

16 APPENDIX E – ALCOA ANGLESEA SITE CLOSURE PLAN



SITE CLOSURE PLAN

ALCOA ANGLESEA

Confidential Document:

Not to be released without the permission of Alcoa Anglesea.



australia's aluminium
since 1963



TABLE OF CONTENTS

1 INTRODUCTION 4

1.1 Purpose of this Site Closure Plan 4

1.2 Objectives..... 4

1.3 Background..... 4

1.4 Overview of Site Closure 5

1.5 Government and Regulatory obligations..... 5

1.6 Alcoa Standard and Guidelines..... 6

1.7 References..... 6

2 STAKEHOLDER INVOLVEMENT 6

2.1 Closure Plan Review 7

2.2 Community Communication and Consultation 7

2.3 Employee Communication and Consultation..... 8

3 RISK ASSESSMENT..... 9

4 CLOSURE CRITERIA 10

5 CLOSURE COSTS 11

6 CLOSURE ACTION PLAN..... 12

6.1 Human Resources and Responsibilities..... 12

6.2 Progressive Rehabilitation 12

6.2.1 Current Alcoa Mine Rehabilitation 12

6.2.2 Roche's Mine Rehabilitation 13

6.3 Land Use and Landform Establishment 14

6.3.1 Future Land Uses 14

6.3.2 Final Mine Design..... 15

6.4 Hydrogeological Assessment..... 15

6.5 Revegetation..... 16



6.6 Decommissioning 16

6.6.1 Dismantling and removal of Infrastructure 16

6.6.2 Office and Amenities Buildings 17

6.6.3 Workshops..... 17

6.6.4 Fuel Bays..... 17

6.6.5 Above ground Storage Tanks..... 17

6.6.6 Underground Storage Tanks 17

6.6.7 Haul Roads and tracks 17

6.6.8 Stream Crossings..... 17

6.6.9 Salt Creek Diversion Channel 18

6.6.10 Electricity 18

6.6.11 References 18

6.7 Management of Hazardous Materials 18

6.7.1 Asbestos 18

6.7.2 Ash Ponds 19

6.7.3 Sewerage Treatment Plant & Ponds..... 19

6.7.4 Land farm 19

6.7.5 Polychlorinated Biphenyls 20

6.7.6 Synthetic Mineral Fibres..... 20

6.7.7 Lead Paint 20

6.7.8 References 20

6.8 Management of Waste Materials..... 21

6.8.1 Concrete 21

6.8.2 Bitumen 21

6.8.3 Scrap Metal 21

6.8.4 Demolition Waste 21

6.9 Investigation of Contaminated Areas..... 22

6.9.1 References 22

6.10 Future Land Management..... 23

6.11 Unplanned Closure 23

6.12 Document Management 23

6.12.1 Location of Hard Copies..... 23

6.12.2 Review History 23



1 INTRODUCTION

1.1 Purpose of this Site Closure Plan

This plan has been developed to outline the decommissioning and rehabilitation of the Alcoa Anglesea Power Station and Mine. The aim of the plan is to inform interested parties such as government agencies, the Shire and community groups on how unwanted facilities and infrastructure will be decommissioned and the areas currently open for mining, roads and infrastructure, rehabilitated and returned to an agreed land use. It is also the operating planning tool to be used by Alcoa personnel during the closure of the mine.

1.2 Objectives

This plan has been developed to achieve Alcoa's safety and environmental objectives by ensuring that:

- We maintain our high focus on environmental and safety standards
- All rehabilitation achieves the completion criteria standard
- Planning for future use of the mine or infrastructure will involve the neighbouring community and other interested parties
- The site is left in a condition which is safe, self sustaining and suitable for future land uses
- The amount of waste disposed to landfill is minimised by recycling and reusing waste materials
- The site is liability free when relinquished to the government or utilised by another body

1.3 Background

The Alcoa Anglesea Site is situated on unreserved Crown Land, 41 kilometres southwest of Geelong, and two hundred metres north of the town of Anglesea (Appendix I).

Alcoa mines brown coal in an open cut mine to fuel its 160-MW Anglesea Power Station located within the lease area. Since 1969 Alcoa has mined approximately 1.1 million tonnes of brown coal each year from the main upper seam within the open cut. The electricity produced is transmitted via a 35-km high voltage power line to Alcoa's aluminium smelter and fabricating mills at Point Henry, near Geelong. The Power Station supplies approximately 40% of Point Henry's power requirements.

The site consists of Alcoa freehold and a 7097-ha area of Crown Land leased under provisions of the *Mines (Aluminium Agreement) Act 1961* which grants Alcoa of Australia Limited exclusive right to explore and extract coal found within the area for 50 years, until 2011, with the right of 50 years renewal.

The Alcoa Lease incorporates the Anglesea Heath. The Anglesea Heath consists of two main areas:

- Mining Area: Coal Mine & Power Station: currently 545 ha of lease and freehold where mining, power generation areas and administration offices are located.
- Land for Conservation: currently 6676 ha of lease.

Since 1969 a total of 413 hectares has been cleared for mining operations. Within the current working area, 52 hectares has been cleared for permanent infrastructure and 151 hectares have been rehabilitated. The current open mining area is 210 hectares. Progressive backfilling of the open cut is reshaped to blend with the surrounding terrain, then covered with sub-soil and top-soil and ripped on contour to encourage germination of plant species native to the area. The aim is to rehabilitate the mined areas to a heathy woodland ecosystem, with values and management needs similar to the surrounding lease.

Alcoa Anglesea is within the Anglesea Heath managed with a cooperative agreement with the Department of Natural Resources and Environment (now Dept. Sustainability and Environment). The implementation of the Anglesea Heath Management Plan is administered by Parks Victoria on behalf of DSE. Ninety-five percent of the Land for Conservation portion of the Anglesea Heath is listed on the Register of the National Estate which is the responsibility of the Federal Department of Environment and Heritage.

Alcoa Anglesea Site Closure Plan

1.4 Overview of Site Closure

As part of the Alcoa closure approval process, adequate consultation is required with community groups and government departments to determine if Alcoa Anglesea could be utilised by another party. This process will look at mine infrastructure and rehabilitation requirements to meet specialised land uses. All proposals must be compatible with the designated land use priorities of the area. The process will not approve new development, but will consider variations to the rehabilitation procedures or determine if infrastructure can remain to be used by another party.

Alcoa will not encourage any community expectations that are clearly incompatible with current land use objectives for the Crown Land as detailed in the Anglesea Heath Management Plan.

Notwithstanding the possibility that some areas will be left for use by future parties, this closure plan assumes that the site is to be fully rehabilitated. In the event of the management of specific areas being transferred to a third party, the Alcoa Environmental, Health and Safety Assessment of Prospective Acquisitions and Divestitures procedure will be enacted to address any areas of concern and future liability.

Rehabilitation of areas open, together with areas selected for rework will be rehabilitated to the current rehabilitation plan as specified in the Land Management Plan.

1.5 Government and Regulatory obligations

A search was undertaken of relevant legislation and government department guidelines to ensure that Alcoa developed a closure plan for the Anglesea site that encompassed all legal and best practice requirements. In Victoria there is no specific legislation, regulations or guidelines covering the environmental aspects of decommissioning mine sites but is generally referred to in the *Mineral Resources Development Act (1990)* under sections relating to rehabilitation.

Alcoa's aluminium operations in Victoria are subject to the *Mines (Aluminium Agreement) Act 1961*. The Agreement, ratified by an Act of parliament, outlines the rights and responsibilities of both the company and the State of Victoria. Alcoa's mineral lease at Anglesea was granted under terms of the Agreement. The *Mines (Aluminium Agreement) Act 1961* overrides all other State Acts. This Act does not have any specific requirements regarding decommissioning of mines, however the Minister for the Environment has the power to instruct works to be carried out under Section 14 (2): Company may be ordered to execute works, states, "The Company shall from time to time carry out on the leased area such works for the purpose of rehabilitating any part thereof as may be agreed upon by the Company and the Minister or failing agreement as may be determined as reasonable by arbitration pursuant to clause 27 hereof, but so that the Company shall not be obliged to rehabilitate a part of the lease area until it has fully exercised its rights under this Agreement in respect of that part".

The Australian and New Zealand Minerals and Energy Council, the Minerals Council of Australia and the Chamber of Minerals and Energy in Western Australia have developed guidelines for mine decommissioning and mine closure.

Environment Australia has produced a series of 'Best Practice Environmental Management in Mining' documents, first in booklets now only available electronically. In July 2002 the proposed Mine Decommissioning principals were developed.

The Australian Minerals Industry launched a Code for Environmental Management in 2000 to which Alcoa World Alumina Australia is a signatory. Within this Code, the signatories commit to "Planning for closure in the feasibility and design phases of a project and regularly reviewing plans to consider changes in site conditions, technology, and community expectations" and "Ensuring resources are adequate to implement the environmental plans during operations and closure".

All these guidelines were utilised when developing this plan.



1.6 Alcoa Standard and Guidelines

Alcoa's own internal document, Bauxite Mine Rehabilitation Standards and Guidelines, that was developed by the Alcoa Environmental Group in Pittsburgh states "Areas used for mining must be restored to a land use that is socially and ecologically sustainable". Under Section 6 Decommissioning and Divestiture, the following standards are relevant to the Anglesea site mine and will be implemented.

- When mining is completed, facilities and equipment must be removed from the site unless some of the infrastructure is of use to landowners or the public. These may be left upon approval from the landowner and/or regulatory authority.
- Where natural ecosystems have been restored, stability and acceptable regenerative capacity should be demonstrated before responsibility ceases.
- All rehabilitated lands must be monitored for achievement of the established completion criteria.
- Until such time as completion criteria can be met, adequate resources must be allocated for effective maintenance of rehabilitated land.
- Where Alcoa remains in control of the land, planning and provision must be made for the effective management of the land.
- If the land is under a mineral lease or concession and not freehold, divestiture should coincide with attainment of completion criteria and, where applicable, recovery of bonds.
- If the company plans to transfer land to private ownership or to a state authority, agreement should be reached on the future use and management of the land.
- Where restoration of natural habitat is the intended land use, an agreed management plan may need to be developed to ensure continued sympathetic management towards the rehabilitation objective.

1.7 References

- [D0073707 Land Management Plan](#)
- [D0075635 Anglesea Heath Management Plan](#)
- [ANZMEC Strategic Framework for Mine Closure](#)
- [MCA Mine Closure Policy](#)
- [Mine Closure Guideline for Minerals Operations in Western Australia](#)
- [Australian Minerals Industry Code for Environmental Management](#)
- [EPA Best Practice Environmental Management in Mining: Mine Decommissioning](#)
- [Alcoa Environment Standard: Bauxite Mine Rehabilitation](#)



2 STAKEHOLDER INVOLVEMENT

The benefits of a successful stakeholder consultation process include:

- Improved planning decisions,
- Better motivated staff,
- Improved relationships with government,
- Better acceptance of closure decisions,
- Enhanced public image and reputation, and
- Improved community receptiveness to future mining proposals.

2.1 Closure Plan Review

The site closure plan is an evolving process. The document and associated action plans shall be reviewed at least annually and updated. The review should incorporate representatives of all appropriate business functions.

The following attendees shall be considered:

- Location Manager
- Power Station, Mine and Maintenance Managers
- EHS Professional(s)
- HR Professional(s)
- Finance Professional(s)
- Community Relations Professional(s)
- Mine Planner(s)

As the planned closure date approaches, the closure plan shall become more detailed, with more specific actions and plans.

2.2 Community Communication and Consultation

Identification of stakeholders and other interested parties is an important part of the closure process.

At the earliest practicable time, Alcoa shall communicate their intent to close the operation to the local community. The details of these communications may depend on the timeframe until expected closure.

The traditional owners of the land (Wathaurong) shall initially be consulted separately to determine their willingness to participate in a group consultative process. An alternative means by consulting with traditional owners may be considered.

The scope of consultation will need to be defined with the community.

Adequate resourcing shall be provided to ensure the effectiveness of the consultation process.

Action Required	Timeframe	SPA
Determine stakeholders for Community Consultation process.	TBD	Public Relations



2.3 Employee Communication and Consultation

Employees potentially facing job loss have an obvious and immediate stake in mine closure.

Employees should be engaged at the earliest possible convenience. More detail is included in Section 6.1.



3 RISK ASSESSMENT

The closure planning process must involve identification of the full range of risks and potential outcomes associated with the closure of the operation in order to control or minimise any negative environment, health and safety, community, financial or other impacts.

A method for determining, ranking and documenting these risks must be established.

Potential closures risks may include, but are not limited to:

- Environmental or safety issues that impact on Alcoa's reputation,
- Environmental or safety issues that raise legal implications for Alcoa,
- Community reaction to activities,
- Market or other conditions or changes impacting the valuation basis of original decisions,
- Legislative outcomes that differ from expectations,
- Changes in legislation,
- Inappropriate remediation,
- Third party actions,
- Under-provisioning,
- Liability from disposal of assets,
- Increased project cost and delayed completion.

Existing legacies and risks from any future activities must be considered.

Action Required	Timeframe	SPA
Conduct and document risk assessment. Prioritise risks and determine cost of mitigation.	TBD	TBD



4 CLOSURE CRITERIA

A closure or completion criteria is necessary, so as to ensure that Alcoa and regulatory standards, plus any criteria agreed to during community consultation processes are met before any transfer of land occurs.

Different closure criteria are required for land leased under the *Mines (Aluminium Agreement) Act 1961* and the freehold land owned by Alcoa:

Action Required	Timeframe	SPA
Develop Closure Criteria.	TBD	Mining



Alcoa Anglesea Site Closure Plan

5 CLOSURE COSTS

All liabilities to the business must be understood and adequately provisioned. This includes the current cost of closure and decommissioning (in the event of unexpected closure) and the estimated cost at the expected closure date.

It is essential that the cost of closure be estimated as early as possible. Closure costs will, by necessity, be indicative only, but can be based on broad industry experience.

The closure cost estimate should include costs for final closure activities, as well as for environmental monitoring and longer-term site management.

These costs should be reviewed regularly to adjust for inflation and closure work requirements, and undergo thorough re-assessment on a regular basis to account for changing community standards and expectations. Return on sale of assets or salvage value are difficult to predict and should not be used to offset the cost of closure.

Accepted accounting standards should be the basis for the financial provision.

Action Required	Timeframe	SPA
Determine cost for closure and decommissioning (for unexpected and scheduled closure)	TBD	Finance
Ensure adequate financial provisions are available and document Alcoa's preferred method of accounting for financial provisions for closure.	TBD	Finance



6 CLOSURE ACTION PLAN

6.1 Human Resources and Responsibilities

The health, safety and well-being of our employees are the most important part of our business, but employees can often be the forgotten aspect as an operation enters the closure phase of its operation. The concept of closure can be a traumatic time for employees at all levels of the business.

“Effective Separation” training for management shall be considered in order to provide some of the skills and background required when dealing with employees during closure.

An employee “Code of Conduct” or “Statement of Commitment” should also be considered. This should compliment Alcoa’s existing Values and ensure that all employees maintain the ethical and safe behaviour during closure.

Alcoa will provide the required support to employees prior to the closure of the operation to minimise the trauma that may be experienced. This may include providing information early on redundancy payments, provision of services such as financial planners, career counsellors, superannuation and investment information, chaplaincy or other employee assistance programs. It also needs to be recognised the impact of closure may have on the families of employees.

Where employees are to be relocated to other Alcoa businesses, every attempt will be made to provide employment in comparable positions. For those employees that are unable to be relocated to other Alcoa sites, professional assistance shall be considered help with alternative employment opportunities.

Alcoa shall determine if the employees at the time of closure have the appropriate skills to contribute to the closure process. The appropriate number of Alcoa and contract labour employees to undertake closure activities safely will need to be determined. Employees require clear communication and feedback on their role during closure, as it most likely is a deviation from the work performed during location operation. Appropriate training is required for employees, whose tasks differ from that during normal operation.

Communication with employees and/or union representatives is essential during the closure planning and decommissioning phases.

Action Required	Timeframe	SPA
Develop a people plan to address employee issues during closure.	TBD	Human Resources

6.2 Progressive Rehabilitation

6.2.1 Current Alcoa Mine Rehabilitation

The current rehabilitation objective for the Anglesea site is to establish a diverse, self-sustaining heathy woodland ecosystem that maintains or enhances the surrounding land use such as conservation, recreation and other natural values. The method as outlined in the Land Management Plan provides the principle strategy of mine rehabilitation at Alcoa Anglesea. However, at the anticipated closure of Anglesea, there will be approximately 200-300 ha of area open. This includes the final open-cut void, haul roads, Power Station and other infrastructure areas. An alternative strategy may be required for these particular circumstances where, for example, there is an absence of topsoil for direct return, the slope is too steep to hold topsoil placement or the slope will be inundated with water. Rehabilitation then may employ the placement of subsoil as a growth medium, the application of a seed mix and/or hydro mulch with supplementary planting of tube stock. Irrespective, of the method employed, all strategies will strive to utilise indigenous species and provide habitat functionality contiguous with the surrounding heathy woodland.

Alcoa Anglesea Site Closure Plan

6.2.2 Roche's Mine Rehabilitation

Exploration for brown coal began in the late 1950's to supplement dwindling brown coal reserves from mines in the Region.

Results of exploratory drilling by the then Mines Department, Roche Brothers and Western Mining Corporation indicated a large economically-viable coal deposit immediately to the north of Anglesea. Roche Brothers commenced open cut mining operations with two small pits at the western end of this deposit in 1959. Later control of the deposit passed to Western Mining Corporation (an associate of Alcoa of Australia Ltd) and in 1961 Alcoa was granted a long-term lease over the deposit.

As drilling information at the time was largely incomplete, the Roche Brothers open cut was established on the western out-cropping of the lower seam instead of the thicker main seam. That lower seam coal reserve was difficult to mine when Alcoa commenced open cut mining operations in the 1960's and output from the Roche Brothers open cut had dwindled from 169,000 tonnes in 1959 to 14,300 tonnes in 1968.

With mining finishing in the Roche Brothers mine, the rehabilitation of the area began in 1979. Roche Brothers No.1 pit was backfilled with overburden from the western end of Alcoa's open cut from 1979 to 1982 (Plate 1a). The area was progressively covered with topsoil, landscaped and ripped and supplementary planted with a variety of trees and shrubs. Roche Brothers No.2 pit was filled with ash from the Power Station ash ponds in 1979, 1983 and 1987 (Plate 1b). In 1996 a stockpile of topsoil was relocated to the No.2 pit to cap the ash and the area was left to naturally regenerate from seed contained within the topsoil (Plate 1c &d).

Plate 1: Roche Brothers Mine

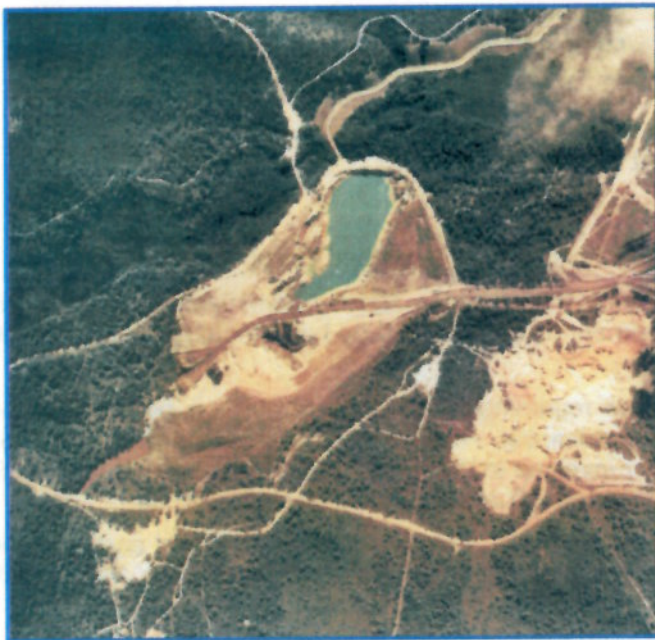


Plate 1a: In 1981, No.1 pit has been backfilled with overburden, No.2 pit remained open (and full of water).



Plate 1b: In 1993, No.1 pit has been rehabilitated and has good vegetation cover, backfilling with ash is visible in No.2 pit.

Plate 1: Roche Brothers Mine



Plate 1c: In 1998, the landscaping portion of the rehabilitation is completed on No.2 pit with a layer of topsoil and contour ripping



Plate 1d: 2004, vegetation cover for No.2 pit is satisfactory, however, it remains distinctly different compared with the surrounding vegetation.

6.3 Land Use and Landform Establishment

6.3.1 Future Land Uses

At the time of preparation of this document, future land uses can only be described as conceptual.

It is understood that the land leased to Alcoa under the provisions of the *Mines (Aluminium Agreement) Act 1961* will be handed back to the Victorian State Government to be managed by Land Victoria (or equivalent) within the Department of Sustainability and Environment.

Whilst it is emphasised that no decisions have been made regarding future land use, there is potential for the land at Alcoa Anglesea to be re-used for a variety of commercial, conservation, educational and recreation activities. It is envisaged that Alcoa would not be directly involved in these future land uses beyond facilitating their implementation as an integral part of the decommissioning, rehabilitation and closure process.

Discussions will be conducted by Alcoa representatives with relevant State and local government agencies and other interested parties, prior to finalisation of the decommissioning process, to ensure feasible and sought-after land use opportunities are not lost.

Alcoa Anglesea Site Closure Plan

6.3.2 Final Mine Design

Alcoa has developed a series of potential closure designs out until 2014. Work is currently underway to conceptually develop several closure strategies and designs for 2030.

The 2014 closure plan generally depicts all high batters being completely filled and redeveloped into rehabilitated slopes that feed down to a void and valley system that disguises the extraction of 50 million tonnes of coal.

Alcoa has previously engaged BFP Consultants to provide a visual indication of what closure might look like. A potential option for closure is to convert the mining void into a lake, which provides an environmental flow to the Anglesea River. It is expected that the 2030 mine closure plan will incorporate most of the aspects developed in the 2014 plan but with varied lake and slope dimensions.

Some images provided by BFP Consultants are shown below.



BFP Consultants have also developed conceptual 2014 mine closure contours and associated cross sections. This information is provided in the supporting documentation.

6.4 Hydrogeological Assessment

The 2014 plan depicts Salt Creek being diverted back into the lake system and then decanted off through a valley system and back into join Marshy Creek before becoming the Anglesea River.

The 2030 plan will have similar features as above but lake dimensions and location will change.

Other mines are believed to have used a similar scenario for their closure strategies and any similar examples will be researched to extract all relevant learnings for Alcoa Anglesea. Further hydrogeological work is required to better understand slope stability underwater but in particular, lake and river chemistry will need to be fully explored to ensure the integrity of the Anglesea River is not jeopardised. Current knowledge suggests flooding of the final lake system by diverting Salt Creek in time of flood rather than allowing the void the fill though natural groundwater intrusion. The mechanism and legal permitting of this will need to be fully explored.

Alcoa has sponsored a PhD study that will investigate the potential for creating a healthy lake at closure. The study is being undertaken by Tim Tutt through Deakin University is being supervised by Associate Professor John Sherwood (Deakin University School of Ecology and Environment) and Barry Knight (Alcoa). The study is entitled "Monitoring and Modelling Hydrogeochemical Interactions with Groundwater: Implications for Mine Dewatering on Groundwater, River and Lake Chemistry". Field trials have begun at the nearby former Wensleydale mine pit and involve the addition of different materials to raise the pH of acid mine water. Bench top trials thus far have been promising. The work is due for completion at the end of 2006.



6.5 Revegetation

Much of the 2014 and the 2030 closure plan area will be completed using rehabilitation methods as described elsewhere in this plan under Progressive Rehabilitation.

The remaining area requiring special revegetation strategies will be the wetland areas adjacent to the final lake and creek systems.

Additional work is required to develop wetland establishment strategies and an understanding of the natural wetland systems within the Anglesea region. Early research suggests that the wetland species should be well established prior to flooding of the mine and hence strategies will need to be focussed on keeping those species moist whilst establishing prior to being inundated.

6.6 Decommissioning

6.6.1 Dismantling and removal of Infrastructure

All infrastructure at Alcoa Anglesea will remain until a decision is made regarding its final use. Although Alcoa is keen to see the facilities at the mine reused this plan will cover the removal of all infrastructure as it is yet unknown which facilities, if any, will remain.

All infrastructure that can be reused will be first offered to other Alcoa sites, any remaining structures will then be put up for sale. Those items not sold will be demolished by a reputable demolition/salvage firm who will be employed as per Alcoa’s Contractor Manual. All salvageable materials that can be reused or recycled will be recovered; the remainder will be bulldozed and transported to an approved landfill facility. Consideration will be given to placing concrete and bitumen, which are inert materials, in the mine for burial. For more specific information on the management of waste materials see Sections 6.7 and 6.8.

An Environmental, Health and Safety Inspection will be undertaken for each item of infrastructure prior to any dismantling or demolition to ensure that all areas of risk are identified and managed.

Where possible, all dismantling and demolition work undertaken on site will be in compliance with the Australian Standard 2601 - 2001 “Demolition of Structures”. Under this standard a documented work plan must be developed detailing how the dismantling or demolition work will be undertaken.

For all infrastructure areas dismantled or demolished the following will apply:

- All infrastructure is to be removed down to bare earth to allow for rehabilitation, unless approval has been given for a structure to remain for a specific purpose.
- Underground services and pipes will be removed where possible.
- Power and water to all services will be isolated prior to commencing any dismantling or demolition activities.
- All material that can be reused or recycled will be salvaged where possible.

Given that Alcoa Anglesea was constructed at a time where asbestos was an accepted product, consideration is required into which areas of plant are “asbestos free” and which need to be dismantled by licenced asbestos removal contractors.

Action Required	Timeframe	SPA
Identify infrastructure determined to be asbestos free.	TBD	TBD
Develop management strategy for infrastructure determined to potentially contain asbestos.	TBD	TBD
Develop draft scope for the dismantling of facilities and infrastructure	TBD	TBD

6.6.2 Office and Amenities Buildings

All buildings on site will be assessed before being dismantled or demolished to ensure salvageable materials are recovered and any hazardous materials are identified. The aim is to try to minimise the amount of building material that is disposed as land fill. Any demountable buildings will probably be offered for sale or alternative use elsewhere.

6.6.3 Workshops

The workshop buildings are steel-framed structures clad in either aluminium or steel sheeting. All salvageable items such as tanks, cranes etc. will be offered to the other sites or put up for auction. Any items or materials not sold will be offered to a scrap metal recycler for removal. Remaining structures (brick walls, concrete foundations, slabs, etc.) will where possible, be offered to a recycling company for reuse. Any unwanted material will be broken up to form rubble and buried as per the guidelines in Sections 6.7 and 6.8.

Due to the use of oils and fuels within the workshops and aprons this area will be investigated for contamination, once the buildings and aprons have been removed, as outlined in Sections 6.7 and 6.8.

6.6.4 Fuel Bays

The fuel bays and aprons will be treated in the same way as the workshop area. There is the potential for some hydrocarbon contamination in these areas. The extent of any contamination and the remedial program to be put in place will be determined using the procedure described in Sections 6.7 and 6.8.

6.6.5 Above ground Storage Tanks

There are a number of bulk tanks on site for the storage of diesel, oils, acids, bases and other chemicals. All unused drums can be returned to the supplier and used drums are sent to a recycling facility. The site has a licence to store dangerous goods from the Worksafe Victoria this will be reviewed two-yearly to ensure it is kept up to date and will only be relinquished when the volume of dangerous goods falls below the license limit.

Where possible, tanks will be re-used by Alcoa or another party. Before removal from site they will be emptied, purged and if necessary reduced in size for transportation. Purging is carried out by specialist tank cleaning companies.

After purging, the tank will be tested to ensure it is totally inert and safe to weld or oxy-cut. All contractors who undertake tank cleaning on site will be trained in Alcoa's confined space policy and procedures.

Once purged, tanks are free to be relocated and re-used or sold as scrap metal if no other use can be found.

6.6.6 Underground Storage Tanks

There are no underground storage tanks remaining on site at Anglesea.

There are currently two underground sumps (employee's car park and near air compressors). Monitoring conducted by IT Environmental has shown some level of hydrocarbon contamination from the sump in the employee car park

A previously removed underground diesel tank also shows some sign of residual hydrocarbon contamination.

These areas will be investigated and remediated as discussed in Sections 6.7 and 6.8.

6.6.7 Haul Roads and tracks

A network of major and minor tracks required for effective land and fire management, exists for the management of the Anglesea Heath and surrounding public land. In some instances existing mining haul roads may form part of this network. Existing roads that do not form part of this network will be rehabilitated.

6.6.8 Stream Crossings

There is one haul road stream crossing and one light vehicle bridge within the current working area. The future of these crossings is dependant on the closure strategy engaged regarding haul roads and tracks. If the crossings are to be removed, the original stream will be rehabilitated with attention paid to stream width, type of flow, streambed structure and vegetation type.

Alcoa Anglesea Site Closure Plan

6.6.9 Salt Creek Diversion Channel.

Once the final void and alternative Salt Creek route is established as part of the closure process, the Salt Creek diversion channel will be filled with the embankment material that was established during the original construction and the area rehabilitated as for the other open land areas.

6.6.10 Electricity

If the site is to be fully rehabilitated, critical equipment such as the water distribution system, waste water and sewage treatment plants will be fully decommissioned prior to the electrical power being disconnected. The entire electrical distribution system (both aerial and subterranean) will be then removed from site.

6.6.11 References

- [Alcoa Environment Standard: Aboveground storage tanks](#)
- [Alcoa Environment Standard: Underground storage tanks](#)
- [D0027851 APS Policy: Safe working in Confined and Restricted Spaces](#)
- [D0073707 Land Management Plan](#)

6.7 Management of Hazardous Materials

To ensure that all hazardous materials are identified before the dismantling or demolition of any infrastructure an Environmental, Health and Safety inspection for each item will be undertaken by EHS professionals. It is Alcoa's responsibility to ensure that all personnel or contractors involved in the dismantling or demolition of any infrastructure containing hazardous materials are aware of these hazards and have been trained in the Alcoa standards and procedures for the removal and disposal of these materials.

Alcoa will abide by all statutory requirements for the handling and disposal of all hazardous materials and will take into account published Government recommendations and guidelines.

6.7.1 Asbestos

During construction of the Power Station in the 1960's, Alcoa utilised asbestos throughout the plant for lagging of pipe work and insulation of the boiler and gas ducting. Over a number of years Alcoa has undertaken removal of asbestos containing materials. As a replacement material, synthetic mineral fibres, principally rock wool, has been used (see later section on Synthetic Mineral Fibres).

This landfill was established in the mid 1980's and asbestos containing waste including pipe lagging, insulating materials and asbestos contaminated waste has been deposited in this facility.

In 1992 Alcoa was granted an EPA licence for disposal of asbestos to land in a small landfill site situation on a portion of crown land and freehold land owned by Alcoa south west of the ash ponds (see Appendix 3). This area has predominantly low permeability mine over burden, which was previously dumped and landscaped at the time the coal mine was opened for production.

The EPA Licence No. EM32162 dated, September 21, 2000 provides conditions for disposal which cover all required management issues including disposal arrangements, licence condition awareness by Power Station personnel, fencing, gates and site security, signage, site maintenance and rehabilitation following cessation of asbestos removal.

Prior to the application of the Licence Alcoa commissioned Mackin Martin and Associates to conduct a detailed site analysis to determine the local soil profile and permeability, local geology, prevailing groundwater table, groundwater quality and water balance.



It is expected that Alcoa will continue to use the asbestos disposal site for as long as asbestos removal continues at the Power Station. During this period, the disposal site will be managed in accordance with the applicable EPA licence conditions. The portion of the asbestos pit located on crown land will be excised from the lease and transferred to Alcoa freehold. At completion of asbestos removal from the Power Station, the site will be landscaped and vegetated according to the rehabilitation standard described in later in this plan. The location of the disposal site will be recorded on the title documents so that future landowners of the property will be aware of the presence of asbestos. A record of asbestos containing waste is made whenever the site is used and a drawing of the site is regularly updated to show disposal location.

6.7.2 Ash Ponds

Anglesea coal contains on average about 3 to 6 percent ash. A portion of this ash is collected in the furnace bottom hopper while the greater portion, the flyash, is entrained in the flue gases. The electrostatic precipitator collects the flyash from the gas stream prior to atmospheric dispersal of the gases via the stack. The ash from the furnace is sluiced away by water from the ash tank and the flyash is removed by a pneumatic system. The combined load of furnace ash and flyash is transported by means of water sluicers through piping to the #1 Ashpond. Bottom hopper waste from the clinker grinder is sent to the clinker recovery pit where the clinker is retained. It's removed periodically to be used as road base. Water from this pit flows into the stormwater ponds.

Ash from the ash collection system and iron oxide waste from the water treatment plant settle out in the channels of #1 ashpond. The inorganic constituents of the coal ash are combinations of the following elements: Aluminium, Iron, Calcium, Magnesium, Sodium, Potassium, Silicon and Sulphur. There is at times a small amount of unburnt fuel with the ash.

Since the commencement of operations coal ash has been disposed of in the ash ponds. About every 8-12 weeks a portion of the ash pond cells are dredged and the ash is sent as back-fill to the mine. About 20,000 to 30,000 tonnes of ash is produced each year. The status of leached coal ash has been changed from a prescribed waste to a material suitable for agricultural and horticultural uses.

The area where ash is disposed will be covered with overburden and topsoil and rehabilitated as per the rehabilitation standard described later in this plan.

6.7.3 Sewerage Treatment Plant & Ponds

The wastewater and sewage stream, including cleaning products used in the maintenance of all the amenities at the Power Plant, are pumped to the sewage lagoons via the ejector station. The sewage from the mine area is piped to a septic tank adjacent to the Mine buildings.

The holding ponds for the untreated waste water will be blocked off after all sources of hydrocarbons have been removed from the site. The sludge remaining at the bottom of the pond will be sucked out and disposed at an EPA approved liquid waste facility.

All pipes to the discharge ponds will be blocked before the ponds are decommissioned. Once the ponds have been emptied of the treated water, which is within the current EPA licence limits, the walkways, pipes and pumps will be decommissioned.

Once the infrastructure has been removed a sampling program will be undertaken to test for contamination under the treatment ponds, within the drains to and from the discharge ponds, under the holding and discharge ponds and at the discharge infiltration area.

6.7.4 Land farm

Soil placed in the land farm from contaminated sites is rehabilitated and is then available to be used for clean fill. The land farm is utilised for the remediation of contaminated soil from any spilled hydrocarbons from sources such as burst mobile equipment hoses or fuel oil unloading facilities. It is envisaged that any soils contained within the land farm at closure will continue to be remediated and tested prior to being returned to the mine as clean fill.

Alcoa Anglesea Site Closure Plan

6.7.5 Polychlorinated Biphenyls

Alcoa historically used PCBs in many hydraulic and electrical systems. This widespread use, which included extensive recycling and reuse into other systems, has resulted in contamination of equipment, and dry electrical equipment such as ballasts and dry transformers. Since PCBs are persistent and bioaccumulative, special care is required to evaluate the level of contamination and remediate it appropriately. This standard establishes requirements for monitoring and reporting on PCBs in use, identifying areas of contamination, managing PCB waste materials, appropriate impervious clothing for employees and contractors directly exposed to PCBs above 50 ppm, communicating on potential impacts on reproductive and developmental functions to women of child bearing age who may be potentially exposed, and for utilizing blood tests rather than "wipe tests" when employee exposure assessments are conducted.

PCB contaminated materials will be treated as per the Pt Henry and Anglesea PCB Management Plan.

6.7.6 Synthetic Mineral Fibres

Failure to manage Refractory Ceramic Fibres (RCF), as with asbestos, can result in the uncontrolled release of airborne fibres, non-compliance with Alcoa internal standards and future litigation. Alcoa's internal standard for RCF mirrors many of the policy and procedures in place for asbestos. This document describes the Industrial Hygiene, Medical and Environmental controls required when handling RCF so as to limit employee exposure.

6.7.7 Lead Paint

Lead is a solid metal at room temperature and is a basic chemical element. It can combine with various other substances to form numerous lead compounds, such as lead pigments, solders, etc. The greatest occupational and environmental risk at Alcoa Anglesea is removal of lead containing paints during demolition, construction or modernization. Lead pigments become very hazardous when the coating is disturbed by methods such as welding, cutting, grinding, or abrasive blasting.

Alcoa's Lead Hazard Control Standard outlines the health and environmental measures Alcoa employees and outside contractors must follow when removing lead containing materials such as paint coatings. A companion document, Alcoa's Specification for Lead Hazard Control, is intended as a contract specification which outlines requirements imposed on the outside contractors (or Alcoa Employee) performing the work. Alcoa's Lead Hazard Control Checklist assists in tracking the requirements and status of the lead abatement project.

6.7.8 References

- [Alcoa Environmental Standard: Asbestos](#)
- [Alcoa Health Standard: Asbestos](#)
- [Anglesea Power Station Asbestos Management Program](#)
- [Anglesea Power Station Asbestos Landfill Register](#)
- [D0042592 EPA Licence EM32162](#)
- [EPA The Transport and Disposal of Waste Asbestos](#)
- [D0066496 Water Management Manual](#)
- [D0066483 Diagram of Ash pond system](#)
- [D0066090 Effluent Pollutant Survey – Analytical Results](#)
- [D0064369 Management of the Sewerage System](#)
- [D0066489 Diagram of Sewerage Treatment Plant](#)
- [Monthly Sewerage Check Sheet](#)
- [ANZECC PCB Management Plan](#)
- [Alcoa Environmental Standard: PCB](#)
- [Alcoa Health Standard: PCB](#)
- [Alcoa Environmental Standard: Refractory Ceramic Fibres](#)
- [Alcoa Health Standard: Refractory Ceramic Fibres](#)

Alcoa Anglesea Site Closure Plan

- [Alcoa Environmental Standard: Lead](#)
- [Alcoa Health Standard: Lead](#)

6.8 Management of Waste Materials

The current waste management program will be maintained during the closure period. Due to the health and environmental issues associated with the disposal of putrescible and hazardous waste these waste will be disposed offsite at an approved landfill or liquid waste facility.

A recycling program is in place at Anglesea for steel, timber products, waste oil, drums, batteries, chemical containers, cardboard, paper, aluminium and steel cans, plastics and air and oil filters. Waste segregation commences in the mine, with recyclables and wastes being put in separate bins. A waste recording system has been developed to record the type and volume of waste leaving the mine to be disposed or recycled. These figures are reported. A waste inventory is also maintained detailing the current disposal or recycling practices and volumes.

During the decommissioning of infrastructure extra bins will be bought on site to handle the increased waste volume. Bins will be available for recycled products such as steel and other metals and contractors will be educated to ensure these products are recycled rather than go to landfill. Below is a description of how the major waste items generated from the dismantling or demolition of infrastructure will be handled.

6.8.1 Concrete

If approval is granted from the Victorian EPA and local community, concrete will be buried, as per the following guidelines:

- Only clean concrete will be buried. Hydrocarbon contaminated concrete will be removed from site and disposed of appropriately.
- Concrete will be broken into pieces of a size no greater than 15 cubic metres with a maximum dimension in any one direction no greater than 3 metres. The objective is that 70% of the concrete pieces will be less than 2 cubic metres.
- A number of disposal sites will be selected ensuring that the concrete can be buried with sufficient soil to allow aesthetic blending of the site into the surrounding landscape. No site will receive more than 1000m³ of concrete.
- Buried concrete will have a minimum of 2 metres of fill placed over it.
- A register of concrete burial sites will be maintained on Alcoa's Geographic Information System (GIS) detailing the location, quantity and type of material buried. These records will be made available to DSE and WRC.

6.8.2 Bitumen

Bitumen areas on the mine comprise workers' carparks, workshop aprons, stores compounds, access and interconnecting roads. Bitumen can be reused as bulk fill for road works and the feasibility of this will be investigated. If reuse of the bitumen is not practical the material will be buried on-site, subject to the same approvals applicable to concrete burial.

6.8.3 Scrap Metal

All scrap metal including structural steel, metal framing and roofing, flashing, guard rails, pipes and electrical cabling will be collected and recycled by a metal recycler.

6.8.4 Demolition Waste

The intent of the demolition process will be to source markets for all reusable or recyclable materials. Those materials for which a market does not exist will be removed and disposed of to an approved landfill facility.

Alcoa Anglesea Site Closure Plan

6.9 Investigation of Contaminated Areas

The National Environment Protection Council (NEPC) has developed a National Environment Protection Measure 1999 for the assessment of contaminated sites. The NEPM contains guidelines for contaminated soil and groundwater. The NEPC Measure has been adopted by each State with the NEPC Committee membership comprised of Ministers from each State (not necessarily environment Ministers) chaired by a Federal Minister.

To ensure that all areas of contamination are identified and remediated a site specific plan will be developed taking into account potential health and environmental impacts and future land use strategies. The plan will be based on the NEPM guidelines and will address the following:

- Investigation: – to determine the nature and extent of contamination.
- Assessment – evaluate the risks presented to human health or the environment using the NEPM guidelines.
- Strategies – develop a strategy to remove or remediate the contamination. There will be a number of feasible strategies, however, the preferred option needs to be effective, use resources efficiently, be acceptable to stakeholders and minimises ongoing liability and management requirements.
- Action Plan – detailed plan of how the work will be conducted and the validation procedures to be employed to demonstrate that the remediation is successful. Disposal of waste soils will be undertaken in accordance with the EPA regulations.
- Consultation – discussion with stakeholders such as the EPA and DPI, regarding the appropriateness of the action plan.
- Implementation – overseeing work and ensuring sampling undertaken as per guidelines.
- Validation – sampling is conducted by an independent consultant to demonstrate that contamination has been effectively removed or reduced to acceptable levels.
- Closure – obtaining written confirmation from the regulators that the contamination has been effectively remediated and no further requirements need to be met.

6.9.1 References

- [Schedule A: Assessment of Site Contamination NEPM 1999](#)
- [Schedule B: Guideline on the Investigation Levels for Soil and Groundwater](#)
- [Schedule B: Guideline on Data Collection, Sample Design and Reporting](#)
- [Schedule B: Guideline on Laboratory Analysis of Potentially Contaminated Soils](#)
- [Schedule B: Guideline on Health Risk Assessment Methodology](#)
- [Schedule B: Guideline on Ecological Risk Assessment](#)
- [Schedule B: Guideline on Risk Based Assessment of Groundwater Contamination](#)
- [Schedule B: Guideline on Health-based Investigation Levels](#)
- [Schedule B: Guideline on Exposure Scenarios and Exposure Settings](#)
- [Schedule B: Guideline on Community Consultation and Risk Communication](#)
- [Schedule B: Guideline on Protection of Health and the Environment During the Assessment of Site Contamination](#)
- [Schedule B: Guideline on Competencies and Acceptance of Environmental Auditors and Related Professionals](#)

Alcoa Anglesea Site Closure Plan

6.10 Future Land Management

Once the Closure Criteria has been met, it is envisaged that Alcoa will hand over management of the Anglesea Heath to the Department of Sustainability and Environment. Negotiations with DSE are required to determine the level of support that Alcoa may continue to provide. Alcoa will continue to provide resources to ensure rehabilitation has been successful, and meets the criteria defined in the Closure Criteria. Suitable records of the history of the closed site shall be preserved to facilitate any further future land use planning.

6.11 Unplanned Closure

This closure plan is constructed on the assumption that closure will occur in a planned and coordinated fashion. Unplanned closure occurs when operations suddenly cease due to business or financial constraints (or similar economic imperatives) or if the operations are instructed to close due to non-compliance with regulatory requirements. This scenario would involve the immediate preparation and implementation of a decommissioning plan taking into account the non-operational status of the operation. Planning for this outcome would involve determining the cost of decommissioning if the operation were to close at any point.

6.12 Document Management

6.12.1 Location of Hard Copies

Copy No	Anglesea
1	Environmental Project Officer
2	Mine Manager
3	EOH Consultant
4	Station Chemist
5	Power Station Manager

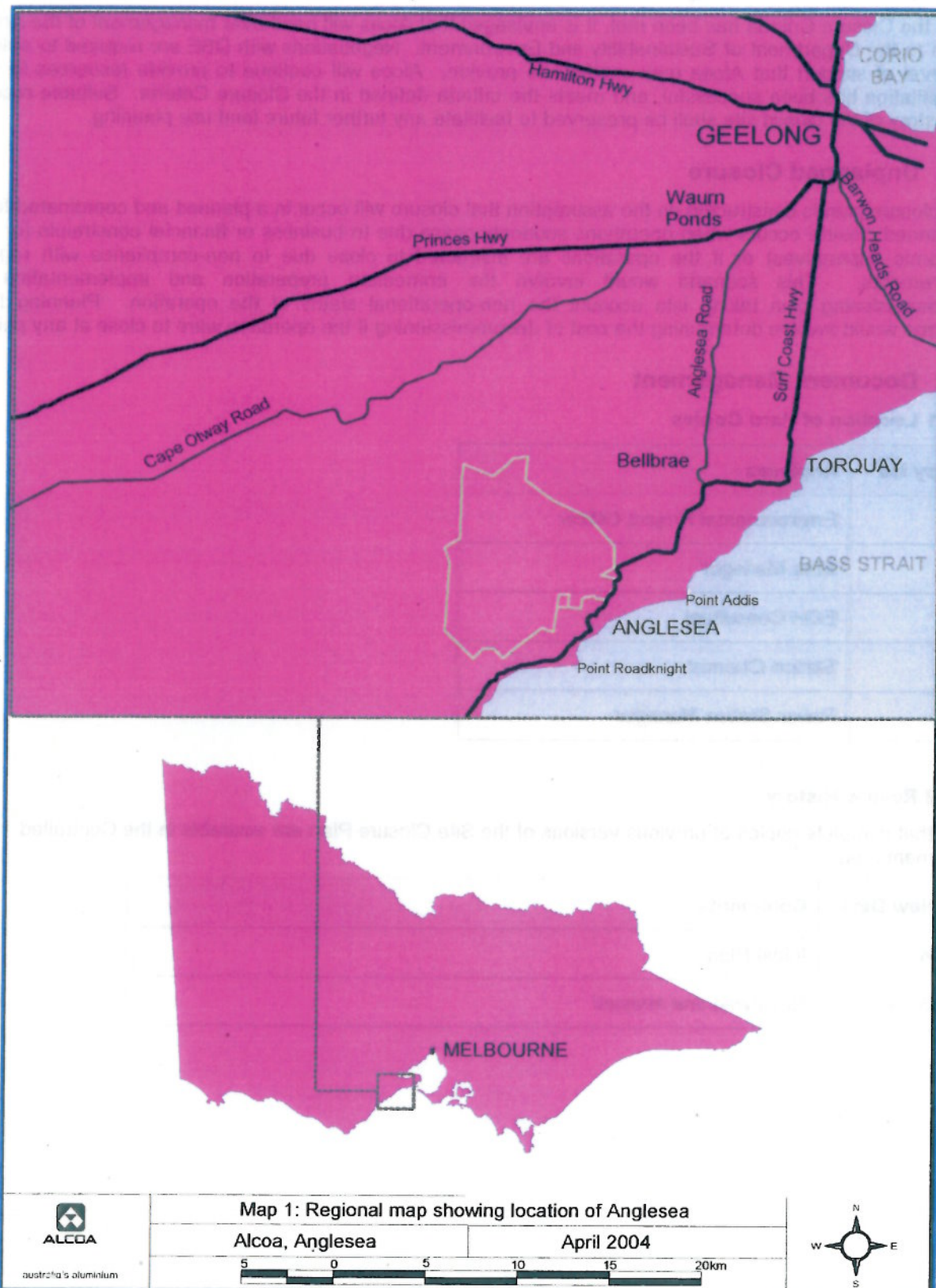
6.12.2 Review History

Note that complete copies of previous versions of the Site Closure Plan are available in the Controlled Document area.

Review Date	Comments
2004	Initial Plan
2005-09	Reviewed and revised

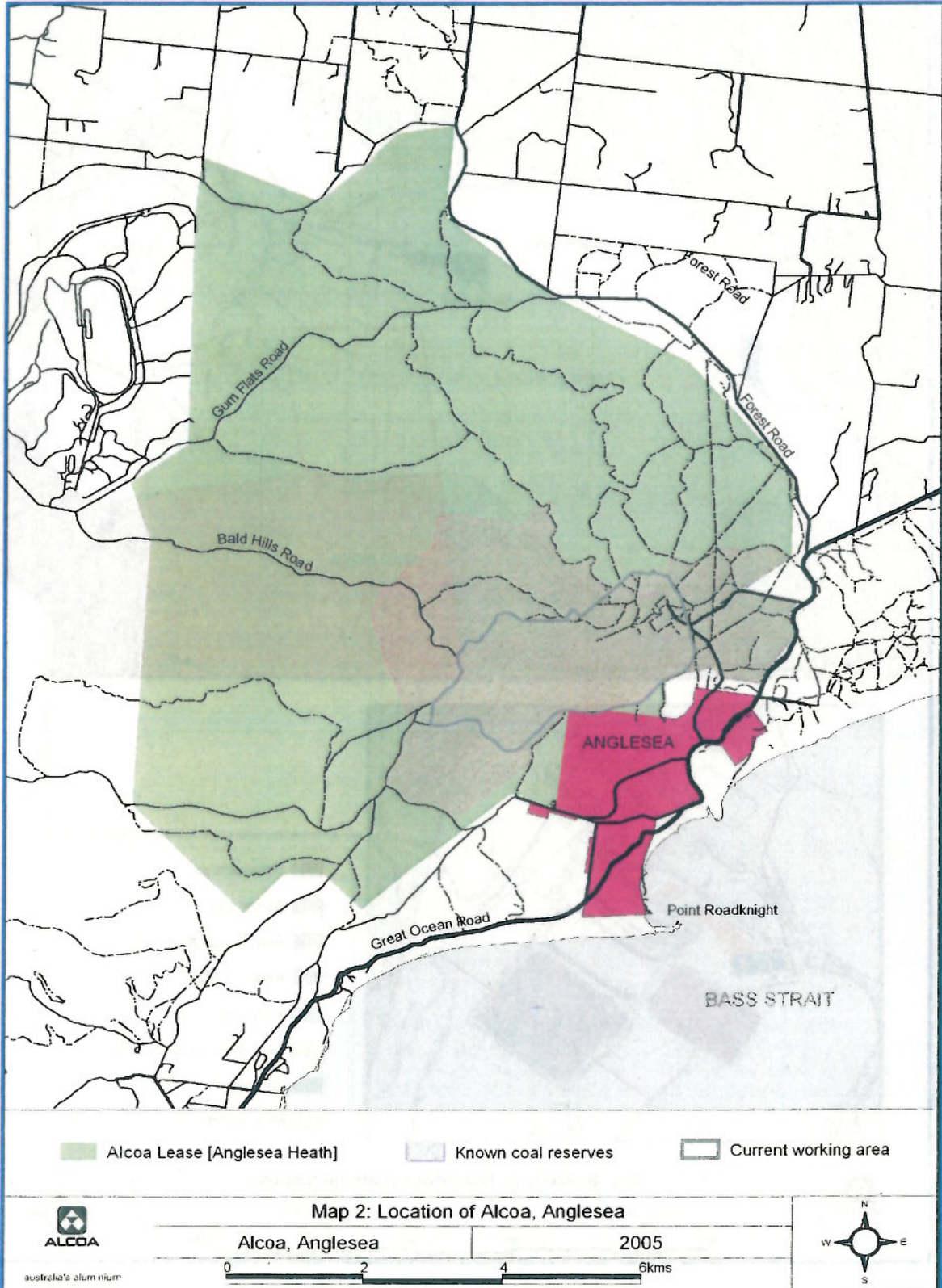


Appendix I: Locality Map





Appendix II: Lease Area



Appendix III: Areas of Hazardous Waste Disposal

