Belmont Quarry Development – Part B

Substantive Application
Appendix B.5.C – Landscape and Ecological Management Plan
Winstone Aggregates

16 August 2026

BELMONT QUARRY OVERBURDEN DISPOSAL AREA

LANDSCAPE AND ECOLOGICAL MANAGEMENT PLAN

04 AUGUST 2026

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DOCUMENT QUALITY ASSURANCE

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RELEASE AND RELIANCE

This report has been prepared by Boffa Miskell Limited on the instructions of our Client, in accordance with the agreed scope of work. If it is intended to support an application under the Fast-track Approvals Act 2024, it may be relied upon by the Expert Panel and relevant administering agencies for the purposes of assessing the application.

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Cover photograph: View of Symonds Hill Pit, © BML, 2025.

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CONTENTS

1.0 INTRODUCTION

1.1 SCOPE AND PURPOSE

The purpose of the Landscape and Ecology Management Plan (LEMP) is to set out the landscape management, rehabilitation and monitoring measures required to implement the landscape and ecology outcomes identified for the Belmont Quarry Overburden Disposal Area (OBDA).

The plan is intended to guide the progressive integration of the overburden disposal area into the surrounding Belmont Hills landscape, while managing adverse landscape, natural character and visual effects during construction, operation and closure and where necessary progressively adapting activities to improve results. The LEMP shall be read in conjunction with the following assessments:

- Belmont Quarry Overburden Disposal Area: Landscape Effects Assessment, prepared by Boffa Miskell Limited, August 2026
- Belmont Quarry OBDA Development: Ecological Values, Effects and their Management, Prepared by BlueGreen Ecology,

1.2 OBJECTIVE

The LEMP will provide the framework for translating the assessment recommendations into practical site-based actions. This includes the staged rehabilitation of completed overburden faces, landform shaping, revegetation, riparian restoration, weed and pest control, monitoring, maintenance and adaptive management. The plan will also provide further detail as to how the performance standards in the conditions will be implemented and demonstrate how reporting requirements will be used to ensure that rehabilitation is implemented progressively and that the specified landscape outcomes are achieved over time.

The Objectives of the LEMP includes:

- Defining the landscape objectives for the overburden disposal area during operation and rehabilitation;
- Guiding the shaping of final landforms so they are visually coherent with the surrounding rolling ridgelines and gullies of the Belmont Hills;
- Setting out progressive rehabilitation methods, including topsoiling, hydroseeding, indigenous planting, managed natural regeneration and enrichment planting;
- identifying measures to visually and physically manage the interface with Belmont Regional Park, including the relocated utility track alignment, planted bunds and adjoining public recreation areas;
- providing for riparian creation and stream margin planting associated with reinstated intermittent and ephemeral drainage paths;
- establishing planting principles, species selection, maintenance requirements and replacement planting triggers;
- providing for the translocation, propagation and replacement planting of uncommon indigenous plant species affected by the works;
- identifying pest plant and animal control measures required to support vegetation establishment;
- setting out monitoring, reporting and adaptive management procedures to track rehabilitation performance;
- ensuring that the long-term rehabilitated landform and vegetation cover progressively integrate with the wider regenerating indigenous landscape of the Belmont Hills; and
- providing a basis for ongoing engagement with mana whenua in relation to implementation and long-term rehabilitation outcomes

1.3 IMPLEMENTATION, CERTIFICATION AND ENGAGEMENT

This LEMP provides the overarching framework for rehabilitation of the OBDA. Effective implementation requires a progressive and staged approach which continues over the life of the project. Relevant plans shall be prepared before each stage is commenced to confirm the planting areas, species mix, plant numbers, plant grades, seed mixes, maintenance requirements and any ongoing management measures required.

Each Stage Rehabilitation Landscape Plan shall address the specific landscape management requirements as outlined in the LEMP, namely:

Section 6.0: Final Landform;

Section 7.0: Planting;

Section 8.0: Stream Corridor Restoration;

Section 9.0: Translocation; and

Section 10.0: Existing Wetland Maintenance and Monitoring

The rehabilitation strategy also includes targeted translocation and propagation measures for uncommon indigenous plant species affected by the OBDA, to assist their retention within suitable habitat outside the works footprint. This is addressed separately in Section 9.0:

Each Staged Rehabilitation Landscape Plan and Species Translocation Plan shall be submitted to HCC for certification prior to implementation. Where the plan relates to reinstated stream corridors, riparian planting, drainage paths or freshwater outcomes, it shall also be provided to GWRC for certification or review, as required by the relevant consent conditions.

Consultation with Taranaki Whainui ki te Upoko o te Ika and Ngati Toa Rangatira will be ongoing and is supported through the LEMP as follows:

- Through review and input into each Staged Rehabilitation Landscape Plan; and
- Through review of annual rehabilitation monitoring reports.

2.0 LOCATION AND CONTEXT

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2.1 SITE DESCRIPTION

The Site is a 23.89 ha area on the eastern flank of the Belmont Hills, immediately north of Belmont Quarry within the Dry Creek Block of Belmont Regional Park. It comprises a rolling ridgeline and steep gullies, with elevations ranging from approximately RL 160–216 m.

The landscape is dominated by regenerating native vegetation, including mahoe, mānuka, tree ferns, and broadleaf species, together with remnant pine and macrocarpa from its former farming use. Several ephemeral and intermittent headwater streams traverse the site. Pockets of mature pine and macrocarpa are also present on the more accessible ridgetop areas associated with its former agricultural use.

2.2 LOCATION

The Site occupies part of the existing north-eastern area of Belmont Regional Park, north of the Belmont Quarry which is subject to the proposed land exchange

To the south of the Site, Belmont Quarry is accessed off Hebden Crescent approximately 1.7 km to the south-west of the Belmont Regional Park entrance at Dry Creek. Belmont Quarry occupies part of the western escarpment defining the edge of the Hutt Valley and part of the lower slopes of the Belmont Hills, approximately 6 km north-east of the Lower Hutt Central Business District.

The proposed Site would be accessed directly from Belmont Quarry within the Dry Creek Block. A utility track passes in the vicinity of the northern edge of the Site and provides access between Boulder Hill and the eastern most park access at Dry Creek.

2.3 LANDSCAPE CONTEXT

The Site occupies part of the western hills of Lower Hutt and part of the eastern flanks of the Belmont Hills within Belmont Regional Park. The Site is elevated above and west of the Wellington Fault scarp which physically and visually encloses much of the western edge of the Hutt Valley. It also occupies the area of existing extraction activity within Belmont Quarry.

The broader landscape containing the Site is recognised as part of the Belmont Hills at the district scale and Boulder Hill character area within Belmont Regional Park. This landscape is characterised by rounded hill tops and slopes which rise above the Wellington Fault scarp and extend east of a distinctive flat top central plateau separating the Hutt Valley from Porirua Harbour.

The Western Escarpment lies to the east of the Site and forms a more immediate backdrop to most residential development contained within the Hutt Valley. Near the Site, existing quarrying activity remains clearly apparent. Areas of rural lifestyle development have also extended on parts of the western hills beyond the existing quarry including rural lifestyle development to the north of Kelson.

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3.1 EXISTING VEGETATION

The fringes of the overburden footprint will extend into the existing dense woody vegetation on the western gullies and spurs of the site. The woody vegetation is a mixture of native vegetation and exotic pest species. Regenerating native vegetation is well established in the base of the gullies where few weeds species persist. The regenerating native vegetation on the upper slopes of the gullies and tops of the spurs is less advanced and comprises a mixture of native species such as mahoe, wineberry, manuka, rangiora, kawakawa with areas of gorse, especially on the crests.

Good seed sources of native species are located in proximity, with two areas of secondary native forest located nearby. One just west of the OBDA has a closed canopy, including tawa and rewarewa. The second area is within the Belmont Quarry in a valley to the north of the OBDA. This area has a diverse mix of broadleaf species with emergent rewarewa and tawa and includes some identified swamp maire and rama rama within the Site for which relocation will occur.

The OBDA is relatively free of woody pest plant species compared to similar sites in the Wellington area. Gorse is the predominant species and has been largely contained to clumps by grazing. Gorse seed, with its long viability in the ground, is expected to be the most persistent weed species throughout the rehabilitation process. The absence of other woody pest plants such as brush wattle which is an aggressive colonising species and is present in many places along the western hills and elsewhere will be a real advantage for the rehabilitation of the site.

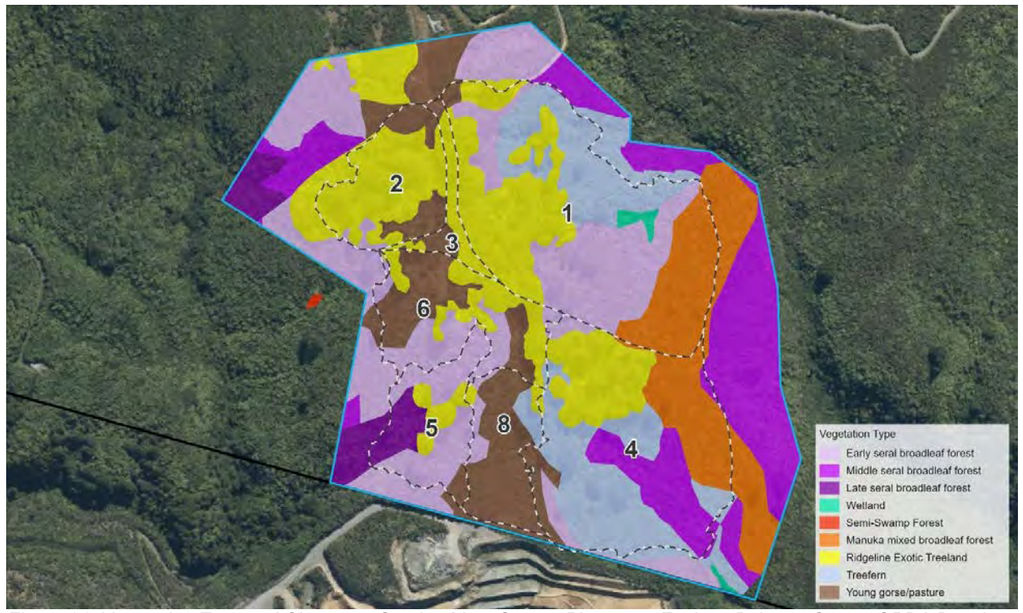


Figure 01: Vegetation Type and Clearance Staging Map. Source Bluegreen Ecology Belmont Quarry OBDA Development Ecological Values,Effects and their Managment

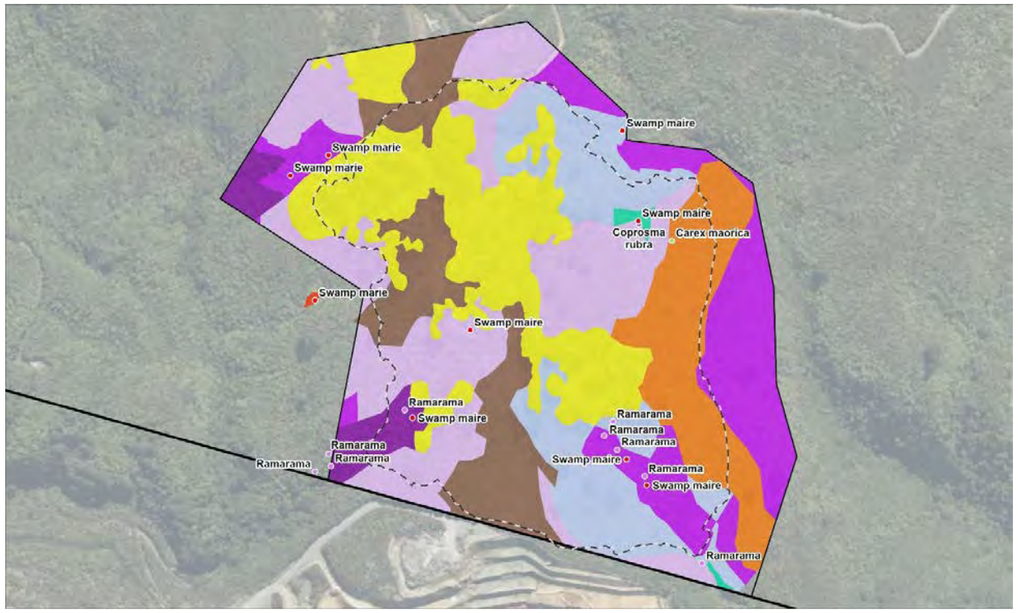


Figure 02: Locations of the threatened and regional uncommon plants in the mapped vegetation communities (locations not actual numbers). Source Bluegreen Ecology Belmont Quarry OBDA Development Ecological Values,Effects and their Managment

4.0 REHABILITATION STRATEGY: LANDSCAPE

4.1 LANDSCAPE STRATEGY

The anticipated landscape outcomes for the rehabilitation of the Site are:

- Progressively rehabilitate the OBDA as part of the staged construction sequence, so that completed landform surfaces are stabilised, topsoiled, hydroseeded and revegetated as soon as practicable, limiting exposed surfaces and reducing landscape and visual effects during operation.
- Integrate the final OBDA landform with the surrounding Belmont Hills landscape character, including plantable and maintainable slopes, a rounded and naturalised final ridgetop form, and landform shaping that avoids an overly engineered or benched appearance.
- Establish a resilient indigenous vegetation cover across the rehabilitated OBDA, using managed natural regeneration, active indigenous planting and enrichment planting with locally appropriate species, naturalistic planting patterns and feathered edges to support long-term ecological succession, slope stability and visual integration.
- Reinstate and naturalise drainage paths, intermittent and ephemeral stream margins, and riparian corridors, using indigenous riparian planting to support stream margin stability, shading, organic matter inputs, weed suppression, ecological function and integration with the surrounding regenerating landscape.
- Maintain, monitor and adaptively manage rehabilitation outcomes until the LEMP objectives are achieved, including pest plant and animal control, replacement and enrichment planting, measurable performance standards, annual reporting, and remedial works where required.

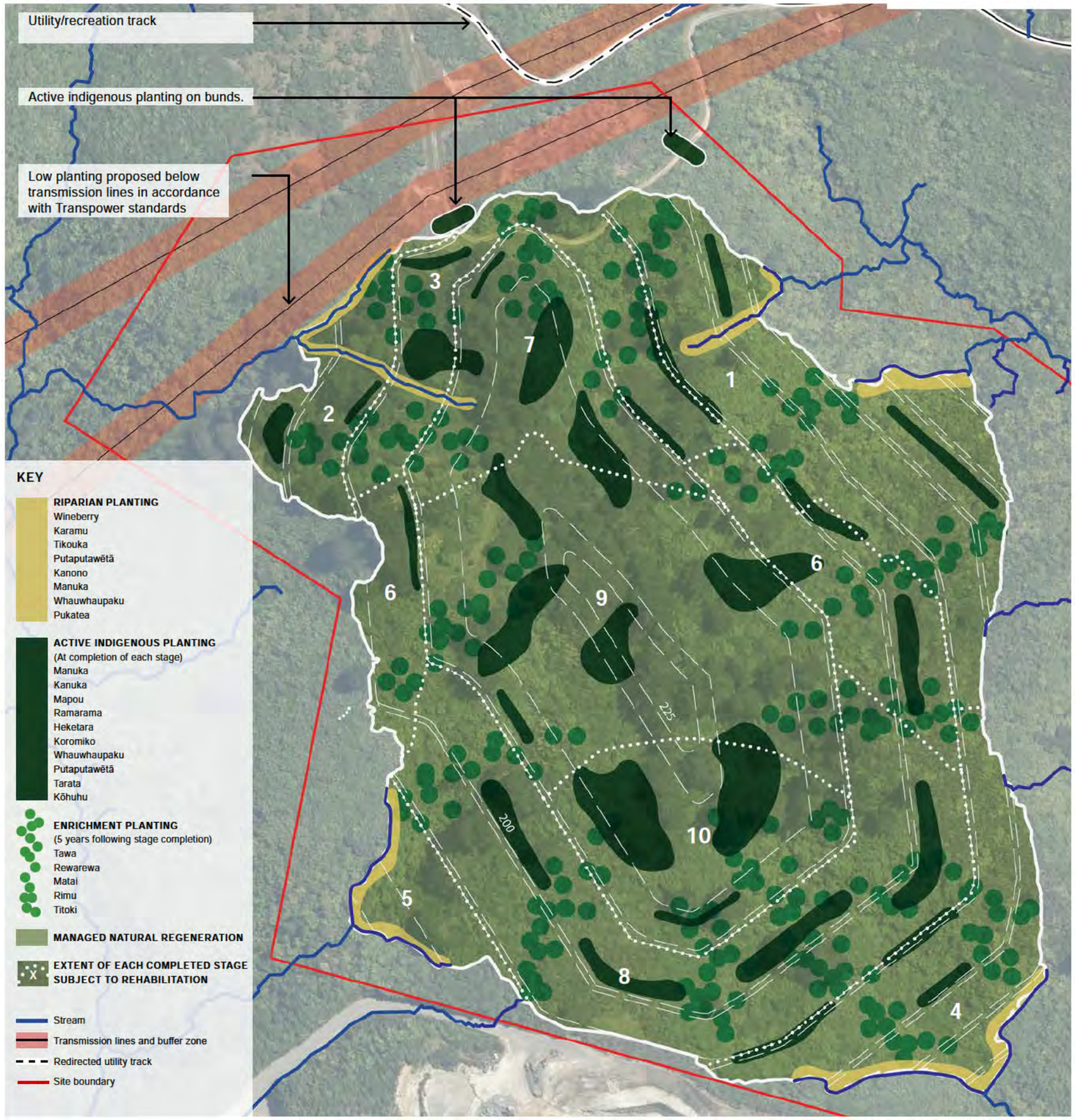


Fig 03: Landscape Strategy

5.0 REHABILITATION STRATEGY: STAGING

5.1 LANDSCAPE STAGING

The following Images Illustrate the indicative OBDA landform development stages as the progress over the life of project and their relationship to the phases of proposed Landscape Rehabilitation associated with the completion of each stage.

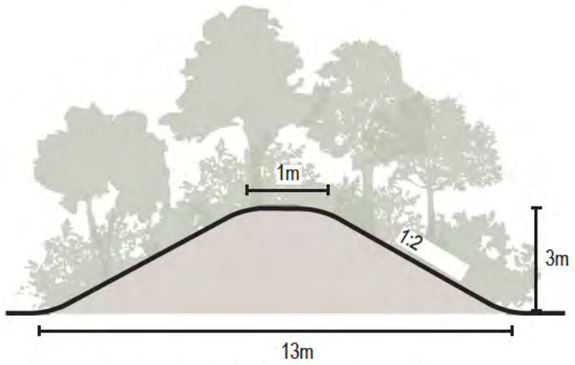
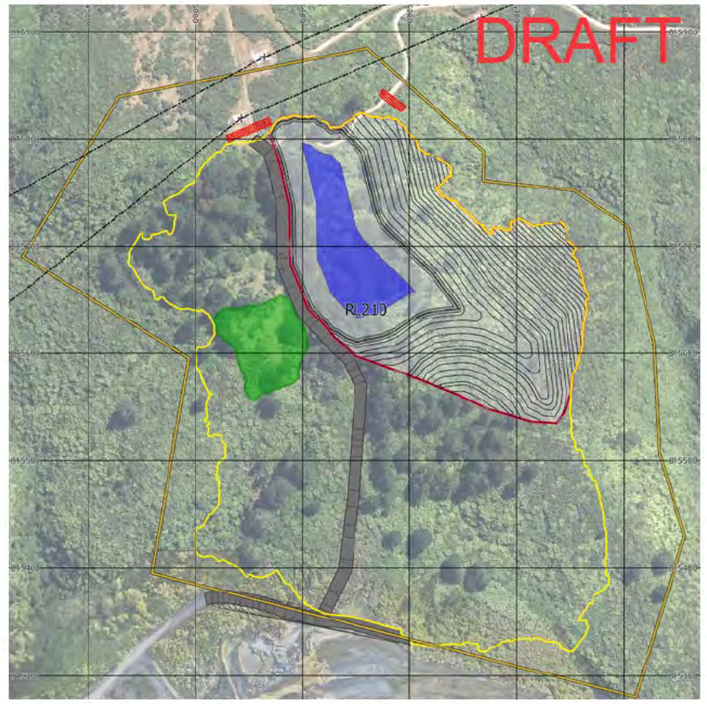


Fig 04: Bund Planting undertaken at stage 0.

In accordance with the landscape strategy, a Staged Rehabilitation Landscape Plan shall be prepared for each stage to address the following:

- the area of final landform to be rehabilitated;
- topsoil placement and soil preparation requirements;
- hydroseeding methodology and seed mix;
- active indigenous planting areas;
- riparian planting areas and indicative planting widths;
- species schedules, plant numbers, plant grades, spacing and densities;
- eco-sourcing requirements;
- enrichment planting triggers and proposed enrichment species;
- weed and pest animal control requirements;
- maintenance and replacement planting requirements;
- monitoring methods and performance standards; and
- any changes required through adaptive management.

Stage 0 Enabling Works

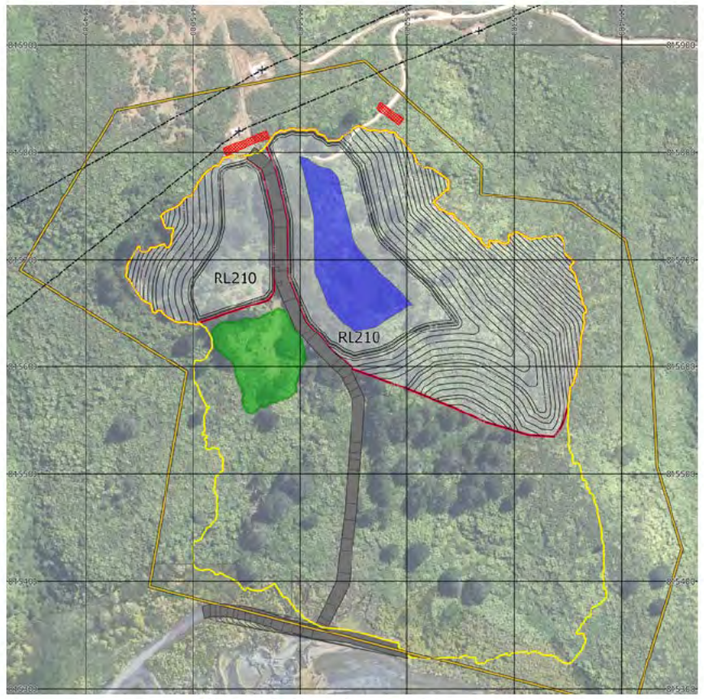


Stage 1 Landform Complete

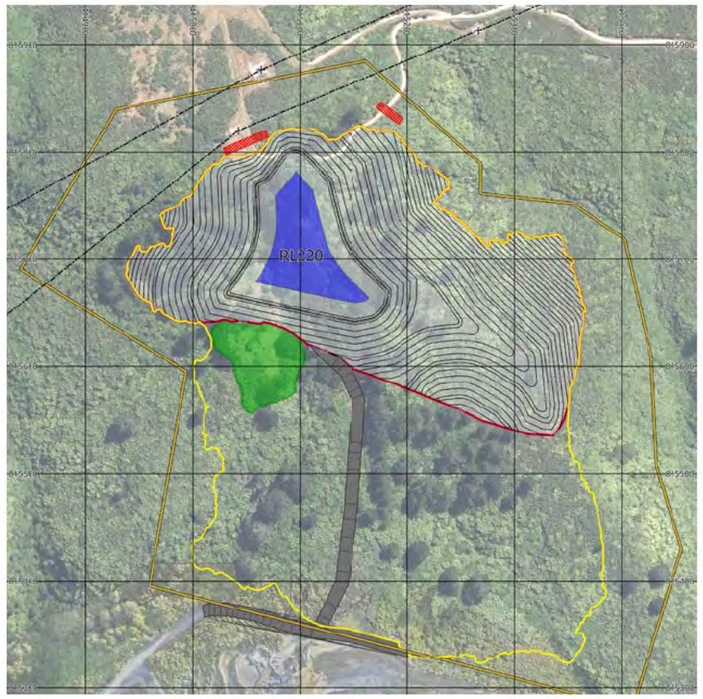
Stage 0 Landscape Rehabilitation extent

Stage 1 Landscape Rehabilitation extent

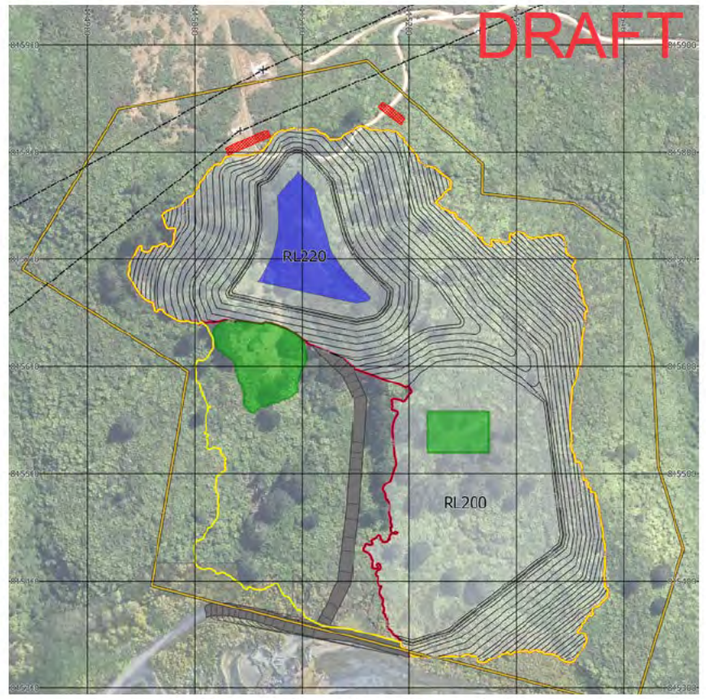
Proposed Stages of Development (Stages 0-1)



Stage 2 Landform Complete

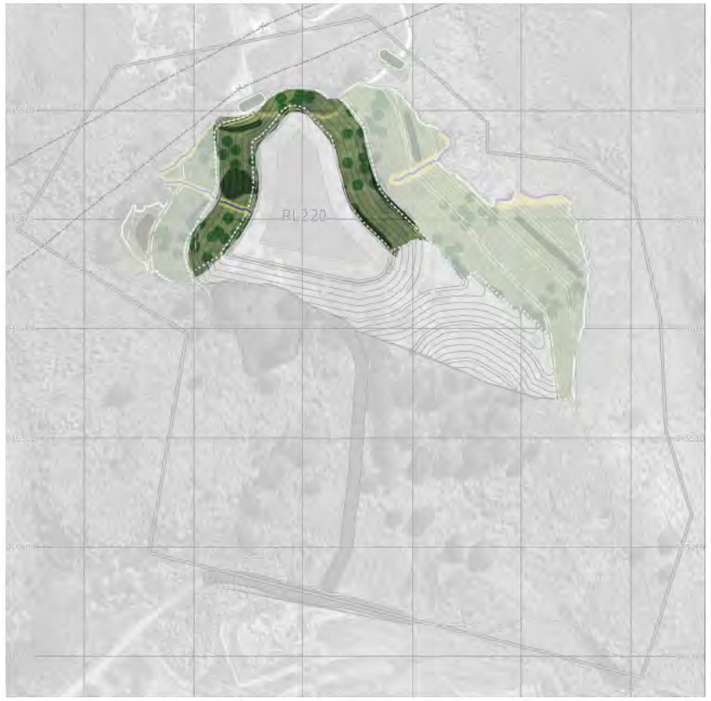


Stage 3 Landform Complete

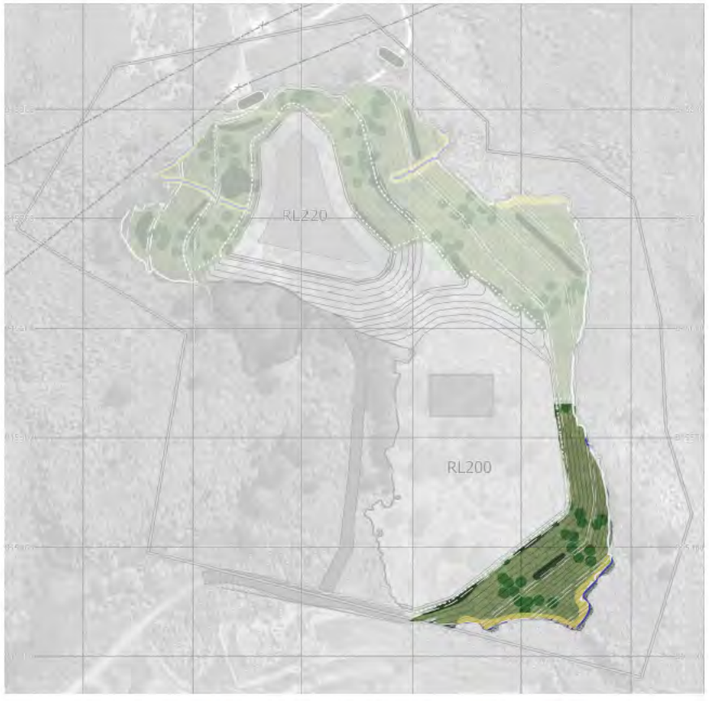


Stage 4 Landform Complete

Stage 2 Landscape Rehabilitation extent

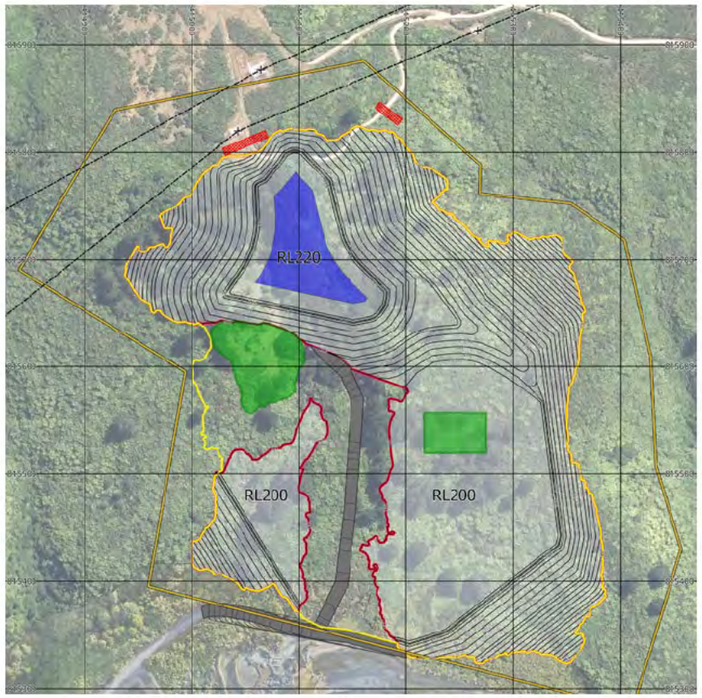


Stage 3 Landscape Rehabilitation extent

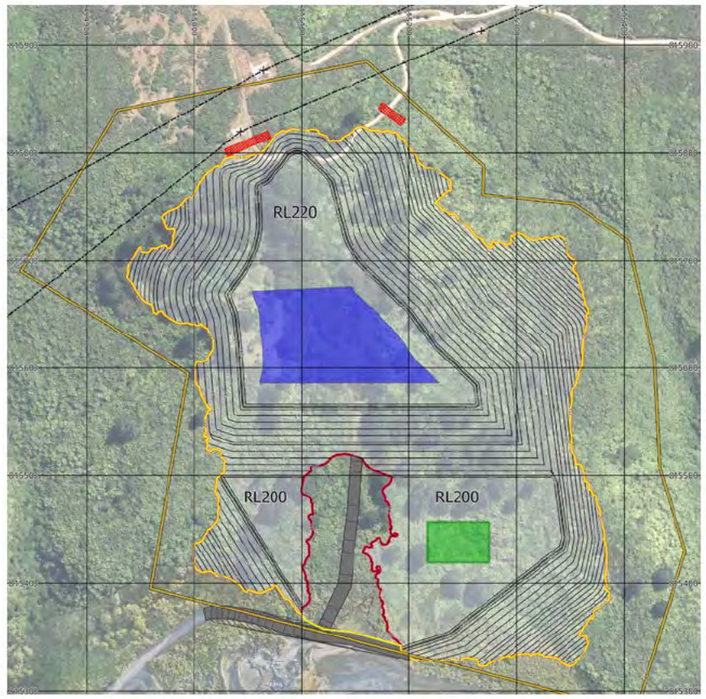


Stage 4 Landscape Rehabilitation extent

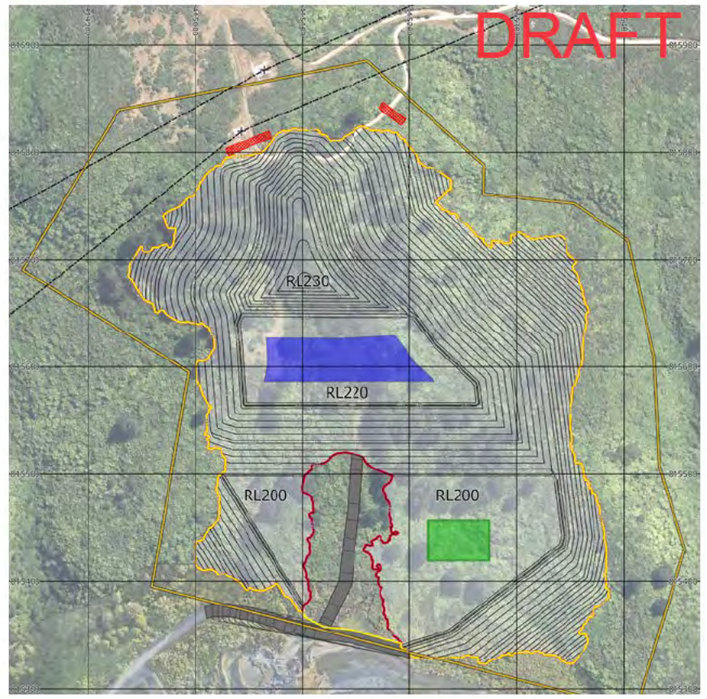
Proposed Stages of Development (Stages 2 - 4)



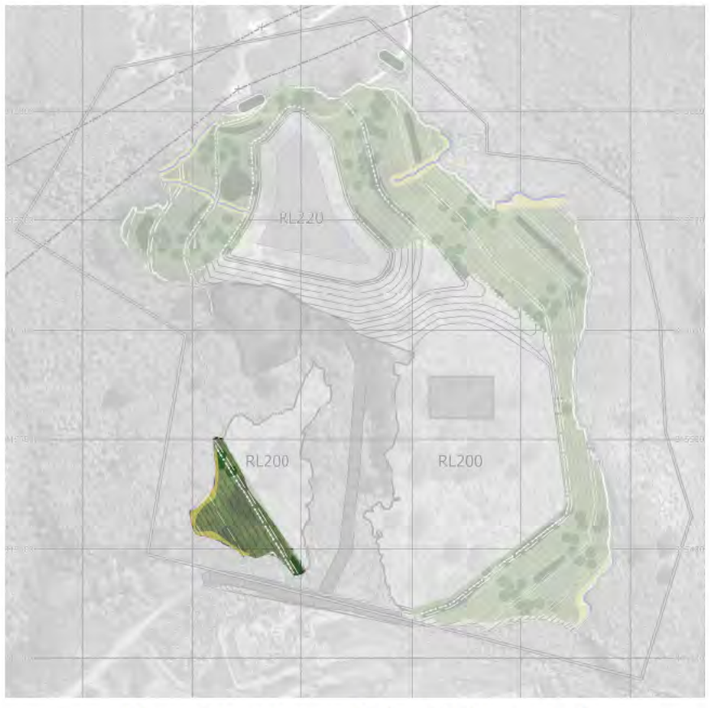
Stage 5 Landform Complete



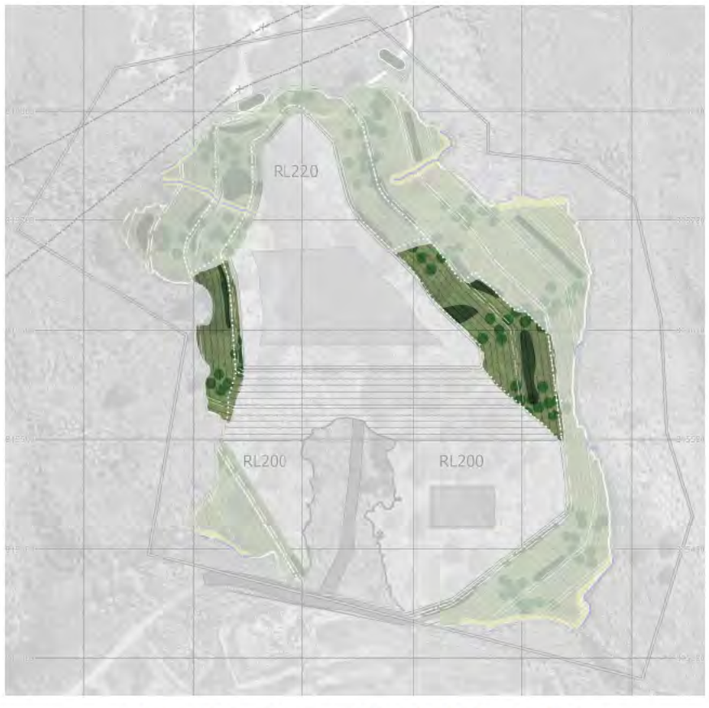
Stage 6 Landform Complete



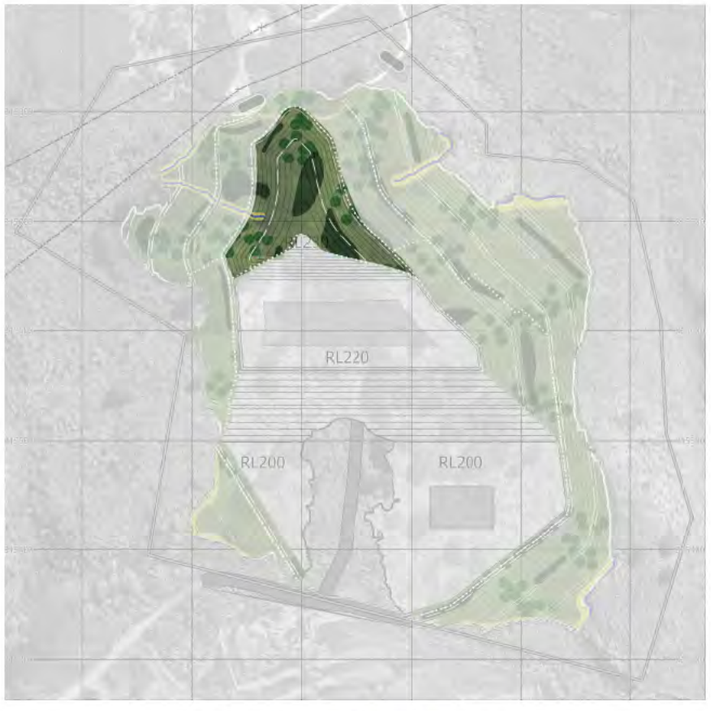
Stage 7 Landform Complete



Stage 5 Landscape Rehabilitation extent



Stage 6 Landscape Rehabilitation extent

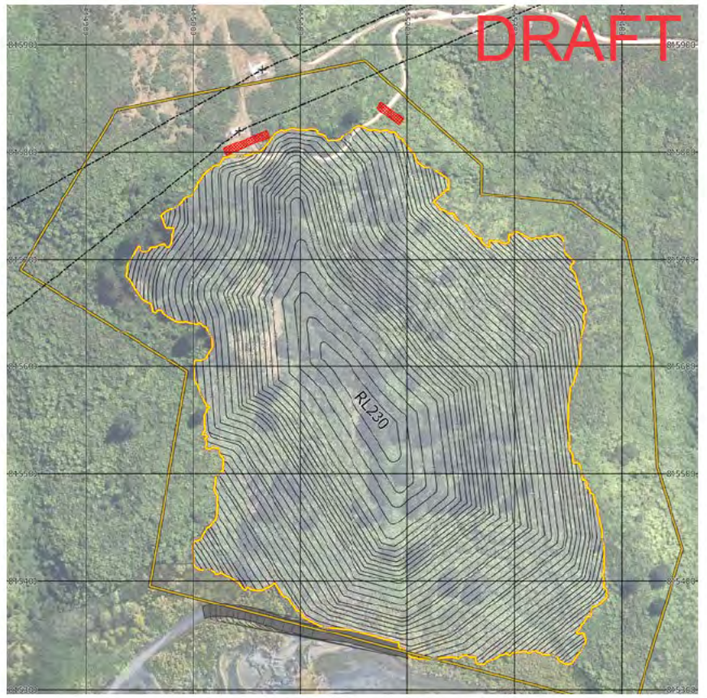


Stage 7 Landscape Rehabilitation extent

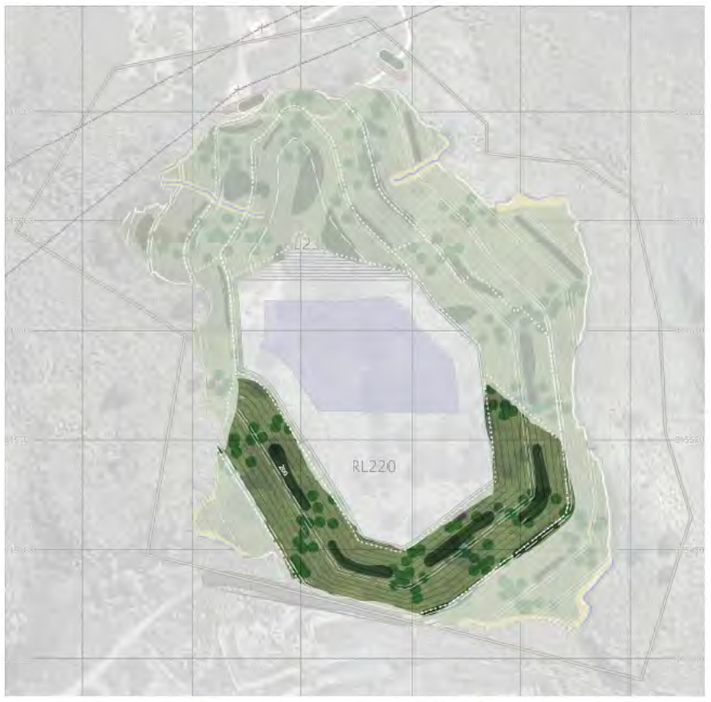
Proposed Stages of Development (Stages 5 - 7)

Stage 8 Landform Complete

Stage 9 Landform Complete



Stage 10 Landform Complete



Stage 8 Landscape Rehabilitation extent

Stage 9 Landscape Rehabilitation extent

Stage 10 Landscape Rehabilitation extent

Proposed Stages of Development (Stages 8- 10)

6.0 REHABILITATION STRATEGY: LANDFORM

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6.1 PURPOSE

Creating new landform is inherent as part of overburden placement. Through this process the purpose of rehabilitation is to progressively create areas of stable, naturalised landform that visually integrate with the surrounding Belmont Hills landscape while providing suitable growing conditions. This aspect of landscape rehabilitation will be undertaken progressively throughout the life of the OBDA to minimise the extent and duration of exposed surfaces and to ensure rehabilitation can commence as soon as areas become available at the completion of each stage. The cumulative completion of landform rehabilitation should ultimately enable the OBDA to appear integrated within the existing hill country topography and support effective long-term revegetation.

6.2 REHABILITATION OBJECTIVES

The landform rehabilitation strategy shall:

- achieve a safe and geotechnically stable landform
- integrate the OBDA with the surrounding ridgelines, spurs and gullies of the Belmont Hills
- reduce the visual prominence of engineered batter slopes and benches
- provide suitable growing conditions for indigenous vegetation establishment and ecological succession
- reinstate natural drainage patterns and stream corridors across the rehabilitated landform and;
- create a landform capable of supporting self-sustaining ecological systems with minimal long-term intervention.

6.3 LANDFORM DESIGN PRINCIPLES

Landform rehabilitation shall be guided by the natural characteristics of the surrounding landscape. Landform shaping should seek to avoid abrupt changes in grade, overly geometric forms, straight slope alignments, or features that emphasise the engineered origin of the OBDA. Where practicable, ridgelines, upper slopes and gully forms shall be rounded and softened to reflect the rolling topography characteristic of the wider Belmont Hills landscape.

While benching may be required for engineering and operational purposes, completed landforms should visually recede over time through addition of overburden and topsoil material, vegetation establishment and natural weathering. Vegetation shall be used as the primary means of integrating the final landform into the surrounding landscape.

The methods use to achieve the identified landform principles are set out below:

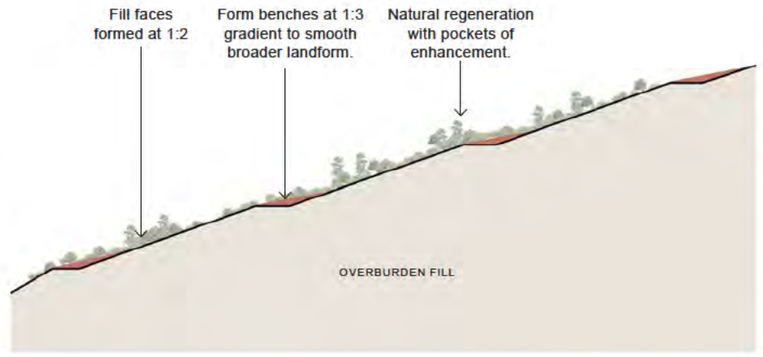

Fig 05: typical cross section of naturalisation of benching fill faces

1) VEGETATION REMOVAL

The removal of vegetation will be progressive with only enough vegetation being removed at any one time to facilitate the immediate placement of overburden. The vegetation removed will be collected and mulched for spreading on the completed batter slopes (where practicable) or lost in the earthworks.

2) TOPSOIL MANAGEMENT

Available topsoil shall be stripped, stockpiled and reused within rehabilitation areas wherever practicable to ensure no more than a maximum of 2.5 ha. is exposed at any one time. Topsoil piles need to be placed in areas where there are Erosion and Sedimentation Control Plans in place and away from wetland fringes and steams. The reuse of site-derived topsoil will assist vegetation establishment by retaining seed banks, soil microorganisms, organic matter and other biological attributes that support ecological restoration. Topsoil shall be spread across rehabilitated surfaces to provide a suitable growing medium for hydroseeding, natural regeneration and indigenous planting.

3) SITE DEVELOPMENT WORKS

Works include construction of an access road, installation of drainage within the gully inverts and forming sediment retention ponding areas and other silt control measures, such as bunds, contour drains and soakage pits.

A bund of granular overburden will be formed at the toe of each gully and granular overburden will be used to construct the face of the overburden batter slope. Soft material in the gully invert beneath the toe of the overburden batter slope may be excavated and a shear key of granular material placed as required to ensure the stability of the batter slope.

4) OVERBURDEN PLACEMENT

Overburden material from the quarry will be placed in layers (lifts), each being approximately 2.0 to 5.0m thick. As the material is placed on the earthworks surface, it will be bladed and compacted using a bulldozer orwheeled compactor. A bulldozer or excavator will be used to shape the batter slope to its final profile.

5) PROGRESSIVE REHABILITATION

Rehabilitation shall occur progressively as individual stages of overburden placement are completed. As soon as practicable following completion of final shaping works subject to landscape rehabilitation, exposed surfaces shall be stabilised through topsoil placement, hydroseeding, natural regeneration, active indigenous planting and riparian planting as appropriate. Progressive rehabilitation will reduce the visual effects of exposed earthworks, improve erosion resistance and to allow vegetation communities to establish throughout the operational life of the OBDA rather than only at its completion.

6) HYDROSEEDING

At the conclusion of the earthworks season all bare surfaces (excluding any required haul roads) will be hydroseeded as soon as reasonably practicable. This initial early cover of grass will assist in reducing the visual impact of the area from surrounding residences while reducing the period that the soil is exposed to the elements and thus progressively reducing sediment runoff from the site. Any areas of permanent revegetation will be topsoiled and hydroseeded with a grass/ native vegetation mix, as per proposed planting set out in Section 7: Planting

7) DRAINAGE AND GULLY RESTORATION

The final landform shall incorporate naturalised drainage corridors and reconstructed stream systems to reflect the existing gully structure affected by the OBDA. Drainage features shall be integrated into the rehabilitated landform and designed to provide stable conveyance of runoff while supporting indigenous riparian vegetation and ecological function. Stream rehabilitation shall contribute to the long-term objective of achieving a Stream Ecological Valuation (SEV) score equivalent to or greater than that of the streams affected by the development. Placement of suitable stabilised and natural gravels and rocks shall be placed to create environments to support ecological function and outcomes present prior to construction of the OBDA as addressed in section 8.0 Rehabilitation Strategy: Stream Restoration

6.4 SUCCESS CRITERIA

Final OBDA landform shaping shall provide plantable and maintainable slopes, generally no steeper than 1V:2H where relied on for rehabilitation planting, unless otherwise certified as suitable for long-term revegetation, maintenance and stability.

Final shaping of Stage 10 shall provide a rounded, naturalised form that responds to the surrounding Belmont Hills landform character and avoids an overly engineered or benched appearance when viewed from surrounding public and residential viewpoints.

7.0 REHABILITATION STRATEGY: PLANTING

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7.1 PLANTING

The proposed ecological restoration programme will progressively restore indigenous vegetation communities and intermittent stream systems across the entire overburden disposal area (OBDA) over approximately 35–40 years. At completion, the Site will support a fully indigenous vegetation cover, including broadleaf forest, mānuka-kānuka shrubland, tree fern communities, and restored ephemeral stream networks.

The rehabilitation stage will comprise the following:

- Hydroseeding and managed natural regeneration
- Active indigenous planting.
- Enrichment planting.

Each aspect of rehabilitation performs a specific function within the overall rehabilitation program and is intended to progressively develop landscape and ecological values over time.

7.2 OBJECTIVES

The planting design is intended to achieve long term native revegetation and ecologicaloutcomes that are equal to or better than the current condition of the Site. Planting will also support the restoration and long-term maintenance of intermittent stream systems and natural drainage pathways, while responding to site-specific landform, soil, hydrological and ecological conditions. This is addressed in further detail in section 8.0

The design and implementation approach will seek to accelerate ecological succession beyond that likely to occur through unmanaged natural regeneration. In doing so, it will minimise biodiversity loss, strengthen ecological connectivity and improve the likelihood of establishing resilient, self-sustaining indigenous vegetation over the long term.

The methods used to achieve these outcomes are set out below:

7.3 MANAGED NATURAL REGENERATION

Natural regeneration will be a primary mechanism for vegetation development throughout the rehabilitation area. Given the proximity of the OBDA to extensive areas of regenerating and established indigenous vegetation, natural recruitment of indigenous species is expected to contribute significantly to long-term rehabilitation outcomes.

As final landforms are completed, a succession-based approach will be adopted whereby an initial hydroseeded cover provides the framework for natural regeneration. The hydroseed mix shall comprise non-clump forming grass species such as sweet vernal (Anthoxanthum odoratum), browntop (Agrostis capillaris) and timothy (Phleum pratense) grass seed interspersed with suitable native species, where practicable, such as kānuka (Kunzea spp.) and mānuka (Leptospermum scoparium), together with fertiliser. Opportunities to include compost and alternative enrichment species within the hydroseed mix should also be trialled with contractors, where practicable, to assist seed germination and subsequent seedling establishment.

Hydroseeded areas will be inspected approximately six weeks after application. Where establishment has been unsuccessful, the likely cause will be assessed and appropriate remedial measures undertaken, including further surface preparation or reapplication of hydroseed where required.

Ongoing maintenance will control weed abundance and composition sufficiently to support natural succession. Enrichment planting may be undertaken where required, generally five years following completion of each stage, using species selected from the enrichment planting list. This will supplement natural regeneration and assist with slope stability, indigenous vegetation development and ecological connectivity.

7.4 ACTIVE INDIGENOUS PLANTING

The primary function of active indigenous planting is to introduce hardy pioneer and early successional species capable of establishing in exposed quarry conditions, stabilising soils, suppressing weed

establishment, and creating the shelter required for natural regeneration and long-term forest succession. The active indigenous vegetation will provide establisheds seed sources and a mosaic of planting to reflect natural succession processes. At approximately Year 5, monitoring will be used to assess vegetation performance and determine whether additional planting or enrichment planting is required to support the ongoing development of a diverse and self-sustaining indigenous vegetation community.

Planting contracts shall include a standard defects liability period for 3 years. During this period, any plant that fails, dies, becomes diseased, or is otherwise not achieving healthy establishment shall be replaced with the same or an appropriate equivalent indigenous species during the next suitable planting season. Replacement planting shall be maintained as part of the ongoing establishment and maintenance requirements for the rehabilitation area.

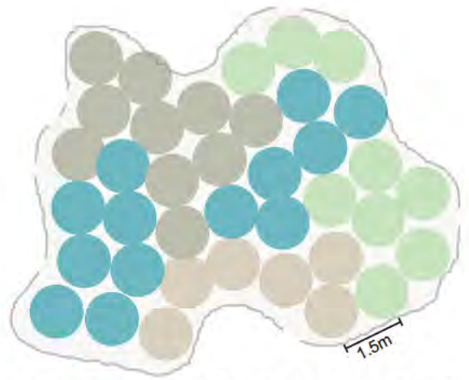

Fig 06: indicative Active Indigenous Planting Layout: Planting will not be carried out in straight lines or within a regular pattern. Instead planting will occur in random clusters with the aim of emulating the plant associations and patterns that occur naturally. Edges to Active indiginous plantings shall be naturalised with no defined linear boundaries

7.5 ENRICHMENT PLANTING

Enrichment planting will be undertaken selectively as a succession management tool to supplement natural regeneration where required. Given the proximity of the OBDA to established and regenerating indigenous forest, natural recruitment of native species is expected to be a significant driver of long-term rehabilitation outcomes.

At Year 5 following stage completion, the site shall be assessed as part of the regular monitoring regime to assess vegetation establishment, species diversity and natural recruitment.

Where succession is progressing as anticipated, natural regeneration will remain the primary mechanism for forest development. Where gaps in canopy development or target species recruitment are identified, enrichment planting will be undertaken to introduce secondary and canopy species, increase biodiversity, accelerate forest succession and enhance the long-term ecological and landscape integration of the rehabilitated landform.

7.6 PLANTING COMPLETION CRITERIA

Upon completion of all stages and restoration works, the OBDA will comprise a continuous indigenous canopy of locally appropriate native species, including mature canopy trees with interspersed exotic scrubland. The site is expected to achieve an ecological condition that is at least equivalent to, and likely better than, the condition that would result if the existing site were left unmanaged. The restoration program is therefore anticipated to deliver a net positive ecological outcome over the long term.

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7.8 PLANT SPECIES OF THE OBDA AREA

Indicative plant species and locations have been provided below: Plant Species shall be selected from this list. Alternative species may be selected at the instruction of the project ecologist and selected from species observed within the OBDA ecology report and noted species

RIPARIAN PLANTING

Wineberry
Aristotelia serrata

Karamū
Coprosma robusta

Tī Kouka
Cordyline australis

Putaputawētā
Carpodetus serratus

Kanono
Coprosma grandiflora

Mānuka
Leptospermum scoparium

Whauwhaupaku
Pseudopanax arboreus

Pukatea
Laurelia novae-zelandiae

The primary purpose of riparian planting is to restore the ecological and visual function of drainage features within the rehabilitated landform, while providing habitat connectivity and supporting natural regeneration processes. At approximately Year 5, monitoring will assess vegetation establishment, channel stability, and indigenous species recruitment to determine whether supplementary planting is required to achieve a continuous and self-sustaining riparian corridor integrated with the surrounding rehabilitated landscape.

ACTIVE INDIGENOUS PLANTING

Mānuka
Leptospermum scoparium

Kānuka
Kunzea ericoides

Māpou
Myrsine australis

Ramarama
Lophomyrtus bullata

Heketara
Olearia Rani var. Colorata

Koromiko
Veronica stricta

Kāpuka
Griselinea littoralis

Whauwhaupaku
Pseudopanax arboreus

Putaputawētā
Carpodetus serratus

Tarata
Pittosporum eugenoides

Kōhūhū
Pittosporum tenufolium

The primary function of active indigenous planting is to introduce hardy pioneer and early successional species capable of establishing in exposed quarry conditions, stabilising soils, suppressing weed establishment, and creating the shelter required for natural regeneration and long-term forest succession. The active indigenous vegetation will provide establisheds seed sources and a mosaic of planting to reflect natural succession processes. At approximately Year 5, monitoring will be used to assess vegetation performance and determine whether additional planting or enrichment planting is required to support the ongoing development of a diverse and self-sustaining indigenous vegetation community.

ENRICHMENT PLANTING

Tawa
Beilschmiedia tawa

Rewarewa
Knightia excelsa

Mataī
Prumnopitys taxifolia

Rimu
Dacrydium cupressinum

Tītoki
Alectryon excelsus

The purpose of enrichment planting is to accelerate ecological succession by introducing longer-lived secondary and canopy tree species that would otherwise take much longer to establish naturally. Enrichment planting will increase species diversity, improve habitat values, enhance long-term landscape integration, and assist in the development of a self-sustaining indigenous forest community characteristic of the Belmont Hills.

FileRef:W15069_LVA_Belmont_Quarry_OverburdenDisposalArea_LMP_260803.indd

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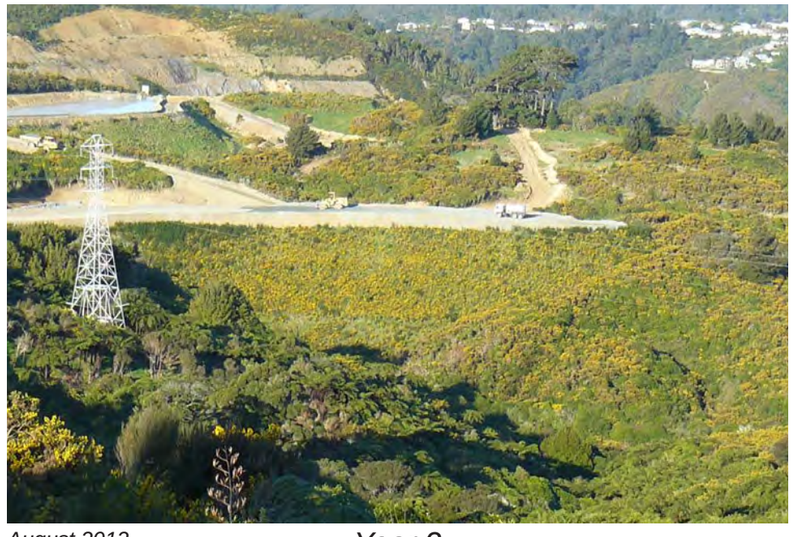
7.9 PRECEDENT IMAGES OF OBDA REHABILITATION

February 2010 — Year 0



August 2012 — Year 2

February 2014 — Year 4

September 2015 — Year 5

December 2016 — Year 6

July 2018 — Year 8

PRECEDENT IMAGES OF OBDA REHABILITATION: BELMONT QUARRY (COTTLE BLOCK), LOWER HUTT, WELLINGTON

The images above illustrate how OBDA rehabilitation can be successfully “re-greened” over time, helping to integrate the exposed soil and earth. These examples show OBDA rehabilitation at Belmont Quarry, operated by Winstone Aggregates in Lower Hutt, Wellington, with photographs from 2010, 2012, 2014, and 2016. OBDA rehabilitation can strongly influence how well the surrounding landscape recovers and integrates over time. The way batter slopes are shaped, stabilised, and planted determines how successfully vegetation can establish, blend, and eventually naturalise across the modified landform. When care is taken with contouring, soil placement, and appropriate species selection, these slopes can support hardy, resilient plant communities that reduce visual contrast and promote long-term landscape cohesion. In this way, well-planned treatment of each batter slope makes a measurable difference in the overall appearance, stability, and landscape integration of the rehabilitated OBDA.

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8.1 STREAM REHABILITATION

The rehabilitated drainage corridors, ephemeral streams and associated riparian margins within the OBDA shall be designed, established and managed to achieve a Stream Ecological Valuation (SEV) score that is equivalent to, or greater than, the SEV score of the streams and drainage features affected by overburden deposition. Rehabilitation measures shall seek not only to reinstate hydrological function, but also to enhance ecological condition through the re-establishment of indigenous riparian vegetation, habitat diversity, naturalised channel form, ecological connectivity and improved stream margin stability. The stream rehabilitation programme shall contribute to a net positive ecological outcome over time, recognising that stream and riparian values will develop progressively as vegetation communities mature.

The objectives of stream rehabilitation are to:

Re-establish natural drainage pathways within the completed landform. Reinstate the visual expression of gullies and stream corridors within the rehabilitated landscape.

- Re-establish natural drainage pathways within the completed landform. Reinstate the visual expression of gullies and stream corridors within the rehabilitated landscape.
- Provide habitat connectivity between surrounding indigenous vegetation remnants.
- Enhance water quality through natural filtration, shading and bank stabilisation.
- Reduce erosion and sediment generation.
- Establish indigenous riparian vegetation reflective of local ecological conditions.
- Support long-term ecological restoration outcomes identified in associated ecological assessments.
- Integrate drainage features into the wider landscape rehabilitation framework.
- Take into account Mana Whenua input into the design, establishment and monitoring of reinstated stream corridors, including the selection of culturally appropriate indigenous riparian species and the recognition of mauri, habitat connectivity, water quality and long-term ecological restoration outcomes

8.2 STREAM CORRIDOR FORMATION

Riparian planting shall be undertaken as soon as practicable following completion of final landform shaping and topsoil placement.

The riparian planting corridor shall generally occur within a minimum 5-10 metre corridor on either side of reconstructed drainage features where space and operational requirements allow.

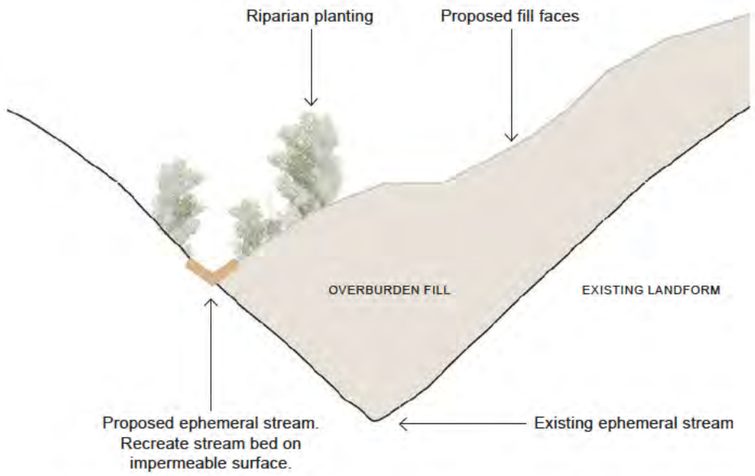

Fig 07: Typical cross section through gully restoration areas

Planting shall utilise a succession based approach comprisingspecies identified in the Landscape Strategy with initial plantings of speciesfrom the riparian planting list and subsequent enrichment planting where required and selected from the enrichment planting list (5 years following stage completion).

8.3 RIPARIAN PLANTING

Riparian creation shall be implemented as part of the progressive rehabilitation of the OBDA, with particular focus on reinstated intermittent and ephemeral stream margins and associated drainage paths. Riparian planting shall be designed to assist the naturalisation of the reinstated stream corridors, support slope stability, provide shade and organic matter inputs, and visually integrate the new drainage patterns with the surrounding regenerating Belmont Hills landscape.

Planting shall be undertaken as soon as practicable following completion of final landform shaping and topsoil placement.

The riparian planting corridor shall generally occur within a minimum 5-10 metre corridor on either side of reconstructed drainage features where space and operational requirements allow.

8.4 STREAM REHABILITATION CRITERIA

Stream rehabilitation outcomes shall be measured through ecological monitoring, including SEV assessment, riparian planting establishment, channel stability, vegetation cover, weed pressure, erosion, sediment generation, shading, habitat diversity and evidence of hydrological function. Baseline SEV scores shall be confirmed for affected streams and drainage features prior to overburden deposition. Following reinstatement, SEV monitoring shall be undertaken at appropriate intervals to confirm whether the rehabilitated drainage corridors are tracking towards an equivalent or greater ecological function than the affected streams.

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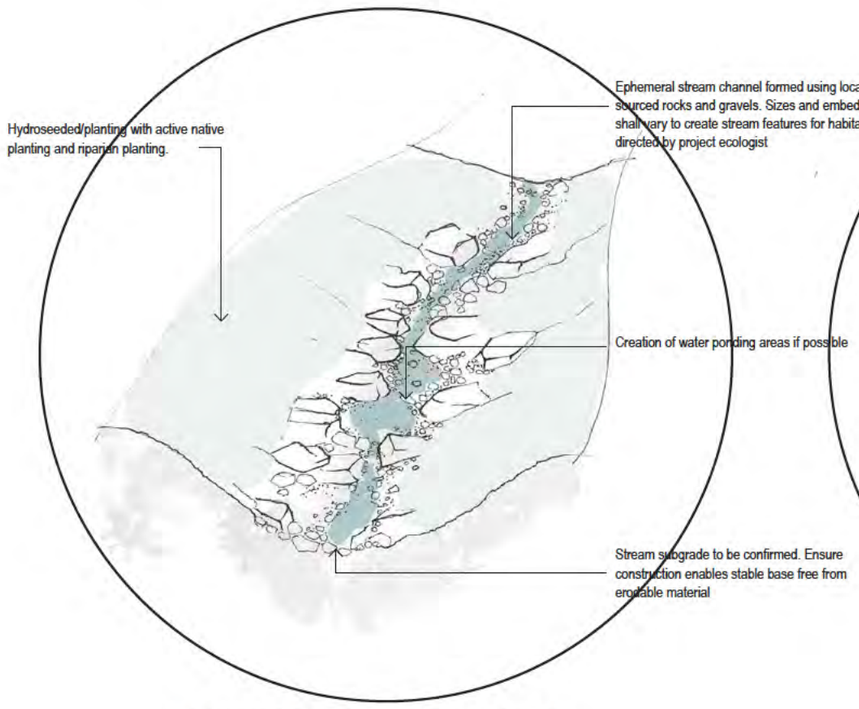
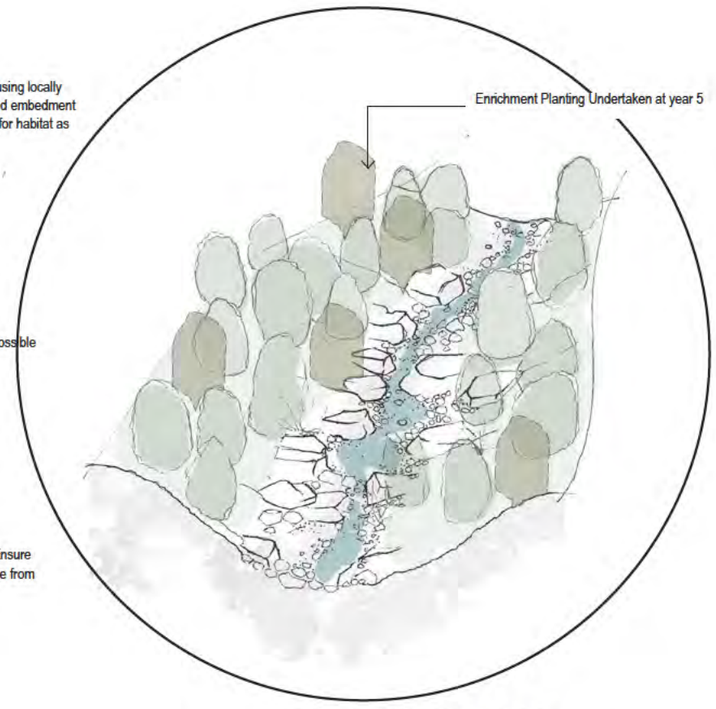
8.4 STREAM REHABILITATION STAGING

The rehabilitated drainage corridors, ephemeral streams and associated riparian margins within the OBDA shall be designed, established and managed to achieve a Stream Ecological Value (SEV) Rating the same or better than prior to the OBDA commencing.



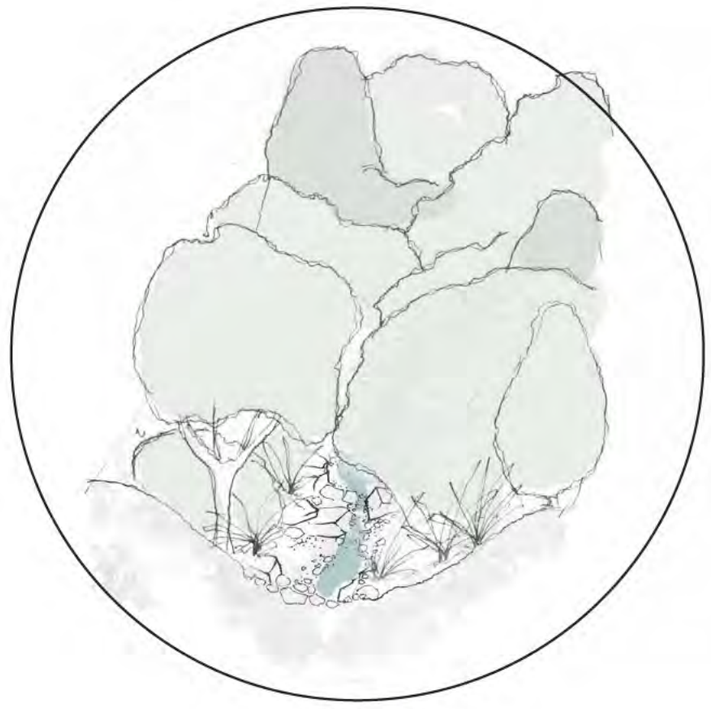
EPHEMERAL STREAM CREATION

Placement of stone features, gravel shall be at the direction of the ecologist to ensure the ecological function achieves that of the pre-existing framework.



ESTABLISHMENT PHASE

Riparian Planting Year 1 (dashed denotes enrichment planting (year 5)



YEAR 10

Riparian Planting on completion of enrichment planting (10 years)

9.0 REHABILITATION STRATEGY: TRANSLOCATION

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9.1 TRANSLOCATION STRATEGY

The ecological assessment has identified three uncommon species (ramarama, swamp maire, Coprosma rubra) which are suitable candidates for translocation to ensure the presence of ongoing locally present uncommon species. Prior to vegetation clearance, all affected swamp maire, ramarama and Coprosma rubra specimens shall be surveyed, tagged and accurately recorded to inform future management and monitoring. Suitable recipient sites shall be identified outside the OBDA footprint (see Figure 8). These sites shall reflect the habitat requirements of each species, including hydrological conditions, soil moisture, vegetation structure and ecological context.

Prior to vegetation clearance within Stage 1, a Species Translocation Plan shall be prepared by an SQEP. The Species Translocation Plan shall be prepared before clearance of the relevant stage and shall identify:

- the location, species, size, condition and health of all affected plants;
- which plants are suitable for direct translocation, propagation, seed collection (for Swamp Maire), cutting material or replacement planting;
- the proposed recipient sites for each species;
- the method of lifting, transport, temporary holding, planting and aftercare;
- site preparation requirements;
- timing of works;

Monitoring shall be undertaken following translocation to assess plant survival, health and establishment. Monitoring shall initially occur at 3 months, 6 months then annually until Year 5, unless otherwise specified in the Species Translocation Plan. Monitoring shall record plant survival, canopy condition, new growth, dieback, pest or disease impacts, weed competition, browsing damage, soil moisture and any remedial works required.

9.2 RAMARAMA TRANSLOCATION

Prior to development of the site, suitable Ramarama shall be selected and translocated by full excavation using the appropriate machines in the same way street trees are often moved where the device encompasses the entire root ball and stem, lifts it and replaces it into a purpose dug receiving hole. Ramarama is less habitat limited than swamp Maire and its success more likely.

Ramarama are located in stage 4 and 5 and so this process, should follow post stage 3 as stage 1 is revegetating with translocation into stages 1 and 2 revegetation. In part the decision when to transfer the individuals should be made based on the time it is likely that stage 1 is ready for revegetation because the more years pass the larger the Ramarama may be and so harder to transfer. We recommend that if stage 1 is unlikely to be revegetated by year 10 then the Ramarama present now be transferred to areas outside the OBDA footprint in year 2 or 3 of the OBDA staging.

Again, where the transplantations are not found to survive then an offset replanting of seed reared plants will be required. Most of the Ramarama in the OBDA is small shrub stages and we consider that a 1:50 ratio better reflects the lag time to recover the same growth stage if direct transfer does not prove successful.

9.3 SWAMP MAIRE TRANSLOCATION

Swamp maire occurs across the stages, for example two in stage 1 (as well as the Coprosma rubra and the Isolepis (in the one wetland affected)); two in stage 2, and five in stage 4 (Figure 02).

There are three management processes to avoid swamp maire loss and lowered numbers:

1. Direct transfer
2. Uplift, grow on and replant 10:1 swamp maire seedlings
3. Take cuttings and grow on and replant those trees.

The staged clearance regime means that the translocation method can be tested for the two specimens through stage 1 to measure if that method will work for swamp maire, to adapt the requirements of a successful up lift and replanting. It is acknowledged as experimental and hence why there is a back-up plan. Direct translocation of swamp maire shall only occur where a SQEP identifies that the plant, access, hydrological conditions and recipient site provide a reasonable prospect of successful establishment.

Suitable translocation and / or replanting wetlands for swamp maire (and the Coprosma rubra and Isolepis) are illustrated in Figure 8. These adjoin the Belmont Regional Park within the OBDA buffer outer boundary Winstone has obtained agreement with GW as manager of the park to use these areas, these areas are considered to have suitable swamp maire habitat. We note that a vehicle access may be required and if that is the case we recommend the eastern wetland as the place for relocation because stage 1 will see the development of a track along the lower edge of stage 1 and that will allow access to the eastern wetland without the need for additional clearances. Whereas the replanted saplings could be placed in any area without any need of further clearance.

9.4 COPROSMA RUBRA

Affected Coprosma rubra shall be managed as part of the Species Translocation Plan. Prior to clearance, affected plants shall be surveyed, tagged, photographed and recorded. Where practicable, plants shall be directly translocated to suitable wetland or damp gully recipient sites outside the OBDA footprint.

Fig 08: Indicative Swamp Maire Translocation Area

Proposed overburden
Existing habitat suitable for swamp maire
Swamp maire
Swamp maire translocation area

Where direct translocation is not practicable, plant material shall be collected for propagation and replanting, or replacement planting shall be undertaken using eco-sourced material. Recipient sites shall be selected to match the hydrological and ecological conditions of the affected plants, including soil moisture, wetland margin position, shade, shelter and surrounding vegetation structure.

9.5 TRANSLOCATION COMPLETION CRITERIA

The translocation program shall be considered successful where translocated or replacement plants are alive, healthy, showing new growth, and are able to persist without intensive intervention by Year 5. Where any translocated plant dies, becomes diseased, or is not achieving healthy establishment, contingency planting or propagation-based replacement shall be undertaken in accordance with the ratios set out above or as otherwise certified through the Species Translocation Plan.

10.0 REHABILITATION STRATEGY: EXISTING WETLAND MAINTENANCE AND MONITORING

10.1 PURPOSE

The purpose of existing wetland maintenance and monitoring is to verify that the construction, operation and rehabilitation of the Overburden Disposal Area (OBDA) does not result in unintended adverse effects on wetlands and wetland-associated habitats located outside the works footprint.

Monitoring focuses on the two wetland receiving environments identified by the ecological assessment:

The Eastern Catchment Wetland System, where ecological values are principally associated with wetland vegetation communities and hydrological conditions; and

The Central Western Catchment Swamp Maire Gully, where ecological values are principally associated with swamp maire and associated wet gully habitat.

Monitoring will provide information to support adaptive management and, where required, guide changes to erosion and sediment control measures, stormwater management, maintenance activities or remedial works.

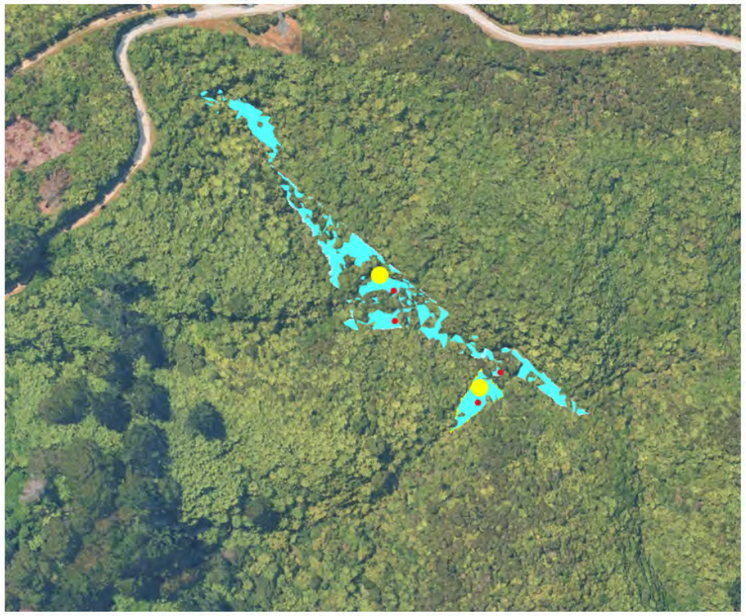

Fig 09: Eastern Gully extent and indicative monitoring points (To be updated by BGE)

10.2 METHODOLOGY

Eastern Catchment Wetland System:
Monitoring of the eastern catchment shall focus on maintaining existing wetland hydrological conditions and vegetation health.

Monitoring shall comprise:

- establishment of permanent wetland vegetation monitoring plots within representative wetland areas;
- installation of groundwater monitoring piezometers within selected drainage lines and a background reference location;
- collection of baseline information prior to commencement of works; biannual assessment of vegetation composition, cover and wetland indicator species;
- continuous monitoring of water levels using automated water level loggers; and
- additional inspections following verified erosion and sediment control incidents where there is potential for sediment discharge to enter the wetland.

Vegetation condition and groundwater level trends shall be considered together to determine whether any observed changes are consistent with natural seasonal variation or may be attributable to project-related activities.

Central Western Catchment Swamp Maire Gully:
Monitoring of the central western catchment shall focus on protection of swamp maire habitat from sediment deposition associated with construction activities.

Monitoring shall comprise:

- establishment of permanent sediment monitoring plots and sediment depth gauges within the swamp maire gully;
- collection of baseline sediment depth and vegetation cover information prior to commencement of works;
- periodic visual inspections of swamp maire habitat condition;
- event-based monitoring following any verified uncontrolled sediment discharge, non-compliant discharge, sediment retention device failure, or other incident with the potential to affect the receiving environment; and
- assessment of sediment accumulation, vegetation burial and condition of swamp maire root structures where a monitoring trigger event occurs.
- Where monitoring identifies sediment accumulation associated with project activities, appropriate remedial measures may include removal of deposited sediment, maintenance of erosion and sediment control devices, or implementation of additional controls.

Event-Based Monitoring and Response:
In addition to routine monitoring, ecological inspections shall be undertaken following any verified incident that has the potential to adversely affect wetland receiving environments, including:

- sediment-laden discharges exceeding compliance limits;
- uncontrolled discharges to the receiving environment;
- verified non-compliant pH discharges; or
- hazardous substance spills entering a wetland or watercourse.

Where required, a suitably qualified ecologist shall assess the magnitude of any ecological effects and recommend appropriate remedial or management actions

Wetland Restoration Plan:

A wetland restoration plan shall be prepared for the eastern and central western catchments and be submitted to council upon completion of the baseline assessment

Fig 10: Central Western Catchment Swamp Maire and indicative monitoring points (To be updated by BGE)

10.0 REHABILITATION STRATEGY: EXISTING WETLAND MAINTENANCE AND MONITORING

10.3 SUCCESS CRITERIA

Monitoring and maintenance of existing wetlands shall be considered successful where:

The objectives of the wetland restoration plan are achieved and;

Eastern Catchment Wetland System

- wetland vegetation communities remain dominated by indigenous wetland species characteristic of baseline conditions;
- no sustained decline in wetland condition attributable to altered site hydrology is identified;
- groundwater level monitoring demonstrates that wetland water level behaviour remains generally consistent with baseline conditions and seasonal variation; and
- no significant project-related sediment deposition is observed within monitored wetland areas.

Central Western Catchment Swamp Maire Gully

- swamp maire trees and seedlings remain healthy and viable; wet gully floor conditions are maintained;
- no significant project-related sediment accumulation occurs within monitored swamp maire habitat;
- swamp maire aerial roots remain free from persistent sediment burial; and
- any project-related sediment deposition identified through monitoring is remediated in a timely manner.

Adaptive Management:
Where monitoring identifies trends that may indicate declining wetland condition, altered hydrological function, or project-related sedimentation, the causes shall be investigated and appropriate corrective measures implemented.

Monitoring results shall be incorporated into annual rehabilitation reporting and used to inform ongoing site management and erosion and sediment control practices.

11.0 REHABILITATION STRATEGY: IMPLEMENTATION, MAINTENANCE AND MONITORING

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This section provides overarching guidance for planting implementation, staging and aftercare, including maintenance and monitoring, to help Winstone Aggregates achieve timely and effective outcomes.

11.1 RESPONSIBILITIES

Winstone Aggregates will oversee the implementation of this plan and ensure the intended outcomes for the Site are achieved. Planting and aftercare are expected to be carried out by contractors with proven experience and capacity to deliver high-quality, consistent work across the project.

All planting layouts shall be confirmed on Site with the approval of Winstone Aggregates or its nominated representative to ensure that the intended landscape, ecological and visual outcomes are achieved.

11.2 TIMELINE AND STAGING

Planting work should generally be undertaken between April and September when weather conditions are mild, damp, and conducive to planting, and when the ground is workable. Operations should be suspended during periods of severe cold or sun exposure, waterlogging, drought, or persistent drying winds. The recommended annual staging timeframes for implementing the LEMP are shown in the table to the right.

11.3 PROPOSED PLANT SPECIES

All areas of planting are to be accompanied by a full planting specification to be developed progressively as part of the staged plans. An indication of the plant species that may be used is set in the plant palette on **page 15**

11.4 PLANT SUPPLY

All plant material shall be fromseed sourced from the sites same Ecological District unless required for regionally uncommon species (ie; Swamp Maire) where genetic source is expected to be retained.

All plants shall be supplied at a minimum size of PB3 (1.5L) at the time of planting. Plants shall be installed at 1.0m centres. A detailed plant schedule, confirming species selection and quantities, shall be prepared prior to planting and must be approved by a suitably qualified Landscape Architect or Ecologist.

Plant material refers to all plants required for the Project. No plant species may be substituted without the prior approval of Winstone Aggregates or its nominated representative. If specified species are unavailable at the time of planting, substitute alternatives may be proposed and approved by a qualified landscape architect or ecologist.

All plants shall be high-quality nursery stock, true to name and type, with well-shaped trunk or stem and head. Stock shall be well hardened to suit local site conditions and free from pests, diseases, and physical defects.

Root systems shall be healthy and fibrous, with roots just reaching the container edge. Plants showing root circling or poor structure should be rejected.

Plants shall also be free from damage such as knots, bark abrasions, wind, or frost injury, and should show evidence of correct pruning.

All plant material is to be made available for inspection by Winstone Aggregates or its nominated representative, prior to planting.

Each plant, or bundle of plants, shall carry a legible label showing the approved botanical name, quantity, and any other required identified details. Plant sizes are to be specified by root trainer or litre container size.

MAINTENANCE PROGRAMME: 2 YEAR PERIOD

DEVELOPMENT STAGE	SPRING/SUMMER SEASON	WINTER SEASON
PLANT SUPPLY	• Obtain seed and propagate plants. • Purchase plants as required from locally sourced seed/district. • Grow on plants during summer.	• Grow on and harden off plants and deliver to the site nursery/holding area as required.
SITE PREPARATION	• Review site-wide boundary fences and upgrade where required. • Assess site for weeds and control as required. • Prepare planting zones. • Undertake fencing upgrades and pest management.	• Continue pest management
PLANTING	• Continue weed control (3-month buffer is required between spraying and planting).	• Commence proposed planting.
WEED AND PEST CONTROL	• Control all weed infestations within planting zones. • Undertake weed surveys over the entire site and control as necessary. • Continue pest management as required.	• Undertake weed surveys over the entire site and control as necessary. Continue pest management as required.
MONITORING AND MAINTENANCE	• Monitor and replace dead plants. • Ongoing maintenance.	• Monitor and replace dead plants. • Continue maintenance.
PROJECT COMPLETION	• Monitoring and maintenance period completed. • Assess need for further weed and pest control.	• Final monitoring and replacement of dead plants as required.

12.0 REHABILITATION STRATEGY: PEST AND WEED MANAGEMENT

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12.1 WEED MANAGEMENT

During the initial stages of rehabilitation, competition for light and nutrients from weeds can cause mortality and substantially reduce seedling growth. All invasive weeds will be removed from planting areas prior to planting.

Winstone Aggregates also has a legal obligation to control or eradicate weeds identified in Greater Wellington's Pest Management Strategy.

Under this, priority pest plants are grouped as follows:

- Exclusion: alligator weed, Chilean needle grass and nassella tussock.
- Eradication: moth plant, Senegal tea, spartina, velvetleaf and woolly nightshade.
- Progressive containment: purple loosestrife and wilding conifers.
- Sustained control: blue passionflower, boneseed, climbing spindleberry and eelgrass.
- Site-led control: banana passionfruit, cathedral bells and old man's beard.

For the Belmont OBDA, the priority weed species also comprise ecological weeds. Ecological weeds are plant species that prevent or inhibit effective indigenous revegetation by competing with native plants for light, space, water or nutrients, or by otherwise compromising the establishment, maintenance and natural succession of native vegetation communities.

Possible weed control methods include cutting, grubbing, mowing, mulching, matting, biological and/or herbicides.

Releasing planted vegetation from tall competing vegetation may be required initially until the trees overtop the surrounding vegetation. Hand weeding can work well for small infestations; however, it is very labour intensive. Where manual control is not sufficient, chemical treatment may be applied. Application methods will include spot treatments and cut-stump applications with herbicides. If chemical control is necessary after planting the following methods will be used to reduce ill effects on the seedlings:

- Spot treatment using a backpack sprayer – increase sprayer's drip size and provide protectionaround the trees where necessary.
- Cut stump application applying herbicide directly to the freshly cut stem in late summer or earlyautumn.

Monitoring and maintenance reporting shall meet the requirments of 13.0: Monitoring and Maintenance Programme.

12.2 GORSE

Gorse shall be maintained as required in accordance with the Greater Wellington Pest Management Strategy (2002-2022).Consequently, all gorse within 10 metres of the Winstone property boundary will be destroyed. Gorse will also be controlled within the identified sheltered areas of native planting.

Potential methods of control include but are not limited to:

Mechanical Control: Clearance by tractor and rotary slasher, bulldozer and blade/rootrake or rollercrusher.

Stump treatment with Herbicide: Cutting gorse with a scrub cutter or chainsaw and treating the stumps with a herbicide mix. Plants will be cut as close to the ground as possible. Freshly cut surfaces and all remaining bark can then be treated with the mix applied through a spray bottle or knapsack sprayer. The addition of a surfactant (e.g. Pulse ®) will aid the penetration of herbicide.

The most suitable herbicide will depend on the time of year, the stage of growth of the gorse, and the chosen application method. Generally, the most reliable results are obtained when gorse is sprayed between November and February.

Where Gorse is being actively managed to assist as a nurse crop, ensuring appropriate management to reduce its spread is required as outlined in the monitoring and maintenance section, weed control is an ongoing activity.

12.3 PEST ANIMAL CONTROL

The Belmont Regional Park has a substantial trapping programme for pest animal species. Winstone Aggregates shall montitor the site for any pest activity including significant animal damage to plants that may affect the outcomes of the Landscape Management Plan and report this within the annual rehabilitation report.

If animal damage is noted on site visits,appropriate methods will be evaluated based on the type of damage and animal species. Measures will then be implemented to control pest animals (in accordance with Greater Wellingtons Pest Management Strategy).

12.4 PEST AND WEED MANAGEMENT CRITERIA

Pest and weed control shall achieve the obejectives of the Greater Wellington Pest Management Strategy (2002-2022) and shall be considered successful when pest weed and animal species are no greater than that found within the Belmont Regional Park

13.0 MONITORING AND MAINTENANCE PROGRAMME

DRAFT

13.1 PURPOSE

Monitoring and maintenance are critical components of the rehabilitation programme and are intended to ensure that the landscape and ecology objectives of the LEMP are achieved. Monitoring will be used to assess vegetation establishment, natural regeneration, erosion performance, pest plant and animal management requirements, and the effectiveness of rehabilitation measures. The results of monitoring will be used to inform adaptive management and guide ongoing rehabilitation works.

13.2 MONITORING OBJECTIVES

The objective of the monitoring programme is to:

- assess the success of active indigenous planting, riparian planting and natural regeneration
- identify areas where rehabilitation objectives are not being achieved; assess vegetation health, survival and growth rates;
- monitor erosion and landform stability;
- identify pest plant and pest animal issues;
- evaluate the success of stream and riparian rehabilitation;
- determine whether enrichment planting is required; and
- Provide information to guide future rehabilitation works.

13.3 MONITORING METHODOLOGY

Monitoring shall be undertaken by a suitably qualified landscape architect, ecologist, rehabilitation specialist, or other suitably qualified and experienced person (SQEP).

Monitoring shall include:

- Site inspections.
- Permanent photographic monitoring points.
- Assessment of vegetation survival and canopy development.
- Assessment of natural regeneration.
- Assessment of weed and pest animal activity.
- Wetland monitoring and maintenance
- Review of stream corridor stability and riparian vegetation establishment.
- Assessment of erosion and sediment generation. Identification of maintenance requirements.

Representative photo monitoring points shall be established throughout the rehabilitated landform, including active indigenous planting areas, riparian corridors and areas managed through natural regeneration.

Photographs shall be taken from the same location and orientation during each monitoring event to provide a consistent visual record of rehabilitation progress, including to document completion targets being met.

13.4 MAINTENANCE AND MONITORING CALENDAR

Prior to rehabilitation works commencing within each stage:

- record baseline site conditions;
- establish photo monitoring points;
- identify existing vegetation and weed distribution; and
- confirm rehabilitation and planting areas

Monitoring shall be undertaken at the following intervals:

ACTIVITY	TIMEFRAME
MONITORING	Pre Planting Post Planting – 3 months Post Planting – 6 months Post Planting – 1 year Post Planting – 2 years Post Planting – 3 years Post Planting – 4 years Post Planting – 5 years
MAINTENANCE	Pre Planting Post Planting – 6 months Post Planting – 1 year (late winter/early spring) Post Planting – 2 years (late winter/early spring) Post Planting – 3 years (late winter/early spring) Post Planting – as required (late winter/early spring)

Maintenance shall be undertaken in accordance with the landscape management plan methodolgy

13.5 REPORTING

Provide an annual rehabilitation report shall be prepared by a SQEP and submitted to HCC, GWRC and Iwi (for the life of the consent and until closure sign-off) summarising:

- stage(s) completed that year;
- areas hydroseeded/planted;
- maintenance undertaken (including pest control);
- monitoring results (refer to 13.3) against performance standards;
- any ongoing management / remedial works proposed and completed.

13.6 YEAR 5 REHABILITATION REVIEW

Approximately five years after rehabilitation of each stage including Stage 10 at Project Completion, a formal review shall be undertaken by a SQEP to assess:

- vegetation establishment;
- indigenous species diversity;
- natural regeneration;
- weed pressure;
- canopy development;
- riparian corridor establishment; and
- achievement of rehabilitation objectives.

The purpose of the review is to determine whether natural succession is progressing as anticipated or whether additional intervention is required.

Where monitoring indicates that natural regeneration is successfully establishing a diverse indigenous vegetation community, no further planting may be required.

Where succession is limited, targeted enrichment planting may be undertaken to introduce additional canopy and secondary forest species and accelerate long-term forest development.

A written report documenting the findings of each five-year rehabilitation review, including any recommended remedial actions, enrichment planting and associated implementation timeframes, shall be submitted to HCC, GWRC and Iwi within three months of completing the review.

13.0 MONITORING AND MAINTENANCE PROGRAMME

13.7 SUCCESS CRITERIA AND COMPLETION STANDARDS

The purpose of rehabilitation is to establish a sympathetic hill country landform which supports a self-sustaining indigenous vegetation cover that integrates the OBDA with the surrounding Belmont Hills landscape and supports long-term ecological succession.

For the purposes of this LEMP, rehabilitation areas shall be considered successfully established when the following performance standards are achieved for each stage (noting that the stages will occur at different times):

Years 1–3

- Minimum 80% survival of installed plant material;
- No active erosion scars greater than 1m²;
- Ground cover established on at least 90% of rehabilitated surfaces; and
- No uncontrolled infestations of priority pest plant species.

Years 3–5

- Minimum 75% survival of planted indigenous vegetation;
- Canopy closure commencing within nurse-crop planting areas;
- Riparian planting established and providing continuous stream margin vegetation where applicable; and
- Pest plant abundance maintained below 10% cover within rehabilitation areas.

Years 5–10

- Establishment of a self-sustaining regenerating indigenous vegetation community;
- Progressive natural recruitment of indigenous species observed;
- Nurse species providing shelter sufficient to support enrichment planting; and
- No significant erosion, instability, or sediment-generating areas.

Long-Term Outcome;

- The rehabilitated OBDA shall achieve a predominantly indigenous vegetation cover integrated with adjacent vegetation communities and capable of ongoing succession without routine intervention.

13.8 ONGOING MANAGEMENT

Where monitoring identifies that rehabilitation objectives are not being achieved, Winstone Aggregates shall review rehabilitation methods and implement corrective actions or remedial measures.

Remedial measures to ensure the performance standards are met may include:

- supplementary planting;
- replacement of failed hydroseeding;
- weed control;
- pest animal management;
- soil amelioration;
- erosion remediation;
- revised species selection;
- alternative planting densities; or
- modification of maintenance regimes.

The rehabilitation programme shall remain flexible to respond to site conditions and to optimise ecological and landscape outcomes over time. Any significant modifications to rehabilitation methodology shall be documented within annual monitoring reports.

13.9 LANDSCAPE REHABILITATION COMPLETION CRITERIA

Landscape Rehabilitation shall be considered successfully established when:

- vegetation cover is continuous across rehabilitated surfaces;
- indigenous vegetation is self-sustaining;
- no significant erosion is occurring;
- riparian vegetation is established and stable;
- natural regeneration is occurring;
- pest plant infestations are controlled;
- canopy development is progressing without the need for ongoing intervention; and
- SEV monitoring on completion indicates equivalent or greater ecological function than prior to the OBDA commencing.

The long-term objective is to establish a resilient indigenous vegetation community that integrates with the surrounding Belmont Hills landscape and is capable of ongoing succession without intensive management intervention.

DRAFT

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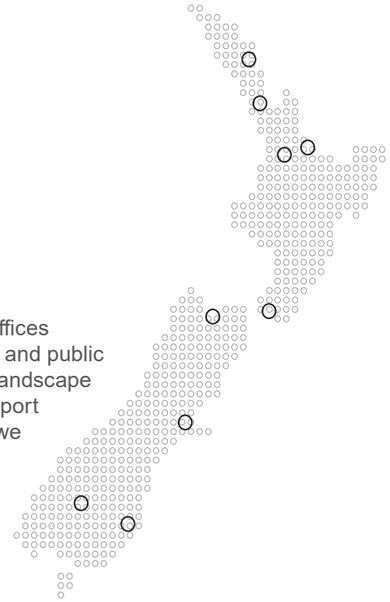

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