2024 Rehabilitation Report

Holcim Quarry Mt Shamrock

General Information

Disclaimer

Naturelinks Landscape Management Pty Ltd has taken all the necessary steps to ensure that an accurate document has been prepared, however the company accepts no liability for any damages or loss incurred as a result of reliance placed upon the report and its contents.

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Report Scope

This report addresses all revegetation and maintenance works carried out by Naturelinks Landscape Management over the 2024 calendar year. Following this, a summary of proposed future management actions is detailed.

Works were undertaken in the following areas depicted in Figure 1:

- Net Gain (Yellow)
- Phase C (White)
- South-East Extraction Backslope (Cream)
- 0.8 Hectare (Dark Red)
- 2023 Planting Area (Dark Green)
- Landslip (Pink)
- Southern Hillside (Purple)
- Chilean Needle Grass Monitoring & Control (Sky Blue)
- Extraction (Peach)
- South-East Extraction (Blue)
- Southern Extraction (Brown)
- 1.2 Hectare (Dark Blue)
- Phase A&B (Ash)
- Paddock Replacement (Turquoise)
- Northern Boundary (Bright Red)
- Lower Car Park (Hot Pink Marker)

Figure 1: Scope of report and individual sites at Holcim Mt Shamrock Quarry.

Revegetation Approach

Preparation and Direct Seeding of Site

Method. Areas for revegetation that were formerly part of active mining operations are rebuilt and sculpted to an even gradient with a layer of top soil spread across the surface by Holcim. For a few months the ground is left to settle and if required herbicide spraying is undertaken to control any germinating weeds. Once any spraying has been completed, a minimum of a two-week period elapses to avoid any residual effect on germinating grasses. Direct seeding takes place during the months of June/July. Native grass seed from species suited to the site's environmental conditions (Weeping grass *Microlaena stipoides* & Wallaby grass *Rytidosperma sp.*) sourced from local provenance is mixed with sterile rye-grass seed and papier-mache then sprayed by a Hydro Seeding machine in a thin layer over the site (works conducted by HydroGrass Pty Ltd).

Using this method, the sterile rye-grass germinates, providing shelter for the Wallaby grass to germinate and grow in the following month, The rapid establishment of sterile rye protects slopes from erosion. It also reduces temperature fluctuation of the soil surface and aids in moisture retention. Sterile rye presence competes with many weed species reducing overall weed load, being much taller than the native grass, it ultimately provides less competition. The rye-grass used in this process does not produce viable seed. Once the native seed mix has established, the sterile rye will have completed its life cycle and decomposed, adding an organic layer to the topsoil and allowing the native grasses to fully establish.

Initially, direct-seeded Wallaby grass (*Rytidosperma sp.*) will dominate the understory. Weeping grass (*Microlaena stipoides*) will predominately germinate and spread over the subsequent years. The Wallaby grass species used prefer drier areas which also is where weed competition is generally least prevalent, whereas Weeping grass will be found in wetter and more shaded areas.

The following sites have been revegetated utilising this process:

- Extraction, South-East Extraction,
- Southern Extraction,
- 0.8 Hectare,
- 1.2 Ha and
- 2023 Planting Area.

Species Selection

Holcim Quarry Mt Shamrock falls within State of Victoria's Ecological Vegetation Class (EVC)16 Lowland Forest. Species for revegetation are selected based on this EVC. However, for South East Extraction, Southern Extraction, 0.8 Hectare, 1.2 Hectare and 2023 planting area, we interpret that site conditions fall outside of EVC 16. These sites are north and north-east facing with dry conditions and exposure to high winds, whereas Lowland Forests typically exist in areas of high soil fertility and relatively high rainfall. In early years of revegetation, the South East and Southern Extraction areas, had relatively low survival rates for species requiring cooler and wetter conditions. As a result, Naturelinks sought to expand species diversity to accommodate these site conditions to select a more dry-tolerant species range.

To determine relevant dry-tolerant species Naturelinks undertook desktop analysis using the Victorian Government 'Naturekit' website (www.environment.vic.gov.au/biodiversity/naturekit) and located several parcels of native vegetation within 5 km of Mt Shamrock for investigation.

Naturelinks conducted on-ground species surveys in two reference areas containing these EVCs:

- RJ Chambers Flora and Fauna Reserve - *Lowland Forest EVC 16 & Shrubby Foothill Forest EVC 45*
- Beaconsfield Nature Conservation Reserve - *Grassy Forest EVC 128*

Species in these EVC's which were identified existing in similar conditions to that found at Mt Shamrock (considering slope, soil type and aspect) and considered appropriate for future planting lists. Species from EVC's 128 and 45 were sought due to their existence within a broader category of Dry Forests, a category which Lowland Forest does not fall within.

The expansion of EVC's to include EVC 45 & 128 was approved by as part of the 5 Year Review of Revegetation Planning. The addition of many species drawn from these EVC's significantly improved plant survival. All seed and tube stock for revegetation are sourced locally (within 5 km).

A comprehensive survey was also undertaken in both sections of Net Gain (North & South, Donazzan's Property, 415 Pakenham Road, Pakenham Upper) with a brief survey (with the landowners' permission) of the adjacent property (465 Pakenham Road SE corner). Many new species were identified, some suitable for revegetation, thus expanding the list of understory species used for revegetation of Net Gain. Both North & South Revegetation Zones of Net Gain fall within EVC 16 Lowland Forest and EVC 83 Swampy Riparian Woodland.[1]

Small surveys have also been undertaken in the immediate area where remnant vegetation remains or where native recruitment has taken place. This includes sections of the quarry and adjoining land, the nature strip west of Pakenham Road between Mt Shamrock Road, and 415 Pakenham Road.

Additional incidental species observations have been recorded while caring out revegetation works. Over time, this has facilitated the construction of an extensive list of both indigenous and exotic plant species providing a valuable resource for Naturelinks staff. A copy of the complete flora and fauna species list is supplied as an attachment to this document.

In 2024 Naturelinks sought approval for species listed under EVC 83 Swampy Riparian Woodland and a several not listed in EVC 16, 45, 83 & 128 for planting.

This resulted in proposed changes to the Landscape & Rehabilitation Management Plan (LRMP) which would allow for limited species selection outside approved EVC's. In principle support has been given by the Environmental Review Committee and Quarry management pending its ratification by relevant government departments.

The justification provided for this request was as follows.

- To increase flora biodiversity including planting of locally rare species
- Planting of additional species recommended by a local indigenous, community nursery
- Expanded species selection for difficult areas: Increase number of species suitable for very wet/dry locations & some areas which experience both.
- Expand plant families: Reduce vulnerabilitiey to diseases and pests that may affect particular plant families. When outbreaks of disease or pest infestation do occur, the effects are likely to be less.

[1] Proposed Extension of the Readymix Mt Shamrock Quarry Pakenham: Vegetation and Habitat Assessment (Ecology). Febuary 2005. Biosis Research

- Increase habitat, food availability and variety for fauna: this could include supporting rare species. Some invertebrates rely on a very small number of plant species, sometimes a single species to survive.

EVC's are an excellent guide for re-vegetation, understanding and classifying an ecosystem. They are also a product of human creation and have their limitations. They are not generally intended to provide an exhaustive and arbitrary species list for any specific location. The following quote is taken from a state government website and footnoted at the bottom of this page.

"The EVC benchmarks contain a subset of "typical" but not comprehensive lists of species for each EVC in a bioregion. It should also be noted that not all species listed in the benchmark will be appropriate to all sites across the range of an EVC in a bioregion nor readily available through local nurseries."[2]

A good example of this is Green Scentbark (*Eucalyptus fulgens*) a locally threatened species endemic to Victoria with remnant trees located within the quarry boundary. It is specifically mentioned for revegetation in multiple Mt Shamrock management plans. This species also officially falls outside any of the currently approved EVC's.

Tree and Shrub Planting Year One

Planting of trees and shrubs commences at a minimum one month after direct seeding has taken place during the months of July/August, avoiding overly wet conditions to limit harm caused to germinating native grass by staff traversing through the site. All trees and shrubs are protected from herbicide overspray and drift, grazing by both native and introduced animals, and strong wings by double staked Corflute guards. Two stakes are used to reduce the high rates of guard dislodgement caused by strong winds and collision from Kangaroos.

Planting selection for year one is usually limited to eucalyptus, fast growing acacias, and adaptable shrub species. Trees and shrubs are generally more vulnerable to temperature extremes and fluctuating site conditions than grasses. The rates of mortality for plantings are generally highest in the first year then decrease in subsequent years as site conditions become more favourable. The species with the highest chances of survival are planted first at half the desired final density.

Planting at half density reduces budgetary costs, labour, and resources when the mortality rate is likely to be the highest. Mortality rates will vary due between sites and different areas within a site.

Plant mortality in the first year usually ranges from 20 - 30% but can be as high as 50% in some areas to as low as 10% or even 5% in others. In the months preceding the second year planting all stakes and guards are removed from dead plants. This reveals where plant mortality has been high and where it has been low. A visual inspection may offer clues to the underlying causes for increased plant mortality and can guide an even more tailored species selection best adapted to particular areas of a site. If required actions such as the installation of a watering system can be undertaken to further increase rates of survival.

All plants are supplied by a local indigenous nursery. Many of the species are sourced specifically from RJ Chambers Flora and Fauna Reserve and Beaconsfield Nature Conservation Reserve. Other sources include Hillview Bushland Reserve (Pakenham) and Donazzan's Property (415 Pakenham Road, Pakenham Upper). Seeds and cuttings are also collected from numerous sections of remnant

[2] https://www.environment.vic.gov.au/biodiversity/bioregions-and-evc-benchmarks

roadside vegetation such as Pakenham Rd (Pakenham Upper), Army Road (Pakenham), Thewlis Road Aqueduct (Pakenham) and Reynolds Road (Pakenham).

Planting Year 2 & Subsequent years

The same number of trees and shrubs are planted in year two as year one, but with an expanded species range. Where plant survival has been high, year two planting density will be low; and where survival has been low, planting density is increased. To limit competition between trees which generally have more extensive root systems and a higher demand for resources, shrubs and trees are planted adjacent to one another.

Year three, and each subsequent year, tree and shrub planting numbers are generally reduced mainly reflecting the rate of attrition from previous year's plantings, while increasing number of species selected as the site becomes more suitable to a wider range of trees and shrubs. Expanding species range and the genus they belong may also reduce the impact caused by outbreaks of plant diseases and pests which certain species and those of a related genus may be more susceptible.

Lilies are planted from years two and three predominantly belong to the genus's *Dianella* and *Lomandra.* From year three onwards, *Poa* species (Tussock Grasses) are planted. Both Lily and Poa species are planted in areas of low weed load with suitable conditions to reduce risk of off target damage from herbicide.

Large monoculture plantings are avoided as they are unsightly and stray from what you would find in nature. In such area's weeds can become difficult to manage as herbicide use is often limited due to increased risk of off target damage and a high planting density can suppress the natural recruitment process.

Additions understory species are generally not planted in this phase of revegetation. In particular, the planting of forbs would make the control of broadleaf weeds growing near them with herbicide more difficult. Spontaneous recruitment of native forbs from seed bank and adjacent area is however encouraged.

Challenges

The main challenges affecting the multiple sites are briefly outlined below, challenges unique to a specific site are discussed in their own section of this report.

- **Fauna:** Physical damage to plants caused by a collision, grazing and ringbarking by Samba Deer & Grey Kangaroos.
- **Wind:** Strong winds impacts the following sites posing a major challenge to revegetation: South East Extraction, Southern Extraction, .8 Hectare, 1.2 Hectare and 2023 Planting area. Strong winds can cause the dislodgement and dispersal of guards particularly if they are already damaged by prior collision from Kangaroos or if stakes integrity has been compromised by waterlogged soft ground. Trees and shrubs can be blown over, at times blown completely out of the ground and can be found 10 or even 20 meters away down a slope. Main branches and central trunks can be snapped occurring more often with semi-mature trees and some specific shrub species.
- **Dry conditions:** Predominately affecting South East Extraction, Southern Extraction, .8 Hectare, 1.2 Hectare and 2023 Planting area. Most severe in the first few years of revegetation at times significantly affecting plantings survival rates.

- **Exotic weeds:** Exotic weeds are present at all sites to varying degrees. Some species have only a minor negative impact and may even disappear naturally over time. Others if not adequately controlled can pose a significant challenge to revegetation efforts. Weed volumes are typically worse in the first few years of revegetation for newly constructed and planted sites. They can also be high in areas that fall outside of regular weed management responsibilities, sites bordering land where weeds are not managed, or done so infrequently and or subject to regular disturbance such as cattle grazing.

Assessing Revegetation Outcomes

Assessing the success of plantings and the species used can be done by standardised surveying at regular intervals or the collation of observations made during site management. They can be done internally by those conducting the works or by a third party, such as an externally hired ecologist whom is more likely to provide an impartial evaluation.

Annual surveying was conducted by external ecologists as part of Net Gains ten-year management plan to assure all management conditions were being met. Infrequent surveying has been undertaken by Naturelinks in the past at request from quarry management. In 2019 responding to high mortality rates for plantings for South Eastern and Southern Extraction surveying revealed rates of survival for both sites to be as low as 30%. This triggered a review of species used for revegetation that resulted in dramatically improved rates of survival in the following years.

In 2024 it was arranged for staff from the plant supplier to visit the quarry for the first time. With extensive knowledge of the local flora, it was hoped they could offer an independent assessment of the long-term suitability of plants used. That they also may be able to suggest further additional or alternative species and insights on how to address the variety of challenges experienced by different sites. The following feedback was supplied and actions taken.

Recommendations from nursery	Action taken by Naturelinks
For high wind areas, be less reliant of on tree and more on shrub species. For eucalyptus species a greater consideration given to those with lower maximum height. The effects of wind will be exacerbated in areas of reduced topsoil. As top soil will likely increase over time the damaging effects of high winds may lessen.	For the lower areas of the Southern slope particularly those who have yet to be or only recently revegetated (2023 Planting area) two very tall species of Eucalyptus, Messmate (*E..obliqua*) and Manna Gum (*E.. viminalis ssp. Viminalis*) will be phased out from new plantings. Although they have some tolerance of dry periods they were already no longer planted higher up the slope in favour of dry tolerant eucalyptus species.
Expand the use of Tasman Flax-lilly (*Dianella tasmanica*) to the lower parts of the Southern Slope (South East Extraction, 0.8-hectare, 2023 Planting area).	50 Tasman Flax-lilly ordered to be planted in this region in 2025, rates of success for this new location will be recorded.

An analysis for species used or could potentially be used for revegetation that have a presence within or near the quarry and Net Gain has been compiled by Naturelinks. This includes estimated rates of survival for plantings, susceptibility to weather conditions, rates of grazing and fauna damage, tolerance of high wind, longevity, rates of growth, recruitment, and suckering. This has

been based from observations made while carrying out revegetation works. This list will assist Naturelinks to better evaluate long term viability of species being used for revegetation. A copy of the species assessment is supplied along with the Flora and Fauna list.

New Species used for revegetation

Most years, Naturelinks seeks to have additional species approved for revegetation. Although revegetation targets are generally able to be met with species already available there is a strong desire to continue to trial new species with the aim of enhanced results for both the environment and client.

New species are planted for the first year in low numbers, between 25–50 plants. If a species is unsuitable, this limits the unproductive financial expenditure. For an uncommon or rare species this also reduces the challenge posed to the local nursery who are tasked with sourcing viable seed and or cuttings for propagation, sometimes the first time they have done so for that species. The effort and quality of service provided by the plant supplier is exemplary.

Table 1. Evaluation of new species approved and planted in 2024. Rates of Survival: Poor Below 40%, Moderate 40 – 60%, Good 60 – 80%, High Above 80-%.

Species	Planted Location	Survival	Growth	Assessment
Muttonwood *(Myrsine howittiana*)	Net Gain (Southern section along creek line), Extraction (SW corner)	High (Net Gain), Moderate (Extraction)	Good (Net Gain), Poor Extraction	Success (Net Gain)
Tree Lomatia (*Lomatia fraseri*)	SE Extraction Backslope & Extraction	Poor	Poor	Failure: most suitable Net Gain
White Elderberry (*Sambucus gaudichaudiana*)	Extraction	Poor	Poor	Failure: most suitable to sections of Net Gain
Black-eyed Susan (*Tetratheca ciliate*)	SE Extraction, Southern Extraction	Good	High	Moderate Success: does very well or dies.
Spike Wattle (*Acacia oxycedrus*)	SE Extraction, SE Extraction Backslope, Southern Extraction, 0.8 Hectare, 1.2 Hectare, 2023 Planting Area, Northern Boundary	High	High	Success: Valuable species for wet and or dry conditions.
Showy Parrot-pea (*Dillwynia sericea*)	SE Extraction, .8 Hectare	Good	Good	Success
Dagger Hakea (*Hakea teretifolia ssp. hirsute*)	SE Extraction	Good	Moderate	Success: Locally rare species
Bootlace Bush (*Pimelea axiflora subsp. axiflora*)	SE Extraction, Southern Extraction	Good	High	Success: Thrives in shaded areas with semi-mature to mature canopy
Dusty Miller (*Spyridium parvifolium*)	SE Extraction, Southern Extraction	Good	Good	Success: Thrives in shaded areas with semi-mature to mature canopy
Hemp Bush (*Gynatrix pulchella*)	SE Extraction Backslope	High	High (Minor Sun Damage)	Success: Near limit of dryness tolerance; Suitable for Net Gain
Tree Violet (*Melicytus dentatus*)	SE Extraction Backslope, SE Extraction, .8 Hectare, 1.2 Hectare, 2023 Planting Area, Northern Boundary, Spring Planting	Good	Moderate	Reliable species for wet and dry conditions

Musk Daisy-bush (*Oleria argophylla*)	SE Extraction Backslope	Good	High (Moderate Sun Damage)	Moderate success: Likely higher attrition in extended dry summer; Suitable for Net Gain

Sustainability

Stakes & Guards: Each year all stakes and guards no longer required for protection of plantings are removed and stored at Naturelinks North Melbourne depot. All stakes and guards that can, will be used for the following years planting. Some stakes and guards will be reused four or five times greatly reducing costs. The reuse of stakes and guards reduces the need to purchase new stakes and guards by around two-thirds each year. Broken or otherwise deteriorating guards are recycled. Some broken stakes will be reused to mark out areas at various sites, the rest designated as firewood.

Naturelinks has trialled eco-friendly tree guards made from unbleached cardboard with very poor results. Cardboard guards let little light through to the plant except for the opening at the top which if damaged can easily close, starving the plant of sunlight. They were more prone to damage from strong winds and animal collision and could not be reused for subsequent year's plantings. Cardboard guards took longer to install increasing labour costs with a plant mortality rate of over 70%. They will not be used again.

Another option is tree guards made from Potato or Corn starch. However, due to their design they would require three stakes and offer even less protection than the cardboard guards if any of the stakes or guard are damaged. Although, they would likely be a better option to cardboard, Naturelinks concludes they would not be suitable.

Pots & Trays: All tube-stock pots and trays acquired in the process of yearly plantings are returned to the supplier for sterilisation and reuse.

Direct Seeding: Direct seeding has been historically undertaken by subcontractors' using machinery with good results. However, with supply of available top soil within the quarry now exhausted there will be an extra expense of outsourcing top soil next year. Aiming to reduce costs Naturelinks sought to secure native grass seed required for future revegetation from existing seed bank within the quarry from previously direct seeded sites.

This was done in December 2024 by using a small plant manually propelled seed harvester not much larger than a domestically used lawn mower. At the front is a broad-brush head designed to dislodge ripe grass seed into a canvas collection bag which when full can manually transferred to unused stock feed bags.

When harvesting areas with viable weed seed are to be avoided where possible. Harvesting should occur when the maximum amount of native grass seed is ripe and easily dislodged. This should ideally be done in dry conditions when machinery performs best and unnecessary volumes of native grass thatch that can get caught in moving parts of the harvester in damp conditions can be avoided.

Even when dry freshly harvested native grass seed will still contain enough moisture that seed will need to be spread out and allowed to fully dry to avoid rot. This will usually take one to two weeks. Seed can then be re-bagged and stored in a secure dry location protected from insects and rodents until use.

Harvesting took place over two days in December of 2024. 5 x 5 kg bags of seed were collected, which is estimated to be surplus for the following years direct seeding. Weed seed contamination of harvested native seed was minimal as seed collection was timed after Toowoomba canary grass (*Phalaris aquatica*) seeding.

Direct seeding will take place by a process known as `hand casting' as compared to by machine and without the addition of sterile rye grass. This will provide a significant cost saving in comparison to subcontracting direct seeding company. Any excess seed stock will be used to reseed managed areas after grassy weed herbicide treatment has taken place. The results will be evaluated in the 2025 Rehabilitation Report.

Picture 1. Grass Grabber, a manually propelled seed harvester

Picture 2. Grass Grabber, showing canvas collection bag and brush head

Works & Management Recommendations

South-East Extraction Area

South-East extraction is split into three sections depicted in Figure 2; Bottom Half (blue), Top Half (pink) and Ridgeline (yellow). This area contains some of the driest sections in the quarry, namely Top Half (north and east), Bottom Half (northern end near Boot Hold Point) and Ridgeline (all parts). This was the second area of the quarry to be direct seeded and planted by Naturelinks after Extraction.

Figure 2: South East Extraction. Bottom Half (blue), Top Half (pink), Ridgeline (yellow), Boot hold point (black), Viewing platform (white), Scattered Chilean Needle Grass infestations (turquoise), individual Chilean Needle Grass clusters (red marker), Area of greatest tree coverage and canopy (red)

2024 Works

Tanker spraying of broadleaf weeds across the entire site has significantly reduced the broadleaf weed coverage in all areas for Ribwort (*Plantago lanceolata*) and Cats-ear (*Hypochaeris radicata*). Other common broadleaf weeds such as Fleabane (*Erigeron sp.)*, Sow Thistle and Prickly Sow Thistle (*Sonchus sp.*) are still present between broadleaf spray runs.

Common grassy weeds are moderately reduced for the top and bottom half of site but are significantly reduced along the ridgeline where native Wallaby Grass *(Rytidosperma spp.)* is now dominant in nearly all parts.

Unfortunately, Chilean Needle Grass (*Nassella neesiana*) has increased in the past year. Individual plants are removed with hand tools and taken off site with larger infestations sprayed with

herbicide when discovered. Afterwards all locations are then marked by a stake with pink flagging tape to denote future monitoring. However targeted spray runs for Chilean Needle Grass through this site did not locate some plants until after they had already producedseed. Actions to address this issue are described in more detail in the Chilean Needle Grass Monitoring and Control section of this report.

Brush cutting weedy grass species for biomass control, fire risk reduction and in preparation for future herbicide application continues for the Top and Bottom Half, brush cutting sections of the Ridgeline was done in preparation for spraying preparation only.

Some trees and shrubs were re-assigned to SE Extraction after another planting area scheduled for direct seeding and planting was delayed by a year. Trees and shrubs were spread across the site in particular the middle section of the Bottom Half and across the Ridgeline which had a general low density of tree and shrub plantings.

Survival of tree and shrub plantings along the Ridgeline past the first year of their planting has only been modest. Here collision with guards by kangaroos is probably the highest amongst all sites causing many plants main stem to snap and the plant to die. Grazing by rabbits adds some further pressure to trees and shrubs (species depending) following guard dislodgment from Kangaroos. Additionally, strong winds are amongst the worst and soil conditions the driest.

The majority of plantings on the ridgeline have been shrubs, the few trees have been shorter draught tolerant Eucalyptus and Black Sheoak's (*Allocasuarina littoralis*) which have a low vegetative mass making them less likely to be adversely affected by strong winds.

Revegetation efforts on the ridgeline will persist. It is expected those trees and shrubs that survive and grow along with others either side of the ridgeline zone will offer some protection from the elements improving overall survival rates. Some Hakea plantings have managed to reach a size that they are able to offer some protection from the wind. Alternative dry tolerant shrub species will also be trialled.

Plantings also focused on two areas on the southern ends for the Top and Bottom Half, in line with the viewing platform where tree coverage is the greatest and canopy most developed. Species planted here were those best adapted to partial and full shade most new to the quarry or had been planted previously in low numbers. The majority of these plants have done well.

A small number of Dagger Hakea (*Hakea teretifolia ssp. hirsute*) a locally rare species was planted for the first time in the middle sections of the Top and Bottom Half.

Table 2. List of species planted South-Eastern Extraction in *2024*.

Species	Common Name	No.
Acacia melanoxylon	Blackwood	20
Acacia myrtifolia	Myrtle Wattle	10
Acacia oxycedrus	Spike Wattle	40
Acacia pycnantha	Golden Wattle	30
Allocasuarina littoralis	Black Sheoak	50
Amperea xiphoclada var. xiphoclada	Broom Spurge	10
Daviesia leptophylla	Narrow-leaf Bitter-pea	25
Dianella laevis var. laevis	Pale Flax-lilly	50
Dillwynia sericea	Showy Parrot-pea	25
Eucalyptus baxteri	Brown Stringybark	16

Eucalyptus goniocalyx	Long Leafed Box	25
Eucalyptus radiata	Narrow-leafed Peppermint	15
Goodia lotifolia var. lotifolia	Common Golden-tip	10
Hakea decurrens ssp. Physocarpa	Bushy Needlewood	45
Hakea nodosa	Yellow Hakea	10
Hakea teretifolia ssp. hirsuta	Dagger Hakea	25
Hakea ulcina	Furze Hakea	50
Lomandra longifolia var. exilis	Cluster-headed Mat-rush	100
Melicytus dentatus	Tree Violet	25
Pimelea axiflora ssp. axiflora	Bootlace Bush	10
Poa labillardierei var. labillardierei	Common Tussock-grass	50
Poa sieberiana var. sieberiana	Grey Tussock-grass	100
Pultenaea scabra	Rough Bush-Pea	15
Spyridium parvifolium	Dusty Miller	10
Tetratheca ciliate	Pink-bells	10

Future Management Recommendations

The recommendations for the south-eastern extraction area include:

- Maintain broadleaf-selective herbicide application.
- Continued slashing and herbicide application of perennial exotic grasses.
- Continued hand-weeding and disposal of seeding Chilean Needle Grass followed up by herbicide spraying of younger plants.
- Continue to monitor rabbit activity and report any suspected rabbit burrows to quarry management
- Continue to monitor tree and shrub plantings, in particular those planted on the ridgeline.
- Plant additional dry-tolerant species for in-fill plantings to expand diversity and reduce weed coverage *(Table 3)*.

Table 3. List of recommended species for planting within the South Eastern Extraction Area in 2025.

Species	Common Name
Acacia mucronata var. longifolia	Narrow-leaf Wattle
Dillwynia cinerascens	Grey Parrot-pea
Hakea teretifolia ssp. Hirsuta	Dagger Hakea
Oleria myrsinoides	Silky Daisy-bush

Southern Extraction Area

Southern Extraction is a north facing slope that borders South Eastern Extraction to the east and 0.8 hectare to the west. It is not as dry as SE Extraction and has the most developed canopy of the direct seeded and planted quarry sites on the Southern and Eastern slopes.

Figure 3: Southern Extraction

2024 Works

Broad leaf control via herbicide application using both knapsack and tanker units has reduced overall broadleaf weed coverage moderately. Broadleaf weeds can still be an issue when the time between broadleaf herbicide spraying increases. The main broadleaf weeds requiring control are Fleabane (*Erigeron* sp.), Black Nightshade (*Solanum nigrum*) and Wild Radish (*Raphanus raphanistrum*).

Exotic weed grass coverage has been reduced by targeted herbicide spraying. Regularly timed brush-cutting very low to the ground for repeated years has decreased the accumulation of biomass for grassy weeds. The main grassy weeds are Toowoomba Canary Grass (*Phalaris aquatica*), Cock's-foot (*Dactylis glomerata*), Paspalum (*Paspalum dilatatum*), Yorkshire fog (*Holcus lanatus*), Bromus (*Bromus* sp.) and Pigeon Grass (*Setaria* sp.).

Weeping grass (*Microlena stipoides*) has expanded coverage in shaded areas. Wallaby Grass (*Rytidosperma* spp.) is present in low numbers due to largely unfavourable conditions. Wallaby Grass remains in scattered pockets across the site and in a higher density at the bottom on the northern edge where it is exposed to sunny and drier conditions. Scattered plantings of Common Tussock-grass (*Poa Labillardierei* var. *labillardierei*) and Purplesheath Tussock-grass (*Poa ensiformis*) from this and previous years plantings are doing well.

Chilean Needle Grass (*Nassella neesiana*) presence remains at similar levels as last year. Targeted weed spraying was performed before the grass had a chance to set seed. Individual plants were removed with hand tools and taken off site with larger infestations sprayed with herbicide when discovered. All locations marked by a stake with pink flagging tape to denote future monitoring.

However, only one spray run for Chilean Needle Grass was completed, a follow up run did not occur. Some plants, when discovered, had already gone to seed. Actions to address this issue are described in more detail in the Chilean Needle Grass Monitoring and Control section of this report.

Plantings focused where tree coverage is the greatest and canopy most developed. Species planted here were those adapted to partial and full shade most new to the quarry or had only been planted previously low in numbers. Most planting installations have established well.

Table 4. List of species planted within Southern Extraction in 2024.

Species	Common Name	No.

Acacia genistifolia	Spreading Wattle	5
Acacia myrtifolia	Myrtle Wattle	5
Acacia oxycedrus	Spike Wattle	25
Acacia verticillata ssp. Verticillata	Prickly Moses	5
Amperea xiphoclada var. xiphoclada	Broom Spurge	40
Eucalyptus obliqua	Messmate	10
Eucalyptus viminalis ssp. viminalis	Manna Gum	5
Goodia lotifolia var. lotifolia	Common Golden-tip	30
Goodenia ovata	Hop Goodenia	5
Hakea nodosa	Yellow Hakea	5
Pimelea axiflora ssp. axiflora	Bootlace Bush	40
Pultenaea scabra	Rough Bush-Pea	10
Spyridium parvifolium	Dusty Miller	40
Tetratheca ciliate	Pink-bells	25

Future Management Recommendations

The recommendations for the Southern Extraction area include:

- Maintain broadleaf-selective herbicide application.
- Continued slashing and herbicide application of perennial exotic grasses.
- Continued hand-weeding and disposal of seeding Chilean Needle Grass followed up by herbicide spraying of younger plants.
- Spot spray with knapsack weedy grass species growing amongst and near Weeping Grass *(Microlaena stipoides)* to reduce competition and encourage Weeping Grass recruitment and spread.
- Plant additional drought-tolerant shrub species *(Table 5)*.

Table 5. List of recommended species for planting within the Southern Extraction Area in 2025.

Species	Common Name
Acacia mucronata var. longifolia	Narrow-leaf Wattle
Dianella tasmanica	Tasman Flax-Lilly
Dillwynia cinerascens	Grey Parrot-pea
Hakea teretifolia ssp. Hirsuta	Dagger Hakea

Extraction Site

The Extraction site is south facing starting from the ridgeline of the northern side of the quarry through to the base of current operational area. This is the first zone that Naturelinks direct seeded with native grass and planted.

Extraction is the wettest of the direct seeded and revegetation zones its sites conditions best match EVC 16 Lowland Forest. However, a rise south of the main access track that divides the site in half opposite and to the east of the cargo container is somewhat drier.

Figure 4: Extraction area. Planting area (blue), Chilean Needle Grass cluster (red marker).

2024 Works

Many aspects of revegetation work for this site are complete except for weed management which will need to remain ongoing. With appropriate weed management a native understory will continue to develop over exotic.

Exotic broadleaf weeds remain at low levels. The following species were sprayed with selective herbicide by knapsack: Sow thistle *(Sonchus sp.)*, Wild Radish *(Raphanus raphanistrum)*, Fleabane *(Erigeron bonariensis)*, Cat's-ear *(Hypochaeris radicata)* and Ribwort *(Plantago lanceolata)*.

Blackberry (*Rubus fruticosus sp. agg.*) was successfully controlled this year by knapsack spraying.

Exotic grass herbicide spraying and control is currently a low priority. Weedy grass species prevalent within the site include: Toowoomba Canary Grass *(Phalaris aquatica)*, Cocksfoot *(Dactylis glomerata)*, Caterpillar Grass *(Paspalum dilatatum)* and Kikuyu *(Chenchrus clandestinum)*.

Chilean Needle Grass (*Nassella neesiana*) was discovered for the first time below the dividing track south of the cargo container (red marker figure 4). Approximately a dozen adult plants were removed manually with seed from site. Multiple juvenile plants and a 60cm buffer where all identifiable plants were removed was sprayed with glyphosate. The location was then marked by a stake with pink flagging tape to denote future monitoring.

A single Serrated Tussock (*Nassella trichotoma*) was located and removed manually. Although seed was developing the seed was not yet were viable and by appearance the plant was in its first year of life. The seeds for Serrated Tussock are incredibly small and light, and have evolved to be blown over large distances. It is most likely it has been seeded from some distance away.

A single Coastal Wattle *(Acacia longifolia ssp. sphorae)*, closely related, but not to be confused with the invasive Sallow wattle *(Acacia longifolia ssp. Longifolia)* remains on the small rise on the south side of the main access track opposite the cargo container. Naturelinks is aware that this plant is outside its natural range and poses a risk of hybridisation between it and Hedge wattle *(Acacia paradoxa)* for which several individuals are planted close by. Naturelinks plans to be removing the

Coastal wattle along with any potential germinates and hybrids by chainsaw, cut and painting young plants by spraying or dabbing the cambium layer with glyphosate.

Increasing biodiversity was the focus of this year's tree and shrub plantings with several new species planted in relatively low numbers. This year plantings took place at the south western corner here tree coverage is the greatest and canopy most developed. Species planted here were those adapted to partial and full shade.

Table 6. List of species planted within the Extraction Area in 2024

Species	Common Name	No.
Corea reflexa var. lobatus	Poweltown Corea	10
Goodia lotifolia var. lotifolia	Common Golden-tip	10
Lomatia fraseri	Tree Lomatia	15
Myrsine howittiana	Muttonwood	25
Polyscias sambucifolia ssp. l	Elderberry Panax	10
Sambucus gaudichaudiana	White Elderberry	15
Tetratheca ciliate	Pink-bells	15

Future Management Recommendations

The recommendations for the Extraction area include:

- Targeting broad leaf exotic species with herbicide application by knapsack.
- Targeting blackberry with herbicide application by knapsack and cut and paint with glyphosate where there is a risk of damage to native vegetation.
- Hand-weeding and disposal of any seeding Chilean Needle Grass and Serrated Tussock followed up by herbicide spraying of younger plants. Maintain vigilance for any new infestations
- Removal of Coastal wattle *(Acacia longifolia)* along with any germinates and hybrids.

Phase A & B Site

The Phase A and B site encompasses a planted area bordering the outer quarry fence-line that acts as a visual barrier and screen for noise and dust pollution.

Figure 5: Phase A & B (teal). Chilean Needle Grass infestation (red), new Chilean Needle grass outbreak (red marker)

2024 Works

Broadleaf weeds were controlled by knapsack spraying except for area around the SW corner where thistle germination formed large stands that required tanker spraying. Broadleaf weed spraying was undertaken in two spray runs in Winter and early summer preventing nearly all weeds from seeding. The broadleaf herbicide Associate (active ingredient Metsulfuron Methyl) was added to Kamba M (active ingredients MCPA & Dicamba) to enable the successful control of Wild Carrot where Kamba alone had previously failed.

Broadleaf weed species sprayed were Spear thistle (*Cirsium vulgare*), Variegated thistle (*Silybum mariamum*), Slender winged thistle (*Carduus tenuiflorus*), Bristly ox-tongue (*Helminthotheca echiodies*), Wild radish (*Raphanus raphanistrum*) and Wild carrot (*Daucus carota*).

Blackberry (*Rubus fruticosus spp. agg.*) was sprayed across the entire site including some large stands in the south eastern corner with very good results.

The near complete prevention of broadleaf weeds from seeding and blackberry fruiting is expected to noticeably reduce broadleaf germination and blackberry re-growth the following year. It is expected to of also reduced the volume of thistle seed blown into the quarry from last year.

One new infestation of Chilean Needle Grass (Nassella neesiana) was located (red marker figure 5) and was sprayed thoroughly with second a follow up spray run preventing any seeding from taking place. The location was then marked by a stake with pink flagging tape to denote future monitoring. More Chilean Needle Grass spraying was also undertaken at the same locations previously detected (red figure 5) with total number of plants present appearing to be reduced from last year.

Deer are continuing to cause damage to softwood trees and shrubs, noting that a deer control program has been initiated. Damage includes removing bark and or otherwise damaging and breaking the main stem, they are also continuing removing some guards from newly planted trees.

850 trees were planted in areas where die-off had occurred continuing the in-fill planting of recent years.

Table 7. List of tree and shrubs planted within the Phase A & B area in 2024

Species	Common Name	No.
Acacia mearnsii	Black Wattle	150
Acacia pycnantha	Golden Wattle	25
Allocasuarina littoralis	Black Sheoak	15
Eucalyptus baxteri	Brown Stringybark	170
Eucalyptus dives	Broad-leafed Peppermint	175
Eucalyptus goniocalyx	Long Leafed Box, Bundy	165
Eucalyptus radiata	Narrow-leaf Peppermint	150

Future Management Recommendations

The recommendations for Phase A & B include:

- Continue herbicide application by both knapsack and tanker spray unit targeting broadleaf weed species.
- Continue herbicide application by knapsack targeting blackberry and small woody weeds.
- Continue herbicide application of Chilean Needle Grass with the aim of eventual elimination.
- Planting of additional trees to bolster screening for nearby stakeholders *(Table 8)*.
- Continue with deer control program.

Table 8. List of recommended tree species for planting Phase A & B area in 2025

Species	Common Name
Acacia mearnsii	Black Wattle
Eucalyptus baxteri	Brown Stringybark
Eucalyptus dives	Broad-leafed Peppermint
Eucalyptus goniocalyx	Long Leafed Box, Bundy
Eucalyptus Radiata ssp. radiata	Narrow-leafed Peppermint

Phase C Site

The Phase C site comprises of disturbed land that has both naturally regenerated and been replanted, it borders the Extraction site to the west. Following high rainfall, a gully fills with water (orange figure 7*)* that provides a breeding ground for large numbers of native frogs. Just north of the gully are two adult remnant Rough Tree-ferns *(Cyathea australis)* (blue markers figure 7*)* and a single remnant Clover Tree *(Goodia lotifolia)* (Green marker figure 7).

East of the Graveyard and North of Extraction are two areas with scattered Tall Sword-sedge *(Lepidosperma elatius)* (red figure 7). This species cannot be supplied from indigenous nursery's due to the difficulty of its propagation. Native fern species including a small number of Rough Tree ferns *(Cyathea australis)* are recruiting naturally below the east/west Graveyard track (green figure 7).

Figure 6: Phase C. Gully (orange), tree ferns (blue marker), clover tree (green marker), fox den (yellow marker), Tall sword sedge (red), recruiting tree ferns (green), Pampas grass (yellow), treated Willows (dark blue), sprayed English ivy (hot pink).

2024 Works

Knapsack and tanker spraying have reduced the remaining stands of blackberry and higher volumes broadleaf weeds along the sites southern edge weeds bordering the Sales yard. Young woody weeds chest-height and below have been sprayed with herbicide.

A large patch of English Ivy *(Hedera helix)* located in the SE corner of the site that was sprayed in December of 2023 has been reduced in size, a follow up spray run in 2024 also successful.

Scattered individuals of Ragwort *(senecio jacobaea)* are either hand-weeded and left in-situ, or if small, sprayed with herbicide. Ragwort prevalence remains small and controlled.

An infestation of Pampas grass *(Cortaderia selloana)* (yellow figure 7) that was spreading along the cliff face above the east/west road and above Sales yard has been successfully controlled by tanker spraying.

A large stand of woody weeds predominantly Willow *(Salix sp.)* (blue figure 7) bordering the southern end of Phase C and east of the main Graveyard track has been further reduced. Adult trees were felled by chainsaw, glyphosate applied to the trunk's cambium.

A fox den was observed under a large Weeping Willow (*Salix babylonica*) (yellow marker figure 7) located in centre of the site three or four fox cubs were observed darting away on approach.

Because of plans in the future to possibly to extend mining operations through much of this zone all plantings in this area have ceased for the time being.

Future Management Recommendations

The recommendations for Phase C include:

- Continue control of broadleaf weeds, blackberry, English ivy and small woody weeds with herbicide.
- Herbicide spray and hand weed all Ragwort when encountered.
- Notify quarry management and those undertaking deer control location of fox den.

0.8 Hectare Revegetation Site

The 0.8 Ha site is north facing slope adjacent to Southern Extraction to the east with 1.2 Hectare and 2023 Planting area to the west. This site was first direct seeded and planted in 2021. Overall survival and growth for planted trees and shrubs has been good except for the very top of the site at its southern end. This part of the site is much drier, the ground hard and the top soil layer appearing to be thinner. A canopy particularly from the bottom half of the site down is starting to develop in some areas.

Figure 7: .8 Hectare Revegetation Site. Drier area (red), Chilean Needle Grass clusters (yellow markers)

2024 Works

Broad leaf control via herbicide application using both knapsack and tanker units has reduced overall broadleaf weed coverage moderately. The addition of Associate (active ingredient Metsulfuron-methyl) at half its standard rate to the selective herbicide Kamba M (active ingredients MCPA & Dicamba) when spraying broadleaf weeds continues to bring results. The prevalence of a weedy mint *(Menth sp.)* that was a problem in the lower sections during the wetter months after spraying for two years with Kamba M & Associate has been reduced in prevalence.

Large stands of Flea Bane (*Conyza albida*) some reaching chest height and above were best controlled by hand weeding. Seeding plants had their seed head removed and bagged to be disposed of off-site.

Weedy grass species presence remains at low to moderate levels across this site. Toowoomba Canary Grass (*Phalaris aquatica*) is starting to spread and was controlled by brush cutting low to the ground with follow up spraying with glyphosate taking place one to two months later. The annual grassy weed Pigeon Grass (*Setaria sp.*) is also slowly increasing its presence but due to its temporary nature its control is currently a low priority.

Several isolated Chilean Needle Grass (*Nassella neesiana*) plants just above the dividing track halfway down the site have been manually removed when discovered. The locations have been marked by a stake with pink flagging tape to denote future monitoring.

Together with 1.2 Hectare site 5 bags of Wallaby grass seed was successfully harvested from large stands of Wallaby grass. This was done using a small plant manually propelled seed harvester. Harvested seed was transferred to unused stock feed bags and stored for future use. This seed is intended to be used to direct seed new areas for revegetation. If successful this will result in a considerable saving in revegetation costs.

Scattered infill planting occurred across the site with a mixture of tree and shrub species.

Table 9. List of species planted in 0.8 Hectare Revegetation Area 2024

Species	Common Name	No.
Acacia dealbata ssp. dealbata	Silver Wattle	20
Acacia genistifolia	Spreading Wattle	35
Acacia melanoxylon	Blackwood	20
Acacia paradoxa	Hedge Wattle	20
Acacia pycnantha	Golden Wattle	20
Acacia oxycedrus	Spike Wattle	25
Dillwynia sericea	Showy Parrot-pea	25
Eucalyptus baxteri	Brown Stringybark	10
Eucalyptus dives	Broad-leafed Peppermint	10
Eucalyptus goniocalyx	Long Leafed Box, Bundy	10
Eucalyptus Radiata ssp. Radiata	Narrow-leafed Peppermint	20
Eucalyptus obliqua	Messmate	10
Eucalyptus viminalis ssp. viminalis	Manna Gum	10
Epacris impressa	Common Heath	35
Goodenia ovata	Hop Goodenia	20
Melicytus dentatus	Tree Violet	10
Pultenaea scabra	Rough Bush-Pea	10

Future Management Recommendations

The recommendations for 0.8 hectare include:

- Continue targeting broadleaf exotic species with a combination of Kamba M & Associate (Associate at half standard rate).
- Control Toowoomba Canary-grass *(Phalaris aquatic)* by brush cutting and follow up spraying with herbicide.
- Continued hand-weeding and disposal of seeding Chilean Needle Grass followed up by herbicide spraying of younger plants.
- Harvest Wallaby grass seed in December 2025 to be used for future direct seeding
- Continue expanding species diversity by planting drought tolerant tree and shrub species (*Table 10)*.

Table 10. List of recommended species for planting in the 0.8 Hectare Revegetation Area in 2025

Species	Common Name

Acacia mucronata var. longifolia	Narrow-leaf Wattle
Banksia marginata	Silver Banksia
Daviesia leptophyllaf	Narrow-leaf Bitter-pea
Dianella tasmanica	Tasman Flax-lilly
Goodia lotifolia	Golden-tip, Clover Tree
Grevilliea alpina	Mountain Grevilliea
Pultanaea scabra	Rough Bush-pea

Picture 3. Harvested Wallaby Grass from 0.8- & 1.2-Hectare site.

Picture 4. Harvested Wallaby Grass drying over Christmas & new year period.

Landslip Sites

In 2024 work was conducted at Mass 4. This site contains a seasonal natural seasonal spring, south of the quarry in a fenced area surrounded by grazing paddocks to the east, south and west, phase A&B to the north. Semi mature and mature trees have been sparsely planted throughout the site. Just above the natural spring is a circular failure. To prevent further collapse Tussock-grass (*Poa sp.*), Spiny-headed Mat-rush (*Lomandra longifolia var. longifolia*) and a mixture of tree and shrub species has been planted above, below and around the failure to stabilise the ground.

Figure 8: Mass 4. Circular failure (red), natural spring (blue), natural spring planting zone (yellow), northern planting zone (purple)

2024 Works

In 2023 a brief site inspection of Mass 4 was undertaken. Substantial damage by grazing deer was evident along with the removal of many guards and muddying of large areas of ground. These effects led to the senescing of many the 2022 plantings and further damage to plantings from earlier years.

Deer control measures have been initiated during 2024. Large stands of blackberry have been successfully sprayed, months later dead canes were brush cut down with a blade. Thistles and other broadleaf weeds have been successfully controlled with herbicide. Broken and loose stakes and guards have been removed.

The areas around the failure and natural spring below have been successfully been replanted where necessary with additional infill planting also taking place. A total of 250 native Tussock Grasses (*Poa* sp.), 100 Spiny-headed Mat-rush (*Lomandra longifolia* var. *longifolia*) and 50 native trees and shrubs were planted in and around Mass 4.

An additional 100 trees and shrubs have also been installed in the northern third of the site.

Table 11. Species planted Landslip site Mass 4 2024

Species	Common Name	No.
Acacia dealbata ssp. dealbata	Silver Wattle	15
Acacia genistifolia	Spreading Wattle	15
Acacia melanoxylon	Blackwood	15
Acacia verticillata ssp. Verticillata	Prickly Moses	15
Bursaria spinosa ssp. spinosa	Sweet Bursaria	15
Eucalyptus obliqua	Messmate	15

Eucalyptus Radiata ssp. radiata	Narrow-leafed Peppermint	15
Eucalyptus viminalis ssp. viminalis	Manna Gum	15
Leptospermum lanigerum	Woolly Tea-tree	15
Lomandra longifolia var. longifolia	Spiny-headed Mat-rush	100
Melicytus dentatus	Tree Violet	15
Poa ensiformis	Purplesheath Tussock-grass	100
Poa labillardierei var, labillardierei	Common Tussock-grass	100
Poa sieberiana var. sieberiana	Grey Tussock-grass	50

Future Management Recommendations

The recommendations for Landslip plantings include:

- Herbicide treatment of blackberry stands and Spear thistles Mass 4.
- Additional trees and shrubs to be planted throughout the site as per request from quarry management (*Table 11*).
- Continue to monitor deer activity and any damage caused to plantings

Table 12. List of recommended species for planting Landslip Site Mass 4 in 2025

Species	Common Name
Eucalyptus cypellocarpa	Mountain Grey Gum
Eucalyptus fulgens	Green Scentbark
Leptospermum continentale	Prickly Tea-tree
Leptospermum lanigerum	Woolly Tea-tree
Leptospermum myrsinoides	Heath Tea-tree

Net Gain Site

The Net Gain Site is located at the Donazzan's Property' 415 Pakenham Road (Quarry owned) comprises of two offset zones Northern and Southern section. Net gain both North & South Revegetation Zones fall within EVC 16 Lowland Forest and EVC 83 Swampy Riparian Woodland. This is the most species diverse of all the sites with the highest amount of remnant vegetation.

Figure 10: Net Gain: North (top) & South (bottom) both marked in yellow, Winter heliotrope (blue marker), eradicated St Augustine Grass (red marker), Wild carrot (dark pink marker), Muttonwood plantings (green marker).

2024 Works

Broad leaf weed control via knapsack herbicide application is predominantly targeting thistles and nightshades. Wild carrot (*Daucus carota*) located along spillway below Donazzan's Dam has been contained and reduced by replacing the herbicide Kamba M with Associate (Metsulfuron-methyl), which targets species with tuberous roots.

A Winter heliotrope (*Petasites gragrans*) infestation above the middle swamp of the Northern section was sprayed using Associate in summer 2024 has been successful. Ragwort (*Senecio jacobaea*), a highly invasive species and a priority weed for control is hand weeded and sprayed with herbicide when encountered. This weed is observed in very low numbers in the Northern section, spreading occasionally from adjacent land to the east.

Blackberry spraying was conducted throughout Northern and Southern Sections between the months of March – April and September – December when herbicide treatment is most effective. Regular spray runs of this weed have been successful, except for hard to access swamp areas of Northern section.

Exotic grass coverage is somewhat reduced in the Northern section where large perennial grass coverage remains low. In the bottom half of the Southern section, large perennial exotic grass coverage has increased in sections due to works prioritised in other areas with budgetary restrictions.

St. Augustine grass *(Stenotaphrum secundatum)* recently eradicated from the NE corner of the Northern Section has remained controlled. This will continue to be monitored.

Native Weeping Grass (*Microlaena stipoides var. stipoides*) has increased in cover, several locations mostly weed free producing adequate seed for harvesting. Optimum time for seed harvesting frequently falls during the Christmas & new year break.

Mutton wood (*Myrsine howittiana*) was planted at the bottom half of Southern Section along the creek line. Plantings have done well putting on good amount of growth.

Evidence of introduced Samba Deer in both Northern and Southern section continues to be observed. Damage to trunks of trees by the rubbing of their horns, grazing and trampling of young plants, disturbance from trails and wallows all have a measurable a negative impact on the site. However now that a deer control program has been initiated, damage caused by deer is no longer increasing.

Table 13. List of species planted within the Net Gain area in 2024.

Species	Common Name	No.
Myrsine howittiana	Muttonwood	25

Future Management Recommendations

The recommendations for Net Gain include:

- Continue managing exotic broadleaf and grassy weeds via herbicide application.
- Continue spraying Wild Carrot and Winter Heliotrope with Associate (metsulfuron methyl) herbicide.
- Continue to control Ragwort by a combination of herbicide application and hand weeding.
- Continue to monitor NE Corner of Northern Section for St. Augustine grass.
- During summer months when water levels are the lowest brush cut access paths into the two main swamp areas of the Northern sections, allowing access for weed control.
- Continue spraying of blackberry with herbicide, access blackberry in swamp areas by using brush cut paths.
- Plant additional eucalyptus adapted to wet and swampy conditions in Northern and Southern zones (table 13).
- Monitor Weeping grass seed development to determine optimal time for harvest. Attempt to harvest viable seed for future direct seeding.
- Continue with deer control program and monitor species impact

Table 14. List of recommended species for planting in Net Gain in 2025

Species	Common Name
Eucalyptus cephalocarpa	Silver-leafed Stringybark
Eucalyptus ovata var. ovata	Swamp Gum

1.2 Hectare Revegetation Site

The 1.2 Ha site is directly to the west 0.8 Revegetation Site sharing similar environmental conditions such as north facing, mostly dry with occasional high winds.

Figure 11: 1.2 Hectare site. NW corner direct seeded by hand (green)

2024 Works

Since 2023 there has been a significant increase in native Wallaby grass germination and growth so that Wallaby grass now dominates the understory as it has been able to compete with and reduce broadleaf weed coverage. Seasonal tanker spraying with selective herbicide has further lessened broadleaf weed load. The most prevalent broadleaf weed species remaining is Flea Bane (*Conyza albida*). Flea Bane can be best controlled by herbicide application when young, then a combination of hand weeding and cut and paint method for larger plants.

Grassy weeds remain under control although Toowoomba Canary Grass (*Phalaris aquatica*) is starting to spread. Toowoomba Canary Grass is controlled by brush cutting low to the ground with follow up application of glyphosate taking place one to two months later, on new growth.

The north eastern end of the site from the point that it narrows was not direct seeded with native grass alongside the rest of the site. To remedy this Wallaby grass seed previously harvested from .8 Hectare and Weeping grass seed harvested from Net Gain was direct seeded by hand after all grassy weeds had been sprayed. In a few years it is hoped with appropriate weed control this area will resemble the rest of the site with a native grass understory.

Together with 0.8 Hectare revegetation, 5 x 5kg bags (25kg total) of Wallaby grass seed was successfully harvested from large stands of Wallaby grass. This was done using a small plant manually propelled seed harvester. Harvested seed was transferred to stock feed bags and stored

at Naturelinks' depot for future use. This seed will be used to direct seed new areas for revegetation. If successful this will result in a considerable saving in revegetation costs.

Trees and shrubs species were re-assigned to SE Extraction after another planting area scheduled for direct seeding and planting was delayed by a year. These species were spread evenly across the site. Spreading Flax-lily (*Dianella admixta),* Common Tussock-grass (*Poa labillardierei var, labillardierei*) *and* Grey Tussock-grass (*Poa sieberiana var. sieberiana*) were scattered throughout the top half of the site.

Table 15. List of tree and shrub species planted in 1.2 Hectare Revegetation Area in 2024.

Species	Common Name	No.
Acacia dealbata ssp. dealbata	Silver Wattle	38
Acacia oxycedrus	Spike Wattle	50
Acacia paradoxa	Hedge Wattle	50
Acacia pycnantha	Golden Wattle	50
Acacia verticillata ssp. Verticillata	Prickly Moses	15
Allocasuarina littoralis	Black Sheoak	50
Corea reflexa var. reflexa	Common Corea	25
Daviesia latifolia	Hop Bitter-pea	20
Dianella admixta	Spreading Flax-lily	100
Eucalyptus baxteri	Brown Stringybark	50
Eucalyptus dives	Broad-leafed Peppermint	45
Eucalyptus goniocalyx	Long Leafed Box, Bundy	50
Eucalyptus Radiata ssp. radiata	Narrow-leafed Peppermint	50
Hakea decurrens ssp. Physocarpa	Bushy Needlewood	45
Hakea Ulcina	Furze Hakea	50
Indigofera australis	Austral Indiogo	40
Melicytus dentatus	Tree Violet	15
Poa labillardierei var, labillardierei	Common Tussock-grass	50
Poa sieberiana var. sieberiana	Grey Tussock-grass	50

Future Management Recommendations

The recommendations for 1.2 Hectare Revegetation Site include:

- Keeping broadleaf weeds controlled via selective herbicide application using tankers.
- Control of Toowoomba Canary-grass by brush cutting and follow up spraying with herbicide.
- Harvest Wallaby grass seed to be used for future direct seeding projects
- Continue expanding species diversity by planting draught tolerant tree and shrub species *(Table 16).*

Table 16. List of recommended species for planting in 1.2 Hectare Revegetation Site in 2025.

Species	Common Name
Acacia mucronata var. longifolia	Narrow-leaf Wattle
Daviesia leptophylla	Narrow-leaf bitter-pea
Epacris impressa	Common Heath

Goodia lotifolia	Golden-tip, Clover Tree
***Grevilliea alpina* (Southern Hills form)**	Mountain Grevilliea
Pimelea humilis	Common Rice-flower

Paddock Replacement

This site encompasses 5 separate paddock areas that are grazed by cattle. Stock proof fencing has been erected around 150 approximately 1.5m^2 quadrants in which Eucalyptus were originally planted in 2018.

Figure 12: Paddock Replacement 5 zones (ash)

2024 Works

16 *Eucalyptus* spp. were replanted inside fenced enclosures. These planting were unsuccessful for multiple reasons:

- Several fenced enclosures were damaged and failed to protect planted Eucalyptus from cattle grazing and rubbing.
- Some plants reached a sufficient size then were blown over by strong winds snapping the main stem.
- Some had not survived from the previous year's plantings possibly due to dry conditions.

Table 17. List of Eucalyptus species planted in Paddock Replacement site 2024.

Species	Common Name	No.
Eucalyptus baxteri	Brown Stringybark	4
Eucalyptus obliqua	Messmate Stringybark	7

Eucalyptus viminalis ssp. Viminalis	Manna Gum	5

Future Management Recommendations

The recommendations for Paddock Replacement Site include:

- Monitor plant survival and replace any dead plantings.
- Notify quarry management if any additional quadrants need repair.

2023 Planting Area

2023 Planting Area sits directly below 1.2 Hectare Revegetation Site, north facing subject to occasional dry winds but with a higher degree of fluctuation in site conditions than adjacent areas. It can be similarly dry during hot periods but its lower elevation also accentuates wet conditions. This variability will pose difficulties for establishing some species particularly during early years of revegetation.

Figure 13: 2023 Planting Area, seasonally wet areas (blue)

2024 Works

Germination of sterile rye and native wallaby grass has increased from the previous year and this is expected to continue next year. Despite increased grass coverage the ground layer is still mostly bare and rocky.

Broadleaf weeds have been controlled through tanker application of herbicide. Below and to the east, in border areas, large volumes of broadleaf weeds also require treatment.

Plantings have mostly focused on the lower half of the site where seasonally wet conditions were not adequately accounted for in the first year when dry tolerant species were being selected. The oversight in species selection stems from the lower half of the site experiences both very wet and very dry conditions depending on season.

Species for second year planting were specifically selected keeping these two very different site conditions in mind. Two of these species Spike Wattle (*Acacia oxycedrus*) and Tree Violet (*Melicytus dentatus*), both well suited for both conditions, were planted at the quarry for the first time.

Each following year it is expected that as grass coverage increases, and trees and shrubs grow that temperature fluctuation on the surface will lessen. It is also expected that as the ground continues to stabilise during wet periods improved drainage will reduce the duration of waterlogged ground.

Table 18. List of tree and shrub species planted in 2023 Planting Area in 2024.

Species	Common Name	No.
Acacia dealbata ssp. dealbata	Silver Wattle	50
Acacia genistifolia	Spreading Wattle	15
Acacia melanoxylon	Blackwood	25
Acacia myrtifolia	Myrtle Wattle	30
Acacia oxycedrus	Spike Wattle	50
Acacia stricta	Hop Wattle	50
Bursaria spinosa ssp. spinosa	Sweet Bursaria	25
Daviesia latifolia	Hop Bitter-pea	30
Eucalyptus oblique	Messmate	50
Eucalyptus viminalis ssp. viminalis	Manna Gum	50
Goodenia ovate	Hop Goodenia	25
Hakea nodosa	Yellow Hakea	25
Leptospermum continentale	Prickly Tea-tree	25
Leptospermum lanigerum	Woolly Tea-tree	25
Melicytus dentatus	Tree Violet	25

Future Management Recommendations

The recommendations for 2023 Planting Area include:

- Maintain control of broadleaf weeds with selective herbicide application by spray tanker for 2023 Planting Area and adjacent areas.
- Monitor lower half of site recording the survival rates by species.
- Plant additional species that are tolerant of both very wet and dry conditions to expand diversity and reduce weed coverage (Table 20).

Table 19. List of recommended species for 2023 Planting Area in 2025.

Species	Common Name
Dianella revoluta,	Spreading Flax-lily
Epacris impressa	Common Heath
Eucalyptus goniocalyx	Long-leafed Box, Bundy
Leptospermum myrsinoides	Heath Tea-tree, Silky Tea-tree

South East Extraction Backslope

This site borders South East Extraction to its west starting from the back end of the ridgeline to the track that borders the bottom of the hillside. Many sections of this site are steep with deep soft soil making planting and spray works difficult in wet conditions.

Figure 14: South East Extraction Backslope

2024 Works

The top of the site consists of dry compacted clay soil with good coverage of Wallaby grass and low levels of grassy and broadleaf weeds. Below, a terrace on a gentle descending slope runs from near the southern end of the site to the east of Boot Hold Point at the far northern tip. Between the ridgeline above and the terrace below much of the slope is very steep which can be ascended and descended by foot with caution. Below the terrace is another slope the majority of which is also quite steep. Like the slope going back up the hill, this slope can be traversed by foot with caution.

The soil from the terrace to the base of the hillside is soft, moist, dark in colour during winter with the soil surface becoming firm in summer. This is an ideal location for deep rooted trees due to fertile soil and because they could compete the broad leaf and weedy grass species in this zone.

Unlike the majority of other revegetation areas direct seeding has yet to take place. This is because there is a high weed load in the soil from the terrace to the base of the hillside. Toowoomba Canary Grass (*Phalaris aquatica*) would easily out compete any direct seeded native Wallaby & Weeping grass in most areas. Herbicide application required to control these infestations would be time and cost restrictive to Holcim and are not recommended at this stage.

All broadleaf and grassy weeds will continue to be tanker sprayed until there comes a time when the weed seed bank is reduced enough to make direct seeding worthwhile. However, in areas where small amounts native grass recruitment does occur, spot praying will occur to encourage further native grass recruitment and spread.

The top half of the site was sprayed and planted in 2023 with infill planting occurring in 2024. The bottom half was sprayed out and planted in 2024 for the first time. Plantings, particularly eucalyptus species are establishing well and rates of survival have been good.

Table 20. List of tree and shrub species planted in South East Extraction Backslope in 2024.

Species	Common Name	No.
Acacia dealbata ssp. dealbata	Silver Wattle	35
Acacia melanoxylon	Blackwood	20
Acacia oxycedrus	Spike Wattle	40
Acacia stricta	Hop Wattle, Straight Wattle	20
Acacia verticillata ssp. Verticillata	Prickly Moses	30
Banksia spinulosa var. cunninghamii	Hairpin Banksia	25
Bursaria spinosa ssp. spinosa	Sweet Bursaria	50
Cassinia aculeata	Dogwood	75
Eucalyptus cypellocarpa	Mountain Grey Gum	25
Eucalyptus fulgens	Green Scentbark	75
Eucalyptus oblique	Messmate	32
Eucalyptus viminalis ssp. viminalis	Manna Gum	40
Gynatrix pulchella	Hemp Bush	35
Hakea nodosa	Yellow Hakea	10
Hakea decurrens ssp. Physocarpa	Bushy Needlewood	10
Leptospermum lanigerum	Woolly Tea-tree	10
Lomatia fraseri	Tree Lomatia	30
Melicytus dentatus	Tree Violet	10
Oleria argophylla	Musk Daisy-bush	60
Pomaderris aspera	Hazel Pomaderris	30

Future Management Recommendations

The recommendations for SE Extraction Backslope include:

- Regular control of all broadleaf and grassy weeds throughout the site with herbicide application via tanker.
- Herbicide spraying of reshooting blackberry by knapsack on slope and immediate area
- Continue careful spray works from ridgeline and down the slope to protect recruiting native Wallaby grass.
- Maintenance of guards around plantings as frequent tanker spaying poses a higher risk of off-target damage
- Undertake additional plantings prioritising species that are well suited to moist deep soils with high fertility

Table 21. List of recommended species for South East Extraction Backslope in 2025

Species	Common Name
Acacia mucronata var. longifolia	Narrow-leaf Wattle
Banksia marginata	Silver Banksia

Cassinia longifolia	Long-leaf Cassinia
Coprosma quadrifida	Prickly Currant-bush
Daviesia latifolia	Hop Bitter-pea
Eucalyptus cypellocarpa	Mountain Grey Gum
Eucalyptus fulgens	Green Scentbark
Leptospermum continentale	Prickly Tea-tree
Leptospermum lanigerum	Woolly Tea-tree
Oleria lirata	Snowy Daisy-bush

Southern Hillside

This site runs south of the road bordering quarry administration, east of the workshop and west of a grazing paddock, going up the hillside to the track that runs along the base of South East Extraction Backslope. Lower levels of disturbance and the presence of a fair degree of remnant vegetation are likely due to the slope's topography. Some of the remnant species present are Kangaroo Grass *(Themeda triandra)*, Austral Bracken *(Pteridium esculentum*), Native Raspberry *(Rubus parvifolius)*, Common Tussock-grass *(Poa Labillardierei),* Weeping grass *(Mircrolena Stipoides*) and Wallaby grass *(Rytidosperma sp.*).

Figure 15: Southern Hillside. Priority area for seasonal brush cutting (red)

2024 Works

Maintaining native vegetation by reducing exotic weed prevalence via herbicide spraying has been the focus for much of the site. Primary weeds controlled have been Blackberry (*Rubus fruticosus sp. agg.*), Hawthorn (*Crataegus monogyna*), Toowoomba canary grass (*Phalaris aquatica*), Cocksfoot (*Dactylis glomerate*) and thistles sp.

Reducing the need for long term maintenance works, in particular brush cutting and spraying of grassy weeds along the main access road bordering the site is a priority expressed by quarry

management. To achieve this, Silver Wattles have been planted in the lower sections of the site. It is expected their future dripline shade-out large perennial weedy grass species.

Green Scentbark *(Eucalyptus fulgens)* an endangered endemic Victorian species which have been planted across the site. Naturelinks has been made aware that there is a hybridisation risk between this species and broad-leafed Peppermint *(Eucalyptus dives)* which features predominantly in Naturelinks plantings for the drier parts of the quarry. Now aware, Naturelinks will make sure the two species are not planted within proximity. We believe this has so far been avoided due to the two species having different environmental preferences.

A modest number of plantings have sought to expand diversity and reduce weed coverage.

Table 22. List of tree and shrub species planted in Southern Hillside in 2024.

Species	Common Name	No.
Banksia spinulosa var. cunninghamii	Hairpin Banksia	25
Correa reflexa var. lobatus	Powelltown Correa	15
Epacris impressa	Common Heath	25
Pimelea flava ssp. flava	Yellow Rice-flower	20
Polyscias sambucifolia ssp. l	Elderberry Panax	15
Pomaderris aspera	Hazel Pomaderris	20

Future Management Recommendations

The recommendations for Southern Hillside include:

- Control of blackberry by application of herbicide
- Control of grassy weeds through herbicide application with an effort to protect and promote recruitment of native grass species
- Control of broadleaf weeds across the site with care taken to limit off target damage to Austral bracken
- Maintain seasonal brush cutting regime along quarry entrance road, collection and removal of woody debris to reduce fire risk and for aesthetic purposes.
- Undertake additional plantings prioritising species suited for fertile deep soils

Table 23. List of recommended species for planting Southern Hillside in 2025.

Species	Common Name
Acacia stictophylla	*Dandenong Ranges Wattle*
Banksia marginata	Silver Banksia
Daviesia latifolia	Hop Bitter-pea
Dillwynia cinerascens	*Grey* Parrot-pea
Goodia lotifolia	Golden-tip, Clover Tree

Northern Boundary

The Northern Boundary borders the Pakenham Pony Club and lies to the north of Phase C. An established canopy is present but a shrub/understory layer largely absent. Naturelinks was directed by quarry management to plant a row of shrubs along the boundary to act as a visual screen.

Figure 16: Northern Boundary

Table 24. List of shrub species planted Northern Boundary in 2024.

Species	Common Name	No.
Acacia genistifolia	Spreading Wattle	30
Acacia stricta	Hop Wattle, Straight Wattle	30
Acacia oxycedrus	Spike Wattle	30
Acacia verticillata ssp. Verticillata	Prickly Moses	30
Acacia myrtifolia	Myrtle Wattle	30
Acacia paradoxa	Hedge Wattle	30
Bursaria spinosa ssp. spinosa	Sweet Bursaria	10
Hakea nodosa	Yellow Hakea	25
Indigofera australis	Austral Indiogo	10
Leptospermum lanigerum	Woolly Tea-tree	25
Melicytus dentatus	Tree Violet	25
Goodenia ovate	Hop Goodenia	25

Future Management Recommendations

The recommendations for Northern Boundary

- Replace dead plantings upon Quarry request
- Stake and guard collection

Lower Car Park

Lower car park refers to the North-South Road that goes to and from the lower car park east of Mt Shamrock Road. Naturelinks was directed to plant a line of trees to offer protection to the vehicles parked in this car park from the elements.

Figure 17: Lower car park plantings (red).

Table 25. List of tree species planted Lower car Park in 2024.

Species	Common Name	No.
Acacia dealbata	Silver Wattle	36
Eucalyptus oblique	Messmate	26
Eucalyptus viminalis ssp. viminalis	Manna Gum	25

Future Management Recommendations

The recommendations for Lower Car Park

- Replace dead plantings upon Quarry request
- Stake and guard collection

Chilean Needle Grass Monitoring & Control

Chilean Needle Grass (*Nassella neesiana,* CNG) is a highly invasive species that presents threats to both natural environments and agriculture. While this species is widespread in the northern and western regions of Melbourne, it is currently found only in limited areas of the outer eastern suburbs. Eradicating Chilean Needle Grass in locations where it has not yet established should be prioritized. Naturelinks recommends that efforts be made to pursue this objective.

Figure 18: Surveyed Chilean Needle Grass infestation (blue), areas of high infestation (red), new outbreak (red marker).

In 2022, a large infestation of CNG) was discovered in a paddock beyond the quarry boundary fence-line, but still within quarry land. Naturelinks concluded that it was likely source of Chilean Needle Grass then spreading within southern revegetation zones under their management. In 2023 Naturelinks conducted a survey in and around all areas that the grass had been located, to properly define the extent of the weed's infestation (shown figure 18).

In 2024 a follow up survey of Chilean Needle grass was undertaken with only one previously unknown infestation in discovered in Phase A & B, about 100 meters from the closest known location. Surveys were conducted by Naturelinks staff with Knapsacks containing glyphosate, concurrently spraying all plants found.

As a result, within the boundaries of the furthest known infestation limits, the total number of Chilean Needle Grass plants appeared to decrease. However, vigilance needs to be maintained if full eradication is possible and it would take several years to achieve as weed seed can remain viable in soil for over 10 years.

CNG seed can be spread through various methods; Primarily the species will spread to its immediate vicinity in the area around existing seeding plants. It can also be transported by vehicles and machinery such as tractors, vehicles, trailers, motorbikes, slashing equipment, and brush cutters. For this reason, vehicle and tool hygiene is essential for any occasion where exposure to weed seed is possible. Naturelinks maintains a strict regime of cleaning vehicles and equipment. Native wildlife in particular Kangaroos seem to be the most likely source of dispersal over distance, especially on this site. The exclusion of Kangaroos from contaminated areas is not viable, so stopping any seed reaching maturity needs to be a focus in management.

Although improvements have been achieved in the grazing land adjacent to the south western corner of the quarry, Chilean Needle Grass has spread within South East Extraction, stayed the same in Southern Extraction, starting to creep into 0.8 Hectare and for the first time, discovered in Extraction.

In 2024 the species was controlled within managed areas during regular weed control works. This proved insufficient due to the species expansion. As a result, the 2025 Chilean Needle Grass Monitoring and Control budget now has budget reserved for dedicated spray runs in managed areas.

Holcim's Environmental Review Committee consulted the Cardinia Shire Council for guidance on addressing the Chilean Needle Grass issue in 2024. The Council recommended that Holcim contact Agriculture Victoria, as they are responsible for administering the Catchment and Land Protection Act 1994 and are best positioned to offer advice on control measures for Chilean Needle Grass. Naturelinks contacted Agriculture Victoria on Holcim's behalf. Agriculture Victoria confirmed that the quarry was not obligated to control the weed and provided a link to a best practice management guide[3].

In consultation with the Environmental Review Committee and quarry management, Tussock Herbicide (active ingredient Flupropanate) is not currently in use. The chemical has several drawbacks primarily based on its toxicity and residual nature. Its benefit is that it has been specifically designed to target the Nassella genus killing the plant and when applied to ground around existing plants will stop further germination of the weed for potentially long periods of time.

Its best use in this situation could be for isolated outbreaks that may be difficult to locate in subsequent years, and it could be used in conjunction with glyphosate which could remain the primary herbicide for weed control for large easily located infestations and grazed areas.

Due to the effectiveness of Flupropanate herbicide, Naturelinks recommends that this option be reviewed if budgets are reduced and or experienced staff familiar with the weed and its locales were no longer available.

[3] https://www.yumpu.com/en/document/view/41300348/cng-manualindd-weeds-australia

Fauna - considerations and concerns

Only fauna of high conservation value or that may pose a negative environmental impact are mentioned here. A full list of fauna observed by Naturelinks staff have been added as attachments.

Introduced species

As part of the requirements of the offset management plan, invasive species, including pest animals require control. Sambar deer are having the most impact through grazing on areas of remnant flora and revegetation areas, followed by Rabbits and Hares. Red fox requires control as it has a negative effect on native fauna, and is a declared pest species.

- Sambar deer (*Rusa unicolor*) are observed to adversely impact some sites. Naturelinks recommends that the deer control program currently in place continue for the following year.
- European Hares (*Lepus europaeus*) are occasionally seen and currently appear to have a minor impact. Hares can impact on revegetation due to their propensity to graze on establishing plants, and their ability to reach above tree guards by standing on their hind legs. Controlling hares along with rabbits (see below) should be undertaken if an increase in damage is observed.
- European Rabbits (*Oryctolagus cuniculus*) are occasionally seen and currently believed to have a minor impact at SE Extraction Ridgeline predating on unguarded plantings. In previous years Rabbits have been observed that are in poor health, and they seem not to be aware of close human presence. They appear to be visually impaired, and may in fact be diseased which may be due to myxomatosis or Rabbit Haemorrhagic Disease (RHD). Monitoring of rabbit damage will be undertaken and if an increase occurs, control may be recommended.
- Red foxes (*Vulpes vulpes*) are occasionally seen or their tracks observed. One active den with cubs was discovered underneath a large Weeping Willow in the centre of Phase C. Their full environmental impact remains uncertain. Impacts on marsupials, native birds and other wildlife is a recognised problem with foxes. Possible control in conjunction with deer or rabbit/ hare treatment could occur, but the impact of foxes is not affecting revegetation works.

Indigenous species

- Eastern grey kangaroo *(Macropus giganteus)* a decade ago were rarely seen but are now abundant. Collision with guarded trees and shrubs is a big issue in most managed areas. Fence repair may reduce this issue, particularly in Phase A & B. Grazing does not yet appear to be a serious problem.
- Peregrine falcon (*Falco peregrinus*) A pair of Peregrine Falcons have historically nested on the western cliff-face of the quarry.
- Gang-Gang Cockatoo *(Callocephalon fimbriatum)*, have been observed at the quarry for several years. Recently the species' conservation status has been elevated to Endangered.

Pest Animal Control 2024, and 2025 proposed.

Deer control. There is a resident population of Sambar deer (*Rusa unicolour*.) As noted, they are having a deleterious effect through browsing of planted and established vegetation, along with rubbing of trees with their antlers. Two control visits were undertaken in 2024, with a total of three deer removed. These visits have assisted in understanding where the deer are sheltering, and optimal times for undertaking deer control. Ear tissue samples were taken for submission to DEECA who are undertaking genetic studies to understand population movements in Sambar deer.

The recommendation is to continue with deer control in 2025, to prevent an escalation of damage to vegetation. Holcim have indicated a willingness to contact neighbouring properties in case they are willing to engage Naturelinks to undertake deer control simultaneously on their properties, which will have the benefit of increasing the effectiveness of the program due to the mobile nature of deer. Timing. As the nights get longer, and daylight savings finishes, this presents the best opportunity for carrying out control works. The start of April is recommended, timed for nights where there is little moonlight.

Rabbit control. Monitoring of rabbit damage will continue and if an increase occurs, control may be recommended. Rabbit control would include Fumigation of warrens, followed up by warren destruction (subject to approval) and follow up shooting.

Fox control. Due to the low numbers of foxes observed, we recommend only carrying out incidental fox control while deer or possible rabbit shooting is being carried out. Trapping may be required If observed numbers increase. Baiting may be necessary if trapping fails, but due to the possibility of dogs from neighbouring properties accessing baits, there would need to be notifications of neighbours informing them of the control period, and signage erected (all legal requirements).

Aspects and Impacts Assessment

Table 26. Aspects and Impacts Assessment – Mt Shamrock

Activity	Aspect	Impacts	Controls
Working onsite	Naturelinks-owned vehicles, trailers, powered plant (electric / petrol), hand tools and PPE (footwear etc.) entering and exiting site	Spread weed seed, pathogens & weed propagules into and out of site	• All Naturelinks employees are to be trained on Hygiene HSEP • Crew leaders are to clean down all vehicles, trailers, powered plant (electric / petrol), hand tools and PPE (footwear etc.) before entering site • Crew leaders are to complete site-specific inspection before entering site "HSE Daily Inspection Checklist - Holcim - Mt Shamrock" which includes questions about hygiene • Before exiting the site, crew leaders are to complete site-specific inspection "HSE Exit Inspection Checklist - Holcim - Mt Shamrock" • If vehicles, trailers, powered plant (electric / petrol), hand tools and / or PPE (footwear etc.) need to be cleaned notify site contact to be provided with access to wash down area • See Table 14: List of noxious weeds in West Gippsland region **Detailed Controls by area** **Landslip** *Noxious weeds West Gippsland region present or potential:* Blackberry, Slender Thistle, Spear Thistle, Variegated Thistle *Actions taken to reduce risk:* Walk into site from adjacent paddock eliminating contamination risk for vehicle from weed seed. Manually clean all petrol-driven plant and hand tools of loose soil and visible weed seed. More thorough cleaning to be undertaken in designated quarry wash down area as required. **Paddock replacement** *Noxious weeds West Gippsland region present or potential:* Blackberry, Ragwort (potential), Slender Thistle, Spear Thistle, Variegated Thistle *Actions taken to reduce risk*: Avoid driving in areas where seeding thistles are present, manually clean all petrol driven plant and hand tools of loose soil and visible weed seed. More thorough clean to be undertaken in designated wash down quarry area as required. Do not remove Ragwort from site; any hand-weeded ragwort is to be left *in situ*; any seed head with viable seed is to be buried where possible.

Phase A&B

Noxious weeds West Gippsland region present or potential: Blackberry, Chilean Needle Grass, Hawthorn, Ragwort (potential), Slender Thistle, Spear Thistle, Variegated Thistle

Actions taken to reduce risk: Site is only to be accessed from cleared track within quarry fence-line by using periodical access gates with the exception of two areas with double gates in which a cleared access area is maintained. Manually clean all petrol-driven plant and hand tools of loose soil and visible weed seed. More thorough clean to be undertaken in designated wash down quarry area as required. Do not remove Ragwort from site; any hand-weeded ragwort is to be left *in situ*; any seed head with viable seed is to be buried where possible.

Any Chilean Needle Grass discovered is to be sprayed immediately with herbicide where possible; hand weeding of Chilean Needle Grass and its removal for disposal offsite is only to be done with caution (Naturelinks has required permits to do this). Avoid using any petrol-driven plant in or near identifiable plants including planting.

1.2 hectare

Noxious weeds West Gippsland region present or potential: Spear Thistle, Stinkwort, Variegated Thistle

Actions taken to reduce risk: Manually clean all petrol-driven plant and hand tools of loose soil and visible weed seed. More thorough clean to be undertaken in designated wash down quarry area as required.

.8 Hectare

Noxious weeds West Gippsland region present or potential: Blackberry, Spear thistle, Stinkwort, Variegated Thistle

Actions taken to reduce risk: Manually clean all petrol-driven plant and hand tools of loose soil and visible weed seed. More thorough clean to be undertaken in designated wash down quarry area as required.

Southern Extraction

Noxious weeds West Gippsland region present or potential: Blackberry, Chilean Needle Grass, Spear Thistle, Stinkwort, Variegated Thistle

Actions taken to reduce risk: Manually clean all petrol-driven plant and hand tools of loose soil and visible weed

seed. More thorough clean to be undertaken in designated wash down quarry area as required.

Any Chilean Needle Grass discovered is to be sprayed immediately with herbicide where possible; hand weeding of Chilean Needle Grass and its removal for disposal offsite is only to be done with caution (Naturelinks has required permits to do this). Avoid using any petrol-driven plant in or near identifiable plants including planting.

South East Extraction

Noxious weeds West Gippsland region present or potential: Blackberry, Chilean Needle Grass, Slender Thistle, Spear Thistle, Stinkwort, Variegated Thistle

Actions taken to reduce risk: Manually clean all petrol-driven plant and hand tools of loose soil and visible weed seed. More thorough clean to be undertaken in designated wash down quarry area as required.

Any Chilean Needle Grass discovered is to be sprayed immediately with herbicide where possible; hand weeding of Chilean Needle Grass and its removal for disposal offsite is only to be done with caution (Naturelinks has required permits to do this). Avoid using any petrol-driven plant in or near identifiable plants including planting.

Extraction/Phase C

Noxious weeds West Gippsland region present or potential: Angled Onion (potential), Blackberry, Crack Willow, Flax-leaf Broom, Gorse, Hawthorn, Ragwort, Slender Thistle, Spear Thistle, Soursob, Stinkwort, Sweet Briar, Variegated Thistle

Actions taken to reduce risk: Manually clean all petrol-driven plant and hand tools of loose soil and visible weed seed. More thorough clean to be undertaken in designated wash down quarry area as required. Do not remove Ragwort from site, any hand-weeded ragwort is to be left *in situ*; any seed head with viable seed is to be buried where possible.

Do not leave designated access tracks with vehicle, do not drive over any flowing weeds growing on tracks. Clean any disturbed mud that may accumulate underneath the wheel arch before leaving site at designated wash down area.

Net Gain

Noxious weeds West Gippsland region present or potential: Angled Onion, Blackberry, Bridal creeper, Crack Willow,

			Flax-leaf Broom (nature strip only), Garden Asparagus, Hawthorn, Maderia Vine (nature strip only), Ragwort, Slender Thistle, Spear Thistle, St John's Wort, Stinkwort, Soursob Variegated Thistle *Actions taken to reduce risk:* Manually clean all petrol-driven plant and hand tools of loose soil and visible weed seed. More thorough clean to be undertaken in designated wash down quarry area as required. Do not remove Ragwort from site, any hand-weeded ragwort is to be left *in situ*; any seed head with viable seed is to be buried where possible. Park vehicle near main access gate only for northern section, leave car in nearby paddock or gate entrance for southern section. Limit all driving unless necessary in northern section. Clean any disturbed mud that may accumulate underneath the wheel arch before leaving site at designated wash down area.
Controlling weeds	Use of herbicide to control weeds	Incorrect use of herbicide on plant species Off-target damage Herbicide entering waterways	All employees who use herbicides are trained in its correct use and hold a Chemcert license, or are under direct supervision while in training, by a Chemcert holder. Restricted use chemicals are to be only used by those staff holding an Agricultural Chemical User's Permit (ACUP) • Herbicides are carefully selected to each species; see Table 13. List of herbicides used at Holcim – Mt Shamrock *Alternative methods to herbicide spraying to be considered by Holcim and quoted by Naturelinks* • **Hand weeding:** Useful for high quality areas and when working near sensitive species. Inefficient for large areas, time consuming. Cut and paint: used for woody weeds when not small. Used for small infestations of blackberry in high quality areas or around sensitive species. Labour intensive depending on scale. • **Brush-cutting/slashing:** Useful for biomass control and maintaining access to tracks and areas with high weed load. Can be used to target annual weedy grasses to prevent seeding depending on site conditions and season. Cost effective in the right circumstance. **Grazing:** Cattle or goats in areas with high weed load and low-quality native vegetation. Environmentally friendly, requires adequate fencing so not suitable to some situations. May require additional permits. Goats will likely be the more effective particularly for control of blackberry. • **Fire:** Historically this method has been ruled out by Quarry management. Naturelinks does have the relevant licenses, Insurance, training,

equipment to undertake controlled burns.

Table 27. List of herbicides used at Holcim – Mt Shamrock

Herbicide	Usage	Species Controlled	Application	Notes
Weedmaster Duo **ACTIVE CONSTITUENT: 360 g/L Glyphosate**	Commonly used across the site Control of grass and broadleaf weed species via backpack spray and tanker spray. Occasionally combined with other herbicides for specific hard to kill weeds Control of woody weeds	Agapanthus, Blue Periwinkle, Holly, English Ivy, Ragwort, Madeira Vine, Willow sp., Pittosporum, Hawthorn, Prunus sp., Chilean Needle grass, annual and perennial grasses, broadleaf weeds where off target damage risk is low.	Cut and paint of woody weeds (both with hand tools and chainsaw) Backpack spay and tanker spray application	Fast acting, non-selective, cost effective, is inactivated immediately in the soil and does not provide residual weed control
Kamba M **ACTIVE CONSTITUENTS: 340 g/L MCPA, 80g/L DICAMBA**	Commonly used across the site. For broadleaf specific weeds when off target damage to native grass species is to be avoided via backpack spray and tanker spray.	Broadleaf weed species	Backpack spray or tanker spray	Average field half-life of dicamba is 14 days. Average field half-life of MCPA is 7 days.
Associate Herbicide **ACTIVE CONSTITUENT: 600g/kg METSULFURON METHYL**	Occasionally used across the sites when targeting particularly hard-to-kill broadleaf weeds, some woody weeds and weeds with tuberous root systems, will not harm grass via backpack spray or tanker spray (rarely). Occasionally combined with other herbicides for specific hard to kill weeds	Bridal Creeper (Asparagus spp.), Angled Onion, Soursob (and other Oxalis spp.), Spanish Heath, Blackberry (occasionally only but can be used all year round)	Backpack spray or tanker spray	Associate will remain in the soil for a period of time. The persistence of Associate in the soil is dependent on various environmental conditions e.g. soil pH, temperature, soil moisture and organic matter. Wet, warm, acid soils high in organic matter favour breakdown of Associate in the soil. It should be noted that Associate does

				not provide a commercially acceptable level of soil residual weed control.
Maca 600 (most widely known by brand name Garlon) **ACTIVE CONSTITUENT: TRICLOPYR**	Control of Blackberry spp., Broom, young Hawthorn and Prunus sp., Briar Rose via pack spray or tanker spray	Blackberry spp., Broom, young Hawthorn, and Prunus spp, Briar Rose	Backpack spray or tanker spray	Cost effective, very effective and fast acting on blackberry (Spring to mid-Autumn), avoid spraying near waterways, selective but will burn grass at high rate. Should not be used when temperature may exceed 30 degrees as this product can evaporate and move through the air and harm nearby vegetation.
Lontrel Advanced **ACTIVE CONSTITUENT: 600g/L CLOPYRALID**	Semi-selective broadleaf herbicide specifically designed for control of Asteraceae and Fabaceae (daisy and pea family) but also effective against some other broadleaf families while leaving other families unharmed, will not harm grass via pack spray and tanker spray (rarely).	Thistles, Fleabane, Bristly Ox-tongue, Stinkwort (*Dittrichia graveolens*), Cat's ear, Plantain, Aster weed, Broom spp., Vetch, Clover, Capeweed. Can harm *Acacia* species when sprayed in high volumes and herbicide can have a detrimental effect on these species (e.g., tanker spraying)	Backpack spray or tanker spray	Local understory species not harmed by overspray: Bidgee widgee and Sheep's Burr, Kidney Weed, Native raspberry, Australian Hounds-tongue. Withholding periods: Do not graze or cut for stock food for 7 days after application. Low toxicity to fish, birds, honeybees, livestock, earthworms and aquatic organisms. Was not used for the 2024 work period partially due to concerns raised by quarry audit. As alternative herbicides are available and the prevalence of weeds which Lontrel Advanced and Apparent Clopyralid

				use is preferred is currently low.
Apparent Clopyralid 300 **ACTIVE CONSTITUENT: 300g/L CLOPYRALID**	Semi-selective broadleaf herbicide specifically designed for control of Asteraceae and Fabaceae (daisy and pea family) but also effective against some other broadleaf families while leaving other families unharmed, will not harm grass via pack spray and tanker spray (rarely).	Thistles, Fleabane, Bristly Ox-tongue, Stinkwort (*Dittrichia graveolens*), Cat's ear, Plantain, Aster weed, Broom spp., Vetch, Clover, Capeweed. Can harm *Acacia* species when sprayed in high volumes and herbicide can have a detrimental effect on these species (e.g., tanker spraying)	Backpack spray or tanker spray	Local understory species not harmed by overspray: Bidgee Widgee and Sheep's Burr, Kidney Weed, Native raspberry, Australian Hounds-tongue. Selective herbicide, useful for herbicide rotation, relatively expensive, less harmful to waterways than alternatives with the exception of Associate, residual in soil and thatch. Withholding periods: Do not graze or cut for stock food for 7 days after application. Was not used for the 2024 work period partially due to concerns raised by quarry audit. As alternative herbicides are available and the prevalence of weeds which Lontrel Advanced and Apparent Chlopyralid use is preferred is currently low.

Table 28. List of noxious weeds in West Gippsland region

Species	Type	Risk of Spreading	Method of potential seed or propagules dispersal by Naturelinks staff
Angled Onion	Restricted Weeds	Low	Loose Seed
Blackberry	Regionally Controlled Weeds	Medium	Fruit
Bridal Creeper	Restricted Weeds	Low	Fruit
Chilean Needle Grass	Restricted Weeds	High	Soil (may contain seed) Loose Seed
Flax-leaf Broom	Regionally Controlled Weeds	Medium	Loose Seed
Garden asparagus	Restricted Weeds	Low	Fruit
Gorse	Regionally Controlled Weeds	Low	Loose Seed
Hawthorn	Regionally Controlled Weeds	Low	Fruit
Ragwort	Regionally Controlled Weeds	High	Soil (may contain seed) Airborne Seed
Maderia Vine	Restricted Weeds	Medium	Vegetation
Slender Thistle	Regionally Controlled Weeds	Medium	Soil (may contain seed) Airborne Seed
Spear Thistle	Regionally Controlled Weeds	Medium	Soil (may contain seed) Airborne Seed
St John's Wort	Regionally Controlled Weeds	Low	Loose Seed
Stinkwort	Restricted Weeds	Medium	Soil (may contain seed) Airborne Seed
Sweet Briar	Regionally Controlled Weeds	Low	Fruit
Soursob	Restricted Weeds	Low	Soil (may contain seed) Loose Seed
Variegated Thistle	Regionally Controlled Weeds	Medium	Soil (may contain seed) Airborne Seed
Crack Willow	Restricted Weeds	Low	Vegetation

Attachments

- Provided in Excel spreadsheet: Indigenous Flora of Holcim Pakenham, Introduced and Weed Species, Mammals Observed, Reptile and Frog Observations, Bird Observations, Assessment of Species used for Revegetation