



BHP Billiton Iron Ore

**Section 46 Amendment to Ministerial Statement 433
Upgrade Dust Management at Finucane Island and Nelson
Point, Port Hedland**

Environmental Scoping Document

**Final
February 2006**

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1 INTRODUCTION

1.1 Background

BHPBIO is one of Australia's largest iron ore producers and operates six open pit mining operations in the Pilbara region of Western Australia: Mt Whaleback, Yandi, Jimblebar, Satellite Orebodies 23 and 25, Area C and Yarrie/Nimingarra. Two dedicated heavy haulage rail systems, one from the Newman, Mining Area C and Yandi mines and the other from Yarrie/Nimingarra, deliver ore to Port Hedland.

The Port Operations consist of processing, stockpiling and shiploading facilities at Nelson Point and Finucane Island, located on opposite sides of the Port Hedland Harbour. The Port Operations are bound by conditions set in Ministerial Statement 433 Upgrade Dust Management at Finucane Island and Nelson Point, Port Hedland, issued in 1996 that includes dust management criteria.

Since 1996, market demand has seen BHPBIO increase production across its mining, rail and port operations. Associated with these changes have been changes to the sites' operational licence dust conditions as well as improvements in the dust management technologies used by the sites.

BHPBIO now considers that the conditions imposed under Ministerial Statement 433 require revisions in line with the continual improvement in BHPBIO's ongoing operations, new standards and technology and changes to community expectations.

To better reflect the current situation, BHPBIO is seeking amendments to Ministerial Statement 433 through Section 46 of Part IV of the *Environmental Protection Act 1986*. The objective of the amendments will be to align the conditions of the Ministerial Statement to more accurately reflect:

- Initiatives and developments in community consultation programs;
- How dust levels will be managed and further reduced;
- Dust emission targets as appropriate to community and regulator expectations;
- Initiatives to improve water-use efficiency; and
- The timeframe for implementation of the proposed revised dust management program.

BHPBIO is planning to expand its Port Operations to a nominal capacity of 165 Mtpa over four berths by around 2010. BHPBIO's objective is to achieve significant reductions in dust emissions while demonstrating improved water use efficiencies. To this end the Dust and Water Management Plans will be integrated.

It is intended that the revised conditions established through the Section 46 process would apply to the existing operations and any expansions subsequently approved. However any subsequent expansions would still require separate consideration and approval under the Environmental Protection Act 1986, including Works Approval under Part V of that Act. In addition, the Dust Management Conditions may also be further reviewed in the future taking into account the results of studies being undertaken by Government agencies (see Section 1.2).

1.2 Regional Context and Relation to Other Studies

The current high market demand for iron ore and other mineral based commodities has brought optimism for companies with resource deposits in the Pilbara. In addition to proposed expansion of existing Pilbara operations, during 2004 several new players lodged proposals with the EPA to seek approval to develop new projects, which include exporting mineral product through the port of Port Hedland. The proposed increase in activity led to the Department of Industry and

Resources commencing a Cumulative Impact Assessment Study during 2004 and the Department of Water commencing a Pilbara Coast Water Study. At the same time the Department of Environment released its Pilbara Air Quality Study. This study reiterated the relatively high ambient dust levels recorded in the town of Port Hedland in comparison to other regional towns. BHPBIO has actively contributed to these studies.

It is recognised that there are historical planning legacies in Port and South Hedland that are required to be addressed by Local and State Government. To consider planning issues, during 2004 the Department of Planning and Infrastructure undertook an 'Enquiry By Design' process in Port Hedland to provide local input into land use planning scenarios to address inherent long-term planning legacies. Results of the Enquiry were summarised by the Department of Planning and Infrastructure for response to participants. BHPBIO contributed to this Enquiry along with other members of the community.

In response to the outcomes of the Enquiry By Design and the proposed 2008 National Environmental Protection Measure (NEPM) for Air Quality, the Department of Health commenced a review of health effects of airborne particles in Port Hedland. This involves a three phase study including:

- a review of international literature (specifically for crustal dust which includes dust particles generated from the natural environment)
- a morbidity study review
- toxicity studies

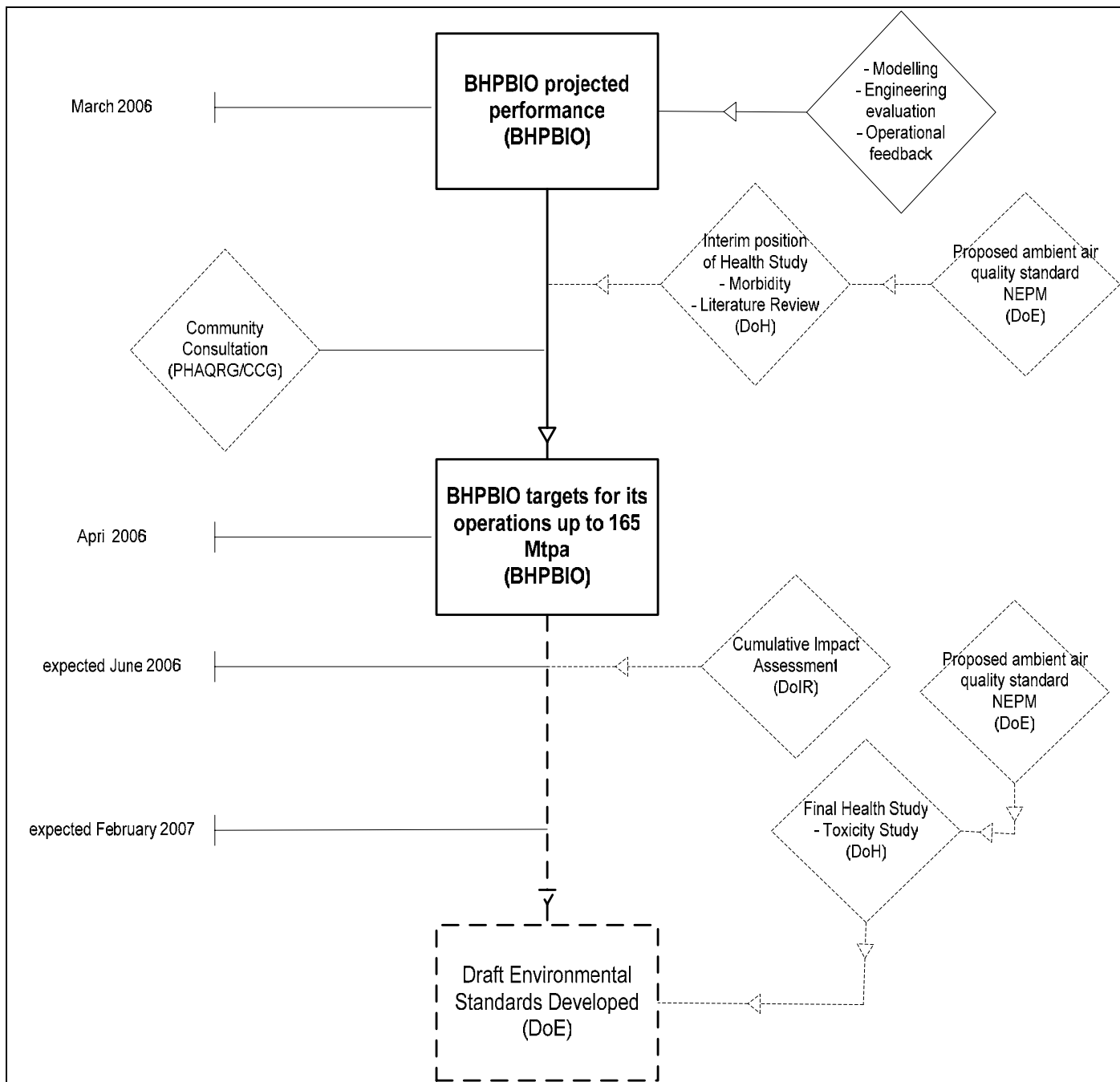
The studies will account for all dust types in Port Hedland. Implementation of the studies has been phased with completion of the literature review and morbidity study expected in the first half of 2006. The toxicity studies will not be completed until 2007. BHPBIO is actively contributing to the studies as required by both Departments, including providing funds for the literature review of health effects of crustal dust.

BHPBIO understands that establishing revised dust management performance targets for its operations is a requirement of this Section 46 process. BHPBIO will use the results of its dust modelling investigations, engineering evaluations and operational reviews to establish improved dust performance targets. It is anticipated that these targets will apply until the government studies are complete, at which time it is expected ambient air quality standards for Port Hedland will be drafted by the Department of Environment (refer Figure 1). BHPBIO will contribute to the development of these standards as required.

It is proposed that the revised Ministerial Conditions include a requirement for BHPBIO to review its dust performance targets once the government studies are complete. If the results of these studies indicate that still more stringent dust limits are required, the Ministerial conditions can be considered further by the Environmental Protection Authority.

While BHPBIO has been working in collaboration with relevant agencies on all of these initiatives, the Company's primary focus remains on reducing dust levels from its Port Operations in Port Hedland. This Section 46 process will lead to revised conditions relating to improved dust and water management at the Port Operations to ensure these meet appropriate standards and Government requirements.

Figure 1.1 Conceptual process for setting BHPBIO dust management performance targets



1.3 Proponent

The proponent of this submission is:

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1.4 Purpose and Structure of Document

This document has been prepared as an Environmental Scoping Document pursuant to Section 6.1 of the *Environmental Impact Assessment (Part IV Division I) Administrative Procedures 2002*. The purpose of the document is to identify potential environmental impacts, relevant environmental factors and to outline relevant studies and activities to be undertaken by BHPBIO as part of the Section 46 process. It seeks to align company expectations with those of key regulatory stakeholders. The scoping document will form the basis of the Environmental Review documentation for the Section 46 process.

The document describes the:

- Scope of the Section 46 level of assessment for the revision of conditions in Ministerial Statement 433 Upgrade Dust Management at Finucane Island and Nelson Point, Port Hedland;
- Planned modelling and engineering investigations to support revisions and implementation of the BHPBIO Dust Management Program;
- Planned modelling and engineering investigations to support the establishment and implementation of the BHPBIO Water Management Program; and
- BHPBIO's approach to consultation through the Section 46 process.

2 OVERVIEW OF SECTION 46 AMENDMENT AND JUSTIFICATION

Since 1996, market demand has seen BHPBIO increase production across its mining, rail and port operations. In line with this the Dust Management Program BHPBIO has sought to continually improve dust management technologies and operational control. This has included regular review of *Environmental Protection Act 1986* operating licence conditions.

To better reflect the current situation, BHPBIO is seeking amendments to Ministerial Statement 433 Upgrade Dust Management at Finucane Island and Nelson Point, Port Hedland through Section 46 of Part IV of the *Environmental Protection Act 1986*. The objective of the amendments will be to align the conditions of the Ministerial Statement to more accurately reflect:

- Initiatives and developments in community consultation programs;
- How dust levels will be managed and further reduced;
- Dust emission targets as appropriate to community and regulator expectations;
- Initiatives to improve water-use efficiency; and
- The timeframe for implementation of the revised Dust Management Program.

BHPBIO is planning to expand its Port Operations to a nominal capacity of 165 Mtpa (from the current approved works to 130 Mtpa) over four berths by around 2010. In doing so, BHPBIO's objective is to achieve significant reductions in dust emissions while demonstrating improved water use efficiencies.

It is intended that the revised conditions established through the Section 46 process would apply to the existing operations and any expansions subsequently approved. However any subsequent expansions would still require separate consideration and approval under the *Environmental Protection Act 1986*, including Works Approval under Part V of that Act. In addition, the Dust Management Conditions may also be further reviewed in the future taking into account the results of studies being undertaken by Government agencies (see Section 1.2).

The Section 46 process will allow a complete review of proponent commitments as a result of studies undertaken to renew both Dust and Water Management Plans. This in turn will provide a basis to review Ministerial conditions contained in Statement 433. Table 2.1 suggests options for anticipated amendments.

Table 2.1 Summary of Likely Amendments to Ministerial Statement 433

Existing Condition	Intent of Amendment
<i>Environmental Condition 1</i>	
In implementing the proposal, the proponent shall fulfil the commitments made in the Consultative Environmental Review and in response to public submissions; provided that the commitments and environmental management measures are not inconsistent with the conditions or procedures contained in this statement.	<p>The proponent shall fulfil <i>the amended commitments made in the section 46 process</i> and in response to public submissions; provided that the commitments and environmental management measures are not inconsistent with the conditions or procedures contained in this statement.</p> <p>The amendment will need to adequately cater for community engagement and consultation and may include consideration of establishment of a Port Hedland based Air Quality Committee an Industry Council to monitor industry performance on behalf of the community.</p>

Existing Condition	Intent of Amendment
<i>New Conditions</i>	
New condition	Include condition to reflect an appropriate timeframe for the implementation of this review.
New condition	Include conditions to reflect improvements in water use efficiency on site.
New condition	Include condition to reflect BHPBIO's community consultation program in Port Hedland.
Proponent Environmental Commitments – Commitment 2	
Develop annual performance targets for TSP - 260 $\mu\text{g}/\text{m}^3$ for PM_{50}	Revise targets to accommodate amenity impact.
Proponent Environmental Commitments – Commitment 5	
The US EPA PM_{10} maximum 24 hour average of 150 $\mu\text{g}/\text{m}^3$ is adopted as the interim exceedance target for health.	Replace this with conditions that reflect revised ambient standards for Port Hedland resulting from the health studies that are being conducted independently by DoH. Revised interim targets are likely to be required to accommodate the timeframe of the health studies and subsequent development of a regional standard for Port Hedland. This will account for appropriate application of NEPM to this situation.

To achieve the proposed amendments BHPBIO is currently undertaking or planning to undertake the following:

- Validation of the dust and water modelling conducted previously;
- Investigations into the plant and equipment changes, and operational practices, required to achieve reduction in dust emissions and improve water use efficiency;
- Development and implementation of a revised dust management plan and water use management plan to achieve reductions and improve efficiency respectively; and
- Incorporate community consultation from this Section 46 process into the current consultation forums.

2.1 Dust Management Performance Targets

Currently the existing air emission targets imposed on BHPBIO through Ministerial Statement 433 "Upgrade Dust Management at Finucane Island and Nelson Point, Port Hedland are maximum 24 hr average of 260 $\mu\text{g}/\text{m}^3$ for PM_{50} and 150 $\mu\text{g}/\text{m}^3$ for PM_{10} . BHPBIO is aware that in the absence of a Pilbara dust standard, the proposed NEPM values will be used as a guide to achieve performance improvement.

BHPBIO also understands that outcomes of the current Department of Health studies, the DoIR led Cumulative Impact Assessment Study, and the DoE ambient particulate monitoring methodology review will be used to determine an applicable dust standard for Port Hedland.

BHPBIO will continue to provide information as requested to relevant Government agencies and stakeholder groups to establish appropriate standards.

(Development of Management Objectives and Performance Targets are described further in Section 6.1.2).

2.2 Consideration of Water Requirements

BHPBIO recognises the importance of water resource management in Western Australia, especially in the arid climate of the Pilbara. Water management studies have identified areas for water use efficiency and BHPBIO has been successful in implementing improvement initiatives. BHPBIO recognise that water use is integral to dust management and will incorporate a review of water use efficiency as part of the Dust Management Program revision.

2.3 Engineering and Operational Improvement

BHPBIO will undertake dust modelling and investigate the impacts of future plant modification on ambient dust levels. Dust levels will be reduced through both operational improvement and engineering design, taking opportunities of staged growth to a nominal capacity of 165 Mtpa over four berths by around 2010.

BHPBIO understands that reductions in dust emissions will be required within practicable timeframes irrespective of growth.

2.4 Stakeholder Consultation and Engagement

BHPBIO will continue to implement its community engagement strategy as part of the Section 46 consultation process. Outcomes of consultations will be incorporated into project design and the proposed revised Dust Management Program.

BHPBIO recognises that sustainable outcomes will require a collaborative approach and therefore supports the DoE (Karratha) initiative in re-invigorating the Port Hedland Air Quality Group.

3 ENVIRONMENTAL LEGISLATIVE FRAMEWORK

In 1996 BHPBIO undertook a Consultative Environmental Review for the upgrade of dust management at Nelson Point and Finucane Island. Ministerial Approval was granted in late 1996 and conditions for dust management were included in Ministerial Statement 433 “Upgrade Dust Management at Finucane Island and Nelson Point, Port Hedland” (Appendix A).

BHPBIO currently holds two operational licences under Part V of the *Environmental Protection Act 1986* (Licence Number 4513/10 for Nelson Point (Appendix B) and Licence Number 5445/10 for Finucane Island (Appendix C)). Both licences include the dust management requirements specified in Ministerial Statement 433 “Upgrade Dust Management at Finucane Island and Nelson Point, Port Hedland”.

Other significant approvals to date have included:

- Works Approval in 2002 for the Products and Capacity Expansion (PACE) Project to modify the material handling system at Nelson Point, construct a new Western BHPBIO Stockyard at Finucane Island, extend the existing Finucane Island berth and construct a new berth at Finucane Island.
- Works Approval in 2004 for the construction of Car Dumper 4 at Finucane Island.
- A current Works Approval in 2005 for the construction of a new Eastern Stockyard at Finucane Island, including decommissioning of the old Goldsworthy operations.

It is intended that the revised conditions established through the Section 46 process would apply to the existing operations and any expansion subsequently approved.. Any works for expansion above 130 Mtpa would still require separate consideration and approval under the *Environmental Protection Act (1986)*, including *Works Approval under Part V of that Act*. In addition, the dust management conditions may also be further reviewed in the future taking into account the results of studies being undertaken by Government Agencies (see Section 1.2).

4 CURRENT OPERATIONS

BHPBIO is one of the main exporters of iron ore in Western Australia (WA), with six mine sites and two port facilities in the Pilbara region of northwest Western Australia (Figure 4.1). The port facilities are located within the town of Port Hedland and comprise the Nelson Point and Finucane Island sites (Figure 4.2). These sites currently give BHPBIO the capacity to receive, process and shipload approximately 118 Mtpa of ore into vessels destined for overseas markets. In accordance with conditions of Works Approval 4115, granted in December 2005, works are currently underway to build an Eastern Stockyard to further increase this capacity to 130 Mtpa by mid-2007. These works will reduce dust levels through the decommissioning of the old Goldsworthy operations at Finucane Island.

A generalised description of the ore handling route includes receipt of ore railed from the mines, processing of the ore to meet customer specifications, stockpiling and reclaiming and ship loading into vessels. Depending on the source of the ore and required specification, ore processing may involve crushing, screening and/or beneficiation prior to stockpiling. The infrastructure at Nelson Point differs from Finucane Island to cater for different ore and product types.

Nelson Point

The infrastructure at Nelson Point (Figure 4.3) comprises:

- Three ore unloading car dumpers;
- A lump re-screening plant;
- Two tertiary crushing and screening plants;
- Two ore handling and stockpile yards (North and South Yards);
- Two shiploading facilities; and
- General administrative and maintenance facilities.

Finucane Island

The infrastructure at Finucane Island (Figure 4.4) comprises:

- Single ore unloading facility and associated rail loop;
- Secondary and tertiary crushing plants;
- Primary and tertiary screening plants;
- Ore handling and stockpile facility;
- Two shiploading facilities; and
- Associated maintenance and administration facilities.

Finucane Island receives ore from the Yarrie/Nimingarra Operations and Mining Area C through the under harbour tunnel.

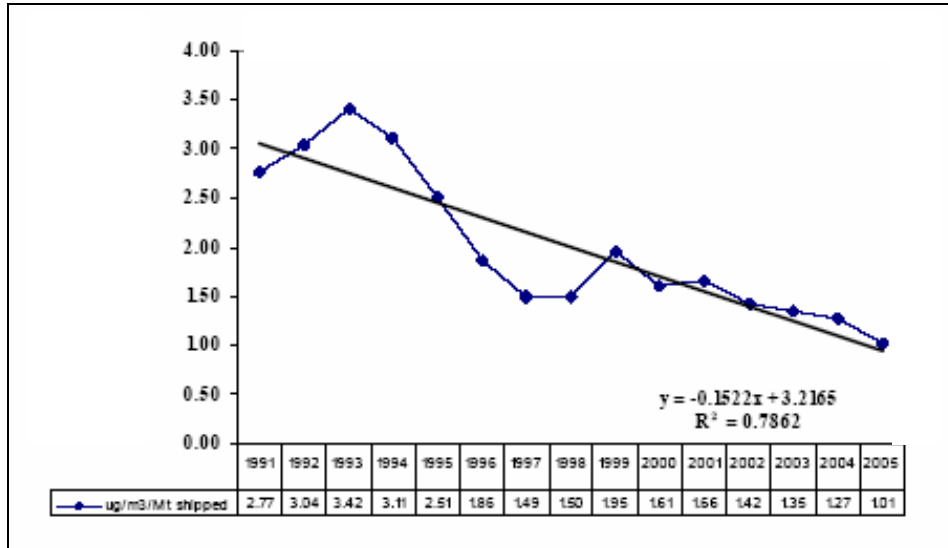
In 2001, BHPBIO undertook a five-year review of the Dust Management Program to assess performance and compliance. This review, along with increased community concern and plans for future operational changes highlighted a need for BHPBIO to update the Dust Management Program. The Dust Management Program was revised in 2002 to include the following aspects:

- Incorporate current and proposed dust management initiatives;
- Reflect changes in technology, regulations and community expectations;
- Reflect operational and procedural changes; and
- Incorporate proposed future operational changes and developments.

BHPBIO assess recorded dust levels against a Dust Management Efficiency Index (Figure 4.5). The index is a measure that expresses dust levels (TSP $\mu\text{g}/\text{m}^3$) as a function of iron ore exported from Nelson Point, Finucane Island and Western Yard per calendar year (million

tonnes, MT). It is intended as an assessment of the effectiveness of dust control measures. The decreasing trend shows an increase in dust management efficiency, despite a significant increase in the number of tonnes exported.

Figure 4.5 Dust Management Efficiency Index 1991 - 2005



In 2004 BHPBIO undertook a water balance study of the Port Hedland operations. This study was commissioned to record and analyse the water system and demand patterns at Nelson Point and Finucane Island and within residential housing areas to improve understanding of water use efficiency. Existing plant demand patterns were established primarily through sample flow metering on site and collation of control system data.

BHPBIO utilise a Water Intensity Index (Figure 4.6) that expresses fresh water consumption (kL) as a function of iron ore exported from Nelson Point, Finucane Island and Western Yard per calendar year (tonnes). It is intended as an assessment of the effectiveness of water efficiency and control measures. The decreasing trend depicts an improvement in water use efficiency despite a significant increase in the number of tonnes exported. BHPBIO recognise that there are opportunities to continually improve water use efficiency across its Port Operations.

Figure 4.6 Water Intensity Nelson Point and Finucane Island (July 2002- June 2005).

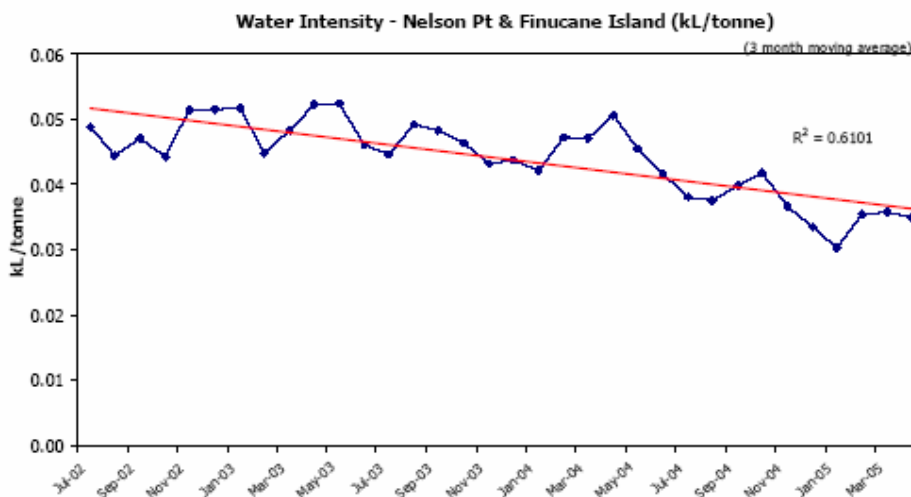


Figure 4 1 Location of BHPBIO Operations in WA

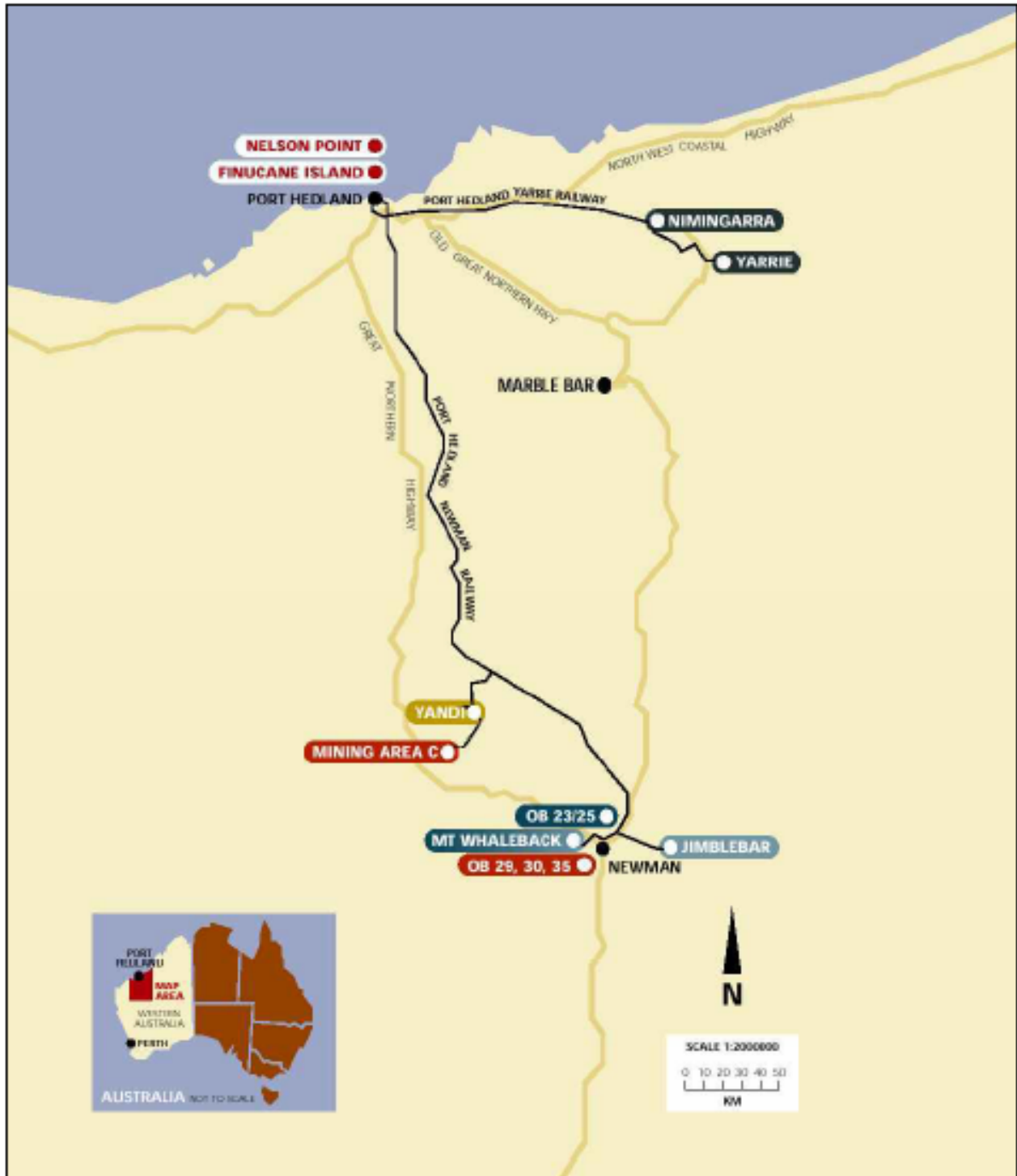


Figure 4 2 Location of Port Hedland, Nelson Point and Finucane Island

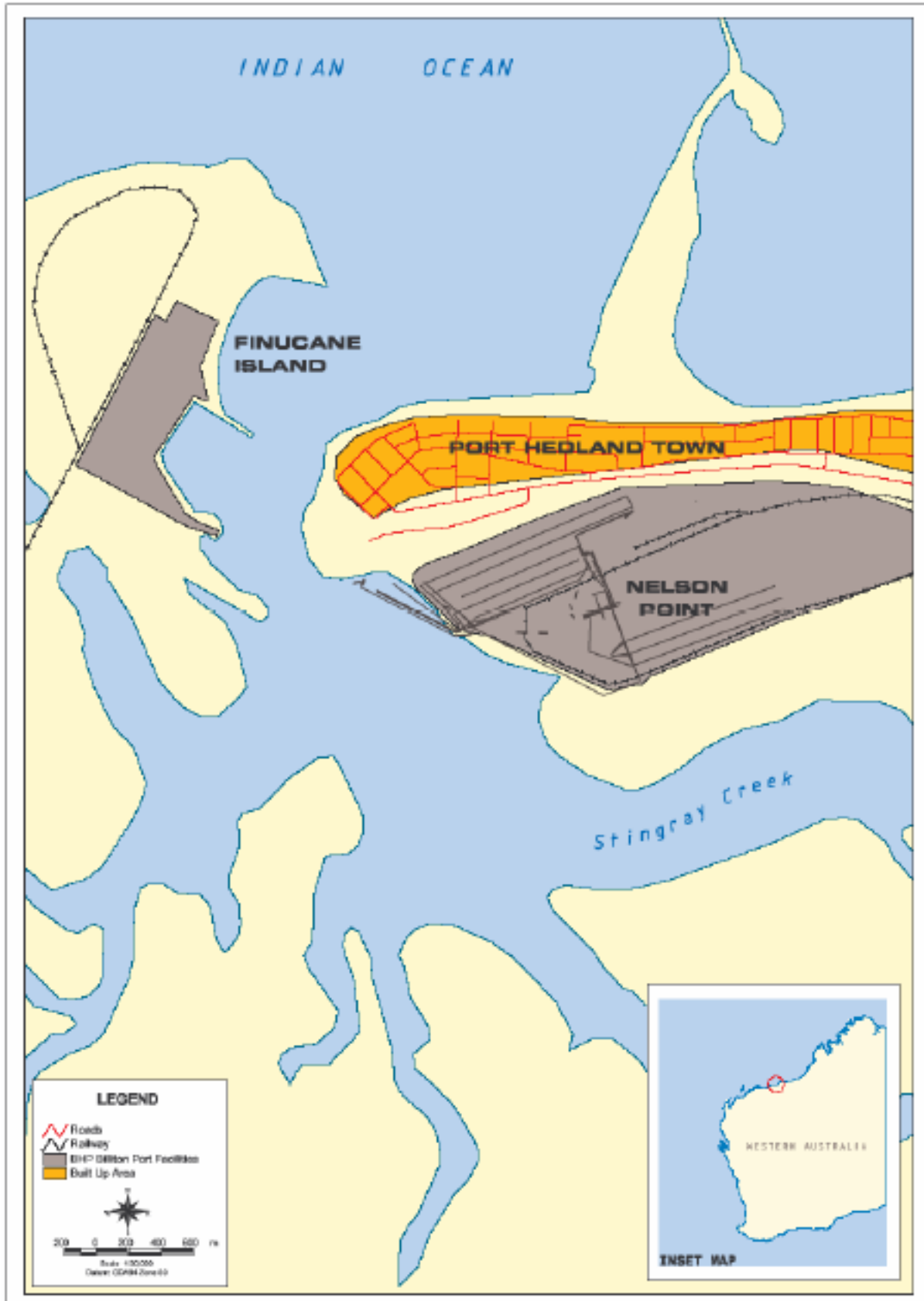


Figure 4.3 Site Layout at Nelson Point



Figure 4.4 Site Layout of Finucane Island



5 REGIONAL SETTING

5.1 Climate

The Pilbara region of Western Australia is situated in the arid-tropical zone and generally experiences a hot wet summer from October to April and a mild winter from May to September. Average maximum temperatures peak in December to March, with monthly means of above 36°C. Winter daily maximum temperatures average approximately 29°C, while the average minimum is 13°C in July and August. Average annual rainfall is 313 mm, typically falling between December and June. Annual evaporation may exceed rainfall by 3000 mm per year. Through summer, sporadic, heavy rainfall results from tropical storms and cyclones.

5.2 Prevailing Winds

BHPBIO Port Hedland operations are subjected to tropical cyclones between November and April, which can bring high wind gusts. The average monthly wind speed for Port Hedland is between 17 and 22 km/h. Gusts have been recorded in excess of 207 km/hr during the cyclone season. The typical wind direction is north-west in summer and south east in winter, a summary of wind records is illustrated in Figure 5.1.

5.3 Water Source

BHPBIO's water supply for its Port Hedland operations originates from two borefields to the east and west of Port Hedland; the Yule River borefield, 38 km to the west of Port Hedland, and the De Grey River borefield, 64 km to the east of town. These two systems pump into water into storage tanks close to the town and distribute the water through separate interconnected systems to Finucane Island, Nelson Point and residential housing at Port Hedland and South Hedland.

Of the two borefields the De Grey borefield is the older of the two and has a marginally greater licence allocation than Yule borefield (Table 5.1). Water from the borefields is transferred to the storage tanks at Lot 2519 and Lot 954 for storage and blending. Water is pumped directly from Lot 2519 to BHPBIO's Finucane Island site, and South Hedland townsite. Water supplying BHPBIO's Nelson Point site, the PACE Project, and the town of Port Hedland is pumped to these locations via Lot 954 at Port Hedland.

Table 5.1 Details of the Yule and De Grey River borefields

	Yule Borefield	De Grey Borefield	Total
Year bores installed/upgraded	1996	1976	
Licence allocation (Including town GL/year)	6.5	7	13.5

(adapted from Water Corporation, 2002)

An increase in demand for water by industry operating in the Port Hedland area will necessitate the expansion of the Water Corporation's borefields in the Yule and De Grey areas. As part of its strategy for growth BHPBIO has funded the Water Corporation to conduct environmental investigations to expand the existing borefields. These studies have been underway for about three years.

On the recent announcement of closure of the Boodarie Iron Operations BHPBIO advised the Water Corporation that it would no longer require the proposed expansion allocation. BHPBIO will continue to fund Water Corporation to complete the environmental study. As part of the Water Management Plan revision, BHPBIO will determine if the current combined water allocation for Boodarie Iron and existing BHPBIO Port Operations will meet its demands for up to 165 Mtpa throughput.

Figure 5.1 Annual Wind Roses for the Port Hedland area.



5.4 Social Environment

5.4.1 History of Port Hedland Township

Port Hedland has an extensive history dating back to the 1870s when it was considered a fishing and pearling centre. The 1960's brought the discovery of significant compositions of iron ore. With the heightened demand for this resource in the Japanese market, and the lifting of the Commonwealth Government's iron ore exportation embargo in 1962, there was a significant escalation in the development of the region's mining industry. This brought dramatic increases in population and as a consequence, the development of South Hedland in 1966. To this day, it remains a regionally significant port for the export of iron ore and livestock.

5.4.2 Demography

Iron Ore mining has been a feature of the Pilbara region for over 40 years. Over this period, the demographics and expectations of the local and regional communities have altered since the establishment of mining in the area.

The trends in the Port Hedland community over the twenty years between 1981 and 2001 show a stable population, approximately 13,000 rising slightly in 2005 to 15,000. The trends show a bias towards younger families; an increasing white collar and decreasing blue collar worker population; decreasing unemployment; decreasing numbers employed in the retail and mining sectors but increasing employment in manufacturing and construction; a decreasing trend in BHPBIO's workforce numbers; increasing median weekly incomes, significantly higher than the State average; an increasing number of occupied private dwellings, and a decrease in the percentage of rental accommodation; an increase in the number of persons with a non-school qualification; and, an increasing indigenous population (15% of the local population), approximately five times the State average.

Dust impacts from BHPBIO's operations primarily extend to the west end of Port Hedland. This area can be split into two zones: west of the hospital and west of the racecourse. Australian Bureau of Statistics, 2001 surveys indicate there are approximately 416 houses in the residential area west of the racecourse. This area was identified to conduct an intensive survey in two stages, between April and June 2005, to hear concerns about dust (see Figure 5.2). In total 139 residents and 93 businesses were surveyed. Results of the surveys were validated with community and published by the Company as part of a feedback process during September 2005. BHPBIO is actively pursuing recommendations from this survey.

5.4.3 Community Consultation

BHPBIO's community engagement program began in 1996 to:

- Provide information as required;
- Identify areas of concern and develop strategies for improvements;
- Improve long term relationships and partnerships with members of the community; and
- Identify and address potential social and environmental impacts of BHPBIO's business plans.

The scope of the consultations and engagement extended to the residential and commercial areas of actual or potential impacts by BHPBIO's operations (Figure 5.2). This area will be included in the Section 46 consultation program.

Figure 5.2 Survey Areas for Community Consultation.



6 ENVIRONMENTAL IMPROVEMENTS AND SCOPE OF INVESTIGATIONS

Strategic Framework

- As part of the scope of the review BHPBIO will make reference to EPA Position Statement #8 in the EIA documentation, in particular the planning phase tiered approach which sets out a hierarchical link between environmental values, objectives and targets. BHPBIO will establish the revised plans linking targets, performance measurement and response and feedback mechanisms.

BHPBIO has adopted the following environmental guiding principles for dust and water:

Dust

- BHPBIO is committed to reducing overall dust levels in the community resulting from its operations;
- BHPBIO understands its contribution to the Port Hedland region air shed and actively supports and participates in collaborative studies to improve knowledge and develop effective management strategies; and
- BHPBIO communicates openly with government and the community around dust performance.

Water

- BHPBIO promotes the responsible and sustainable use of water;
- BHPBIO will seek to continually improve the water-use efficiency of its operations; and
- BHPBIO communicates openly with government and the community around water performance.

In the development of this proposal BHPBIO has also adopted the principles of environmental protection, as outlined in Appendix E.

6.1 Dust

6.1.1 Current Performance

Dust monitoring at BHP Billiton Iron Ore's Port Hedland Operations is undertaken in accordance with Ministerial Statement 433 and supported by the *Environmental Protection Act* (1986) licences. The preambles of the licences set the following ambient air quality performance targets:

- Total Suspended Particles (TSP) 260 $\mu\text{g}/\text{m}^3$ (24-hour average)
- Particles (as PM_{10}) 150 $\mu\text{g}/\text{m}^3$ (24-hour average)

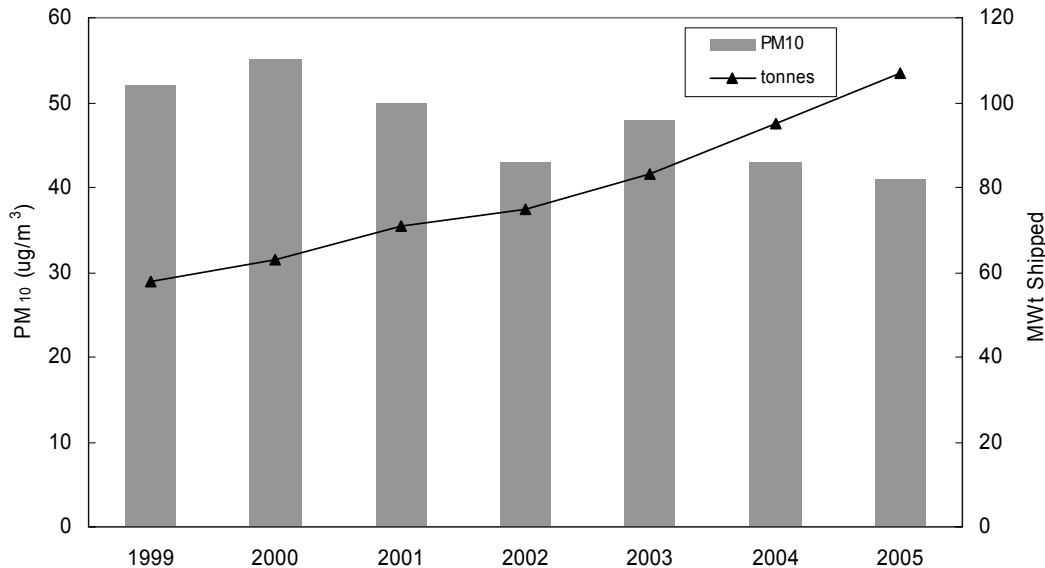
In addition, BHPBIO undertakes ambient monitoring for $\text{PM}_{2.5}$ and reports results through its Annual Environmental Report.

Compliance to the stated licence conditions and performance targets is monitored through high volume air sampling units measuring ambient atmospheric dust concentrations ($\mu\text{g}/\text{m}^3$) in compliance with Australian Standard 3580.9.3:2003 for TSP and 3580.9.6:2003 for PM_{10} .

Since 1996, following the introduction of Ministerial Statement 433, BHPBIO has decreased dust levels from its operations, despite significantly increasing the amount of iron ore shipped through its Port (Figure 6.1). These improvements have resulted from a series of initiatives, including:

- Establishment of the Dust Management Program for Port Hedland operations in 1996;
- A five-year review of the Dust Management Program and establishment of the Clear Air Taskforce, a dedicated team responsible for improving dust performance, in 2001;
- Introduction of research and development initiatives (eg belt-washing);
- Improved response management systems linking operations to real time measurement systems to provide immediate feedback; and
- More recently, the Boodarie Iron operation being placed on care and maintenance during 2005.

Figure 6.1 Dust concentration (PM₁₀) vs tonnes shipped



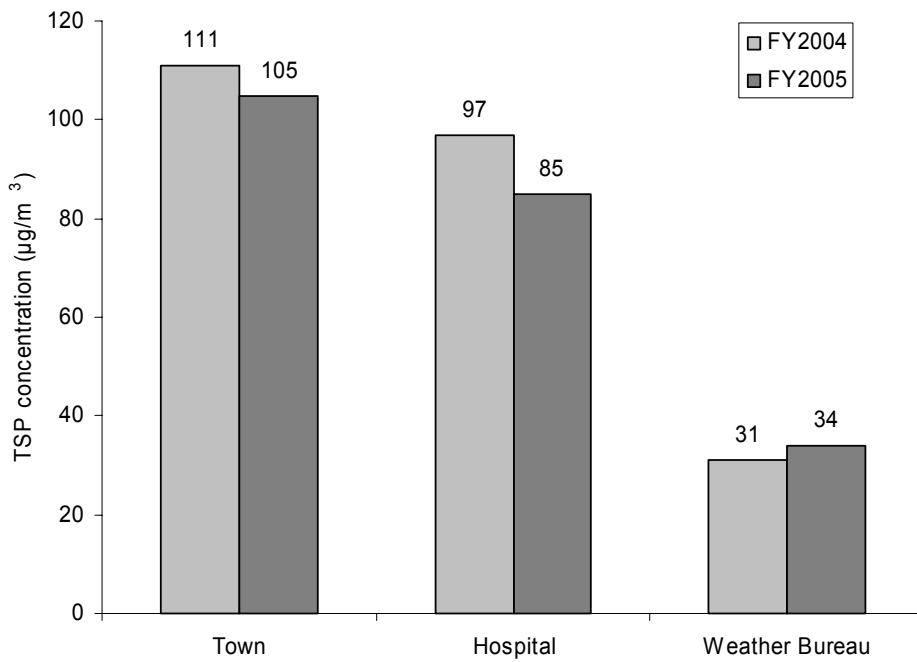
BHPBIO has two primary dust monitoring sites located in the residential areas of Port Hedland (Town and Hospital). An additional monitoring site at the Weather Bureau measures background dust concentrations.

6.1.1.1 2004/2005 TSP Data Review

During FY2005, TSP concentrations ranged from 19 to 319 µg/m³ at the Town site with two exceedances of the 24-hour licence target of 298 µg/m³ and 319 µg/m³ reported during this time. At the Hospital site, TSP concentrations ranged from 18 to 330 µg/m³ with one exceedance of the 24-hour licence target of 330 µg/m³. At the Bureau of Meteorology background location, concentrations ranged from 7 µg/m³ to 112 µg/m³.

Annual averages for TSP for FY2004 and FY2005 are shown in Figure 6.2.

Figure 6.2 Annual Average TSP Concentration (µg/m³)

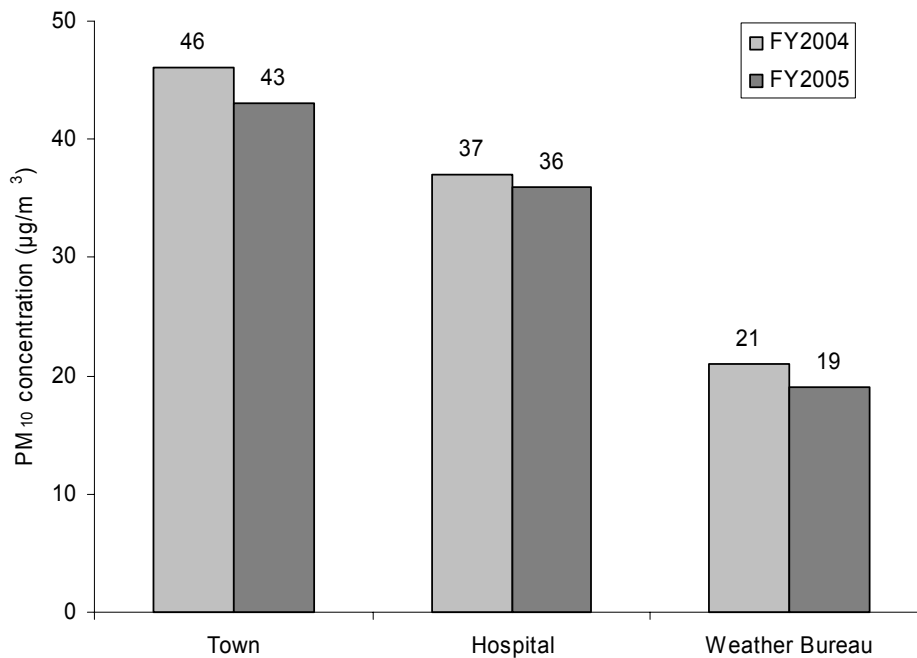


6.1.1.2 2004/2005 PM₁₀ Data Review

PM₁₀ concentrations ranged from 10 to 111 µg/m³ at the Town site, 7 to 112 µg/m³ at the Hospital site, and 2 to 59 µg/m³ at the Bureau of Meteorology background location. There were no exceedances of the 24-hour licence target during FY2005.

Annual averages for PM₁₀ for FY2004 and FY2005 are shown in Figure 6.3.

Figure 6.3 Annual Average PM₁₀ Concentration (µg/m³)



6.1.2 Management Objectives and Performance Targets

BHP Billiton understands that the proposed National Environmental Protection Measure (NEPM) for Ambient Air Quality is derived from studies associated with health effects within large urban populations ie. London, Birmingham and relates to the inhalable fraction of airborne particulates, which in these large urban environments largely comprise combustion products resulting from burning fossil fuels. These particulates are generally less than 2.5 microns in diameter.

The Ambient Air Quality NEPM, proposed to be applied in 2008, will set standards for both PM10 and PM2.5 fractions of airborne particulates within large urban areas.

Regional areas in Western Australia typically have smaller population centres and dry, windy environments with fugitive dusts being characterised by coarser crustal particulates (2.5 – 100 micron diameter). As such, additional studies are required to understand how these dusts relate to the proposed Air Quality NEPM.

Similarly, characterisation of airborne dust in Port Hedland has identified a large proportion of the airborne dust being crustal in nature and in the coarse fraction (10µm). To understand this better the Department of Health is undertaking a study in conjunction with the Department of Environment, Asthma & Allergy Research Institute at UWA and the Institute of Occupational Medicine in Edinburgh to determine health effects of Port Hedland dust and will provide results to the Department of Environment to determine how to appropriately apply the Ambient Air Quality NEPM to Port Hedland. It is expected that the study will be completed during early 2007.

BHPBIO is contributing to these studies as requested by both the Department of Health and the Department of Environment. In particular, BHPBIO is working with the Department of Environment to determine the most appropriate method of ambient air measurement for Port Hedland.

Currently in Port Hedland the primary concern associated with iron ore dust is amenity in neighbouring residential and commercial areas. As part of this review BHPBIO will seek to develop a target for total suspended particulates (TSP) which can be used to reduce impact on amenity and address responsiveness around incidents of high dust events.

BHPBIO therefore proposes to establish revised targets around both health and amenity as part of this review.

The objectives for the management of dust at the BHPBIO Port Hedland operations are to:

- Significantly reduce dust emissions;
- Adopt new targets for PM₁₀ that appropriately accommodate NEPM;
- Adopt new targets for TSP that appropriately address amenity issues;
- Revise the Dust Management Plan to reflect current expectations, knowledge and changes to operational facilities;
- Review (with the DoE Air Quality Branch) the ambient monitoring methodology for the Port Hedland area; and
- Move towards an industry based ambient monitoring program that reports performance to the community.

6.1.3 Dust Reductions as a Result of Staged Growth

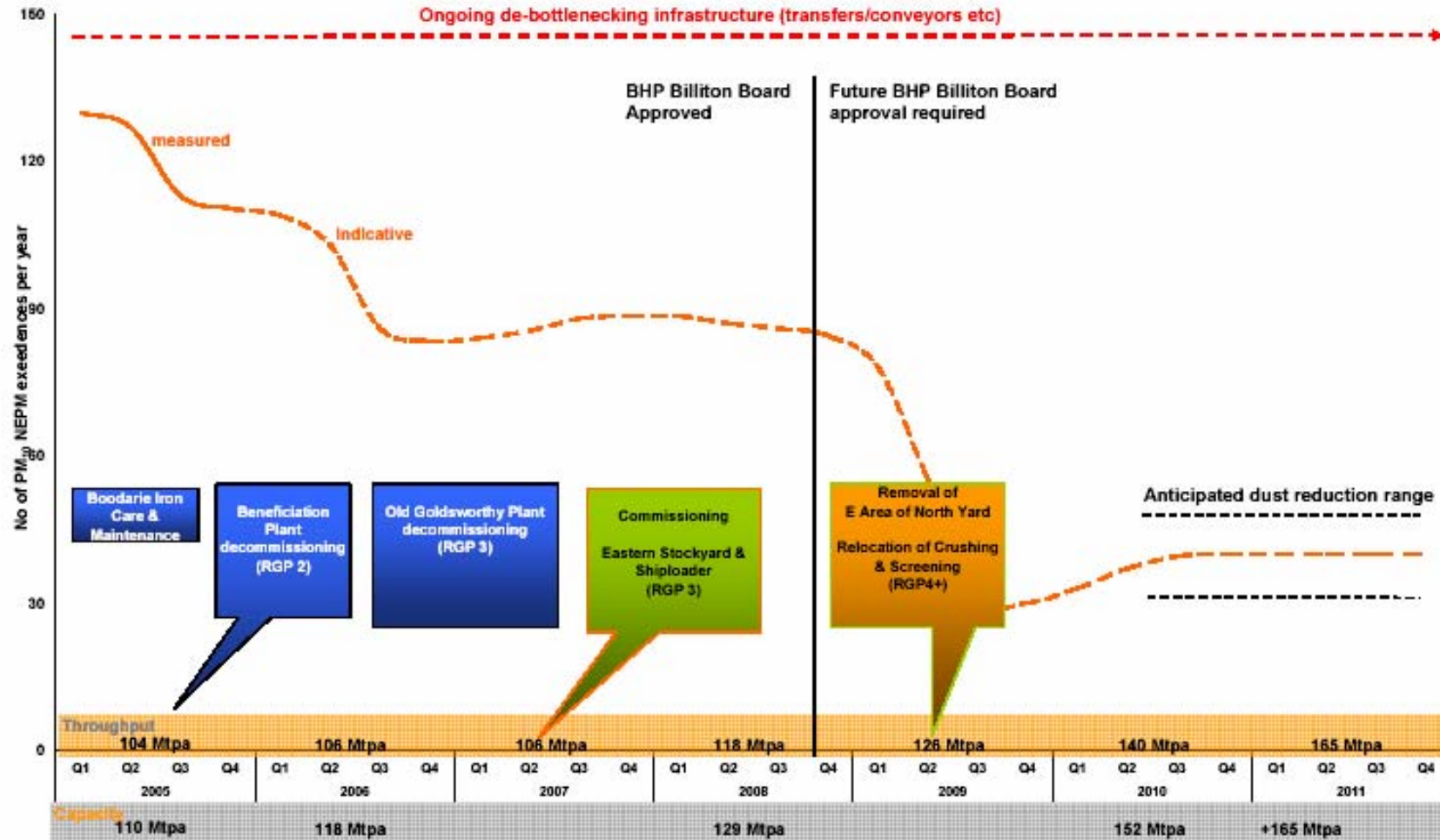
BHPBIO has an ongoing program to improve dust management at its Port Hedland operations. Works required as part of planned growth expansion will provide a greater opportunity to create fundamental step changes however any works for expansion above 130 Mtpa would still require separate consideration and approval under the Environmental Protection Act (1986), particularly Works Approval under Part V of that Act.

Redesign involves four key steps in reducing the number of events (based on a 24-hour average) where PM₁₀ levels exceed the NEPM value of 50 $\mu\text{g}/\text{m}^3$ (refer Figure 6.4). These involve:

1. Decommissioning of the beneficiation plant on Finucane Island (completed)
2. Decommissioning of the old Goldsworthy processing plant on Finucane Island (underway)
3. Removal of the E Area of the North Yard at Nelson Point Operations – closest stockyard to town (proposed)
4. Decommissioning of tertiary crushing and screening at Nelson Point Operations (proposed)

The result of implementation of these initiatives is expected to produce an estimated 70% reduction in the number of excursions above the proposed NEPM value (50 $\mu\text{g}/\text{m}^3$ 24-hour average).

Figure 6.4 Anticipated dust reductions associated with growth to 165 Mtpa at Port Hedland (conceptual)



6.1.4 Environmental Improvement

The changes to Ministerial Statement 433 “Upgrade Dust Management at Finucane Island and Nelson Point, Port Hedland” and subsequent improvements associated with future approvals under the Environmental Protection Act (1986), including Works Approvals under Part V will lead to the following:

- A significant reduction in dust emissions;
- Resultant improvements in visual and town amenity issues related to dust; and
- Alignment of dust control performance with stakeholder expectations

6.1.5 Alternatives

BHPBIO commits to the net reduction of dust emissions from its Port operations. Growth is dependent on market demand. Current projections show a requirement for the staged expansion to 165 Mtpa by around 2010. BHPBIO will undertake necessary works to meet revised conditions and commitments irrespective of growth.

6.1.6 Survey and Investigations

BHPBIO is undertaking a two phased investigation of dust emission levels from its Port Operations.

Phase one of the investigation included validation of the 2002 model using data collected in the 2004/2005 financial year. The process validation was similar to that used for the previous validation scenarios. Data utilised in the validation incorporated real time monitoring data and process flow information from the Nelson Point and Finucane Island operations. This process flow information included hourly tonnages, production type and moisture content. Parameters that were used to derive emission estimates representative of emissions from Nelson Point and Finucane Island were used in the dispersion model, AUSPLUME (ver 6). Results were compared with the monitoring data collected from the Town and Hospital sites using frequency distribution graphs.

Phase two of the investigation is currently being carried out. Extensive on-site measurements of emissions from various dust sources at the BHPBIO facilities in Port Hedland have been taken. These measurements are required to determine if the emission rates from the modelled sources have changed since the model was originally developed. The re-evaluation of emissions from Nelson Point and Finucane Island include measurements from point source data from:

- Crushing and screening buildings;
- Lump re-screening plants (Nelson Point only);
- Transfer stations;
- Vehicle road emissions;
- Conveyors;
- Bulldozers / front end loaders;
- Stackers and reclaimers;
- Shiploading areas;
- Wind erosion from open areas; and
- Wind erosion from stockpiles.

Testing was carried out over two field trips to ensure that different wind speeds and directions were encountered. The late September and early October testing has been completed to

capture easterly and southerly winds with the current testing will capture dust loads associated with north westerly winds.

To gain insight into better engineering solutions a series of Pareto graphs of the top 10-15 emitters and impactors will be constructed. These will aid in determining sources that need to be targeted for reduction strategies. When a reduction strategy has been decided the model can be run to predict overall dust reduction.

6.1.7 Management

Results from investigations will be used to revise the 2002 Dust Management Plan. The Plan will refine the existing management measures to minimise dust generation including:

- Improved operational dust control procedures;
- Continual implementation of dust suppression techniques; and
- Implementation of new technology where appropriate.

The Dust Management Plan will be used by personnel in Port Hedland as part of standard operating procedures and will include monitoring and auditing processes to measure the success of implementation against revised targets. The results will be used to review management actions contained in the Plan.

The Dust Management Plan will include:

- Revised dust modelling and field calibration which will incorporate annualised predictions of ground level concentrations (contours) and recommendations arising from the re-validation;
- Results of community consultation programs and future engagement strategies;
- Objectives and targets for dust;
- Risk assessment;
- Plans for engineering controls, operational controls, maintenance, land management, procedures for selection of new equipment;
- Timeline for implementation, with reference to planned increases in throughput;
- Implementation strategies – including employee training and awareness programs, consultation and reporting;
- Response mechanisms in the event of dust incidents; and
- Monitoring, auditing, evaluation, feedback mechanisms and reporting processes.

The monitoring program will be conducted in accordance with the conditions, including revised targets, outlined in the Environmental Protection Licences for Nelson Point and Finucane Island, while accounting for the recommendations of the re-validation assessment. The key objectives of this monitoring network are as follows:

- To quantify ambient regional and residential dust levels;
- To measure actual levels of dust within the operational sites to accurately predict changes to levels and assist in detailing operational controls to deliver improvement; and
- To provide a measure of conformance of the BHPBIO facilities with the regulatory conditions and requirements relating to dust.

Implementation of the revised Dust Management Plan will result in:

- Significant reductions in dust emissions with the aim to decrease the number of complaints relating to dust;
- Increased community acceptance of the program; and
- Improved visual amenity.

6.2 Water

Water use has reduced significantly from the Port Hedland operations resulting from the closure of Boodarie Iron. BHPBIO understands its operations remain in a water constrained environment. This is recognised in the Pilbara Coast Water Study being carried out by Department of Environment and Department of Water.

6.2.1 Management Objectives

The objectives for the management of water use at the BHPBIO Port Hedland operations are to:

- Reassess the monitoring of water use across the operations;
- Improve water use efficiency, including water used for dust suppression; and
- Revise the Water Management Plan to reflect current expectations, knowledge and changes to operational facilities.

6.2.2 Applicable Standards and Guidelines

Applicable standards and guidelines include:

- EPA Guidance No. 33 Environmental Guidance for Planning and Development;
- DoH (Draft) Guidelines for the Use of Recycled Water in Western Australia; and
- AS 3500: 1 2003 Plumbing and Drainage.
- Australian Drinking Water Guidelines (2004);

6.2.3 Environmental Improvements

The changes to Ministerial Statement 433 “Upgrade Dust Management at Finucane Island and Nelson Point, Port Hedland” and subsequent improvements associated with future approvals under the Environmental Protection Act (1986), particularly Works Approvals under Part V will lead to the following:

- Improved water use efficiency at BHPBIO Port Hedland operations; and
- reduced future demand of water from the Water Corporation borefields.

6.2.4 Alternatives

BHPBIO commits to improved water use efficiency. Growth is dependent on market demand. Current projections show a requirement for the staged expansion to 165 Mtpa by around 2010. BHPBIO will undertake necessary works to meet revised commitments irrespective of growth.

6.2.5 Survey and Investigations

BHPBIO has conducted several studies into opportunities for improved water use efficiency at the Port Hedland operations. Studies that have been undertaken by BHPBIO include:

- BHP Billiton Iron Ore Water Management Review (2002) – a review of the water management procedures utilised on site;
- Nelson Point, Finucane Island and Housing Management Study (2004) – involved the completion of a watercad – water system modelling and identified improvement recommendations;
- Nelson Point Recovered Water System - System Capacity Analysis Report (2005) – an extension to the 2004 watercad report to include the recovered water system at Nelson Point; and
- Water Management Program (2005) - Basis of water efficiency programmes carried out at the Port Hedland sites.

BHPBIO will identify low water use efficiency contributors across the operations and will incorporate these into the Water Management Plan.

BHPBIO will revalidate the current water use model. Based on the investigation conducted in 2004, BHPBIO is proposing to:

- Investigate measures to increase efficiency of dust suppression, incorporating water cannons, over belt sprays and launders;
- Investigate the installation of flow metering systems on site to facilitate the development of department-specific targets;
- Investigate non-water based dust control mechanisms;
- Investigate maximising the efficiency from the Freshwater Recovery Plant at Nelson Point and Finucane Island; and
- Embed water management into operational areas.

BHPBIO has and will continue to consider strategy for potential alternative sources of water for use in dust suppression. This remains a longer term process. The Water Management Plan will incorporate a demand projection curve accounting for all modelling and investigations undertaken for growth.

6.2.6 Management

Results from investigations listed in section 6.2.5 will be used to revise the existing Water Management Plan. The Water Management Plan will be used as part of standard operating procedures and will include monitoring and auditing processes to measure the success of implementation and review management actions contained in the Plan.

The Water Management Plan will include:

- Information on the background of water usage, monitoring and current studies;
- Objectives and targets for water management;
- Risk assessment;
- Plans for engineering controls, operational controls, maintenance, and procedures for selection of new equipment to aid in improvements in water-use efficiency;
- Studies on feasibility of non-water based dust control methods;
- Timeline for implementation, with reference to planned increases in throughput;
- Implementation strategies – including employee training and awareness programs, consultation and reporting; and
- Monitoring, auditing, evaluation, feedback mechanisms and reporting processes.

The implementation of the Water Management Plan will result in an overall increase in water use efficiency.

7 STAKEHOLDER ENGAGEMENT

BHPBIO has developed a community engagement strategy which aims to:

- Provide information as required;
- Identify and address potential social and environmental impacts of BHPBIO's business plans
- Identify areas of concern and develop strategies for improvements; and
- Work to continually improve long term relationships and partnerships with members of the community..

The strategy revolves around providing information to the community, acquiring feedback on performance, social impact assessment, management of complaints, and community engagement and enhancement programs.

The Port Hedland Community Consultative Group (CCG) comprises representatives from a range of government and community groups. The group meets on a regular basis to discuss issues of relevance to the Port Hedland Community.

BHPBIO maintains various channels for providing information to the community. In addition to participating in community working groups, BHPBIO provides community briefings and information sheets on an as-needs basis, and distributes its monthly Iron Chronicle to Port and South Hedland residents. Ambient dust results from the town monitors are also published in the local newspaper. These materials are designed to inform the community on BHPBIO's business plans, progress with expansion works, and performance against areas of community interest.

7.1 Social Impact

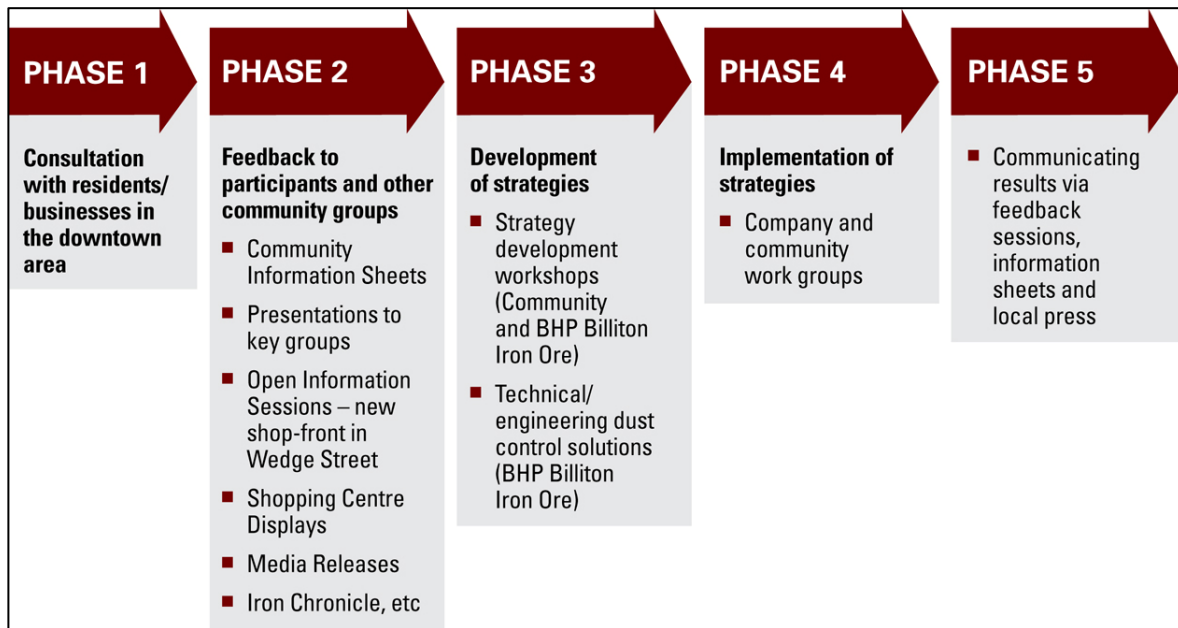
BHPBIO has commissioned several programs to ascertain social impacts of its operations, and its reputation amongst local residents and interest groups. The programs provide information on BHPBIO's dust management activities and seek feedback from stakeholders on BHPBIO's performance and reputation in the community. In addition, a complaints management system is maintained by BHPBIO to receive, document, investigate and follow up on public complaints. This information is reported to DoE as part of the annual regulatory reporting requirements.

Surveys that have been commissioned by BHPBIO include:

- URS 2002 Community Consultation (Asset Development Program);
- 2003 Reputational Survey
- 2004 Social Impact Assessment (SIA)

The dust issues that were raised in 2004 were followed up in 2005 through a series of extensive consultations with residents and business owners in the 'downtown' area of Port Hedland. This work is ongoing. As part of this strategy BHPBIO has endeavoured to work more closely with residents in the west end of Port Hedland around dust related issues. The phases of this program are illustrated in Figure 7.1.

Figure 7.1 BHPBIO consultation phases in the West End of Port Hedland.



BHPBIO’s consultation program is continually evolving and has now been refined to include stakeholder working groups as well as individual members of the community. BHPBIO understands that community engagement and consultation will be a significant component of this Section 46 process. It is proposed that consultation associated with the Section 46 process be incorporated into existing mechanisms.

8 PROJECT SCHEDULE

The proposed timeline for the Section 46 process is outlined in Table 8.1.

Table 8.1 Proposed Timeline for the Section 46 process.

Activity	Timeframe
Develop draft Section 46 EIA documentation, Dust Management Plan, Water Management Plan	November 2005 – March 2006
Release draft documents for comment	March 2006
Submit final document to EPA	March - April 2006
Public release of document	April 2006
Public Review Period	April – June 2006
Collate and respond to public submissions	July 2006
EPA Bulletin Development	August – November 2006
EPA Bulletin released	November 2006
Public Appeals Period	November 2006
Collate and respond to appeals	December 2006
Ministers Approval	early 2007

9 PEER REVIEW

BHPBIO will continue to work in close collaboration with relevant government agencies and stakeholder groups while preparing the modelling, management plans and monitoring programs to ensure all elements are addressed. This includes consultations with relevant technical experts such as the DoE Air Quality Branch throughout the Section 46 process.

In addition, BHPBIO will seek to engage subject matter experts as independent peers to review critical components of the project. These persons will be selected in consultation with the appropriate regulatory agencies such as the Department of Environment.

10 REFERENCES

Paling, E.I, Humphries, G., McCardle, I. and Thomson, G. (2000) The effects of iron ore dust on mangroves in Western Australia: Lack of evidence for stomatal damage, *Wetlands Ecology and Management* 00: 1-8, 2000, Murdoch University, Perth.

11 APPENDICES

APPENDIX A

MINISTERIAL STATEMENT 433 UPGRADE DUST MANAGEMENT AT FINUCANE ISLAND
AND NELSON POINT, PORT HEDLAND



Ass # 955

Bull # 831

State # 433

MINISTER FOR THE ENVIRONMENT WESTERN AUSTRALIA

**STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED
(PURSUANT TO THE PROVISIONS OF THE
ENVIRONMENTAL PROTECTION ACT 1986)**

UPGRADE DUST MANAGEMENT
AT FINUCANE ISLAND AND NELSON POINT,
PORT HEDLAND (955)

BHP IRON ORE PTY LTD

This proposal may be implemented subject to the following conditions:

1 Proponent Commitments

The proponent has made a number of environmental management commitments in order to protect the environment.

- 1-1 In implementing the proposal, the proponent shall fulfil the commitments made in the Consultative Environmental Review and in response to public submissions; provided that the commitments and environmental management measures are not inconsistent with the conditions or procedures contained in this statement.

The consolidated environmental management commitments were published in Environmental Protection Authority Bulletin 831 (Appendix 3) and a copy is attached.

2 Implementation

Changes to the proposal which are not substantial may be carried out with the approval of the Minister for the Environment.

- 2-1 Subject to these conditions, the manner of detailed implementation of the proposal shall conform in substance with that set out in any designs, specifications, plans or other technical material submitted by the proponent to the Environmental Protection Authority with the proposal.
- 2-2 Where, in the course of the detailed implementation referred to in condition 2-1, the proponent seeks to change the designs, specifications, plans or other technical material submitted to the Environmental Protection Authority in any way that the Minister for the Environment determines, on the advice of the Environmental Protection Authority, is not substantial, those changes may be effected.

Published on

9 June 1995

12th Floor, Dumas House, 2 Havelock Street, West Perth, Western Australia 6005
Telephone (09) 321 2222 Facsimile (09) 322 5149

3 Proponent

These conditions legally apply to the nominated proponent.

- 3-1 No transfer of ownership, control or management of the project which would give rise to a need for the replacement of the proponent shall take place until the Minister for the Environment has advised the proponent that approval has been given for the nomination of a replacement proponent. Any request for the exercise of that power of the Minister shall be accompanied by a copy of this statement endorsed with an undertaking by the proposed replacement proponent to carry out the project in accordance with the conditions and procedures set out in the statement.

4 Time Limit on Approval

The environmental approval for the proposal is limited.

- 4-1 If the proponent has not substantially commenced the project within five years of the date of this statement, then the approval to implement the proposal as granted in this statement shall lapse and be void. The Minister for the Environment shall determine any question as to whether the project has been substantially commenced.

Any application to extend the period of five years referred to in this condition shall be made before the expiration of that period to the Minister for the Environment.

Where the proponent demonstrates to the requirements of the Minister for the Environment on advice of the Department of Environmental Protection that the environmental parameters of the proposal have not changed significantly, then the Minister may grant an extension not exceeding five years.

5 Compliance Auditing

To help determine environmental performance and compliance with the conditions, periodic reports on the implementation of the proposal are required.

- 5-1 The proponent shall submit periodic Performance and Compliance Reports, in accordance with an audit programme prepared by the Department of Environmental Protection in consultation with the proponents.

6 Environmental Management

- 6-1 The proponent shall exercise all care and due diligence in managing the proposal to ensure the protection of the environment.

- 6-2 The proponent shall prepare and implement an environmental management plan and environmental management procedures (for example those provided for in Australian Standards 9000 and 14000 (draft) series) to manage the relevant environmental factors to achieve the objectives specified by the Environmental Protection Authority in the assessment report (Bulletin 831), with appropriate monitoring, auditing and reporting to ensure compliance with these conditions and procedures and the ongoing protection of the environment.

- 6-3 If through the implementation of the procedures referred to in 6-2 the proponent identifies a relevant environmental factor not listed as such in Environmental Protection Authority Bulletin 831, the proponent shall immediately report to the Minister on that factor, a proposed objective and any proposals for management of the factor to achieve the objective.

7 Performance Review

7-1 Following the approval of the proposal, the proponent shall carry out an annual audit of the dust management performance and management system. The proponent shall provide the audit report to the Department of Environmental Protection each year for the first five years of the approval.

7-2 Each five years following the approval of the proposal, the proponent shall prepare a major review of the following:

1. environmental protection, including but not limited to consideration of the environmental objectives;
2. the audit of performance against the environmental objectives; and
3. the annual audits required by condition 7-1,

to the requirements of the Environmental Protection Authority on advice of the Department of Environmental Protection.

These environmental objectives shall include but not be limited to those identified by the Environmental Protection Authority in the assessment report (Environmental Protection Authority Bulletin 831).

The environmental objectives may be changed by the Environmental Protection Authority following the review.

Procedure

- 1 Unless otherwise specified, the Department of Environmental Protection is responsible for assessing compliance with the conditions contained in this statement and for issuing formal clearance of conditions.
- 2 Where compliance with any condition is in dispute, the matter will be determined by the Minister for the Environment.

Hon Peter Foss QC MLC
MINISTER FOR THE ENVIRONMENT

14 NOV 1996

Proponent's Environmental Management Commitments

**UPGRADE DUST MANAGEMENT
AT FINUCANE ISLAND AND NELSON POINT,
PORT HEDLAND (955)**

BHP IRON ORE PTY LTD

PROPONENT'S ENVIRONMENTAL MANAGEMENT COMMITMENTS

The proponent makes the following commitments in relation to the development:

General

Commitment 1

The proponent will develop and implement the Dust Management Programme as a component of BHP Iron Ore Pty Ltd (BHPIO) Environmental Management Programme to improve dust management and reduce operational dust impacts.

The programme will incorporate:

- quality assurance and environmental management principles according to AS/ISO 9000 and draft AS/ISO 14000 series;
- performance measurement/ continual improvement;
- bench marking for all Hedland Operations;
- operational feedback; and
- community consultation.

The programme will be developed and implemented to the satisfaction of the Department of Environmental Protection (DEP).

Community Amenity Impacts

Commitment 2

The proponent will develop and implement for community amenity impacts, an issue definition and dust management performance assessment process, to:

- (i) address community consultation by maintaining a community complaints register;
- (ii) develop Total Suspended Particulate (TSP or PM50) air quality criteria for the Port Hedland residential area;
- (iii) develop annual performance targets based on the number of complaints/exceedances; and
- (iv) address community consultation on community amenity impacts.

The process will include the following:

- recording and responding to community complaints;
- informing Port Hedland Dust Management Committee (PHDMC) of status on a regular basis;
- maintain residential TSP monitoring programme;
- setting agreed interim TSP criteria;
- assisting the development of an air quality policy for Port Hedland in conjunction with the DEP and PHDMC;
- establishing a protocol for exceedance / complaint analysis and reporting to DEP; and
- developing and maintaining community consultation on community amenity impacts.

The above components will be developed and implemented in consultation with PHDMC and to the satisfaction of the DEP. The DEP Kwinana PM₅₀ 24h limit of 260µg/m³ is adopted as the interim exceedance target for amenity.

Commitment 3

To complete the dust management upgrade programme for Nelson Point and Finucane Island, the proponent will undertake the upgrading of:

- materials handling;
- dust suppression equipment;
- traffic and open areas; and
- dust management system.

The upgrades will be to the satisfaction of the DEP and will be completed by May 1997.

Commitment 4

The proponent will carry out ongoing review of new developments in dust management technology to continually improve dust management through:

- undertaking continual review of dust management technology; and
- implementing appropriate developed technology.

Potential Environmental Health Impacts

Commitment 5

The proponent will develop and implement a process for ongoing definition of the potential for environmental health impacts. This will be based on:

- establishing a PM₁₀ monitoring programme;
- setting agreed interim PM₁₀ criteria; and
- establishing a protocol for exceedance analysis and reporting to the DEP;
- assisting the development of an air quality policy for Port Hedland in conjunction with the DEP and PHDMC;
- continual review of developments in monitoring/criteria in conjunction with DEP and implement agreed programmes; and
- informing PHDMC of status on a regular basis.

The above components will be developed and implemented in consultation with the Health Department and the PHDMC, and to the satisfaction of the DEP. The US EPA PM₁₀ maximum 24h average of 150µg/m³ is adopted as the interim exceedance target for health.

Commitment 6

The proponent will develop and implement a process to inform community on status of environmental health impacts, through dissemination of relevant information and data to the community on a regular basis, in consultation with the Health Department, the DEP and PHDMC.

Potential Ecological Impacts

Commitment 7

The proponent will develop and implement a process for ongoing definition of the potential for ecological impacts. This will be based on:

- establishing a dust deposition/ vegetation monitoring programme;
- establishing effluent discharge/harbour monitoring studies; and
- informing PHDMC of status on a regular basis.

The above components will be developed and implemented to the satisfaction of the DEP.

Any agreed potential impacts identified from these monitoring studies will be addressed through an appropriate management programme to be developed in consultation with the DEP.

Commitment 8

The proponent will develop and implement a process to inform community on status of ecological impacts, through dissemination of relevant information and data from the above studies (Commitment 7) to the community, in consultation with the DEP and PHDMC.

Commitment 9

The proponent will develop and implement programmes to minimise iron ore fines waste generation, to the satisfaction of the DEP.

APPENDIX B
NELSON POINT OPERATIONAL LICENCE

WESTERN AUSTRALIA
DEPARTMENT OF ENVIRONMENT

Environmental Protection Act 1986

LICENCE

LICENCE NUMBER: 4513/10

FILE NUMBER: L2/69

NAME OF OCCUPIER:

BHP Billiton Iron Ore Pty Ltd

ADDRESS OF OCCUPIER:

PO Box 231
PORT HEDLAND WA 6721

NAME AND LOCATION OF PREMISES:

Nelson Point Processing Facility
Wilson Street
Port Hedland WA 6721

Environmental Protection Regulations 1987

CLASSIFICATION(S) OF PREMISES:

Category 05 - Processing or beneficiation of metallic or non metallic ore
Category 58 - Bulk material loading or unloading
Category 85 - Sewage facility

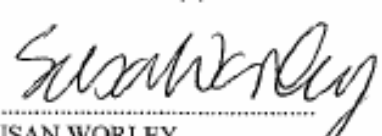
COMMENCEMENT DATE OF LICENCE: Tuesday, 22 November 2005

EXPIRY DATE OF LICENCE: Tuesday, 21 November 2006

CONDITIONS OF LICENCE:

As described and attached:

DEFINITIONS (9)
GENERAL CONDITION(S) (2)
AIR POLLUTION CONTROL CONDITION(S) (7)
WATER POLLUTION CONTROL CONDITION(S) (6)
MARINE POLLUTION CONTROL CONDITION(S) (1)
SOLID WASTE CONTROL CONDITION(S) (1)
ATTACHMENTS (3)



.....
SUSAN WORLEY
Officer delegated under Section 20
of the *Environmental Protection Act 1986*

Date of Issue: Monday, 21 November 2005

WESTERN AUSTRALIA
DEPARTMENT OF ENVIRONMENT

Environmental Protection Act 1986

LICENCE NUMBER: 4513/10

FILE NUMBER: L2/69

PREAMBLE

The following statements in this preamble provide relevant background information for the Licensee. They should not be regarded as conditions of licence.

Applicability

This licence is issued to BHP Billiton Iron Ore Pty Ltd for the operation of the Nelson Point Processing and Shiploading Facility, located at Nelson Point, Wilson Street, Port Hedland (see Attachment 1 and 2). This is a prescribed premises within Schedule 1 of the *Environmental Protection Regulations 1987*, as outlined in Table 1, and includes but is not necessarily limited to, the following operations:

- train unloading;
- crushing;
- lump re-screening plant;
- stockpiling of iron ore;
- shiploading;
- Nelson Point - Finucane Island harbour tunnel; and
- wastewater treatment plant.

Table 1: Categories under which BHP Billiton Iron Ore Pty Ltd Nelson Point processing and shiploading operations are prescribed.

<i>Category Number</i>	<i>Category Name</i>
5	Processing or Beneficiation of Metallic or Non Metallic Ore
58	Bulk Material Loading and Unloading
85	Sewage Treatment Facility

Throughput

Any increase in throughput shall not occur unless the Licensee has been granted prior approval in writing from the Director under the provision of the *Environmental Protection Act 1986*.

Dust Management

Dust in the Port Hedland community is an issue. The Consultative Environmental Review and Ministerial Conditions released by the Environmental Protection Authority (EPA) in 1996 for this premises focussed on set objectives for three areas of fugitive dust management and ambient dust levels in Port Hedland:

- community amenity;
- community health; and
- ecological impacts.

In response to this, BHP Billiton Iron Ore (BHPBIO) has embedded the management of fugitive dust into operations through the development of an environmental management system certified to the international ISO14001 standard. BHPBIO recognises that despite introducing a number of initiatives over the life of the Dust Management Program, overall dust levels in the Port Hedland community continue to be an issue. The EPA's objective for this environmental factor is to ensure that "...the amenity of nearby residents are protected from adverse dust impacts resulting from the proponents operations..."(EPA 1996). In accordance with this objective BHPBIO should aim to comply with the following performance targets.

WESTERN AUSTRALIA

DEPARTMENT OF ENVIRONMENT

Environmental Protection Act 1986

LICENCE NUMBER: 4513/10

FILE NUMBER: L2/69

Table 2: BHP Billiton Iron Ore Dust Management Performance Targets.

Parameter	Units	Averaging Time	Performance Targets
Total suspended particles (TSP)	µg/m ³	24 hours	260
Particles (as PM ₁₀)	µg/m ³	24 hours	150

Management actions should be reviewed against these targets to ensure the objectives of the Dust Management Programme are achieved. Consistent with BHPBIO commitment to continual improvement these targets should be reviewed and revised as required based on community concern, increasing improvements in dust control and monitoring technology.

Community Consultation

BHPBIO commitment to improve dust management and reduce dust impacts in their Environmental Management Programme incorporates the implementation of the Dust Management Programme. This Programme involves community consultation to address community health and amenity impacts from iron ore dust. Forums available for community consultation include the Port Hedland Air Quality Control Working Group, the Port Hedland Community Consultative Group, Care for Hedland Interest Group and the Port Hedland Townscape Working Group meetings, held on a regular basis.

Reinforcing this commitment the Licensee should inform the Port Hedland Community on the effectiveness of the Dust Management Programme, in relation to:

- dust management initiatives;
- dust management objectives against management actions and performance targets;
- management actions addressing community complaints;
- investigations to improve dust and water management practices;
- effectiveness of current dust control equipment;
- status of environmental health from iron ore dust; and
- status of environmental impacts from iron ore dust.

Water Use Efficiency

The Licensee should endeavour to integrate the Dust Management Programme and the Water Management Plan to ensure multiple objective outcomes against measurable management actions. This should include a review of current dust management practices, investigation of alternative dust suppression options and identifying water efficiency opportunities.

Ministerial conditions

The Licensee is reminded that this premises was assessed under Part IV of the *Environmental Protection Act 1986* and that the Minister for the Environment set conditions on the construction and operation of this facility. The Licensee is required to comply with the requirements of the Minister's Statement (Statement 433) as well as those in this licence.

Emergency, Accident or Malfunction

The Licensee should inform the Director as soon as practicable of the identification of any discharge of waste which has occurred as a result of an emergency, accident or malfunction, or

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DEPARTMENT OF ENVIRONMENT

*Environmental Protection Act 1986***LICENCE NUMBER: 4513/10****FILE NUMBER: L2/69**

extreme weather conditions, otherwise than in accordance with any condition of this licence and has caused or is likely to cause pollution.

Alteration to Premises

Prior to making any significant alterations to the premises, which may affect the air, water or noise emissions from the premises, the Licensee must submit a proposal to the Director accompanied by supporting information and plans, which allow the environmental impact of that change to be assessed.

Non-Standard Operations

The Licensee should inform the Director at least 24 hours prior to commencement of any planned non-standard operations, which may have the potential to cause pollution.

Other Legal Requirements

The Licensee should be aware that these conditions do not exempt the premises/Licensee from other statutory obligations under the *Environmental Protection Act 1986*, or any other Acts.

This includes the Licensee's obligations under the:

- *Environmental Protection Regulations 1987*;
- *Environmental Protection (Noise) Regulations 1997*;
- *Environmental Protection (Native Vegetation Clearing) Regulations 2004*;
- *Environmental Protection (Unauthorised Discharges) Regulations 2004*; and
- *Environmental Protection (Controlled Waste) Regulations 2004*.

Where there is a conflict between the conditions set in this licence and any Act or Regulations, the latter takes precedence.

CONDITIONS OF LICENCE**DEFINITIONS**

In these conditions of licence, unless inconsistent with the text or subject matter:

"Director" means Director, Environmental Management Division of the Department of Environment for and on behalf of the Chief Executive Officer as delegated under Section 20 of the *Environmental Protection Act 1986*;

"Director" or "Department of Environment" for the purpose of correspondence means:

The Manager, North West Region

Department of Environment

PO Box 836

KARRATHA WA 6714

Telephone: (08) 9144 2000

Facsimile: (08) 9144 2610;

"hazardous waste" includes any substances which are toxic, infectious, mutagenic, carcinogenic, teratogenic, explosive, flammable, corrosive, oxidising and radioactive;

"inform" means inform by telephone or facsimile;

"Licensee" for the purpose of this licence means BHP Billiton Iron Ore Pty Ltd;

"premises" for the purpose of this licence means BHP Billiton Iron Ore Pty Ltd Nelson Point Processing and Shiploading Facility, located at Nelson Point, Wilson Street, Port Hedland (see Attachment 1 and 2);

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"PM₁₀" means particulate matter with a mass median aerodynamic diameter less than or equal to nominally 10 micrometers (10 µm);

"PM_{2.5}" means particulate matter with a mass median aerodynamic diameter less than or equal to nominally 2.5 micrometers (2.5 µm); and

"TSP" means total suspended particles.

GENERAL CONDITIONS**ANNUAL REPORT**

G1 The Licensee shall provide to the Director, a consolidated annual report containing information as required by any condition of this licence for the period. The report shall be submitted no later than **30 September 2006** and provide at least the following information for this reporting period:

- (i) noise abatement initiatives;
- (ii) water reduction initiatives;
- (iii) waste minimisation initiatives;
- (iv) effectiveness of current dust monitoring programme;
- (v) dust mitigation initiatives;
- (vi) dust management objectives against management actions and performance targets;
- (vii) specific actions implemented to address community complaints;
- (viii) any exceedances of performance targets over the reporting period;
- (ix) progress of rehabilitation of disturbed and open areas;
- (x) review of maintenance programmes; and
- (xi) environmental impacts from iron ore dust and spillages.

A single report may be submitted to encompass the Nelson Point and Finucane Island operations.

COMPLAINTS REGISTER

G2(a) The Licensee shall maintain a register of all complaints received directly by the Licensee.

G2(b) The Licensee shall make all reasonable efforts to obtain the following information, which shall be recorded on the register on receipt of each complaint:

- (i) date and time of the complaint;
- (ii) date and time of the alleged incident;
- (iii) name of the complainant;
- (iv) contact telephone number of the complainant;
- (v) location of the alleged incident; and
- (vi) identity of the process being undertaken on the premises that is alleged source of the incident.

WESTERN AUSTRALIA

DEPARTMENT OF ENVIRONMENT

*Environmental Protection Act 1986***LICENCE NUMBER: 4513/10****FILE NUMBER: L2/69****AIR POLLUTION CONTROL CONDITIONS****GENERAL PLANT - DUST SUPPRESSION**

- A1(a) The Licensee shall employ routine maintenance and housekeeping practices to ensure dust emissions are minimised from the accumulation of spillage material from any active operating area inclusive of conveyor systems, transfer points and on the wharf.
- A1(b) The Licensee shall ensure all accumulated spillage material as specified in part (a) of this condition is collected and removed on a daily basis and is either redirected back through the process or disposed of to ensure dust emissions are minimised.

HAUL ROADS, ACCESS ROADS, WORK AREAS - DUST SUPPRESSION

- A2 The Licensee shall employ measures to ensure that dust emissions from haul roads, access roads, stockpiles and active work areas are minimised. Such dust control measures include:
- (i) water sprays;
 - (ii) water trucks to maintain roads in a damp condition;
 - (iii) controlling vehicular speeds;
 - (iv) approved chemical dust suppressants; and
 - (v) rehabilitation of disturbed areas.

STOCKPILING, RECLAIMING AND SHIPLOADING – DUST SUPPRESSION

- A3(a) The Licensee shall ensure dust emissions are minimised from non-working faces and working faces of stockpiles by implementing dust suppression techniques such as:
- (i) maintaining stockpiles in a damp condition;
 - (ii) sealing non-working faces to minimise dust lift off; and
 - (iii) limiting vertical faces after reclaiming activities.
- A3(b) The Licensee shall ensure dust emissions are minimised from stockpiling, reclaiming and ship loading iron ore activities by implementing dust suppression techniques such as:
- (i) water sprays and/or mist sprays on stacker booms; and
 - (ii) maintaining the stacker boom and ship loader boom at a position so as to prevent visible dust emissions.

DUST CONTROL EQUIPMENT – DUST SUPPRESSION

- A4(a) The Licensee shall maintain and inspect the air pollution control equipment and record any of the following details in a log book, which shall be accessible at all times and be provided when required. The log book record shall include the following details:
- (i) pressure drop readings across baghouse fabric filters- weekly basis;
 - (ii) incidents of baghouse filter media failure and replacement - weekly basis;
 - (iii) emissions from wet scrubbers stacks – as occurs;
 - (iv) balances of flows from wet scrubber units – monthly basis;
 - (v) condition of dust control equipment on all transfer points - monthly basis; and
 - (vi) condition of all dust suppression sprays - monthly basis.

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A4(b) The Licensee shall ensure all dust control equipment is maintained and calibrated to manufacturer's specifications to ensure dust emissions are minimised.

CONVEYORS AND TRANSFER POINTS – DUST SUPPRESSION

A5 The Licensee shall operate and maintain (where installed) all conveyor transfer points, dust suppressants, including between belts and belts/screens/crushers/storage facilities and vice versa to ensure dust emissions are minimised through the implementation of dust control measures such as:

- (i) water sprays;
- (ii) dust extraction/filtration equipment;
- (iii) belt cleaning mechanisms; and
- (iv) sealing and enclosing conveyor transfer and discharge points.

DUST MONITORING PROGRAMME

A6(a) The Licensee shall undertake a continuous dust monitoring programme for the purpose of determining the off-site dust impact from these operations. The programme shall incorporate the following:

- (i) utilise high volume samplers and real time dust monitoring equipment. The high volume samplers shall be used in accordance with Australian Standards AS 3580.9.3:2003 (TSP) and AS 3580.9.6:2003 (PM₁₀);
- (ii) the monitors shall be located at the sites indicated in Attachment 3;
- (iii) a control site located at the Airport (Bureau of Meteorology) indicated in Attachment 3;
- (iv) measurement and recording of total suspended particles (TSP), PM₁₀ and PM_{2.5}, averaged on a 24-hour basis; and
- (v) measurement and recording of wind direction, wind speed, temperature and humidity.

A6(b) The Licensee shall ensure all dust monitoring equipment is maintained to manufacturer's specifications.

DARK SMOKE EMISSIONS - FIRE TRAINING BURNING

A7(a) The Licensee shall ensure that materials, including waste oil, rubber, rubber products, plastic or plastic products are not burned at any time on the licensed premises except if required for emergency response fire training purposes.

A7(b) The Licensee shall inform the Director prior to any fire training, and undertake burning only:

- (i) at the Fire Training Facility located at approximately the co-ordinates; AMG 665 297 East and AMG 775 2171 North;
- (ii) when the wind conditions are such that smoke emissions do not drift over any sensitive area which should not be affected by smoke including Port Hedland town; and
- (iii) during the period between sunrise + 2 hours and sunset + 2 hours to avoid meteorological conditions which are not conducive to adequate dispersion of the smoke.

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- A7(c) The Licensee shall not undertake burning during periods in which the wind direction may change resulting in smoke blowing over any sensitive area including the Port Hedland Town area (notably the onset of a seabreeze).
- A7(d) The Licensee shall keep a log of the date and time of each burn, the type of materials burnt and the meteorological conditions at the time of the burn. The log shall be kept on the premises for a period of at least three months and shall be made available upon request.

WATER POLLUTION CONTROL CONDITIONS

OILY AND SOLVENT WASTEWATER TREATMENT SYSTEM

- W1 The Licensee shall operate an oily and solvent wastewater treatment system such that:
- (i) waste oil and solvents are collected for reuse, recycling or disposal; and
 - (ii) wastewater is directed to storage facilities for subsequent treatment and disposal.

WASTE MANAGEMENT FROM ANCILLARY OPERATIONS

- W2(a) The Licensee shall utilise and maintain practical measures such as protective bunding, silt traps, fuel traps, and collection sumps to manage hydrocarbon wastes from maintenance workshops, vehicle washdown bays, refuelling depots and laboratories.
- W2(b) The Licensee shall collect waste lubricants and hydraulic fluids in lined or banded holding tanks for recycling or disposal to an approved waste management facility.
- W2(c) The Licensee shall collect spent radiator coolant/inhibitors in holding tanks for subsequent disposal to an approved waste management facility.

STORMWATER MANAGEMENT

- W3(a) The Licensee shall ensure stormwater is retained in sedimentation basins on the premises to maximise removal of suspended solids prior to discharge.
- W3(b) The Licensee shall ensure that the quality of any wastewater, including contaminated stormwater, discharged from the premises contains a hydrocarbon concentration of less than 5mg/L.

LIQUID CHEMICAL STORAGE

- W4(a) The Licensee shall store environmentally hazardous chemicals including, but not limited to, fuel, oil or other hydrocarbons (where the total volume of each substance stored on the premises exceeds 250 litres) within low permeability (10^{-9} metres per second or less) compound(s) designed to contain not less than 110% of the volume of the largest storage vessel or inter-connected system, and at least 25% of the total volume of substances stored in the compound.
- W4(b) The compound(s) described in part (a) to this condition shall:
- (i) be graded or include a sump to allow recovery of liquid;
 - (ii) be chemically resistant to the substances stored;

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- (iii) include valves, pumps and meters associated with transfer operations wherever practical. Otherwise the equipment shall be adequately protected (eg. bollards) and contained in an area designed to permit recovery of chemicals released following accidents or vandalism;
 - (iv) be designed such that jetting from any storage vessel or fitting will be captured within the bunded area [see for example Australian Standard 1940-1993 Section 5.9.3 (g)];
 - (v) be designed such that chemicals which may react dangerously if they come into contact, are in separate bunds in the same compound or in different compounds; and
 - (vi) be controlled such that sufficient capacity of the bund is maintained at all times (eg. regular inspection and pumping of trapped uncontaminated rain water).
- W4(c) The Licensee shall immediately recover, remove or dispose of any liquid resulting from spills or leaks of chemicals including fuel, oil or other hydrocarbons, whether inside or outside the low permeability compound(s).

MAINTENANCE OF WASTEWATER PACKAGE PLANT

- W5 The Licensee shall manage the wastewater package plant in a manner such that:
- (i) stormwater runoff resulting from roof and site drainage shall not enter the wastewater treatment system;
 - (ii) extreme rainfall events do not cause overtopping of the tanks;
 - (iii) there is not discernible seepage loss from the treatment system;
 - (iv) vegetation (emergent or otherwise) shall be prevented from growing in the tank treatment system; and
 - (v) disposal of sewage sludges is in accordance with "Western Australian Guidelines for Direct Land Application of Biosolids and Biosolids Products", dated February 2002.

DISCHARGE FROM WASTEWATER PACKAGE PLANT

- W6 The Licensee shall ensure that all treated wastewater from the premises excluding stormwater be discharged to the irrigation area only. The Licensee shall manage the irrigation area in accordance with the safeguards listed in the National Water Quality Management Strategy, "Guidelines for Sewage Systems - Use of Reclaimed Water", dated November 2000.

MARINE POLLUTION CONTROL CONDITIONS**CONTAMINATION OF THE MARINE ENVIRONMENT**

- M1(a) The Licensee shall minimise spillages of materials entering the harbour during ship loading/unloading operations.
- M1(b) The Licensee shall ensure all spillage material on the wharf is collected and removed following ship loading/unloading operations.

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LICENCE NUMBER: 4513/10

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SOLID WASTE CONTROL CONDITIONS

SOLID WASTE DISPOSAL

- S1(a) The Licensee shall ensure all solid wastes are disposed of to an approved waste management facility.
- S1(b) The Licensee shall ensure solid hazardous wastes are disposed of to an approved waste management facility.

SEVERANCE

It is the intent of these licence conditions that they shall operate so that, if a condition or a part of a condition is beyond my power to impose, or is otherwise *ultra vires* or invalid, that condition or part of a condition shall be severed and the remainder of these conditions shall nevertheless be valid to the extent that they are within my power to impose and are not otherwise *ultra vires* or invalid.



.....
SUSAN WORLEY

Officer delegated under Section 20
of the *Environmental Protection Act 1986*

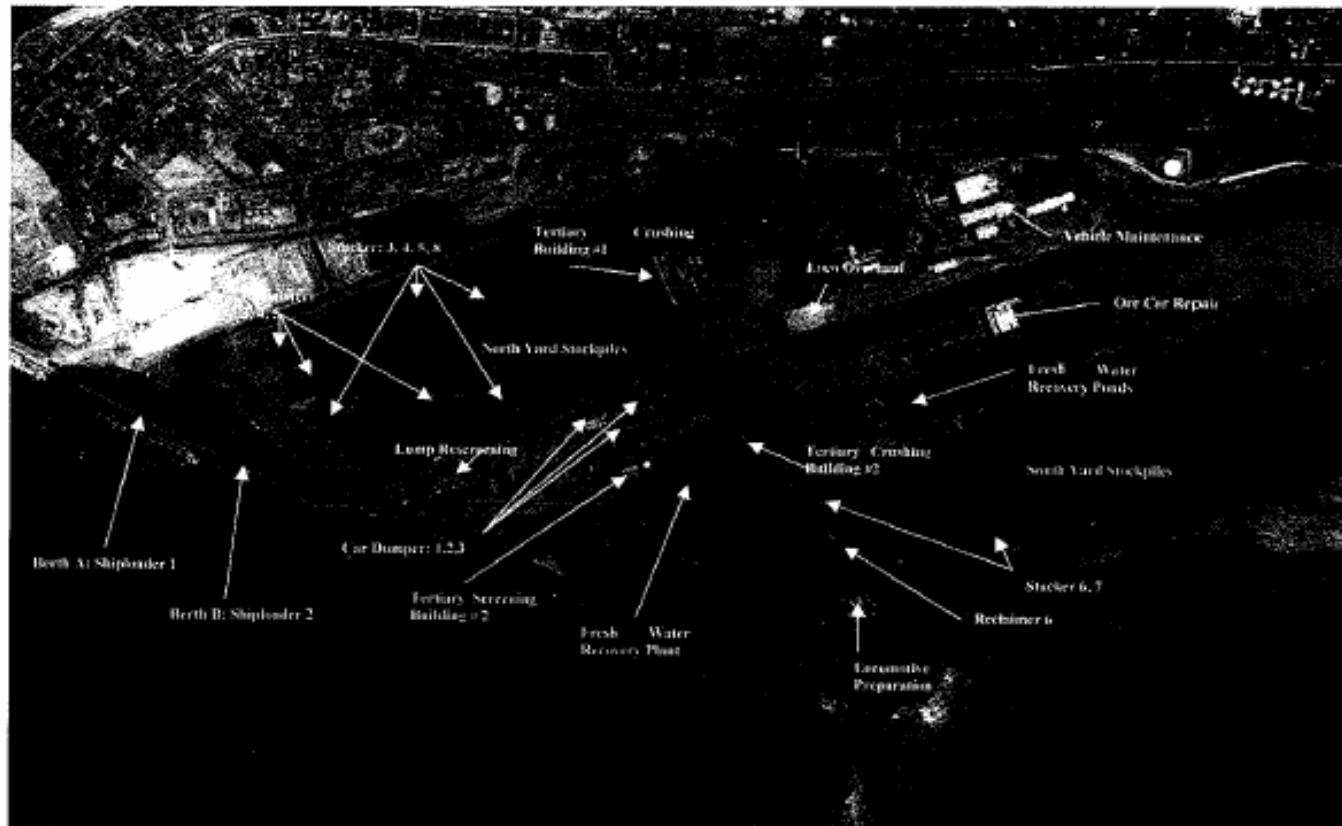
Date of Issue: Monday, 21 November 2005

WESTERN AUSTRALIA
DEPARTMENT OF ENVIRONMENT
Environmental Protection Act 1986

LICENCE NUMBER: 4513/10

FILE NUMBER: L2/69

Attachment One:

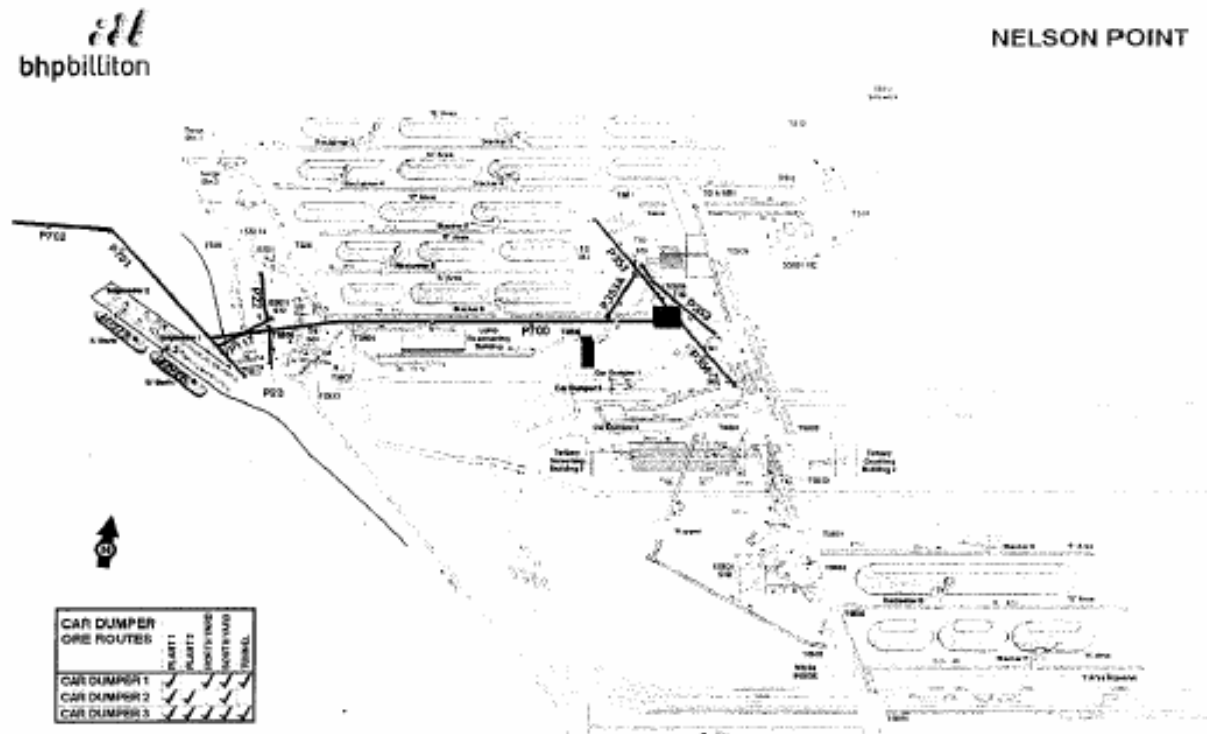


WESTERN AUSTRALIA
DEPARTMENT OF ENVIRONMENT
Environmental Protection Act 1986

LICENCE NUMBER: 4513/10

FILE NUMBER: L2/69

Attachment Two:



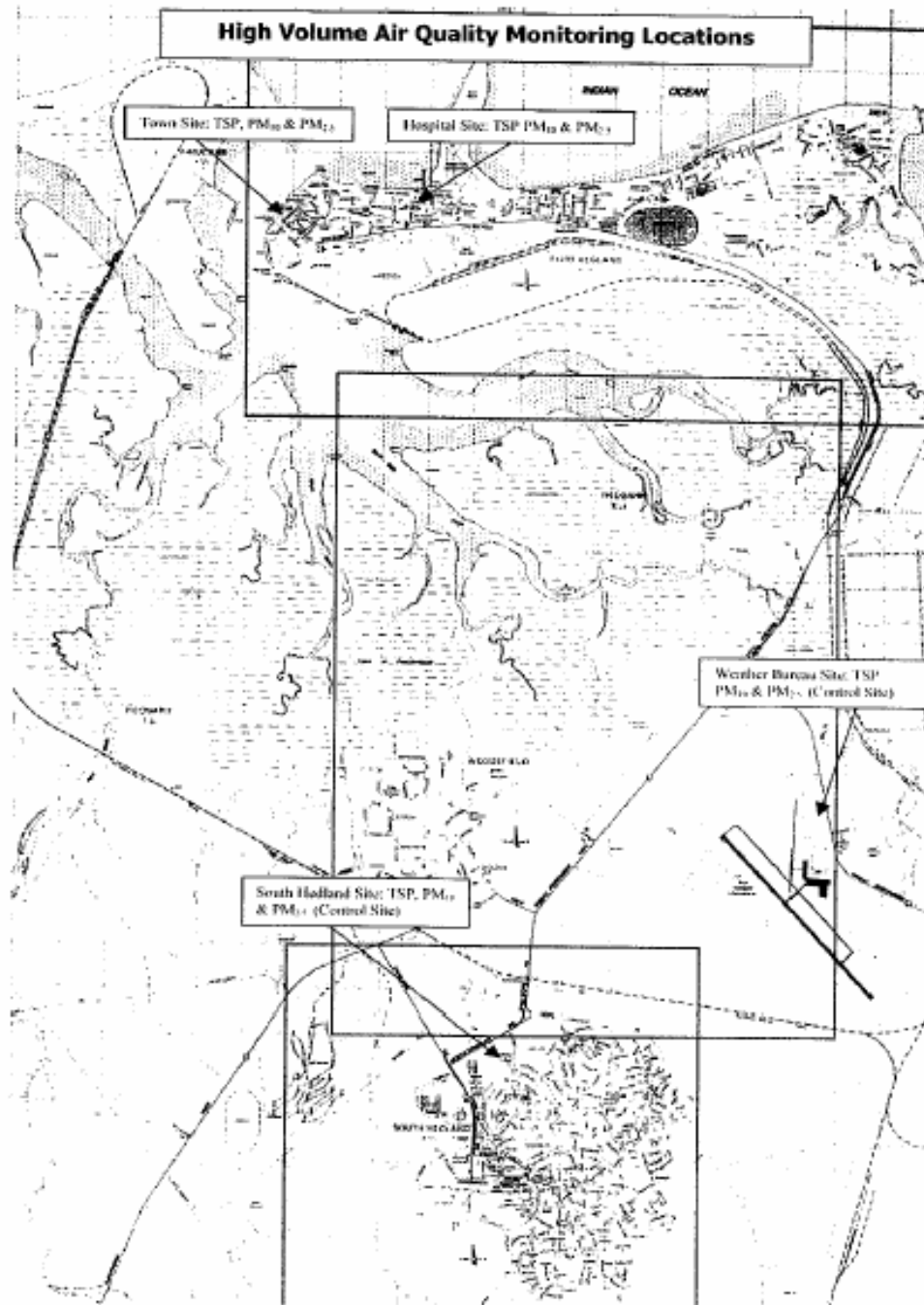
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LICENCE NUMBER: 4513/10

FILE NUMBER: L2/69

Attachment Three:



APPENDIX C

FINUCANE ISLAND OPERATIONAL LICENCE

WESTERN AUSTRALIA
DEPARTMENT OF ENVIRONMENT

Environmental Protection Act 1986

LICENCE

LICENCE NUMBER: 5445/10

FILE NUMBER: L8/68

NAME OF OCCUPIER:

BHP Billiton Iron Ore Pty Ltd

ADDRESS OF OCCUPIER:

PO Box 231
PORT HEDLAND WA 6721

NAME AND LOCATION OF PREMISES:

Finucane Island and Western Yard Processing Plant
Finucane Island
South Hedland WA 6722

Environmental Protection Regulations 1987

CLASSIFICATION(S) OF PREMISES:

Category 05 - Processing or beneficiation of metallic or non metallic ore
Category 58 - Bulk material loading or unloading
Category 85 - Sewage facility

COMMENCEMENT DATE OF LICENCE: Thursday, 17 November 2005

EXPIRY DATE OF LICENCE: Thursday, 16 November 2006

CONDITIONS OF LICENCE:

As described and attached:

DEFINITIONS (10)

GENERAL CONDITION(S) (2)

AIR POLLUTION CONTROL CONDITION(S) (7)

WATER POLLUTION CONTROL CONDITION(S) (6)

MARINE POLLUTION CONTROL CONDITION(S) (1)

SOLID WASTE CONTROL CONDITION(S) (1)

ATTACHMENTS (3)



SUSAN WORLEY

Officer delegated under Section 20
of the *Environmental Protection Act 1986*

Date of Issue: Thursday, 17 November 2005

WESTERN AUSTRALIA

DEPARTMENT OF ENVIRONMENT

Environmental Protection Act 1986

LICENCE NUMBER: 5445/10

FILE NUMBER: L8/68

PREAMBLE

The following statements in this preamble provide relevant background information for the Licensee. They should not be regarded as conditions of licence

Applicability

This licence is issued to BHP Billiton Iron Ore Pty Ltd for the operation of the Finucane Island and Western Yard Processing and Shiploading Facility, located at Finucane Island, Port Hedland (see Attachment 1 and 2). This is a prescribed premises within Schedule 1 of the *Environmental Protection Regulations 1987*, as outlined in Table 1, and includes but is not necessarily limited to the following operations:

- train unloading;
- crushing, screening and lump re-screening plant;
- stockpiling of iron ore;
- shiploading;
- tailings ponds; and
- wastewater treatment plant (Registration 00684).

Table 1: Categories under which BHP Billiton Iron Ore Pty Ltd - Finucane Island processing and shiploading operations are prescribed.

Category number	Category name
5	Processing or Beneficiation of Metallic or Non Metallic Ore
58	Bulk Material Loading and Unloading
85	Sewage Treatment Facility

Throughput

Any increase in throughput shall not occur unless the Licensee has been granted prior approval in writing from the Director under the provision of the *Environmental Protection Act 1986*.

Dust Management

Dust in the Port Hedland community is an issue. The Consultative Environmental Review and Ministerial Conditions released by the Environmental Protection Authority (EPA) in 1996 for this premises focussed on set objectives for three areas of fugitive dust management and ambient dust levels in Port Hedland:

- community amenity;
- community health; and
- ecological impacts.

In response to this, BHP Billiton Iron Ore (BHPBIO) has embedded the management of fugitive dust into operations through the development of an environmental management system certified to the international ISO14001 standard. BHPBIO recognises that despite introducing a number of initiatives over the life of the Dust Management Program, overall dust levels in the Port Hedland community continue to be an issue. The EPA's objective for this environmental factor is to ensure that "...the amenity of nearby residents are protected from adverse dust impacts resulting from the proponents operations..." (EPA 1996). In accordance with this objective BHPBIO should aim to comply with the following performance targets

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Table 2: BHP Billiton Iron Ore Dust Management Performance Targets.

Parameter	Units	Averaging Time	Performance Target
Total suspended particles (TSP)	µg/m ³	24 hours	260
Particles (as PM ₁₀)	µg/m ³	24 hours	150

Management actions should be reviewed against these targets to ensure the objectives of the Dust Management Programme are achieved. Consistent with BHPBIO commitment to continual improvement these targets should be reviewed and revised as required based on community concern, increasing improvements in dust control and monitoring technology.

Community Consultation

BHPBIO commitment to improve dust management and reduce dust impacts in their Environmental Management Programme incorporates the implementation of the Dust Management Programme. This programme involves community consultation to address community health and amenity impacts from iron ore dust. Forums available for community consultation include the Port Hedland Air Quality Working Group, the Port Hedland Community Consultative Group, Care for Hedland Interest Group and the Port Hedland Townscape Working Group meetings, held on a regular basis.

Reinforcing this commitment the Licensee should inform the Port Hedland Community on the effectiveness of the Dust Management Programme, in relation to:

- dust management initiatives;
- dust management objectives against management actions and performance targets;
- management actions addressing community complaints;
- investigations to improve dust and water management practices;
- effectiveness of current dust control equipment;
- status of environmental health from iron ore dust; and
- status of ecological impacts from iron ore dust.

Water Use Efficiency

The Licensee should endeavour to integrate the Dust Management Programme and the Water Management Plan to ensure multiple objective outcomes against measurable management actions. This should include a review of current dust management practices, investigation of alternative dust suppression options and identifying water efficiency opportunities.

Ministerial Conditions

The Licensee is reminded that this premises was assessed under Part IV of the *Environmental Protection Act 1986* and that the Minister for the Environment set conditions on the construction and operation of this processing plant. The Licensee is required to comply with the requirements of the Minister's Statement (Statement 433) as well as those in this licence

Emergency, Accident or Malfunction

The Licensee should inform the Director as soon as practicable of the identification of any discharge of waste which has occurred as a result of an emergency, accident or malfunction,

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*Environmental Protection Act 1986***LICENCE NUMBER: 5445/10****FILE NUMBER: L8/68**

or extreme weather conditions, otherwise than in accordance with any condition of this licence and has caused or is likely to cause pollution.

Alteration to Premises

Prior to making any significant alterations to the premises, which may affect the air, water or noise emissions from the premises, the Licensee must submit a proposal to the Director accompanied by supporting information and plans which allow the environmental impact of that change to be assessed.

Non-Standard Operations

The Licensee should inform the Director at least 24 hours prior to commencement of any planned non-standard operations, which may have the potential to cause pollution.

Other Legal Requirements

The Licensee should be aware that these conditions do not exempt the premises/Licensee from other statutory obligations under the *Environmental Protection Act 1986*, or any other Acts.

This includes the Licensee's obligations under the:

- *Environmental Protection Regulations 1987*;
- *Environmental Protection (Noise) Regulations 1997*;
- *Environmental Protection (Native Vegetation Clearing) Regulations 2004*;
- *Environmental Protection (Unauthorised Discharges) Regulations 2004*, and
- *Environmental Protection (Controlled Waste) Regulations 2004*

Where there is a conflict between the conditions set in this licence and any Act or Regulations, the latter takes precedence.

CONDITIONS OF LICENCE**DEFINITIONS**

In these conditions of licence, unless inconsistent with the text or subject matter:

“advise” means advise in writing;

“approved” or “approval” means approved or approval in writing;

“Director” means Director, Environmental Management Division of the Department of Environment for and on behalf of the Chief Executive Officer as delegated under Section 20 of the *Environmental Protection Act 1986*;

“Director” or “Department of Environment” for the purpose of correspondence means:

The Manager, North West Region
Department of Environment
PO Box 836
KARRATHA WA 6714

Telephone: (08) 9144 2000
Facsimile: (08) 9144 2610;

“hazardous waste” includes any substances which are toxic, infectious, mutagenic, carcinogenic, teratogenic, explosive, flammable, corrosive, oxidising and radioactive;

“inform” means inform by telephone, facsimile or e-mail;

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DEPARTMENT OF ENVIRONMENT

*Environmental Protection Act 1986***LICENCE NUMBER: 5445/10****FILE NUMBER: L8/68**

“Licensee” for the purpose of this licence means BHP Billiton Iron Ore Pty Ltd;

“premises” for the purpose of this licence means BHP Billiton Iron Ore Pty Ltd Finucane Island and Western Yard Processing and Shiploading Facility located at Finucane Island, Port Hedland (see Attachment 1 and 2);

“PM₁₀” means particulate matter with a mass median aerodynamic diameter less than or equal to nominally 10 micrometers (10 µm); and

“TSP” means total suspended particles.

GENERAL CONDITIONS

ANNUAL REPORT

G1 The Licensee shall provide to the Director, a consolidated annual report containing information as required by any condition of this licence for the licensing period. The report shall be submitted no later than **30 September 2006** and shall provide at least the following information for this reporting period:

- (i) noise abatement initiatives;
- (ii) water reduction initiatives;
- (iii) waste minimisation initiatives;
- (iv) effectiveness of current dust monitoring programme;
- (v) dust mitigation initiatives;
- (vi) dust management objectives against management actions and performance targets;
- (vii) specific actions implemented to address community complaints;
- (viii) any exceedances of performance targets over the reporting period;
- (ix) progress of rehabilitation of disturbed and open areas (as indicated in Attachment 1);
- (x) review of maintenance programmes; and
- (xi) any ecological impacts from iron ore dust and spillages.

A single report may be submitted to encompass the Nelson Point and Finucane Island operations.

COMPLAINTS REGISTER

G2(a) The Licensee shall maintain a register of all complaints received directly by the Licensee.

G2(b) The Licensee shall make all reasonable efforts to obtain the following information, which shall be recorded on the register on receipt of each complaint:

- (i) date and time of the complaint;
- (ii) date and time of the alleged incident;
- (iii) name of the complainant;
- (iv) contact telephone number of the complainant;
- (v) location of the alleged incident; and
- (vi) the identity of the process being undertaken on the premises that is the alleged source of the incident

WESTERN AUSTRALIA

DEPARTMENT OF ENVIRONMENT

*Environmental Protection Act 1986***LICENCE NUMBER: 5445/10****FILE NUMBER: L8/68****AIR POLLUTION CONTROL CONDITIONS****GENERAL PLANT - DUST SUPPRESSION**

- A1(a) The Licensee shall employ routine maintenance and housekeeping practices to ensure dust emissions are minimised from the accumulation of spillage material from any active operating area inclusive of conveyor systems, transfer points and on the wharf.
- A1(b) The Licensee shall ensure all accumulated spillage material as specified in part (a) of this condition is collected and removed daily and either redirected back through the process or disposed of to an appropriate area to ensure dust emissions are minimised.

HAUL ROADS, ACCESS ROADS, WORK AREAS - DUST SUPPRESSION

- A2 The Licensee shall employ measures to ensure that dust emissions from haul roads, access roads, stockpiles and active work areas are minimised. These may include but not be limited to:
- (i) water sprays;
 - (ii) water trucks to maintain roads in a damp condition;
 - (iii) controlling vehicular speeds;
 - (iv) approved chemical dust suppressants; and
 - (v) rehabilitation of disturbed areas.

STOCKPILING, RECLAIMING AND SHIPLOADING – DUST SUPPRESSION

- A3(a) The Licensee shall ensure dust emissions are minimised from non-working faces and working faces of stockpiles by implementing appropriate dust suppression techniques such as:
- (i) maintaining stockpiles in a damp condition;
 - (ii) sealing non-working faces to minimise dust lift off; and
 - (iii) limiting vertical faces after reclaiming activities.
- A3(b) The Licensee shall ensure dust emissions are minimised from stockpiling, reclaiming and ship loading iron ore and DRI briquettes activities by controlling dust through:
- (i) water sprays and/or mist sprays on stacker booms;
 - (ii) maintaining the stacker boom and ship loader boom at a position so as to prevent visible dust emissions; and
 - (iii) shadecloth screens utilised when loading DRI briquettes.

DUST CONTROL EQUIPMENT – DUST SUPPRESSION

- A4(a) The Licensee shall maintain and inspect the air pollution control equipment and record any of the following details in a log book, which shall be accessible at all times and be provided when required. The log book record shall include the following details:
- (i) pressure drop readings across baghouse fabric filters-weekly basis;
 - (ii) incidents of baghouse filter media failure/replacement - weekly basis;
 - (iii) emissions from wet scrubbers stacks – as occurs;
 - (iv) balances of flows from wet scrubber units – monthly basis;
 - (v) condition of dust control equipment on all transfer points - monthly basis; and
 - (vi) condition of all dust suppression sprays - monthly basis.

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A4(b) The Licensee shall ensure all dust control equipment is maintained to manufacturer's specifications to ensure dust emissions are minimised.

CONVEYORS AND TRANSFER POINTS – DUST SUPPRESSION

A5 The Licensee shall operate and maintain (where installed) all conveyor transfer points, dust suppressants, including between belts and belts/screens/crushers/storage facilities and vice versa to ensure dust emissions are minimised through the implementation of appropriate dust control measures such as:

- (i) water sprays;
- (ii) dust extraction/filtration equipment;
- (iii) belt cleaning mechanisms; and
- (iv) sealing and enclosing conveyor transfer points and discharge points

DUST MONITORING PROGRAMME

A6(a) The Licensee shall undertake a continuous dust monitoring programme for the purpose of determining the off-site dust impact from these operations. For this reporting period the programme shall incorporate the following:

- (i) utilise high volume samplers and real time dust monitoring equipment. The high volume samplers shall be used in accordance with Australian Standards AS 3580.9 3:2003 total suspended particles (TSP) and AS 3580.9 6:2003 (PM₁₀);
- (ii) monitors located at sites indicated in Attachment 3;
- (iii) a control site located at the Airport (Bureau of Meteorology) indicated in Attachment 3;
- (iv) measurement and recording of TSP, PM₁₀ and averaged on a 24-hour basis; and
- (v) measurement and recording of wind direction, wind speed, temperature and humidity.

A6(b) The Licensee shall ensure all dust monitoring equipment is maintained and calibrated to manufacturer's specifications.

DARK SMOKE EMISSIONS - FIRE TRAINING BURNING

A7(a) The Licensee shall ensure that materials, including waste oil, rubber, rubber products, plastic or plastic products are not burned at any time on the licensed premises except if required for emergency response fire training purposes.

A7(b) The Licensee shall inform the Director prior to any fire training, and undertake burning only:

- (i) at the Fire Training Facility located at approximately the co-ordinates; AMG 665 297 East and AMG 775 2171 North; and
- (ii) when the wind conditions are such that smoke emissions do not drift over any sensitive receptors which should not be affected by smoke including Port Hedland town; and
- (iii) during the period between sunrise + 2 hours and sunset + 2 hours to avoid meteorological conditions which are not conducive to adequate dispersion of the smoke.

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- A7(c) The Licensee shall not undertake burning during periods in which the wind direction may change resulting in smoke blowing over any sensitive area including the Port Hedland Town area (notably the onset of a seabreeze).
- A7(d) The Licensee shall keep a log of the date and time of each burn, the type of materials burnt and the meteorological conditions at the time of the burn. The log shall be kept on the premises for a period of at least three months and shall be made available upon request.

WATER POLLUTION CONTROL CONDITIONS

TAILINGS POND FREEBOARD

- W1 The Licensee shall ensure that at least 300mm freeboard (embankment crest to tailings level) is maintained at the main embankment at all times.

OILY AND SOLVENT WASTEWATER TREATMENT SYSTEM

- W2 The Licensee shall operate an oily and solvent wastewater treatment system such that:
- (i) waste oil and solvents are collected for reuse, recycling or disposal; and
 - (ii) wastewater is directed to storage facilities for subsequent treatment and disposal.

WASTE MANAGEMENT FROM ANCILLARY OPERATIONS

- W3(a) The Licensee shall utilise and maintain practical measures such as protective bunding, silt traps, fuel traps, and collection sumps to manage hydrocarbon wastes from maintenance workshops, vehicle washdown bays, refuelling depots and laboratories.
- W3(b) The Licensee shall collect waste lubricants and hydraulic fluids in lined or bunded holding tanks for recycling and disposal to an approved waste management facility.
- W3(c) The Licensee shall collect spent radiator coolant/inhibitors in holding tanks for subsequent disposal to an approved waste management facility.

STORMWATER MANAGEMENT

- W4(a) The Licensee shall ensure stormwater is retained in sedimentation basins on the premises to maximise removal of suspended solids prior to discharge.
- W4(b) The Licensee shall ensure that the quality of any wastewater, including contaminated stormwater, discharged from the premises contains a hydrocarbon concentration of less than 5mg/L.

LIQUID CHEMICAL STORAGE

- W5(a) The Licensee shall store environmentally hazardous chemicals including, but not limited to, fuel, oil or other hydrocarbons (where the total volume of each substance stored on the premises exceeds 250 litres) within low permeability (10^{-9} metres per second or less) compound(s) designed to contain not less than 110% of the volume of

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the largest storage vessel or inter-connected system, and at least 25% of the total volume of substances stored in the compound.

- W5(b) The compound(s) described in part (a) to this condition shall:
- (i) be graded or include a sump to allow recovery of liquid;
 - (ii) be chemically resistant to the substances stored;
 - (iii) include valves, pumps and meters associated with transfer operations wherever practical. Otherwise the equipment shall be adequately protected (eg. bollards) and contained in an area designed to permit recovery of chemicals released following accidents or vandalism;
 - (iv) be designed such that jetting from any storage vessel or fitting will be captured within the bunded area [see for example Australian Standard 1940-2004 Section 5.9.3 (h)];
 - (v) be designed such that chemicals which may react dangerously if they come into contact, are in separate bunds in the same compound or in different compounds; and
 - (vi) be controlled such that sufficient capacity of the bund is maintained at all times (eg. regular inspection and pumping of trapped uncontaminated rain water).
- W5(c) The Licensee shall immediately recover or remove and dispose of any liquid resulting from spills or leaks of chemicals including fuel, oil or other hydrocarbons, whether inside or outside the low permeability compound(s).

MAINTENANCE OF WASTEWATER PACKAGE PLANT

- W6 The Licensee shall manage the wastewater package plant in a manner such that:
- (i) all treated effluent from the package wastewater treatment system shall only be discharged to the adjacent clay lined evaporation ponds;
 - (ii) vegetation growth is minimised and controlled in the pond wastewaters and on the inner pond embankments;
 - (iii) stormwater runoff resulting from site drainage shall not enter the wastewater treatment system;
 - (iv) extreme rainfall events do not cause overtopping of the tanks;
 - (v) there is no discernible seepage loss from the wastewater treatment system; and
 - (vi) disposal of sewage sludges is in accordance with "Western Australian Guidelines for Direct Land Application of Biosolids and Biosolids Products" dated February 2002.

MARINE POLLUTION CONTROL CONDITIONS**CONTAMINATION OF THE MARINE ENVIRONMENT**

- M1(a) The Licensee shall minimise spillages of materials entering the harbour during ship loading/unloading operations.
- M1(b) The Licensee shall ensure all spillage material on the wharf is collected and removed following ship loading/unloading operations.

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SOLID WASTE CONTROL CONDITIONS

SOLID WASTE DISPOSAL

- S1(a) The Licensee shall ensure all solid wastes are disposed of to an approved waste management facility.
- S1(b) The Licensee shall ensure solid hazardous wastes are disposed of to an approved waste management facility

SEVERANCE

It is the intent of these licence conditions that they shall operate so that, if a condition or a part of a condition is beyond my power to impose, or is otherwise *ultra vires* or invalid, that condition or part of a condition shall be severed and the remainder of these conditions shall nevertheless be valid to the extent that they are within my power to impose and are not otherwise *ultra vires* or invalid.



SUSAN WORLEY
Officer delegated under Section 20
of the *Environmental Protection Act 1986*

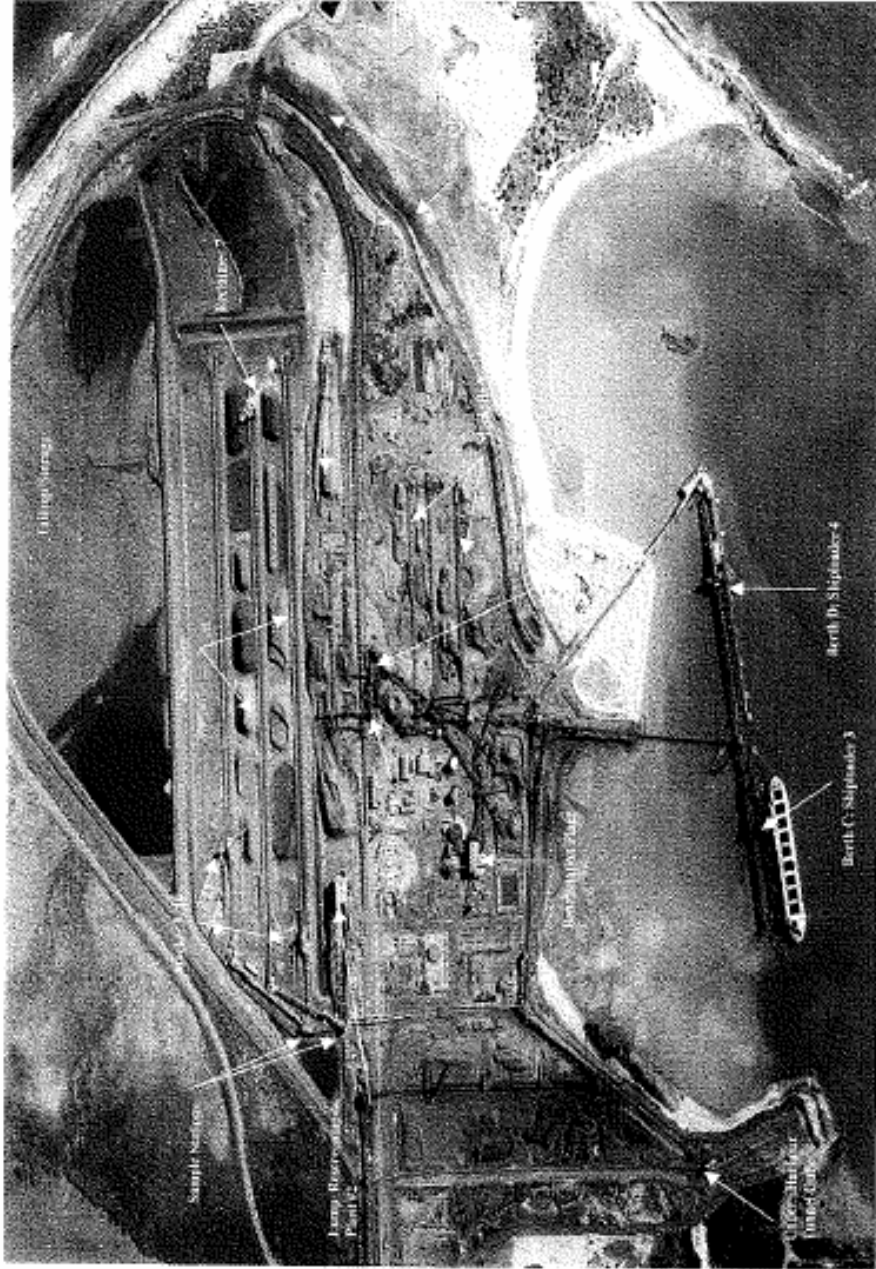
Date of Issue: Thursday, 17 November 2005

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Attachment One:



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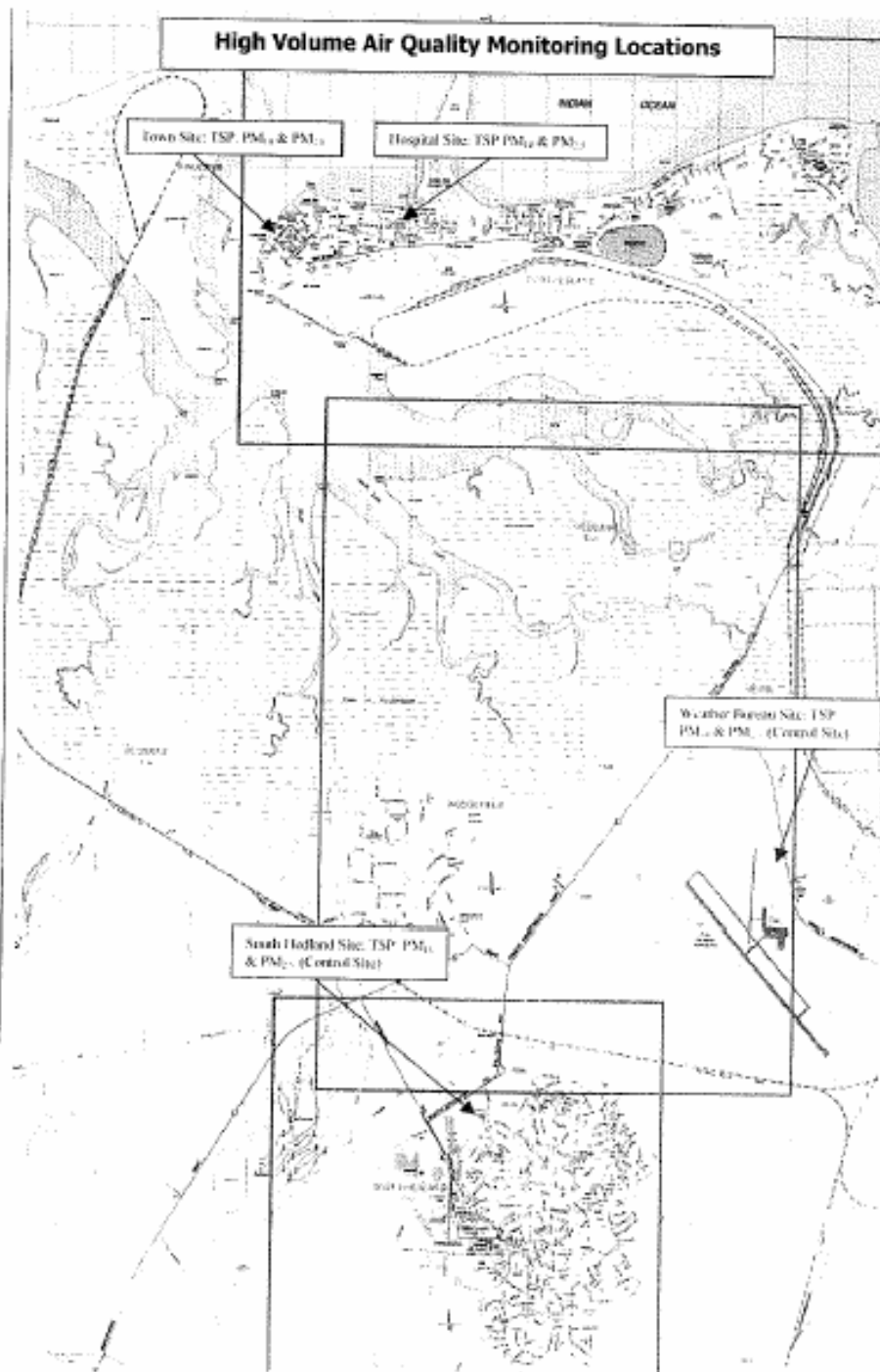
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Attachment Three:



APPENDIX D
DEPARTMENT OF HEALTH BULLETIN

Port Hedland Community Bulletin

Department of Health Dust Review

Why is the Department of Health (DOH) investigating the health impacts of particle pollution in Port Hedland?

Recent studies have identified high levels of particle pollution (dust) in the western section of Port Hedland. The Western Australian Government is a signatory to a National Environmental Protection Measure (NEPM) for Air Quality. This NEPM includes a goal to limit the frequency of episodes of high dust levels by 2008.

Recently, different government departments have combined to undertake a number of studies into the future of Port Hedland. These studies have included the cumulative impact study by the Department of Industry and Resources (DOIR), looking into the likely impact of Port expansions, the Pilbara Air Quality study undertaken by the Department of Environment (DoE), and the Enquiry by Design coordinated by the Department of Planning and Infrastructure (DPI). The DOH is responding to the finding of the Enquiry by Design, which recommends that the department investigate the health impacts of particle pollution in the town.

What health guidelines exist?

Particulate matter or dust is classified according to its size and possible impacts. The size of particles is directly linked to their potential for causing health effects. Small particles pose the greatest problems because they can get deep into the lungs and the very small particles may even get into the bloodstream. Small particles include fine particles, such as those found in smoke and haze, and coarse particles, such as those found in wind blown dust. Exposure to larger particles is of less concern, although they can irritate your eyes, nose and throat.

In Australia, health guidelines are based on the air quality NEPM. This has a goal to keep dust levels on average over a whole day to below 50µg of small particles in every cubic metre of air. Breaches of this level should occur less than five times per year, allowing some leeway for natural extremes such as bushfires and unusual circumstances. The guideline was developed for managing air quality in major urban areas and is linked to known health impacts in that setting.

No target for fine particles has been set here, although guidelines exist in other countries.

What are the potential health effects of dust?

Fine and coarse particles can build up in the respiratory system and excessive levels are linked to numerous health effects such as asthma, decreased lung function, and, in severe cases, premature death. Seniors, children and people with heart or lung disease appear to be at greatest risk.

Long term exposures, such as those experienced by people living for many years in areas with high particle levels, have been associated with reduced lung function and chronic bronchitis.

Short-term exposure, for hours or days, can result in asthma attacks and acute bronchitis and may also increase susceptibility to respiratory infections. Healthy adults and children have not been reported to suffer serious effects from short-term exposure, although they may experience temporary minor irritation when particle levels are high.

Are the health guidelines applicable to the type of dusts seen in Port Hedland?

It appears that dusts from rural and mining environments are safer than city type dusts but the studies are needed to quantify by how much. Most of the studies used to set up the Air Quality NEPM and similar guidelines were derived from large urban areas, cities such as London, Birmingham, and Chicago and these areas have a lot of car pollution and other combustion products. We know that fine particles are the major cause of health impacts and are worse than the coarser particles. We also know the proportion of fine particles in dust in Port Hedland is much lower than in cities and that there is relatively little contribution of car pollution and other combustion products.

What does the investigation involve?

There are three parts to the Department of Health review. The first is a review of previous international studies into the health impacts of coarse particles like those in Port Hedland. It will look at particles overall and also the specific types of dust found in Port Hedland. The Asthma and Allergy Research Institute at The University of Western Australia (AARI) and the Institute of Occupational Medicine in Edinburgh will complete this section of the study. The draft report will be reviewed by Imperial College in London and Health Canada.

The second part of the DOH review will then look at 10 years of records of Port Hedland people hospitalised with respiratory and cardiovascular disease. The review will compare those people living in the dust zone with those living in other areas. This review will be undertaken by an epidemiologist from the DOH and will tell us if there is evidence that dust has caused health effects.

The final part of the review will examine whether lung and other cells are damaged or stimulated by components of the dust in Port Hedland compared to similar particulate levels in dusts from Sydney and another coastal town. This study will answer the question about whether the Port Hedland dust is less toxic to cells than dust from urban areas.

Is the investigation independent?

Yes. The Department of Health has total control of the studies. Industry has been required to contribute to the costs of the study, but they have not influenced the design of the work nor who undertakes it. Industry representatives will receive reports with everyone else, but they will not have any editorial role.

The dust has been here for a long time. Why investigate it now and not before?

Information about possible health impacts of dust has only emerged in the last few years with increasing studies into the health effects of particulates. The Department of Environment report that found high particulate levels in Port Hedland was completed in 2004. The air quality NEPM guideline is not due to come into force until 2008. Even now, very little information exists about the type of dusts seen in Port Hedland and any possible health impacts.

If the dust has been a problem why has continued expansion of the port been allowed?

Dust levels have not increased over time. Expansion, paradoxically, often brings with it investments in new technology which enables dust reduction. If any health issue exists it has not been worsened by changes over the last few years as dust levels have not increased with changes to activity.

Will the DOH resist current proposed expansions by BHP Billiton?

No, the current plans for expansion include changes to operations at East Finucane Island, changes to stockpiles at Nelson Point, some direct ship loading and alterations to crushing and mixing processes. The effect of these will be to actually reduce dust levels as the expansion takes place. If there is a health risk associated with the dust from iron ore crushing and loading activities, the proposed expansion will actually improve matters.

What about the specialised dusts from the port like manganese and copper? Will the Department of Health investigate these also?

Yes, the DOH is looking into the levels of metals in the air including manganese and copper and will make recommendations about the management of these, as well as iron ore, if any level of risk is found.

When will the results be available?

Many of the results will be available by the end of the year and all studies are due to be completed within 12 months.

How can the public keep informed about the studies?

As the information becomes available it will be posted on the Health Protection Group section of the Department of Health website. This is currently being set up. The information will also be widely shared by releases to local media and further newsletters.

How will government and others use the results?

The DOH will analyse the data to provide the public and other agencies with a health risk assessment. For example, the results may suggest that the dust only causes irritation, or only effects old people and asthmatics. Other departments will use this information in planning activities, setting licensing guidelines, and organising any proposed improvements. It will also be available to the officers of the Town of Port Hedland for planning purposes. It is likely that the information from all the studies will be used to set a local Environmental Protection Plan for Port Hedland.

If the studies suggest health impacts, is there a risk to workers at Nelson Point?

The guidelines used to protect the public from health impacts are much more stringent than workplace guidelines. Workers spend a quarter to a third of their time working, and are not exposed to the workplace 24 hours a day, seven days a week. Residents may be at home all the time. Secondly, workers are healthier than the most vulnerable of residents. For example, old people with severe heart disease and young children with asthma are not found in workplaces. Public guidelines are designed to protect these most vulnerable groups. Hence, dust levels deemed too high in residential parts of West Port Hedland may be acceptable as a workplace level. In addition, workers have protective equipment available to them if needed. Employers will have access to the results and if necessary can modify existing work practices.

It is also known from previous workplace studies in the Pilbara that iron ore dust does not cause the 'miners' lung' problems seen with some other mineral dusts.

What about the monitoring of dust in Port Hedland? Will this improve?

The Pilbara Air Quality Study conducted by DoE in 2004 identified gaps in the monitoring network. The DoE is developing a consolidated dust monitoring program to address this. The monitoring program will provide the community with easily accessible information on air quality in Port Hedland and Wedgefield. This will include monitoring campaigns for special interest issues including bulk-loading stockpiles of minerals at the port. The DoE is working with the Town of Port Hedland, the Port Authority and the Pilbara Development Commission to establish an air quality group to provide a forum that brings together industry, regulators, and the community to address air quality management in the Port Hedland area. Information about dust levels will be available to all.

APPENDIX E
PRINCIPLES OF ENVIRONMENTAL PROTECTION

Recent amendments to the *Environmental Protection Act 1986* (section 4a) have the effect of requiring the EPA to take into account the following principles in the assessment of development proposals:

(1) The Precautionary Principle

Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, decisions should be guided by –

- (a) Careful evaluation to avoid, where practicable, serious or irreversible damages to the environment; and
- (b) An assessment of the risk-weighted consequences to various options.

(2) The Principles of Intergenerational Equity

The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

(3) The Principle of the Conservation of Biological Diversity and Ecological Integrity

Conservation of biological diversity and ecological integrity should be a fundamental consideration.

(4) Principles in relation to Improved Valuation, Pricing and Incentive Mechanisms

- (a) Environmental factors should be included in the valuation of assets and services;
- (b) The polluter pay principle – those who generate pollution and waste should bear the cost of containment, avoidance and abatement;
- (c) The users of goods and services should pay prices based on the full life cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any wastes; and
- (d) Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, which enable those responses to environmental problems.

(5) The Principle of Waste Minimisation

All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.

BHPBIO have embraced the EPA's principles of environmental protection as part of project engineering and design. The environmental objective of the project's design, in order of priority, is to:

- Completely avoid the impact if possible;
- Substitute with a lesser impact;
- Include rehabilitation and engineering solutions to reduce the degree and risk of impact;
- Design operational controls and emergency response around reduction of impact consequences; and
- Provide primary environmental offsets for the impact.