

<b>Code of Practice- Care and rehabilitation of orphaned, sick or injured protected animals by wildlife carers(2013)</b>	<ul style="list-style-type: none"> <li>Provides guidelines on the rehabilitation and care of wildlife</li> </ul>	Detailed guidelines, in regards to hygiene, housing, capture and release, euthanasia and relevant legislation
<b>Seqwater-Guideline- Fish Stranding and Salvage</b>	<ul style="list-style-type: none"> <li>The purpose of this guidance document is to ensure native fish recovery operations are conducted in a timely and safe manner to minimise or eliminate loss of fish from stranding.</li> </ul>	Guideline on managing aquatic fauna during dewatering works.
<b>Fisheries Act 1994</b>	<ul style="list-style-type: none"> <li>The main purpose of the Fisheries Act is to provide for the use, conservation and enhancement of the community's fisheries resources and fish habitats in a way that seeks to apply the principles of ecologically sustainable development.</li> </ul>	Outlines fish habitats and fish movement and migration (regulation of waterway barriers). Guidelines on commercial, recreational and indigenous fishing.
<b>Biosecurity Act 2014</b>	<ul style="list-style-type: none"> <li>The Biosecurity Act provides a framework for an effective biosecurity system for Queensland, to ensure the safety and quality of agricultural inputs, and to align responses to biosecurity risks in the state with national and international obligations.</li> </ul>	Under the Biosecurity Act, pest species must not be kept, fed, given away, sold, or released into the environment without a permit. Under the Biosecurity Act, everyone has a general biosecurity obligation to take reasonable and practical steps to minimise the risks associated with restricted plants and animals.
<b>DAF Guidelines for Fish Salvage, 2018</b>	<ul style="list-style-type: none"> <li>Purpose of these guidelines is to minimise the risk to aquatic fauna during dewatering works.</li> </ul>	These guidelines provide detailed instructions for dewatering waterbodies and salvaging aquatic fauna.

Australia Wide Environmental Consultants (AWEC) holds a current DES rehabilitation permit (Permit #WA0002250), with an extended authority issued by the Department of Environment and Science specifying that the holder may take, keep, or use an animal whose habitat is about to be destroyed by human activity.

### 3. OCCUPATIONAL HEALTH AND SAFETY

Before commencement of work on the site all inductions including client, inductions must be completed; all onsite requirements outlined in the inductions must always be adhered to.

Before handling any venomous snakes, you must have completed a Venomous snake relocation course and an acceptable level of attainment must have been achieved.

#### 3.1. Personal Protective Equipment (PPE)

The PPE required on site must always be worn. As a minimum a long sleeve high visibility work shirt, long work pants, hard hat with sun brim, lace up work boots, safety glasses and suitable gloves for your planned task are to be worn.

#### 3.2. First Aid

It is a requirement of your position as a Fauna Handler that you have a current first aid certificate and first aid kits have been placed in every vehicle for your use. If working in the field and are situated away from your site vehicle you must carry a snake bit kit.

### 3.3. Biosecurity/ Hygiene Measures

Biosecurity/hygiene measures include-

Zoonotic diseases (those that affect both animals and humans and may be passed between them) are known to be present in Australian native wildlife e.g., Australian bat lyssavirus. Diseases may also be transferred between animals. Fauna handlers should therefore take basic precautions to prevent animal-animal, animal-human and human-animal transfer of disease. Such precautions should include the following:

- High levels of personal hygiene.
- Using personal protective equipment such as gloves, boots etc.
- Not eating, drinking, or smoking while handling wildlife, also disinfecting before eating or drinking.
- Washing field clothes and equipment that has encounter animal's blood or body fluids and cleaning all trapping equipment between surveys.
- Basic first aid for treatment of cuts, bites, and scratches.
- Observe conditions in Queensland Hygiene protocol for handling to avoid spreading Chytrid fungus.
- Obtaining vaccinations against Australian bat lyssavirus before handling bat species.
- Knowledge and familiarisation with C3 bat protocol
- Should anyone who handled animals become ill within two months of a survey, the attending medical practitioner should be informed of the potential exposure to zoonosis.

### 3.4. Working around plant

#### **Placement**

When working besides plant (Bulldozers and Excavators) a clear line of sight to the machine operator is required. For the operator to maintain line of sight it is important to be on the correct side of the machine, for excavators this is the left side (operator cabin side). For bulldozers, the correct place is on either side, not in front or behind the machine and always maintain positive communication with the operators. When vegetation is being felled it is important to stand well clear (but still within sight of the operator). If further inspection of a tree is required, the operator must be contacted and place the machine in the "safe" position (Stationary with the bucket or blade on the ground) before you can approach the tree.

#### **Clearing zone**

Clearing zone is defined as that area within two tree lengths (50 metres) from the operating machine. This zone is a hazardous area, care must always be taken while working within this zone. The clearing zone is where most of the spotter/catcher's work occurs.

#### **Communication**

Communication with the plant operator is to be made via hand held UHF radios. Radios must always be charged and carried on your person. Clear communication with the

operator is essential to ensure safety and the required co-operation is achieved. The operator must be informed upon the sighting of any wildlife and of your intentions to catch the animal; you require positive communication before approaching the machinery.

## 4. FAUNA MANAGEMENT

### 4.1. Managing Disturbance Activities

#### 4.1.1. Prior to Work Commencing-

A quick inspection of the site prior to any construction activities commencing every morning. The purpose of this inspection is to check for any fauna (in particular Koalas) are present within the next area to be cleared, if any habitat features or nesting sites are located within the site and that their clearly marked out and that their planned mitigation measures have been discussed with the clearing crew.

#### 4.1.2. During Disturbance Works-

During clearing works a spotter/catcher is to be present to manage the risk to native fauna within the site. The spotter/catcher will ensure that significant habitat features and breeding sites are cleared in a manner that best mitigates the risk to fauna potentially in-habiting them.

The spotter-catcher will also manage the direction of clearing to ensure that fauna is directed into a suitable location.

### 4.2. Fauna Capture

One of the roles of the fauna spotter/catcher on site is to remove any fauna within the disturbance site. Where practical animals are to be moved out of an area proposed for disturbance before clearing/stripping works commence.

Where there is a risk to native fauna a spotter/catcher is to be present during clearing works and watch out for any fauna, fauna signs and significant habitat features. When an animal is sighted, and it is deemed safe to approach the animal the capture procedure listed below will be adhered to.

This does not apply to the Vulnerable Koala which cannot be captures, handled, stored, or removed from site and must be managed in accordance with the Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006-2016.

#### 4.2.1. Fauna Identification

It is important that correct identification (Fauna/Flora) is made for record keeping purposes. If a sighted or captured/collected flora or fauna specimen can't be identified on site an ecologist is to be contacted who will direct the Spotter/Catcher on site on the types of images they require to correctly identify the specimen.

#### 4.2.2. Fauna Handling Equipment

Various methods can be used to safely capture native wildlife in the field, capturing native wildlife does not only pose a risk to the handler's personal safety but could also cause unnecessary stress and or injury to the animal involved. Before capturing any wildlife plan your capture, handle the animal as per training and have the correct equipment available.

#### 4.2.3. Fauna Handling Procedure

Capture myopathy is a disease associated with the capture or handling of many species of mammals and birds and minimising the stress on any captured fauna is a priority. Emphasis should be on prevention as treatment of wild fauna has a very low success rate.

The following principal should be applied-

- Remove stressors if possible. Physically separating the animal from the stressors, e.g., by blindfolding the animal, placing it in a darkened area, or moving other activities away from the holding area.
- Treat shock if present. Ensure adequate ventilation, replace fluids, correct acidosis, and keep the animal warm.
- Restriction of free movement as a result of muscle injury means a careful watch must be kept on fluid balance. Many animals with capture myopathy will suffer from exposure and /l one of the common features in hot environments is dehydration. Balanced electrolyte replacers may be needed.
- If possible, restrict movement of the animal to reduce the chance of rupturing necrotic muscles.
- Minimizing duration of exposure to stressors. High stress situations include frequent handling, repeated blood sampling, or being left in exposed conditions (such as in a trap enclosure without natural cover)

#### Species specific procedures-

##### **Possums**

To capture possums on the ground, it is best practice to grab the tail and the back of the neck. This will ensure the best grip on the animal and ensures that the handler is not in danger of being scratched or bitten, where practical the spotter/catcher should wear the appropriate gloves. Once the possum is restrained, it should be placed into an appropriately sized calico bag or pet carrier.

Where the presence of a possum is confirmed within a drey or hollow using an EWP or inspection camera, the spotter/catcher will deem which method is practical and will gain the best outcome for the in-habitant. Potential methods include removal using an EWP where practical or soft felling the tree. As possums are predominantly nocturnal, they should be released after sunset.



### **Gliders**

To capture gliders on the ground it is best practice to grab the tail and the back of the neck. This will ensure the best grip on the animal and ensures that staff are in no danger of being scratched or bitten, where practical the spotter/catcher should wear the appropriate gloves. Gliders are smaller than possums so it will be easier to get a grip around the back of the neck. Once the glider is caught it is to be placed into an appropriately sized calico bag, where multiple gliders are found in one hollow, they should be housed in one large calico bag.

### **Non-venomous Snakes**

Caution should be taken when handling non-venomous snakes. If the identification can't be confirmed prior to handling or if there's any uncertainty the snake should be handled as if it's venomous. Where possible the hook and bag technique should be used, where this is not possible the animal can be restrained at the base of the skull with a thumb and forefinger either side of the head and to the rear of the lower jaw.

When a snake is sighted, warn others of its location, and ask them to stand back as you capture and secure the animal. Place the animal into snake hoop bag and securely close the bag. The bag should be placed in safe location and everyone should be made aware not to touch any bags containing fauna.

### **Venomous Snakes**

Do not handle Venomous snakes unless you have completed a venomous snake handling course with a suitably qualified trainer and have been approved by Joel Keady to handle venomous snakes. Where practical use the hook and bag method to capture venomous snakes.

When a snake is sighted, warn others of its location, and ask them to stand back as you capture and secure the animal. Place the animal into snake hoop bag and securely close the bag. The bag should be placed in safe location and everyone should be made aware not to touch any bags containing fauna. All containers or bags containing a venomous animal should be labelled and closed using zip ties.

### **Monitors**

Monitors can be caught by the base of the tail; caution should be taken as these animals are powerful and their bite can easily result in severe infections. When you have grabbed an animal take care as they will easily swing towards the handler and can cause severe injuries through scratching and biting. Once the animal is under some control, use a catch bag or towel to cover their head, this will allow the handler to take hold of the neck. The hand/arm holding the neck must align the wrist and forearm along the back of the monitor, the animal can then be lifted. Tilt the head/neck back a small amount and hold the animal (away from your body) be careful of the tail as it will be used to strike.

These animals need to be released straight away or placed into a suitably sized pet carrier or calico/hessian bag.

### **Frogs**

The spread of disease, such as the chytrid fungus, may occur as a result of handling frogs. Unnecessary handling should be avoided, and the specimen released as soon as possible. When handling amphibians, the handler should wear unused disposable gloves or capture and handle frogs in single use lightweight plastic bags. Bare hands may be used provided they are wiped before each capture with a sterilising alcohol-based hand disinfectant.

### **Bats/Flying Foxes**

Bats should not be handled by staff that are not immunised. Bats should always be handled with gloves, flying foxes should be handled with heavy duty gloves. Bats can carry a disease called Lyssavirus which is closely related to the common rabies. If handlers are bitten or scratched it should be reported immediately.

If several micro-bats are removed from one hollow, they should all be stored in the same calico bag.

## **4.3. Storing Captured Fauna**

Captured fauna should be secured in either a calico bag, snake bag or pet carrier after being captured. If an animal is placed into a bag the end should be securely knotted closed and then tied using a bag tie or zip-tie.

These bags should be placed in a quite dark location that is the appropriate temperature for the species that has been captured. Captured fauna should be released into suitable habitat as soon as possible. Some species are nocturnal and cannot be released till dusk, extra care should be taken when storing an animal for this long a period to ensure it isn't stressed or over/under heated.

If an animal is injured or orphaned, it should be secured in a manner that prevents unnecessary stress or increases the severity of its injuries. It should be transported to a wildlife carer or vet clinic as soon as possible.

## **4.4. Releasing Captured Fauna**

When releasing animals away from disturbed habitat, attention must be paid to several factors, including weather conditions, seasonal conditions, and the animal's ecology. Native Fauna should be released:

- Into suitable Habitat with an adequate food supply
- In appropriate weather, season, and time of day. This is particularly important for migratory species.
- Under circumstances which will not cause additional stress, such as extreme weather conditions, the wrong time of day (i.e., nocturnal species)
- In the appropriate social group. Some animals fare better if released into social groups.
- Within 1km of the site as per EHP guidelines.

Fauna should be released at a suitable time of day, in a protected location close to the site. Data should be recorded and kept on all fauna species trapped and relocated in accordance with EHP guidelines under the Rehabilitation Permit issued to AWEC.

If situations occur where animals can be re-released on the clearing site once clearing is complete the following criteria must be followed:

- Sufficient habitat is retained on site to support the animal's required niche, considering factors such as: vulnerability to predation; availability of nesting sites, hollows or microhabitats and the availability of water and sufficient food sources.
- Habitat corridors retained are of a suitable size, topography, and vegetation cover to provide effective routes for normal ecological processes such as immigration, emigration, recruitment, and dispersal.
- Habitat blocks and corridors are of sufficient size to maintain ecological integrity and effectiveness, considering likely edge effects.
- Long term risk factors to individual and population survival associated with the development have been (or will be) adequately managed or mitigated. For example: domestic animal control, motor vehicle/road impacts, swimming pool risk.

#### 4.5. Injuries & Euthanasia

Euthanasia is sometimes required to alleviate any pain or suffering of an injured captured animal that is not capable of recovering to a degree to be released back into its natural habitat. Any euthanasia that is required should be done promptly and, in the manner, most humane to that particular species.

Any injured animals that have a reasonable chance of being rehabilitated and released back into their natural habitat should immediately be given the care that they require. Any animals that require medical attention to treat or diagnose an injury should be taken to the closest vet. Any orphaned young or fauna with minor injuries (e.g., concussion) should be taken to the closest carer. Some animals for example koalas will require specialist care and the closest suitable care facility should be contacted.

#### **Recommended Wildlife Surgery-**

- Brisbane Veterinary Emergency and Critical Care Services- 53 Old Northern Road, Albany Creek QLD
- The Bloomin Vet- Greenbank Shopping Centre- Teviot Road, Greenbank, QLD

## 5. Fauna Management Measures

### 5.1 Clearing Methodology

Proposed disturbance site is to be sequentially cleared according to Figure 3 using excavators and bulldozers.

After under scrubbing of each area is complete, non-habitat trees (i.e., trees other than those identified as habitat trees) will be cleared and stockpiled for mulching. Clearing of non-habitat trees will only occur where their removal will not impact on identified habitat trees (e.g., canopies do not interconnect with habitat trees).

(e) After under scrubbing and clearing on non-habitat trees, an elevated work platform or cherry-picker will be used in conjunction with a chainsaw operator and suitably qualified fauna spotter/catcher to inspect and remove hollows a necessary prior to habitat tree felling. This method involves the fauna spotter/catcher inspecting each of the potential habitat features (usually hollows, dreys and arboreal termite nests) to determine the presence of arboreal fauna. This process is detailed following the step-by-step basis below:

1. The fauna spotter/catcher (with arborist unless the fauna spotter/catcher is a qualified chainsaw operator) will inspect each visible hollow or potential habitat resource (i.e., ringtail possum drey) identified in each tree using the cherry-picker. This is usually carried out by simply looking into hollows with the assistance of a small torch, however, burrow and bore-scopes can also be useful for deep hollows.
2. If fauna is located within a hollow, a piece of towel or rag will be firmly laced in the entrance to prevent the wildlife from escaping as in most cases arboreal fauna become aware of the presence of the fauna spotter/catcher and may attempt to flee the nesting/denning hollow due to a perceived threat. If an occupied ringtail possum drey is encountered, the fauna spotter/catcher should quietly approach (i.e., avoid contacting other branches) the drey in the cherry-picker bucket and physically capture the possum by placing the entire drey in a catch bag or only the possum if it emerges from the drey.
3. Once the hollow entrance has been secured the arborist or fauna spotter/catcher will cut the entire hollow limb off below the cavity where the branch remains solid. In circumstances where a hollow continues into the main stem of the tree, a small window will be carefully cut into the hollow, allowing the fauna spotter/catcher to plug the hollow above and below the window, then the hollow limb removed and lowered to the ground in sections.
4. When the fauna has been safely secured within its hollow, the entire limb can then be placed in the cherry-picker bucket or lowered to the ground using ropes depending on the size of the limb.
5. This limb will then be placed in a cool, quiet location until translocation to the recipient habitat site, when at dusk the hollow entrance is re-opened to allow the fauna to emerge of its own accord.

## 5.2 Checking Hollows

Habitat trees of high importance should be felled last, after surrounding less important vegetation has been cleared to allow easy access of special plant and equipment (such as an EWP), and to allow unhindered lowering of hollow bearing limbs.

Prior to felling any hollow bearing trees, the hollows are to be checked for occupants. A fibre optic camera on an extended pole will be used to check all hollows prior to the trees being felled. All the trees containing a hollow with an occupant will be marked and the machine operator will be notified of its location. Where ground conditions allow a cherry picker will be used to either the remove the animal from the hollow or close the hollow up and remove the entire hollow containing the animal and bring it down with the EWP. Prior to any intervention, exit holes should be plugged to prevent escape of wildlife.

If ground conditions do not allow the use of an EWP, a tree climber is to be used to remove the hollows prior to the tree being softly felled using on site machinery.

Whenever possible, the integrity and structure of tree hollows contained in trees which are to be removed should be preserved. These should be relocated to appropriate habitat retained on the site, or to appropriate habitat close to the site.

## 5.3 Native Beehive Relocation

All native bee hives of the genera *Tetragonula* (*syn Trigona*) and/or *Austroplebelia* are to be recovered during vegetation clearing associated with “bulk earthworks/civil works” for relocation into the retained vegetation and/or recovered and “boxed up” (if damaged) for later installation.

If a native beehive is located on site, its entrance is to be blocked off prior to sunrise. The extent of the beehive within the hollow is to be established using a fibre optic camera. The beehive is then to be cut out and both ends of the hive sealed off using treated wood. The beehive is then to be relocated to a suitable location and left-over night. The next morning at sunrise the entrance is to be opened.

**FIGURE 2- RELOCATED NATIVE BEEHIVE**

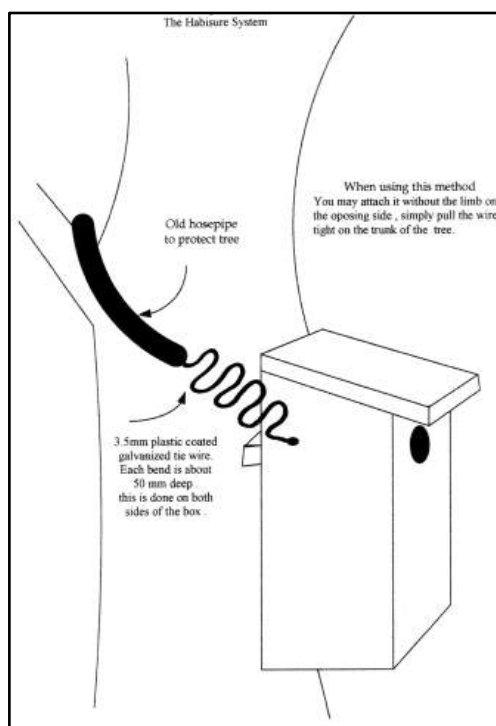


## 5.4 Habitat Replacement

The aim of nest boxes is to compensate for the loss of habitat features by developing the site (See Figure 1). The types of nest boxes installed was influenced by the Fauna Pre-clearance survey conducted on site by AWEC and the fauna captured and sighted during the clearing works on site.

Nest boxes will be sourced from Hollow Log Homes and hollows suitable to the species sighted/signs of species sighted/captured on site will be ordered. Nest boxes will be fixed to trees using a method designed to ensure no damage is done to the tree as the tree matures (See Figure 3). Possum and glider boxes will be placed in the foliage to protect them from hot afternoon sun and can be positioned facing any direction except for west. The nest boxes should be placed in an area that gives protection from direct sunlight and the entrance should face away from prevailing winds and rain. Nest boxes for possums should be attached 2-4m off the ground and 3- 6m high for glider and bird boxes (Franks, 2006). The nest boxes should be placed within an area that contains suitable species and quantities of food trees that are favoured by the species that the nest box was designed for.

**FIGURE 3- NEST BOX INSTALLATION**



The compensation ratio to be applied where hollows are identified as being used by possums, gliders or hollow dependant bird species will be a 1:1 ratio. In the case where hollows are identified but occupancy is not confirmed a 3:1 compensation ratio will be used (Smith, 1999).

The amount of arboreal fauna captured during the disturbance activity will also influence the quantity and type of habitat replacement features that will be required. Suitable nest boxes will be provided if possums, gliders, or hollow dependant birds are found to be utilising hollows within the proposed disturbance site. Installing these nest boxes prior to clearing works commencing will ensure that hollow dependant species have immediate access to suitable habitat.

5.5 Fauna Management Measures- Clearing Works

TABLE 2- FAUNA MANAGEMENT MEASURES

OBJECTIVE	MANAGEMENT METHODS	RESPONSIBILITY	TIMING
<b>A) Pre-clearing</b>			
Mitigate the risk to native fauna	<ol style="list-style-type: none"> <li>1. Prior to the commencement of works a temporary star picket fence shall be installed around open space areas and any individual trees identified for retention within the works area. Fencing shall be fauna friendly and provide at least a 30 cm gap between the bottom of the fence and the ground.</li> <li>2. A Queensland National Parks &amp; Wildlife Service (QNPWS) and DES approved fauna spotter catcher shall inspect the site no more than two weeks prior to clearing works commencing onsite and prepare a Fauna Spotter Catcher Report. The report must include a full list of fauna species encountered during the inspection, as well as the marking and identification of significant habitat trees.</li> <li>3. In addition, the DES registered fauna spotter catcher must assess the site for: <ul style="list-style-type: none"> <li>• The presence of native fauna and/or supporting habitat on-site.</li> <li>• Available adjacent habitat.</li> <li>• The presence of any fauna that is ‘protected wildlife’ as defined under the Nature Conservation Act 1992 (‘protected wildlife’)</li> <li>• The presence of any species that is a ‘listed threatened species under the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (‘listed species’)</li> </ul> </li> <li>4. The DES approved fauna spotter must be present during the pre-start meeting to identify all fauna habitat trees prior to commencement of works; damage to any such trees, to ensure that wildlife is unharmed; and at the time of tree clearing operations.</li> <li>5. A quick active fauna inspection is to be conducted the morning prior to clearing works commencing, active search over micro-habitats for any fauna, locate any potential</li> </ol>	Fauna Spotter	Pre-construction

OBJECTIVE	MANAGEMENT METHODS	RESPONSIBILITY	TIMING
	<p>nesting sites, ensure all habitat trees are marked and inspect canopy for the presence of koalas.</p> <p>6. Any fauna sighted during the pre-clearance survey should be relocated to a nearby suitable habitat.</p>		
<b>B) Clearing and Grubbing</b>			
<p>Reduce risk to native fauna during disturbance activities</p>	<ol style="list-style-type: none"> <li>1. Suitably qualified S/C's are to be present for all clearing and grubbing activities where there is a risk to native fauna. S/C's are to implement and check that all practical measures to minimise the risk to fauna during construction are adhered to. S/C's must hold or be approved to work under DES a Rehabilitation spotter/catcher endorsed permit and damage mitigation permit.</li> <li>2. Vegetation must be cleared sequentially to direct wildlife into surrounding retained vegetation and prevents isolates patches of vegetation where wildlife may seek refuge. The relocating of fauna is not permitted, and fauna must move off at its own accord and encouraged/flushed into safe havens. Unless the animal is at high risk of injury or predation if allowed to self-relocate.</li> <li>3. In the event of an animal being located an area of 5 m radius should be established around the tree excluding machinery from the area until the animal has relocated (usually overnight). Unless the animal is at high risk of injury or predation if allowed to self-relocate.</li> <li>4. All habitat trees and hollow bearing trees will be inspected using a camera on an extendable pole whether they are currently occupied. Any occupied trees will be blocked off and relocated using an EWP or tree climber where practical and site conditions allow.</li> <li>5. Any habitat or hollow bearing trees with un-confirmed occupancy are to be soft-felled in order to reduce the risk of injury to any fauna in-habiting the tree and to reduce the risk of damaging the hollows.</li> <li>6. Any injured wildlife will be taken to receive veterinary attention within 24 hours if required. If veterinary attention is not required any injured or orphaned wildlife is to be transferred to a suitably qualified Wildlife Carer. Any native</li> </ol>	<p>Fauna spotter and construction/clearing crew</p>	<p>Earthworks</p>



OBJECTIVE	MANAGEMENT METHODS	RESPONSIBILITY	TIMING
	fauna orphaned or injured by the development process must be immediately reported to the DES (1300 130 372) or RSPCA (1300 264 625).		
<b>C) Koala Management</b>			
To protect the local population of Koalas	<ol style="list-style-type: none"> <li>1. If a koala is sighted within the site a koala spotter will be on site to manage and monitor the animal until it has self-relocated out of the site. A koala spotter is to be present on the first day of clearing works with the sole responsibility to inspect all the vegetation proposed for disturbance for the presence of koalas.</li> <li>2. Following measures will be undertaken to minimise, reduce or mitigate impacts to koalas in potential koala habitat areas:               <ol style="list-style-type: none"> <li>a. Sequential clearing will be utilised to assist fauna in relocating to nearby habitat on their own accord.</li> <li>b. No tree in which a Koala is present and no tree with a crown overlapping a tree with a Koala present will be disturbed. A 50m buffer around any tree containing a Koala is to be established and works to cease within this buffer until the koala has moved off on its own accord.</li> <li>c. A vegetation corridor is to be left where practical to allow the koala to self-relocate to a suitable area that is not a proposed disturbance site.</li> <li>d. In areas containing a dominance of koala food trees and positively identified Koala sightings and/or identified scat or scratch marks a koala spotter is to be present during clearing activities.</li> <li>e. If a Koala is not injured but refuses to move from the clearance area on its own accord after two days, the S/C will liaise with DES and negotiate appropriate methods for removal and relocation.</li> </ol> </li> <li>3. A DES approved Koala Spotter is a person who holds a tertiary qualification in Biology or Zoology, or who is demonstrably experienced in the identification and location of Koalas in their natural habitat and has authorisation from DES to conduct such activities.</li> </ol>	Fauna spotter and clearing crew	Earthworks

OBJECTIVE	MANAGEMENT METHODS	RESPONSIBILITY	TIMING
	<p>4. Prior to the commencement and during felling operations, it is the responsibility of the DES approved Koala spotter to:</p> <ul style="list-style-type: none"> <li>• be present at the site of felling operations.</li> <li>• Identify any tree at the site within which a Koala is present, as well as any tree that has a crown which is intermeshed or overlapping with such a tree; and</li> <li>• Advise the person who is authorised to conduct the felling operation, or that person’s representative, of the precise location of each such tree.</li> </ul>		
<b>D) Releasing Fauna</b>			
<p>To reduce the impact the project has on native fauna</p>	<ol style="list-style-type: none"> <li>1. The animal must be released as near as practical to the point of capture.</li> <li>2. Where practical animals should be relocated with the hollow in which they were found or a suitable nest box.</li> <li>3. When releasing wildlife attention must be paid to several factors, including weather conditions, seasonal conditions, and the animal’s ecology.</li> <li>4. Fauna should be released at a suitable time of day in a suitable location.</li> </ol>	<p>Fauna spotter</p>	<p>Project Duration</p>
<b>E) Mulching Works</b>			
<p>To reduce the impact the project has on native fauna</p>	<ol style="list-style-type: none"> <li>1. All the hollow features within the cleared vegetation should either be removed so that they can be relocated into the protected areas or destroyed. This reduces the risk of any native fauna occupying the cleared vegetation stockpiles and being injured during the mulching works.</li> <li>2. Stockpiled vegetation, topsoil and other materials can quickly become temporary habitat for animals displaced during the actual clearing and earthworks. Prior to removal of any stockpiled vegetation, the Fauna Spotter Catcher must inspect for any fauna using the stockpile as temporary shelter.</li> </ol>	<p>Fauna spotter and construction/clearing crew</p>	<p>Clearing Works</p>
<b>F) Reporting</b>			

OBJECTIVE	MANAGEMENT METHODS	RESPONSIBILITY	TIMING
<p>To reduce the impact the project has on native fauna</p>	<ol style="list-style-type: none"> <li>1. Wildlife Habitat Management Plan – Aspects of the planning, design, construction, and ongoing operation of the project in which risks to wildlife have been identified. This plan should also include recommendations and outline the type, of frequency and timeframes for monitoring</li> <li>2. Wildlife Capture and Disposal Plan – Should contain the following details for each captured animal:               <ol style="list-style-type: none"> <li>a. Species</li> <li>b. Identification name or number</li> <li>c. Sex (M, F or unknown)</li> <li>d. Approximate Age or Age Class (neonate, juvenile, sub-adult, adult)</li> <li>e. Time and date of capture</li> <li>f. Method of capture</li> <li>g. Exact point of capture (GPS coordinates)</li> <li>h. State of health</li> <li>i. Incidents associated with capture likely to affect health</li> <li>j. Veterinary intervention or treatments</li> <li>k. Time held in captivity</li> <li>l. Disposal method (euthanasia, translocation, re-release) m. Date and time of disposal</li> <li>n. Detailed of disposal (GPS points of release)</li> <li>o. For released animals, location relative to point of capture</li> </ol> </li> <li>3. Animal Injury and Euthanasia Report – similar details for the Wildlife Capture and Disposal Plan should be included in this report.</li> </ol>	<p>Fauna Spotter</p>	<p>Post-clearing Works</p>
<p><b>G) Earthworks and Construction Phase</b></p>			
<p>To reduce the impact the project has on native fauna</p>	<ol style="list-style-type: none"> <li>1. The Contractor shall ensure that to the extent possible project infrastructure and auxiliary works (laydown areas, stockpile sites, site office) are constructed in a manner that does not create additional hazards for wildlife.</li> <li>2. To minimise impacts and conflicts between native animals, vehicular movement and access during construction, site access should be controlled via a single entry and exit point.</li> </ol>	<p>Construction Crew</p>	<p>Clearing Works</p>

OBJECTIVE	MANAGEMENT METHODS	RESPONSIBILITY	TIMING
	<ol style="list-style-type: none"> <li>3. Inspect open trenches, culverts and other structures prior to works being undertaken within an area to determine whether there are any trapped or injured native fauna species present and act as appropriate.</li> <li>4. Trenches, manholes, excavations for footings, etc. while open pose threats to native animal entrapment and should be backfilled as soon as possible. In some location's barriers may be required overnight to eliminate the accidental capture of animals moving through the site.</li> <li>5. Educate staff, including sub-contractors, in relation to the risk of fauna injury and deaths and how to manage animals which are displaced, including threatened species</li> <li>6. All native wildlife is protected (including snakes) and shall not be intentionally harmed as a result of work or workers actions.</li> <li>7. All native animal fatalities must be reported immediately to the Environmental Coordinator.</li> <li>8. Where any site staff (contractors or subcontractors) witness or locates distressed, injured, or orphaned animals they should immediately contact the Fauna Spotter Catcher and Environmental Coordinator. Works within the area of the animal must cease until further instruction is provided by one of the above authorities.</li> </ol>		

**TABLE 3 – DE-WATERING MANAGEMENT MEASURES**

Phase	De-Watering Management Measures	Responsibility
<b>Pre-Dewatering Works</b>	<ol style="list-style-type: none"> <li>1. Dewatering works will be conducted under the following permits at a minimum:               <ol style="list-style-type: none"> <li>a) Rehabilitation Permit by appropriately qualified ecologists</li> </ol> </li> </ol>	Environmental Contractor
	<ol style="list-style-type: none"> <li>2. On significant waterbodies with a high density of aquatic fauna, load reduction trapping will be conducted. In order to reduce the fish load within the waterways, a two day long trapping program will start once the dam is 40% dewatered. This trapping program will focus particularly on crustaceans and turtles, due to their tendency to dig into the substrate which makes them hard to relocate during de-watering works. Traps will also be used to reduce the load of juvenile/small fish species and eels from the waterbody.</li> </ol>	Environmental Contractor

<b>De-Watering Works</b>	3. The morning prior to dewatering commencing; the fish load within the waterway will be further reduced using scoop, dip nets and seine nets.	Environmental Contractor
	4. Suitable release locations have been selected. These locations have been selected due to their: <ul style="list-style-type: none"> <li>a) Proximity to site.</li> <li>b) Access.</li> <li>c) Similar aquatic values; and</li> <li>d) Size.</li> </ul>	Environmental Contractor
	5. Required ESC measures are to be installed prior to dewatering works commencing.	Site Supervisor
	1. Water quality testing will be done twice daily throughout the dewatering process in order to monitor the water quality for things such as drops in the oxygen saturation levels that may have a detrimental impact on the aquatic occupants of the waterbody. <p>Acid sulphate soils may be exposed during the dewatering process and could have a significant impact on the water quality of the waterbody.</p> <p>If the water does not meet the required standard to be released, dewatering works should be suspended until the water has been treated and meet the standard for release.</p> <p>Acid Sulphate soils should be managed according to the State Planning Policy 2/02, Planning and Managing Development Involving Acid Sulphate Soils, State Planning Policy 2/02 Guideline, Acid Sulphate Soils and Queensland Acid Sulphate Soil Technical Manual, Soil Management Guidelines.</p>	
	2. To remove the last of the water out of the dam a few sumps will be dug out within the waterbody and the pumps (with fish shields) will be placed into these sumps. This will reduce the risk of fish being left in isolated ponds that are hard to reach and it will also make it easier to relocate the last few fish when all the water is almost drained.	Site Supervisor
3. The water level will then be reduced by increments of 25%, this will allow as many fish as possible to be removed. If the water level drops too fast there will not be enough water or oxygen to support all the fauna within the waterbody.	Site Supervisor	

**De-Watering Works (cont.)**

<p>4. All fish are to be removed, stored, and released as quickly as possible. Animals will be transported within large, aerated tubs. Storage containers are to be filled with water from the waterbody that the fish were captured out of and are to be sized appropriately to allow for fish to swim comfortably in an upright position. Containers are also to be soft with rounded edges and have a lid to provide a darkened environment for captured fauna. Overcrowding is to be avoided, with approximately 0.2kg of fish per litre of water is considered appropriate. Water conditions within the containers are to be monitored continuously and the water should be changed hourly to ensure appropriate levels of oxygen are maintained.</p>	<p>Environmental Contractor</p>
<p>5. Fish are to be released carefully, with the container placed in the water to allow fish to swim away. All fish are to be handled using wet hands or a wet towel and Shimano enviro nets will be used which minimises the risk of removing any of the fish's protective mucus coating and reduces the possibility of split fins or any damage to their eyes.</p>	<p>Environmental Contractor</p>
<p>6. Only native species were relocated, any pest or exotic species captured will be humanely euthanized. Where prohibited or restricted invasive animals or noxious fish listed under the Biosecurity Act 2014 are captured, these will be euthanised. Methods used will be in accordance with relevant authority guidelines and the ANZCCART's Euthanasia of Animals Used for Scientific Purposes (2001).</p>	<p>Environmental Contractor</p>
<p>7. Exotic or pest plant species will be disposed of appropriately so as to avoid the spread of weeds into waterways.</p>	<p>Environmental Contractor</p>
<p>8. To further reduce the risk of fatalities in the final dewatering stage due to low levels of dissolved oxygen, there will be several suitably qualified staff on site to ensure that the fish are relocated as fast as practical.</p>	<p>Environmental Contractor</p>
<p>9. Tadpoles will be collected with soft handheld dip-nets. Any handling of amphibians will follow the DES Interim Hygiene Protocol for Handling Amphibians.</p>	<p>Environmental Contractor</p>

## 6. Conclusion

Australia Wide Environmental Consultants were commissioned by Shadforth Civil Contractors to manage fauna during the clearing and mulching works for Everleigh Precinct 9.4-9.7 subdivision development of Teviot Road in Greenbank, Queensland (**See Figure 1**).

Direct potential impacts raised in the Wildlife Protection and Management Plan will be mitigated by ensuring the fauna management measures listed in Section 5.5 of this report are adhered to for the duration of works on Precinct 9.3. Potential cumulative impacts raised in the Wildlife Protection and Management Plan will be minimised through the habitat replacement measures listed section 5.4 of this plan.

## 7. References

- Eyre TJ, Ferguson DJ, Hourigan CL, Smith GC, Mathieson MT, Kelly, AL, Venz MF & Hogan, LD.  
2012. Terrestrial Vertebrate Fauna Survey Assessment Guidelines for Queensland Department of Science, Information Technology, Innovation and the Arts, Queensland Government, Brisbane.
- Nature Conservation Act 1992 (Qld), [http://www.legislation.qld.gov.au/Acts\\_SL\\_N.htm](http://www.legislation.qld.gov.au/Acts_SL_N.htm)
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- Lee K Curtis & Andrew J Dennis, 2012, Queensland's Threatened Animals, CSIRO Publishing, Collingwood, Victoria
- Nita C.Lester, 2008, Woodland to Weeds- Southern Queensland Brigalow Belt, Second Edition, CopyRight Publishing, Brisbane
- Nick Romanowski, 2011, Australian Grasses, Hyland House Publishing, Australia

Everleigh

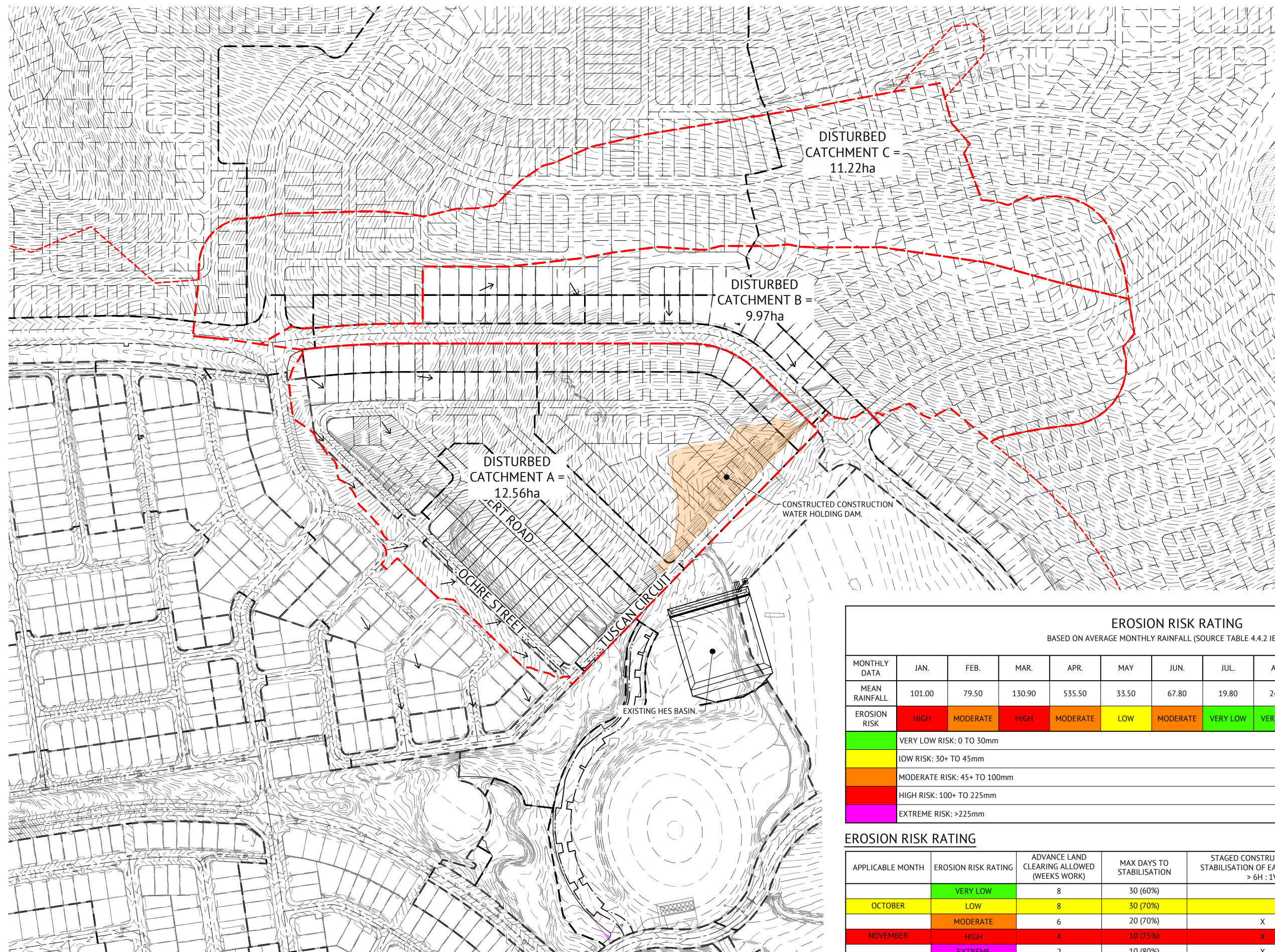


Environmental Pre-Start Checklist

# Attachment 8

Erosion and Sediment Control Plan






**REVIEWED BY:**  
 TERRY CLARK  
 CPESC NO. 6089  
 J. Clark 26/11/21

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

**NOTE:**  
 FOR DISPERSIVE SOILS MANAGEMENT NOTES, REFER TO DRAWINGS C210.

**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											

**EROSION RISK RATING**

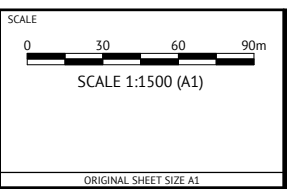
APPLICABLE MONTH	EROSION RISK RATING	ADVANCE LAND CLEARING ALLOWED (WEEKS WORK)	MAX DAYS TO STABILISATION	STAGED CONSTRUCTION AND STABILISATION OF EARTH BATTERS > 6H : 1V	STOCKPILES STABILISED
	VERY LOW	8	30 (60%)		
OCTOBER	LOW	8	30 (70%)		
	MODERATE	6	20 (70%)	X	
NOVEMBER	HIGH	4	10 (75%)	X	X
	EXTREME	2	10 (80%)	X	X

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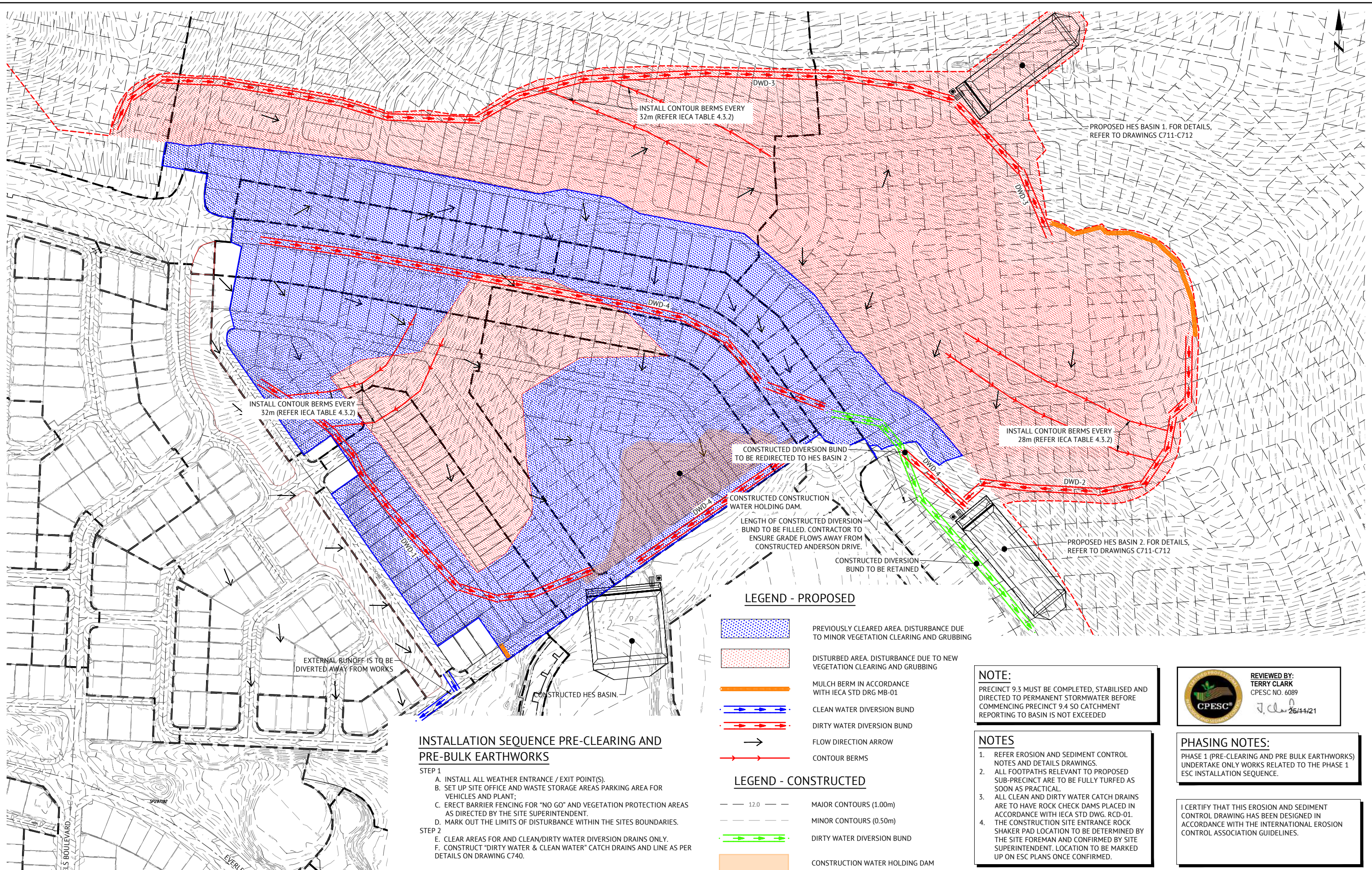
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**EVERLEIGH PRECINCT 9.4 SUBDIVISION DEVELOPMENT**  
 LOCATION  
**TEVIOT ROAD, GREENBANK**  
 SHEET TITLE  
**OVERALL EROSION & SEDIMENT CONTROL KEY PLAN**

JOB CODE  
**MIR-0904**  
 SHEET NUMBER  
**C700**  
 REV  
**A**





INSTALL CONTOUR BERMS EVERY 32m (REFER IECA TABLE 4.3.2)

INSTALL CONTOUR BERMS EVERY 32m (REFER IECA TABLE 4.3.2)

INSTALL CONTOUR BERMS EVERY 32m (REFER IECA TABLE 4.3.2)

INSTALL CONTOUR BERMS EVERY 28m (REFER IECA TABLE 4.3.2)

CONSTRUCTED DIVERSION BUND TO BE REDIRECTED TO HES BASIN 2

CONSTRUCTED CONSTRUCTION WATER HOLDING DAM.

LENGTH OF CONSTRUCTED DIVERSION BUND TO BE FILLED. CONTRACTOR TO ENSURE GRADE FLOWS AWAY FROM CONSTRUCTED ANDERSON DRIVE.

CONSTRUCTED DIVERSION BUND TO BE RETAINED

PROPOSED HES BASIN 1. FOR DETAILS, REFER TO DRAWINGS C711-C712

PROPOSED HES BASIN 2. FOR DETAILS, REFER TO DRAWINGS C711-C712

EXTERNAL RUNOFF IS TO BE DIVERTED AWAY FROM WORKS

CONSTRUCTED HES BASIN.

**LEGEND - PROPOSED**

- PREVIOUSLY CLEARED AREA. DISTURBANCE DUE TO MINOR VEGETATION CLEARING AND GRUBBING
- DISTURBED AREA. DISTURBANCE DUE TO NEW VEGETATION CLEARING AND GRUBBING
- MULCH BERM IN ACCORDANCE WITH IECA STD DRG MB-01
- CLEAN WATER DIVERSION BUND
- DIRTY WATER DIVERSION BUND
- FLOW DIRECTION ARROW
- CONTOUR BERMS

**LEGEND - CONSTRUCTED**

- 12.0 MAJOR CONTOURS (1.00m)
- MINOR CONTOURS (0.50m)
- DIRTY WATER DIVERSION BUND
- CONSTRUCTION WATER HOLDING DAM

**INSTALLATION SEQUENCE PRE-CLEARING AND PRE-BULK EARTHWORKS**

- STEP 1
- A. INSTALL ALL WEATHER ENTRANCE / EXIT POINT(S).
  - B. SET UP SITE OFFICE AND WASTE STORAGE AREAS PARKING AREA FOR VEHICLES AND PLANT;
  - C. ERECT BARRIER FENCING FOR "NO GO" AND VEGETATION PROTECTION AREAS AS DIRECTED BY THE SITE SUPERINTENDENT.
  - D. MARK OUT THE LIMITS OF DISTURBANCE WITHIN THE SITES BOUNDARIES.
- STEP 2
- E. CLEAR AREAS FOR AND CLEAN/DIRTY WATER DIVERSION DRAINS ONLY.
  - F. CONSTRUCT "DIRTY WATER & CLEAN WATER" CATCH DRAINS AND LINE AS PER DETAILS ON DRAWING C740.

**NOTE:**  
PRECINCT 9.3 MUST BE COMPLETED, STABILISED AND DIRECTED TO PERMANENT STORMWATER BEFORE COMMENCING PRECINCT 9.4 SO CATCHMENT REPORTING TO BASIN IS NOT EXCEEDED

- NOTES**
1. REFER EROSION AND SEDIMENT CONTROL NOTES AND DETAILS DRAWINGS.
  2. ALL FOOTPATHS RELEVANT TO PROPOSED SUB-PRECINCT ARE TO BE FULLY TURFED AS SOON AS PRACTICAL.
  3. ALL CLEAN AND DIRTY WATER CATCH DRAINS ARE TO HAVE ROCK CHECK DAMS PLACED IN ACCORDANCE WITH IECA STD DWG. RCD-01.
  4. THE CONSTRUCTION SITE ENTRANCE ROCK SHAKER PAD LOCATION TO BE DETERMINED BY THE SITE FOREMAN AND CONFIRMED BY SITE SUPERINTENDENT. LOCATION TO BE MARKED UP ON ESC PLANS ONCE CONFIRMED.

**REVIEWED BY:**  
TERRY CLARK  
CPESC NO. 6089  
26/4/21

**PHASING NOTES:**  
PHASE 1 (PRE-CLEARING AND PRE BULK EARTHWORKS) UNDERTAKE ONLY WORKS RELATED TO THE PHASE 1 ESC INSTALLATION SEQUENCE.

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

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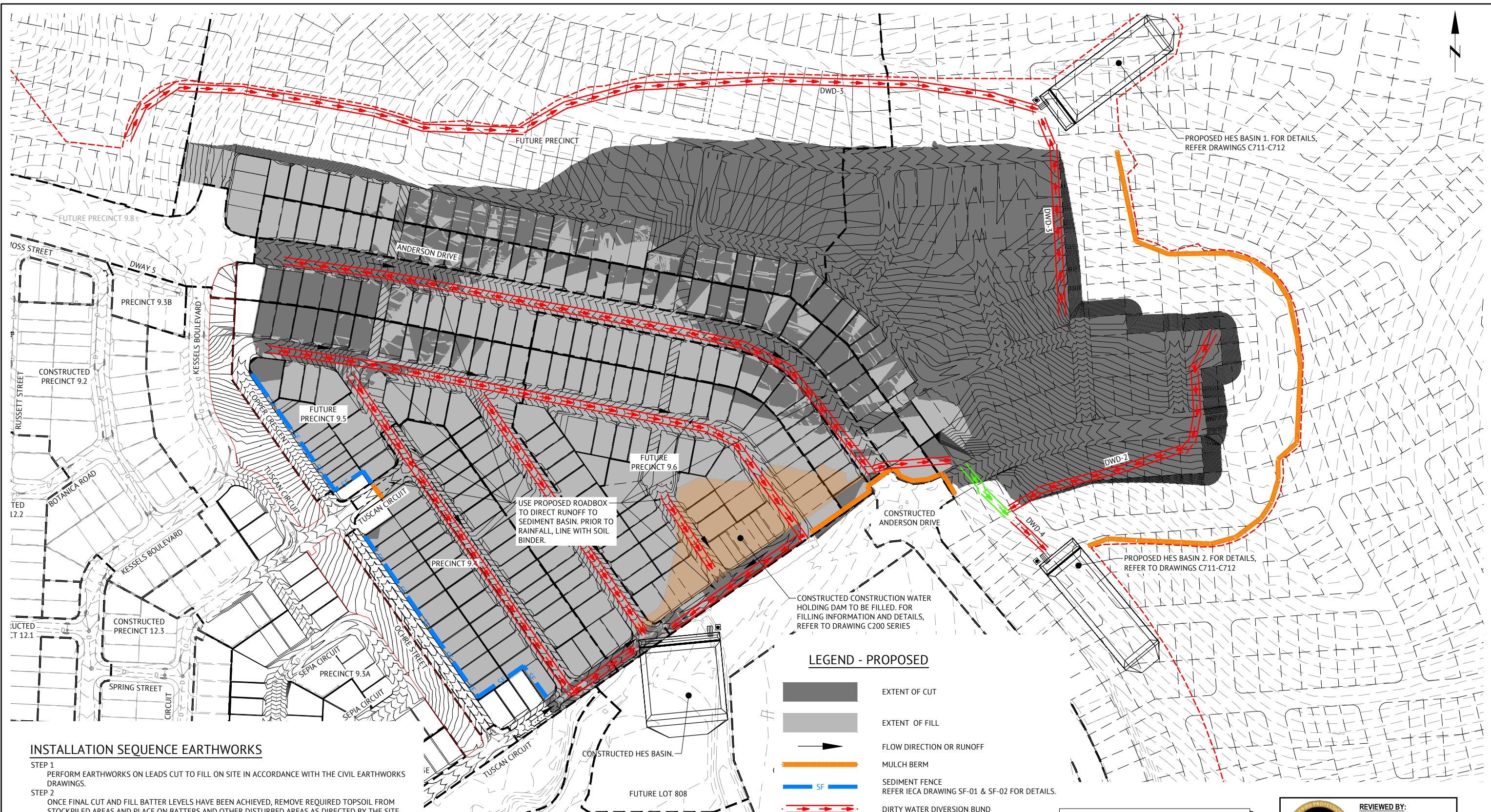
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SIMON STEINHOFFER  
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PATRICK BRADY RPEQ 7112

SCALE  
0 30 60 90m  
SCALE 1:1500 (A1)  
ORIGINAL SHEET SIZE A1

CLIENT  
**MIRVAC QLD PTY LTD**  
PROJECT  
**EVERLEIGH PRECINCT 9.4 SUBDIVISION DEVELOPMENT**  
LOCATION  
**TEVIOT ROAD, GREENBANK**  
SHEET TITLE  
**EROSION AND SEDIMENT CONTROL - CLEAR AND GRUB PHASE**

JOB CODE  
**MIR-0904**  
SHEET NUMBER  
**C701**  
REV  
**A**





**INSTALLATION SEQUENCE EARTHWORKS**

- STEP 1**  
PERFORM EARTHWORKS ON LEADS CUT TO FILL ON SITE IN ACCORDANCE WITH THE CIVIL EARTHWORKS DRAWINGS.
- STEP 2**  
ONCE FINAL CUT AND FILL BATTER LEVELS HAVE BEEN ACHIEVED, REMOVE REQUIRED TOPSOIL FROM STOCKPILED AREAS AND PLACE ON BATTERS AND OTHER DISTURBED AREAS AS DIRECTED BY THE SITE SUPERINTENDENT.
- STEP 3**  
AS SOON AS POSSIBLE AFTER TOPSOIL HAS BEEN PLACED ON BATTERS AND OTHER DISTURBED AREAS, THESE AREAS SHOULD BE STABILISED PER FINAL DESIGN TREATMENT (REFER DRAWING C703) WITHIN TIMEFRAMES PER 'MAX DAYS TO STABILISATION' BASED ON EROSION RISK (REFER DRAWING C700). IF A RAINFALL EVENT IS FORECAST WHICH IS LIKELY TO CAUSE RUNOFF PRIOR TO DISTURBED OR EXPOSED AREAS BEING STABILISED, A COMBINATION OF MULCH, BINDER OR BIDUM IS TO BE USED TO COVER EXPOSED AREAS. INSTALLATION OF TEMPORARY EROSION CONTROL TO ACTIVE OR INACTIVE WORK AREAS, PRIOR TO RAINFALL EVENTS UNTIL FINAL DESIGN TREATMENT (STABILISATION PER DRAWING C701) IS CRITICAL FOR CATCHMENTS WHICH DO NOT DRAIN TO TYPE 1 CONTROLS.
- STEP 4**  
ALL SEDIMENT AND EROSION CONTROL MEASURES ARE TO REMAIN IN PLACE AND BE MONITORED UNTIL CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED. ADDITIONAL EROSION CONTROLS ARE TO BE ERECTED AS REQUIRED BY THE SUPERINTENDENT.

USE PROPOSED ROADBOX TO DIRECT RUNOFF TO SEDIMENT BASIN. PRIOR TO RAINFALL, LINE WITH SOIL BINDER.

CONSTRUCTED CONSTRUCTION WATER HOLDING DAM TO BE FILLED. FOR FILLING INFORMATION AND DETAILS, REFER TO DRAWING C200 SERIES

**LEGEND - PROPOSED**

- EXTENT OF CUT
- EXTENT OF FILL
- FLOW DIRECTION OR RUNOFF
- MULCH BERM
- SEDIMENT FENCE REFER IECA DRAWING SF-01 & SF-02 FOR DETAILS.
- DIRTY WATER DIVERSION BUND
- FINISHED MAJOR CONTOURS (0.50m)
- FINISHED MINOR CONTOURS (0.25m)

**LEGEND - CONSTRUCTED**

- MAJOR CONTOURS (1.00m)
- MINOR CONTOURS (0.50m)

**NOTES**

1. REFER EROSION AND SEDIMENT CONTROL NOTES AND DETAILS DRAWINGS.
2. ALL FOOTPATHS RELEVANT TO PROPOSED SUB-PRECINCT ARE TO BE FULLY TURFED AS SOON AS PRACTICAL.
3. ALL CLEAN AND DIRTY WATER CATCH DRAINS ARE TO HAVE ROCK CHECK DAMS PLACED IN ACCORDANCE WITH IECA STD DWG RCD-01.
4. CONTRACTOR TO ENSURE STORMWATER DRAINAGE IS COVERED AT ALL TIMES DURING EARTHWORKS PHASE.

**REVIEWED BY:**  
TERRY CLARK  
CPESC NO. 6089

25/4/21

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

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SCALE  
0 30 60 90m

SCALE 1:1500 (A1)

ORIGINAL SHEET SIZE A1

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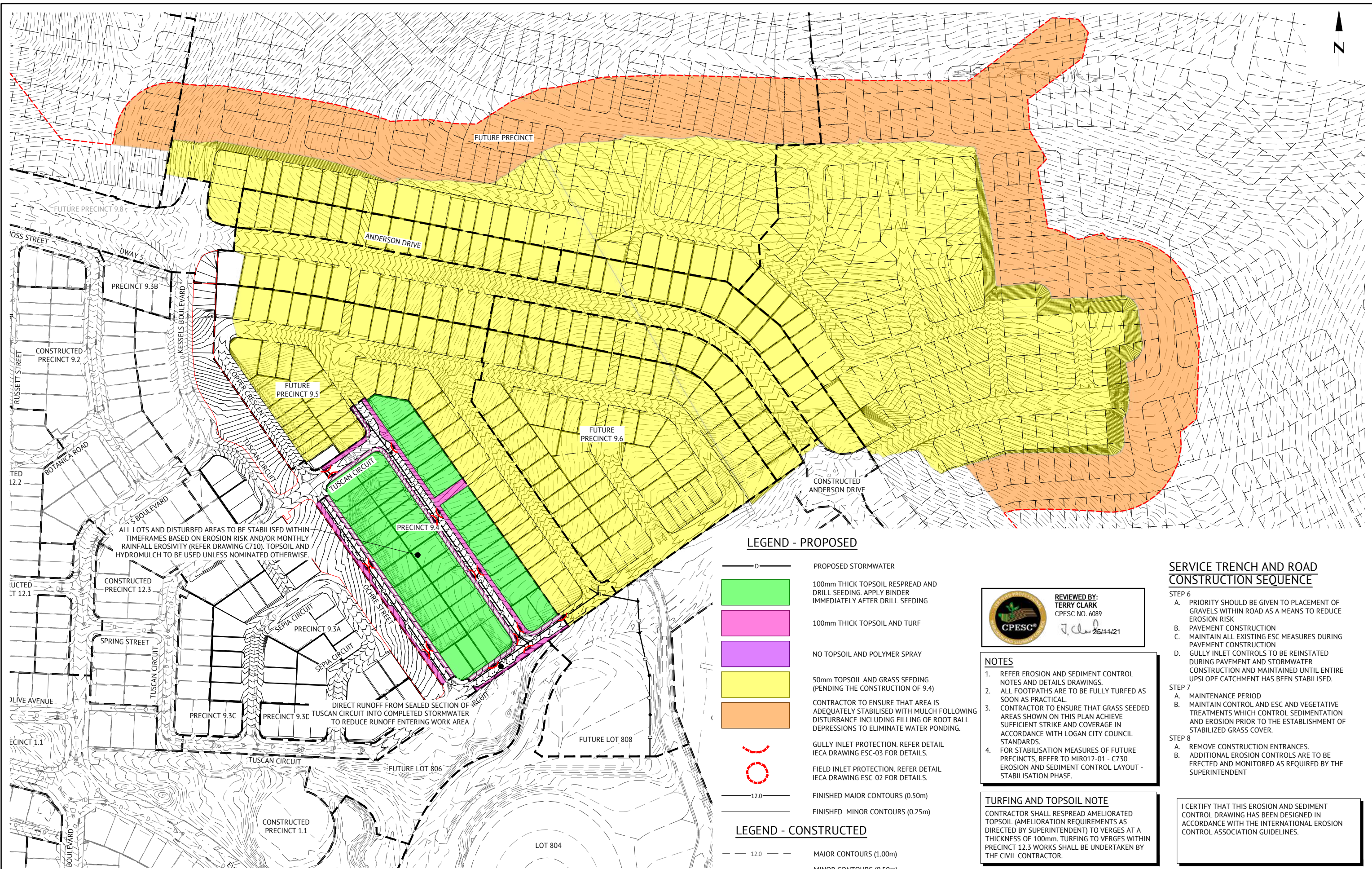
SHEET TITLE  
**EROSION AND SEDIMENT CONTROL - BULK EARTHWORKS PHASE**

JOB CODE  
**MIR-0904**

SHEET NUMBER  
**C702**

REV  
**A**





ALL LOTS AND DISTURBED AREAS TO BE STABILISED WITHIN TIMEFRAMES BASED ON EROSION RISK AND/OR MONTHLY RAINFALL EROSIIVITY (REFER DRAWING C710). TOPSOIL AND HYDROMULCH TO BE USED UNLESS NOMINATED OTHERWISE.

DIRECT RUNOFF FROM SEALED SECTION OF TUSCAN CIRCUIT INTO COMPLETED STORMWATER TO REDUCE RUNOFF ENTERING WORK AREA

**LEGEND - PROPOSED**

- PROPOSED STORMWATER
- 100mm THICK TOPSOIL RESPREAD AND DRILL SEEDING. APPLY BINDER IMMEDIATELY AFTER DRILL SEEDING
- 100mm THICK TOPSOIL AND TURF
- NO TOPSOIL AND POLYMER SPRAY
- 50mm TOPSOIL AND GRASS SEEDING (PENDING THE CONSTRUCTION OF 9.4)
- CONTRACTOR TO ENSURE THAT AREA IS ADEQUATELY STABILISED WITH MULCH FOLLOWING DISTURBANCE INCLUDING FILLING OF ROOT BALL DEPRESSIONS TO ELIMINATE WATER PONDING.
- GULLY INLET PROTECTION. REFER DETAIL IECA DRAWING ESC-03 FOR DETAILS.
- FIELD INLET PROTECTION. REFER DETAIL IECA DRAWING ESC-02 FOR DETAILS.
- FINISHED MAJOR CONTOURS (0.50m)
- FINISHED MINOR CONTOURS (0.25m)

**LEGEND - CONSTRUCTED**

- MAJOR CONTOURS (1.00m)
- MINOR CONTOURS (0.50m)

**REVIEWED BY:**  
TERRY CLARK  
CPESC NO. 6089  
25/11/21

- NOTES**
- REFER EROSION AND SEDIMENT CONTROL NOTES AND DETAILS DRAWINGS.
  - ALL FOOTPATHS ARE TO BE FULLY TURFED AS SOON AS PRACTICAL.
  - CONTRACTOR TO ENSURE THAT GRASS SEEDING AREAS SHOWN ON THIS PLAN ACHIEVE SUFFICIENT STRIKE AND COVERAGE IN ACCORDANCE WITH LOGAN CITY COUNCIL STANDARDS.
  - FOR STABILISATION MEASURES OF FUTURE PRECINCTS, REFER TO MIR012-01 - C730 EROSION AND SEDIMENT CONTROL LAYOUT - STABILISATION PHASE.

**TURFING AND TOPSOIL NOTE**  
CONTRACTOR SHALL RESPREAD AMELIORATED TOPSOIL (AMELIORATION REQUIREMENTS AS DIRECTED BY SUPERINTENDENT) TO VERGES AT A THICKNESS OF 100mm. TURFING TO VERGES WITHIN PRECINCT 12.3 WORKS SHALL BE UNDERTAKEN BY THE CIVIL CONTRACTOR.

**SERVICE TRENCH AND ROAD CONSTRUCTION SEQUENCE**

- STEP 6
- PRIORITY SHOULD BE GIVEN TO PLACEMENT OF GRAVELS WITHIN ROAD AS A MEANS TO REDUCE EROSION RISK
  - PAVEMENT CONSTRUCTION
  - MAINTAIN ALL EXISTING ESC MEASURES DURING PAVEMENT CONSTRUCTION
  - GULLY INLET CONTROLS TO BE REINSTATED DURING PAVEMENT AND STORMWATER CONSTRUCTION AND MAINTAINED UNTIL ENTIRE UPSLOPE CATCHMENT HAS BEEN STABILISED.
- STEP 7
- MAINTENANCE PERIOD
  - MAINTAIN CONTROL AND ESC AND VEGETATIVE TREATMENTS WHICH CONTROL SEDIMENTATION AND EROSION PRIOR TO THE ESTABLISHMENT OF STABILIZED GRASS COVER.
- STEP 8
- REMOVE CONSTRUCTION ENTRANCES.
  - ADDITIONAL EROSION CONTROLS ARE TO BE ERECTED AND MONITORED AS REQUIRED BY THE SUPERINTENDENT

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

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PROJECT  
EVERLEIGH PRECINCT 9.4 SUBDIVISION DEVELOPMENT  
LOCATION  
TEVIOT ROAD, GREENBANK  
SHEET TITLE  
EROSION AND SEDIMENT CONTROL - STABILISATION PHASE

JOB CODE  
MIR-0904  
SHEET NUMBER  
C703  
REV  
A



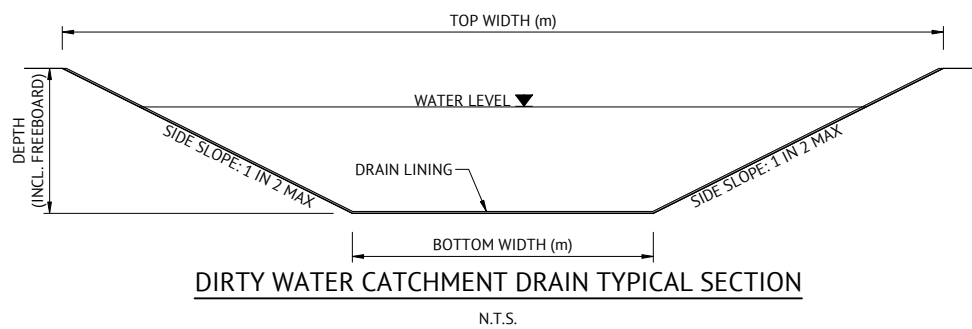
**EROSION & SEDIMENT CONTROL NOTES**

- LOCATION & LEVELS OF ALL EXISTING SERVICES TO BE CONFIRMED ON SITE BY CONTRACTOR PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
- REFER EARTHWORKS DRAWINGS FOR ADDITIONAL NOTES.
- ALL TRENCHES, FOOTPATH EXCAVATIONS & STOCKPILES TO BE PROTECTED BY TEMPORARY SEDIMENT FENCES UNTIL 80% GRASS COVERAGE IS ACHIEVED TO DISTURBED AREAS.
- 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.
- THESE NOTES SHALL BE READ IN CONJUNCTION WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.
- THE EROSION AND SEDIMENT CONTROL WORKS SHALL COMPLY WITH THE REQUIREMENTS OF THE LOCAL AUTHORITIES EROSION AND SEDIMENT CONTROL STANDARDS.
- THE CONTRACTOR SHALL TAKE ALL REASONABLE AND PRACTICABLE MEASURES TO:
  - ALLOW STORMWATER TO PASS THROUGH THE SITE IN A CONTROLLED MANNER AND AT NON EROSIIVE 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.
- THE CONTRACTOR SHALL APPOINT AN APPROPRIATELY EXPERIENCED PERSON TO BE MADE RESPONSIBLE FOR IMPLEMENTATION OF THE ESC.
- 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.
- 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
ESC MEASURES	WHEN SETTLED SEDIMENT VOLUME EXCEEDS 25% OF THE CAPACITY OF THE ESC MEASURE	BY THE END OF THE DAY

- INSTALL DIVERSION CATCH DRAINS UPSTREAM OF, AND SILT FENCE DOWNSTREAM OF, STOCKPILES.
- STOCKPILES ARE TO BE LOCATED AWAY FROM EROSION HAZARD AREAS SUCH AS DRAINAGE LINES AND STEEP SLOPES.
- STOCKPILES ARE TO BE PROTECTED FROM EROSION BY THE WIND.
- 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.
- 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.
- DISTURBED AREA ARE TO BE STABILISED AS SOON AS POSSIBLE ON COMPLETION OF BULK EARTHWORKS. LOTS TO BE STABILISED FOLLOWING RESPREADING OF TOPSOIL.
- SUPPLEMENTARY ESC MEASURES SHALL BE DIRECTED BY THE SUPERINTENDENT.

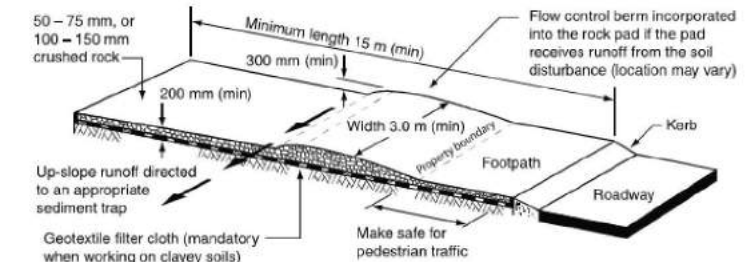
CATCH DRAIN SIZING	
$Q_y = (C_y \cdot I_{tc,y} \cdot A) / 360$ [Equation 1 (IECA 2008)]	
where:	
$Q_y$	PEAK FLOW RATE (m <sup>3</sup> /s) OF AVERAGE RECURRENCE INTERVAL (ARI) OF Y YEARS
$C_y$	RUNOFF COEFFICIENT (DIMENSIONLESS) FOR ARI OF Y YEARS
$I_{tc,y}$	AVERAGE RAINFALL INTENSITY (mm/hr) FOR DESIGN DURATION OF TC HOURS AND ARI OF Y YEARS
A	AREA OF CATCHMENTS (ha)
360	CONVERSION FACTOR
FLOW HEIGHT IS SOLVED BY TRIAL AND ERROR USING THE THREE EQUATIONS BELOW AS PER IECA 2008.	
$Q = 1/n \cdot A \cdot R^{2/3} \cdot S^{1/2}$ [Equation 2 (IECA 2008)]	
where:	
Q	PEAK FLOW RATE (m <sup>3</sup> /s) OF AVERAGE RECURRENCE INTERVAL (ARI) OF Y YEARS
n	MANNING'S COEFFICIENT (UNITLESS)
A	CROSS SECTIONAL AREA OF FLOW (m <sup>2</sup> ), REFER TO EQUATION 3
R	HYDRAULIC RADIUS (m), REFER TO EQUATION 4
S	SLOPE OF ENERGY LINE, EQUAL TO SLOPE OF CHANNEL BED (m/m)
$A = (b + xy)y$ [Equation 3 (IECA 2008)]	
where:	
A	CROSS SECTIONAL AREA OF FLOW (m <sup>2</sup> )
b	BASE WIDTH OF CHANNEL (m)
x	SIDE SLOPE OF CHANNEL
y	DEPTH OF FLOW IN CHANNEL (m) + REQUIRED 0.15m FREEBOARD
$R = ((b + xy)y) / (b + 2y(1 + x^2)^{1/2})$ [Equation 4 (IECA 2008)]	
where:	
R	HYDRAULIC RADIUS OF FLOW (m)
b	BASE WIDTH OF CHANNEL (m)
x	SIDE SLOPE OF CHANNEL
y	DEPTH OF FLOW IN CHANNEL (m) + REQUIRED 0.30m FREEBOARD



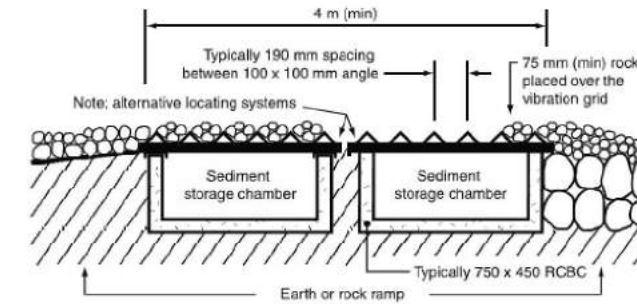
**DIRTY WATER CATCH DRAIN DETAILS**

DRAIN ID	SLOPE	LINING	BASE WIDTH (m)	TOP WIDTH (m)	DEPTH INCLUDING FREEBOARD (m)
DWD-01	4.50%	BLACK PLASTIC	2.000	3.350	0.330
DWD-02	5.20%	BLACK PLASTIC	2.000	3.050	0.260
DWD-03	8.20%	BLACK PLASTIC	2.000	3.100	0.280
DWD-04	3.20%	BLACK PLASTIC	2.000	3.070	0.270

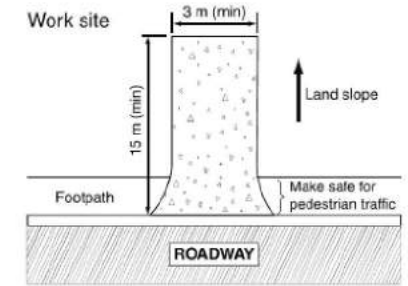
REFER TYPICAL SECTION ABOVE FOR DETAILS  
NOTE: CATCH DRAINS SIZED FOR Q2 FLOW



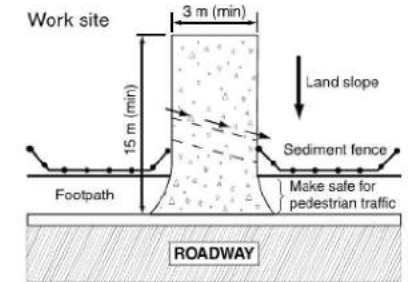
**(a) Rock entry/exit pad for construction sites (refer to Standard Drawing Exit-03 for building sites)**



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



**(b) Rock pad sloping away from road**



**(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 FLOW 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.

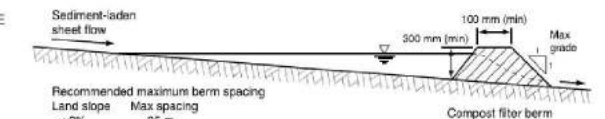
5. DISPOSE OF SEDIMENT IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

**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**

**MULCH BUND DETAIL**

REVIEWED BY:  
**TERRY CLARK**  
CPESC NO. 6089  
26/4/21

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

**APPROVAL ISSUE – NOT FOR CONSTRUCTION**

DATE	REV	DESCRIPTION	KK	PB
26/11/2021	A	ORIGINAL ISSUE	KK	PB
12/11/2021	1	PRELIMINARY ISSUE	KK	PB
			REC	APP

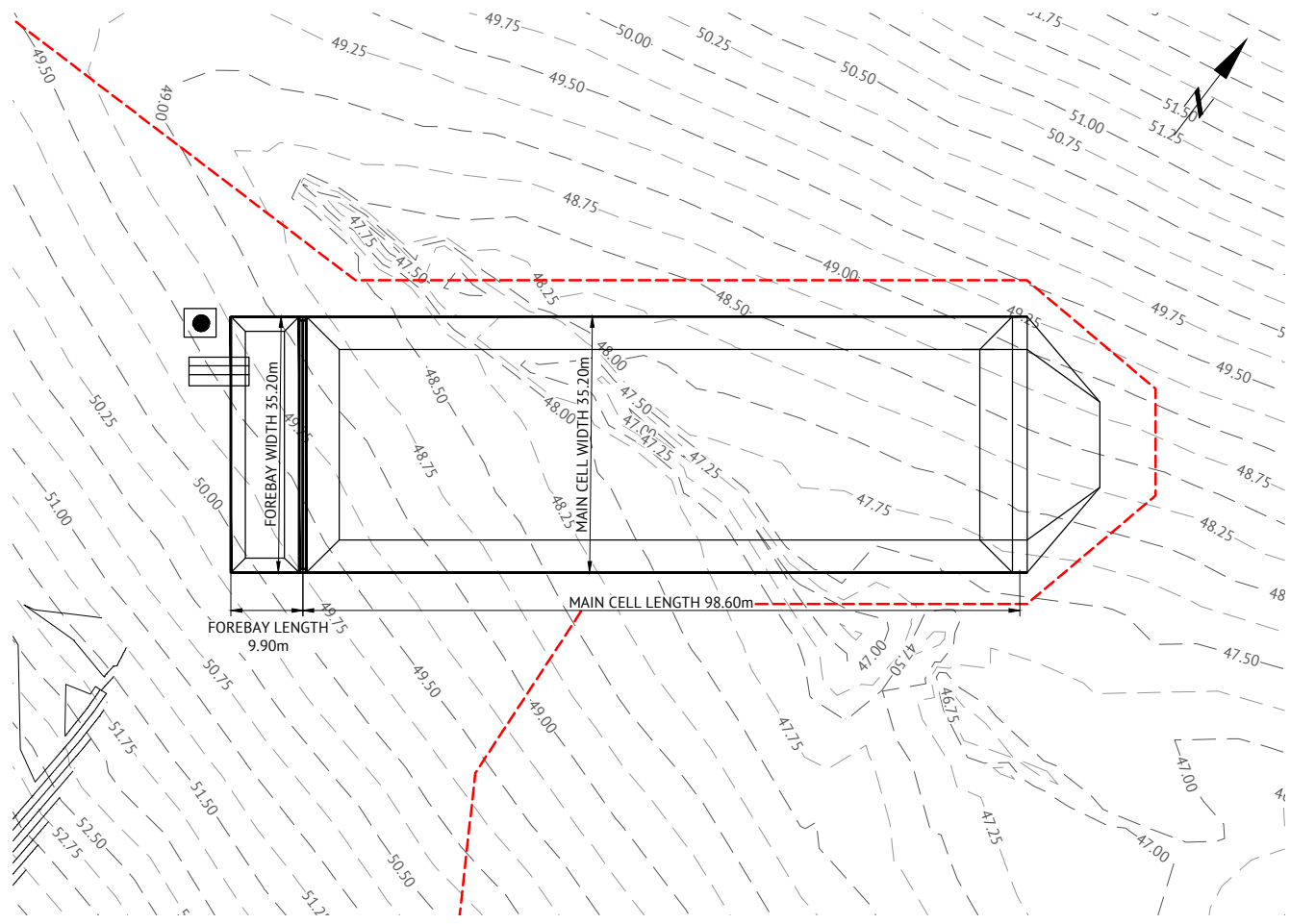
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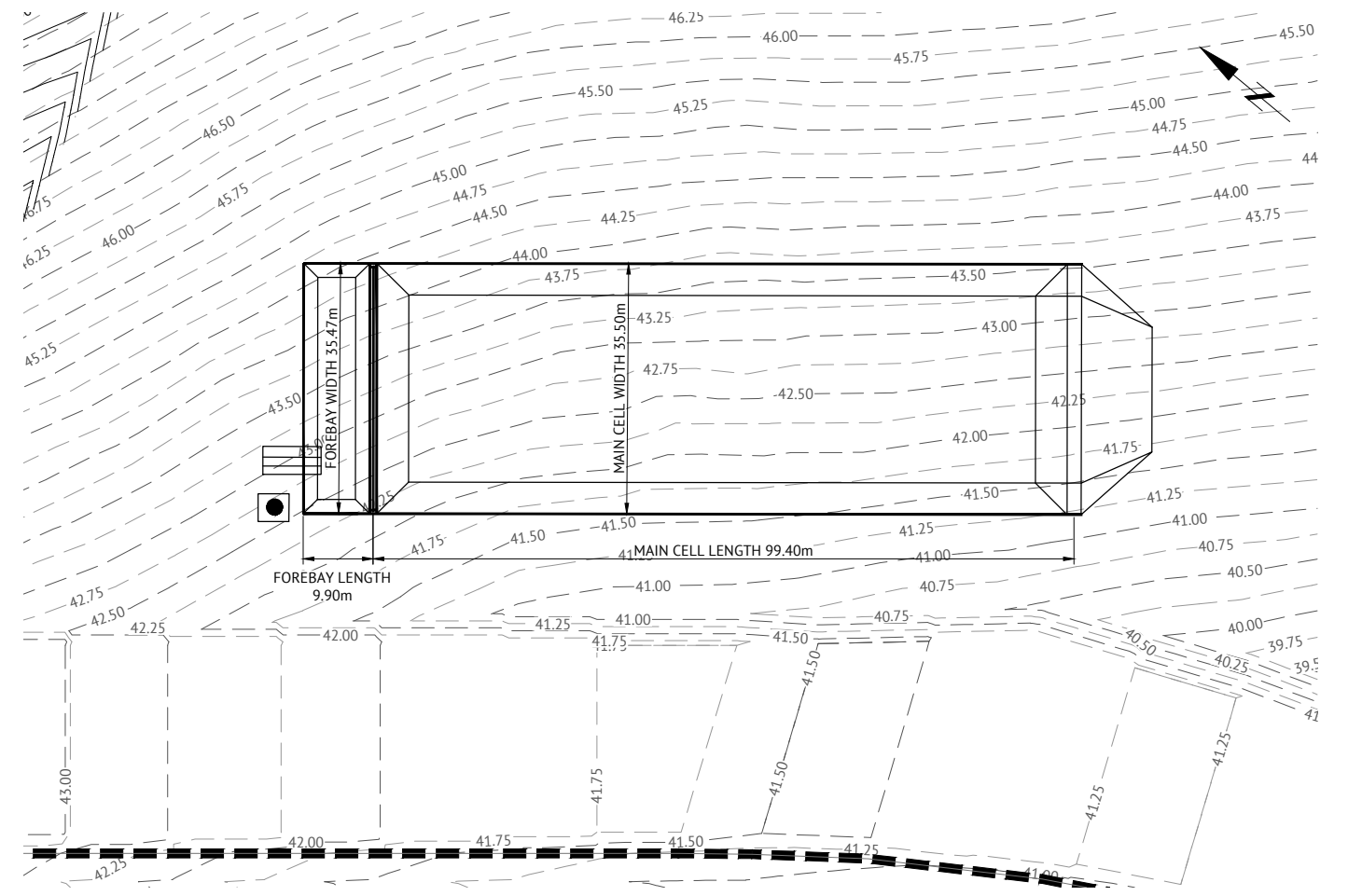
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CLIENT  
**MIRVAC QLD PTY LTD**  
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**EVERLEIGH PRECINCT 9.4 SUBDIVISION DEVELOPMENT**  
LOCATION  
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SHEET TITLE  
**EROSION AND SEDIMENT CONTROL NOTES AND DETAILS - SHEET 1**

JOB CODE  
**MIR-0904**  
SHEET NUMBER  
**C710**  
REV  
**A**



HES BASIN 1



HES BASIN 2

HES BASIN DETAILS

BASIN ID	SETTLING ZONE (INCLUDING SEDIMENT STORAGE)				FOREBAY				HYDRAULIC CONTROLS			
	VOLUME	LENGTH	WIDTH	DEPTH	VOLUME	LENGTH	WIDTH	DEPTH	SPILLWAY CREST WIDTH	SPILLWAY CREST	EMBANKMENT	LEVEL SPREADER CREST
	(m³)	(m)	(m)	(m)	(m³)	(m)	(m)	(m)	(m)	RL	RL	RL
HES BASIN 1	7832.8800	98.600*	35.200*	1.000*	429.0000	9.900*	35.200*	1.000*	15.0000	49.550*	50.200*	49.750*
HES BASIN 2	7832.8800	99.400*	35.500*	1.000*	429.0000	9.900*	35.500*	1.000*	15.0000	43.300*	43.800*	43.500*
EXISTING	5233.0000	65.000*	66.000*	1.500*	429.0000	6.500*	66.000*	1.000*	15.0000	44.150*	45.050*	44.450*

\* - EXACT DIMENSIONS TO BE MODIFIED ON SITE TO FIT AVAILABLE SITE CONSTRAINTS.  
 \* - ESTIMATE RL TO BE FINALISED ON-SITE BASED ON SITE CONSTRAINTS

NOTE: SEDIMENT BASIN SIZED BASED ON A SETTLEMENT RATE OF 150mm IN 15 MINUTES DUE TO THE TIME CONSTRAINTS, NO JAR TESTS HAVE BEEN UNDERTAKEN, SETTLEMENT RATE IS TO BE VERIFIED PRIOR TO CONSTRUCTION OF SEDIMENT BASINS



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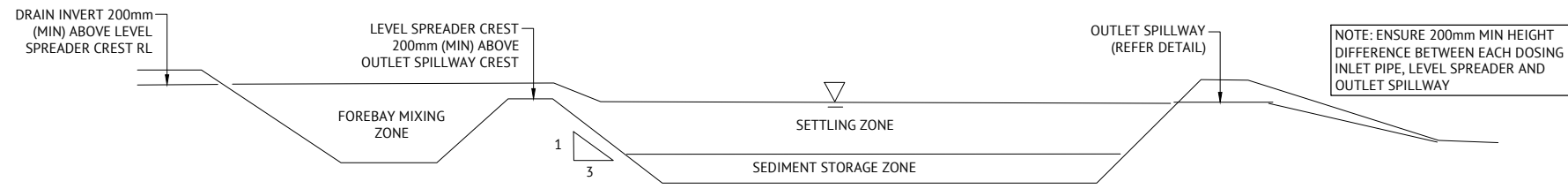
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 SIMON STEINHOFER  
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SCALE  
  
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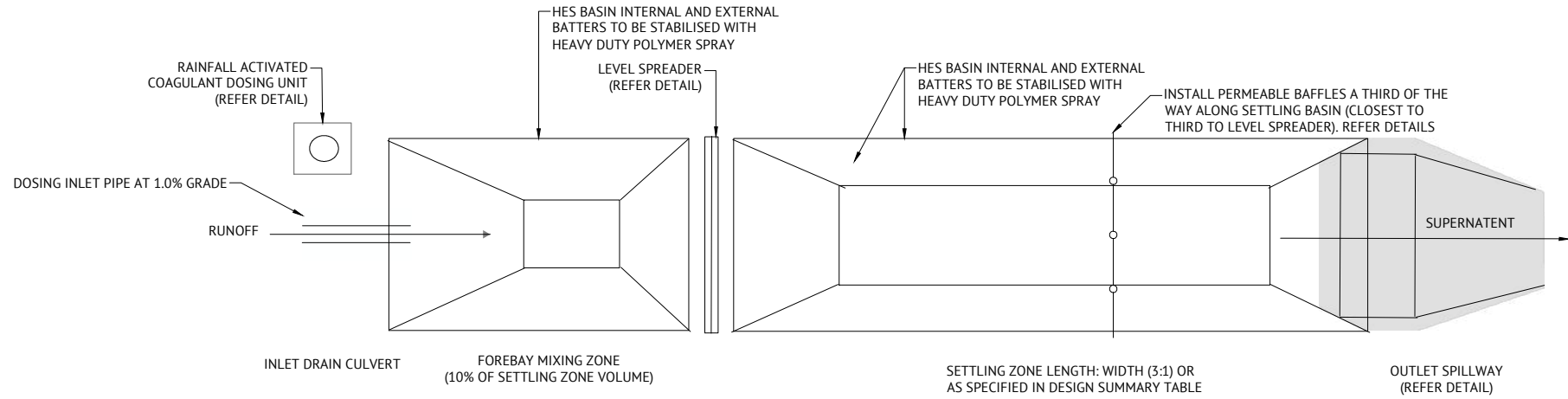
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 LOCATION  
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**EROSION AND SEDIMENT CONTROL NOTES AND DETAILS - SHEET 2**

JOB CODE  
**MIR-0904**  
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**C711**  
 REV  
**A**





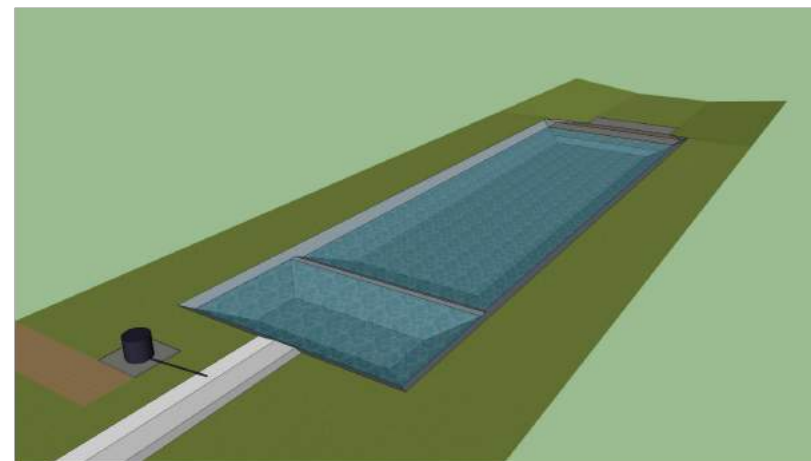
**TYPE B SEDIMENT BASIN LONG SECTION**  
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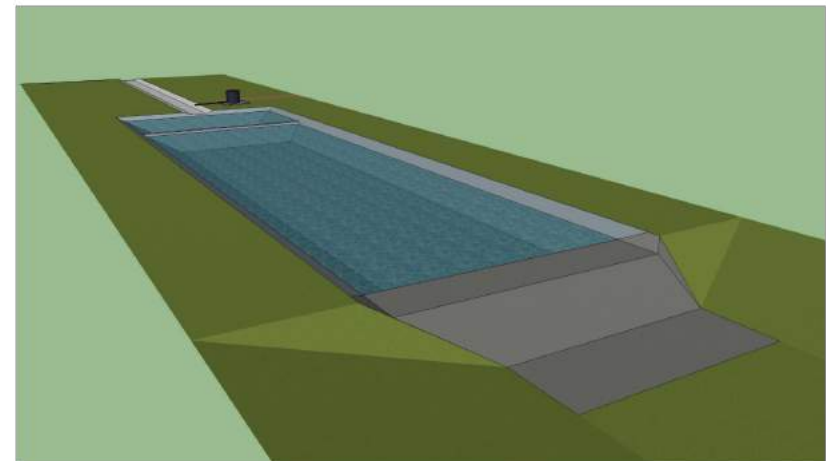
**TYPE B SEDIMENT BASIN PLAN VIEW**  
N.T.S.




**iFOD FLOW DOSING UNIT (CUSTOM BUILT)**



**BASIN PERSPECTIVE (LOOKING DOWNSTREAM)**



**BASIN PERSPECTIVE (LOOKING UPSTREAM)**



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 26/11/21

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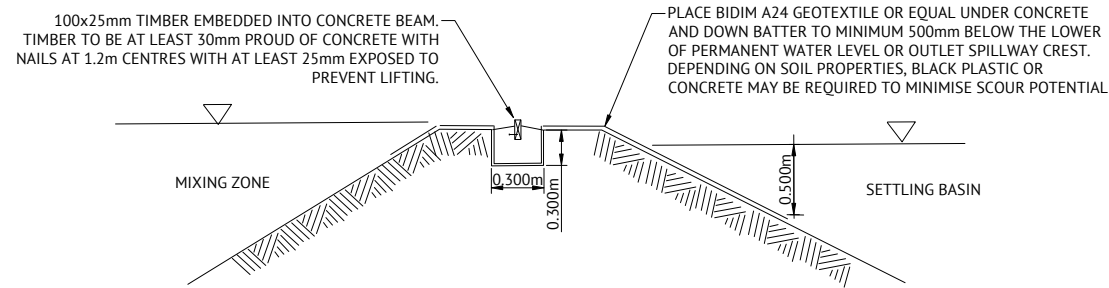

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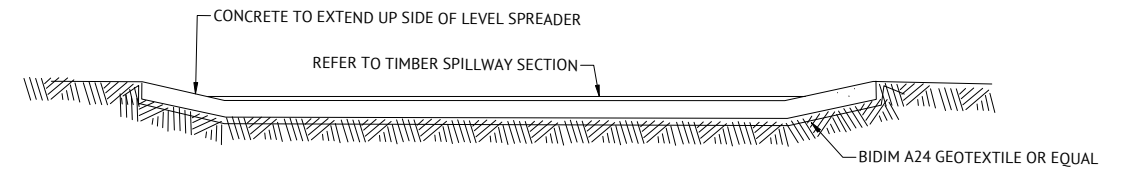
SCALE  
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CLIENT  
**MIRVAC QLD PTY LTD**  
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 LOCATION  
**TEVIOT ROAD, GREENBANK**  
 SHEET TITLE  
**EROSION AND SEDIMENT CONTROL NOTES AND DETAILS - SHEET 3**

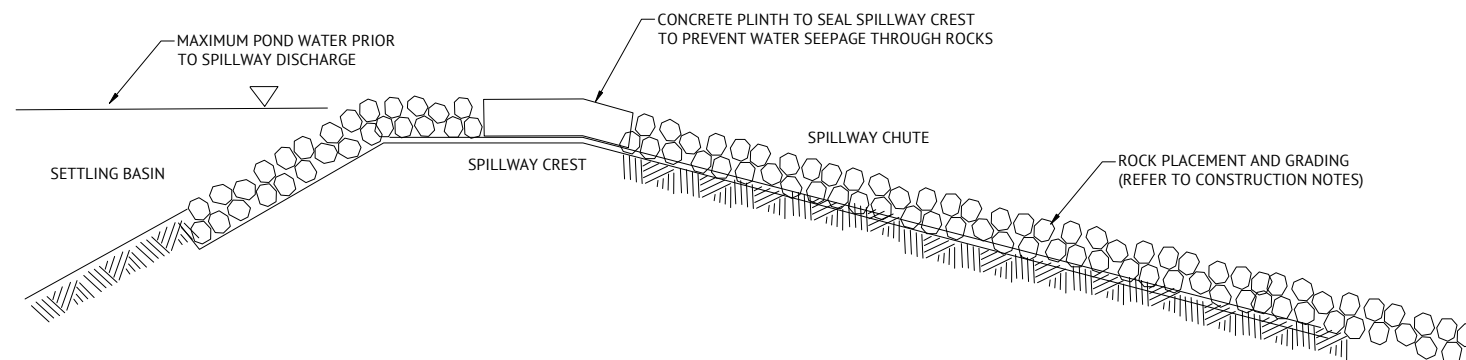
JOB CODE  
**MIR-0904**  
 SHEET NUMBER  
**C712**  
 REV  
**A**



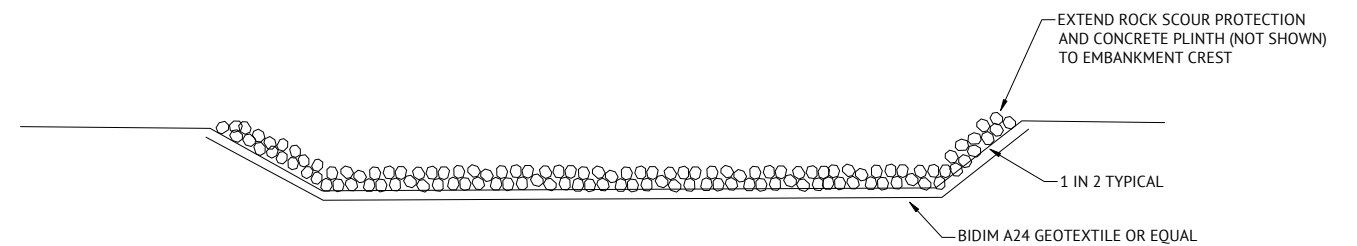
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N.T.S.



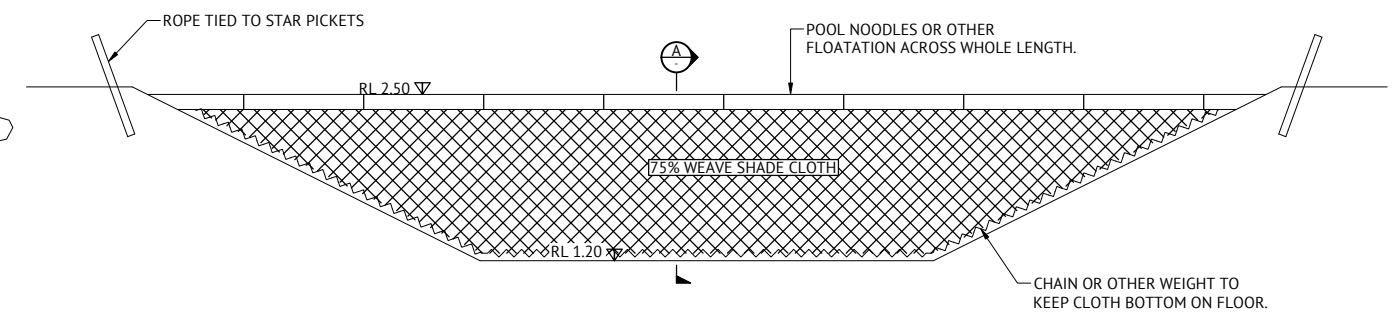
**LEVEL SPREADER DETAILS - TYPICAL LONG SECTION**  
N.T.S.



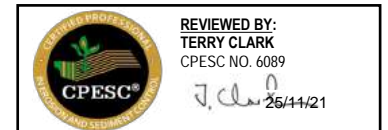
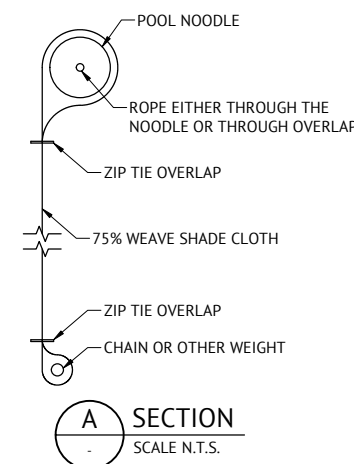
**OUTLET SPILLWAY DETAILS - TYPICAL CROSS SECTION**  
N.T.S.



**OUTLET SPILLWAY DETAILS - TYPICAL LONG SECTION**  
N.T.S.



**PERMEABLE BAFFLE SECTION**  
N.T.S.



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SCALE  
ORIGINAL SHEET SIZE A1

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**EROSION AND SEDIMENT CONTROL NOTES AND DETAILS - SHEET 4**

JOB CODE  
**MIR-0904**  
SHEET NUMBER  
**C713**  
REV  
**A**



## NOTES

### AUTO DOSER

- PROVIDED AS EITHER FLOC BOX OR IFOD-RAIN TO MANUFACTURES SPECIFICATION.
- DOSER AND SUPPLY OF FLOCCULANT TO BE PROVIDED ON LEVEL PAD 4m x 4m WITHIN 10m OF DOSING POINT.
- ALL-WEATHER ACCESS TRACK TO BE PROVIDED TO DOSER.
- 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

- 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 EMERSON CLASS 4 AND 5 MAY NOT BE SUITABLE DEPENDING ON PARTICLE SIZE DISTRIBUTION AND DEGREE OF DISPERSION.
  - CLASS 2(1) SHOULD ONLY BE USED UPON RECOMMENDATION FROM GEOTECHNICAL SPECIALIST.
- 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.
- GEOTEXTILE FABRIC: HEAVY DUTY, NEEDLE-PUNCHED, NON-WOVEN CLOTH, MINIMUM 'BIDIM' A24 OR EQUIVALENT.

### CONSTRUCTION

- 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.
- 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.
- BEFORE STARTING ANY CLEARING OR CONSTRUCTION, ENSURE ALL THE NECESSARY MATERIALS AND COMPONENTS ARE ON THE SITE TO AVOID DELAYS IN COMPLETING THE SEDIMENT BASIN ONCE WORKS BEGIN.
- INSTALL REQUIRES SHORT TERM SEDIMENT RUNOFF DURING CONSTRUCTION OF THE BASIN.
- 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.
- 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

- SCARIFY AREAS ON WHICH FILL IS TO BE PLACED BEFORE PLACING THE FILL.
- ENSURE ALL FILL MATERIAL USED TO FORM THE EMBANKMENT MEETS THE SPECIFICATIONS CERTIFIED BY A SOIL SCIENTIST OF GEOTECHNICAL SPECIALIST.
- 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.
- 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.
- 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.
- 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.
- ENSURE DEBRIS AND OTHER UNSUITABLE BUILDING WASTE IS NOT PLACED WITHIN THE EARTH EMBANKMENT.
- AFTER COMPLETION OF THE EMBANKMENT, ALL LOOSE UNCOMPACTED EARTH-FILL MATERIAL ON THE UPSTREAM AND DOWNSTREAM BATTER MUST BE REMOVED PRIOR TO SPREADING TOPSOIL.
- TOPSOIL AND RE-VEGETATE/STABILISE ALL EXPOSED EARTH AS DIRECTED WITHIN THE APPROVED PLANS.

### CUT-OFF TRENCH

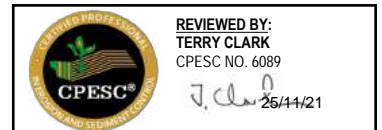
- BEFORE CONSTRUCTION OF THE CUT-OFF TRENCH OR ANY ANCILLARY WORKS WITHIN THE EMBANKMENT FOOTPRINT, ALL GRASS GROWTH AND TOPSOIL MUST BE REMOVED FROM THE AREA TO BE OCCUPIED BY THE EMBANKMENT AND MUST BE DEPOSITED CLEAR OF THIS AREA AND RESERVED FOR TOPDRESSING THE COMPLETED EMBANKMENT.
- EXCAVATED A 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).
- 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 SOIL MUST HAVE A MOISTURE CONTENT AND DEGREE OF COMPACTION THE SAME AS SPECIFIED FOR THE CORE ZONE.
- 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

- 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.
- 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.
- 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.
- 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.
- TAKE CARE NOT TO DAMAGE THE FABRIC DURING OR AFTER PLACEMENT. IF DAMAGE OCCURS, REMOVE THE ROCK AND REPAIR THE SHEET BY ADDING ANOTHER LAYER OF FABRIC WITH A MINIMUM OVERLAP OF 300mm AROUND THE DAMAGED AREA. IF EXTENSIVE DAMAGE IS SUSPECTED, REMOVE AND REPLACE THE ENTIRE SHEET.
- WHERE LARGE ROCK IS USED, OR MACHINE PLACEMENT IS DIFFICULT, A MINIMUM 100mm LAYER OF FINE GRAVEL, AGGREGATE, OR SAND MAY BE NEEDED TO PROTECT THE FABRIC.
- PLACEMENT OF ROCK SHOULD FOLLOW IMMEDIATELY AFTER PLACEMENT OF THE FILTER FABRIC. PLACE ROCK SO THAT IT FORMS A DENSE, WELL GRADED MASS OF 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.
- 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.
- 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

- 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.
- 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.
- 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.
- 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.
- 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.

## APPROVAL ISSUE – NOT FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
26/11/2021	A	ORIGINAL ISSUE	KK	PB
12/11/2021	1	PRELIMINARY ISSUE	KK	PB



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**PATRICK BRADY**

SCALE

ORIGINAL SHEET SIZE A1

CLIENT  
**MIRVAC QLD PTY LTD**

PROJECT  
**EVERLEIGH PRECINCT 9.4 SUBDIVISION DEVELOPMENT**

LOCATION  
**TEVIOT ROAD, GREENBANK**

SHEET TITLE  
**EROSION AND SEDIMENT CONTROL NOTES AND DETAILS - SHEET 5**

JOB CODE  
**MIR-0904**

SHEET NUMBER  
**C714**

REV  
**A**

## ROLES AND RESPONSIBILITIES

ROLE	RESPONSIBILITY
PROJECT MANAGER	<ul style="list-style-type: none"> <li>• OVERALL RESPONSIBILITY OF ESC IMPLEMENTATION</li> <li>• NOTIFY THE ENVIRONMENTAL MANAGER IMMEDIATELY OF ANY NON-COMPLIANCE WITH ESCP</li> <li>• ENSURE THE PROMPT IMPLEMENTATION OF MEASURES TO MITIGATE EROSION AND SEDIMENT GENERATION</li> </ul>
SITE SUPERVISOR / FOREMEN	<ul style="list-style-type: none"> <li>• MONITOR DAILY RAINFALL</li> <li>• NOTIFY ENVIRONMENTAL ADVISOR/CONSULTANT WHEN RUNOFF GENERATING RAINFALL OCCURS IN THE PREVIOUS 24 HOURS</li> <li>• MAINTAIN CURRENT RECORDS OF RAINFALL, STORAGE VOLUMES, WATER QUALITY, TREATMENT PRACTICES, DISCHARGE VOLUMES (AS APPROPRIATE)</li> <li>• INSTALLATION AND MAINTENANCE OF ESC</li> </ul>
ENVIRONMENTAL MANAGER	<ul style="list-style-type: none"> <li>• PROVIDE DESIGN INFORMATION AS REQUIRED</li> <li>• CONDUCT IN-SITU MONITORING (AS REQUIRED)</li> <li>• COLLECT AND SUBMIT SAMPLES TO LABORATORY (AS REQUIRED)</li> <li>• COLLATE RESULTS AND PREPARE REPORTS (AS REQUIRED)</li> <li>• CONDUCT SITE INSPECTIONS AND AUDITS (AS REQUIRED)</li> <li>• INSPECT ESC INSTALLATION AND MAINTENANCE</li> <li>• INSPECT OFFSITE IMPACTS AND MANAGEMENT</li> <li>• PROVIDE ADVICE REGARDING ESC SITE IMPROVEMENT (AS REQUIRED)</li> </ul>
ALL PERSONNEL	<ul style="list-style-type: none"> <li>• 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</li> </ul>

## 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 FROM THE SITE, INCLUDING DEPOSITION BY VEHICULAR MOVEMENTS.

**REVIEWED BY:**  
TERRY CLARK  
CPESC NO. 6089

*T. Clark* 25/11/21

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

### APPROVAL ISSUE – NOT FOR CONSTRUCTION

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SCALE

ORIGINAL SHEET SIZE A1

CLIENT **MIRVAC QLD PTY LTD**

PROJECT **EVERLEIGH PRECINCT 9.4 SUBDIVISION DEVELOPMENT**

LOCATION **TEVIOT ROAD, GREENBANK**

SHEET TITLE **EROSION AND SEDIMENT CONTROL NOTES AND DETAILS - SHEET 6**

JOB CODE **MIR-0904**

SHEET NUMBER	REV
<b>C715</b>	<b>A</b>

Everleigh



Environmental Pre-Start Checklist

# Attachment 9

Bushfire Hazard Assessment Management Plan

# Bushfire Hazard Assessment and **Fire** Management Plan

Teviot Road, Greenbank

138-168 Teviot Road, 456-520 Greenbank Road & 96-102 Brightwell Street, Greenbank



Prepared for

Mirvac Qld

By

Rob Friend & Associates Pty Ltd

**PLANS AND DOCUMENTS  
referred to in the PDA  
DEVELOPMENT APPROVAL**

**Approval no:** DEV2016/768

**Date:** 2 June 2017



Queensland  
Government

November 2016

## 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.	3 November 2016
02	Rob Friend	FINAL	Rob Friend, Director, RF&A Pty. Ltd.	4 November 2016

This document has been prepared solely for the benefit of Mirvac Qld, its sub-consultants and Economic Development Queensland (EDQ) is issued in confidence for the purpose only for which it is supplied which is to provide information with regard to bushfire hazards, mitigation and management within the properties identified in this document. Unauthorised use of this document in any form whatsoever is prohibited. No liability is accepted by Rob Friend & Associates Pty Ltd or any employee, contractor or sub-consultant of this company with respect to its use by any other person.

This disclaimer shall apply notwithstanding that, the document may be made available to other persons for an application for permission or approval or to fulfil a legal obligation.

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



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## Introduction

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

- J 96-102 Brightwell Street, Greenbank described as Lot 205 on RP845844 (15.9284 ha.),
- J 138-168 Teviot Road, Greenbank, described as Lot 434 on RP845844 (400.8 ha), and
- J 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 Area 1 of the development.

## 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.

Area 1 is located in the south-western portion of the site abutting Teviot Road and Greenbank Road and within an area which has been previous cleared for cattle agistment and as such within an area of low bushfire hazard.

Access to the development will be via a new road from the existing Teviot Road / Pub Lane, Greenbank intersection.

### Topography

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

### Existing Vegetation

Area 1 is located within a portion of the site that is predominantly clear pastoral land. Such pastoral land is defined as the area to the south and west of the EPBC excision boundary as shown on Figure 2 of Appendix A.

The pastoral areas within the EPBC excision boundary can be classed as grassland, however depending on rainfall and the commencement of bulk earth works within the property, this grassland may grow to become a hazard.

The hazards presented by this grassland, if it is permitted to grow, prior to being developed maybe sufficient to involve the adjacent open forests or other bushlands on neighbouring properties as well as produce significant quantities of

smoke which could be a safety hazard for vehicles on the surrounding road network. Notwithstanding the above, the re-stocking of the property with beef grazing cattle supplemented by slashing (where required) will assist in managing the abovementioned hazards.

## Development proposal

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

Area 1 consists of two types of residential uses, Residential – Standard and Residential – Interface Lots – South. In addition to the two residential areas, Area 1 will also see part of the Regional Open space/Recreation area established in the eastern and lower portions of this area.

It is noted that the proposal will also see the establishment of a 100-metre-wide maintained buffer around the perimeter of the Area 1 footprint and as such no residential lot 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 in Area 1. This clearing is addressed in technical reporting by Saunders Havill Group in support of the Area 1 development application.

## 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 High and Medium potential bushfire intensity over some of the area over which Area 1 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 all residential allotments in Area 1 are 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 residential allotments in Area 1 are in a bushfire prone area in the post clearing scenario. Therefore, no residential allotments within Area 1 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



**Legend**

- SITE BOUNDARY
- CADASTRE BOUNDARIES
- - - AREA 1 BOUNDARY
- - - GREATER FLAGSTONE UDA BOUNDARY
- EXISTING EASEMENTS
- RAIL CORRIDOR
- POTENTIAL TRAIN STATION <sup>1</sup>
- 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) <sup>1</sup>
- 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

<sup>1</sup> 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.

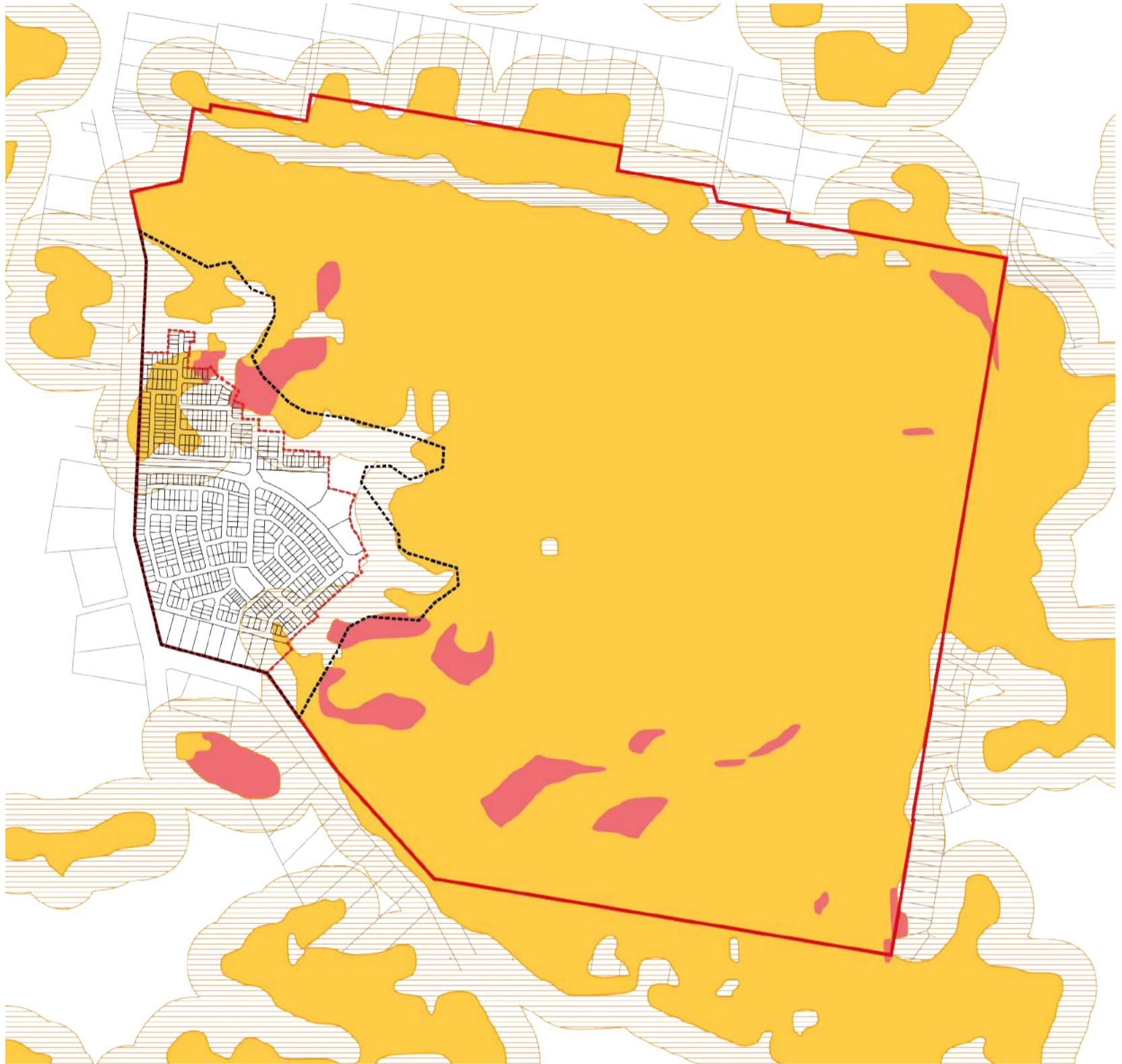


**GREENBANK  
LAND USE PLAN WITH AREA 1**



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

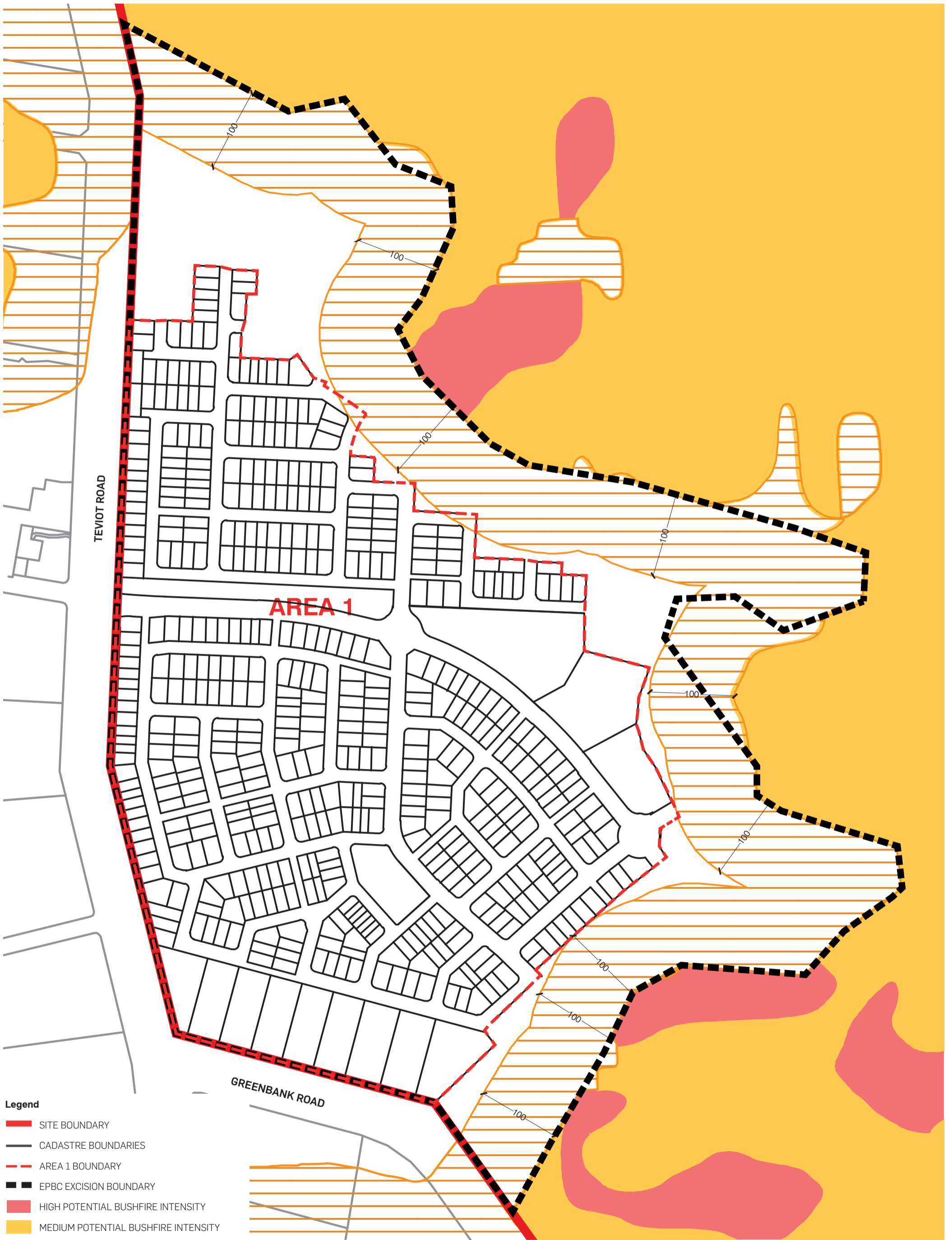
Figure 2 – Bushfire hazard plan – Area 1 – Pre-clearing



**Legend**

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

Figure 3 - Bushfire hazard plan – Area 1 – Post-clearing land within the EPBC excision boundary



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



**GREENBANK**  
**BUSHFIRE HAZARD PLAN - AREA 1 - POST CLEARING**



1:4,000 @ A3

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



Everleigh



Environmental Pre-Start Checklist

# Attachment 10

Site/Project Induction



<b>Inductee Name</b>		<b>Project</b>	
<b>Position</b>			

<b>Coronavirus COVID-19 Questions:</b>	<b>Y</b>	<b>N</b>
I declare that I have not returned from any overseas country in the last 14 days.	<input type="checkbox"/>	<input type="checkbox"/>
I declare that in the last 14 days I have not been in contact with a confirmed case of Covid-19 and do not have any symptoms related to COVID-19.	<input type="checkbox"/>	<input type="checkbox"/>
I agree that Shadforth COVID -19 preventative measures have been explained to me and I will always adhere to these measures.	<input type="checkbox"/>	<input type="checkbox"/>

<b>The Following site requirements have been explained to me:</b>	<b>Y</b>	<b>N</b>	<b>NA</b>
Onsite Communication Procedures – UHF Channels on this site -	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Daily Pre-start Meeting, Sign in Requirements, Toolbox Talks and Working Hours	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VMP, Haul Roads and Parking procedures onsite	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Emergency and First Aid Procedures and Locations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Incident, Injury and Hazard procedures and reporting requirements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Site Amenities (Office, Crib room, Toilets, Clean Water)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Site Security Procedures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Safe Work Method Statements- Reviewing and Understanding prior to works	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PPE Requirements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
High Risk Activities – Procedures and Permits (Confined Space, Hot Works, Excavation and Maintenance)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Plant, Vehicles, Equipment and Machinery (VOC, pre-starts, minimum requirements, maintenance procedure, mobile phones, seat-belts, quick-hitches, vehicle recovery)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Site Specific Hazards and No-Go Zones	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Site Specific Environmental Issues, Waste and Stormwater Management and Erosion and Sediment Controls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Site Specific Cultural Heritage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<b>Inductee Acknowledgment</b>			
I acknowledge that I have completed the Online General Workplace Induction and HIRAC training paper, along with having participated in the project specific induction and confirm that I understand the requirements, procedures and standards expected of me and agree to work safely and comply with the site's standards and procedures at all times and all information provided is true and correct.			
<b>Signature</b>		<b>Date</b>	
<b>Employer</b>		<b>Phone Number</b>	

**Shadforth Representative to Complete this Section**

Shadforth Representative - Verifications	Y	N	NA
Online General Workplace induction and Construction Card- compliant and verified on Rapid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
High Risk Licences, Tickets and VOC's uploaded and verified on Rapid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Person has the correct PPE for works being carried out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Site Specific VOC completed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Shadforth Representative Acknowledgment**

I confirm that I am authorised by Shadforth, to provide this induction and I have explained in detail, the items outlined above. I have checked/verified the inductee has completed the induction requirements to enter/work on this project site.

Name	Signature	Date

# Appendix D

## *Melaleuca irbyana* Impact Management Plan (July 2022)

# Permit

Section 86 of Nature Conservation (Plants) Regulation 2020

## Protected Plant Clearing Permit

This wildlife authority is issued under the following legislation: Nature Conservation (Plants) Regulation 2020.

**Permit number:** WA0045420

**Valid from:** 23 August 2022 to 22 August 2024

**Activity:** Clearing endangered, vulnerable or near threatened plants

Role	Name	Registered address	
<b>Principal Holder:</b>	Saunders Havill Group Pty Ltd	9 Thompson St BOWEN HILLS QLD 4006 Australia	
<b>Person In Charge:</b>	Mark Clancy		
<b>Business name:</b>		<b>ABN/ACN</b>	144972949
<b>Activity location/licensed premises</b>	LOT 804/SP331504 LOT 9002/SP331504 LOT 9003/SP327532 LOT 9004/SP327213		

### Schedule

Family or Species or Schedule	Details	Category	Quantity	Unit
Species	bush house or weeping paperbark or swamp teatree, Melaleuca irbyana	Live	215	Hectares

Bradley Cooper  
Department of Environment and Science  
Delegate of the administering authority  
Nature Conservation Act 1992

**Enquiries:**  
Wildlife Assessment Team  
Email: [wildlife@des.qld.gov.au](mailto:wildlife@des.qld.gov.au)  
Postal Address: PO Box 102, Toowoomba, QLD, 4350

**Date issued: 12 August 2022**

## Legislative Requirements and Conditions

### Legislative Requirements

- PPCLR02 Activities carried out under this authority, unless otherwise authorised, apply to non-protected areas only.
- PPCLR03 This permit includes the clearing of least concern protected plants within the clearing area. This permit also authorises the clearing of additional species and plants that were not specified in the Flora Survey Report.
- PPCLR01 This permit does not exempt the permit holder from obtaining other approvals relevant to the harvest of whole protected plants at the site.
- PPCP003 ADVISORY INFORMATION NOTICE: Clearing is to be conducted in a sequential manner and must be conducted in a way that directs escaping wildlife away from the area and into adjacent natural areas. A licensed spotter/catcher must be employed where there is a risk to native fauna present within the clearing site. The permit holder must ensure any injured animals are referred to an appropriate wildlife carer group or veterinarian.

### Conditions

- PPCM01 Activities relating to the impact of the threatened species listed on this permit must be in accordance with the procedures and actions outlined in the following documents, except where conditions below indicate otherwise:  
"Impact Management Plan, Melaleuca irbyana, Renewal for Permit No. WA0026119, 432 – 520 Greenbank Road, Greenbank, Prepared for Mirvac Queensland Pty Ltd, 8 July 2022, Job No. 7598 E", associated appendices and any other supporting documentation submitted to the department in relation to application number APP0096367 lodged electronically on 12 July 2022.
- PPCM02 The permit holder is to notify DES in writing at least 48 hours in advance of clearing commencing, for example, via an email to [wildlife@des.qld.gov.au](mailto:wildlife@des.qld.gov.au)
- PPCM04 Should the project not proceed, in addition to the requirement to rehabilitate the area/s once cleared, the site/s must not be further disturbed and must be maintained to ensure erosion and weed control.
- PPCM08 It is the permit holder's responsibility to ensure that the rehabilitation area with the threatened species *Melaleuca irbyana* remains legally secured.

PPCC04 Rehabilitation and/or translocation reporting advising of the progress and outcome of impact management measures to protect *Melaleuca irbyana* must be maintained from the commencement date of clearing and continue for a minimum period two (2) years or until the department is satisfied that section 3.1.4 of the Protected Plant Assessment Guidelines and section 87(1)(d)(ii) of the Nature Conservation (Plants) Regulation 2020 has been achieved.

The written report (including advice on each monitoring period) must be lodged with the department via an email to [wildlife.operations@des.qld.gov.au](mailto:wildlife.operations@des.qld.gov.au) within 10 business days after each annual period.





# Impact Management Plan

## *Melaleuca irbyana*

Renewal for Permit No. WA0026119

432 – 520 Greenbank Road, Greenbank  
Prepared for Mirvac Queensland Pty Ltd  
8 July 2022

Job No. 7598 E



# Document Control

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

## Document Issue

Issue	Date	Prepared By	Checked By
A	08.07.22	LT	LT

Prepared by

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ABN 24 144 972 949

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# Abbreviations and Acronyms

DAM	Declared Area Map
DES	Department of Environment and Science (Qld)
DNRME	Department of Natural Resources, Mines and Energy (Qld)
DOR	Department of Resources (Qld)
EDQ	Economic Development Queensland (Qld)
EVNT	Endangered, Vulnerable or Near Threatened (as defined by the NCA)
NCA	<i>Nature Conservation Act 1992</i> (Qld)
NCPR	Nature Conservation (Plants) Regulation 2020
NESS	Natural Environment Site Strategy
PDA	Priority Development Area (herein referencing the Greater Flagstone PDA)
PMAV	Property Map of Assessable Vegetation
SHG	Sunders Havill Group
VMA	<i>Vegetation Management Act 1999</i> (Qld)

# 1. Introduction

Saunders Havill Group (SHG) was engaged by Mirvac Queensland Pty Ltd (Mircac) to prepare an Impact Management Plan (IMP) for *Melaleuca irbyana* (Swamp Tee Tree) specimens located within the development footprint located at 432 – 520 Greenbank Road, Greenbank. The proposed works are for the development of master planned community, referred to as Everleigh and is located within the Greater Flagstone Priority Development Area (PDA) Economic Development Queensland (EDQ) is the administering authority. The development was approved by EDQ in accordance with the Greater Flagstone PDA Development Scheme.

As required under the *Protected Plants Assessment Guidelines* (the Guidelines) this IMP has been prepared to support the renewal of the Protected Plants Clearing Permit (Permit No. WA0026119) for the clearing of *M. irbyana* specimens within the 277 hectares (ha) development footprint located at 432-520 Greenbank Road, Greenbank. A copy the Protected Plants Clearing Permit is included at **Appendix A**.

## 1.1. Background

Initial Protected Plants Flora Surveys were undertaken over the development footprint in 2018 and recorded four (4) isolated patches of *M. irbyana*; three (3) of which are located within the Clearing Impact Area (refer **Plan 1**). The species is listed as Endangered under the *Nature Conservation Act 1992* (NCA).

Subsequently, an Impact Management Plan '*Impact Management Plan Melaleuca irbyana 432-520 Greenbank Road, Greenbank prepared for Mirvac QLD Pty Ltd, dated 3 July 2018*' (IMP) was prepared to support a Protected Plants Clearing Permit 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*. A copy of the IMP is included at **Appendix B**.

A Protected Plants Clearing Permit (Permit No. WA0009354) was issued by the DES on 24 August 2018 which allows for clearing of all *M. irbyana* over the entire Clearing Impact Area (i.e. 277 ha). Conditions of the Permit (PPCM01) require all activities relating to the impact of threatened plant species under the permit to be carried out in accordance with the procedures and actions in the IMP. This included rehabilitation planting of *M. irbyana* within 5,000m<sup>2</sup> area in on-site conservation area to ensure no significant residual impact on the species occurs as a result of the development.

Rehabilitation works by land care consultant Evolve commenced in the 5,000 m<sup>2</sup> *M. irbyana* rehabilitation area of the on-site conservation area commenced in March 2019 in accordance with the IMP, prior to the removal of any *M. irbyana* identified within the Clearing Impact Area. As the on-site conservation area (and *M. irbyana* rehabilitation area) will be ultimately handed over to Logan City Council, the proposed *M. irbyana* rehabilitation area was requested to be legally secured as a Declared Area (Category A) under the *Vegetation Management Act 1999* (VMA) to counterbalance the clearing of *M. irbyana*. on-site and to ensure objectives of the exchange area are fully achieved. The Voluntary Declaration Management Plan was approved by DNRME and the Declared Area was secured on title on 3 March 2020 and is shown as Category A (PMAV 2019/002658). A copy of the Declared Area Map is included at **Appendix C**.

Clearing activities had not been completed by the end of the first permit period (i.e. 23 August 2020) and a Protected Plants Clearing Permit renewal (Permit No. WA0026119) was issued by DES to continue clearing within the development area between 23 August 2020 and 22 August 2022. Surveys conducted to support the permit renewal (Permit No. WA0026119) recorded five (5) isolated patches of *M. irbyana*; four (4) of which were identified in the previous surveys and covered by Permit No. WA0009354.

The Protected Plants Clearing Permit (Permit No. WA0026119) expires on 22 August 2022. Clearing within the Permit area has been undertaken including the removal of one (1) location of the *M. irbyana*. Importantly, intensive rehabilitation works are complete with the rehabilitation area being self-sufficient. The purpose of this report is to support renewal of the Protected Plants Clearing Permit (Permit No. WA0026119).

## 1.2. Property Details

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.

The proposed clearing works will be undertaken over 277 ha of the 412 ha site to facilitate a master planned development and will be subject to future operational works approvals from Economic Development Queensland (EDQ) (DEV 2016/768).

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

**Table 1: Property Summary**

<b>Address</b>	432 - 520 Greenbank Road, Greenbank Qld 4124
<b>RPD</b>	Lot 804 on SP331504, Lot 9002 on SP331504, Lot 9003 on SP327532 and Lot 9004 on SP327213
<b>Local Government Area</b>	Logan City Council
<b>Administering Authority</b>	Economic Development Queensland
<b>Priority Development Area</b>	Greater Flagstone
<b>Planning Scheme</b>	Greater Flagstone PDA Development Scheme
<b>Area Classification / Zone</b>	Urban Living
<b>Existing Land Use</b>	Rural and Low-Medium density Residential
<b>Approved Land Use</b>	Low-Medium Density Residential

### 1.3. IMP Intent

The IMP has been prepared in accordance with Section 3.2.1, as follows:

<b>3.2.1 Impact management plan</b>
An impact management plan must include the following sections:
<ul style="list-style-type: none"> <li>• attempts to avoid and minimise impact</li> <li>• nature of impact</li> <li>• management of impact</li> <li>• justification of impact management</li> <li>• survival of plant in the wild</li> </ul>

### 1.4. Protected Plants Flora Survey

In accordance with the regulatory requirements, Protected Plant 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 and as per the Guidelines. The 2022 surveys were undertaken in accordance with the Guidelines (i.e. High Risk Areas), but also included survey at the four previously known locations of *M. irbyana* on-site recorded by 2018 and 2020 surveys. A copy of the 2022 Protected Plans Flora Survey Report is provided under a separate cover.

Protected Plants Flora Surveys undertaken in June 2022 confirmed *M. irbyana* in four (4) previously recorded locations. One (1) location (Location 5 recorded in the 2020 surveys) has been cleared (refer **Table 2** for summary of records from 2018 to 2022). Refer **Plan 1** and **Plan 2** for *M. irbyana* located during 2018 and 2020 surveys, respectively and **Plan 3** for *M. irbyana* located during 2022 surveys.

**Table 2** provides a summary of all the *M. irbyana* locations, number of specimens and growth categories recorded in previous and contemporary surveys. Growth categories define whether the specimen is either mature, semi-mature or juvenile (refer **Section 2.2** for categorisation methodology).

**Table 2: *M. irbyana* Locations**

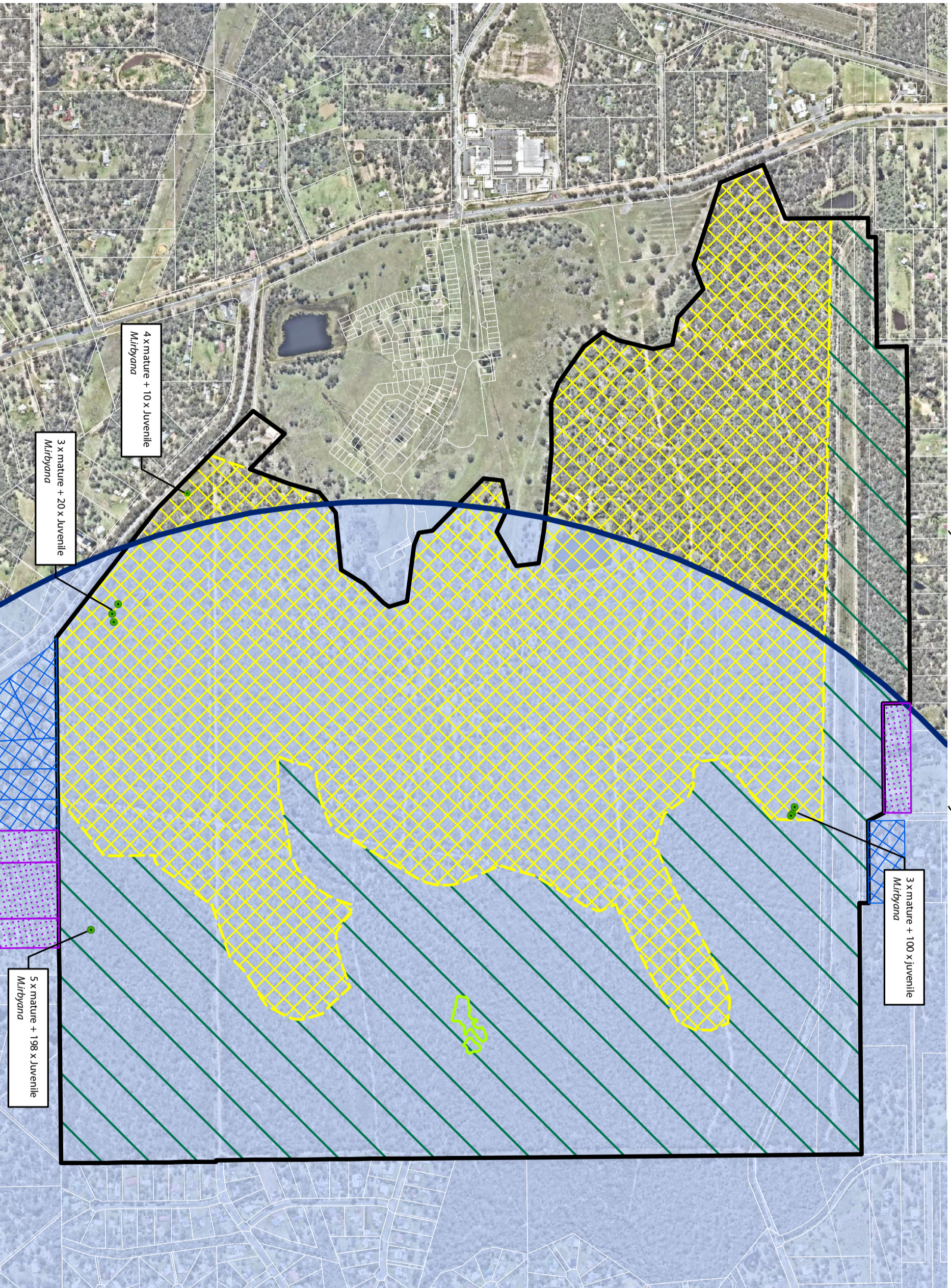
Location	2018 Survey Results	2020 Survey Results	2022 Survey Results
1	3 x mature + 100 juveniles	3 x mature + 1 x semi mature + 100 juvenile	2 x mature + 67 x semi mature juvenile
2	3 x mature + 20 x juveniles	3 x mature + 11 x semi mature + 10 juvenile	3 x mature + 11 x semi mature + 10 juvenile
3a	4 x mature + 10 x juveniles	3 x mature	3 x mature
3b		1 x mature + 9 x juvenile	1 x mature + 9 x juvenile
3c		2 x mature + 9 x semi mature + 3 x juvenile	2 x mature + 9 x semi mature + 3 x juvenile

■ Impact Management Plan – *Melaleuca irbyana*

<b>Location</b>	<b>2018 Survey Results</b>	<b>2020 Survey Results</b>	<b>2022 Survey Results</b>
3d		2 x semi mature + 2 x juvenile	2 x semi mature + 2 x juvenile
4	5 x mature + 100 juveniles	5 x mature + 107 x semi mature + 8 x juvenile	5 x mature + 107 x semi mature + 8 x juvenile
5		2 x mature + 3 x semi mature + 24 x juvenile	Modified Environment – Cleared during existing Permit period (Permit No. WA0026119)



# 1. 2018 Protected Plants Survey - *Melaleuca irbyana*



**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 are 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 any change when a full survey is undertaken 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.

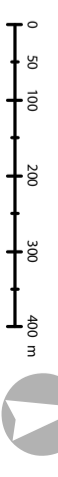
Layer Sources: QLD GISLayers (QLD Gov. Information Service 2020), Aerial (Aesmap 2020)

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

## LEGEND

- Project DCDB
- Qld 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
- Melaleuca irbyana* planting/rehab site (Approx. 5,000m<sup>2</sup>)

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

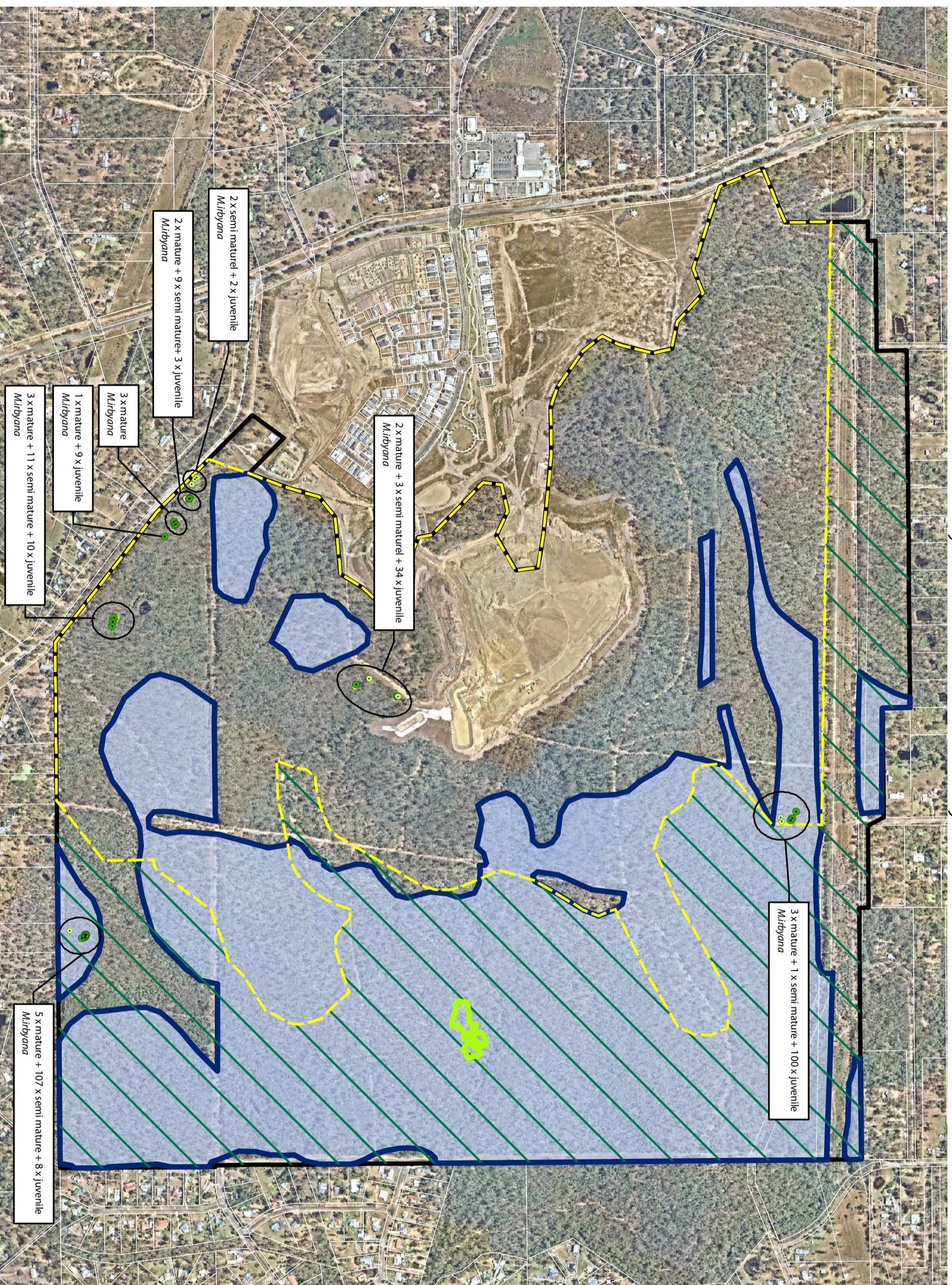


Issue	Date	Description	Drawn	Checked
A	13/07/2020	Preliminary	MP	KG

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



## 2. 2020 Protected Plants Survey - *Melaleuca irbyana*



2 x semi mature + 2 x juvenile  
*Mirbyana*

2 x mature + 9 x semi mature + 3 x juvenile  
*Mirbyana*

2 x mature + 3 x semi mature + 34 x juvenile  
*Mirbyana*

3 x mature  
*Mirbyana*

1 x mature + 9 x juvenile  
*Mirbyana*

3 x mature + 11 x semi mature + 10 x juvenile  
*Mirbyana*

3 x mature + 107 x semi mature + 8 x juvenile  
*Mirbyana*

3 x mature + 1 x semi mature + 100 x juvenile  
*Mirbyana*

### NOTES

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Layer Sources: QLD GIS Layers (QLD Gov. Information Service 2020), Aerial (Nearmap 2020)

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### LEGEND

- Project DCDB
- QLD DCDB
- Development footprint
- Conservation area
- NCA flora survey trigger area
- Mature *Melaleuca irbyana* specimen
- Semi-mature or juvenile *Melaleuca irbyana* specimen
- Melaleuca irbyana* planting/rehab site (Approx. 5,000m<sup>2</sup>)

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

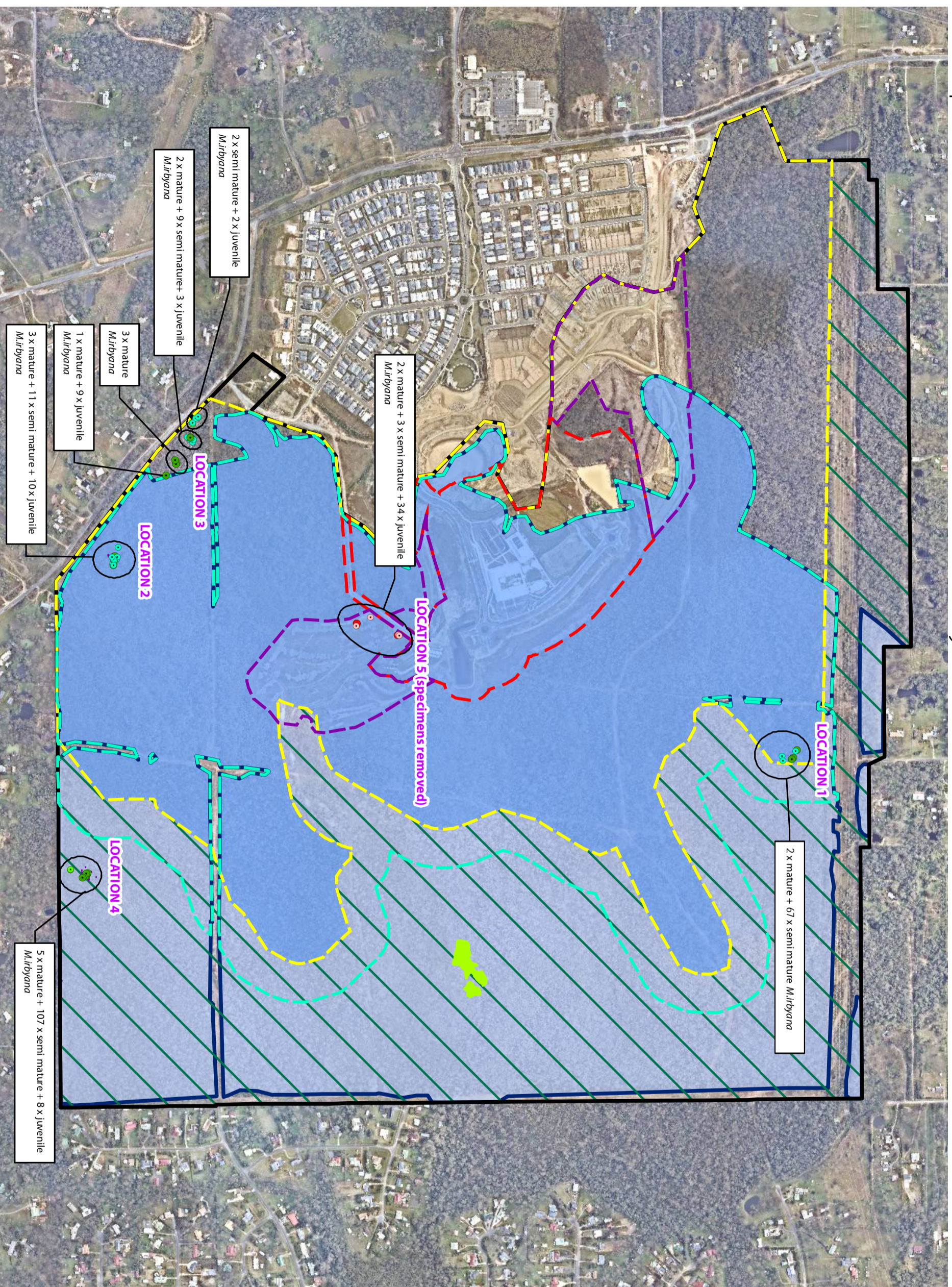
Issue	Date	Description	Drawn	Checked
A	14/07/2020	Preliminary	MP	NG

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





### 3. Impact Assessment - *Melaleuca irbyana*



Notes:

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Layer Sources:  
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 Updated data available at  
<http://qldspatialinformation.qld.gov.au/cataologue/>

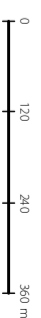
© Nearmap, 2022

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

#### Legend

- Project DCDB
- QLD DCDB
- Development footprint
- Conservation area
- NCA flora survey trigger area
- Clearing impact area - 100m buffer from development footprint
- Category A - Melaleuca irbyana planting/rehab site (Approx. 5,000m<sup>2</sup>)
- Mature *Melaleuca irbyana* specimens
- Semi-mature or juvenile *Melaleuca irbyana* specimens
- Mature *Melaleuca irbyana* specimen removed by clearing works
- Semi-mature or juvenile *Melaleuca irbyana* specimens removed by clearing works
- Melaleuca irbyana* patch

Issue	Date	Description	Drawn/Checked
A	7/07/2022	Preliminary	TC UT



Transverse Mercator (GDA 1994, Zone 56) 110,000 @A3



Address / RPD: Revot Road, Greenbank

7/07/2022 | 7598 E 03 NCA 2022 IMP A



## 1.5. Nature Conservation Act 1992

The NCA classifies and protects significant areas (Protected Areas) and protects threatened plant and animal species. The *Nature Conservation (Plants) Regulation 2020* (NCPR) 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 overlaid as 'High Risk' and so are subject to flora survey requirements (refer **Plan 2**).

Prior to flora surveys, the schedules of the NCPR were considered in this report using a Wildlife Online Database Search with a 5km radius from the site (refer **Appendix D**). One (1) threatened flora species was identified as having the potential to occur on-site and are presented in **Table 3**.

**Table 3: Wildlife Online Search Results–Flora**

Scientific Name	Common Name	NCA Status
<i>Melaleuca irbyana</i>	Swamp Tea Tree	Endangered

## 2. Nature of the Impact

### 2.1. Background

The only threatened flora species located within the development footprint was *M. irbyana* (Swamp Tea Tree). The profile of the species is detailed below in **Section 2.2**. This species was the only threatened flora species recorded by 2018, 2020 and 2022 surveys. Four (4) patches of *M. irbyana* preciously located in 2018; three (3) located within the Clearing Impact Area (refer **Plan 1**). One (1) additional patch of *M. irbyana* was recorded in the 2020 surveys within the Clearing Impact Area (location 5, refer **Plan 2**). The four (4) patches originally recorded in the 2018 surveys were confirmed within contemporary surveys in June 2022. Location 5, recorded in 2020 surveys, has been cleared and was not surveyed in 2022 surveys.

The existing Permit considered impacts for the entire Clearing Impact Area (i.e. 277 ha). This IMP has been prepared to support the renewal of the Protected Plants Clearing Permit (Permit No. WA0026119) with the same Clearing Impact Area. It is anticipated the clearing of *M. irbyana* will continue within the next 2 years.

### 2.2. Protected Plant Profile

*M. irbyana*, a member of the Myrtaceae family, is listed as a threatened species under Schedule 2 of the NCPR and is classified as “endangered”. *M. 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 VMA. This vegetation community is also listed as a ‘Critically Endangered’ when present as a Threatened Ecological Community (TEC) 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. irbyana* 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.

Growth categories for this assessment are defined as juvenile specimens less than two (2) meters in height, semi-mature specimens greater than two (2) meters in height but with a trunk less than 100mm DBH, and mature specimens retaining a trunk diameter of at least 100mm.

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 Clearing Impact Area and 100m buffer was traversed as part of previous and contemporary NCA searches. *M. irbyana* were recorded in four (4) separate locations during both 2018 (refer **Plan 1**) and confirmed again in 2020, with an additional patch recorded in 2020 surveys (location 5; refer **Plan 2**). Contemporary surveys undertaken in June 2022 to support the renewal of the Protected Plants Clearing Permit, recorded four (4) locations (refer **Plan 3**). Location 5, previously recorded in 2020 surveys, was cleared during the existing permit period (Permit No. WA0026119). Three (3) of the four (4) remaining locations occur within the Clearing Impact Area (Locations 1, 2 and 3; refer **Plan 3**). Location 4 is located outside the Clearing Impact Area and will be retained by the development in Conservation. Each of the remaining locations (Locations 1, 2, 3 and 4) have been described in the following subsections.

#### 2.3.1 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 11<sup>th</sup> of May 2017. This patch of *M. irbyana* consists of two (2) established specimens, sixty-seven (67) semi-mature specimens. This patch of is surrounded by vegetation dominated by *Acacia spp.*, *Allocasuarina littoralis* (Black She-oak) and *Alphitonia excelsa* (Soap Tree) regrowth with a *Corymbia citriodora* (Spotted Gum) dominated canopy, representing the Least Concern RE12.9-10.2.



**Photo Plate 1: Location 1**

#### 2.3.2 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 11<sup>th</sup> of May 2017. This *M. irbyana* patch consists of three (3) established (mature) specimens, eleven (11) semi-mature specimens and ten (10) juvenile specimens. This patch was recorded within a regrowth vegetation community, with surrounding vegetation dominated by *Allocasuarina littoralis* (Black She-oak) and *Acacia spp.* regrowth.





**Photo Plate 2: Location 2**

### 2.3.3 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 11<sup>th</sup> of May 2017. This patch of *M. irbyana* consists of six (6) mature specimens, eleven (11) semi-mature specimens and fourteen (14) juvenile specimens. The overall patch was recorded within a regrowth vegetation community, with surrounding vegetation dominated by *Acacia leiocalyx* (Early Flowering Black Wattle), *Allocasuarina littoralis* (Black She-oak) and *Alphitonia excelsa* (Soap Tree) regrowth. The patch is separated into four separate patches.



**Photo Plate 3: Location 3**

### 2.3.4 Location 4

Location 4 is situated towards the southern property boundary, approximately 800 m east of Location 3. 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 11<sup>th</sup> of May 2017. This *M. irbyana* patch consists of five (5) mature specimens, one hundred and seven (107) semi-mature specimens and eight (8) juvenile specimens with a height less than two (2) meters. This patch is 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, typically representing the Least Concern RE12.9-10.2.



Photo Plate 4: Location 4

Table 4: Regional Ecosystems Descriptions

Status	Code	Description
<b>Endangered</b>	12.9-10.12	<i>Corymbia intermedia</i> , <i>Angophora leiocarpa</i> , <i>Eucalyptus seeana</i> +/- <i>E. siderophloia</i> , <i>E. tereticornis</i> , <i>E. racemosa</i> subsp. <i>racemosa</i> , <i>C. citriodora</i> subsp. <i>variegata</i> woodland to open forest. <i>Lophostemon suaveolens</i> is often present as a sub-canopy or understorey tree. Occasional <i>Melaleuca quinquenervia</i> on lower slopes. Does not include areas dominated by <i>Eucalyptus racemosa</i> subsp. <i>racemosa</i> . Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 9g).
<b>Of Concern</b>	12.9-10.7:	<i>Eucalyptus crebra</i> +/- <i>E. tereticornis</i> , <i>Corymbia tessellaris</i> , <i>Angophora leiocarpa</i> , <i>E. melanophloia</i> woodland. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 13c).
<b>Of Concern</b>	12.3.11	<i>Eucalyptus tereticornis</i> +/- <i>E. siderophloia</i> and <i>Corymbia intermedia</i> open forest to woodland. <i>Corymbia tessellaris</i> , <i>Lophostemon suaveolens</i> and <i>Melaleuca quinquenervia</i> frequently occur and often form a low tree layer. Other species present in scattered patches or low densities include <i>Angophora leiocarpa</i> , <i>E. exserta</i> , <i>E. grandis</i> , <i>C. trachyphloia</i> , <i>C. citriodora</i> subsp. <i>variegata</i> , <i>E. latisinensis</i> , <i>E. tindaliae</i> , <i>E. racemosa</i> and <i>Melaleuca sieberi</i> . <i>E. seeana</i> may be present south of Landsborough and <i>Livistona decora</i> 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)
<b>Least Concern</b>	12.3.6:	<i>Melaleuca quinquenervia</i> +/- <i>Eucalyptus tereticornis</i> , <i>Lophostemon suaveolens</i> , <i>Corymbia intermedia</i> open forest to woodland with a grassy ground layer dominated by species such as <i>Imperata cylindrica</i> . <i>Eucalyptus tereticornis</i> may be present as an emergent layer. Occurs on Quaternary floodplains and fringing drainage lines in coastal areas. (BVG1M: 22a)

Status	Code	Description
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 *M. irbyana* community due to the patches predominately containing juvenile individuals with relatively few fully mature specimens. Importantly, these patches are not associated with Endangered RE. 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.



## 3. Management of the Impact

The remaining earthworks to facilitate the development footprint will require the removal of the three (3) remaining *M. irbyana* locations within the Clearing Impact Area (refer **Plan 3**). These patches are relatively small and predominately juvenile *M. irbyana* specimens. Clearing of these areas is expected to continue over the next two years as development progresses.

A significant residual impact (SRI) assessment was undertaken in accordance with the *Queensland environmental Offsets Policy - Significant Residual Impact Guideline (DES 2014)* as part of the approved IMP (refer **Appendix B**). Prior to the SRI, an assessment survival in the wild and avoidance and mitigation was considered.

### 3.1. Avoidance and Minimisation of Impact

An assessment for the survival of the plant in the wild was previously made as part of the IMP (refer **Appendix B**) and has been updated as part of this assessment.

The proposed works are for the development of a master planned community, referred to as Everleigh, 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 include the creation of residential allotments, the new Everleigh State School, roads, park, sports ovals and conservation areas. Minimisation of overall clearing impacts are evident through location of the proposed development, located outside 'Endangered' remnant vegetation and waterway corridors. As part of the development, rehabilitation of the conservation area and waterways has commenced.

The proposed earthworks to facilitate the development footprint will require the removal of the remaining three (3) relatively small patches of predominately juvenile *M. irbyana* specimens over the following two years, and ongoing property boundary maintenance within 100 m of the retained patch (Location 4). These specimens are located within 'Of Concern' and non-remnant regrowth areas (refer **Plan 3**).

As per the EDQ endorsed Natural Environment Site Strategy (NESS), 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 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 RE to augment ecological values and enhance connectivity.

*M. 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 approved conservation area rehabilitation works include an established *M. irbyana* thicket within remnant woodland forest to the north of the central waterway (**Plan 3** and **Plan 4**). This land is relatively low lying and adjoins an ephemeral waterway that contains permanent billabongs. The approved *Me. irbyana* rehabilitation area is therefore considered ideal for the species, which is dependent on specific groundwater and / or surface water hydrology. Impacts to *M. irbyana* have been minimised to the greatest practical extent and include establishing the *M. irbyana* community, on the project site, within a conservation area and managing potential impacts from ongoing works that will occur within 100 m of the retained patch (Location 4).

### 3.2. Survival of the Plant in the Wild

An assessment for the survival of the plant in the wild was previously made as part of the IMP (refer **Appendix B**) and has been updated as part of this assessment.

Based on the current disturbed nature of the site and the locations of the *M. irbyana* specimens mostly along property boundaries, it is not anticipated that the removal of the remaining three (3) relatively small patches of predominately juvenile *M. irbyana* specimens will significantly impact the viability of this species on-site or in the wider landscape. Importantly, Location 4 is to be preserved within the conservation area and *M. irbyana* rehabilitation area legally secured on title as a declared area (Category A) under the VMA will protect the in perpetuity.

### 3.3. Significant Residual Impact (Justification of the Impact)

A SRI assessment (refer Section 3 of the IMP at **Appendix B**) was made to support the Protected Plants Clearing Permit (Permit No. WA0009354) for the clearing of *M. irbyana* specimens within the Clearing Impact Area. The SRI assessment concluded the clearing of three small patches of *M. irbyana* for the development would not result in a SRI due to extensive rehabilitation works proposed within the on-site Conservation area, including the establishment of a 5,000 m<sup>2</sup> *M. irbyana* thicket resulting in a net gain in *M. irbyana* across the site.

While rehabilitation for the 5,000 m<sup>2</sup> *Melaleuca irbyana* thicket has been undertaken and is now considered to be self-sustaining, the permit for Clearing Impact Area (Permit No. WA0026119) will expire on 22 August 2022.

Renewal of the Protected Plant Clearing Permit for the same Clearing Impact Area of 277 ha is requested. The impact is considered to same as previously assessed under the Permit No. WA0009354 and WA0026119. The below SRI assessment for the clearing of the remaining three (3) patches of mostly juvenile *M. irbyana* proposed under this permit renewal concludes, with the established rehabilitation works, the impact would not result in a SRI.

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* was provided below for ease of reference

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

The impact on the matter is the removal of the remaining three (3) relatively small patches (Locations 1, 2 and 3) of predominately juvenile *M. irbyana* specimens from former paddock areas that have already been subject to high disturbance from cattle grazing and historical clearing. Location 4 will be retained with the on-site conservation area within 100 m of ongoing works. Ongoing works within 100 m of Location 4 will be limited to the maintenance of the nearby property boundary. The sites are described in detail in **Section 2.3**, shown in **Plan 3** and summarised below:

- Location 1: 2 x mature + 67 x semi mature, located within the north-east along a drainage feature
  - Location 2: 3 x mature + 11 x semi mature + 10 juvenile specimens, located along the southern boundary
  - Location 3: 5 mature + 20 semi mature + 14 juvenile specimens, located along the southern boundary
  - Location 4: 5 mature + 107 x semi mature + 8 x 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.**

As required under Permit No. WA0009354 and WA0026119, planting of six hundred and twenty-five (625) advanced tube stock specimens of *M. irbyana* occurred within a 5,000m<sup>2</sup> area within the on-site conservation area in March 2019 (refer **Plan 4**). The *M. irbyana* tube stock was planted in a thicket to replicate as close to natural conditions for a *M. irbyana* ecological community as possible and will be maintained as part of the extensive rehabilitation works for the conservation area. The *M. irbyana* rehabilitation area adjoins the central waterway corridor and is not within 100 m of future development areas. This location was selected to avoid human disturbance and to be as far as possible from conflicting uses. Importantly, the rehabilitation area has been legally secured on title as a declared area (Category A) under the VMA (refer **Appendix C**) and will transition to the responsibility Logan City Council, along with the entire on-site conservation area, following the on-maintenance period. Further, Location 4 will be retained within the on-site conservation area and will continue to be managed through weed suppression and monitored for persistence as part of site maintenance before becoming the responsibility of Logan City Council.

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

It is important to note that the RE within and adjoining the creek corridor reflect those where the *M. irbyana* patches are currently located on-site. The rehabilitation area was chosen after detailed ecological surveys including the prevailing low-lying topography, proximity to the creek, and canopy gaps with limited existing understorey. Thus, the planting of *M. irbyana* in the creek corridor was determined to have a high likelihood of success given the suitable landscape and habitat.

Planting was undertaken by land care experts Evolve Environmental. Given that the impact is the removal predominately juvenile *M. irbyana*, the planting of six hundred and twenty-five (625) specimens of *M. irbyana* within the on-site conservation area will provide a consolidated *M. irbyana* thicket exceeding the impacted matter resulting in a positive ecological outcome.

- **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 the three (3) remaining 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*, planting occurred prior to the removal of any *M. irbyana* specimens in March 2019 to reduce the potential time lag-effect to the greatest practical extent.

To date only one (1) Location (Location 5) has been cleared and the rehabilitation area is considered to be self-sustaining. As the process to clear the *M. Irbyana* patches has occurred slowly there is limited lag-time in realising the ecological benefits. Overall, the rehabilitation area provides a far superior ecological outcome for the viability of the local population.

The extent and number of *M. irbyana* planted was 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. As discussed the *M. irbyana* rehabilitation area is considered to be self-sustaining however monitoring will continue.

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, however, it is requested that DES consider the approval of Permit No. WA0009354 and WA0026119 for the clearing of 277 ha on the site consistent with the clearing being proposed.

### 3.4. Voluntary Declaration

As the on-site conservation area (and *M. irbyana* rehabilitation area) will be ultimately handed over to Logan City Council, the proposed *M. irbyana* rehabilitation area was legally secured as a Declared Area (Category A) under the VMA to counterbalance the clearing of *M. irbyana* on-site and to ensure objectives of the exchange area are fully achieved.

The “*Voluntary Declaration Management Plan (Melaleuca irbyana Declared Area), 432-520 Greenbank Road, Greenbank, prepared by Saunders Havill Group for Mirvac (Queensland) Pty Ltd, dated March 2019*” was submitted to the Department of Natural Resources, Mines and Energy (DNRME), now the Department of Resources (DOR), as part of the Voluntary Declaration and included the following attachments:

- Appendix A – Protected Plants Clearing Permit (Permit No. WA0009354)
- Appendix B - *Impact Management Plan Melaleuca irbyana 43-520 Greenbank Road, Greenbank prepared for Mirvac QLD Pty Ltd, dated 3 July 2018*

## ■ Impact Management Plan – *Melaleuca irbyana*

- Appendix C – Declared Area Plan (proposed)
- Appendix D - *Melaleuca irbyana* Declared Area Rehabilitation Plan, prepared for Mirvac QLD Pty Ltd, by SHG dated March 2019.

Importantly, the Rehabilitation Plan in Appendix D of the Voluntary Declaration application, provides detailed rehabilitation, monitoring and reporting procedures in format suitable for tender and expands on the single page plan in **Section 3** (previously assessed and approved by DES in 2018 (Permit No. WA0009354)).

The Voluntary Declaration Management Plan was approved by DNRME and the Declared Area was secured on title on 3 March 2020 and is shown as Category A (PMAV 2019/002658).

A copy of the *Melaleuca irbyana* Declared Area Rehabilitation Plan has been provided at **Appendix E**.

### 3.5. Rehabilitation

Land care Consultants Evolve were engaged by Mirvac to undertake installation and establishment of the *M. irbyana* rehabilitation area. As required under Permit No. WA0009354 and WA0026119, six hundred and twenty-five (625) advanced tube stock specimens of *M. irbyana* are to be planted within a 5,000m<sup>2</sup> area within the on-site conservation area (refer **Plan 4**). The *Melaleuca irbyana* Declared Area Rehabilitation Plan included with the Voluntary Declaration is provided at **Appendix E**.

Primary planting of *M. irbyana* tube stock commenced in March 2019, prior to the removal of *M. irbyana* locations, and was completed in January 2020. The establishment period for this specific location within the offset area is 24 months utilising adaptive management (refer **Appendix E**). Following primary planting (i.e. March 2019) the rehabilitation area was actively managed for 3 years, exceeding the minimum establishment period of 24 months, to ensure the planted tube stock achieved the minimum survival rate. Management activities during this time included remedial planting as a result of tube stock failure, watering, weed removal, photo monitoring and audits.

The *M. irbyana* rehabilitation area completed 3 years of management in March 2022, achieved the minimum survival rate and is now considered to be self-sustaining. Rehabilitation works are no longer considered necessary, however monitoring of the on-site conservation area will continue annually until responsibility is transferred to Council and adaptive measures will be implemented as required. Refer to **Plan 4** for rehabilitation area and recent inspection images.