Part 5: Social and cultural environmental impact assessment

16. Indigenous cultural heritage

16.1 KEY STATUTORY REQUIREMENTS, POLICY AND GUIDANCE

16.1.1 Objective

The EPA objective for indigenous cultural heritage is:

To ensure that changes to the biophysical environment do not adversely affect historical and cultural associations and comply with relevant heritage legislation.

16.1.2 Legislation

Commonwealth

The Commonwealth *Aboriginal and Torres Strait Islanders Heritage Protection Act 1984* was enacted for the preservation and protection from injury or desecration of areas and objects in Australia and its waters that are of particular significance to Traditional Owners. The intention of this Act is to constrain its use to occasions where it is considered that state or territory laws do not adequately protect indigenous cultural heritage objects and sites. Under this Act, the Commonwealth can issue declarations in relation to indigenous cultural heritage sites that may be at risk of disturbance. The Commonwealth may also commission reports into the history and significance of indigenous cultural heritage sites.

Native title, or indigenous land rights, is a concept in Australian law that recognises and protects the continued ownership of land by local Australian Aborigines or Torres Strait Islanders. The *Native Title Act 1993* establishes the ways in which future dealings affecting native title may proceed, establishes a mechanism for determining native title claims and provides for, or permits, the validation of past acts invalidated because of the existence of native title thereby clarifying the legal position of other landholders.

State

The Minister for Indigenous Affairs is responsible for the administration of the *Aboriginal Heritage Act 1972*. Under section 17 of the Aboriginal Heritage Act, it is an offence to disturb any Aboriginal site without consent under section 18. The Minister considers recommendations from the Aboriginal Cultural Material Committee and the general interests of the community when making a decision on proposal disturbance to a site and setting the conditions under which any section 18 consents are granted.

The Registrar of Aboriginal Sites is responsible for maintaining a detailed Register of Places and Objects. Respecting the confidential nature of much of the information, the Department of Indigenous Affairs (DIA) has a publicly available database that provides general and limited information on the location and description of these sites. Broad boundaries, incorporating sometimes substantial buffer zones, are drawn around the sites to avoid disclosing the precise location and to ensure as much as possible that disturbances do not encroach on the actual site.

16.1.3 Policy and guidance

EPA Guidance Statement No. 41, Assessment of Aboriginal Heritage (EPA, 2004b), provides guidance on the process for the assessment of Aboriginal heritage as an environmental factor. The guidance statement seeks to ensure that a proposal gives attention to the Aboriginal Heritage Act and the EP Act and that changes to biological and physical environment resulting from a proposal do not adversely affect matters of heritage significance to Aboriginal people.

This guidance statement also details those actions that may be pertinent to the factor of indigenous heritage, including:

- consultation with DIA staff and desktop review of sites on the DIA register;
- undertaking ethnographic or archaeological surveys in consultation with relevant Aboriginal representatives;
- consultation with relevant Aboriginal people regarding the Proposal; and
- demonstrating that any concerns raised by the Aboriginal people have been considered in the environmental management of the factor and that this is made known to the relevant Aboriginal people.

16.2 DESCRIPTION

16.2.1 Introduction

Indigenous cultural heritage has been identified by API as an environmental factor on the basis of the:

- cultural attachment of Traditional Owners to "country";
- risk of disturbance to specific sites or to areas of significance to Traditional Owners;
- importance placed by API on considering indigenous cultural heritage in finalising project design; and
- need for survey and consultation to identify and manage indigenous cultural heritage matters.

API is engaged with the Ngarluma People who have determined native title over the land on which the Proposal is located. Consultation and discussions to date have involved the content of the PER/draft PER, potential risks and opportunities presented by the Proposal, the conduct of heritage assessments and native title matters. These discussions are ongoing. The multi-user requirements of the state for the Port has meant that much of the discussion has involved the state and other industry parties.

16.2.2 Studies

Table 16.1 briefly outlines the key outcomes of the investigations relevant to indigenous heritage.

Table 16.1 Summary of indigenous heritage investigations and key outcomes

Investigations proposed within ESD	Investigations completed	Key outcomes relevant to indigenous heritage	PER section
Comprehensive survey of Proposal area and development of Cultural Heritage Management Plan in consultation with Ngarluma.	Preliminary desktop assessment completed based on published data (DIA).	There are archaeological and ethnographic sites identified within proximity to the Proposal on the DIA Register, including Dixon Island and the mainland portion of the Proposal area. Consultation with the Ngarluma people is ongoing to agree and implement heritage surveys.	Section 16

16.3 IMPACT ASSESSMENT

16.3.1 Environmental aspects and potential impacts

Potential impacts from the Proposal considered relevant to indigenous cultural heritage in proximity to Anketell Point include:

- possible disturbance of heritage sites during vegetation clearing, infrastructure establishment or operations;
- possible disturbance or contamination of heritage sites by the workforce during construction or operation; and
- possible restrictions or access to certain areas.

16.3.2 Assessment of potential impacts

A preliminary assessment of known indigenous cultural heritage sites on the DIA register within proximity to the Proposal has identified a number of archaeological and ethnographic sites (Figure 3.26). Information available from the DIA's databases indicates that a total of 12 indigenous cultural heritage surveys have been completed in proximity to the Proposal; many completed over 15 years ago. Detailed surveys in consultation with Traditional Owners is planned for the Proposal area.

Based on previous surveys in the Proposal area and the wider Pilbara, it is also considered likely that Aboriginal archaeological sites will be located in the vicinity of major creeks and rivers.

The DIA register identifies numerous archaeological and ethnographic sites that are located in proximity to the Proposal. No rock shelters have been publically recorded to date.

Although it is API's intention to minimise and avoid disturbance of sites, the location and extent of some sites may mean some disturbance is unavoidable.

The significance of these sites and the extent of impacts will be identified through consultation with the Ngarluma People and qualified archaeologists and anthropologists during detailed heritage surveys that will be conducted once the heritage agreement and protocols for these surveys have been agreed.

API endeavours to manage and protect Indigenous cultural heritage through ongoing consultation and agreements to be developed with the Ngarluma People. This is proposed to include the development of an agreed Cultural Heritage Management Plan.

16.4 MITIGATION

16.4.1 Approach

Management of indigenous cultural heritage is primarily driven by API corporate-level policy and associated management plans and procedures and by meeting its obligations under the Aboriginal Heritage Act. Mitigation strategies for cultural management will primarily be undertaken through consultation with the Ngarluma People and the DIA with the objective of establishing internal systems to ensure the monitoring and compliance of cultural heritage management.

API recognises the Traditional Owners' cultural association to country and the concerns regarding the potential to disturb sites. A Cultural Heritage Management Plan (CHMP) is proposed to be developed in consultation with the Ngarluma People, to serve as the primary tool for management of impacts on indigenous cultural heritage.

General mitigation measures with respect to the affect of the Proposal on indigenous cultural heritage are outlined in Section 16.4.3. These measures are consistent with the mitigation hierarchy recommended by EPA (EPA, 2006).

16.4.2 Performance management

API has developed environmental targets and performance indicators based on the environmental management objectives for indigenous cultural heritage for the WPIOP area (Table 16.2). These will be incorporated into the CHMP. Currently, API operates under the auspices of a suite of Environmental Operating Procedures (EOP) that provides a management framework for low impact activities. This will be reviewed and updated in consultation with Ngarluma People as the project progresses.

Table 16.2 Indigenous cultural heritage management objectives, targets and performance indicators

Objectives	Target	Performance indicators
Protect known indigenous cultural heritage sites outside of approved development footprint during the life of the Proposal.	No sites of significance will be disturbed adversely without consultation with the Ngarluma People and the approval granted through the provisions of section 18 of the Aboriginal Heritage Act.	Develop and implement CHMP and meet compliance and reporting obligations under the approval conditions of section 18 of Aboriginal Heritage Act.
Prevent disturbance to indigenous cultural heritage sites unless consent has been given under section 18 of the Aboriginal Heritage Act.	As above.	Completion of Heritage surveys Compliance with section 18 of Aboriginal Heritage Act approvals.
Ensure that all personnel are aware of the cultural significance of indigenous cultural heritage and the obligations under the Aboriginal Heritage Act.	As above.	Cultural awareness induction and training for all personnel.

16.4.3 Management actions

Management actions will be implemented to achieve indigenous cultural heritage objectives. These actions are intended to be included in the CNMP, subject to consultation with the Ngarluma People and the DIA, prior to commencement of the Proposal. This management plan is expected to be a cornerstone document in the negotiation of agreements as may be required pursuant to the *Native Title Act 1993*. The key management actions as they relate to the EPA (2006) hierarchy of controls are described within Table 16.3.

Where heritage disturbance is unavoidable, API will consult with the Ngarluma People and work within the provisions of Section 18 of the Aboriginal Heritage Act. Section 18 notices require detailed surveys and consultation to enable the assessment of the extent of site disturbance and mitigative measures.

Agreements to be negotiated with the Ngarluma People under the Native Title Act are anticipated to include compensatory provisions for impacts on Native Title interests, and include cultural heritage management provisions.

A monitoring programme for indigenous cultural heritage will be developed in consultation with the Ngarluma People. This programme will be developed as part of the CHMP and could include provision for Ngarluma People to be engaged as heritage monitors during ground disturbance activities. Policies and procedures relevant to monitoring will be detailed in the CHMP.

Contingency actions will be developed as necessary through ongoing consultation with Ngarluma, and with qualified archaeologists and anthropologists.

Table 16.3 Indigenous cultural heritage key management actions

Action	Accountability	Timing
Undertake indigenous heritage surveys within proposed disturbance footprints using suitably qualified archaeologists and anthropologists.	Land Access Manager	Prior to commencement of disturbance.
Determine the nature, extent and significance of sites within the potential disturbance envelopes.	Land Access Manager	Prior to commencement of disturbance.
Consider the information available on indigenous cultural heritage in project planning and detailed design, avoiding significant sites where practicable.	Land Access Manager and Project Manager	Prior to commencement of disturbance.
Consult with the Ngarluma People regarding impact of sites within the project area.	Land Access Manager and Project Manager	Prior to commencement of disturbance and then throughout project planning and construction.
In consultation with the Ngarluma People, seek approval to disturb known sites to be impacted under section 18 of the Aboriginal Heritage Act.	Land Access Manager	Prior to commencement of disturbance.
Mark and peg sites in consultation with the Ngarluma People to reduce the likelihood of inadvertent damage.	Land Access Manager	Prior to commencement of disturbance.
In consultation with the Ngarluma People, implement an induction program for construction personnel that contains information on: • significance of indigenous cultural heritage and the potential impacts of the project; • procedures to report potential new sites and skeletal material; • obligations under the Aboriginal Heritage Act; and • requirements for the protection of known indigenous cultural heritage sites.	Training Manager	All site inductions throughout life of project.

Action	Accountability	Timing
Document the location of protected indigenous heritage sites and make available (acknowledging confidentiality issues) to mine planners, contractors, and relevant employees.	Land Access Manager	As sites are determined (in accordance with the Aboriginal Heritage Act).
Implement procedures as outlined in the Cultural Heritage Management Plan if a heritage site is identified.	All	All stages
Monitor clearing and earthworks activities with Ngarluma heritage site monitors (as required).	Construction Manager	Construction
Brief and update the Ngarluma People on proposed works and work schedules and inform them of detailed aspects of the project.	Construction Manager and Land Access Manager	Prior to commencement of construction.
Ensure regular involvement of the Ngarluma People in heritage management throughout life of project.	Land Access Manager	All stages
Establish cultural heritage policies and procedures to identify indigenous heritage site locations within the Proposal area.	Land Access Manager	All stages
Implement the API ground disturbance permit system incorporating monitoring of known heritage sites.	Project Manager and Environment Manager	All stages
Implement policy of no disturbance outside the footprint area.	Project Manager and Land Access Manager	All stages
Manage and implement consent conditions of any section 18 applications where impacts to sites are to be impacted and arrange for salvage.	Project Manager	All stages
Audit and compliance reporting of section 18 conditions, ground disturbance incidents and management of sites.	Land Access Manager and Environment Manager	During construction and operations.

16.5 PREDICTED OUTCOME

Potential impacts to indigenous cultural heritage from the implementation of the Proposal include disturbance to land (in general) and direct impacts to indigenous cultural heritage. A CHMP best developed in consultation with the Traditional Owners over the period of the project development, will be the primary means for managing these impacts. API has described a number of management measures that it envisages would be included in the CHMP.

Through implementation of an agreed CHMP, other consents to be obtained under the provisions of the Native Title Act and the protection afforded by processes under the Aboriginal Heritage Act, this Proposal will meet the EPA objective to ensure that changes to the biophysical environment do not adversely affect historical and cultural associations and comply with relevant heritage legislation.

17. Air quality

17.1 KEY STATUTORY REQUIREMENTS, POLICY AND GUIDANCE

17.1.1 Objectives

The EPA objective for air quality is:

To ensure that emissions do not adversely affect environment values or the health, welfare and amenity of people and land uses by meeting statutory requirements and acceptable standards.

17.1.2 Legislation

Legislation and guidelines most relevant to the construction and operation of the Proposal include:

- EP Act, Part V, prevention of pollution, environmental harm and unreasonable emissions;
- *Occupational Safety and Health Act 1984*;
- *Mining Act 1978* (and associated Regulations);
- National Environment Protection (Ambient Air Quality) Measure (Ambient Air Quality NEPM) (NEPC, 1998, 2003); and
- Environmental Protection (NEPM-NPI) Regulations 1998, which implement the National Environment Protection (National Pollution Inventory) Measure in Western Australia.

17.1.3 Policy and guidelines

Policies and guidelines relevant to air quality during the construction and operation of the Proposal include:

- Environmental Protection (Kwinana) (Atmospheric Wastes) Policy 1999 (Kwinana EPP), which establishes ambient air quality standards for total suspended particulates (TSP) and sulphur dioxide for Kwinana, Western Australia (EPA, 1999);
- EPA Guidance Statement No. 15, Emissions of Oxides of Nitrogen from Gas Turbines (EPA, 2000b); and
- New South Wales Department of Environment and Climate Change, provides dust deposition criteria and comparison data (NSW DEC, 2005).

17.2 DESCRIPTION

17.2.1 Introduction

The terrestrial environment of the Proposal area is semi-arid. High levels of atmospheric dust are not uncommon during dry, windy conditions.

The stockpiling of ore and ore transfer/handling activities to be undertaken within the Proposal area are potential sources of dust emissions. Dust is generally defined as particles that can remain suspended in the air by turbulence for a period of time and can consist of a range of matter, including crustal material, pollens, sea salts and smoke from combustion products. Dust or particulate matter is commonly defined by the size of the particles, measured as:

- TSP: refers to all particulate matter with an equivalent aerodynamic particle size below 50 µm diameter. The term "equivalent aerodynamic particle" is used to reference a spherical-shaped particle and a density of 1 g/cm^3;
- PM_{10}: particulate matter below 10 µm in aerodynamic diameter; and
- $PM_{2.5}$: particulate matter below 2.5 µm in aerodynamic diameter.

TSP, which contains both the PM_{10} and $PM_{2.5}$ fractions, is normally associated with nuisance impacts, such as dust fallout and soiling of washing. PM_{10} and $PM_{2.5}$ are associated with the potential for health impacts, as finer particle fractions can enter deeper into the lungs.

In addition to particulate matter, the proposed power station may also generate such air emissions as sulphur.

17.2.2 Studies

The technical information provided in this section of the PER is based on the following reports, which are included in Appendix 1:

- Supporting Study 17.1: Air Quality Particulate Modelling
  ENVIRON. 2010. Particulate Modelling Assessment for Proposed Anketell Port Operations 115Mtpa Export Scenario. September. Report prepared by ENVIRON Australia Pty Ltd. for API Management Pty Ltd, Como, Western Australia
- Supporting Study 17.2: Air Dispersion Modelling
  ENVIRON. 2010. Air dispersion modelling of proposed Power Station, Anketell Point Port Operations. August. Report prepared by ENVIRON Australia Pty Ltd. for API Management Pty Ltd, Como, Western Australia

Table 17.1 briefly outlines the key outcomes of the investigations relevant to air quality.

Table 17.1 Summary of air quality investigations and key outcomes

Investigation	Investigations Completed	Key Outcomes Relevant to Air Quality	PER Section
Proposed within ESD			
Meteorological measurements at the Proposal site.	Meteorological stations are positioned at Anketell Point and Bezout Island.	Over 2 years of meteorological data have been collected at the port area.	Section 3.2.1
Estimation of greenhouse gas emissions during construction and operation.	A carbon footprint assessment has been carried out for port activities.	Greenhouse gas estimates of the Proposal completed. Estimated emissions constitute a negligible increase in State and Federal net emissions.	Section 15
Modelling of dust generation and deposition during construction and operation.	Air dispersion modelling of fugitive dust emissions from port activities has been undertaken to assess the potential ambient air quality impacts associated with the 115 Mtpa export scenario.	At the towns of Wickham and Point Samson, the maximum predicted 24-hour and annual average TSP, PM_{10} and $PM_{2.5}$ concentrations remain well below the applicable guideline values.	Section 15.3.2 Supporting Study 17.1
Additional Investigations to those Proposed in ESD			
Air dispersion modelling to predict ground level concentrations of criteria pollutants (SO_2, NO_2, CO and particulate matter (PM_{10})) from a power station that may be established at the port facility.	Air dispersion modelling has been undertaken of pollutants sulphur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO) and particulate matter (PM_{10}) from a power station.	Predicted concentrations at all points across the modelling domain are well below all nominated ambient air quality guidelines.	Section 15.3.2 Supporting Study 17.2

17.3 IMPACT ASSESSMENT

17.3.1 Environmental aspects and potential impacts

Environmental aspects of the Proposal that may potentially affect air quality include:

- stockpiling, handling and transporting ore; and
- operation of the power station.
- Other minor dust related impacts may result from vegetation clearing, vehicle movements on unsealed surfaces and quarry operations have not been the focus of this assessment.

17.3.2 Assessment of potential impacts

Standards adopted for the assessments

In June 1998, the Ambient Air Quality NEPM (NEPC, 1998) was endorsed by the National Environment Protection Council. The desired environmental outcome of this measure is ambient air quality that allows for the adequate protection of human health and well-being. The measure included standards for air quality, including for particulates as PM_{10}. In 2003, the Ambient Air Quality NEPM was amended to include advisory reporting standards for particles as $PM_{2.5}$ (NEPC, 2003).

The EPA (1999) established an environmental protection policy providing ambient air quality standards for TSP and sulphur dioxide for Kwinana, Western Australia. The standards were established to maintain acceptable air quality in and around the Kwinana Industrial Area. The Kwinana EPP defined three regions covered by the policy as follows:

- the industrial zone (Area A);
- the buffer zone surrounding heavy industry (Area B); and
- the rural and residential zone (Area C).

In the absence of a more locally specific ambient air quality standard for TSP, the EPA (1999) standard for TSP within the industrial zone (Area A) has been applied to this Proposal to provide a contextual assessment.

The Ambient Air Quality NEPM and Kwinana EPP ambient air quality standards for particulates relevant to the Proposal are provided in Table 17.2.

Predicted Monthly average TSP deposition rates can be compared to of the New South Wales Department of Environment and Climate Change dust deposition criteria (NSW DEC, 2005) (discussed later in this Section).

Table 17.2 Ambient Air Quality NEPM and Kwinana EPP ambient air quality standards relevant to the Proposal

Pollutant	Averaging period	Standard (µg/m^3)	Goal	Reference
Carbon monoxide (CO)	8-hour	11,240	1 day per year	NEPC (1998)
Nitrogen dioxide (NO_2)	1-hour	246	1 day per year	NEPC (1998)
	1-year	62	none	
Sulphur dioxide (SO_2)	1-hour	572	1 day a year	NEPC (1998)
	1-day	228	1 day a year	
	1-year	57	none	
TSP	1 day	150	N/A	EPA (1999)
Particles as PM_{10}	1 day	50	Five days per year	NEPC (1998)
Particles as $PM_{2.5}$	1 day	25	To gather sufficient data to facilitate a review of the standard.	NEPC (2003)
	1 year	8		

Predicted ambient particulate concentrations from port operations

Air dispersion modelling of fugitive dust emissions from the proposed Anketell port facility were undertaken to assess the potential ambient air quality impacts associated with construction and operation of the Proposal (Supporting Study 17.1). The modelling considered fugitive dust emissions associated with unloading, handling, stockpiling and ship loading of ore for a design rate of 115 Mtpa.

The results of dust modelling were used to predict short-term and long-term ambient ground-level concentrations (GLC) of TSP, PM_{10} and $PM_{2.5}$ across the modelled domain (20 km by 20 km). The model was also used to predict particulate deposition rates to determine the potential effects of particulate deposition on the surrounding environment. The conceptual site boundary used in the modelling to determine offsite impacts has been based on the Proposal footprint at the port area within the strategic industry zone and buffer (under the town planning scheme for the Shire of Roebourne) (Figure 17.1).

A summary of the off-site TSP, PM_{10} and $PM_{2.5}$ concentrations predicted for API's proposed port facility operating at 115 Mtpa is presented in Table 17.3.

Figure 17.1 Conceptual site boundary used for air dispersion modelling.

Table 17.3 Predicted off-site concentrations of TSP, PM_{10} and $PM_{2.5}$ from fugitive dust emissions from the proposed port facility (115 Mtpa)

Particulate Fraction	Averaging Period	Standard (µg/m³)	Predicted Ground-level Concentration[1] (µg/m³)		
			Off-site Maximum[2]	Wickham	Point Samson
TSP	24-hour	150	456	24	21
	Annual	N/A	58	2.8	3.1
PM_{10}	24-hour	50	137	7.3	6.4
	Annual	N/A	17	0.9	0.9
$PM_{2.5}$	24-hour	25	41	2.2	0.3
	Annual	8	5.2	1.9	0.3

Notes:
[1] Maximum predicted 24-hour ground-level concentrations and annual average ground-level concentrations presented.
[2] Maximum ground-level concentrations predicted beyond the conceptual site boundary.

The offsite maximum 24-hour and annual average TSP GLCs predicted for API's proposed operations are 456 µg/m³ and 58 µg/m³ respectively. Contours of the maximum predicted 24-hour TSP concentrations (Figure 17.2) indicate that exceedance of the Kwinana EPP Area A maximum 24-hour TSP standard are predicted to occur over a distance of up to approximately 3 km from proposed operations. At the towns of Wickham and Point Samson the maximum predicted 24-hour TSP GLCs are equal to 16% and 14% of the maximum 24-hour TSP standard respectively. Contours of the predicted annual average TSP concentrations (Figure 17.3) illustrate a similar pattern of distribution, where peak concentrations are localised to the operations and annual average concentrations at the towns of Wickham and Point Samson are significantly lower.

The maximum predicted offsite maximum 24-hour and annual average PM_{10} GLCs are 137 µg/m³ and 17 µg/m³ respectively. Contours of the maximum 24-hour PM_{10} concentrations (Figure 17.4) indicate that exceedance of the maximum 24-hour PM_{10} NEPM standard are predicted to occur over a distance of up to approximately 2.5 km from the port area. However, exceedance of the NEPM goal (i.e. no more than five exceedance of the maximum 24-hour PM_{10} NEPM standard per annum) are expected to remain within 2km of the conceptual site boundary (Figure 17.5). The maximum 24-hour PM_{10} GLCs predicted at the towns of Wickham and Point Samson are equal to 15% and 13% of the maximum 24-hour PM_{10} NEPM respectively. Contours of the predicted annual average PM_{10} concentrations illustrate a similar pattern of distribution, where peak concentrations are localised to API's operations and annual average concentrations at Wickham and Point Samson are significantly lower (Figure 17.6).

The maximum predicted offsite maximum 24-hour and annual average $PM_{2.5}$ GLCs are 41 µg/m³ and 5.2 µg/m³ respectively. Contours of the maximum 24-hour $PM_{2.5}$ concentrations (Figure 17.7) indicate that exceedences of the NEPM maximum 24-hour $PM_{2.5}$ advisory reporting standard are predicted to occur within approximately 1 km of the conceptual site boundary. The maximum 24-hour $PM_{2.5}$ GLCs predicted at the towns of Wickham and Point Samson are no more than 8.8% of the maximum 24-hour $PM_{2.5}$ advisory reporting standard. Contours of the annual average $PM_{2.5}$ concentrations (Figure 17.8) indicate that exceedance of the annual $PM_{2.5}$ advisory reporting standard are not expected to occur outside of the conceptual site boundary. At Wickham and Point Samson the predicted annual $PM_{2.5}$ concentrations are no more than 4% of the guideline value.

While the dust concentrations predicted at the towns of Wickham and Point Samson remain well below the nominated guidelines, the maximum predicted offsite TSP, PM_{10} and $PM_{2.5}$ concentrations exceed the nominated guideline values. Analysis of the source contribution to predicted GLCs indicates that the maximum predicted offsite TSP, PM_{10} and $PM_{2.5}$ GLCs are primarily driven by fugitive emissions from the shipping stockpiles as a result of stockpiling and reclaiming activities and wind erosion. Dust suppression measures have been assumed in the model to ensure ambient air quality guidelines are met offsite (Supporting Study 17.1). These measures include (but are not limited to) enclosed car dumpers and a bag-house filter installed for trail unloaders and enclosed conveyor transfer points.

Cumulative impacts (PM_{10}) from the Proposal and existing port facilities in the region

The cumulative impact of fugitive dust emissions from the Proposal and the existing Cape Lambert facility operated by Pilbara Iron Pty Ltd (located approximately 9 km northeast of Anketell Point) was also considered in Supporting Study 17.1. This involved adding the maximum 24-hour PM_{10} concentrations predicted at Point Samson for the proposed Anketell Point Prot operations to the maximum 24-hour PM_{10} concentrations predicted at Point Samson for the Cape Lambert port facility by SKM (2006) to provide a conservative indication of the potential short-term cumulative impacts of these operations at Point Samson.

An estimation of the cumulative impacts of PM_{10} emissions at Point Samson for the Proposal and Pilbara Iron's existing Cape Lambert Port A facility is presented in Table 17.4.

Table 17.4 Cumulative predicted PM_{10} ground-level concentrations at Point Samson for fugitive dust emissions from the Proposal and the existing Cape Lambert facility

Maximum 24-hour Average PM_{10} Ground-level Concentration Predicted at Point Samson ($\mu g/m^3$)			24-Hour PM_{10} Standard ($\mu g/m^3$)
Proposed Anketell Point Operations[1]	Existing Cape Lambert Operations[2]	Cumulative Operations	
6.4	20	26	50

Notes:
[1] Maximum 24-hour average PM_{10} ground-level concentration predicted at Point Samson for API's proposed operations under the 115 Mtpa export scenario.
[2] Maximum 24-hour average PM_{10} ground-level concentration predicted at Point Samson for Pilbara Iron's Cape Lambert Operations under the 85-Mtpa "worst-case scenario" (SKM, 2006).

The cumulative impact of PM_{10} emissions at Point Samson from the combined operations of API's proposed port facility and the existing Cape Lambert facility is expected to remain well below the 24-hour PM_{10} air quality standard of 50 $\mu g/m^3$ (see Table 17.4) This concentration of 26 $\mu g/m^3$ a conservative estimate as it assumes that the maximum 24-hour average PM_{10} concentrations attributable to operations at each of the port facilities occur at Point Samson at the same time, which is unlikely given the difference in orientation of each facility in relation to Point Samson. The estimated cumulative impact does not consider the existing background concentrations due to the absence of publicly available, site-specific monitoring data.

Predicted dust deposition rates

A summary of the monthly average TSP deposition rates predicted for API's proposed port facility operating at 115 Mtpa and a comparison of these rates to the New South Wales Department of Environment and Climate Change dust deposition criteria (NSW DEC, 2005) is presented in Table 17.5.

Table 17.5 Predicted TSP dust deposition rates for the proposed port facility operating at 115 Mtpa

Particulate Fraction	Dust Deposition Criteria (g/m^2/month)	Maximum Predicted Deposition Rate (g/m^2/month)		
		Off-site Maximum[1]	Wickham	Point Samson
TSP	2 (increase)[2]	17	0.3	0.5
	4 (total)[3]			

Notes:
[1] Maximum deposition rate predicted offsite.
[2] Maximum increase in deposited dust level.
[3] Maximum total deposited dust level.

Exceedances of the NSW DEC (2005) total monthly dust deposition criteria are predicted to occur for distances of up to approximately 2 km from API's proposed port facility under the 115 Mtpa export scenario (see Table 17.5). The monthly deposition rates predicted at the towns of Wickham and Point Samson are 0.3 g/m^2 and 0.5 g/m^2 respectively, well below the NSW DEC (2005) criteria (see Table 17.5). The peak off-site monthly average dust deposition rate indicates that additional dust control measures may be required to ensure compliance with the deposition criteria offsite.

Predicted pollutant impacts from the power station

Air dispersion modelling was conducted to predict ground level concentrations of criteria pollutants SO_2, NO_2, CO and particulate matter (PM_{10}) from a power station that may be established at the port facility (Supporting Study 17.2). The predicted ground level concentrations were assessed in isolation, and the cumulative impact of PM_{10} emissions from the proposed power station and from port operations also assessed. Ground level concentrations were predicted using the Victorian Environmental Protection Agency's Gaussian plume dispersion model Ausplume (Version 6.0). The following power station scenarios were modelled:

- worst-case scenario: six gas units plus one diesel unit; and
- emergency-case scenario: four diesel units (only anticipated in the event of a gas outage).

Modelling has been based on three 30 m high stacks, two for the six gas units and one for the four diesel units. The emissions estimates used in the air dispersion modelling for the power station are presented in Table 17.6. For the worst-case scenario, where only one diesel-fired unit was in operation, emissions were assumed to be released from the individual flue for that unit.

A model domain, which included the towns of Wickham and Point Samson, was established as one of the parameters of the modelling.

Table 17.6 Emissions estimates used in the air dispersion modelling for the proposed power station

Source	Emissions Estimates (g/s)			
	NO_x (NO_2)[1]	SO_2	PM_{10}	CO
Combined Stack 1 (3 gas units)	3.60	NA	0.21	9.72
Combined Stack 2 (3 gas units)	3.60	NA	0.21	9.72
Combined Stack 3 (4 diesel units)	90.88	14.05	1.52	4.76
Single diesel unit	22.72	3.51	0.38	1.19

Note:

[1]It has been assumed that 100% of the NO_x emissions are NO_2, a conservative estimate; and in reality, it is expected that the actual ground level concentrations of NO_2 will be much smaller.

The maximum predicted CO, NO_2, SO_2 and PM_{10} ground level concentrations for the proposed power station in isolation at any location across the modelled domain (including the towns of Wickham and Point Samson) are predicted to remain below the relevant Ambient Air Quality NEPM standards for both the worst-case and emergency-case scenarios (Table 17.7 and Figure 17.9). The compound that had the highest predicted concentration was NO_2, which was 25% and 37% of the NEPM standard for the worst-case and emergency-case scenarios respectively. The other compounds were below 8% of the NEPM standard. In addition, NO_2 was modelled conservatively assuming that all NO_x was released as NO_2, when in reality the concentrations of NO_2 emitted from the power station would be likely to be much lower (Supporting Study 17.2).

Table 17.7 Predicted ground-level concentrations of pollutants from the power station (at any location across the modelled domain)

Pollutant	Averaging Period	Standard (µg/m³)	Maximum Predicted Ground-level Concentration (µg/m³)	Proportion of Standard (%)
Worst-case Scenario				
Carbon monoxide (CO)	8-hour	11,240	16	0.1
Nitrogen dioxide (NO_2)	1-hour	246	62	25
	1-year	62	3.9	6.3
Sulphur dioxide (SO_2)	1-hour	570	10	1.8
	1-day	228	3.9	1.8
	1-year	60	0.5	0.8
Particles as PM_{10} (in isolation)	1 day	50	0.6	1.2
Particles as PM_{10} (cumulative)	1 day	50	298	596

Pollutant	Averaging Period	Standard (µg/m³)	Maximum Predicted Ground-level Concentration (µg/m³)	Proportion of Standard (%)
Emergency-case Scenario				
Carbon monoxide (CO)	8-hour	11,240	2.6	0.02
Nitrogen dioxide (NO_2)	1-hour	246	91	37
	1-year	62	3.9	6.3
Sulphur dioxide (SO_2)	1-hour	570	14	2.5
	1-day	228	5.2	2.3
	1-year	60	0.6	0.8
Particles as PM_{10} (in isolation)	1 day	50	0.6	1.2
Particles as PM_{10} (cumulative)[1]	1 day	50	298	

Note:

[1] The maximum predicted PM_{10} ground-level concentrations for cumulative operations is dominated by fugitive dust emissions from the proposed port facility. Emissions from the proposed power station contribute less than 0.3% to the predicted cumulative PM_{10} ground-level concentration.

Cumulative impacts (PM_{10}) from power station and port operations

The maximum predicted concentration of cumulative PM_{10} from the power station and the port operations was above the Ambient Air Quality NEPM standard for both scenarios (see Table 17.7). Analysis of the contribution of the PM_{10} component associated with the power station indicated that it comprised less than 0.3% of the predicted concentration (Supporting Study 17.2). The remaining contribution was associated with the proposed port activities. Exceedance of the NEPM goal (i.e., no more than five exceedances of the 24-hour PM_{10} NEPM standard per annum) associated with the fugitive PM_{10} emissions from the proposed port are predicted to remain within the conceptual site boundary, and PM_{10} ground-level concentrations are predicted to be well below the PM_{10} NEPM standard at the towns of Wickham and Point Samson (Supporting Study 17.1).

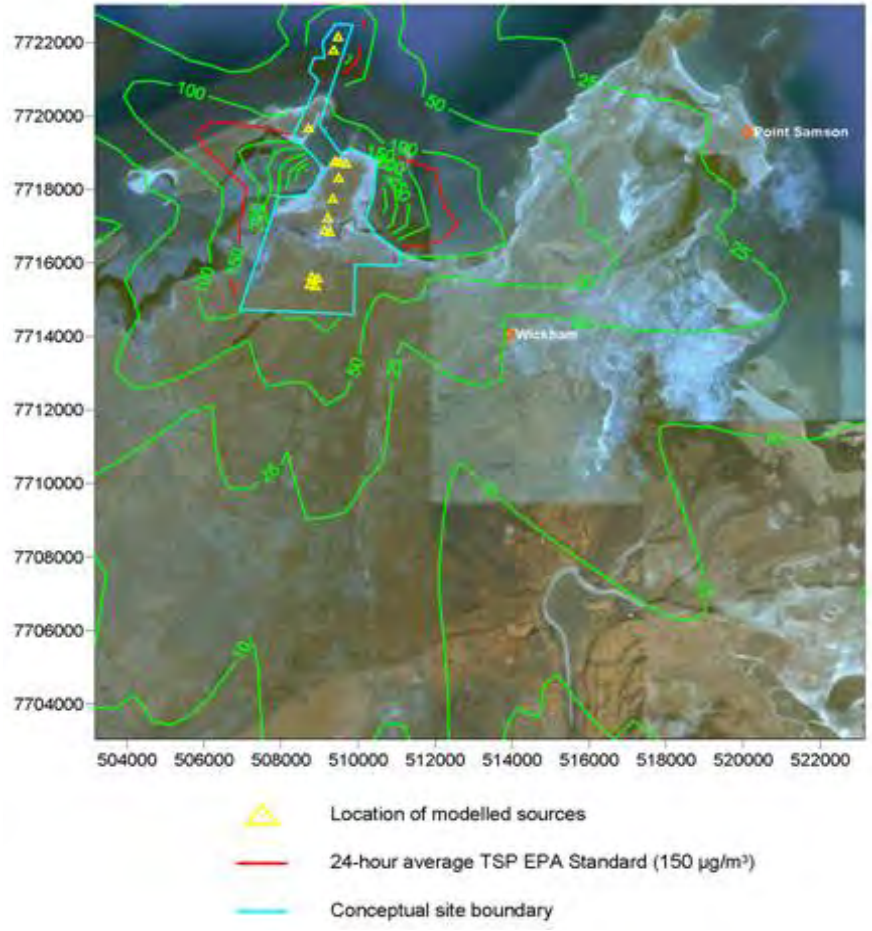

Figure 17.2 Maximum predicted 24-hour average TSP ground-level concentrations (µg/m^3) from fugitive dust emissions (115 Mtpa scenario)

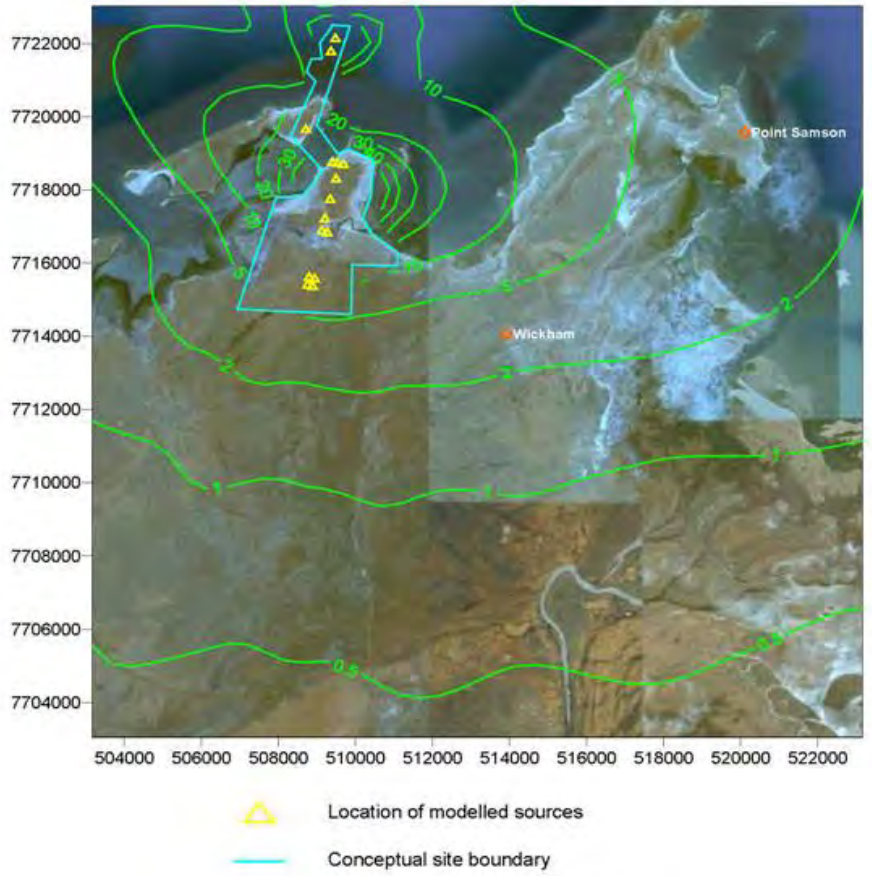

Figure 17.3 Maximum predicted 24-hour average PM_{10} ground-level concentrations (µg/m^3) from fugitive dust emissions at the proposed port (note, standards are not used because there is no relevant average available)

Figure 17.4 Maximum predicted 24-hour average PM_{10} ground-level concentrations (µg/m³) (115 Mtpa scenario)

Figure 17.5 Number of predicted exceedences of the 24-hour PM_{10} NEPM Standard (115 Mtpa scenario)

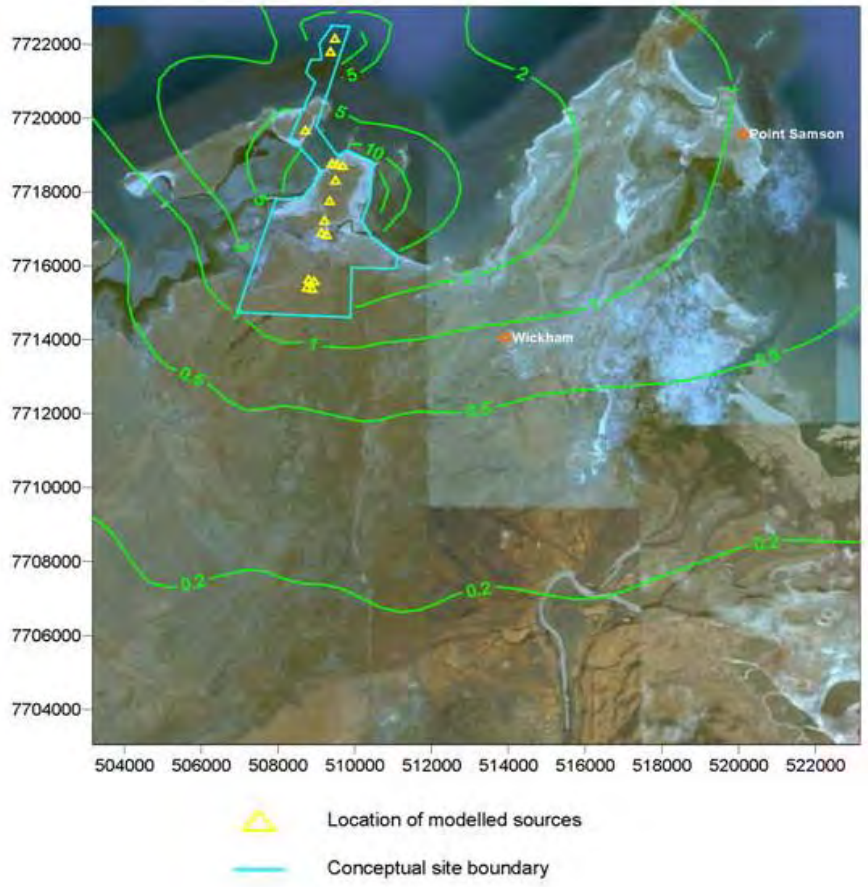

Figure 17.6 Predicted annual average PM_{10} ground-level concentrations (µg/m³) (115 Mtpa scenario) (note, standards are not used because there is no relevant average available)

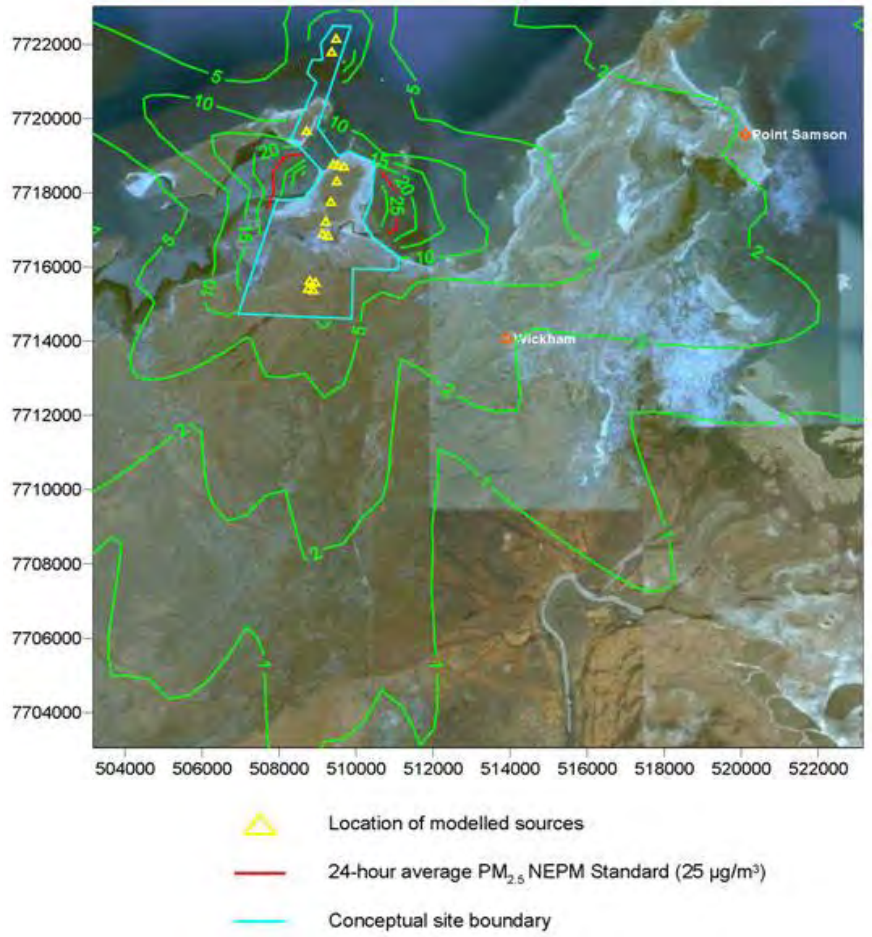

Figure 17.7 Maximum predicted 24-hour average $PM_{2.5}$ ground-level concentrations (µg/m³) (115 Mtpa scenario)

Figure 17.8 Predicted annual average $PM_{2.5}$ ground-level concentrations (µg/m³) (115 Mtpa scenario)

Figure 17.9 Maximum predicted 1-hour average SO_2 ground-level concentrations (µg/m³) from the power station for the emergency-case scenario

17.4 MITIGATION

17.4.1 Approach

API will minimise impacts to air quality through appropriate infrastructure and equipment design and application of dust suppression and control procedures, to be implemented through a Project Environmental Management Programme.

The maximum predicted offsite TSP, PM_{10} and $PM_{2.5}$ ground-level concentrations are primarily driven by fugitive dust emissions from stockpiles as a result of reclaiming activities and wind erosion. Dust control measures at the proposed port facility will target these sources.

Emissions from the power station will by managed under a Part V, EP Act licence, administered by the DEC. The licence application process includes further formal opportunities for stakeholder engagement.

API's approach has adopted EPA's heirachy of mitigation (EPA, 2006).

Performance management

The success of mitigation and management measures will be measured by assessing key performance indicators against specific targets for each management objective (Table 17.8).

Table 17.8 Dust management objectives, targets and performance indicators

Management objectives	Targets	Performance indicators
Prevent dust impacts on human population and recreation areas during construction and operation.	No impact on residential and recreational areas.	Dust monitoring at Proposal boundary Complaints register.

17.4.2 Key management actions

Key management actions will be implemented to facilitate the achievement of dust management objectives (Table 17.9).

Table 17.9 Dust key management actions

Action	*Accountability*	*Timing*
Clear vegetation only as required.	Construction Manager	During construction.
Apply dust suppressants to dust-prone haul roads, stockpiles and working surfaces.	Port Manager	During operation.
Maintain ore moisture content and operate dust extraction systems at ore handling and rail loadout facilities.	Port Manager	During operation.
Restrict dust generating activities during dust prone climatic conditions where appropriate.	Port Manager	If required during operation.
Rehabilitate or stabilise disturbed areas to minimise total exposed area.	Construction Manager	During construction.
Register any dust related complaints received during construction and operation, and take any necessary corrective action to ensure operational and management procedures and practices are implemented in accordance with the Project Environmental Management Programme.	Construction/Operation Managers	During construction and operation.

17.5 PREDICTED OUTCOME

Based on the results of modelling (Supporting Studies 19 and 20), the predicted outcomes are:

- Any exceedances of the Air Quality NEPM goal for fugitive dust emissions (i.e., no more than five exceedances of the 24-hour PM_{10} NEPM standard per annum) are expected to occur within the Proposal area.
- The maximum 24-hour TSP, PM_{10} and $PM_{2.5}$ ground-level concentrations for fugitive dust emissions predicted at the towns of Wickham and Point Samson are less than 20% of the 24-hour NEPM guideline.
- The maximum predicted CO, NO_2, SO_2 and PM_{10} ground-level concentrations for the proposed power station at any location across the modelled domain (including the towns of Wickham and Point Samson) are well below the relevant NEPM standards for both the worst-case and emergency-case scenarios.
- The cumulative impact of PM_{10} emissions at Point Samson from the combined operations of API's proposed port facility and the existing Cape Lambert facility is expected to remain well below the 24-hour PM_{10} air quality standard.

It is predicted that, with appropriate management all relevant standards will be met during both construction and operation. This will ensure that emissions do not adversely affect environment values or the health, welfare and amenity of people and land uses, and thus the EPA objective will be met by the Proposal.

18. Noise amenity

18.1 KEY STATUTORY REQUIREMENTS, POLICY AND GUIDANCE

18.1.1 Objective

The EPA objectives relating to noise are:

To protect the amenity of nearby residents from noise impacts resulting from activities associated with the proposal by ensuring noise levels meet statutory requirements and acceptable standards.

To minimise disturbance to recreational and tourist areas and ensure that existing and planned recreational uses are not compromised.

18.1.2 Legislation

Environmental noise in Western Australia is governed by the EP Act through the Environmental Protection (Noise) Regulations 1997. These regulations provide standards for maximum allowable noise levels at sensitive premises based on a combination of the "base noise level" and an "influencing factor" added to the base noise level. The influencing factor takes into consideration the existing surrounding land use of the receiver location. Regulation 7 of the Noise Regulations requires that noise emitted from any premises must comply with assigned noise levels when received at any other premises and be free of the intrusive characteristics of tonality, modulation and impulsiveness.

Worker health and safety, as relevant to noise, is governed by the *Occupational Safety and Health Act 1984* and the *Mining Act 1978* (and associated Regulations).

18.1.3 Policy and guidance

EPA draft Guidance Statement No. 8

The EPA's Draft Guidance Statement No. 8, Environmental Noise (EPA, 2007a), provides guidance to proponents submitting proposals for environmental impact assessment to ensure that noise emissions from the premises on which the proposal is based comply with the Environmental Protection (Noise) Regulations. The guidance material falls into two main parts:

- EPA policy covering a range of types of proposals that may emit noise; and
- EPA guidance on the assessment of noise and presentation of information to the EPA.

State Planning Policy 5.4

Noise from the operation of railways is exempt from the Environmental Protection (Noise) Regulations. For noise sensitive premises adjacent to railways, State Planning Policy 5.4, Road and Rail Transport Noise and Freight Considerations in Land Use Planning, is generally applied. This policy provides noise level criteria to assess the impact of noise on sensitive premises from new road and railway transport corridors. It outlines targets and limits for noise levels emitted either during the day or at night. The criteria apply to any point 1 m from a habitable facade of a noise-sensitive premise and in one outdoor living area.

18.2 DESCRIPTION

18.2.1 Introduction

Noise and vibration will be generated during the Proposal through construction and operation of the port facilities (including ore processing) and railway.

The closest noise sensitive premises to the Proposal are:

- Cleaverville Beach camping area, located approximately 6.5 km west of the Proposal area;
- the town of Wickham, located approximately 7 km east-southeast of the Proposal area; and
- a construction camp (which may be developed into an accommodation village) for the Proposal, potentially located southwest of the proposed port.

18.2.2 Studies

The technical information provided in the section of the PER/draft PER is based on the following report, which is included in Appendix 1:

- Supporting Study 18.1: Noise Impact Assessment
  Lloyd George Acoustics. 2010. Noise Impact Assessment West Pilbara Iron Ore Project, July. Report prepared by Lloyd George Acoustics Pty Ltd for API Management Pty Ltd, Como, Western Australia.

Table 18.1 briefly outlines the investigations and key outcomes relevant to noise.

Table 18.1 Summary of noise investigations and key outcomes

Investigations Proposed within ESD	Investigations Completed	Key Outcomes Relevant to Noise	PER Section
Modelling of noise and vibration emission during port construction and operation.	Noise impact assessments were conducted to assess the predicted noise emissions from port piling operations, port operations and rail operations against the appropriate criteria for Western Australia.	Port: As the noise level of individual sources is generally below 20 dB(A), the overall noise is not expected to exhibit any annoying noise characteristics, in particular, tonality. Compliance with the Regulations will be achieved at all noise sensitive premises. The noise levels as a result of the operation at the port are predicted to be : Wickham = 26dB; Cleaverville Beach = 26dB; Camp Option 1 = 17dB; Camp Option 2 = 6dB. The railway noise level to the camp options 1 and 2 are 53 and 47dB respectively. .	Section 18.3.2, Supporting Study 18.1.
If noise modelling identifies a significant risk of breaching the Environmental Protection (Noise) Regulations, additional noise management measures will be investigated to mitigate the risk.	Noise impact assessments provided mitigation measures, where warranted.	For construction camp options near the rail, acceptable internal noise levels could be achieved using conventional building facade materials.	

18.3 IMPACT ASSESSMENT

18.3.1 Environmental aspects and potential impacts

Environmental aspects that may potentially result in noise emissions include:

- construction of port facilities (particularly port piling operations);
- operation of the port facilities (including ore processing); and
- railway operations.

18.3.2 Assessment of potential impacts

The section describes the potential noise impact on local residences and other noise sensitive premises in the area. For noise impacts on fauna, refer to Sections 9, 13 and 20.

Construction noise

Construction noise is not required by the Environmental Protection (Noise) Regulations to comply with the assigned noise levels. Management practices as defined in Regulation 13 of the regulations should be implemented. The main construction activity expected to result in noise impacts to sensitive premises is impact piling during jetty construction. The assigned noise-level criteria for assessing the impact of noise from piling on sensitive premises (Wickham, Cleaverville Beach, Camp option 1 and 2) has been based on the night-time assigned noise level of 35 dB L_{A10}. outlined in the regulations.

Noise modelling (Supporting Study 18.1) conducted to predict the noise levels from piling operations shows that the activity will meet assigned noise levels at all sensitive premises (Figure 18.1 to Figure 18.3). Figure 18.1 shows that the predicted noise levels at the Cleaverville Beach Camping Area point receiver are at the assigned noise levels. The formal camping area is further west than the location shown in Figure 18.1 (see Figure 3.19 for a more accurate depiction of the location); and noise levels at the Cleaverville Camping Area are predicted to comply with the assigned noise levels.

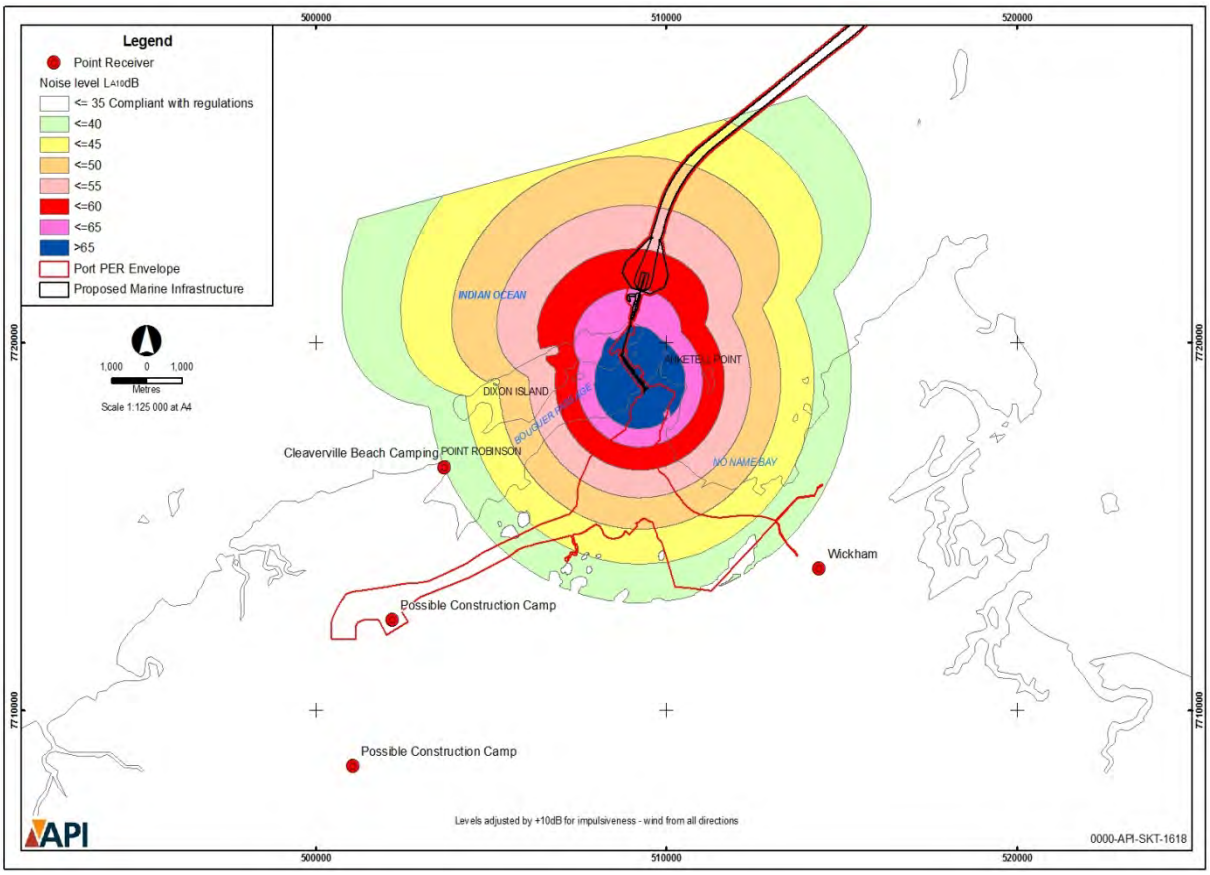

Figure 18.1 Predicted noise levels from port piling activities during construction at the port area

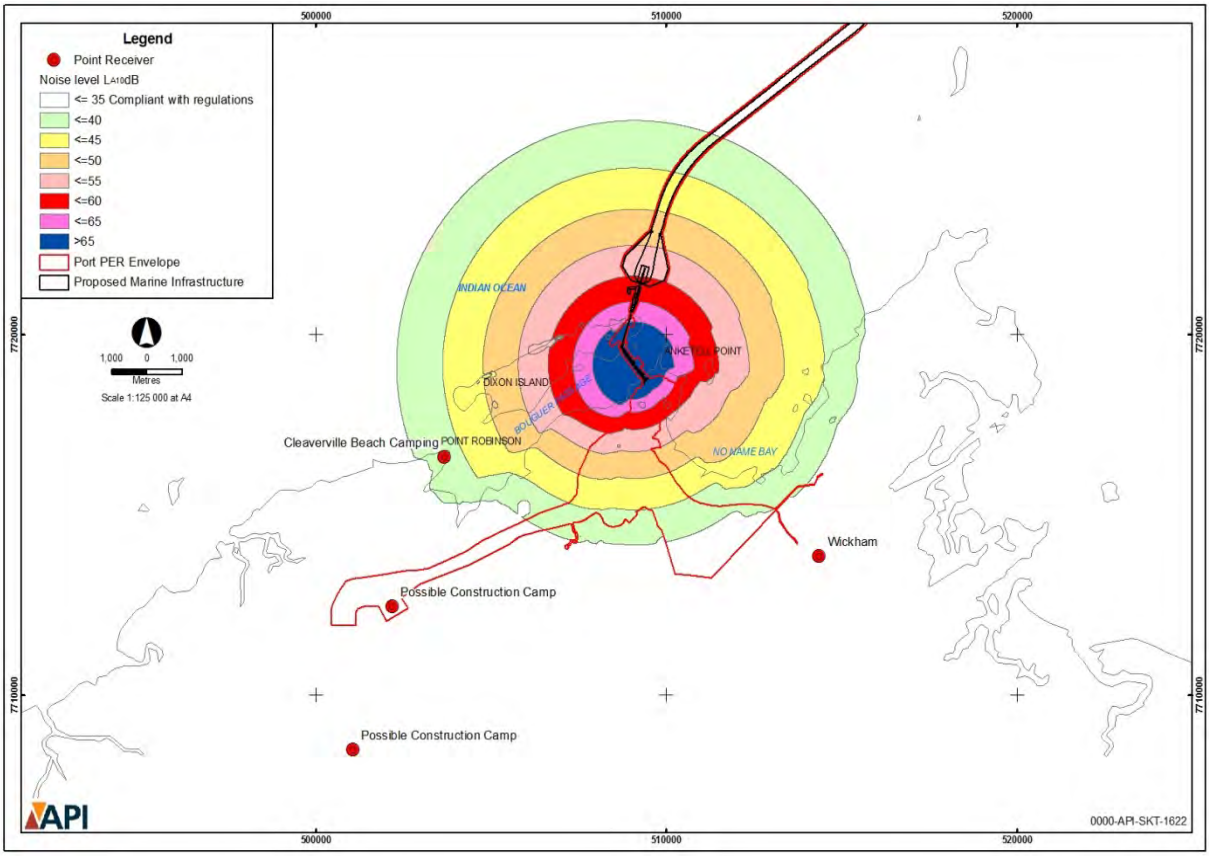

Figure 18.2 Predicted noise levels from port piling activities during construction at the causeway

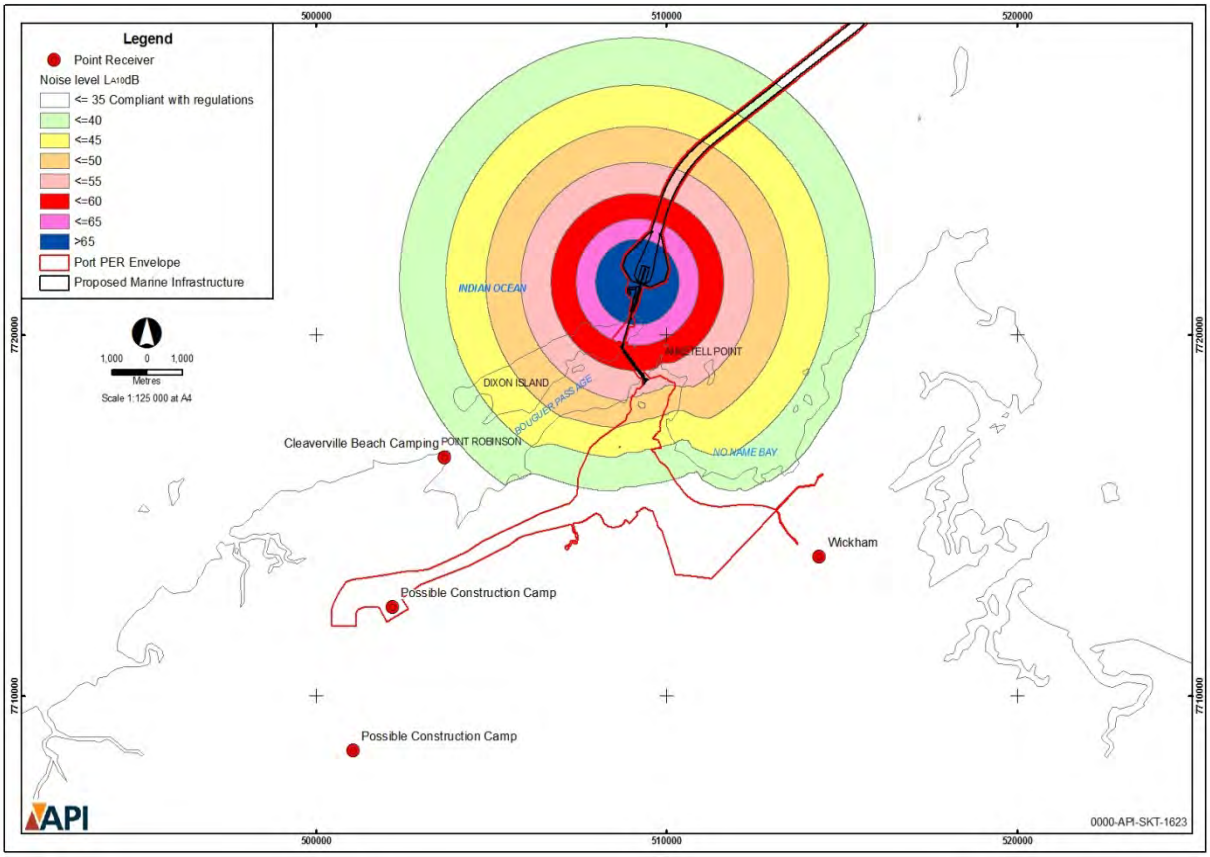

Figure 18.3 Predicted noise levels from port piling activities during construction at the wharf and jetty

Operational noise

Port operations

Noise modelling of the port operations was based on simultaneous operation of all port facilities during worst-case meteorological conditions. The criteria for assessment of noise levels have been set at 35 dB(A) for the Cleaverville Beach Camping Area and Wickham based on the night-time assigned noise levels for noise-sensitive premises outlined in the Noise Regulations. According to the draft EPA Guidance Statement No. 8 (EPA, 2007a), as the potential construction camp (and potential accommodation village) locations are located on the same premises as the port, compliance with the assigned levels from the Noise Regulations is not required. However, the EPA policy is that an aspirational goal of L_{A10} 40 dB(A) should be used (EPA, 2007a), and as such this has been set as the assigned noise level criteria for the potential camp locations.

Modelling indicates that compliance with the assigned noise level criteria will be achieved at all noise-sensitive premises (Table 18.2 and Figure 18.4). The noise levels of individual sources is generally below 20 dB(A), so the overall noise is not expected to exhibit any annoying noise characteristics, such as tonality (Supporting Study 18.1).

Table 18.2 Summary of noise from port operations to key receivers

Location	Assigned Noise Level Criteria L_{A10}	Overall L_{A10} Noise Levels Assuming Worst-case Downwind
Wickham	35 dB(A)	26 dB(A)
Cleaverville Beach camping area	35 dB(A)	26 dB(A)
Potential construction camp and accommodation village location 1	40 dB(A)	17 dB(A)
Potential construction camp and accommodation village location 2	40 dB(A)	6 dB(A)

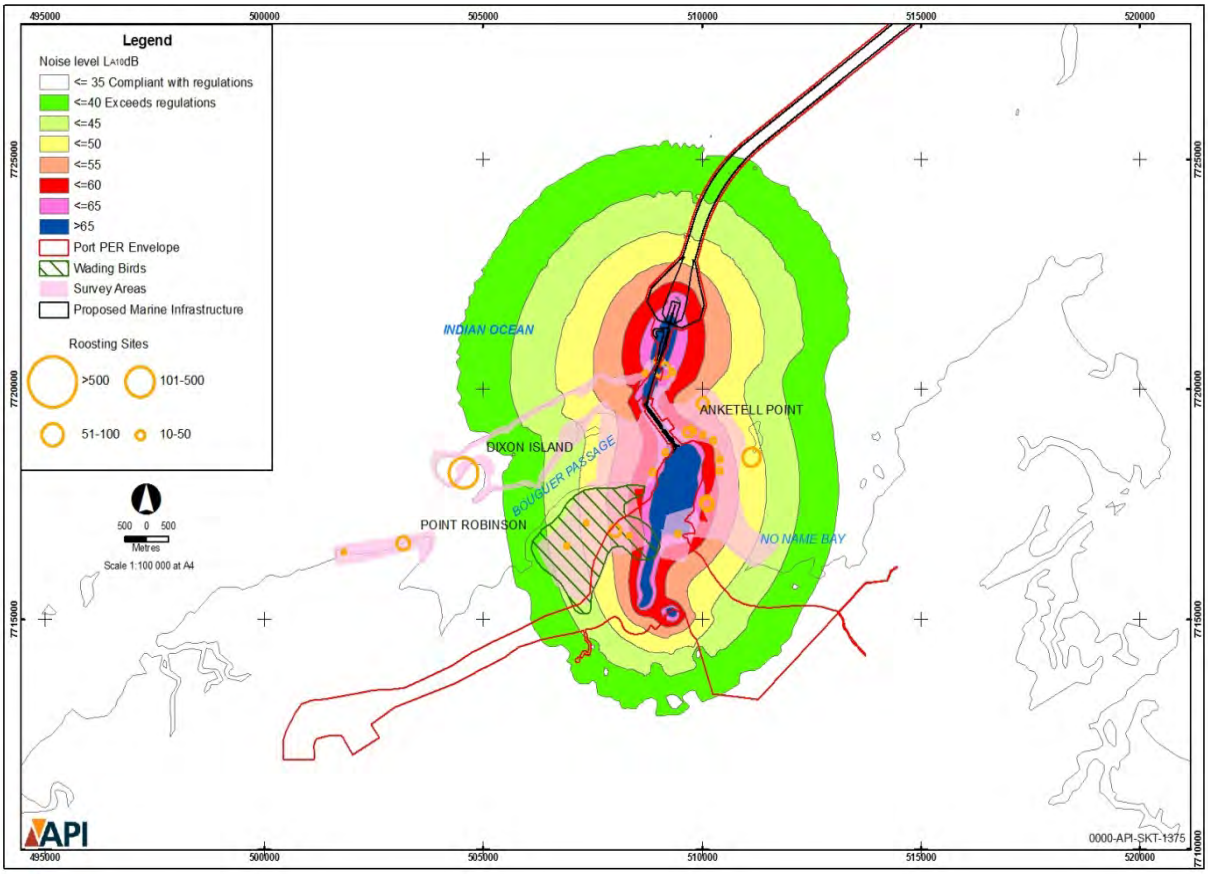

Figure 18.4 Predicted noise levels from port operations

Railway operation

The assessment of noise from the railway was based on measured noise levels of similar iron ore trains operating in the Pilbara and assumed worst-case meteorological conditions. The assigned noise-level criteria for all receivers was based on the night-time noise-level target and limit of 50 dB $L_{Aeq(Night)}$ and 55 dB $L_{Aeq(Night)}$ respectively as outlined in State Planning Policy 5.4.

Noise modelling of the railway operations (Supporting Study 18.1) indicates that the predicted night-time noise level from trains achieves the noise-level target outlined in State Planning Policy 5.4 (Table 18.3). The railway noise levels within the potential construction camps (potential accommodation village) can be further attenuated using conventional building facade materials.

Table 18.3 Summary of noise from railway operations to key receivers

Location	Assigned Noise Level Target L_{Aeq} (State Planning Policy 5.4)	Assigned Noise Level Limit L_{Aeq} (State Planning Policy 5.4)	Overall L_{Aeq} Noise Levels Assuming Worst-case Downwind
Wickham	50 dB(A)	55 dB(A)	36 dB(A)
Cleaverville Beach camping area	50 dB(A)	55 dB(A)	47 dB(A)
Potential construction camp/ accommodation village location 1	50 dB(A)	55 dB(A)	53 dB(A)
Potential construction camp/ accommodation village location 2	50 dB(A)	55 dB(A)	45 dB(A)

18.4 MITIGATION

18.4.1 Approach

API will ensure that noise from the Proposal complies with the requirements of the Environmental Protection (Noise) Regulations through the implementation of management actions outlined below. The Project Environmental Management Programme (PEMP) will include procedures for the management of noise emissions. API's migiation approach is in keeping with EPA's recommended mitigation heirachy (EPA, 2006).

18.4.2 Performance management

API has developed environmental targets and performance indicators based on the environmental management objectives, targets and performance indicators for noise for the entire WPIOP area, which includes the Proposal area that is the subject of this PER/draft PER (Table 18.4).

Table 18.4 Noise management objectives, targets and performance indicators

Objectives	Target	Performance indicators
Minimise noise impacts to surrounding population centres and recreational areas.	No significant impacts at population centres and major recreational areas.	Community consultation. Complaints register.

18.4.3 Key management actions

Key management actions will be implemented to minimise noise impacts on sensitive premises (Table 18.5).

Table 18.5 Key management actions to minimise noise impacts on sensitive premises

Action	Accountability	Timing
Carry out all construction work in accordance with AS 2436-2010, Guide to noise and vibration control on construction, demolition and maintenance demolition sites.	Project Manager	During construction.
Use equipment, machines and vehicles that are the quietest	Project Manager	All stages.

Action	Accountability	Timing
reasonably available consistent with operational requirements and that will be routinely maintained to ensure the effectiveness of noise suppression systems and equipment.		
Inform all construction personnel (including contractors) through site inductions of their responsibilities and the importance of managing noise levels during the construction phase.	Project Manager	Prior to and during construction.
Register any noise-related complaints received during construction and operations and take any necessary corrective action to ensure operational or management procedures and practices are put in place in accordance with the PEMP.	Construction Manager Operations Manager	During construction and Operation.

18.5 PREDICTED OUTCOME

Based on the results of modelling (Supporting Study 18.1), the anticipated outcomes are:

- Noise levels from construction activities, including piling will meet assigned noise levels at all sensitive premises;
- Noise emissions from port operations are predicted to meet the assigned noise level criteria as outlined in the Noise Regulations at all noise-sensitive premises; and
- The predicted night-time noise levels from trains achieve the noise level target outlined in State Planning Policy 5.4.

The distances between the area of the proposed activities and the nearest noise-sensitive premises and the results of noise modelling indicates that impacts from noise emissions will be low and noise levels will meet the EPA objectives relating to noise.

19. Recreational use

19.1 KEY STATUTORY REQUIREMENTS, POLICY AND GUIDANCE

19.1.1 Objectives

The EPA objectives relating to recreational use are:

To minimise disturbance to recreational and tourist areas and ensure that existing and planned recreational uses are not compromised.

To ensure that fisheries, nursery areas and recreational fishing locations are not significantly affected by heavy visitor pressures.

19.1.2 Legislation

Commonwealth

The Commonwealth Government has implemented a maritime security regime, through the *Maritime Transport and Offshore Facilities Security Act 2003*, to help safeguard Australia's maritime transport system and offshore facilities from terrorism and unlawful interference. Under this regime, all security-regulated ports, port facilities, offshore facilities, port and offshore service providers and ships undertake security risk assessments and implement security plans to address identified risks.

State

Under the EP Act, the EPA will have regard for impacts of a Proposal on the physical or biological surroundings of a Proposal that may have aesthetic, cultural, economic and social implication including impacts on recreation.

The *Port Authorities Act 1999* is likely to be used to proclaim a Port Authority Area over the land on which this Proposal is located, which will provide for the imposition of access restrictions if necessary .

19.1.3 Policy and guidance

EPA Guidance Statement No. 33 Environmental Guidance for Planning and Development

EPA Guidance Statement No. 33, Environmental Guidance for Planning and Development (EPA, 2008b), provides the EPA's advice in relation to the environmental factor "recreation" and land use planning projects, in order to promote outcomes consistent with the objectives of the EP Act. The focus of the EPA is on the protection of recreational opportunities of high importance to the community that derive from the natural environment (for example, the coast) where these are consistent with maintaining key conservation values.

19.2 DESCRIPTION

19.2.1 Introduction

Recreational activities are undertaken in and around the Proposal area by day-trippers (locals and tourists passing) and campers, with Cleaverville Beach being the focus of recreational activities adjacent to the Proposal area. Intermittent camping occurs on the foredunes around Anketell Point. The waters around Dixon Island are utilised for recreational fishing, with boats being launched from Point Samson, Boat Beach and Cossack. API has examined the potential impacts of construction and operation of the Proposal on these activities, and has identified management measures to minimise potential impacts.

19.2.2 Studies

Consultation undertaken by API has provided an understanding of the recreational use of the proposed port area and surrounds by local communities and travellers (see Section 4). There is a general attachment by the local communities to the beaches and coastal waters in proximity to the area of the Proposal;

Matters considered important to local communities include:

- access to beaches within Bouguer Passage and in proximity to Anketell Point, particularly Cleaverville Beach;
- recreational fishing pressures associated with increased workforce population; and
- potential environmental impacts that might affect recreational activities.

19.3 IMPACT ASSESSMENT

19.3.1 Environmental aspects and potential impacts

Aspects of the Proposal that may potentially result in impacts to recreation include:

- development of linear infrastructure (road and rail) and creation of a port area could restrict public access;
- proclamation of a "port" by the state under the Port Authorities Act may involve associated restrictions on access to certain areas to meet security requirements;
- restriction on access to or through operational areas to ensure public safety;
- port construction and operational personnel (some of whom will be, or will become local residents) may participate in activities that increase recreational pressures, such as fishing, boating, picnicking etc.; and
- port construction or operational activities may result in environmental impacts that in turn compromise recreational values. These potential impacts are discussed and assessed in Section 7, Benthic Primary Producer Habitat; Section 8, Mangroves; Section 9, Marine Fauna; Section 10, Water and Sediment Quality; Section 11, Chemical Spills; Section 12, Terrestrial Vegetation; Section 13, Terrestrial Fauna; and Section 20, Matters of National Environmental Significance.

19.3.2 Assessment of potential impacts

Recreational access restrictions

Implementation of the Proposal is unlikely to restrict access to, or the utilisation of, the Cleaverville Beach area. As proposed by API, final detailed designs of the port precinct and transport corridor is subject to heritage assessments and ongoing consultation with government and indigenous stakeholders (Refer to Section 16).

Safety requirements for the construction and operation of the Proposal will mean that public access to some areas in proximity to Anketell Point will be restricted on a temporary basis and potentially other areas (facilities on Dixon Island) on a permanent basis.

In accordance with requirements under the Port Authorities Act, it is expected that a Port Authority Area will be proclaimed over the area of this Proposal. Combined with requirements under the Commonwealth Government's maritime security regime, this may lead to access restrictions to certain areas, similar to controls implemented at Dampier Port. API will work with the Dampier Port Authority to ensure public access is considered to the greatest extent practicable and is consistent with the objectives of relevant environmental management plans.

Increased recreational pressure

Total resource related employment in the Pilbara is projected to grow from a current 15,000 to more than 30,000 from 2015 onwards (Heuris Partners Ltd, 2008). These totals are based on both local jobs required to support direct employment in the Pilbara and fly-in/fly-out positions. Residential employment increases are expected to rise from 10,000 to 15,000 in 2015, while fly-in/fly-out is expected to grow at a faster rate, rising from 5,000 to a potential 17,000 by 2015 (Heuris Partners Ltd, 2008). Depending on their location, FIFO workers may create a range of pressures on Pilbara infrastructure and services.

The Proposal area is located in proximity to a number of regional population centres, including Karratha, Roebourne, Wickham and Point Samson. A large proportion of people living in these centres are involved in recreational pursuits in proximity to the Proposal area and the waters of Nickol Bay.

On current estimations, the construction workforce is anticipated to peak at approximately 4,000 during an estimated 2 year construction period. With this many people being located on site, even a small proportion of workers utilising the identified recreational areas has the potential to result in a significant increase in usage of these areas. A significant increase in the usage of recreational areas has the potential to increase pressure on resources (e.g., fish stocks) and on sensitive habitats (e.g., beaches). The fly-in/fly-out construction workforce will have limited time available for any recreational activities off site, therefore limiting the impact they may have on the area's recreational resources during this time. In addition, the mitigation and management measures API will implement will reduce the impact the workforce may have on coastal and marine areas in and surrounding the Proposal (see Section 9, and the Marine Fauna Management Plan and Coastal Habitat Management Plan in Appendix 3 of the PER/draft PER).

While a large proportion of API's port operational staff are planned to be housed within local communities, a contingency will be required that may accommodate these personnel within an accommodation village in close proximity to the Proposal, as such, the Proposal description has allowed for the inclusion of such a village. Regardless of where these operational personnel reside, the Proposal will only result in an approximate 5% increase to the regional population that resides within Wickham, Karratha, Roebourne and Point Samson.

19.4 MITIGATION

19.4.1 Approach

Some uncertainty will remain as to the precise effect on public access to the Proposal area that will flow from the proclamation of a port, until the design of the multi-user port and associated industrial estate, as announced by the Premier on 4 March 2010 (Govt of WA, 2010), is progressed.

API will aim to minimise impacts on recreation in the local area through the detailed design of its Proposal, which will need to conform with the broader plans to be developed in consultation with the state. API's approach to mitigation has been developed in accordance with the EPA's recommended mitigation heirachy (EPA, 2006).

19.4.2 Performance management

Targets and performance indicators based on the environmental management objectives, targets and performance indicators for recreational use for the overall WPIOP area, which includes the Proposal that is the subject of this PER/draft PER (Table 19.1).

Table 19.1 Recreational use management objectives, targets and performance indicators

Objectives	Target	Performance indicators
Seek to capitalise on opportunities presented by the Proposal for the enhancement of recreational facilities, in consultation with governments and the community.	Agreed facilities enhanced	Community consultation records
Avoid negative impacts on recreational areas by construction and operational personnel	No complaints of workforce behaviour at recreational areas	Community consultation records Complaints register

19.4.3 Key management actions

Management measures relating to recreational use have been developed and will be implemented for the Proposal (Table 19.2).

Table 19.2 Key management actions for recreational use and access

Action	Accountability	Timing
Protect workforce and community safety by prohibiting recreational fishing as required within the construction and operational areas of the Proposal.	Project Manager	At all times
Control the use of private vehicles and fishing boats by personnel during the construction period, thereby limiting the means to access off-site areas.	API Environment Manager	During construction
Maintain a register of complaints relating to the effects of implementation of the Proposal on recreational activities.	API Environment Manager	Ongoing

19.5 PREDICTED OUTCOME

After implementation of mitigation measures, the Proposal is expected to result in the following outcomes in relation to recreational use:

- The Proposal will not restrict people from undertaking recreational activities associated with Cleaverville Beach as access to the area will be maintained.
- As the construction workforce will be fly-in/fly-out, there will be very limited time available for any recreational activities off site. In addition, the use of private vehicles and fishing boats will be discouraged, so the workforce will have limited means to access off-site areas.
- The residential workforce will result in a minor increase in demand on recreational areas and fishing pressure.

This Proposal will meet the EPA objectives for recreation.