



Hornsby Shire Council
Hornsby Quarry Rehabilitation EIS
Preliminary Construction Environmental Management Plan

November 2019

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1. Introduction

1.1 Overview

Hornsby Shire Council (Council) proposes to rehabilitate the former Hornsby Quarry site (the project). GHD Pty Ltd (GHD) has been engaged by Council to prepare a Preliminary Construction Environmental Management Plan (CEMP) for the project.

1.2 Purpose of this preliminary CEMP

The purpose of this preliminary CEMP is to provide an environmental management framework and associated management procedures to avoid or minimise the actual and potential environmental impacts associated with rehabilitation of the quarry.

1.3 Limitations

This report: has been prepared by GHD for Hornsby Shire Council and may only be used and relied on by Hornsby Shire Council for the purpose agreed between GHD and the Hornsby Shire Council as set out in section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than Hornsby Shire Council arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Hornsby Shire Council and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

2. General

2.1 Background

Hornsby Quarry is a former breccia hard rock quarry that was operated by private business from the early 1900s and ceased in the late 1990s. The quarry is considered a safety risk and has therefore been closed to the public since that time.

Hornsby Shire Council (Council) acquired the site in 2002 and has since undertaken a number of investigations and studies with regard to the future use of the site and the environmental and technical constraints that the site poses. Through these studies, Council identified the need to:

- stabilise the quarry
- manage the site in a safe and environmentally sustainable manner, and
- actively seek opportunities to fill the quarry void with spoil arising from major infrastructure projects in the region

Council also resolved to ultimately develop the site into a community parkland.

In 2016 approval was granted to Roads and Maritime Services (Roads and Maritime), to beneficially reuse up to 1.5 million cubic metres of excavated rock and soil (spoil) from the construction of the NorthConnex tunnel to partially fill the Hornsby Quarry (the '2016 Planning Approval'). Filling has been undertaken at the site under this approval.

Following completion of filling by NorthConnex, Council is proposing to rehabilitate and reshape the site in a suitable way to ensure public safety and allow future development into a parkland for community use (the project).

2.2 Site location

The project is located in the Hornsby local government area (LGA), approximately 21 kilometres (km) to the north west of the Sydney central business district.

The site can be defined as:

- Lots A, B, C, D and E in Deposited Plan (DP) 318676
- Lot 1 DP 926103
- Lot 1 DP 926449
- Lot 1 DP 114323
- Lots 1 and 2 in DP 169188
- Lot 7306 DP 1157797
- Lot 1 DP 859646
- Lot 1 DP 926449
- Lot 13 DP 734459
- Lot 114 DP 749606
- Lot 213 DP 713249
- Summers Avenue, Hornsby partly formed
- Old Mans Valley Trail

Figure 2-1 shows the location of the site.

2.2.1 Surrounding land uses

Land use and existing development in the areas surrounding the site are predominantly suburban residential, with commercial and light industrial land uses along Peats Ferry Road.

Residential areas are located to the south of the site and on the southern side of Quarry Road. Residential development also occurs to the north of the site, off Fern Tree Close and Manor Road and to the east on Bridge Road and Peats Ferry Road, as shown on Figure 2-1.

Other surrounding land uses include the Mt Wilga Private Hospital to the north and the Hornsby Town Centre to the east, Hornsby TAFE, the Hornsby Aquatic and Leisure Centre, Hornsby Park, Hornsby Shire Council Chambers, police and Court precinct, various businesses along Peats Ferry Road and the Hornsby railway station.

To the west of the site is an extensive bushland area known as Berowra Valley National Park, which is primarily managed by the NSW National Parks and Wildlife Service in conjunction with Council.

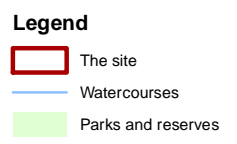
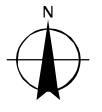
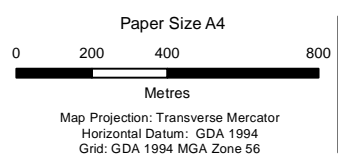
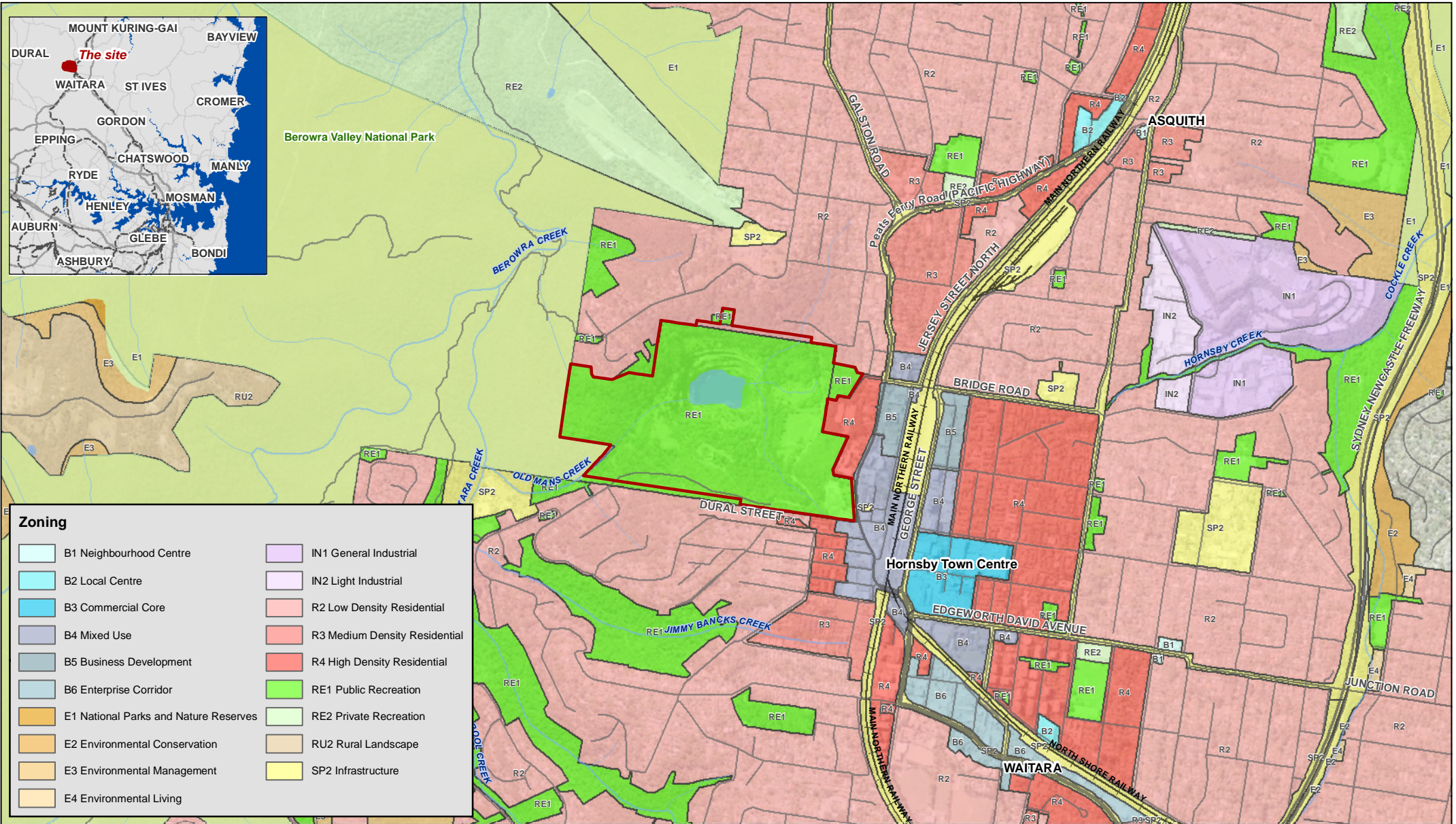
2.2.2 Land zoning

The majority of the site is zoned RE1 Public Recreation and a small section of land within the site that is connected to Summers Avenue is zoned R2 Low Density Residential. Land zoning is shown on Figure 2-1

2.2.3 Land ownership

The majority of the site is owned by Council. Lot 7606, DP1157797 is Crown land.

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Hornsby Shire Council
Hornsby Quarry Rehabilitation

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Revision | A
Date | 29 Aug 2019

Site location, surrounding
land uses and zoning

Figure 2-1

2.3 Work zones

The rehabilitation works are split across four work zones:

- Northern spoil mound works area
- Southwest fill works area
- Quarry void works area
- Old mans valley works area

The location of each work zone is shown in Figure 2-2.

2.3.1 Nature of work

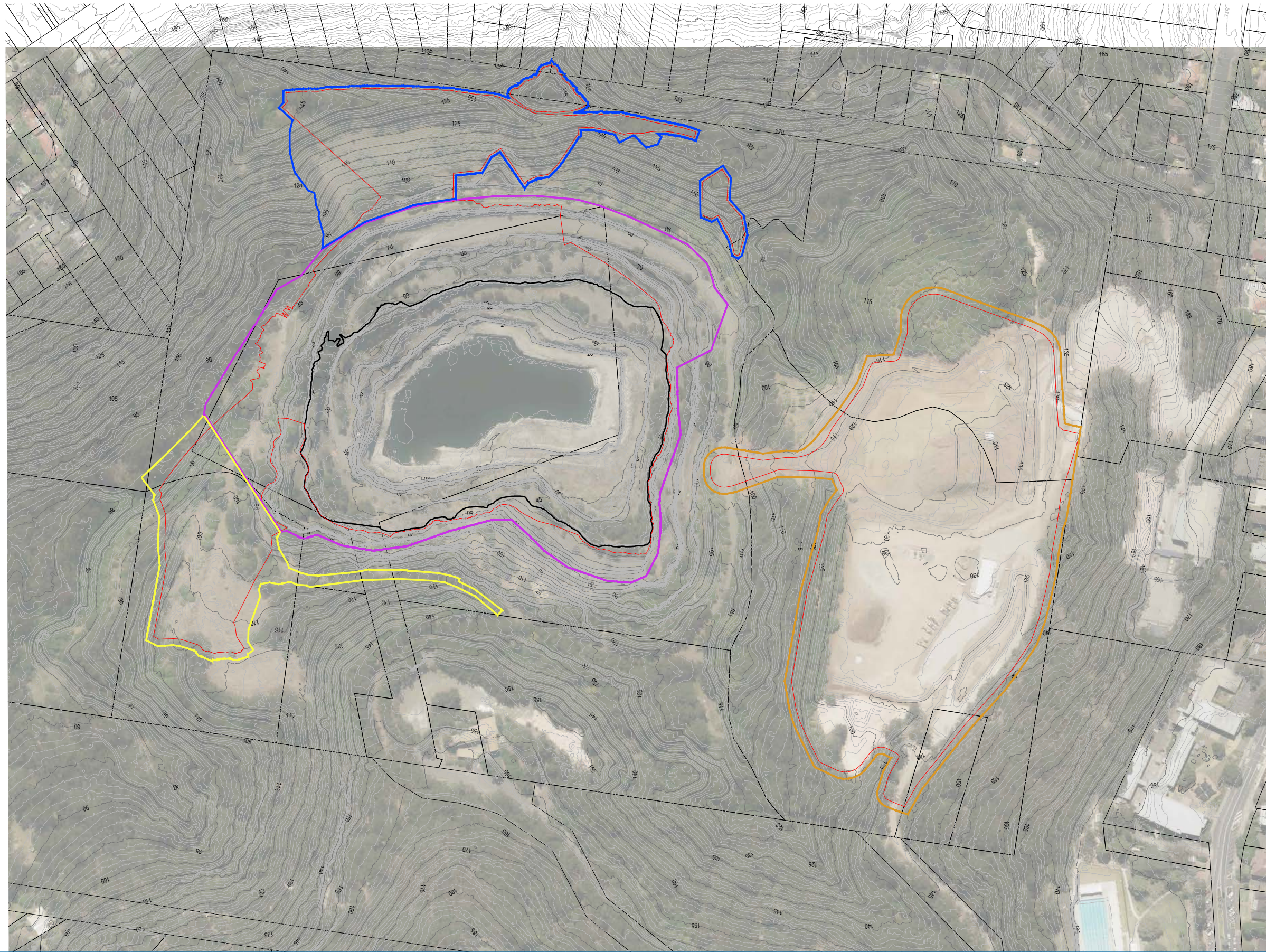
Rehabilitation works will be conducted across all four work zones identified in section 2.3. The works consist primarily of earthworks using heavy plant and equipment. Key features of the project include:

- Rehabilitation, stabilisation and geotechnical safety management works around various parts of the site
- Earthworks and placement of material won from within the site to create the desired final landform
- Revegetation of disturbed areas.

Approximately 300,000 m³ of spoil is expected to be generated onsite from earthworks. Much of this material will be placed on the NorthConnex spoil to create a landform within the quarry void that has large level platforms and would allow for the creation of a new parkland to be constructed within the quarry void.

The landform will include a lake directly below the exposed eastern face of the quarry. There will also be cut and fill works on Old Mans Valley to create a landform suitable for future development into playing fields and other recreational activities.

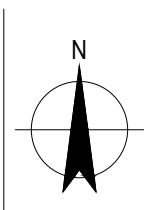
It is expected that a combination of ripping, rock breaking and rock sawing will be required to shift the material. Rock fragments will be crushed onsite using a mobile crusher or rock breaker prior to placement as fill.



LEGEND

- CADASTRE
- PRE-NORTHCONNEX FILL SURVEY SURFACE
- APPROX. NORTHCONNEX FILL BOUNDARY
- EARTHWORKS DESIGN EXTENT
- NORTHERN SPOIL MOUND WORKS AREA
- SOUTH-EAST FILL WORKS AREA
- QUARRY VOID WORKS AREA
- OLD MANS VALLEY WORKS AREA

0 30 60 90m
SCALE 1:3000 AT ORIGINAL SIZE



**HORNSBY SHIRE COUNCIL
HORNSBY QUARRY REHABILITATION
EXTENT OF WORKS**

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Date | OCT 2019

Figure 2-2

2.3.2 Machinery/equipment to be used

Typical plant required to undertake the construction works by load and haul operation includes:

- Excavators – with rippers or rock-breakers
- Rock saw
- Vibratory roller/compactor
- Bulldozers
- Loaders
- Articulated dump trucks
- Mobile screen
- Mobile crusher
- Fuel truck
- Off-road - water cart
- Tub grinder and mulcher

Proposed geotechnical safety management works will also be installed using the same equipment. However specific attachments may be used (such as drilling equipment applied to excavators for micro-piling, grab arms for placing gabion/facings etc) where required.

2.3.3 Estimated duration of work

The project is expected to take approximately two years to complete. However the majority of key earthworks activities are expected to be completed in an approximate 15 month period. The estimated duration of works in each work zone is shown in Table 2-1.

Table 2-1 Estimated duration of works

Work area	Months							
	0	3	6	9	12	15	18	21
Quarry void	X	X	X	X	X	X	X	X
Northern spoil mound	X	X	X	X	X	X		
South west fill area		X	X	X	X			
Old Mans Valley					X	X	X	X

The proposed works will be carried out during the following standard construction times:

- Monday to Friday 7 am to 6 pm
- Saturday 8 am to 1 pm
- No work on Sundays or public holidays

While no works are anticipated to occur outside of standard hours there may be circumstances where out-of-hours activities associated with the project are necessary. Activities which may be undertaken outside of standard daytime hours (in accordance with Section 2.3 of the Interim Construction Noise guidelines (ICNG) would include the following circumstances:

- The delivery of materials or oversized plant as required by the Police or other authorities for safety reasons.

- Where it is required to avoid the loss of lives, property and/or to prevent environmental harm in an emergency.
- Activities which are determined to comply with the relevant Noise Management Level (NML) at the most affected sensitive receiver, excluding activities associated with the transport and handling of spoil. Such activities may include refuelling of plant and equipment maintenance.
- Where agreement is reached with affected receivers.

2.4 Site management and safety

2.4.1 Site contacts

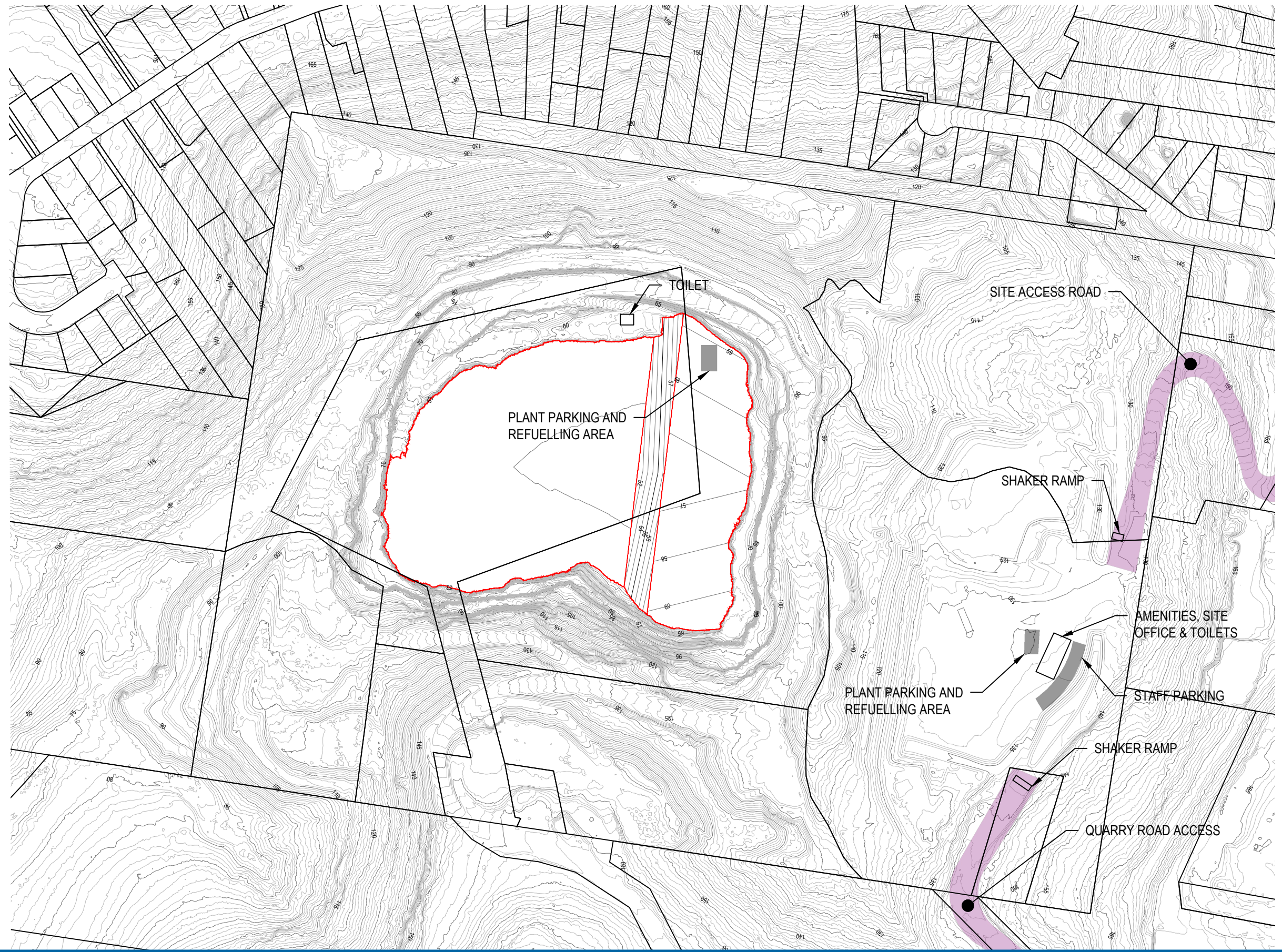
The CEMP will include contact details for (at a minimum):

- Key council personnel
- Key Contractor personnel
 - Contractor project manager
 - Contractor environmental manager

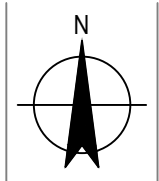
2.4.2 Site offices/amenities

The site office and amenities block are located on the eastern side of the site near Bridge Rd and Quarry Road access roads.

The location of the site office and amenities block is shown on Figure 2-3.



- LEGEND**
- ≡ SURVEY SURFACE
 - ≡≡ APPROX. FILL SURFACE (NORTHCONNEX)
 - APPROX. FILL BOUNDARY (NORTHCONNEX)



HORNSBY SHIRE COUNCIL
 HORNSBY QUARRY REHABILITATION
SITE MANAGEMENT PLAN

Job Number | 21-26457
 Revision | B
 Date | AUG 2019
Figure 2-3

2.4.3 Waste management

Waste will be generated on the site as a result of rehabilitation activities. This includes construction waste (steel, packaging, etc.) and personnel waste (sewerage, general rubbish, etc.). Waste materials are to be managed and disposed of to avoid land contamination, maintain visual amenity and to reduce the proclivity of waste to attract fauna.

2.4.4 Site access and fencing

The site is surrounded by an extensive network of security fencing and gates.

The site is accessible via Quarry Road (off Dural Street and other local roads) from the south east and from Bridge Road (off the Peats Ferry Road) from the north east. Dural Street links to Peats Ferry Road, an arterial road that connects with the state road network, including the Sydney-Newcastle Freeway.

2.4.5 Induction protocols

All employees, contractors and sub-contractors will receive an environmental induction prior to commencing any work on site. The induction will include:

- all relevant project specific and standard noise and vibration mitigation measures
- relevant licence and approval conditions
- permissible hours of work
- any limitations on high noise generating activities
- location of nearest sensitive receivers
- construction employee parking areas
- designated loading/ unloading areas and procedures
- construction traffic routes
- site opening/closing times (including deliveries)
- environmental incident procedures
- unexpected find protocols
- ecological values of the study area, protection measures to be implemented to protect biodiversity and penalties for breaches.

2.4.6 Public safety

Site access will be restricted during rehabilitation works for safety reason. There will be no general public or pedestrian access to the site.

2.5 Incident and complaints protocols

2.5.1 Incident reporting

All personnel shall report all environmental incidents to the Project Manager and complete an environmental incident report form. The Contractor may use internal Health, Safety and Environment (HSE) incident management systems for recording, investigation and close-out of incidents. Examples of environmental incidents include the following:

- Fuel, oil and/or chemical spills
- Fire and/or explosions

- Unearthing of historical or Indigenous cultural heritage
- Major erosion and sediment control failure.

The Contractor shall be responsible for investigating environmental incidents and maintaining records of actions taken. Where applicable, environmental incidents shall be reported to Council and the relevant Administering Authority by the Project Manager, or in accordance with relevant contractual obligations.

2.5.2 Complaints

Complaints represent an opportunity for improvement or enhancement of project environmental performance. All project complaints, including those from members of the public, stakeholder groups and regulatory authorities, shall be recorded by the Contractor. The Contractor may use internal management systems for investigating and responding to complaints in a timely manner.

As a minimum, a standardised Environmental Complaint Record Form will be created to record all complaints. The Project Manager shall be responsible for investigating and responding to complaints in a timely manner.

2.5.3 Non-conformance and preventative/corrective actions

Non-conformances managed by the Contractors CEMP shall include the following:

- An incident or near miss with potential or actual environmental impact
- Complaints regarding project construction activities
- Not meeting an objective or target
- Management review not being undertaken.

The Project Manager shall be responsible for identifying and implementing any preventative and/or corrective actions in response to any non-conformance. Preventative and correction actions shall be incorporated into the Contractors CEMP as required.

2.5.4 Audit and inspections

Aspects with a potential for environmental impact shall be subject to environmental audits as required (risk based approach) and in accordance with internal Contractor procedures. Audits shall be conducted by the Project Manager (or qualified delegate). Audit objectives shall be to verify compliance with the Contractors CEMP and applicable permits, approvals and regulations.

Environmental inspections shall be conducted in accordance with internal Contractor procedures or on at least at least a weekly basis (minimum).

2.5.5 Reporting

Contractor reporting shall be undertaken in accordance with applicable third party approval conditions or as requested by the relevant Administering Authority and Council. Reporting shall include all relevant information pertaining to environmental matters (e.g. records, monitoring results, incidents, complaints, audits and inspections, etc.) as required under the approval or as requested by the Administering Authority.

The Project Manager shall be ultimately responsible for reporting with support from suitably experienced and qualified staff as required.

The Project Manager shall report on environmental performance to Council (as required) in any meetings or documented progress reports in accordance with contractual obligations.

2.6 Traffic

2.6.1 Vehicle movements

The expected traffic generation associated with the construction works at the Hornsby Quarry rehabilitation development is summarised in Table 2-2.

Table 2-2 Hornsby quarry development construction traffic generation

Type	Daily		AM Peak Hour		PM Peak Hour	
	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
Light vehicle movements	30	30	30	0	0	30
Heavy vehicle movements	20	20	10	5	5	10
Total	50	50	40	5	5	40

During each of the peak hour periods per day, 30 light vehicle movements and 15 heavy vehicle movements are expected to occur for a worst case scenario assessment. It is noted that most of the movements associated with construction activity will occur outside the road network peak periods (i.e. prior to 7 am and before 5 pm).

2.6.2 Adherence to construction traffic management plan

A detailed **Construction Traffic Management Plan** will be prepared and approved by Council prior to construction commencing. The Construction Traffic Management Plan will include the following:

- Traffic control measures in works areas
- Restrictions on the delivery of heavy plant and materials to site during peak traffic periods
- Appropriate entry/exit points for the proposed construction compound area(s)
- Advising motorists of the change in traffic conditions associated with the work.

2.6.3 General traffic and truck haulage routes

General traffic (light vehicles and some heavy vehicles) will access the site from Bridge Road.

Heavy vehicles such as low loaders, wide loaders and less manoeuvrable vehicles would be unable to navigate the steep Bridge Road access. Consequently, these vehicles will access the site via Quarry Road (utilising William Street/Fredrick Street). Heavy vehicles utilising Quarry Road will be limited to off-peak periods and will be limited to one vehicle per hour during the night period and a maximum of three heavy vehicle movements per night (after hours).

2.6.4 Parking

The project will operate with 30 employees at the site and adopting the conservative estimate (assuming a vehicle occupancy of one), 30 parking spaces will be required.

Provision has been made for onsite parking. Workers travelling to the site will use a designated available area to park their vehicles on site.

The designated parking zone should provide for:

- Construction crew members / workers
- Space for loading and unloading of equipment and materials.

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Parking demands generated by the project will be satisfactorily accommodated on-site with no demand for on-street parking.

Therefore, the proposed parking provisions are considered supportable.

2.7 Site facilities

2.7.1 Equipment and fuel storage

Construction plant, equipment and fuel will be stored at the designated plant parking and refuelling area located on the eastern side on the site adjacent to the site office and amenities building. A refuelling procedure will be prepared by the Contractor to management potential spills and leaks.

2.7.2 Loading/unloading

Plant and equipment loading and unloading will occur at the designated loading area located near the on site parking area.

2.7.3 Materials storage/stockpiles

Storage/stockpile will be in bunded areas within Old Mans Valley and the quarry void.

2.8 Soil manufacturing

On site soil manufacturing will be undertaken to aid bush regeneration activities. All appropriate topsoil from the proposed earthworks will be retained on site for reuse in the bush revegetation work. To supplement the retained topsoils, soils will be 'manufactured' from areas of cut and by blending it with mulch or compost generated onsite from cleared vegetation (green waste). The 'manufactured' soil will replicate the original soil profile.

Inappropriate top soil will be used as fill material to shape the landform as required.

2.8.1 Equipment

A tub grinder and mulcher will be operated on site during the early part of the construction period to create mulch for onsite landscaping purposes, from the cleared vegetation.

2.8.2 Storage

Manufactured soil will be stored in windrows established in Old Mans Valley.

3. Construction environmental management plan

Environmental mitigation and management measures that will be undertaken during the construction of the project are detailed in this section.

3.1 Noise

Environmental aspect	Noise	
Objective	To minimise noise impacts to nearby receivers and preserve the noise amenity of the surrounding area	
Issue	Risk	Mitigation and management measures
<ul style="list-style-type: none"> Noise generated during rehabilitation works 	<ul style="list-style-type: none"> Excessive noise Noise disturbance and impact to nearby residences and commercial facilities 	<ul style="list-style-type: none"> A detailed Construction Noise and Vibration Management Plan (CNVMP) will be prepared by the Contractor and approved by Council prior to construction commencing. The CNVMP will describe the methods that will be implemented for each construction work phase to minimise noise and vibration impacts and will identify if any further noise modelling is required. All activities on site will be confined between 7:00 am to 6:00 pm from Monday to Friday and 7:00 am to 1:00 pm on Saturday All personnel on site will be made aware of the potential for noise impacts and should aim to minimise impact or elevated noise levels, where possible Regular identification of noisy activities and adoption of improvement techniques Minimise the need for vehicle reversing (for example, by arranging for one-way site traffic routes) Construction heavy vehicles utilising William Street/Fredrick Street and Quarry Road will be limited to one vehicle per hour during the night period and there will be a maximum of three heavy vehicle movements per night (after hours). Scheduling of respite periods for high noise activities including rock breaking, ripping and sawing A noise monitoring program will be carried out for the duration of the works in accordance with any approval and license conditions. The noise monitoring program will include long-term verification monitoring of noise during construction should be conducted at a minimum of four affected receiver(s)¹ surrounding the project

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¹ Affected receivers defined as receptors likely to experience noise levels 10 dB(A) greater than Noise Management Levels (NML).

Environmental aspect	Noise	
Objective	To minimise noise impacts to nearby receivers and preserve the noise amenity of the surrounding area	
Issue	Risk	Mitigation and management measures
		<p>area. Monitoring should provide alerts to the contractor when the highly noise affected level is exceeded (or a level agreed with the regulator).</p> <ul style="list-style-type: none"> • The purpose of monitoring is to confirm that: <ul style="list-style-type: none"> – construction noise and vibration from the project are consistent with the predictions in the noise assessment – mitigation and management of construction noise and vibration is appropriate for receivers affected by the works • Where noise monitoring finds that the actual noise levels exceed those predicted in the noise assessment then immediate refinement of mitigation measures may be required and the CNVMP amended • No swearing or unnecessary shouting or loud stereos/radios on site • All employees, contractors and sub-contractors will receive an environmental induction (details discussed in Section 2.4.5). • The community will be notified in advance about high noise generating works that are likely to exceed noise criteria. The notification will include a detailed description of work activities, dates and hours, impacts and mitigation measures indication of work schedule, and contact phone number (for noise complaints and project information). • Periodic notification will be given to receivers likely to experience noise levels 10 dB(A) greater than the Noise Management Levels (NML). The periodic notification entitled 'Project Update' or 'Construction Update' will be produced and distributed to stakeholders via letterbox drop and distributed to the project postal and/or email mailing lists. • Periodic notifications provide an overview of current and upcoming works across the project and other topics of interest. The objective is to engage, inform and provide project-specific messages. Advanced warning of potential disruptions (e.g. traffic changes or noisy works) can assist in reducing the impact on stakeholders. The approval conditions for projects specify requirements for notification to sensitive receivers where works may impact on them.

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Environmental aspect	Noise	
Objective	To minimise noise impacts to nearby receivers and preserve the noise amenity of the surrounding area	
Issue	Risk	Mitigation and management measures
		<ul style="list-style-type: none"> • Specific notifications in the form of a personalised letter or phone call to stakeholders identified to experience noise level equal to or greater than 75 dB(A) no later than seven calendar days ahead of construction activities that are likely to exceed the noise objectives. Alternatively (or in addition to), communications representatives from the contractor would visit identified stakeholders at least 48 hours ahead of potentially disturbing construction activities and provide an individual briefing. <ul style="list-style-type: none"> – Letters may be letterbox dropped or hand distributed – Phone calls provide affected stakeholders with personalised contact and tailored advice, with the opportunity to provide comments on the proposed work and their specific needs – Individual briefings are used to inform stakeholders about the impacts of noisy activities and mitigation measures that will be implemented. Individual briefings provide affected stakeholders with personalised contact and tailored advice, with the opportunity to comment on the project • The following measures will be implemented to reduce noise at source: <ul style="list-style-type: none"> • Substitution: <ul style="list-style-type: none"> • Where reasonably practicable, noisy plant will be replaced by less noisy alternatives • Modification of equipment: <ul style="list-style-type: none"> • All engine covers will be kept closed while equipment is operating • Plant and vehicles will be kept properly serviced and fitted with appropriate mufflers and silencers, where applicable • The use of exhaust brakes will be eliminated, where practical • Where practical, plant operating on site will be fitted with broadband reversing alarms. • Acoustic enclosures will be provided for suitable equipment • Use and siting of plant:

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Environmental aspect	Noise	
Objective	To minimise noise impacts to nearby receivers and preserve the noise amenity of the surrounding area	
Issue	Risk	Mitigation and management measures
		<ul style="list-style-type: none"> • The offset distance between noisy plant and adjacent sensitive receivers will be maximised where practical • Plant used intermittently will be throttled down or shut off • Noise-emitting plant will be directed away from sensitive receivers, where possible • Regular and effective maintenance: • Regular inspection and maintenance of equipment to ensure it is in good working order and checking the condition of mufflers • Machines found to produce excessive noise compared to industry best practice will be removed from the site or stood down until repairs or modifications can be made • Ensure air lines on pneumatic equipment do not leak • Return of any hired equipment that is causing noise that is not typical for the equipment – the increased noise may indicate the need for repair • Alternative methods: • Examine and implement, where feasible and reasonable, alternatives to rock-breaking work methods, such as hydraulic splitters for rock and concrete, hydraulic jaw crushers, chemical rock and concrete splitting. The suitability of alternative methods should be considered on a case-by-case basis

3.2 Vibration

Environmental aspect	Vibration	
Objective	To minimise vibration impacts to nearby structures and receivers	
Issue	Risk	Mitigation and management measures
<ul style="list-style-type: none"> • Vibration generated during remediation works 	<ul style="list-style-type: none"> • Excessive vibration • Damage to nearby structures due to vibration from construction equipment 	<ul style="list-style-type: none"> • Where vibratory rolling or compacting works undertaken within 100 metres of the most western building of the Hornsby TAFE, the occupants of this building will be notified of the expected impacts • Vibration monitoring will be undertaken to determine the extent of the vibration impact and to guide mitigation measures, which may include the use of smaller equipment when the TAFE is in use • Where practical, rolling works near the TAFE will be undertaken during their holiday break period to minimise potential vibration impacts.

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3.3 Air quality

Environmental aspect	Air quality	
Objective	To minimise air quality (dust) impacts to nearby receptors	
Issue	Risk	Mitigation and management measures
<ul style="list-style-type: none"> Dust generated during rehabilitation works 	<ul style="list-style-type: none"> Dust impacts to nearby receptors 	<ul style="list-style-type: none"> Where appropriate, material will be watered prior to it being loaded for on-site haulage and loads will be covered The size of storage piles will be minimised where possible Cleared areas will be monitored and dust suppression (watering) will be used when adverse conditions prevail Cleared areas of land will be limited where practicable and only cleared when necessary to reduce fugitive dust emissions On-site traffic will be controlled by designating specific routes for haulage and access and limiting vehicle speeds to below 25 km/h All trucks hauling material on the way to the site will be covered and a reasonable amount of vertical space will be maintained between the top of the load and top of the trailer Operations conducted in areas of low moisture content material will be suspended during high wind speed events or water sprays will be used Rock saws will be equipped with in built wet control systems that reduce dust generation to negligible levels. These wet control systems will be used during all rock sawing activities. Water will be applied to exposed surfaces that are causing dust generation. Surfaces may include unpaved roads, stockpiles, hardstand areas and other exposed surfaces (for example recently graded areas). Vehicles must travel at appropriate speeds to limit dust generation.

3.4 Water quality

Environmental aspect	Water quality	
Objective	To minimise off site impacts of sediment transport and to minimise impacts to the water quality of nearby surface water and groundwater catchments.	
Issue	Risk	Mitigation and management measures
<ul style="list-style-type: none"> Erosion and sediment control 	<ul style="list-style-type: none"> Off site impacts to water bodies due to sediment transportation 	<ul style="list-style-type: none"> A Soil and Water Management Plan will be developed prior to construction, in accordance with Landcom (2015) 'The Blue Book', including consideration of erosion and sediment control impacts. The Soil and Water Management Plans (as part of the Soil and Water Management Plan) will ensure any areas disturbed will have soil and erosion control measure put in place (such as hydromulch) until longer-term vegetation is established in accordance with the Vegetation Management Plan (VMP) developed for the project.
<ul style="list-style-type: none"> Dewatering of quarry void 	<ul style="list-style-type: none"> Dewatering discharge impact the 	<ul style="list-style-type: none"> All water discharge into creeks will be guided by the ANZECC Water Quality Guidelines (2000)

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Environmental aspect	Water quality	
Objective	To minimise off site impacts of sediment transport and to minimise impacts to the water quality of nearby surface water and groundwater catchments.	
Issue	Risk	Mitigation and management measures
	<ul style="list-style-type: none"> natural waterways Contamination of natural waterways 	<ul style="list-style-type: none"> Continuation of all requirements of the groundwater licence

3.5 Biodiversity

Environmental aspect	Biodiversity	
Objective	To protect flora and fauna biodiversity surrounding and within the project site	
Issue	Risk	Mitigation and management measures
<ul style="list-style-type: none"> Clearing of vegetation 	<ul style="list-style-type: none"> Removal of habitat resources and degradation of landscape Disruption and damage to natural habitats Pollution of land 	<ul style="list-style-type: none"> An offset package for the project will be developed in accordance with Hornsby Shire Council's Green Offsets Code and with reference to OEH's recommendations Collection of seeds and propagules from areas of Blue Gum High Forest will be considered prior to vegetation clearing occurring. Seeds (if collected) will be planted in Council's community nursery and any individuals grown used for on-site plantings during creation of the parkland Disturbance of vegetation will be limited to the minimum necessary to construct works Where the project area adjoins native vegetation, mark the limits of clearing and install temporary protective fencing around the vegetated area prior to the commencement of construction activities to prevent vegetation and habitat removal Clearing of mature, native trees will be minimised where possible and exclusion barriers set up to prevent indirect impacts Erosion and sediment control plans (as part of the Soil and Water Management Plan) will be prepared in accordance with Volume 2D of Managing Urban Stormwater: Soils and Construction (DECC, 2008c). The erosion and sediment control plans will be established prior to the commencement of construction and be updated and managed throughout as relevant to the activities during the construction phase All water discharge into creeks will be guided by the ANZECC Water Quality Guidelines (2000) Temporary scour protection and energy dissipation measures should be designed to protect receiving environments from erosion Erosion and sediment control measures will be established prior to construction Erosion and sediment control measures will be regularly inspected, particularly following rainfall events, to ensure their ongoing functionality Stabilised surfaces will be reinstated as quickly as practicable after construction

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Environmental aspect	Biodiversity	
Objective	To protect flora and fauna biodiversity surrounding and within the project site	
Issue	Risk	Mitigation and management measures
		<ul style="list-style-type: none"> All stockpiled material should be stored in bunded areas and kept away from waterways to avoid sediment entering the waterway
<ul style="list-style-type: none"> Impacts on flora and fauna 	<ul style="list-style-type: none"> Further endanger threatened flora and fauna Loss of native species 	<ul style="list-style-type: none"> All workers will be provided with an environmental induction prior to starting work in the project area. This will include information on the ecological values of the study area, protection measures to be implemented to protect biodiversity and penalties for breaches. A Flora and Fauna Management Plan will be prepared as part of the CEMP, incorporating recommendations below, and expanding where necessary Equipment storage and stockpiling of resources will be limited to designated areas in cleared land An unexpected finds procedure will be developed for any threatened biota or habitat resources detected during pre-clearing or clearing surveys or revealed by other sources A trained ecologist will be present during the clearing of native vegetation or removal of potential fauna habitat to avoid impacts on resident fauna and to salvage habitat resources as far as is practicable. Clearing surveys should include: <ul style="list-style-type: none"> inspections of native vegetation for resident fauna and/or nests or other signs of fauna occupancy inspection of culverts proposed for demolition/removal for roosting microbats prior to works commencing inspection and identification/marketing of hollow-bearing trees and termite mounds protocols for the removal of hollow-bearing trees and termite mounds must be developed prior to removal to minimise mortality or injury of native fauna capture and relocation or captive rearing of less mobile fauna (such as nestling birds) by a trained fauna handler and with assistance from Wildlife Information Rescue and Education Service (WIRES) as required salvage of habitat features such as mature tree trunks and woody debris from the project area for future use in the parkland or surrounding areas.
<ul style="list-style-type: none"> Introduction of foreign species 	<ul style="list-style-type: none"> Foreign species (weeds) impact existing biodiversity 	<ul style="list-style-type: none"> A Vegetation Management Plan (VMP) was developed for the project Weed management actions were developed (as part of the VMP) to manage weeds during the construction phase of the project. This included the management and disposal of the weeds that were recorded within the project area including the priority weeds listed in section 11.2.2 of the EIS (GHD, 2019) in accordance with the Biosecurity Act Vehicles and other equipment to be used within the impact area will be cleaned to prevent the introduction of further exotic plant species or disease Protocols to prevent introduction or spread of chytrid fungus will be implemented (as part of the VMP)

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Environmental aspect	Biodiversity	
Objective	To protect flora and fauna biodiversity surrounding and within the project site	
Issue	Risk	Mitigation and management measures
		following OEH Hygiene protocol for the control of disease in frogs (DECC, 2008b).

3.6 Aboriginal heritage

Environmental aspect	Aboriginal heritage	
Objective	To minimise impact to Aboriginal heritage including archaeological remains and artefacts surrounding and within the project area	
Issue	Risk	Mitigation and management measures
<ul style="list-style-type: none"> Rehabilitation works near Aboriginal heritage areas 	<ul style="list-style-type: none"> Damage to Aboriginal heritage including archaeological remains and artefacts 	<p>An unexpected finds policy will be implemented in the event of Aboriginal archaeological deposits being identified during ground works and excavation. The unexpected finds policy will involve the following actions:</p> <ul style="list-style-type: none"> Induction of workers Stop work within the affected area, protect the potential archaeological find, and inform environment staff or supervisor Contact a suitably qualified archaeologist to assess the potential archaeological find If Aboriginal archaeological material is identified, works in the affected area will cease, and the OEH will be informed. Further archaeological mitigation may be required prior to works recommencing If human remains are found: <ul style="list-style-type: none"> not further disturb or move these remains immediately cease all work at the particular location notify NSW Police notify OEH's Environment Line on 131 555 as soon as practicable and provide available details of the remains and their location not recommence any work at the particular location unless authorised in writing by OEH.

3.7 Non-Aboriginal heritage

Environmental aspect	Non-Aboriginal heritage	
Objective	To minimise impact to heritage of the site and surrounding areas	
Issue	Risk	Mitigation and management measures
<ul style="list-style-type: none"> Rehabilitation works near heritage areas 	<ul style="list-style-type: none"> Damage to site heritage including the diatrema and Old Man's Cemetery 	<ul style="list-style-type: none"> Induction of workers Should any unexpected archaeological finds be made during the project, work will cease immediately and a suitably qualified archaeologist will be contacted to assess the finds before any works continue A condition report will be prepared for the SHR listed Old Man's Valley Cemetery (SHR 01764) prior to

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Environmental aspect	Non-Aboriginal heritage	
Objective	To minimise impact to heritage of the site and surrounding areas	
Issue	Risk	Mitigation and management measures
		<p>commencement of works and integrated into the Heritage Management Plan</p> <ul style="list-style-type: none"> The Heritage Management Plan will identify working areas that contain Heritage items and supply appropriate remediation methods suitable to minimise potential impact to the heritage items and exposed diatreme face on the eastern side of the quarry void.

3.8 Traffic and transport

Environmental aspect	Traffic and transport	
Objective	To manage traffic to protect site worker and road user safety	
Issue	Risk	Mitigation and management measures
<ul style="list-style-type: none"> Additional construction vehicle movements 	<ul style="list-style-type: none"> Project leads to overcrowding local roadways and disruption to local road users Unsafe traffic conditions 	<ul style="list-style-type: none"> A detailed Construction Traffic Management Plan will be prepared by the Contractor and approved by Council prior to construction commencing. The Construction Traffic Management Plan will include the following: <ul style="list-style-type: none"> Traffic control measures in works areas Restrictions on the delivery of heavy plant and materials to site during peak traffic periods Appropriate entry/exit points for the proposed construction compound area(s) Advising residents and motorists of the change in traffic conditions associated with the work The construction contractor will liaise with Council in relation to the location of proposed construction compound areas and any other requirements. If alternate construction compound locations are identified, approval will be obtained from Council and further assessment carried out Only existing roads and access roads will be utilised All traffic control devices will be in accordance with AS 1742.3-2009 – Manual of uniform traffic control devices: traffic control for works on roads and Roads and Maritime Traffic control at worksites manual.
<ul style="list-style-type: none"> Interaction between vehicles and public 	<ul style="list-style-type: none"> Risk to pedestrians 	<ul style="list-style-type: none"> Appropriate exclusion barriers, signage and site supervision to ensure that the site is controlled and that unauthorised vehicles and pedestrians are excluded from the works area The community will be kept informed about the project through advertisements in the local media, notices and/or signs, Council's website and Council's 40,000+ email list.

3.9 Land resources and contamination

Environmental aspect	Land resources and contamination	
Objective	To minimise the effects of erosion and spread of contamination	
Issue	Risk	Mitigation and management measures
<ul style="list-style-type: none"> Erosion control 	<ul style="list-style-type: none"> Excessive erosion 	<ul style="list-style-type: none"> Soil and Water Management Plan which includes erosion and sediment control plans (as discussed in Section 10.4 of the EIS (GHD, 2019) will be prepared by the Contractor prior to commencing work.
<ul style="list-style-type: none"> Contamination control 	<ul style="list-style-type: none"> Spread of contamination and hazardous materials Impact to the environment from contamination Exposure of site personnel to hazards 	<ul style="list-style-type: none"> The existing underground fuel tank and any associated contamination will be removed in accordance with a Remedial Action Plan (RAP) Procedures to manage potential contaminants and or hazardous materials identified during the works would be developed by the Contractor If acid sulfate soils are encountered, they will be managed in accordance with the Acid Sulfate Soil Manual (Acid Sulfate Soil Management Advisory Committee, 1998) Potentially contaminated areas directly affected by the project will be managed in accordance with the requirements of the CLM Act and Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites (OEH, 2011)
<ul style="list-style-type: none"> Vehicle refuelling 	<ul style="list-style-type: none"> Fuel spills and leaks contaminate land 	<ul style="list-style-type: none"> A refuelling procedure would be developed by the Contractor. This would include procedures to address spills and leaks from refuelling.

3.10 Waste management

Environmental aspect	Waste management	
Objective	To manage waste generated on site	
Issue	Risk	Mitigation and management measures
<ul style="list-style-type: none"> Waste generation, handling, recovery, storage and disposal 	<ul style="list-style-type: none"> Production of unnecessary waste Inappropriate disposal of site generated waste 	<ul style="list-style-type: none"> A Waste Management Plan will be prepared by the contractor and included as part of the CEMP for the project. The plan will include procedures for the management of wastes in accordance with relevant NSW legislation and the principles of the waste management hierarchy set out in the NSW Waste Avoidance and Resource Recovery Strategy 2014-21 (EPA 2014a) Cleared vegetation will be shredded and mulched/composted and used for soil manufacture or reused on site where practicable. Care will be taken to ensure any onsite reuse would not spread weeds General waste from site personnel will be temporarily stored in mobile skip bins or wheelie bins on the site before being collected for recycling or disposal. Recyclable waste such as containers, paper and cardboard etc would be collected separately to facilitate offsite recycling

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Environmental aspect	Waste management	
Objective	To manage waste generated on site	
Issue	Risk	Mitigation and management measures
		<ul style="list-style-type: none"> Wastewater and sewage from site offices/amenities will be appropriately stored and regularly transported off site for disposal at a licensed facility.

3.11 Visual

Environmental aspect	Visual	
Objective	To preserve the visual amenity of the site during construction activities	
Issue	Risk	Mitigation and management measures
<ul style="list-style-type: none"> Rehabilitation activities including land clearing and reshaping 	<ul style="list-style-type: none"> Changes to landscape character within the proposed works areas Damage to visual amenity of the site 	<ul style="list-style-type: none"> Earthworks activities will be limited to standard construction hours Screening vegetation will be maintained where practicable Community updates and newsletters will be provided to nearby properties Revegetation will be undertaken consistent with the objectives of the VMP as soon as practical after earthworks have been completed.

4. Implementing the CEMP

4.1 Roles and responsibilities

The roles and responsibilities of the following key participants in the construction works are outlined below:

- Construction contractor
- Council

4.2 Construction contractor

The roles and responsibilities of the construction Contractor are as follows:

- Develop a detailed CEMP that is consistent with, and no less stringent than, the intended outcomes identified in this outline CEMP
- Carry out rehabilitation works in accordance with the requirements of the CEMP
- Review the CEMP periodically during rehabilitation works and update as necessary
- Make all staff aware of the requirements of the CEMP and provide the required Health, Safety and Environmental training to enable staff to safely undertake their work activities and ensure environmental impacts are managed
- Ensure staff comply with all relevant environmental guidelines
- Keep a register of all environmental accidents, incidents, non-conformances and complaints
- Carry out environmental audits, inspections and monitoring to verify compliance with the CEMP
- Undertake complaint investigations and report complaint investigation findings to Council
- Correct all non-conformances to the satisfaction of Council in the timeframe specified by Council
- Report on the implementation and effectiveness of corrective actions specified Council or implemented to ensure correction of non-compliances
- Provide monitoring and reporting to Council on all activities on site as required in the CEMP
- Communicate project need and objectives with the public and residents. Notify the public in advance of any activities likely to impact their amenity (e.g. high noise generating works that are likely to exceed noise criteria).

4.3 Council

The roles and responsibilities of Council are as follows:

- Review and provide commentary on the Contractor's CEMP
- Inform the Contractor of any site specific, environmental performance related requirements
- Facilitate a "continuous improvement" approach by raising any issues and opportunities for improvement of practice with the Contractor throughout the course of the project.

5. Individual plans

The following plans and procedure would be prepared by the Contractor prior to rehabilitation activities:

- Construction Traffic Management Plan
- Soil and Water Management Plan
- Flora and Fauna Management Plan
- Unexpected Finds Procedure
- Weed Management Plan
- Heritage Management Plan
- Contamination Management Procedures
- Waste Management Plan
- Refuelling Procedure
- Site Induction Procedures
- Complaints handling Procedures
- Construction Noise and Vibration Management Plan

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Appendices

Appendix A – Plans and Procedures

The following management plans and procedures accompany the CEMP prepared by the Contractor:

- Construction Traffic Management Plan
- Soil and Water Management Plan
- Flora and Fauna Management Plan
- Unexpected Finds Procedure
- Weed Management Plan
- Heritage Management Plan
- Contamination Management Procedures
- Remedial Action Plan for fuel tank
- Waste Management Plan
- Refuelling Procedure
- Site Induction procedures
- Complaints handling procedures
- Construction Noise and Vibration Management Plan

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