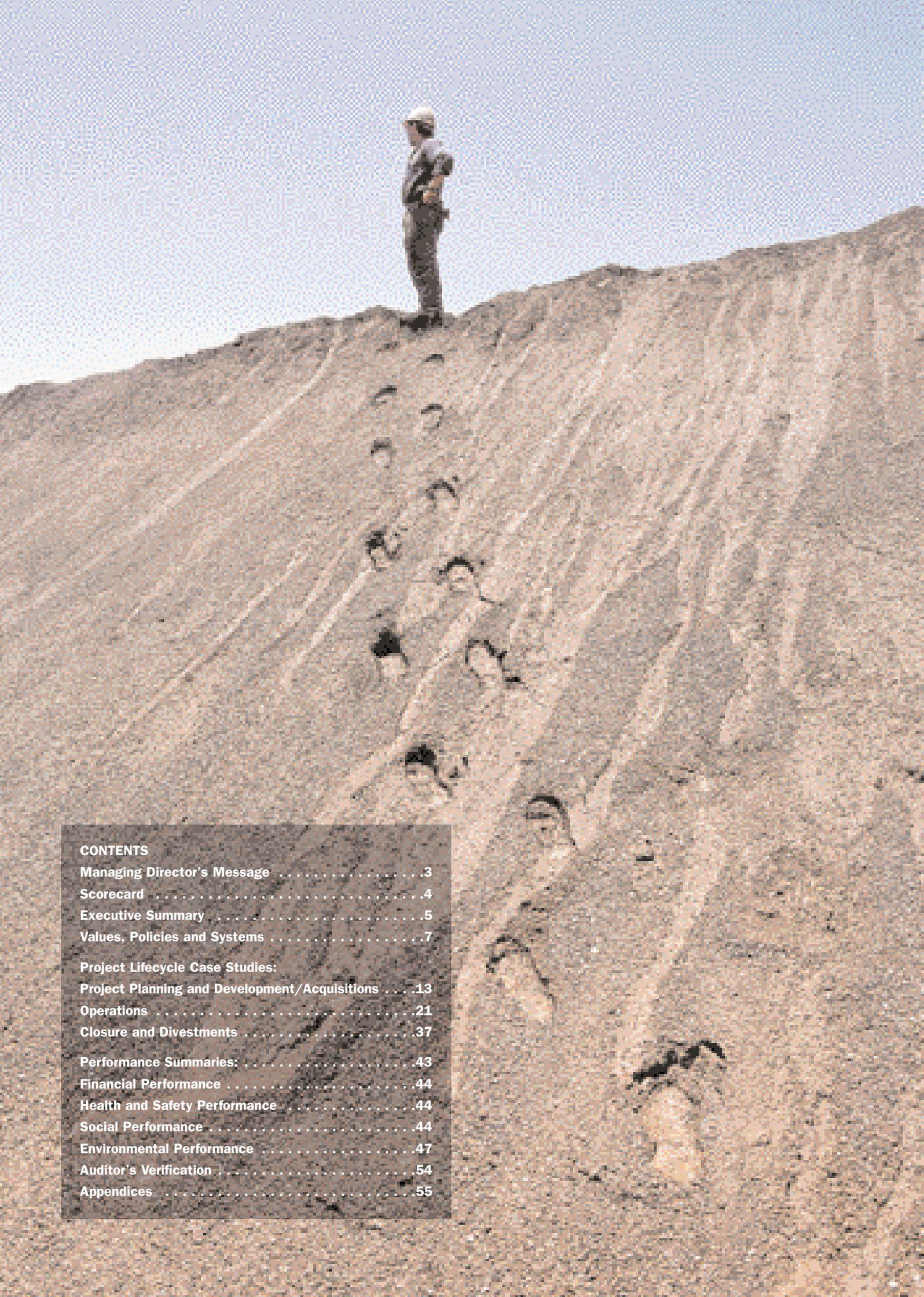


# WE'RE TREADING CAREFULLY...





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# ...AND SEEING CLEARLY

**“Some aspects of our past performance have not always matched our values. We take the social and environmental consequences of our actions seriously, and are making progress by reacting in a positive and progressive way.”**

**T**his is our fourth public environment report and our second to combine environment and community information. As in previous years, we have sought to improve the report in line with the feedback we received from our readers and formal benchmarking exercises.

We have integrated environment and community material by adopting a structure that broadly follows the main phases of a project's life. We have increased the emphasis on case study material while maintaining our review of the Company's overall performance.

In addition, we have addressed a number of specific recommendations included in the

feedback. Our policy position on health, safety, environment and community has been clarified, and we have shortened the executive summary and included a 'scorecard' highlighting our performance against our targets. We have also included new performance targets aligned with our overall business strategy.

BHP is continuously improving its reporting systems and endeavours to present useful and accurate information. However, some reporting systems are still being developed and anyone seeking to rely on any representation made in this report should first verify the information with the Company.

*This report covers facilities owned and operated by BHP during the 13-month period ending 30 June 2000 (see Appendix A). This reporting period is a 'one-off' result of the change in BHP's financial year from the end of May to the end of June. Data has been normalised for a 12-month period, except where noted, to compare this year's performance with that of previous years. Where BHP has closed or sold an asset, performance for the reporting period has been estimated on a pro-rata basis. All dollar figures are Australian unless otherwise indicated.*

## BHP CHARTER – MOVING INTO THE 21ST CENTURY

We are BHP, an Australian based global company founded in 1885, which is undergoing fundamental change as we adjust to a highly competitive global business environment.

**Our purpose is to create shareholder value through the discovery, development, and conversion of natural resources.**

### To survive and prosper we must:

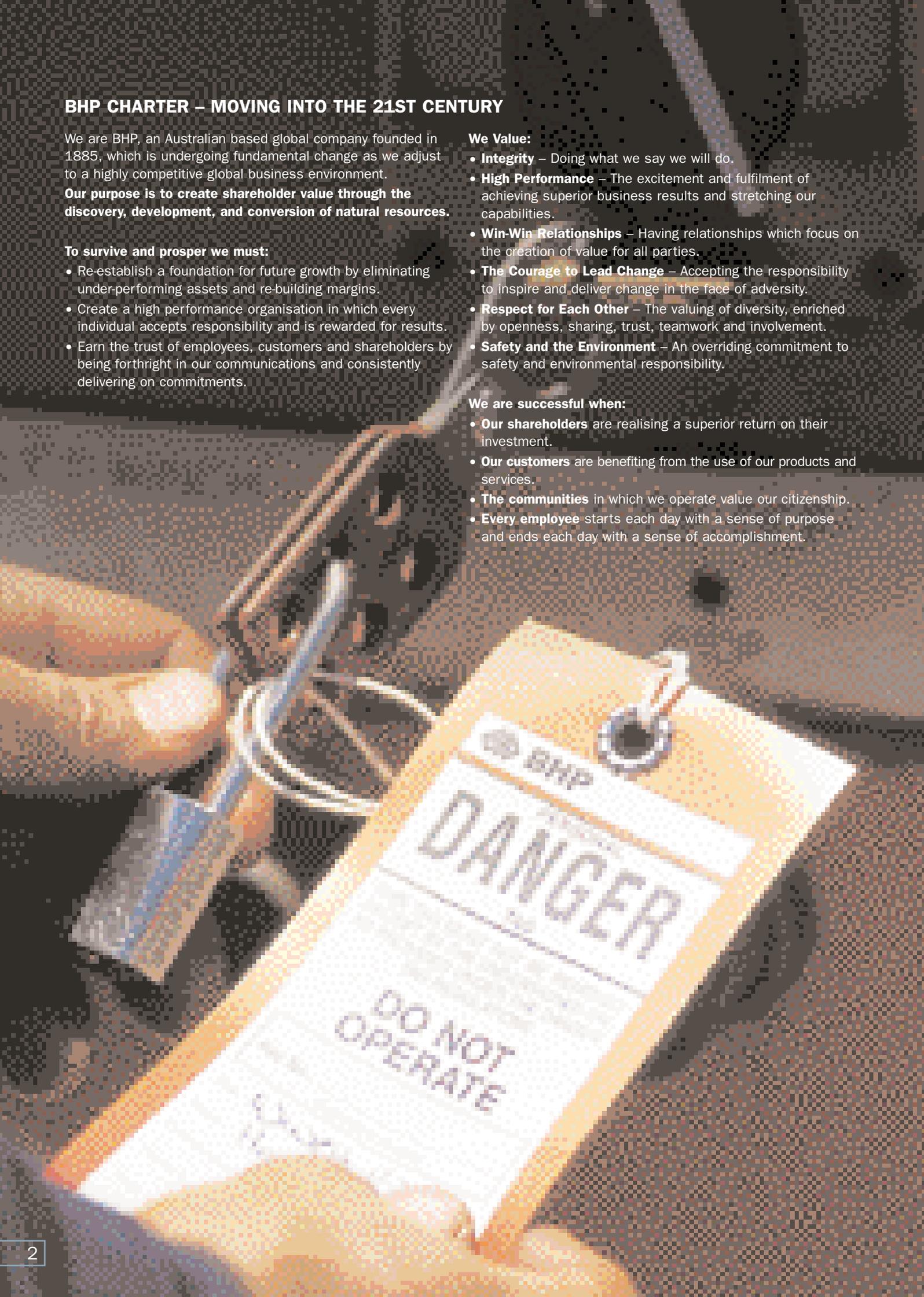
- Re-establish a foundation for future growth by eliminating under-performing assets and re-building margins.
- Create a high performance organisation in which every individual accepts responsibility and is rewarded for results.
- Earn the trust of employees, customers and shareholders by being forthright in our communications and consistently delivering on commitments.

### We Value:

- **Integrity** – Doing what we say we will do.
- **High Performance** – The excitement and fulfilment of achieving superior business results and stretching our capabilities.
- **Win-Win Relationships** – Having relationships which focus on the creation of value for all parties.
- **The Courage to Lead Change** – Accepting the responsibility to inspire and deliver change in the face of adversity.
- **Respect for Each Other** – The valuing of diversity, enriched by openness, sharing, trust, teamwork and involvement.
- **Safety and the Environment** – An overriding commitment to safety and environmental responsibility.

### We are successful when:

- **Our shareholders** are realising a superior return on their investment.
- **Our customers** are benefiting from the use of our products and services.
- **The communities** in which we operate value our citizenship.
- **Every employee** starts each day with a sense of purpose and ends each day with a sense of accomplishment.



# ACTING RESPONSIBLY

**“Our approach goes beyond simple compliance. We have an overriding commitment to safety and environmental responsibility, and recognise we will only be successful as a company when the communities in which we work value our citizenship.”**



**D**uring the past 12 months, we have responded to business pressure by shifting the direction of the Company. This pressure has made us more resourceful, and has encouraged innovative ways of thinking and operating.

Being part of the global community continues to be a driving force for change, not only in business but also in the areas of health, safety, environment and community relations. Community expectations regarding the way large corporations operate throughout the world are increasing. At BHP, we will act responsibly wherever we do business and will be open and transparent in the way we report our progress.

We are committed to sustainable development. We believe that successful companies can achieve outstanding financial performance without compromising safety, environmental or social performance. We are also committed to ensuring that the communities in which we work share in our success. In addition to the traditional benefits that flow from our activities, such as royalties, taxes, and business and employment opportunities, we have set ourselves a target to spend one per cent of our pre-tax profits on community development programs, calculated on a three-year rolling average.

We have integrated our existing health, safety, environment and community relations policies into one clear document that outlines the Company's position on these important issues.

The integrated policy contains a number of new commitments, including our support for

fundamental human rights, a high standard of business conduct and sustainable community development. We have also advanced the implementation of Company-wide management standards that support the new policy.

We are pleased to be able to feature in this year's report the winners of the inaugural BHP Environment and Community Awards. The awards encourage and reward our employees and contractors for engaging in community and environmental initiatives. The response from employees and the calibre of entries was outstanding.

Earlier this year, we reviewed our position on the disposal of tailing into rivers and publicly announced we would no longer consider investing in new projects using this technology. We are keen to continue open dialogue with our key stakeholders on other issues of mutual interest, such as greenhouse gas emissions, deep-sea tailing placement and external verification of performance and reporting.

While I feel proud of the progress we have made, significant challenges still remain. We are setting some aggressive targets to improve our performance toward our goal of zero harm to people and the environment.

Paul Anderson  
Managing Director and Chief Executive Officer

**“We are proud of our achievements. However, we understand that sustained effort will be required to maintain our performance and achieve further improvements.”**

**Scorecard – How we performed against our targets\***

Indicator	Goal/Target	Comments on previous results
Compliance	Comply with environmental regulations at all operations. Target: 30 per cent reduction per annum in non-compliance level.	Target not met. In 1999/2000, BHP received 16 fines totalling \$212 490, compared with 12 fines totalling \$153 000 in 1998/1999. Performance improvements associated with the reduced number of significant incidents reported during 1999/2000 are obscured by the fines and prosecutions resulting from incidents that occurred during 1997/1998.
Energy consumption	Target: five per cent reduction in energy intensity between 1995 and 2000.	Target met. Energy Intensity Index has improved by 13 per cent since 1995.
Greenhouse gases	Target: 10 per cent reduction in greenhouse intensity between 1995 and 2000.	Target met. Greenhouse Intensity Index has improved by 12 per cent since 1995.
Ozone-depleting substances (ODSs)	Eliminate emissions of ODSs to atmosphere.	Target not met. Estimated total emissions based on reported use of all types of ODSs in 1999/2000 was 6 146 kilograms. (Total emissions included HFCs, which are approved for long-term use; HCFCs, which are to be progressively phased out by 2030; and small quantities of halons and CFCs.)
Hazardous waste	Target: 20 per cent reduction in hazardous waste by 2000.	Target met. Reported levels of hazardous waste have been reduced by more than 50 per cent between 1998/1999 and 1999/2000.
General waste	Target: 20 per cent reduction in general waste by 2000.	Target met. Reported quantities of general waste (not including waste rock and tailing) have decreased by approximately 25 per cent since last year.
Oil and fuel spills	Eliminate oil and fuel spills. Target: 30 per cent reduction per annum in volume of oil and fuel split.	Target met relative to previous year. The total volume of oil spilt to water in 1999/2000 was approximately 6 300 litres. This was significantly lower than last year. However, this was not as low as 1997/1998, when it was reported that only 1 270 litres of oil were spilt to water.

\* A new set of targets, consistent with moving toward our goal of zero harm to people and the environment has been set for future years. These include safety and community targets, as well as revised environmental performance targets. (See Targets on page 9.)

## Executive Summary

# REACHING FOR OUR GOALS

**W**e have produced a new Company policy *Working Responsibly* that brings together our position on health, safety, environment and community relations. The policy is supported by management standards for safety and environment, as well as community standards that are currently being updated.

The Company achieved a substantial turnaround in its financial performance, producing a record profit of \$1 986 million for the financial year. During the year, we also paid \$636 million in income tax and \$476 million in royalties to our host governments. To ensure that the local communities in which we work directly share in our success, we have set ourselves a target to contribute the equivalent of one per cent of our pre-tax profit (on a three-year rolling average) to community development programs and partnerships.

We directly employ 35 000 employees, down from 50 000 a year ago (May 1999). This reduction reflects the transfer of employees to third parties through asset sales, such as BHP Engineering and BHP Information Technology, as well as retrenchments due to plant closures and general cost reduction programs. We also employed 21 000 contractors on a full-time equivalent basis during the past 12 months. Our staff numbers will reduce further in the coming year due to the spin-off of our long products steel business.

As shown in the scorecard, we have met or exceeded many of the environmental performance targets that we established in our first public environmental report in 1997. While

targets for compliance and ozone-depleting substances were not met, we aim to continue to improve our performance.

Our overall use of resources (such as energy and water) has been reduced, as have emissions to air and reported levels of general and hazardous wastes. While some of these reductions represent real improvements in performance of continuing assets, they can largely be attributed to divestments and closures during the period.

Dialogue with our key stakeholders on health, safety, environmental and community issues remains an important process. To assist with this, we have established a Forum on Corporate Responsibility and maintained our membership of the Global Mining Initiative.

Ok Tedi remains a major challenge for us. We have indicated to the other project shareholders that we would prefer to close the mine early in a manner that seeks to mitigate against further environmental impacts, while addressing critical social issues. However, the Papua New Guinea (PNG) Government has advised that, on balance, it considers that the mine should run for the remainder of its economic life. While we understand the PNG Government's position, we feel it would not be appropriate for BHP to have any ongoing involvement beyond the point at which all parties can agree on how we can best withdraw. We are seeking to ensure a smooth transition that minimises the environmental impact, maximises the social benefits and does not incur liabilities for the future operations of the mine.



# ESTABLISHING OUR GUIDELINES

# BHP

is an Australian-based global natural resources company with a regional steel business. We create shareholder value through the discovery, development, production and marketing of iron ore, coal, copper, oil and gas, diamonds, silver, lead, zinc, and a range of other natural resources. We are also a market leader in value-added flat steel products with a focus in the Australasian region.

BHP comprises businesses in Minerals, Petroleum and Steel. These businesses are supported by a Transport and Logistics business, a Corporate Services group, and functional groups in such areas as finance, strategy, health, safety, environment, community relations and legal. BHP's headquarters are in Melbourne, Australia, with operations in Australasia, North and South America, Asia, the United Kingdom and Africa.

## **BHP Charter and the Health, Safety, Environment and Community Policy**

Since it was introduced in 1999, the BHP Charter (see page 2) has provided a foundation for our business strategy by setting out in simple terms our purpose, business imperatives and values, as well as our overall measures of success. The Charter embodies the key elements of sustainable development, which include addressing our overriding commitment to safety and environmental responsibility, as well as seeking to create value for our shareholders and the communities in which we operate. Creating and delivering value for all stakeholders – our shareholders, customers, communities and employees – underpins our approach to doing business. It provides a strong link between our internal policies and our practices in relation to health, safety, environment and community (HSEC). This concept of creating value for all stakeholders, as well as the close alignment and interdependence of BHP's existing policies in these areas, led to the decision in 2000 to simplify our approach and develop a single integrated Health, Safety, Environment and Community Policy – *Working Responsibly*.

## WORKING RESPONSIBLY AT BHP

### Our Health, Safety, Environment and Community Policy

At BHP, we value our commitment to health, safety, environment and community responsibility. This is integral to the way we do business.

We commit to continual improvement in our performance and aspire to a goal of zero harm to people and the environment.

Wherever we operate, we will:

- Develop, implement and maintain Management Standards for Health, Safety, Environment and the Community that enable us to:
  - identify, assess and manage risks to employees, the environment and local communities;
  - meet or exceed applicable laws;
  - set and achieve targets, including the reduction and prevention of pollution;
  - employ skilled people and the necessary resources to meet our targets;
  - support the fundamental human rights of employees, contractors and the communities in which we operate;
  - respect the traditional rights of indigenous people; and
  - value cultural heritage and care for the environment.
- Communicate openly with our employees, contractors and other stakeholders to build relationships based on confidence, mutual trust and involvement.
- Actively seek opportunities to share our success by:
  - helping local communities meet social infrastructure needs through the development and use of appropriate skills and technologies; and
  - developing partnerships that focus on creating sustainable value for everyone.
- Engage employees, business partners, contractors, suppliers and visitors in a shared responsibility for meeting the requirements of this Policy.

We will be successful when we achieve our targets toward our goal of zero harm and are valued by the communities in which we work.

While it combines the essential elements of existing policies, *Working Responsibly* has evolved to include some new and important features, such as our positions on human rights, standards of business conduct and sustainable community development.

It clarifies our position on important issues for key stakeholders and ensures consistent management approaches to these issues wherever we operate.

Stakeholders are those groups who affect or are affected by BHP and its activities. This primarily includes employees, contractors, suppliers and the communities in which we operate. It also includes government, regulators, non-government organisations and shareholders.

### Part of the Global Community

As part of our commitment to the global community, BHP is addressing broad social and environmental issues.

We have established a Forum on Corporate Responsibility (FCR), which provides an opportunity for representatives of our senior management team to directly interact with the leadership of several key non-government organisations and opinion leaders on these issues. The FCR also provides advice to, and challenges senior management about, the broader sustainable development and corporate social responsibility agenda. The Company is not bound by this advice, just as the Group does not endorse particular actions or policies of the Company – rather it is a means for dialogue and debate with members of broader civil society.

In addition, BHP is a founding member of the Global Mining Initiative (GMI). Members of the GMI are committed to ensuring the industry remains responsive to the global community's concerns and aspirations. The GMI work program includes a detailed analysis of the industry's performance in its transition to sustainable development.

We are involved with other organisations, including the Business Council of Australia, the Minerals Council of Australia and the World Business Council for Sustainable Development – a coalition of 150 international companies sharing a commitment to the environment, and to the principles of economic growth and sustainable development.

Individual businesses are also active through their sectoral organisations at national and international levels.

### Business Ethics

In addition to the requirements of *Working Responsibly*, the *BHP Guide to Business Conduct* gives further direction and reflects our approach to business integrity. It clearly describes the core values that define how we should behave in the workplace and interact with others. It is relevant to all our activities in all parts of the world.

The Guide incorporates issues related to doing business internationally, including relationships with governments, communities and business partners, financial inducements, bribery, and conflicts of interest. It relates to all BHP employees, regardless of their specific job or location.

To strengthen the effectiveness of the Guide, BHP also operates a *Business Conduct Helpline*, a worldwide service open to all employees and external parties to question, discuss, express concern about or resolve

business conduct issues, thereby maintaining not only BHP's but also their own business integrity.

### Indigenous Relations

A Company-wide review of existing indigenous relations policies and principles took place in October and November 1999. A decision was made to incorporate indigenous relations principles into *Working Responsibly* and the supporting management standards. These management standards are currently under development.

The principles that form the basis of our approach to indigenous people are to:

- be inclusive, and willing to listen to and address concerns;
- provide early and continuous consultation throughout the life of a project;
- provide formal and informal mechanisms for engagement; and
- ensure indigenous people receive benefits to assist with their material and social wellbeing. This can take various forms, including education, training and employment opportunities, and specific cultural, community and business partnership programs.

At BHP Cannington in Queensland, Australia, the Cannington Aboriginal Liaison Group (CALG), originally established in 1994, continues to meet regularly. The CALG is open to all interested Aboriginal groups, and provides a formal forum to discuss cultural heritage and other issues affecting Aboriginal people. (See BHP Cannington's Cross-Cultural programs case study on page 35.)

We contributed to the reconciliation process in Australia through the support of Corroboree 2000, a national event aimed at achieving shared understanding and reconciliation between Aboriginals and other Australians.

At our EKATI™ diamond mine in northern Canada, consultation with indigenous elders and the hiring of skilled indigenous people as employees and contractors means that traditional knowledge is being successfully integrated into environmental plans and programs. In the second year of the mine's life, more than 40 per cent of its employees comprise indigenous people.

During 2000, BHP Iron Ore's Pilbara operations in Western Australia undertook a substantial review and benchmarking exercise of its indigenous relations area. The recommendations and action plan resulting from this review have been finalised. One of the objectives will be to provide a structured program to increase indigenous employment at its operations.

### Targets

BHP's environmental goals and targets were introduced in 1997 and have provided the basis for reporting progress and performance for the past three years. This is the last year that we are reporting against the current set of targets.

As outlined in *Working Responsibly*, BHP aspires to a goal of zero harm to people and the environment. We have set new targets to guide our progress toward this goal.

BHP's safety targets include:

- no fatalities;
- a 20 per cent reduction in Lost Time Injuries (LTIs) per annum; and
- no critical risk incidents.

BHP's environmental targets include the following:

- Major assets to achieve certification of their management systems to ISO 14001.
- No significant environmental incidents. (A significant incident is defined as being Severity Three or above.) Continuous improvement in performance will require an annual reduction of approximately 20 per cent in the number of significant incidents. (Refer to Appendix E.)
- Achieve continuous reduction in the volume and number of oil and chemical spills to the environment.
- Achieve year-by-year reduction in energy and greenhouse intensities for our major products.
- Achieve year-by-year reduction in hazardous and general wastes.

BHP's community and social targets include:

- all BHP operations to have in place community relations management plans by December 2001;
- social impacts to be included in the feasibility stage of project approvals;
- no serious health or safety risks in local communities or breaches of legal requirements;
- compliance with the principles embodied in the United Nations Declaration on Human Rights as they relate to our sphere of influence (for example, performance against child labour standards and minimum wages); and
- contribution to community programs, including in-kind support, to a target of one per cent of pre-tax profits calculated on a three-year rolling average.

As we move forward, more detailed targets will be developed that are consistent with the Company's overall strategy and policy goal of zero harm to people and the environment.

### Structure and Responsibilities

BHP has adopted a Portfolio Business Model to ensure the progressive development of a high quality portfolio of assets. Portfolio decisions are made in the best interests of the Company as a whole using specialised functional support. Under the model, assets are managed by operational managers with a clear focus on core business activities. Finance and accounting, supply, human resources and payroll services, and other support functions are shared across many assets. This will remove costly duplication and increase effectiveness and efficiency through the introduction of best practice and standardisation where possible.

These broad-based changes will affect the health, safety and environment functions, as well as employees involved in community and indigenous relations.

At the corporate and business levels, these functions support the BHP Board and executive management by providing a focus on governance requirements, driving policies and systems, and managing strategic risks associated with the changing portfolio of assets, as well as overseeing asset performance.

Managers of businesses, assets and sites remain ultimately responsible for the management of HSEC issues affecting their operations. Functional employees will support management by providing advice on these issues and how to deal with hazards and risks.

The general structure of the new portfolio model includes the following functions:

- An External Affairs Council and a Health, Safety and Environment Council to provide a strategic overview of functional effectiveness. The councils include management and functional representatives.
- Governance groups within the councils for policy and standards assurance, and an overview of portfolio performance, risks and liabilities.
- Shared resource groups for expert and large scale services, involving a combination of internal and external service provision.
- On-site resources dedicated to particular sites and assets.

### Standards and Systems

BHP released its Company-wide standards for environmental management, the BHP Environmental Management Standards, in October 1999. A similar set of standards covering safety, the BHP Safety Management Standards, were released in 1998. A set of standards relating to the management of social and community areas is currently being updated.

#### Environmental Management Standards

The BHP Environmental Management Standards combine BHP's objectives of having management systems that align with the international standard for environmental management systems ISO 14001; the Australian Minerals Industry Code for Environmental Management; the International Chamber of Commerce Charter for Sustainable Development; and the United Nations Environment Programme Declaration on Cleaner Production.

BHP's Environmental Management Standards comprise 20 standards covering areas that are normally addressed by management systems (for example, legal requirements, planning and objectives, and document control). The Standards also contain eight management guidelines covering areas that are significant environmental issues or risks to BHP overall, such as oil spills and waste management.

The Standards link our integrated Health, Safety, Environment and Community Policy with our management systems. (See [www.bhp.com](http://www.bhp.com).)

Within our businesses, each site and new project is required to implement management systems that meet the requirements of the Standards. This was the first year that a program of site self-assessments was used to evaluate the extent of implementation of the BHP Environmental Management Standards. The level of conformance and implementation of each of the performance requirements in the Standards was evaluated using a one (lowest) to five (highest) tiered scoring system.

The results of the site self-assessments were then consolidated into an overall aggregate average score for each business group:

Business	Score against requirements of BHP Environmental Management Standards	Score against requirements of ISO 14001
Steel (excluding OneSteel)	3.8	3.7
Petroleum	3.7	3.4
Minerals	3.6	3.5
Transport and Logistics	3.2	3.6

The results of the self-assessments indicate performance gaps against the Standards and where improvements need to be made.

These self-assessments will be undertaken annually so that progressive implementation of the Standards can be measured. The results of the self-assessments will be checked and verified.

We aim to obtain certification for all of our major assets against ISO 14001. While the results of the self-assessments indicate that this is achievable, a sustained effort will be required to make the necessary improvements to our management systems and achieve the corresponding improvements in performance.

#### Community Relations Management Standards

In line with our new policy, we will adopt consistently high standards in relation to our interactions with local communities. We are in the process of updating a set of Community Relations Management Standards to be applied across the Company wherever we operate. The Standards will be modelled on the existing BHP Environmental and Safety Management Standards. Issues addressed in the Standards will include our position on human rights, social development, employment practices and social impact assessment for capital project approvals.

### **Community relations plans and interactions with local communities**

A requirement of the Community Management Standards will be the preparation of a community relations plan for each operation by December 2001. At present, 28 sites have a community relations plan in place, either formal or informal.

A total of 39 sites have a formal or informal community consultative process in place. These processes range from regular formal meetings with community representatives to public forums on specific issues.

The value of a formal and regular consultative process with local communities has been demonstrated at a number of our sites. The process used varies, depending on the level of interest and perceptions of the community regarding the significance of issues. Clearly, some processes are better than others and simply formalising them will not ensure effective engagement. The Community Management Standards will provide guidance with a view to ensuring effective communication with our community stakeholders.

### **Risk management**

Over the past few years, we have made a significant effort to improve the rigour and consistency of risk management approaches as they apply to HSEC relations. A number of initiatives and developments have helped to integrate HSEC risks into overall BHP business risk considerations, including:

- adopting the Australian/New Zealand Standard for Risk Management (AS/NZS 4360) as the internal standard for all risk management, including HSEC;
- developing a BHP Health, Safety and Environmental Risk Management Guideline for the identification and assessment of hazards and HSEC related consequences;
- requiring HSEC risk registers at site, business group and Company levels;
- holding a number of risk profiling workshops for existing and planned operations;
- developing a BHP Incident Severity Rating Matrix for risk assessment and reporting purposes (see Appendix E); and
- introducing minimum HSEC risk assessment requirements for business risk management processes, including capital approvals and property transactions.

### **Emergency planning and response**

Within BHP, we have developed emergency response plans to deal with a wide range of possible crisis and emergency scenarios, including oil spills. To test the effectiveness of these plans and ensure personnel are prepared for emergency situations, we carry out coordinated crisis and emergency response exercises on a regular basis.

### **Auditing**

We use audits to check legal compliance and effective implementation of management systems, including the requirements of BHP standards. Audits help to identify HSEC risks and opportunities for performance improvements. Environmental audits conducted across BHP this year varied in scope, duration and frequency but generally focussed on management systems, regulatory compliance and internal improvements.

Previously, the businesses were responsible for determining the approach toward audit programs that best met their specific internal audit requirements. Over the coming year, we intend to undertake independent management system audits on a Company-wide basis. This program will be integrated to cover the requirements of environment, safety, health and community.

At BHP Minerals, only one business-level audit was conducted, since the audit program is on hold pending the roll-out of the planned Company-wide audit program. During the past year, the sites undertook self-audits and BHP Cannington conducted its first community audit. (See Cannington and *Griffin Venture Audits* case study on page 23.)

BHP Steel conducted environmental management system audits at a divisional level, with selected site verification reviews set against the requirements of ISO 14001 using an external independent auditor. The results of this audit program, as well as the self-assessments, are being used to upgrade management systems in preparation for ISO 14001 certification audits. BHP Steel undertook audits of compliance with project environmental licence conditions for most sites. Behavioural safety and observational audits continue to be the main focus of the safety audit program.

BHP Petroleum operates an audit program that measures the implementation of health, safety and environment standards at each site. These standards will be updated to incorporate the full requirements of the BHP Environmental and Safety Management Standards. Employees generally conduct audits, although some audits use external independent auditors, and community and government representatives. (See Cannington and *Griffin Venture Audits* case study on page 23.)

BHP Transport and Logistics is currently updating its integrated safety, environment and quality management system and audit program to incorporate the full requirements of BHP's Environmental and Safety Management Standards and to achieve ISO 14001 certification. Internal and independent external audits are being undertaken, including vessels being audited against relevant maritime standards to maintain operating certification.



## Project Planning and Development/Acquisitions

# MOVING CAUTIOUSLY AHEAD

**E**nvironment and community relations are fundamental considerations in planning exploration programs, new project developments, expansions to existing operations, and acquisitions and divestments.

Before the start of an exploration program, we engage in community and government consultation to ensure that our intentions are understood, and we comply with laws and codes of practice specific to each country and industry.

We carry out environmental and social risk assessments in the planning stage. These assessments identify the potential environmental and social impacts, as well as alternative designs or operational procedures that eliminate, mitigate or minimise those impacts.

For example, in the case of offshore oil and gas exploration, seismic activities may be restricted to avoid disturbance of whales along known migratory routes or in breeding areas. Support vessels may be directed to anchor in special areas to avoid physical damage to seabed communities.

For onshore exploration activities, vehicles and trenching and drilling equipment are cleaned and inspected prior to use to minimise the possibility of exotic plant species and soil diseases being introduced. Drill holes are capped once samples have been taken. Trenches, pits, drill sites, seismic tracks, access tracks and other disturbed areas are rehabilitated.

If a development moves forward, the risk assessment is refined and evolves into a full Environmental Impact Assessment (EIA). The EIA is a systematic evaluation of the proposal, which may be a formal process where required by law, or if not, an internal Company process. The EIA process also evaluates social impacts and involves extensive community consultation.

The findings and conclusions of the EIA are incorporated into an environmental management plan for the life of the proposed development, including a closure plan that describes how the site will be decommissioned and rehabilitated once operations cease.

BHP's Capital Projects Review Committee (CPRC) reviews all capital projects or commitments that exceed \$30 million. The CPRC is a review and governance body that aims for the review process to ensure:

- capital investment is aligned with Company priorities, agreed strategies and values; and
- risks are identified and evaluated in an integrated risk-reward context, and appropriate risk management strategies are pursued.

The process incorporates a progressive review of project development to ensure that an appropriate EIA has been conducted, and that approvals and agreements have been reached with the appropriate regulatory bodies in that country.

## CASE STUDY

### ESCONDIDA SALAR DE PUNTA NEGRA WATER RESOURCE

BHP is working with Chilean government departments, non-government organisations and research institutions to develop long-term protection measures for the sensitive wetland habitat adjacent to the Escondida water supply borefield.

In 1990, BHP commenced operations at the Escondida copper mine, approximately 170 kilometres south-east of the city of Antofagasta, Chile. The site is located at an altitude of 3 100 metres above sea level in the Atacama Desert, one of the driest places on earth.

Water is a key commodity for the success of the operation. Groundwater has been extracted from the Punta Negra basin, 30 kilometres south-east of the mine, over the past 10 years. Within the basin is the Salar de Punta Negra. It provides a variety of land forms and, owing to the presence of small areas of permanent open water, contains a range of flora and fauna species.

The surface area of Salar de Punta Negra is approximately 235 km<sup>2</sup>. Most of the area has saline springs throughout. In its interior, saline water bodies cover around 3 km<sup>2</sup>. These saline systems have a common structure: they start as vegas (wetland springs) at the edge of the Salar and continue in canals towards the interior, finishing in surface lagoons. The vega, canal and lagoon systems are referred to as VCL systems.

In 1994, Escondida submitted an environmental impact assessment describing the potential impacts of groundwater extraction from the Punta Negra basin. Chile's Agricultural and Livestock Ministry approached Escondida to discuss the findings of the environmental assessment. Together, Escondida and the Ministry signed an agreement that would ensure the protection of the Salar ecosystem indefinitely.

With continuous pumping over the past 10 years, impacts on the Salar de Punta Negra ecosystem are becoming apparent. There is evidence that the cones of depression resulting from groundwater extraction could ultimately impact the VCL systems. Potential impacts would include changes to the flow regime if high volumes of extraction were maintained. This could reduce the flow to the springs and ultimately dry up the VCL systems, resulting in significant biological impact to the local ecosystem. Salar de Punta Negra is an important breeding and nesting area for the Andean flamingo and will remain so, provided sufficient water is present.

Escondida has conducted research to develop mitigation tools to alleviate any impacts on the Salar. These include artificial surface recharge of the VCL systems to maintain the natural ecosystems, while programs such as incubation and rearing of Andean flamingo chicks for subsequent release in the wild will assist in the survival of this endangered species well beyond the mine's life. Escondida is consulting with government departments and non-government organisations to fully review and further develop options for mitigating the impacts associated with groundwater extraction. Escondida is also considering alternative water supply options and is planning to reduce groundwater extraction to levels consistent with the natural recharge of the groundwater system. Whatever options are selected, Escondida is committed to long-term mitigation to protect the ecosystems in Salar de Punta Negra.



*Saline spring within Salar de Punta Negra.*

## CASE STUDY

### PROJECT FALCON

A revolutionary new resource discovery tool called Falcon, currently being deployed by BHP Minerals, is minimising environmental impacts usually associated with mineral exploration activities.



*The Cessna containing the Falcon system on survey in the Northwest Territories, Canada.*

Falcon enables BHP to perform high-resolution gravity gradiometer surveys from the air for the first time. The radical new airborne exploration system is based on technology designed for use in the US Navy's Trident submarines and developed by Lockheed-Martin. In Australia and North America, BHP has two fully operational airborne gravity gradiometer (AGG) systems in use.

Project Falcon was the result of a strategic vision of a small group of BHP Research and Minerals Discovery employees in the early 1990s. Following a worldwide search for suitable gravity technologies, BHP initiated a feasibility study into the most appropriate technology in 1993. The manufacture of two operational systems commenced in 1995 and the first airborne gravity mapping system entered operational service in October 1999.

BHP surveyed all the known gravity technologies in the world to assess the practicality of developing an operational airborne system with the sensitivity, reliability and operating costs required by the minerals industry. It was decided that a sensor technology, originally developed for the US Navy in the 1970s, held the greatest promise. With the end of the Cold War, the Navy technology was declassified and made available to industry.

BHP Research employees negotiated the release of the technology with the US Navy and State Department, and Lockheed-Martin built the instrumentation to specifications determined jointly with BHP. BHP Research managed the development and construction of the airborne gravity gradiometer and the development of data processing and interpretation software.

This new tool significantly reduces the time and cost of identifying mineral resource targets and improves the efficiency of exploration programs. From an environmental perspective, Falcon reduces the need for ground surveys, which may involve constructing access tracks, and drilling or digging trenches to extract rock samples.

A deployment program developed by BHP Minerals Discovery is aligned to the discovery strategy to consider brownfield (expansion of an existing facility or site) and greenfield (development of new operations from the ground up) opportunities.

We propose to use the AGG technology in developing alliances and joint ventures with other companies to leverage further value. This will provide opportunities to obtain access to areas not owned by BHP and further develop the technology. The AGG technology may also have application in the discovery of oil and gas.

## CASE STUDY

### MANAK PERMIT, SWEDEN

BHP surrendered its licence to explore for base metals in an area of northern Sweden after extensive consultation with the indigenous Sami people, despite believing that there is excellent potential for an economic mineral deposit within the area.

In deciding to surrender the licence, BHP took into account the cultural, environmental and commercial issues of the Manak permit area.

The Inspector of Mines, in accordance with the Swedish Minerals Act, granted the Manak permit in May 1999. The permit area was four kilometres from the Sarek National Park, which forms part of the Lapponia World Heritage site. In recognition of its cultural value and ecological diversity, the United Nations named Lapponia a world heritage area in 1996.

The eastern part of the area is important to the Sami people who use it for reindeer husbandry and, during each September, for marking and slaughtering of the reindeer. Central to this area is the historic and cultural village of Kuorpak.

The Inspector of Mines' decision to grant the permit resulted in three separate appeals from the Swedish Society for Nature Conservation, an individual landholder and the local Sami group from the Sirkas Sami village.

Concerns raised included the fear of a mine site on the fringes of the Sarek National Park, potential damage to a

sensitive natural environment, and the potential impact on commercial activities and cultural traditions of the Sami people.

In response to these concerns, BHP engaged in an intensive consultation program and amended its Exploration Environmental Code of Practice to reflect the importance of the Sami community, reindeer husbandry and the national park. The consultation program provided an opportunity for the Sami community to gain a better understanding of the exploration process as a minimal impact land use, and to learn more about BHP and its environmental standards. At the same time, BHP gained a greater understanding of Sami culture, and an opportunity to address the concerns of the Sami group and to make an informed decision regarding the licence.

In the end, BHP decided to relinquish its exploration licence. However, the Company's proactive approach to community consultation gained respect from the Sami people. This approach has enhanced relations with the Sami and other communities have now given us their full cooperation with other drilling programs in Sweden.

*Right: Sami round up their reindeer in northern Sweden.*

## CASE STUDY

### NEW SHIP

The launch of BHP's newest ship, the 185 500-dwt bulk carrier *Pacific Triangle*, highlights innovation in design.

The ship's design incorporates the most up-to-date environmental guidelines. The engine design and operation reduces oxides of nitrogen (NO<sub>x</sub>) emissions by some 30 per cent.

The propeller design improves fuel efficiency and protection against accidental oil spills has been increased. While the NO<sub>x</sub> emission reduction technology reduces the vessel's engine efficiency, this is more than offset by improved hull and propeller design.

The resultant impact was almost an eight per cent reduction in fuel consumed to move one tonne of cargo one nautical mile with no speed penalties. The energy

consumed to light a 60-watt globe for one hour could transport one tonne of cargo 8.8 nautical miles in this vessel.

The *Pacific Triangle* was the result of a partnership between BHP, steelmaker Sumitomo and shipping company Daiichi Chuo Kisen Kaisha to build, own and operate the ship.

The ship is 299 metres long, 50 metres wide and can sail at 14.5 knots. BHP Transport and Logistics operates this vessel on an efficient triangular route, which maximises the vessel's cargo-carrying capacity while reducing the volume of ballast water carried.



## CASE STUDY

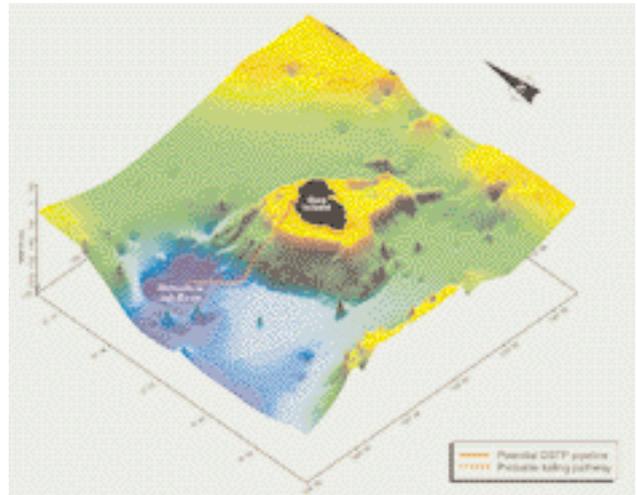
### GAG ISLAND NICKEL PROJECT

BHP, in a joint venture with PT Aneka Tambang, a partially privatised Indonesian company, is conducting engineering, environmental and socio-economic studies for the development of a nickel laterite mine on Gag Island. Gag Island is located 160 kilometres west-north-west of Sorong, in the Indonesian province of Irian Jaya (West Papua).

Gag Island is a small, hilly island of 56 km<sup>2</sup>, with a fringe of coral reef. Beyond the reef, to the west, the ocean bottom falls away sharply to approximately 1 600 metres in depth. The island receives intense tropical rain and is in a seismically active area. The first permanent settlement occurred in the 1960s, and now some 600 people live on the north-eastern side of the island at Gambir Bay. They make a living from reef fishing, traditional gardens and the production of copra, grown mainly on the northern third of the island.

The southern two-thirds of the island is covered by leached, nutrient-poor lateritic soils containing elevated levels of nickel and cobalt minerals. Subject to the outcome of a feasibility study, the project plan is to mine and process these minerals on the island. The management of process plant residues on such a small island is recognised as a significant environmental and social issue. Engineering studies are considering three residue management options, based on existing technologies and practices. These include:

- containment of residues initially as a slurry within two conventional dams: one on the north of the island and one on adjacent mined-out land later in the life of the project;



Deep-sea tailing placement option for Gag Island.

- the establishment of a small starter dam in the north followed by residue filtration and storage in mined-out areas to the south; and
- the possibility of deep-sea tailing placement (DSTP) of treated residue into the deep ocean basin to the west of the island.

DSTP is only considered where the ocean is very deep close to the coast and when land-based sites may conflict with environmental or community issues. It is currently practised at non-BHP projects, including two in Indonesia, two in Papua New Guinea, two in France and one in Turkey.

Environmental and socio-economic baseline and impact assessment studies started on and around Gag Island in 1996 are continuing to assist in establishing which residue management option will have the least overall impact. At this time, no decision has been taken on which option would be appropriate for the project. Over the next two to five years, engineering studies and an extensive and inclusive consultation program with government, the local community and non-government organisations will be undertaken to determine the preferred option.

Important considerations for a sustainable development program for Gag Island are the appropriate use of available land, both during and after mining; minimising land use conflicts; the efficient recovery and use of available natural resources; and the development of socio-economic opportunities for the people of the island and the broader Indonesian community.

Left: Engineering assessment of on-land tailing option for Gag Island.

## CASE STUDY

### EKATI™ DIAMOND MINE: PANDA DIVERSION CHANNEL FISHERIES CHARGES

The Panda Diversion Channel was constructed at the EKATI™ diamond mine to divert water around the former Panda and Koala Lakes (where the open cut mining now takes place) into Kodiak Lake.

The 3.4 kilometre-long channel was intended to provide replacement of fish habitat lost through development of the mine. Kodiak is one of several thousand lakes on the EKATI™ claim block. During the initial spring run-off in June 1997, water from the newly constructed channel deposited sediment into Kodiak Lake. BHP Diamonds Inc. was charged on 9 June 2000 with eight violations under the Canadian Fisheries Act.

The charges related to whether BHP, in the course of its construction and operation of the Panda Diversion Channel, unlawfully deposited a deleterious substance in water frequented by fish, or caused harmful alteration, disruption or destruction of fish habitat.

BHP believes that it has always acted responsibly in constructing and maintaining the Channel to protect the environment and create fish habitat in accordance with its *Authorization and Fish Habitat Compensation Agreement* with the Government of Canada. Therefore, it has pleaded “not guilty” to all charges.

Extensive remedial and mitigation measures were undertaken by BHP in 1997 and 1998, and subsequent monitoring has shown that the mitigation efforts were successful in stabilising the channel. Silt and sand also filled gaps between the rock used to line the channel, enabling the man-made channel to become more like a natural streambed. A 10-year monitoring program of the channel began in 1998 along with additional improvements. Boulders were placed in the streambed to improve the fish habitat, larger culverts were installed and aquatic plants were transplanted.

The overall results of the 1999 monitoring program indicated that the channel was performing to its design characteristics, based on observations of fish activity and capture, fish larvae, zooplankton and macro-invertebrates. Fish were effectively using the entire channel.



Water sampling in the Panda Diversion Channel.



## Operations

# BUILDING TRUST AND SECURING THE FUTURE

**S**uccessful management of environmental and social issues during the operation of a project is critical to our success. It impacts on a company's licence to operate, approval for future expansions and successful closure.

The diverse nature of our operations means we face a wide range of health, safety, environment and community (HSEC) issues. However, a number of issues are common to many of our operations. These include dust, water quality, air quality, safety, noise levels, traffic, oil spills, waste disposal, indigenous employment, transportation of product, waste recycling, rehabilitation and closure.

Environmental and social issues vary due to the nature of the project, the landscape and climate, and the project's proximity to local communities.

Consultation with nearby communities, landowners, residents, employees and regulatory authorities on environmental and social issues is essential. Our aim is to be proactive, open and transparent in all project consultations.

Consultation enables us to access expertise and traditional knowledge of indigenous people and assists in effectively managing the impact of our projects on the quality of life in local communities.

We also try to maximise the benefits of our operations to local communities through employment and training opportunities, and by using the skills and services of businesses in the area.

During the project's life, we may implement a variety of community-relations initiatives, including public open days, site visits, community consultative committees, local education and awareness programs, and support for community programs.

Management systems across the Company ensure a consistent approach, and provide for rigorous assessments and the monitoring of our performance to ensure we achieve our ongoing targets and commitments.

## CASE STUDY

### PORT KEMBLA HEALTH RISK ASSESSMENT

Early this year, BHP Steel released the results of Stage One of a community Health Risk Assessment (HRA) conducted by an independent consultant. Stage One assessed the risk of health impacts on nearby residents from emissions from the sinter plant at the Port Kembla Steelworks in New South Wales, Australia.

An integral part of the steelmaking process, the sinter plant produces feed for the blast furnaces by fusing iron ore and coke fines in a high-temperature process.

The objectives of the assessment were to determine the potential risk to health and the Company's contribution to ambient conditions, and to use the results as a management tool to plan and prioritise emission control and environmental strategies.

The process included identifying significant emission sources, and reviewing existing data, chemical-screening assessments, monitoring, analysis of ambient air quality and air dispersion modelling, followed by the HRA at the sinter plant. An HRA for the rest of the plant is expected to be completed by the end of this year.

Chemicals evaluated in the study included dioxins and furans, polycyclic aromatic hydrocarbons, benzene, metals (arsenic, cadmium, hexavalent chromium, lead, antimony, manganese and nickel), naphthalene, hydrochloric acid and hydrogen fluoride.

The health risk was evaluated based on exposure to the chemicals by inhalation, soil ingestion and absorption through the skin. Ingestion of chemicals through the consumption of home-grown produce and mothers' milk was also considered.

The study found that the incremental lifetime risk of cancer in the worst case scenario was three in a million. This level is slightly above the recommended guideline set by the New South Wales Environment Protection Authority (NSW EPA) of one in a million, but is well below the limit of one in 10 000, regarded as unacceptable by the EPA.



*BHP Port Kembla Steelworks sinter plant.*

BHP has been investigating risk reduction options for some time and has recently concluded an extensive worldwide search for technology to reduce emissions including dioxins from the Port Kembla sinter plant.

A report was submitted to the NSW EPA outlining two appropriate technologies that will achieve a pollution reduction program target for dust (20 milligrams per normal cubic metre) and dioxins (0.3 nanograms toxic equivalent factor per normal cubic metre). A pilot program for BHP's preferred technology, the carbon-packed bed, commenced in August 2000. BHP Steel has also examined this current pilot program to see if it will reduce emissions of radioactive material (see Port Kembla Radioactive Material case study below).

## CASE STUDY

### PORT KEMBLA RADIOACTIVE MATERIAL

Recent European studies conducted at sinter plants have revealed very low level releases of naturally occurring radioactive materials in stack emissions. BHP became aware of this research during discussions with other steelmakers about its upgrade plans for the Port Kembla sinter plant. BHP is currently upgrading the sinter plant to reduce emissions to limits agreed with the NSW EPA.

The European research indicates there is no significant health risk associated with the radioactive material. Even so, BHP conducted tests at its Port Kembla sinter plant to allay any concerns about possible health impacts of emissions. The tests confirmed low level radioactive material in the stack emissions at similar levels to those measured in European steelworks.

BHP estimates this material would deliver a maximum dose of 20 microsieverts per year to the community. For comparison, the Australian and international public health limit is 1 000 microsieverts per year, in addition to

natural background levels of around 2 000 to 3 000 microsieverts per year.

These numbers indicate that low-level radiation from the sinter plant does not pose a significant health risk to our employees or to the community. Iron ore and coke both contain trace amounts of naturally occurring radioactive materials.

BHP has consulted with the NSW EPA and the Illawarra Area Health Service and has engaged a specialist consultant to provide technical advice (see also Port Kembla Health Risk Assessment case study above).

## CASE STUDY

### CANNINGTON AND GRIFFIN VENTURE AUDITS

Independent third-party audits and appraisals of our environmental performance are becoming increasingly important as communities, governments and other organisations expect greater transparency in how we measure and monitor our management systems. BHP Cannington invited the North Queensland Conservation Council (NQCC) to appraise its environmental performance, while a representative from the Western Australian Conservation Council (WACC) went aboard the offshore oil and gas facility *Griffin Venture* to participate in an audit as part of the Common Ground initiative.

#### BHP Cannington

BHP Cannington engaged the NQCC to conduct an appraisal of the operation's environmental performance and to produce its inaugural environment and sustainability report. The appraisal included an evaluation of the environmental values, processes, personnel and performance of the BHP Cannington silver, lead and zinc mine in North Queensland, Australia, including the Yurbi railhead and Townsville port facility. The appraisal was based on documents provided by BHP Cannington, with some verification of data based on site observations by NQCC and specialist consultants employed by the Council.

In general, NQCC commended BHP Cannington's commitment to exceed legislative requirements, and reported that the operation had achieved considerably better performance than BHP's targets, in many cases, or legislative requirements. The NQCC commended BHP Cannington's approach to community participation and its adoption of a values approach to its operations. The appraisal found BHP Cannington had substantially met or exceeded legislative requirements in the areas of environmental management programs, best practice, general procedures, waste management, spill prevention and control, and water management. Specific legislative requirements to conserve energy do not exist but BHP Cannington has increased efficiency by converting from diesel to gas-fired power generation, reducing greenhouse gas emissions by 14.5 per cent.

Key recommendations arising from the audit included the development of product lifecycle analysis and stewardship protocols, greater incorporation of community involvement in risk assessment and review, and further detailed environmental research.

#### The Griffin Venture

Following consultation with various community groups, fisheries associations, local government and environmental groups, the WACC was invited to participate in an environmental audit of the *Griffin Venture* in Western Australia.

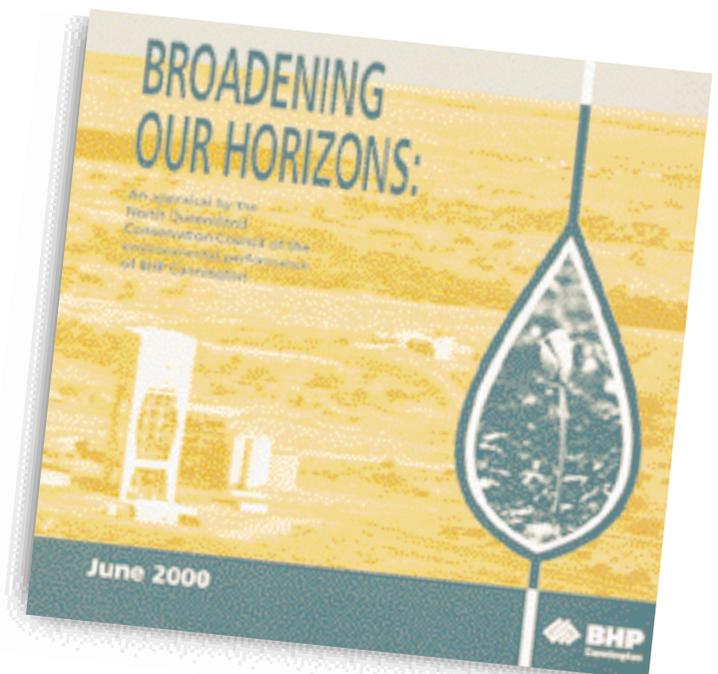
The audit was conducted by BHP Petroleum and Dr Nick Dunlop of the WACC and involved a comprehensive evaluation of issues, including crude oil transfer to a tanker, water treatment and discharge, laboratory analysis confirming the automatic treatment of discharge water, waste management, chemical use, emergency response procedures, routine discharges, and air emissions.

The audit process provided an opportunity for BHP Petroleum to monitor and improve its environmental performance and was an essential element of the environmental management process. The audit found that employees had a high level of commitment and enthusiasm for environmental management, and that procedures covering environmental issues were comprehensive, up-to-date and well understood. Recommendations for improvement were identified in the areas of:

- monitoring discharges of produced formation water; and
- follow-up of waste disposal by contractors.

Dr Dunlop commented that, although conservationists have concerns regarding the effects of routine discharges on the surrounding marine environment, he was satisfied with the environmental management on the *Griffin Venture*.

The recommendations made by the audit team were welcomed by the *Griffin Venture* management. An implementation plan addressing the recommendations was put in place immediately following the audit. This highlights the value placed by the management on external involvement in environmental assessments.



*Broadening Our Horizons: an appraisal by the North Queensland Conservation Council of the environmental performance of BHP Cannington.*

## CASE STUDY

### ESCONDIDA FOUNDATION

In the coastal city of Antofagasta, located in the Chilean desert, the Escondida Foundation is working hard to develop much-needed resources for local communities. A major achievement has been the construction of a Home and Early Detection Centre that is providing medical attention and temporary accommodation for low-income cancer patients.

Since its inauguration in October 1999, the Centre has carried out a full program, subsidising medical attention in areas related to drug banks and early cancer detection. The Centre also provides a temporary home for those patients from northern Chile undergoing specialised cancer treatment and care at the regional hospital in Antofagasta.

At a cost of more than \$1.22 million, the Escondida Foundation, established by the Escondida copper mine, built the Centre as a way to help solve one of Chile's most urgent health needs. The project was completed in conjunction with the regional hospital, the Antofagasta health authorities, and through a strategic alliance between the Foundation and the national cancer organisation, known as Conac.

Conac is a non-government and non-profit organisation that is focussed on cancer patients. It has made available a drug bank, technology and personnel specifically for the care of cancer patients.

The Centre is managed by Conac, which has many volunteers throughout Chile. Conac also carries out preventive work for the early detection of breast,



*Escondida Foundation Home and Early Detection Centre.*

cervical/uterine and prostatic cancer through programs developed by the Antofagasta Health Service and implemented through the regional hospital.

To date, more than 1 000 people have attended the Centre, thus realising the Escondida Foundation's objectives to provide a real contribution to the fight against cancer and to help those patients who may not have the financial resources to seek treatment for their illness.

## CASE STUDY

### LOCALISATION

When Indonesia's political landscape went through a dramatic upheaval last year, BHP responded with a strategy to manage changing expectations and relationships. To maintain our 'licence to operate', BHP continues to adapt to evolving national and community expectations and priorities.

At the height of the political unrest, BHP evacuated its expatriate employees from Indonesia. The evacuations and the changing political scene prompted BHP to fast track its strategy to localise the management and operation of its Indonesia Coal mining and port facilities. This included a major organisational restructure, which resulted in fewer expatriate employees and the relocation of senior management from Balikpapan to Jakarta.

Following the establishment of a new government under the leadership of Abdurrahman Wahid in late 1999, BHP reviewed and redirected its government relations and community development programs.

BHP has changed its government-focussed, centralist external relations program to one that is more community-based with an interactive, participative and supportive approach that involves all stakeholders.

The Company is also renegotiating its 'licence to operate' in a new environment that requires approval from a much broader stakeholder group that includes not only the Indonesian Government but also the community.

These changes are reflected in BHP Indonesia Coal's various community development programs, which include agribusiness, entrepreneurship training and small business development.

These programs are designed to assist in the development of sustainable, self-sufficient communities that focus on the immediate needs of the local people, while attempting to avoid over-reliance on continued handouts.

## CASE STUDY

### ACID ROCK DRAINAGE

BHP Iron Ore is researching a number of techniques to minimise the production and potential effects of acid rock drainage (ARD) at Mt Whaleback and some of its other mining operations in the Pilbara region of Western Australia. In progressing the various strategies for managing ARD, communication with internal and external stakeholders has been effective in building relationships and effecting changes in site operations.

The geology of the Pilbara's Hamersley Ranges includes pyritic shales. When exposed to the atmosphere, the pyrite, or iron sulfide in these shales oxidises and can produce heat and sulphurous gases. When combined with water, these materials release diluted sulphuric acid, commonly referred to as acid rock drainage. Currently, a system of dams captures clean run-off water to minimise contact with these pyritic materials. A dam and a series of evaporation ponds have been constructed to capture all remaining run-off as an integral part of our management strategy to ensure no off-site impacts.

The control techniques being researched by BHP Iron Ore include covering (encapsulating) the pyritic shales within overburden storage areas to minimise contact with water and the atmosphere. An overburden cover placed on the storage area is designed to store rainfall and release it to the atmosphere before it can enter the pyritic shale and

result in ARD. In addition, we are trialing methods that may limit atmospheric interactions, and thus minimise heat and sulphur dioxide emissions from pyrite. In formulating management strategies, key issues identified included keeping regulatory agencies involved and effecting operational changes. To resolve these issues, communication plans have been set up to ensure all governmental and work groups are kept aware of the issues confronting the operation, the planned actions and the groups' roles in effecting the outcomes. This year, an independent scientific review was conducted of the research, monitoring and management program, and the resulting report was provided to government and other interested parties as part of this consultative approach. The research and communication with key stakeholders will continue so as to improve the management of pyritic material.



From left, Stuart Miller, Consultant and Peter Waters, Superintendent Environmental Projects, BHP Iron Ore inspect pyritic shale at Mt Whaleback.

## CASE STUDY

### SAMARCO

The Samarco iron ore operation in Brazil has developed initiatives in environmental education and cultural awareness as part of a commitment to environmental and social responsibility. The environmental initiatives are multi-dimensional and address matters specific to different areas.

Near the Samarco mine in the Bento Rodrigues area in Minas Gerais state, an environmental education program has been established to reduce forest fires and encourage recycling. The program incorporates a variety of activities, including paper recycling workshops, ecological tours and a community visitation program. Various government agencies, the local school and the Federal University of Ouro Preto are partners in this program. Similar initiatives

have since been established in the nearby district of Santa Rita. An initiative to improve water quality by providing the local community with knowledge and technical expertise in water use has also been effective.

The Azimut project at the Tomas Gonzaga Municipal School, also located near the Samarco mine, focusses on garbage collection, environmental promotional events, planting initiatives in school grounds and qualifying local teachers in environmental education. Samarco partnered the municipal government, consultants and environmental agencies on this initiative.

The Salvamar project in the coastal area of Espirito Santo state, close to the pellet plant, aims to educate communities about recovering waste oil from boats instead of disposing of it into the sea. The focus has been on developing protocols and procedures for safe and efficient waste disposal.

The Casa da Avore initiative aims for wide impact through the local television station TOP Cultura. Programs focus on developing environmental citizenship in local youth.



Recycling of oil promoted by the Salvamar project.

## CASE STUDY

### CONTRACTOR MANAGEMENT

BHP Transport and Logistics is taking a proactive approach to ensuring employees and contractors work together to meet or exceed the Company's health, safety and environmental standards and requirements. As we move away from an 'own and operate' business model, we are increasingly working with contractors and alliance partners to provide a range of services, including chartering of ships.

This approach is being achieved through improvements in contractor management, building strong relationships with contractors to ensure a collaborative approach to achieving high health, safety and environmental standards, and through effective monitoring and measurement of contractor performance. BHP Transport and Logistics is also undertaking a review of all its contracts to ensure that not only general legal and commercial issues are covered but also health, safety and environmental issues are appropriately addressed.

BHP requires that contracts clearly specify environmental responsibilities, and special safety and design requirements where relevant.

Such provisions are particularly important where contractors are bringing equipment onto operating sites. Additionally, contractors are provided with instructions that include the Company's policies and procedures. BHP regularly audits contractors' on-site facilities and the quality of service and work.

## CASE STUDY

### LIVERPOOL BAY

The Liverpool Bay development comprises four oil and gas fields discovered during the early 1990s in the Liverpool approaches of the Irish Sea. This asset comprises offshore and onshore facilities and has a projected life of at least 20 years. Point of Ayr, where the onshore facilities are located, lies at the outer reaches of the Dee Estuary. This area is recognised nationally as a Site of Special Scientific Interest, at European level as a Special Protection Area for birds, and as an internationally important wetland due to the significant numbers of waders and wildfowl it supports. Nearby dunes also have protected status.

In addition, the Liverpool Bay development is located alongside the popular Welsh holiday village of Talacre.

BHP Petroleum is undertaking a long-term conservation program covering more than 350 acres of land surrounding the Point of Ayr gas terminal. The conservation program resulted from a land management agreement between BHP Petroleum and the Countryside Council for Wales, which is the government's statutory adviser on wildlife and conservation issues. The project area comprises three distinct sites, including two farms, which are integral to the local community and part of the last remaining sand dune system along the North Wales coast.

The conservation work is focussed on bird species that visit the area, since Point of Ayr is one of the Dee Estuary's main high-tide roosting sites for many species. The program also includes a large-scale landscaping scheme, and a dunes restoration and conservation scheme that incorporates various educational and community initiatives. Detailed ecological monitoring and reporting requirements are also integral to the program.

The overall program has improved local habitat diversity, while landscaping work has reduced the visual and audible impact of the terminal. The numbers of most species of wading birds and wildfowl on the conservation program area

are being recorded as higher than elsewhere along the coastal plain.

BHP Petroleum has also constructed an interactive visitor centre as part of the land management program. The centre enables residents, schools and the general public to find out more about the nature of the oil and gas industry. The facility features an exhibition about the formation, exploration and extraction of oil and gas, BHP's facilities, the local environment, pollution control, safety at sea, and the lives of people who work on the platforms.

The visitor centre forms the nucleus of an extensive community involvement program. It offers an array of activities for children and adults. Examples include miniature sets of rock and fossil samples, interactive models, CD-ROMs and, most recently, the *Dunes and Us* workbook.

Training and development workshops are an important part of the services arranged for local teachers at the centre. Commenting on a recent course, a local headteacher said, "The two days offered a focussed approach to the requirements of the national curriculum in subject areas of geography, science and history. An excellent delivery on every aspect, creating enthusiasm and awareness of environmental issues in industry."



Rangers carry out conservation management on Talacre dunes at Liverpool Bay.

## OLYMPIC GAMES

With the Sydney 2000 Olympic and Paralympic Games now a recent memory, we are proud of our contribution toward staging this internationally successful event. As a Team Millennium Olympic Partner, BHP's sponsorship extended to several of the highest profile symbols of the Games: steel for the Olympic Cauldron, Equestrian Centre, the massive Stadium Australia arches, and silver for the athletes' victory medals.

The Company also made a significant contribution behind the scenes to upholding the commitments of the 'Green Games'. BHP Steel's environmental credentials paved the way for using more than 140 000 tonnes of steel in the Olympic construction and infrastructure program. BHP's performance in waste minimisation and energy conservation and the recyclability of steel were primary factors in ensuring the approval of steel as a construction material of choice. Similarly, BHP Cannington's environmental reputation facilitated the direct supply of more than one tonne of silver for the athletes' victory medals.

During the past year, BHP finalised its contribution of silver and steel and concentrated on communicating the 'Green Games' message to our employees, guests and key stakeholders. BHP employees continued their involvement in Olympic Landcare events in various communities throughout the country. Our employees helped plant two million trees to assist in offsetting greenhouse gas emissions associated with running the Sydney 2000 Olympic Games.

We took this a step further and planted an Australian tree for every guest of BHP over the Games period in Bicentennial Park at Homebush Bay, amounting to 2 500 trees. BHP guests were asked to sign a pledge to the 'Green Games' and encouraged to plant a tree indigenous to their area when they returned home. Also, Team 2000, an environmental awareness program at the Port Kembla Steelworks linked to the Games, finalised winners and awarded Olympic-related prizes in recognition of employees who developed innovative environmental solutions on site.

*Right: Steel was used extensively throughout the Sydney 2000 Olympic construction program, including the Equestrian Centre.*





## CASE STUDY

### GREENHOUSE CHALLENGE

As a significant emitter of greenhouse gases and a producer of fossil fuels, we believe it is important to monitor and reduce greenhouse gas emissions in our operations, and we are developing strategies that reflect the changing policy environment.

Since the mid-1990s, a key component of our strategic response to climate change has been our participation in the Greenhouse Challenge, a voluntary program developed as a joint initiative between industry and government in Australia. It aims to systematically seek out 'win-win' projects that simultaneously reduce greenhouse gas emissions and improve economic outcomes. BHP is one of the founding companies in the Greenhouse Challenge. Through the program, we committed to undertake and report on actions to reduce greenhouse gas emissions from our Australian operations.

BHP's action plans are estimated to have resulted in emission reductions of almost six million tonnes of carbon dioxide equivalent (Mt CO<sub>2</sub>-e) per annum, or 25 per cent less than what would have occurred without these actions. This does not include the net reduction due to closures, divestments, acquisitions and new projects. This six Mt CO<sub>2</sub>-e reduction represents a significant portion of the total estimated reduction in emissions (24 Mt CO<sub>2</sub>-e) by Australian industrial participants in the program. Our 25 per cent reduction is also substantially higher than the average 16 per cent achieved by industry participants.

#### Activities and action plans

BHP's reduction in greenhouse gas emissions resulted from a total of 51 action plans. These plans fall into five broad categories: recovering waste energy resources, energy efficiency, energy substitution, research and development, and helping others to improve. Examples of the plans are:

##### • Coal seam gas projects

BHP, together with Energy Development Limited (EDL) and Lend Lease, has captured methane (a greenhouse gas with a global warming potential 21 times that of CO<sub>2</sub>) from

coal mining operations at the Tower and Appin collieries in New South Wales to convert it to electricity. A total of 94 1-MW reciprocating engines are installed at the two collieries. The overall greenhouse gas saving is 3.2 Mt CO<sub>2</sub>-e per year, including 2.5 Mt of direct savings and 0.7 Mt of indirect savings due to replacement of coal-fired electricity.

Recently, a seven kilometre-long pipeline has been constructed to deliver methane captured at the nearby West Cliff Colliery to the EDL power station at Appin. This pipeline now supplies enough methane to power 10 gas engines and results in additional direct and indirect savings of 0.4 Mt CO<sub>2</sub>-e per year.

##### • Efficient ironmaking technology

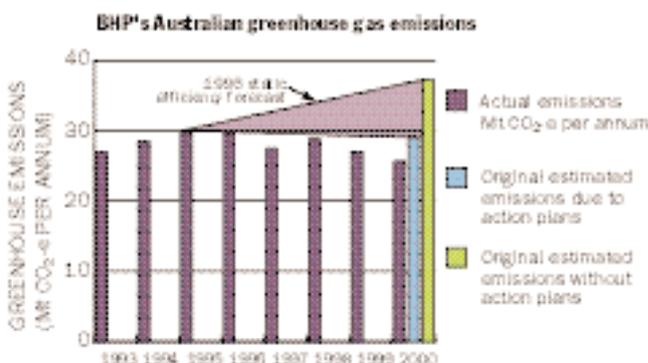
In June 1996, a new, more efficient blast furnace was commissioned at Port Kembla Steelworks. The number six blast furnace replaced two smaller and less efficient furnaces. Best-practice technology is used to control the operations of this furnace, including extensive use of computers for data acquisition and control, probes to monitor the in-furnace condition and adjust the gas distribution for optimal fuel rate, and significant research and development support. The savings in greenhouse gas emissions relative to the smaller furnaces amount to 0.46 Mt CO<sub>2</sub>-e per year.

##### • Griffin operations gas flaring policy

A predetermined gas venting and flaring policy for the *Griffin Venture* and Griffin Gas Plant in Western Australia has minimised gas vented to the atmosphere in the event of equipment or plant downtime. Wells are checked back or shut in to ensure the maximum flare allowance is not exceeded. Implementation of the policy has resulted in reduced venting and flaring for the Griffin operations, reducing greenhouse gas emissions by more than 46 000 t CO<sub>2</sub>-e in 1999.

#### Reporting and verification

As part of its Greenhouse Challenge commitment, BHP has submitted annual progress reports to the government since 1996, as well as public reports on our actions and emissions performance. These reports present the activities of BHP-operated sites within Australia and contain updated emissions inventories, trends in greenhouse indicators, information on actions and progress in implementing them, and revised estimates of the savings from actions relative to forecast emissions.



An independent verification of BHP under the Greenhouse Challenge has been recently completed. The verification report summarises that “examination of BHP’s Cooperative Agreement and Progress Report did not identify any material discrepancies with respect to baseline and current emission inventories or with the achieved emission reductions as a result of abatement actions”. The report also makes several valuable suggestions on how BHP’s Greenhouse Challenge activities can be improved. These suggestions are currently being considered or implemented.

### **Moving forward**

Looking forward, the emissions targets facing Australia under the Kyoto Protocol are challenging. Meeting them may involve significant structural change across the

economy, including those sectors in which BHP is an important player.

In the corporate sector, managing the business risk of the Kyoto Protocol requires an understanding of the future, as yet uncertain, price of carbon. The sheer scale of uncertainties around these issues is a major obstacle to industry investment, either in projects with major greenhouse gas implications or in abatement projects that are not fully economic in their own right.

These issues are best addressed by a policy framework that provides effective incentives for early action and the inclusion of all greenhouse gas sources and sinks, both domestically and internationally.



*New pipework connecting West Cliff mine to Appin Power Station.*

## CASE STUDY

### EAST TIMOR AID

The partnership between BHP, World Vision Australia and Community Aid Abroad has helped thousands of East Timorese people rebuild their lives, and demonstrates the importance of alliances between corporate and not-for-profit organisations.

BHP's involvement aimed to provide disaster relief in neighbouring communities where BHP capabilities closely matched the need, and to further develop its relationship with World Vision and Community Aid Abroad.

As a result, BHP donated 120 tonnes of steel roofing material and three tonnes of nails to World Vision to repair damaged domestic housing. BHP Steel manufactured the steel materials, and BHP Transport and Logistics provided the logistical support for the shipment of donated materials to Dili in East Timor. In addition, BHP provided office space at its Transport and Logistics site in Darwin for World Vision's emergency staff.

World Vision packaged the donated steel materials with timber, hammers and saws to provide roofing kits to 6 000 families. World Vision also managed the distribution of materials on the ground and was responsible for overseeing the rebuilding project. A feature of this project involved equipping local East Timorese people with construction skills to ensure they had ownership of the rebuilding process.

BHP experts, well-acquainted with regional weather conditions in East Timor, assisted AusAID in specifying the correct materials for the rebuilding project. BHP employees were proud that their Company could contribute its own products to assist people who had lost their homes. The successful project outcome led to World Vision securing further AusAID-funded projects, and to BHP Steel and BHP Transport and Logistics being offered new business opportunities through World Vision and other aid agencies working in East Timor.

BHP also donated 44 steel water tanks of various sizes to Community Aid Abroad for use in domestic dwellings and larger community facilities. Logistical support for the shipment of donated materials was again provided by BHP Transport and Logistics, while Community Aid Abroad managed the deployment of the tanks to East Timorese communities in urgent need of improved water and sanitation.



From left, Isabel Gomes, Peter Green and Mal Ralston from the World Vision East Timor team.

## CASE STUDY

### DIAMONDS WASTE MANAGEMENT

Effective waste management is critical at any operation as part of its environmental management program, and the EKATI™ diamond mine is no different.

The mine is located at Lac de Gras, 300 kilometres north-east of Yellowknife in Canada's Northwest Territories and 200 kilometres south of the Arctic Circle.

The site is linked by air and a seasonally operated ice road, which is rebuilt every year and remains open for 10 weeks. The road stretches for about 440 kilometres, traversing small frozen ponds and lakes, from Yellowknife to a point near Lac de Gras.

The remote location of the mine and the harsh climate (average daily winter temperature is  $-26^{\circ}\text{C}$ ) provide additional challenges to designing and operating an effective waste management program. It has evolved since the first plan was developed during mine construction in 1996.

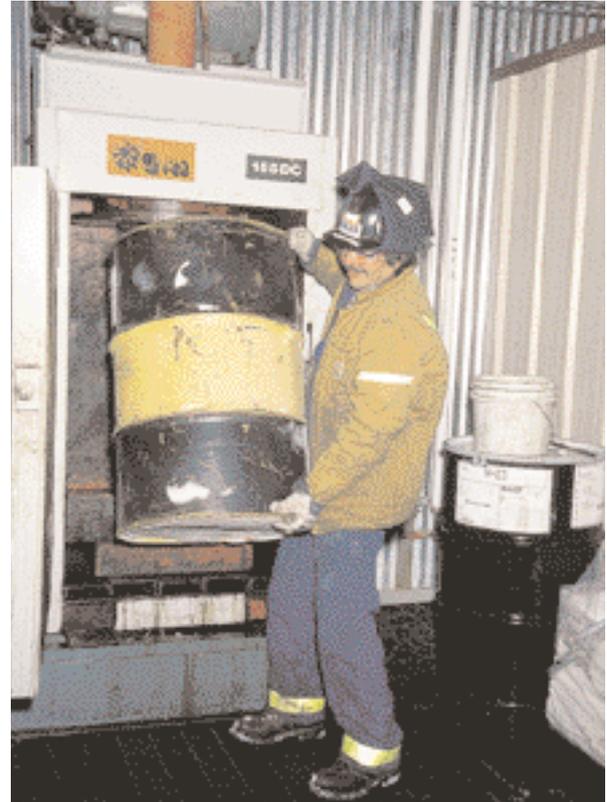
To help address these challenges, a dedicated waste management building and landfill site have been constructed. The building provides a central location to collect, prepare, process and temporarily store waste materials.

Waste is segregated according to how it is processed. A coloured bin system helps employees correctly segregate materials. The only materials placed in the landfill site are those that are inert to the environment.

The site recycles or reuses all used oils, waste fuels, other hydrocarbons, glycol and paint. All food wastes are incinerated to minimise the potential for wildlife to be attracted to the landfill site. Materials to be sent off-site are inventoried and stored until the winter road opens.

Between April 1999 and March 2000, approximately 500 000 litres of waste hydrocarbons were recycled.

Ensuring all employees accept responsibility for waste management has underpinned the success of the program.



*A coloured bin system has been set up to help segregate materials according to how waste is processed.*

## CASE STUDY

### THAILAND COMMUNITY RELATIONS

BHP Steel Building Products in Thailand has developed a strong relationship with the local government to raise awareness about safety and with a local school to promote more learning opportunities for students.

During recent years, a number of activities have been implemented at the school opposite the Rangsit roll-forming factory in Thailand.

The initiatives include scholarships for 10 students who have achieved outstanding study results and demonstrated a leadership role among the broader school community. Tours of the factory are conducted for students and teachers with the aim of creating greater awareness about safety in the workplace. Each year, BHP Steel Building Products donates sports equipment to the school. The factory also donates office equipment and has provided roof sheets for the school's buildings.

The operation's focus on safety and its contribution to the community's welfare have been recognised by the Thai Government with a Safety Management Award, and Company representatives have worked closely with the Nonthaburi and Pathumthani Labor and Welfare Department. A BHP representative was invited to join a government committee set up to establish best practice and guidelines for managing safety within manufacturing sites.

These initiatives have demonstrated that BHP's presence in Thailand is valued by the community, while raising the profile and importance of safety within Thailand's industry sector among a broad cross-section of people.

## CASE STUDY

### ST BEDE'S CHURCH

BHP owns and operates five underground coal mines in the Illawarra region of New South Wales, Australia. The oldest of the mines, established in 1962, is at Appin, which is also home to one of the country's most historic churches, St Bede's.

Originally designed by the first Catholic priest to the colony of New South Wales, Fr John Joseph Therry, St Bede's Church was constructed between 1837 and 1841. Its early parish priests included the first Catholic priest to be ordained in Australia and the first Australian to be ordained a Catholic priest.

Over the past 160 years, the sandstone church had suffered structural problems associated with shallow foundations and the swelling and contraction of reactive clay soils in the area, exposing the interior of the church to the elements. Cracking in the masonry posed a threat to the building's structural integrity and was a genuine safety concern.

During consultation with the Appin community before the start of longwall mining in a new area of the nearby West Cliff colliery, BHP discussed its concerns about the stability of St Bede's with the community. Although mining had never occurred under it, and is not planned to occur, scientific

predictions revealed the nearest point of influence of subsidence was only 100 metres from the historic church. Even though subsidence data indicated the church would not be disturbed, BHP Illawarra Coal chose to support the Appin community in strengthening and preserving the heritage structure.

BHP took a leading role in the efforts of the Appin community to save the church by underwriting the structural renovations. Further support for the project came from Appin residents, local parishioners and the Campbelltown Catholic Club, who contributed additional funds toward internal restoration and painting. Throughout the project, BHP Illawarra Coal worked closely with the Catholic Diocese of Wollongong, the Parish of Rosemeadow and the Wollondilly Shire Council to ensure that renovations to St Bede's were carried out in an historically sensitive manner.



*St Bede's Church was constructed between 1837 and 1841.*

## CASE STUDY

### LAND REHABILITATION TRAINEE PROGRAM

A partnership between BHP Iron Ore and Pundulmurra College in Western Australia's Pilbara region has provided a group of Aboriginal trainees with important work skills and on-the-job experience in rehabilitation and earth-moving plant operation.

Through the partnership, Pundulmurra College provided the training expertise while BHP offered industry expertise and access to state-of-the-art machinery.

For nine months, 12 Aboriginal trainees attended a variety of classes at Pundulmurra College, including occupational health and safety, workplace communications, first aid, numeracy and literacy, computer studies, and land care.

The trainees then undertook rehabilitation work at BHP Iron Ore's Finucane Island operations in Port Hedland, Western Australia, where they gained practical experience in operating plant and equipment before beginning significant rehabilitation work at shallow excavations or borrow pits along the Port Hedland to Newman rail line.

During the last month of the program, the trainees planned and undertook road, drainage and landfill projects at two local Aboriginal communities. This allowed trainees to draw on skills learnt in the previous eight months of the course, and also improved access and reduced the risk of houses being flooded during the wet season.

Since completing the program, almost half of the trainees have found full-time work.



From left, Teddy Allen, Punjunjamal Community Leader with Mike Jose, Senior Aboriginal Affairs Officer, BHP Iron Ore in Western Australia.

## CASE STUDY

### BHP CANNINGTON'S CROSS-CULTURAL PROGRAMS

The Cannington silver, lead and zinc operation in Queensland, Australia, is committed to working with indigenous communities to ensure traditional rights and culture are understood and respected by the work force. To meet this commitment, BHP Cannington has developed inclusive consultation and innovative cross-cultural programs.

Cannington is situated in a region that is home to five major Aboriginal communities, seven language groups and a number of smaller clan groups, each with specific needs and concerns.

Since Cannington's discovery in 1990, the development team acknowledged that establishing a meaningful way of consulting with remote Aboriginal communities was critical to the project's success. They began an extensive consultation program with indigenous people. In 1994, this was formalised into the Cannington Aboriginal Liaison Group (CALG) to give Aboriginal groups a voice in the project. CALG consists of representatives from the various Aboriginal organisations in the region and individuals who do not wish to be represented by an organisation.

One of the first priorities of CALG was to provide all non-indigenous BHP employees in the region with a background in the history, culture and issues impacting on traditional owners.

The North-West Queensland Indigenous Awareness Course was developed 'from the ground up', using issues and topics identified by the local Aboriginal communities. The eight-hour course involves challenging historical, cultural and legal material in balanced and positive ways and makes extensive use of local Aboriginal presenters.

Over the past two years, the course has been developed into an effective training package and has been well received by more than 150 course participants. It has been on-sold to external clients and handed back to an indigenous management agency to market and present. The North-West Queensland Indigenous Awareness Course Trust has been established to distribute the funds from royalties charged to each course participant. The Trust will fund indigenous projects specifically in the areas of health, education, culture and sport.



## Closure and Divestments

# TAKING RESPONSIBILITY FOR WHAT WE LEAVE BEHIND

**S**uccessful closure of any operation is dependent on the preparation and implementation of a detailed closure plan, as well as good environmental and social management of the project during the operations phase. Our objective is to begin planning for closure in the early stages of project development. This ensures that our feasibility studies take into account the expectations of local communities and the likely costs associated with closure. The closure plans are then progressively revised and updated throughout the project's life to take into account changes in operations, legislative requirements or community expectations. The project's environmental costs do not include any provision for closure, since these costs are reported separately in the accounts.

All BHP's extractive operations make financial provisions for their ultimate closure. The estimated costs of site restoration and rehabilitation are provided for over the estimated life of that operation. Provisions are made for manufacturing operations when it is known that the site will be vacated.

Strong ongoing relationships with stakeholders and communities are fundamental to the successful closure of an operation.

Stakeholder input is particularly critical to the development of, and agreement on, the next land use concept.

While progressive rehabilitation of a project is an ongoing aspect of responsible environmental management during the operations phase, after closure the land or marine environment must be returned to an agreed final use. At closure, the site may be rehabilitated as close as possible to its original state or prepared for an agreed alternative use.

Infrastructure built as part of the project is normally removed unless otherwise arranged with regulatory authorities and landowners.

Because of the generally large-scale nature and longevity of BHP's projects, they are often a major source of employment, taxes, royalties and other economic inputs to the local community. Sensitive management of social issues associated with the cessation of these inputs is critical to the successful closure of an operation. We aim to help develop sustainable local economies, which are not dependent on BHP, to assist communities in the transition following our departure.

## CASE STUDY

### BEENUP

Rehabilitation is progressing at BHP Minerals' Beenup mine site in south-west Western Australia following its early closure in February 1999. One of the key environmental issues for the rehabilitation program is the management of pyrite, a naturally occurring sulphide mineral that has the potential to form acid if exposed to air and water. Consultation with the community, Western Australian Department of Environmental Protection, and other state and local authorities has been a critical component in developing concepts for successful long-term rehabilitation of the site.

The rehabilitation plan is designed to prevent oxidation by keeping the pyrite either beneath the permanent water table in the backfilled dredge pond or saturated in the mine development storage area. Surface materials are being treated with lime sand to neutralise any potential acid generated.

In addition, pyrite, which began to oxidise after a trial mining operation in 1992, has generated two localised pockets of acid soils alongside the primary mining area. These pockets are being treated and neutralised as part of the rehabilitation program. Leeuwin Limestone, a local company, was awarded the contract to supply up to 130 000 tonnes of lime sand over the next three years to complete the program.

The tender submissions for the supply of lime sand were evaluated according to product quality, price, management of environmental and transport issues, and supplier capability. The tender criteria were reviewed with members of the Beenup Consultative Group. This group comprises shire councillors, landowners, and business and conservation group representatives.

One of the key issues was the transport of the lime sand, which created considerable concern about visual impacts, noise and transportation. Alternative routes were assessed according to the number of homes on the transportation route, distances and population density, the standard of vehicles to be used and the quality of the road system, safety, and potential areas of impact. To address concerns of local residents, a number of constraints were placed in the haulage contract, including haulage days, times, speed limits, noise reduction measures, dust minimisation measures, number and type of transport vehicles, and delivery rate.

In addition to the management of pyrite and supply of lime sand, BHP is working closely with local authorities and the community to ensure the effective management of the dredge pond water being released from the site. As the dredge pond is backfilled with clay and sand-mined material, water is displaced and therefore needs to be released. Extensive liaison between BHP, the government and the community, through the Beenup Consultative Group, found that the preferred method of release was through irrigation. BHP subsequently developed the rehabilitation plan to incorporate irrigation of nearby farmland.

Although unlikely to be used, BHP has also developed a contingency plan to pipe water to the ocean via dune infiltration in the event that water needs to be released during the winter months when irrigation is impractical. The Western Australian Water and Rivers Commission has set water-quality criteria for both irrigation and dune infiltration.

The release of this water has begun and is expected to occur over three to four years. After this time, surface water drainage will be reconstructed across the site.

The mine site rehabilitation program involves recontouring the land, revegetating the area with native flora, establishing wetlands, creating new pasture areas and monitoring to ensure there are no long-term environmental impacts.

BHP is continuing to liaise with the Beenup Consultative Group, government and other stakeholders as rehabilitation of the former Beenup mine site continues.



*A local haulage contractor delivers lime sand for use in rehabilitating the trial mine area.*

## CASE STUDY

### OK TEDI

The Ok Tedi copper mine (BHP 52 per cent) in Papua New Guinea (PNG) remains a difficult and complex issue for BHP, with competing environmental impacts and social and economic benefits.

BHP has indicated to the other shareholders of Ok Tedi Mining Limited (OTML) that it thought the best approach to this dilemma was to close the mine early in a manner that sought to mitigate further environmental impacts while addressing critical social issues. However, the PNG Government has advised that it considers that the balance of environmental, social and economic issues means that the mine should run for its economic life. We understand the reasons for its position.

As a result, we have come to the view that it would not be appropriate for BHP to have any direct involvement with the mine beyond the point at which all parties can agree on how we can best exit. We want to achieve this exit in a way that ensures a smooth transition, minimises the environmental impact, maximises the social benefits and does not incur liabilities for the future operations of the mine. We are currently in discussions with the other shareholders about how this is best achieved.

Since the public release by OTML in August last year of detailed scientific risk assessments, work has continued on a number of important unresolved issues. The potential for acid rock drainage associated with the oxidation of sulphide minerals in the tailing and waste rock material is being evaluated by specialist experts. A number of different management strategies are currently being developed while modifications to the mill have increased copper recoveries with respect to earlier projections. The dredging trial at Bige continues mitigation work and a volume of sand equal to about one year of tailing discharge has been removed from the Ok Tedi. The area is being progressively rehabilitated with pasture and food crops, including pineapples, spices and coconuts.

There has also been a careful process of consultation with government, the communities affected by the mine's operations and other interested groups. Patrols have gone to villages along the rivers to explain the conclusions, options and uncertainties contained in the Health and Ecological Risk Assessment (HERA), and to help the communities develop an informed consensus on whether they want the mine to continue. Many visitors from government, the media and NGO groups have travelled to the Western Province to see the issues for themselves. Some have made valuable suggestions on how things can be done better.

In April 2000, plaintiffs involved in the 1996 class action regarding environmental damages from the mine, issued new legal proceedings against BHP and OTML in the Victorian Supreme Court alleging non-compliance with the terms of the agreement, which settled that litigation. BHP believes it has complied with all requirements under the agreement and is defending the action. Resolution is not expected until late 2001, at the earliest.

Despite the court action, it appears that the community groups want the mine to continue, provided they can see a fair share of generated wealth invested in their communities. This sentiment reinforces BHP's wish to manage its exit in a way that supports the development of an effective and sustainable program for the longer term social and economic benefit of the people of the Western Province. The programs being developed by OTML will focus on infrastructure maintenance, including roads, schools, medical services, creation of alternative employment and income opportunities, and the maintenance of secure food supplies. Opportunities for

institutional strengthening programs with local and regional government will also be fostered.

Only 10 years of mineable reserves remain and environmental, climatic and other technical risks could intervene to further shorten mine life. Given the scale of social and economic issues to be addressed, the stakeholders have turned their focus to rehabilitation and closure planning, and the associated social and sustainable development issues. Full community participation, including the active involvement of women and youth, will be necessary for success.

These issues are reviewed in detail in the publication *BHP and Ok Tedi* (visit [www.bhp.com](http://www.bhp.com)).



From left, Community Relations Program Manager Willy Kupo and Community Relations Senior Officer Jeff Ransley participate in a meeting with Middle Fly Landowners at Obo.

## AWARDS PROGRAM RECOGNISES OUR CHAMPIONS

BHP's inaugural Environment and Community Awards program recognises our 'unsung heroes' by identifying initiatives that go above and beyond what is required in caring for the environment or the local community.

The BHP Environment and Community Awards honour employees who openly embody the values expressed in the BHP Charter and contribute more than what is required in their day-to-day job.

With almost 80 nominations from all around the world, the two judging panels, with representatives from BHP and non-government, education and government sectors, had a challenging task to narrow the field to 11 finalists in each category and then select the winners, highly commended, and individual prizes.

Donations of US\$5 000 (winners) and US\$1 000 were made to each award winner's nominated environment or non-profit community group. All award winners received a trophy designed by Sydney College of the Arts student Hong Seung Ki. The standard of entries was so impressive that the remaining finalists also received US\$1 000 to donate to their nominated group.

We congratulate nominees for their contributions.

### Environment Awards

#### WINNER: Goodbye gas emissions

Stuart Gaynor, Jacinda Edwards, John Coombs, Nick De Guingand and Pas Vilella, Coal and Coke Engineering Technical Services, Port Kembla, Australia, BHP Steel.

The winning team from Coal and Coke Engineering Technical Services at the Port Kembla Steelworks developed an in-house solution to reduce gas emissions at the gas processing plant. Their simple solution saved millions of dollars in high-tech capital expenditure, and reduced employee and community exposure to potentially harmful gases.

With two of the three stages of the project complete, emissions have already been reduced by 90 per cent and the ability to re-use the gases throughout the Steelworks has been significantly increased.

The system involved the installation of a pressure/vacuum sealpot and level control. It is easy to operate and maintain since it has no moving parts and does not rely on power or instrumentation.



Stuart Gaynor and Pas Vilella inspect the seal pots on the Vapour Recovery System.

The technology is fully transferable and, in principle, could be applied to any storage tank installation.

The NSW EPA was consulted throughout the process and contributed to the development of the technology.

#### Highly commended prizes

Ben Tulloch, Sam Balestra, Jeff Pisani and Rod Cribbs, Sydney Logistics Centre, Australia, BHP Transport and Logistics.

Ben's initiative involved the innovative application of gluing technology to eliminate the use of plastic pallet wrapping material in the distribution process.

Ian McFarlane, Electrical Power Distribution Team, Energy Services, Port Kembla, Australia, BHP Steel.

Ian's project involved the relocation of nesting birds to reduce high voltage trips that posed a danger to the birds, employees and plant at the Steelworks.

Gary Atatahak, BHP Diamonds, Yellowknife, Canada, BHP Minerals.

Gary's land use study was designed to integrate traditional Inuit knowledge into the screening of mineral development projects in the arctic regions of Canada, recognising the importance of recording indigenous experience and wisdom.

#### Individual prize

Helen McSpadden, Point of Ayr, Wales, BHP Petroleum.

Helen's comprehensive land management project involves the ongoing management of 350 acres in an environmentally sensitive area on the Point of Ayr in Wales for the purposes of long-term nature conservation.

#### Other finalists

Tim Jacques, Piet De Voogd and Gary Anderson, BHP Steel, Port Kembla.

Introduction of a mould powder feeder system at the Slab Casters.

Lorrie Zammit, BHP Steel, Port Kembla.

Development of an Olympic Environmental Awareness Program at the Port Kembla Steelworks.

Brian Gray, BHP Steel, Sydney.

Development of an innovative waste packaging initiative.

Steve Malone, BHP Minerals, Cannington.

Development of a dynamic environmental display to educate Cannington employees and the general community on regional environmental values.

Vincente Gonzales, BHP Minerals, Tintaya.

Introduction of a potable water treatment project in the Tintaya Marquiri community.

Beenup Rehabilitation Team, BHP Minerals, Beenup.

Implementation of the Beenup rehabilitation project.

**Community Awards**

**WINNER: Community care**

Edison Herrera on behalf of the Community Attention Centre Team, Escondida, Chile, BHP Minerals.

The creation of a Community Attention Centre in Antofagasta, Chile, is an inspiring example of BHP employees identifying specific needs within their local community and working together to improve conditions for all.

The Centre comprises a chapel, an open house dining area that can cater for 80 children, a basic medical station that opens two days a week for children and pregnant women, and a day care centre for 25 children to enable mothers to work within the community. Social assistance is also provided to the most needy.

For more than three years, BHP employees worked to raise funds to establish the Centre for the underprivileged people in the area. Many of the people who visit the Centre live in the municipal waste dumps in the city and are ordinarily provided with little respite from their poor living conditions.

The project has increased community awareness of poverty in the area, and various institutions and groups of people have contributed with food and cash donations. Other areas of the community assist in preparing meals, counselling and providing training in such areas as home economics and first aid.

The Community Attention Centre is voluntarily staffed and assisted by several groups at the Escondida mine.

**Highly commended prizes**

Mick Roche on behalf of Cannington Mine, Australia, BHP Minerals, and the North Queensland Conservation Council.

Mick coordinated the first audit and environmental report for an Australian mining company to be undertaken by a non-government organisation. In June 2000, the North Queensland Conservation Council released BHP Cannington's environment and sustainability report *Broadening Our Horizons*.

Peter Angel, Nelson Point Terminal, Port Hedland, Australia BHP Minerals.

As deputy manager in Port Hedland for the State Emergency Service (a volunteer organisation), Peter and his team revolutionised the way roof repairs are undertaken in emergencies, significantly reducing personal trauma suffered by community members in the aftermath of cyclones.

Jan Craig, Sarah Anderson and Bill Chadburn, Port Kembla, Australia, BHP Steel.

Through a community-oriented 'head-shaving' event, the team raised enough money to purchase four cardiac monitors for the Wollongong Hospital to help save the lives of premature babies in the region.

**Individual prize**

Cameron Bennett, Glenbrook Steelworks, New Zealand, BHP Steel.

Cameron was part of the original committee to establish Mensline as a mainstream service provided by Lifeline. Mensline, a telephone helpline, encourages men to talk about personal issues and solve problems by communicating.

**Other finalists**

Dennis Ryan, BHP Steel, Port Kembla.

Involvement in the Illawarra Cancer Care Centre.

Shift A Mine Operations, BHP Minerals, Escondida.

Implementation of the 'No to Drugs' program.

Frances Waltham, Diane Rowlands and Helen McSpadden, BHP Petroleum, Point of Ayr, Wales.

Establishment of the BHP Visitors' Centre and community involvement at Point of Ayr.

Anthony Quinn, BHP Corporate, Melbourne.

Establishment of St Joseph's Housing Association in South Yarra.

Stuart Bensley, BHP Corporate, Melbourne.

Establishment of a not-for-loss centre in Melbourne's western suburbs.

Mike Robertson, BHP Transport and Logistics, Sydney.

Commitment to voluntary foster care.



Children enjoy lunch at their community attention centre, Chile.



# REVIEWING OUR PERFORMANCE

**A**t BHP, we demonstrate our commitment to health, safety, environmental and community matters through transparent disclosure of our performance. We encourage external involvement in the monitoring, review and verification of our environment and community performance across the Company.

Our success as a global natural resources company will largely be determined by how effectively we work with our employees and the communities in which we operate.

Community relations issues are relevant to all aspects of our operations, and positive interaction with communities is essential if BHP is to continue to prosper and grow. Often, issues raised by our local communities arise from environmental or related concerns.

We recognise that reporting on our social performance is as important as reporting on our financial and environmental performance. At BHP, as in other areas of the corporate sector, social reporting is in its formative stages as we determine how best to present this information.

This year, we have started to collect social performance data so that employees, communities and other stakeholders can determine our social impacts, both positive and negative. The data may not be as accurate as we would like, but by starting to record this data, we are in a better position to understand and manage the social aspects of our activities. In coming years, we will improve our systems and processes so we can more accurately capture this essential element of our business.

## FINANCIAL PERFORMANCE

One of the biggest challenges of today's society is balancing resource needs with the need to conserve the world's natural environment. We must help get this balance right. At the same time, we must deliver against our business imperatives and ensure shareholder value.

During the past 12 months, our financial performance has been particularly strong, reflecting the effectiveness of a number of significant change processes within the Company and the recovery in prices for key commodities.

The Company's profit of \$1 986 million was a record. Figures 1 and 2 summarise the Company's financial performance over the past five years.

## HEALTH AND SAFETY PERFORMANCE

At BHP, our goal of zero harm to people and the environment is applicable to all the Company's activities and operations worldwide. We remain committed to achieving the highest possible standard in health and safety performance.

Although we had achieved a 51 per cent reduction in Lost Time Injury Frequency Rate (LTIFR) between July 1997 and June 1999, our safety performance over the past 12 months was disappointing, showing no significant further improvement (Figure 3). We were also deeply saddened by the death of five contractors in separate accidents during the year. These fatalities, all vehicle-related, and our general accident and incident profile, have been analysed with a view to addressing the root causes of the accidents.

## SOCIAL PERFORMANCE

BHP contributes to the community in many positive ways through taxes, royalties, employment, training and specific community partnership programs. We also recognise our activities will have negative impacts on communities in which we operate if our interaction is poorly managed.

By collecting and reporting social data, we aim to better understand and manage the social aspects of our activities. This data is presented as follows.

### Employment Demographics

The number of direct employees has fallen significantly over the past year, reflecting the transfer of employees to third parties through the sale of assets, such as BHP Engineering and BHP Information Technology, closure of loss-making assets, and general restructuring activities. BHP also employs a significant number of contractors. The Company's employee and contractor statistics are presented in Figure 4.

Employment opportunities provided by BHP's operations result in significant flow-on employment in service industries. It has been estimated that this multiplier effect may be in the order of 5.5 in Australia and is likely to be higher in developing countries.

### Employee Diversity

At BHP, diversity among our employees is an important consideration. It is a sensitive issue that has many aspects, including gender, culture, religion, age, physical ability, education and experience.

Figure 1: Financial summary 1996-2000

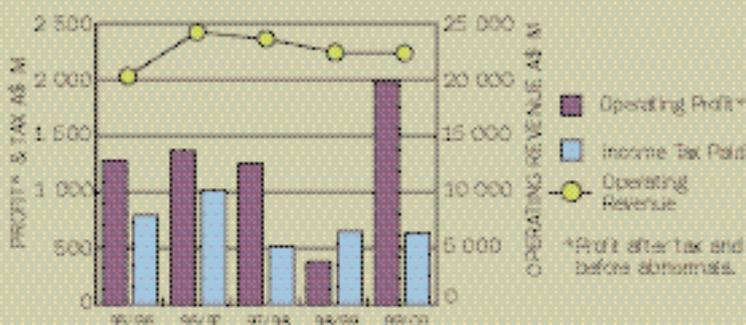
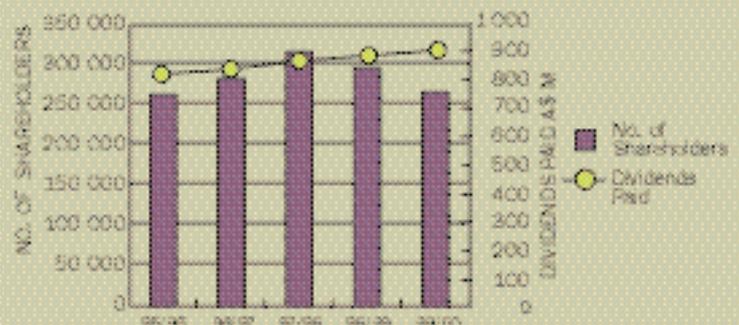


Figure 2: Financial summary 1996-2000



The proportion of women in the BHP workforce is approximately seven per cent. Compared to other industries, this is a relatively small percentage. Although the mining and energy sector has traditionally been male-oriented, BHP is committed to enhancing opportunities for women through equal employment and affirmative action policies in place throughout the Company.

Indigenous employment is important in ensuring that local communities share in the benefits of BHP's operations. Through our Community Management Standards, we establish strategies to ensure that local and indigenous communities have positive employment opportunities within the Company.

Many sites do not formally collect data on racial or ethnic background, and figures rely mainly on voluntary self-classification by employees.

In examining the data collection for all social metrics, we are considering a more comprehensive process to collect information regarding diversity among BHP employees.

Some of our sites have an obligation to monitor and report their performance against agreed targets. More than 85 per cent of BHP employees at the Navajo coal mine in the United States are from the local Navajo Indian community. In contrast, other sites, such as the Senakin coal mine in Indonesia, have recorded that the most significant community complaint relates to the low levels of local and indigenous employment.

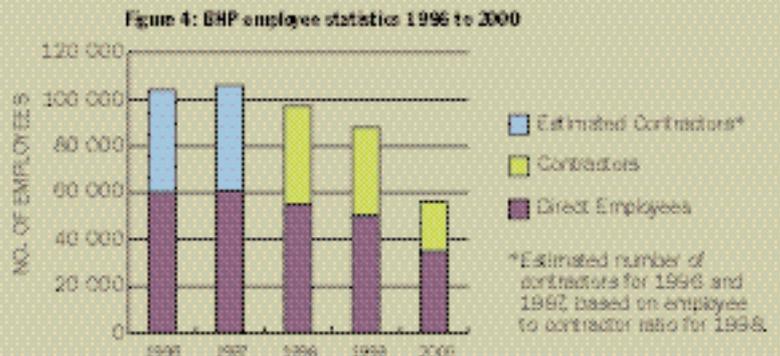
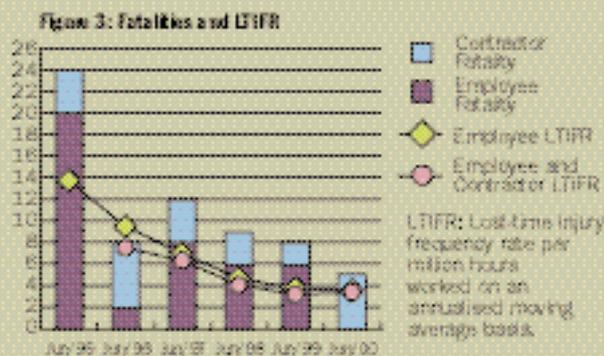
## Employee Rights

In our Health, Safety, Environment and Community Policy, we outlined our commitment to human rights. In honouring this commitment, we collected data to establish baseline performance and set future targets.

As a responsible member of society, we must have the mechanisms in place to identify breaches of human rights. Child labour is a significant issue, particularly in developing countries, and BHP will continue to monitor its performance in this area.

All BHP employees are above the minimum legal age of employment. Our youngest employee works as a maintenance technician apprentice in Queensland, Australia, and is 16 years old. The legal working age in Australia is 15.

Closely linked to child labour is the issue of fair wages. We have identified that all BHP employees earn more than the applicable national statutory minimum wage.



## Business Ethics

BHP operates a *Business Conduct Helpline*, a worldwide service open to all employees and external parties to address business conduct issues. The helpline recorded more than 200 calls and all issues were addressed, the majority having a successful outcome or resolution.

Figure 5 illustrates the nature of issues reported via the helpline. The majority of issues relate directly to how well BHP businesses are complying with Company policies and guidelines.

## Community Contributions

At BHP, we support the communities in which we operate through financial support of community organisations, providing in-kind assistance and volunteer labour.

In 1999/2000, BHP's financial contributions to community-based organisations totalled \$10.7 million. This amount included contributions to the Escondida Foundation in Chile and the Fly River Development Trust in Papua New Guinea. It does not include in-kind assistance or administrative costs, such as equipment loans, advice, labour or donation of materials. We believe this type of assistance to communities is highly valued, but BHP does not currently measure these benefits in a consistent manner. The projected community programs expenditure, including in-kind and administrative costs for the current financial year, is expected to be \$20 million.

At a corporate level, community support is focussed on areas that reflect the nature of BHP as a resources company. The three key areas are the environment, education (specifically science and technology) and community development. We are developing substantial partnerships with a number of community organisations to address important social and environmental issues.

At a local and regional level, most sites have a representative committee of employees to consider how BHP can best contribute to their local area.

Teams of BHP employees and their families have been keen to volunteer for community activities during the year. These have included revegetation events with Olympic Landcare in Australia and the Galveston Bay Foundation in Houston, US, and volunteers who work at a Community Attention Centre for needy people in Antofagasta, Chile.

BHP employees across the world also participated in an innovative World Environment Day campaign titled *Time to Act*. The web-based project encouraged employees to personally undertake environmental tasks, such as recycling, tree planting or clean-up activities. The Company pledged to match every action with a \$2 donation to an environmental project in an area chosen by employees. The activity raised \$10 000 for a World Wide Fund for Nature project in Papua New Guinea to train local communities in sustainable forestry management.

## Tax and Royalty Payments

During the period, our sites and operations paid a total of \$636 million in taxes and \$476 million in royalties throughout the world.

Royalties are effectively an economic rent paid on the basis of the value of products generated by our businesses. Royalties help ensure that our host countries share in the success of our operations.

Royalties paid during the period were equivalent to 24 per cent of our profit. When combined with income taxes, the proportion increases to 56 per cent. This provides an indication of the significant contribution BHP makes to host communities.

Figure 5: Business conduct helpline issues 1999/2000

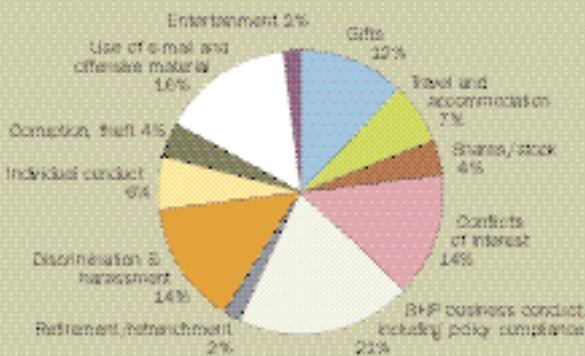
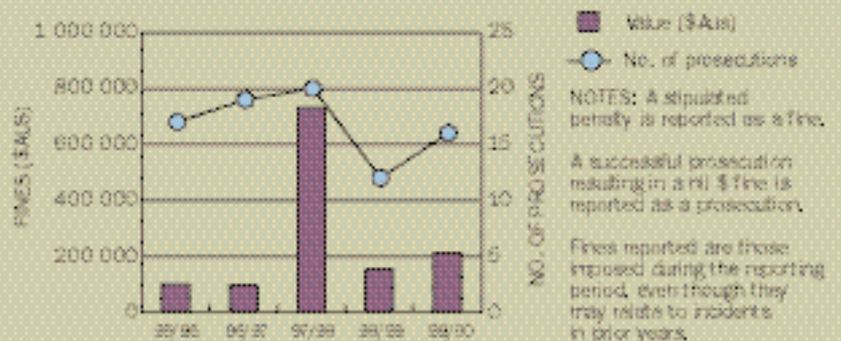


Figure 6: Fines and prosecutions (1995/96 to 1999/00)



## ENVIRONMENTAL PERFORMANCE

### Spending on the Environment

The Company's estimated environmental expenditure for 1999/2000 was approximately \$90 million. As a result of asset sales and broad cost-cutting measures, this is down from last year's reported environmental expenditure of \$105 million.

The environmental costs reported above are the direct functional costs, including labour and consultants' fees, of running various environmental programs and studies across the organisation. It does not, however, include the various process or activity costs that have environmental consequences, such as treatment of atmospheric emissions, discharges to water, waste management, rehabilitation, dredging at Ok Tedi, or the clean-up costs associated with incidents. Nor does it include the environmental component of capital projects, since these are usually considered to be an integral part of the project.

The environmental costs quoted above do not include any provision for closure, since these are reported separately in the accounts.

### Fines and Prosecutions

BHP's objective is to comply with applicable laws and regulations. However, from time to time, incidents with environmental consequences occur, or we fail to meet specific licence conditions or other legal requirements, resulting in authorities prosecuting and/or imposing fines or penalties.

During 1999/2000, we did not achieve our target of reducing fines and prosecutions by 30 per cent per annum. BHP received 16 fines totalling \$212 490.

This is an increase both in the number and value of fines over the previous year. (In 1998/99, BHP received 12 fines totalling \$153 000.)

Figure 6 shows the trends in both the number of prosecutions and the total cost of fines over the past five years.

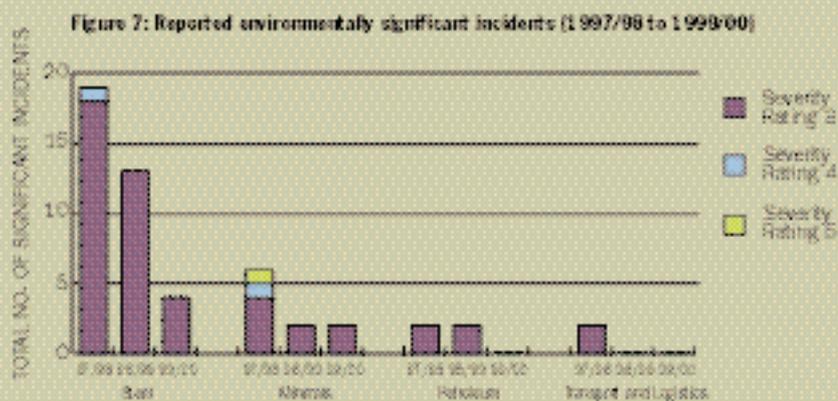
A summary of individual prosecutions and fines is contained in Appendix C. Note that a number of the fines relate to incidents that occurred during 1997 and 1998 but were not resolved until the current reporting period.

### Environmental Incidents

For BHP's reporting purposes, an environmental incident is an event that causes an adverse environmental impact, or a non-conformance with environmental regulations, licence conditions or internal policies and standards. A significant incident is an incident with consequences rated as Severity Level Three or above, as described in Appendix E. Ok Tedi, which we recognise as a long-term environmental issue, is not recorded here. (Refer to the Ok Tedi case study on page 39.)

In 1999/2000, there were only six reported significant environmental incidents across all of BHP's operations worldwide, compared with the 17 significant incidents reported during the previous year. While some of this change is attributable to a more rigorous application of the severity criteria for reporting purposes, it also indicates a real improvement in performance over the period.

The trend in the number of significant incidents over the past three years is shown for each business group in Figure 7. Appendix D contains summary details of the significant incidents for 1999/2000.



## Resource Use

### Land use

Consideration of future land use is an integral component of a whole-of-life approach to planning, developing and operating a resource project. The government, community and other stakeholders are ideally included in the decision-making process associated with the form and use of land following the closure of an operation. The approach also involves identifying environmental liabilities as they arise and ensuring that adequate provision is made to meet our rehabilitation obligations, in line with accounting practices and regulatory requirements.

The areas of land disturbed and rehabilitated each year are shown in Figure 8, together with the estimated total area of disturbed land. (Note that the area of land disturbed does not include land affected by overbank flooding and dieback from the Ok Tedi operations.) During the year, BHP has continued to disturb more land than it rehabilitated, although the difference this year is smaller than in previous years. The total amount of land disturbed by mining managed by BHP has actually declined due to the sale of the Moura coal mine and other divestments.

## Water

Water resources are of great importance to many of BHP's sites, both in terms of possible environmental impacts of discharges to water from our operations and of ensuring that our consumption of water in our production processes does not adversely impact water resources.

Water consumption across the Company has declined during 1999/2000, continuing a general trend that has seen consumption reduce by some 42 per cent since 1995/96. Figure 9 shows the trends in water use by some of our major sites, as well as BHP's overall consumption during the past five years. Data includes fresh water and ground water extracted for site use.

A small component of the reduced water consumption is due to process improvements. The majority of the decrease from 145.3 to 102.4 gigalitres can be directly attributed to the sale and closure of a number of sites and operations. Specifically, the major reductions in water consumption have resulted from closing the Beenup titanium minerals mine, and putting key North American copper mines and smelter onto 'care and maintenance'.

During the reporting period, increases in water consumption were reported at the Hot Briquetted Iron (HBI) plant in Western Australia as it stepped up production, and a small increase occurred at the integrated steelworks at Port Kembla in New South Wales.

Figure 8: Land disturbance and rehabilitation (1995/96 to 1999/00)

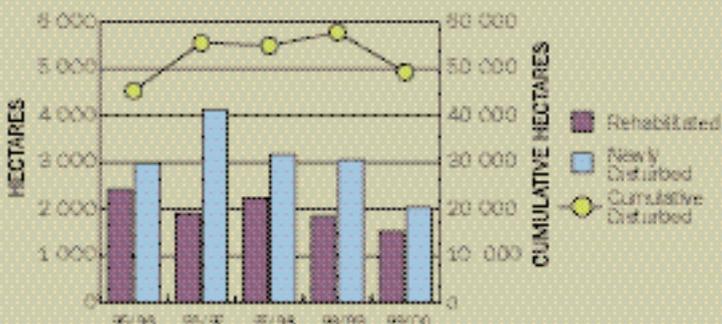
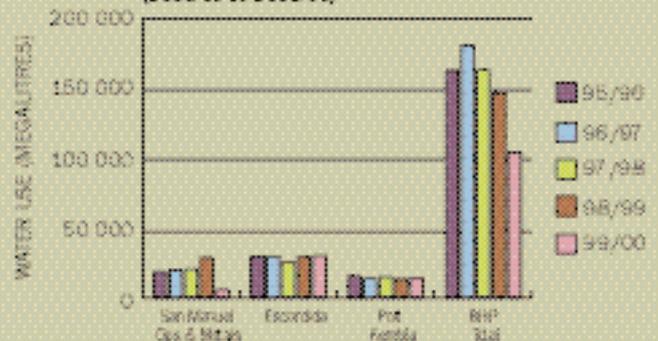


Figure 9: Water consumption at key sites, and BHP overall (1995/96 to 1999/00)



**Energy**

BHP is a significant producer and consumer of energy, most of which is based on fossil fuels, including coal, coke, oil, gas, liquified natural gas (LNG) and other petroleum products.

Energy production statistics based on BHP's interests in both non-operated joint ventures and BHP-operated assets are presented in the environmental data tables in Appendix F. While overall energy production has risen slightly during the year, increased production from most facilities (including the resumption of oil and gas production from Bass Strait following the Longford incident in 1998) tended to be offset by the divestment of a range of operated and non-operated assets.

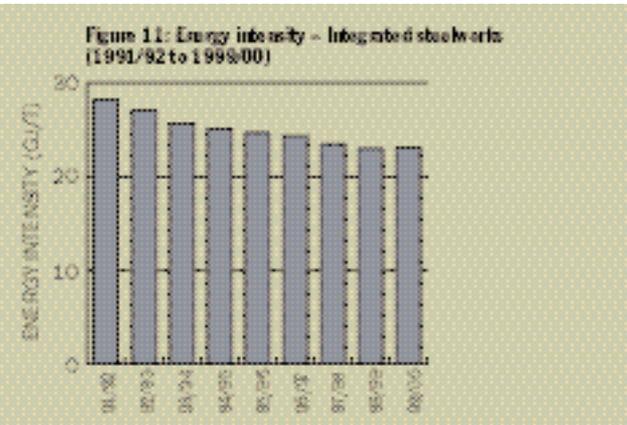
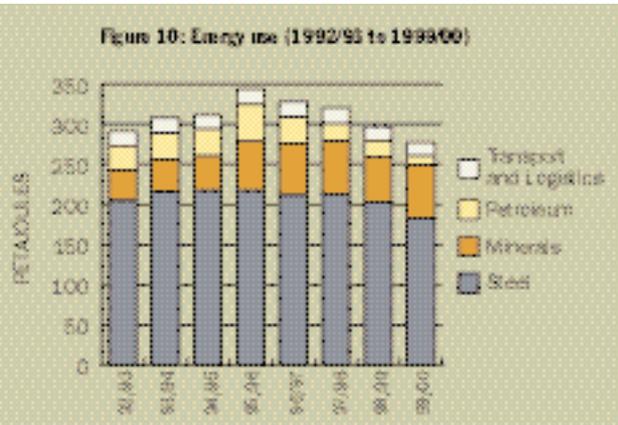
BHP's energy consumption during 1999/2000 is shown in Figure 10. The reduction in energy consumption reflects the balance between divestment and closure of some assets, and some new facilities coming on line. Steel's energy consumption has decreased substantially, largely due to the closure of Newcastle Primary Operations and, to a lesser extent, the sale of smaller entities, such as Tubemakers and some Building Product assets. The decrease in Transport and Logistics' energy consumption is the direct result of the withdrawal of eight ships from the BHP fleet during the year. Petroleum's reduced energy consumption resulted from the sale of operated facilities in the Timor Sea.

Within Minerals, energy consumption increased from 56 to 65 petajoules, despite the sale or closure of a number of facilities. This increase was mainly due to the 'ramping-up' of operations at HBI, with an additional 17 petajoules of natural gas consumed by the plant during the financial year.

The fuel mix has changed only slightly during the year, with coal and coke consumption decreasing by approximately three per cent due to the closure of Newcastle Steelworks Primary Operations. The fuel mix has continued the trend toward the displacement of diesel by natural gas at a number of sites.

Energy intensities are convenient measures of how efficiently we use energy in our key production process. They measure the amount of energy required to produce a unit of output or activity (for example, gigajoules of energy per tonne of crude steel). We have monitored the energy intensities of each of our main products and services for many years. Figure 11 shows the long-term reduction in energy intensity for the production of crude steel, which represents around two-thirds of BHP's total energy consumption.

For the Company overall, we set ourselves a target of five per cent improvement in energy efficiency between 1995 and 2000. In our previous reports, we tracked our overall performance using a measure we refer to as the Energy Intensity Index. This was calculated by weighting the energy intensities for 13 of our main products according to the proportion of total energy consumption that they represent. We have recently identified an improved methodology for calculating the Energy Intensity Index to account for real improvements in energy intensities. The previous method resulted in the largest improvements in energy intensity being partially obscured by the corresponding reduction in energy weighting factors.



Our Energy Intensity Index performance relative to the 1995/96 baseline is presented in Figure 12. (Note that the improved calculation methodology has been applied to all previous years. The revised Energy Intensity Index is based on the ratio of the current year's energy consumption divided by the energy consumption in the base year adjusted for current production levels.) As can be seen from the figure, the revised Energy Intensity Index shows an overall improvement of around 13 per cent, which easily exceeds our initial target of a five per cent reduction over the five-year period. This reduction is due to a combination of factors, including process efficiency improvements, energy purchasing arrangements, and structural changes, such as closures, divestments and acquisitions.

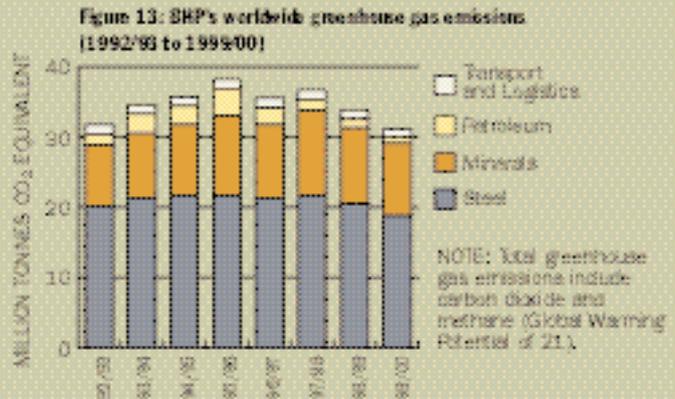
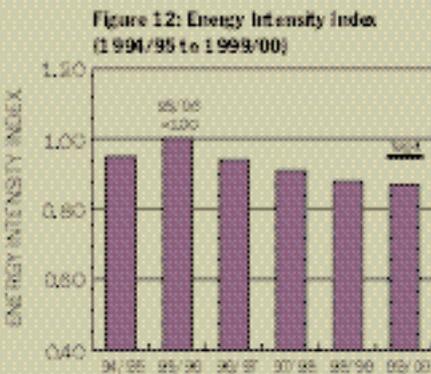
**Emissions to Air**  
**Greenhouse**

BHP is a significant emitter of greenhouse gases, specifically carbon dioxide and methane. BHP's carbon dioxide emissions are a product of chemical reduction processes, including iron and steelmaking, the use of fluxes, fuel combustion (including power generation) and, to a small extent, venting from coal mines. Methane is a powerful greenhouse gas, with a global warming potential 21 times that of carbon dioxide over a 100-year time horizon. BHP's methane emissions result from coal mining and oil and gas production, and represent approximately 13 per cent of our total greenhouse emissions on a CO<sub>2</sub> equivalent basis.

The trend in BHP's worldwide greenhouse gas emissions is shown in Figure 13. Total greenhouse emissions in 1999/2000 was 31.2 Mt CO<sub>2</sub>-e, the lowest levels since we started keeping records of our emissions in 1992/93. This is 2.7 million tonnes less than the previous reporting period and seven million tonnes lower than our peak in 1995/96. This decrease in the last year is largely attributable to the closure of primary operations at Newcastle and the sale of Timor Sea petroleum assets. Other improvement initiatives at various sites have also contributed to the decrease in emissions (see the Greenhouse Challenge case study on page 30).

Because total greenhouse gas emissions change with production, we measure our greenhouse performance using greenhouse intensities, which represent the amount of greenhouse gases released per unit of activity or output. We have been tracking the greenhouse intensities of our main products for several years.

For the Company overall, BHP has set an ambitious target of a 10 per cent reduction in greenhouse intensity by the year 2000, relative to 1995/96. We have tracked and reported our overall greenhouse performance since 1998, using a measure we term the Greenhouse Intensity Index. This Index was calculated by weighting the greenhouse intensities for 13 of our main products according to the proportion of total greenhouse emissions that they represent. Similar to the problem identified with the Energy Intensity Index, the previous methodology has tended to mask the real reductions in greenhouse intensities, as the greatest improvements have been obscured by the corresponding reductions in the emission weighting factors.



The revised method of calculating the Greenhouse Intensity Index gives a more accurate representation of the changes in our overall greenhouse performance. Our Greenhouse Intensity Index performance relative to the 1995/96 baseline is presented in Figure 14. (The revised Greenhouse Intensity Index is based on the ratio of the current year's total greenhouse gas emissions divided by the emissions of the base year adjusted for current production levels.)

There has been an overall reduction in the revised Greenhouse Intensity Index of approximately 12 per cent, which meets our initial target of 10 per cent improvement over the five-year period. As with the trend in the Energy Intensity Index, this improvement is due to a combination of factors, which include the effects of greenhouse reduction measures and process improvements, as well as structural changes involving the closure, divestment, acquisition and start-up of projects.

### Ozone

Ozone-depleting substances (ODS) include halons and chlorofluorocarbons (CFCs), as well as less damaging substances such as hydrochlorofluorocarbons (HCFCs). International treaties and various national laws and regulations control the use and disposal of these substances.

In pursuit of our goal of no discharges of ODSs to the atmosphere, we are progressively eliminating equipment from our sites that use CFCs and halons, while plant that uses HCFCs and hydrofluorocarbons (HFCs) is in relatively common use. CFCs and halons are used in some safety-critical situations, such as halon fire-fighting systems in the engine rooms of older ships, since suitable alternatives are limited. New ships are designed to incorporate safe alternatives.

Emissions to atmosphere are now estimated indirectly from the amounts of ODSs being used to 'top up' such equipment as refrigeration and air-conditioning plant, as well as other essential applications as previously mentioned.

Total estimated atmospheric emissions of all forms of ODSs for 1999/2000 was 6 146 kg. These were primarily HCFCs and HFCs but also included some small quantities of halons and CFCs for essential uses. Significant reported quantities were from our integrated steelworks at Port Kembla (3 227 kg) and Whyalla (932 kg) as well as from our Transport and Logistics operations (1 890 kg). A summary of ODS emissions data is presented in Appendix F.

### Oxides of sulphur and nitrogen

Oxides of sulphur (SO<sub>x</sub>) in sufficient concentration can affect air quality and human health and, in some environments, cause acid rain. SO<sub>x</sub> emissions are associated with a variety of industrial and domestic activities, including power generation, combustion of fuels, smelting of metal ores containing sulphur, oil refining and transportation.

Oxides of nitrogen (NO<sub>x</sub>) emissions are produced from the combustion of fuels and, in sufficient concentration and quantity, can have adverse effects, particularly in highly industrialised areas, by combining with hydrocarbons to form photochemical smog.

BHP's approach to managing SO<sub>x</sub> and NO<sub>x</sub> emissions is determined by environmental licence limits set by regulators, or is based on good environmental practice to ensure emissions do not adversely affect air quality or result in adverse environmental impacts.

BHP's total SO<sub>x</sub> emissions to air are shown in Figure 15. This is an estimate developed from monitoring emissions from major point sources, plus the estimated emissions from the combustion of fuels. Emissions of SO<sub>x</sub> have reduced by approximately 35 per cent since 1997/98.

Figure 14: BHP's Greenhouse Intensity Index (1994/95 to 1999/00)

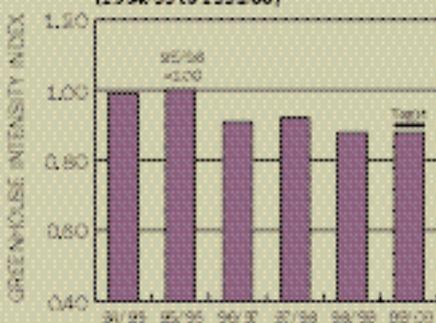
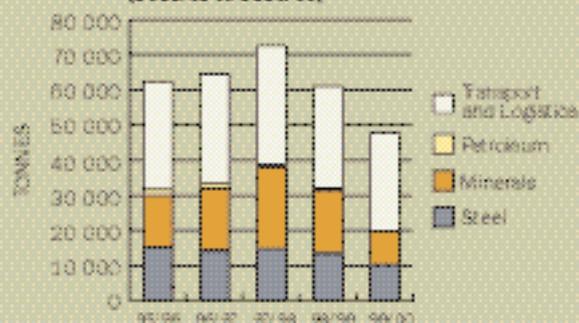


Figure 15: SO<sub>x</sub> emissions to air (1995/96 to 1999/00)



All business groups have contributed to this reduction, with significant reductions occurring in Minerals, Transport and Logistics, and Steel. Specifically, reductions in SO<sub>x</sub> emissions have occurred as a result of the scaling back of our United States copper operations, the closure of Newcastle primary operations and the reduction in our shipping fleet.

Figure 16 shows the NO<sub>x</sub> emissions to air. NO<sub>x</sub> levels are estimated based on monitored emissions from major point sources, plus that emitted from the combustion of fuels. Emissions of NO<sub>x</sub> have reduced by approximately 22 per cent since 1996/97. All business groups have contributed to the observed reduction over this period. The main reductions have resulted from the closure of Newcastle primary operations, the sale of Timor Sea assets and the scaling back of United States copper operations.

### Other emissions to air

Dust emissions, as well as being a nuisance, can be a potential health risk depending on their chemical composition and physical properties. Where dust is an issue, programs have been put in place to monitor and control emissions.

Standard techniques for estimating dust emissions have been developed as part of the National Pollutant Inventory (NPI) in Australia. Even though application of these techniques tends to overestimate actual dust levels, the methodology will be applied consistently across a range of industries. Links to the NPI reports for our participating Australian facilities are accessible via BHP's Internet site at [www.bhp.com](http://www.bhp.com)

Other forms of emissions to atmosphere that are of potential concern include a range of organic compounds, such as benzene and dioxin. These are by-products of various industrial and combustion processes and may have potential adverse health effects because of their toxicity. Since 1993, BHP has undertaken various studies to measure dioxin emissions from potential sources within its

Steel operations. The results of these studies have been shared with communities through public forums, information provided to regulators and communications with non-government organisations. (See Port Kembla Health Risk Assessment case study on page 22.)

### Oil spills and discharges

Minimising releases of oil and grease to water is achieved through attention to operating practices during loading and discharge, as well as the use of grease traps, oil-water separators and bunding around storage tanks. In the event of an accidental spill, response capabilities are also important. Hence, clean-up and control equipment, such as oil-absorbent material and oil capture booms, are available at critical sites.

The main sources of oil released to water from BHP Petroleum's offshore facilities is contained in produced water (i.e. water that is extracted during the production of oil and gas) and in oil-based drilling muds. This oil is dispersed at a low concentration of less than 30 to 40 parts per million in accordance with regulatory requirements and is not included in oil spill data.

Figure 17 shows the total amount of oil spilled to water since 1995/96. The total volume of oil spills to water is almost 6 300 litres and was significantly lower than the previous year (which included a spill of approximately 48 500 litres from the Liverpool Bay facilities). The target of 30 per cent per annum reduction in spills was met relative to both the base year and the previous year but was not down to the 1 270 litres achieved in 1997/98. The main spills to water occurred at our coal-mining operations at Senakin (4 030 litres) and Satui (1 030 litres) in east Kalimantan, Indonesia.

We have begun collecting information on accidental spills and leakages of oil and other materials to land, and will be including these in future reports.

Figure 16: NO<sub>x</sub> emissions to air (1995/96 to 1999/00)

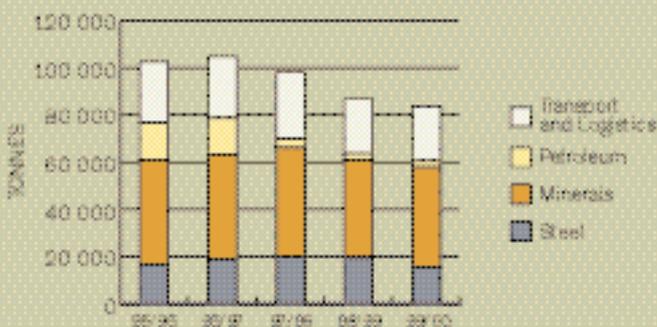
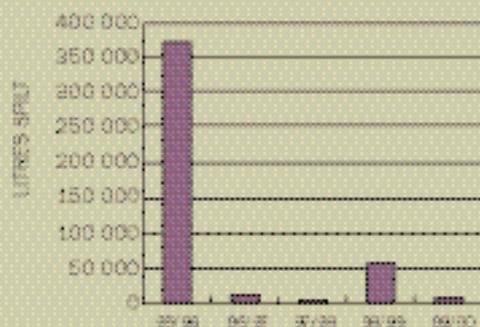


Figure 17: Oil spills to water (1995/96 to 1999/00)



## Wastes

In last year's Environment and Community report, we discussed the difficulties in obtaining consistent and reliable data for measuring and reporting site wastes. With more than 85 per cent of the reported waste data considered reliable, last year we established a set of baseline rates for general and hazardous wastes. Some further anomalies in waste reporting have been identified this year in our effort to improve the quality of measuring and reporting waste data.

Figure 18 shows the Company-wide aggregated data for general and hazardous wastes. Reported quantities of waste (not including waste rock and tailing) have decreased approximately 25 per cent since last year, due primarily to the closure and sale of a number of operating sites in Minerals and Steel.

Reported levels of hazardous waste have reduced by more than 50 per cent for the year, decreasing from 61 600 tonnes in 1998/99 to 30 200 tonnes during 1999/2000. Reductions in hazardous wastes were reported at various Steel, Minerals and Petroleum sites. The effects of closure and sale of assets appear to be the main reasons for the decrease.

## Waste rock and tailing

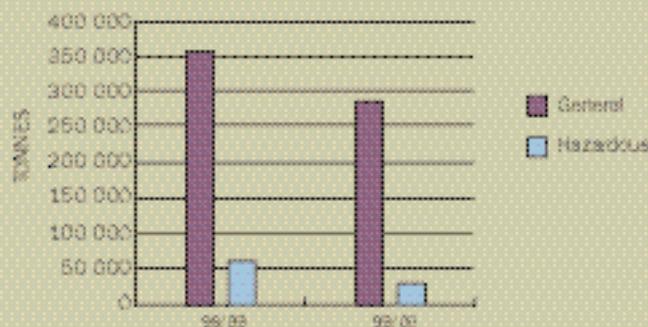
Waste rock (overburden) and tailing from mining and ore-processing operations are normally stored on site in secure locations that minimise the risk of release of contaminants. These areas are rehabilitated as a normal part of operations and mine closure. Materials discharged to tailing and waste rock disposal facilities are not considered discharges to the environment as the material is either contained or any emissions effectively managed. These waste materials are therefore excluded from the volumes of total wastes presented in Figure 18. (See also the Ok Tedi case study page 39.)

## Contaminated site management

BHP has a number of sites that have some degree of soil or groundwater contamination resulting from accidental leaks and discharges or historical waste disposal practices. Across the Company, efforts to identify potentially contaminated sites, and to assess the associated risks to human health and the environment are continuing.

Where risks are identified, suitable management plans are developed that may range from simple containment of contaminated materials to remediation appropriate to the current or proposed future use of the land. For example, part of the land in the Steel River project in Newcastle, New South Wales, was used as a project waste disposal area and has been rehabilitated for future commercial and industrial use.

Figure 18: Total wastes (1998/99 to 1999/00)



## AUDITOR'S VERIFICATION STATEMENT

URS Corporation (incorporating Dames & Moore) has been retained by BHP this year to collate and independently assess the validity of environmental and community relations data used in the *BHP Environment and Community Report 2000*.

### Scope:

The scope included the following:

- The collation and validation of the quantitative data presented in spreadsheets used by BHP Corporate for inclusion in the *BHP Environment and Community Report 2000*. The data covers energy, greenhouse and environment, and is provided by the businesses.
- The collation of community relations data, which was conducted for the first time in the reporting process, and the validation of a significant sample of that data.
- Selected site audits to validate related environment and community relations data provided to BHP Corporate. These validation audits were conducted by experienced auditors and in accordance with URS protocols, based on international environmental auditing practices. The site audits included a comprehensive examination of the data, including data collection methods, the adequacy of these methods, and the overall quality of the data.
- The validation process focussed on quantitative environmental and community relations data but did not include an assessment of the qualitative statements presented in the *BHP Environment and Community Report 2000*. It also did not include data relating to compliance, health and safety, environmental management systems, and financial information.

In addition to the above scope, URS assisted BHP Corporate in the improvement of the data questionnaire based on our experience from last year's verification process.

URS utilised personnel and resources to conduct the data validation separate to those used in the site audits.

### Data collation and validation:

The key findings and recommendations arising from the data collation and validation process are presented below:

- BHP has refined and improved the spreadsheets for collecting and reporting data, resulting in a general improvement in the quality of the data being reported by site.
- Management of data, both current and historical, has improved and is now easily accessible and has been safeguarded against accidental loss.
- Data collection and reporting procedures have improved at a Company-wide level, however, approximately 15 per cent of sites still require improvement in data reporting and responsiveness. Issues relating to these problems will need to be addressed next year so that a commitment to the public reporting process is demonstrated by all sites.
- This is the first year BHP has reported community relations data and further development is required to identify key performance indicators.

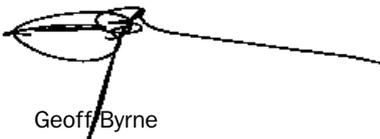
### Site validation audits:

URS selected the seven sites to be audited, including three international sites. It was not practical to review all of BHP assets, however, we believe that the sites selected form an adequate sample of the data contained in this Report and represent the diversity and nature of BHP's business. The sites were not aware of the audit until after their submission of final data to BHP Corporate and were audited shortly after being notified.

The sites audited were: Discovery (Australia/Asia operations); Escondida, Chile; Liverpool Bay, United Kingdom; Norwich Park, Queensland; Sydney Steel Mill, New South Wales; New Zealand Steel; and Navajo US.

### Concluding statement:

Based on the data review process and the sites that have been audited, we believe that the data presented in the *BHP Environment and Community Report 2000* is sound, and reflects the Company's overall environmental and community performance. The addition of community relations data to the Report this year and the data quality illustrate to URS that BHP is improving its public reporting process. These initiatives need to be expanded to ensure further improvements to Company environmental and community relations performance.



Geoff Byrne  
Senior Principal  
URS Australia

## Appendix A: List of sites and entities

BHP Minerals	% Owned
<b>Appin</b> , New South Wales, Australia	100
<b>Beenup</b> , Western Australia (in closure)	100
<b>Blackwater</b> , Queensland, Australia	52.1
<b>Cannington</b> , Queensland, Australia	100
<b>Centre for Minerals Technology</b> , Nevada, United States	100
<b>Cordeaux</b> , New South Wales, Australia	100
<b>EKATI™</b> , Northwest Territories, Canada	51
<b>Elouera</b> , New South Wales, Australia	100
<b>Escondida</b> , Chile	57.5
<b>Florence*</b> , Arizona, United States	100
<b>Gag Island</b> , Indonesia	75
<b>Goonyella/Riverside</b> , Queensland, Australia	60.52
<b>Gregory/Crinum</b> , Queensland, Australia	64.1
<b>Hartley*</b> , Zimbabwe	67
<b>Hay Point Coal Terminal</b> , Queensland, Australia	52.1
<b>Hot Briquetted Iron Project</b> , Western Australia	100
<b>Jimblebar</b> , Western Australia	85
<b>Minerals Discovery</b> (minerals exploration activities) worldwide	100
<b>Mt Whaleback/Orebody 29</b> , Western Australia	85
<b>Moura</b> , Queensland, Australia (sold August 1999)	80
<b>Navajo</b> , New Mexico, United States	100
<b>North Pulau Laut Coal Terminal</b> , South Kalimantan, Indonesia	80
<b>Norwich Park</b> , Queensland, Australia	52.1
<b>Ok Tedi</b> , Papua New Guinea	52
<b>Orebodies 23 and 25</b> , Western Australia	85
<b>Peak Downs</b> , Queensland, Australia	52.1
<b>Petangis</b> , East Kalimantan, Indonesia	80
<b>Pinto Valley*</b> , Arizona, United States	100
<b>Railways and Ports</b> , Western Australia	100
<b>Robinson*</b> , Nevada, United States	100
<b>Samarco</b> , Brazil	50
<b>San Juan and La Plata Coal Company</b> , New Mexico, United States	100
<b>San Manuel Metals*</b> , Arizona, United States	100
<b>San Manuel Operations</b> , Arizona, United States	100
<b>Saraji</b> , Queensland, Australia	52.1
<b>Satui</b> , South Kalimantan, Indonesia	80
<b>Senakin</b> , South Kalimantan, Indonesia	80
<b>South Walker Creek</b> , Queensland, Australia	80
<b>Superior</b> , Arizona, United States	100
<b>Tintaya</b> , Peru	100
<b>Tower</b> , New South Wales, Australia	100
<b>West Cliff</b> , New South Wales, Australia (included from acquisition in March 1997)	100
<b>White Pine</b> , Michigan, United States (sold June 2000)	100
<b>Yandi</b> (also known as Marillana Creek), Western Australia	100
<b>Yarrie</b> , Western Australia	85
* care and maintenance	
BHP Petroleum	% Owned
<b>Angola Exploration</b> , West Africa	30
<b>Atlantis</b> , Gulf of Mexico	44
<b>Block 2(ab)</b> , Trinidad	50
<b>Block 2(c)</b> , Trinidad	45

BHP Petroleum	% Owned
<b>Block 401/402</b> , Algeria, North Africa	100
<b>Buffalo Venture</b> , Western Australia, Australia	50
<b>Exploration</b> (seismic and drilling operations) worldwide	variable
<b>Gabon Exploration</b> , West Africa	64.71
<b>Griffin Venture, Griffin Gas Plant</b> , Western Australia, Australia	45
<b>Keith Field</b> , North Sea, United Kingdom	31.83
<b>Lara Fertiliser Project</b> , Victoria, Australia	100
<b>Liverpool Bay</b> , Irish Sea, United Kingdom	46
<b>Methanol Research Plant</b> , Victoria, Australia (sold June 2000)	80
<b>Minerva Development</b> , Victoria, Australia	90
<b>Ohanet</b> , Algeria, North Africa	60
<b>Point of Ayr Gas Plant</b> , North Wales, United Kingdom	46
<b>Viper</b> , Gulf of Mexico	37
<b>West Cameron</b> , Gulf of Mexico	33
<b>Zamzama</b> , Pakistan	38.6

### BHP Transport and Logistics

**Vessels:** Approximately 30 owned and managed and approximately 13 on long-term time charter (where fuel is supplied by BHP).

**Operating centres:** Australia (Adelaide, Brisbane, Darwin, Gladstone, Hay Point, Kwinana, Newcastle, Port Hedland, Whyalla, Port Kembla, Braeside, Western port and Villawood), South-east Asia, United States (Oakland) and New Zealand.

BHP Steel	% Owned
<b>BHP Building Products Australia</b> , various sites, Australia	100
<b>BHP Building Products International</b> , 23 sites, Asia-Pacific region	average 60
<b>BHP Reinforcing Products</b> , various sites, Australia	100
<b>BHP Ropes</b> , New South Wales, Australia	100
<b>Brisbane Market Mill</b> , Queensland, Australia	100
<b>Coated Steel Australia Service Centres</b> , Chullora, Acacia Ridge, Braeside, Sunshine, Wingfield and Myaree, Australia	100
<b>Coated Steel Australia</b> , Western Port, Victoria, Australia	
<b>Springhill and CRM Works</b> , New South Wales, Australia	100
<b>Coated Steel International</b>	
• two sites in Asia; and	average 65
• two in the United States	100
<b>Geelong Wire Mill</b> , Victoria, Australia	100
<b>New Zealand Steel</b> , Primary Operations, Rolling and Coating (Glenbrook) and Ironsand Mining (Taharao, Maioro) New Zealand	100
<b>Newcastle Mill</b> , New South Wales, Australia	100
<b>Newcastle Steelworks</b> , Primary Operations, Rod and Bar Mills, New South Wales, Australia	100
<b>Port Kembla Steelworks</b> , New South Wales, Australia	100
<b>Structural and Pipeline Products</b> , Somerton, Newcastle, Kembla Grange, four minor sites, Australia	100
<b>Sydney Steel Mill</b> , New South Wales, Australia	100
<b>Tube-makers Merchandising</b> , more than 110 merchandising centres, Australia	100
<b>Whyalla Steelworks</b> , South Australia	100

## Appendix B: BHP financial summary 1995/96 – 1999/2000

Year ending 30 June	millions of dollars				
	95/96	96/97	97/98	98/99	1999/2000
Operating revenue	19 941	23 790	23 192	22 019	21 953
Operating profit*	1 283	1 361	1 258	378	1 986
Income tax paid	789	1 011	514	647	636
Dividends paid	819	836	866	884	903
Market capitalisation at year end	34 798	39 239	28 264	30 914	35 317

\* After income tax and excluding abnormals.

Year ending 30 June	95/96	96/97	97/98	98/99	1999/2000
Number of shareholders#	263 000	283 000	317 000	297 000	267 000
Direct employees	60 000	61 000	55 000	50 000	35 000
Contractors	N/A	N/A	42 000	38 000	21 000

# Approximately 65 per cent of the Company's shareholders are based in Australia.

## Appendix C: Prosecutions, fines and penalties (1999/2000)

BHP business	Fines and prosecutions
Steel	<ul style="list-style-type: none"> <li>Port Kembla Steelworks, Australia, in February 2000 received three fines totalling \$45 000. The fines related to an incident on 24 November 1997 when a coke ovens' gas emission occurred due to a major power failure across the plant. Fines were: \$25 000 for failure to maintain electrical equipment; \$12 000 for ammonia and cyanide exceeding the licence drain discharge limits; and \$8 000 for oil exceeding the licence drain discharge limits.</li> <li>Coated Steel, Springhill, Australia, in June 1999 was fined \$25 000, plus \$25 000 in costs relating to an incident on 25 April 1997 when oil leaked from a heat exchanger and resulted in a discolouration in Allans Creek.</li> <li>Coated Steel, Springhill, Australia, in June 1999 received a \$4 000 fine. The fine related to an administrative omission involving two discharge events to waterways in February 1997 that were omitted from the annual Licence Certificate of Compliance submitted to the NSW EPA.</li> <li>Port Kembla Steelworks, Australia, in August 1999 was fined \$30 000 plus \$12 000 in NSW EPA costs. The fine was related to a 560 000-litre spill of coke ovens' liquor that occurred in April 1998 when drain ammonia licence limits were exceeded.</li> <li>Port Kembla Steelworks, Australia, in December 1999 received two \$1 500 fines. The fines related to a drain discharge on 20 September 1999 where ammonia and phenol exceeded the licence limits.</li> <li>Coated Steel, Kalama, United States, in December 1999 received a fine of US\$1 500. The Southwest Air Pollution Control Authority audited the site in September 1999 and found violations to some record-keeping requirements.</li> </ul>
Minerals	<ul style="list-style-type: none"> <li>Cordeaux Colliery, Australia, in January 2000 received a \$1 500 fine relating to a continuous monitoring and recording meter not being installed on the wastewater discharge for the licence period November 1998 to November 1999.</li> <li>Elouera Colliery, Australia, in August 1999 received a \$1 500 fine relating to a stockpile dust suppression failure and complaint incident that occurred on 20 July 1999.</li> <li>Elouera Colliery, Australia, in April 2000 received a \$14 000 fine relating to a stockpile dust management incident that occurred on 13 October 1998.</li> <li>Elouera Colliery, Australia, in April 2000 received a \$1 500 fine relating to a stockpile discharge of dirty water that occurred on 4 April 2000.</li> <li>San Manuel Operations, United States, in September 1999, received a US\$18 500 fine relating to a heap leach drain overflow that occurred on 7 July 1998.</li> </ul>
Petroleum	<ul style="list-style-type: none"> <li>None</li> </ul>
Transport and Logistics	<ul style="list-style-type: none"> <li>Iron Kembla, South Korea, on 10 October 1999 received two fines totalling 40 000 000 Korean won (KRW) and were ordered to pay clean-up costs of KRW5 894 836. The fines and costs related to an oil spill incident on 7 October 1999 of approximately 95 litres that occurred during a transfer operation.</li> </ul>
Total BHP	<ul style="list-style-type: none"> <li>16 fines and prosecutions totalling \$212 490.</li> </ul>

Data in this table are based on site data reported by BHP's managed businesses to BHP Corporate.

## Appendix D: Significant incidents (1999/2000)

Incident Severity Rating	Date and location of occurrence	Incident description	Response
<b>Minerals</b>			
3	August 1999 Australia	HBI Port Hedland: Depressurisation of the lock hopper occurred, resulting in the release of dried iron ore fines to the atmosphere under pressure. The release resulted in a loud noise and a large cloud of black dust. Two emergency shut-off valves failed, resulting in pressurised hot gas and a jet fire to atmosphere.	The Emergency Management Team were immediately activated, and the system was depressurised to extinguish the fire and prevent further discharge of iron ore fines. The Department of Environmental Protection was notified of the incident. Corrective measures determined from the investigation have been assigned to prevent re-occurrence.
3	Ongoing Australia	Elouera Colliery: In October 1998, the NSW EPA commenced an investigation into dust from the Elouera stockpile following a resident's complaint. Stockpile sprays were working but their effectiveness required review. A prosecution summons was received in September 1999 from the NSW EPA.	The stockpile operator was instructed to cease work should dust be seen coming from the operation. The dust suppression system was reviewed and inspections were increased. Other improvements included trial sprays, larger spray guns, and spray cycle time reduced and duration extended.
<b>Steel</b>			
3	August 1999 Australia	Whyalla Steelworks: Raw gas from the coke ovens was emitted due to a loss of steam.	The SA EPA was notified, emergency services activated and some areas of the plant evacuated.
3	August 1999 Australia	Steel River: A water quality pond was emptied inappropriately, resulting in pond water with high solids content being pumped into the Hunter River.	The NSW EPA investigated and took photographs and water samples.
3	September 1999 Australia	Port Kembla Steelworks: A small number of fish in the main drain were killed as a result of contaminated water discharges from gas processing operations. Measured concentrations of ammonia and phenols were more than three times the licence limit.	A potential source for the discharges was identified and corrective actions were set in place.
3	November 1999 Australia	Whyalla Steelworks: Diesel fuel was discovered leaking from corroded underground piping in a fuelling facility operated by a contractor. Based on the findings of groundwater investigations, it is estimated that up to 300 000 litres of diesel fuel may have leaked.	The leaking pipes were isolated and free-phase diesel was pumped out. A specialist consultant assisted in the design of a suitable remediation strategy.

*\*Note that for BHP's reporting purposes, an environmental incident is an event that causes an adverse environmental impact or a non-conformance with environmental regulations, licence conditions or internal policy and standards. A significant incident is an incident with consequences rated as Severity Level Three or above, as described in Appendix E, BHP's Incident Severity Rating matrix. It should also be noted that Ok Tedi, which we recognise as a long-term environmental issue, is not recorded here. (See Ok Tedi case study, page 39.)*

*Data in this table are based on site data reported by BHP's managed businesses to BHP Corporate.*

## Appendix E: Incident Severity Rating matrix

Low	Minor	Moderate	Major	Extreme
Level 1	Level 2	Level 3	Level 4	Level 5
<b>Injury and disease (includes workers and community)</b>				
Low level short-term subjective inconvenience or symptoms. No measurable physical effects. No medical treatment.	Objective but reversible disability/impairment and/or medical treatment injuries requiring hospitalisation.	Moderate irreversible disability or impairment (less than 30 per cent) to one or more persons.	Single fatality and/or severe irreversible disability or impairment (greater than 30 per cent) to one or more persons.	Short- or long-term health effects leading to multiple fatalities or significant irreversible human health effects to more than 50 persons.
<b>Environmental effects</b>				
No lasting effect. Low-level impacts on biological or physical environment. Limited damage to minimal area of low significance.	Minor effects on biological or physical environment. Minor short- to medium-term damage to small area of limited significance.	Moderate effect on biological or physical environment but not affecting ecosystem function. Moderate short- to medium-term widespread impacts (e.g. oil spill causing impacts on shoreline).	Serious environmental effects with some impairment of ecosystem function (e.g. displacement of a species). Relatively widespread medium- to long-term impacts.	Very serious environmental effect with impairment of ecosystem function. Long-term, widespread effects on significant environment (e.g. unique habitat, national park).
<b>Social/cultural heritage</b>				
Low-level social or cultural impacts. Low-level repairable damage to commonplace structures.	Minor medium-term social impacts on local population. Minor damage to structures/items of some significance. Minor infringement of cultural heritage. Mostly repairable.	Ongoing social issues. Permanent damage to structures/items of cultural significance, or significant infringement of cultural heritage/sacred locations.	Ongoing serious social issues. Significant damage to structures/items of cultural significance, or significant infringement and disregard of cultural heritage, sacred locations.	Very serious widespread social impacts. Irreparable damage to highly valued structures/items/locations of cultural significance. Highly offensive infringements of cultural heritage.
<b>Community/government/media/reputation</b>				
Public concern restricted to local complaints. Ongoing scrutiny/attention from regulator.	Minor, adverse local public or media attention and complaints. Significant hardship from regulator. Reputation is adversely affected with a small number of site-focussed people.	Attention from media and/or heightened concern by local community. Criticism by NGOs. Significant difficulties in gaining approvals. Environment credentials moderately affected.	Significant adverse national media/public/NGO attention. May lose licence to operate or not gain approval. Environment/management credentials are significantly tarnished.	Serious public or media outcry (international coverage). Damaging NGO campaign. Licence to operate threatened. Reputation severely tarnished. Share price may be affected.
<b>Legal</b>				
Low-level legal issue. On-the-spot fine. Technical non-compliance. Prosecution unlikely.	Minor legal issues, non-compliances and breaches of regulation. Minor prosecution or litigation possible.	Serious breach of regulation with investigation or report to authority with prosecution and/or moderate fine possible.	Major breach of regulation with potential major fine and/or investigation and prosecution by authority. Major litigation.	Investigation by authority with significant prosecution and fines. Very serious litigation, including class actions.
<b>Operational impact (safety, health and environment related incidents)</b>				
Easily addressed or rectified by immediate corrective action. No loss of production. No damage to equipment.	Minor or superficial damage to equipment and/or facility. No loss of production.	Moderate damage to equipment and/or facility. Loss of production less than one week.	Major damage to facility requiring significant corrective/preventative action. Loss of production less than six months.	Future operations at site seriously affected. Urgent corrective/remedial action. Loss of production greater than six months.
<b>Total estimated cost (including HSEC related costs, e.g. potential clean-up, corrective actions, fines, liabilities)</b>				
Less than \$10 000	\$10 000 to \$100 000	\$100 000 to \$1 000 000	\$1 000 000 to \$10 000 000	Greater than \$10 000 000

## Appendix F: Environmental data tables

Data in these tables are aggregate figures based on site data reported by BHP's managed businesses for the BHP financial year. Totals may differ due to rounding of data. Production data can be found in *BHP's Report to Shareholders 2000 - Description of Business and Financial Statements*. During a review of energy and environmental data, some errors were identified in previously reported figures. These figures have been corrected in this year's Report.

### ENERGY

Energy production (petajoules)	94/95	95/96	96/97	97/98	98/99	99/00
Crude oil and condensate	443	406	409	444	574	591
Natural gas	229	236	227	224	262	275
LNG, LPG, ethane	104	97	101	110	74	104
Black coal	1 452	1 497	1 547	1 686	1 725	1 743
<b>TOTAL</b>	<b>2 228</b>	<b>2 237</b>	<b>2 284</b>	<b>2 464</b>	<b>2 635</b>	<b>2 713</b>

Production reported is BHP's share of production from joint ventures and 100% of production from controlled entities.

Energy use (petajoules) – includes electricity	94/95	95/96	96/97	97/98	98/99	99/00
Minerals	43	62	65	65	56#	65*
Transport and Logistics	18	19	19	20	19	17
Petroleum	33	45	32	22	19	11^
Steel	217	217	211	213	203	183+
<b>TOTAL</b>	<b>311</b>	<b>343</b>	<b>327</b>	<b>320</b>	<b>297</b>	<b>277</b>

# Decrease primarily due to Ferrous Minerals now purchasing electricity instead of self-producing.

\* Increase primarily due to higher HBI plant production (20 PJ increase in energy consumption during 1999/2000).

+ Decrease due to closure of Newcastle Primary Operations.

^ Decrease due to sale of Elang, Challis and Jabiru during 1998/99.

Energy use by fuel type – 1999/2000 (petajoules)	Coal and coke	Natural gas and coal seam gas	Electricity	Process and fuel oil	Distillate	Other (petrol, LPG, etc.)	Total
Minerals	1	23	13	2	25	1	65
Transport and Logistics	0	0	0	16	1	0	17
Petroleum	0	11	0	0	1	0	11
Steel	146	22	12	1	1	1	183
<b>TOTAL</b>	<b>147</b>	<b>56</b>	<b>25</b>	<b>19</b>	<b>28</b>	<b>2</b>	<b>277</b>

Energy intensities (gigajoules per tonne of product)	94/95	95/96	96/97	97/98	98/99	99/00
Four Integrated Steelworks	25.09	24.69	24.34	23.47	22.95	23.11
Electric Arc Furnace (Sydney Steel)	3.39	3.43	3.70	3.72	4.41	3.16
Hot Strip Mill (Westernport)	4.78	4.84	5.06	5.34	6.40	5.79
Iron Ore	0.14	0.17	0.16	0.17#	0.09#	0.10#
Coal (Collieries)	0.22	0.05	0.02	0.01	-0.04	-0.16
Coal (Queensland Coal)	0.23	0.21	0.25	0.24	0.22	0.21
Coal (New Mexico)	0.11	0.13	0.12	0.12	0.13	0.12
Coal (Indonesia)	0.45	0.47	0.60	0.40	0.51	0.58
TEMCo <sup>†</sup>	13.50	15.10	14.10	14.00	14.00	-
Petroleum <sup>^</sup>	0.06	0.07	0.05	0.04	0.04	0.03
Transport	0.22	0.24	0.24	0.26	0.25	0.24
Copper Ore*	10.18	16.72	15.09	13.89	14.91	11.23
Copper Metals	-	23.30	22.10	21.70	15.80	26.98

\* Copper Ore includes copper in concentrate and copper from solvent extraction – electrowinning.

# Does not include HBI plant.

† Sold in December 1998.

^ Petroleum has been calculated as a petajoule of energy consumed divided by petajoules of energy produced.

## Appendix F: Environmental data tables continued

## WATER USE

Water use (megalitres)	95/96	96/97	97/98	98/99	99/00
<b>Minerals</b>	<b>127 300</b>	<b>145 700</b>	<b>128 500</b>	<b>114 000</b>	<b>72 000</b>
San Manuel Operations and Metals	18 500	19 100	20 400	28 100	5 400#
Escondida	29 400	29 300	25 500	29 000	29 800
Mt Whaleback	5 400	7 800	8 500	4 100	4 200
Other	74 000	89 500	74 100	52 800	32 600
<b>Transport and Logistics</b>		<b>60</b>	<b>20</b>	<b>90</b>	<b>100</b>
<b>Petroleum</b>		<b>1 300</b>	<b>1 100</b>	<b>400</b>	<b>1 000</b>
<b>Steel</b>	<b>33 700</b>	<b>32 000</b>	<b>31 800</b>	<b>30 800</b>	<b>29 300</b>
NZ Steel	7 600	7 300	5 000	6 700	6 000
Port Kembla	15 100	13 800	14 400	13 300	14 100
Other	11 000	11 000	12 400	10 800	9 200
<b>TOTAL</b>	<b>161 000</b>	<b>179 060</b>	<b>161 420</b>	<b>145 290</b>	<b>102 400</b>

Water consumption includes run-off, town water and ground water. It does not include consumption from mine dewatering.  
# San Manuel Operations and Metals were consolidated into one asset during 1999/2000.

## OIL SPILLS TO WATER

Oil spills (litres)	95/96	96/97	97/98	98/99	99/00
Minerals	0	0	0	7 280	5 800
Transport and Logistics	362 200#	410	80	30	100
Petroleum	10 500	11 980	1 190	49 300+	350
Steel	50	0	0	40	70
<b>TOTAL</b>	<b>372 750</b>	<b>12 390</b>	<b>1 270</b>	<b>56 650</b>	<b>6 320</b>

# Includes Iron Baron Incident of 362 200 litres.  
+ Includes 48 500 litre spill at Liverpool Bay (offshore).

## LAND – REHABILITATION AND CLEARING

Land use (hectares)	95/96	96/97	97/98	98/99	99/00
Rehabilitated	2 430	1 910	2 240	1 850	1 520
Newly disturbed*	2 980	4 130	3 170	3 050	2 040
Cumulative disturbed#*	45 300	55 550	54 980	57 820	49 310

# Includes the effect of new projects, acquisition and divestments.

\* Area of land disturbed does not include land affected by overbank flooding and vegetation die-back from the Ok Tedi operations.

## Appendix F: Environmental data tables continued

## AIR – GREENHOUSE GAS EMISSIONS

Carbon dioxide (million tonnes)	94/95	95/96	96/97	97/98	98/99	99/00
Minerals	4.6	5.9+	6.2	6.4	5.9	6.3#
Transport and Logistics	1.3	1.4	1.4	1.5	1.4	1.3
Petroleum	2.3	2.8	2.1	1.4	1.0 <sup>^</sup>	0.8
Steel	21.6	21.6	21.3	21.6	20.4	18.7
<b>TOTAL</b>	<b>29.8</b>	<b>31.7</b>	<b>31.0</b>	<b>30.9</b>	<b>28.7</b>	<b>27.1</b>

+ BHP purchased Magma Copper in 1995/96.

# Increase primarily due to higher HBI plant production that resulted in 1.2 Mt CO<sub>2</sub>-e increase.

<sup>^</sup> Decrease due to sale of Jabiru, Challis and Elang during 1998/99.

Methane (tonnes)	94/95	95/96	96/97	97/98	98/99	99/00
Minerals	259 300	255 700	197 700	268 500	231 100	187 000
Transport and Logistics	0	0	0	0	0	0
Petroleum	18 600	52 000#	11 300	5 400	12 000	5 000
Steel	2 900	2 900	3 200	3 100	3 500	2 500
<b>TOTAL</b>	<b>280 800</b>	<b>310 610</b>	<b>212 200</b>	<b>277 000</b>	<b>246 600</b>	<b>194 500</b>

# The increase in 1995/96 methane production can be attributed to the flaring of the Griffin facility.

Fluctuations can be attributed to the commissioning of facilities, flaring of gas and disposal of assets.

Total greenhouse gases (million tonnes CO <sub>2</sub> equivalent)	94/95	95/96	96/97	97/98	98/99	99/00
Carbon dioxide	29.8	31.7	31.0	30.9	28.7	27.1
Methane (Global Warming Potential = 21)	5.9	6.5	4.5	5.8	5.2	4.1
<b>TOTAL</b>	<b>35.7</b>	<b>38.2</b>	<b>35.5</b>	<b>36.7</b>	<b>33.9</b>	<b>31.2</b>

Greenhouse gas intensities (tonnes of greenhouse gases per tonne of product)	94/95	95/96	96/97	97/98	98/99	99/00
Four Integrated Steelworks	2.46	2.42	2.41	2.33	2.32	2.35
Electric Arc Furnace (Sydney Steel)	0.73	0.68	0.69	0.70	0.74	0.56
Hot Strip Mill (Western Port)	0.58	0.56	0.59	0.63	0.71	0.69
Iron Ore	0.01	0.01	0.01	0.01	0.01	0.01
Coal (Collieries)	0.61	0.50	0.32	0.41	0.40	0.35
Coal (Queensland Coal)	0.07	0.06	0.06	0.07	0.06	0.05
Coal (New Mexico)	0.04	0.04	0.04	0.04	0.04	0.04
Coal (Indonesia)	0.06	0.06	0.07	0.06	0.06	0.07
TEMCo <sup>#</sup>	0.78	0.86	0.78	0.76	0.42	–
Petroleum <sup>^</sup>	4.70	6.38	3.36	2.84	2.66	2.63
Transport	0.02	0.02	0.02	0.02	0.02	0.02
Copper Ore*	1.11	1.74	1.72	1.69	1.75	1.62
Copper Metals		1.55	1.51	1.53	1.16	2.08

\* Copper mining/extraction includes copper in concentrate and copper from solvent extraction – electrowinning.

<sup>^</sup> Petroleum has been calculated as kilotonnes of greenhouse gases (kt CO<sub>2</sub>-e) per petajoule of energy produced.

<sup>#</sup> Sold in December 1998.

## Appendix F: Environmental data tables continued

## AIR – OZONE DEPLETING SUBSTANCES

Ozone depleting substances (kilograms)	95/96	96/97	97/98	98/99	99/00
Discharged to air	262	0	211	48	6 146
(Number of incidents)	(4)	(0)	(3)	(2)	*
Recycled to approved bank	9 856	9 943	3 209	610	1 005
Transferred within BHP businesses	5 186	0	0	0	0

For 1999/2000, these totals include CFCs, HCFCs, HFCs and halons. In previous years, only halons were reported.  
\* Number of incidents was not reported during 1999/2000.

## AIR – OXIDES OF SULPHUR

SO <sub>x</sub> (tonnes)	95/96	96/97	97/98	98/99	99/00
Minerals	14 800	17 700	23 200	17 900	9 200#
Transport and Logistics	30 700	31 000	34 000	28 900	27 800
Petroleum	1 700	1 600	700	650	200+
Steel	15 100	14 100	14 700	13 500	10 300^
<b>TOTAL</b>	<b>62 300</b>	<b>64 300</b>	<b>72 600</b>	<b>60 950</b>	<b>47 500</b>

# Decrease due to closure of San Manuel and Hartley during 1999/2000.  
+ Decrease primarily due to the sale of Jabiru, Elang and Challis in 1998/99.  
^ Decrease primarily due to the closure of Newcastle Primary Operations in September 1999.

## AIR – OXIDES OF NITROGEN

NO <sub>x</sub> (tonnes)	95/96	96/97	97/98	98/99	99/00
Minerals	44 200	44 000	46 200	41 500	42 400
Transport and Logistics	25 800	26 000	28 600	23 400	23 300
Petroleum	15 800	15 800	3 700	2 400	2 500
Steel	16 800	19 000	19 900	19 700	15 700#
<b>TOTAL</b>	<b>102 700</b>	<b>104 800</b>	<b>98 500</b>	<b>87 000</b>	<b>83 900</b>

# Decrease primarily due to closure of Newcastle Primary Operations in September 1999.

## WASTES

Wastes (tonnes)	Minerals	Transport and Logistics	Petroleum	Steel	Total
<b>1998/99 (baseline)</b>					
General	88 400	5 500	5 300	261 500	360 700
Hazardous	4 600	0	1 100	55 900	61 600
<b>TOTAL</b>	<b>93 000</b>	<b>5 500</b>	<b>6 400</b>	<b>317 400</b>	<b>422 300</b>
<b>1999/2000</b>					
General	68 100	4 100	1 600	214 900	288 700
Hazardous	1 100	800	800	27 500	30 200
<b>TOTAL</b>	<b>69 200</b>	<b>4 900</b>	<b>2 400</b>	<b>242 400</b>	<b>318 900</b>

The data presented above do not include recycled materials.

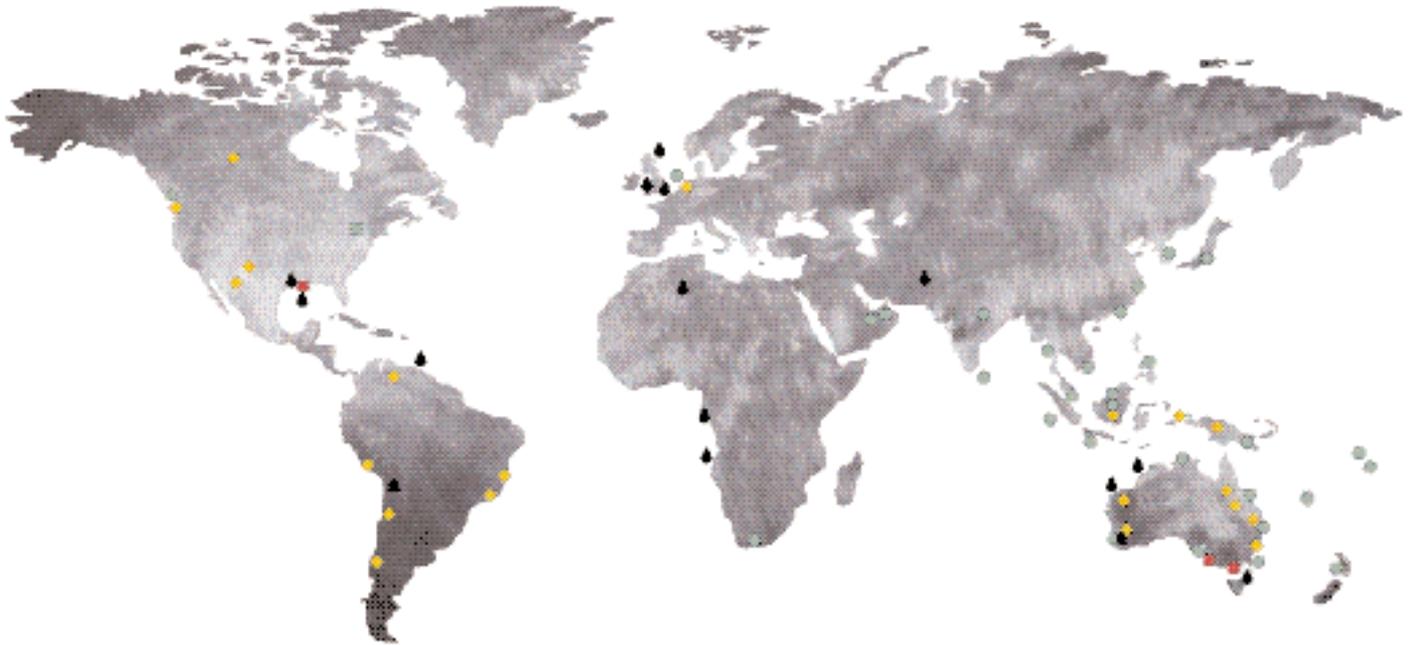
## Appendix G: Awards and recognition

BHP business	Awards and recognition
Steel	<ul style="list-style-type: none"> <li>• CHAPPY, a life cycle analysis (LCA) model that enables a student to calculate the environmental impact of his or her family, received the Newcastle Environmental Achievement Award in the Cleaner Production category. The Sustainable Technology team at BHP's Research Centre in Newcastle, Australia developed this software tool.</li> <li>• New Zealand Steel received an IPENZ (Institute of Professional Engineers of New Zealand) Millennium Award recognising its perpetual contributions to New Zealand economic, social and environmental development and history.</li> <li>• CSA Springhill/CRM - Healthy Cities Illawarra awarded BHP Steel (JLA) 'Innovation and Excellence in the Integration of Environmental Practices in Business Operation'.</li> <li>• CS-Rancho awarded the National Coil Coater Association's 1999 NCCA Pollution Prevention Award. The award recognises the changes made to the waste water process. (Rancho now divested.) Rancho also received awards from two local government agencies for compliance with both agencies' requirements.</li> </ul>
Minerals	<ul style="list-style-type: none"> <li>• Benjamin Teplinsky Environmental Award from Mining Minister, Escondida, Chile.</li> <li>• Industrial Association of Antofagasta Environmental Management Awards, Escondida, Chile.</li> <li>• National Environmental Award from National Environmental Commission, Escondida, Chile.</li> <li>• Pentangis in East Kalimantan, Indonesia, received Green Flag and Certificate as second best in environmental management practices at the provincial level.</li> <li>• 'Setor Mineração magazine' received the first prize for its social and environmental responsibility, Samarco, Brazil.</li> <li>• Eco Cidadania Empresarial Prize – American Chamber of Commerce – Samarco was a finalist with the program of Popular Environmental Education at Bento Rodrigues, Samarco, Brazil.</li> <li>• Top Cultura Environmental Prize – Given after a survey made in the neighbouring communities. This is the third consecutive time Samarco in Brazil has won this prize.</li> <li>• Ponta Ubu Pelletizing Plant won the FINDES (Industrial Council of Espírito Santo State) Ecology Award in the category Hydric Resources Protection presenting the project 'Monitoring of hydric effluents by means of <i>Pomaceae haustrum</i> snail as a quality bioindicator', Samarco, Brazil.</li> </ul>

## Appendix H: Publications

BHP business	Publications
Steel	<ul style="list-style-type: none"> <li>• Steel and the Environment.</li> <li>• Steel: Building an Environmental Games.</li> <li>• The Making of Iron and Steel.</li> <li>• BHP Steel Olympic Information Kit.</li> <li>• A recently published report for Australian Coal Association Research Program (ACARP) entitled 'Environmental Credentials of Coal'. This report can be found on the Internet site <a href="http://www.sustainabletechnology.com.au">www.sustainabletechnology.com.au</a></li> </ul> <p>BHP has two Life Cycle Analysis software programs for use by the public, CHAPPY and LISA.</p> <ul style="list-style-type: none"> <li>• CHAPPY is designed for use by schools and the community.</li> <li>• LISA is designed for use by architects, engineers and designers.</li> </ul> <p>Both software programs and extra information can be found at the Internet site <a href="http://www.sustainabletechnology.com.au">www.sustainabletechnology.com.au</a>. There is a brief introduction covering each program on the site.</p>
Minerals	<ul style="list-style-type: none"> <li>• Beenup Closure Rehabilitation Plan August 1999 and associated technical documents.</li> <li>• Beenup Environmental Management Triennial Report June 1999 and Annual Report June 2000.</li> <li>• Beenup Rehabilitation Plan Brochure.</li> <li>• Environmental Assessment Executive Summary, Sable Pigeon and Beartooth Kimberlite Pipes, April 2000.</li> <li>• EKATI™ Diamond Mine Environmental Agreement Annual Report 1999; Environmental Impact Report 2000 March 2000.</li> <li>• EKATI™ Annual Environmental Plain English Summaries – 1998, 1999.</li> <li>• Independent Environmental Monitoring Agency (report on EKATI™), Annual Report 1999/2000, March 2000.</li> <li>• Book 'Minería del Cobre Ecología y Ambiente Costero' (published in 1998).</li> <li>• Toxic release Inventory Report; Annual OSM Report; Permit Renewal Public Comment.</li> </ul>
Petroleum	<ul style="list-style-type: none"> <li>• Big Bank Shoals of the Timor Sea.</li> <li>• Trinidad – Four Public Environment Assessments.</li> <li>• Keith Development Environment Assessments.</li> <li>• Lara Fertiliser Facility Environment Assessment Report.</li> <li>• Liverpool Bay Asset:               <ul style="list-style-type: none"> <li>- Coast of North Wales: An Environmental Appraisal.</li> <li>- The Dunes and Us.</li> <li>- Annual scientific reports on land management including ornithological, entomological, ecological and botanical reports.</li> <li>- Offshore Environmental Statement for proposed Lennox LL and LR wells.</li> </ul> </li> </ul>
Transport and Logistics	<ul style="list-style-type: none"> <li>• Long-term Impact Assessment Report on the <i>Iron Baron</i> Oil Spill, report dated July 1999 (available through the Department of Environment and Land Management, Tasmania).</li> </ul>
BHP site reports	<ul style="list-style-type: none"> <li>• Public environment reports for various sites are posted on the BHP Internet site at <a href="http://www.bhp.com">www.bhp.com</a></li> </ul>

# BHP key assets and offices



## Minerals

Global operations include coal, iron ore, hot briquetted iron, copper, silver, lead, zinc, diamonds and exploration.



## Steel

Produces and markets a wide range of flat and coated steel products.



## Petroleum

A global explorer and producer of oil, natural gas and LNG.



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Provides 'best value' business services including Global Procurement and Shared Business Services.



## Corporate Office

### BHP Limited

Australian Business Number 49 004 028 077

BHP Tower – Bourke Place

600 Bourke Street

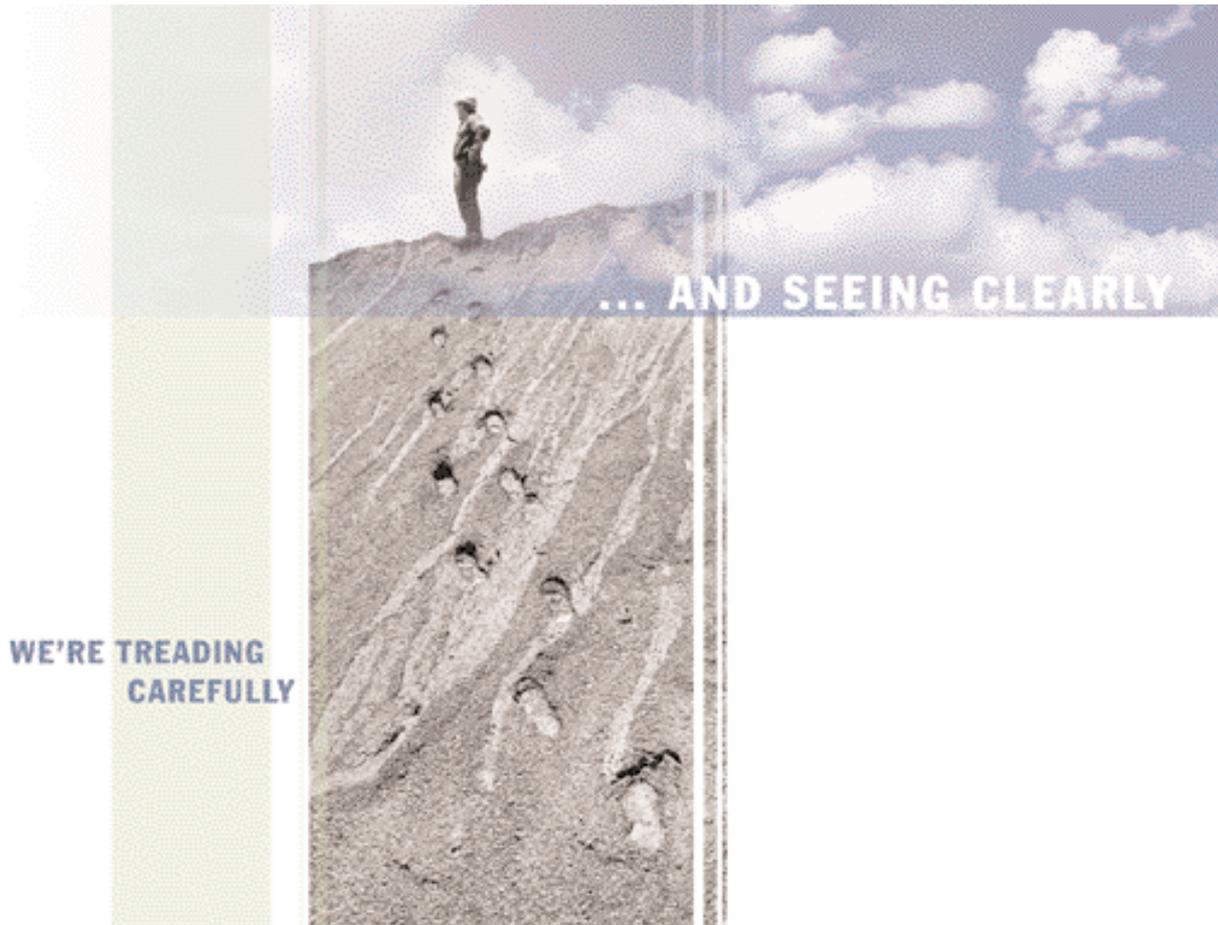
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