Our people, our operations, our community
“Addressing global issues with local actions, says it all. You are informing the community about major issues but on a scale that matters to them as individuals.”
Carol Shuttleworth,
Tannum Sands resident.
Contents
03 Rio Tinto Alcan
04 Overview
07 Highlights
08 Our Approach
10 About this Report
12 Performance Summary - Rio Tinto Alcan Yarwun
13 Performance Summary - Boyne Smelters Limited
14 Communities - Rio Tinto Alcan Gladstone
18 Rio Tinto Alcan Yarwun
   Process Overview
   People
   Safety and Health
   Environment
   Greenhouse Gas Emissions and Energy
   Business Performance
30 Boyne Smelters Limited
   Process Overview
   People
   Safety and Health
   Environment
   Greenhouse Gas Emissions and Energy
   Business Performance
Rio Tinto Alcan

World Operations Map

Bauxite and Alumina
- Bauxite Mines / Deposits
- Smelter Grad Manjina Refineries
- Specialty Alumina Plants
- Offices / Other

Primary Metal
- Smelters
- Power Facilities
- Technology Sales
- Equipment Sales Centre (ECL)
- Engineering Services
- Supporting Production Facilities
- Offices / Other

Engineered Products
- Aerospace, Transportation and Industry (ATI)
- Cables
- Composites
- Extruded Products
- Engineered and Automotive Solutions
- Alcan International Network (AIN)
- Specialty Sheet
- Offices / Other

Packaging
- Food
- Beauty and Personal Care
- Pharmaceuticals and Medical
- Tobacco
- Offices

Corporate
- K&D
Rio Tinto Alcan is a global supplier of bauxite, alumina and primary aluminium, with an annual production of 32 million tonnes of bauxite, 8.5 million tonnes of alumina and 4.2 million tonnes of aluminium. In October 2007, Rio Tinto acquired Alcan Inc. for US$38.1 billion - the biggest ever mining sector takeover up to that time. Rio Tinto Alcan emerged out of Alcan Inc. and Rio Tinto’s existing aluminium business.

The combination has created the world number one producer of bauxite and aluminium. It also has a number of projects in place to secure the leading position in alumina production. Rio Tinto Alcan owns, operates or has interests in seven bauxite mines and deposits, six alumina refineries, six specialty aluminas plants, 26 aluminium smelters and 13 power generating plants, nine of them hydroelectric.

The business is a product group of Rio Tinto and maintains large, long life, cost effective operations that deliver high quality products. The strategy is to maximise shareholder return by committing to excellence in health, safety and environmental performance; working with communities to help contribute positively to their health and sustainability; maximising value generated from existing assets; and opportunistically growing the bauxite, alumina and aluminium portfolio.

Rio Tinto Alcan in Gladstone
Rio Tinto Alcan (formerly known as Rio Tinto Aluminium and before that Comalco) has operated in the Gladstone region for 40 years. Through management of Rio Tinto Alcan Yarwun and Boyne Smelters Limited, and its interests in Queensland Alumina Limited and the Gladstone Power Station, Rio Tinto Alcan has more than $2.7 billion invested in fixed assets in the region. An economic study conducted in 2006 found these business interests contributed $1.65 billion annually, or 21 per cent, of the region’s economy.
Welcome to the first combined Sustainable Development Report for Rio Tinto Alcan in Gladstone. In recognition of the closer collaboration between Rio Tinto Alcan’s two managed operations in the Gladstone region, we have combined the information formerly provided in two separate reports. Combining these reports is an important acknowledgement that our sites operate largely within the same local community. Performance data is still provided by site, however, we have amalgamated information regarding our interactions with the Gladstone community.

In July 2007 the second stage of the Rio Tinto Alcan Yarwun refinery was announced and, by year end, construction of Yarwun 2 was well underway with site clearing works and recruitment activities in full swing. In February 2008, the Boyne Smelters development project was launched, involving capital upgrades to the cranes and rails in Lines 1 and 2 and a new carbon baking furnace. These major projects further cemented Gladstone as a critical focus for Rio Tinto globally.

2007 has been a year of successes and challenges for both operations. Rio Tinto Alcan Yarwun and Boyne Smelters Limited experienced a significant improvement in overall safety performance in 2007 compared with 2006. It was a record safety year for Boyne Smelters that also represented a very encouraging improvement on the particularly poor safety performance of 2006. However, both operations still have considerable improvements to make before reaching our goal of zero injuries and illnesses.

Process stability remained a focus for Rio Tinto Alcan Yarwun for much of the year. After initial process upsets, the refinery has been producing at record levels since the major planned shutdown in October was completed. We are confident that 2008 will see the refinery operating consistently at nameplate capacity. Despite process issues, Rio Tinto Alcan Yarwun’s environmental performance significantly improved with an approximately 60 per cent reduction in the number of Category 2 and above incidents recorded (refer to page 13 for definitions).

Conversely, Boyne Smelters produced a record 550,000 tonnes of aluminium in 2007 but also experienced a number of very disappointing incidents which affected the surrounding environment. Boyne Smelters’ employees are working closely with regulators and suppliers on improvements to address environmental issues and to ensure the operation remains compliant with the conditions of the operating licence.

Both sites continued to work closely with local people to develop and strengthen relationships within the neighbouring communities. Notably during 2007, we were very pleased to have forged stronger links with the Indigenous community as we assisted with funding, employment opportunities and community projects. The mechanisms used to engage the community such meetings and other events were well attended and the feedback has been extremely valuable for Rio Tinto Alcan. These community relationships were tested during 2007, particularly at Boyne Smelters, and we are determined to retain the confidence of the community in our ability to safely and effectively manage our operations and our impacts.

Looking forward, both operations will focus on achieving further process stability. Maintaining stable and predictable processes has significant flow-on benefits for production, product quality, the health and safety of our people and the environment. Supported by Lean Manufacturing, our results for 2007 demonstrate again that we need to be constantly vigilant about all aspects of our operations as we have seen how quickly good performance can be eroded.

Finally, this Sustainable Development Report provides a summary of Rio Tinto Alcan’s performance across its Gladstone businesses in 2007, with a focus on the external impacts of our operations. Should you wish to make a comment or require further detail on either operation, we encourage you to complete the attached feedback form or contact us directly.

Doug Grimmond Brian Cooper
General Manager General Manager
Rio Tinto Alcan Yarwun Boyne Smelters Limited
“Looking forward, both operations will focus on achieving further process stability.”

Daniel Marcus, Ingot Production
“Stage 2 of the Yarwun refinery was announced in July 2007.”
Boyne Smelters celebrated one of its most successful years to date with an annual production of 550,000 tonnes of aluminium and a record safety performance in terms of recordable injuries which represented a huge step change from a poor result in 2006.

Rio Tinto Alcan Yarwun also celebrated a successful year with a 60 per cent reduction in environmental incidents and a 50 per cent reduction in safety incidents in 2007.

Rio Tinto Investment Committee approved $680 million for the Boyne Smelters Development Projects.

Rio Tinto Alcan Yarwun Stage 2, a US$1.8 billion project, was announced in July 2007. Site clearing and earthworks are now almost complete.

Approximately $174 million was paid in salaries and wages to employees at Rio Tinto Alcan Yarwun (470) and Boyne Smelters (1,248).

Approximately $162 million was paid to local suppliers at both sites. This is a testament to Rio Tinto Alcan’s commitment to using local suppliers where possible so the region may benefit directly from the operations.

Boyne Smelters apprentices won four gold and two silver medals while two Rio Tinto Alcan Yarwun apprentices won silver medals at the regional WorldSkills Australia competition.

Boyne Smelters received commendations in the biennial Rio Tinto Health, Safety and Environment Audit for its reduction to musculoskeletal injury and disease and the hazardous substance control system implemented in the Carbon MRU.

Boyne Smelter’s annual Ergonomic Improvement Awards was a finalist in the Queensland Government’s Work Safe Awards.

Rio Tinto Alcan Community Fund was re-launched and extended for another three years with an additional $1 million available for community projects.

Employees and community members joined together to celebrate Boyne Smelters’ 25 years of operations in August at a series of events. This milestone for Boyne Smelters was commemorated with a site tour day for the community, a stakeholder dinner and a coffee table book distributed to all employees.

Our people, our operations, our community
As a business, Rio Tinto Alcan contributes to global sustainable development by optimising the use of resources; adopting a responsible resources management approach which includes finding ways to avoid waste and contribute to recycling; and contributing to the knowledge, skills and capacity of host communities. Environmental, social and economic considerations are incorporated into business systems and processes including capital approval, project approval, acquisitions and divestments. All employees are responsible for considering the economic, social and environmental outcomes of business decisions.

Communities
We aim to be the preferred partner for communities by building enduring relationships with neighbours based on mutual respect, active partnership and long-term commitment. We do this by establishing and maintaining relationships that encourage open dialogue and by supporting partnerships that build capacity and promote community growth and sustainability.

People
People are the key to our business. We are striving to create workplaces where employees feel respected, supported and encouraged to achieve their full potential. We want to be the employer of first choice for potential employees.

Safety and Health
Our goal is zero. We believe that all injuries and illnesses are preventable and recognize that excellence in safety performance comes from strong leadership, consistent standards, equipment in good operational condition and the commitment of all. We have a long term health improvement strategy in place to encourage all employees and contractors to enjoy healthy lifestyles.

Environment
We are committed to managing our impacts to protect the environment. We are responsible stewards of our land and resources. Our goal is to be recognized as an industry leader in land, water and waste management.

Greenhouse Gas and Energy
As an emitter of greenhouse gases and an intensive user of energy, we have a responsibility to constructively engage with others on policy and technology solutions. We are implementing a portfolio of initiatives to identify options to meet the challenge of climate change.

Business Performance
Our global competitiveness relies on our ability to build long term, mutually beneficial relationships with customers and respond to growth opportunities. We must also work with suppliers to improve the contribution of our products to society and limit the impacts of production. We also work to ensure that the communities neighbouring our operations can share in the benefits of our operations.
“Employees are responsible for considering the economic, social and environmental outcomes of business decisions.”
Sustainable Development reports are prepared annually by all Rio Tinto Alcan businesses to provide local communities with an update on performance on sustainability indicators. In an effort to ensure the report provides relevant and interesting information, Rio Tinto Alcan asks members of its intended Gladstone audience to provide feedback on previous reports and the current report while in its draft form.

To prepare this report:
1. We analysed the Feedback Forms returned by readers of the 2006 Sustainable Development Report.
2. Attendees at a Stakeholder Forum were asked to provide specific feedback on the 2006 Sustainable Development Report and make suggestions for improvements. Many of these suggestions were incorporated.
3. Draft copies of this report were made available to community members who were asked to provide further comment before publication.

We thank those community members who returned a Feedback Form, participated in the Forum or provided verbal feedback about the content and style of this report. In balancing the need to provide detailed, relevant information in a concise and readable format, we acknowledge that not all comments have been directly incorporated this year. All feedback is both valued and considered.

Summary of stakeholder feedback

“Content
I would like to see more on Rio Tinto Alcan’s involvement in future planning for the region. What is being done now in terms of sustainability?”

Todd Comrie
Many of the stakeholders wanted more information about Rio Tinto Alcan’s plans for the future in terms of its operations and the community. Stakeholders also value transparency in reporting, particularly where there were negative impacts on health and safety or the environment. They were interested in the robustness of improvement programmes, measurement and reporting improvements and how Rio Tinto Alcan works with other organisations. More comparisons of Rio Tinto Alcan’s performance against competitors or benchmarking information were also sought.

**Response**

Each section of this report contains a “Looking Forward” section outlining focus areas and planned activities for 2008. The Performance Summary tables for each site also contain 2008 targets. Rio Tinto Alcan’s plans for engaging the community about the future as a region is the subject of the Case Study on page 17. The quantity and nature of health, safety, environment and community incidents are all documented in their relevant sections.

**Style of document**

“I’m a neighbour at Boyne and I receive this report in the mail and I pick it up and read it. It’s very readable.” Andrea Hughes

“I like the case study approach. It’s very personal.” David Kopelke

Stakeholders were largely positive about the style of report in terms of its conciseness, length and use of employee photos. The use of case studies was also well received as it gave the report a more personalised feel.

**Response**

The format has changed in 2007, combining the information from both Rio Tinto Alcan Yarwun and Boyne Smelters into a single report. The style of document has also changed to reflect the new integrated Rio Tinto Alcan branding. Every attempt was made to retain the simplicity of language, conciseness and personalised approach of previous reports.

**2007 Draft Review Feedback**

“I feel as though my input has been incorporated fairly well. With so many different views it would have been a difficult job. A follow up group discussion would have been interesting.” Kaylene Hooley

“I like the case study approach. It’s very personal.” David Kopelke
Our people, our operations, our community

Rio Tinto Alcan Yarwun Performance Summary

<table>
<thead>
<tr>
<th>Category</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2007 Target</th>
<th>2008 Target</th>
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<td>371</td>
<td>431</td>
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<td>Contractors</td>
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<td>11</td>
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<td>10</td>
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<td>Trainee intake</td>
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<td>Employee turnover</td>
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<td>Local employment</td>
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<td>63%</td>
<td>50%</td>
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<td>Indigenous employees (includes contractors)</td>
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<td>5.39%</td>
<td>3.02%</td>
<td>3.4%</td>
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<td>Female employees</td>
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<td>24%</td>
<td>19%</td>
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<td>Non traditional roles</td>
<td>11%</td>
<td>14.5%</td>
<td>10.7%</td>
<td>10.19%</td>
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<td>&gt;15%</td>
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<td>Lost Time Injuries (Ha)</td>
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<td>6</td>
<td>15</td>
<td>7</td>
<td>5</td>
<td>3</td>
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<td>All Injury Frequency Rate¹</td>
<td>1.07</td>
<td>2.55</td>
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<td>1.48</td>
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<td>Lost Time Injury Frequency Rate²</td>
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<td>New occupational illness</td>
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<td>1</td>
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<td>Wellness Programme participants</td>
<td>120</td>
<td>135</td>
<td>1.75</td>
<td>336</td>
<td>50%</td>
<td>employees</td>
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<td>Community complaints²</td>
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<td>-</td>
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<tr>
<td>- Category 0</td>
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<td>-</td>
<td>-</td>
<td>(Cat 2 and above)</td>
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<td>- Category 1</td>
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<td>7</td>
<td>7</td>
<td>25</td>
<td>(Cat 2 and above)</td>
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<td>- Category 2</td>
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<td>0</td>
<td>0</td>
<td>0</td>
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<td>Sponsorships and donations</td>
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<td>$68,203</td>
<td>$64,232</td>
<td>$84,252</td>
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<td>$70,000</td>
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<td>Rio Tinto Alcan Community Fund</td>
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<td>Environmental Incidents - Category 2+</td>
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<td>11</td>
<td>13</td>
<td>5</td>
<td>6</td>
<td>3</td>
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<tr>
<td>Non compliance with licence conditions²</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Fresh water use (L)</td>
<td>356</td>
<td>3,200</td>
<td>3,943</td>
<td>3,199.2</td>
<td>2,750.4</td>
<td>2,254</td>
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<td>Fresh water use efficiency (ML/t alumina)</td>
<td>2.8</td>
<td>3.8</td>
<td>3.2</td>
<td>3.18</td>
<td>2.8</td>
<td>3.156</td>
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<td>Seawater use¹ (ML)</td>
<td>2,336</td>
<td>4,001</td>
<td>4,257</td>
<td>5,657</td>
<td>6,658</td>
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<td>Sulphur dioxide emissions (t)³</td>
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<td>349</td>
<td>895</td>
<td>121</td>
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<td>Nitrogen dioxide emissions (t)³²</td>
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<td>-</td>
<td>-</td>
<td>104.1</td>
<td>33</td>
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<td>Land cleared for Yarwun Stage 2 (Ha)</td>
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<td>-</td>
<td>-</td>
<td>46.2</td>
<td>-</td>
<td>0</td>
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<tr>
<td>Land revegetated (Ha)</td>
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<td>-</td>
<td>-</td>
<td>4.1</td>
<td>-</td>
<td>30.3 (2010)</td>
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<tr>
<td>Total site footprint (Ha)³</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>826.75</td>
<td>-</td>
</tr>
<tr>
<td>Greenhouse gas emissions (t CO₂-e)</td>
<td>166,486</td>
<td>679,625</td>
<td>973,977</td>
<td>1,015,958</td>
<td>1,111,080</td>
<td>1,128,400</td>
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<tr>
<td>Greenhouse gas efficiency (t CO₂-e/t alumina)</td>
<td>1.31</td>
<td>0.81</td>
<td>0.79</td>
<td>0.81</td>
<td>0.79</td>
<td>0.81</td>
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<tr>
<td>Energy use (GJ)</td>
<td>2,055,897</td>
<td>679,562</td>
<td>1,240</td>
<td>1,015,958</td>
<td>1,111,080</td>
<td>1,128,400</td>
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<tr>
<td>Energy efficiency (GJ/t alumina)</td>
<td>16.2</td>
<td>9.5</td>
<td>9.0</td>
<td>9.06</td>
<td>8.82</td>
<td>8.92</td>
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<td>Wages and benefits</td>
<td>$23m</td>
<td>$35m</td>
<td>$43m</td>
<td>$50m</td>
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<td>-</td>
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<tr>
<td>Payments to local suppliers</td>
<td>-</td>
<td>$46m</td>
<td>$79.5m</td>
<td>$83.1m</td>
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<td>-</td>
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<tr>
<td>Production (’000 tonnes alumina)²</td>
<td>175</td>
<td>835</td>
<td>1,240</td>
<td>1,260</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Business improvement savings (combined target)</td>
<td>$18,000</td>
<td>$92,793</td>
<td>$4.5m</td>
<td>$2.89m</td>
<td>$10m</td>
<td>$15m</td>
</tr>
</tbody>
</table>

¹ Employee turnover in 2007 was calculated to include internal transfers across the Rio Tinto Alcan operations.
² Non traditional roles include those where a female fills a traditionally male dominated role and vice versa. This category also includes people trained in a particular skill and now working in a different area.
³ The All Injury Frequency Rate is Recordable Incidents (Lost Time Injuries plus Medical Treatment Injuries) x 200,000/number of hours worked (includes contractors).
⁴ The number of Lost Time Injuries is used in an equation to determine the Lost Time Injury Frequency Rate (LTIFR) which gives an indication of injuries against the number of hours worked. The LTIFR is the rate of occurrence of Lost Time Injuries per 200,000 hours worked.
⁵ A new community complaints category (Category 0) was introduced in 2007. This encompassed issues that had potential to impact the community but did not. The new classification means incidents classified as Category 2 in 2004 are now Category 0 in 2007.
⁶ Relevant standards are available through the Environmental Protection Agency website at www.epa.gov.au or copies of environmental licences are available by phoning 13 14 58.
⁷ Waste recycled on and off site.
⁸ Total non-mineral waste recycled on and off site.

References:
1. Rio Tinto Alcan has adopted two tools to drive process improvement and efficiencies. Lean Manufacturing provides tools to identify and eliminate waste.
2. Figures amended from 2006 report as Yarwun refined the emission estimation techniques for NOx and SOx emissions. 2006 emission figures have been updated to reflect the more accurate emission estimation methodologies.
The All Injury Frequency Rate is Recordable injuries (Lost Time Injuries plus Medical Treatment Injuries) x 200,000/number of man hours worked (includes employees and all contractors).

The number of Lost Time Injuries is used in an equation to determine the Lost Time Injury Frequency Rate (LTIFR) which gives an indication of injuries against the number of hours worked. The LTIFR is the rate of occurrence of Lost Time Injuries per 200,000 hours worked.

A new community complaints category (Category 0) was introduced in 2007. This encompasses ‘near misses’ that had potential to impact the community but did not. The new classification means incidents classed as Category 2 in 2006 are now Category 1 in 2007.

Category 2 incidents are single events causing onsite harm that is immediately recoverable or non-compliances that exceed a regulatory limit.

Category 3 incidents are an event that causes onsite harm that cannot be immediately recovered or a single event causing offsite harm that is immediately recoverable.

Relevant standards are available through the Environmental Protection Agency website at www.epa.gov.au or copies of environmental licences are available by phoning 07 49716500.

Boyne Smelters’ total greenhouse gas emissions include offsite emissions created by the generation of coal-fired electricity.

Boyne Smelters has adopted two tools to drive process improvement and efficiencies. Employees are trained in statistical analysis to understand, control and improve processes. Lean Manufacturing provides tools to identify and eliminate waste.
Community complaints
Both Rio Tinto Alcan’s Gladstone operations set a target of zero community complaints (Category 2 and above). In 2007, there were two Category 2 complaints at Rio Tinto Alcan Yarwun. One related to dust emissions of fugitive alumina at the shiploader and conveyor and the second related to a member of the public contacting the Environmental Protection Agency about dust at the refinery’s wharf.

There were two Category 3 complaints in 2007 at Boyne Smelters, both relating to community concerns about carbon emissions. The smelter’s Category 2 complaints related to odour (9), landfill dust (2), carbon emissions (1) and the buffer zone (1).

Site Managed Assessment
Rio Tinto’s Communities Standard requires all of its sites to undergo a Site Managed Assessment (SMA) every three years. The SMA team interviewed external stakeholders and employees, reviewed community programmes, documentation and policies to assess Rio Tinto Alcan’s community relations performance in Gladstone. The community relations function was found to be “well-managed and operating broadly in compliance with the Rio Tinto Communities Standard”.

Using feedback and recommendations from the Site Managed Assessment, a ten year communities plan was developed to enable a more strategic, long term focus to community relations.

Rio Tinto Alcan Community Fund
The Fund was established in 2002 to address priority issues identified by the community, namely environment, employment and education. A review of the Fund’s projects and operations was conducted by The University of Queensland’s Centre for Social Responsibility in Mining in 2007. As a result, a new focus area of “Liveability” was added as an objective in order to allow the Fund to broaden its outlook and support a sustainable community.

Following the review, Rio Tinto Alcan announced a further $1 million extension of the Fund over the next three years. In 2007, the Fund committed more than $278,000 to community projects in 2007. Examples of these projects include:

- Gladstone Area Group Apprentices Limited Technical Training Centre: a purpose built industrial shed comprised of workshop areas and training rooms for the region’s trade trainees and apprentices.
- Make the Move – Gladstone Investment and Skills Attraction Programme: a programme to address the skills shortage through the promotion of the Gladstone region as a place to live and work.

A full list of Community Fund projects are outlined in the 2007 Community Fund Annual Report.

Stakeholder engagement and community participation
Rio Tinto Alcan continued its comprehensive stakeholder engagement programme through regular newsletters, community forums, stakeholder meetings, site tours and other events. A highlight of 2007 was the public Site Tour Day at Boyne Smelters in August to celebrate 25 years of operations.

CASE STUDY
Rio Tinto Alcan supports Clean Air
Rio Tinto Alcan is participating in the Clean and Healthy Air for Gladstone study to address community concerns about air quality.

While a previous study by the Environmental Protection Agency (EPA) found no link between industry air emissions and specific illnesses in the region, further concern about Gladstone’s air prompted the EPA and Queensland Health to launch a new project to assess the impact of industry emissions on air quality and community health.

Rio Tinto Alcan is an active participant in the project and has representatives from each of its operations on the Industry Reference Group.

“We have a large number of employees and their families who live in the community and it is critical that we understand the possible impact of air emissions on them,” Community Relations Manager Mitchell Innes said.

Mitchell said Rio Tinto Alcan was helping to develop the scope of the study to ensure it is scientifically robust and allows the community to fully participate.

“It is critical that the community has full confidence in the study process and therefore its outcomes,” he said.

“Ultimately, we hope the project will allow authorities to accurately plan for future growth and development in the Gladstone region and for the community to have confidence in air quality, in their neighbouring industries and in the authorities who regulate it,” Mitchell said.

The project will be conducted over a two year period and progressive reports will be publicly available.

14
“The Community Fund announced a further $1 million extension over the next three years.”
“The Indigenous Funding Programme is assisting with the development of a local Murri Centre for Indigenous people in the region.”
These community engagement activities assist the business to determine how it can best support the community with sponsorships and donations. Over $80,000 was allocated by each site for sponsorships and donations to local schools and other not for profit organisations.

**Indigenous community**

Traditional owners worked with Rio Tinto Alcan and contractors to log and document items of cultural significance on land to be cleared for Yarwun 2. The design of Yarwun 2 was also reconfigured to preserve identified cultural heritage sites.

Four Indigenous community forums were held with a total of 70 attendees, mostly Elders and members of local Traditional Owner groups. Issues such as Rio Tinto Alcan’s health, safety, environment and operational performance, Indigenous employment and cultural heritage were discussed and actions agreed.

Attendees at the Indigenous community forum meetings also discussed, evaluated and approved applications to Rio Tinto Alcan’s Gladstone Indigenous Funding Programme. The Fund committed approximately $96,000 for projects in 2007 including the pre-feasibility study and follow up development of a local Murri Centre. The Murri Centre will be a place where local and other Indigenous people can gather as well as an area to consolidate current Indigenous organisations.

A partnership between Rio Tinto Alcan and Gladstone Area Maths, Science, Engineering & Technology Teachers supports a new programme to enhance Indigenous youth participation in the fields of science and technology. Akaltye (pronounced a-cu-l-chay), comprises a mixture of fun and interesting science, problem solving, team building and Indigenous technology activities.

**LOOKING AHEAD**

- The Baseline community study conducted in 2006 will be updated in 2008. This study includes a review of the socio-economic study of the Gladstone region and the Gladstone Community and Community Leader Survey.
- The identification of issues related to maximising local employment and the procurement of local goods and services will be carried out in 2008 with a plan to implement a strategy to manage these issues in 2009.
- Membership of the Boyne Smelters Community Forum will be reviewed in 2008 and a public meeting will be held to call for forum participants.
- A cultural heritage management strategy will be developed for Rio Tinto Alcan’s Gladstone operations.

**CASE STUDY**

Project seeks 2028 vision

Rio Tinto Alcan has a huge investment in ensuring a successful future for the Gladstone region. With literally billions invested in the region, Rio Tinto Alcan intends to be an integral member of the region’s community for many years to come.

Just what that future may hold for the region will now be determined by a cross-section of local residents who will lead the community in defining a vision for Gladstone.

Rio Tinto Alcan Gladstone Community Relations Manager Mitchell Innes said recent research had found that the community wanted a say in future planning for the region.

“We hope the project will allow all residents to provide input into how they think the Gladstone region should be developed over the next 20 years. This input will be used to create an inspiring vision for the region’s future,” Mitchell said.

The Gladstone Regional Community Visioning Project will also ask for feedback about the issues and opportunities already present in the region and where partnerships between the community, industry and government might be formed to create further opportunities.

While the project is funded by the Rio Tinto Alcan Community Fund, the company will not lead the project. “Rio Tinto Alcan already has a significant economic and social impact in the region and it is important that the community defines the sort of future it envisages for itself,” Mitchell said.

“We do hope the project establishes a platform for community input into industrial and local government planning into the future.”
Rio Tinto Alcan Yarwun was officially opened in March 2005, following a three-year construction phase. The refinery has an annual production capacity of 1.4 million tonnes of smelter grade alumina. The operation is 100 per cent owned by Rio Tinto Alcan.

Yarwun 2
In July 2007, Rio Tinto approved a US$1.8 billion expansion of the refinery which will result in more than double annual alumina production, increasing output by two million tonnes to 3.4 million tonnes by 2011.

The process
Refining alumina (aluminium oxide) is the second step in the production of aluminium. Alumina is refined from bauxite using a chemical process, known as the Bayer Process. This process, invented in 1888 by German scientist Karl Bayer, has four stages:

Digestion: Bauxite is finely ground in mills and then mixed with a hot, caustic soda solution which dissolves the alumina contained in the bauxite.

Clarification: The solution of alumina and caustic soda passes into rows of thickener tanks, in which the solid impurities sink to the bottom as a fine, red mud. This red mud is a by-product of the process, and is washed several times with water and stored at the Residue Management Area.

Precipitation: Alumina trihydrate is added to the mixture to seed the formation of additional alumina trihydrate crystals.

Calcination: The alumina trihydrate crystals are washed, filtered and then heated in gas-fired kilns at temperatures greater than 1,100°C to remove water molecules, creating a fine white powder – alumina.
Employee retention

The 2007 turnover rate for Rio Tinto Alcan Yarwun was higher than expected at 18.9 per cent. While the continued high demand for skilled workers made retaining employees difficult, several initiatives were put in place in 2007 to further understand the issue of retention, including the implementation of the findings of the 2005 Employee Opinion Survey, which included a Working Hours Survey.

Rio Tinto Alcan Yarwun exceeded the 50 per cent target for local employment by 13 per cent which reflects the refinery’s focus on employment strategies that benefit the region.

Yarwun 2 also places a priority on hiring local people to work on the project. There were 240 personnel working on the Yarwun 2 project site at year-end. Approximately 78 per cent were local residents.

Developing talent

All apprentices and trainees were hired from the Gladstone region in a concerted attempt to develop ‘local talent’ Rio Tinto Alcan Yarwun has doubled the number of trainees employed.

The introduction of dedicated training officers into Production areas in 2007 resulted in increased completion of competency training for existing employees.

Indigenous employment

Six Indigenous people gained site experience at Rio Tinto Alcan Yarwun through the Goorie Pre-Employment Programme, first instigated by Rio Tinto Alcan and now managed by Gladstone Area Group Apprentices Limited.

Rio Tinto Alcan continued to work with regional schools and job network providers to increase the participation of Indigenous people in their workforce, largely through supporting pre-employment programmes to improve the skills and job-readiness of applicants.

Performance at a glance

- Employee turnover: Target not met
- Female employment: Target not met
- Local employment: Target met
- Apprentices intake: Target met
- Trainee intake: Target met
- Indigenous employment: Target met

Looking ahead

- Reducing employee turnover remains a priority issue for 2008. This will be addressed by:
  - Redesigning leadership programmes to improve leader competencies, particularly in managing the team leader/team member relationship.
  - Development of ‘onboarding programmes’ to provide structure to a new starter’s first 90 days.
- Rio Tinto Alcan Yarwun will instigate closer involvement with the two school-based skill centres supported by the Rio Tinto Alcan Community Fund and local high schools to encourage students to consider careers with the company.
- Findings of the 2007 Employee Opinion Survey will be analysed and an implementation plan developed.
- The Diversity Plan will be reviewed to ensure the refinery is on track to meet Rio Tinto Alcan’s target of 20 per cent of women in leadership roles by 2012.
- Dedicated training officers will be introduced into Reliability (Maintenance) areas in 2008.
CASE STUDY

Local employment brings local benefits

Australia’s highly competitive labour market is well documented and its impacts are acutely felt in the Gladstone region.

With many opportunities available to workers, particularly those with valuable trade skills, employers like Rio Tinto Alcan must continually seek new strategies to attract and retain quality employees. This will become even more pressing as the construction of Yarwun 2 will require a peak workforce of 2,200 manual personnel and an additional 270 operational staff.

One of the many strategies implemented by Rio Tinto Alcan Yarwun is to encourage applications from a range of sources including females, the Indigenous community and others without an industrial employment background. Where possible, Rio Tinto Alcan Yarwun will hire local residents as it brings significant benefits to the business and the community. These benefits include school-leavers having opportunities to stay within their community, demand on accommodation is eased, it can result in greater workforce stability and economic benefits are retained in the region.

In 2007, the refinery’s long-standing local employment policy was underpinned by an active local recruitment campaign that saw all external vacancies advertised first in local media.

Rio Tinto Alcan Yarwun’s Human Resources Manager Anthony Heald said only if vacancies were unable to be filled locally were they advertised more widely. “This practice was successful, particularly at recruiting for entry-level positions,” he said.

All eight apprentices and trainees recruited in 2007 were also local residents. This has the added benefit of providing young people with quality training to develop valuable and lifelong skills. In July, Rio Tinto Alcan Yarwun apprentices – Troy Delaney and Matthew Dickinson – won silver medals in the Worldskills Australia Central Queensland Competition.

“It is great to show the wonderful opportunities in the region for young people especially.”

Kaylene Hooiley, Yarwun resident

Mechanical Apprentice

Troy Delaney and

Electrical and Instrumentation

Apprentice Matt Dickinson.
CASE STUDY

Refinery risks registered

Employees at Rio Tinto Alcan Yarwun can now better manage the risks of working in the refinery following the update of the site’s Risk Register.

A current Risk Register is an important tool to identify and reduce the health, safety and environmental risks of the refinery operations. Health, Safety and Environment Systems Compliance Specialist Colleen Mercer said that while a Risk Register was in place at Rio Tinto Alcan Yarwun, it was cumbersome and contained more than 3,000 entries. “We were faced with a challenge to improve the usability of the Risk Register but without losing any important data,” she said.

The Risk Register also needed to be compliant with a number of different quality Standards including ISO 14001 for certification, AS4360 to meet licence conditions, AS4401 and Rio Tinto’s internal HSEQ and SAP business management tools.

After widespread consultation with other employees, the result is a far more functional tool. “While all 3,000 entries still exist, we have identified 220 top line items which are classed as high risk and critical,” Colleen said. “This will help us drive our energies and directs priorities for the business planning process.”

The Risk Register will be used by leaders across Rio Tinto Alcan Yarwun when planning operating and capital expenditure budgets. “We can compare budgets and planned activities against the Risk Register and identify any gaps,” Colleen said.

“Health issues, for example, can often be overlooked as they tend to be more chronic and develop over time. Now, due to the risk register, they get the profile and attention they deserve.”

“RTA’s focus on reporting minor incidents is very encouraging.”

Craig Butler, Gladstone Region Councillor.

Health, Safety and Environment Systems and Compliance Specialist Colleen Mercer and Hydrate Team Leader Anthony Allen.
Safety performance
Rio Tinto Alcan Yarwun continues to strive for improved safety performance. While the goal is zero injuries, targets are set to drive progress towards achieving this goal. Significant progress was made in 2007 with a 54 per cent improvement in safety.

While the number of Lost Time Injuries significantly decreased in 2007, the refinery did not achieve the target of five Lost Time Injuries (LTIs). A major safety incident occurred in January resulting in significant injury to an employee burned when removing a valve in Clarification. Other LTIs injuries were Restricted Work Day Injuries classified as musculoskeletal injuries (4) and eye irritation (2).

The All Injury Frequency Rate is calculated using both Lost Time Injuries and Medical Treatment Cases. Rio Tinto Alcan Yarwun employees worked hard at improving safety performance, resulting in a 56 per cent reduction in the All Injury Frequency Rate in 2007.

Health performance
Rio Tinto Alcan Yarwun repeated its performance of 2006 and recorded one new case of occupational illness - an incidence of job-related stress.

The Wellness Programme is designed to assist employees and their families manage their health through regular checks and setting goals to improve physical and mental health. In 2007, more than 150 employees and their partners participated in this programme.

Improvement initiatives
All employees were asked to contribute ideas to address health and safety issues in the refinery funded by a $4 million capital expenditure programme in 2007. Priorities were:

- Noise
- Lighting
- Access to areas
- Bunding and containment

All leaders participated in a Safety Leadership Development Programme introduction and have agreed to personal development plans to improve their ability to lead by example in a combined effort to improve safety.

The Rio Tinto Health, Safety and Environment Quality Management System was implemented during 2007 to ensure the refinery’s ongoing compliance with internal and external standards. This system will ensure all leaders are aware of their legal health, safety and environment accountabilities and are kept up to date with changing requirements.

Yarwun 2 construction contractor Bechtel has implemented site safety systems consistent with Rio Tinto Alcan Yarwun site systems and standards. Regular communication processes between the construction and operations teams have been established to minimise potential health and safety risks when work overlaps.

Looking ahead
- The capital programme instigated in 2007 to address perennial health and safety issues will continue in 2008 and focus on:
  - Noise
  - Lighting
  - Access to areas
  - Dust
  - Manual handling
  - Ongoing focus on leadership to improve safety through actioning personal development plans, improved safety auditing and interactions with employees.
- The new HSEQ Management System will be rolled out.

Performance at a glance
- Lost Time Injuries: Target not met
- All Injury Frequency Rate: Target met
- New occupational illness: Target not set
- Wellness Programme participation: Target met
Environmental incidents
Rio Tinto Alcan Yarwun’s environmental performance significantly improved in 2007. The number of Category 2 and above incidents was reduced from 13 in 2006 to five in 2007 and therefore met the set target of six. The four Category 2 and above incidents included the discharge of seawater to Port Curtis with high pH or temperature (2), dust generated by the wharf shiploader (1) and a pipe, damaged by a bushfire, discharged seawater on a neighbour’s property (1). Yarwun 2 reported one Category 2 incident following a discharge from the Northern First Flush Pond.

The three licence non-compliances related to the discharge of small volumes of seawater of higher than licenced pH and temperatures discharged to Port Curtis. Rio Tinto Alcan Yarwun continues to work closely with the Environmental Protection Agency (EPA) to keep them informed of the refinery’s operations and enlist their support in minimizing impacts.

Environmental initiatives
Generating greater environmental awareness among employees was a focus for 2007 and resulted in an encouraging increase in reporting of incidents and near misses. The refinery’s environmental issues were also reassessed and included in the revised Risk Register (see Safety and Health case study). A DVD on refinery hazards was also produced in 2007.

Air emissions
A major project to measure the actual composition of stack emissions was completed in 2007. Flue gas desulphurisation equipment will be installed to Yarwun 2’s coal fired boiler which will ensure that sulphur dioxide emissions will only increase by 10 per cent in spite of a 140 per cent increase in alumina production.

Water
Water usage increased during 2007 in line with increased alumina production.

To ensure seawater discharges do not have a detrimental impact, an efficient ecotoxicology project was commissioned to assess the impact of the refinery’s operations. The project will conclude in mid-2008 but preliminary results indicate the effluent is not toxic to marine life.

Environmental monitoring
Offsite monitoring of groundwater, vegetation, the marine environment, noise, vibration and odour continued throughout 2007 and demonstrated these impacts were unchanged from previous years. Further targeted investigations into dust, noise, terrestrial and marine vegetation and groundwater have already commenced to gather more specific data.

Yarwun 2
Updated environmental modeling was conducted to ascertain the projected impact of Yarwun 2 on the environment. This information was shared with the community. The Yarwun 2 team have recovered 300 grass trees and relocated wildlife from the land cleared for the expanded refinery.

Environmental Management System 14001
The refinery obtained re-certification for its Environmental Management System in September 2007.

LOOKING AHEAD
• A major effort is underway to reduce water use to minimise the refinery’s take of water from Awoonga Dam. This will assist the Gladstone Area Water Board to have greater supply capability during times of drought. Several water optimisation projects are already under investigation.

• Further focus on improving leaders’ understanding of their environmental accountabilities.

• Capital improvement programmes targeting reduction and containment of liquid and air emissions have been approved for 2008.

• A focus on waste reduction and reuse and reprocessing of gloves, wood and filters has been targeted by the Health, Safety and Environment team.
CASE STUDY

Groundwater under focus

A review commissioned by Rio Tinto Alcan Yarwun has found that refinery operations have not impacted local groundwater.

Environment Specialist Natalie Madden said the review covered the refinery area, the Residue Management Area (RMA) and the caustic storage area. Analysis of data collected from these areas was compared to background data and compared to data included in the refinery’s 1998 Environmental Impact Statement (EIS) found that environmental values have remained unchanged.

Rio Tinto Alcan Yarwun’s groundwater monitoring programme includes quarterly sampling of six bores at the refinery, 32 bores at the RMA and four bores at the caustic storage area at Fisherman’s Landing. The quarterly, six monthly and annual programme includes analysis of pH, total dissolved solids, alkalinity, salinity, fluoride aluminium, gallium, molybdenum and vanadium.

To manage this data set, Rio Tinto Alcan Yarwun has purchased a geographic information system (GIS).

“One of the Health, Safety and Environment Advisors is kept busy, full-time, mapping environmental data and looking for trends and changes in various environmental parameters, including groundwater quality,” Natalie said.

The use of the GIS brings state of the art technology to Rio Tinto Alcan Yarwun and allows the Environment Team to respond quickly in the event that results differ from background.

“‘The visual presentation of the information means that we can readily involve operators, refinery managers and the community in the groundwater programme by showing them impacts on a map instead of pages of numbers,’ she said.

“It goes back to being open and transparent. I value being asked for my opinion as a community representative.”

Carol Shuttleworth, Tannum Sands resident.
As a modern refinery, Rio Tinto Alcan Yarwun is already one of the most energy efficient alumina refineries in the world.

The majority of greenhouse gases associated with alumina refining are created as a result of energy requirements, rather than as process emissions. By improving site energy efficiency, Rio Tinto Alcan Yarwun will have its largest impact on reducing its greenhouse footprint.

Steam specialist Brad Melham said improved process stability, allowing the refinery to operate at full capacity, will make the largest improvement. “Running at anything less than nameplate doesn’t allow the inbuilt energy efficiencies to be fully realised,” he said. “However, there is still lots of scope for smaller improvement.”

The Yarwun Energy Team (YET) was established in 2007 to drive operational improvements at the refinery, and work to increase knowledge and understanding of climate change and energy efficiency amongst employees.

Led by Health, Safety and Environment Manager Peter Firth, the team is comprised of a cross section of employees working in areas throughout the refinery, from process technicians to technical experts.

Peter said the team was charged with generating and considering ideas to reduce site energy use.

“The team will also set the refinery’s energy targets looking out to 2012,” he said.

One of the team’s first major tasks was to review the recommendations of the Energy Management Review presented in December 2007, identify key improvement projects and set energy efficiency targets for the refinery.

“I am looking forward to the gas co-generation facility”.

Kaylene Hooley, Yarwun resident.
Greenhouse gas emissions
Most greenhouse gas emissions associated with alumina refineries are generated through burning coal to generate steam or using gas to heat the calciners.

Greenhouse gas emissions rose in 2007 as a function of increased production at the refinery. However, the refinery produced less greenhouse gas emissions than anticipated as it produced less alumina than planned.

Greenhouse gas efficiency, or the amount of greenhouse gas produced per tonne of alumina produced, increased and exceeded the set target. This is largely due to the refinery not operating efficiently at nameplate capacity for significant periods of time.

Energy
The refinery used more energy in 2007 than 2006, but used less than anticipated. Process difficulties meant that energy was not used as efficiently as intended and therefore the 2007 energy efficiency target was not met.

An Excellence in Energy Management Review report was commissioned in late 2007 to better understand opportunities for energy use improvements on site. The Yarwun Energy Team was established to review and implement energy efficiency initiatives at the refinery (see Case Study).

Current practices and processes of the existing refinery were also reviewed to ensure the design of Yarwun 2 is as energy and greenhouse gas efficient as possible.

Improvement projects
A number of projects were implemented to improve energy and greenhouse gas emission efficiency in the production process. These included:

• A change in the specification on steam traps. Traps were failing within weeks and not catching condensation, therefore wasting steam (energy) and water.

• A process change was implemented to remove silica from the product solution before the digestion process. Known as desilication, the process is expected to reduce scaling on the inside of pipes that causes a loss of heat transfer.

• Optimisation work on the soot blower in the boiler area has saved steam loss and reduced maintenance.

LOOKING AHEAD

• The Yarwun Energy Team will develop a long term energy plan using recommendations of the energy review.

• Yarwun 2 will include a 160 megawatt gas turbine and heat recovery steam generator. Modelling predicts that this option will see greenhouse gas emissions from the expanded plant increase by 0.95 million tonnes of carbon dioxide rather than 1.49 million tonnes. It will improve greenhouse gas intensity across the expanded plant by 36 per cent compared to current performance. The cogeneration facility will also provide approximately 75 megawatts of highly efficient gas fired electricity to the Queensland power grid.
Production
Alumina production increased by 20,000 tonnes in 2007 which was less than anticipated. A series of technical issues contributed to process instability and lost production. However, following scheduled shutdowns in October, the refinery reached record levels of alumina production in the last two months of the year.

The quality of alumina produced at the refinery was the focus of improvement work in 2007. If alumina particles are too small, they can cause process issues and efficiency losses for smelter customers. A new instrument was commissioned in 2007 to enable better analysis of alumina particle size that will result in more consistent product quality.

Operations at Fisherman’s Wharf saw 104 ships processed including the delivery of bauxite in 51 ships and caustic in 11 ships. A total of 42 ships were dispatched carrying alumina to customers.

Economic contribution
Rio Tinto Alcan Yarwun’s operations continued to generate significant income for the Gladstone region with more than $133 million flowing into the local economy through salaries and payments to local suppliers.

Yarwun 2
Rio Tinto approved a US$1.8 billion expansion of the refinery, known as Yarwun 2. The expansion will allow an extra two million tonnes of alumina to be produced annually. Work began on the site in October with the clearing of 46.2 hectares of land. The project will be mechanically complete in September 2010.

The Yarwun 2 Employment and Mobilisation Centre was established in December 2007 to coordinate the recruitment of construction personnel and an online registration facility was also established.

Business improvement
The full savings from the successful application of Six Sigma and Lean Manufacturing tools were not achieved as planned in 2007 as the Business Improvement team were instead focused on resolving more immediate production issues. However, business improvement efforts did generate $11.76 million in value for the business over the year.

Performance at a glance

<table>
<thead>
<tr>
<th>Category</th>
<th>Target</th>
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<tbody>
<tr>
<td>Production</td>
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<tr>
<td>Wages and salaries</td>
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</tr>
<tr>
<td>Payments to local suppliers</td>
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</table>

LOOKING AHEAD

- With the refinery processes stabilising during the latter half of 2007, the focus of 2008 is to consistently achieve nameplate production.
- Six Sigma and Lean Manufacturing programmes will be revitalised to achieve business improvement through more rigorous selection of improvement projects.
- Work will focus on ensuring smooth interaction between operations and construction workforces though these interactions are not expected until mid 2009.
CASE STUDY

Business improvement pumps out value

Combining the business improvement tools of Six Sigma and Lean Manufacturing has solved one of the refinery’s long-standing issues.

Ever since commissioning, displacement pumps installed in the Digestion area of the plant (where ground bauxite is combined with caustic soda solution) have not operated at their peak.

The Pump Reliability Improvement Team was established in 2007 to apply business improvement techniques to addressing pump issues. The team’s first step was to develop some simple tools to measure performance on a daily basis and identify the root causes of the issue. They identified that daily, basic maintenance could reduce the failure rate and also recommended regularly cleaning of suction screens and an upgrade of the pump’s propelling systems.

Borrowing from Lean techniques, the team established systems and processes to ensure improvement were maintained, including the use of visual tools (such as photos) to make it easier for employees to understand how the pump should look and therefore allow early identification of problems.

The results have been impressive. Business Improvement Specialist Errol Rowland said the improvements generated $1.8 million in value in 2007 and reduced production losses due to pump failures by 56 per cent.

“It has also enabled us to stabilise the process at the front end of the plant. This has many flow on health, safety and environment benefits by reducing the number of unplanned start ups and shut downs,” he said.

“What is being done now in terms of sustainability?”

Todd Comrie, BSL community forum member.
Boyne Smelters Limited
Boyne Smelters Limited is Australia’s largest aluminium smelter, producing 550,000 tonnes of aluminium in 2007. Rio Tinto Alcan manages Boyne Smelters on behalf of its joint venture partners.

Producing aluminium

- Bauxite is mined by Rio Tinto Alcan at Weipa in Cape York and shipped to Queensland Alumina Limited (QAL) and the Rio Tinto Alcan Yarwun alumina refinery, both at Gladstone, where it is refined into alumina. Alumina is transported by a ten kilometre conveyor from QAL to Boyne Smelters for the third stage of the aluminium production process – smelting.

- Boyne Smelters uses the Hall-Heroult process to turn alumina into aluminium metal. This process requires alumina, electricity and carbon. The alumina is fed into individual reduction cells and dissolved in a bath of molten cryolite (sodium aluminium fluoride). The electric current required for chemical reduction of alumina (231,000 amps for Lines 1 and 2 and 436,000 amps for Line 3) flows into the bath through carbon blocks called anodes. This initiates a reaction that reduces the alumina to molten aluminium and carbon dioxide.

- Molten aluminium is attracted to carbon cathodes and is siphoned at the base of the cell. A proportion of the accumulated metal is siphoned out of the cell every 36 hours. Gases generated during the reduction process are collected and cleaned to better than 99 per cent efficiency before being released into the atmosphere.

- Crucible transport vehicles transfer the molten aluminium from the reduction lines to the Metal Products Casthouse, where the metal is formed into either ingot, t-bar or billet products.

## Process Overview

### Ownership

<table>
<thead>
<tr>
<th>Shareholding in Boyne Smelters Limited %</th>
<th>Interest in Reduction Lines 1&amp;2 %</th>
<th>Interest in Reduction Line 3 %</th>
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</table>
Employee Turnover
While a slight improvement on 2006 turnover was recorded, Boyne Smelters failed to reduce turnover to its target of eight per cent. The widely-acknowledged skills shortage has created a very competitive employment market with significant wage growth in Central Queensland.

To address employee turnover, an annual market review of salaries and benefits was conducted and some adjustments made. Additionally, an employee ‘health check’ was conducted to engage employees on issues of specific concern. Human resources staff were also embedded within teams across the site to improve frontline service delivery and ensure they were accessible to deal with day to day issues.

Developing Talent
Boyne Smelters again offered a range of training and development opportunities for its people.

The skills shortage experienced in Gladstone over recent years prompted Boyne Smelters to increase its commitment to apprentice training with 18 new apprentices starting work in 2007, taking the total number of apprentices on site to 39. Five new trainees were also hired in 2007. All apprentices and trainees were recruited from the local region (see Case Study).

Twenty-five new graduates started a three year graduate training programme at Boyne Smelters and 30 other university students gained important work experience through paid vacation employment for a three month block from November to February.

A total of 26 people completed Frontline Leadership Development Programme (FLDP), comprising 20 days of training, to improve the quality of leadership.

Indigenous employment
Recruitment activities directly targeting Indigenous candidates continued throughout 2007. Rio Tinto Alcan’s Indigenous employment team have worked closely with the Indigenous community to identify and overcome barriers to employment (such as transport). As many of the potential candidates are also the long term unemployed, Rio Tinto Alcan is also working on a range of practical responses such as pre-employment training programmes to help candidates develop their job-seeking skills.

Performance at a glance

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Target</th>
<th>Result</th>
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<tbody>
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<td>Employee turnover:</td>
<td></td>
<td>Target not met</td>
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<tr>
<td>Apprentices and Trainee intake:</td>
<td>Target met</td>
<td>Target met</td>
</tr>
<tr>
<td>Graduate intake:</td>
<td>Target met</td>
<td>Target met</td>
</tr>
<tr>
<td>Indigenous employment:</td>
<td>Target not met</td>
<td>Target not met</td>
</tr>
<tr>
<td>Female employment:</td>
<td>Target not set</td>
<td>Target not set</td>
</tr>
</tbody>
</table>

LOOKING AHEAD

• A key focus of 2008 will be to reduce turnover and ensure that employees are engaged in the business.
• A new training model will be implemented to ensure more effective hands-on training for process technicians.
• New leaders will continue to be engaged and developed through FLDP and other training programmes.
• In response to community feedback, a new electronic recruitment system will be commissioned to make it easier for potential candidates to apply for positions online.
CASE STUDY

Training investment pays dividends

A commitment to providing quality trade training to local people has started to show results for Boyne Smelters. The 18 apprentices who began their careers with Boyne Smelters in 2007 spent much of their time at the new Trade Training Centre. The Centre includes a classroom for theoretical training, mechanical practical training area and electrical training area and is designed to provide training for apprentices and qualified equipment technicians.

Boyne Smelters’ Technical Training Officer and Apprentice Coordinator Paul Camman said the training centre enabled staff to meet away from their work environment and daily interruptions. “It enables training to be held in a comfortable and safe training facility with minimal disruptions,” he said.

The quality of Boyne Smelters’ apprentice training programme was put to the test in 2007 when apprentices competed in the WorldSkills Australia competition, a national trade competition for young people. Boyne Smelters’ apprentices were awarded four gold and two silver medals (fitter, turning, electrical control and electrical installation) in the regional competition, an achievement not matched by another local company.

Paul attributed the success to the time and effort spent in recruiting and training apprentices. “There is a lot of competition among industries in Gladstone to attract the top applicants so we have to make sure we are offering attractive packages covering training and employment conditions,” Paul said. “We also put a lot of time into ensuring our apprentices have the right disposition.”

The gold medal winners will compete at the National WorldSkills competition in Sydney in July 2008.

In 2007 BSL supported a total of 39 apprentices on site.

“The community really appreciates what you are doing with training.”

Kaylene Hooley, Yarwun resident.
Safety performance
While the target was not met, the number of Lost Time Injuries (LTIs) was halved in 2007 after a particularly disappointing year in 2006. There were nine LTIs in 2007 and seven Medical Treatment Injuries which resulted in a total of 16 recordable injuries. This is four less than Boyne Smelters’ previous best recordable injuries performance.

Of the nine LTIs, there was one Lost Day Injury (a dislocation) and eight Restricted Work Day Injuries including a contusion (1), fractures (4), muscle/soft tissue disorder (1) and strains/sprains (2). While the Lost Time Injury Frequency Rate target was not met, significant reductions were achieved in 2007 and the business is back on track towards achieving the goal of zero injuries.

Contractors at Boyne Smelters also continued to improve their safety performance with three LTIs reported in 2007 compared with five in 2006. Contractor injuries are included in the site’s overall safety statistics.

Safety improvement activities
Boyne Smelters continued to focus on the basic underlying tools of its safety system to ensure they were well embedded and effective. Four key programmes were selected: Safety Interactions, Tool Box meetings, Take 5 and Standards.

Safety interactions are used to engage and encourage people to agree on safer ways of doing work to avoid hurting themselves and others. Toolbox meetings are designed to engage the team in safety discussions before work begins. Take 5 is a pre-task risk assessment process designed to encourage people to think about hazards and appropriate controls before beginning a specific task.

Teams were established in 2007 to review existing Safety Interaction and Tool Box meeting processes and develop new and effective systems. These were developed and fully documented during 2007 and initial training commenced.

Safety training
Approximately 75 per cent of employees completed Zero Incident Process (ZIP) training which helps participants understand how their personal beliefs contribute to safety. Analysis of the 2006 safety result pointed to poor safety leadership as a contributing factor. This has prompted a renewed commitment from leaders to more actively and rigorously support safety systems.

Health Performance
The 16 new cases of occupational disease reported in 2007 related to musculoskeletal disease (10), occupational asthma (4) and skin disease (2). Of the ten musculoskeletal diseases incurred, eight were as a result of Hand Arm Vibration (HAV) exposure.
Health improvement activities

The Health and Hygiene team continued routine personal monitoring to ensure employee exposure to noise, dust and fluoride remained within limits. Monitoring of employee exposure to HAV was also a focus of 2007 and resulted in the early detection of potential issues. Approximately 900 personal routine health checks were conducted in 2007. A number of capital projects to reduce employee exposure to noise continued throughout 2007. For example, control rooms were installed for operators working on ingot machines and inkjet printing of logos on products have replaced a stamper.

The team also expanded personal monitoring activities to contractors working on Queensland Alumina Limited’s neighbouring red mud dam following concerns about their exposure to emissions from Boyne Smelters.

Skin Check Campaign

More than 600 employees and their partners took advantage of free skin checks provided by specialist consultants stationed at the smelter for three weeks. Of those people checked, 12.5 per cent were diagnosed by a dermatologist with suspicious lesions requiring further treatment.

Are You Ready?

Analysis of safety statistics showed the majority of incidents requiring first aid treatment occurred during the first four hours of a shift for shiftworkers or on Monday mornings for day workers. In response, the smelter’s Health, Safety and Environment Activity team (comprised of representatives from across the site) launched the “Are You Ready?” campaign to raise awareness about being fit for work. Using tools such as handing out water bottles and breakfast bars and producing posters, pamphlets and fridge magnets, the team urged the workforce to ensure they were well rested, hydrated, alert and had eaten well before attending work.

Health promotion activities

Helping employees and their families to maintain a healthy lifestyle is a key component of Boyne Smelters’ overall health strategy. More than 260 employees again participated in the Wellness Programme in 2007.

PASH Day

The inaugural and hugely successful Promote Active Safety and Health, or “PASH”, Day was held in October. The event comprised a series of information stalls and demonstrations to raise employee awareness of a range of health and safety issues including ergonomics, lifting and manual handling, alcohol awareness, Hand Arm Vibration signs and symptoms, mini health checks, respirator maintenance, hydration, healthy eating, physical activity and home fire safety. More than 300 people attended the event and provided very positive feedback about the event and suggested expanding topics to include guest speakers and information about work life balance. Based on the success of the 2007 event, PASH Day will become an annual event.

Performance at a glance

- Lost Time Injuries: Target not met
- Lost Time Injury Frequency Rate: Target not met
- All Injury Frequency Rate: Target met
- New occupational illness: Target not met
- Wellness Programme participation: Target not met

LOOKING AHEAD

- The redesigned Take 5 system will be rolled out to employees.
- Employees will continue to be trained in the new Safety Interactions and Tool Box systems.
- A team will be formed to work on a new system for monitoring and implementing safety standards.
- All employees will have completed ZIP training.
- Nine of the ten musculoskeletal diseases reported in 2007 were caused by exposure to Hand/Arm Vibration. A new machine will be commissioned in 2008 to eliminate 95 per cent of the hand ramming tasks that cause much of this damage.
- Further noise reduction projects will be implemented.
- A Health, Safety and Environment document management system will be implemented.
Environmental incidents
Boyne Smelters’ environmental performance in 2007 was disappointing. There were 32 Category 2 incidents and six Category 3 incidents in 2007. Four of the Category 3 incidents related to fluoride air emissions due to the failure of filter bags in gas treatment centres on Reduction Lines. A fire in the Carbon Bake gas treatment centre caused the two remaining incidents related to higher than permitted air emissions and the occurrence of a high amount of suspended solids in water discharge.

The six Category 3 incidents also resulted in breaches of Boyne Smelters' environmental licence conditions. The Environmental Protection Agency (EPA) fined Boyne Smelters $1,500 for a fluoride emission breach in January and the smelter entered into an Environmental Management Plan (EMP) to reduce these emissions. All actions associated with the EMP were completed in November 2007. During the second half of 2007, the smelter ran at 18 per cent below licence requirements related to fluoride emissions.

Air Emissions
A fire in the Carbon Bake gas treatment centre in July caused a number of environmental issues and prompted community concern. Gases produced by the baking of carbon anodes are collected and passed through a gas treatment centre to remove fluoride prior to the release of gases to the atmosphere. While the fire was quickly extinguished by Boyne Smelters’ emergency crews, the gas treatment centre remained inoperable for seven days during which time untreated gases were released, causing a Category 3 environmental incident.

While fluoride emissions were lower in 2007 than 2006, they did not meet internal targets. A programme to reduce fluoride emissions released from across the site was undertaken to restore Boyne Smelters to operational compliance with its licence conditions (see Case Study).

In 2004, Rio Tinto Alcan commissioned sulphur dioxide (SO2) ambient air modelling for the area around Boyne Smelters. The modelling was based on SO2 emissions calculated from the site that showed that Boyne Smelters could have been exceeding state guidelines for ambient SO2 concentrations (although the probability was very low). This model was validated in 2007 using real-time SO2 measurements from two smelter locations. Using the model, data collected from the monitoring stations demonstrated that SO2 ambient air concentration around Boyne Smelters, and in the community, was well below state guidelines.

Odour
Approximately $250,000 was spent in October on modeling discharges from the Carbon Bake stacks to determine the concentrations of gases and potential sources of odour. This data will be used in modeling work during 2008 to determine Boyne Smelters’ impact on air quality from this source.

Water
The fire in Carbon Bake in July also resulted in a water-related Category 3 incident. Sampling of the water in Spillway Creek found that water used to extinguish the fire had entered the Creek with a suspended solids level of 42mg/L, which exceeded Boyne Smelters’ licence limit of 30mg/L. The EPA is still investigating the incident.

Performance at a glance

| Environmental incidents (Cat 2 and above): | Target not met |
| Non compliance with licence conditions: | Target not met |
| Water recycled: | Target not set |
| Fluoride emissions: | Target not met |
| Waste to landfill: | Target not met |
| Clean tar recycled: | Target not met |

A number of projects to improve water efficiency have been implemented across Boyne Smelters. For example, an upgrade of Reduction Line 1 & 2 Compressor Cooling Towers has resulted in reduced water loss and chemical consumption, while employees in Metal Products are now recycling 500 litres of clean water onto gardens each week.

Waste
A number of recycling initiatives were instigated across the site including soft plastics, mobile phones, printer toners, and cartridges and plastic bottle recycling.

LOOKING AHEAD

- A significant campaign will be undertaken to reduce the waste being stored on site through increased awareness, training, recycling, reuse and other waste minimisation initiatives.

- Boyne Smelters is aiming to improve water quality through better drain management, spill cleanup and minimisation, and projects focused on reducing the amount of fresh water used.

- An EMP to reduce alumina spillage along the haul road conveyor will expire in December 2009. Actions completed to date include the temporary encapsulation of the transfer points, regular inspections and clean up of spillage. Engineering design work is in progress to enable construction of effective emission free transfer systems to begin in 2008.

- Further refurbishment and upgrade work will be completed on the ship unloader to reduce fugitive dust emissions. This work is detailed in the Transitional Environmental Programme (formerly known as an EMP) lodged with the EPA with work planned for completion in September 2008.

- The A$685 million project to replace Carbon Bake furnaces announced in February 2008 will further reduce sulphur and nitrogen dioxide emissions, greenhouse gases and odour.
CASE STUDY

Fluoride emission campaign successful

Fluoride emissions are generated as part of the aluminium smelting process. Boyne Smelters’ environmental licence states that, on a monthly basis, fluoride emissions should not exceed 1kg/tonne of aluminium produced and this limit was consistently met prior to 2007.

However, in January 2007, total fluoride emitted from total site exceeded the licence limit. This occurred again in February, March and May, prompting four Category 3 environmental incidents which also constituted breaches of the smelter’s environmental licence.

A team was set up comprised of members from across the smelter to understand the problem and provide pathways to solution. Their investigations found that filter bags in the gas treatment centres, which normally have a three-year life, were failing.

Environment Specialist Jo Burns said the decline in filter bag effectiveness was believed to be caused by higher cell fume temperatures exacerbated by hot summer weather.

Jo said Boyne Smelters submitted an Environmental Management Programme, a legally binding commitment, to the EPA detailing the actions to be undertaken to restore the smelter to compliance.

The actions included an accelerated filter bag replacement programme to ensure that filter bags were replaced before the end of their effective life. New hoods, used to cover the reduction cells, were designed and installed. The hoods are lighter and fit the cell cavity more closely, thereby reducing fugitive emissions from the cells.

A new style of filter bag was also trialled: “They are known as star bags and have a larger surface area to clean gases,” Jo said. “These bags have been very successful in reducing fluoride emissions since their installation.”

Combined with greater employee focus on the issue, these measures have helped Boyne Smelters stay within licence limits since May and average 0.82 kg/t Al for the last six months. All actions to be undertaken by Boyne Smelters under the EMP were completed in November.

The team will continue to focus on further reducing fluoride emissions throughout 2008.

It would be good to say in the report, “We believe that these things are important and we want to work with you to achieve outcomes for them.”

Todd Comrie, BSL community forum member.
CASE STUDY

Eliminating PFCs

Aluminium production is a highly greenhouse intensive business. Boyne Smelters’ reliance on coal-fired electricity generated by the Gladstone Power Station makes it even more so.

Emissions are generated by using fuels onsite, consuming carbon anodes, producing perfluorocarbons, and purchasing electricity.

Perfluorocarbons (PFCs) are one source of preventable greenhouse gas emissions. PFCs are released from reduction cells during anode effects which occur when cells are not operating optimally.

Technical manager Alan Milne said that until recently, PFC emissions were considered to be an inherent byproduct of the smelting process. “We have now changed our thinking and believe it is possible to substantially reduce PFCs,” he said.

The Comalco Control System, an automated process control system designed and developed by Rio Tinto Alcan, is helping Boyne Smelters work towards this goal.

While the CCS has been controlling Reduction Lines 1 & 2 for some years, it was only fully implemented on Reduction Line 3 during 2007.

“The CCS is able to more rapidly extinguish anode effects and hence markedly reduces the time PFCs are being emitted,” Alan said. “It allows greater control of cells and has delivered a substantial reduction in anode effect frequency and PFCs emissions.” Alan said.

Carbon dioxide equivalent emissions from anode effects on Reduction Line 3 is approximately 13,000 tonnes lower in 2007 than 2006.

“This is a reduction of approximately 25 per cent,” he said.
Greenhouse gas emissions

Boyne Smelters’ overall greenhouse gas emissions include those created by the off site generation of power the smelter consumes. The overall greenhouse gas emissions decreased in 2007 due to efficiency improvements at the Gladstone Power Station that supplies the smelter’s energy needs.

The smelter itself experienced some challenges with greenhouse gas emissions in 2007. In particular, a major power outage in June caused a process disruption that took some months to recover from, resulting in higher than anticipated emissions.

A number of programmes and initiatives were implemented during 2007 to reduce Boyne Smelters’ greenhouse gas emission footprint. The most significant impact in 2007 was the implementation of the Comalco Control System (CCS) to control reduction cells on Line 3 (see Case Study).

A Climate Change Team, with members representing all departments, also worked on a range of projects and communication activities aimed at raising awareness of climate change and energy-related issues.

Energy

Boyne Smelters’ record 2007 production also resulted in increased total energy use. The process instability caused by the power outage in June also reduced Boyne Smelters’ ability to achieve planned improvements in energy efficiency.

During 2007, energy efficiency experts were commissioned by Boyne Smelters to assess the smelter’s energy use practices and suggest improvement projects.

Performance at a glance

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LOOKING AHEAD

- Boyne Smelters has undertaken a programme to replace all petrol-fired vehicles with diesel vehicles which will result in fewer greenhouse gases generated, on a fuel-usage basis.
- Further tuning of the CCS on Reduction Lines in 2008 is expected to further reduce anode effect duration and frequency.
- A programme to improve the efficiency of anodes to reduce the generation of greenhouse gas emissions will be undertaken in 2008.
- The energy efficiency improvements projects identified by consultants will be scoped, prioritised and implemented in 2008.
- The new Carbon Bake plant, included in the Boyne Smelter Development project, will help reduce the smelter’s on site emissions by a further 20,000 tonnes per annum.
Production
Boyne Smelters produced a record of 550,000 tonnes of primary aluminium products in 2007. Boyne Smelters again benefited from a strong metal price throughout 2007 and high customer demand for its products.

Boyne Smelters is a tolling operation and therefore does not directly market its product. Aluminium is shipped to owners in line with their percentage ownership. Approximately 41 per cent of total annual production is sent to Japanese participants and Rio Tinto Alcan’s remaining 59 per cent share is sold to domestic and international customers.

A total of 68 ships were processed at the wharf including 25 ships transporting raw materials to the smelter and 44 ships carrying aluminium to customers.

Economic contribution
Boyne Smelters’ operations continued to generate significant income for the Gladstone region with more than $203 million flowing into the local economy through salaries and payments to local suppliers.

Business Improvement
Projects to improve production processes and reduce waste delivered $15.6 million in value to Boyne Smelters in 2007.

Boyne Smelters was the first of Rio Tinto Alcan’s sites to pilot Lean Manufacturing in 2006. Lean is intended to deliver an organisation that is the safest, lowest cost, highest quality producer of aluminium. The many Lean Manufacturing initiatives implemented across Boyne Smelters have delivered significant improvements towards process stability that also delivers health, safety, environment and greenhouse emission benefits. Approximately $3.8 million in value was realised through Lean Manufacturing improvements in 2007.

Six Sigma has been an integral component of Rio Tinto Alcan’s business improvement programme since 2002. There were six Six Sigma specialists, working full time on improvement projects and 32 specialists working on projects part time over the year. During 2007, these projects delivered benefits by improving the metal pueity of Reduction Lines 1&2, current efficiency and the output of Vertical Direct Chill casting. Value generated from Six Sigma projects in 2007 was $11.8 million, $4.3 million more than planned.

LOOKING AHEAD
• Lean Manufacturing’s foundation elements will be embedded during 2008 following a system review and clarification.
• Further Six Sigma improvement projects will be developed and more strategically aligned to business needs.
• Opportunities to work closely with former Alcan colleagues are expected to deliver significant benefits for Boyne Smelters in terms of technical/operational knowledge-sharing and business improvement programmes.
CASE STUDY
Preventing for the future

While Boyne Smelters employees joined community members in celebrating 25 years of operations, a project team was working on plans to extend the smelter’s life for at least another quarter century.

After 25 years, some of the smelter’s original plant and supporting infrastructure was starting to show its age and the Boyne Smelter Development team had been considering options to ensure continued operations and future growth opportunities.

In February 2008, Rio Tinto approved two major projects with a total value of A$685 million.

Boyne Smelters General Manager Brian Cooper said work would begin in 2008 and the existing Carbon Bake 1&2 plant was expected to be decommissioned in late 2010. A workforce of approximately 450 at peak will be required for the construction project.

“Boyne Smelters General Manager Brian Cooper said work would begin in 2008 and the existing Carbon Bake 1&2 plant was expected to be decommissioned in late 2010. A workforce of approximately 450 at peak will be required for the construction project.

“This represents further significant investment in Boyne Smelters and our future by our owners,” he said.

“These improvements not only secure our future operations but will bring other significant benefits. For example, commissioning of the new Carbon Bake plant alone will reduce our overall greenhouse gas emissions, as well as odour emissions, by a further two per cent,” he said.

Gail Sellers, Gladstone Region Councillor.

“IT’s great to have a warts and all approach. Let’s celebrate the good, but acknowledge where improvements need to be made.”

Over seven kilometres of crane rail will be replaced.
Feedback

Please take a moment to complete this pre-paid mailback form.

Your comments will help improve our future reports and ensure that you get the information you require.

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   □ Poor  □ Fair  □ Good  □ Very good  □ Excellent

   Gave me the information I wanted
   Was clear and understandable
   Had an appropriate level of technical detail
   Was well laid out and readable
   Was transparent and credible

2. What sections did you find the most interesting and why?

3. What sections did you find the least interesting and why?

4. What would you like to see included in future editions of the report?

5. Other comments?

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Addressing global issues with local actions, says it all. You are informing the community about major issues but on a scale that matters to them as individuals.

Carol Shuttleworth, Gladstone resident.