be designed and maintained in a way as to:
    - Prevent injury;
    - Prevent escape;
    - Prevent rolling/tipping during transit;
    - Prevent damage to plumage (feathers);
    - Be hygienic;
    - Minimise stress and
    - Be suitably ventilated.
- Non-compatible species must not be transported in a manner which allows for visual or physical contact;
- Containers must be secured to prevent movement and provide protection from direct sunlight, wind and rain;
- Venomous, dangerous or potentially disease transmitting animals must be clearly marked with warning labels (i.e. Caution –'venomous snake' or 'live bat') and be locked and secured.

6. Willdlife Release and disposal plan

All vertebrate fauna species encountered (relocated, moved, injured or killed) during the preclearing, construction and operational works will be recorded and a summary of events will be presented to the client within the post clearing report.

The fauna spotter catcher will collect information pertaining to each capture, sighting and release
of all animals interacted with onsite including:

a. species;

b. identification name or number;
c. sex (M, F, or unknown);
d. approximate age or age class (neonate, juvenile, sub-adult, adult);
e. time and date of capture;
f. method of capture;
g. exact point of capture (GPS point);
h. state of health;
i. incidents associated with capture likely to affect the animal;
j. veterinary intervention or treatments;
k. time held in captivity;
l. disposal (euthanasia, re-release, translocation etc);
m. date and time of disposal;
n. details of disposal (if released, exact point of release GPS);
o. for released animals: distance in metres from point of capture to point of release.

7. Post Works Impact Minimisation

Where fauna is found on site during the absence of the fauna spotter (i.e., on days or in areas where no fauna spotter catcher is required), the following will occur:

- Cease works at the location of the animal;
- Report the animal immediately to the site foreman and environmental officer
- Contact the fauna spotter catcher
- Do not attempt to touch or catch an animal as it may be dangerous;
- Maintain site and known area of animal;
- If required, set up an exclusion zone around the animal;
- Once the TWC fauna spotter catcher arrives, take them to the animal.
- The fauna spotter catcher will follow the procedures outlined above.

8. Recommendations

Where fauna is found on site during the absence of the fauna spotter (i.e., on days or in areas where no fauna spotter catcher is required), the following will occur:

- Cease works at the location of the animal;
- Report the animal immediately to the site foreman and environmental officer
- Contact the fauna spotter catcher
- Do not attempt to touch or catch an animal as it may be dangerous;
- Maintain site and known area of animal;

- If required, set up an exclusion zone around the animal;
- Once the TWC fauna spotter catcher arrives, take them to the animal.
- The fauna spotter catcher will follow the procedures outlined above.

EROSION RISK RATING

BASED ON AVERAGE MONTHLY RAINFALL (SOURCE TABLE 4.4.2 IECA 2008)

MONTHLY DATA	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEPT.	OCT.	NOV.	DEC.
MEAN RAINFALL	101.00	79.50	130.90	535.50	33.50	67.80	19.80	24.50	23.40	35.80	109.10	75.500
EROSION RISK	HIGH	MODERATE	HIGH	MODERATE	LOW	MODERATE	VERY LOW	VERY LOW	VERY LOW	LOW	HIGH	MODERATE

	VERY LOW RISK: 0 TO 30mm
	LOW RISK: 30+ TO 45mm
	MODERATE RISK: 45+ TO 100mm
	HIGH RISK: 100+ TO 225mm
	EXTREME RISK: >225mm

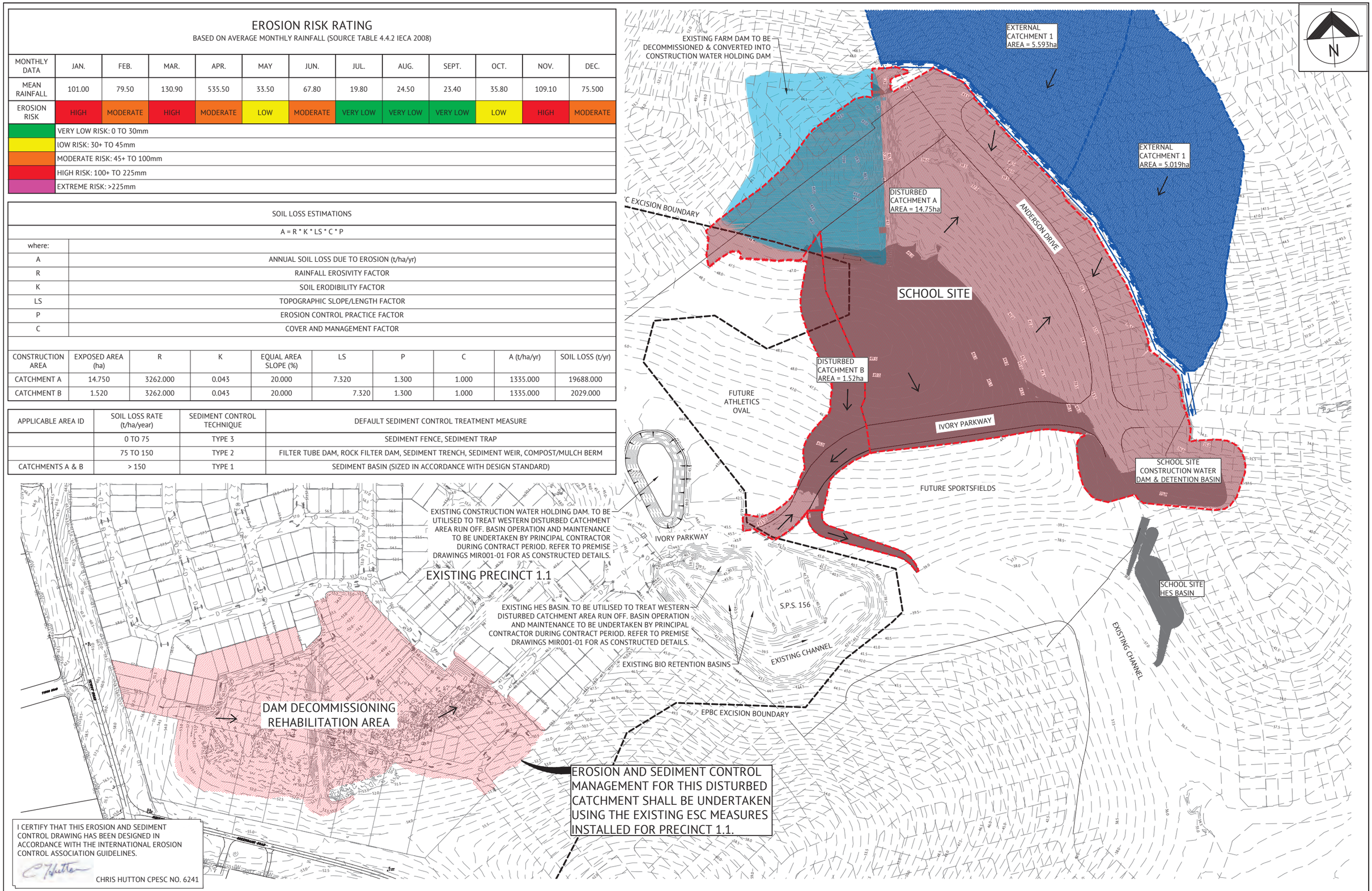
SOIL LOSS ESTIMATIONS

A = R * K * LS * C * P

where:	
A	ANNUAL SOIL LOSS DUE TO EROSION (t/ha/yr)
R	RAINFALL EROSIVITY FACTOR
K	SOIL ERODIBILITY FACTOR
LS	TOPOGRAPHIC SLOPE/LENGTH FACTOR
P	EROSION CONTROL PRACTICE FACTOR
C	COVER AND MANAGEMENT FACTOR

CONSTRUCTION AREA	EXPOSED AREA (ha)	R	K	EQUAL AREA SLOPE (%)	LS	P	C	A (t/ha/yr)	SOIL LOSS (t/yr)
CATCHMENT A	14.750	3262.000	0.043	20.000	7.320	1.300	1.000	1335.000	19688.000
CATCHMENT B	1.520	3262.000	0.043	20.000	7.320	1.300	1.000	1335.000	2029.000

APPLICABLE AREA ID	SOIL LOSS RATE (t/ha/year)	SEDIMENT CONTROL TECHNIQUE	DEFAULT SEDIMENT CONTROL TREATMENT MEASURE
	0 TO 75	TYPE 3	SEDIMENT FENCE, SEDIMENT TRAP
	75 TO 150	TYPE 2	FILTER TUBE DAM, ROCK FILTER DAM, SEDIMENT TRENCH, SEDIMENT WEIR, COMPOST/MULCH BERM
CATCHMENTS A & B	> 150	TYPE 1	SEDIMENT BASIN (SIZED IN ACCORDANCE WITH DESIGN STANDARD)



I CERTIFY THAT THIS EROSION AND SEDIMENT CONTROL DRAWING HAS BEEN DESIGNED IN ACCORDANCE WITH THE INTERNATIONAL EROSION CONTROL ASSOCIATION GUIDELINES.

CHRIS HUTTON CPESC NO. 6241

FOR CONSTRUCTION

DATE	REV	DESCRIPTION	RPEQ
18/07/19	A	SELF-CERTIFIED DRAWING ISSUE	

REVISIONS

Premise

BRISBANE OFFICE
LEVEL 1, 100 BRUNSWICK STREET
PO BOX 361
FORTITUDE VALLEY, QLD 4006
PH: (07) 3253 2222
WEB: www.premise.com.au

DESIGNED MICHAEL MAIZNER
CHECKED JOSHUA STONE
PROJECT COORDINATOR CLINT THORP
PROJECT CERTIFIER DATE
JOSHUA STONE

RPEQ JOSHUA STONE RPEQ 15187

SCALE 0 40 80 120m
SCALE 1:2000 (A1)

CLIENT MIRVAC
PROJECT EVERLEIGH SCHOOL SITE PACKAGE 1 - BULK EARTHWORKS
LOCATION TEVIOT ROAD, GREENBANK
SHEET TITLE OVERALL EROSION & SEDIMENT CONTROL KEY PLAN

JOB CODE MIR016
SHEET NUMBER C400
REV A

LEGEND - PROPOSED

- DISTURBED AREA
- CLEAN WATER DIVERSION BUND
- DIRTY WATER DIVERSION DRAIN *
- MULCH BUND
- FLOW DIRECTION ARROW

LEGEND - EXISTING

- MAJOR CONTOURS (1.00m) — 12.0
- MINOR CONTOURS (0.50m)
- CLEAN WATER DIVERSION DRAIN
- DIRTY WATER DIVERSION DRAIN

***** DIRTY WATER DIVERSION DRAIN NOTE:

LOCATION SHOWN ON THIS DRAWING IS INDICATIVE ONLY AND SHALL BE CONFIRMED BY THE CONTRACTOR FOR SUITABILITY. FINAL LOCATION TO BE APPROVED BY THE SUPERINTENDENT.

N

FUTURE PRECINCT

EXISTING DAM TO BE DECOMMISSIONED

EPBC EXCISION BOUNDARY

INSTALL MULCH BUND AT DOWNSTREAM OF EDGE OF EXISTING DAM

SCHOOL SITE

INSTALL CLEAN WATER DIVERSION PRIOR TO CLEAR AND GRUB PHASE

DWD - 1

CWD - 1

CWD - 2

START POINT OF CLEAN WATER DIVERSION DRAIN 2 (CWD - 2)

FUTURE PRECINCT

I CERTIFY THAT THIS EROSION AND SEDIMENT CONTROL DRAWING HAS BEEN DESIGNED IN ACCORDANCE WITH THE INTERNATIONAL EROSION CONTROL ASSOCIATION GUIDELINES.

CHRIS HUTTON CPESC NO. 6241

JOINS DRAWING C402

FOR CONSTRUCTION

DATE	REV	DESCRIPTION	RPEQ
18/07/19	A	SELF-CERTIFIED DRAWING ISSUE	

REVISIONS

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DESIGNED	MICHAEL MAJZNER	RPEQ	JOSHUA STONE RPEQ 15187
CHECKED	JOSHUA STONE	SCALE	0 30 60 90m
PROJECT COORDINATOR	CLINT THORP		SCALE 1:1500 (A1)
PROJECT CERTIFIER	DATE		
JOSHUA STONE			

CLIENT	MIRVAC
PROJECT	EVERLEIGH SCHOOL SITE PACKAGE 1 - BULK EARTHWORKS
LOCATION	TEVIOT ROAD, GREENBANK
SHEET TITLE	EROSION & SEDIMENT CONTROL - CLEAR AND GRUB PHASE - SHEET 1

JOB CODE	
MIR016	
SHEET NUMBER	REV
C401	A

JOINS DRAWING C401

N

FUTURE ATHLETICS OVAL

SCHOOL SITE

DWD - 1

DWD - 2

CWD - 2

FUTURE PRECINCT

FUTURE SPORTS FIELDS

CONSTRUCTION WATER HOLDING DAM / DETENTION BASIN

INSTALL MULCH BUND AT DOWNSTREAM OF CLEAR AND GRUB AREA

INSTALL CLEAN WATER DIVERSION BUND UPSTREAM OF WORKS AREA

EPBC EXCISION BOUNDARY

FORM 'U' SHAPED BUND AT DOWNSTREAM END OF CLEARING WORKS.

HIGH FLOW BYPASS CHANNEL FROM DETENTION BASIN SPILLWAY

OUTLET TO HES BASIN

EXISTING CHANNEL

HES BASIN
FOR DETAILS, REFER TO DWGS C408-C411

FUTURE PRECINCT

FUTURE PRECINCT

I CERTIFY THAT THIS EROSION AND SEDIMENT CONTROL DRAWING HAS BEEN DESIGNED IN ACCORDANCE WITH THE INTERNATIONAL EROSION CONTROL ASSOCIATION GUIDELINES.

CHRIS HUTTON CPESC NO. 6241

FOR CONSTRUCTION

DATE	REV	DESCRIPTION	RPEQ
18/07/19	A	SELF-CERTIFIED DRAWING ISSUE	

REVISIONS

Premise

BRISBANE OFFICE
LEVEL 1, 100 BRUNSWICK STREET
PO BOX 361
FORTITUDE VALLEY, QLD 4006
PH: (07) 3253 2222
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DESIGNED	MICHAEL MAJZNER
CHECKED	JOSHUA STONE
PROJECT COORDINATOR	CLINT THORP
PROJECT CERTIFIER	DATE

JOSHUA STONE

RPEQ

JOSHUA STONE RPEQ 15187

SCALE

0 30 60 90m

SCALE 1:1500 (A1)

CLIENT	MIRVAC
PROJECT	EVERLEIGH SCHOOL SITE PACKAGE 1 - BULK EARTHWORKS
LOCATION	TEVIOT ROAD, GREENBANK
SHEET TITLE	EROSION & SEDIMENT CONTROL - CLEAR AND GRUB PHASE - SHEET 2

JOB CODE	
MIR016	
SHEET NUMBER	REV
C402	A

LEGEND - PROPOSED

- FLOW DIRECTION OR RUNOFF
- CLEAN WATER DIVERSION BUND
- DIRTY WATER DIVERSION DRAIN
- MULCH BUND
- EXTENT OF CUT
- EXTENT OF FILL
- 12.0 — FINISHED MAJOR CONTOURS (0.50m)
- FINISHED MINOR CONTOURS (0.25m)

LEGEND - EXISTING

- 12.0 — MAJOR CONTOURS (1.00m)
- MINOR CONTOURS (0.50m)
- CLEAN WATER DIVERSION DRAIN
- DIRTY WATER DIVERSION DRAIN

N

FUTURE PRECINCT

INSTALL MULCH BUND AT TOE OF BATTER

EPBC EXCISION BOUNDARY

SCHOOL SITE

ANDERSON DRIVE

RUNOFF TO FLOW DOWN ROAD BOX TO CONSTRUCTION WATER DAM DURING BULK EARTHWORKS PHASE

CONSTRUCT 0.5m HIGH GEOFABRIC LINED BUND ALONG SCHOOL FRONTAGE TO DIRECT SCHOOL SITE FLOWS TO CONSTRUCTED STORMWATER PIT

ONCE FINAL LEVELS ARE ACHIEVED, SPRAY CHANNEL WITH HEAVY DUTY POLYMER SPRAY AND INSTALL ROCK CHECKS AT 20m CRS

FUTURE PRECINCT

INSTALL MULCH BUND AT TOE OF BATTER

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CHRIS HUTTON CPESC NO. 6241

JOINS DRAWING C404

FOR CONSTRUCTION

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PROJECT CERTIFIER	JOSHUA STONE
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RPEQ	JOSHUA STONE RPEQ 15187

SCALE 0 15 30 45m

SCALE 1:750(A1)

CLIENT	MIRVAC
PROJECT	EVERLEIGH SCHOOL SITE PACKAGE 1 - BULK EARTHWORKS
LOCATION	TEVIOT ROAD, GREENBANK
SHEET TITLE	EROSION & SEDIMENT CONTROL - BULK EARTHWORKS PHASE - SHEET 1

JOB CODE	
MIR016	
SHEET NUMBER	REV
C403	B

JOINS DRAWING C403

N

FUTURE ATHLETICS OVAL

SCHOOL SITE

ONCE FINAL LEVELS ARE ACHIEVED, SPRAY CHANNEL WITH HEAVY DUTY POLYMER SPRAY AND INSTALL ROCK CHECKS AT 20m CRS

CONSTRUCT 0.5m HIGH GEOFABRIC LINED BUND ALONG SCHOOL FRONTAGE TO DIRECT SCHOOL SITE FLOWS TO CONSTRUCTED STORMWATER PIT

STORMWATER INLET FOR FLOWS CAPTURED FROM THE SCHOOL SITE

CONSTRUCT CONTAINMENT BUND AT DOWNSTREAM END OF CHANNEL BUND LEVEL RL 43.2

IVORY PARKWAY

RUNOFF TO FLOW DOWN ROAD BOX TO CONSTRUCTION WATER DAM DURING BULK EARTHWORKS PHASE

FUTURE SPORTS FIELDS

ANDERSON DRIVE

ROAD 81

FUTURE PRECINCT

INSTALL MULCH BUND AT TOE OF BATTER

EXTEND CLEAN WATER DIVERSION AROUND CONSTRUCTION WATER DAM

CONSTRUCTION WATER HOLDING DAM / DETENTION BASIN

HIGH FLOW BYPASS CHANNEL FROM DETENTION BASIN SPILLWAY

OUTLET TO HES BASIN

HES BASIN
FOR DETAILS, REFER TO DWGS C408-C411

ONCE FINAL LEVELS ARE ACHIEVED, SPRAY CHANNEL WITH HEAVY DUTY POLYMER SPRAY AND INSTALL ROCK CHECKS AT 20m CRS

EPBC EXCISION BOUNDARY

EXISTING CHANNEL

FUTURE PRECINCT

FUTURE PRECINCT

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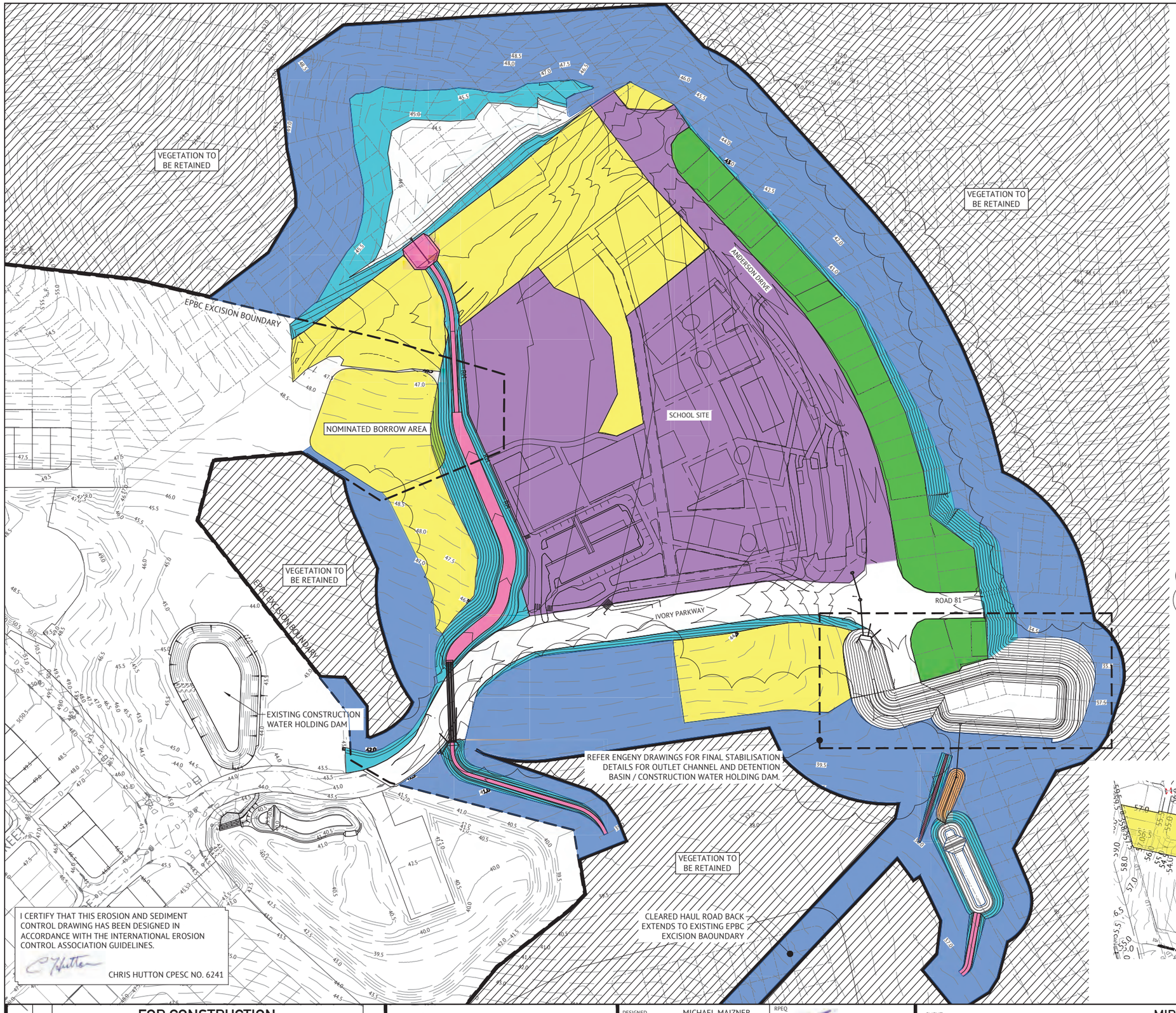


N

STABILISATION LEGEND

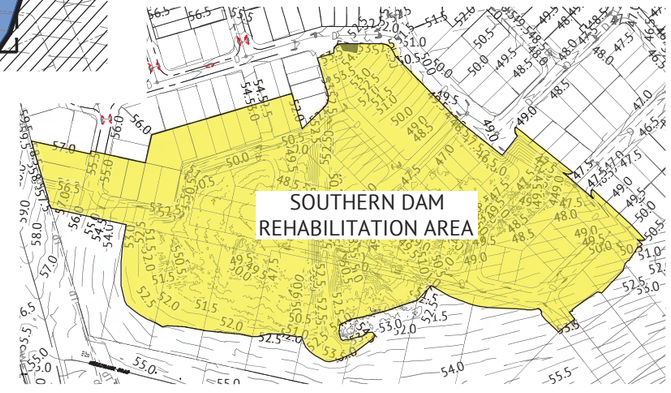
- 50mm THICK TOPSOIL AND GRASS SEEDING
- 100mm THICK TOPSOIL AND GRASS SEEDING AND STICK RAKING (TO FUT. ALLOTMENTS)
- 100mm THICK TOPSOIL AND GRASS SEEDING AND STICK RAKING (TO BATTERS)
- 100mm THICK TOPSOIL AND TURF
- NO TOPSOIL AND POLYMER SPRAY
- GEOFABRIC LINING (TO BATTERS)
- CLEARING AREA STABILISATION. CONTRACTOR TO ENSURE AREA IS ADEQUATELY STABILISED FOLLOWING DISTURBANCE INCLUDING FILLING OF ROOT BALL DEPRESSIONS TO ELIMINATE WATER PONDING.
- D — PROPOSED STORMWATER
- 12.0 — FINISHED CONTOURS (0.50m)

LEGEND - EXISTING

- 12.0 — CONTOURS (0.5m INTERVAL)

NOTES:

1. CONTRACTOR TO ENSURE THAT GRASS SEEDING AREAS TO ACHIEVE SUFFICIENT STRIKE AND COVERAGE IN ACCORDANCE WITH LOGAN CITY COUNCIL STANDARDS.



INSET A

SCALE: 1:2500

0 50 100 150m

SCALE 1:2500 (A1)

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CHRIS HUTTON CPESC NO. 6241

FOR CONSTRUCTION

DATE	REV	DESCRIPTION	RPEQ
17/10/19	D	CLEARING AREA EXTENT INCREASED	JCS
20/08/19	C	BORROW AREA EXTENT INCREASED	JCS
05/08/19	B	AMENDED HATCH AREA	JCS
18/07/19	A	SELF-CERTIFIED DRAWING ISSUE	JCS

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	SCALE 1:1500 (A1)

CLIENT	MIRVAC
PROJECT	EVERLEIGH SCHOOL SITE PACKAGE 1 - BULK EARTHWORKS
LOCATION	TEVIOT ROAD, GREENBANK
SHEET TITLE	EROSION & SEDIMENT CONTROL - STABILISATION PHASE

JOB CODE	
MIR016	
SHEET NUMBER	REV
C405	D

EROSION & SEDIMENT CONTROL NOTES

1. LOCATION & LEVELS OF ALL EXISTING SERVICES TO BE CONFIRMED ON SITE BY CONTRACTOR PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
2. REFER EARTHWORKS DRAWINGS FOR ADDITIONAL NOTES.
3. ALL TRENCHES, FOOTPATH EXCAVATIONS & STOCKPILES TO BE PROTECTED BY TEMPORARY SEDIMENT FENCES UNTIL 80% GRASS COVERAGE IS ACHIEVED TO DISTURBED AREAS.
4. EVERY PRECAUTION IS TO BE TAKEN TO PREVENT THE TRANSPORT OF SILT INTO THE NEWLY LAID STORMWATER PIPES THAT ARE CONNECTED TO THE DOWNSTREAM PIPE SYSTEMS, AND ANY EXISTING OPEN CHANNELS.
5. THESE NOTES SHALL BE READ IN CONJUNCTION WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.
6. THE EROSION AND SEDIMENT CONTROL WORKS SHALL COMPLY WITH THE REQUIREMENTS OF THE LOCAL AUTHORITIES EROSION AND SEDIMENT CONTROL STANDARDS.
7. THE CONTRACTOR SHALL TAKE ALL REASONABLE AND PRACTICABLE MEASURES TO:

- ALLOW STORMWATER TO PASS THROUGH THE SITE IN A CONTROLLED MANNER AND AT NON EROSIVE FLOW VELOCITIES;
- MINIMISE SOIL EROSION FROM WATER AND WIND;
- MINIMISE ADVERSE EFFECTS OF SEDIMENT RUN-OFF;
- MINIMISE OR PREVENT ENVIRONMENTAL HARM ASSOCIATED WITH DISCHARGES FROM THE SITE (E.G. THE EFFECTS OF SEDIMENTATION ON THE ENVIRONMENTAL VALUES OF RECEIVING WATERS); AND
- ENSURE THAT THE VALUE AND USE OF RESIDENTIAL PROPERTIES ADJACENT TO THE DEVELOPMENT (SUCH AS DRAINAGE AND ROADS) ARE NOT DIMINISHED AS A RESULT OF THE MIGRATION OF SEDIMENT FROM THE DEVELOPMENT.

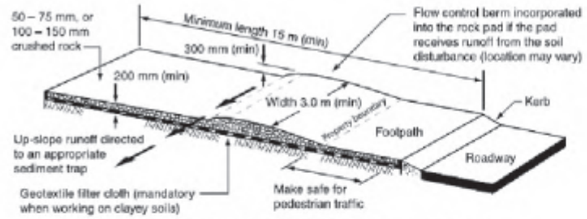
4. THE CONTRACTOR SHALL APPOINT AN APPROPRIATELY EXPERIENCED PERSON TO BE MADE RESPONSIBLE FOR IMPLEMENTATION OF THE ESC.
5. ALL ESC MEASURES SHALL BE INSPECTED:

- AT LEAST DAILY (WHEN WORK IS OCCURRING ON SITE).
- AT LEAST WEEKLY (WHEN WORK IS NOT OCCURRING ON SITE).
- WITHIN 24 HOURS OF EXPECTED RAINFALL.
- WITHIN 18 HOURS OF RAINFALL OCCURRING.

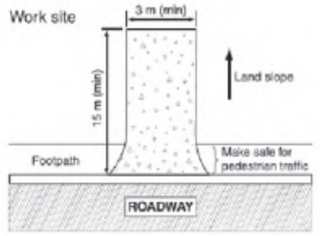
6. MAINTENANCE OF ESC MEASURES SHALL OCCUR TO ENSURE THEY ARE OPERATING EFFICIENTLY AND IN ACCORDANCE WITH THE FOLLOWING SCHEDULE:

ESC MEASURES	MAINTENANCE TRIGGER	TIME FRAME FOR UNDERTAKING MAINTENANCE
SEDIMENT BASINS	WHEN SETTLED SEDIMENT VOLUME EXCEEDS THE VOLUME OF THE SEDIMENT SETTLEMENT ZONE	WITHIN 4 DAYS OF INSPECTION
OTHER ESC MEASURES	WHEN SETTLED SEDIMENT VOLUME EXCEEDS 25% OF THE CAPACITY OF THE ESC MEASURE	BY THE END OF THE DAY

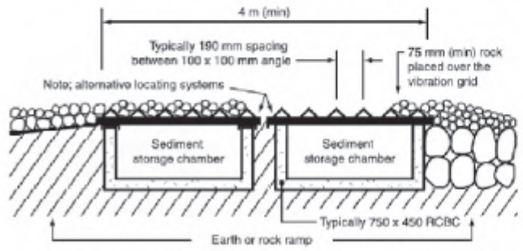
7. INSTALL DIVERSION CATCH DRAINS UPSTREAM OF, AND SILT FENCE DOWNSTREAM OF, STOCKPILES.
8. STOCKPILES ARE TO BE LOCATED AWAY FROM EROSION HAZARD AREAS SUCH AS DRAINAGE LINES AND STEEP SLOPES.
9. STOCKPILES ARE TO BE PROTECTED FROM EROSION BY THE WIND.
10. ADEQUATE SUPPLIES OF EMERGENCY MAINTENANCE MATERIALS, INCLUDING (BUT NOT LIMITED TO) TIE WIRE, STAKES, FILTER CLOTH, WIRE MESH AND CLEAN GRAVEL SHOULD BE AVAILABLE ON-SITE.
11. ESC MAINTENANCE ACTIVITIES ARE TO BE RECORDED IN AN ON-SITE REGISTER. THE REGISTER IS TO BE MAINTAINED FOR THE DURATION OF THE WORKS AND IS TO BE MADE AVAILABLE TO THE SUPERINTENDENT.
12. DISTURBED AREA ARE TO BE STABILISED AS SOON AS POSSIBLE ON COMPLETION OF BULK EARTHWORKS. LOTS TO BE STABILISED FOLLOWING RESPREADING OF TOPSOIL.
13. SUPPLEMENTARY ESC MEASURES SHALL BE DIRECTED BY THE SUPERINTENDENT.



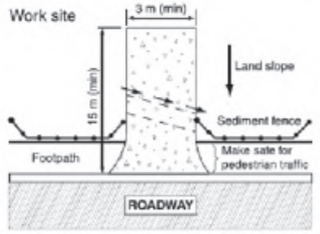
(a) Rock entry/exit pad for construction sites (refer to Standard Drawing Exit-03 for building sites)



(b) Rock pad sloping away from road



(c) Alternative low maintenance arrangement (still under development)



(d) Rock pad sloping towards the road

CONSTRUCTION ENTRANCE DETAIL

MATERIALS

COMPOSTS MUST COMPLY WITH THE REQUIREMENTS OF AS4454.

(i) WELL-DECOMPOSED 100% ORGANIC MATTER PRODUCED BY CONTROLLED AEROBIC (BIOLOGICAL) DECOMPOSITION.

(ii) MAXIMUM OF 1% OF INERT MATERIAL.

(iii) MAXIMUM SOLUBLE SALT CONCENTRATION OF 5dS/m, AND pH RANGE OF 5.0 TO 8.5.

(iv) MOISTURE CONTENT OF 30 TO 50% PRIOR TO APPLICATION.

INSTALLATION

1. REFER TO APPROVED PLANS FOR LOCATION AND EXTENT. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, EXTENT, MATERIAL TYPE, OR METHOD OF INSTALLATION CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. WHEN SELECTING THE LOCATION OF A COMPOST FILTER BERM, TO THE MAXIMUM DEGREE PRACTICABLE, ENSURE THE BERM IS LOCATED:

(i) TOTALLY WITHIN THE PROPERTY BOUNDARIES;

(ii) ALONG A LINE OF CONSTANT ELEVATION (PREFERRED, BUT NOT ALWAYS PRACTICAL);

(iii) AT LEAST 1m, IDEALLY 3m, FROM THE TOE OF A FILL EMBANKMENT;

(iv) AWAY FROM AREAS OF CONCENTRATED FLOW.

3. ENSURE THE BERM IS INSTALLED IN A MANNER THAT AVOIDS THE CONCENTRATION OF FLOW ALONG THE BERM, OR THE UNDESIRABLE DISCHARGE OF WATER AROUND THE ENDS OF THE BERM.

4. ENSURE THE BERM HAS BEEN PLACED ALONG THE CONTOUR SUCH THAT WATER WILL POND EVENLY ALONG THE LENGTH OF THE BERM.

5. ENSURE BOTH ENDS OF THE BERM ARE ADEQUATELY TURNED UP THE SLOPE TO PREVENT FLOW BYPASSING PRIOR TO WATER PASSING OVER THE BERM.

6. ENSURE 100% CONTACT WITH THE SOIL SURFACE.

7. WHERE SPECIFIED, TAKE APPROPRIATE STEPS TO VEGETATE THE BERM.

MAINTENANCE

1. DURING THE CONSTRUCTION PERIOD, INSPECT THE BERM AT LEAST WEEKLY AND AFTER ANY SIGNIFICANT RAIN. MAKE NECESSARY REPAIRS IMMEDIATELY.

2. REPAIR OR REPLACE ANY DAMAGED SECTIONS.

3. WHEN MAKING REPAIRS, ALWAYS RESTORE THE SYSTEM TO ITS ORIGINAL CONFIGURATION UNLESS AN AMENDED LAYOUT IS REQUIRED OR SPECIFIED.

4. REMOVE ACCUMULATED SEDIMENT IF THE SEDIMENT DEPOSIT EXCEEDS A DEPTH OF 100mm OR 1/3 THE HEIGHT OF THE BERM.

5. DISPOSE OF SEDIMENT IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

REMOVAL (IF REQUIRED)

1. WHEN DISTURBED AREAS UP-SLOPE OF THE BERM ARE SUFFICIENTLY STABILISED TO RESTRAIN EROSION, THE BERM MAYBE REMOVED.

2. REMOVE ANY COLLECTED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

3. REHABILITATE/REVEGETATE THE DISTURBED GROUND AS NECESSARY TO MINIMISE THE EROSION HAZARD.

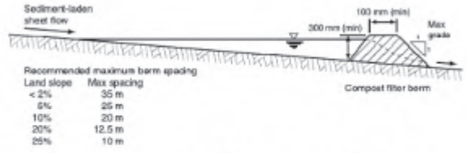


Figure 1 - Typical profile of a compost filter berm

CATCH DRAIN DETAILS

Drain ID	Drain Type	Slope	Lining	Base Width (m)	Top Width (m)	Depth Incl. freeboard (m)
CWD-1	Type B	1.0%	Geofabric	3	4.2	0.3
CWD-2	Type C	1.0%	Coir TMC7	3	5	0.5
DWD-1	Type C	1.0%	Coir TMC7	3	5	0.5
DWD-2	Type B	1.0%	Geofabric	2	3.2	0.3

NOTE:

COIR LOG CHECK DAMS TO BE INSTALLED AT 20m CRS

MULCH BUND DETAIL

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SHEET TITLE	EROSION & SEDIMENT CONTROL NOTES AND DETAILS - SHEET 1 OF 2

JOB CODE	
MIR016	
SHEET NUMBER	REV
C406	A

ROLES AND RESPONSIBILITIES

ROLE	RESPONSIBILITY
PROJECT MANAGER	• OVERALL RESPONSIBILITY OF ESC IMPLEMENTATION • NOTIFY THE ENVIRONMENTAL MANAGER IMMEDIATELY OF ANY NON-COMPLIANCE WITH ESCP • ENSURE THE PROMPT IMPLEMENTATION OF MEASURES TO MITIGATE EROSION AND SEDIMENT GENERATION
SITE SUPERVISOR / FOREMEN	• MONITOR DAILY RAINFALL • NOTIFY ENVIRONMENTAL ADVISOR/CONSULTANT WHEN RUNOFF GENERATING RAINFALL OCCURS IN THE PREVIOUS 24 HOURS • MAINTAIN CURRENT RECORDS OF RAINFALL, STORAGE VOLUMES, WATER QUALITY, TREATMENT PRACTICES, DISCHARGE VOLUMES (AS APPROPRIATE) • INSTALLATION AND MAINTENANCE OF ESC
ENVIRONMENTAL MANAGER	• PROVIDE DESIGN INFORMATION AS REQUIRED • CONDUCT IN-SITU MONITORING (AS REQUIRED) • COLLECT AND SUBMIT SAMPLES TO LABORATORY (AS REQUIRED) • COLLATE RESULTS AND PREPARE REPORTS (AS REQUIRED) • CONDUCT SITE INSPECTIONS AN AUDITS (AS REQUIRED) • INSPECT ESC INSTALLATION AND MAINTENANCE • INSPECT OFFSITE IMPACTS AND MANAGEMENT • PROVIDE ADVICE REGARDING ESC SITE IMPROVEMENT (AS REQUIRED)
ALL PERSONNEL	• REPORT ANY DAMAGE TO ESC DEVICES AND ANY POTENTIAL OR ACTUAL ENVIRONMENTAL HARM IN LINE WITH DUTY TO NOTIFY UNDER THE REQUIREMENTS OF THE ENVIRONMENTAL PROTECTION ACT 1994

CORRECTIVE AND PREVENTATIVE ACTION

AN ENVIRONMENTAL INCIDENT WITH RESPECT TO THE ESCP IS DEFINED AS ANY OCCURRENCE WHERE SEDIMENT IS RELEASED FROM THE SITE, WHETHER CONTROLLED OR UNCONTROLLED, OR WHERE STORM WATER IS RELEASED (CONTROLLED) FROM SITE WHICH DOES NOT MEET THE WATER QUALITY REQUIREMENTS.

ALL INCIDENTS AND NON-CONFORMANCES ARE TO BE REPORTED, INVESTIGATED AND CORRECTED IN ACCORDANCE WITH THE ESCP TO ENSURE EFFECTIVE SOIL AND WATER QUALITY MANAGEMENT PRACTICES AT ALL TIMES.

BEST PRACTICE SITE MANAGEMENT REQUIRES ALL ESC MEASURES TO BE INSPECTED BY THE CONTRACTORS NOMINATED REPRESENTATIVE AT LEAST DAILY WHEN RAIN IS OCCURRING, WITHIN 24 HOURS PRIOR TO EXPECTED RAINFALL, AND WITHIN 18 HOURS OF A RAINFALL EVENT OF SUFFICIENT INTENSITY AND DURATION TO CAUSE ONSITE RUNOFF (IECA, 2008). SUCH INSPECTIONS MUST CHECK:

- DAILY SITE INSPECTIONS (DURING PERIODS OF RUNOFF PRODUCING RAINFALL)
  - ALL DRAINAGE, EROSION AND SEDIMENT CONTROL MEASURES
  - OCCURRENCES OF EXCESSIVE SEDIMENT DEPOSITION (WHETHER ON-SITE OR OFF-SITE)
  - ALL SITE DISCHARGE POINTS (INCLUDING DEWATERING ACTIVITIES AS APPROPRIATE)
- WEEKLY SITE INSPECTIONS (EVEN IF WORK IS NOT OCCURRING ON-SITE)
  - ALL DRAINAGE, EROSION AND SEDIMENT CONTROL MEASURES
  - OCCURRENCES OF EXCESSIVE SEDIMENT DEPOSITION (WHETHER ON-SITE OR OFF-SITE)
  - OCCURRENCES OF CONSTRUCTION MATERIALS, LITTER OR SEDIMENT PLACED, DEPOSITED, WASHED OR BLOWN FROM THE SITE, INCLUDING DEPOSITION BY VEHICULAR MOVEMENTS.
  - LITTER AND WASTE RECEPTORS
  - OIL, FUEL AND CHEMICALS STORAGE FACILITIES
- PRIOR TO ANTICIPATED RUNOFF PRODUCING RAINFALL
  - ALL DRAINAGE, EROSION AND SEDIMENT CONTROL MEASURES
  - ALL TEMPORARY FLOW DIVERSION AND DRAINAGE WORKS
- FOLLOWING RUNOFF PRODUCING RAINFALL
  - ALL DRAINAGE, EROSION AND SEDIMENT CONTROL MEASURES
  - OCCURRENCES OF EXCESSIVE SEDIMENT DEPOSITION (WHETHER ON-SITE OR OFF-SITE)
  - OCCURRENCES OF CONSTRUCTION MATERIALS, LITTER OR SEDIMENT PLACED, DEPOSITED, WASHED OR BLOWN FORM THE SITE, INCLUDING DEPOSITION BY VEHICULAR MOVEMENTS.

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SHEET TITLE	EROSION & SEDIMENT CONTROL NOTES AND DETAILS - SHEET 2 OF 2

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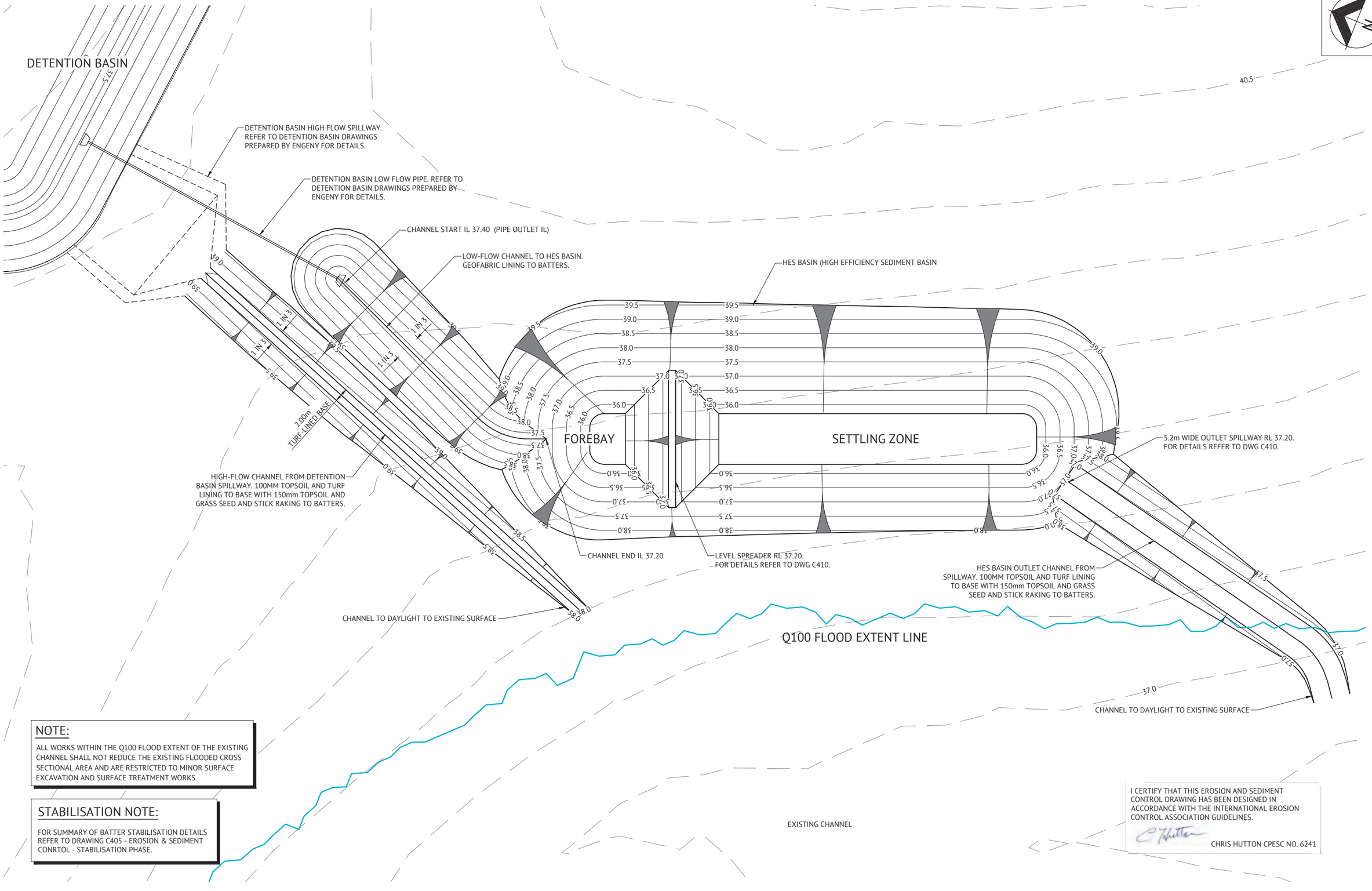


NOTE:

ALL WORKS WITHIN THE Q100 FLOOD EXTENT OF THE EXISTING CHANNEL SHALL NOT REDUCE THE EXISTING FLOODED CROSS SECTIONAL AREA AND ARE RESTRICTED TO MINOR SURFACE EXCAVATION AND SURFACE TREATMENT WORKS.

STABILISATION NOTE:

FOR SUMMARY OF BATTER STABILISATION DETAILS REFER TO DRAWING C405 - EROSION & SEDIMENT CONRTOL - STABILISATION PHASE.

I CERTIFY THAT THIS EROSION AND SEDIMENT CONTROL DRAWING HAS BEEN DESIGNED IN ACCORDANCE WITH THE INTERNATIONAL EROSION CONTROL ASSOCIATION GUIDELINES.

CHRIS HUTTON CPESC NO. 6241

FOR CONSTRUCTION

DATE	REV	DESCRIPTION	RPEQ
18/07/19	A	SELF-CERTIFIED DRAWING ISSUE	JCS

REVISIONS

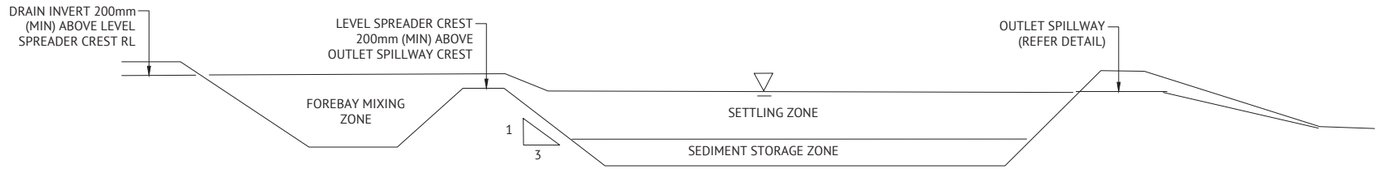
Premise

BRISBANE OFFICE
LEVEL 1, 100 BRUNSWICK STREET
PO BOX 361
FORTITUDE VALLEY, QLD 4006
PH: (07) 3253 2222
WEB: www.premise.com.au

DESIGNED	MICHAEL MAJZNER
CHECKED	JOSHUA STONE
PROJECT COORDINATOR	CLINT THORP
PROJECT CERTIFIER	JOSHUA STONE
DATE	18/07/19
RPEQ	JOSHUA STONE RPEQ 15187
SCALE	0 5 10 15m
	SCALE 1:250 (A1)

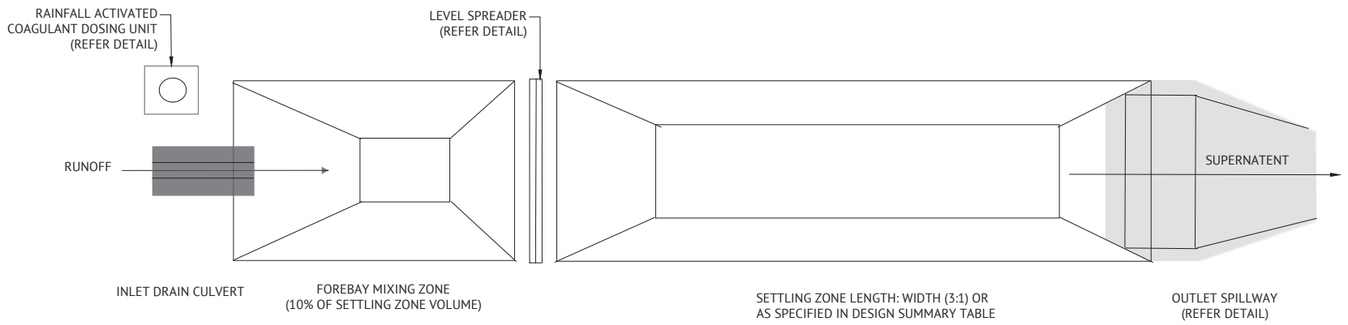
CLIENT	MIRVAC
PROJECT	EVERLEIGH SCHOOL SITE PACKAGE 1 - BULK EARTHWORKS
LOCATION	TEVIOT ROAD, GREENBANK
SHEET TITLE	HES BASIN LAYOUT PLAN

JOB CODE	
MIR016	
SHEET NUMBER	REV
C408	A



TYPE B SEDIMENT BASIN LONG SECTION

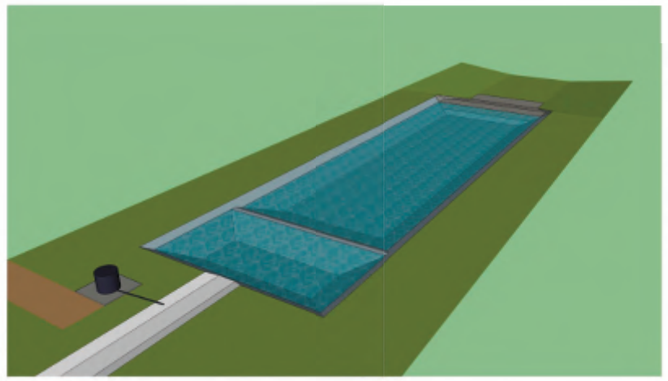
N.T.S.



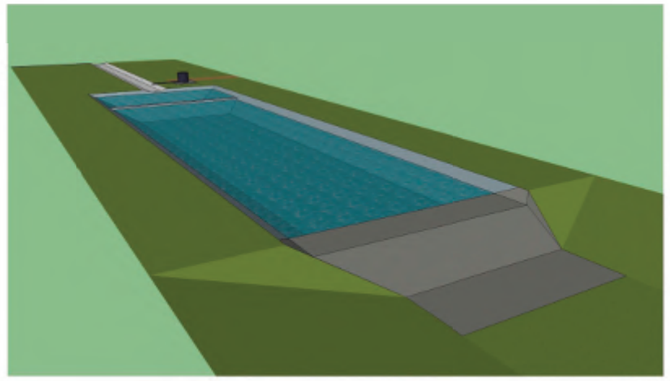
TYPE B SEDIMENT BASIN PLAN VIEW

N.T.S.

iFOD RAIN DOSING UNIT (CUSTOM BUILT)



BASIN PERSPECTIVE (LOOKING DOWNSTREAM)



BASIN PERSPECTIVE (LOOKING UPSTREAM)

HES BASIN DETAILS

BASIN ID	SETTLING ZONE (INCLUDING SEDIMENT STORAGE)				FOREBAY				HYDRAULIC CONTROLS			
	VOLUME	LENGTH	WIDTH	DEPTH	VOLUME	LENGTH	WIDTH	DEPTH	SPILLWAY CREST LENGTH	SPILLWAY CREST	EMBANKMENT	LEVEL SPREADER CREST
	(m^3)	(m)	(m)	(m)	(m^3)	(m)	(m)	(m)	(m)	RL	RL	RL
A	985.000	41.400	16.600	1.720	117.990	4.100	16.600	1.720	5.200	37.000	37.750	37.200

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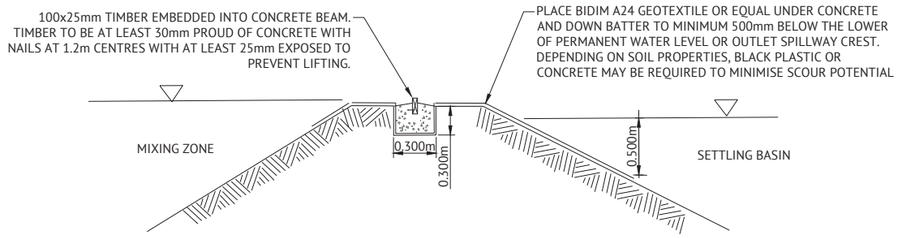
PROJECT COORDINATOR	CLINT THORP	SCALE	
PROJECT CERTIFIER	JOSHUA STONE	DATE	18/07/19

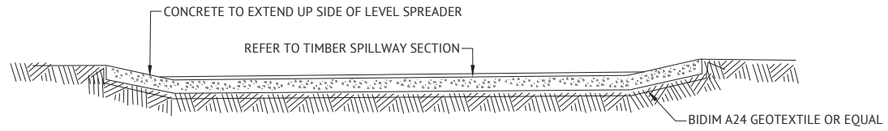
CLIENT	MIRVAC
PROJECT	EVERLEIGH SCHOOL SITE PACKAGE 1 - BULK EARTHWORKS
LOCATION	TEVIOT ROAD, GREENBANK
SHEET TITLE	HES BASIN NOTES AND DETAILS - SHEET 1 OF 3

JOB CODE	
MIR016	
SHEET NUMBER	REV
C409	A



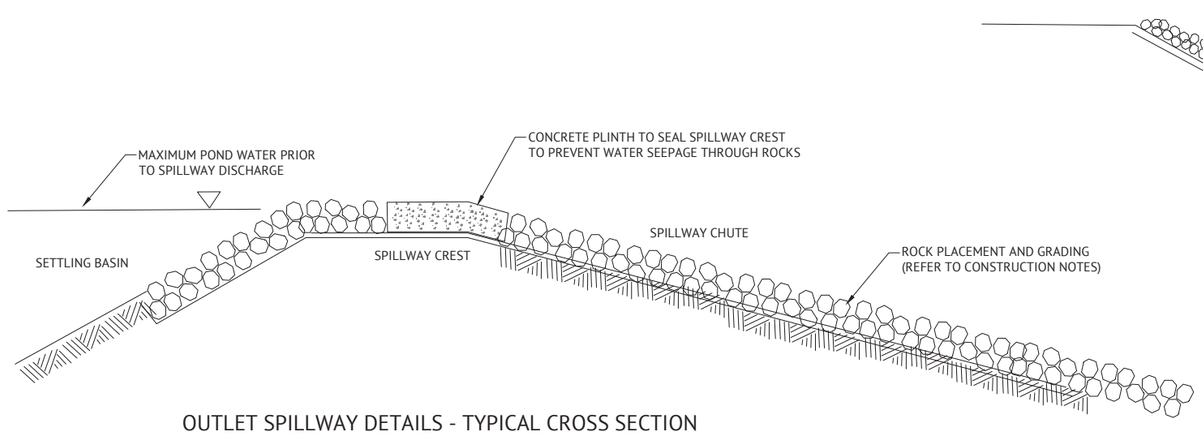
LEVEL SPREADER DETAILS - TYPICAL CROSS SECTION

N.T.S.



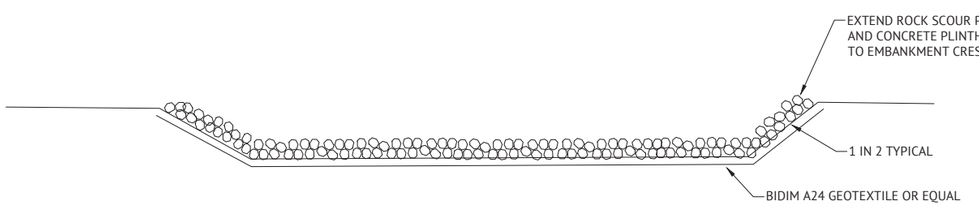
LEVEL SPREADER DETAILS - TYPICAL LONG SECTION

N.T.S.



OUTLET SPILLWAY DETAILS - TYPICAL CROSS SECTION

N.T.S



OUTLET SPILLWAY DETAILS - TYPICAL LONG SECTION

N.T.S.

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CHRIS HUTTON CPESC NO. 6241

FOR CONSTRUCTION

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RPEQ	JOSHUA STONE RPEQ 15187
SCALE	

CLIENT	MIRVAC
PROJECT	EVERLEIGH SCHOOL SITE PACKAGE 1 - BULK EARTHWORKS
LOCATION	TEVIOT ROAD, GREENBANK
SHEET TITLE	HES BASIN NOTES AND DETAILS - SHEET 2 OF 3
JOB CODE	MIR016
SHEET NUMBER	C410
REV	A

NOTES

AUTO DOSER

1. PROVIDED AS EITHER FLOC BOX OR iFOD-RAIN TO MANUFACTURES SPECIFICATION.
2. DOSER AND SUPPLY OF FLOCCULANT TO BE PROVIDED ON LEVEL PAD 4m x 4m WITHIN 10m OF DOSING POINT.
3. ALL-WEATHER ACCESS TRACK TO BE PROVIDED TO DOSER.
4. FLOCCULANT PROVIDED AS TURBICLEAR (ahc). IF ALTERNATIVE FLOCCULANT USED THEN THE BASIN SIZE IS TO BE INCREASED ACCORDING TO JAR SETTLEMENT TEST (REFER TO TABLE BELOW).

JAR SETTLEMENT AFTER 15 MINUTES	MULTIPLICATION FACTOR TO SETTLING ZONE
(mm)	VOLUME
50	x3
75	x2
100	x1.5
150	x1

BASIN CONSTRUCTION

MATERIALS

1. EARTH FILL: CLEAN SOIL WITH EMERSON CLASS 2(1), 3, 4 OR 5 AND FREE OF ROOTS, WOODY VEGETATION, ROCKS AND OTHER UNSUITABLE MATERIAL. SOIL WITH EMERSION CLASS 4 AND 5 MAY NOT BE SUITABLE DEPENDING ON PARTICLE SIZE DISTRIBUTION AND DEGREE OF DISPERSION.
   1.1. CLASS 2(1) SHOULD ONLY BE USED UPON RECOMMENDATION FROM GEOTECHNICAL SPECIALIST.
2. SPILLWAY ROCK: HARD, ANGULAR, DURABLE WEATHER RESISTANT AND EVENLY GRADED ROCK WITH 50% BY WEIGHT LARGER THAN THE SPECIFIED NOMINAL (d50) ROCK SIZE. LARGE ROCK SHOULD DOMINATE, WITH SUFFICIENT SMALL ROCK TO FILL THE VOIDS BETWEEN LARGER ROCK. THE DIAMETER OF THE LARGEST ROCK SHOULD BE NO LARGER THAN 1.5 TIMES THE NOMINAL ROCK SIZE. THE SPECIFIED GRAVITY SHOULD BE AT LEAST 2.5.
3. GEOTEXTILE FABRIC: HEAVY DUTY, NEEDLE-PUNCHED, NON-WOVEN CLOTH, MINIMUM 'BIDIM' A24 OR EQUIVALENT.

CONSTRUCTION

1. NOTWITHSTANDING ANY DESCRIPTION CONTAINED WITH APPROVED PLANS OR SPECIFICATIONS,, THE CONTRACTOR SHALL BE RESPONSIBLE FOR SATISFYING THEMSELVES AS TO THE NATURE AND EXTENT OF THE SPECIFIED WORKS AND THE PHYSICAL AND LEGAL CONDITIONS UNDER WHICH THE WORKS WILL BE CARRIED OUT. THIS SHALL INCLUDE MEANS OF ACCESS, EXTENT OF CLEARING, NATURE OF THE MATERIALS TO BE EXCAVATED, TYPE AND SIZE OF MECHANICAL PLANT REQUIRED, LOCATION AND SUITABILITY OF WATER SUPPLY FOR CONSTRUCTION AND TESTING PURPOSES, AND ANY OTHER LIKELY MATTERS AFFECTING THE CONSTRUCTION OF THE WORKS.
2. REFER TO APPROVED PLANS FOR LOCATION, DIMENSIONS, AND CONSTRUCTION DETAILS. IF THERE ARE ANY QUESTIONS OR PROBLEMS WITH THE LOCATION, DIMENSIONS, OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.
3. BEFORE STARTING ANY CLEARING OR CONSTRUCTION, ENSURE ALL THE NEXESSARY MATERIALS AND COMPONENTS ARE ON THE SITE TO AVOID DELAYS IN COMPLETING THE SEDIMENT BASIN ONCE WORKS BEGIN.
4. INSTALL REQUIRES SHORT TERM SEDIMENT RUNOFF DURING CONSTRUCTION OF THE BASIN.
5. THE AREA TO BE COVERED BY THE EMBANKMENT, BORROW PITS AND INCIDENTAL WORKS, TOGETHER WITH AN AREA EXTENDING BEYOND THE LIMITS OF EACH FOR A DISTANCE NOT EXCEEDING 5m ALL AROUND MUST BE CLEARED OF ALL TREES, SCRUB, STUMPS, ROOTS, DEAD TIMBER AND RUBBISH AND DISPOSED OF IN A SUITABLE MANNER. DELAY CLEARING THE MAIN BASIN AREA UNTIL THE EMBANKMENT IS COMPLETE.
6. ENSURE ALL HOLES MADE BY GRUBBING WITHIN THE EMBANKMENT FOOTPRINT ARE FILLED WITH SOUND MATERIAL, ADEQUATELY COMPACTED, AND FINISHED FLUSH WITH THE NATURAL SURFACE.

EMBANKMENT

1. SCARIFY AREAS ON WHICH FILL IS TO BE PLACED BEFORE PLACING THE FILL.
2. ENSURE ALL FILL MATERIAL USED TO FORM THE EMBANKMENT MEETS THE SPECIFICATIONS CERTIFIED BY A SOIL SCIENTIST OF GEOTECHNICAL SPECIALIST.
3. THE FILL MATERIAL MUST CONTAIN SUFFICIENT MOISTURE SO IT CAN BE FORMED BY HAND INTO A BALL WITHOUT CRUMBLING. IF WATER CAN BE SQUEEZED OUT OF THE BALL, IT IS TOO WET FOR PROPER COMPACTION. PLACE FILL MATERIAL IN 150mm TO 200mm CONTINUOUS LAYERS OVER THE ENTIRE LENGTH OF THE FILL AREA AND THEN COMPACT BEFORE PLACEMENT OF FURTHER FILL.
4. UNLESS SPECIFIED ON THE APPROVED PLANS, COMPACT THE SOIL AT ABOUT % TO 2% WET OPTIMUM AND TO 95% MODIFIED OR 100% STANDARD COMPACTION. EMBANKMENT TO AN ELEVATION 10% HIGHER THAN THE DESIGN HEIGHT TO ALLOW FOR SETTLING.
5. WHERE BOTH DISPERSIVE AND NON-DISPERSIVE CLASSIFIED EARTH-FILL MATERIALS ARE AVAILABLE, NON-DISPERSIVE EARTH-FILL MUST BE USED IN THE CORE ZONE. THE REMAINING CLASSIFIED EARTH-FILL MATERIALS MUST ONLY BE USED AS DIRECTED BY THE SITE SUPERINTENDENT.
6. WHERE SPECIFIED, CONSTRUCT THE EMBANKMENT TO AN ELEVATION 10% HIGHER THAN THE DESIGN HEIGHT TO ALLOW FOR SETTLING; OTHERWISE FINISHED DIMENSION OF THE EMBANKMENT AFTER SPREADING OF TOPSOIL MUST CONFORM TO THE DRAWING WITH A TOLERANCE OF 75mm FROM SPECIFIED DIMENSIONS.
7. ENSURE DEBRIS AND OTHER UNSUITABLE BUILDING WASTE IS NOT PLACED WITHIN THE EARTH EMBANKMENT.
8. AFTER COMPLETION OF THE EMBANKMENT, ALL LOOSE UNCOMPACTED EARTH-FILLMATERIAL ON THE UPSTREAM AND DOWNSTREAM BATTER MUST BE REMOVED PRIOR TO SPREADING TOPSOIL.
9. TOPSOIL AND RE-VEGETATE/STABILISE ALL EXPOSED EARTH AS DIRECTED WITHIN THE APPROVED PLANS.

CUT-OFF TRENCH

1. BEFORE CONSTRUCTION OF THE CUT-OFF TRENCH OR ANY ANCILLARY WORKS WITHIN THE EMBANKMENT FOOTPRINT, ALL GRASS GROWTH AND TOPSOIL MUST BE REMOVED FROM THE AREA TO BE OCCUPIED BY THE EMBANKMENT AND MUST BE DEPOSITED CLEAR OF THIS AREA AND RESERVED FOR TOPDRESSING THE COMPLETED EMBANKMENT.
2. EXCAVATED A CUT-OFF TRENCH ALONG THE CENTRE LINE OF THE EARTH FILL EMBANKMENT. CUT THE TRENCH TO STABLE SOIL MATERIAL, BUT IN NO CASE MAKE IT LESS THAN 600mm DEEP. THE CUT-OFF TRENCH MUST EXTEND INTO BOTH ABUTMENTS TO AT LEAST THE ELEVATION OF THE OUTLET SPILLWAY CREST. MAKE THE MINIMUM BOTTOM WIDTH WIDE ENOUGH TO PERMIT OPERATION OF THE EXCAVATION AND COMPACTION EQUIPMENT, BUT IN NO CASE LESS THAN 600mm. MAKE THE SIDE SLOPES OF THE TRENCH NO STEEPER THAN 1:1 (H:V).
3. ENSURE ALL WATER, LOOSE SOIL, AND ROCK ARE REMOVED FROM THE TRENCH BEFORE BACKFILLING COMMENCES. THE CUT-OFF TRENCH MUST BE BACKFILLED WITH SELECT EARTH-FILL OF THE TYPE SPECIFIED FOR THE EMBANKMENT, AND THIS SOUL MUST HAVE A MOISTURE CONTENT AND DEGREE OF COMPACTION THE SAME AS SPECIFIED FOR THE CORE ZONE.
4. MATERIAL EXCAVATED FROM THE CUT-OFF TRENCH MAY BE USED IN THE CONSTRUCTION OF THE EMBANKMENT PROVIDED IT IS SUITABLE AND IT IS PLACED IN THE CORRECT ZONE ACCORDING TO ITS CLASSIFICATION.

SPILLWAY CONSTRUCTION

1. THE SPILLWAY MUST BE EXCAVATED AS SHOWN ON THE PLANS, AND THE EXCAVATED MATERIAL IF CLASSIFIED AS SUITABLE, MUST BE USED IN THE EMBANKMENT, AND IF NOT SUITABLE IT MUST BE DISPOSED OF INTO SPOIL HEAPS.
2. ENSURE EXCAVATED DIMENSIONS ALLOW ADEQUATE BOXING-OUT SUCH THAT THE SPECIFIED ELEVATIONS, GRADES, CHUTE WIDTH, AND ENTRANCE AND EXIT SLOPES FOR THE EMERGENCY SPILLWAY WILL BE ACHIEVED AFTER PLACEMENT OF THE ROCK OR OTHER SCOUR PROTECTION MEASURES AS SPECIFIED IN THE PLANS.
3. PLACE SPECIFIED SCOUR PROTECTION MEASURES ON THE EMERGENCY SPILLWAY. ENSURE THE FINISHED GRADE BLENDS WITH THE SURROUNDING AREA TO ALLOW A SMOOTH FLOW TRANSITION FROM SPILLWAY TO DOWNSTREAM CHANNEL.
4. IF A SYNTHETIC FILTER FABRIC UNDERLAY IS SPECIFIED, PLACE THE FABRIC DIRECTLY ON THE PREPARED FOUNDATION. IF MORE THAN 1 SHEET OF FILTER FABRIC IS REQUIRED, OVERLAP THE EDGES BY AT LEAST 300mm AND PLACE ANCHOR PINS AT MINIMUM 1m SPACING ALONG THE OVERLAP. BURY THE UPSTREAM END OF THE FILTER FABRIC A MINIMUM 300mm BELOW GROUND AND WHERE NECESSARY, BURY THE LOWER END OF THE FABRIC OR OVERLAP A MINIMUM 300mm OVER THE NEXT DOWNSTREAM SECTION AS REQUIRED. ENSURE THE FILTER FABRIC EXTENDS AT LEAST 1m UPSTREAM OF THE SPILLWAY CREST.
5. TAKE CARE NOT TO DAMAGE THE FABRIC DURING OR AFTER PLACEMENT. IF DAMAGE OCCURS, REMOVE THE ROCK AND REPAIR THE SHEET BY ADDING ANOTHER LATER OF FABRIC WITH A MINIMUM OVERLAP OF 300mm AROUND THE DAMAGED AREA. IF EXTENSIVE DAMAGE IS SUSPECTED, REMOVE AND REPLACE THE ENTIRE SHEET.
6. WHERE LARGE ROCK IS USED, OR MACHINE PLACEMENT IS DIFFICULT, A MINIMUM 100mm LATER OF FINE GRAVEL, AGGREGATE, OR SAND MAY BE NEEDED TO PROTECT THE FABRIC.
7. PLACEMENT OF ROCK SHOULD FOLLOW IMMEDIATELY AFTER PLACEMENT OF THE FILTER FABRIC. PLACE ROCK SO THAT IT FORMS A DENSE, WELL GRADED MASS O ROCK WITH A MINIMUM OF VOIDS. THE DESIRED DISTRIBUTION OF ROCK THROUGHOUT THE MASS MAYBE OBTAINED BY SELECTIVE LOADING AT THE QUARRY AND CONTROLLED DUMPING DURING FINAL PLACEMENT.
8. THE FINISHED SLOPE SHOULD BE FREE OF POCKETS OF SMALL ROCK OR CLUSTERS OF LARGE ROCKS. HAND PLACING MAY BE NECESSARY TO ACHIEVE THE PROPER DISTRIBUTION OF ROCK SIZES TO PRODUCE A RELATIVELY SMOOTH, UNIFORM SURFACE. THE FINISHED GRADE OF THE ROCK SHOULD BLEND WITH THE SURROUNDING AREA. NO OVERFALL OF PROTRUSION OF ROCK SHOULD BE APPARENT.
9. ENSURE THAT THE FINAL ARRANGEMENT OF THE SPILLWAY CREST WILL NOT PROMOTE EXCESSIVE FLOW THROUGH THE ROCK SUCH THAT THE WATER CAN BE RETAINED WITHIN THE SETTLING BASIN AT THE ELEVATION NO LESS THAN 50mm ABOVE OR BELOW THE NOMINATED SPILLWAY CREST ELEVATION.

ESTABLISHING THE SETTLING POND

1. THE AREA TO BE COVERED BY THE STORED WATER OUTSIDE OF THE LIMITS OF THE BORROW PITS MUST BE CLEARED RUBBISH. TREES MUST BE CUT DOWN STUMP HIGH AND REMOVED FROM THE IMMEDIATE VICINITY OF THE WORK.
2. ESTABLISH ALL REQUIRED INFLOW CHUTES AND INLET BAFFLES, IF SPECIFIED, TO ENABLE WATER TO DISCHARGE INTO THE BASIN IN A MANNER THAT WILL NOT CAUSE SOIL EROSION OR THE RE-SUSPENSION OF SETTLED SEDIMENT.
3. INSTALL A SEDIMENT STORAGE LEVEL MARKER POST WITH A CROSS MEMBER SET JUST BELOW THE TOP OF THE SEDIMENT STORAGE ZONE (AS SPECIFIED ON THE APPROVED PLANS). USE AT LEAST A 75mm WIDE POST FIRMLY SET INTO THE BASIN FLOOR.
4. IF SPECIFIED, INSTALL INTERNAL SETTLING POND BAFFLES. ENSURE THE CREST OF THESE BAFFLES IS SET LEVEL WITH, OR JUST BELOW, THE ELEVATION OF THE EMERGENCY SPILLWAY.
5. INSTALL ALL APPROPRIATE MEASURES TO MINIMISE SAFETY RISK TO ON-SITE PERSONNEL AND THE PUBLIC CAUSED BY THE PRESENCE OF THE SETTLING POND. AVOID STEEP, SMOOTH INTERNAL SLOPES. APPROPRIATELY FENCE THE SETTLING POND AND POST WARNING SIGNS IF UNSUPERVISED PUBLIC ACCESS IS LIKELY OR THERE IS CONSIDERED TO BE AN UNACCEPTABLE RISK TO THE PUBLIC.

I CERTIFY THAT THIS EROSION AND SEDIMENT CONTROL DRAWING HAS BEEN DESIGNED IN ACCORDANCE WITH THE INTERNATIONAL EROSION CONTROL ASSOCIATION GUIDELINES.

CHRIS HUTTON CPESC NO. 6241

FOR CONSTRUCTION

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PROJECT COORDINATOR	CLINT THORP	SCALE	
PROJECT CERTIFIER	DATE		
JOSHUA STONE	18/07/19		

CLIENT	MIRVAC
PROJECT	EVERLEIGH SCHOOL SITE PACKAGE 1 - BULK EARTHWORKS
LOCATION	TEVIOT ROAD, GREENBANK
SHEET TITLE	HES BASIN NOTES AND DETAILS - SHEET 3 OF 3

JOB CODE	
MIR016	
SHEET NUMBER	REV
C411	A

URBAN SPECIFIC SITE DETAILS

Project Name	Everleigh		Project Scope	Bulk earthworks, Clearing, Civils	
Title	**Name**	**Contact**	**Title**	**Name**	**Contact**
Project Manager	Cam Mcclure	0437 930 319	**Supervisor**	Stan Reid	0417 734 258
SHET Advisor	Josh Jurgens	0427 029 582	**Engineer**	Derek Hennessy	0427 573 703
Location	**440 Greenbank Rd**		**Co-ordinates**	Lat -27.74328, Long 152.99071	

General Project Specific Information

- Site boundaries
- Muster points
- Key Infrastructure
- First aid facility & kits locations
- Crib Huts, Toilets & LV park up areas
- Live service permit zones & any other restricted areas

Emergency Response Details

EMERGENCY RESPONSE TEAM / FIRST AIDERS

EMERGENCY RESPONSE PROCEDURE

Call up on UHF on Designated channel and state: **Emergency, Emergency, Emergency**

Your Name, location and the emergency situation;

- Continue to state Emergency until you receive a confirmation. If no response, dial 000 directly;
- Remain in location & assist the Emergency Response Team/Emergency Services as directed;
- Be prepared to assist to secure the incident site and:
  - Prevent unauthorised access to incident site;
  - Act as an escort as required/directed for emergency services or external officials;
  - Comply with radio silence (no chatter over dedicated emergency channel);

Don't take photos or speak with external parties including any media or co-workers from other sites

Site Specific Hazards and Issues

- **Federally protected fauna corridors, Absolutely no clearing of any trees without direct instruction and verification of limits from Golding Supervisor.**
- **20km speed limit on access roads between areas of works**
- **Access to site will be shared with other contractors as further works commence**

URBAN SPECIFIC SITE DETAILS

From:	Cameron McClure
To:	accepteddevelopment@daf.qld.gov.au
Cc:	Derek Hennessy ; Josh Jurgens (Josh.Jurgens@golding.com.au)
Subject:	Everleigh, Greenbank - Application for Waterway Barrier Works
Date:	Tuesday, 12 November 2019 2:41:00 PM
Attachments:	Everleigh - Waterway barrier works application.pdf image001.png

To whom it may concern,

Please find attached Golding Contractors application to undertake waterway barrier works on the above mentioned project.

If you have any questions please don't hesitate to call

Regards,

Cameron

Cameron McClure
Civil Project Manager
M 0437 930 319 | P (07) 5557 6100
58 Union Circuit, Yatala
QLD 4207
Cameron.McClure@golding.com.au | www.golding.com.au

11 Notification forms for accepted development

11.1 Pre-works notification form

Pre-works notification can be submitted through the online notification system at http://adr.fisheries.qld.gov.au.

If you are having trouble accessing the online system, this notification form can be used instead. You are required to complete all sections of this form and email it to Fisheries Queensland, Department of Agriculture and Fisheries at **acceptedevelopment@daf.qld.gov.au**.

All applicable fields must be completed. Incomplete forms will not be registered and your works will not be lawful. It is your responsibility to ensure the work complies with all accepted development requirements.

You may be required to obtain approvals from other agencies prior to commencing work.

PART 1. PRE-WORKS NOTIFICATION FORM

Pre-works notification must be provided prior to but no more than 20 business days before commencing works (unless Section 7 Disaster provisions apply and then it must be provided as soon as practicable after commencement).

1. **Contact details of person undertaking the works**
   This person must be contactable and may be contacted by Fisheries Queensland for monitoring purposes.

Name and organisation (if applicable): Cameron McClure - Golding Contractors Pty Ltd

Physical address: 58 Union Circuit, Yatala QLD 4207

Postal address: As above

Email: cameron.mcclure@golding.com.au Telephone: 0437 930 319

2. Work Details ☑ Private or ☐ Public

Attach additional sheet if more space is required

Ensure site photos are attached as per Appendix 4, and a map of the location of the works. ***Ensure a work type from one of the tables in this document is specified below.***

Date works to commence and expected timeframe *e.g. 26/06/17, 220 days*	Lot on Plan or adjacent Lot on Plan; and street address	Co-ordinates (decimal degrees) and datum system used (GDA94 or WGS84) (GDA94)	Colour and name of mapped waterway and specify if tidal	New work or maintenance *(e.g. new work)*	**Work type*** *(e.g. 2.2 replacement of bed level crossing)* ***For work types 4.1 and 4.2, complete Part 2 of the table**	Work size (dimensions), description (including option chosen if applicable) and method
18/11/2019	1SP297192	152.996788 / -27.741728	Green	New Work	2.2 - Option 1 - Fig 21	

PART 2. WORK TYPES 4.1 AND 4.2 - ADDITIONAL DETAILS FORM

For retrofitting inverts or re-sleeving existing culvert cells, please provide additional information as requested below.

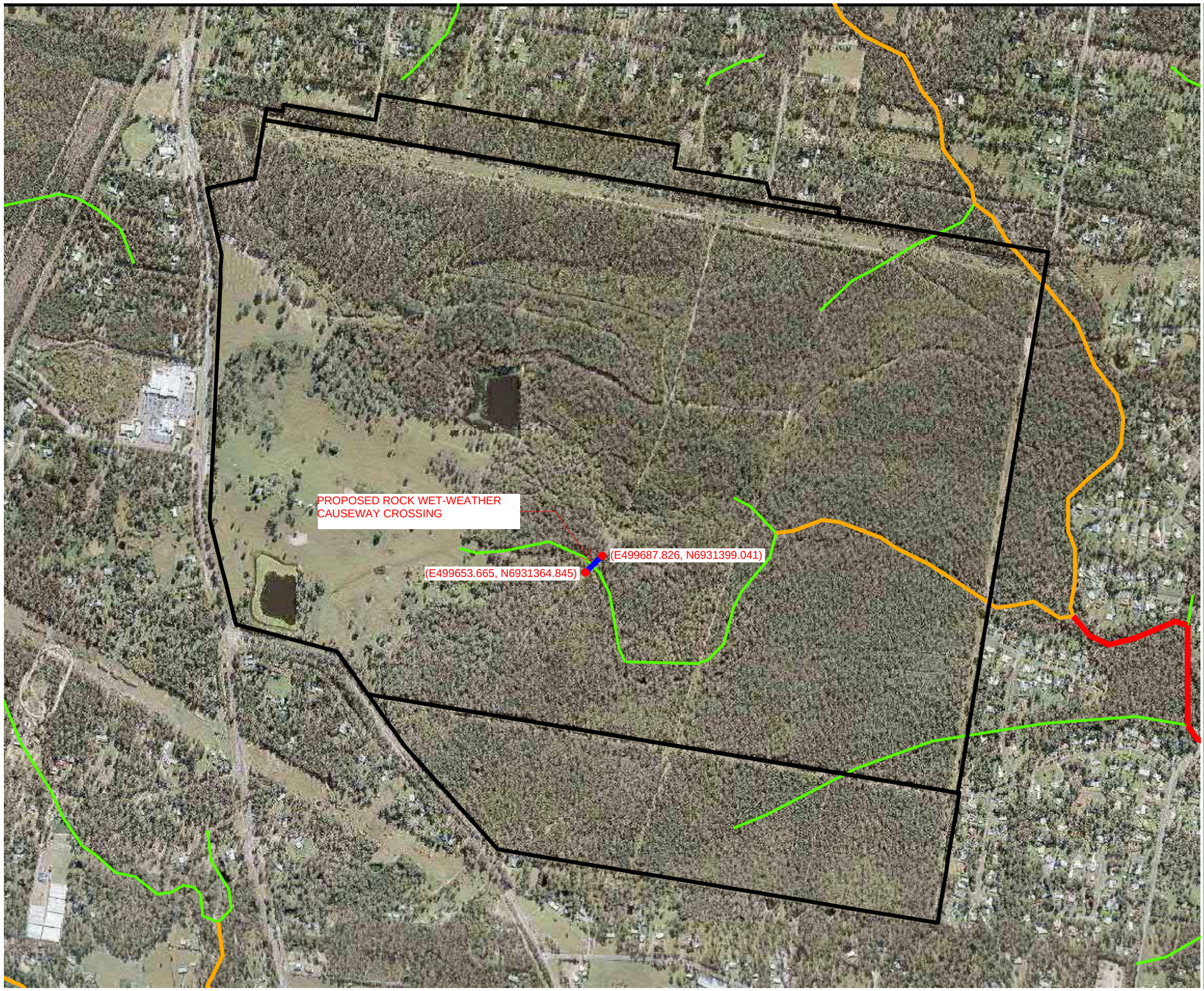
Are works for retrofitting inverts on existing culvert cell(s)? ☐ Yes ☒ No	Are works for re-sleeving existing culvert cell(s)? ☐ Yes ☒ No
If yes: Total number of culvert cells in the array _____. Number of culvert cells to be retrofitted: _____. Number of culvert cells requiring ramped apron: _____.	If yes: Existing number of culvert cells in the array: _____. Number of culvert cells to be re-sleeved: _____. Number of culvert cells requiring ramped apron: _____. Number of additional culvert cells to be installed: _____.

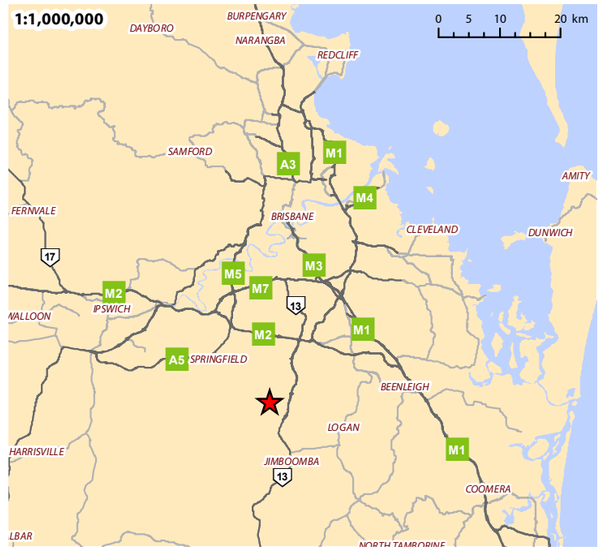
3. Declaration

In completing the pre-works notification form, I confirm the following:

☒ This document has been read ☒ This document has been understood ☒ The proposed works meet the work standards and the requirements for accepted development
Name and organisation of person notifying: *Name to be provided in full* Cameron McClure - Golding Contractors Pty Ltd **Date of notification:** 12/11/2019

You must keep a copy of the pre-works notification form and evidence of the notification date and any reference number you are provided. You must be able to provide this information if requested.





Legend

Project site DCDB

Waterways

Risk of Impact

1 - Low

2 - Moderate

3 - High

4 - Major

0 100 200 400 600 800 1,(

N

saunders havill group

mirvac

APPROVED COMPANY ISO 9001 Quality Management System QMS

APPROVED COMPANY ISO 14001 Environmental Management System QMS

ISSUES:

Issue	Date	Description	Drawn	Checked
A	18/03/2016	Prelim Draft	TC	MS

Greenbank

Natural Environment Site Strategy

Fisheries - Waterways for Waterway Barrier Works

Date | 18/03/2016
Scale | 1:12,000 @ A3
Coordinate System | GDA 1994 MGA Zone 56
Projection | Transverse Mercator
Client | MIRVAC
Project | Greenbank
Address/RPD | Lot 434 on RP845844
Sources | QLD GIS Layers (QLD Gov. Info Services 2015), Structure Plan (URBIS, 2015)

Plan 5

SHG File
7598 E 05 Fisheries A


Looking North


Looking West


Looking East


Looking South

Bushfire Hazard Assessment and Fire Management Plan

(State Primary School Site)

Ivory Parkway, Greenbank

Prepared for

Mirvac Qld

By

Rob Friend & Associates Pty ltd

February 2019

Document Management

Quality Assurance Statement				
Revision No.	Author	Status	Approved for Issue	
			Name	Date
01	Rob Friend	Draft	Rob Friend, Director, RF&A Pty. Ltd.	27 February 2019
02	Rob Friend	FINAL	Rob Friend, Director, RF&A Pty. Ltd.	28 February 2019

Photograph cover page – Photograph of a typical Acacia regrowth area covering much of the property.

Table of Contents

Introduction

This Bushfire Hazard Assessment and Fire Management Plan has been prepared for Mirvac Qld with respect to the development application for the State Primary School Site and the immediate vicinity as identified in Figure 1 (see Appendix A). The footprint of the State Primary School Site is located within Mirvac's Greenbank land holding as identified below:

- 96-102 Brightwell Street, Greenbank described as Lot 205 on RP845844 (15.9284 ha.),
- 138-168 Teviot Road, Greenbank, described as Lot 434 on RP845844 (400.8 ha), and
- 456-520 Greenbank Road, Greenbank, described as Lot 9 on S312355 (64.75 ha).

This fire management plan seeks to provide a number of bushfire management actions with regard to the school site and surrounds.

Site description

General location

The property is located to the east of Teviot Road, and north of Greenbank Road, Greenbank. To the east is a Council managed bushland park, Wearing Park, along with rural residential allotments primarily accessible from Greenhill Road, Greenbank. To the north are rural and rural residential allotments around Brightwell Street and Campbell Road. Rural properties also abut the site along its southern boundary and to the west is Teviot Road.

The property has had a history of cattle use prior to the settlement and transfer of land to Mirvac Qld. It is noted that balance areas of the property awaiting future development will continue to be managed for rural residential/agricultural purposes including the grazing of cattle.

The school site is located in the centre of the site abutting Teviot Road and Greenbank Road.

Access to the development will be via Everleigh DRive and Ivory Parkway from the existing Teviot Road / Pub Lane,

Greenbank intersection.

Topography

The landform within this area generally slopes from west to east.

Existing Vegetation

The school site is located within a portion of the site that has generally poor vegetation and also contains and existing water holding dam. Such land is defined as the area to the south and west of the EPBC excision boundary as shown on Figure 2 of Appendix A.

Development proposal

The proposal is to undertake the development of an area identified on the proposal plans as the 'School Site'. The School Site is located in the centre of 138-168 Teviot Road, Greenbank (Lot 434 on RP845844 covering an area of 400.8 hectares) (see Figure 1 of Appendix A).

It is noted that the proposal will also see the establishment of a minimum 100-metre-wide maintained buffer around the perimeter of the School Site footprint and associated infrastructure, and as such no habitable/occupied structure will be within 100 metres of any area of mapped potential bushfire hazard area.

All hazardous vegetation within the EPBC excision boundary will be cleared on commencement of site works on the School Site.

Bushfire Hazard Assessment

Existing

The Natural Hazards Risks and Resilience - Bushfire hazard area mapping provided by the State Planning Policy of April 2016, maps areas of Medium potential bushfire intensity over the area which the School Site will be developed (see Figure 2).

Post Clearing

The post clearing area within the EPBC excision boundary can be classified as grassland. Therefore, this area is considered to be an area of low bushfire risk.

However, areas of medium and high potential bushfire intensity remain outside the EPBC excision area after the EPBC excision area has been cleared. A 100m potential hazard buffer is required from such medium and high potential bushfire intensity areas. The post clearing medium and high potential bushfire intensity areas and buffers are shown on Figure 3 of Appendix A.

Figure 3 shows that the School Site is outside the potential hazard buffer and are therefore classified as having a low bushfire risk, or not in a bushfire prone area.

Bushfire Management Plan

No areas of the School Site are in a bushfire prone area in the post clearing scenario. Therefore, no structures within the school site will be required to be assessed against the Australian Standard Building in a Bushfire Prone Area, AS3959-2009 once such clearing works are complete.

The following land management specifications have been made to ensure the management of the area within the EPBC excision boundary is such that this area remains as an area of low bushfire hazard.

1. The 100-metre-wide buffer is to be maintained by slashing at regular intervals such that the vegetation within the buffer is maintained at all times, less than 200 mm in height.
2. A 6-metre-wide fire trail is to be established along the outer edge of the 100-metre-wide buffer and setback from that edge by a maximum of 10 metres. This space allows for effective zone within which to conduct any bushfire suppression operations by Emergency Services if and when required.
3. The fire trail is to have access for Emergency Service and maintenance contractors from: -
    a. Teviot Road via a locked gate
    b. Greenbank Road via a locked gate
    c. At least four points from the internal road network including from the end of the main boulevard road. This point is to ensure access is directly available to the north and east of this dead end of the boulevard roadway.
4. In the event of a bushfire commencing within the properties owned by Mirvac Qld, the Property Caretaker is to ensure the locked gates which provide access from Teviot and Greenbank Roads are unlocked. However, a key is to be provided to the Greenbank Rural Fire Brigade for their purpose and to enable access at all times for any purpose involving the management of bushfire within the whole property.

Appendix A – Figures

Figure 1 – Overall Land use plan including Area 1 and State Primary School Site

Legend

- SITE BOUNDARY
- CADASTRE BOUNDARIES
- AREA 1 BOUNDARY
- GREATER FLAGSTONE UDA BOUNDARY
- EXISTING EASEMENTS
- RAIL CORRIDOR
- POTENTIAL TRAIN STATION [1]
- TRUNK CONNECTOR ROAD NETWORK
- NEIGHBOURHOOD CONNECTOR ROAD NETWORK
- RESIDENTIAL ACCESS STREETS

Land Uses

- RESIDENTIAL - STANDARD LOTS
- RESIDENTIAL - INTERFACE LOTS - NORTH
- RESIDENTIAL - INTERFACE LOTS - SOUTH
- NEIGHBOURHOOD CENTRE
- DISTRICT CENTRE (EXTERNAL) [1]
- COMBINED REGIONAL RECREATION AND REGIONAL SPORTS PARK
- INDICATIVE LOCATIONS OF MAJOR LINEAR PARKS
- CONSERVATION PARKLAND
- POTENTIAL ECO LOT PRECINCT (SUBJECT TO FURTHER ASSESSMENT)
- INDICATIVE LOCATIONS OF NEIGHBOURHOOD PARKS
- INDICATIVE LOCATION OF STATE PRIMARY SCHOOL
- COMMUNITY FACILITY

1 Location as nominated in the Greater Flagstone PDA Development Scheme. These items are outside the area controlled by the applicant and are subject to approval and delivery by others.

Note: Locations of Context Plan features are indicative and subject to detailed design.

URBIS

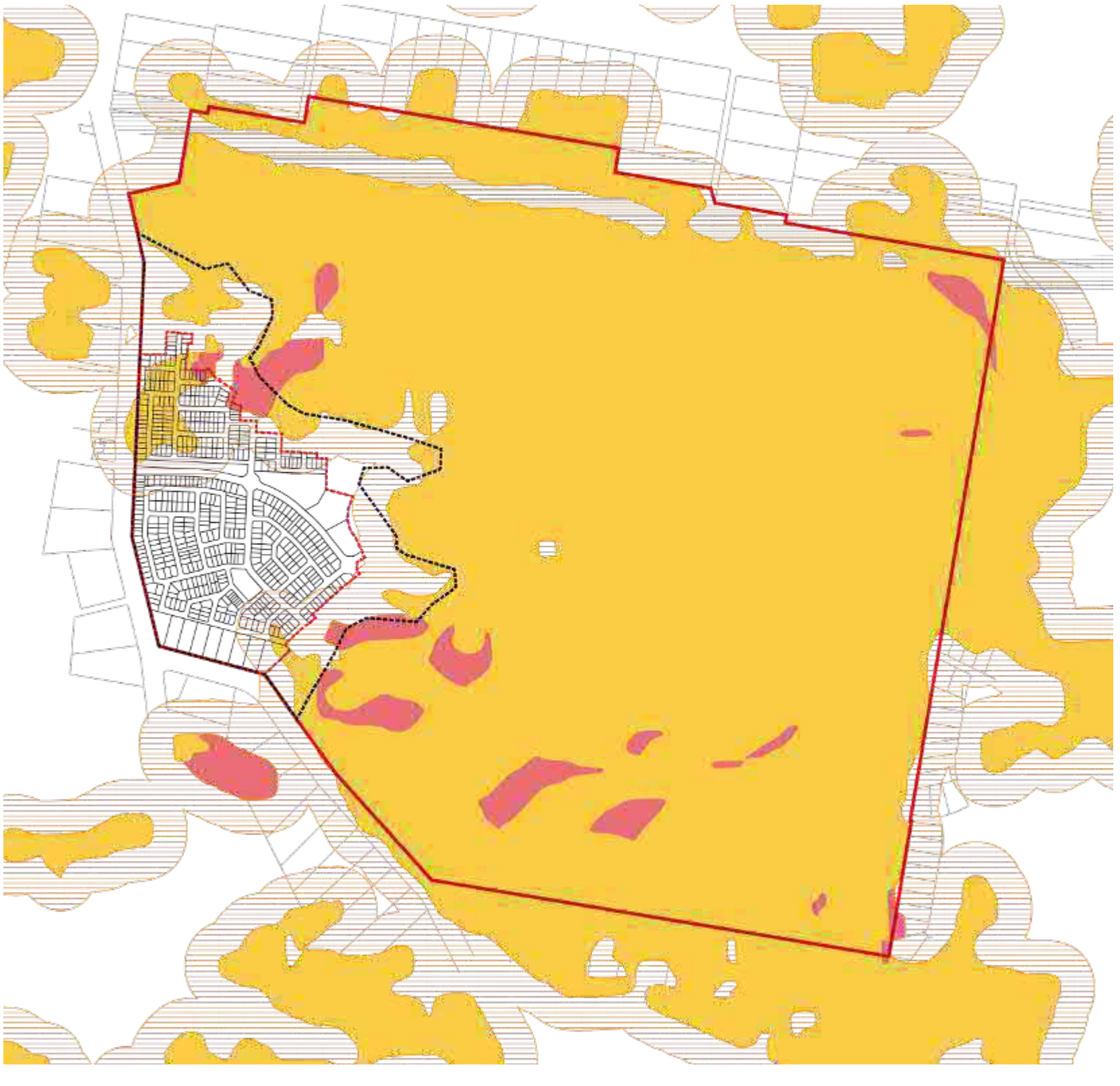
GREENBANK
LAND USE PLAN WITH AREA 1 & STATE PRIMARY SCHOOL SITE

1:15,000 @ A3

0 200 400 600 800

DATE: 02.11.2016
JOB NO: ND1309
DWG NO: LU:02
REV: 5

Figure 2 – Bushfire hazard plan – Primary School Site
– Pre-clearing



Legend

- SITE BOUNDARY
- CADASTRE BOUNDARIES
- AREA 1 BOUNDARY
- EPBC EXCISION BOUNDARY
- HIGH POTENTIAL BUSHFIRE INTENSITY
- MEDIUM POTENTIAL BUSHFIRE INTENSITY
- POTENTIAL IMPACT BUFFER (100M)

URBIS

GREENBANK

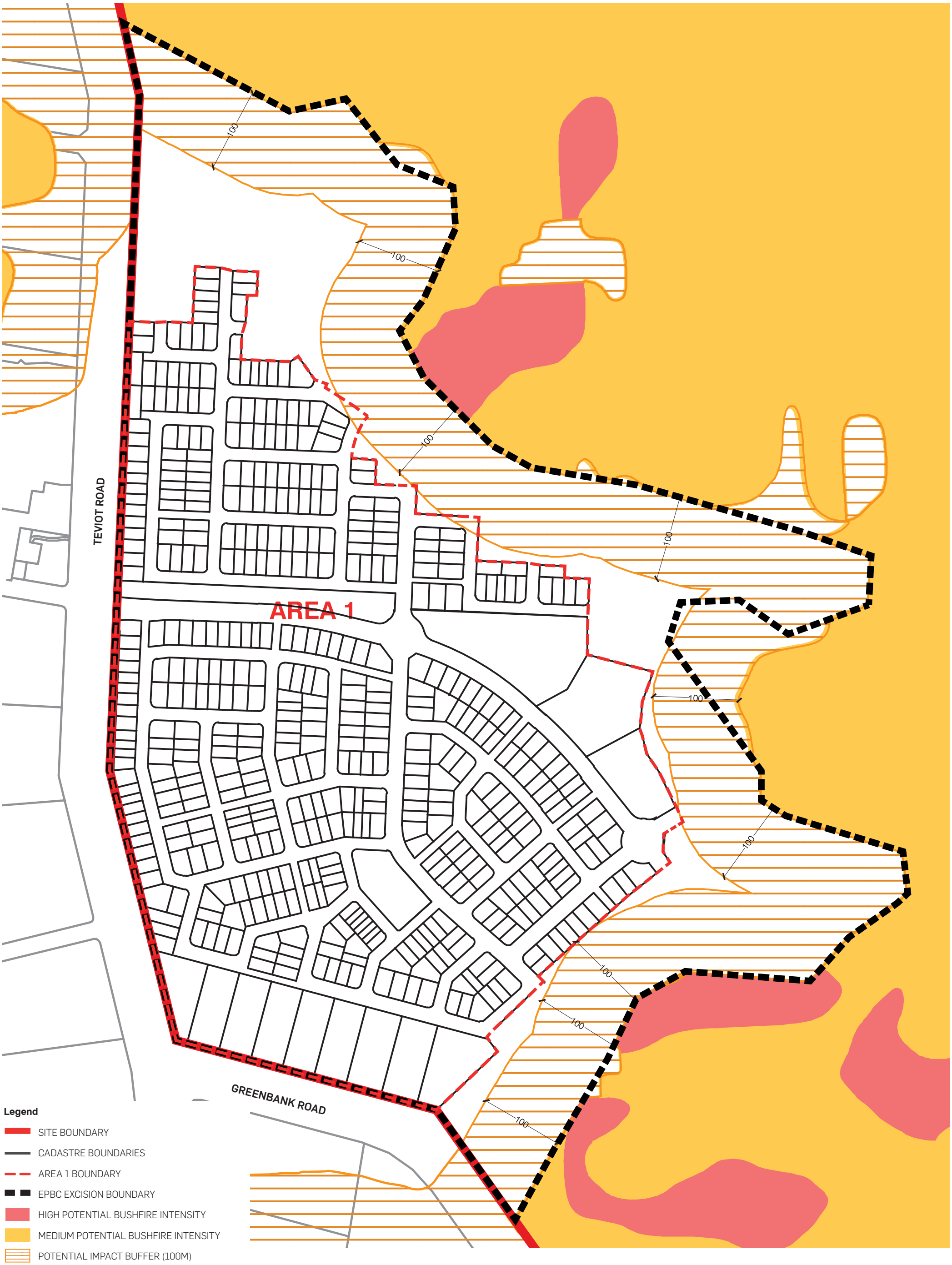
BUSHFIRE HAZARD PLAN - PRIMARY SCHOOL SITE - EXISTING

1:15,000 @ A3

0 200 400 600 800

DATE: 03.11.2016
JOB NO: ND1309
DWG NO: BF:01
REV: -

Figure 3 - Bushfire hazard plan – Primary School Site – Post-clearing land within the EPBC excision boundary



URBIS

GREENBANK

BUSHFIRE HAZARD PLAN - AREA 1 & PRIMARY SCHOOL SITE - POST CLEARING

1:4,000 @ A3

0 50 100 150 200

DATE: 03.11.2016
JOB NO: ND1309
DWG NO: BF:03
REV: 1

Environmental Pre-Start Checklist

Everleigh mirvac

Project Area: School Site – Phase 1 (Stage 2)	**Date: 29 November 2019**
Contractor: Golding	**Scope of Works:** Vegetation clearing associated with (DEV2016/768) Phase 1 (Stage 2 clearing) for the School Site. Refer Attachment 1 for clearing extent.
Date work is to start 2 December 2019	
Date work is to cease: 20 December 2019	

		Compliance (✓ × N/A)					
#	**Control Measure**	**Client**	**Superintendent**	**Contractor**	**Fauna Spotter Catcher**	**Environmental Coordinator**	**Details**
MANGEMENT PLANS							
1a	Has the **environmental coordinator** obtained approval for works located inside the *Environment Protection and Biodiversity Conservation Act 1999* referral area (EPBC 2016/7817)?					✓	Yes. Refer Attachment 2 – for a copy of the EPBC Approval. Appendix A shows the Phase 1 approval extent. The Phase 1 (Stage 2) clearing extent (refer Attachment 1) is only part of the Stage 1 area and forms the balance of the Phase 1 clearing extent. As per EPBC conditions, all works must occur in accordance with the *Mirvac Greater Flagstone Project: Natural Environmental Strategy (18 April 2017), as approved by Economic Development Queensland on 2 June 2017 [NESS]* (Refer Attachment 3).

Environmental Pre-Start Checklist

Everleigh mirvac

#	Control Measure	Client	Superintendent	Contractor	Fauna Spotter Catcher	Environmental Coordinator	Details
1b	Has a Vegetation Clearing Management Plan (VMP) been prepared and self-certified by the **environmental coordinator**?					✓	Refer to Attachment 3 - *'Vegetation Management Plan, Proposed School Development, prepared by Saunders Havill Group, dated Sept 2019 [VMP]'.*
1c	Has Fauna Management Plan (FMP) been prepared and self-certified by the **environmental coordinator**?					✓	Refer to Attachment 4 – *'Fauna Management Plan, School Site – Greenbank Road, Greenbank, prepared by Saunders Havill Group, dated July 2019 [FMP].*
1c	Has the **environmental coordinator** undertaken a Protected Plants flora survey for the clearing impact area and obtained an exemption / permit to clear from the Department of Environment and Science (DES) for protected species under the *Nature Conservation Act 1992*?					✓	Refer to Attachment 5 for a copy of the DES Wildlife Authority Permit for clearing of protected plants (WA0009354) grated 24 August 2018 and approved clearing impact area. No M. irbyana specimens are to be cleared under the VMP. All works must be undertaken in accordance with *'Impact Management Plan Melaleuca irbyana 432-520 Greenbank Road, Greenbank prepared for Mirvac QLD Pty Ltd 3 July 2018'*

Environmental Pre-Start Checklist

Everleigh mirvac

#	Control Measure	Client	Superintendent	Contractor	Fauna Spotter Catcher	Environmental Coordinator	Details
							[IMP], and associated appendices and supporting documentation.
CONTRACTOR RESPONSIBILITES							
2a	Has the **contractor** issued copies of the NESS and self-certified VMP and FMP been issued to all site contractors and sub-construction and made these management plans available in the site construction office?			✓			Copies of the VMP and FMP have been provided to the contractor as attachments to this environmental pre-clearance package.
2b	Have clearing extents provided by the **site superintendent** to the site **contractor** and **environmental coordinator**?		✓	✓		✓	Clearing extents were provided to the environmental coordinator in preparation of the VMP. Tree protection fencing lines as shown on the VMP were provided to the contactor prior to the installation of tree protection fencing.
2c	Have clearing extents been marked out and fenced as per VMP requirements by the **contractor** and demarcation fencing signed off by the **environmental coordinator**?		✓	✓		✓	Clearing extents were checked by the environmental coordinator on 22nd November and again on the 28th November. Refer to Attachment 6 for sign off by the environmental coordinator of demarcation fencing.
2d	Has the **contactor** appointed a **fauna spotter catcher** holding required DES permits (approved by the **environmental**			✓	✓	✓	Refer Attachment 7 for references of current licenses and operating permits for the appointed fauna spotter catcher in Section 1.3

Environmental Pre-Start Checklist

#	Control Measure	Client	Superintendent	Contractor	Fauna Spotter Catcher	Environmental Coordinator	Details
	coordinator) to be present during all clearing activities and made aware of their responsibilities under the FMP and VMP?			✓	✓		of the *Wildlife Protection Management Plan Everleigh Estate, School (Phase 1 – Stage 2), prepared by TWC* (WPMP) (refer Attachment 7).
2e	Has the appointed **fauna spotter catcher** completed pre-clearance surveys and reports and have these been reviewed by the **environmental coordinator**?				✓	✓	Preclearance surveys were undertaken on the 25th November 2019. Refer Attachment 7 for a copy of the WPMP and Attachment 8 for a copy of the *Wildlife Habitat Impact Mitigation Plan Everleigh Estate, School (Phase 1 – Stage 2), prepared by TWC* (WHIMP). Review of the WPMP and WHIMP was undertaken by the environmental coordinator on 28th November 2019.
2f	If any threatened fauna species or habitat/breeding places have been identified by the **fauna spotter catcher**, have appropriate controls been implemented and discussed with the key personnel?			✓	✓	✓	Refer to WPMP (Attachment 7) for the location of significant habitat features identified by pre-clearance surveys. Appropriate mitigation measures have been provided in the WHIMP (Attachment 8). Appropriate controls will be discussed with key personnel at the pre-start meeting.
2g	Has an Erosion and Sediment Control Plan been prepared and self-certified by a RPEQ or accredited CPESC professional / **site superintendent** and supplied to the **contactor**?		✓	✓			Refer to Attachment 9 for the construction issue ESCP plans prepared by the superintendent and CPESC.

Environmental Pre-Start Checklist

Everleigh mirvac

#	Control Measure	Client	Superintendent	Contractor	Fauna Spotter Catcher	Environmental Coordinator	Details
2h	Has the **contractor** put in place appropriate induction and management controls to ensure all contractors, subcontractors and associated personnel been instructed on environmental procedures and controls, including timing of clearing, stop-works procedures and non-compliance reporting requirements?			✓		✓	Refer to Attachment 10 for evidence of environmental awareness supplied by the Contactor.
BIODIVERSITY VALUES							
3a	Will the works occur in an area of significant biodiversity values as shown by the NESS?		N/A	N/A		NA	No.
3b	Will the works occur in an area of other biodiversity values as shown by the NESS?		✓	✓		✓	A mapped drainage feature traverses the site. Impacts of clearing will be managed through the ESCP.
3c	Will the works occur in a Department of Agriculture and Fisheries (DAF) mapped waterway?		✓	✓		✓	No.
3d	Will the works involve the clearing of Koala Habitat as mapped by Koala Habitat Values mapping and do offsets apply to the clearing?	✓		✓		✓	In accordance with the NESS offsets for the clearing of Koala habitat will be addressed through EPBC approval conditions, which take precedence over any State Government Offset or obligations for the same prescribed matter.
3e	Has a Bushfire Hazard Assessment and Management Plan been prepared for the stage of works and endorsed by EDQ?	✓	✓	✓		✓	Refer to Attachment 11 for a copy of the *Bushfire Hazard Management Plan (State*

Environmental Pre-Start Checklist

#	Control Measure	Client	Superintendent	Contractor	Fauna Spotter Catcher	Environmental Coordinator	Details
		✓	✓	✓			*Primary School), prepared by Rob Friend and Associates, dated February 2019.*
PRESTART MEETING							
4	Has a pre-start been completed with all relevant parties?						A pre-start meeting will be held with all relevant parties 2nd December 2019.

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

Environmental Pre-Start Checklist

Additional Notes

Three listed threatened species occur on site, as protected under Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC) and State *Nature Conservation Act 1992* (NCA) legislation, which include:

- Koala
- Grey-headed Flying-fox
- Melaleuca irbyana

Specific approval conditions relating to protected species and their habitat are applicable to works within the clearing area, including:

EPBC 2016/7818 approval conditions (Attachment 2):

- The approval holder must ensure that **no** clearing o Koala or Grey-headed Flying-fox habitat for Stage 1 occurs outside the Stage 1 site.
- The approval holder must implement the *Mirvac Greater Flagstone Project: Natural Environmental Strategy (18 April 2017), as approved by Economic Development Queensland on 2 June 2017* to avoid degradation of the onsite conservation area until such time as handover is accepted by Logan City Council.

DES Wildlife Authority Permit conditions (Attachment 5):

- All works must be undertaken in accordance with *"Impact Management Plan Melaleuca irbyana 432-520 Greenbank Road, Greenbank prepared for Mirvac QLD Pty Ltd 3 July 2018'*, and associated appendices and supporting documentation.

All works must be undertaken in accordance with the following management plans:

- NESS - *Mirvac Greater Flagstone Project: Natural Environmental Strategy (18 April 2017), as approved by Economic Development Queensland on 2 June 2017*
- IMP - *Impact Management Plan Melaleuca irbyana 432-520 Greenbank Road, Greenbank prepared for Mirvac QLD Pty Ltd 3 July 2018'*
- FMP - *Fauna Management Plan, School Site – Greenbank Road, Greenbank, prepared by Saunders Havill Group, dated July 2019*
- VMP - *Vegetation Management Plan, Proposed School Development, prepared by Saunders Havill Group, dated Sept 2019 [7598 E 01 SCH VMP B*

Copies of these management plans has been supplied to all signatory parties as part of the Environmental Pre-clearance Package.

Environmental Pre-Start Checklist

Compliance Awareness

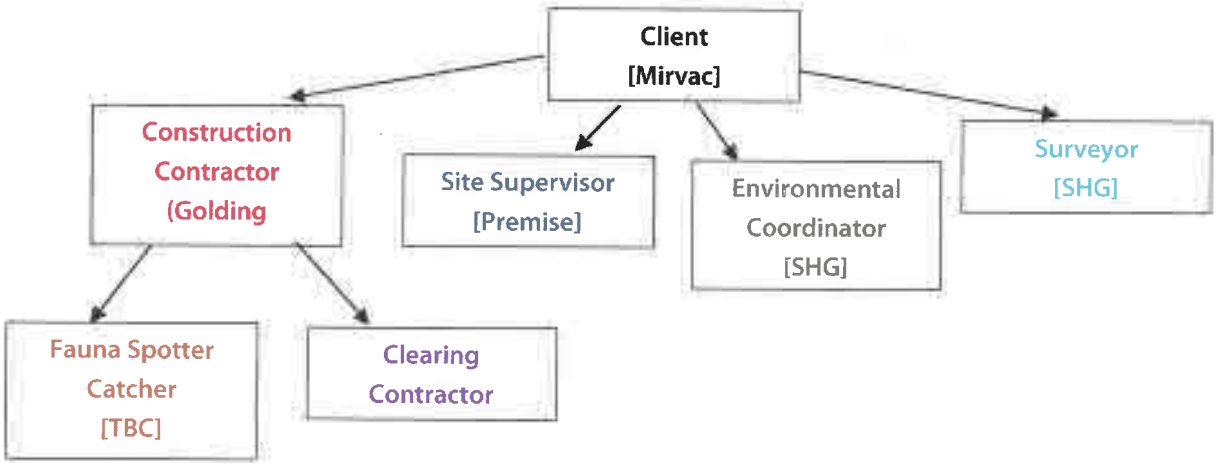
Signing below demonstrates acknowledgement of the environmental pre-start procedures and requirements listed in the checklist above and associated attachments.

Name	Company	Position	Signature	Date
Jason Augustine	Mirvac Queensland Pty Limited	**Client Representative**	Jason Augustine Digitally signed by Jason Augustine DN: cn=Jason Augustine Date: 2019.11.29 07:55:25 +10'00'	
Clint Thorp	Premise	**Site Superintendent**		29/11/19
Cameron McClure	Golding	**Site Contractor**		28/11/19
Frank Court	Tomewin Wildlife Consultancy	**Fauna Spotter Catcher**		28/11/19
Luke Davies	QLD Mulching	Clearing Contractor		28/11/19
Keira Grundy	Saunders Havill Group	**Environmental Coordinator**		**29/11/19**

Mirvac's Everleigh Project
Environmental Responsibilities

This document sets out the environmental responsibilities for relevant parties appointed by Mirvac for the Everleigh project at Greenbank.

For the Everleigh Project, the following management structure will be adopted:



Abbreviations

The following abbreviations have been adopted in this document:

BHMP	Bushfire Hazard Mitigation Plan
DES	Department of Environment and Science (Qld)
FMP	Fauna Management Plan
NESS	Natural Environment Site Strategy
IMP	Impact Management Plan (Melaleuca irbyana)
VMP	Vegetation Management Plan

1.1. Construction Contractor Responsibilities

The **Construction Contractor** is responsible for the following environmental controls on the project:

- Ensuring construction works (including pre-clearance checks (see Section 1.1.1), erosion and sediment control measures, clearing processes and post clearing requirements (see Section 1.1.2)) are undertaken in accordance with the Environmental Pre-Start Package for the Stage of Works and approved management plans (e.g. Vegetation Management Plans (VMP) / Fauna Management Plans (FMP) / Natural Environment Site Strategy (NESS) / Bushfire Hazard Assessment Management Plan (BHAMP) / Impact Management Plan (IMP))
    - In the event of a non-compliance, all works are halted immediately and non-compliances are reported to the **site supervisor** and **environmental coordinator**.
    - Weekly review and reporting on compliance with approved management plans (N.B. this can be shown as an item in a weekly review / report / checklist).
    - Monthly environmental compliance reports / checklist to the **environmental coordinator.**
- Engagement and management of **fauna spotter catcher** t to undertake pre and post clearance checks, attend pre-start meetings and be present on site during all clearing activities.
    - The appointed **fauna spotter catcher** must hold a Damage Mitigation Permit and a Rehabilitation Permit for native wildlife, including Koala, issued from Department of Environment and Science (DES).
- Installation and maintenance of erosion and sediment controls as per approved management plans prepared by the **site supervisor**
- Installation of demarcation fencing as detailed on the Stage of works VMP in associated with the appointed **surveyor**
    - Fencing must be maintained during works and reinstated immediately if damaged or knocked down.
    - Temporary star picket fencing must be installed around the Stage of Works site, any open space areas and / or individual trees to be retained on the Stage of works VMP.
    - Fencing must be fauna friendly and provide a least a 30cm gap between the bottom of the fence and the ground.
    - Fencing shall be erected prior to the commencement of clearing activities and shall be removed in accordance with the WPMP to enable animals to safely move to refuge areas.
    - Once terrestrial fauna has safely moved out of the area, temporary fauna exclusion fencing will then be erected for the two polygons of retained vegetation (identified as future sports ovals) to ensure animals do not re-enter these areas and become trapped.
    - Fencing shall be reinstated immediately if damaged or knocked down.
    - Fencing must remain in place until completion of bulk earthworks and removed prior to on maintenance or as required as subsequent stages of the development occurs.
- Ensuring daily limits and volumes of vegetation clearing occur in accordance with approval allowances (e.g. EPBC Act Approval, EDQ Approval).
- Ensuring stockpiles and cleared vegetation is managed in accordance with approved management plans.
- Ensuring clearing occurs between the hours of 6am – 6pm.

- Ensuring no dogs are permitted on site.
- Ensuring cleared vegetation free of weeds is to be reused on site, in accordance with the VMP.
- Ensuring clearing occurs in accordance with the direction of clearing plan as detailed in the VMP / FMP or as prepared by the **fauna spotter catcher**.
- Ensuring all contractors, subcontractors and associated personnel been instructed on environmental procedures and controls.
    - Environmental procedures and controls must form part of induction material (and evidence should be able to be provided to the **environmental coordinator** on request).
    - Copies of approved management plans are made available at the site office at all times and evidence should be able to be provided to the **environmental coordinator** on request).
    - General education and awareness notification of contractors and sub-contractors involved in activities potentially impacting native animals as part of site induction – contractors must know the location of the FMP, key phone numbers including the nominated Fauna Spotter Catcher and DES, and who to report to if potential breaches of the FMP occur.
    - A list of relevant contact numbers as listed in the VMP and FMP kept in a visible and accessible location in the site office.

1.1.1 Construction Contractor Pre-Clearance Procedure (for each Stage of Works)

This procedure is to be followed by the **contractor** prior to clearing for each Stage of Works.

1. Have all **contractors**, subcontractors and associated personnel been instructed on environmental procedures and controls as part of their site induction?
2. Do you have a copy of the approved management plans?
3. Have copies of the approved management plans been made available to all site **contractors** and sub-contractors?
4. Have copies of the approved management plans been made available in the site construction office?
5. Have clearing extents as per approved management plans been flagged by the **contactor** in association with the appointed **surveyor** and checked by the **environmental coordinator**? N.B Fencing must be installed prior to the pre-start meeting for the Stage of Works.
6. Have erosion and sediment controls been installed as per approved plans prepared by the **site supervisor**?
7. Have you engaged a DES **fauna spotter catcher** to undertaken necessary reporting requirements and be present during all clearing activities?
8. Has the appointed **fauna spotter catcher** undertaken pre-clearance checks and reporting, no more than 2 weeks prior to when clearing is to occur?
9. If any threatened fauna species or habitat/breeding places have been identified by the **fauna spotter catcher**, have appropriate controls been implemented and this information provided to the **environmental coordinator**?
10. Has a pre-start been completed with all relevant parties?
11. Have the requirements of the approved management plans been discussed a pre-start meeting?
12. Have all relevant parties reviewed the Environmental Pre-Start Package and signed the Environmental Pre-Start Checklist as issued by the **environmental coordinator**?

1.1.2 Construction Contractor During & Post-Clearance Checklist (for each Stage of Works)

This procedure is to be followed by the **contractor** during and post clearing for each Stage of Works.

1. Has the clearing occurred in accordance approved management plans? If not, have any non-compliances been reported to the **site supervisor** and **environmental coordinator**?
2. Have erosion and sediment controls been maintained as per approved plans prepared by the **site supervisor**?
3. Has compliance with environmental procedures and controls been reported on within the weekly site compliance checklist?
4. Has weed free, cleared vegetation been processed though an on or off-site wood-chipper and disposed of as firewood or landscape mulch or otherwise reused / relocated for future use or as per the approved VMP?
5. If vegetation has been stockpiled, has the **fauna spotter catcher** checked the stockpile prior to its removal?
6. Once clearing has ceased, has a post-clearance report been prepared by the **fauna spotter catcher** and provided to the **environmental coordinator**?
7. Once clearing has ceased, has a post-clearance report been prepared by the **arborist** and provided to the **environmental coordinator**?
8. Has a monthly environmental compliance report / checklist been prepared and provided to the **environmental coordinator**?

1.2. Fauna Spotter Catcher Responsibilities

The appointed **fauna spotter catcher** must hold a Damage Mitigation Permit and Rehabilitation Permit issued by DES and is responsible for the following environmental controls on the project:

- Ensuring works are undertaken in accordance with the Environmental Pre-Start Package for the Stage of Works and approved management plans (e.g. VMP / FMP / NESS / BHAMP).
- Undertaking pre-clearance fauna checks for the Stage of Works no more than 2 weeks prior to clearing.
- Preparing a Wildlife Protection Management Plan (WPMP) and Wildlife Habitat Impact Mitigation Plan (WHIMP) (as per the Draft Code for Fauna Spotter Catchers) for each stage of works. This includes Identifying fauna habitat values, potential risks to fauna, and appropriate mitigation measures as well as identifying the direction and sequencing of clearing activities to ensure safe flushing of fauna. These are to be provided to the **contractor** and **environmental coordinator** for review.
- Attending the pre-start for each Stage of Works.
- Implementing controls and procedures and controls in the WPMP and WHIMP, which includes being present during all clearing activities, and:
    - Immediately prior to the commencement of clearing of native vegetation undertaking a daily visual inspection of the area must be carried out.
    - Being present during all clearing activities and inspect trees continuously ahead of clearing for Koalas.

- In the event of an animal being located, an area within a minimum 5 m radius should be established excluding machinery from the area until the animal has relocated (usually overnight). The no go zone should be determined by the **fauna spotter catcher** dependant on the species.
- If any used hollows or nests are identified from inspection by the **fauna spotter catcher**, the hollows and nest must be removed by an experienced machinery operator and carefully lowered for inspection and fauna removal by the **fauna spotter catcher**
- Translocation of threatened fauna is not permitted and fauna must move off at its own accord. There is no approval to translocate threatened fauna as part of operational works onsite.
- Any native fauna orphaned or injured by the development process must be immediately reported to DES, RSPCA and the **environmental coordinator** and the **client**.
- Inspecting stockpiled vegetation for fauna prior to its removal.

- Preparing a post-clearing report to be provided to the **contractor** and **environmental coordinator** no more than 2 weeks after clearing has finished, specifying the following:
  - Length and time of clearing;
  - Details of any fauna that were caught and/or released and the placement of any release/s
  - Inventory of species encountered during tree removal;
  - Brief summary of any fauna handling, mortalities or other relevant fauna related
  - incidents that may have occurring during tree removal

1.3. Site Supervisor Responsibilities

The **site supervisor** is responsible for the following environmental controls on the project:

- Ensuring construction works are undertaken in accordance with the Environmental Pre-Start Package for the Stage of Works and approved management plans (e.g. VMP / FMP / NESS / SBMP / BHAMP).
- Ensuring the **contractor** receives copies of approved management plans for the Stage of Works.
- Ensuring required surveys and pre-clearance checks from the **fauna spotter catcher** and **environmental coordinator** have been conducted. (N.B. this includes any surveys i.e. tree plots, required to inform design stages or required for preparation of management plans and development applications).
- Providing the **environmental coordinator** with CAD copies of works extents (including clearing extents for bulk earthworks, access tracks, crossing etc.).
- Coordinating clearing extents to be demarcated with the **surveyor** and **contractor**, and checked by the **environmental coordinator**.
- Confirming works within waterways comply with *Water Act 2000* requirements for riverine protection and proceed under an applicable exemption or a riverine protection permit
- Confirming works within waterways comply with *Fisheries Act 1994* requirements for waterway barrier works and proceed under accepted development outcomes or a permit.
- Ensuring erosion and sediment controls have been installed and maintained as per approved ESCPs prepared by the **site supervisor.**
- Coordination of any pre-start meetings and signing of the Environmental Pre-Start Checklist.
- Ensuring no clearing occurs until sign off is received from the **environmental coordinator**.

1.4 Environmental Coordinator Responsibilities

The **environmental coordinator** is responsible for the following environmental controls on the project:

- Ensuring all Commonwealth and State environmental approvals are obtained for the Stage of Works.
- Ensuring all required management plans have been prepared for the Stage of Works.
- Ensuring all required management plans have been approved / self-certified for the Stage of Works.
- Ensuring all relevant parties receive copies of approved / self-certified management plans for the Stage of Works.
- Preparing, managing and compiling the Environmental Pre-Start Package for the Stage of Works, including the Environmental Pre-Start Checklist.
- Undertaking checks of demarcation flagging installed by the **contractor** and **surveyor**.
- Reviewing **fauna spotter catcher** pre-clearance and post-clearance reporting.
- Ensuring works are undertaken in accordance with the Environmental Pre-Start Package for the Stage of Works and approved management plans (e.g. VMP / FMP / NESS / SBMP / BHAMP / IMP).

Everleigh mirvac

Acknowledgement

No clearing works can occur until the Environmental Pre-Start Package, for the specific works site, is distributed by the Environmental Coordinator and written instruction is given by the Site Coordinator (Engineer).

By signing I agree that I have read and understood the Environmental Pre-Start Check Procedure and will comply with the procedure for all clearing works.

Name	Company	Position	Signature	Date
Jason Augustine	Mirvac	Client Representative		14/11/19
Cameron McClure	Lasinda	Contractor Coordinator		14/11/19
Clint Thorp	Premise	Site Supervisor		15/11/19
Keira Grundy	SHG	Environmental Coordinator		**15/11/19**
Frank Court	Tomkin Wildlife	Fauna Spotter		12/11/19
Luke Davies	QLD Mulching	Clearing Contractor		14-11-19
Gavin Wheatley	Hutch	Project Surveyor	G Wheatley	14/11/19