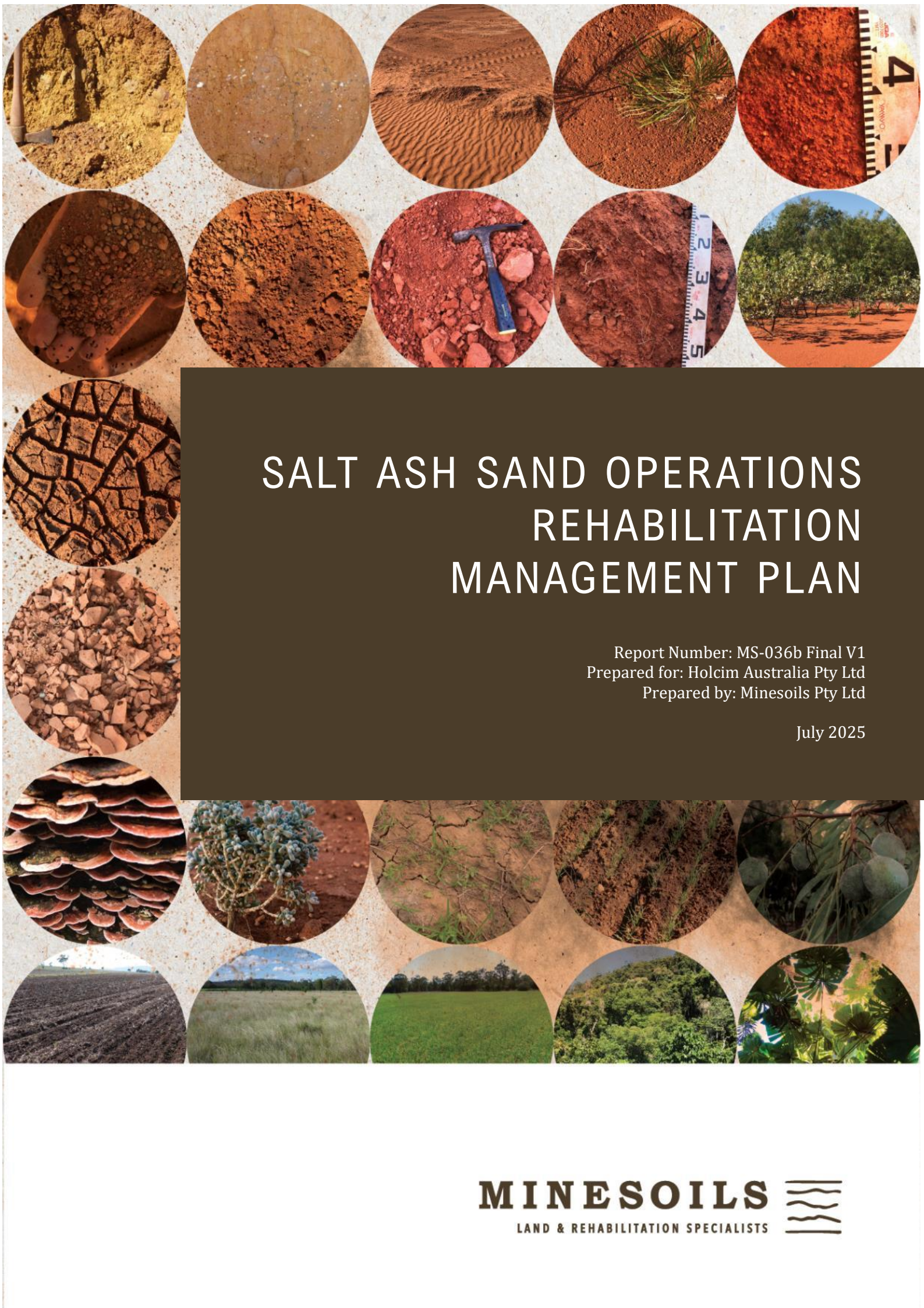




SALT ASH SAND OPERATIONS REHABILITATION MANAGEMENT PLAN

Report Number: MS-036b Final V1
Prepared for: Holcim Australia Pty Ltd
Prepared by: Minesoils Pty Ltd

July 2025

PREPARED BY

Minesoils Pty Ltd
ABN 84 627 497 509

-  0408 474 248
-  clayton@minesoils.com.au
-  www.minesoils.com.au
-  Tamworth NSW 2340

DISCLAIMER

This report has been prepared by Minesoils Pty Ltd with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with the Client. Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of Holcim (Australia) Pty Ltd. No warranties or guarantees are expressed or should be inferred by any third parties. Minesoils disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

DOCUMENT CONTROL

Reference	Date	Prepared by	Approved
MS-036b_ Draft 1	7 July 2025	Maddie Whitten	Clayton Richards
MS-036b_ Final V1	23 July 2025	Maddie Whitten	Clayton Richards



SUMMARY TABLE

Salt Ash Sand Quarry Rehabilitation Management Plan Summary Table	
Name of site:	Salt Ash Sand Quarry
Landowner:	Holcim (Australia) Pty Ltd
Rehabilitation Management Plan Commencement Date:	TBC
Rehabilitation Management Plan Revision Dates and Version Numbers:	Version 1.0

The purpose of this Rehabilitation Management Plan (RMP) for Holcim’s Salt Ash Sand Operations State significant development application to outline the Holcim’s approach to progressive rehabilitation and site closure for Salt Ash Sand Quarry, ensure compliance with regulatory requirements, and demonstrate how the site will be returned to a safe, stable, and sustainable final land use.

This RMP has been prepared generally in accordance with the Form and Way for Rehabilitation Management Plans for Large Mines (the Form and Way), prepared by the NSW Resources Regulator (2024).



TABLE OF CONTENTS

SUMMARY TABLE	3
1 INTRODUCTION TO PROJECT	6
1.1 HISTORY OF OPERATIONS	6
1.2 CURRENT DEVELOPMENT CONSENTS, LEASES, AND LICENCES	6
1.3 LAND OWNERSHIP AND LAND USE	7
2 FINAL LAND USE	10
2.1 REGULATORY REQUIREMENTS FOR REHABILITATION	10
2.2 FINAL LAND USE OPTIONS ASSESSMENT	11
2.3 FINAL LAND USE STATEMENT	13
2.4 FINAL LAND USE AND DOMAINS	14
2.4.1 FINAL LAND USE DOMAINS	14
2.4.2 Quarry DOMAINS	14
3 REHABILITATION RISK ASSESSMENT	15
4 REHABILITATION OBJECTIVES AND REHABILITATION COMPLETION CRITERIA	19
4.1 REHABILITATION OBJECTIVES AND REHABILITATION COMPLETION CRITERIA	19
4.2 REHABILITATION OBJECTIVES AND REHABILITATION COMPLETION CRITERIA- STAKEHOLDER CONSULTATION	19
4.2.1 REHABILITATION COMPLETION CRITERIA	20
4.2.2 STAKEHOLDER CONSULTATION	23
5 FINAL LANDFORM AND REHABILITATION PLAN	25
5.1 FINAL LANDFORM AND REHABILITATION PLAN	25
6 REHABILITATION IMPLEMENTATION	27
6.1 LIFE OF REHABILITATION SCHEDULE	27
6.2 PHASES OF REHABILITATION AND GENERAL METHODOLOGIES	27
6.2.1 ACTIVE EXTRACTION PHASE	28
6.2.2 DECOMMISSIONING	30
6.2.3 LANDFORM ESTABLISHMENT	31



6.2.4	GROWTH MEDIUM DEVELOPMENT	32
6.2.5	ECOSYSTEM AND LAND USE ESTABLISHMENT	33
6.2.6	ECOSYSTEM AND LAND USE DEVELOPMENT	33
6.3	REHABILITATION OF AREAS AFFECTED BY SUBSIDENCE	34
7	REHABILITATION QUALITY ASSURANCE PROCESS	35
8	REHABILITATION MONITORING PROGRAM	37
8.1	ANALOGUE SITE BASELINE MONITORING	39
8.2	REHABILITATION ESTABLISHMENT MONITORING	39
8.3	MEASURING PERFORMANCE - REHABILITATION OBJECTIVES AND COMPLETION CRITERIA	40
9	REHABILITATION RESEARCH, MODELLING AND TRIALS	41
9.1	CURRENT REHABILITATION RESEARCH, MODELLING AND TRIALS	41
9.2	FUTURE REHABILITATION RESEARCH MODELLING AND TRIALS	44
10	INTERVENTION AND ADAPTIVE MANAGEMENT	45
11	REVIEW, REVISION AND IMPLEMENTATION	46
12	REFERENCES	47



1 INTRODUCTION TO PROJECT

1.1 HISTORY OF OPERATIONS

Holcim (Australia) Pty Ltd (Holcim) owns and operates the Salt Ash Sand Operations (the 'site'), a long-standing quarry at 8 Oakvale Drive, Salt Ash, New South Wales (Lot 4 DP 774726) that imports, extracts, processes and transports sand products for use in the production of industrial and construction materials, such as glass and concrete. The site has been in operation since 1980, produces a variety of dry form and wet processed sand for glass and construction applications.

Initial development consent under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) was granted to Australian Consolidated Industries – Industrial Minerals Division Pty Ltd in 1980. The 1980 consent permitted the extraction and processing of sand in the western portion of Lot 6 DP 600870, which was sub-divided in 1988 to Lots 3 and 4 DP 774726.

A second development consent was granted in 1992, permitting the expansion of sand extraction in the eastern portion of the site.

Holcim took over ownership of the site in April 2020 from Sibelco Australia Pty Ltd. Holcim propose to maximise the extraction of remaining sand resource from the quarry through a State significant development (SSD) application, which is under assessment by NSW Department of Planning, Housing and Infrastructure (DPHI). This document will be reviewed following approval of the SSD application and revised to accommodate any specific conditions of approval regarding rehabilitation and landscape management for the site.

The proposed development includes the extraction and processing of up to 550,000 tonnes per annum (tpa) of sand at the site using both dry extraction and dredging techniques. Holcim also propose to continue to import up to 200,000 tpa of sand from their Tanilba Bay and Anna Bay operations, as well as other local extractive operations for processing at the site, resulting in a total of up to 750,000 tonnes of sand products processed and dispatched from the site per year (the 'Project'). The Project will operate for up to 30 years.

During the operational phase and following the completion of sand extraction from the site, rehabilitation and revegetation will be undertaken. Whilst still operational, the onsite rehabilitation will focus on stabilising those areas which have already been excavated and enhancing those areas on site which exist outside of operational areas, such as historical rehabilitation areas, and the boundary buffer zone. Once operations are complete, rehabilitation of the remaining areas will be achieved.

1.2 CURRENT DEVELOPMENT CONSENTS, LEASES, AND LICENCES

Details of the development consents, authorisations and licenses issued by the relevant government agencies for the quarry are provided in **Table 1**.

Table 1 Overview of Current Development Consents, Leases and Licences

Relevant Authority	Instrument	Approval/Licence No.	Issue Date	Expiry Date
Port Stephens Council	Development Consent	DA 73/80	26 March 1980	Current and operational
Port Stephens Council	Development Consent	DA 575/88	24 May 1988	Current and operational
Port Stephens Council	Development Consent	DA 73/80	August 1991	Current and operational



Relevant Authority	Instrument	Approval/Licence No.	Issue Date	Expiry Date
Port Stephens Council	Development Consent	DA 5499-91	23 December 1992	Current and operational
Port Stephens Council	Development Consent	DA 481/95	26 June 1995	Current and operational
Port Stephens Council	Development Consent	E 147/96	12 November 1996	Current and operational
Port Stephens Council	Development Consent	DA 16-2006-739-1	11 January 2007	Current and operational
Port Stephens Council	Development Consent	DA 16-2008-210-1	31 July 2008	Current and operational
Port Stephens Council	Development Consent	DA 16-2006-24-1	19 February 2009	Current and operational
Port Stephens Council	Development Consent	DA 16-2008-210-2	3 January 2013	Current and operational
NSW Environment Protection Authority	Environment Protection Licence (EPL)	EPL 11685	25 May 2023	Until the licence is surrendered, suspended or revoked.

1.3 LAND OWNERSHIP AND LAND USE

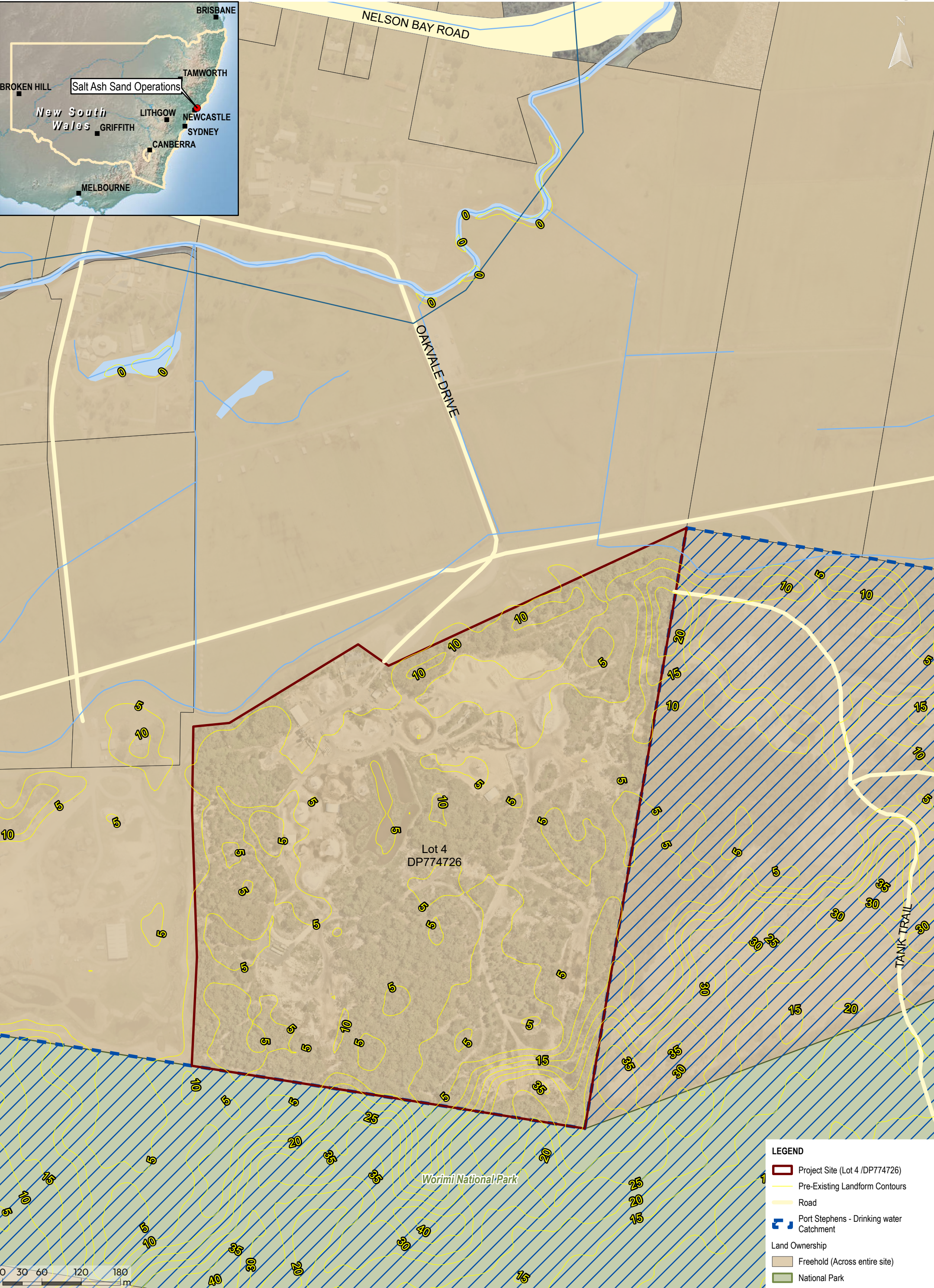
The site is owned and operated by Holcim and is located approximately 20km northeast of Newcastle and 190km north of Sydney in Salt Ash, NSW (Figure 1a). Land use surrounding the site (Figure 1b) is a mixture of rural residential, agriculture, tourism, public recreation and environmental conservation. Extractive industries are also prominent in the Salt Ash locality, with Macka's Sand Quarry adjacent to both the east and west of the site. **Table 2** identifies the schedule of land ownership surrounding the site.

Table 2 Overview of Land Ownership

Lot/Deposited Plan	Land Tenure	Landownership	Occupancy/Land Use
4/774726	Freehold	Holcim	Extractive industry
220/1049608 (adjacent)	Freehold	Macka's Sand Quarry	Extractive industry
592/1097992 (adjacent)	National Park Estate	Crown	No dwelling
8/833768 (adjacent)	Freehold	Macka's Australian Black Angus Beef Macka's Sand Quarry	Agriculture Extractive industry
3/739188 (adjacent)	Freehold	Unknown	Agriculture

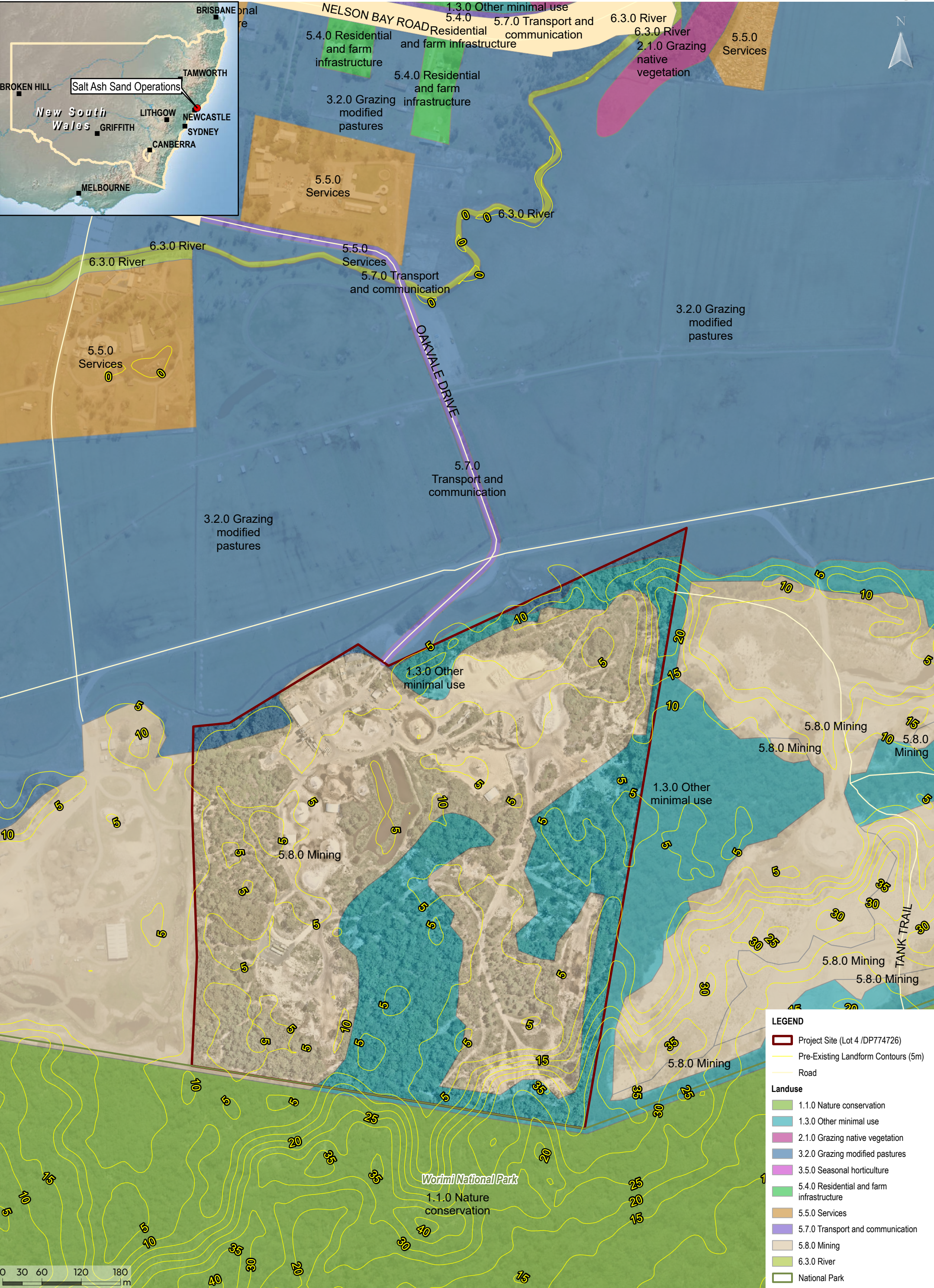


FIGURE 1a
Land Ownership



C:\Global_Design_Hub\A02_Clients\MMS_Minesoils\Holcim\MMS01_002_Holcim_SaltAsh_ARRFP_FLRP\MMS01_002_SaltAsh_ARRFP_FLRP\MMS01_002_SaltAsh_ARRFP_FLRP_01.aprx | Figure 1a - Current Land Ownership (A3)

FIGURE 1b
Land Use



2 FINAL LAND USE

2.1 REGULATORY REQUIREMENTS FOR REHABILITATION

For SSD, development consent granted under the EP&A Act requires the preparation of a 'rehabilitation management plan'. It must address and include any specific requirements approved in the Development Consent, including any approved rehabilitation objectives and final land use(s).

Although Holcim is currently seeking approval for continued operations through a SSD application, a new Development Consent has not yet been approved. **Table 3** therefore details the current conditions of Development Consents DA 5499-91, DA 07_0094, and EPL 11685. This RMP will need to be updated following approval to include all additional regulatory requirements for rehabilitation provided in the new SSD Development Consent.

Table 3 also includes the area of site to which the below conditions apply, the relevant timing to meet each requirement, and the section of the RMP in which it is addressed.

Table 3 Regulatory Requirements for Rehabilitation

Condition	Requirement	Area	Relevant RMP Section
Development Consent DA 5499-91			
Sch 1, Cond. 5	All timber and shrubs cleared from the site shall be used in the rehabilitation process whether used while or chipped.	Entire site	6.2.1
Sch 1, Cond. 7	No extraction of sand shall take place on the site until the applicant has submitted for Council approval and Council has given its approval to a plan for progressive extraction, natural vegetation retention and site rehabilitation. This plan shall include: a) The areas for successive extraction and revegetation. b) Any significant areas of vegetation which are not to be disturbed and those to be retained in accordance with Condition 2. c) All rehabilitation procedures, techniques, densities and species to be used in each location. d) Include a program for monitoring the site by the applicant during extraction and for a period of not less than three years after, the cessation of extraction.	Entire site	This document
Development Consent DA 07_0094			
Sch 2, Cond. 5	Quarrying operations may take place on the site until 31 December 2030. Note: Under this consent, the Applicant is required to rehabilitate and revegetate the site and provide and implement a Biodiversity Offset Strategy to the satisfaction of the Secretary. Consequently, this consent will continue to apply in all other respects other than the right to conduct quarrying operations until the site has been rehabilitated and revegetated and the biodiversity offset strategy implemented to a satisfactory standard.	Entire site	This document
Sch 3, Cond. 9	The Applicant must maintain the site in a condition that minimises or prevents the emission of dust or sand from the site, including the prompt and effective rehabilitation of all disturbed areas, to the satisfaction of the Secretary.	Entire site	This document
Sch 3, Cond. 20	The Applicant must rehabilitate the site to the satisfaction of the Secretary.	Entire site	Section 4.1



Condition	Requirement	Area	Relevant RMP Section
Sch 3, Cond. 23	The Applicant must prepare a Landscape Management Plan for the development to the satisfaction of the Secretary. This plan must: c) include: a Rehabilitation Management Plan	Entire site	This document
Sch 3, Cond. 24	The Rehabilitation Management Plan must include: a) the rehabilitation objectives for the site; b) a description of the measures that would be implemented to: - rehabilitate and stabilise the site; - minimise the removal of mature trees; and - manage the remnant vegetation and habitat on the site; c) detailed performance and completion criteria for the rehabilitation and stabilisation of the site; (d) a detailed description of how the performance of the rehabilitation of the quarry would be monitored over time to achieve the stated objectives; e) a detailed description of what measures would be implemented to rehabilitate and manage the landscape of the site, including the procedures to be implemented for: - progressively rehabilitating and stabilising areas disturbed by quarrying; - implementing revegetation and regeneration within the disturbance areas; - protecting areas outside the disturbance areas, including groundwater dependent ecosystems; - vegetation clearing protocols, including a protocol for clearing any trees containing hollows and the - relocation of hollows from felled trees; - managing impacts on fauna; - controlling terrestrial and aquatic weeds and pests; - controlling access; - bushfire management; and - reducing the visual impacts of the development; f) a description of the potential risks to successful rehabilitation, and a description of the contingency measures that would be implemented to mitigate these risks; and g) details of who is responsible for monitoring, reviewing, and implementing the plan.	Entire site	This document
Sch 5, Cond. 3	By the end of March each year, the Applicant must review the environmental performance of the development to the satisfaction of the Secretary. This review must: (a) describe the works (including rehabilitation) that were carried out in the previous calendar year, and the works that are proposed to be carried out over current calendar year	Entire site	Annual Review

2.2 FINAL LAND USE OPTIONS ASSESSMENT

Appropriate, well defined, and achievable rehabilitation commitments that account for a range of environmental and social factors are a requirement of project approval. Holcim have investigated several options for rehabilitation of the site subject to the availability of suitable fill material and identified three final land use options.



Option 1: Option 1 accounts for the potential to fill the site to a nominated level for community use and /or environmental conservation. Community use may include sporting fields, off leash dog park, etc. The conservation approach would involve revegetation with endemic coastal woodland vegetation to restore the Site to an equivalent of its original condition. This may also include the establishment of typical dune topography, undulation, and swales into the landform to emulate local hind dune geomorphology. Alternatively, a portion of the Site may be developed for community use, while the remainder is allocated for conservation.

Option 2: Option 2 accounts for the partial backfilling of the dredge pond which would remain in-situ and open up the Site for use community use (e.g. rest stop for Nelson Bay Road or hiking trails), an ecotourism attraction and/or environmental conservation.

Possible use of this landform for Eco-tourism may be able to implement a combination of rehabilitation of disturbed areas to coastal woodland native vegetation (e.g. to allow for hiking or other tourism use such as an eco-lodge, café or restaurant) and/or allow an area for the establishment of tourism facilities focused on a water recreation tourism facility (e.g. wake park).

The conservation approach would involve rehabilitating the pond edges and disturbed area to restore native woodland, as well as establish native aquatic vegetation on pond edges to mitigate erosion.

Option 3: Option 3 accounts for the possibility of dredging the pond to remain at its full extent over approximately 30 ha for use as for use as an ecotourism attraction, leisure area and/or environmental conservation as per Option 2, albeit with a more significant pond footprint over the Project Site.

Holcim has determined that partial or complete backfilling of the pond is not viable, based on the following considerations.

1. In order to protect water quality and flow in the aquifer, the selection of backfill material will essentially be limited to similar sand material that is extracted from the pit. There are no developments with appropriate soil properties that could supply enough fill to backfill the dredge pond. Initially tunnel boring projects in Sydney were considered (similar to how the recent Hornsby Quarry was backfilled with spoil from the various metro tunnelling projects), however soil overlying Hawkesbury sandstone is high in iron content, which if placed in the dredge pond has the potential to mobilise in the aquifer and compromise water quality.
2. Emplacement of material in the aquifer has the potential to alter existing hydrological flow regime of the aquifer which if reduced could impact receiving water users and Tilligerry Creek downslope.

Therefore, Option 3 is determined as the conceptual final land use for the site, as assessed and detailed in the site Environmental Impact Statement (EIS). Final land uses of this option include:

- Water storage area/pond covering the majority of the site, to be used for ecotourism attraction or environmental conservation purposes, or a combination of the two, covering approximately 30ha.
- Native ecosystem, consistent with the surrounding ecosystem and vegetation communities of the Worimi National Park, surrounding the pond and covering approximately 5.4ha.
- Ecotourism, there is also potential for an ecotourism development located on the remaining periphery terrestrial area.

The resulting final landform of an approximately 30 ha pond and potential land use options for its periphery area of approximately 5.4 ha have been developed to align with the Hunter Regional Plan 2036 (NSW Planning and Environment, 2016) and the Port Stephens Local Strategic Planning Statement (LSPS) (Port Stephens Council, 2020). The LSPS was adopted by Port Stephens Council in July 2020 and identifies the 20-year vision for land use



in Port Stephens, informed by the broader planning goals of the Hunter Regional Plan 2036: Economy, Environment, Housing and Transport.

The final land use option presented is designed to account for local and regional land use objectives, with direct regard for the LSPS priorities 3, 6 and 7, in conjunction with an aim to integrate with the character of the locality.

The following key factors in particular were considered when determining the suitable final land use options:

- Project site location adjacent to conservation area;
- Project site location immediately adjacent to the proposed Nelson Bay Road duplication alignment (thereby providing optimal positioning for future community and eco-tourism uses);
- Context of Worimi National Park, Oakvale Wildlife Park and Stockton Bight as tourist attractions; and
- Low agricultural potential of the Project site and immediate surrounds.

The visitor economy in the Port Stephens LGA is strongly linked to the appeal of the natural environment. There has been significant recent investment in growing emerging tourism markets and infrastructure such as the Tomaree Coastal Walk, the Koala Sanctuary at Anna Bay, and the Birubi Information Centre (Port Stephens Council, 2020).

The creation of a pond is considered a unique asset for ecotourism and would be a supplementary attraction in addition to the locality's other tourist attractions.

The final landform of a pond will be used as a landscape feature basis to promote an eco-tourism enterprise and attract spending to the area, which would have a positive economic impact on the local businesses, such as the Oakvale Wildlife Park, Foodworks, fuel stations and food option (restaurants, shops and take-aways). Eco-tourism would provide additional employment availability to the locality (refer LSPS priorities 3 and 7).

Alternatively, returning the pond periphery to a natural ecosystem would be suitable given the unimpeded movement of species and the flow of natural processes between the Worimi National Park and the rehabilitated area. This is known as ecological connectivity and would promote successful long-term conservation (refer LSPS priority 7).

Given the low agricultural potential of the Project site, conservation and ecotourism are considered environmentally, socially and economically beneficial final land use options that take advantage of the remaining pond, and the visual amenity, landscape values and tourism infrastructure of the region.

2.3 FINAL LAND USE STATEMENT

The proposed final landform and final land use at the site is depicted spatially in the Final Landform and Rehabilitation Plan provided in **Section 5** of this RMP. The final land uses are consistent with those described in **Section 2.2**.

Water storage/pond: Approximately 30ha

Native ecosystem: Approximately 5.4ha

Additional consultation regarding the proposed landform and approval requirements for the post-closure environment at the site may be undertaken with DPHI and other government agencies. When revised, this RMP will be updated to reflect the outcomes of any consultation undertaken.



2.4 FINAL LAND USE AND DOMAINS

2.4.1 FINAL LAND USE DOMAINS

Final land use domains are land management units characterised by a similar post-operation land use objective. Consistent with contemporary rehabilitation guidelines and rehabilitation planning best practice, final land use domains have been developed for the site. In accordance with the Final Landform and Rehabilitation Plan outlined in **Section 5** of this RMP, the final land use domains and associated codes at the site are provided in **Table 4**.

Table 4 Final Land Use Domains

Final Land Use Domain	Code	Area (Ha)
Native Ecosystem	A	16.5
Water Storage Area	G	29.2
Infrastructure	I	2.4

2.4.2 QUARRY DOMAINS

The site consists of infrastructure areas, water management areas, sand extraction areas, and stockpile areas. The codes associated with the site's quarry domains are presented in **Table 5**.

Table 5 Quarry Domains

Final Land Use Domain	Code
Infrastructure Area	1
Water Storage Area	2
Active Extraction Area	3
Stockpile Area	4



3 REHABILITATION RISK ASSESSMENT

Key risks associated with proposed rehabilitation activities at the site are identified and assessed below in **Table 6**. Further risk assessment will be undertaken following approval of the SSD application, with consideration of the Guideline: Rehabilitation Risk Assessment and the Joint Australian and New Zealand Standard AS/NZS 31000:2009 Risk Management – Principles and Guidelines (Standards Australia).

The methods used for the risk assessment include the following key steps:

- identifying the rehabilitation related risks, including what could happen, when and where;
- analysing the risks using a qualitative risk approach (i.e. identifying existing controls, determining specific consequences/likelihoods and then determining the residual level of risk);
- making decisions based on the outcomes of the risk assessment about which of the risks need controls or the implementation of a mitigation strategy; and
- establishing controls to mitigate/treat the risks identified as part of the process.

Rehabilitation risks, controls and proposed controls will regularly be reviewed and revised (as required).

Table 6 Risks for Rehabilitation

Risk	Risk Controls	Where Addressed in RMP
Geotechnical stability of final landform	• Design acceptance criteria (DAC) of final landforms in line with Geotechnical best practices (Encompass Mining, 2025).	6.2.3
Erosion and sedimentation	• Best practice erosion and sediment control measures will be used (to be outlined in relevant erosion and sediment control plans). • Progressive rehabilitation will occur to limit exposed areas. • Monitoring will identify any areas of erosion and recommended appropriate mitigation measures. • Long-term erosion and sediment controls will be designed and installed in accordance with the specifications contained in Managing Urban Stormwater – Soils and Construction, Volume 1, 4th edition (Landcom, 2004), Volume 2A Installation of Services (DECC, 2008a) and Volume 2C Unsealed Roads (DECC, 2008b) or equivalent. • Development of erosion and sediment control plans for each stage of the Project. • Diversion of 'clean' overland flow away from 'dirty' areas; • Vegetation and maintenance of drainage pathways to minimise erosion and sediment accumulation in flowing water; • Dust suppression on the existing and proposed haul roads (as required). • Maintain the exposed sand surface to a minimum to reduce erosion. • Additional stabilisation in high wind areas, including use of more robust vegetation, if required. • Temporary control measures will be utilised for erosion and sediment control, prior to the re-establishment of vegetation cover. These measures may include the use of sediment fences for non-channelised flow over disturbed areas, sandbags, rip rap, or any combination of those materials.	6.2.1



Risk	Risk Controls	Where Addressed in RMP
	Where additional rehabilitation is required using heavy machinery, the extent of the works area will be clearly delineated to minimise disturbance to non-target areas.	
Poor pond water quality	- Never spray herbicides over the waterbody; - Direct the spray away from the waterbody where possible (never spray herbicides over the waterbody); - Spray only to the extent of covering foliage with droplets; - Spray when weather is calm; - Use a flat fan nozzle and a low pump/spray pressure to reduce the likelihood of spray drift; and - Do not spray when rainfall is forecast within six hours as herbicide can be washed off the pest plant and run off into aquatic ecosystem.	6.2.3
Groundwater evaporation and quality	- Virgin Excavated Natural Material (VENM) and/or Excavated Natural Material (ENM) appropriately selected and utilised to aide in batter and ground stabilisation, while preventing any degradation of groundwater quality related to the materials used. - Selected material will be analysed to ensure it will not degrade groundwater quality and add to acid sulfate soils (ASS) acid generation under natural moderately acidic conditions. - Imported material will be sampled and characterised and consistent with the guidelines for ENM material provided by the NSW EPA.	6.2.3
Inadequate growth medium volumes	- Source and budget for purchasing topsoil growth medium for use in rehabilitation, - Investigate options and alternatives to be able to meet future topsoil requirements, e.g. organic material.	6.2.4
Inadequate growth medium quality	- Investigate application of additional soil, and/or use of appropriate soil ameliorants or management options to address soil quality if deemed necessary. - Engage consultant to assist with recommendations to appropriately remediate soil quality and depth. Remediate as soon as practicable.	6.2.4
Insufficient ground cover	- Investigate likely causes of unsatisfactory germination rates. - Reseed areas with unsatisfactory cover. - Review seeding procedures including seasonal mixes, timing and seed rate per hectare. - Undertake analytical soil testing and evaluation, where appropriate implement recommendations for amelioration. - Implement appropriate management actions including revising rehabilitation procedures if required.	6.2.4
Poor vegetation health	- Investigate likely causes of vegetation sickness and / or mortality rates. If required, engage a suitably qualified specialist. - Review seeding and / or planting procedures. - Reseed or replant areas with high sickness or mortality rates.	6.2.1, 6.2.5, 6.2.6



Risk	Risk Controls	Where Addressed in RMP
	- Only seed collected from the disturbance area and surroundings (through seed collection or brush matting) will be used on the rehabilitation. - Seeds will be sown rather than broadcast to limit loss, and direct seeding will be avoided in summer. - Tubestock will be planted during autumn to maximise survival rates. - Biannual monitoring will identify areas containing any failed plantings which can then be replanted if necessary. - Implement appropriate management actions including revising rehabilitation procedures if required.	
Prolonged drought	- Investigate long term rainfall forecast and consider planting sterile cover crop as interim measure to reduce wind erosion, dust generation and weed invasion. - Consider delay to final seeding rehabilitation with approval from Resources Regulator. - If any extreme weather events occur the regular monitoring events will detect impacts (erosion and plant die-off) and recommend appropriate mitigations measures. - Install increased erosion and sediment controls to reduce topsoil loss when drought breaks.	6.2.6
Off target species composition	- Only species outlined in this RMP will be seeded and planted into the rehabilitation area. - Only seed collected from the disturbance area and surroundings (through seed collection or brush matting) will be used on the rehabilitation. - Investigate the likely causes of unsatisfactory germination and or, growth rates. - Reseed areas with unsatisfactory cover. - Review seeding procedures including seasonal mixes, timing and seed rate per hectare. - Undertake analytical soil testing and evaluation. Where appropriate implement recommendations for amelioration. - Implement appropriate management actions including revising rehabilitation procedures if required.	6.2.5, 6.2.6
Weed proliferation	- During pre-clearing surveys, areas of weed infestation will be delineated to allow for separate stockpiling of this soil. - Vehicle hygiene to be maintained before accessing the site. - Implement rehabilitation monitoring programs and routine inspections will be undertaken to identify potential weed infestations. - Undertake weed management to remove introduced weed species. Ensure ongoing effort to identify and eliminate existing weed populations on-site over the life of the Project. - Treatment of infestations as appropriate to the species. - Prior to re-spreading stockpiled topsoil onto the disturbance area, an assessment of weed infestation on stockpiles will be undertaken to	6.2.6



Risk	Risk Controls	Where Addressed in RMP
	determine if individual stockpiles require herbicide application and / or “scalping” of weed species prior to topsoil spreading. • Maintain records of weed infestations and control programs and be implemented according to best management practice for the weed species concerned. • Investigate management measures to reduce weeds including additional soil amelioration, establishment and retention of cover crops until weed presence is at acceptable levels. Implement recommendations as appropriate.	
Pest animal presence	• Feral animal control will be undertaken in consultation with neighbouring landholders. • Programs to control feral animals will include the determination of appropriate control practices, consultation with appropriate authorities, obtaining appropriate approvals, implementing control practices and undertaking follow-up monitoring and control as required. • Monitoring will identify pest problems and recommend actions as required.	6.2.6
Bushfire impacts	• A separation distance of 10 m will be maintained between stockpiles of combustible material and remnant vegetation. • Operations and the site will be managed to minimise the likelihood of ignition sources through good ‘housekeeping’ (for example, all waste in bins). • Bushfire risk must be reviewed by contractors working within the site to both avoid ignition of fires and evacuate in the event of fire. • Any work areas (e.g. involving vehicles and machinery) will be equipped with firefighting measures to assist in the management of any fires on site. Fire extinguishers in all machinery, trucks and vehicles, water cart (as contracted).	6.2.6
Unauthorised access impacting on development of rehabilitation	• Only authorised personnel are allowed to enter the site. • All contractors must undergo site induction prior to entering the site. • The boundaries of the extraction area will be protected through installing locked gates (or similar) at access points, delineation barriers (felled trees, sand mounds, fencing) and the retention of vegetation along boundaries to control access to the area. • Monitoring and maintenance of the boundary will occur during regular inspections of the site (bi-annual monitoring).	6.2.2



4 REHABILITATION OBJECTIVES AND REHABILITATION COMPLETION CRITERIA

4.1 REHABILITATION OBJECTIVES AND REHABILITATION COMPLETION CRITERIA

The ultimate rehabilitation objective for the site is to create a safe, stable and sustainable landform that compliments existing natural resource values and connectivity to and adjacent lands and ecosystems. Rehabilitation will be completed, consistent with the rehabilitation objectives in **Table 7**.

Table 7 Rehabilitation Objectives

Feature	Objective
Project site (as a whole) (35.4ha)	• Safe, stable and non-polluting • Constructed landforms drain to the natural environment
Water storage area (30ha)	• Minimise the size and depth of the final water storage area as far as is reasonable and feasible • Minimise the drainage catchment of the final water storage area as far as is reasonable and feasible
Surface infrastructure	• To be decommissioned and removed, when practical to do so
Remaining land (excluding water storage area) (5.4ha)	• Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems comprised of: - o local native plant species; and - o a landform consistent with the surrounding environment
Community	• Ensure public safety • Minimise the adverse socio-economic effects associated with quarry closure

4.2 REHABILITATION OBJECTIVES AND REHABILITATION COMPLETION CRITERIA-STAKEHOLDER CONSULTATION

In order to achieve the broad rehabilitation objectives presented in **Table 7**, Holcim have developed specific domain rehabilitation objectives.

The key rehabilitation objectives for each of the domains are defined in **Table 8**.

Table 8 Rehabilitation Domain Objectives

Current Domain	Final Land Use Domain	Description
Infrastructure Area	Native Ecosystem (A)	• All site infrastructure will be removed progressively, and the area rehabilitated, when no longer required. • All land contamination will be identified and appropriately remediated.



Current Domain	Final Land Use Domain	Description
		- Topsoil stockpiles will be stabilised with sterile cover crops to minimise weed infestation and retain soil biological health. - Topsoil stockpiles will be constructed and managed to optimise physical, chemical and biological characteristics. - Topsoil stockpile areas will be rehabilitated progressively when no longer required.
Water Management Area	Water Management Area (G)	Clean water will be diverted around operational areas prior to disturbance, where practical.
Stockpile Area	Native Ecosystem (A)	- Final landform will be safe, stable and adequately drained. - Final landforms will be designed to integrate with the surrounding landscape. - Outer boundary batter slopes will be predominantly constructed at 20 degrees or shallower. - Final outer surfaces of batter emplacements will be constructed with non-sodic or low sodicity and/or will be treated with gypsum. - Operations will be optimised to facilitate progressive shaping and rehabilitation.
Active Extraction Area	Water Management Area (G)	- Rehabilitation resources including vegetation, topsoil and habitat resources will be identified for salvage ahead of disturbance. - Vegetation and topsoil will be progressively stripped ahead of sand extraction to minimise the total area of disturbance and the potential period of soil storage. - Quarried areas will be progressively rehabilitated where possible.

4.2.1 REHABILITATION COMPLETION CRITERIA

Completion criteria are objective target levels or values assigned to a variety of indicators (e.g., slope, species diversity, percent groundcover), which can be measured to demonstrate progress and ultimate success of rehabilitation.

As such, they provide a defined end point, at which point in time rehabilitation can be deemed successful and the closure process can proceed. The draft rehabilitation completion criteria for the site are listed **Table 9 and Table 10**.

Closure criteria have been informed by current Development Consent conditions, but it is noted that they may need to be reviewed and/or updated following approval of a new SSD consent.



Table 9 Rehabilitation Completion Criteria

Final Land Use Domain	Mining Domain	Rehabilitation Objective	Indicator	Completion Criteria and Validation Method
Native Ecosystem (A)	Infrastructure area, stockpile area	The vegetation composition of the rehabilitation is recognisable as the target vegetation community	Native plant species recorded from monitoring plots are characteristic of the target vegetation community	Criteria: Rehabilitation monitoring verifies that native ecosystem indicators have achieved the completion criteria targets listed in Table 10. Validation method: Before and after photos, rehabilitation monitoring reports, independent ecological reports that validate rehabilitation completion criteria have been met.
Native Ecosystem (A)	Infrastructure area, stockpile area	The vegetation structure of the rehabilitation is recognisable as, or is trending towards (based on ongoing monitoring data) the target vegetation community	Cover and abundance of plant growth forms recorded from monitoring plots are characteristic of the target vegetation community, or an ongoing trend toward becoming characteristic is evident from the monitoring data	Criteria: Rehabilitation monitoring verifies that native ecosystem indicators have achieved the completion criteria targets listed in Table 10. Validation method: Before and after photos, rehabilitation monitoring reports, independent ecological reports that validate rehabilitation completion criteria have been met.
Native Ecosystem (A)	Infrastructure area, stockpile area	Levels of ecosystem function have been established that demonstrate the rehabilitation is self-sustainable.	Indicators of nutrient cycling are suitable for sustaining the target vegetation community	Criteria: Established species survive and/or regenerate after disturbance, and species are capable of setting viable seed, flowering or otherwise reproducing. Validation method: Rehabilitation monitoring reports, which demonstrate long-term function of rehabilitated landform.



Final Land Use Domain	Mining Domain	Rehabilitation Objective	Indicator	Completion Criteria and Validation Method
Native Ecosystem (A)	Infrastructure area, stockpile area	The final landform is stable for the long term and does not present a risk of environmental harm downstream / downslope of the site or a safety risk to the public/native fauna.	Visual/ measured/ modelled evidence of erosion/ landform stability.	Criteria: Survey or remote sensing of the rehabilitated landforms shows an absence of erosion that could compromise stability. Any erosion is minimal with no ongoing management works. Validation method: Survey or remote sensing monitoring, visual inspection records, photograph series from photo points, Specialist consultant assessment reports.
Water Storage (G)	Water management area	Runoff water quality from site meets the requirements of the relevant development consent(s) / Environment Protection Licence and does not present a risk of environmental harm.	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2018 and/or or Environment Protection Licence	Criteria: Water quality in retained dredge pond is suitable for the final land use. Validation method: Water quality sampling and analyses as per the approved Groundwater Management Plan
Water Storage (G)	Water management area	Groundwater quality meets the requirements of the relevant development consent(s) / Environment Protection Licence and does not present a risk of environmental harm.	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2018	Criteria: Water quality generally consistent with ANZECC guidelines for specific environment. Independent hydrological assessment report. Validation method: Independent hydrological assessment report



Table 10 Rehabilitation Completion Criteria

Ecosystem and Land Use Establishment – Native Ecosystem		Benchmark	Target	Justification Validation Method
Plant Community Types (PCTs) 1646 Smooth-barked Apple/ Blackbutt/ Old Man Banksia woodland on coastal sands of the Central and Lower North Coast; and 1718 Swamp Mahogany - Flax-leaved Paperbark swamp forest on coastal lowlands of the Central Coast.	Native species richness	Minimum Target	Monitoring undertaken at: 12-18 months: at least 15 individuals per 20x20 plot 2-5 years: At least 24 individuals per 20x20 plots 5-10 years: At least 24 individuals per 20x20 plots	Rehabilitation monitoring records.
	Abundance of Species that will contribute to native overstory cover	Minimum Target	Monitoring undertaken at: 12-18 months: at least 8 individuals per 20x20 plot 2-5 years: at least 8 individuals per 20x20 plot 5-10 years: at least 8 >2m height individuals per 20x20 plot	Rehabilitation monitoring records.
	Abundance of Species that will contribute to native mid-story cover	Minimum Target	Monitoring undertaken at: 12-18 months: at least 2 species per 20x20 plot 2-5 years: at least 2 species per 20x20 plot 5-10 years: at least 2 species per 20x20 plot	Rehabilitation monitoring records.
	Native Groundcover (Grasses)	Minimum Target	Monitoring undertaken at: 12-18 months: 20% 2-5 years: 20% 5-10 years: 20%	Rehabilitation monitoring records.
	Vegetation Surface Cover	Minimum Target	Monitoring undertaken at: 12-18 months: 60% 2-5 years: 60% 5-10 years: 60%	Rehabilitation monitoring records.

4.2.2 STAKEHOLDER CONSULTATION

To inform the social impact assessment (SIA) for the EIS for the current SSD application, Holcim prepared a stakeholder engagement and consultation plan with the following objectives:

- To identify relevant stakeholders and provide them with clear and timely information about the project and its potential impacts.



- To seek feedback on the project and the proposed approaches to minimising impacts.
- To ensure stakeholders' views are understood, appropriately managed and considered in the project's planning, design and implementation, and in the EIS.
- To provide feedback on how matters raised have been considered and addressed.
- To establish enduring relationships with key stakeholders, based on trust and mutual respect.

The identified stakeholders were:

- Adjacent landholders/businesses – those adjacent to (neighbouring) the quarry.
- Local area landholders/businesses/community – receivers in the local areas of Salt Ash, Williamtown and Tomago that could be aware of the project during construction or operation as they could potentially see the project or experience traffic, noise or air quality impacts from it.
- Government – State agencies, Council and the local Member of NSW Parliament (MP).
- Worimi Local Aboriginal Land Council (LALC)

A summary of the consultation completed by Holcim through the recent EIS process is included **Table 11** below.

Table 11 Stakeholder Consultation

Relevant Stakeholder	Form of Consultation	Actions Taken
DPE	Face to face meetings	Please refer Section 4, and Appendix A of the Holcim Salt Ash Sand Operations EIS
DPE - Water	Face to face, and video conference meetings	
Port Stephens Shire Council	Video conference meeting	
Local Landholders	Community information session, held via video conference	
EPA	Written Correspondence	
Heritage NSW	Written Correspondence	
Hunter Water	Written Correspondence	
NSW Rural Fire Service	Written Correspondence	
TfNSW	Written Correspondence	



5 FINAL LANDFORM AND REHABILITATION PLAN

5.1 FINAL LANDFORM AND REHABILITATION PLAN

The Final Landform and Rehabilitation Plan has been prepared to show the proposed final land use and final landform at the end of the life of the site. This Figure 2 is generally in accordance with the details of the Salt Ash Sand Quarry EIS and Development Consent. Following approval of the Final Landform and Rehabilitation Plan, this RMP will be amended to substitute the proposed version (Figure 2) with the version approved by DPHI following approval of the SSD application.



FIGURE 2
Final Landform



LEGEND

- Project Site (Lot 4 /DP774726)
- Final Landform Contours (1m)
- Final Landuse Domain**
 - Final Void
 - Infrastructure
 - Native Ecosystem
 - National Park

0 15 30 60 90
m

Scale: 1:3,000
Sheet Size : A4

Source: LPI (2025) ESRI Basemaps, Holcim (2021), Cambium Group Landform (2022)

GDA2020 MGA Zone 56
23/07/2025

Holcim Salt Ash Operations

6 REHABILITATION IMPLEMENTATION

6.1 LIFE OF REHABILITATION SCHEDULE

Areas that are disturbed at the site will be progressively rehabilitated following operational activities in accordance with current conditions of approval, and any future consent conditions following approval of the SSD application.

Rehabilitation at the site will be undertaken progressively once areas become available for rehabilitation, with the aim of creating a structurally stable landform capable of sustaining the agreed final land use(s).

Plans 1 and 2 outline the proposed rehabilitation over the life of the site, from the commencement of this RMP until achievement of the rehabilitation completion criteria and relinquishment.

The site Annual Rehabilitation Report and Forward Program will provide further details of activities at the site.

In developing the rehabilitation schedule, several assumptions were made to ensure that rehabilitation is undertaken progressively and as soon as reasonably practicable, including:

- No major changes to sand extraction schedules due to market conditions or other reasons.
- There are no extreme weather events that will prohibit landform establishment or rehabilitation progression (e.g. severe and prolonged dry or wet periods).

6.2 PHASES OF REHABILITATION AND GENERAL METHODOLOGIES

The rehabilitation methodologies described in this section have been developed in consideration of the key risks identified at the site (**Section 3**). The methodologies are linked to the risk reduction strategies/actions developed to adequately control the individual risk items as described in **Section 3**.

The final land use objectives will be achieved through a series of rehabilitation phases as defined in the NSW Resources Regulator's (2021a) *Form and Way: Rehabilitation Management Plan for Large Mines* and detailed below:

- **Active extractive areas** – Land associated with extraction domains is considered 'active' for the period following disturbance until the commencement of rehabilitation.
- **Phase 1: Decommissioning** – This phase of rehabilitation includes activities associated with the removal of extraction and processing infrastructure, unless agreed to be retained, and the removal, remediation or management of any generated contaminated and hazardous materials.
- **Phase 2: Landform Establishment** – This phase of rehabilitation consists of the processes and activities required to construct the approved final landform. In addition to profiling the surface of rehabilitation areas to the approved final landform profile, this phase may include works to construct surface water drainage features, encapsulate problematic materials, and prepare a substrate with the desired physical and chemical characteristics.
- **Phase 3: Growth Media Development** – This phase of rehabilitation consists of activities required to establish the physical, chemical and biological components of the substrate required to establish the desired vegetation community (including short-lived pioneer species). This phase may include spreading the prepared landform with topsoil and/or subsoil and/or soil substitutes, applying soil ameliorants to enhance the physical, chemical and biological characteristics of the growth media, and actions to minimise loss of growth media due to erosion.
- **Phase 4: Ecosystem and Land Use Establishment** – This phase of rehabilitation consists of the processes to establish the approved final land use following construction of the final landform. For vegetated land



uses this rehabilitation phase includes establishing the desired vegetation community (e.g. seeding or tube stocking) and implementing land management activities such as weed control.

- **Phase 5: Ecosystem and Land Use Development** – This phase of rehabilitation consists of the activities to manage maturing rehabilitation areas on a trajectory to achieving rehabilitation objectives, completion criteria and the Final Landform and Rehabilitation Plan. Completion criteria for this phase will include components of floristic structure, nutrient cycling recruitment and recovery, community structure and function which are the key elements of a sustainable landscape.
- **Phase 6: Rehabilitation Completion** – This final phase of rehabilitation occurs where a rehabilitation area has achieved the final land use for the domain as stated in the approved rehabilitation objectives and the approved rehabilitation completion criteria and spatially depicted in the approved Final Landform and Rehabilitation Plan. Rehabilitation areas may be classified as complete when DPHI has determined in writing that rehabilitation has achieved the final land use following submission of the relevant application by Holcim.

The phases listed above, and methodologies (where relevant) are discussed in more detail in the following sub-sections.

6.2.1 ACTIVE EXTRACTION PHASE

The following subsections summarise how key aspects of the site active extraction phase is managed and how relevant components may continue into the closure phase.

Soils and Materials

The following management measures will be implemented during the stripping of soils:

- areas of disturbance will be stripped progressively, as required, to reduce the potential for erosion and sediment generation, and to minimise the extent of topsoil stockpiles and the period of soil storage;
- areas of disturbance requiring topsoil stripping will be clearly defined following vegetation clearing;
- topsoil stripping during periods of high soil moisture content (i.e. following heavy rain) will be avoided, wherever practicable, to reduce the likelihood of damage to soil structure; and
- in preference to stockpiling, stripped soil will be directly replaced on completed sections of the final landforms wherever practicable.

Long-term soil stockpiles will be managed to maintain long-term soil viability through the implementation of relevant management practices as listed below:

- Soil stockpiles will be retained at a height of up to 3 metres (m), with slopes no greater than 1:2 (V:H) and a slightly roughened surface to minimise erosion.
- Soil stockpiles will be constructed to minimise erosion, encourage drainage, and promote revegetation.
- Ameliorants such as lime, gypsum and fertiliser will be applied to stockpiles where needed to improve the condition of stripped soil.
- All soil stockpiles will be seeded with a non-persistent cover crop to reduce erosion potential as soon as practicable after completion of stockpiling.
- Soil stockpiles will be located in positions to avoid surface water flows. Silt stop fencing will be placed immediately down-slope of stockpiles until stable vegetation cover is established.
- An inventory of soil resources (available and stripped) on the site will be maintained and reconciled annually with rehabilitation requirements.
- Weed control programs will be implemented on soil stockpiles if required.



Flora

Progressive vegetation clearing would be undertaken during both the establishment and operational phase of the site.

Pre-clearance surveys will be undertaken by an appropriately qualified person. Where possible, collection of seed for propagation of seed/vegetative material for use in revegetation and rehabilitation will be undertaken during pre-clearance surveys.

Fauna

Fauna will be managed at SASO in accordance with a Biodiversity Management Plan.

During pre-clearing surveys active searches for koalas will be conducted and any trees containing koalas will be marked. If prior to clearing commencing the koala/s have not relocated from the site the following methodology will be followed:

- Surrounding vegetation will be cleared;
- The occupied tree will be left standing for two nights to encourage self-relocation;
- If the koala/s have not self-relocated they will be retrieved from the tree prior to felling and relocated to a safe location outside the disturbance area, if possible with a preferred Koala feed tree

Potential fauna habitat (e.g. logs/hollows) salvaged during pre-clearance surveys will be relocated to rehabilitation areas and provided as a habitat resource for fauna. Tree hollows and logs will be selectively chosen for placement in areas where habitat enhancement is required. Cleared vegetation from within areas of disturbance will be re-used wherever practicable.

Rock/Overburden Emplacement

Overburden at the site consists of topsoil and subsoil material. It will be stored in accordance with the long-term stockpile management measures specified above under Soils and Materials.

Waste Management

The describes the measures that will be implemented to avoid, minimise, reuse and recycle all waste streams generated during the construction and operation stages of the SASO.

The following waste management strategies will be implemented to ensure waste generated and received at SASO are minimised:

- Site induction including information regarding the management of waste and correct disposal of waste streams to support segregation and recycling occurs where available.
- Waste storage areas appropriately signposted.
- Appropriate waste receptacles made available.
- No long-term storage of any waste.
- Avoid over-ordering of materials.
- Procuring alternate products or bulk ordering will be considered to reduce packaging.
- Regular review of stock levels.
- Except as permitted in the applicable EPL, specific resource recovery order or exemption under the Protection of the Environment Operations (Waste) Regulation 2014, receiving waste at the site for storage, treatment, processing, reprocessing or disposal will not be undertaken.

Geology and Geochemistry

A Groundwater, Sediment and Acid Sulfate Geochemistry Assessment was undertaken for the EIS by GeoTerra (2022). This study concluded that proposed dredging beneath the water table is anticipated to lead to generation



and potential increased off-site discharge of acidic leachate waters. In addition, generation and off-site discharge of elevated metals, and elevated salinity is also anticipated to occur, compared to the current off-site discharging groundwater quality.

To minimise the potential for the project to result in soil and groundwater acidification along with the release of dissolved metals, an Acid Sulfate Soil Management Plan and Groundwater Management Plan were developed as detailed in the submissions report for the SSD application.

Material Prone to Spontaneous Combustion

Spontaneous combustion has not been identified as a risk for the site.

Material Prone to Generating Acid Mine Drainage

Acid Mine Drainage has not been identified as a risk for the site.

Erosion and Sediment Control

The site sediment and erosion control system will be managed through preparation of erosion and sediment control plans for the site. The sediment and erosion control system will be updated periodically to address changes over the life of the site. The effectiveness of the system will be assessed through regular monitoring.

The operational sediment and erosion control works will be retained and maintained during initial rehabilitation. Following the establishment of self-sustaining, stable final landforms, key elements of the operational sediment control structures will either be removed unless otherwise agreed with the relevant government agencies

Ongoing Management of Biological Resources for Use in Rehabilitation

Biological resources such as native seeds and habitat features (stag trees, fallen logs and large flat rocks) will be managed to ensure viability for use in rehabilitation. Management measures include but are not limited to the management of weeds, effective storage, regular inspections and maintenance programs.

Subsidence

No subsidence impacts will occur as a result of the operations planned at the site, as extractive operations are open pit.

Management of Potential Cultural and Heritage Issues

Aboriginal heritage is managed in accordance with the EIS which was developed in consultation with Registered Aboriginal Parties (RAPs) and Heritage NSW.

Engagement with RAPs will be maintained throughout the life of the site, including as part of detailed closure planning.

6.2.2 DECOMMISSIONING

The Decommissioning Phase encompasses all works required to prepare land for rehabilitation, including decommissioning of infrastructure.

Decommissioning, demolition, and removal of infrastructure from the site will generally be undertaken during the closure phase. Any infrastructure including roads and buildings which are beneficial for future use by post operation landowners may be left in place subject to relevant landowner agreements and regulatory approvals.

Decommissioning and demolition activities will be appropriately planned and documented to ensure that appropriate approvals are in place for the works. Further detail regarding demolition activities will be determined as the operation approaches closure. Detail in this regard will be reported in the Forward Program.



Site Security

Site security measures will be implemented during and following the decommissioning process to prevent access by members of the public and secure rehabilitation areas, including any heritage places or objects and any retained infrastructure items. Site security measures include:

- site sign-in and induction processes;
- maintenance of existing security fences and signage; and
- restricted offroad access to rehabilitated areas.

Infrastructure to be removed or demolished

Under their current development consents, Holcim is required to decommission and remove surface infrastructure at the site.

The priority will be to dismantle fixed equipment and infrastructure for removal from site and re-use at another location, or for recycling. Non-salvageable/non-recyclable infrastructure will be disposed of at suitable off-site disposal areas, or on-site, subject to demonstration that no land contamination risk will be posed and relevant approvals are obtained.

Buildings, Structures and Fixed Plant to be Retained

Infrastructure will only be retained post-operations in agreement with the relevant regulatory authority and landowners.

Management of Carbonaceous/Contaminated Material

Potential land contamination risks from the site include leaks/spills, fires and explosions associated with the transport, storage and use of hydrocarbons and chemicals. General measures to reduce the potential for contamination of land will include the following:

- Contractors that transport dangerous goods to and from site will be appropriately licensed in accordance with the provisions of the Australian Code for the Transport of Dangerous Goods by Road and Rail (National Transport Commission, 2014) (or its latest version).
- On-site consumable storage areas will be designed with appropriate bunding.
- Fuel and explosive storage areas will be regularly inspected and maintained.

Hazardous Materials Management

Prior to commencing any demolition of the structures on site, a hazardous material survey will be undertaken to assess the potential for lead paints and asbestos-containing material within building structures to allow management/removal actions to be appropriately implemented.

Management measures will also be developed to control and mitigate potential waste and bushfire hazards.

Underground Infrastructure

The site is an open pit quarry subsequently there is currently no underground infrastructure.

6.2.3 LANDFORM ESTABLISHMENT

The following subsection details the key characteristics of landform establishment at the site in accordance with the design of the Final Landform and Rehabilitation Plan (**Section 5**).

Water Management Infrastructure

Water management structures will be established during the construction and operational phase of the site.



Following closure, water storage areas will remain as part of the final landform. Other elements of the final landform such as constructed channels will be shaped, as much as practical, to undulating profiles in keeping with natural landforms of the surrounding environment. Water management structures will be designed to collect surface runoff from rehabilitation or disturbed areas.

Water management areas to be retained following closure of the site are shown on Plan 1.

Final Landform Construction: General Requirements

The final landform has been designed to integrate with the surrounding natural landforms including consideration of elevation, slope and drainage. The final landform has been constructed to include the following:

- Water storage area designed to optimise landform stability and integration with surrounding catchments.
- Drainage features designed to be stable in the long-term.
- Rehabilitated areas that are contiguous with the surrounding natural ecosystem areas.

Final Landform Construction

Oversize material exceeding 20mm (waste) which has been screened out during processing will be stockpiled on site and emplaced during rehabilitation. This material would be periodically sampled during the project life to confirm geochemical characteristics and to enable the disposal strategy to be adjusted as necessary.

Drainage Design

Vegetated drainage paths will be designed to minimise flow velocities and located to minimise the overall slope of the drainage path. The drainage paths will be developed in consideration of length, slope, reporting catchment area and final land use.

Revegetation

Disturbed areas and constructed landforms will be revegetated with native tree, shrub and grass species.

Final Landform Construction: Final Voids, Highwalls and Low Walls

The final landform will include a rehabilitated water storage area. No high walls are anticipated.

Final Void Surface Water and Groundwater Inflows

Inflows into the final water storage will comprise groundwater and incident rainfall runoff within the final dredge pond catchment area.

Construction of Creek/River Diversion Works

Not applicable for the site.

6.2.4 GROWTH MEDIUM DEVELOPMENT

In the context of this RMP, growth medium development encompasses activities to reinstate soils with the initial physical, chemical and biological characteristics required to establish the desired vegetation community.

Characterisation

Sampling will determine if the topsoil and subsoil is suitable for rehabilitation use or if it requires amelioration or selective handling and placement.

Topsoil Respreading and Amelioration

Topsoil will be spread onto areas requiring rehabilitation to a nominal depth of approximately 0.1m for areas rehabilitated to native woodland/forest (McKenzie Soil Management, 2012; Thackway and Freudenberger, 2016).



Soil testing results will be used to determine if physical and/or chemical amelioration is required, and the rates and method of application. The spreading of soil, addition of soil ameliorants, fertiliser, and application of seed will be carried out where possible in consecutive operations to reduce the potential for soil loss to wind and water erosion.

All soils will be lightly ripped prior to seeding. This will be conducted on the contour where possible and will be managed to minimise the potential for unsuitable spoil material being ripped up to the surface.

Seed Bed Preparation

Thorough seedbed preparation will be undertaken to ensure optimum establishment and growth of vegetation. All soils will be lightly ripped prior to seeding to ensure any ameliorants are incorporated into the soil and rough surface is established to capture seed. This will be conducted along the contour where possible and will be managed to minimise the potential for unsuitable spoil material being ripped up to the surface.

For tree planting / tubestock areas, tree mounds should be scheduled well ahead of the target planting date to allow for settlement, to capture rain, improve soil moisture and ongoing moisture retention.

6.2.5 ECOSYSTEM AND LAND USE ESTABLISHMENT

Native Ecosystem Establishment

The final landform will be revegetated to one or more of the native woodland/forest vegetation types that occur in the surrounding sub-region and are the same vegetation class as required by the Development Consent.

The woodland/forest will be a recognisable vegetation type that is self-sustaining. Native species to be planted in revegetation areas will be selected on a site by site basis depending on pre-existing vegetation, nearby remnant vegetation associations, soil types, aspect and site conditions.

6.2.6 ECOSYSTEM AND LAND USE DEVELOPMENT

At the ecosystem and land use development phase, rehabilitation monitoring results will be used to confirm rehabilitation areas are on a trajectory towards a self-sustaining ecosystem and meeting the rehabilitation completion criteria. Monitoring results will also be used to determine the recommendations and requirements for maintenance and/or contingency measures (e.g. supplementary plantings, weed control and erosion repair) to improve rehabilitation performance.

Key activities in the ecosystem and land use development phase include:

- rehabilitation monitoring (**Section 8**);
- rehabilitation maintenance including ongoing:
 - weed and feral animal control;
 - erosion control work maintenance;
 - maintenance fertilizing and re-seeding or re-planting (where required); and
 - repair of fence lines, access tracks and other general related land management activities;
- intervention and adaptive management

Weed and Feral Animal Control of Rehabilitation Areas

Weed management practices adopted include:

- ongoing visual assessments and annual weed monitoring;
- application of herbicides where required to control weed infestations;
- recording and controlling any occurrences of noxious weeds
- restriction of grazing and vehicular traffic to minimise spread of weeds; and
- liaison with the Local Land Services (LLS) and adjacent landowners.

Controls in place to minimise the impact and potential for feral animal infestation include:



- Ongoing visual observations of feral animal activity including inspections for all the nominated vertebrate pests will be conducted in conjunction with the Biodiversity Management Plan and Rehabilitation Monitoring Program.
- Liaison with adjoining landholders and the LLS, and participation with any local landholder and/or LLS vertebrate pest control programmes.

Seedlings (tubestock) planted in rehabilitation areas may be protected from grazing pest animals including rabbits or kangaroos by installing plastic tree guards if required.

Native Vegetation Rehabilitation Management and Agricultural Monitoring

Rehabilitation monitoring will be established for the native ecosystem areas of rehabilitation.

Rehabilitation monitoring includes a combination of visual monitoring and Ecosystem Function Analysis monitoring. These monitoring methods are described in the Rehabilitation Monitoring Program (**Section 8**).

Inherent Environmental Risks

Prolonged periods of drought impact rehabilitation success. All tube stock plantings and seeding will be undertaken during the appropriate season, in considering of the forecast to maximise the chance of plant establishment. During periods of drought supplementary watering of establishing tube stock will be undertaken on an as-needed basis.

Bushfire also poses a risk to areas of existing rehabilitation and nearby established ecosystems, such as the Worimi National Park. Required asset protection zones will be maintained for operational areas of the quarry.

6.3 REHABILITATION OF AREAS AFFECTED BY SUBSIDENCE

The site has no areas affected by underground mining subsidence.



7 REHABILITATION QUALITY ASSURANCE PROCESS

A Rehabilitation Quality Assurance Process will be implemented which details rehabilitation, key actions and/or processes nominated for each phase throughout the life of the operations to ensure that:

- Rehabilitation is implemented in accordance with the nominated methodologies.
- Identified risks to rehabilitation are adequately addressed before proceeding to the next phase of rehabilitation.
- Rehabilitation is completed to the standard required to achieve the applicable completion criteria.

The Rehabilitation Quality Assurance Process will measure how the requirements of this RMP have been met and will document the rehabilitation evidence used for assessing against the completion criteria. The Rehabilitation Quality Assurance Process will be integrated into day to day operations at the site and implemented throughout the life of the operation, including into closure until rehabilitation relinquishment has been achieved. The Rehabilitation Quality Assurance Process is outlined in **Table 12**. Rehabilitation validation monitoring is undertaken as described in **Section 8**.



Table 12 Rehabilitation Quality Assurance Program

Rehabilitation Phase	Quality Assurance Actions and Processes	Responsibilities for Implementation	Methods for Documenting and Recording
Active Mining (extractive activities)	- Documentation of pre-clearance surveys. - Resource salvage records (e.g. topsoil, habitat trees etc). - Records of competent personnel for extractive activities and rehabilitation. - Soil testing.	Operations and Environmental personnel	- Inspections and documentation. - Pre clearance records - Soil tracking register
Decommissioning	. - Contaminated land assessment. - Hazardous material assessment. - Removal of waste. - Inspections and demolition reports. - Water quality monitoring. - Hydraulic and hydrologic modelling. - Retained water infrastructure assessment - Monitoring and assessment of final landform.	Environmental personnel	- Annual Rehabilitation Report and Forward Program. - Annual Review. - Inspections and documentation. - Demolition reports - Consultation records. - Modelling reports. - Monitoring reports. - Survey.
Landform Establishment	- Final landform topographic survey. - Landform erosion modelling. - Surface water quality monitoring. - Groundwater quality monitoring. - Erosion and sediment control monitoring. - Geotechnical assessment of stability. - Photographic monitoring of rehabilitation landforms. - Visual monitoring.	Quarry rehabilitation and closure team	- Expert assessment reports. - Inspections and documentation. - Validation reports. - Survey.
Growth Medium Development	- Supervision of topsoil spreading. - Visual and photographic monitoring. - Tracking and review of topsoil balance. - Soil chemistry analysis. - Erosion and sediment control monitoring.	Environmental personnel	- Annual Rehabilitation Report and Forward Program. - Annual Review. - Inspections and documentation. - Monitoring reports.
Ecosystem and Land Use Establishment	- Analysis of ecosystem function. - Landscape Function Analysis (LFA). - Surface water quality monitoring, including visual inspections for algal bloom. - Groundwater quality monitoring. - Visual and photographic monitoring.	Environmental personnel	- Annual Rehabilitation Report and Forward Program. - Annual Review. - Inspections and documentation. - Monitoring reports.
Ecosystem and Land Use Development	- Analysis of ecosystem function. - LFA. - Water quality monitoring. - Visual and photographic monitoring.	Environmental personnel	- Annual Rehabilitation Report and Forward Program. - Annual Review. - Inspections and documentation. - Monitoring reports.



8 REHABILITATION MONITORING PROGRAM

Monitoring of the rehabilitation areas will be conducted in accordance with the following sections. Rehabilitation will be monitored on a regular basis to ensure vegetation is establishing in the rehabilitation areas and to determine the need for any maintenance and/or contingency measures (e.g. supplementary plantings, weed or erosion control). The monitoring will also aim to demonstrate the effectiveness of the rehabilitation techniques and track the progression towards achieving the Rehabilitation Objectives and Rehabilitation Completion Criteria (**Section 4**).

Rehabilitation monitoring reports are prepared annually and include:

- monitoring of rehabilitation areas;
- native vegetation surveys;
- terrestrial fauna and habitat surveys; and
- analysis of results including statistical analysis (where appropriate).

The aim of the rehabilitation monitoring reports is to document the annual monitoring results and provide a quantitative assessment of rehabilitation performance against nearby undisturbed (i.e. control) landscapes. Specific monitoring objectives include:

- quantitative tracking of rehabilitation performance;
- assess key aspects of flora (upper, mid and lower strata) in native ecosystem areas;
- compare data with previous monitoring;
- evaluate monitoring results against monitoring triggers and rehabilitation objectives as outlined in this RMP; and
- provide recommendations to assist with the improvement of rehabilitation or monitoring methods and closure for Holcim.

Monitoring will be undertaken in line with the rehabilitation monitoring program proposed in the Salt Ash Sand Quarry Rehabilitation Strategy and included below in **Table 13**.

Table 13 Rehabilitation Monitoring Program

Rehabilitation Element	Factors for Monitoring	Monitoring Frequency
Pond and Site Water	Water quality including pH, EC and total suspended solids.	Monthly for the first 12 months after establishment and then quarterly + opportunistic after significant* rainfall events.
	Groundwater quality and depth	
	Efficiency of landform surface water drainage systems (integrity of banks and drains)	
	Visual inspections for algal bloom	
Native Vegetation	Describe the vegetation in general terms	Quarterly for the first 12 months after establishment and then every 12 months
	Count the number of plants of all species, excluding grass	
	Record details of ground cover (litter, logs, rocks etc.)	



Rehabilitation Element	Factors for Monitoring	Monitoring Frequency
	Count, by species, all trees >1.6m tall	
	Tag and measure the diameter at breast height (DBH) of trees >1.6m tall, to a maximum of 10 for any one species	
	Subjectively describe tree health, by species if relevant, noting signs of drought stress, nutrient deficiencies, disease and severe insect attack. Where health problems are noted, record the percentage of unhealthy trees	
	Record any new plant species not targeted, including any problem and declared noxious weeds	
	Maintain photographic record with constant reference points	
Native Fauna	General observations relating to the availability and variety of food sources (e.g., flowering/fruited trees, presence of invertebrates etc)	Quarterly for the first 12 months after establishment and then every 12 months
	Availability and variety of habitat and shelter (e.g. depth of leaf litter, presence of logs, hollows etc.)	
	Presence/absence of free water in the rehabilitated areas	
	General observations of vertebrate species (including species of conservation significance)	After rehabilitation is 3 years old undertake monitoring biennially at a time of year determined to be appropriate for majority of species
	Detailed fauna surveys including presence and approximate abundance and distribution of vertebrate species (focussing on species of conservation significance)	
	Diversity and abundance of present invertebrate species	Bi-Annually, at times of year determined to be appropriate for majority of species
Pests	Species identified	Quarterly during the first two years and biennially after that. Inspections should be opportunistic after significant rainfall events.
	Approximate numbers/level of infestation	
	Observations of impact on rehabilitation (if any)	
Landform Stability	Assessment of the stability of batters and also looking at surface settlements (sink holes). In particular where these features could impact on the performance of any surface water management system	Annually or opportunistic after significant* rainfall events.
	Pond stability	
	Surface integrity of landform cover/capping (measurement of extent of integrity failure)	
	Severity and presence of landform slumping	
	Severity of erosion and sedimentation	



Rehabilitation Element	Factors for Monitoring	Monitoring Frequency
Safety Hazards	Risk assessment (likelihood vs consequence) of site health and safety hazards and their controls.	Quarterly for the first 12 months after establishment and then annually.
Land Use	Land use achievability of selected rehabilitation option and landform design	Annually

8.1 ANALOGUE SITE BASELINE MONITORING

Holcim will undertake monitoring at appropriate analogue sites to assist in quantifying the key desirable indicators of Native Ecosystem rehabilitation. Native vegetation analogue site monitoring is used to determine bench marks for indicators including percent foliar coverage for midstorey and canopy species, species presence and abundance for all strata (groundcover, midstorey and canopy) and weed species presence.

8.2 REHABILITATION ESTABLISHMENT MONITORING

The following rehabilitation establishment monitoring is associated with closure activities proposed for the site.

Remote Sensing

Annual high-resolution LiDAR will to be used to monitor changes across the entire site. The remotely sensed data will allow for quantitative comparison of key land surface condition parameters in native vegetation environments. Repeat annual capture and analysis of the LiDAR imagery will allow for identification and mapping changes in land and vegetation cover. Targeted field work will be implemented to examine the causes of any change. If changes are confirmed or discovered on-ground site specific management responses and remedial actions are developed and implemented.

Native Vegetation Monitoring

Vegetation surveys will be undertaken for Native Ecosystems, focusing on the condition, composition and structure of woodland vegetation in rehabilitation areas and analogue sites. The native vegetation monitoring program provides quantitative data on woodland structure and composition, exotic fauna species and soil attributes. Surveys of native vegetation areas are used to detect any significant declines in each strata, specifically:

- overstorey: cover, health, richness, recruitment;
- mid storey: cover, richness; and
- groundcover: total percent ground cover, native ground cover (cover and richness), weeds (percent cover and richness).

During native vegetation monitoring events, native and exotic fauna observations and soil erosion observations are also recorded. For the purposes of rehabilitation monitoring, change in vegetation condition for rehabilitated sites is measured against control sites; in this case control sites selected outside of the area of influence of the quarry which are representative of the native vegetation communities (structure and floristics) in the surrounding landform. Revegetation surveys will be undertaken by an appropriately qualified and experienced person to identify the success of rehabilitation and identify any additional measures required to achieve ongoing rehabilitation success.



8.3 MEASURING PERFORMANCE - REHABILITATION OBJECTIVES AND COMPLETION CRITERIA

The results of rehabilitation monitoring will be compared against the proposed Rehabilitation Objectives and Rehabilitation Completion Criteria (where appropriate) described in **Section 4.1** to track rehabilitation progress. Outcomes of the rehabilitation monitoring will be provided in subsequent Annual Reviews and the Annual Rehabilitation Report.

Summaries of the monitoring results and performance against rehabilitation objectives and completion criteria will be included in this section when this RMP is updated or revised.



9 REHABILITATION RESEARCH, MODELLING AND TRIALS

Holcim is committed to ensuring that activities are undertaken effectively to ensure that the success of rehabilitation enables the overall rehabilitation objectives to be achieved.

For rehabilitation to be effective, Holcim are able to transfer knowledge of rehabilitation practices, trials and research at other operations within the region, to improve the knowledge of rehabilitation. Additionally, historical rehabilitation at the site is able to be referred to and is demonstrated by the successful historical rehabilitation completed which is self-sustaining.

Holcim has experience in native ecosystem rehabilitation undertaken at the Dunloe, Dubbo, and Lang Lang quarries.

9.1 CURRENT REHABILITATION RESEARCH, MODELLING AND TRIALS

There is historical rehabilitation on site (Plates 1-3) as part of existing operations (circa 2001). The success of this rehabilitation process, combined with successful rehabilitation at other operations within the region will guide rehabilitation at the site for new rehabilitation areas. Current practices include the collection (Plate 4) and propagation of native seeds from existing vegetation on site. The mulching of vegetation to be cleared is practiced and will continue to be utilised to enhance the surface organic layer on rehabilitation (Plate 5). Logs and large woody debris is also salvaged and used in rehabilitation for native fauna habitat (Plate 6).



Plate 1: Existing rehabilitation established on site.





Plate 2: Existing rehabilitation established on site.



Plate 3: Existing rehabilitation developing organic layer of mulch on surface over time





Plate 4: Local native seeds collected and propagated for rehabilitation



Plate 5: Mulch salvaged on site for rehabilitation.





Plate 6: Large logs on rehabilitation provides native fauna habitat.

9.2 FUTURE REHABILITATION RESEARCH MODELLING AND TRIALS

Following approval of the continued operations at the site, rehabilitation trials will be undertaken on site in new areas prepared for rehabilitation. Learnings from these trials will be included in revisions of this RMP and will inform future rehabilitation activities on site.



10 INTERVENTION AND ADAPTIVE MANAGEMENT

Holcim will use adaptive management techniques where a response or action is required based on a pre-determined trigger. The key rehabilitation risks associated with the site have been identified in a Rehabilitation Risk Assessment (**Section 3**).

Holcim will undertake ongoing rehabilitation maintenance works as required which will be instigated by a Trigger Action Response Plan (TARP). This TARP is included in full in **Appendix 1**.

The TARP has been developed to reflect the key risks to successful rehabilitation at the site identified by the risk assessments conducted to date, as described in **Section 3** and further undertaken through the EIS progress. The TARP, and the risk assessment in **Section 3** will be reviewed regularly to continuously improve rehabilitation practices.



11 REVIEW, REVISION AND IMPLEMENTATION

Holcim will amend this RMP in the following circumstances:

- Following Project approval;
- As a consequence of an amendment made to the rehabilitation objectives and rehabilitation completion criteria (**Section 4**) or Final Landform and Rehabilitation Plan (**Section 5**);
- To reflect any changes to the risk control measures in the RMP that are identified in a rehabilitation risk assessment – as soon as practicable after the rehabilitation risk assessment is conducted; and
- Whenever directed in writing to do so DPHI – in accordance with the direction.

Holcim will ensure that the RMP remains current and relevant to ensure it defines the rehabilitation outcomes to be achieved in relation to the extraction area and sets out the strategy to achieve those outcomes. This will be partly informed by ensuring that the effectiveness of the rehabilitation risk assessment and controls adopted in the progressive rehabilitation schedule and rehabilitation phases are routinely evaluated throughout the life cycle of the site.

Whenever any foreseeable hazard is identified that presents a risk to achieving the rehabilitation objectives and rehabilitation completion criteria, or the Final Landform and Rehabilitation Plan, Holcim will update the rehabilitation risk assessment and RMP.

If necessary, Holcim will update this RMP to include more detailed site closure activities as rehabilitation progresses. The results of any environmental performance monitoring undertaken during the Forward Program term will also contribute to refining future RMPs.

The rehabilitation principles and targets described in this RMP will continue to be tracked via Holcim's internal review and tracking systems and the reporting and auditing mechanisms.



12 REFERENCES

- AECOM (2016) Independent Environmental Audit: Tanilba North Dune.
- Commonwealth of Australia (2006). Mine Rehabilitation – Leading Practice Sustainable Development Program for the Mining Industry.
- Commonwealth of Australia (2006). Mine Closure and Completion – Leading Practice Sustainable Development Program for the Mining Industry.
- Encompass Mining Pty Ltd (2025) Salt Ash Quarry Geotechnical Design Assessment
- Environmental Earth Sciences (2019) Rehabilitation Strategy for Stockton Sand Quarry Dredging, Coxs Lane, Fullerton Cove NSW.
- Geosyntec Consultants Pty Ltd (2025) Acid Sulfate Soils Characterisation Investigation: 8 Oakdale Drive, Salt Ash, NSW, 2318
- Geosyntec Consultants Pty Ltd, (2022) Preliminary Evaluation of Sand Dredge Pond and Groundwater Treatment Options
- GeoTerra (2022) Holcim Salt Ash Sand Operations Groundwater, Sediment and Acid Sulfate Geochemistry Assessment
- Hydrominex Geoscience Pty Ltd (2022) 202010 Holcim Stockton Groundwater Impact Assessment
- Niche Environment and Heritage Pty Ltd (2024) Salt Ash Sand Operations Biodiversity Development Assessment Report
- NSW Department of Environment (1998) Landform Design for Rehabilitation, Best Practice Environmental Management in Mining.
- NSW Department of Environment & Heritage (2002) Best Practice Environmental Management in Mining Booklet for Mine Closure.
- NSW Department of Planning and Environment (2016) Hunter Regional Plan 2036
- NSW Soil and Land Information System (2021) State of NSW and Department of Planning, Industry and Environment.
- Port Stephens Council (2020) Port Stephens Local Strategic Planning Statement
- Secretary's for State Significant Mining Developments (2 November 2020) Planning Secretary's Environmental Assessment Requirements (SEARs).
- Umwelt (Australia) Pty Ltd (2020) Mackas Sands Annual Review 2020, Annual Rehabilitation Inspection.
- Xstract Mining Consultants Pty Ltd (2021) Geotechnical report: Salt Ash Quarry, Salt Ash XSTP21011-REP-001-REVB



Appendix 1

Trigger Action Response Plan



Aspect/ Category	Key Element	Completion Criteria Performance Indicator	Trigger/ Response	Condition Green	Condition Amber	Condition Red
Landform Stability	Slope gradient	Landform Stability / Slopes / Erosion	Trigger	Rehabilitated boundary dune batter has slopes that are generally 20°.	Rehabilitated boundary dune batter has slopes >20° but <25°.	Rehabilitated boundary dune batter has slopes >25°.
			Response	No response required. Continue monitoring program.	If it is not designed to be between 10° and 14°, undertake regrading and revegetation of the area within 1 year.	Undertake a review of the landform design, including survey if required. Undertake regrading and revegetation of the area, within 1 year.
		Landform Stability / Slopes / Erosion	Trigger	Rehabilitation areas have no signs of slumping or movement.	Rehabilitation areas exhibit some minor slumping or movement.	Rehabilitation areas exhibit significant slumping or mass movement.
			Response	No response required. Continue monitoring program.	Monitor and assess stability of area. Undertake regrading and revegetation of the area, if required, within 1 year.	Undertake a review of the landform design, including survey if required. Undertake regrading and revegetation of the area, if required, within 1 year.
	Erosion control	Landform Stability / Slopes / Erosion	Trigger	No gully or tunnel erosion. No active rilling present >200mm deep.	Minor gully or tunnel erosion present and/or active rilling >200 mm deep.	Significant gully or tunnel erosion present and/or rilling >600 mm deep.
			Response	No response required. Continue monitoring program.	A suitably trained person to inspect the site. Investigate opportunities to install water management infrastructure to address erosion. Remediate as appropriate within 1 year	Undertake a review of the drainage of the area and provide recommendations to appropriately remediate the erosion. Remediate as soon as practicable within 6 months.
	Drainage Condition	Landform Stability / Slopes / Erosion	Trigger	Drainage condition is in accordance with the design criteria established for the final landform.	Landforms exhibiting minor drainage issues but does not threaten to cause rehabilitation failure.	Landforms exhibiting significant drainage issues, threatening or causing rehabilitation failure.
			Response	No response required. Continue monitoring program.	A suitably trained person to inspect the site. Investigate opportunities to address issues. Remediate as appropriate within 1 year	Undertake a review of the drainage design and provide recommendations to appropriately remediate the area. Remediate as soon as practicable, within 1 year.
Water Quality	Monitoring parameters	Geomorphic stability / Water Quality	Trigger	Surface water quality of runoff from rehabilitation areas is within EPL criteria and rehabilitation performance criteria established within this document.	Water quality exceeds EPL or performance criteria but does not indicate a long-term rehabilitation issue. Surface water quality or runoff must comply with section 120 of the Protection of the Environment Operations Act 1997.	Water quality exceeds criteria, indicating a long-term rehabilitation liability. Surface water quality or runoff must comply with section 120 of the Protection of the Environment Operations Act 1997.

Aspect/ Category	Key Element	Completion Criteria Performance Indicator	Trigger/ Response	Condition Green	Condition Amber	Condition Red
Water Quality	Monitoring parameters	Geomorphic stability / Water Quality	Response	No response required. Continue monitoring program.	Reporting as per Statutory reporting requirements. Review and investigate water quality monitoring and management where appropriate. Implement relevant remedial measures where required within 6 months.	Reporting as per statutory reporting requirements. Implement relevant responses and undertake immediate review to determine source of issues and implement remediation measures identified as soon as practicable within 1 year.
Soil/spoil quality	Monitoring parameters	Growing media development / Amelioration/ Topsoil characterisation / Surface cover / Ground Cover	Trigger	Properties of soil/spoil are not limiting the plant establishment.	Rehabilitation vegetation underperforming, i.e. limited establishment of vegetation present over areas >400m ²	Rehabilitation vegetation underperforming, i.e. bare areas of rehabilitation greater than >400m ²
			Response	No response required. Continue monitoring program.	Investigate application of additional soil, and/or use of appropriate soil ameliorants or management options to address soil/spoil quality if deemed necessary. Conduct soil sampling and analysis if appropriate Area requires redo within 1 year.	Unless a clear cause for the underpinning such as drought a consultant to be engaged to assist with recommendations to appropriately remediate soil/spoil quality and depth. Remediate as soon as practicable. Conduct soil sampling and analysis Area requires redo within 6 months.
Topsoil Availability	Topsoil quantity	Growing media development / Amelioration/ Topsoil characterisation	Trigger	Sufficient topsoil identified for rehabilitation over the project life.	Topsoil balance indicates a deficiency in topsoil available for rehabilitation over the Life of the project	Deficiency significant enough to delay rehab progression during the life of the project.
			Response	No response required.	Investigate options and alternatives (eg Source Separated Green Waste Compost) to be able to meet future topsoil requirements. Develop topsoil alternative plan considering other sources within 1 year. Modify EPL waste exemption if required.	Investigate use of alternatives such as Green Waste Mulch. Develop topsoil alternative plan considering other sources within 1 year. Modify EPL waste exemption if required.
Vegetation	Ground cover	Growing media development / Amelioration/ Topsoil characterisation / Surface cover / Ground Cover	Trigger	Vegetation is on a timely trajectory developing groundcover of diversity and density consistent with final landform and completion criteria.	Vegetation is not on a timely trajectory of developing groundcover of diversity or density consistent with final landform and/or completion criteria.	No target groundcover present.
			Response	No response required. Continue monitoring program.	Review procedures where required to increase vegetation cover. Review ground cover at next Annual Review	A suitably trained person to inspect the site and conduct soil sampling and analysis if appropriate. Investigate use of appropriate management options to remediate. Remediate as appropriate within 1 year.
	Weed presence	Weed presence Surface cover / Ground Cover	Trigger	Weed presence is within range found at analogue sites and does not present a risk to rehabilitation.	Weeds present a risk to the establishment of rehabilitation areas. Outbreak of weeds greater than 10% of ground cover.	Weeds are limiting the establishment of rehabilitation significantly. Weed % greater than 15%

Aspect/ Category	Key Element	Completion Criteria Performance Indicator	Trigger/ Response	Condition Green	Condition Amber	Condition Red
			Response	No response required. Continue monitoring program.	Engage weed management contractor to remove / control weed species from the site. Targeted spray campaign within the next reporting period (Annual Review).	Engage weed management contractor to remove weeds from the site as soon as practicable. Conduct soil sampling and analysis if appropriate Investigate management measures to assist plant establishment including use of ameliorants and implement as appropriate. Targeted spray campaign within the next reporting period (Annual Review).
			Trigger	Region is Declared Non-Drought as defined by Department of Primary Industries Combined Drought Indicator	Region is Drought Affected as defined by Department of Primary Industries Combined Drought Indicator	Region is Declared in Drought as defined by Department of Primary Industries Combined Drought Indicator
			Response	No response required. Continue monitoring program.	Investigate long term rainfall forecast and consider planting cover crop as interim measure to reduce wind erosion, dust generation and weed invasion. Consider delay to final seeding rehabilitation with approval from Resources Regulator. Investigate increased erosion and sediment controls.	Plant cover crop as interim measure on any new rehab areas to reduce wind erosion, dust generation and weed invasion. Delay final seeding rehabilitation with approval from Resources Regulator. Install increased erosion and sediment controls to reduce topsoil loss when drought breaks.
	Prolonged Drought	Erosion and sediment control / Vegetation health/ Species composition				
Vegetation	Species composition	Surface cover / Second generation trees/ Stem Count / Vegetation health	Trigger	Vegetation is on a timely trajectory developing groundcover of tree species consistent with final landform and completion criteria.	Vegetation is not on a timely trajectory of developing tree species composition consistent with final landform and/or completion criteria.	Vegetation is not developing or has significant maintenance required to achieve composition consistent with final landform and/or completion criteria.
			Response	No response required. Continue monitoring program.	Review native seed mix and amend accordingly. Consider remedial actions such as tubestock planting, reseeding or other management practices to achieve required species composition. Remedial action to be undertaken if recommended with consideration of drought for any tubestock plantings.	An inspection of the site will be undertaken by a suitably trained person. Investigate remedial options to achieve required species composition. Remedial action to be undertaken within appropriate period if recommended with consideration of drought for any tubestock plantings.