Recreational Trails and Facilities Management Plan

Willowdale Mine – Larego region

Alcoa of Australia Limited
17 December 2024

→ **The Power of Commitment**



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Executive summary

This Recreational Trails and Facilities Management Plan (RTFMP) has been prepared in accordance with the Environmental Protection Authority (EPA) Instructions on how to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans (EPA 2024).

The following table summarises the context and purpose of the RTFMP in the context of EPA environmental objectives.

Proposal name	Willowdale Mine, Larego region
Proponent name	Alcoa of Australia Limited
Ministerial Statement number	Not applicable
Purpose of the RTFMP	– To fulfil Alcoa's commitment under the Western Australian Operations 2023-2027 Mining and Management Program to develop a recreational management plan for the Larego region in consultation with DBCA. – The RTFMP covers existing mined areas and proposed mining areas – Larego region as itemised in the 5-year mine plan (2023-2027). – The RTFMP provides a framework for stakeholder engagement, planning, design, and management to mitigate impacts to recreational trails and facilities.
Key environmental factor	Social surroundings defined under the EP Act can be summarised as: *'In the case of humans' social surroundings refers to aesthetic, cultural, economic and other social surroundings to the extent to which they directly affect or are affected by physical or biological surroundings'*
Key environmental factor objective	The EPA's environmental objective for the factor of Social Surroundings is: '*To protect social surroundings from significant harm*'
RTFMP objectives	1. Minimise direct impacts to Munda Biddi Trail and Waterous Trail 2. Minimise noise and dust impacts to users of Munda Biddi, Waterous Trail and Lake Brockman recreational facilities 3. Reinstate public access to Hoffman Mill and Bridge Trails facilities where practicable, in consultation with DBCA and other key stakeholders 4. Maintain viability of existing and planned commercial opportunities 5. Maintain adequate camping amenities 6. Maintain access and adequacy of day-use areas 7. Maintain the ability for major events to occur 8. Maintenance of access for facility and asset management 9. Maintain water quality in response to new or changed recreational facility use 10. Minimise direct and indirect impacts on trails and their users in relation to exploration drilling activities
Condition clauses	Not applicable
Key components of the RTFMP	Objective-based management actions and targets that align with Government policies and strategies relating to recreational trails and forest industry commercial opportunities. Management actions are prioritised to very high and high risks and adopt a hierarchy to avoid, minimise and rehabilitate amenity impacts. The management actions reflect the potential for amenity impacts during mine operations, and longer-term visual and access impacts that may occur during rehabilitation and post-closure.
Proposed construction date	Staged construction is to occur throughout the five-year mine plan 2023-2027.
RTFMP required pre-construction	Yes

Contents

Acronyms and abbreviations **1**

1. Context, Scope and Rationale **2**

1.1 Overview 2

1.1.1 Regional context and setting 2

1.2 Rationale and Approach 4

1.2.1 Environmental management objectives 4

1.2.2 Study findings 4

1.2.2.1 Identified recreational trails and facilities 5

1.2.2.2 Noise impact assessment 10

1.2.2.3 Landscape and visual impact assessment 11

1.2.2.4 Air quality impact assessment 11

1.2.2.5 Exploration drilling potential impacts 12

1.2.2.6 Light pollution 12

1.2.3 Key assumptions and uncertainties 14

1.2.3.1 Regional planning and stakeholder consultation 14

1.2.4 Risk-based approach to management 14

1.2.5 Rationale for choice of provisions 15

2. Environmental Management Components **16**

2.1 Adaptive Management and Review 18

2.1.1 Environmental monitoring and corrective actions 18

2.2 Revisions 18

3. Stakeholder Consultation **20**

4. References **21**

Table index

Table 1 Site-specific Values, Potential Impacts and Environmental Management Objectives 4

Table 2 Relevant Studies 4

Table 3 Trail Classification Under WA Strategic Trails Blueprint 5

Table 4 Recreational Trails and Facilities Identified within the Larego Region and 2km Study Area 5

Table 5 Commercial Operators and Opportunities Identified within the Larego Region and 2km Study Area 6

Table 6 Strategies and Plans Relevant to Recreational Trails and Facilities within the Larego Region and 2km Study Area. 7

Table 7 Compatibility of Recreation Activities 8

Table 8 Potential Risks to Facilities During the Life of Mine 14

Table 9 Recreational Facilities and Commercial Opportunities within the Larego Region – Management Components 16

Table 10 Trigger and Threshold 17

Table 11 Key Stakeholders 20

Table 12 External Stakeholder Consultation in Relation to this RTFMP 20

Figure index

Figure 1	Regional Context	3
Figure 2	Identified Recreational Facilities	9
Figure 3	Exploration Drilling	13
Figure 4	RTFMP Review Process	19

Appendices

Appendix A	Identified Impacts – Recreational Facilities and Commercial Opportunities
Appendix B	Risk Assessment

Acronyms and abbreviations

Acronym/abbreviation	Expanded
4WD	Four Wheel Drive
Alcoa	Alcoa of Australia Limited
DBCA	Department of Biodiversity, Conservation and Attractions
DFES	Department of Fire and Emergency Services
DJTSI	Department of Jobs Tourism Science and Industry
DLGSCI	Department of Local Government Sport Cultural Industries
DMP	Dust Management Plan
EPA	Environmental Protection Authority (WA)
ERD	Environmental Review Document
FDRA	Forest Disease Risk Area
FMP	Forest Management Plan
LGA	Local Government Authority
LVIA	Landscape and Visual Management Assessment
PDWSA	Public Drinking Water Source Areas
MAZ	Mining Avoidance Zone
MMP	Mining and Management Plan
MMPLG	Mining and Management Program Liaison Group
ML1SA	Alcoa's Mining Lease 1SA
MOG	Mine Operations Group
NGO	Non-Government Organisation
NIA	Noise Impact Assessment
NMP	Noise Management Plan
RFA	Regional Forest Agreement
RTFMP	Recreational Trails and Facilities Management Plan
WA	Western Australia

1. Context, Scope and Rationale

1.1 Overview

Alcoa of Australia Limited (Alcoa) proposes the continuation of mining operations in Willowdale Mine, Larego region until 2040. This will support the continuity of bauxite supply to the Wagerup Alumina Refinery.

Larego region is located within the shires of Waroona and Harvey, the traditional lands of the Binjareb people. Located within the Peel and South West region, approximately 120km southeast of Perth, the Larego region is situated east of the townsites of Yarloop and northeast of Harvey (see Figure 1).

Larego region encompasses both existing and proposed mining areas, as outlined in the Larego region five-year mine plan (2023-2027) (The Proposal), with a staged rehabilitation integrated into the process. Proposed mining areas include vegetation clearing, mining earthworks (e.g. creating mine pits and secondary haul roads), and mining operations (ore extraction). Existing mining areas consist of both ceased mine pits and secondary haul roads, yet to be rehabilitated, along with active mine pits and haul roads.

The 2023-2027 Mining and Management Plan (MMP) includes a commitment by Alcoa to develop a recreational management plan for the Proposal, in partnership with the Department of Biodiversity, Conservation and Attractions (DBCA). The Recreational Trails and Facilities Management Plan (RTFMP) will be reviewed as required to incorporate significant updates and changes in pertinent internal and external factors.

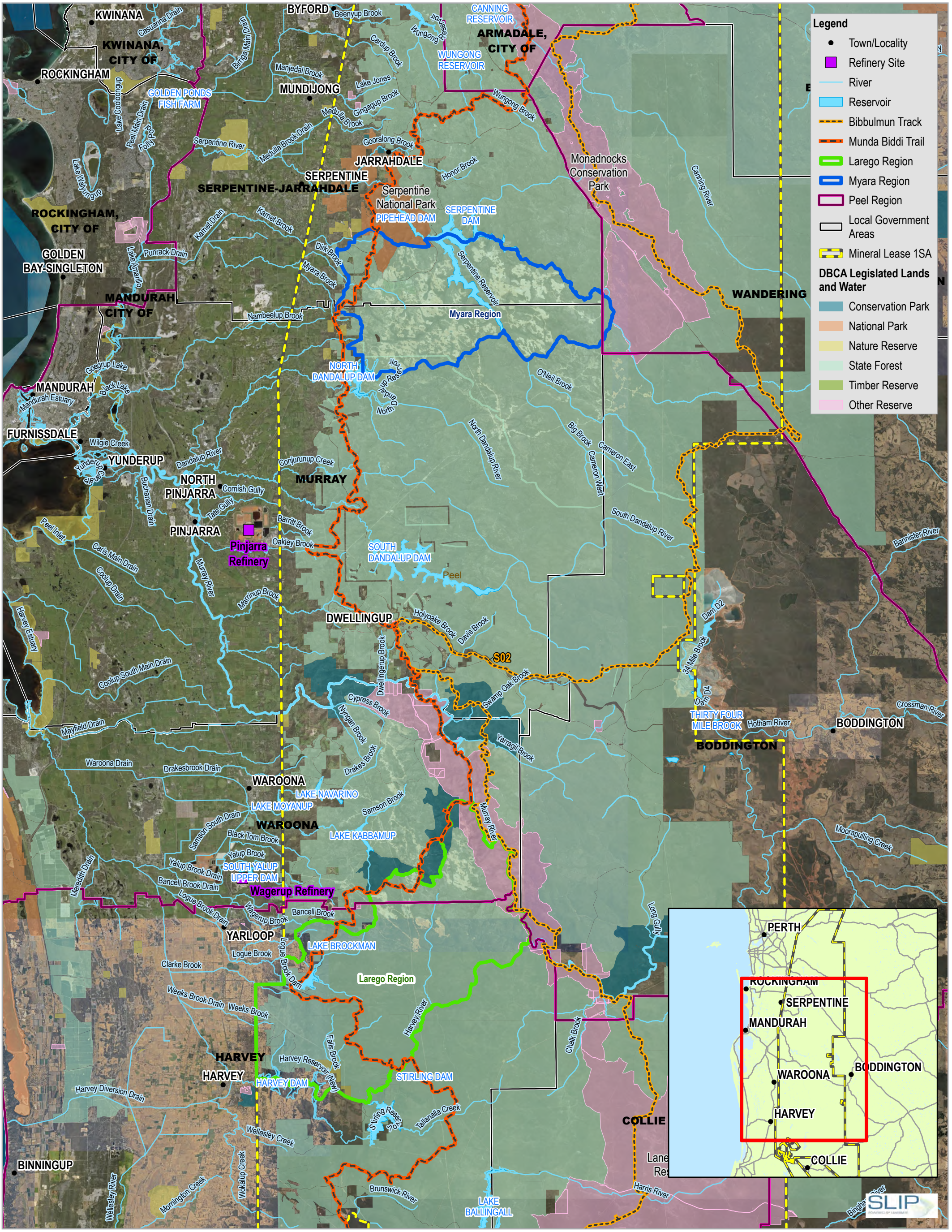
1.1.1 Regional context and setting

The Larego region is located within the Northern Jarrah Forest on the Darling Plateau within the shires of Harvey and Waroona (see Figure 1). The Larego region boundary lies approximately 16.5km south of Dwellingup townsite, 14km southeast of Waroona townsite and 2.5km east of Harvey townsite.

The mine region is located predominantly within Dwellingup State Forest, Harris River State Forest and Lane Poole Reserve, which are managed for multiple uses under the Regional Forest Agreement (RFA) and Forest Management Plan (FMP) including conservation, recreation, timber harvesting and water supply. Since the FMP 2014-2023 began in January 2014, significant changes in Government policies have influenced southwest forest management. These updates are reflected in the 2024-2033 plan, prepared by DBCA. In September 2021, the State Government introduced new policies for managing the south-west forests, which will be implemented through FMP 2024-2033. The most notable change is the cessation of large-scale commercial timber harvesting in native forests. From now on, timber will only be removed from these forests through activities aimed at improving forest health or clearing for approved mining operations and infrastructure.

The Northern Jarrah Forest includes extensive Forest Disease Risk Areas (FDRAs, see Figure 2). The FDRAs are proclaimed under the *Conservation and Land Management Act 1984* and comprise areas at high risk of the introduction or spread of *Phytophthora* Dieback. Strict quarantine and access restrictions apply to these areas. The Larego region borders the FDRA along its eastern boundary, however, there is no overlap. This is due to the Larego region lying in the high rainfall zone with a substantial infestation of *Phytophthora* Dieback from historic forest industries.

The Munda Biddi Trail runs through the north, west and south portions of the mine region and Bibbulmun Track is located 650m east of the mine region, within Lane Poole Reserve. Other formal and informal recreational facilities and commercial opportunities are located within and in the vicinity of the Larego region (Figure 2).



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Grid: GDA 1994 MGA Zone 50

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Alcoa Australia Limited
Larego Region
Recreational Trails
and Facilities Management Plan

Regional Context

Project No. **12638705**
Revision No. **G**
Date **17/12/2024**

FIGURE 1

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1.2 Rationale and Approach

1.2.1 Environmental management objectives

The environmental management objectives of this RTFMP are presented in Table 1. The objectives are based on the following:

– Site-specific environmental, social and commercial values and potential impacts (see Table 1)
– Study findings, assumptions and uncertainties (see Section 1.2.2 and Section 1.2.3)
– Risk assessment and prioritisation (see Section 1.2.4).

Section 2 presents the environmental management components of the RTFMP, which detail how monitoring and management will assist in demonstrating compliance with the environmental management objectives.

Table 1 Site-specific Values, Potential Impacts and Environmental Management Objectives

Region-specific environmental, social and commercial values	Value impacts	Environmental management objectives
– Recreational trails within and in close proximity to the Larego region as listed in Table 1.3. – Recreational campsites and day-use sites as listed in Table 1.3. – Commercial operations as listed in Table 5. Other values and events associated with the region include: – Events • Equestrian • Enduro motorbike • Rogaining – Historic value • Shield/reference trees • Bridges and minor culverts – Cultural heritage values* – Aboriginal heritage values* – Water resource values	– Closure and restricted public access to recreational facilities, commercial opportunities and/or cultural heritage. – Potential direct and indirect impacts to recreational facilities and commercial opportunities within and outside the mine region. – Potential amenity impacts to facilities. – Potential indirect impacts to water quality in reservoirs within the mine region that support recreational use. – Clearing of shield/reference trees. – Potential impacts of exploration drilling on recreational trails	1. Minimise direct impacts to Munda Biddi Trail and Waterous Trail 2. Minimise noise and dust impacts to users of Munda Biddi, Waterous Trail and Lake Brockman recreational facilities 3. Reinstate public access to Hoffman Mill and Bridge Trails facilities where practicable, in consultation with DBCA and other key stakeholders 4. Maintain viability of existing and planned commercial opportunities 5. Maintain adequate camping amenities 6. Maintain access and adequacy of day-use areas 7. Maintain the ability for major events to occur 8. Maintenance of access for facility and asset management 9. Maintain water quality in response to new or changed recreational facility use 10. Minimise direct and indirect impacts on trails and their users in relation to exploration drilling activities

**Cultural and Aboriginal heritage have not been considered further within the RTFMP.*

1.2.2 Study findings

Table 2 presents the social surroundings studies undertaken for the Proposal which have informed the rationale and approach for this RTFMP.

Table 2 Relevant Studies

Key environmental factors	Studies	Author
Social surroundings	Identification of recreational trails and facilities	GHD
	Noise impact assessment – Larego Mine Region	GHD (2024a)
	Landscape and visual impact assessment – Larego Region	GHD (2024b)
	Air quality impact assessment – Larego Mine Region	GHD (2024c)
	Exploration drilling potential impacts	GHD
	Light pollution	GHD

1.2.2.1 Identified recreational trails and facilities

This RTFMP provides a summary of the recreational trails and facilities within the Larego region and a surrounding 2km Study Area (Figure 2).

Recreational trails and facilities were identified based on published documents and stakeholder consultation, including the Department of Biodiversity, Conservation and Attractions (DBCA), Local Government Authorities and non-government organisations. Details of stakeholder consultation regarding recreational trails and facilities are presented in Section 3. The RTFMP does not currently consider scientific facilities or monitoring sites located within the Larego region or the 2km Study Area as the locations of these sites have not been confirmed by DBCA due to issues with the register and the age of previous records.

Recreational facilities were classified, where applicable, with definitions (see Table 3) drawn from the WA Strategic Trails Blueprint 2017-2021 (TRC Tourism, 2017) and as proposed in the Peel Regional Trails Strategy (Common Ground Trails, 2019). The classifications are proposed to prioritise investment for the purposes of economic and social development.

Table 3 Trail Classification Under WA Strategic Trails Blueprint

Classification	Definition
Trail Town	A population centre that has been assessed and accredited as a destination for its trails offering through the provision of high-quality trails and related services, businesses, branding and signage; and outdoor experiences that encourage extended visitation.
Trail Centre	A managed multiple trail facility with dedicated visitor services supported by high-quality trails and related services; and outdoor experiences that encourage single-day visitation. May be stand-alone or within a Trail Town.
Trail Network	A multiple trail facility with limited or no visitor services, supported by high-quality trails, branding and signage; and outdoor experiences that encourage single or part-day visitation. May be stand-alone or part of a Trail Town or Trail Centre.
State Trails	An extended trail or trail network that is of sufficient quality and with appropriate, products and services to be recognised beyond the State and to attract visitors to WA.
Regional Trails	A major trail or trail network that services a population centre or large regional community, with facilities and services of a standard and appeal that could attract visitors from outside the region.
Local Trails	A trail that services the local community and provides facilities suited to local use. Some local trails may have the potential for development to regional status.

Figure 2 and Table 4 present an overview of the identified facilities within the Larego region and 2km Study Area, with details provided in Appendix A. The facilities include eight campsites, eleven trails and seven day-use facilities.

In addition, there are many informal trails located within and around the Larego region that are not promoted or managed by DBCA. Issues associated with informal trails and informal access include damage to native vegetation and fauna, damage to Aboriginal cultural heritage, water catchment/water quality risks (e.g., by pathogens) and risks to users of getting lost or injured on poorly aligned or unmaintained trails.

Table 4 Recreational Trails and Facilities Identified within the Larego Region and 2km Study Area

Asset type	Name	Use/Value	ID
State trails	Munda Biddi Trail	Mountain bike trail	S01
	Bibbulmun Track	Bushwalking trail	S02
Regional trails	Captain Fawcett 4WD Trail	Drive trail (4wd)	R01
	Waterous Trail	Mountain bike trail	R02
Local trails	Unnamed Walk Trail*	Bushwalking trail	L01
	Bridge Trail – Hoffman Mill (closed)*	Bushwalking trail	L02
	Harvey Wildflower Ridge Walk	Bushwalking trail	L03
	Lake Brockman Loop*	Bushwalking trail	L04
	Nanga Heritage Circuit*	Drive trail (4wd)	L05
	King Jarrah Circuit	Bushwalking trail	L06

Asset type	Name	Use/Value	ID
	Dick Lofthouse Rotary Walk*	Bushwalking trail	L07
Recreational sites	Wildflower Picnic Site	Day-use	DU1
	Gibbs Pool Amphitheatre	Day-use	DU2
	Fish Ladder Picnic Site	Day-use	DU3
	Picnic Site	Day-use	DU4
	Five Mile Bridge	Day use	DU5
	Rocky Crossing	Day use	DU6
	Clarke Picnic Site	Day use	DU7
Campsites	Lake Brockman Tourist Park	Campsite	CS1
	Logue Brook Campground	Campsite	CS2
	Hoffman Mill	Campsite	CS3
	Saddleback Campground	Campsite	CS4
	Brockman Campground	Campsite	CS5
	Dookanelly Campsite	Campsite	CS6
	Bidjar Ngoulin Campsite	Campsite	CS7
	Murray Campsite	Campsite	CS8
Informal facilities	The Larego region has been identified as being used informally for hiking, camping and day use. Some of these use types and facilities may hold local significance.		
Shield/reference trees	167 within the Larego region; 75 within the current gated area	Historic value	

**Local trails (formal or informal) are not official DBCA trails and therefore are not managed by DBCA.*

1.2.2.1.1 Commercial operators and opportunities

Commercial operators and opportunities were identified based on published information as indicated in Table 5.

Table 5 Commercial Operators and Opportunities Identified within the Larego Region and 2km Study Area

Asset Type	Description
Apiary sites	27 current and one pending apiary site licences are located within the Larego region.
Commercial tour operators	Sites to the east of Larego, have historically been accessed on roads running through the Larego region.
Logue Brook commercial opportunities	Commercial opportunities currently exist for DBCA leases at Logue Brook.
Seed collecting	Commercial seed collection occurs within the Larego region.
Commercial wildflower picking	Commercial wildflower picking occurs within the Larego region.

1.2.2.1.2 Relevant state and regional recreational strategies and plans

Table 6 presents state and regional strategies and plans that relate to recreational trails and facilities within the Larego region and Study Area. The strategies and plans identify the state significance of the Munda Biddi Trail and Bibbulmun Track.

Table 6 Strategies and Plans Relevant to Recreational Trails and Facilities within the Larego Region and 2km Study Area.

Document	Author	Sponsor	Statements and provisions relating to recreational facilities within the Larego region and 2km Study Area
WA Strategic Trails Blueprint 2022 –2027	Common Ground Trails 2023	Department of Local Government, Sport and Cultural Industries (DLGSCI) and DBCA	Existing trails that already have a strong awareness in the market are the Bibbulmun Track and the Munda Biddi Trail. Achieving an excellent suite of iconic trails for Western Australia will require considerable investment in planning and development over time. Since 2017 Dwellingup (rewarded with Trails Town status in April 2024) has built on the natural assets of the town, as well as the connection to iconic trails Munda Biddi and Bibbulmun Track to become a place 'where the trails meet'.
Western Australian Mountain Bike Strategy 2022-2032	WestCycle Incorporated Purpose Drive Performance	DLGSCI and DBCA	The document identifies the Munda Biddi Trail as one of the world's top cycling trails, offering significant opportunities to boost participation, economic growth, and tourism. Enhancing the Munda Biddi and other potential long-distance off-road cycling experiences is crucial. Moreover, Strategy highlights the challenge in the rapid growth of off-road cycling for transport and recreation, noting that off-road transport routes, rail trails, and long-distance touring trails like the Munda Biddi present opportunities to encourage more people to ride off-road.
Two-Year Action Plan for Nature-Based Tourism in Western Australia 2019 and 2020	DBCA	DBCA	Continue to promote, maintain and improve the …Munda Biddi … and encourage new industry investment in accommodation and visitation products.
WA Hiking Strategy Bushwalking and trail running in Western Australia 2020 - 2030	Common Ground Trails 2019	DBCA and DLGSCI	No facilities within, or surrounding, the Larego region were identified.
Taking the Reins - The Western Australian Recreational Horse Trail Strategy	PX2 Pty Ltd 2015	Australian Trail Horse Riders Association	No facilities within, or surrounding, the Larego region were identified.
Shire of Harvey Advocacy Priorities: Harvey Trails and Adventure Precinct	Shire of Harvey		Identified as a priority in the SW Mountain Bike Master Plan 2017, including connecting Harvey with Logue Brook Dam and the existing Munda Biddi trail to create a new 75km 3 day 2-night loop from Harvey. **Stage 1:** Munda Biddi Harvey Spur will take adventure riders and families from the Munda Biddi Trail to Harvey's town centre past some of the most iconic scenery in the region, including the Harvey Dam. Due to Harvey's undulating topography, it will provide an exciting downhill descent ride, filling a critical gap in Western Australia's downhill trail opportunities and event venues. **Stage 2:** Logue Brook - Clarke State Forest – Munda Biddi Harvey Spur North - Harvey Dam Trails and Connection Links: Clarke State Forest Trail Network and Challenge Park. Adventure Trails connecting Logue Brook Dam, Clarke Forest Trail Network and Harvey Dam with the Munda Biddi Spur and the town of Harvey, including finalising infrastructure for a three-day loop.
South West Mountain Bike Master Plan	Common Ground Trails Pty Ltd for WestCycle 2017	Lotterywest, Department of Sport and Recreation, Department of Parks and Wildlife, West Australian Mountain Bike Association	Identifies the Clarke State Forest as a priority site. It offers significant topography, excellent views, steep terrain, and diverse vegetation. In addition, it includes the Logue Brook Dam facilities and will connect the Munda Biddi Trail to Harvey. Constraints include conservation reserves, competing demands and other environmental issues.
Harvey Region Trails and Adventure Masterplan	Common Ground Trails Pty Ltd for the Shire of Harvey 2023		Objectives of this plan, relevant to the Study Area include the creation of a signature trail and adventure hub, providing complimentary immersive experiences and marketing and promoting the experiences. This includes making use of attributes of the Darling Scarp and Plateau through increasing the availability of walking, mountain biking, paddling, gravel and road riding trails in addition to adventure activities and experiences, bolstered by upgrades and improvements to existing trails.

1.2.2.1.3 Public drinking water source areas

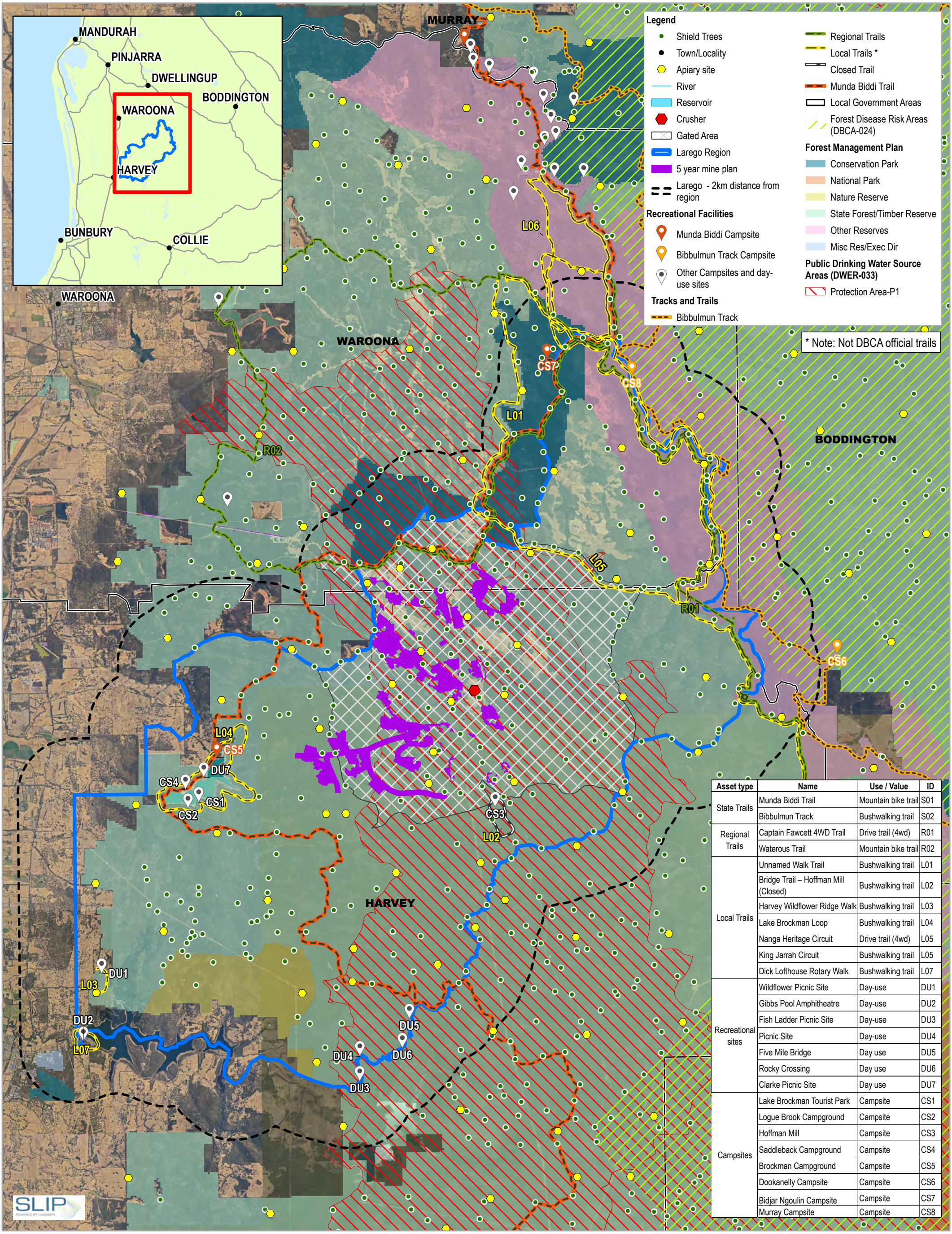
The Larego region lies in the catchments of Murray River, Harvey River, and Logue Brook. The Murray River drains into Lane Poole Reserve and supports water-based recreation (paddling) as well as riparian foreshore amenities for recreational facilities and trails. Logue Brook drains into Lake Brockman (Logue Brook Dam which supports water-based recreation (boating) as well as foreshore amenities for camping).

The Larego region intersects the Public Drinking Water Source Areas (PDWSA) of Stirling Dam. Recreational uses pose a risk to PDWSAs through potential pathogen loading. Recreational use within PDWSAs must be in accordance with *Operational Policy 13: Recreation within Public Drinking Water Source Areas on Crown Land* (Department of Water, 2019). Table 7 outlines the acceptability of various recreational activities within PDWSAs according to Operational Policy 13.

Table 7 Compatibility of Recreation Activities

Recreation type	Public drinking water source area location	
	Surface water – Reservoir protection zone	Surface water – Outer catchment
Vehicular activities		
Caravanning at approved designated sites	Incompatible	Supported at designated sites
Caravanning (off-road)	Incompatible	Incompatible
Coach tours/scenic driving	Incompatible (except on public roads[1])	Supported
Off-road driving All motorised vehicles (including 4WD vehicles, motorbikes, trail bikes and quad bikes) whether licensed or unlicensed.	Incompatible	Incompatible (except at legally designated sites)
Rallying	Incompatible	Incompatible
Paragliding/gliding - motorised or non-motorised	Incompatible	Incompatible
Land-based activities		
Abseiling/rock climbing	Incompatible	Supported
Barbequing	Incompatible	Supported at designated sites
Bike riding/power-assisted pedal cycling on public roads	Supported	Supported
Bike riding/power-assisted pedal cycling within approved designated sites - trails, tracks or areas	Incompatible (except on the Munda Biddi Trail)	Supported in designated sites
Bike riding/power-assisted pedal cycling (free range/off-trail)	Incompatible	Incompatible
Bush skills/navigational exercises	Incompatible	Supported
Bushwalking/trekking/hiking/trail running at approved designated sites - trails, tracks or areas	Incompatible (except on the Bibbulmun Track or Munda Biddi Trail)	Supported
Bushwalking/trekking/hiking (free range/off-trail)	Incompatible	Supported
Camping at approved designated sites	Incompatible	Supported at designated sites
Camping (free-range)	Incompatible	Incompatible
Drone flying (electric)	Incompatible (except on public roads[1])	Supported
Orienteering/rogaining/geo-caching/cross-country running.	Incompatible	Supported*
Photography/painting/sightseeing/birdwatching/astronomy	Incompatible (except on public roads[1])	Supported
Picnicking	Incompatible	Supported
Prospecting	Incompatible	Supported
Riding/walking/training of animals (including dogs and horses)	Incompatible	Incompatible
Riding/walking/training of animals on public roads[1] and on approved designated sites - trails, tracks or areas (including dogs and horses)	Supported on public roads[1] and at designated sites	Supported on public roads[1] and at designated sites
Hunting/shooting	Incompatible	Incompatible
Water based activities		
Boating (motorised)/jet skiing/water skiing/power boating (fuel and low-powered electric)	Incompatible	Incompatible
Boating (non-motorised) Canoeing/kayaks/buoyancy devices/rowing/sailing/model boating/ windsurfing/kite surfing	Incompatible	Incompatible
Fishing	Incompatible	Incompatible[2]
Introduction of fish/aquatic species	Incompatible	Incompatible
Marroning	Incompatible	Incompatible
Swimming/wading/bathing/scuba diving/snorkelling (all activities that involve direct human contact with water)	Incompatible	Incompatible

[1] 'Public roads' does not include tracks or trails for the purposes of fire control, mining, forestry or infrastructure access/maintenance.
[2] Fishing was an existing, approved activity as at September 2012 at Big Brook Dam in the Lefroy Brook Catchment Area.



Asset type	Name	Use / Value	ID
State Trails	Munda Biddi Trail	Mountain bike trail	S01
	Bibbulmun Track	Bushwalking trail	S02
Regional Trails	Captain Fawcett 4WD Trail	Drive trail (4wd)	R01
	Waterous Trail	Mountain bike trail	R02
Local Trails	Unnamed Walk Trail	Bushwalking trail	L01
	Bridge Trail – Hoffman Mill (Closed)	Bushwalking trail	L02
	Harvey Wildflower Ridge Walk	Bushwalking trail	L03
	Lake Brockman Loop	Bushwalking trail	L04
	Nanga Heritage Circuit	Drive trail (4wd)	L05
	King Jarrah Circuit	Bushwalking trail	L05
	Dick Lofthouse Rotary Walk	Bushwalking trail	L07
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	Fish Ladder Picnic Site	Day-use	DU3
	Picnic Site	Day-use	DU4
	Five Mile Bridge	Day use	DU5
	Rocky Crossing	Day use	DU6
	Clarke Picnic Site	Day use	DU7
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	Bidjar Ngoulin Campsite	Campsite	CS7
	Murray Campsite	Campsite	CS8

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Alcoa Australia Limited
Larego Region
Recreational Trails and Facilities Management Plan

Project No. **12638705**
Revision No. **G**
Date **06/12/2024**

Identified Recreational Facilities

FIGURE 2

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Data source: WANow: Landgate / SLIP. Created by: cbataller

1.2.2.2 Noise impact assessment

GHD (2024a) undertook a Noise Impact Assessment (NIA) of the Proposal. The NIA included modelling of noise emissions from operations to ascertain the risk of non-compliance under the Environmental Protection (Noise) Regulations 1997 (the Regulations) at the identified Noise Sensitive Receptors (NSR) located in and around the Proposal. The assessment also included an assessment of blasting activities to determine potential airblast and groundborne noise and vibration impacts at the NSRs.

The NIA indicates that mining operations in the Larego region may not comply with the daytime noise criteria (i.e. exceeding 40 dB (A) during Sundays and public holidays) at some noise-sensitive receptor locations. Considering the 40 dB(A) noise contour provided in the NIA report, GHD (2024a), it is expected that mine noise may impact the users of the following recreational trails under worst-case mining operations and meteorological conditions:

– Hoffman Mill campsite (CS3)
– Bridge Trail – Hoffman Mill (L02)

There are access restriction controls in place, with DBCA closing Hoffman Mill to the public in November 2022. Alcoa acknowledges the tradition of reuniting at the Hoffman Mill camping area on the first Sunday in November each year, often extending into a weekend for many participants. Alcoa's public commitments include facilitating the annual Back to Hoffman Reunion event on the 1st weekend in November; and implementing an ad-hoc, day-use process. In addition, a Mining Avoidance Zone (MAZ) is proposed for Hoffman Mill. The proposed MAZ is 500m from Hoffman Mill during daytime and 1100m from Hoffman Mill during night-time.

Audibility is predicted to occur over a short distance on the Munda Biddi Trail located to the north of the Larego region, i.e. parallel to R02 – Waterous Trail. The predicted levels do not exceed the daytime criteria along the Bibbulmun Track located east of the Larego region (GHD 2024a).

The noise modelling of the mining operations during the night shows the potential to exceed the night-time noise criteria t (i.e. 35 dB(A)) over the northwestern portion of the mine region. It is expected that mine noise may impact the users of the following recreational trails under worst-case mining operations and meteorological conditions at nighttime:

– Lake Brockman Tourist Park (CS1)
– Logue Brook Campground (CS2) (if tonality is considered)

Night-time noise prediction was not predicted to impact users of the Bibbulmun (GHD 2024a).

It should be noted that the daytime and night-time noise criteria (40 dB(A) and 35 dB(A) mentioned above) are assigned by the Regulations to assess the impact of noise on the NSRs which are defined as dwellings or occupied buildings. As a result, the audibility of the operational noise may be considered more relevant to assess the impact of noise on the users of the recreational trails and facilities surrounding the Larego region. The audibility of mining noise at the NSRs depends on the ambient baseline levels, the weather conditions and the tonal content of the noise. These are factors that are difficult to predict given the range of distances involved. As a result, 30 dB(A) during nighttime when the background noise is lower, is considered as a simplified approach to assess the audibility.

The audibility noise contour line (30 dB(A) for night-time noise modelling scenarios) provided in the NIA report, GHD (2024a) show that the following recreational facilities may be impacted by audible noise during nighttime:

– Brockman Campground (CS5)
– Saddleback Campground (CS4)
– Lake Brockman Tourist Park (CS1)
– Lake Brockman Tourist Park (CS1)
– Logue Brook Campground (CS2) (if tonality is considered)

The audibility assessment provided in the NIA report shows that the operational noise will be audible at the northern part of the Munda Biddi Track, but there are no facilities in which users will be impacted during nighttime. Also, the Bibbulmun Track is not impacted by audibility (i.e. the predicted noise level is below 30 dB(A) all along the path during nighttime).

Accordingly, mine operations will require management during worst-case meteorological conditions and particularly during periods of peak public usage of the above trails (e.g. events, weekends, and school holidays) to minimise noise impacts on recreational values.

Blasting would occur on an approximately daily basis during mining operations, generating airblast noise and vibration. The NIA (GHD, 2024a) indicates that ground-borne noise and vibration (resultant from blasting) may be significant within 1.2km of mine pits during mine development. No NSRs except for Hoffman Mill will be affected.

There would be potential noise exceedances resulting from blast noise impacting the users of the following trails:

– Hoffman Mill campsite (CS3) - closed for public access during the life of mine
– Bridge Trail – Hoffman Mill (L02)

According to the parameter of 1.2km distance from the mine pits, Munda Biddi Trail (S01) and Waterous Trail (R02) located in close proximity to the northern portion of the 5-year plan are likely to be impacted by blasting required for mining operation.

GHD proposes an MAZ for Hoffman Mill and campsites surrounding Lake Brockman/Logue Brook Dam to mitigate noise impacts.

1.2.2.3 Landscape and visual impact assessment

GHD (2024b) undertook a Landscape and Visual Impact Assessment (LVIA) for the Larego region, as summarised below.

The Larego region is located within the topographic landform of the Darling Plateau within the Darling Uplands subtype. The landscape in the western part of the Study Area is relatively flat and low-lying. Moving eastward, the elevation rises as it becomes part of the Darling Range. Much of the surroundings of the mine region are covered by forests and therefore views of mining will be effectively screened by vegetation. There is a lack of elevated viewpoints with public access within proximity of the mine region. However, there is potential for landscape and visual impacts on the Munda Biddi Trail within the northern component of the Larego region (GHD 2024b).

Drawn from the LVIA recommendations in regard to visual impacts on tracks, trails, and recreational areas include (GHD 2024b):

– Avoid: Relocate haul road routes and mine pits to avoid visibility from tracks and trails whenever possible.
– Minimise: Reduce visual impacts on recreational facilities, including the Munda Biddi Trail, by providing screening corridors appropriate to the area.
– Mitigate: If mining occurs near tracks, trails, or recreational areas, initiate rehabilitation promptly to establish replanted vegetation as quickly as possible.

Visual screening studies conducted within the Myara region for the Pinjarra Alumina Refinery Revised Proposal ERD, indicate that a vegetive buffer of approximately 200m provides effective screening (GHD, 2021).

Mining operations within the Larego region (Willowdale Mine) and Myara region (Huntly Mine) occur concurrently throughout the duration of the 5-year mine plan. As such an understanding of cumulative visual impacts to Munda Biddi Trail andBibbulmun Track is relevant. Based on the LVIA assessments for both mine regions findings suggest that no cumulative impacts are anticipated.

1.2.2.4 Air quality impact assessment

GHD (2024c) undertook an air quality assessment for the Proposal, including an assessment of concentrations of total suspended particulates (TSP) and dust deposition that could affect the amenity of users of recreational trails and facilities. The assessment (GHD, 2024c) indicates that incremental concentrations of TSP from the mining operations were below relevant criteria for identified sensitive receptors, except for one exceedance at CS3, Hoffman Mill Campground (labelled as R01 in the Larego Air Quality Impact Assessment report), during the modelled period for one scenario. However, it is also understood that public access to Hoffman Mill Campground is closed by DBCA, and it is only open for ad-hoc day visits. Hence the likelihood of exceedance to occur during the day visits is low. Predicted dust deposition was below the relevant criteria for identified sensitive receptors.

Munda Biddi Trail (S01), Waterous Trail (R02), and Bibbulmun Track (S02) were not assessed as receptors in the air quality assessment. However, based on the distribution of dust as per the contours, it is likely that there will be TSP and dust deposition exceedances along parts of the Munda Biddi Trail (S01) and Waterous Trail (R02) running close to the north and north-west boundary of the Proposal. No dust emission exceedances are likely to occur along the Bibbulmun Track which is located further to the east of Larego region.

1.2.2.5 Exploration drilling potential impacts

Required for strategic long-term mine planning up to 20 years prior to mining, exploration drilling activities occur throughout the entirety of the mining lease. Using tractor-mounted drill rigs, modified to operate in forested areas, a fleet of 10 – 19 rigs (Alcoa and contract) undertake drilling activities between May – September (annually), 7 days a week, 11 hours a day (6am – 5pm). There is also a small shutdown period of approximately 10 days over Christmas through to the start of January.

Each year approximately 105,000 drill holes are undertaken across the mining lease with approximately 25 holes drilled each day in three phases, being:

– Phase 1: 60m x 60m apart
– Phase 2: 30m x 30m apart
– Phase 3:15m x 15m apart

Phase 3 usually occurs within the gated mine area, however, DBCA has raised concerns regarding exploration activities outside gated areas.

The following non-negotiable exploration drilling constraints are in place in relation to trails and recreational facilities:

– 200m buffer to the Bibbulmun Track
– 50m buffer to the Munda Biddi Trail

Negotiable constraints relate to all other sanctioned trails whereby drilling within 300m of trails will only occur Monday – Friday outside of school holidays. Exploration activities will occur within these trails if required.

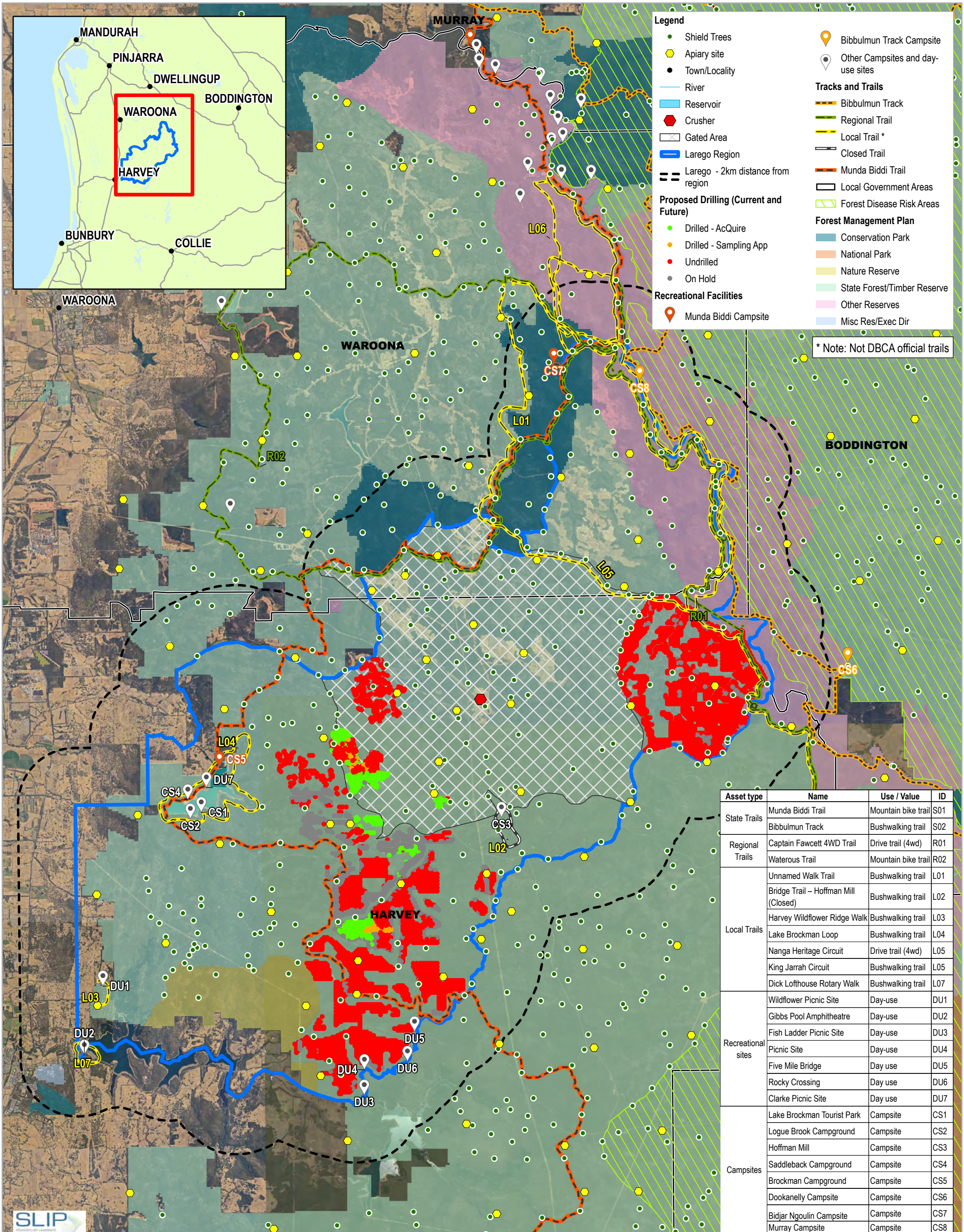
As indicated in Figure 3, drilling activities over 2023-2027 MMP are identified within close proximity to Munda Biddi Trail (S01), Bibbulmun Track (S02), Unnamed Walk Trail (L01) and Captain Fawcett 4WD Trail (R01). Similarly, exploration drilling is proposed within the vicinity of a number of day-use facilities including Fish Ladder Picnic Site (DU3), Picnic Site (DU4), Five Mile Bridge (DU5) and Rocky Crossing (DU6). Potential visual impacts resulting from exploration activities are considered short-term and may include visibility of drill rigs, rig operators and support vehicles in addition to removed trees (up to 150m diameter), warning signage and disturbed patches of earth from filled drill holes.

1.2.2.6 Light pollution

Existing light sources within the Larego region are dominated by the mine facilities situated along the existing conveyor line and the mine pits in operation. The townsites of Harvey and Yarloop emit comparatively limited light, with the largest light emitter, in the vicinity of the Larego region, being Wagerup Alumina Refinery.

The main light sources associated with mining activities identified in the 5-year MMP, within the Larego region, will comprise permanent lighting at mine facilities and conveyor transfer stations, vehicle headlights and mobile LED light towers at operating mine pits. Due to the distance from Harvey and Yarloop, rural properties and overnight campsites, it is unlikely that lighting associated with mining activities identified in the 5-year MMP will have a significant impact on night-time amenities.

Implementation of MAZ for the Larego region is expected to avoid impacts on night-time amenities to rural residential properties and campgrounds.



Asset type	Name	Use / Value	ID
State Trails	Munda Biddi Trail	Mountain bike trail	S01
	Bibbulmun Track	Bushwalking trail	S02
Regional Trails	Captain Fawcett 4WD Trail	Drive trail (4wd)	R01
	Waterous Trail	Mountain bike trail	R02
Local Trails	Unnamed Walk Trail	Bushwalking trail	L01
	Bridge Trail – Hoffman Mill (Closed)	Bushwalking trail	L02
	Harvey Wildflower Ridge Walk	Bushwalking trail	L03
	Lake Brockman Loop	Bushwalking trail	L04
	Nanga Heritage Circuit	Drive trail (4wd)	L05
	King Jarrah Circuit	Bushwalking trail	L05
	Dick Lofthouse Rotary Walk	Bushwalking trail	L07
Recreational sites	Wildflower Picnic Site	Day-use	DU1
	Gibbs Pool Amphitheatre	Day-use	DU2
	Fish Ladder Picnic Site	Day-use	DU3
	Picnic Site	Day-use	DU4
	Five Mile Bridge	Day use	DU5
	Rocky Crossing	Day use	DU6
	Clarke Picnic Site	Day use	DU7
Campsites	Lake Brockman Tourist Park	Campsite	CS1
	Logue Brook Campground	Campsite	CS2
	Hoffman Mill	Campsite	CS3
	Saddleback Campground	Campsite	CS4
	Brockman Campground	Campsite	CS5
	Dookanelly Campsite	Campsite	CS6
	Bidjar Ngoulin Campsite	Campsite	CS7
	Murray Campsite	Campsite	CS8

Paper Size ISO A3

0 0.5 1 1.5 2

Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

GHD

Alcoa Australia Limited
Laregro Region
Recreational Trails and Facilities Management Plan

Project No. **12638705**
Revision No. **D**
Date **06/12/2024**

Exploration Drilling

FIGURE 3

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1.2.3 Key assumptions and uncertainties

1.2.3.1 Regional planning and stakeholder consultation

The recreational facilities within the Larego region have been identified and classified in accordance with published State and regional planning documents as summarised in Section 1.3.2.

It is assumed that the identified and classified facilities are correct and current as per the published documents. There remains the potential for changes to occur in the identified facilities (e.g., new facilities developed) or changes to their significance at some point over the period of mining and rehabilitation and as a result of trail usage, promotion and stakeholder consultation.

1.2.4 Risk-based approach to management

This objective-based RTFMP adopts a risk-based approach to identify and prioritise targets and actions. Appendix B Presents a risk assessment of the potential impacts on recreational facilities and commercial opportunities identified within the Larego region and associated Study Area.

– Table B-1 Closure and direct disturbance
– Table B-2 Indirect impacts noise
– Table B-3 Indirect impacts on visual
– Table B-4 Indirect impacts on air quality
– Table B-5 Exploration drilling impacts

Consideration of potential impacts and the implementation of management measures have been determined within related studies identified in Table 2

Tables B-2 to B-5 present residual risks incorporating proposed access restrictions/closure of facilities during the life of mine as proposed in Table B-1. The risk assessment considered consequences based on the significance class of recreational trails, magnitude and duration of impact, and likelihood.

As presented in Appendix B, the risk assessment indicated the following very high and high risks, to which mitigations/actions need to be applied (Table 8).

Table 8 Potential Risks to Facilities During the Life of Mine

High risks
Potential noise, dust and visual impacts to a proportion of Munda Biddi Trail and Waterous Trail due to the proximity of mining operations
Potential noise and dust and to day-use areas (Logue Brook dam and Lake, Hoffman Mill Campsite[3], Lake Brockman Tourist Park, Logue Brook Campground, Saddleback Campground, informal day-use) due to proximity to mining operations
Potential noise, dust and visual impacts to commercial operators (Apiary sites, commercial tour operators and Logue Brook commercial opportunities) due to proximity to mining operations
Potential noise, dust and visual impacts to other facilities (shield trees) due to proximity to mining operations
Potential noise, dust and visual impacts on day-use areas and trails due to exploration drilling activities

A further identified risk is the limited stakeholder consultation at the time of preparing this RTFMP. This risk is addressed through the proposed stakeholder consultation in Section 3.

The management approach in this RTFMP is consultative and conservative, with the view of managing impacts during all phases of mining. The RTFMP adopts an environmental management hierarchy in the prioritisation of management provisions:

– Avoidance: measures taken to avoid impact
– Minimisation: measures taken to reduce the duration, intensity and/or extent of impact
– Rehabilitation: measures taken to restore previously existing conditions.

[3] Currently closed due to the mining activities in surrounding area

1.2.5 Rationale for choice of provisions

Changes in intensity, duration, magnitude and geographic footprint of the impact

The management provisions have been developed to address how impacts to recreational facilities and commercial opportunities may vary in intensity, duration, magnitude and geographic footprint, including:

– variation in direct and indirect impacts as mining progresses within the Larego region
– variation in meteorological conditions affecting noise propagation or dust dispersion during mining
– progression and restoration of visual impacts over mining and rehabilitation timeframes.

Environmental changes and rate of change

Management measures have been developed to address the potential for external threatening processes to affect visual screening by vegetation surrounding the region.

The RTFMP will be reviewed by Alcoa and with DBCA in the event of material changes to environmental conditions or social surroundings that may influence the Proposal's impacts on recreational facilities or commercial opportunities.

External issues

The provisions have taken into account third-party proposals for new trails, recreation and tourism (e.g., Harvey Region Trails and Adventure Masterplan). The RTFMP will be reviewed in the event of material changes to external issues.

2. Environmental Management Components

Table 9 presents objective-based management provisions relating to those recreational facilities and commercial opportunities within the Larego region with the potential for very high and high risks. Table 10 lists trigger and threshold criteria related to the environmental impacts management plan.

Table 9 Recreational Facilities and Commercial Opportunities within the Larego Region – Management Components

Management target	Management actions	Monitoring	Timing/Frequency of actions	Reporting
Objective 1: Minimise direct impacts to Munda Biddi Trail and Waterous Trail				
– Direct impacts are minimised as far as practicable to: • Munda Biddi • Waterous Trail	– Establish and maintain MAZ within the region to allow uninterrupted access to these trails. – Rehabilitate be re-instated as early as practicable with consideration to rehabilitation priorities given other environmental and social values and constraints. – Rehabilitation to recreate the pre-mining trail condition and facilities, in consultation with DBCA and other key stakeholders, where practicable	Annual spatial database review of MAZ.	– MAZ (for trails to be retained) was established and demarcated prior to the construction of the adjacent mine development. – Any required rehabilitation is conducted as early as practicable or at the end of mine region life.	Compliance assessment report will include a review of the MAZ.
Objective 2: Minimise noise and dust impacts on users of Munda Biddi, Waterous Trail and Lake Brockman recreational facilities				
– Minimise audible noise, blast overpressure and dust levels on Munda Biddi, Waterous Trail and Lake Brockman recreational facilities.	– Implement MAZ including daytime noise sensitivity zones around the Munda Biddi Trail and Brockman Campground, Saddleback Campground, Lake Brockman Tourist Park, and Logue Brook Campground.	Annual spatial database review of MAZ.	– MAZ was established and demarcated prior to the construction of the adjacent mine development. – Pre-mining noise planning – During mining noise planning – Daily – blast modelling	Compliance assessment report will include a review of the MAZ.
Objective 3: Reinstate public access to Hoffman Mill and Bridge Trails facilities where practicable, in consultation with DBCA and other key stakeholders				
– Where practicable, rehabilitate and reinstate access to: • Bridge Trail – Hoffman Mill	– Maintain closure or partial closure for the life of the mine – Rehabilitate trails to be re-instated as early as practicable with consideration to rehabilitation priorities given other environmental and social values and constraints. – Rehabilitation to recreate the pre-mining trail condition and facilities, in consultation with DBCA and other key stakeholders, where practicable	To be determined in consultation with DBCA.	– Any required rehabilitation is conducted as early as practicable or at the end of mine region life. – Any required access was reinstated at the closure of the mine region.	To be determined in consultation with DBCA.
Objective 4: Maintain the viability of existing and planned commercial opportunities				
– Maintain viability of existing and planned commercial opportunities as identified in Table 5.	– Alcoa to consult with DBCA when reviewing mine planning to ensure commercial operators are advised of changes to access to minimise disruption to commercial activity.	Annual spatial database review of negotiable constraints.	– Concept planning, site surveys and detailed design	Pre-construction/mine development site inspection..
Objective 5: Maintain adequate camping amenities				
– Ensure camping and adequate amenities for campers remain at Logue Brook Dam for the life of mine.	– Establish and maintain MAZ surrounding sites to be retained – MAZ will be demarcated in construction and mining maps to guide mine development and construction personnel	Pre-construction and pre-mine development inspection of facility condition.	– MAZ was established and demarcated prior to the construction of the adjacent mine development.	Compliance assessment report will include a review of the MAZ.
Objective 6: Maintain access and adequacy of day-use areas				
– Enable existing informal day-use opportunities to occur, inclusive of existing DBCA day-use areas in and adjacent to the mine area.	– Demarcate areas for mining and construction	Annual spatial database review of MAZ.		Compliance assessment report will include a review of the MAZ.
Objective 7: Maintain the ability for major events to occur				
– Limit the disruption to major recreational events that occur within or partially within the Larego region, including (but not limited to): • Equestrian events • Enduro motorbike events • Rogaining events	– Alcoa to consult with relevant stakeholders and event organisers to minimise the impacts of mining on any proposed event. – Inform event planners of upcoming and future operations to allow for the planning of safe, high-quality events.	Not applicable	– Agreement reached with event organisers prior to the event to clearly demarcate the event footprint	Post-event reporting, where applicable.
Objective 8: Maintenance of access for facility and asset management				
– Ensure DBCA and DFES have suitable access to the mine region to allow for: • Appropriate fire management, including upkeep of fire breaks and allowance of strategic access.	– Prepare and maintain a site access plan to allow for regulated movement of DBCA/DFES officials – Minimise direct impacts to access tracks as far as practicable.	To be determined in consultation with DBCA.	– Prior to clearing, DBCA/DFES to provide an indication of essential service roads. – Any required rehabilitation is conducted as early as practicable or at the end of mine region life.	Pre-construction/mine development site inspection

Management target	Management actions	Monitoring	Timing/Frequency of actions	Reporting
• On-going ability to maintain the Western Shield Baiting Program within the mine region • DBCA nominated public firewood areas • Avoidance of Disease Risk Areas for relocated facilities – Have an agreed Forest Access Plan for general vehicle access	– Recreate the pre-mining site conditions and facilities, in consultation with DBCA and other key stakeholders, where practicable.		– Any required access was reinstated at the closure of the mine region.	
Objective 9: Maintain water quality in response to new or changed recreational facility use				
– Ensure the following water quality objectives are maintained: • Public drinking water in the constituted public drinking water source areas of Stirling Dam and Samson Brook • Recreational water quality in Harvey Dam and Logue Brook Dam (Lake Brockman). • Waterways and wetlands at pre-development levels (winter concentrations) or improved.	– Ensure any new or changed recreation facilities or events are consistent with Operational Policy 13 or noted by the Minister for Water. – Ensure access is not increased to the Stirling Dam reservoir protection zone, where public access is prohibited under the Metropolitan Water Supply, Sewerage and Drainage By-laws 1981, except on public roads.	Surface water monitoring as per the Water Resources Management Plan in conjunction with relevant standards and guidelines.	– MAZ was established and demarcated prior to the construction of the adjacent mine development.	As per the Water Resources Management Plan.
Objective 10: Minimise direct and indirect impacts on trails and their users in relation to exploration drilling activities				
– Limit the disruption to the Munda Biddi Trail as a result of exploration drilling, with appropriate management and mitigation measures applied.	– Maintain a minimum 50m MAZ between exploration drilling activities and Mundi Biddi Trail to minimise associated impacts.	Annual spatial database review of MAZ.	Prior to exploration drilling activities occurring	Compliance assessment report will include a review of the MAZ.
– Limit the disruption to the trails as a result of exploration drilling, with appropriate management and mitigation measures applied	– Maintain a minimum 200m buffer to Bibbulmun Track – Drilling within 300m of all other trails only occurs Mon-Fri outside of school holidays	Annual spatial database review of MAZ.	Prior to exploration drilling activities occurring	Compliance assessment report will include a review of the MAZ.

Table 10 Trigger and Threshold

Indicator/Value	Response actions	Monitoring: frequency and location	Reporting
Trigger criterion 1 Required exploration or construction is identified to be on a trajectory towards any MAZ (within 30m) listed for the region.	**Trigger level action** – Undertake a review of the Mine Plan and ensure MAZ is incorporated into the Mine Plan Process. – Review map layers where relevant, including updates. – Conduct an in-field assessment to confirm or verify potential exceedance. – If required implement trigger level response action in consultation with relevant stakeholders (for example, rehabilitation).	– Reconciliation assessment against clearing activities once a specific clearing area is completed. – If triggered, an in-field assessment will be undertaken against trigger criteria. – Annual spatial database of MAZ.	The compliance assessment report will include a discussion around the assessment/s and whether revision of the trigger criterion is required.
Threshold criterion 1 Required exploration or construction activity has intruded into any MAZ listed in Table 9.	**Threshold contingency action** As above, including the addition of: – If avoidance cannot be achieved, Alcoa must provide, to the satisfaction of the State Development Minister, a written report explaining why the relevant avoidance cannot be met prior to the exploration or construction activity being undertaken.	– Annual audit of activities and review of internal protocols, – where relevant. – Annual spatial database review of MAZ.	In the event that monitoring or surveys indicate an exceedance of the threshold, the exceedance will be reported to the State Development Minister in writing within 21 days of the exceedance being identified. The compliance assessment report will include a discussion around the assessment/s and whether revision of the management objective is required.

2.1 Adaptive Management and Review

2.1.1 Environmental monitoring and corrective actions

Environmental monitoring will occur during the construction and operational phases of mining in the Larego region including the establishment and progress of rehabilitation.

Any non-conformances with the requirements of this RTFMP will be investigated to identify the root cause and the relevant corrective action. If necessary, the RTFMP will be amended to incorporate the corrective action to prevent future non-conformances. Non-conformances will be rectified or mitigated as soon as possible to ensure minimal ongoing harm to social surroundings.

Relevant procedures will be amended/updated as necessary and inductions and other workforce communication will be undertaken in a timely manner to minimise the risk of re-occurrences.

In the event of unforeseen impacts from the Proposal to recreational or scientific facilities within the Larego region, relevant stakeholders (e.g., DBCA) will be notified and consulted in regard to the appropriate remedial actions.

2.2 Revisions

This RTFMP is intended to be dynamic and may be updated to reflect changes in management practices and social surroundings with time. This will also allow flexibility to respond to new environmental impacts and adopt new technologies/management measures. Figure 4 outlines the process for review, upon revisions to the MMP.

Amendments to management actions will be completed on an as-needed basis. This will include revision/amendment of management actions that are not achieving the desired outcomes, environmental monitoring identifying additional impacts and management actions, and changes to relevant legislation or improvements to practices that are likely to achieve better environmental outcomes.

Where substantial changes to the RTFMP are required, Alcoa will engage with DBCA and relevant stakeholders on the proposed changes to inform and update the document, and the document will be distributed to DBCA and the relevant stakeholders. Once agreed upon, updates to the RTFMP can be discussed in the Alcoa DBCA Conflicts Meeting.

This RTFMP will be reviewed and updated as necessary to reflect material changes and updates in relevant internal and external factors, which may include:

– Material changes in the Larego mine plan, construction or rehabilitation programs that may affect recreational or scientific facilities
– Non-conformances and corrective actions
– Material updates of existing recreational strategies (e.g., Peel Regional Trails Strategy) or release of new recreational strategies (e.g., Harvey Region Trails and Adventure Masterplan) that relate to recreational facilities within the mine region.
– Advice from DBCA or key stakeholders regarding material changes to recreational, commercial or scientific facilities that may be directly or indirectly impacted by the Proposal, or material changes in environmental conditions that may affect impacts from the Proposal (e.g., external threatening processes).

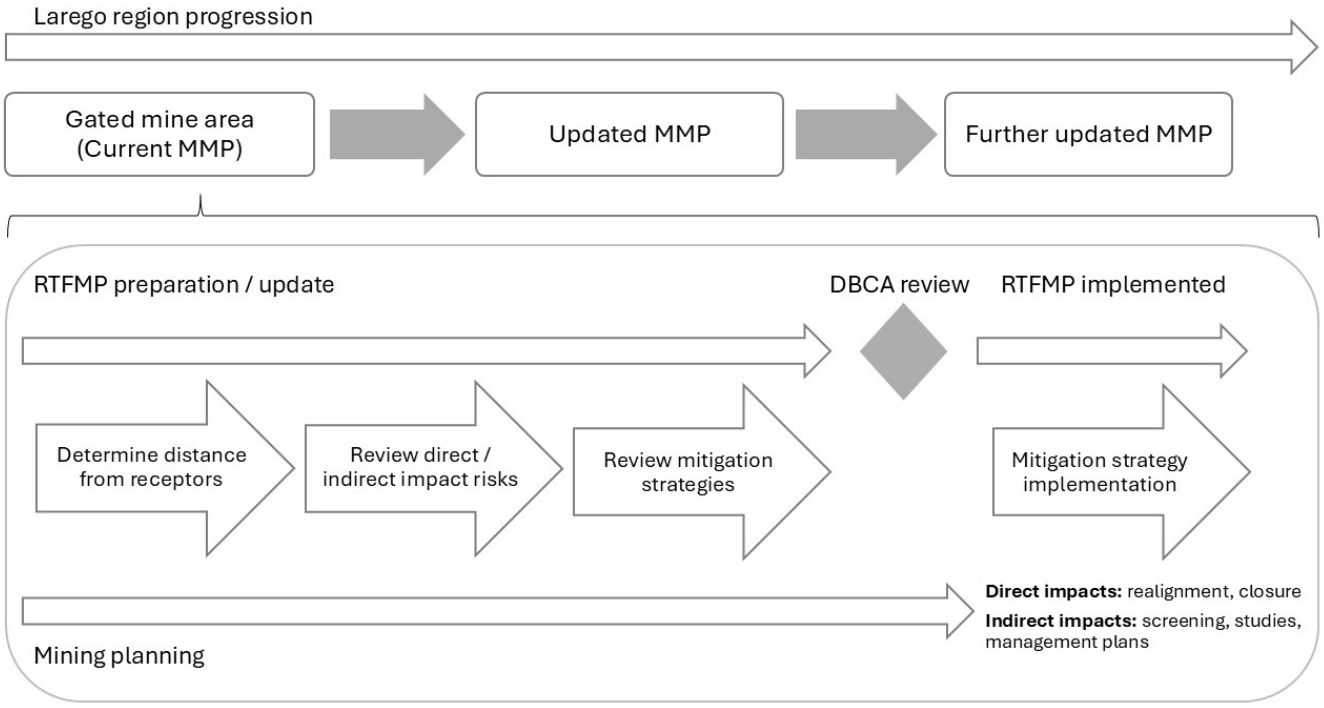


Figure 4 ***RTFMP Review Process***

3. Stakeholder Consultation

Preliminary stakeholders have been identified and are summarised in Table 11. Consultation with these stakeholders regarding environmental issues associated with recreational facilities and commercial opportunities within the Larego region will be undertaken. This will ensure management actions are suitable to meet plan objectives. External stakeholder consultation details including stakeholders, the responses and Alcoa actions are listed in Table 11.

Table 11 Key Stakeholders

Stakeholders	Details of consultation
State Government	Departments – Jobs Tourism, Science and Innovation; DBCA, DLGSCI, Water Corporation, EPA, Tourism WA, Local Members of Parliament – Forrest and Murray-Wellington, DWER
Local Government	Shire of Waroona and Shire of Harvey
Recreation and tourism groups	Back to Hoffman Mill Reunion Group and Munda Biddi Trail Foundation
Environmental groups:	Harvey River Restoration Taskforce
Community groups	Nearby communities and nearby private landowners/residents
Traditional Owners	Harvey Aboriginal Corporation
Industry Stakeholders	Trails WA, HikeWest, West Cycle, Outdoors WA, WA Mountain Bike Association

Table 12 External Stakeholder Consultation in Relation to this RTFMP

Date	Stakeholder	Consultation	Stakeholder response	Alcoa action
6/10/2023	DBCA	Larego RTFMP drafted in 2022 was sent to MMPLG for review and DBCA provided written feedback.	Extensive feedback, more than 10 recommendations.	Alcoa provided comments back to these and has incorporated this feedback into both the Myara and Larego RTFMPs.
8/8/2024	DBCA	Email request for information on scientific sites in Myara and Larego. Several emails were sent over the following months.	No current information is available as the register is not functional and therefore GIS is out of date.	Asked GHD to leave this query open and can update in further versions of the report.
24/07/2024	DBCA – Wellington	In-person meeting to discuss Larego mine plan.	Better documentation is needed around the Munda Biddi trail alignment request and noise and dust assessments for Logue Brook are of interest to the department.	Ensure the process for trail realignments is documented and ensure noise and dust assessment for Logue Brook is shared.
22/10/2024	DBCA	Alcoa provided DBCA with the drafts of the two RTFMPs and a summary presentation. DBCA agreed to provide comment.	DBCA asked Alcoa to add a note that local trails are not DBCA endorsed and agreed to send written feedback – this was received on 22/11/2024.	Comments have been incorporated prior to finalising the report.

4. References

Common Ground Trails Pty Ltd 2017, *South West Mountain Bike Master Plan*, prepared for WestCycle Inc.

Common Ground Trails Pty Ltd 2019, *Peel Regional Trails Strategy 2019*, prepared for the City of Mandurah, Shire of Boddington, Shire of Murray, Shire of Serpentine Jarrahdale and Shire of Waroona.

Conservation and Parks Commission and Department of Biodiversity, Conservation and Attractions (DBCA) 2023, Forest Management Plan 2024–2033. retrieved 18 April 2024, from https://www.conservation.wa.gov.au/

Department of Biodiversity, Conservation and Attractions 2019, *Two Year Action Plan for Nature-Based Tourism in Western Australia 2019 and 2020*, Government of Western Australia.

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Appendices

Appendix A

Identified Impacts – Recreational Facilities and Commercial Opportunities

Colour key

Impact	Colour representation
Direct impact short term (facility within / part within gated area)	
Direct impact long term (facility within / part within region)	
Direct impact mitigated	
No impact	

Table A-1 State significance trails and facilities

ID	Existing assets	Identified values	Proximity to mine region	Direct impact within region	Indirect impact within region
S01	Munda Biddi Trail	State significance, very high priority in Peel Regional Trails Strategy (PRTS) via Consultation – important to Dwellingup ecotourism Mountain biking, camping	Total of 36.2 km within region	Short-term impact to 9.7 km within the gated area and long term impact to 36.2 km total within the region. Potential short-term impact from exploration drilling.	Proposed to be realigned; Potential noise, dust and visual impacts due to proximity to mining operations.
S02	Bibbulmun track	State significance; important to WA ecotourism Bushwalking, camping	Outside of region (along eastern boundary)	No impact	Potential visual impacts due to proximity to mining operations and exploration drilling activities

Table A-2 Regionally and locally significant trails and facilities

ID	Existing Assets	Identified values	Proximity to Larego region	Direct Impact	Indirect impact
L01	Unnamed Walk Trail	Hiking, bushwalking	Within region, along north eastern boundary of gated area	Potential short-term impacts related to exploration drilling activities, dust, noise and visual impact.	Potential noise, dust and visual impacts due to proximity to mining operations and exploration drilling activities.
L02	Bridge Trail – Hoffman Mill	Bushwalking	Within region, outside of current gated area	Directly impacted by mining -Trail closed for life of mine	Potential noise, dust and visual impacts due to proximity to mining operations.
L03	Harvey Wildflower Ridge Walk	Bushwalking	Within region, along south west boundary	No impact	Potential visual impacts due to proximity to mining operations.
L04	Lake Brockman Loop	Bushwalking	Within region, along western boundary	Potential short-term impacts – noise and dust.	Potential noise, dust and visual impacts due to proximity to mining operations and exploration drilling activities.
L05	Nanga Heritage Circuit	4WD track	Within region, north eastern boundary	Potential short-term impacts related to exploration drilling activities.	Potential noise, dust and visual impacts due to proximity to mining operations and exploration drilling activities.
L06	King Jarrah Circuit	Bushwalking	Outside of region, northern boundary	No impact	No impact
L07	Dick Lofthouse Rotary Walk	Rotary Walk Trail	Outside of region, southern boundary	No impact	No impact
R01	Captain Fawcett	4WD track	Outside region, along north eastern boundary	Potential short-term impacts related to exploration drilling activities.	Potential for access restrictions as a result of road closures and diversions and exploration drilling activities.
R02	Waterous Trail	Mountain bike trail	Within region, partially within current gated area	Potential long term impact – visual impact and dust. Short term impact to 1.5 km within the gated area – noise, visual and dust.	Potential noise, dust and visual impacts due to proximity to mining operations.
CS1	Lake Brockman Tourist Park	Camping, recreation, boating	Within region, outside of current gated area	Potential long term impact – MAZ proposed to mitigate noise and dust impacts	Potential noise, dust and visual impacts due to proximity to mining operations.
CS2	Logue Brook Campground	Camping, recreation, boating	Within region, outside of current gated area	Potential long term impact – MAZ proposed to mitigate noise and dust impacts	Potential noise, dust and visual impacts due to proximity to mining operations.
CS3	Hoffman Mill (day use also)	Camping; community heritage	Within region, outside of current gated area	Directly impacted by mining – Facility closed for life of mine	n/a – closed for life of mine
CS4	Saddleback Campground	State forest, camping	Within region, outside of current gated area	Potential long term impact - – MAZ proposed to mitigate noise and dust impacts	Noise and dust impacts based on proximity to mining operations.
CS5	Brockman Campground	State forest, camping	Within region, outside of current gated area	Potential long term impact - – MAZ proposed to mitigate noise and dust impacts	Noise and dust impacts based on proximity to mining operations.
CS6	Dookanelly Campsite	State forest, camping	Outside of region, eastern boundary	No impact	Potential short-term noise impacts related to exploration drilling.

ID	Existing Assets	Identified values	Proximity to Laregо region	Direct Impact	Indirect impact
CS7	Bidjar Ngoulin Campsite	State forest, camping	Outside of region, northern boundary	No impact	n/a
CS8	Murray Campsite	State forest, camping	Outside of region, northern boundary	No impact	n/a
DU1	Wildflower Picnic Site	Day use	Within region, outside of current gated area	No impact	Potential visual impacts due to proximity to mining operations.
DU2	Gibbs Pool Amphitheatre	Day use	outside of region (south-west boundary)	No impact	n/a
DU3	Fish Ladder Picnic Site	Day use	within region, outside of current gated area	Potential short-term impacts related to exploration drilling activities.	Potential noise, dust and visual impacts due to exploration drilling activities.
DU4	Picnic Site	Day use	Within region, outside of current gated area	Potential short-term impacts related to exploration drilling activities.	Potential noise, dust and visual impacts due to exploration drilling activities.
DU5	Five Mile Bridge	Day use	within region, outside of current gated area	Potential short-term impacts related to exploration drilling activities.	Potential noise, dust and visual impacts due to exploration drilling activities.
DU6	Rocky Crossing Site	Day use	outside of region (south boundary)	Potential short-term impacts related to exploration drilling activities.	Noise and dust impacts based on proximity to mining operations.
DU7	Clarke Picnic Site	Day use	within region, outside of current gated area	Potential long term impact - MAZ proposed to mitigate noise and dust impacts	Noise and dust impacts based on proximity to mining operations.
	Informal camping within state forest	Camping	no specific site	Potential short and long term impact	Potential noise, dust and visual impacts due to proximity to mining operations.
	Other informal day use of state forest	Day use	no specific site	Potential short and long term impact	Potential noise, dust and visual impacts due to proximity to mining operations.

Table A-3 Significant events, economic and scientific facilities

ID	Existing assets	Identified values	Proximity to Laregо Mine Region	Direct impact	Indirect impact
	Apiary sites	Agricultural	27 current and one pending apiaries within mine region	Potential clearance within gated mine area Possible disturbance due to exploration drilling activities.	Potential reduction in nectar sources resulting from clearing; dust impacts within 500m of mining.
	Commercial tour operators	Tourism	no specific site	n/a	Increase in the travel times within region due to closes/ diverted roads.
	Logue brook commercial opportunities	Tourism, recreation	Within mine region, outside of current gated area	n/a	Potential for reduction in turnover should reduce recreational use occur based on proximity to mining operations.
	Seed collecting	Commercial	no specific site	Reduction of accessible vegetation as a result of clearing for mining operations. Potential impact due to exploration drilling.	Reduction of access to vegetation as a result of road closures.
	Commercial wildflower picking	Commercial	no specific site	Reduction of accessible vegetation as a result of clearing for mining operations. Potential impact due to exploration drilling.	Reduction of access to vegetation as a result of road closures.
	Equestrian	Recreation	unknown - potentially within mine region	Potential for loss of activity if tracks and trails located within planned mining areas within mine region. Potential impact due to exploration drilling.	Reduction of access to tracks and trails as a result of road closures. Noise dust impacts based on proximity to mining operations.
	Enduro motor bike	Recreation	unknown - potentially within mine region	Potential for loss of activity if tracks and trails located within planned mining areas within mine region. Potential impact due to exploration drilling.	Reduction of access to tracks and trails as a result of road closures.
	Rogaining	Recreation	unknown - potentially within mine region	Potential for loss of activity if tracks and trails located within planned mining areas within mine region. Potential impact due to exploration drilling.	Reduction of access to tracks and trails as a result of road closures. Noise dust impacts based on proximity to mining operations.
	Shield trees	Former forest industry grid reference trees, widespread through Northern Jarrah Forest. Used for orienteering.	167 within mine region	Potential clearance within gated mine area	Dieback, weeds, long term dust
n/a	Aboriginal cultural and heritage customary access	Cultural	no specific site	Potential for loss of access	Increase in the travel times within region due to closes/ diverted roads.
n/a	Bridges and minor culverts	Public access	unknown	Mine traffic use may accelerate the rate of degradation.	n/a

Appendix B

Risk Assessment

Consequence criteria

Classification	Short term minor impact	Long term minor impact	Short term major impact	Long term major impact
State significance	Moderate	Major	Major	Critical
Regional significance	Minor	Moderate	Major	Major
Local / informal	Minor	Minor	Moderate	Moderate

Risk matrix

Consequence	Likelihood: Unlikely	Potential	Likely	Almost certain
Critical	Medium	High	Very high	Very high
Major	Medium	High	High	Very high
Moderate	Medium	Medium	High	High
Minor	Low	Medium	Medium	Medium

Table B.1 Risk assessment: Closure and direct disturbance

Asset	Significance	Magnitude	Duration	Consequence	Likelihood	Risk	Strategy
Trails and campsites							
Hoffman Mill (closed)	Local	Major	Long-term	Major	Almost certain	Very high	Closed for life of mine, control public access for life of mine
Bridge Trail – Hoffman Mill (closed)	Local	Major	Long-term	Moderate	Almost certain	High	Closed for life of mine, control public access for life of mine
Commercial operators							
Apiary sites	Regional	Minor	Long-term	Moderate	Likely	High	Discussion with DBCA regarding licences.
Seed collecting	Local	Minor	Long-term	Minor	Likely	Medium	Discussion with DBCA regarding licences.
Commercial wildflower picking	Local	Minor	Long-term	Minor	Likely	Medium	Discussion with DBCA regarding licences.
Events							
Equestrian	Local / informal	Minor	Long-term	Minor	Likely	Medium	Control public access during mining.
Enduro motor bike	Local / informal	Minor	Long-term	Minor	Likely	Medium	Control public access during mining.
Rogaining	Local / informal	Minor	Long-term	Minor	Likely	Medium	Control public access during mining.
Other facilities							
Shield trees	Regional	Minor	Long-term	Major	Likely	High	Avoidance with other controls also put in place
Bridges and minor culverts	Local / informal	Minor	Long-term	Minor	Likely	Medium	Avoidance with management in accordance with works agreement with DBCA.

Table B.2 Risk assessment – audible noise and airblast

Asset	Significance	Magnitude	Duration	Consequence	Likelihood	Risk	Strategy
State significant trails							
Munda Biddi Trail	State	Major	Long term	Major	Likely	Very high	Noise management plan
Region significant tracks and trails							
Waterous Trail	Regional	Major	Long-term	Major	Likely	High	Noise management plan
Local trails							
Bridge Trail – Hoffman Mill (closed)	Local	Major	Long-term	Major	Likely	High	Restrict access
Lake Brockman Loop	Local	Major	Long-term	Major	Likely	High	Noise management plan
Campsites							
Lake Brockman Tourist Park	n/a	Major	Long-term	Major	Likely	High	Noise management plan
Logue Brook Campground	n/a	Major	Long-term	Major	Likely	High	Noise management plan
Hoffman Mill (closed)	n/a	Major	Long-term	Major	Likely	High	Restrict access
Saddleback Campground	n/a	Major	Long-term	Major	Likely	High	Noise management plan
Brockman Campground	n/a	Major	Long-term	Major	Likely	High	Noise management plan

Table B.3 Risk assessment – visual impact

Asset	Significance	Magnitude	Duration	Consequence	Likelihood	Risk	Strategy
State significant trails and camping							
Munda Biddi Trail	State	Major	Long-term	Major	Almost certain	Very high	Implement MAZ - Avoid impact, maintain public access, prioritise rehabilitation
Region significant trails							
Waterous Trail	Regional	Major	Long-term	Major	Almost certain	Very high	Implement MAZ - Avoid impact, maintain public access, prioritise rehabilitation

Table B.4 Risk assessment – Air quality impact

Asset	Significance	Magnitude	Duration	Consequence	Likelihood	Risk	Strategy
State significant trails and camping							
Munda Biddi Trail	State	Major	Long term	Major	Likely	Very high	Dust management plan
Region significant tracks and trails							
Waterous Trail	Regional	Major	Long-term	Major	Likely	High	Dust management plan
Other tracks and trails							
Bridge Trail – Hoffman Mill (closed)	Local / informal	Major	Long-term	Major	Likely	High	Restrict access
Campsites							
Hoffman Mill (Closed)		Major	Long-term	Major	Likely	High	Restrict access

Table B.5 Risk assessment – Exploration drilling

Asset	Significance	Magnitude	Duration	Consequence	Likelihood	Risk	Strategy
State significant trails and camping							
Munda Biddi Trail	State	Major	Short term	Major	Potential	High	Manage impacts of exploration drilling
Region significant tracks and trails							
Captain Fawcett 4WD Track	Regional	Major	Short term	Major	Potential	High	Manage impacts of exploration drilling
Other tracks and trails							
Unnamed Walk Trail	Local	Major	Short term	Major	Potential	Medium	Manage impacts of exploration drilling
Day use areas							
Picnic Site		Major	Short term	Major	Potential	Medium	Manage impacts of exploration drilling
Five Mile Bridge		Major	Short term	Major	Potential	Medium	Manage impacts of exploration drilling
Rocky Crossing Day use		Major	Short term	Major	Potential	Medium	Manage impacts of exploration drilling

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The Power of Commitment

Recreational Trails and Facilities Management Plan

Huntly Mine – Myara region

Alcoa of Australia Limited
17 December 2024

→ **The Power of Commitment**



Project name		Alcoa Myara Recreational Trails and Facilities Management Plan					
Document title		Recreational Trails and Facilities Management Plan | Huntly Mine – Myara region					
Project number		12638705					
Status Code	Revision	Author	Reviewer		Approved for issue		
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Executive summary

This Recreational Trails and Facilities Management Plan (RTFMP) has been prepared in accordance with the Environmental Protection Authority (EPA) Instructions on *how to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans* (EPA 2024)

The following table summarises the context and purpose of the RTFMP in the context of EPA environmental objectives.

Proposal name	Huntly Mine, Myara region
Proponent name	Alcoa of Australia Limited
Ministerial Statement number	Not applicable
Purpose of the RTFMP	– To fulfil Alcoa's commitment under the Western Australian Operations 2023-2027 Mining and Management Program to develop a recreational management plan for the Myara region in consultation with DBCA. – The RTFMP covers existing mined areas and proposed mining areas – Myara region as itemised in the 5-year mine plan (2023-2027). – The RTFMP provides a framework for stakeholder engagement, planning, design, and management to mitigate impacts to recreational trails and facilities.
Key environmental factor	Social surroundings defined under the EP Act can be summarised as: *'In the case of humans' social surroundings refers to aesthetic, cultural, economic and other social surroundings to the extent to which they directly affect or are affected by physical or biological surroundings'*
Key environmental factor objective	The EPA's environmental objective for the factor of Social Surroundings is: '*To protect social surroundings from significant harm*'
RTFMP objectives	1. Maintain amenity, scenic values and quality of landscape as experienced by users of Kingsbury Drive. 2. Minimise direct impacts on recreational trails within the Myara region. 3. Minimise noise and dust impacts on users of Munda Biddi Trail and Kingsbury Drive. 4. Maintain viability of existing and planned commercial opportunities. 5. Maintain access and adequacy of day-use areas. 6. Maintenance of access for facility and asset management. 7. Minimise direct and indirect impacts on trails and their users in relation to exploration drilling activities.
Condition clauses	Not applicable
Key components of the RTFMP	Objective-based management actions and targets that align with Government policies and strategies relating to recreational trails and facilities are prioritised to high and medium risk, and adopt a hierarchy to avoid, minimise and rehabilitate amenity impacts. The management actions reflect the potential for amenity impacts during mine construction and operations, and longer-term visual and access impacts that may occur during rehabilitation and post-closure.
Proposed construction date	Not applicable – Construction within the Myara region has been completed.

Contents

Acronyms and abbreviations **1**

1. Context, scope and rationale **1**

1.1 Overview 1

1.1.1 Regional context and setting 1

1.2 Rationale and approach 3

1.2.1 Environmental management objectives 3

1.2.2 Study findings 4

1.2.2.1 Identified recreational trails and facilities 4

1.2.2.2 Noise impact assessment 9

1.2.2.3 Landscape and visual impact assessment 9

1.2.2.4 Air quality impact assessment 10

1.2.2.5 Exploration drilling potential impacts 10

1.2.2.6 Light pollution 11

1.2.3 Key assumptions and uncertainties 13

1.2.3.1 Regional planning and stakeholder consultation 13

1.2.4 Risk-based approach to management 13

1.2.5 Rationale for choice of provisions 14

2. Environmental management components **15**

2.1 Adaptive management and review 17

2.1.1 Environmental monitoring and corrective actions 17

2.2 Revisions 17

3. Stakeholder consultation **19**

4. References **21**

Table index

Table 1 Site-specific values, potential impacts and environmental management objectives 3

Table 2 Relevant studies 4

Table 3 Trail classification under WA Strategic Trails Blueprint 4

Table 4 Recreational trails and facilities Identified within the Myara region and 2 km Study Area 5

Table 5 Commercial operators and opportunities identified within the Myara region and 2 km Study Area 5

Table 6 Strategies and plans relevant to recreational trails and facilities within the Myara region and 2 km Study Area 6

Table 7 Compatibility of recreation activities 7

Table 8 Potential risks to the facilities during life of mine 13

Table 9 Recreational facilities and commercial opportunities within the Myara region – Management components 15

Table 10 Trigger and threshold 16

Table 11 Key stakeholders 19

Table 12 Stakeholder feedback 19

Table 13 External stakeholder consultation in relation to this RTFMP 20

Figure index

Figure 1	Regional Context	2
Figure 2	Recreational trails and facilities	8
Figure 3	Exploration drilling	12
Figure 4	RTFMP Review process	18

Appendices

Appendix A	Identified impacts - Recreational facilities and commercial opportunities
Appendix B	Risk assessment

Acronyms and abbreviations

Acronym/abbreviation	Expanded
Alcoa	Alcoa of Australia Limited
DBCA	Department of Biodiversity, Conservation and Attractions
DFES	Department of Fire and Emergency Services
DJTSI	Department of Jobs Tourism Science and Industry
DLGSCI	Department of Local Government Sport Cultural Industries
DMP	Dust Management Plan
DWER	Department of Water and Environmental Regulation
EPA	Environmental Protection Authority (WA)
ERD	Environmental Review Document
FDRA	Forest Disease Risk Area
FMP	Forest Management Plan
LVIA	Landscape and Visual Management Assessment
MAZ	Mining Avoidance Zone
MMP	Mining and Management Plan
MMPLG	Mining and Management Program Liaison Group
NIA	Noise Impact Assessment
NMP	Noise Management Plan
NSR	Noise Sensitive Receptors
PRTS	Peel Regional Trails Strategy
RPZ	Reservoir Protection Zone
RTFMP	Recreational Trails and Facilities Management Plan
TSP	Total Suspended Particulates
WA	Western Australia

1. Context, scope and rationale

1.1 Overview

Alcoa of Australia Limited (Alcoa) proposes the continuation of mining operations in Huntly Mine, Myara region from 2024-2028. At the conclusion of mining operations, the mine facilities may continue to be used to process the ore from Myara North. This will support the continuity of bauxite supply to the Pinjarra Alumina Refinery and potentially Kwinana Alumina Refinery.

The Myara region is located within the Shire of Serpentine-Jarrahdale and Shire of Murray, on the traditional lands of the Binjareb people, within the Metropolitan and Peel regions, approximately 100km southeast of Perth (see Figure 1).

The Myara region encompasses both existing and proposed mining areas, as outlined in the Myara region's five-year mine plan (2023-2027) (The Proposal), with a staged rehabilitation integrated into the process. Proposed mining areas include vegetation clearing, mining earthworks (e.g. creating mine pits and secondary haul roads), and mining operations (ore extraction). Existing mining areas consist of both ceased mine pits and secondary haul roads, yet to be rehabilitated, along with active mine pits and haul roads.

The 2023-2027 Mining and Management Plan (MMP) includes a commitment by Alcoa to develop a recreational management plan for the Proposal, in partnership with the Department of Biodiversity, Conservation and Attractions (DBCA). The Recreational Trails and Facilities Management Plan (RTFMP) will be reviewed as required to incorporate significant updates and changes in pertinent internal and external factors.

1.1.1 Regional context and setting

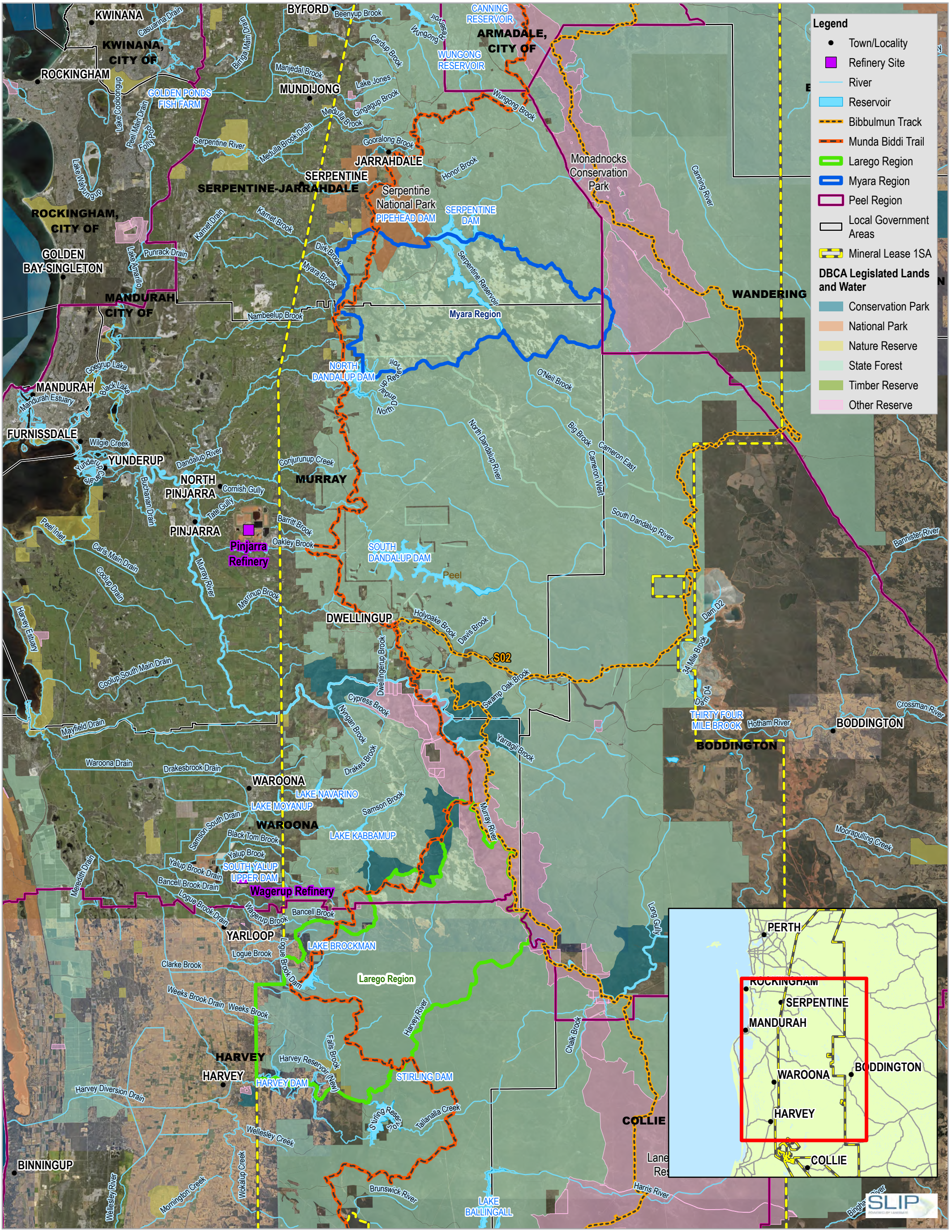
The Myara region is located in Northern Jarrah Forest on the Darling Plateau predominantly within the Shires of Serpentine-Jarrahdale and Murray, with the eastern portion located within the Shire of Wandering (see Figure 1). The Myara region is located approximately 5km south of Jarrahdale townsite and 20 km north-east of Pinjarra townsite.

The mine region is located primarily within Jarrahdale State Forest and Dwellingup State Forest, which are managed under the Forest Management Plan (FMP) for a multitude of use types including conservation, recreation and water supply. Since the FMP 2014-2023 began in January 2014, significant changes in Government policies have influenced southwest forest management. These updates are reflected in the 2024-2033 plan, prepared by DBCA. In September 2021, the State Government introduced new policies for managing the south-west forests, which will be implemented through FMP 2024-2033. The most notable change is the cessation of large-scale commercial timber harvesting in native forests. From 2024 onwards, timber will only be removed from these forests through activities aimed at improving forest health or clearing for approved mining operations and infrastructure.

The Northern Jarrah Forest includes extensive Forest Disease Risk Areas (FDRAs). The FDRAs are proclaimed under the *Conservation and Land Management Act 1984* and comprise areas at high risk of the introduction or spread of *Phytophthora* Dieback. Strict quarantine and access restrictions apply to these areas. The eastern side of the Myara region has an overlap with an FDRA.

The Myara region lies south of Serpentine National Park and incorporates a portion of the National Park in its northwest extent (see Figure 1). West of the mine region lies the Darling Scarp and rural lands, including the hamlets and rural areas of North Dandalup, Keysbrook and Serpentine. The Myara region is bordered to the east by the Monadnocks Conservation Park.

The Munda Biddi Trail runs through the west portions of the Myara region (see Figure 1). The Bibbulmun Track is located approximately 6.5km east of the Myara region boundary, within the Monadnocks Conservation Park.



Paper Size ISO A3

0 2 4 6 8 10

Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

GHD

Alcoa Australia Limited
Myara Region
Recreational Trails and Facilities Management Plan

Regional Context

Project No. **12638705**
Revision No. **I**
Date **17/12/2024**

FIGURE 1

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Print date: 17 Dec 2024 - 14:15

Data source: WANow: Landgate / SLIP. Created by: cbataller

1.2 Rationale and approach

1.2.1 Environmental management objectives

The environmental management objectives of this RTFMP are presented in Table 1. The objectives are based on the following:

– Site-specific environmental, social and commercial values and potential impacts (see Table 1).
– Study findings, assumptions and uncertainties (See Sections 1.2.2 and 1.2.3)
– Risk assessment and prioritisation (see Section 1.2.4).

Section 2 presents the environmental management components of the RTFMP, which details how monitoring and management will assist in demonstrating compliance with the environmental management objectives.

Table 1 Site-specific values, potential impacts and environmental management objectives

Region-specific environmental, social and commercial values	Value impacts	Environmental management objectives
– Recreational trails within and in close proximity to the Myara region as listed in Table 1.3: – Recreational campsites and day-use sites as listed in Table 1.3. – Commercial operations as listed in Table 5. Other values associated with the region include: – Regional ecotourism destinations – Bodhinyana Buddhist Monastery – Karnet Prison Farm and associated activities – Water resource values – Cultural heritage values* – Aboriginal heritage values associated with the Serpentine River* – Serpentine Dam commercial opportunities – Historic value of shield/reference trees	– Closure and restricted public access to recreational facilities, commercial opportunities and/or cultural heritage. – Potential direct and indirect impacts to recreational facilities and commercial opportunities within and outside the mine region. – Potential noise, dust and visual amenity impacts to facilities. – Clearing of shield/reference trees. – Potential impacts of exploration drilling on recreational trails.	1. Maintain amenity, scenic values and quality of landscape as experienced by users of Kingsbury Drive. 2. Maintain amenity, scenic values and quality of landscape of nearby roads and trails. 3. Minimise direct impacts to recreational trails within the Myara region, which includes investigating options to maintain access, where feasible. Where impacted, rehabilitate and reinstate these facilities where practicable, in consultation with DBCA and other key stakeholders. 4. Minimise noise, dust and visual impacts to users of Munda Biddi Trail and Kingsbury Drive. 5. Maintain viability of existing and planned commercial opportunities. 6. Maintain access and adequacy of day-use areas. 7. Maintenance of access for facility and asset management. 8. Minimise direct and indirect impacts on trails and their users in relation to exploration drilling activities.

**Cultural and Aboriginal heritage have not been considered further within the RTFMP.*

1.2.2 Study findings

Table 2 presents the social surrounding studies undertaken for the Proposal which have informed the rationale and approach for this RTFMP.

Table 2 Relevant studies

Key environmental factors	Studies	Author
Social surroundings	Identification of recreational trails and facilities	GHD
	Noise impact assessment – Myara region	GHD (2024a)
	Landscape and visual impact assessment – Myara region	GHD (2024b)
	Air quality impact assessment	GHD (2024c)
	Exploration drilling potential impacts	GHD
	Light pollution	GHD

1.2.2.1 Identified recreational trails and facilities

This RTFMP provides a summary of recreational trails and facilities (assets) within the Myara region and a surrounding 2km Study Area (Figure 2).

Recreational assets were identified based on published documents and stakeholder consultation, including the DBCA, Local Government Authorities and non-government organisations. Details of stakeholder engagement regarding recreational assets are presented in Section 3. The RTFMP does not currently consider scientific facilities or monitoring sites located within the Myara region or the 2km Study Area as the locations of these sites have not been confirmed by DBCA due to issues with the register and the age of previous records.

Recreational facilities were classified, where applicable, with definitions (see Table 3) drawn from the WA Strategic Trails Blueprint 2017-2021 (TRC Tourism, 2017) and as proposed in the Peel Regional Trails Strategy (PRTS) (Common Ground Trails, 2019). The classifications are proposed to prioritise investment for the purposes of economic and social development.

Table 3 Trail classification under WA Strategic Trails Blueprint

Classification	Definition
Trail Town	A population centre that has been assessed and accredited as a destination for its trails offering through the provision of high-quality trails and related services, businesses, branding and signage; and outdoor experiences that encourage extended visitation.
Trail Centre	A managed multiple trail facility with dedicated visitor services supported by high-quality trails and related services; and outdoor experiences that encourage single-day visitation. May be stand-alone or within a Trail Town.
Trail Network	A multiple trail facility with limited or no visitor services, supported by high-quality trails, branding and signage; and outdoor experiences that encourage single or part-day visitation. May be stand-alone or part of a Trail Town or Trail Centre.
State Trails	An extended trail or trail network that is of sufficient quality and with appropriate, products and services to be recognised beyond the State and to attract visitors to WA.
Regional Trails	A major trail or trail network that services a population centre or large regional community, with facilities and services of a standard and appeal that could attract visitors from outside the region.
Local Trails	A trail that services the local community and provides facilities suited to local use. Some local trails may have the potential for development to regional status.

Figure 2 and Table 4 present an overview of the identified facilities within the Myara region and 2km Study Area, with identified impacts to facilities provided in Appendix A. The facilities include two day-use facilities at Serpentine Dam. No campsites are located within 2km of the Myara region, with the closest campsites being located at Dardanup (Munda Biddi Trail) approximately 3km to the south-west, and at Mount Cooke (Bibbulmun Track) approximately 6 km to the north-east.

In addition, there are informal trails located within and around the Myara region that are not promoted or managed by DBCA. Issues associated with informal trails and informal access include damage to native vegetation and

fauna, damage to Aboriginal cultural heritage, water catchment/water quality risks (e.g., by pathogens) and risks to users of getting lost or injured on poorly aligned or unmaintained trails.

Table 4 Recreational trails and facilities Identified within the Myara region and 2 km Study Area

Asset type	Name	Use/Value	ID
State trails	Munda Biddi Trail	Mountain bike trail	S01
Regional trails	Jarrahland Wildflower Scenic Drive	Drive trail (2wd)	R01
Local trails*	Serpentine Dam Walk	Bushwalking trail	L01
	Gobby Road via Serpentine Track	Bushwalking trail	L02
	Kingsbury Drive Cycling	Road cycling trail	L03
	North Dandalup Dam via Jarrahdale Railway Trail	Bushwalking trail	L04
	Mount Solus Walk (closed)	Bushwalking trail	L05
	Thorpe Road Loop (closed)	Bushwalking trail	L06
Recreational sites	Serpentine Dam picnic area, accessible toilets and playground	Recreation	DU1
	Bistro by the Dam (Serpentine Dam)	Recreation	DU2
Informal facilities[1]	The Myara region has been identified as being used informally for hiking, camping and day use. Some of these use types and facilities may hold local significance.		
Shield/reference trees	169 within the Myara region	Historic value	

* *Local trails (formal or informal) are not official DBCA trails and therefore are not managed by DBCA.*

Commercial operations, opportunities and other use types

Commercial operators and opportunities were identified based on published information as indicated in Table 5.

Table 5 Commercial operators and opportunities identified within the Myara region and 2 km Study Area

Asset type	Description
Apiary sites	16 current apiary site licences are located within the Myara region
Serpentine Dam commercial opportunities	Bistro by the Dam
Seed collecting	Commercial seed collection opportunities exist except in Serpentine and Monadnocks National Parks.
Wildflower harvesting	Commercial wildflower picking opportunities exist except in Serpentine and Monadnocks National Parks.

[1] Informal trails are defined, through consultation with DBCA, as those not promoted or managed by DBCA.

1.2.2.1.1 Relevant state and regional recreational strategies and plans

Table 6 presents state and regional strategies and plans that relate to recreational trails and facilities within the Myara region and the 2 km Study Area. The strategies and plans identify the state significance of Munda Biddi Trail and Bibbulmun Track in addition to a number of regional and locally significant trails.

Table 6 Strategies and plans relevant to recreational trails and facilities within the Myara region and 2 km Study Area

Document	Author	Sponsor	Statements and provisions relating to recreational facilities within the Myara region and surrounding 2km and State significant trails
WA Strategic Trails Blueprint 2022 – 2027	Common Ground Trails 2023	Department of Local Government, Sport and Cultural Industries (DLGSCI) and DBCA	Existing trails that already have a strong awareness in the market are … the Munda Biddi Trail. Achieving an excellent suite of iconic trails for Western Australia will require considerable investment in planning and development over time. Since 2017 Dwellingup has built on the natural assets of the town, as well as the connection to iconic trails Munda Biddi and Bibbulmun Track. To become a place 'where the trails meet'.
Western Australian Mountain Bike Strategy 2022 – 2032	WestCycle Incorporated Purpose Drive Performance	DLGSCI and DBCA	The document identifies the Munda Biddi Trail as one of the world's top cycling trails, offering significant opportunities to boost participation, economic growth, and tourism. Enhancing the Munda Biddi and other potential long-distance off-road cycling experiences is crucial. Moreover, Strategy highlights the challenge in the rapid growth of off-road cycling for transport and recreation, noting that off-road transport routes, rail trails, and long-distance touring trails like the Munda Biddi present opportunities to encourage more people to ride off-road.
Two-Year Action Plan for Nature-Based Tourism in Western Australia 2019 and 2020	DBCA	DBCA	Continue to promote, maintain and improve the …Munda Biddi … and encourage new industry investment in accommodation and visitation products.
WA Hiking Strategy |Bushwalking and Trail Running in Western Australia 2020 – 2030	Common Ground Trails 2019	DBCA and DLGSCI	No facilities within, or surrounding, the Myara region were identified.
Taking the Reins - The Western Australian Recreational Horse Trail Strategy	PX2 Pty Ltd 2015	Australian Trail Horse Riders Association	No facilities within or surrounding the Myara region were identified.
PRTS incorporating: Shire of Serpentine Jarrahdale Local Trail Plan	Common Ground Trails 2019	Peel Region Local Government Authorities	Identifies Jarrahdale and Dwellingup as potential/future Trail Towns, indicating the importance of recreational facilities in proximity to the towns (Dwellingup was officially rewarded with Trails Town status in April 2024). Identifies recreational facilities within the Myara region that are significant and/or development priorities for: – Munda Biddi Trail: state trail, very high priority – Jarrahland Wildflower Scenic Drive: regional trail, very high priority – Kingsbury Drive Cycling: local trail, medium priority
Perth and Peel Mountain Bike Master Plan	Common Ground	WestCycle	Identifies Munda Biddi Trail as supporting existing mountain bike demand in Jarrahdale with the potential to develop the town to regional significance.
Economic Development Strategy 2018 – 2023	Lucid Economics 2018	Shire of Serpentine Jarrahdale	Identifies economic development opportunities and investment strategies as including: – Tourism - Jarrahdale – Visitor Centre – Major accommodation facility – Glamping – Adventure tourism
Economic Tourism Strategy 2018 – 2023	Brighthouse 2018	Shire of Serpentine Jarrahdale	Identifies Jarrahdale as 'the centrepiece of this Tourism Strategy', including the strategy to foster the development of Jarrahdale as a Trail Town. Identifies recreational facilities within the study area: – Munda Biddi Trail
Jarrahdale Trail Town Business Case and Implementation Plan (October 2021)	Tredwell Management Services	Shire of Serpentine Jarrahdale	Aspirational plan to provide strategic guidance to the Shire of Serpentine Jarrahdale to support Jarrahdale to become a fully accredited Trail Town. Identifies recreational facilities within the mine region that start/finish at Jarrahdale: – Munda Biddi Trail: state hierarchy, poor quality Existing trails within the Shire of Serpentine Jarrahdale that start/finish in close proximity to Jarrahdale: – Bibbulmun Track: state hierarchy

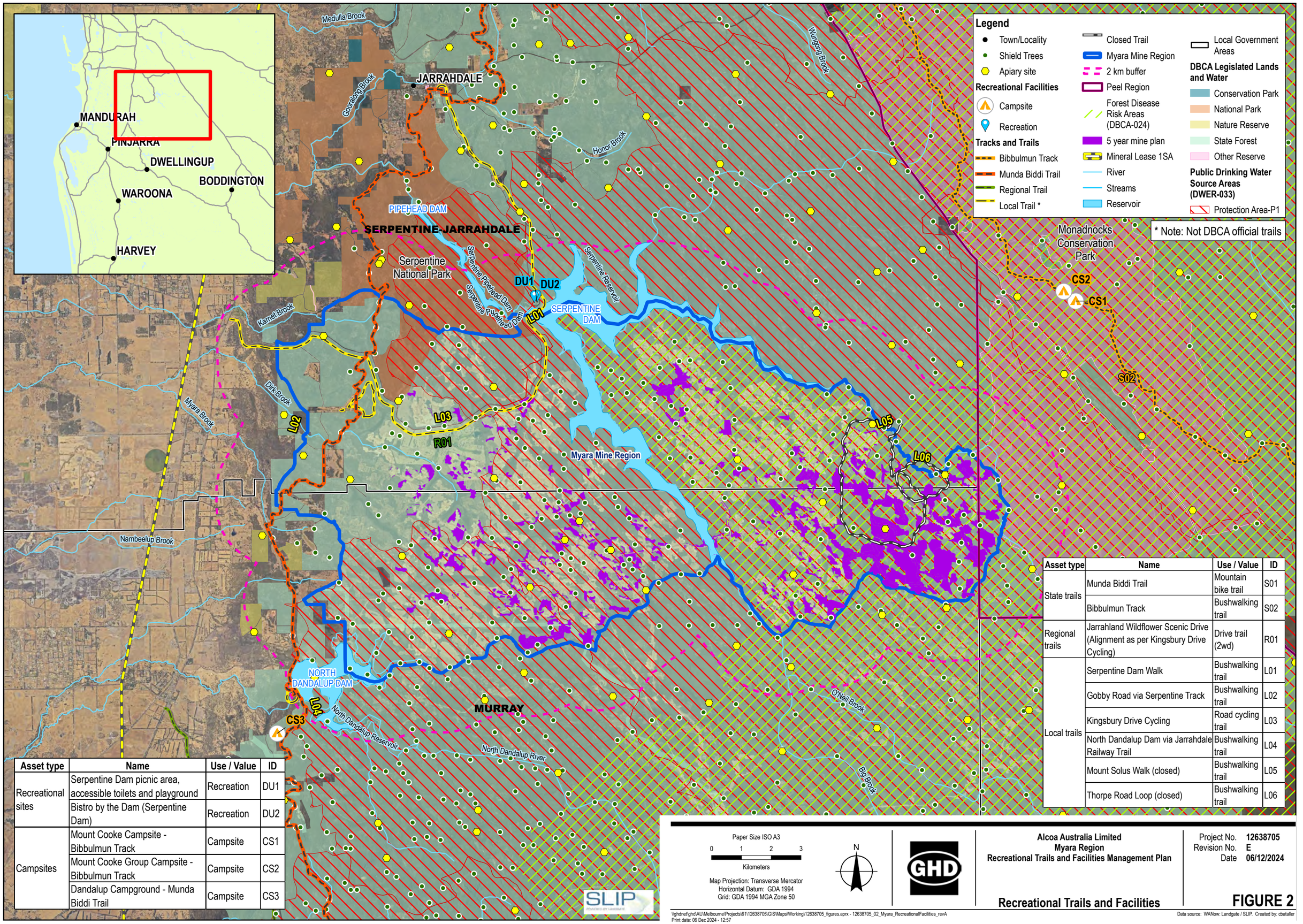
1.2.2.1.2 Public drinking water source areas

The Myara region lies predominantly within the Serpentine River catchment and lies adjacent to the Serpentine River, Serpentine Dam and Pipehead Dam Reservoirs. The Serpentine River, originates to the east of the Myara North region, flowing north-west along the southern boundary towards the Serpentine Dam. Drainage floors occur in areas of alluvial deposits along the Serpentine River and tributaries and form ephemeral waterlogged damp lands during the winter and spring (GHD, 2022). Water resources provide recreational and commercial opportunities and aesthetic values. Table 7 outlines the acceptability of various recreational activities within PDWSAs according to *Operational Policy 13: Recreation within Public Drinking Water Source Areas on Crown Land* (Department of Water, 2019).

Table 7 Compatibility of recreation activities

Recreation type	Public drinking water source area location	
	Surface water – Reservoir protection zone	Surface water – Outer catchment
Vehicular activities		
Caravanning at approved designated sites	Incompatible	Supported at designated sites
Caravanning (off-road)	Incompatible	Incompatible
Coach tours/scenic driving	Incompatible (except on public roads[2])	Supported
Off-road driving All motorised vehicles (including 4WD vehicles, motorbikes, trail bikes and quad bikes) whether licensed or unlicensed.	Incompatible	Incompatible (except at legally designated sites)
Rallying	Incompatible	Incompatible
Paragliding/gliding - motorised or non-motorised	Incompatible	Incompatible
Land-based activities		
Abseiling/rock climbing	Incompatible	Supported
Barbequing	Incompatible	Supported at designated sites
Bike riding/power-assisted pedal cycling on public roads	Supported	Supported
Bike riding/power-assisted pedal cycling within approved designated sites - trails, tracks or areas	Incompatible (except on the Munda Biddi Trail)	Supported in designated sites
Bike riding/power-assisted pedal cycling (free range/off-trail)	Incompatible	Incompatible
Bush skills/navigational exercises	Incompatible	Supported
Bushwalking/trekking/hiking/trail running at approved designated sites - trails, tracks or areas	Incompatible (except on the Bibbulmun Track or Munda Biddi Trail)	Supported
Bushwalking/trekking/hiking (free range/off-trail)	Incompatible	Supported
Camping at approved designated sites	Incompatible	Supported at designated sites
Camping (free-range)	Incompatible	Incompatible
Drone flying (electric)	Incompatible (except on public roads[1])	Supported
Orienteering/rogaining/geo-caching/cross-country running.	Incompatible	Supported*
Photography/painting/sightseeing/birdwatching/astronomy	Incompatible (except on public roads[1])	Supported
Picnicking	Incompatible	Supported
Prospecting	Incompatible	Supported
Riding/walking/training of animals (including dogs and horses)	Incompatible	Incompatible
Riding/walking/training of animals on public roads[1] and on approved designated sites - trails, tracks or areas (including dogs and horses)	Supported on public roads[1] and at designated sites	Supported on public roads[1] and at designated sites
Hunting/shooting	Incompatible	Incompatible
Water based activities		
Boating (motorised)/jet skiing/water skiing/power boating (fuel and low-powered electric)	Incompatible	Incompatible
Boating (non-motorised) Canoeing/kayaks/buoyancy devices/rowing/sailing/model boating/ windsurfing/kite surfing	Incompatible	Incompatible
Fishing	Incompatible	Incompatible[3]
Introduction of fish/aquatic species	Incompatible	Incompatible
Marroning	Incompatible	Incompatible
Swimming/wading/bathing/scuba diving/snorkelling (all activities that involve direct human contact with water)	Incompatible	Incompatible

[2] 'Public roads' does not include tracks or trails for the purposes of fire control, mining, forestry or infrastructure access/maintenance.
[3] Fishing was an existing, approved activity as at September 2012 at Big Brook Dam in the Lefroy Brook Catchment Area.



Asset type	Name	Use / Value	ID
Recreational sites	Serpentine Dam picnic area, accessible toilets and playground	Recreation	DU1
	Bistro by the Dam (Serpentine Dam)	Recreation	DU2
Campsites	Mount Cooke Campsite - Bibbulmun Track	Campsite	CS1
	Mount Cooke Group Campsite - Bibbulmun Track	Campsite	CS2
	Dandalup Campground - Munda Biddi Trail	Campsite	CS3

Asset type	Name	Use / Value	ID
State trails	Munda Biddi Trail	Mountain bike trail	S01
	Bibbulmun Track	Bushwalking trail	S02
Regional trails	Jarrahland Wildflower Scenic Drive (Alignment as per Kingsbury Drive Cycling)	Drive trail (2wd)	R01
Local trails	Serpentine Dam Walk	Bushwalking trail	L01
	Gobby Road via Serpentine Track	Bushwalking trail	L02
	Kingsbury Drive Cycling	Road cycling trail	L03
	North Dandalup Dam via Jarrahdale Railway Trail	Bushwalking trail	L04
	Mount Solus Walk (closed)	Bushwalking trail	L05
	Thorpe Road Loop (closed)	Bushwalking trail	L06

Paper Size ISO A3

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Kilometers

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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Alcoa Australia Limited
Myara Region
Recreational Trails and Facilities Management Plan

Project No. **12638705**
Revision No. **E**
Date **06/12/2024**

Recreational Trails and Facilities

FIGURE 2

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1.2.2.2 Noise impact assessment

GHD (2024a) undertook a Noise Impact Assessment (NIA) of the Proposal. The NIA included modelling of noise emissions from operations to ascertain the risk of exceedance of assigned levels under the Environmental Protection (Noise) Regulations 1997 (the Regulations) at the identified Noise Sensitive Receptors (NSR) located in and around the Proposal. The assessment also included an assessment of blasting activities to determine potential airblast and groundborne noise and vibration impacts at the NSRs.

The NIA indicates that mining operations at the Myara region may not comply with the criteria during the daytime (i.e. exceeding 40dB(A) level during Sundays and public holidays) at some noise-sensitive receptor locations over the north-west portion of the mine region along Kingsbury Drive and Karnet Prison Farm. Considering the 40dB(A) noise contour provided in the NIA report, GHD (2024a), it is expected that mine noise may impact users of the following recreational trails under worst-case mining operations and meteorological conditions:

– Munda Biddi Trail (S01) – mountain bike cyclists
– Jarrahland Wildflower Scenic Drive (R01) – road vehicle drivers, particularly if windows are down or exiting the vehicle to observe wildflowers
– Kingsbury Drive Cycling (L03) – road cyclists
– Gobby Road via Serpentine Track (L02) – bushwalkers

Accordingly, mine operations will require management during worst-case meteorological conditions and particularly during periods of peak public usage of the above trails (e.g. events, weekends and school holidays) to minimise noise impacts on recreational values.

Audible daytime noise was not predicted to occur in the day-use areas at Serpentine Dam. Audible daytime and night-time noise was not predicted to occur at the Bibbulmun Track located east of the Myara region (GHD 2024a).

Blasting would occur on an approximately daily basis during mining operations, generating airblast noise and vibration. The NIA (GHD, 2024) indicates that groundborne noise and vibration (resultant from blasting) may be significant within 1.2km of mine pits during mine development, which may affect sections of Kingsbury Drive (R01 and L03) in proximity to the Proposal. Blasting will require management when occurring in proximity to Kingsbury Drive, particularly during periods of peak public usage, to prevent blast overpressure impacts on recreational values.

1.2.2.3 Landscape and visual impact assessment

GHD (2024b) undertook a Landscape and Visual Impact Assessment (LVIA) for the Proposal. The assessment indicated that the Proposal is likely to be visible from elevated viewpoints within the Monadnocks Conservation Park east of the Myara region (e.g. Mount Cooke and Mount Vincent), which form part of the Bibbulmun Track and is likely to cause a high–moderate visual impact for visitors to these scenic locations. The high-moderate visual impact is resultant of high sensitivity to change (visitors place a high value on the existing landscape) and moderate magnitude (discernible changes in the existing view).

The LVIA report recommended a 200m buffer along Kingsbury Drive for visual screening to mitigate foreground visual impacts. However, in areas where mid-ground vegetation has been removed, there is a risk that visual impacts may become visible. Notably, the proposed mining activities are likely to be visible from the scenic Kingsbury Drive, located along Karnet Prison Farm.

In addition to the scenic Kingsbury Drive, the LVIA indicates that the Proposal is anticipated to have a high-moderate visual impact on the recreational facilities at North Dandalup Dam and Serpentine Dam Picnic Area. The high-moderate visual impact is a result of high sensitivity to change and moderate magnitude.

The LVIA report indicates that within the Myara region, the Proposal is unlikely to be visible from other recreational facilities and trails that would remain accessible to the public, including Munda Biddi Trail. The lack of visibility at these other locations is expected due to the visual screening from topography and/or forest vegetation. The modelled zone of theoretical visibility within the LVIA report indicates that if the screening forest vegetation were to be substantially reduced (e.g. large-scale clearing or bushfire) there is potential for mining activities to become visible from the following trails that would remain accessible throughout the life of mine.

– Bibbulmun Track
– Jarrahland Scenic Drive
– Kingsbury Drive Cycling

– North Dandalup Dam via Jarrahdale Railway Trail

Visual screening studies conducted within the Myara region for the Pinjarra Alumina Refinery Revised Proposal ERD, indicate that a vegetive buffer of approximately 200m provides effective screening (GHD, 2021).

Mining operations within the Myara region (Huntly Mine) and Larego region (Willowdale Mine) occur concurrently throughout the duration of the 5-year mine plan. As such an understanding of cumulative visual impacts to Munda Biddi Trail and Bibbulmun Track is relevant. Based on the LVIA assessments for both mine regions findings suggest that no cumulative impacts are anticipated.

1.2.2.4 Air quality impact assessment

GHD (2024c) undertook an air quality assessment for the Proposal, including an assessment of concentrations of total suspended particulates (TSP) and dust deposition that could affect the amenity of users of recreational trails and facilities. The assessment (GHD, 2024) indicates that incremental concentrations of TSP from the mining operations were below relevant criteria for identified sensitive receptors, however, there may be exceedances of cumulative concentrations of 24-hour average TSP if the background concentrations are elevated, and potentially exceedance of dust deposition criteria at some receptors in the vicinity of Kingsbury Drive. Elevated background concentrations in the local area surrounding the Myara region could generally be attributed to agricultural activities, domestic fuel burning, dust storms, prescribed burns, bushfires, motor vehicle emissions and existing mining operations.

The air quality assessment indicates that elevated dust levels may occur for short periods of time during worst-case meteorological conditions over Kingsbury Drive and the Munda Biddi Trail. The assessment is considered conservative, excluding the effects of rainfall and including cumulative effects of ambient dust levels recorded at the Alcoa Yamba Drive ambient monitoring station. Monitoring data from Yamba Drive was reviewed to remove anomalous events that may be attributable to Alcoa operations and events associated with prescribed burns and recorded bushfires. However, not all high dust concentrations can be removed as the source of emissions could not be verified. Hence the background concentrations would still reflect dust emissions from existing mining at the Myara region and likely lead to a conservative estimate of cumulative dust emissions from the Proposal.

1.2.2.5 Exploration drilling potential impacts

Required for strategic long-term mine planning up to 20 years prior to mining, exploration drilling activities occur throughout the entirety of the mining lease. Using tractor-mounted drill rigs, modified to operate in forested areas, a fleet of 10 – 19 rigs (Alcoa and contract) undertake drilling activities between May – September (annually), 7 days a week, 11 hours a day (6am – 5pm). There is also a small shutdown period of approximately 10 days over Christmas through to the start of January.

Each year approximately 105,000 drill holes are undertaken across the mining lease with approximately 25 holes drilled each day in three phases, being:

– Phase 1: 60m x 60m apart
– Phase 2: 30m x 30m apart
– Phase 3: 15m x 15m apart

Phase 3 usually occurs within the gated mine area, however, DBCA has raised concerns regarding exploration activities outside gated areas.

The following non-negotiable exploration drilling constraints are in place in relation to trails and recreational facilities:

– 200m buffer to the Bibbulmun Track
– 50m buffer to the Munda Biddi Trail

Negotiable constraints relate to all other sanctioned trails whereby drilling within 300m of trails will only occur Monday – Friday outside of school holidays. Exploration activities will occur within these trails if required.

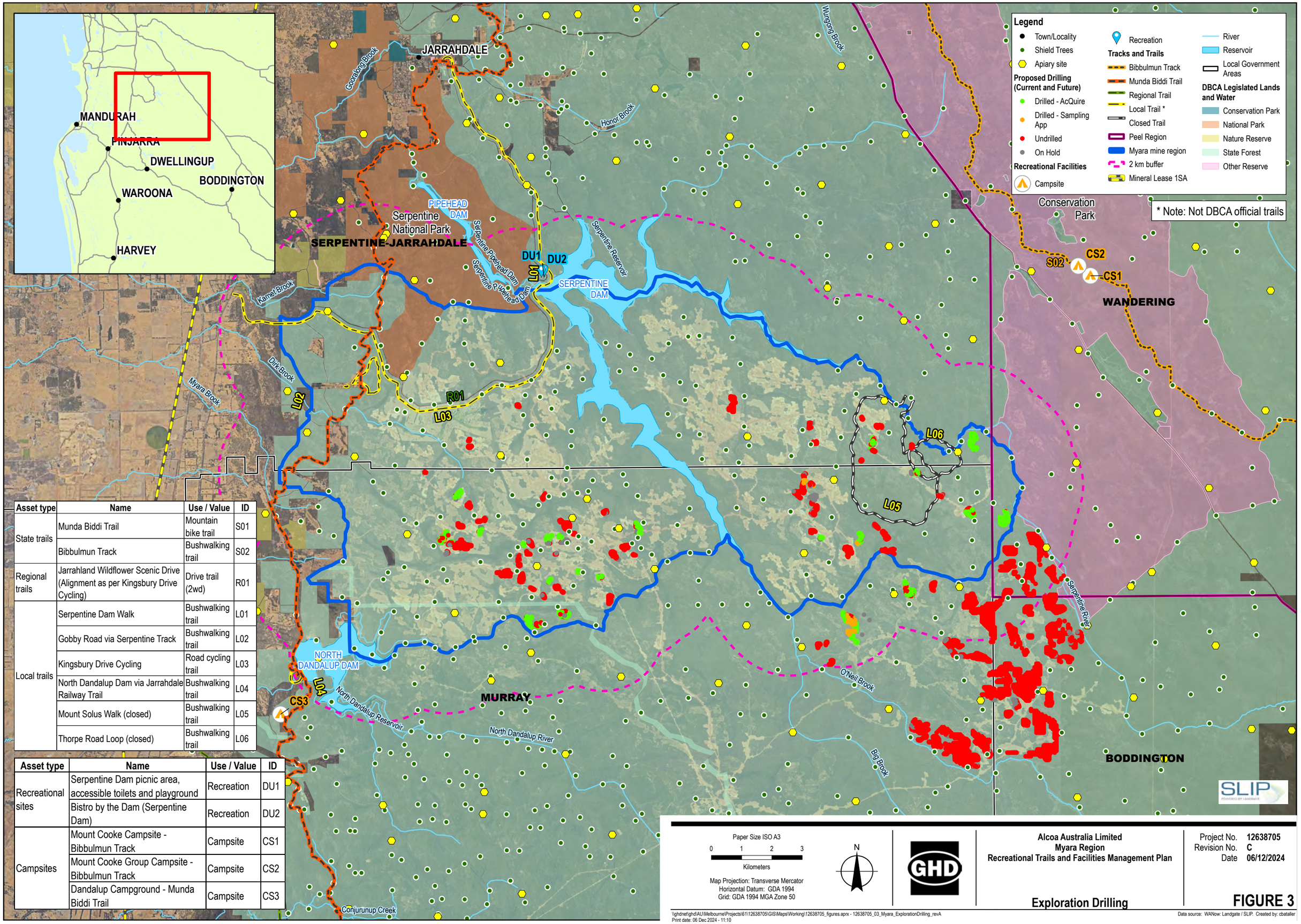
Figure 3 presents the proposed exploration drilling program for Huntly Mine between 2023-2027, which covers the Myara region and the O'Neil Mine Region to the southeast of Myara. As presented, drilling activities over 2023-2027 do not lie over any identified recreational trails and facilities within the Myara region and 2km Study Area, apart from Thorpe Road Loop and Mount Solus Walk both of which have been previously closed for the life of the mine.

1.2.2.6 Light pollution

Prevailing light sources within Myara region is dominated by the existing mine facilities situated along the existing conveyor line and the mine pits in operation. The townsite of Jarrahdale emits comparatively limited light. Other recognisable light sources within or adjacent to Myara region include Karnet Prison and North Dandalup.

The main light sources associated with mining activities identified in the 5-year MMP, within Myara region, will comprise permanent lighting at mine facilities and conveyor transfer stations, vehicle headlights and mobile LED light towers at operating mine pits. Due to the distance from Jarrahdale, rural properties and overnight campsites it is unlikely that lighting associated with mining activities identified in the 5-year MMP will have a significant impact on night-time amenity.

Implementation of MAZ for the Myara region is expected to avoid impacts to night-time amenity at the identified rural properties along Kingsbury Drive.



Asset type	Name	Use / Value	ID
State trails	Munda Biddi Trail	Mountain bike trail	S01
	Bibbulmun Track	Bushwalking trail	S02
Regional trails	Jarrahland Wildflower Scenic Drive (Alignment as per Kingsbury Drive Cycling)	Drive trail (2wd)	R01
Local trails	Serpentine Dam Walk	Bushwalking trail	L01
	Gobby Road via Serpentine Track	Bushwalking trail	L02
	Kingsbury Drive Cycling	Road cycling trail	L03
	North Dandalup Dam via Jarrahdale Railway Trail	Bushwalking trail	L04
	Mount Solus Walk (closed)	Bushwalking trail	L05
	Thorpe Road Loop (closed)	Bushwalking trail	L06

Asset type	Name	Use / Value	ID
Recreational sites	Serpentine Dam picnic area, accessible toilets and playground	Recreation	DU1
	Bistro by the Dam (Serpentine Dam)	Recreation	DU2
Campsites	Mount Cooke Campsite - Bibbulmun Track	Campsite	CS1
	Mount Cooke Group Campsite - Bibbulmun Track	Campsite	CS2
	Dandalup Campground - Munda Biddi Trail	Campsite	CS3

Paper Size ISO A3

0 1 2 3

Kilometers

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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Alcoa Australia Limited
Myara Region
Recreational Trails and Facilities Management Plan

Project No. **12638705**
Revision No. **C**
Date **06/12/2024**

Exploration Drilling

FIGURE 3

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1.2.3 Key assumptions and uncertainties

1.2.3.1 Regional planning and stakeholder consultation

The recreational facilities within the Myara region have been identified and classified in accordance with published State and regional planning documents as summarised in Table 6. The recreational and scientific assets have also been identified and assessed in accordance with stakeholder consultation as summarised in Section 3.

It is assumed that the identified and classified facilities are correct and current as per the published documents and consultation. There remains the potential for changes to occur in the identified facilities (e.g., new facilities developed) or changes to their significance at some point over the period of mining and rehabilitation and as a result of stakeholder consultation.

1.2.4 Risk-based approach to management

This objective-based RTFMP adopts a risk-based approach to identify and prioritise targets and actions. Appendix B presents a risk assessment of the potential impacts on recreational facilities and commercial opportunities identified within the Myara region and associated Study Area:

– Table B-1 Closure and direct disturbance
– Table B-2 Indirect impacts noise
– Table B-3 Indirect impacts on visual
– Table B-4 Indirect impacts on air quality
– Table B-5 Exploration drilling impacts

Consideration of potential impacts and the implementation of management measures have been determined within related studies identified in Table 8.

Tables B-2 to B-5 present residual risks incorporating proposed access restrictions/closure of facilities during the life of mine as proposed in Table B-1. The risk assessment considered consequences based on the significance class of recreational trails, magnitude and duration of impact, and likelihood.

As presented in Appendix B, the risk assessment indicated the following very high and high risks, to which mitigations/actions need to be applied (Table 8).

Table 8 Potential risks to the facilities during life of mine

Very high risk
– Visual impact to Jarrahland Scenic Drive and Kingsbury Drive Cycling as a result of five-year mine plan activities
– Continued closure of Mount Solus Walk and Thorpe Road Loop
High risks
– Potential visual impacts to the state-significant trail (Bibbulmun Track) due to elevated views on the Monadnocks
– Potential visual impacts to trails (Kingsbury Drive Cycling, Jarrahland Wildflower Scenic Drive, North Dandalup Dam via Jarrahdale railway trail) due to proximity to mining operations.
– Potential noise and dust impact to trails (Munda Biddi Trail, Kingsbury Drive Cycling, Jarrahland Wildflower Scenic Drive) during worst-case conditions/operations.
– Potential noise, dust and visual impacts to commercial operators due to proximity to mining operations
– Potential noise, dust and visual impacts to shield trees due to proximity to mining operations

A further identified risk is the limited stakeholder consultation at the time of preparing this draft RTFMP. This risk is addressed through the proposed stakeholder consultation in Section 3.

The management approach in this RTFMP is consultative and conservative, with the view of managing impacts during all phases of mining. The RTFMP adopts an environmental management hierarchy in the prioritisation of management provisions:

– Avoidance: measures taken to avoid impact
– Minimisation: measures taken to reduce the duration, intensity and/or extent of impact
– Rehabilitation: measures taken to restore previously existing conditions.

1.2.5 Rationale for choice of provisions

Changes in intensity, duration, magnitude and geographic footprint of the impact

The management provisions have been developed to address how impacts to recreational facilities and commercial opportunities may vary in intensity, duration, magnitude and geographic footprint, including:

– variation in direct and indirect impacts as mining progresses within the Myara region
– variation in meteorological conditions affecting noise propagation or dust dispersion during mining.
– progression and restoration of visual impacts over mining and rehabilitation timeframes.

Environmental changes and rate of change

Management measures have been developed to address the potential for external threatening processes to affect visual screening by vegetation surrounding the region.

The RTFMP will be reviewed by Alcoa and with DBCA in the event of material changes to environmental conditions or social surroundings that may influence the Proposal's impacts on recreational facilities or commercial opportunities.

External Issues

The provisions have considered third-party proposals for new trails, recreation and tourism. The RTFMP will be reviewed in the event of material changes to external issues.

2. Environmental management components

Table 9 presents objective-based management provisions relating to those recreational facilities and commercial opportunities within the Myara region with the potential for very high and high risks.

Table 10 listed trigger and threshold criteria related to the environmental impacts management plan.

Table 9 Recreational facilities and commercial opportunities within the Myara region – Management components

Management target	Management actions	Monitoring	Timing/frequency of actions	Reporting
Objective 1: Maintain amenity, scenic values and quality of landscape as experienced by users of Kingsbury Drive				
– Maintain amenity on Kingsbury Drive inclusive of Jarrahland Wildflower Scenic Drive and Kingsbury Drive Cycling.	– Increase and maintain Kingsbury Drive MAZ with a buffer of 200m throughout the length of Kingsbury Drive to enable screening of mining activity from the roadway. – MAZ is to be clearly marked on construction and mining maps to guide mine development personnel. – Implement hillslope MAZ within the hillslope south of Karnet Prison Farm and prioritise the rehabilitation of visible previously mined areas.	Annual spatial database review of MAZ.	– MAZ was established and demarcated prior to the commencement of the proposed mine development. – Revise a 5-year mine plan to facilitate roadway and hillslope MAZ. – Prioritise rehabilitation of previously mined areas visible within the hillslopes south of Karnet Prison.	Compliance assessment report will include a review of the MAZ.
Objective 2: Minimise noise and dust impacts on users of Munda Biddi Trail and Kingsbury Drive.				
– Minimise audible noise, blast overpressure and dust levels on Munda Biddi Trail and Kingsbury Drive	– Implement MAZ including daytime noise sensitivity zones around the Munda Biddi Trail and Kingsbury Drive. – Identify periods of peak usage of Munda Biddi Trail and Kingsbury Drive, in consultation with DBCA and the Shire of Serpentine-Jarrahdale. – Undertake long-term and short-term planning using noise modelling of planned mine operations over historic and forecast weather conditions to predict audible noise over periods of peak usage. – Undertake modelling based on weather forecasts to predict blast overpressure during periods of peak usage. Postpone blasting if blast overpressure is predicted to exceed standard or use alternative charges to reduce overpressure to standard.	Annual spatial database review of MAZ.	– MAZ was established and demarcated prior to the construction of the proposed mine development. – Pre-mining noise planning – During mining noise planning – Daily – blast modelling	Compliance assessment report will include a review of the MAZ.
Objective 3: Minimise direct impacts to recreational trails within the Myara region, which includes investigating options to maintain access, where feasible. Where impacted, rehabilitate and reinstate these facilities where practicable, in consultation with DBCA and other key stakeholders.				
– Public access is maintained for the life of the mine to Munda Biddi Trail, Bibbulmun Track, Serpentine Dam Walk, Kingsbury Drive Cycling, North Dandalup Dam via Jarrahdale Railway Trail, Jarrahland Wildflower Scenic Drive, Sullivan Rock to Mount Cooke Trail, Sullivan Rock to Mount Vincent Summit Trail, Serpentine Dam Walk, Gobby Road via Serpentine Track and Mount Cooke Loop.	– Establish and maintain MAZ to allow uninterrupted access to these trails.	Annual spatial database review of MAZ.	– The gated mine and MAZ were established and demarcated prior to the construction of the proposed mine development.	Compliance assessment report will include a review of the MAZ.
– Where practicable, rehabilitate and reinstate access to: • Mount Solus Walk • Thorpe Road Loop	– Maintain closure or partial closure for the life of mine. – Rehabilitate trails to be re-instated as early as practicable with consideration to rehabilitation priorities given other environmental and social values and constraints. – Rehabilitation to recreate the pre-mining trail condition and facilities, in consultation with DBCA and other key stakeholders, where practicable	To be determined in consultation with DBCA.	– Agreement reached with DBCA prior to rehabilitation processes on what trails should be rehabilitated and access reinstated. – Any required rehabilitation is conducted as early as practicable or at the end of mine region life.	To be determined in consultation with DBCA.
Objective 4: Maintain the viability of existing and planned commercial opportunities				
– Maintain viability of existing and planned commercial opportunities as identified in Table 5.	– Alcoa to consult with DBCA when reviewing mine planning to ensure commercial operators are advised of changes to access to minimise disruption to commercial activity.	Annual spatial database review of negotiable constraints.	– Concept planning, site surveys and detailed design	Pre-mine development site inspection
Objective 5: Maintain access and adequacy of day-use areas				
– Maintain access and adequacy of existing DBCA day-use areas, including: • Serpentine Dam and recreational facilities • Bistro by the Dam	– Establish and maintain MAZ – MAZ will be demarcated in construction and mining maps to guide mine development and construction personnel. – If mining is predicted to be visible from visually sensitive sites, then prepare and implement a VMP in consultation with DBCA.	Pre-construction and pre-mine development inspection of facility condition	– MAZ was established and demarcated prior to the commencement of adjacent mine development.	Compliance assessment report will include a review of the MAZ.
– Enable existing informal day-use opportunities to occur in and adjacent to the mine area.	– Demarcate areas for mining and construction	Annual spatial database review of MAZ.		Compliance assessment report will include a review of the MAZ.

Management target	Management actions	Monitoring	Timing/frequency of actions	Reporting
Objective 6: Maintenance of access for facility and asset management				
– Ensure DBCA and DFES have suitable access to the mine region to allow for: • Appropriate fire management, including upkeep of fire breaks and allowance of strategic access. • On-going ability to maintain the Western Shield Baiting Program within the mine region • DBCA nominated public firewood areas • Avoidance of Disease Risk Areas for relocated facilities – Have an agreed Forest Access Plan for general vehicle access	– Prepare and maintain a site access plan to allow for regulated movement of DBCA/DFES officials – Minimise direct impacts to access tracks as far as practicable. – Recreate the pre-mining site conditions and facilities, in consultation with DBCA and other key stakeholders, where practicable.	To be determined in consultation with DBCA.	– Prior to clearing, DBCA/DFES to provide an indication of essential service roads. – Any required rehabilitation is conducted as early as practicable or at the end of mine region life. – Any required access was reinstated at the closure of the mine region.	Pre-construction/mine development site inspection
Objective 7: Maintain water quality in response to new or changed recreational facility use				
– Ensure the following water quality objectives are maintained: • Public drinking water in the constituted public drinking water source areas of Serpentine Dam Catchment Area. • Recreational water quality in Serpentine Dam Catchment Area. • Waterways and wetlands at pre-development levels (winter concentrations) or improved.	– Ensure any new or changed recreation facilities or events are consistent with Operational Policy 13 or noted by the Minister for Water. – Ensure access is not increased to the Serpentine Dam reservoir protection zone, where public access is prohibited under the Metropolitan Water Supply, Sewerage and Drainage By-laws 1981, except on public roads.	Surface water monitoring as per the Water Resources Management Plan in conjunction with relevant standards and guidelines.	– MAZ was established and demarcated prior to the construction of the adjacent mine development.	As per the Water Resources Management Plan.
Objective 8: Minimise direct and indirect impacts on trails and the users in relation to exploration drilling activities				
– Limit the disruption to the trails as a result of exploration drilling, with appropriate management and mitigation measures applied	– Establish and maintain a minimum 50 m MAZ between exploration drilling activities and Mundi Biddi Trail to minimise associated impacts. – Establish and maintain a minimum 200 m buffer to Bibbulmun Track – Drilling within 300 m of trails only occurs Mon-Fri outside of school holidays	Annual spatial database review of MAZ.	– MAZ was established and demarcated prior to the construction of the adjacent mine development.	Compliance assessment report will include a review of the MAZ.

Table 10 Trigger and threshold

Indicator/Value	Response actions	Monitoring: Frequency and location	Reporting
Trigger criterion 1 Required exploration or construction are identified to be on trajectory towards any MAZ (within 30 m) listed for the region.	**Trigger level action** – Undertake review of Mine Plan and ensure MAZ is incorporated into the Mine Plan Process. – Review map layers where relevant, including updates. – Conduct in-field assessment to confirm or verify potential exceedance. – If required implement trigger level response action in consultation with relevant stakeholders (for example, rehabilitation).	– Reconciliation assessment against clearing activities once specific clearing area is completed. – If triggered, an in-field assessment will be undertaken against trigger criteria. – Annual spatial database of MAZ	The compliance assessment report will include discussion around the assessment/s and whether revision of the trigger criterion is required.
Threshold criterion 1 Required exploration or construction activity has intruded into any MAZ listed in Table 9.	**Threshold contingency action** As above, including the addition of: If avoidance cannot be achieved, Alcoa must provide, to the satisfaction of the State Development Minister, a written report explaining why the relevant avoidance cannot be met prior to the exploration or construction activity being undertaken.	– Annual audit of activities and review of internal protocols, – where relevant. – Annual spatial database review of MAZ.	In the event that monitoring, or surveys indicate exceedance of the threshold, the exceedance will be reported to the State Development Minister in writing within 21 days of the exceedance being identified. The compliance assessment report will include discussion around the assessment/s and whether revision of the management objective is required.

2.1 Adaptive management and review

2.1.1 Environmental monitoring and corrective actions

Environmental monitoring will occur during the construction and operational phases of mining in the Myara region including the establishment and progress of rehabilitation.

Any non-conformances with the requirements of this RTFMP will be investigated to identify the root cause and the relevant corrective action. If necessary, the RTFMP will be amended to incorporate the corrective action to prevent future non-conformances. Non-conformances will be rectified or mitigated as soon as possible to ensure minimal ongoing harm to social surroundings.

Relevant procedures will be amended/updated as necessary and inductions and other workforce communication will be undertaken in a timely manner to minimise the risk of re-occurrences.

In the event of unforeseen impacts from the Proposal to recreational or scientific facilities within the Myara region, relevant stakeholders (e.g., DBCA) will be notified and consulted in regard to the appropriate remedial actions.

2.2 Revisions

This RTFMP is intended to be dynamic and may be updated to reflect changes in management practices and social surroundings with time. This will also allow flexibility to respond to new environmental impacts and adopt new technologies/management measures. Figure 4 outlines the process for review, upon revisions to the MMP.

Amendments to management actions will be completed on an as-needed basis. This will include revision/amendment of management actions that are not achieving the desired outcomes, environmental monitoring identifying additional impacts and management actions, and changes to relevant legislation or improvements to practices that are likely to achieve better environmental outcomes.

Where substantial changes to the RTFMP are required, Alcoa will engage with DBCA and relevant stakeholders on the proposed changes to inform and update the document, and the document will be distributed to DBCA and the relevant stakeholders. Once agreed upon, updates to the RTFMP can be discussed in the Alcoa DBCA Conflicts Meeting.

This RTFMP will be reviewed and updated as necessary to reflect material changes and updates in relevant internal and external factors, which may include:

– Material changes in the Myara mine plan, construction or rehabilitation programs that may affect recreational or scientific facilities
– Non-conformances and corrective actions
– Material updates of existing recreational strategies (e.g., PRTS) or release of new recreational strategies that relate to recreational trails or facilities within the mine region.
– Advice from DBCA or key stakeholders regarding material changes to recreational or scientific facilities that may be directly or indirectly impacted by the Proposal, or material changes in environmental conditions that may affect impacts from the Proposal (e.g., external threatening processes).

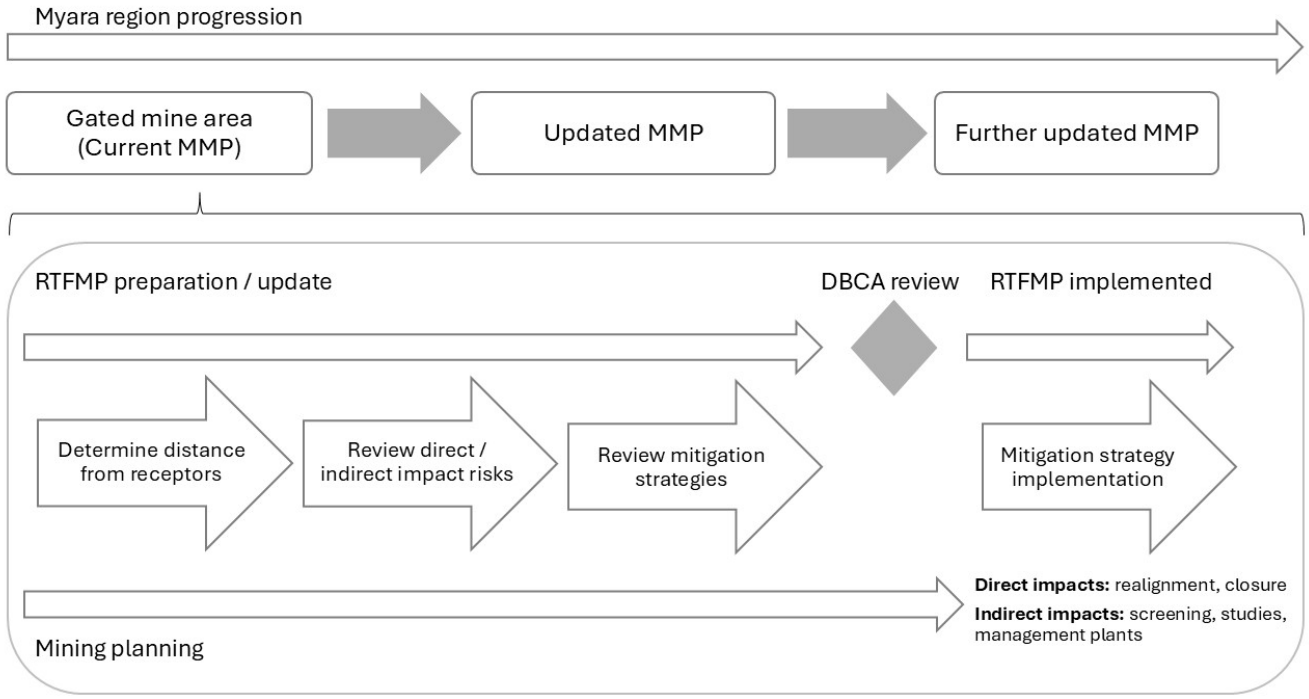


Figure 4 ***RTFMP Review process***

3. Stakeholder consultation

Alcoa has been engaging with a broad range of stakeholders regarding the Hunty Mine's move to the Myara region since ~2005. Stakeholders who have been engaged with Alcoa operations are summarised in Table 11.

A variety of engagement methods have been deployed to ensure stakeholders and community members can access information and have opportunities for meaningful consultation. Alcoa has actively listened to stakeholders and community members, considering their feedback in commissioning studies.

Table 11 Key stakeholders

Stakeholder group	Details of consultation
State Government	– Departments – Jobs Tourism, Science and Innovation; Biodiversity, Conservation and Attractions; Justice, Local Government, Water Corporation, Sport and Cultural Industries and Department of Justice – Agencies – EPA Tourism WA; Peel Development Commission – Local Members of Parliament – Darling Range; Murray-Wellington;
Local Government	– Shire of Boddington – Shire of Wandering – Shire of Murray – Shire of Serpentine-Jarrahdale – City of Mandurah
Recreation and tourism groups	– Bibbulmun Track Foundation – Munda Biddi Trail Foundation
Environmental groups:	– Peel-Harvey Catchment Council – Peel Alliance – Mandurah Environmental and Heritage Group
Business and industry groups	– Institute of Forests of Australia, WA Division – Bistro on the Dam (Serpentine Dam) – Bodhinyana Monastery – Karnet Prison Farm
Community groups	– Jarrahdale Community Consultation Network – Nearby communities and nearby private landowners/residents: – Neighbours in Keysbrook

Areas of concern raised by stakeholders relative to landscape and visual impacts associated with Myara region related to potential impacts on a range of values including recreation and ecotourism, local communities and their forest setting, private properties, transport routes, clearing, rehabilitation and cumulative impacts as detailed in Table 12. External stakeholder consultation details including stakeholders, the responses and Alcoa actions are listed in Table 13.

Table 12 Stakeholder feedback

Value	Concerns
Recreation and ecotourism	– Potential impacts on visual and landscape values that forested areas provide for the general recreational and ecotourism product of the Jarrahdale area, both current and envisaged. – Potential landscape and visual impacts on recreational and ecotourism facilities in the shires of Murray and Serpentine-Jarrahdale including formal and informal tracks, trails and associated campsites. These include: – Facilities associated with the Serpentine Dam including Kingsbury Drive. – The nationally recognised Munda Biddi Trail, which runs through the western edge of the Myara Region
Local communities and their forest setting	– Potential impact on the visual and landscape values of the surrounding forest as an enjoyable place to live and/or visit.

Value	Concerns
	– Potential impacts on local businesses and the economy of North Dandalup, Keysbrook, Yamba, Jarrahdale and Dwellingup due to visual and landscape value impacts deterring people from living and/or visiting the areas.
Private properties	– Potential visual amenity impacts on private properties in or near the proposed mine regions, in particular landowners within the Myara region such as the Bodhinyana Buddhist Monastery and neighbouring Keysbrook.
Transport routes	– Potential visual impacts on major and/or significant roads that fall within or near the proposed mine regions. This concern was heightened by a recent clearing conducted by Alcoa along Kingsbury Drive near the Karnet Prison Farm.
Clearing	– Potential visual impacts associated with the extent of clearing associated with bauxite mining.
Rehabilitation	– Potential visual impacts are associated with the length of time required for rehabilitated forests to become established.
Cumulative impacts	– Potential visual impacts associated with Alcoa's past, present and future operations, including beyond those currently being assessed.

Table 13 External stakeholder consultation in relation to this RTFMP

Date	Stakeholder	Consultation	Stakeholder response	Alcoa action
8/8/2024	DBCA	Email request for information on scientific sites in Myara and Larego. Several emails were sent over the following months.	No current information available as register is not functional and therefore GIS is out of date.	Asked GHD to leave this query open and can update in further versions of report.
22/10/2024	DBCA	Alcoa provided DBCA with the drafts of the two RTFMPs and a summary presentation. DBCA agreed to provide comment.	DBCA asked Alcoa to add a note that local trails are not DBCA endorsed and agreed to send written feedback – this was received on 22/11/2024.	Comments have been incorporated prior to finalising the report.
22/10/2024	DBCA	Request for information on apiary and commercial groups operating within Myara Region.	DBCA will follow up and confirm – response received 4/12/2024.	Incorporated into the Myara report.
25/11/2024	Shire of Serpentine-Jarrahdale	Email request explaining DBCA's preference to leave out local trails and asking for Shire of SJ preference.	Include local trails in the plan as they align with DLGSC's goal of increasing participation in outdoor recreation and nature-based tourism.	Included in the Myara report – noted as not DBCA endorsed trails.

4. References

Common Ground Trails Pty Ltd 2017, *South West Mountain Bike Master Plan*, prepared for WestCycle Inc.

Common Ground Trails Pty Ltd 2019, *Peel Regional Trails Strategy 2019*, prepared for the City of Mandurah, Shire of Boddington, Shire of Murray, Shire of Serpentine Jarrahdale and Shire of Waroona.

Department of Biodiversity, Conservation and Attractions 2019, *Two Year Action Plan for Nature-Based Tourism in Western Australia 2019 and 2020*, Government of Western Australia.

Department of Water and Environmental Regulation, 2019. Operational Policy 13: Recreation within public drinking water source areas on crown land

Environmental Protection Authority (EPA) 2021, *Instructions on how to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans*, EPA, Western Australia.

GHD 2024a, Myara Mine Region Noise Impact Assessment

GHD 2024b, Myara Mine Region Landscape and Visual Impact Assessment

GHD 2024c, Myara Mine Region Air Quality Impact Assessment

PX2 Pty Ltd 2015, *Taking the Reins The Western Australian Recreational Horse Trail Strategy*, prepared for the Australian Trail Horse Riders Association.

Shire of Harvey 2020, *Advocacy Priorities*, retrieved 22 April 2022, from https://www.harvey.wa.gov.au/build-and-develop/projects/advocacy-priorities

TRC Tourism 2017, *Western Australian Strategic Trails Blueprint 2017-2021*, prepared for the Trails Reference Group, Department of Sport and Recreation, May 2017.

Western Australian Conservation and Parks Commission (2019). *Position Statement: Protecting and conserving the value of the land to the culture and heritage of Aboriginal persons.* Conservation and Parks Commission, Perth.

WestCycle Incorporated & Purpose Drive Performance (2022). retrieved 06 August 2024, from Western Australian Mountain Bike Strategy 2022-2032. https://westcycle.org.au/wp-content/uploads/2023/01/WA-Mountain-Bike-Strategy-2022-2032.pdf

Appendices

Appendix A

Identified impacts - Recreational facilities and commercial opportunities

Colour key

Impact	Colour representation
Direct impact short term (facility within / part within gated area)	
Direct impact long term (facility within / part within region)	
Direct impact mitigated	
No impact	

Table A.1 State significance trails and facilities

ID	Existing asset	Identified values	Proximity to Myara region	Direct impact within mine region	Indirect impact
S01	Munda Biddi Trail	State significance, very high priority in PRTS. Consultation – important to the shires of Murray and Serpentine-Jarrahdale for recreation and ecotourism, use types include mountain biking and camping.	Approximately 11 km within the mine region	Potential	None

Table A.2 Regionally significant trails and facilities

ID	Existing assets	Identified values	Proximity to Myara region	Direct impact within mine region	Indirect impact
R01	Jarrahland Wildflower Scenic Drive	Regional significance, very high priority in PRTS, tourism input to Jarrahdale. 2WD drive – Jarrahdale Road, Kingsbury Drive.	Approximately 12.5 km within mine region	Potential	Potential audible noise and visual impact.

Table A.3 Local significant trails and facilities

ID	Existing assets	Identified values	Proximity to Myara region	Direct impact within mine region	Indirect impact
L01	Serpentine Dam Walk	Used by visitors to Jarrahland Wildflower Drive	Adjacent to the northern boundary of mine region	No impact	Potential visual impacts due to proximity to mining operations.
L02	Gobby Road via Serpentine Track	Bushwalking	Within mine region	No impact	Potential visual impacts due to proximity to mining operations.
L03	Kingsbury Drive Cycling	Road cycling	Within mine region	Potential	Potential visual impacts due to proximity to mining operations.
L04	North Dandalup Dam via Jarrahdale Railway Trail	Bushwalking	Approximately 1.7 km south-west of the mine region	No impact	Potential visual impacts due to proximity to mining operations.
L06	Mount Solus Walk (closed)	Bushwalking (prior to closure for mining activities)	Within mine region	Potential	Potential noise and visual impacts due to proximity to mining operations.
L07	Thorpe Road Loop (closed)	Bushwalking	Within mine region	Potential	Potential noise and visual impacts due to proximity to mining operations.
L04	Serpentine Dam picnic area, accessible toilets and playground	Used by visitors to Jarrahland Wildflower Trail Scenic Drive Picnic areas, toilets, lookout, café, day visits and Playground opened in 2024.	Adjacent to the northern boundary of mine region	No impact	Potential visual impacts due to proximity to mining operations.
n/a	Shield trees	Former forest industry grid reference trees, widespread (total 3437 trees within ML1SA) through northern Jarrah forest. Used for orienteering	169 trees within mine region	Potential	Dieback, weeds

Table A.4 Commercial operators and opportunities

ID	Existing assets	Identified values	Proximity to Myara region	Direct impact within mine region	Indirect impact
n/a	Apiary sites	Agricultural	16 current apiaries within mine region	Potential	Potential reduction in nectar sources resulting from clearing; dust impacts within 500 m of mining.
n/a	Bistro by the Dam	Tourism, recreation	within region, outside of current gated area	No impact	Potential for reduction in turnover should reduce recreational use occur based on proximity to mining operations.
n/a	Seed collecting	Commercial	no specific site	Reduction of accessible vegetation as a result of clearing for mining operations.	Reduction of access to vegetation as a result of road closures.
n/a	Commercial wildflower picking	Commercial	no specific site	Reduction of accessible vegetation as a result of clearing for mining operations.	Reduction of access to vegetation as a result of road closures.

Appendix B

Risk assessment

Consequence criteria

Classification	Short term minor impact	Long term minor impact	Short term major impact	Long term major impact
State significance	Moderate	Major	Major	Critical
Regional significance	Minor	Moderate	Major	Major
Local / informal	Minor	Minor	Moderate	Moderate

Risk matrix

Consequence	Likelihood: Unlikely	Potential	Likely	Almost certain
Critical	Medium	High	Very high	Very high
Major	Medium	High	High	Very high
Moderate	Medium	Medium	High	High
Minor	Low	Medium	Medium	Medium

Table B.1 Risk assessment: Closure and direct disturbance

Asset	Significance	Magnitude	Duration	Consequence	Likelihood	Risk	Strategy
Mount Solus Walk (closed)	Local	Moderate	Long-term	Major	Almost certain	Very high	Restrict access, minimise impacts, rehabilitate and restore at closure
Thorpe Road Loop (closed)	Local	Moderate	Long-term	Major	Almost certain	Very high	Restrict access, minimise impacts, rehabilitate and restore at closure
Commercial operators							
Apiary sites	Informal	Moderate	Long-term	Moderate	Potential	Medium	Restrict access, minimise impacts
Seed collecting	Informal	Moderate	Long-term	Moderate	Potential	Medium	Restrict access, minimise impacts
Commercial wildflower picking	Informal	Moderate	Long-term	Moderate	Potential	Medium	Restrict access, minimise impacts
Other facilities							
Shield trees	Regional	Moderate	Long-term	Moderate	Likely	High	Restrict access, minimise impacts

Table B.2 Risk assessment – Audible noise and airblast

Asset	Significance	Magnitude	Duration	Consequence	Likelihood	Risk	Strategy
State significant trails and camping							
Munda Biddi Trail	State	Moderate	Short-term	Moderate	Likely	High	Noise management plan
Region significant trails							
Jarrahland Wildflower Trail Scenic Drive	Regional	Minor	Short-term	Minor	Likely	Medium	Noise management plan
Local trail							
Kingsbury Drive Cycling	Local	Minor	Short-term	Minor	Potential	Medium	Noise management plan

Table B.3 Risk assessment – Visual impact

Asset	Significance	Magnitude	Duration	Consequence	Likelihood	Risk	Strategy
Region significant tracks and trails							
Jarrahland Wildflower Trail Scenic Drive	Regional	Major	Long-term	Major	Almost certain	Very high	Avoid impact, maintain public access, prioritise rehabilitation
Other tracks and trails							
Kingsbury Drive Cycling	Local	Moderate	Long-term	Major	Almost certain	Very high	Avoid impact, maintain public access, prioritise rehabilitation
North Dandalup Dam via Jarrahdale railway trail	Local	Minor	Long-term	Moderate	Almost certain	High	Avoid impact, maintain public access, prioritise rehabilitation
Day use areas							
Serpentine Dam, picnic area, accessible toilets and playground	Regional	Minor	Long-term	Minor	Almost certain	Medium	Avoid impacts, maintain public access

Table B.4 Risk assessment – Air quality impact

Asset	Significance	Magnitude	Duration	Consequence	Likelihood	Risk	Strategy
Other tracks and trails							
Kingsbury Drive Cycling	Local	Minor	Short-term	Minor	Potential	Medium	Dust management plan

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