

## **12 APPENDIX A – ENVIRONMENTAL IMPROVEMENT PLAN**

environmental improvement plan  
published 2008



australia's aluminium

anglesea

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You can view the complete set of Alcoa's Environmental Improvement Plans on our website [www.alcoa.com.au/eip](http://www.alcoa.com.au/eip)

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Anglesea power station supplies approximately 40% of the power required by Alcoa's Point Henry aluminium smelter near Geelong.

Cover Photo: The Anglesea power station and coal mine are situated within the Anglesea Heath and adjacent to the Anglesea River.

# alcoa of australia anglesea

This Environment Improvement Plan (EIP) forms part of Alcoa Anglesea's business plan and has been prepared by Alcoa in consultation with employees and members of the Anglesea community.

An EIP is an effective tool for guiding a company's environmental management through a process of continuous improvement. This document is a public commitment to improving environmental performance. It gives an overview of Alcoa Anglesea's operations, the progress made to date and future initiatives planned for environmental improvement. It also talks more broadly about Alcoa's operations to provide a context for our business at Anglesea.

This is the fourth EIP produced by Alcoa Anglesea since 2003. These documents are distributed widely to community, media and government stakeholders. This version will also be made available online on the Alcoa website, which is a new medium for accessing the EIP.

Every Alcoa operation in Australia has an EIP and continues to find the process a valuable tool to measure progress and gather feedback from those interested in our environmental performance.

At Alcoa Anglesea, we have recorded some significant improvements in our environmental performance during the 2006/07 EIP period with a reduction in town water usage of more than 60% since 2000, significant reductions in waste to landfill and greatly improved land rehabilitation techniques.

Like any business, Alcoa Anglesea must consider environmental strategies alongside business sustainability considerations and set clear priorities. Our community consultation processes help us to identify which issues are important to the community and assist with decisions on where Alcoa must focus effort and resources.

As you read through our action plan, you will note that, while we have set new targets in some areas, in others our aim is to maintain efficiencies achieved to date. In these areas, Alcoa Anglesea strives to maintain its performance levels at the best possible rates whilst being active in the search to discover new ways of operating in the expectation of implementing new methods across our business in the future.

An area we have been achieving good results in is our land rehabilitation work following our mining operations. Improved rehabilitation techniques have resulted in significant species return and richness in our rehabilitation areas. Our focus is to continually improve on these good results and the way we document and plan our rehabilitation work.

As a brown coal-fired power station, we maintain our strong commitment to operating as efficiently as possible in order to manage our emission rates. Alcoa Anglesea has continued to focus heavily on the improved management of SO<sub>2</sub> emissions. This work will continue this year and into the future.


Consultation with the community is an integral part of any EIP. I would like to take this opportunity to thank community members and employees at Alcoa Anglesea who have contributed their time and energy to this document.

Alcoa Anglesea actively seeks opportunities to eliminate waste, conserve resources and reduce pollution. We will report regularly on the progress of the environmental improvement action plan in this publication to the community and our employees through the monthly environment report and regular community consultation meetings.

Our focus is to  
continually improve  
on these good  
results and the  
way we document  
and plan our  
rehabilitation work.



Arnaud Soirat  
General Manager  
Victorian Operations

  
Chris Rolland  
Power Station Manager  
Alcoa Anglesea

# external verification

Alcoa Anglesea views the consultation of our local community as an integral step in ensuring sustainable development.

In 2001, a Community Consultation Network (CCN) was formed by Alcoa Anglesea to provide information and a regular forum for any individual or community organisation to raise any concerns they may have in respect to our environmental impact, performance and management, directly with managers or environment team members. This consultative group is made up of local residents, community group representatives, local government, environmental group representatives and the EPA.

The EIP provides a mechanism through which the community is consulted on past and future environmental performance, and provides an opportunity to discuss strategies to address issues. The Alcoa Anglesea CCN provides input into the aims, targets and actions in this EIP document. Importantly, this EIP establishes a benchmark against which the community will assess our future performance.

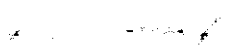
Alcoa Anglesea CCN meetings are held regularly throughout the year. For more information about the EIP or the Alcoa Anglesea CCN contact Dave Ryan in Community Relations on (03) 5263 4249.

## Community Endorsement

As members of the community consultative process we acknowledge our participation in the development of the EIP with representatives from Alcoa Anglesea.



Rose Herben  
Community Consultative  
Partner

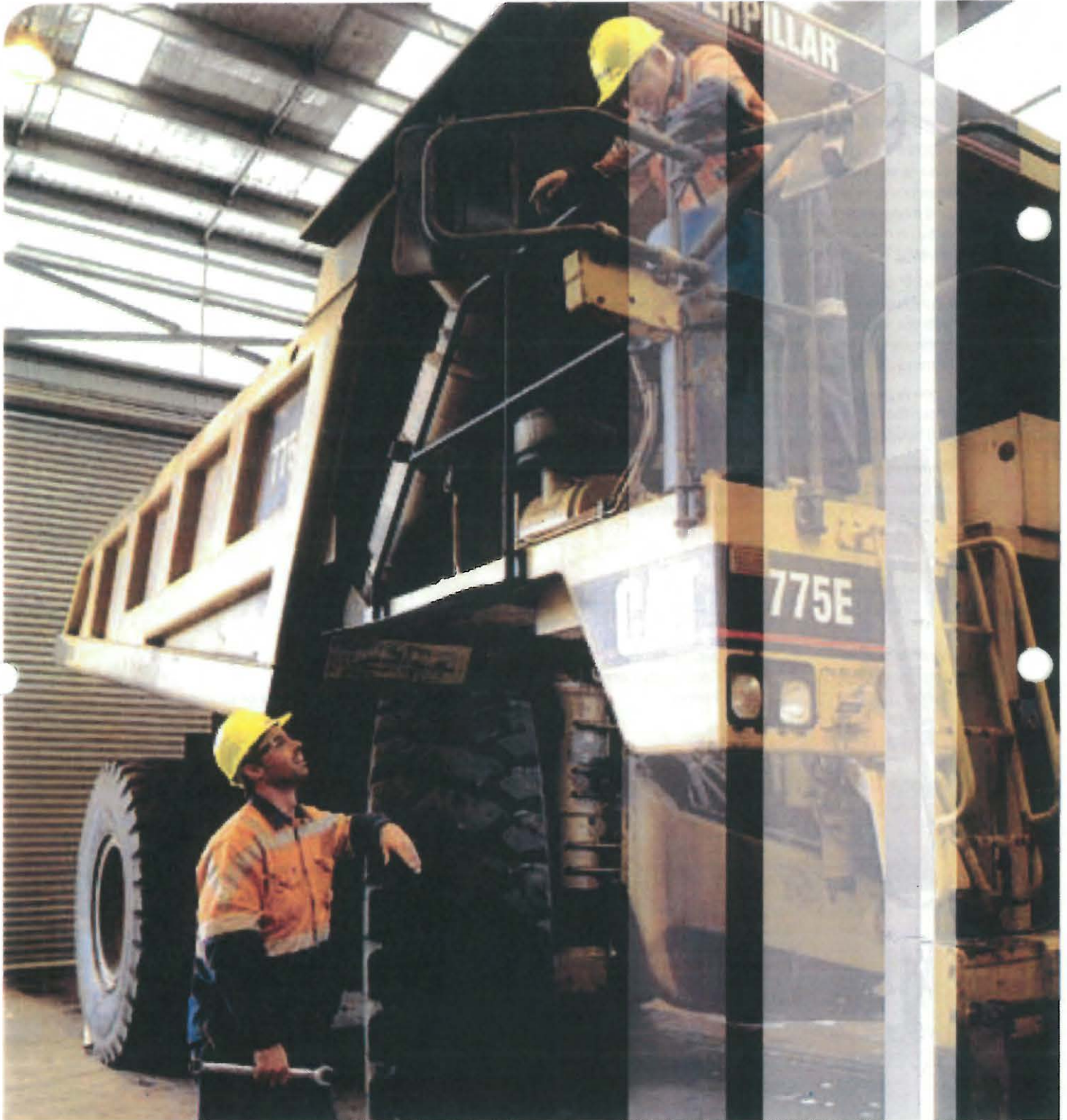


Jim Clements  
Community Consultative  
Partner



Gavan Mathieson  
Manager South West  
Environment Protection Authority of Victoria

# overview of operations



60 tonne trucks deliver brown coal from the open-cut mine to the power station.

## alcoa operations in australia

### principal operations within western australia

**huntly** mine  
**willowdale** mine  
**kwinana** refinery/port  
**pinjarra** refinery  
**wagerup** refinery  
**bunbury** port  
**dampier bunbury** pipeline (20% ownership)

### principal operations within victoria

**portland** smelter  
**anglesea** power station  
**point henry** smelter/rolling mill  
**melbourne** alcoa wheel products  
**oakleigh** alcoa fastening systems

### principal operations within new south wales

**yennora** rolling mill and recycling facility



## Alcoa Anglesea

Alcoa Anglesea Power Station is located on a 7,221 hectare mining lease, known as the Anglesea Heath. The Power Station began operating in 1969 and operates at world class efficiency levels for brown coal-fired power stations. It supplies approximately 40 per cent of the power required by Alcoa's Point Henry aluminium smelter near Geelong. Each year the Power Station uses approximately 1.1 million tonnes of brown coal, which is mined using open cut mining methods. Crushing and pulverising reduces the coal to a fine dust that is dried and injected into the boiler. The hot gases in the boiler are used to heat the boiler water to generate steam, which in turn produces very high pressure steam to drive a two-cylinder condensing turbine of 160MW capacity to generate electricity. Power is transmitted to the Point Henry plant through a 45km, high voltage line.

After mining, the mine is progressively back-filled using earth being stripped to expose new coal reserves, the topsoil is replaced, the area is mulched and then it is allowed to regenerate naturally. This rehabilitation process results in the restoration of a self-sustaining ecosystem. Alcoa manages the Anglesea Heath together with Parks Victoria, the Victorian Department of Sustainability and Environment, and the local community. Under this unique agreement, over 90% of the mining lease is co-managed by Alcoa and our partners as if it were a National Park. It is the first case in Australia where a conservation agency and industry have come together to form a cooperative partnership to manage an area for conservation.

In 2005, Anglesea was recognised for excellence in natural environmental management with a high commendation in the Victorian State Government Strzelecki Awards. The award was bestowed for Anglesea's mine rehabilitation work. Anglesea was also a finalist in the SaveWater award in 2007.

Other recent environmental milestones for Alcoa Anglesea include its reduction in waste to landfill by more than 50% since 2000 and its decreased town water use by more than 60% since 2000.

Alcoa Anglesea employs close to 100 permanent staff and has strong links with the local community. A Community Consultation Network meets every two months to exchange information and discuss topics of interest to both Alcoa and the community. Alcoa Anglesea has also maintained a strong community partnership program since it began operating, with over 20 community groups currently benefiting each year. Major local partners include Anglesea CFA, Anglesea Surf Life Saving Club, ANGAIR and Anglesea Primary School. Free tours of the operation are available on Tuesdays and Thursdays.

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Anglesea power station is slated to generate 160MW of electricity, which is transmitted to the Point Henry smelter via a 45km high-voltage line.

## Alcoa of Australia

Alcoa's Australian operations make up an integrated aluminium industry which includes mines, refineries, smelters, rolled products plants and a recycling operation - adding value to Australia's resources at every stage.

Alcoa of Australia Limited operates the mines, refineries and smelters while Alcoa Australia Rolled Products Pty Ltd operates the rolled products plants.

Together, these two businesses directly employ around 6,200 people plus another 1,000 contractors, predominantly in regional Australia.

Alcoa makes a significant contribution to the Australian economy with investment in Australia totalling over \$12 billion. We are one of Australia's leading exporters, exporting almost \$A5 billion of product in 2007. Alcoa is Victoria's largest exporter and accounts for around 8% of Victoria's goods exports. Alcoa is also a leading Western Australian exporter and accounts for around 5% of the State's exports. Around 80 cents in every export dollar earned by Alcoa stays in Australia.

Alcoa distributed over \$3.5 billion in Australia in 2007, including wages, local suppliers, royalties, taxes, rates and dividends.

Alcoa provides around \$6 million each year in sponsorships and partnerships to help build stronger communities and an additional \$8 million a year for community-based apprentices and trainees.

## Alcoa Australia Rolled Products Pty Ltd and other Operations

Alcoa Australia Rolled Products has operations at Point Henry in Victoria and Yennora in Western Sydney, producing rolled aluminium products for food and drink packaging, pharmaceutical packaging, building materials, road signs and boats. The Yennora plant is Australia's largest aluminium recycling facility.

Alcoa's other operations in Australia are Alcoa Wheel Products Australia Pty Ltd which distributes aluminium truck wheels and Alcoa Fastening Systems Australia Pty Ltd which manufactures and distributes specialist fasteners.

Alcoa Australia Rolled Products, Alcoa Wheel Products Australia and Alcoa Fastening Systems Australia are owned 100% by Alcoa Inc.

## The Aluminium Production Process

The aluminium production process starts in Western Australia where Alcoa operates the Huntly and Willowdale bauxite mines in the Darling Ranges south of Perth, supplying bauxite to Alcoa's alumina refineries at Kwinana, Pinjarra and Wagerup which extract alumina from it. The Huntly Mine is the world's biggest bauxite mine.

Alcoa operates two aluminium smelters in Victoria, at Point Henry in Geelong and at Portland. Portland Aluminium is a joint venture with CITIC Nominees Pty Limited and Marubeni Aluminium Australia Pty Limited. Our Victorian operations also include a coal mine and power station at Anglesea which supply electricity to the Point Henry smelter and rolled products plant.

These operations produced 32 million tonnes of bauxite, 8.7 million tonnes of alumina and 548,000 tonnes of aluminium in 2007. This represents around 47% of Australia's alumina production and 30% of aluminium production.

Alumina production also accounts for 11% of total world demand.

Alcoa owns 20% of the Dampier Bunbury Natural Gas Pipeline and operates dedicated port facilities in Western Australia and Victoria.

Alcoa of Australia Limited is 60% owned by Alcoa Inc. and 40% by Alumina Limited.

# environment, health and safety



(Above) The peregrine falcons return to nest at the station each year, successfully laying eggs and raising chicks.  
(Right) Working safely to help protect our employees and the environment is promoted widely.

## EHS Value

We work safely in a manner that protects and promotes the health and well-being of the individual and the environment.

## EHS Policy

It is Alcoa's policy to operate worldwide in a safe, responsible manner that respects the environment and the health of our employees, our customers and the communities where we operate. We will not compromise environmental, health or safety values for profit or production.

All Alcoans are expected to understand, promote and assist in the implementation of this Policy and the accompanying Principles.

## EHS Principles

- We value human life above all else and manage risks accordingly.
- We relentlessly pursue and continually improve EHS systems and processes to achieve an EHS incident-free workplace.
- We do not compromise our EHS Value for profit or production.
- We comply with all laws and set higher standards for ourselves and our suppliers where unacceptable risks are identified.
- We support pollution prevention and sustainable development by incorporating social responsibility, economic success and environmental excellence into our decision making process.
- We measure and assess our performance and are open and transparent in our communications.
- We supply and use safe and reliable products and services.
- We use our knowledge to enhance the safety and well-being of our communities.
- We are all accountable for conforming with and deploying our EHS Values and Principles.

At Anglesea Power Station, all employees and contractors will demonstrate our commitment to this EHS Policy and Principle Statement by progressively reducing our environmental, health and safety impacts and the intensity of our resource and energy use by participating in programs to:

- ensure environmental, health and safety factors are integrated into business planning and review through the Alcoa Business System, as part of the implementation of comprehensive environmental and safety management systems;
- systematically address key environmental impacts for the power station and mine, such as land management issues, equipment noise, air quality, process water usage and discharge, energy efficiency and greenhouse gas emissions.
- work together to care for ourselves, other people in our work area, and our neighbours.
- actively share our improvements and achievements within the station and the wider Alcoa Organisation.

# history of continuous improvement

1961

Mines (Aluminium Agreement) Act 1961 gives Alcoa rights to mine and explore for brown coal over mining lease.

1963

Point Henry Smelter commences operations.

1969

Anglesea Power Station commences operations.

1972

Initial attempts begin with mine rehabilitation.

1973

Water conservation strategy developed to improve management of water resources used in station.

1992

Approximately 7500ha of public land in the Anglesea area listed on the Register of the National Estate with the Australian Heritage Commission, including approximately 6341ha located within the Land for Conservation section of the Alcoa lease.

1996

Anglesea Heath Consultative Committee was established bringing together individuals and groups with specific expertise and/or management responsibilities within Anglesea Heath.

1998

Alcoa becomes a participant with the Australian Aluminium Industry in the National Greenhouse Challenge. This is a voluntary

agreement that saw the aluminium industry commit to a reduction of greenhouse gas emissions from the 1990 level by 20% by the year 2000. (The power station has also signed a Deed of Generator Efficiency with the Greenhouse Office to develop plans to further improve the greenhouse efficiency of the station).

2000

An additional 190ha of the Mt Ingoldsby area of the Alcoa lease was added to the National Estate Register with the Australia Heritage Commission, taking the area of the Land for Conservation Area of the Alcoa lease on the Register to approximately 6531ha.

New turbine rotating element was installed in the 2000 maintenance outage improving power generation from 150MW to 160MW to increase operational efficiency.

Alcoa Anglesea becomes a signatory to the Minerals Council of Australia Code for Environmental Practice.

Establishment of a Land Management Cooperative Agreement for the Land for Conservation in the Alcoa lease between Alcoa World Alumina Australia (Alcoa) and the Secretary of the Department of Natural Resources and Environment (NRE). The agreement is the first case where a conservation agency and a resources company have come together to form a cooperative partnership to manage an area for biodiversity conservation.

2001

Draft of the Anglesea Heath Management Plan released.

Alcoa Anglesea Heath Management project wins global Alcoa Environment Health and Safety Award.

Ambient air monitor installed at Anglesea Primary School in response to community request.

2002

EcoRecycle Victoria presented Alcoa Anglesea with Waste Wise certification in recognition of waste minimisation achievements. Alcoa is the first Victorian manufacturing company to receive this certification.

Official launch of the completed Anglesea Heath Land Management Plan.

Appointment of Alcoa Anglesea Environmental Project Officer dedicated to mine rehabilitation and land management.

2003

Publication of first ever Environment Improvement Plan for Alcoa Anglesea.

Additional ambient air monitor installed in Anglesea Community House precinct.

Water and Land management plans documented.

Target of 50% reduction in solid waste to landfill from 2000 baseline figure achieved four years ahead of schedule.

2004

2004/05 EIP released.

Awarded global Alcoa Environment Health and Safety Award for on-line asbestos removal program.

Alcoa Anglesea awarded Best Practice for Environmental Communication as part of global Alcoa auditing program.

Peregrine falcon pair establish a breeding territory at the Power Station.

Partnership with Barwon Water developed to reduce water use.

Three more ambient air monitors installed in Anglesea township, taking the number of sites to six.

2005

Awarded Highly Commended in the Victorian Government Strzelecki Award for Management of the Natural Environment.

80% recycled paper introduced at Alcoa Anglesea.

Water Conservation Award from Barwon Water, presented by Victorian Environment Minister.

2006

2006/07 EIP released.

Finalist in the World Environment Day Awards.

60% reduction in town water (potable water purchased from Barwon Water) achieved.

2007

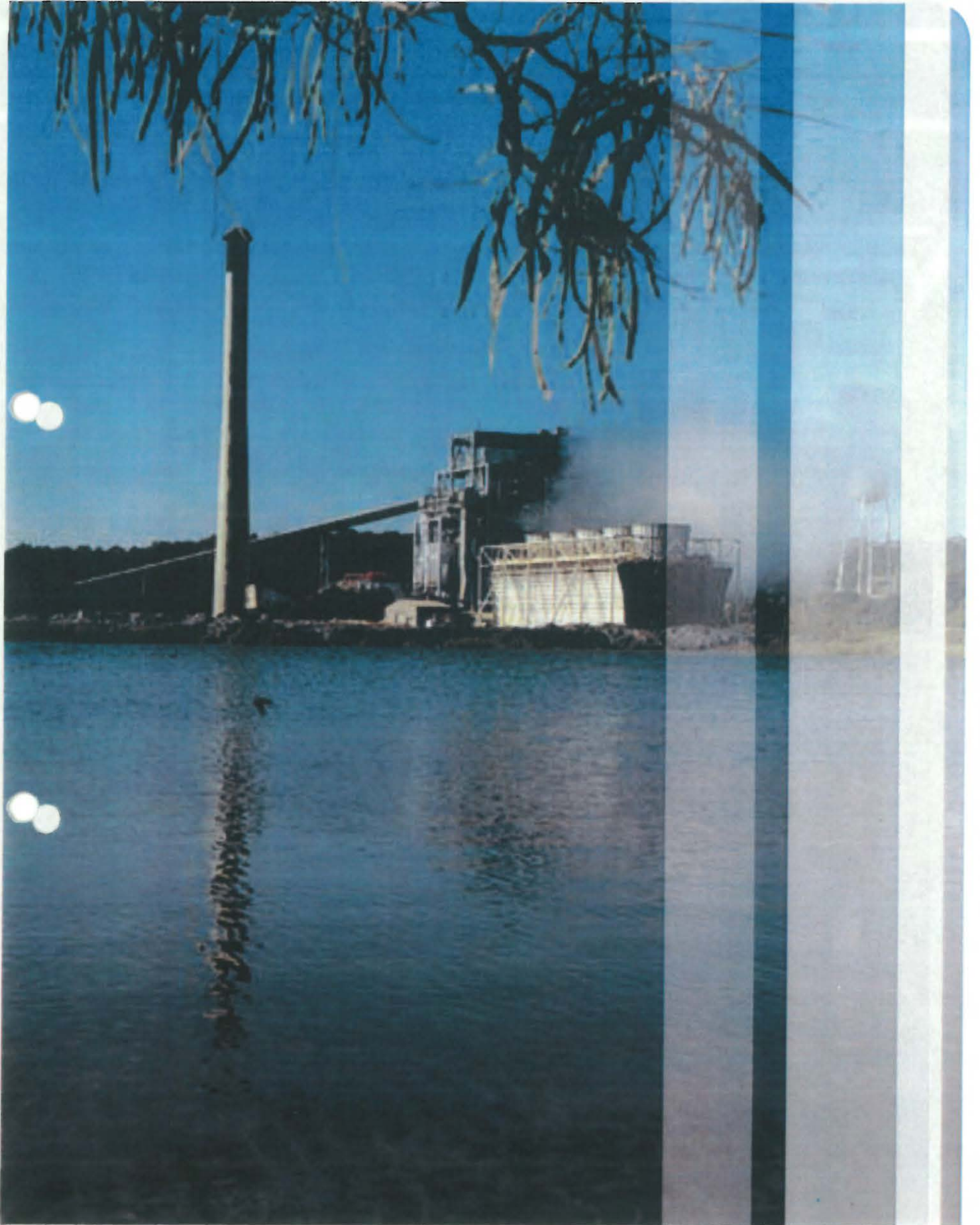
Finalist in the SaveWater Awards.

Webcam images of the peregrine falcon chicks broadcast live on Alcoa internet.

Signing of an Agreement between Alcoa Anglesea and the Wathaurong Aboriginal Cooperative.

Two excellent ratings were issued for Anglesea's Land Management and Environmental Communication during the ISO14001 continuous improvement audit.

All six ambient air monitoring stations fitted with direct telemetry back to Anglesea Power Station.



The Anglesea power station first commenced operations in 1969.



Pulveriser mill wheels crush the coal to a 'talcum-powder' consistency before it's air-blown into the boiler.

# 2008-09 targets and actions chart

Air Management – Alcoa's aim is to reduce all air emissions and to continue to improve station efficiency.		
Area	Targets	Actions
SO <sub>2</sub>	<p>No exceedances of the Air Quality Objective for 1 hourly average (200 ppb).</p> <p>Stack SO<sub>2</sub> emissions are not to exceed licence limits.</p>	<p>Formally document and continue to review the Air Management Plan, including current and future activities and continue investigations into long term plans to reduce SO<sub>2</sub> emissions. (Q2 2008)</p> <p>Further refine the load reduction protocol. (End 2009)</p> <p>Investigate additional meteorological and emissions modelling. (End 2009)</p> <p>Continue annual vegetation surveys. (End 2008 &amp; 09)</p> <p>Continue to progress investigations into clean coal and other emerging technologies that meet triple bottom line objectives (End 2009).</p>
Greenhouse Gas (GHG)	<p>Annual GHG Emissions not to exceed 1.2 t CO<sub>2</sub>/MWh.</p>	<p>Implement a Boiler cleaning schedule.</p> <p>Complete the action plan detailed in the Generator Efficiency Standard program.</p> <p>Continue the use of environmentally friendly diesel where available for mine fleet (End 2009).</p> <p>Investigate the use of environmentally friendly diesel for light vehicles (End 2009).</p> <p>Continue investigations into clean coal technologies (End 2009).</p> <p>Investigate improvements in combustion tuning methods (End 2009)..</p> <p>Participate in relevant Australian Greenhouse Gas Office or Alcoa Greenhouse Gas audits (end 2009).</p>
Particulate Stack Emissions	<p>Particulate Stack Emissions not to exceed 0.25 g/m<sup>3</sup> based on 10 minute averaged data (during normal operations).</p>	<p>Continue stack emissions monitoring program, to meet licence requirements (ongoing).</p> <p>Analyse data obtained from the pilot ambient dust program and determine future improvement options.</p>
Fugitive Dust		<p>Continue annual monitoring program for fugitive dust emissions.</p> <p>Analyse data obtained from the pilot ambient dust program and determine future improvement options (End 2008).</p>
PAH, VOCs etc.		<p>Implement monitoring program (Q1 2008).</p>

# 2008-2009 targets and actions

Water Management - Alcoa's aim is to continue to improve the efficient use of our natural resources, including water.		
Area	Targets	Actions
Water Use and Discharge	Using a 2000 baseline: 70% reduction in town water usage by 2010.	<p>Investigate the installation of further water recycling infrastructure.</p> <p>Develop strategic long term water management plan including surface water discharge reduction targets (Q2 2008).</p> <p>Initiate investigations into ways of eliminating mine water discharges into the Anglesea River (end 2009).</p> <p>Implement a maintenance strategy for surface water channels to optimum flow and minimal erosion of waterways (end 2008).</p> <p>With appropriate partners, continue projects relating to the Anglesea catchment:</p> <ul style="list-style-type: none"> <li>• Healthy Waterways Project with Corangamite Catchment Management Authority, Surf Coast Shire and Environmental Protection Authority. Includes Ecological Risk Assessment on the Anglesea River (partnership with EPA)</li> <li>• Estuary Entrance Management Decision Framework with Deakin University and Western Coastal Board</li> <li>• Anglesea River Masterplan Project with Surf Coast Shire</li> </ul> <p>Improve water metering around the station.</p> <p>Continue to review and refine the Alcoa Anglesea Water Management Plan (end 2009).</p> <p>Continue the water loss minimisation strategy that involves the condenser vacuum breaker valve (boiler water) and the water associate panel cooling tank (general service water).</p>
Area	Targets	Actions
Groundwater		<p>Continue to investigate opportunities for reducing bore water use (end 2009).</p> <p>Perform a gap analysis against the Hydrogeological Assessment (Groundwater Quality Guidelines) (end 2008).</p> <p>Receive and share complete report from Tim Tutt PhD study – "Monitoring and Modelling Hydrogeochemical Interactions with Groundwater: Implications for Mine Dewatering on Groundwater, River and Lake Chemistry".</p> <p>Continue projects relating to the Anglesea catchment:</p> <ul style="list-style-type: none"> <li>• Anglesea Borefield Project with Barwon Water</li> <li>• Southern Rural Water licencing of groundwater.</li> </ul> <p>Investigate automating the sand filter back wash system to reduce water use and enhance overall water quality (end 2008).</p>
Land Management - Alcoa's aim is to establish a diverse healthy woodland ecosystem with mine rehabilitation whilst identifying and protecting archaeological sites; protecting healthy vegetation from Phytophthora cinnamomi; continuing existing vegetation protection strategies; improving habitat and restoring native vegetation within the mining area.		
Area	Targets	Actions
Mine Rehabilitation	<p>100% species richness in post 2000 mine rehabilitation areas.</p> <p>Area of land rehabilitated per annum &gt; area of clearing per annum.</p>	<p>Continue to experiment and refine rehabilitation techniques (ongoing).</p> <p>Continue to implement the botanical monitoring program to assess post-2000 rehabilitation areas (ongoing; review ongoing requirement Q1 2009).</p> <p>Continue seed dormancy and mine rehabilitation research for recalcitrant plants (Depth and Quantification of Topsoil Reserves in the Anglesea Heath Vegetation (Q3 2008)).</p> <p>Further refine rehabilitation targets in line with Department of Sustainability and Environment's Native Vegetation Framework guidelines (Q4 2009).</p> <p>Formally document rehabilitation procedures (Q4 2009).</p>

Area	Targets	Actions
Mining Area and Freehold Land	To manage the freehold and mining area; to complement land management works in the adjacent lease and private freehold.	<p>Maintain MOU with the Wathaurong Aboriginal Cooperative for identification and protection of archaeological sites in Mining Area (ongoing).</p> <p>Continue to monitor and manage phytophthora in the mining and freehold areas (ongoing).</p> <p>Continue fire management program on freehold parcels and mining area (ongoing).</p> <p>Continue extensive environmental weed removal program within the Mining Area and freehold parcels and revegetate with indigenous species (ongoing).</p> <p>Continue to manage short term goals and long term strategy for freehold parcels (ongoing).</p>

Waste Management - Alcoa's aim is to reduce waste to landfill and reduce the production of waste by our processes. The program for removing asbestos and other hazardous materials from the power station will continue.

Area	Targets	Actions
Waste to Landfill	No targets set	<p>Investigate options for management of prescribed waste ie. Oily water.</p> <p>Continue to find reuse or recycling options for wastes and educate employees on new procedures (end 2009).</p> <p>Continue to actively manage the rehabilitation of contaminated soils and refine associated management procedures (end 2009).</p> <p>Continue to refine and implement the waste oil management education program.</p>

Asbestos	No targets set	<p>Continue to remove asbestos from the plant where appropriate, using licensed contractors for disposal to landfill in compliance with EPA licence conditions (end 2009).</p> <p>Continue the education program for employees regarding transport of asbestos waste offsite (end 2009).</p> <p>Review and consider licence requirements for asbestos landfill rehabilitation plan (and site closure plan) (end 2008).</p>
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Environmental Management - Alcoa's aim is to continually improve our environmental management processes. This would be demonstrated by a reduction in the number of environmental incidents occurring at the site and by receiving external recognition of our efforts.

Area	Targets	Actions
Environmental Management	Complete all EHS Management System and Environmental Audits as per Alcoa auditing schedule (90% compliance to monthly schedule, 100% completion in the annual and two yearly cycles).	<p>Continue to strategically plan for and allocate funds to Alcoa Anglesea's Environmental Management Program.</p> <p>Investigate new or alternative measuring systems for environmental management/ incident performance (Q2 2008).</p> <p>Continued focus on encouraging employees to report 'Environmental Near Miss' incidents.</p> <p>Maintain ISO14001 certification for the Alcoa Anglesea Environmental Management System (continuous).</p> <p>Maintain environmental auditing process at Level 5 (Good) (End 2009).</p> <p>Continue discussions with EPA and other regulatory authorities on licence conditions to ensure shared understanding of environmental management systems (continuous).</p>

Community Engagement - Alcoa's aim is to communicate openly with interested community members on its environmental management.

Area	Targets	Actions
Community Engagement	No targets set	<p>Continue to produce quarterly EIP progress reports against the actions documented in this EIP (published on the internet and distributed via email). (every Quarter).</p> <p>Continue to produce the Alcoa Anglesea Monthly Environment Report (published on the internet and distributed via email) and formally document the Report production procedure (Monthly and documentation by Q1 2009).</p> <p>Continue Community Consultation Network meetings as a public forum for Alcoa to engage with local community members (continuous).</p> <p>Investigate new ways of engaging with people in the local community who are interested in Alcoa Anglesea's environmental management (End 2009).</p>





Alcoa Anglesea has had its Environmental Management System accredited to ISO14001 since 2002.

# environmental management

Environmental Management at Alcoa Anglesea refers to the administrative processes and mechanisms that support the environmental performance of our operations. Examples include our EPA Licence, ISO14001 accreditation, internal and external auditing, employee training and environmental and incident reporting.

Alcoa Anglesea maintains a database of all environmental incidents, and employees are encouraged to report actual incidents and those with the potential to occur or "near miss" incidents. All incidents, other than "near misses", are reported to the EPA annually and those with any unauthorised discharge to the environment are reported immediately.

Alcoa submits an annual report to the EPA, summarising its environmental performance in all areas. In addition to developing EIPs, the operation develops monthly environmental reports.

Alcoa Anglesea has an Environmental Lead Team that meets monthly to look at the environmental performance of the operation. It deploys an environmental training program, reviews the progress of audits and incidents, identifies improvements to the ISO14001 system and communicates environmental issues across the business.

Alcoa also reports annually to the National Pollutant Inventory (NPI). See [www.npi.gov.au](http://www.npi.gov.au).

# environmental research and development

## Completed Projects

Year	Partnering Organisation	Study	By whom
1995	Melbourne University	A Comparative Study of Plant Communities in the Alcoa Lease Area, Anglesea.	Maria Taranto
2000	Melbourne University	Natural and industrial sources of acidification in natural ecosystems surrounding a coal-fired power station.	Dr Scott Laidlaw
2000	Deakin University	Restoration and management of habitats of threatened species on manufacturing industry land of high conservation value.	Lesley Gibson
2002	CSIRO	Emission modelling in the region around the Anglesea Power Station and Portland Smelter.	Dr Peter Hurley / J. Hill
2003	University of Ballarat	A hydrogeological and geochemical assessment of trace element concentration in the shallow aquifer at the Alcoa Power Station, Anglesea Victoria.	Narelle Beattie
2003	Deakin University	An assessment of the effect of the construction of a proposed weir on biodiversity in the Anglesea Power Station wetlands.	Emma Parker
2005	University of Queensland	Master of Mineral Resources (Environment) Thesis Title: Mulch and smoke effects for mine rehabilitation in heathy woodland of southwest Victoria.	Elise Jeffery
2006	Deakin University	Freshwater influences on hydrology and seagrass dynamics of intermittent estuaries.	Adam Pope
2007	Alcoa Anglesea Vacation Student study	Mapping and quantification of top soil seed reserves in the Anglesea heath vegetation assemblage.	Nerida Anderson

## Current Projects

Year	Partnering Organisation	Study	By whom	Expected Completion date
2003	Deakin University	Monitoring and modelling hydrogeochemical interactions with groundwater: Implications for mine dewatering on groundwater, river and lake chemistry.	Tim Tutt	Draft thesis completed and received by Alcoa for review

# environmental audit program

## 1. Integrated Audit

This is managed by Alcoa's Corporate Internal Audit Department located at Alcoa's headquarters in Western Australia. The results of an integrated audit are published to corporate head office and involve a strict management process ensuring all identified risks are properly managed. These are undertaken at least every three years. The process includes interviews, procedure reviews, site verification inspection and a review of the location's self assessment progress.

## 2. Self-Assessment Audit

This is managed by personnel at each Alcoa location and reported via an Alcoa global web-based reporting tool on an ongoing basis. Each location is required to complete a self-assessment audit using the Alcoa Self Assessment Tool, commonly known as ASAT. These internal audits must be completed every 12 months. The process is similar to that used during an integrated audit.

Areas covered by both audit systems include the plant's environmental management system, waste, water, air emission, chemical and land management systems. The process includes interviews, procedure reviews, site verification inspection and a review of the location's self assessment progress.

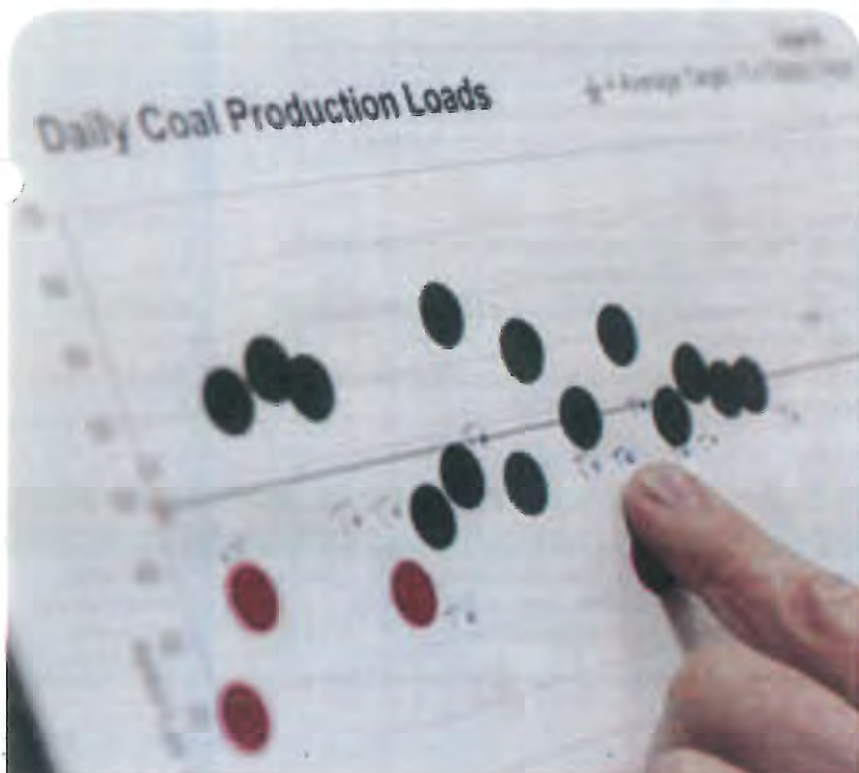
## External audit and verification

External audit and verification is also an important management tool for Alcoa. At Alcoa Anglesea, ISO (International Organization for Standardization) certification has provided us with a useful tool to ensure that we meet ISO standards, as well as provide an internal learning mechanism for the business.

ISO is a global network that identifies what International Standards are required by business, government and society, develops them in partnership with the sectors that will put them to use, adopts them through transparent procedures based on national input and delivers them to be implemented worldwide.

ISO14001 is a framework for the overall management of environmental issues for an operation. It includes the opportunity to identify significant environmental aspects and impacts, define the controls in place to manage those risks and develop action plans for improvement. Environmental management is integrated and reflected in all levels of Alcoa Anglesea's operations from standard work instructions to environmental policies. ISO14001 also requires that potential environmental, regulatory and community impacts be addressed.

Alcoa Anglesea has had its Environmental Management System accredited to ISO14001 since 2002. This involves auditing by external parties on an annual basis (at a minimum).



Daily Management Boards track the performance of the mine and power station's operations.



Alcoa Anglesea management team track business performance on a daily basis.

### Environmental Objectives

In total 44 environmental objectives are audited including:

EHS Policy & Commitment	EHS Aspects, Risks & Impacts	Legal & Other Requirements
EHS Objectives, Targets & Action Plans	EHS Organisational Structure, Responsibility & Accountability	Training, Awareness & Competence
Chemical Release Reporting Procedures	EHS Management Systems Audit	Emergency Preparedness & Response
Communication	Monitoring & Measurement	Operational Control
Records	Training	Management Review
Waste Identification & Classification	On-site accumulation & storage	Dross and Dross Residue Management
Recordkeeping	Emissions Inventory	Drinking Water
Water Discharge Identification & Characterisation	Wastewater Permitting for Surface Water Discharges	Off-site Waste Disposal & Transport Management
Underground Wastewater Disposal System	Wastewater Treatment Facilities	Discharge To Municipal Treatment Systems
Regulatory Analysis & Managing Requirements	Chemical Management - Allegations And Inventories	Emission & Process Changes
Permit/License Compliance Program	Remedial Assessment & Clean-Up	Reporting & Corrective Actions
Control equipment Operation	Impacts Evaluation	Emergency Response Plan
EHS Management System Documentation & Document Control	Hazardous Chemical Inventory, Pollution Release & Off-Site Transfer Reporting	EHS Incidents & Non-conformance Corrective & Preventative Action
Pcb Management	Aboveground Storage Tanks	Location Land Management
Groundwater Monitoring	Sampling & Monitoring	

The most recent integrated audit for Alcoa Anglesea in 2004 rated the site to have an overall "Good" rating. To obtain a Good rating "all the testing suggestions and minimum expectations must be in place". The overall audit process is designed to ensure minimum standards are being met and that sites are striving to continually improve their performance in each area. Commencing in 2008, ASAT auditing will be an assessment of the combined Point Henry and Anglesea locations. It is expected that the next integrated audit will be conducted during 2008.

Each objective has minimum expectations which are applied to all Alcoa sites globally. Each minimum expectation has a series of testing suggestions against which each site's processes are audited.

# national pollutant inventory



Visitors are often surprised to learn that the plume from the cooling towers is steam.

The National Pollutant Inventory (NPI) provides the community, industry and government with free information about substance emissions in Australia.

The NPI is a cooperative program implemented by the Australian, state and territory governments.

The NPI shows emission estimates for 93 substances and the source and location of these emissions. Alcoa Anglesea reports 26 substances to the NPI each reporting period.

Through the NPI, you can find out what substances are being emitted to air, land and water in your community from different sources like cars, power stations and factories.

Around 4000 facilities from a wide range of industry sectors - including the Anglesea Power Station - report annually to the NPI. 2006-07 facility data is now available on the NPI website which is updated each year: [www.npi.gov.au](http://www.npi.gov.au)

# legislation and accreditations

Alcoa Anglesea operates in accordance with several environmental Acts and Regulations. The list below is a summary of the main Acts and Regulations guiding the site's activities.

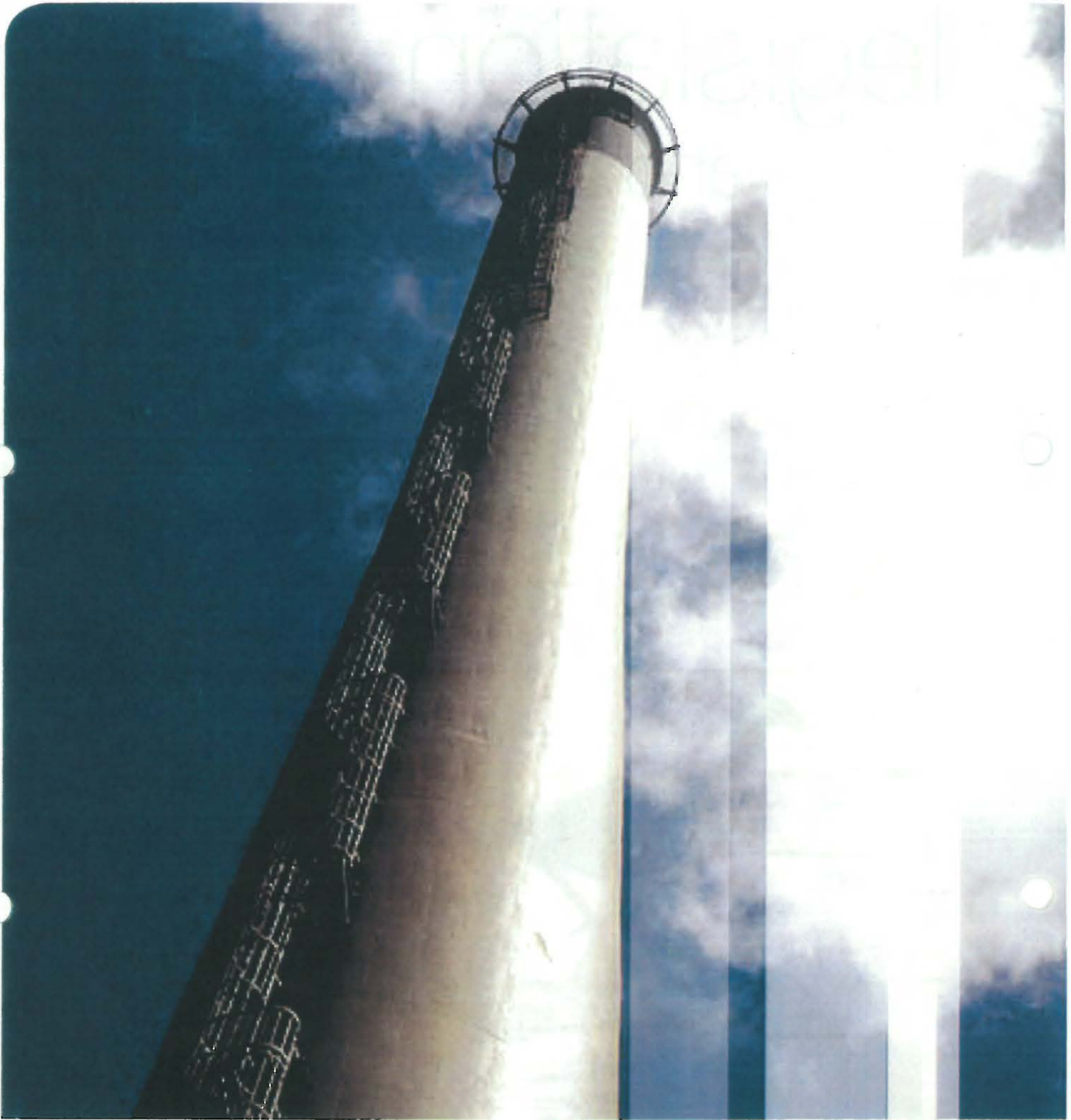
- Mines (Aluminium Agreement) Act 1961
- Conservation, Forests and Land Act 1987
- Environment Protection Act 1970
- Occupational Health and Safety Act (2004)
- Dangerous Goods (Storage and Handling) Regulations 2000
- Flora and Fauna Guarantee Act 1988
- Environment Protection and Biodiversity Conservation Act 1999
- Archaeological and Aboriginal Relics Act 1972
- Aboriginal and Torres Strait Islander Heritage Protection Act 1984
- Occupational Health and Safety (Asbestos) Regulations 2003
- State Environment Protection Policy (SEPP) – Air Quality Management 2001
- SEPP – Ambient Air Quality 1999
- SEPP – Waters of Victoria 2003
- SEPP – Groundwater of Victoria 1997
- SEPP – Prevention and Management of Contaminated Land 2002
- SEPP – Variation of SEPP – Control of Noise from Commerce, Industry and Trade 2001
- EPA Waste Discharge Licence EM32162
- Surf Coast Shire Local Laws No. 4 & 5

In addition, Alcoa has the following accreditations:

- Accredited to ISO14001 (1996-present)
- Accredited to ISO9001 (2000-present)
- NATA Accredited Laboratory (to ISO17025)



The Anglesea Heath is rich in wildlife and plant diversity.



The power station's stack is 108m tall and was designed by Melbourne University in 1969.

# air emission management



Continuous monitoring of SO<sub>2</sub> ground level concentrations (GLC's) is now conducted at six sites in Anglesea.



Advanced process control systems in the control room provide power station operators with the ability to see and manage the process and potential emissions.

### Sulphur Dioxide

Sulphur dioxide (SO<sub>2</sub>) is formed by the combustion of materials containing sulphur or sulphur compounds. It is commonly used as a fruit-preserving agent, in wine making, as a bleach and as a fumigant for growing grains, grapes and citrus fruit. It is a colourless, non-flammable gas with the chemical formula SO<sub>2</sub>.

### Process Source

Sulphur is contained in the brown coal mined at Anglesea. Compared to the coal in the Latrobe Valley, Anglesea has a higher sulphur content averaging approximately 3%. SO<sub>2</sub> is produced when brown coal is burnt in the power station.

Natural sources of SO<sub>2</sub> can be volcanic eruptions and the decay of vegetation.

### Limits

SO<sub>2</sub> emitted from the exhaust stack is limited by the Power Station's EPA licence (EM32162) to 100 kg/min. Alcoa Anglesea voluntarily reduced this limit from 111.34 kg/min as part of a recent licence review.

During 2006, the reporting target of the EPA Intervention Level for SO<sub>2</sub> of 210 parts per billion (ppb) was changed to reflect the Air Quality Objective of 200ppb averaged over a one-hour period, emanating from the Victorian EPA State Environment Protection Policy (Ambient Air Quality).

Alcoa Anglesea has adopted stricter internal limits of 170 ppb for hourly averaged data and 60 ppb for 24-hour data.

### Minimising and controlling substance emissions

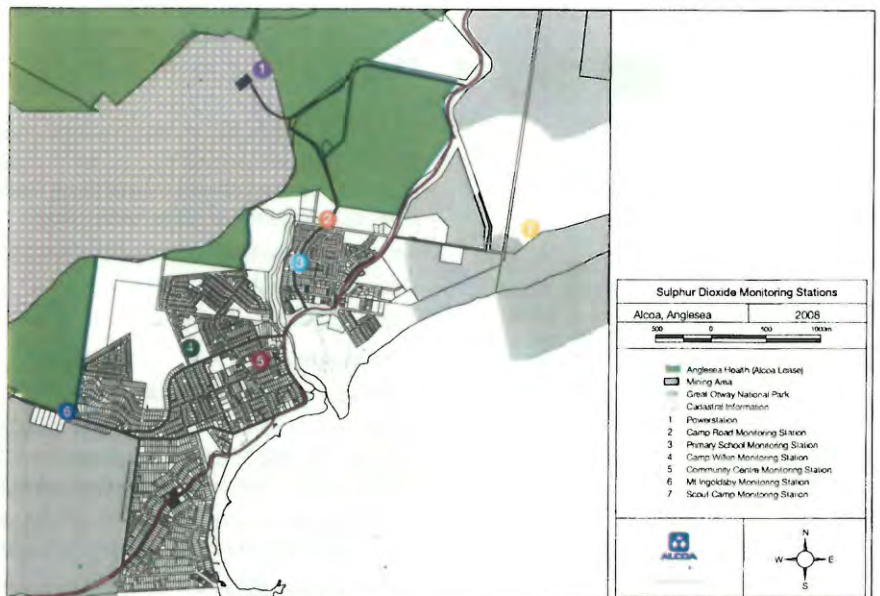
SO<sub>2</sub> is formed at Alcoa Anglesea as the coal is burnt. The coal at Anglesea contains varying levels of sulphur. Blending of the coal as it is delivered to the power station boilers can lower peak concentrations of SO<sub>2</sub> emissions. If SO<sub>2</sub> concentrations exceed internal alarm limits (set at less than 50% of the Air Quality Objective) a load reduction protocol is activated which sees less coal being burnt meaning a decrease of power generation and, in turn, a reduction of SO<sub>2</sub> emission levels.

### Monitoring

Stack emission levels and concentrations are verified through annual stack testing carried out by an independent qualified organisation. On line stack gas measuring equipment was installed during 2003 and enables Alcoa to monitor variations and trends in SO<sub>2</sub> emissions.

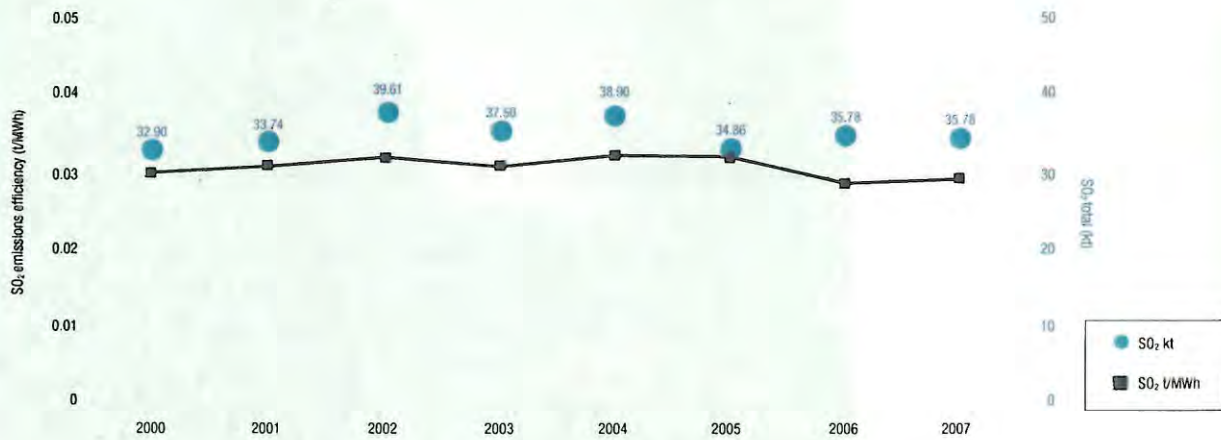
Continuous monitoring of SO<sub>2</sub> ground level concentrations (GLC's) is now currently conducted at six sites in Anglesea.

These are shown in the map below.





## monitoring air emissions



During 2007, additional telemetry was installed at the three remaining monitoring sites. All six sites are now equipped with telemetry, which transmits data back to the Power Station Control Room in real time. As explained above, if SO<sub>2</sub> concentrations exceed internal alarm limits, a load reduction protocol is activated to reduce SO<sub>2</sub> emission levels.

In the period of the 2006/07 EIP, occurrences of GLCs exceeding the Air Quality Objective of 200ppb were recorded. Each of these events is reported to the EPA and the local community when it occurs.

A load management protocol developed by operations personnel has been an effective strategy in controlling the majority of events and continues to be further refined. Monitoring has also indicated that the local topography and weather conditions affect readings and Alcoa is currently undertaking climatic modelling to better understand contributing factors.

During 2007, a Sulphur Dioxide Management Plan was developed and submitted to the EPA and as previously communicated to the Community Consultation Network (CCN) a major project has been underway for some time to identify effective ways to improve the management of SO<sub>2</sub> emissions.

Alcoa Anglesea also undertakes an annual assessment of vegetation health and any impacts on the vegetation by power station operations. The 2006 assessment was undertaken by Dr David Doley from the University of Queensland, and in 2007 Professor Alan Davison from the University of Newcastle Upon Tyne, UK due to Dr Doley's unavailability. Both researchers are recognised experts in this field and found that there were no visible symptoms of emission injury to the vegetation at any of the sites.

A monitoring program that records accumulated SO<sub>2</sub> on passive plate samplers continues at eight sites around the Anglesea operations.

## Biodiesel Trial in the Mine

During 2007, Alcoa Anglesea trialled an environmentally friendly diesel product – biodiesel – to operate all of the major equipment at its coal mine in a bid to reduce greenhouse emissions across the site. As part of the Alcoa Anglesea's commitment to environmental improvements, the mine trialled biodiesel – commercially known as FLEX Diesel – for approximately 8 months.

Biodiesel has the potential to deliver substantial reductions in emissions, including:

- > 28% reduction in CO<sub>2</sub> emissions;
- > 20% reduction in particulates;
- > 35% reduction in SO<sub>2</sub>; and
- > reductions in hydrocarbons and NO<sub>x</sub>.

Based on the 1.7 million litres of fuel used by Alcoa Anglesea for its mining operations each year, emission reductions that could be achieved are estimated at 1150 tonnes of CO<sub>2</sub>, 51 tonnes of CO, 5 tonnes of particulate matter, together with additional reductions in hydrocarbons, NO<sub>x</sub> and SO<sub>2</sub>.

During 2007, Alcoa Anglesea achieved the greenhouse gas target set in the previous edition of the EIP, with the help of the reduced emissions from the use of biodiesel.

FLEX is no longer produced in Victoria and the Alcoa Anglesea mining group continues to investigate alternative supplies.



## Workshopping Climate Change

Alcoa of Australia decided to focus its 2007 Month of Service activities on climate change reduction through a Climate Change Challenge theme that featured a range of volunteer activities focussed on conservation and sustainability.

Water-wise workshops were organised by Barwon Water at Anglesea. The workshops featured handy hints such as how to reduce water consumption at home, how to create a waste wise garden featuring drought tolerant plants, greywater usage ideas and an overview of the water restriction and rules that are in place in our local region.

### Greenhouse gases

Greenhouse gases refer to the range of gases that contribute to the greenhouse effect. They include carbon dioxide, methane, perfluorocarbons, nitrous oxide, hydrofluorocarbons and sulphur hexafluoride. These form a blanket of gas that covers the earth, allowing light energy from the sun to reach the earth's surface, where it is converted to heat and other forms of energy. These gases in the atmosphere trap the heat before it can escape back into space. This is a natural effect, which keeps the earth warm and allows us all to survive.

This process occurs naturally and is accelerated by human activities such as power generation and everyday domestic activities such as use of fuel in cars, wood fires and home energy use. This enhanced greenhouse effect is referred to by scientists as climate change.

### Process Source

Carbon dioxide is the predominant greenhouse gas produced by the Anglesea Power Station, although there is a range of other gases that contribute to the greenhouse effect. Carbon dioxide is generated principally by the combustion of carbon-based fuels.

At Anglesea, the power station's fuel is brown coal. Additional greenhouse gas emissions come from the diesel powered mining equipment and the combustion of propane gas for heating.

### Monitoring and Reporting Greenhouse emissions

Alcoa has adopted a Greenhouse Gas Reporting System under which Alcoa Anglesea reports its greenhouse gas emissions in an open, transparent and consistent manner.

Alcoa Anglesea is a participant in the Australian Greenhouse Office Generator Efficiency Standard Program, and also annually submits its greenhouse gas emissions in performance reports to the EPA.

### Climate change

Alcoa has taken a voluntary global leadership position on addressing climate change and reducing greenhouse gas emissions. In 2003, Alcoa achieved its target of reducing global direct greenhouse gas emissions by 25% from a base year of 1990.

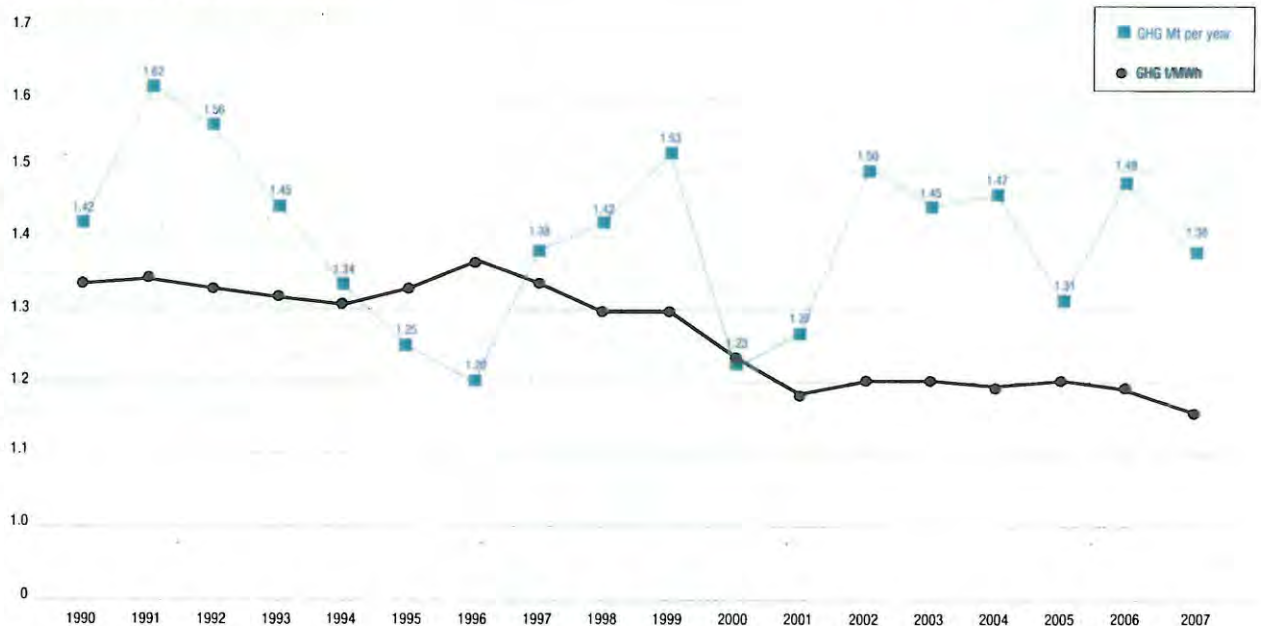
In Australia, Alcoa is addressing greenhouse gas emissions through energy efficiency, productivity improvements and technological innovation. Alcoa has reduced the direct greenhouse intensity – the amount of greenhouse emissions produced per tonne of production – of its operations:

- aluminium smelters – by 60% from 1990 levels
- alumina refineries – by 9.5% from 1990 levels
- rolled product plants – by 5.5% from 1990 levels

Total direct and indirect greenhouse emissions were 16.5 million tonnes in 2006. This was below 1990 levels, despite production increasing during that period.

Alcoa is a member of the Australian Government's Greenhouse Challenge Plus program.

### greenhouse gas emissions



## Make An Impact

In a first for Australian industry, Alcoa and Greening Australia have partnered to develop a greenhouse footprint reduction program for the families of Alcoa employees and their immediate communities.

Known as 'Make an Impact', the program includes access to a greenhouse calculator and a kit featuring a range of tips on how to lower energy and water consumption and more effectively manage waste.

Australian households generate almost one-fifth of Australia's greenhouse gas emissions through everyday activities. This bold initiative, teamed with employee commitment, will empower local households to address climate change – and find local solutions to this very important global issue.

The Make an Impact program is supported by the Australian Greenhouse Office and was officially launched in June 2006 by Alcoa General Manager Environment Health and Safety, Kim Horne and Victorian Parliamentary Secretary to the Environment, Elaine Carbines.

The program has been embraced by employees at all of Alcoa's operations in Victoria, NSW and WA.

To read more about the program, visit [www.alcoa.com.au](http://www.alcoa.com.au).

## Dust and Particulate Matter

There are two types of dust emissions from the Alcoa Anglesea operations. The first is particulate matter from the mining operations and is generally referred to as dust. The second is particulate emissions from the Power Station stack and these emissions are generally referred to as ash or fly ash.

### Process Source

The primary sources of dust resulting from mining operations are from the movement of large vehicles, loading and unloading soil and coal and the crushing of coal, while other sources of dust in Anglesea come from transport, unsealed roads and the beach.

Fly ash is the very fine ash produced by the combustion of powdered coal with forced draft, and is carried off with the flue gases. It is formed at approximately 1200°C; its chemical components are largely bound together in a glassy state as complex silicates.

Fly ash is grey to tan in colour, odourless and non-flammable. Anglesea coal contains on average approximately 4% ash. A portion of this ash is collected in the furnace hopper along with ground clinker while the greater portion, the fly ash, is entrained in the flue gases.

## Limits

The fly ash limit at the stack as per EPA licence (EM 32162) is 4.19 kg/min.

Dust emission limits are determined by the SEPP (Air Quality Management) recommendations for particulate fallout. The SEPP lists the Intervention level for PM10 dust as 0.060 mg per cubic metre over a 24-hour period.

### Minimising and controlling substance emissions

Alcoa Anglesea regularly monitors dust emissions. Dust suppression is undertaken using water carts to spray water onto road surfaces, particularly in and around the mining area and where excavation activities take place. The water sprayed on to road surfaces is recycled process water and reduces windblown dust, and dust raised by vehicles. This is especially important on haul roads, as poor visibility can be a serious safety hazard. Through considered mine planning, the development of the mine can be designed so that it shields the mine from strong northerly and north-westerly winds and that watering the higher upwind surfaces can also minimise fugitive dust emissions.

Spray lines service the permanent coal stockpile and are activated when weather conditions warrant dust reduction measures. Water sprays are also used to wet down the transfer chute areas on the coal conveyor belts.

Electrostatic precipitators collect the fly ash prior to atmospheric dispersal of the gases via the stack. The fly ash is removed from the precipitators by a pneumatic system and is transported to the ash pond by the ash water system. The precipitators operate at an efficiency of greater than 99%.

EPA Licence (EM 32162) covers periodical removal of sludge from the ash ponds. Sludge removed from the ponds is used as fill in the open cut and is covered with overburden to prevent nuisance dust forming.

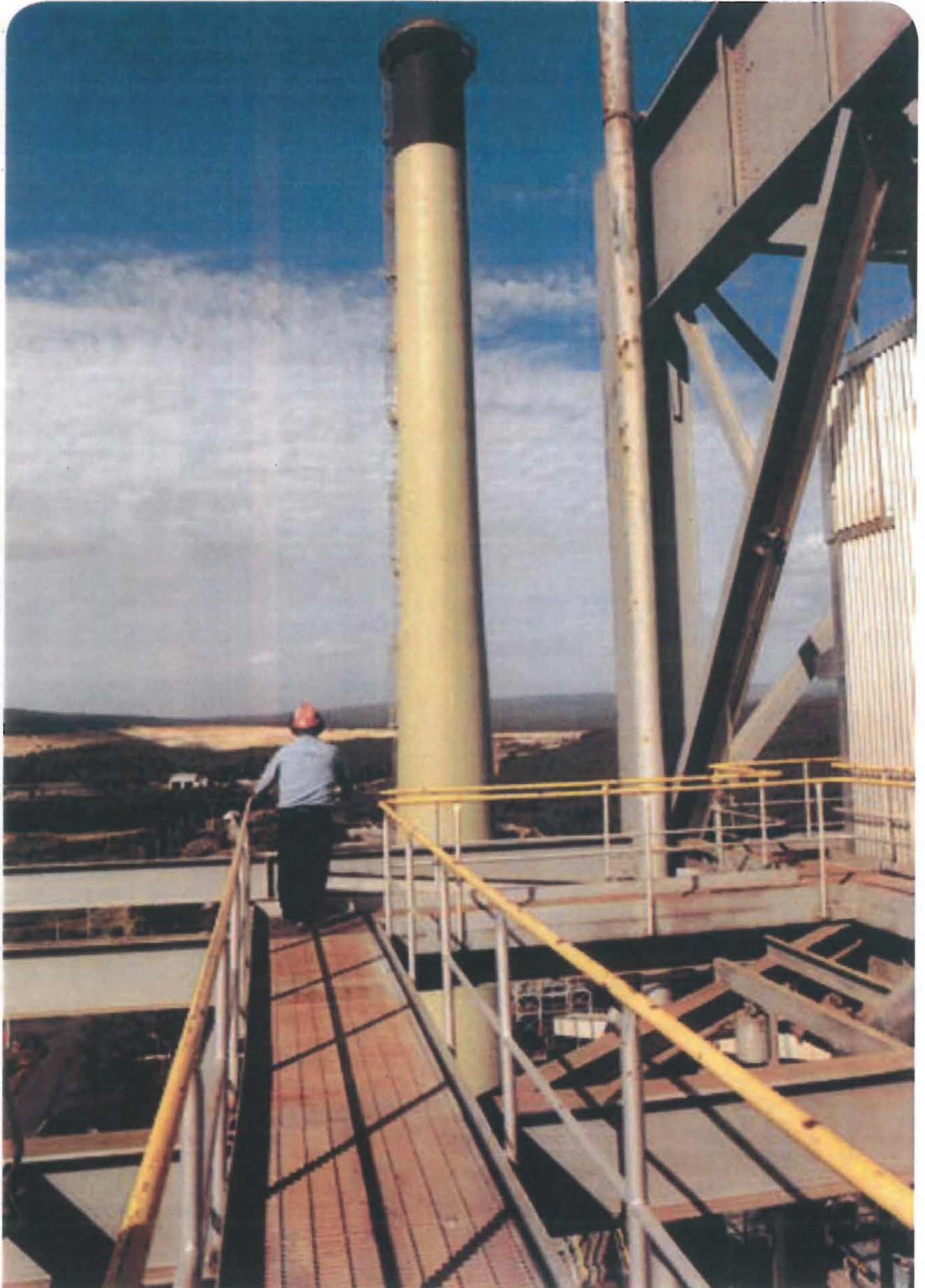
Although fly ash is largely insoluble in water, a 20% aqueous suspension can have a pH range of 4–13. Procedures are in place to keep the ash pond discharge to a pH range of 7–9.6.

Ash is a major waste by-product of coal fired power stations and significant effort is required to dispose of this waste. Alcoa is seeking alternative uses for the ash as part of its ongoing waste minimisation strategy.

### Monitoring

Discharge from the stack is monitored in a variety of ways, from on-line instrumentation measuring opacity, daily inspections to monthly sampling for water quality compliance to EPA licence (EM 32162). Annual stack testing is undertaken to measure particulate emissions as per EPA licence requirements.

Dust from the mining operations is monitored annually. This monitoring takes place on a number of sites in and around the mine and power station. In April 2007, a fugitive dust characterisation program was initiated. This program sees total dust, particulate matter less than 10 micron and particulate matter less than 2.5 micron collected over a weekly time frame. The results of this will be collated over twelve months and reviewed.



Management of sulphur dioxide emissions is currently Alcoa Anglesea's major environmental initiative.



Alcoa is continually developing strategies to minimise overall water use.

# water management

The major water usage on site is to cool the return steam from the turbine. Other processes include boiler water feed, auxiliary cooling systems and dust suppression for conveyor belts and coal surfaces.



The Cooling Tower at Anglesea Power Station is one of the major sources of water usage.

### Water Usage

The station receives process water from three sources – town water, bore water and recycled water from the mine. Since 2000, Alcoa Anglesea has achieved a greater than 60% reduction in town water consumption.

### Water Usage Monitoring

Alcoa Anglesea has a series of strategically placed flow meters to determine water usage from each of its three water sources. More detailed water usage patterns within the plant processes can also be determined.

### Water treatment processes

Two water treatment systems are operated at Alcoa Anglesea: the plant sewage system and the bore water treatment plant. The bore water treatment plant is supplied with water from six well bores situated within the Alcoa lease area. The water is pumped to a degasifier, removing carbon dioxide and hydrogen sulphide and aerating the water to partially oxidise the iron. Sodium hydroxide is then added to increase the acidity, causing precipitation of the iron and manganese.

### Limits

Alcoa Anglesea's extraction of bore water is limited by Southern Rural Water Authority Number 8706922 to 4000 ML annually.

### Water Discharge

Process water and storm water from the site is discharged from the ash ponds. Mine water, not utilised in the station, is discharged from the reclamation pond. The discharge from this pond has been minimal with efforts made to reuse the water in the station.

Both discharges are EPA licensed and flow through a natural wetland mixing zone prior to entering the estuarine section of the Anglesea River via the final EPA licence point.

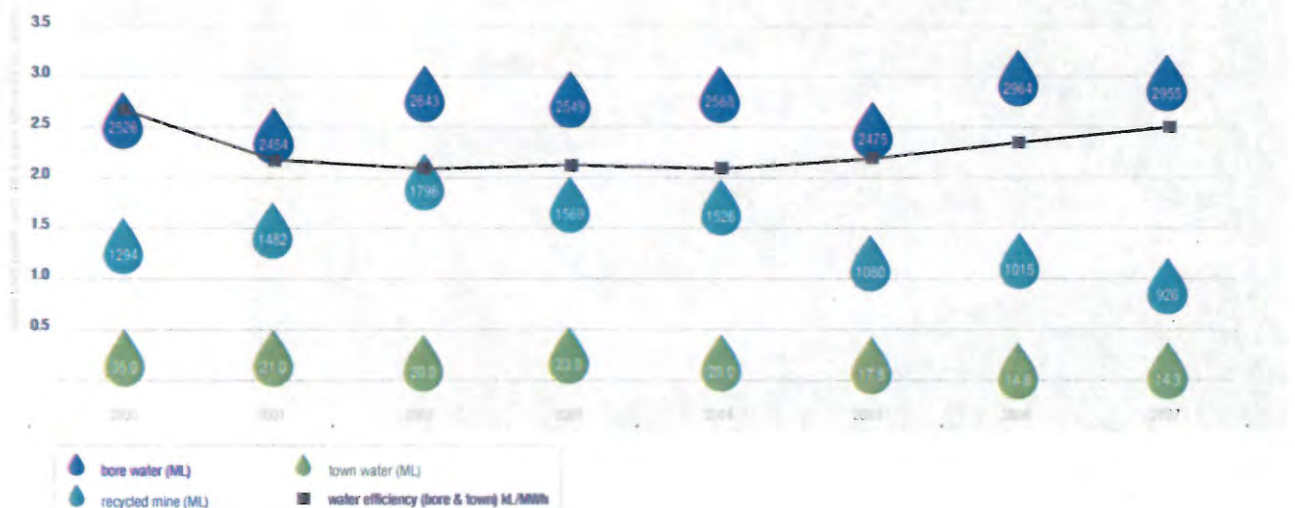
Anglesea's EPA licence has parameters set on flow, pH, suspended solids, colour, aluminium, iron and zinc.

### Water Discharge Monitoring

Discharge from the site is monitored using on-line instrumentation; daily inspections and monthly sampling are conducted for water quality compliance.

## water usage monitoring

Note: No target is set for recycled Mine water. The use of this water is maximised in preference to Bore water, and the amount used is dependent on whether conditions and mining operations.



# waste management

In 1991, the Anglesea waste minimisation team was formed to explore ways of reducing waste, conserving resources and reducing pollution.



Alcoa has had a proactive recycling program underway now for a number of years.



Alcoa encourages employees to separate recyclable waste at the source by providing separate bins for each type of waste.

The initial Alcoa aim of reducing waste to landfill by 50% by 1995 was achieved much earlier, by 1993. Sound waste management principles have been adopted to minimise the creation of waste and where waste creation is unavoidable, use a waste management hierarchy to consider reuse and recycle options prior to disposal. It is then disposed of in a manner that minimises its impact on the environment.

Alcoa has had a pro-active recycling program underway now for a number of years. This includes:

- All plastic bags and packaging being recycled by a third party;
- Sorting of waste to reduce volume to land fill;
- Grease drums, fluorescent tubes, and waste oil are disposed of at Victorian EPA licensed disposal sites;
- Crushing oil filters and recycling metal and waste oil;
- On site Victorian EPA licensed disposal landfill for asbestos;
- Water from cooling towers is used to remove ash from the precipitators;
- Air cleaners reconditioned for mine heavy vehicles;
- On-site rehabilitation area for oil and fuel contaminated soils; and
- A worm farm is operated to deal with waste such as paper and food scraps.

### Minimising and Controlling Waste

Designated, colour-coded, 3-cubic metre skips and 240-litre wheelie-bins are used extensively around the plant to collect and source-separate waste materials. The bins are transported to our Material Recovery Facility (MRF) and fully sorted for reuse by a number of companies. The MRF also packages recyclable material for sale to local recycling companies. Alcoa employees manage this facility and coordinate the delivery and transport within each department.

All cardboard and plastics are recycled through local recycling businesses. Both plastic and cardboard are large volume materials, but Alcoa's supply department has been successful in encouraging suppliers to minimise packaging on deliveries.

Full oil drums of waste oil are placed within a banded area before transportation off-site for recycling by a local company. Empty drums are also recycled.

### Waste History and Targets

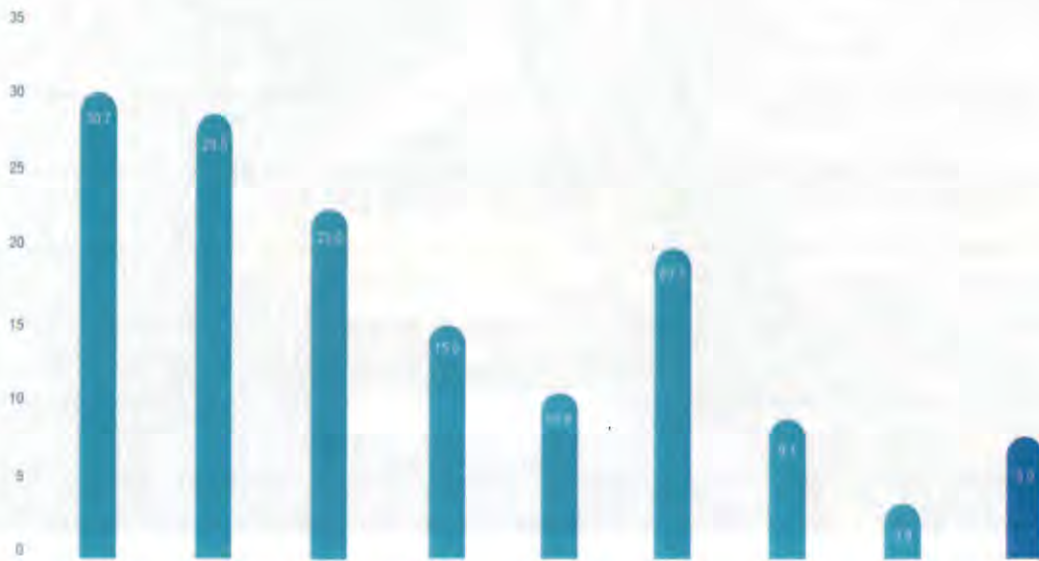
Using a 2000 baseline, Alcoa set a further reduction target involving a reduction in waste to offsite landfill by 50%. This was again achieved ahead of time – by 4 years in fact. During 2006 and 2007, work focussed on reducing and recycling waste resulted in over an 80% reduction in waste from the 2000 baseline. As the Alcoa Corporate target has already been achieved, aggressive reduction targets continue to be set.

Using a 2000 baseline, Alcoa set a further reduction target involving a reduction in waste to offsite landfill by 50%.





## monitoring waste



### Monitoring

All waste transported on or off site is recorded, regardless of whether the material is to be reused, recycled or sent to landfill. Data is routinely collated and reported internally and to the EPA as part of Alcoa Anglesea's annual performance report.

### Hazardous Waste

Alcoa Anglesea manages all hazardous (prescribed) waste as required by the Victorian EPA.

Minor amounts of medical waste and materials contaminated with oils (gloves, rags and cardboard) are sent off site for processing. Oil and water mixtures are also treated off site.

Small quantities of materials contaminated with polychlorinated biphenyls (PCBs) exist at Anglesea. Even though the importing of PCBs was banned in 1976, they are still present in pre-1976 transformers and capacitors in the electrical industry. From December 2001, PCB contaminated materials have been transported from Point Henry and Anglesea for treatment and disposal to BCD Technologies in Queensland. Approval was obtained from both the Queensland and Victorian Authorities to do this. Anglesea will continue to eliminate PCB contaminated materials during 2008/09.

### Asbestos

#### Introduction

Asbestos is the fibrous form of mineral silicates, the most significant being chrysotile, crocidolite and amosite (white, blue and brown asbestos respectively). Generally, fibres below 3 micrometres in diameter and greater than 8 micrometres in length are potentially carcinogenic.

#### Process source

Asbestos has been used in many products, including heat resistant textiles, asbestos cement products, thermal insulation products such as pipe and boiler insulation, friction materials such as clutch plates and brake linings, gaskets, floor tiles and roofing materials.

#### Minimising and controlling asbestos exposure

In October 1988, the Anglesea Asbestos Control Management Committee, made up of employees, was formed to safeguard all personnel at the Anglesea Power Station from the risk of exposure to asbestos fibre. The Anglesea Asbestos Management Program was developed by this committee and has been in operation since February 1989.

### Monitoring and Waste Disposal

The Power Station has been surveyed for the presence of asbestos, and the results of over 900 sample analyses are recorded in a series of registers on site. An approved occupational hygienist carries out routine air monitoring during asbestos removal jobs.

Asbestos and material contaminated with asbestos is disposed of by placing the material in plastic membrane bags bearing the asbestos warning label. It is double bagged, double tied and transported to the on-site EPA licensed disposal tip. When the asbestos waste is two metres deep it is covered with 300 mm of dirt and compacted using a bulldozer.

During 2003/04, approximately 300 tonnes of asbestos containing materials was removed from Alcoa Anglesea, at a cost of approximately \$4.2 million. All materials were disposed of into the asbestos landfill, in accordance with licensing requirements.

During 2007, as per the new licence requirement, an Asbestos Landfill Rehabilitation Plan was developed and submitted to the EPA. The plan outlined the current practises and ongoing maintenance of the landfill, in addition to the rehabilitation strategy to be employed at the closure of the landfill site.

All employees received updated asbestos awareness training during 2007.



A unique agreement between Alcoa, DSE and Parks Victoria allows government and industry to jointly manage and protect the non-mining part of Alcoa Anglesea's lease.

## land management

The area known as the Anglesea Heath overlays land leased by Alcoa under the Mines (Aluminium Agreement) Act 1961 (7097ha) and additional 124 ha of freehold land owned by Alcoa. It is comprised of the area used for mining and power generation, known as the Mining Area (currently 545 ha) and the remainder known as the Land for Conservation (currently 6676 ha). The current lease agreement expires in 2011, although Alcoa holds a further 50-year option to mine coal until 2061, which it intends to renew.

## Anglesea Signs Agreement with Wathaurong Aboriginal Cooperative

In 2007, Alcoa Anglesea and the Wathaurong Aboriginal Co-operative formalised a four year working relationship by signing a Memorandum of Understanding (MOU) in relation to Alcoa's coal mining operations in Anglesea.

The progression of the open cut coalmine requires excavation and therefore has the potential to impact on any Aboriginal sites in surface or subsurface contexts. These sites are not identifiable until the vegetation has been cleared.

Heritage consulting firm Terra Culture was employed by Alcoa Anglesea in 2003 to assist with their first cultural heritage survey process. As part of this process, Alcoa voluntarily approached the Wathaurong Aboriginal Co-operative to ask them to assist in undertaking an archaeological survey of a 35-hectare area of land where Alcoa planned to continue its open cut mine in a westward direction.

This survey found two archaeological sites within the area surveyed on the side of existing tracks and all parties recommended that a Memorandum of Understanding be signed between Alcoa Anglesea and the Wathaurong Aboriginal Cooperative to ensure this process continued.

The Wathaurong Aboriginal Co-operative viewed the MOU and survey work as a way to encourage respect for significant local sites and build working relationships in the local community. Alcoa Anglesea viewed the MOU and survey work as a way to enhance its community and environmental engagement processes.

Both parties have worked together in the intervening years to create the MOU which will assist in protecting any buried archaeological deposits that may be found on the identified archaeological sites at Alcoa Anglesea when brown coal is mined.

Alcoa is pleased to be working with the Wathaurong Aboriginal Co-operative as the process has helped to establish the views of some local aboriginal people and groups interested in archaeology on matters such as the interpretation and significance of the recorded sites.

### Land for Conservation

Currently, the Land for Conservation consists of a 6,676-hectare area of public land, located north of the coastal township of Anglesea. The area offers one of the most diverse and spectacular areas for flora, scenic landscape and wildlife communities in Victoria. The National Estate listing of much of the area recognises the area's contribution to significant natural places, not only within Victoria but also in Australia.

A remarkable number of flora species exists within a relatively small area with over 620 species, or approximately one quarter of the total Victorian flora. Over a quarter of Victorian orchid species are found in the Lease area with over 80 species and five hybrid species having been recorded.

A unique agreement between Alcoa and the Department of Sustainability and Environment (DSE), allows government and industry to jointly manage the non-mining part of the lease and ensure that this important area is protected. The entire leasehold has been named the Anglesea Heath and is managed using the Anglesea Heath Management Plan. Alcoa fund a Parks Victoria Ranger and has an Environmental Scientist on staff to implement the strategies and actions of this Management Plan including the protection of threatened species, track rationalisation and rehabilitation.

### Mining Area and Alcoa Freehold

The Land Management Cooperative Agreement and the Anglesea Heath Management Plan apply only to the Land for Conservation. The Mining Area is managed solely by Alcoa and although the current lease expires in 2011 Alcoa intends to renew its mining rights to 2061. Both the Agreement and the Management Plan allow continued use and management of the Mining Area and any future expansion of that area in accordance with the requirements of the Mines (Aluminium Agreement) Act 1961.

In addition to the leased land, Alcoa owns freehold land adjacent to Anglesea between the township and mine. This freehold consists of natural heathland and seeks to minimise the impacts of having an open cut mine and power station close to the town. Consistent with the Anglesea Heath that surrounds it, this freehold has flora and fauna values that require active management. It also provides for passive recreational opportunities, including the Anglesea Bike Park, that are not appropriate for the Anglesea Heath.

### Land Management Plan

To manage the Mining Area and freehold in a manner consistent with the surrounding lease, a Land Management Plan was developed in 2003 for the mining impacted area including the Alcoa freehold. The plan provides environmental amelioration, aesthetic benefit and biological conservation to lands owned by Alcoa at Anglesea.

The Land management plan includes the following:

- Mine rehabilitation: method, standards and monitoring;
- Vegetation restoration and revegetation works for the mining and freehold areas;
- Protection of flora and fauna values on Alcoa freehold;
- Environmental weed program for the mining and freehold areas; and
- Development of a GIS project to assist in the mapping, monitoring and coordination of tasks within the management plan.



At the end of 2007, the total area of rehabilitated land was approximately 157 ha.

### Mine Rehabilitation

- Alcoa began mine rehabilitation at Anglesea in the early 1970s.
- The total area rehabilitated at the end of 2007 is approximately 157ha, including 5ha in 2007.
- The total size of the area 'open' at the end of 2007 is approximately 212ha including 52ha of infrastructure that will remain until decommissioning of the Power Station and includes the 2.9ha cleared in 2007.
- There will be no vegetation cleared in 2008. Consequently there will be no mine rehabilitation in 2008.
- The area to be rehabilitated in 2009 is dependent upon the progress of the mine plan, but the aim is to rehabilitate at a ratio of roughly 1:2. For example, if 3 hectares is cleared, 6 hectares will be rehabilitated.

### New Peregrine Falcons for Alcoa Anglesea

**The Peregrine Falcons returned again to alcoa anglesea in 2007, the fourth consecutive year.**

A purpose-built nesting box was built on top of the Alcoa Anglesea water tower to accommodate the 2004 breeding season and this was once again home to the peregrine family in 2006 and 2007.

Once considered a species on the brink of extinction, the ban on the use of DDT in Australia and diligent efforts from conservationists have seen Peregrine Falcon populations make a strong recovery.

Despite laying four eggs in 2007, only two successfully hatched - the chicks were aptly named by Anglesea Primary School students as Dash and Concorde. There is no explanation for why this happened, a similar scenario occurred in 2006 with only one of the four eggs hatching successfully. There are several reasons why an egg may not hatch - drought, adults may be incompatible or an adult may have left the eggs resulting in a drop in incubation temperature. The positive for having two chicks instead of four is the increased amount of food each chick receives with less sibling competition. The more food the two chicks receive, the stronger they will be, giving them a better chance of survival. This extra benefit was clearly evident when volunteers from the Victorian Peregrine Project took a travel tower to the elevated home this month to check on the chicks. Weighing in at a very healthy 905g was our female, Dash, with all the characteristics to be as formidable as her mother, Sheila. More reserved and weighing in at 590g was our male, Concorde. Sheila made her presence felt during the expedition up to retrieve the chicks - hard hats were essential under the circumstances! Whilst both parents exhibited agitated behaviour, Sheila in particular didn't hesitate on getting a close look at the bright yellow duco of our hats. The health assessment and banding of the chicks was completed and the chicks returned to the nest box as quickly as possible so that the parents could rest easy.

The webcam at [www.alcoa.com/falcons](http://www.alcoa.com/falcons) broadcasts images from the peregrine falcon nest box at Alcoa Anglesea over the internet. Regular updates are also included on the website. During 2007, the website was one of the most popular on the Alcoa system with many people logging on to check the chicks' progress.

# amenity

With Alcoa's lease and freehold land providing all of the Anglesea township's northern - and some of the western - boundary the company must observe a duty of care when it comes to matters like noise, visual impact and fire protection.



Fire prevention is one component of Anglesea power station's comprehensive crisis management plan.

## Noise

Noise pollution can be disturbing, especially to residents and holiday makers close to mining or manufacturing industries, such as the Alcoa site at Anglesea. Excessive noise can range from sleep intrusion to general nuisance value.

### Process Source

Noise from Alcoa's operations emanate from a number of sources -

- Maintenance of equipment
- Vehicle and transport associated noise
- Coal dumping
- PA systems
- Alarms
- Power Station operations.

### Limits

The State Environment Protection Policy N-1 Control of Noise from Commerce, Industry and Trade determines the allowable environmental noise levels.

### Monitoring

Personal noise is monitored and noise in work areas mapped at Alcoa's Anglesea operations. Opportunities for noise reduction are investigated and measures such as personal protective equipment (PPE) are put in place to deal with noise.

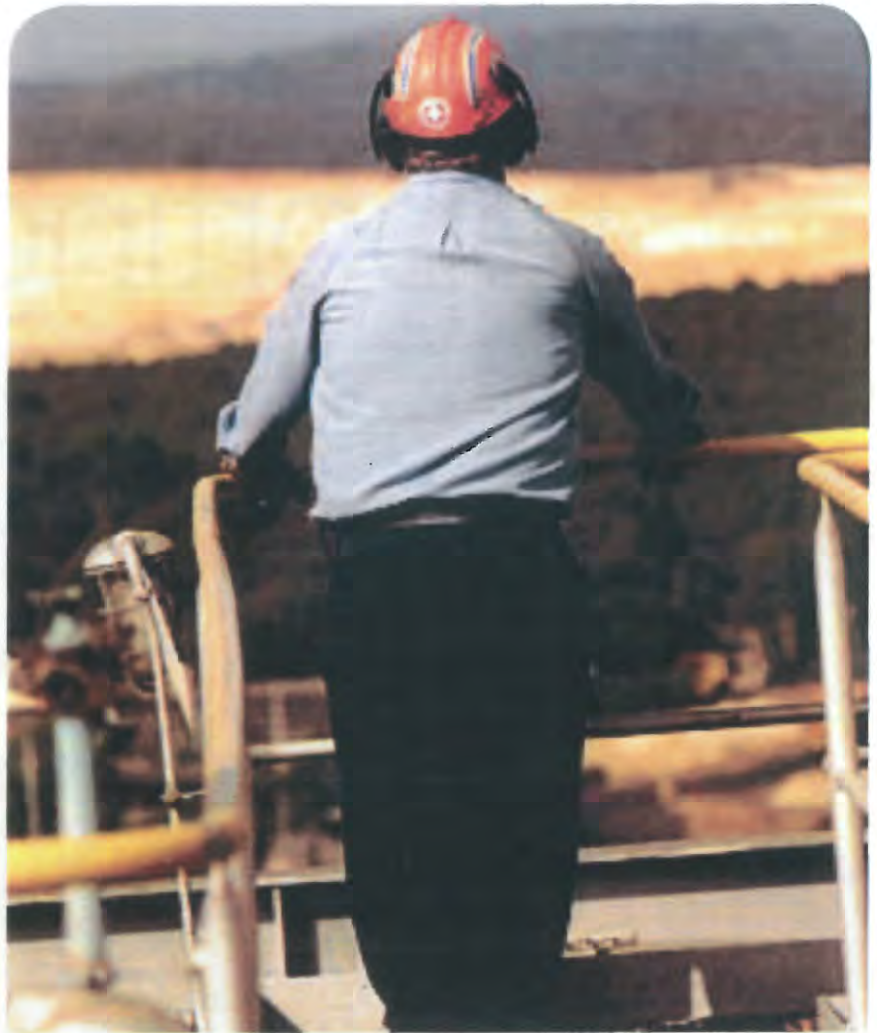
In the early 1990s, the mining operation's work hours were reduced to between 7:00am and 7:00pm, seven days per week. Extensive township noise monitoring and predictive computer modelling have been carried out at Anglesea to assist in the formulation of noise specifications for all new mining equipment entering the site.

As the nearest Anglesea residence is only 200 metres from the southern crest of the mine, ongoing maintenance of equipment also needs to manage noise levels on the various machines. This requires constant vigilance of reverse beeping, engine muffler systems, coal truck tailgate rubbers and noise generated when dumping coal all need to be considered.

The power station is a 24-hour per day operation and although the general operation noise cannot be regulated, attention needs to be applied to intermittent noise sources, such as auto-start alarms on conveyor systems, the PA system and the testing of steam relief valves in shutdown periods.

Alcoa Anglesea has completed noise monitoring assessments that indicate compliance with the SEPP.

Our slashing program is strategic and satisfies all fire prevention requirements whilst not compromising the integrity of the significant heathland communities.



Alcoa is serious about reducing the visual impact of our mining operations.

### Visual Impact

Alcoa is mindful of the visual impact of its operations in Anglesea. The establishment of the Land Management Plan for the Alcoa mining and freehold areas encompasses mine rehabilitation, revegetation of denuded areas and the planting of indigenous species along Coalmine Road to reduce the visual impact of the open cut mine.

### Fire

Alcoa plays an important role in assisting with the protection of Anglesea from wildfires with either the Lease (Anglesea Heath) or Alcoa freehold present on three sides of the township. For the freehold areas, Alcoa maintains a series of slash breaks adjacent to assets and property. Our slashing program is strategic and satisfies all fire prevention requirements whilst not compromising the integrity of the significant heathland communities. The program has been reviewed by DSE, Parks Victoria, Surf Coast Shire, Powercor, Vegetation Management Company and the Country Fire Authority (CFA).

DSE is responsible for fire management within the Anglesea Heath. Current fire protection measures are in accordance with the Otway Fire Protection Plan (DCNR 1995) and the Code of Practice for fire management of Public Land in Victoria (DCNR 1995).

The risk of fire spreading from open campfires is a significant threat to the Anglesea Heath and the adjoining the Great Otway National Park. This risk is minimised through the prohibition of open fires in conjunction with increased visitor awareness and ranger patrols. DSE also has a summer fire crew stationed at Anglesea to assist with fire protection works and respond to a wildfire in the Anglesea Heath.

In the event of a Total Fire Ban Day, a sign is displayed entering the Power Station. Signs displaying the status of the Fire Risk are also found at the CFA shed when entering Anglesea and picnic grounds in the adjoining the Great Otway National Park.

The Anglesea power station has a comprehensive crisis management plan in place that seeks to prevent fire occurring in the first place. Alcoa Anglesea has a long standing commitment to building the strength and capacity of the Anglesea CFA through its "Partnering Stronger Communities" program and will continue to support the Anglesea CFA financially and through the use of our facilities for training purposes. The Power Station has ready sources of water and the ponds on-site are available for use to CFA and DSE fire management.

# EIP progress reporting



Tours are one of many ways in which Alcoa Anglesea communicates with the community.

Alcoa Anglesea regularly updates interested community members and Alcoa employees on the status of the actions contained in the EIP.

The Community Consultation Network (CCN) is a consultative group made up of representatives from the local community, local government, industry neighbours, environment groups and the EPA.

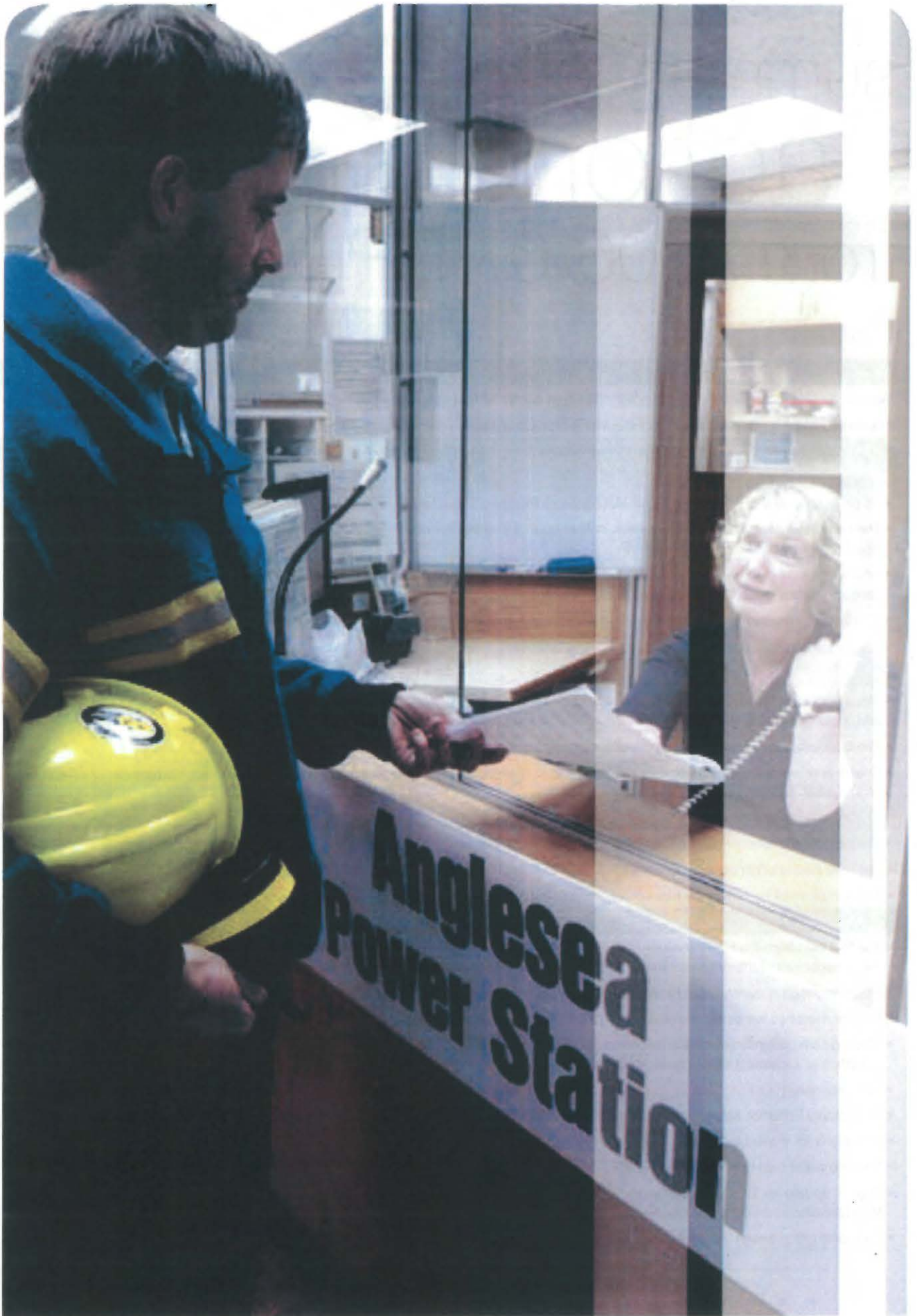
The CCN creates a forum for two-way communication between the Power Station and the broader community regarding issues that both Alcoa Anglesea and the Anglesea community can work on together. The EIP is regularly discussed and reported on at these meetings.

This group meets regularly to discuss a broad range of issues relating to all aspects of Alcoa Anglesea's operations and minutes are circulated from each meeting to all interested community members.

In addition, a regular environment report is produced for employees, which outlines the key environmental activities and reporting for the site including the progress of the EIP.

For more information about the EIP or the CCN, contact the Community Relations Department on (03) 5263.4249.

For Alcoa Anglesea EIP Status reports, go to: [www.alcoa.com.au/anglesea](http://www.alcoa.com.au/anglesea)





# summary of key actions items from 2006/07 EIP

## Environmental Management

Successful Continued Assessment for ISO14001 Environmental Management System in November 2007.

Maintained Alcoa's internal environmental auditing process at Level 5 (Good) 100% to schedule in 2006 and 2007.

## Air Emissions Management

### SO<sub>2</sub>

- As part of the new EPA Licence, an Air Management Plan was submitted to EPA at the end of January 2008.
- The Load Reduction Protocol was revised in April 2007 and alarm set points lowered. All six monitoring stations are now equipped with direct telemetry back to the control room.
- Initial attempts at predictive modelling using weather conditions that may cause a potential exceedance of ambient ground level SO<sub>2</sub> concentrations showed highly inaccurate results. Further investigations will be undertaken to attempt to improve the accuracy of this modelling.
- EPA issued a revised licence in March 2007 with the SO<sub>2</sub> limit reduced from the previous licence.
- Annual vegetation survey conducted in 2006 and in 2007.

## Greenhouse Gas (GHG)

- Alcoa Anglesea joined Challenge Plus as Associate Member. A GHG Action Plan was submitted to Australian Greenhouse Office (AGO) and is currently being assessed
- The business case for investigating the boiler cleaning upgrade is being reviewed.
- Coal drying technologies are being investigated. Other alternatives regarding renewable energy or waste energy recovery are the subject of a research program with Deakin University.

## Dust

- The particulate monitoring (ambient air) program was implemented.
- The dust load is continuously monitored.
- The annual stack air emissions monitoring program was completed and all tests were within licence limits.

## Water Management

- The final plan from the Healthy Waterways Project was adopted by the Surf Coast Shire council in April 2006 and now forms the basis for management of the Anglesea River.
- Alcoa Anglesea is currently not targeting zero water discharge as a result of recommendations from Healthy Waterways Project.
- Regular meetings were held with Barwon Water to discuss aquifer storage and recycling opportunities.
- Meetings are currently being held regarding the Water Management Plan, developed and submitted to the EPA in October 2007, in relation to accessing lower aquifer for potable water.
- Demineralisation plant modification to save 10kL every demineralisation cycle, or the equivalent of between 200,000 and 250,000 L per year.
- The Estuary Entrance Management Support System (EEMS) released for the Anglesea River Estuary.
- Final plans for the Anglesea River Masterplan Project have been approved by the Surf Coast Shire council.
- No mine water was discharged during 2007.
- Regular update for Tim Tutt's PhD study "Monitoring and Modelling Hydrogeochemical Interactions with Groundwater: Implications for Mine Dewatering on Groundwater, River and Lake Chemistry" provided. Draft thesis is currently being reviewed by Alcoa Anglesea.
- Additional groundwater wells installed August 2006.

#### Waste Management

- Improved processes were established around rehabilitation of contaminated soils. The operation of the land farm was reviewed during 2007, and a routine schedule was developed to maintain the area.
- Category 4 – 7 plastics are now recyclable. Communicated to workforce through "Environmental Angle" and Waste Minimisation refresher training.
- Investigating opportunities to reuse flyash.
- Delivered refresher waste management training to all employees.
- Asbestos management procedures were reviewed.

#### Land Management

- The final report was received for the 2006 and 2007 botanical monitoring programs completed for the 2002, 2003, 2005 and 2006 rehabilitation areas.
- A new topsoil seed research program with SA Botanic Gardens was initiated in the second quarter of 2007. The report was received in the first quarter of 2008.
- A summer vacation student was employed for 2006/2007 to investigate topsoil and subsoil depths and the location and depth of seed propagules and rhizomes.
- A summer vacation student was employed for 2007/2008 to investigate the physical and chemical properties of topsoil, subsoil and overburden suitable for plant growth.
- Rehabilitation targets were developed including investigation of rehabilitation similarity index standard.
- Rehabilitation procedures were documented and reviewed by an ISO14001 external auditor during the fourth quarter of 2007 with Land Management rated Excellent.
- Formalised rehabilitation/clearing targets.
- A Memorandum of Understanding (MOU) was finalised between Alcoa and the Wathaurong Aboriginal Cooperative. Advice is required for future survey and site protection under new archaeological legislation.
- Signage and protection of Phytophthora free areas maintained
- Fire management program on freehold parcels continued. Annual slashing was completed in the fourth quarter of 2007. Ecological burns were completed at Coalmine Road and Ixodia Track during 2006/2007.
- The annual pest plant removal program was completed in the fourth quarter of 2007.
- The long term strategy for freehold (Alcoa owned) parcels of land was finalised.
- Regular Land Management Meetings were held.
- Horse agistment ceased in December 2005.
- Lease of freehold land to the Surf Coast Shire for the Anglesea Bike Park was finalised in the second quarter of 2006 with construction of the new facility completed during the fourth quarter of 2006.

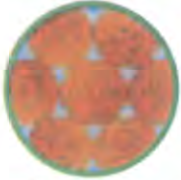
#### Community Impact

- A comprehensive environmental noise monitoring program was completed in the first quarter of 2007.
- 800 trees were planted along denuded Coal Mine Rd in 2006.
- Manual lighting was installed on the cooling tower to reduce visibility at night.
- Landscape and visual analysis was completed in the first quarter of 2007.

# from dirt to aluminium

Aluminium is endlessly recyclable and Alcoa runs the largest aluminium recycling operation in Australia at our plant at Yennora in Western Sydney.

## mining and rehabilitation



### preparation of mining area

After clearing of timber and other material, topsoil and overburden are carefully removed and returned after mining when the areas are being rehabilitated.



### bauxite mining

A 4-5 m layer of caprock and bauxite is removed using large excavators or loaders and haul trucks.



### crushing plant

Ore is taken to a crusher where it is crushed into smaller pieces.



### ore conveyors

The ore is then transported by conveyor belt and rail to the refineries for processing.



### rehabilitation

After mining, topsoil and overburden are returned to the area and the site is prepared for revegetation.



## refining process

### digestion

Finely ground bauxite is mixed with hot caustic soda solution to dissolve the alumina from the bauxite. Every six tonnes of bauxite makes two tonnes of alumina.

## smelting process



### dissolving alumina

Alumina is dissolved in an electrolytic bath of molten cryolite within a large lined furnace known as a "pot". There are hundreds of pots at a typical smelter.



### chemical process

Alumina is made up of aluminium and oxygen, which need to be separated to produce the metal. Every two tonnes of alumina makes one tonne of aluminium.



### calcination

The alumina hydrate is washed, then heated to remove water, leaving a pure dry alumina in the form of a fine white powder. This is cooled and stored, then shipped to smelters for processing.



### precipitation

The liquid containing alumina hydrate is then cooled in large open tanks and seed crystals added, causing the alumina to crystallise out of solution.



### clarification

Insolubles, such as sand and mud, are settled and filtered out, leaving a solution of dissolved alumina hydrate.



### reduction process

A high electric current is passed through pots via carbon blocks. The current flows continuously from the carbon block (positive) through the alumina/cryolite mix to the lining of the pot (negative), and then on to the next pot.



### forming aluminium

Electricity maintains the temperature of the process at about 950°C and enables the alumina to split into aluminium and oxygen, with aluminium settling to the bottom of the pot.



### casting

The molten aluminium is cast at a temperature of just over 700°C to form ingots.



### hot rolling

Aluminium ingot is reheated to around 600°C, then passed through a hot finishing mill where it is reduced in thickness to 3-6mm.



### coiling

The aluminium strip from the hot rolling mill is coiled and cooled before being sent to the cold rolling mill.

## rolling process



### final processing and casting

Molten aluminium is transferred to a holding furnace and then cast into ingots. Recycling aluminium consumes only five per cent of the energy required to make new aluminium, with no loss in quality.



### initial processing

Coated aluminium (painted or lacquered) is processed through a gas fired rotary furnace before being sent to a "melter" where it is mixed with uncoated or new aluminium.



### classification

Upon receipt at the Alcoa Australia Rolled Products' Yennora recycling centre, the recycled aluminium is classified so the optimal end use and processing path can be determined.



### preparation

Recycling aluminium starts with preparation for transporting, which involves compaction to improve the density of the aluminium and to reduce freight, storage and handling costs.



### sheet finishing

Most sheet products require a finishing step such as cleaning, coating and slitting. All products are trimmed to customer specified widths.

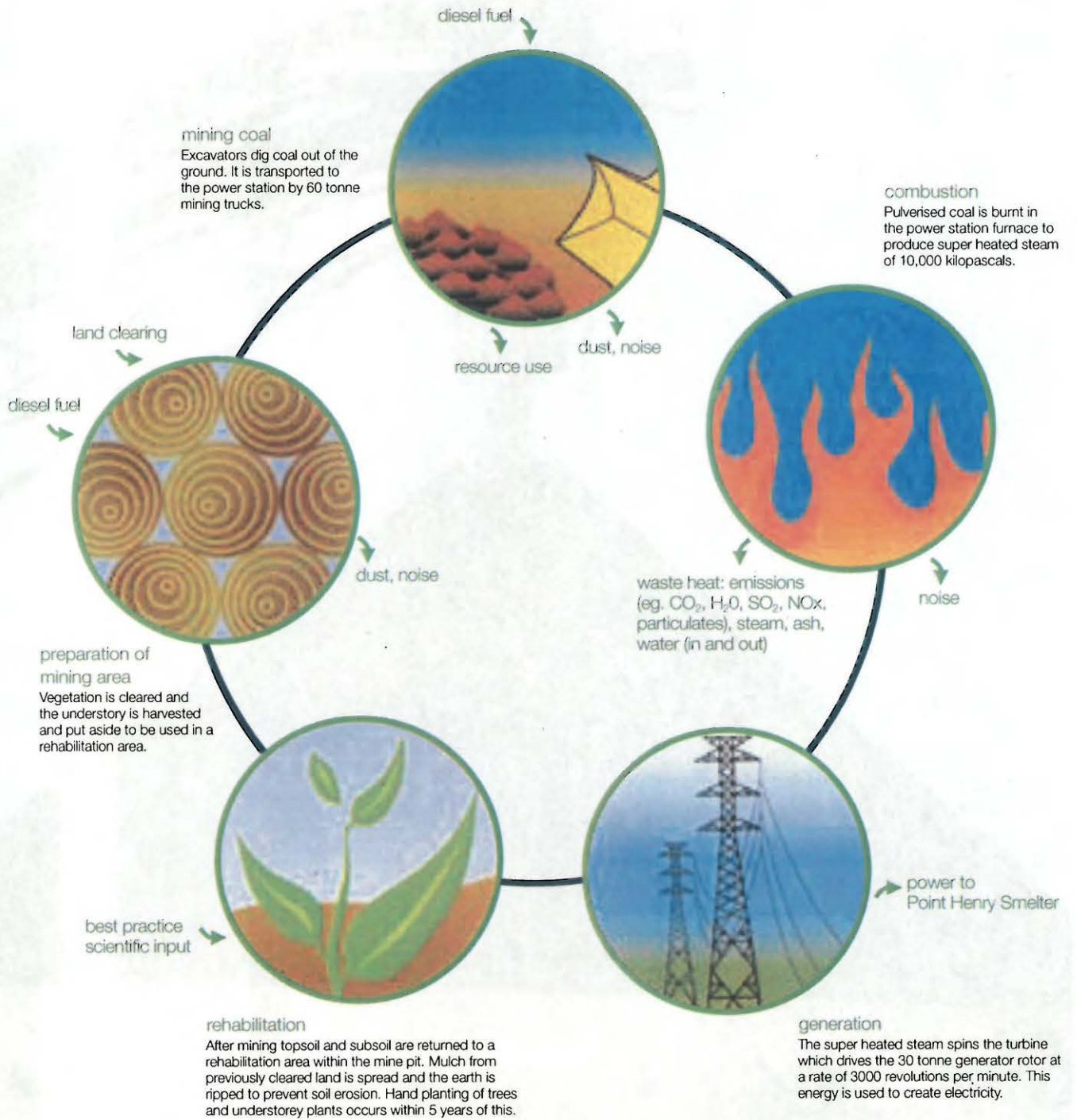


### cold rolling

The aluminium coil is further reduced (to as thin as 0.24 mm) by three passes through a cold rolling mill. Exit speeds of cold rolling mills are as high as 1000 metres per minute.

## recycling process

# alcoa anglesea power station's process steps





Approximately 1.1 million tonnes of brown coal is mined at Anglesea each year.

# glossary

## of terms and abbreviations

<b>Action</b>	Environmental or process improvement projects which will be completed during the timeframe of the EIP to achieve a Target.	<b>MW</b>	An abbreviation for megawatt (one million watts), a measure of electrical power generated at power stations.
<b>Aim</b>	The long term strategy which Alcoa will strive to meet through setting Targets and completing Actions.	<b>NOx</b>	NOx is an abbreviation for the oxides of nitrogen. Formed as a combustion product, generally when nitrogen in the air is oxidised in the presence of oxygen. NOx are largely emitted by motor vehicles and energy generators but can also be produced by lightning, forest fires and the use of fertiliser in agriculture.
<b>Ambient</b>	The surrounding environment.	<b>NPI</b>	An abbreviation of National Pollutant Inventory, Australia's national database of pollutants emitted into the environment.
<b>Anglesea Heath</b>	Overlays land leased by Alcoa from the state government under the Mines (Aluminium Agreement) Act 1961 (7097ha) and an additional 124ha of freehold land owned by Alcoa. A unique agreement with state government allows Alcoa to co-manage the area with Parks Victoria as if it were a state park.	<b>Opacity</b>	A measure of the particulates in stack gas emissions.
<b>Asbestos</b>	The fibrous form of mineral silicates, the most significant being chrysotile, crocidolite and amosite (white, blue and brown asbestos respectively). Fibres below 3 micrometres in diameter and greater than 8 micrometres in length are potentially carcinogenic.	<b>Particulate Matter (PM10)</b>	Particulate matter (PM10) is a term used to describe dust particles of less than one hundredth of a millimetre. They are emitted by industry where there are any activities involving the movement of raw materials and combustion of fuels. They are also caused by lawn mowing, wood stoves, fires and cigarette smoke.
<b>Carbon</b>	Occurs naturally in the environment. Is a product <b>dioxide</b> of complete combustion (burning) of carbon-containing (CO <sub>2</sub> ) materials. Imperative role in animal and plant life respiration (breathing). Contributes to the greenhouse effect.	<b>PCBs</b>	Polychlorinated biphenyls are mixtures of up to 209 individual chlorinated compounds (known as congeners). There are no known natural sources of PCBs. PCBs are either oily liquids or solids that are colourless to light yellow. Some PCBs can exist as a vapour in air. PCBs have no known smell or taste. At Alcoa, PCBs were historically used as coolants and lubricants in transformers, capacitors, and other electrical equipment, such as light bulbs. These are no longer used and Alcoa Anglesea is working towards being PCB free.
<b>DSE</b>	An abbreviation for the Department of Sustainability and Environment, partners with Alcoa Anglesea in the Anglesea Heath agreement.	<b>SEPP</b>	State Environment Protection Policy.
<b>EHS</b>	An abbreviation for Environment, Health and Safety.	<b>Sulphur dioxide (SO<sub>2</sub>)</b>	A colourless, non-flammable gas with the chemical formula, SO <sub>2</sub> . It is commonly used as a fruit-preserving agent, in wine making, as a bleach and as a fumigant for growing grains, grapes and citrus fruit. Natural sources of SO <sub>2</sub> can be volcanic eruptions and the decay of vegetation. It is emitted by the combustion of coal at Alcoa Anglesea.
<b>EIP</b>	An abbreviation for Environment Improvement Plan.	<b>Target</b>	A Target is a measurable goal or objective set in the EIP. It is achieved by the completion of Actions.
<b>EPA</b>	An abbreviation for the Environment Protection Authority, a statutory body established under an Act of the Victorian Parliament in response to community concern about pollution.		
<b>GLCs</b>	An abbreviation for ground level concentrations. The GLCs of SO <sub>2</sub> are measured by Alcoa's ambient air monitors in the Anglesea community.		
<b>Greenhouse gases</b>	Gases that contribute to global warming such as carbon dioxide and perfluorocarbons. These gases trap the radiant heat of the sun, allowing less of the radiation to be reflected back into space.		
<b>ISO 14001</b>	The international standard for environmental management systems (EMS) and a framework for the overall management of environmental issues at an operation.		

# we welcome your feedback

We regard community engagement and external input as the most important part of our EIP. In order to allow us to further improve on the content and development of our future EIPs, we would greatly value your thoughts and feedback. Please take the time to consider the following points and feel free to add any additional comments that you feel necessary.

Were you satisfied with the information contained in the EIP?

1 = not satisfied    2 = somewhat satisfied  
3 = satisfied        4 = exceeded expectations

Could you explain what information you found useful? \_\_\_\_\_

What information would you like to see included in future? \_\_\_\_\_

Was the EIP easy to read/follow?

1 = it was difficult to read/follow                      2 = some areas were easy to read/follow  
3 = most areas were easy to read/follow              4 = it was easy to read and follow

Please explain why you felt this way? \_\_\_\_\_

What would improve the EIP to enable you to read/follow it easier in the future? \_\_\_\_\_

Did the EIP give you a better understanding of the environmental initiatives at Alcoa Anglesea?

1 = no it did not improve my understanding              2 = it detailed environmental initiatives, but I did not learn anything new  
3 = it improved my understanding of environmental initiatives  
4 = I feel confident to discuss the quality of environmental initiatives at Alcoa's operations

Please explain why you felt this way? \_\_\_\_\_

What would you like to see included in future? \_\_\_\_\_

Would you consider being involved in Alcoa's community engagement processes in the future? \_\_\_\_\_

Are you happy for Alcoa to contact you regarding your comments or specific query?    Yes     No

Name: \_\_\_\_\_

Phone: \_\_\_\_\_

Address: \_\_\_\_\_

Email: \_\_\_\_\_

Further comments: \_\_\_\_\_

**Please send your comments to:**

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Station Chemist

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