Shire of Donnybrook-Balingup

Management and Rehabilitation of Basic Raw Material Pit

Gavins Road Strategic Gravel Supply

May 2018

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1 Background

1.1 Purpose

The Shire of Donnybrook-Balingup (SoDB) has an ongoing need for a strategic source of gravel, close to the Donnybrook townsite, for asset management requirements going into the future.

The Shire has extracted gravel from Department of Biodiversity, Conservation and Attraction (DBCA) managed land in the past near the Donnybrook townsite. The latest pit provided approximately 20,000 m3 of gravel over a four-year period. The gravel extracted from this site is now exhausted and a new pit is required for renewals and upgrades of Shire roads, that have a direct nexus of benefit to the DBCA.

This Pit Management Plan (PMP) has been prepared by the SoDB for the extraction of raw material (gravel) from land managed by DBCA. The proposed pit is located off Gavins Road, a distance of approximately 2.5km from the Donnybrook town centre. Figure 1 shows the location of the proposed gravel pit in proximity to Donnybrook townsite.

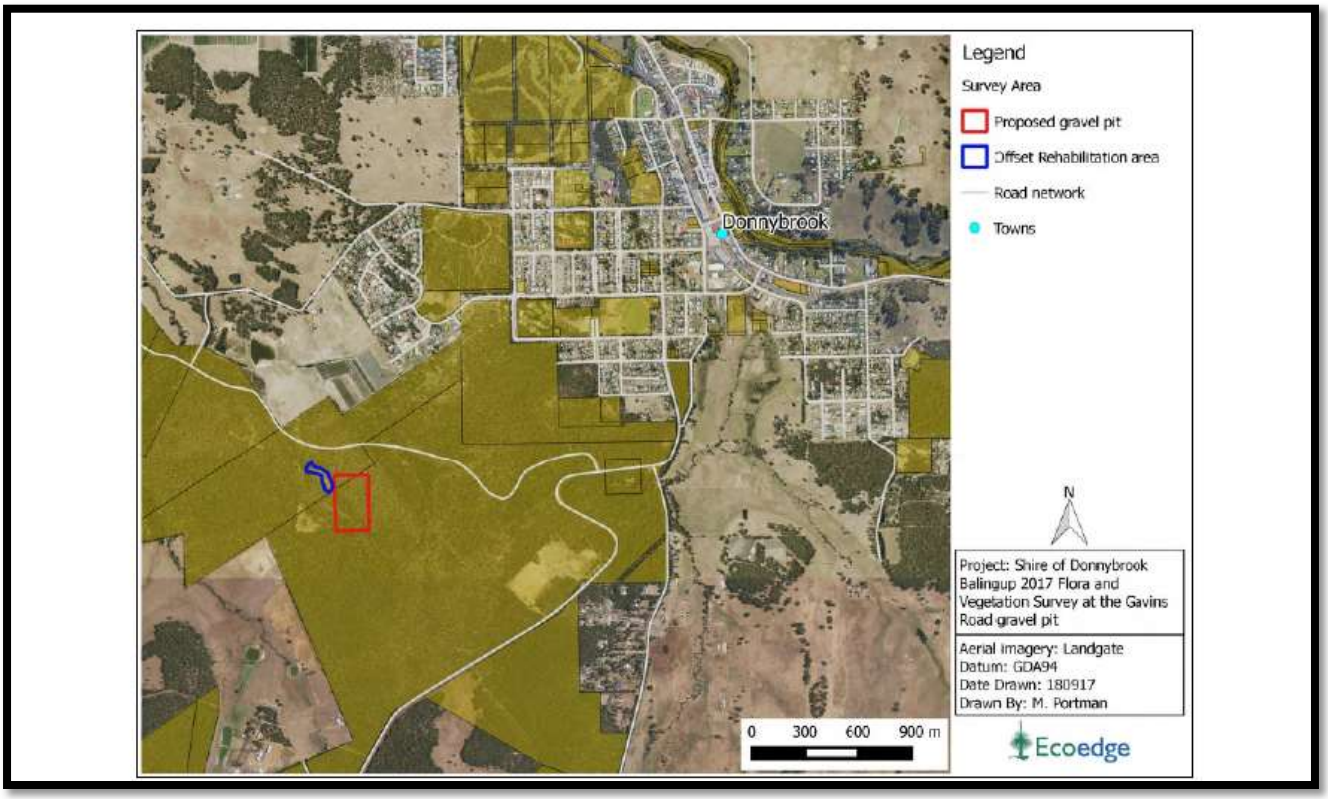

Figure 1 The proposed gravel pit is situated in State Forest (Ecoedge 2018a).

1.2 Scope

The Shire has identified the degraded bushland off Gavin's Road (as a site of high potential to facilitate our requirements for a long-term strategic gravel supply located with close proximity of Donnybrook. Gavins Road runs between Goodwood Road south of Donnybrook through to Capel. The proposed pit access track on Gavins Road is located 1.85 kilometres west of the junction with Goodwood Road. The total assessment area is 13 hectares including between the pit access track and Goodwood Road (*NPC & Ecoedge 2017*).

The site is on land under the management of DBCA, and has a number of factors which are considered to make it suitable for the extraction of gravel including:

- The area has had limited amounts of gravel extracted in the past, indicating good quality and depth,
- been previously disturbed,
- fair-good separation from the nearest housing, and
- good access and egress to the site.

The Shire understands the licencing process and Section 91 requirements and has no objections to going through this process. Department of Biodiversity, Conservation and Attractions support of this location, and extraction of raw material, is critical to proceed with the permits required by the Department of Water and Environment Regulation (DWER).

The PMP address the following issues related to the proposed gravel pit development and rehabilitation:

The pit management plan will include:
• Alternatives examined
• BRM requirements and disease status;
• Management of sensitivities identified;
• Pit / access road demarcation;
• Dieback management;
• Topsoil management;
• Fire management;
• Pit drainage;
• Safety;
• Rehabilitation prescription and timing (Checklist B);
• Revegetation plan;
• Weed management and
• Monitoring pit management.

1.3 Custodianship and management of this document

The report was written in accordance with the *Guidelines for the Management and Rehabilitation of Basic Raw Material Pits,* an internal document produced by the Department of Environment and Conservation (now the Department of Parks and Wildlife DBCA) in 2008.

2 Site Selection and Planning

2.1 Lead times

It is anticipated 9 months lead time is required to allow for approvals from DBCA and DWER, allow time for environmental checks.

2.2 Sensitive Management

The WALGA environmental planning tool will be utilised as a desktop tool to identify the environmental values of this proposed site. This report is available on request.

2.2.1 Protection of Informal Reserves

The area flagged for the extraction of raw material is not within an informal reserve. This includes (DBCA 2008): -

- Old growth forest;
- Areas previously classified as old growth forest;
- River and stream zones;
- Travel route zones;
- Diverse ecotypes zones (DEZ);
- Less well reserved vegetation complexes;
- Poorly reserves forest ecosystems; and
- Regional Forest Agreement accredited linkage zones.

2.2.2 Flora / Fauna Conservation Values

2.2.2.1 Declared rare, priority and threatened flora

Desktop and field surveys (during spring) checked the proposed area for declared Rare Flora (DRF), priority flora and threatened species before any operations proceeds.

A flora survey of the proposed gravel pit area was conducted by a botanist from Ecoedge Consultant on the 10th October 2017. Within Gavins Road gravel pit extension, there was found to be 106 taxa were identified within the Survey Area, with one introduced species. No declared pest plants or environmental weeds were found within the study site. A species of *Synaphea* that is possibly the endangered species *S. stenoloba* was found in the north-west corner of the Survey Area. A specimen was collected and forwarded to the State herbarium for identification. *Synaphea stenoloba* is known only from the Swan Coastal Plain – it is listed as Declared Rare Flora under Section 23F of the WC Act and is listed as Endangered under the *Commonwealth EPBC Act.* No other threatened or priority flora were found in the Survey Area (Ecoedge January 2018).

2.2.2.2 Priority fauna

The assessment was carried out for Ecoedge on 3rd October, 2016 by Greg Harewood (Zoologist).

The majority of the survey area consists of an open forest of jarrah (*Eucalyptus marginata*) and marri (*Corymbia calophylla*) over sheoak (*Allocasuarina fraseriana*) over an open shrubland of parrotbush (*B. sessilis*) over open shrubland over sparse forbland on laterite. Cutting across the southern section of the proposed gravel pit area is a subtle gully containing an open forest of jarrah, marri and sheoak over open shrubland over open forbland/sedgeland on grey-brown loamy sand. This vegetation unit was also recorded at the western end of the proposed offset area.

The central section of the proposed offset area has been subject to previous gravel extraction activities and, with the exception of a few small shrubs/trees, lacks vegetation.

The majority of the trees present are relatively young. The vegetation represents regrowth from a relatively recent (<50 years) historical clearing episode. Regrowth is generally sparse, especially where gravelly soils dominate. Canopy connectivity is very poor, a consequence of the small size of the mid-storey vegetation with the larger widely scattered emergent trees providing little contribution to its continuity.

Overall the fauna biodiversity likely within the survey area would be relatively low, however given the presence of woodland vegetation and trees with hollows, the remnants still have value for some fauna species able to persist in degraded habitats of this type. Most of the fauna species likely to be present would however be common, widespread species (mainly birds), with a few exceptions (e.g. black cockatoos).

The assessment identified 41 trees within the survey area with a DBH of >50cm. Just over half the trees (21) appeared not to contain hollows of any size. A single dead tree appeared to have at least one hollow potentially of a size large enough for a black cockatoo to use for nesting though this assessment was based on the size of the entrance into an apparent hollow only. No actual evidence of the tree actually being used by black cockatoos for nesting (currently or previously) was seen. Appendix Habitat trees mapped within the Survey Area.

One species of conservation significance was positively identified as utilising the site for some purpose during the course of the field survey (the forest red-tailed black cockatoo). Based on habitats present it has been determined that an additional nine species of conservation significance may possibly utilise the survey area for some purpose at times but their current status on-site and/or in the general area is, in some cases, difficult to determine because they were not sighted during the survey period, or evidence of use of the survey area was not found.

The impact on the significant species listed as potentially being present will vary depending on their current degree of utilisation/population densities and preferred habitat requirements (e.g. quantity and quality of potential foraging and breeding habitat that is affected if clearing of the site is undertaken).

The potential impacts on fauna species of conservation significance and/or their habitat will need to be taken into consideration during ongoing planning and construction phases of the proposed project. If approval for the project is obtained it is recommended that a fauna relocation program be implemented prior to and during clearing works to ensure direct impact on sedentary fauna most likely to be encountered, are minimised.

Consideration may be given to carrying out a pre-clearing trapping program aimed at catching and relocating ground dwelling vertebrate fauna species which also utilise hollow trees and hollow logs (e.g. brushtail possum and phascogales) (Ecoedge 2018b).

Less than 1ha of native vegetation will be cleared at one time and therefore will not be referred to the Federal Department of Environment.

2.2.3 Weeds

As reported in in Ecoedge Report 2018a there were no declared pest plants listed under the *Biosecurity and Agriculture Management Act 2007*, and no other environmental weeds or weeds of national significance (WONS). The one introduced species is *Aira caryophyllea* or silver hairgrass which is common in this area and not classified as a weed.

2.2.4 Heritage values

The Gavins Road area is not situated within a registered aboriginal site. The Shire will engage an aboriginal monitor whilst the clearing process including the removal of topsoil. Any items of significance are likely to be in the top 30cm-50cm of the soil profile. The Shire will abide by any terms and conditions applied by the Department of Planning, Lands and Heritage (DPLH) and South West Land and Sea Council (SWLASC).

This area has historically utilised for gravel extraction due to the accessibility and high quality of gravel. These small disused pits will be rehabilitated as part of the process.

2.2.5 Water conservation

The proposed pit is within the Capel River catchment. A small tributary starts in the south western corner and will not be disturbed as part this process. The better quality gravel is situated higher in the landscape profile.

2.2.6 Landscape values

This site for the basic raw material pit (BRM) will not have a high visual impact. The BRM pit is: -

- Approx. 800m from the nearest residents,
- Access into pit is doglegged,
- Buffer of at least 20m around edge of pit,
- Operations will be kept clean and tidy at all times,

2.3 Prospecting

This area has been historically utilised as a source of gravel. No recent test holes have been dug. Before test holes are dug the following will be required: -

- DBCA pre-operations checklist approval,
- Flora and fauna survey,
- *Phytophthora cinnamomi (P.c)* occurrence survey.

2.4 Alternative sources

The Shire has explored private options over the past few years, within a 30km radius of the Donnybrook Town Site, unfortunately there hasn't been any successful negotiations with owners, or test holes haven't achieved desired results to progress further.

It is considered that the Shire's ability to secure a resource from the private sector is hindered by the location of large private gravel supply company pits within the area, which appears to inflate the desired price that many property owners are seeking for gravel resources located on their land. These companies mainly stock gravel to Main Road WA (MRWA) specifications and maintain a significant higher price for this material.

The Shire does utilise gravel from private landowners when available, ensuring we are not solely relying on gravel sourced from DBCA managed land. The Shire also has a strategic pit located in the Grimwade area that services the Balingup and surrounding areas.

2.5 BRM requirements

The Shire estimates a minimum of 10,000m^3 of gravel is required for the maintenance, renewal and upgrade of roads around the entire Shire each year. It is estimated that gravel in this pit is at least 1m deep, giving approx. 10,000m^3 of gravel per hectare. Large cap-rock and laterite floaters will be stockpiled separately and crushed when economically feasible, during the extraction timeframe.

2.6 Dieback status

The proposed gravel pit has been assessed by NPC Consulting and declared *P.c* infested, and (Oct 2017) can't be utilised on roads that are known to be protectable or dieback free. The Shire will treat raw material using a proven method to ensure dieback free material. No rechecks are required. The Shire will comply with alternative methods of treating contaminated soil, if methods are proven to be successful.

2.7 Safety

The Shire will be responsible for the management and implementation of safety within the pit area.

2.8 Fire Management

The following fire management conditions shall be complied with:-

1. All machinery to be shut down during periods of extreme fire hazard as advised by DBCA.
2. Ready access to water.
3. All machinery to be fitted with fire extinguishers.
4. A loader (if on site) made available for fight fighting and fire breaks if required.
5. No fires shall be permitted in the pit area.

Any necessary on-site fuel and chemicals are to be stored in a bunded area. Any fuel or chemical spill shall be cleaned up and contaminated soils shall be disposed of in an appropriate manner. DBCA and the Shire of DB shall be advised of any fuel or chemical spill.

3 Operational Procedures

3.1 Clearing

Demarcation standards currently apply within the Wellington district of the Department of Parks and Wildlife:

1. TAPE: Yellow, as per DBCA specifications[1] or as supplied by DBCA,
2. TAPE LENGTH: About 300mm (length of 1 A4 sheet of paper),
3. ORIENTATION: Tape to face inwards to the centre of the area to be cleared,
4. ATTACHMENT: Tape to be attached to a tree at a minimum height of 1.8 m, from the bottom of the tape to the ground, using heavy-duty staples. A minimum of five staples is to be used: two at the top, two at the bottom and one in the center to prevent flapping. If a suitable tree is not available, a survey peg can be used. In the case of chunky bark trees like red gum, the area should be lightly shaved with a tool such as a machete to ensure tape is firmly attached to the tree.
5. TAPE PLACEMENT: Maximum of 25m apart, less where vegetation obstructs the view when positioned in the seat of a D7 bulldozer. The tape should also be attached to the tree or survey peg about 1m outside of the area to be cleared, so that the tape will be clearly visible and undamaged upon the completion of clearing.
6. APPROVAL TO CLEAR: After the demarcation tape has been attached in accordance with the above standards and it has been checked in the field for accuracy, the approval to clear (authorised by a Departmental officer) is signified by the placement of a white diagonal paint stripe across the demarcation tape. Aerosol cans of white tree marking paint make this job very easy. It is very important to note that the clearing or any phase of it cannot commence till the white diagonal paint marks have been placed across the demarcation tape.

As part of the clearing operation all commercial forest produce must be:

- Harvested and removed from the pit and access road; or
- Harvested and stockpiled within the pit boundary, in a position that can be accessed without compromising hygiene, and not behind topsoil or gravel stockpiles; and
- When less than 3 months' notice is given to the District, the harvesting may be carried out at the proponent's expense.

Following removal of commercial products, debris must be cleared into heaps or windrows (which must be free of topsoil) at a distance no closer than 10 m from standing trees, so that it can be burnt within the confines of pit boundary. Some debris (logs, stumps rocks) can be used for fauna habitat at the rate of 4 habitat mounds per hectare, and this material should be retained for later scattering over the rehabilitated pit after topsoil has been spread over

[1] Description: uv stabilised yellow rectangular flagging tape; 150mm wide 125um thick

the pit surface. It should be neatly stockpiled within the pit area, in a location that will allow it to be recovered after rehabilitation earthworks are completed (DBCA 2008).

It is planned that vegetation clearing and stockpiling of topsoil will occur in spring/early summer. Pit clearing will occur in one operation and less than 10,000m2 (1 ha) will be cleared to extract approximately 10,000m3 of gravel, depending on depth in the different areas.

To maximise the yield of the gravel resource from the cleared area, the Shire intends to utilisise existing cleared areas (adjacent to the area to be cleared) for the stockpile and storage of cleared material.

3.2 *P.c* Hygiene Management

The assessment was carried out in October 2017.

All activities associated with the gravel winning, stockpiling and cartage operations shall be conducted under the following hygiene conditions: -

1. All contractors and site employees shall be advised of the dieback management measures;
2. All machinery coming into the pit shall be cleaned free of all soil and plant material prior to arrival and prior to departing the site.
3. It is encouraged that all workers on site have 'green card' dieback training.

3.3 Stripping topsoil

Topsoil management is of critical importance. This is the only effective means of re-establishing a diverse vegetation community on the site, and will be managed according to the following criteria:

1. A nominal 100 to 150 mm of topsoil is to be immediately re-spread on pre-prepared pit or stockpiled;
- Topsoil stock piles should not exceed 2 metres in height; and
- Topsoil should not be left standing for more than 12 months (when possible).
2. • Overburden or subsoil below 150 mm should be removed if necessary and stored separately;
3. Immediate topsoil use should be encouraged by sequential operations if the pit is ongoing,
4. Topsoil from newly cleared area should be used for rehabilitation of the previously mined area; and
5. Topsoil from road alignments may be used to assist with rehabilitation of BRM pits with DBCA approval, providing that the soil has a suitable disease status, and is not required for rehabilitation of the road. (DBCA 2008).

The remaining timber debris shall be stockpiled and reused and respread over the area during rehabilitation. The area shall be burnt as part of the ongoing burning prescription of the area or as required by DBCA.

The extent of clearing has been flagged with yellow demarcation tap (as used by DBCA and FPC) on the trees that are to remain**.** Large habitat trees on the edge of the pit are to remain with a minimum of 5m undisturbed soil around the base.

Where possible *Xanthorrhoea preissii (grass trees)* shall be salvaged. The grass trees shall be removed with an excavator or front-end loader. They will be moved to a suitable section of the gravel pit to be later utilized as part of the rehabilitation of the gravel pit. A large root ball will be surrounding the individual trees and they will be watered 2 x a week by the water truck on site, during dry months.

3.4 Winning Resources

Working in a general uphill pattern, gravel should be won from the front of the pit first and progress to the back of the pit if possible.

The pit will supply approximately 10,000m2 of gravel per year. This area has been historically been utilised for gravel extraction. The depth of the gravel is expected to be between 0.8m to 1.5m.

Gravel will be stockpiled close to the access/turnaround track. The gravel is to be screened to remove undesirable objects (if required) eg roots etc. Large rocks will be stockpiled separately. Any overburden not incorporated into the gravel shall be stockpiled for used as road fill or respread as part of the pit rehabilitation. Once there is a feasible amount of rock to be crushed, a crushing plant will be commissioned by the Shire.

Stockpile and access areas will be kept to a minimum, and will be rehabilitated once all gravel has been removed from the stockpile.

3.5 Pit Drainage

During the establishment and use of BRM pits it is important to plan for the management of water. This will involve attention to the movement of water in relation to the pit itself, and the access road. This can include:

- Selection of the pit location (water gaining or water shedding), and issues relating to hygiene management;
- Construction of drains to encourage water to drain off the pit, and reduce the potential for significant ponding in the pit;
- Installation of surface water management structures above the pit, to ensure that water is dispersed into vegetation or debris, and does not drain into the pit; and
- Orientation of drains so that water is directed outside the curve of any access road to reduce the likelihood of the effluent water being re-collected on the road. Pits should be inspected for potential ponding or erosion issues in winter to determine if the surface water management has been effective. Urgent remedial action to correct ineffective drainage and/or repair erosion must be completed immediately, and non-urgent remedial action completed as soon as hygiene or soil conditions permit.
- The pit floor shall be contoured to direct any surface water drainage downslope towards the edge of the pit where containment banks shall be constructed. Runoff

from the gravel stockpile area, turnaround and loading areas shall be directed to the containment areas to prevent surface water leaving the pit area.

3.6 Pollutants/Rubbish

Any necessary on-site fuel and chemicals are to be stored in a bunded area. Any fuel or chemical spill shall be cleaned up and contaminated soils shall be disposed of in an appropriate manner. DBCA and the Shire of DB shall be advised of any fuel or chemical spill.

Domestic site rubbish shall not be disposed of by burning. All domestic rubbish, site effluent and other rubbish shall be disposed of at an authorised waste disposal site.

3.7 Weed Management

The site is regularly inspected and maintained free from introduced weeds both agricultural and environmental. Spraying weeds using recommended herbicides at prescribed rates should be undertaken as required. Equipment and trucks should be cleaned and inspected for potential sources of weeds, in conjunction with *P.c* hygiene management prior to the commencement of clearing, carting or rehabilitation operations (DEC 2008).

4 Rehabilitation Earthworks

The sequence of events recommended for rehabilitation of BRM pits and access roads are detailed below. This sequence is also summarised in the Pit Rehabilitation Flow Chart and Checklist B must be used to record completion of the rehabilitation phases outlined.

4.1 BRM Pits

It is proposed that the gravel pit will be developed and rehabilitated in stages by the Shire of Donnybrook-Balingup under the supervision of the DBCA.

At the completion of BRM extraction and prior to rehabilitation earthworks:

- Remove all litter;
- Clean up any oil or fuel spills by removing contaminated soil and disposing of this in an approved manner;
- Remove any potentially saleable log material from the pit;

Complete landscaping earthworks so that:

- Batters are no greater than 1 vertical to 4 horizontal (14$^{o)}$;
- Pit floors should have at least 1:100 fall, and effective dispersal from the pit to prevent ponding and dieback intensification;
- Drainage should be constructed to avoid disease spread on a broad front downhill from the pit;
- Laterite floaters will be stockpiled for crushing at later date,
- Rip lines should be constructed primarily to alleviate compaction, secondly to promote infiltration and thirdly to assist to divert water off the pit floor without causing erosion.
- Rip the pit floor across the contour with a winged-tyne ripper, at 1 m spacing.
- Once the ripping, replacement of topsoil and surface scarification have been completed then the pit should have surface water management structures installed;
- Provide fauna protection by creating rock heaps, or replacing stumps or logs;
- Pits and drainage areas down slope of the pit should be inspected for potential ponding or erosion issues as appropriate, until they have been signed off as completed by a DBCA Officer as part of the completion criteria; and

4.2 Pit Access Road

Access to the gravel pit is via DBCA tracks utilised as fire breaks and logging roads.

Minor access track improvements and construction of the truck turn around shall be carried out. Where tracks are to be gated/closed logs, rocks (greater diameter than 1m) or earth bund greater than 1m high will be placed in appropriate positions.

4.3 Success criteria

The outcomes that must be achieved to ensure successful rehabilitation of BRM pits and access roads are dependent on the phase of the rehabilitation process as described below.

In all cases where the rehabilitation criteria have not been achieved, then the proponent will be advised and will need to have the work completed to the required standard.

The log and debris clean-up phase:

- All heaped material spread or burnt as required.

The ripping phase:

- The area has been reshaped to the natural contour (if required);
- Ripping has not resulted in avoidable mixing of the topsoil and subsoil layers;
- Rip lines in the pit are aligned within 0.5% of the natural contour; and
- An 8 mm rod can be pushed by hand to a depth of at least 0.8 m at 80 per cent of test points in the rip lines (based on 30-50 points / ha in the pit and across the pit, and a point every 5-10 m along access roads).
- The scarification and soil surface preparation phase:
- Stored overburden and topsoil has been evenly spread over the ripped area;

Scarification has not resulted in avoidable mixing of the topsoil and subsoil layers;

- Clods of compacted soil are less than 100 mm in diameter;
- Topsoil is generally loose and friable to a minimum depth of 100 mm (and a maximum of 200 mm) at approximately 250 mm centres; and
- An 8 mm rod can be pushed by hand to a depth of 100 mm over 80 per cent of test points off the rip lines (based on 30-50 points / ha in the pit and across the pit, and a point every 5-10 m along access roads).

Rehabilitation earthworks phase:

- The pit and access road has been reshaped to the natural contours;
- Ripping and / or scarifying has been completed to the required standard;
- Stored topsoil has been respread uniformly across the pit or road alignment; and
- Rehabilitation operations have not resulted in major erosion, deposition or ponding;

The rehabilitation operations:

- The requirements for the preceding phases have been met;
- Seedlings and regeneration achieve the stocking and survival rate specified in the Revegetation plan; and
- The rehabilitated area is stabilised without ongoing major erosion, deposition or ponding of water.

As per outlined in DEC 2008.

5 Revegetation Requirements

The following general requirements apply to seeding and planting activities associated with rehabilitation. The Pit Management Plan will define whether rehabilitation will be undertaken using seeding only or a mixture of seeding and planting.

5.1 Seeding

Once the gravel has been exhausted and the area is no longer required for stockpiling, the pits, banks, and batters will be seeded with an approved seed mix and fertilised according to the following standards below. Seeding will only be required if the topsoil cannot be used within 24 months of disturbance.

- Seed mixes relevant to the surrounding forest type, and from the species determined in the vegetation and flora survey (Ecoedge 2018a).
- Prior to broadcast, seed should be pre-treated using recognised seed dormancy breaking procedures; to break seed dormancy and improve germination rates;
- Seed mix is to be applied to recently rehabilitated pits and access roads in autumn, before the first winter rains. Heavy rain prior to sowing may compact the surface soil and reduce germination success;
- Seed mix is to be evenly spread over proposed area for rehabilitation;
- It is expected that the sowing will be supplemented by natural seed dispersal from adjacent vegetation or from soil stored seed to provide establishment of other local species; and

5.2 Planting

Revegetation will be monitored and assessed after the second winter. If there are less than 1 plant per m2 then the pit may be planted with seedlings and fertilised according to the following standards:

- Use plants propagated from local supplier, using species as determined in the vegetation and flora survey (Eceodge 2018a),
- Planting will generally be by means of a potti putki planting spear or other appropriate tools;
- 80% of plants will be trees species (jarrah and marri), 20% understory plants and,

During the planting of seedlings the following requirements must be adhered to:

- Planters should use random spacing and pattern or alternatively rows should not be visible from adjacent roads;
- Species should be planted in groups of 3 or 5 plants,
- Aim to position plants immediately on the edges of rip lines where possible;
- Plants must not be planted closer than 1 metre to logs and stumps;
- Do not plant beneath the crowns of retained trees;
- Planting lines must not commence within 3 metres of the edge of any road; and
- Seedlings should be watered in using approximately 2L per plant (water tanker may be required), if high rainfall is not predicted within 24hours.

5.3 Monitoring Survival

Rehabilitated areas will be monitored by the Shire of DB Environmental Officer for regeneration success and seedling survival no sooner than the end of the first summer following rehabilitation. Monitoring stations and quadrants (10m x 10m) will be set up and photography evidence recorded.

Unless otherwise determined by a qualified Environment Officer, second year planting of trees and shrubs is required if a success criterion of at least 10 x legume and 15 x non-legume shrubs and 5 x trees per 100 m2 (10 m x 10 m) is not achieved by year 2. Areas of 0.5 hectares or greater not meeting the success criteria will be reseeded or replanted until the area is successfully rehabilitated. Areas that receive additional seeding will be re-monitored the following year.

5.4 Weed Control

Weed infestation of rehabilitated sites should be assessed in conjunction with survival assessments, and where necessary weed control should be carried out in year 2. The intention is that weed populations should not exceed the weed populations on the original site or be no greater than that of surrounding vegetated areas. (DEC 2008).

6 Completion Criteria

The rehabilitation process will be considered complete when DBCA is satisfied that:

- All requirements of Checklist B have been satisfactorily completed;
- Regeneration surveys indicate that the regeneration requirements have been achieved (at least one summer following rehabilitation);
- Rehabilitated area is stabilised without ongoing erosion, deposition or ponding of water; • Areas down slope of the rehabilitated area are not negatively affected by pit effluent; and
- The rehabilitated site does not have weed infestations that exceed the weed populations on the original site or are greater than that of surrounding vegetated areas.

7 Reporting

The Shire of DB will report start-up date and time, weekly personal on site with emergency contacts, milestones and amounts of gravel exported from pit. and work in conjunction with DBCA to ensure acceptable outcomes have been met.

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8 References

Department of Environment and Conservation (2008) ***Guidelines for the Management and Rehabilitation of Basic Raw Material Pits*** Internal booklet.

Ecoedge (January 2018a) **Report of Flora and Vegetation Survey at the proposed gravel pit, Gavins Road, Donnybrook**, Bunbury, Western Australia.

Ecoedge (February 2018b) **Gavins Road Gravel Pit and Offset Area Fauna Survey Report,** Bunbury, Western Australia.

Ecoedge & NPC Consulting (October 2017) **Gavins Road Proposed Gravel Pit.** *Phytophthora* Dieback Interpretation report, Bunbury WA.

Yellow tape details (by Tom Kenneally DBCA)

Available from: Sussex Industries, 20 May Holman Drive, Bassendean P: 93770744 F: 93773704. E: accounts @sussex.com.au

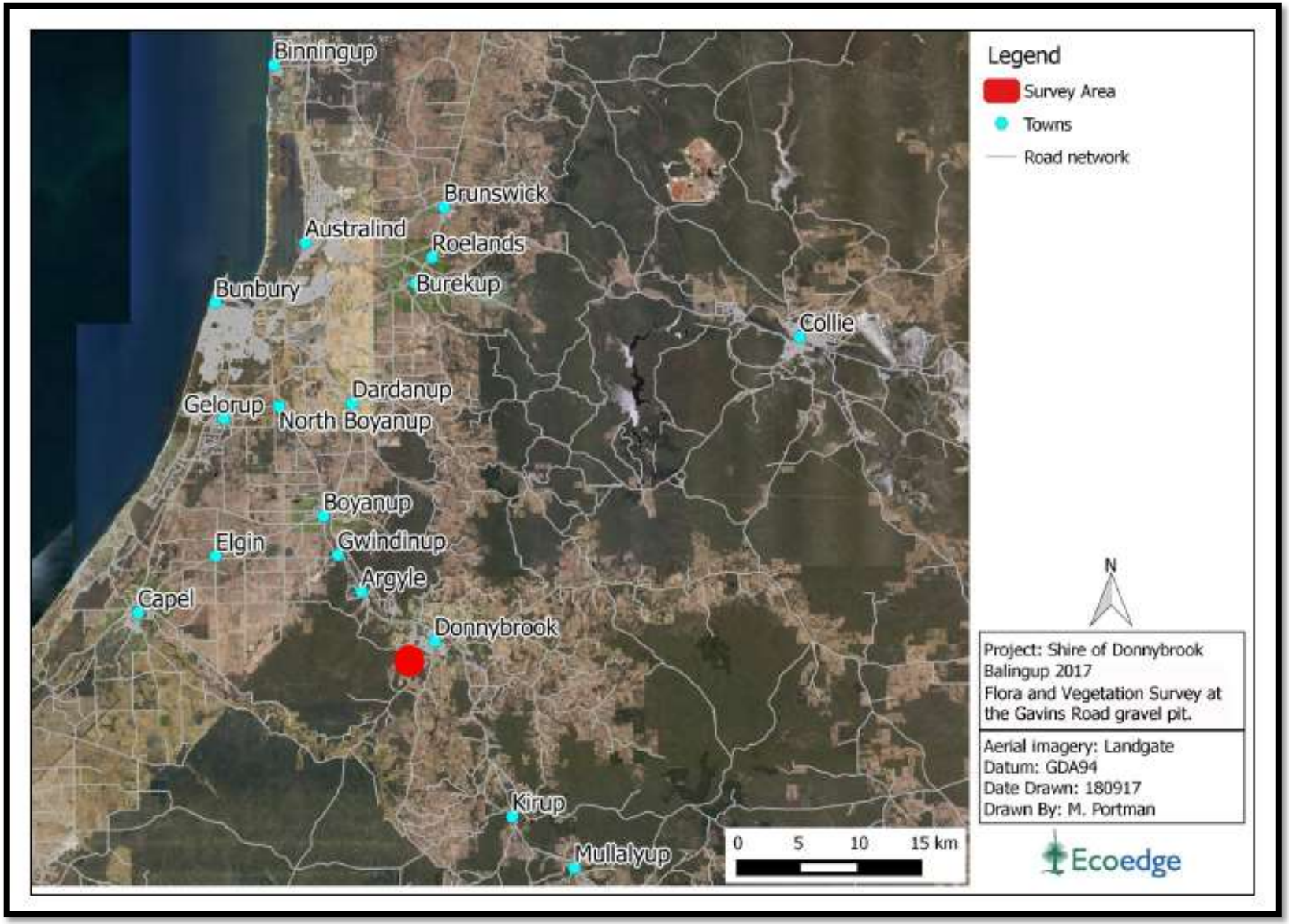
Product code: Yellow PF150STD

Price: $165.75+GST/6Rolls

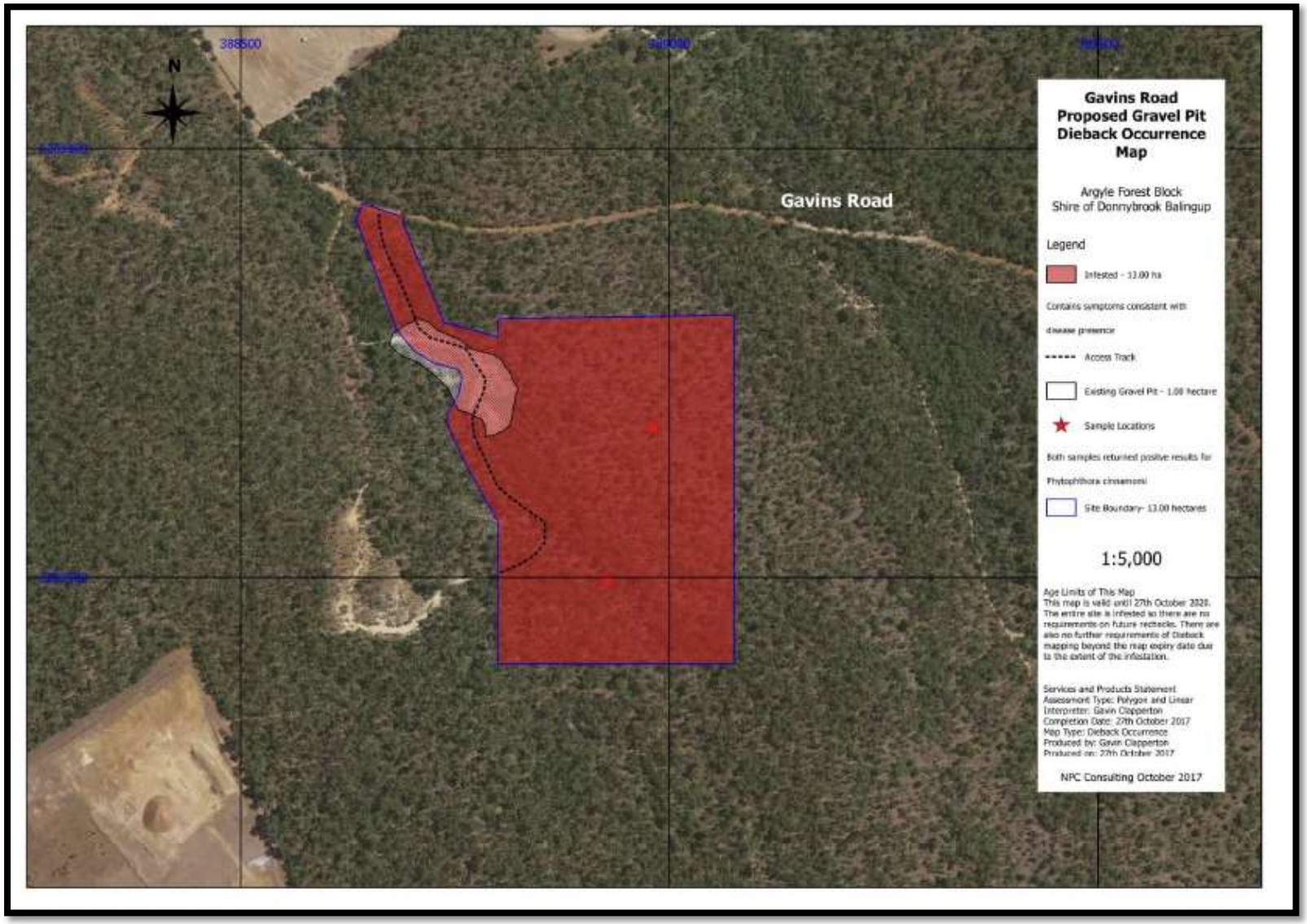
Min. Order: multiples of 6 rolls, length of each roll is about 75lin.metres

Delivery time: about 7days from date of order if product is in stock

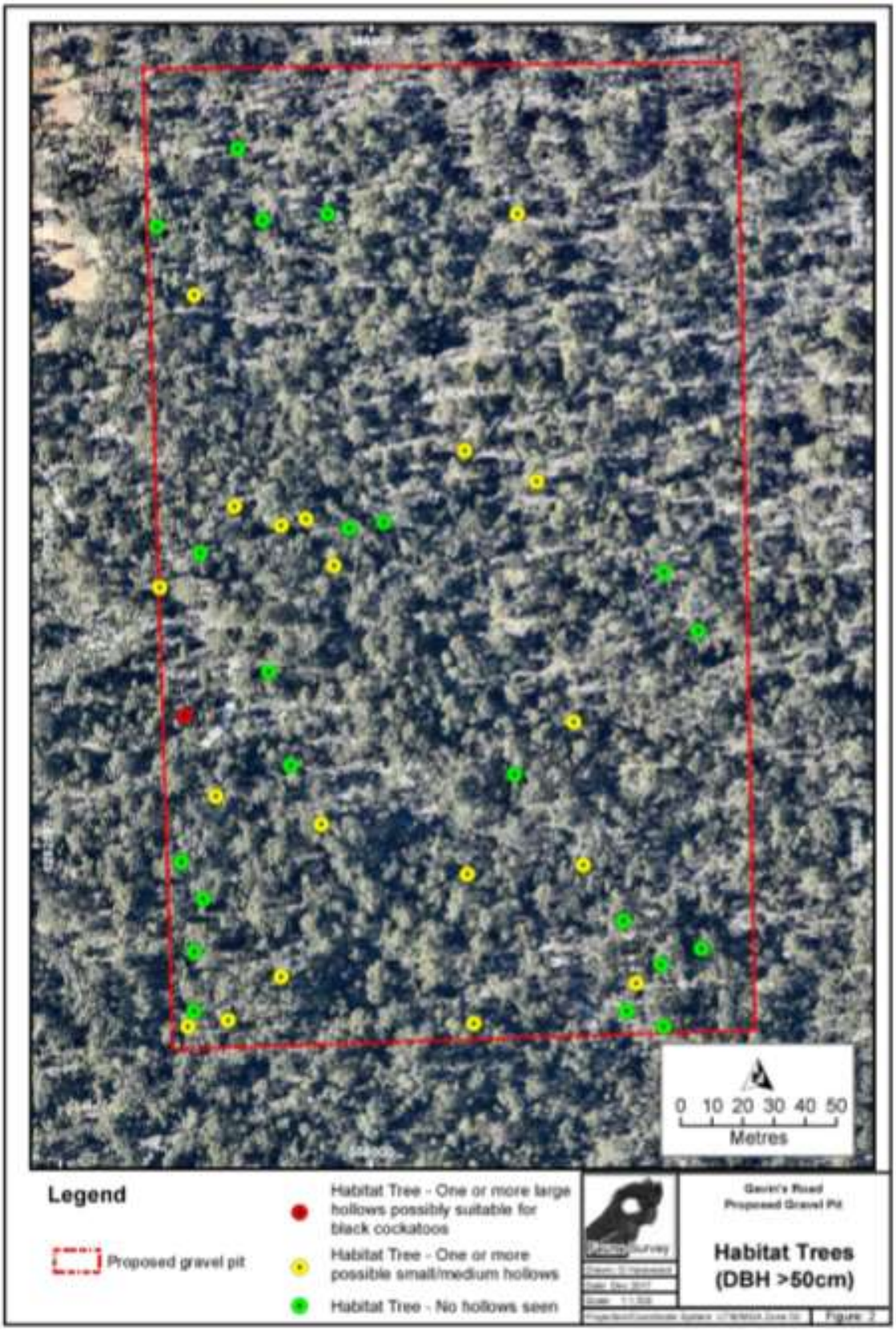
9 Appendix 1 Location map of proposed gravel pit.



10 Appendix 2 Phytophthora Dieback Interpretation Map.



11 Appendix 3 Habitat trees within the Survey Area.



12 Appendix 4 Checklist B – Pit rehabilitation

	PHASE	DATE	COMMENTS
PIT MANAGEMENT	BRM REMOVAL HAS BEEN COMPLETED - Confirm removal of BRM from current operational area is completed; and - Plan transition to next phase (if required).		
INITIAL EARTHWORKS	RESIDUE LOGS - The removal of the log material is satisfactory; - Location / amount or type of residue remaining after burning or physical removal will not cause subsequent problems for DEC.		
	RESHAPING WORK HAS BEEN COMPLETED - Large floaters have been buried / crushed / removed; - Pit area has been reshaped to the natural contours; - Sides have been battered to 1:4; and - Pit floors should have at least 1:100 fall.		
	INITIAL SOIL PREPARATION HAS BEEN COMPLETED - Pit floor has been ripped across the contour to 0.8m at 1m spacing; - Rip along the contour to 0.8m at 1m spacing; - Clods of compacted soil are less than 100mm diameter; and - An 8mm rod can be pushed by hand to a depth of at least 0.8m at 80 per cent of sample points in the rip lines (up to 20% below standard is not located in one area).		
FINAL EARTHWORKS	SOIL PREPARATION HAS BEEN COMPLETED - Topsoil and ash has been respread uniformly across the pit or access road; - Topsoil is generally loose and friable to a minimum depth of 100 mm at approximately 250 mm centres; - An 8 mm rod can be pushed by hand to a depth of 100 mm over 80 per cent of the pit or access road.		
	WATER MANAGEMENT STRUCTURES ARE INSTALLED - Upslope runoff and excessive water flow has been diverted away from the rehabilitated area; - Surface water management structures have been installed across the contour (0.5%); - Pit floors should have at least 1:100 fall, and effective water dispersal to prevent ponding and dieback intensification.		
REVEGETATION WORKS	SEEDING - Completed before May; - Approved seed mix of local seed used; - Fertilised with approved type and quantity of fertiliser.		
	PLANTING - Completed before mid - August; - Stocking is 1000 seedlings / ha and seedlings are properly planted; - Fertilised with approved type and quantity of fertiliser.		
	DRAINAGE - Rehabilitated area is stabilised without ongoing erosion, deposition or ponding of water.		

Signed: (Operator) (District Manager)
Date: