



West Pilbara Iron Ore Project Stage 1 Mine & Rail Proposal

Public Environmental Review

Response to Submissions Report

February 2011



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API Management Pty Ltd

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Response to Submissions Report
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Prepared by API Management Pty Ltd

| Report | Version | Prepared by | Reviewed by | Submitted Copies | Date |
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Front cover image: *Corymbia ferritcola* over hummock grassland (source Doug Blandford Photography)

Executive Summary

INTRODUCTION

API Management Pty Ltd (API) is the proponent for West Pilbara Iron Ore Project (WPIOP), an iron ore mining and export operation based on a number of resources located on the western fringe of the Hamersley Ranges, south of Pannawonica, Western Australia. The project involves the development of a series of open-cut mines, a railway and port facilities at Anketell Point, near Dixon Island.

For the purposes of environmental assessment under the *Environmental Protection Act 1986* (WA) (EP Act) and the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) (EPBC Act), the project comprises two proposals:

1. The establishment and operation of the mining area and associated infrastructure and the construction of a transport corridor.
2. The establishment and operation of a deepwater Port at Anketell Point.

The Proposal to develop the mine area and railway was referred by API to the Western Australian Environmental Protection Authority (EPA) on 12 September 2008. On 3 December 2008, the EPA determined that the Proposal should be assessed under Part IV of the EP Act at the level of Public Environmental Review (PER), with an eight-week public review period. The Proposal was referred to the Commonwealth Department of the Environment, Water, Heritage and the Arts (DEWHA) by API on 16 January 2009. On 16 February 2009, DEWHA determined that the Proposal was a controlled action and required approval under the EPBC Act, following a bilateral assessment under the Western Australian Government approvals process.

As part of a review of the state environmental impact assessment process, the EPA proposed a more systematic, risk-based approach to environmental impact assessment. The EPA and API agreed to trial this approach in the environmental impact assessment of this Proposal. A structured process of evaluating and treating environmental risks was employed to identify the higher-risk elements that warranted further investigation and more detailed review in the PER.

PUBLIC ENVIRONMENTAL REVIEW PROCESS

The Public Environmental Review (PER) document for the West Pilbara Iron Ore Project Stage 1 Mine and Rail Proposal was available for public review between 21 June 2010 and 16 August 2010. During this period, any party was provided the opportunity to comment on the proposal and the PER documentation as part of the environmental impact assessment process under the Western Australian *Environmental Protection Act 1986* and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

Comments received

Comments on the PER were submitted to the Office of the Environmental Protection Authority (OEPA) and forwarded to API for response on the 23 August 2010. Ten submissions were received, as detailed in Table 1.1 below.

Table ES.0.1 West Pilbara Iron Ore Project Stage 1 Mine and Rail Proposal Submissions

| Category | Name | Submission Number |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| WA State Government Agencies | Office of the Environmental Protection Authority (Strategic Policy and Planning Services Division - Terrestrial Ecosystems Branch) | 1 |
| | Department of Environment and Conservation (Environmental Management Branch) | 2 |
| | Department of Environment and Conservation (Contaminated Sites Branch) | 3 |
| | Department of Mines and Petroleum | 4 |
| | Department of Health | 5 |
| | Department of Indigenous Affairs | 6 |
| | Department of Water | 10 |
| Indigenous groups | Yamatji Marlpa - Aboriginal Corporation on behalf of the Kuruma Marthudunera Native Title Claimant Group | 7 |
| | Taylor Linfoot and Holmes on behalf of the Ngarluma Aboriginal Corporation | 8 |
| Non-government Organisations | The Wildflower Society of Western Australia Inc | 9 |

The submissions contained general comments and acknowledgements and raised a number of matters which are summarised below, and discussed in detail in Part 2 of this report. Matters raised included:

Water management

- Groundwater (dewatering and discharge)
- Water quality management
- Waste water (management and treatment)

Fauna

- Troglifauna (extent of habitat, risk treatment measures, further investigations)
- Stygofauna (distribution of species)
- Terrestrial fauna (sampling for Orange leaf-nosed Bat [*Rhinionicteris aurantia*], management of trenching activities)
- Pest management (control measures and mosquitoes)

Vegetation and flora:

- *Triodia* sp. Robe River (Priority Ecological Community, protective measures, propagation)
- Vegetation and flora along the transport corridor (weed management, sheetflow dependent vegetation and borrow pits)

Rehabilitation and closure:

- Rehabilitation standards
- Closure management and planning

Indigenous cultural heritage

- Consultation and engagement
- Cultural heritage and environmental impact assessment, including rights of Traditional Owners
- Heritage surveys and management
- Risk treatment measures relating to cultural heritage
- Cultural awareness training
- Other environmental factors that relate to cultural heritage, including waterways and terrestrial fauna
- Proposed Ministerial conditions

Geodiversity

- Impacts on mesa landforms
- Geodiversity assessment
- Geodiversity values of the West Pilbara region, including cumulative impacts on mesa-type landforms and tourism values

Response to submissions - outcomes

API has responded to each submission received. The submissions did not identify any matters that had not been addressed in the PER or studies undertaken to date, and the summary of key predicted outcomes as provided in Table ES4 (PER, p xvi), remains unchanged.

CONFIRMATION OF PROPOSAL DESIGN

API has taken the opportunity of this report to confirm several aspects of the proposal that were presented as alternatives or have changed since the publication of the PER. These aspects are

- The adoption of a single 'Central Processing Facility' in the mine area to receive and process iron ore, in preference to 4 separate ore processing nodes.
- The adoption, on heritage, land access and environmental grounds of an alignment for a section of the railway that is adjacent to the North West Coastal Highway for approximately 17km, and crosses the Fortescue River in proximity to and upstream of the Fortescue Road bridge.
- A preference to utilise the existing, gazetted Mt Stuart Red Hill Road for access to the mine area over the construction of the 'Southern Access Road'.
- An expansion to the proposed mine pit, and extent of known troglofauna habitat at the Kens Bore deposit, based on additional drilling and geological mapping completed since the public release of the PER.

In each case, these amendments result in an improvement in the environmental profile of the proposal.

SUMMARY

The additional information and responses to submissions provided in this report support the conclusion of the PER that the proposal is environmentally acceptable and can be implemented without compromising the objectives of the EPA and the EPBC Act.

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APPENDIX 1: Complete submissions and response table

APPENDIX 2: Cross section of each resource area showing geology and troglofauna sampling

APPENDIX 3: Astron (2010) West Pilbara Iron Ore Project, *Triodia* sp. Robe River Mapping and Targeted Search. July 2010. Prepared for API Management Pty Ltd.

PART 1: INTRODUCTION AND STRUCTURE

1 Introduction

1.1 OVERVIEW OF REPORT

This report provides the response of API Management Pty Ltd (API) to submissions made on the West Pilbara Iron Ore Project (WPIOP) Public Environmental Review (PER) and also confirms aspects of the proposal that were presented as alternatives or may have undergone minor changes following the publication of the PER.

The definition of the proposal is addressed in Part 1 (Section 2) and responses to submissions are presented in Part 2 of this report.

1.2 OVERVIEW OF SUBMISSIONS

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1.3 STRUCTURE OF RESPONSES TO SUBMISSIONS

This report provides a summary of the comments raised in the submissions and API's response to these comments. The description of each matter is transcribed directly from the submission, or in some instances has been paraphrased.

In some cases, submission matters are grouped by theme to enable a more efficient response. Each submission has been provided with a unique number based on the author. For details of the submissions and a summary response, refer to Appendix 1.

2 Confirmation of proposal description

2.1 BACKGROUND

API has continued to gather data and complete studies that inform the design of the proposal. Since the public release of the PER, several aspects of the proposal design have been confirmed or amended. These include:

- Adoption of the Central Processing Facility (CPF)
- Expansion of Kens Bore deposit resource area
- Road access to the mine area
- Confirmation of a preferred alignment for a section of the transport corridor

2.2 CENTRAL PROCESSING FACILITY & ACCOMMODATION VILLAGE

The Central Processing Facility (CPF) was presented in the PER as an alternative to constructing four separate iron ore processing nodes as part of the proposal (PER, p16). Adoption of the CPF option has resulted in improved materials flow, more efficient ore handling and processing and reduced ground disturbance. As indicated in the PER (p 21 & Figure 2.13, p 29), as a consequence of the adoption of the CPF, the accommodation village is now located on an area identified near the proposed airstrip site.

The mining, processing and loading flow diagram presented in Figure 2.5 of the PER (PER, p 17) has been revised to reflect the adoption of the CPF (Figure 2.1 of this report).

Adoption of the CPF will also result in a reduction in the overall disturbance footprint associated with the proposal. The CPF negates the requirement for rail loops at each mining node and reduces the requirement for power distribution corridors, resulting in an approximate, minimum 250 ha reduction in disturbance within the mine area associated with the transport corridor.

The CPF replaces four separate processing nodes across the mine area that were situated at the base of the mesa-type landforms. The CPF is located on more common vegetation and land systems and consequently there has been a marginal reduction in impact on the *Triodia* sp. Robe River Priority Ecological Community (PEC).

Changes to the carbon footprint of the proposal are negligible, with emissions from a slight increase in truck haulage of ore (from the Kens Bore deposit to the CPF) offset by improved efficiency in ore processing at a single, larger plant.

2.3 KENS BORE RESOURCE AREA

Resource drilling completed since the publication of the PER has resulted in a slightly larger proposed mine pit at the Kens Bore deposit which remains within the previously identified disturbance envelope.

The change in the proposed mine pit at the Kens Bore deposit is depicted in Figure 2.2. The proposed mine pit is increased by 66 ha. The extended area falls partly on land previously earmarked for processing infrastructure, and with the adoption of the CPF, there is no net increase in ground disturbance associated with the revised mine pit.

The extension to the mine pit does not alter the negligible impact to flora species of conservation significance or the *Triodia* sp. Robe River PEC. The additional area does not constitute the particular habitat of any fauna species of significance.

Ongoing troglofauna sampling and geological mapping has enabled the extension of habitat boundaries for estimating the volume of troglofauna habitat. Hence, the impact of the mine pit extension on troglofauna associated with the Kens Bore palaeodrainage system is not material. The impact on troglofauna is more fully discussed in Section 4.1.1.

Part of the additional resource occurs below the water table and will require dewatering in order to mine. API does not expect this to increase its estimate of the dewatering rate, or volume that may need to be discharged to the environmental (i.e after consumption for dust suppression). The maximum depth of the additional resource below the water table is 20 m and it falls within the area of drawdown created by the dewatering of deeper ore (to 52m below the water table) immediately to the south west. Mining the additional resource is very unlikely to increase the predicted drawdown in areas supporting groundwater dependent ecosystems.

2.4 MINE AREA ACCESS

API continues to examine the feasibility and merits of utilising the existing gazetted Mt Stuart – Red Hill Road to provide access to the mine area. This would result in less ground disturbance than that associated with the construction of a new access road from the Catho Well deposit to the Nanutarra – Wittenoom Road (refer to Figure 2.3).

2.5 TRANSPORT CORRIDOR

An alternative alignment for approximately 17km of the proposed railway presented in the PER (Figure 2.3, p 13 and p 19) is now the preferred alignment based on heritage, environmental and land tenure grounds. The preferred alignment extends a section of the railway that is adjacent to the North West Coastal Highway for a further 16 km south of the Fortescue Road bridge (Figure 2.4 of this report). This alignment crosses the Fortescue River upstream of the Fortescue Road bridge

The preferred alignment reduces habitat fragmentation and requires less cutting to achieve required gradients than the alignment to the south. Flora and vegetation surveys along the preferred alignment (including borrow sites) have recorded three Priority flora species (*Indigofera* sp. Bungaroo Creek P3, *Acacia aneura* var. *intermedia*, *Triodia* sp. Robe River P3) (Astron, in prep) (Figure 2.2), compared with 11 Priority flora records along the original alignment (including *Indigofera* sp. Bungaroo Creek P3, *Acacia aneura* var. *intermedia*, *Triodia* sp. Robe River P3, and *Terminalia supranitifolia* P3) (PER, Figure 22.1, p 229).

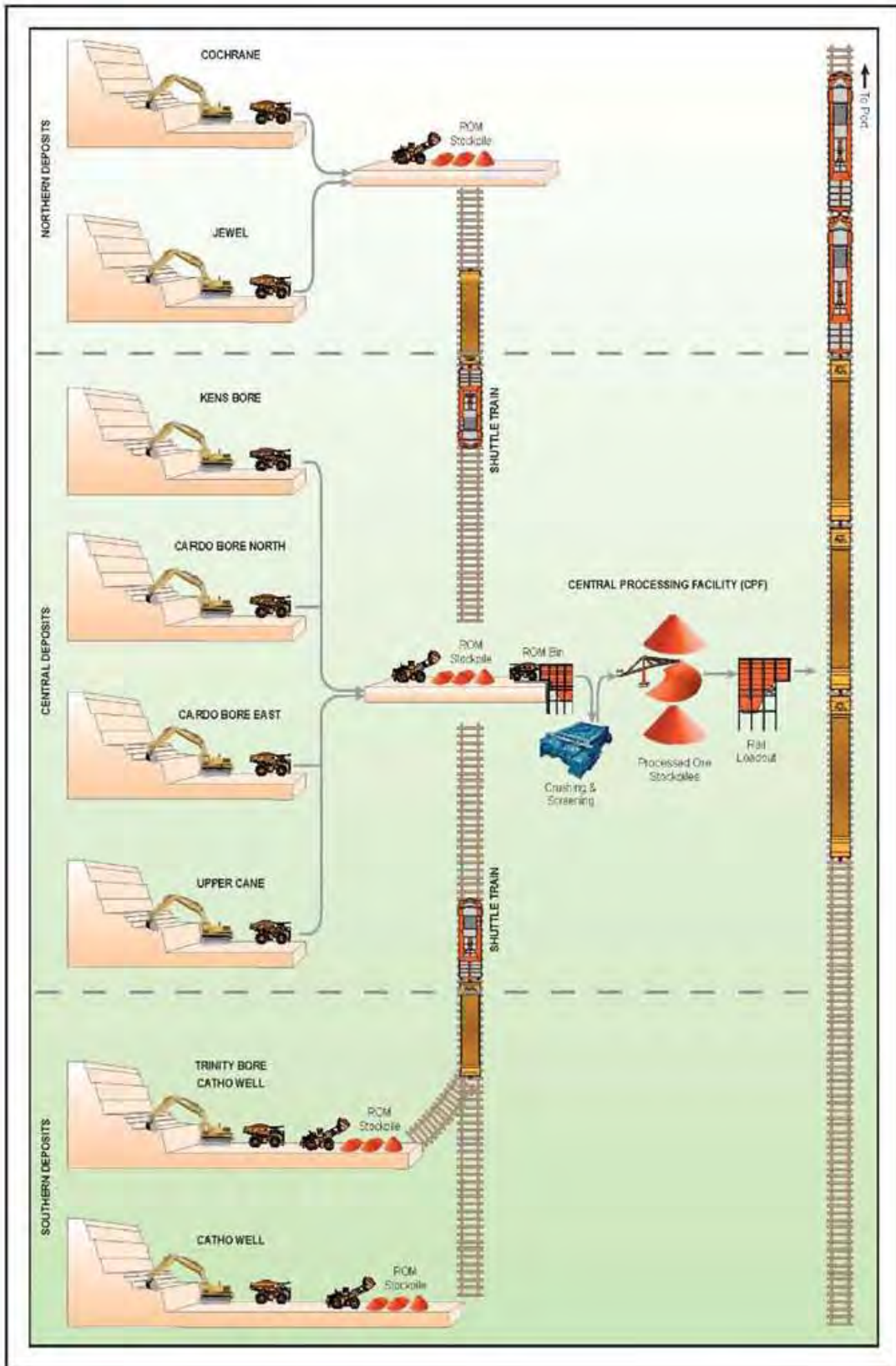
In ethnographic surveys and consultation undertaken with the Kuruma Marthudunera people and the Yaburara Marthudunera people since the release of the PER, the alignment that follows the highway was identified as the more preferable route on cultural heritage grounds.

In discussions with the Department of State Development, the alignment that follows the highway was considered to have less impact on areas prospective for minerals on land subject to the *Iron Ore Processing (Mineralogy Pty Ltd) Agreement Act 2002*. This is a better outcome for the grant of appropriate land tenure for the railway.

The revised alignment brings the railway closer to the Fortescue Roadhouse. The roadhouse provides accommodation for travellers and an accommodation village for construction workers at the Sino Iron project. Construction of the Sino Iron project is scheduled to be completed well ahead of the establishment and operation of the railway. Noise modelling predicts that average night time noise levels generated by proposed rail operations will be 58.1 dB(L_{Aeq(Night)}), which exceeds the 'limit' criteria set under *State Planning Policy 5.4 Road and Rail Transport Noise and Freight Considerations in Land Use Planning* of 55 dB. Under this policy, the noise emissions may be 'deemed to comply' based on appropriate noise mitigation measures. API will consult with the owner of the roadhouse, Citic Pacific Mining, and investigate noise mitigation measures to minimise the noise received at the roadhouse.

2.6 SUMMARY

Overall the changes described above improve the environmental profile of the proposal, with reduced ground disturbance, reduced risk of impacting species of conservation significance and reduced impact on indigenous cultural heritage.



0000-API-SKT-1262-005 **API**

Figure 2.1 Mining, processing and loading flow diagram for the Central Processing Facility (CPF) (updated version of Figure 2.5 in PER, p 17)

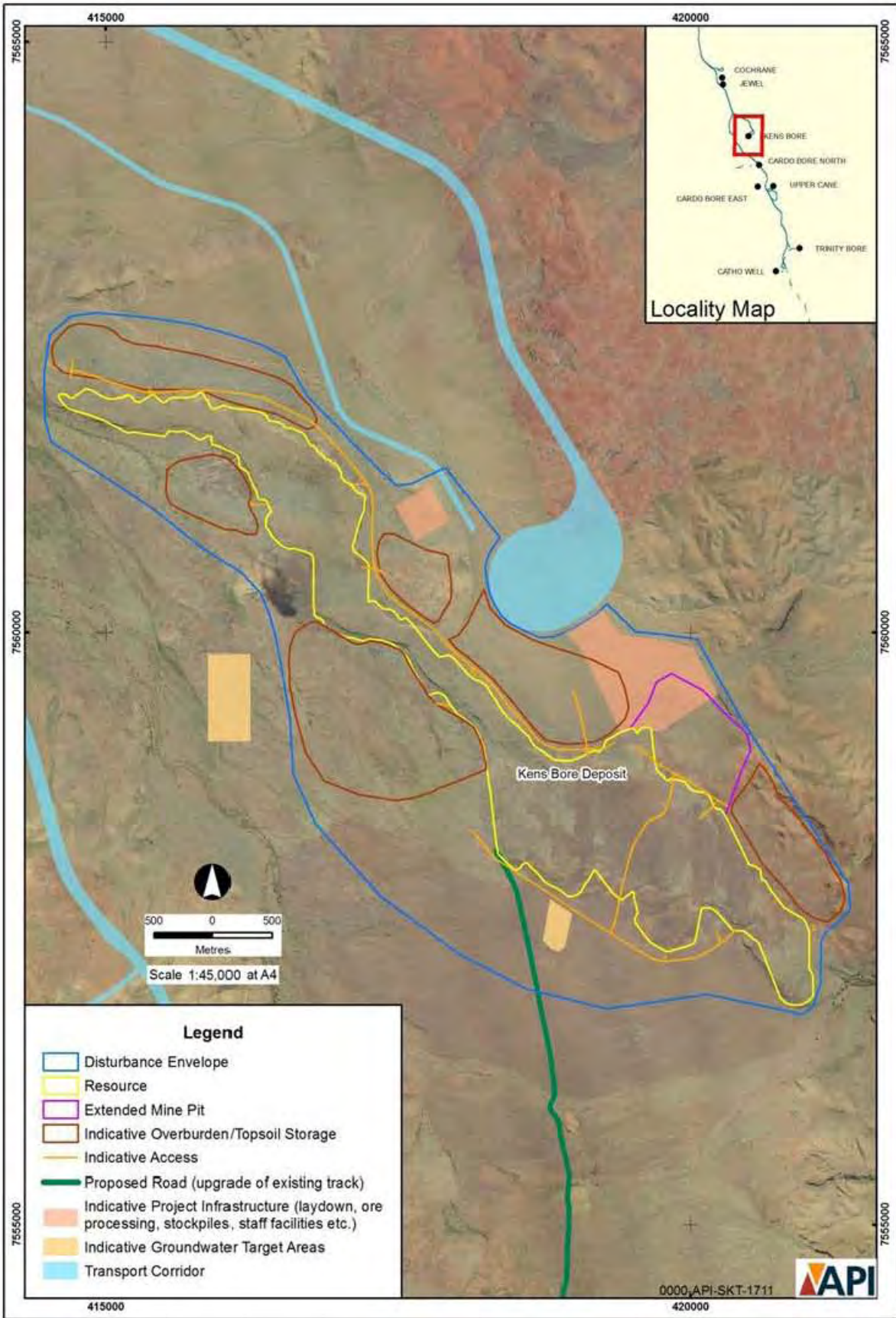


Figure 2.2 Expansion to the proposed mine pit at the Kens Bore deposit.

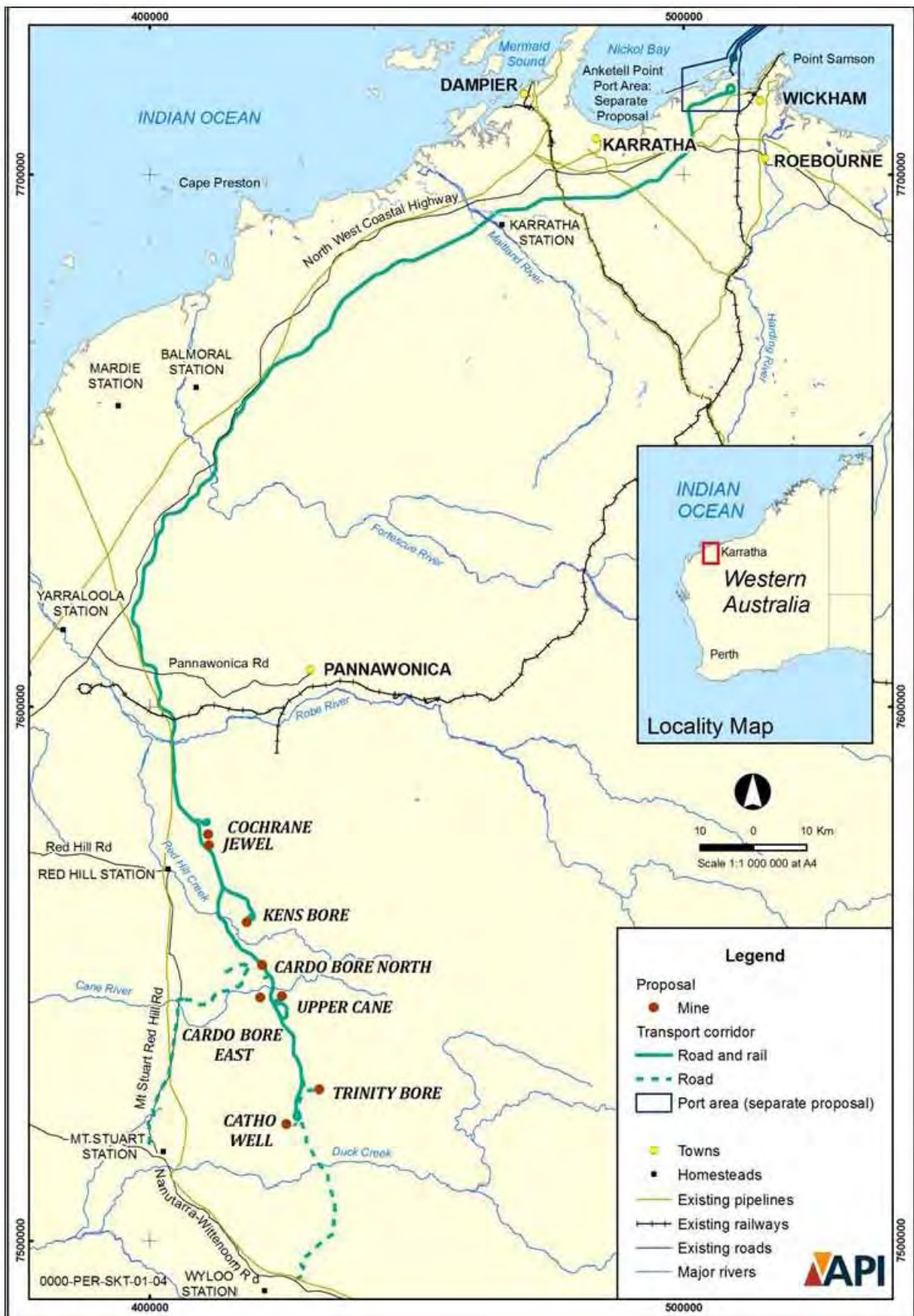


Figure 2.3 Proposed access to the mine area: Mt Stuart Red Hill Road (existing) and access road south of Catho Well

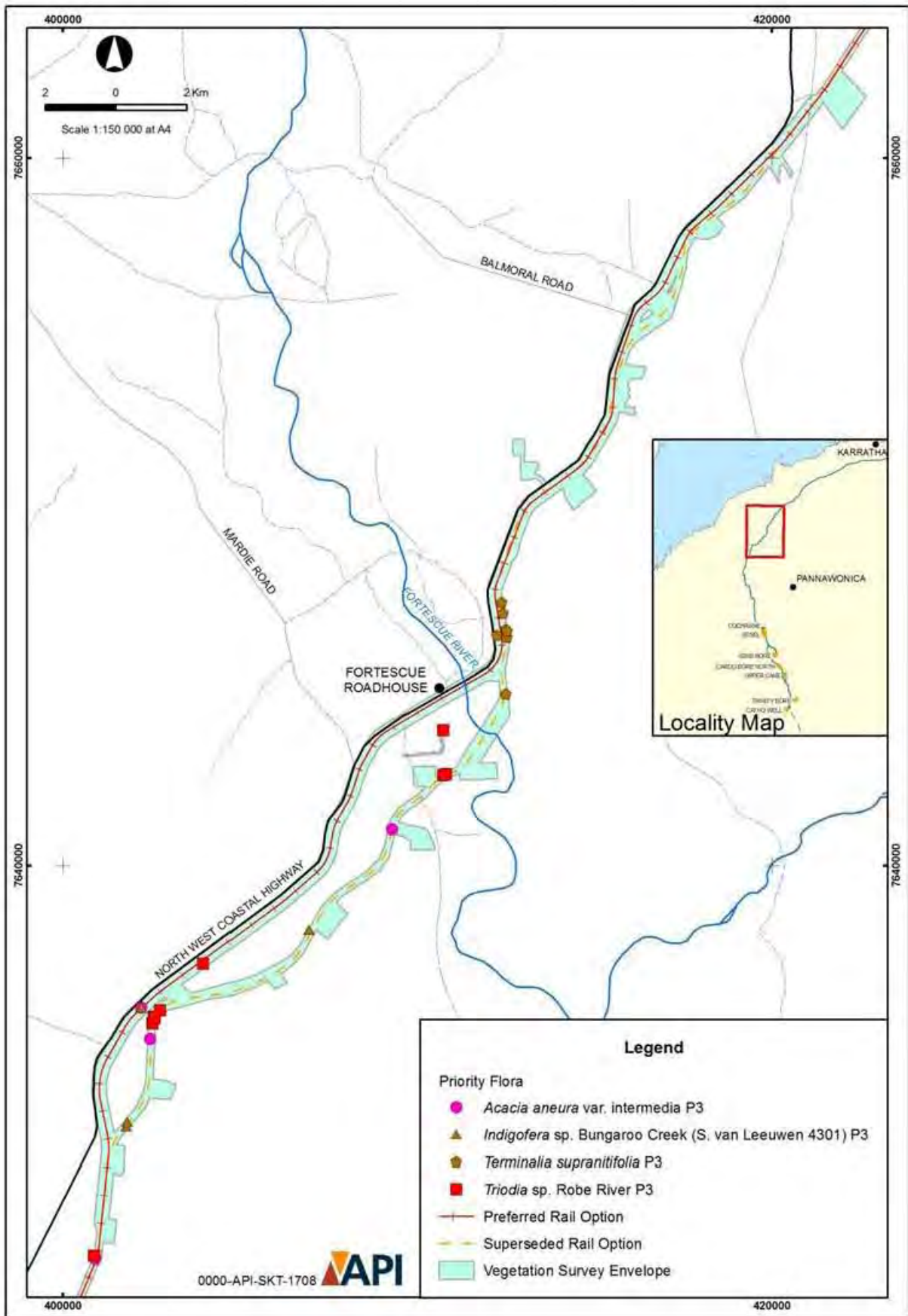


Figure 2.4 Alternative (now preferred) alignment for part of the Transport Corridor presented in the PER

2.7 KEY CHARACTERISTICS – CHANGES

Project description changes or confirmation of alternatives presented in the PER have an overall net benefit on the environmental disturbance footprint and have a minor influence on the key characteristics of the Proposal. Table 2.1 presents the key characteristics of the Proposal as stated in the PER (PER, Section 2.1, p 9) along with confirmation of its change status.

Table 2.1 Key characteristics of the Proposal

| Component | Description | Changes |
|--------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mine area | | |
| Iron ore resource | Approximately 500 Mt of pisolitic hematite within eight deposits | No change |
| Mine life | 15 to 20 years | No change |
| Overburden & interburden | Stockpiled out of pit with some in pit placement | No change |
| Processing | Crushing, grinding and screening of ore | No change |
| Quarry | Directly north of Cardo Bore East and Upper Cane deposits. Smaller borrow sites may also be located in the mine area. | No change |
| Transport (non-rail) | Haul trucks from mine face to processing plant along haul roads, and conveyors from processing plant to rail loadout areas | Haul trucks from mine face to Central Processing Facility (CPF) for the central resource areas (Kens Bore, Cardo Bore North, Cardo Bore East and Upper Cane). Haul trucks from mine face to shuttle train that then transfers ore to CPF for the northern (Cochrane and Jewel) and southern (Trinity and Catho Well) resource areas. |
| Groundwater supply and abstraction, including pit dewatering | Water supply, which will deliver up to 5 GLpa, is largely based on excess water from mine pit dewatering at Kens Bore and Cardo Bore East deposits (channel iron deposit aquifers). Site production bores in proven aquifers will provide additional water, as required. | No change |
| Discharge of excess water | No more than, on average, 1.5 GLpa | No change |
| Power | Approximately 20 to 30 MW per annum, from gas and diesel-fired onsite generators in a power station | No change |
| Natural gas pipeline | 20 km between the power station and the Goldfields Gas Transmission Pipeline, including an access road | No change |
| Accommodation (mine) | Permanent village at mine site | No change |
| Airstrip | Approximately 2 km airstrip will receive B717 aircraft (100 seats) or equivalent, 3 times daily on average. | No change |
| Direct vegetation disturbance from clearing | Not more than 4,970 ha for mine pits, overburden landforms and quarry within mine area disturbance envelopes: mine infrastructure, including service roads, accommodation and administrative buildings and airstrip; and utilities, including gas pipeline and transmission towers | No change. (disturbance redistributed within previous identified disturbance envelope) |
| Indirect vegetation disturbance from dewatering | Not more than 125 ha of high and medium to high groundwater dependent vegetation may be impacted from the mine pit dewatering aspects of the Proposal at Kens Bore and Cardo Bore East resource areas. | No change |

| Component | Description | Changes |
|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Transport corridor | | |
| Width | Variable, averaging 100 m (does not include provision for bridges, borrow pits, marshalling yards and construction camps) | No change |
| Overall length | About 285 km (rail corridor) and 40 km (southern access road) | No change |
| Water supply for rail construction | Up to 7 GLpa over about a two-year period | No change |
| Accommodation (construction) | Temporary construction camps at various locations along the corridor, including service roads | No change |
| Direct vegetation disturbance from clearing | Not more than 4,800 ha for transport facilities, including railway, major roads (rail access road and southern access road), borrow pits, laydown areas and construction camps | Not more than 4,550 ha for transport facilities, including railway, major roads (rail access road and southern access road), borrow pits, laydown areas and construction camps |
| Indirect vegetation disturbance from sheetflow shadow | Approximately 200 ha of vegetation considered to be highly reliant on surface water sheetflow may be impacted by the establishment of the transport corridor | No change |

PART 2: RESPONSE TO ISSUES RAISED

3 Water management

3.1 GROUNDWATER

3.1.1 Dewatering impacts on communities at Red Hill Creek

Submissions

Submission item 2.11: The area of vegetation to be affected by dewatering at Red Hill Creek near Kens Bore to be documented in the PER and appropriately managed.

Submission item 2.12: That the proponent characterises the ecological communities of Red Hill Creek, delineates the extent of groundwater dependent vegetation and identifies the values (i.e. significant mature tree stands) that warrant protection during the dewatering operations.

Response

The area of vegetation at Red Hill Creek predicted to be affected by dewatering part of the Kens Bore deposit is described on page 183 and 184 of the PER. The communities along Red Hill Creek have been characterised and groundwater dependent vegetation delineated in the PER (PER, Section 13.2.2, Figure 13.6 and Supporting Study 13.4). Table 13.6 (PER, p 183) presents the area of vegetation relative to predicted drawdown around the Kens Bore deposit. Figure 13.12 (PER, p 184) depicts the groundwater dependent vegetation and predicted drawdown contours at the Kens Bore deposit.

The vegetation along Red Hill Creek is characterised as a high dependency base flow groundwater dependent ecosystem, based on ephemeral water bodies in the area (PER, Section 13.3.2, p 188). This type of vegetation is characteristic of wide open major creek systems that consist of mature *Eucalyptus camaldulensis* and *E. victrix* with moderately dense *Acacia* spp. with *Triodia* spp. and *Cyperus vaginata*.

Within the predicted groundwater drawdown around the Kens Bore deposit, 125ha of vegetation on Red Hill Creek is considered to have a High level of dependency on groundwater. Of this vegetation, 41ha (32%) is predicted to experience groundwater drawdown less than 5m. A total of 60ha (48%) and 24ha (19%) will experience a drawdown of 5-10m and 10-15m respectively.

The areas of Medium and High groundwater dependency depicted in Figure 13.12 of the PER (PER, p 184) are a focus of management strategies. Investigations are planned to understand the underlying soil and subsoil strata and groundwater conditions. Groundwater recharge using surplus water from dewatering to reduce drawdown in these areas will be investigated. Potential contingency management strategies to be investigated in the years prior to orebody dewatering include:

- Recharge of the surface aquifer in the vicinity of the higher value riparian vegetation by discharge of water to the existing drainage channels as a rate less than the infiltration rate (i.e. no prolonged ponding).
- Re-injection of excess water into bores that are connected to the underlying aquifer.

3.1.2 Discharge of excess water

Submissions

Submission item 2.13: Proposed actions and commitments relating to excess water are unclear.

Submission item 2.14: Recommendation 9: Given that the PER does not have a clear strategy for the management of excess water from dewatering, the Water Management Plan (which is not included as part of the PER) be developed in consultation with the Department of Water and DEC. It is recommended that the management plan includes a strategy for managing dewatering and excess water issues, as well as contingencies in the event that dewatering requirements exceed current predictions. Sharing of water between mine sites is an important strategy for inclusion in the Water Management Plan and adoption if possible to minimise impacts of dewatering and discharge.

Submission item 2.15: If discharge to creeklines is to be included in the range of options that may be employed as part of this proposal, an effective process be developed to determine suitable discharge locations to avoid and minimise environmental impacts, in consultation with DEC. Any discharges to creeklines be to those supporting groundwater dependent vegetation and the design of the discharge scheme be such that water is delivered through a subsurface irrigation system with numerous outlets.

Submission item 2.17: Impacts on vegetation as a result of surface water discharge do not appear to have been assessed in the PER.

Submission item 2.18: If discharge of excess water to creeklines is included as a possible water management option, a full assessment of the conservation and ecological impacts of discharge be undertaken prior to its approval.

Submission item 2.19: This issue is not addressed in the PER. Discharging excess water to natural creeks has the potential to significantly alter the riparian ecosystem through the permanent addition of water to a typically ephemeral environment, resulting in the proliferation of species (notably weeds) that respond well to additional water, and the decline of plants that are not adapted to a more permanent water source. When discharge ceases, there is potential for further change to the community as species adapt back to an ephemeral environment. In order to avoid such impacts, as mentioned above, alternative measures should be considered in preference to the discharge of excess water to creeks, such as sharing water between sites. If the option of discharging to creeks is retained, it is recommended that the proponent ensures that receiving creeks are of a sufficient size and support groundwater dependent vegetation (e.g. river gums, coolabah).

Submission 10.02: No discussion on the impacts of discharge of excess water to the creeks. The predicted drawdown contours at Kens Bore indicate drawdown within Redhill Creek. This area supports a rich groundwater dependant vegetation community and has important indigenous cultural values. Uncertainty exists with regards to modelling in this area.

Response

Hydrological investigations and groundwater modelling have indicated that the environmental risk associated with the dewatering of parts of the Kens Bore and Cardo Bore East deposits is low, and manageable. The water table is not encountered by mining until 2019, around 6 years after the commencement of mining, which provides significant opportunity to gather extensive empirical data on which to develop and test a Water Management Plan (PER, Table 8.4, p 111). This includes evaluation of techniques for the disposal of excess water. For this reason there is little merit in prescribing in detail water management actions in the PER, which may prove in time, to be sub-optimal.

The strategy to manage water produced in orebody dewatering and production that exceeds water use requirements in order of priority is articulated in the PER (PER, Table 8.4, page 111). This strategy and management options includes:

- Maximise consumption for dust suppression and processing. This will include the pumping of water 6km to the 'Central Processing Facility';
- Transfer of water to nearby operations;
- Evaluation of potential to discharge to completed mine pits;
- Evaluation of potential to discharge to groundwater via galleries that intercept subsurface strata with high permeability;
- Evaluation of potential to discharge to stream beds, to mitigate drawdown in the vicinity of groundwater dependent vegetation, and undertaken in a way so that the ephemeral nature of local watercourses (i.e. Red Hill Creek) is maintained.
- A combination of all of the above as management methods.

Proposed actions and commitments relating to potential excess water are discussed in Section 8.3 (PER, p 109) and are summarised in Table 8.4 (PER, p 110), with the residual environmental risk level as a result of this factor (PER, Table 8.5, p 112) determined to be 'Low' after the proposed risk treatments outlined in Table 8.4 are taken into account.

As stated in the PER, API will prepare and implement a Water Management Plan to optimise water management, incorporating an operating strategy and quantity and quality monitoring programme. Where practicable, API will match the operational water requirement with the volume produced by pit dewatering.

The Water Management Plan will be developed in consultation with the Department of Water and be supported by the studies to be completed, and made possible, by the aquifer abstraction in the early years of mining operations.

As shown in Table 2.2 (PER, p 20), there is the potential for requirement to discharge surplus pit dewatering water to a maximum of 1.5 GLpa when Kens Bore and Cardo Bore East are being dewatered at the maximum rate.

Regulatory approval for abstraction of groundwater will be addressed through the application for a 5C licence under the *Rights in Water and Irrigation Act 1914* from the Department of Water. The discharge of excess water from mine pit dewatering will be subject to a licence to dewater under Part V of the *Environmental Protection Act 1986* (EP Act, Scheduled Premises – Category 06 Mine Dewatering) to be obtained from the Department of Environment and Conservation. Both licences will be applied for based on a Water Management Plan for the proposal, and provide opportunity for review of the detailed management actions developed through investigations and in consultation with these agencies.

3.1.3 Discharge to the Robe River

Submission

Submission item 2.16: If large quantities of water are required for discharge, this water be piped to the Robe River where Rio Tinto has been discharging for many years and the ecology of the system has already been altered. Alternatively the proponent may consider reinjection into the CID downstream of the mine operation.

Response

Studies have indicated the required abstraction volumes for dewatering are at least an order of magnitude less than at other mine sites in the Pilbara. After the maximisation of consumption in operations, a pipeline to discharge surplus water 30km to the Robe River is very unlikely to be warranted or justified. Surplus water is best utilised to mitigate the effects of local groundwater drawdown, if this can be achieved without substantial 'side effects' for the local ecology (e.g. such as artificial surface/watercourse inundation).

The alternative suggested is not feasible given the distance between API's mine site and the Robe River. API will transfer water 6km from the dewatering area to supply process water to the central ore processing facility, and may, subject to improved certainty on volumes and feasibility investigations, pipe water further afield to supply other parts of the project.

API will continue to evaluate the feasibility of discharging surplus water into the channel iron deposit downstream of mining operations as part of developing the Water Management Plan. This could be achieved through reinjection or discharge to completed mine pits.

3.1.4 Mine pit lakes

Submissions

Submission item 3.01: DEC considers that the risk of mining causing environmental harm is greatest at the deposits where dewatering will be required, and where pit lakes will be formed in the mined areas after mining has ceased. This is because there is a significant risk that lowering of the water table, caused by dewatering, will trigger oxidation of aquifer sediments and the release of metals and metalloids into groundwater. After dewatering has ceased, contaminated groundwater could continue to discharge into pit lakes where metal and metalloid concentrations may be further concentrated by evaporation from the lakes, and pose a risk to the health of wildlife populations that may use the lakes as sources of food or water.

Submission item 3.02: Although this risk is typically highest when acidic conditions are produced by mine dewatering, recent international literature indicates that concentrations of some elements can reach high concentrations in water in mining environments, even when groundwater has near-neutral or alkaline pH values. In particular, metalloids like selenium can reach high concentrations in water due to evaporative concentration at some mines sites, and can cause significant impacts to bird populations that use water bodies affected by groundwater discharge from these sites.

Submission item 3.03: The risk that mining at the Ken's Bore and Cardo Bore East deposits will cause adverse changes to groundwater and pit lake quality at these sites has not been assessed in the PER. DEC recommends that representative rock materials from below the water tables at these sites are subject to appropriate kinetic leaching tests to determine the changes that are likely to take place in groundwater as a result of mine dewatering.

Submission item 3.04: DEC also recommends that geochemical modelling is undertaken to determine how the concentrations of potentially harmful chemical constituents in groundwater will change over time with discharge to, and evaporative concentration within, pit lakes. This information will help determine whether these lakes are likely to cause adverse impacts on wildlife health and, if necessary, to develop management strategies to minimise these impacts.

Response

API has made the commitment to backfill mine pits to above the post-mining groundwater level at the resource areas where dewatering is required (Cardo Bore East and Kens Bore deposits) to avoid exposed groundwater (PER, Section 8.3.2, p 110 and Section 24.5.4, p 288). As a result of this commitment, no pit lakes will remain post mining and there is no risk of associated impacts such as metal and metalloid contamination.

Geochemical assessments of the materials within the orebodies are summarised at pp 288 to 289 of the PER. The materials are classified as non-acid forming and have metal and metalloid concentrations well within National Environmental Protection Council health based guideline criteria for soils. The risk of metal mobilisation is considered negligible. These assessments are consistent with the geological history of the palaeochannel deposits.

3.1.5 Water quality management

Submission

Submission item 5.04: The proponent should comply with the Australian Drinking Water Guideline 2004, establish drinking water quality reporting procedures with WA Health, establish a Drinking Water Quality Management Plan for each site with a water treatment plant (or storage tanks) including the temporary construction camps, establish a Drinking Water Quality Management Plan for each site with a water treatment plant (or storage tanks) including the temporary construction camp.

Response

API will comply with all regulatory requirements with regards to the provision of potable water.

3.2 WASTE WATER

3.2.1 Water management

Submission

Submission item 5.05: Wastewater to be managed under the Health (Treatment of Sewage and Disposal of Effluent and Liquid Wastes) Regulations and in accordance with the (draft) Guidelines for the Use of Recycled Water in Western Australia April 2009.

Response

API will comply with all regulatory requirements with regards to waste water management. This will include obtaining a Part V licence under the EP Act, and approvals from Local Government and Department of Health as appropriate.

3.2.2 Waste water treatment

Submission

Submission item 5.06: Part 5, Section 34 Rehabilitation and Closure, of the PER, refers to recoverable materials being sold or recycled when the sites are eventually closed. Consideration must be given to the hygienic handling and disinfection of any materials used in wastewater treatment or disposal. The proponent should also consider how residual sewage treatment by-products in Wastewater Treatment Plants will be disposed of and how waste water ponds (if any) will be decommissioned. The decommissioning processes for the temporary construction camps should also be addressed.

Response

API considers these matters are readily managed and will attend to them in closure plans and in the decommissioning of temporary construction camps in accordance with all regulatory requirements.

3.3 WATER MANAGEMENT PLANNING

3.3.1 Development of a Water Management Plan

Submission

Submission item 10.01: The department would expect that a Water Management Plan be produced to address potential impacts, and should include: life of mine water balance, construction and operating water requirements; Monitoring approach; review and improvement mechanisms to show how monitoring results will be used to improve water management; an updated groundwater model; water use efficiency strategies, contingency responses for impacts on GDEs, discharge strategies; and recognition and management of impacts on other users.

Response

API has committed to the development and implementation of a Water Management Plan to optimise water management and incorporating an operating strategy and quality monitoring programme (PER, Section 8.3.2, p 110). The Water Management Plan will address the matters raised in this submission. The Water Management Plan is also driven by core secondary approvals related to water abstraction licences from Department of Water under the *Rights in Water and Irrigation Act 1914* (RIWI Act) and dewatering covered under Part V of the EP Act in respect to a premises licence (Scheduled Premises – Category 06 Mine Dewatering). These secondary approvals include the requirement to produce annual and triennial aquifer reviews under the RIWI Act and provide water quality and management information under the Annual Environmental Reporting and compliance obligations as part of the premises licensing under Part V of the EP Act.

4 Fauna

4.1 TROGLOFAUNA

4.1.1 Extent and quality of habitat type

Submissions

Submission item 1.07: Long term certainty about the amount of habitat needing to be retained post-mining is questionable. Although the supporting study 7.1 indicates that troglofauna communities can be sustained in significantly less post-mining habitat than that proposed to be left in the Kens Bore palaeodrainage system, there are no data presented on how long this fauna which has survived 10 years post-mining will continue to survive. The issue of attrition over time has not been considered. The precautionary principle should require the retention of a significant area of habitat where there are known restricted species.

Submission item 2.01: The potential for major variability in the type and quality of troglofauna habitat within palaeochannel habitat areas (particularly at Kens Bore and Upper Cane deposits) is not adequately addressed in the risk assessment. Based on currently available information, the current mine pit design at this deposit poses an apparent high risk to conservation of some troglofauna species

Submission item 2.02: The proponent addresses uncertainties regarding the extent and quality of troglofauna habitat by providing greater detail on the information used in habitat modelling (i.e. drill core information). The proponent to demonstrate more conclusively that suitable volumes and types of troglofauna habitat, comparable to areas proposed for mining, exist throughout the proposed remnant Channel Iron Deposit (CID). Specifically, the proponent to investigate and report to the EPA on the vertical and horizontal distribution of troglofauna within the CID, to enable assessment of the various grades of habitat quality within the CID prior to approval of mining at Kens Bore and Upper Cane. In order for DEC to assess and provide advice on the extent of habitat which should be maintained at Kens Bore and Upper Cane, information on the three dimensional distribution of habitat types be provided.

Response

There is little data available in this emerging field with which to predict long term persistence of troglobitic species, which would rely on extended studies of population dynamics, or at least very long periods of post mining monitoring of species persistence in remnant habitats.

The PER reports two examples of troglofauna communities existing in remnant habitat over ten (Mesa K) and twenty (Mesa 2402E) years after the cessation of mining (Table 7.14, p 99). Based on terrestrial schizomid (Rowland 1972) and pseudoscorpion life cycles, these periods post mining could provide for approximately 3-4 generations (10 years) and 6-8 generations (20 years). The inference of multiple, successive generations post mining suggests a capacity of the remnant habitat to sustain troglofauna populations. In both examples, the remnant habitat is at the most 10 – 15 % of the volume of habitat proposed to be retained at the Kens Bore Habitat Unit.

Further troglofauna and geological data has been obtained since the release of the PER. Ongoing troglofauna sampling (Phase 9) and geological mapping has extended the habitat boundaries in the estimation of the volume of troglofauna habitat. Phase nine sampling recorded troglofauna species to the north west beyond the existing, conservatively adopted habitat boundaries for the Kens Bore Habitat Unit. One troglofauna specimen recorded from a buried section of palaeochannel formation (i.e. no surface expression) groups with *Paradraculoides* sp. 'cochrana' and two other specimens were *Polenixidae* sp. 'A' which have been recorded broadly across the mine area. On the basis of this additional data and further geological mapping, API has re-evaluated the extent of habitat for the Kens Bore Habitat Unit. Figure 4.1 presents the original extent of habitat and Figure 4.2 depicts the extended boundaries to the Kens Bore Habitat Unit in the context of the expanded mine pit. The prospect of extending the conservatively adopted boundaries for the Kens Bore Habitat Unit was indicated in the PER (Table 7.9, p 82). The updated analysis of impact to troglofauna habitat is presented in Table 4.1, below. Table 4.2 presents the revised analysis for the area of undisturbed surface within the habitat unit.

Overall there has been an increase in the proposed mine pit volume of approximately 14 million m³ (above water table) and an increase in the volume of estimated troglofauna habitat of approximately 94 million m³. On this basis, the proportion of undisturbed, retained habitat is now estimated to be 54%. Similarly, the proportion of undisturbed ground surface overlying troglofauna habitat is now estimated to be 60%, up from 38% in the PER (PER, Table 7.10, p 83).

In light of this assessment, API has revised its target, with respect to troglofauna management for the Kens Bore complex (PER, Table 7.11, p 95) to "Retain a minimum of 50% (formerly 35%) of the channel iron deposits (potential troglofauna habitat) in the Kens Bore palaeodrainage system." This is now consistent with the target for each of the other habitat complexes adopted in the mine area.

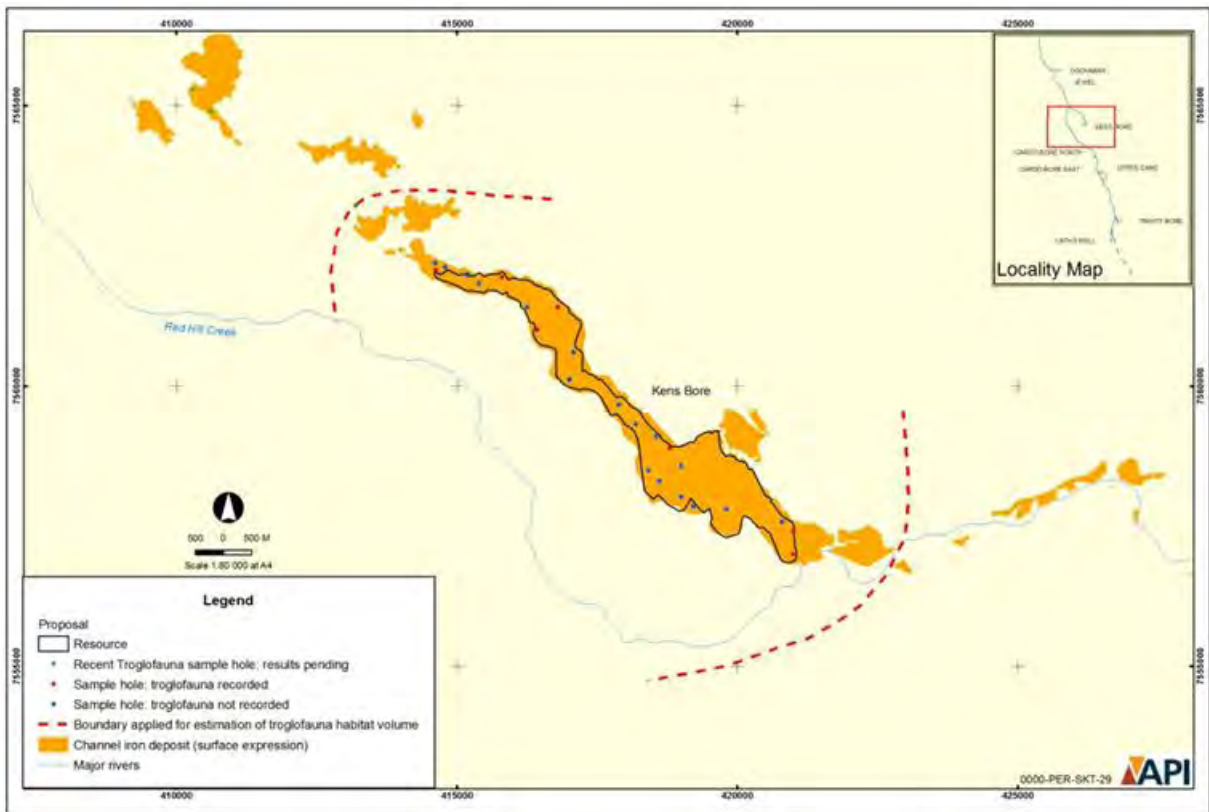


Figure 4.1 Extent of Kens Bore habitat unit and proposed mine pit as defined in the PER.

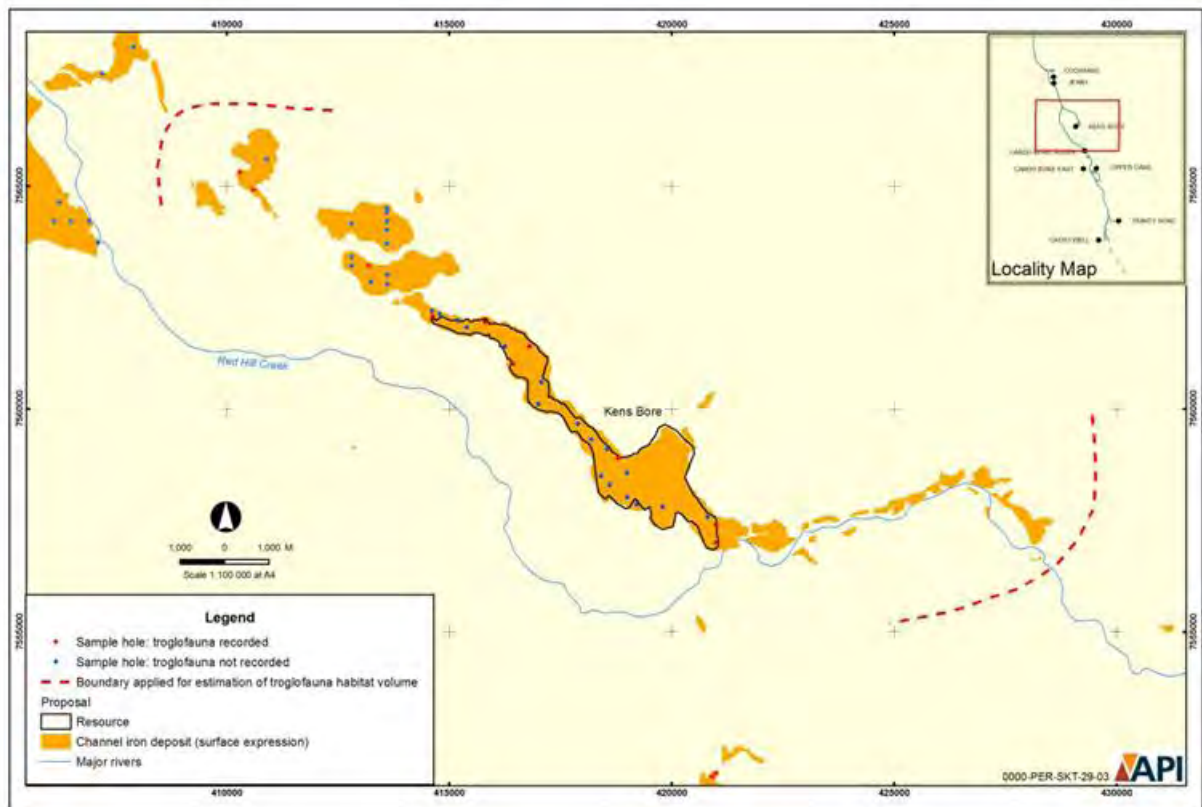


Figure 4.2 Revised boundaries of Kens Bore habitat unit and proposed mine pit for troglofauna habitat assessment.

Table 4.1 Kens Bore habitat unit updated troglofauna habitat assessment (volume)

| Project details | Kens Bore Complex (June 2010) million m ³ | Kens Bore Complex (October 2010) million m ³ |
|----------------------------------------------|---------------------------------------------------------|------------------------------------------------------------|
| Mine pit volume | 160 | 186 |
| Mine pit volume above water table | 116 | 130 |
| Total volume of mapped CID above water table | 178 | 282 |
| Total volume of CID remaining post mining | 62 | 152 |
| Proportion of CID remaining (%) | 35% | 54% |

Table 4.2 Kens Bore habitat unit updated troglofauna habitat assessment (surface area)

| Project details | Kens Bore Complex (June 2010) | Kens Bore Complex (October 2010) |
|----------------------------------------------------------------------------|-------------------------------|----------------------------------|
| Modelled CID surface area within the Kens Bore complex (ha) | 800 | 1360 |
| CID surface expression within pit (ha) | 495 | 550 |
| Undisturbed surface area of potential troglofauna habitat post mining (ha) | 305 | 810 |
| Proportion of CID remaining (%) | 38% | 60% |

API considers that the retention of at least 150 million m³ of troglofauna habitat (over 20 times the volume of remnant Mesa K habitat) constitutes a significant volume of habitat and is reflective of a precautionary approach to the retention of habitat.

In the case of Mesa K, sampling completed between 2004 and 2007, discovered 10 taxa from seven orders endemic to Mesa K (EPA, 2008). The abundance and diversity of troglobitic species in this remnant habitat is comparable to undisturbed troglofauna communities (Mesa A) and the five habitat units described in the PER (Table 7.14, p 99). It was noted that more troglofauna were recorded from historically disturbed areas than from relatively undisturbed areas (EPA, 2008).

The retention of troglofauna habitat at least an order of magnitude greater than the volume and surface area of remnant post mining habitat in which representative troglofauna assemblages have been recorded over ten years post mining suggest the risk to the sustainability of troglofauna communities posed by the proposal is low.

The troglofauna research programme proposed by API (PER, Table 7.12) will contribute data and information relevant to investigating the long term persistence of troglofauna communities in remnant post mining landforms.

Variability in habitat type (items 2.01 and 2.02)

The geological stratigraphy of the channel iron deposits (CID) was modelled using data from over 3,000 drill holes (PER, p 182). Over 2,000 troglofauna samples were used to evaluate the vertical and horizontal distribution of troglofauna and the results reported against mineralogical units in Table 7.8 (PER, p 81). A number of winzes (vertical shafts) in each orebody were logged to assist in characterising the mineralogical strata (PER, p 79). API has conservatively, defined the distribution of potential troglofauna habitat to the greatest extent practicable given the available data.

It is clear from drill cores, drill logs and winze inspections that at least three of the mineralogical strata (hardcap, hard zone and mixed zone exhibit the void space and 'vugginess' necessary to host troglofauna. It is also clear that, while the exploration drill holes increase the vertical mobility of troglofauna, appropriate humidity levels occur throughout the majority of these strata (as evidenced by the range of positive records).

Many hundreds of figures presenting cross sections of mineralogical, geological and troglofauna data have been produced at 100 m intervals across the orebodies that have then been interrogated. The cross-sections present the location of positive troglofauna records in relation to existing topography, the indicative mine pit, mineralogy, lithology and the water table (Appendix 2). These cross-sectional figures were tabled and the level of investigation discussed at a meeting with the Department of the Environment and Conservation on April 1 2010. Illustrative plan and cross sections depicting the shape, volume and mineralogy of remnant habitat were presented in Figures 7.8 to 7.14 of the PER (PER, p 88 to 94). Figure 4.3 of this report provides an oblique, three dimensional view of the proposed mining and remaining habitat for the Upper Cane, Cardo Bore East and Cardo Bore North habitat complex.

In spite of the intensive sampling, the degree and distribution of interconnected voids within channel iron formations is not readily quantified (PER, p 98). There is no feasible, practicable way of meaningfully defining the distribution of relative qualities, or precise quantities of habitat. The extent of the hardcap, hard zone and mixed zone remain the most appropriate measure of habitat.

API considers the analysis presented in the PER is the best available and most appropriate assessment of retained habitat. This analysis reports the retention of at least 50% of suitable habitat within each habitat unit, with the exception of the Kens Bore habitat unit which was reported at 38% and is now updated to greater than 50% based on the most recent available field data.

The approach taken to analysis of potential impacts to troglofauna due to this proposal is in accord with the risk based approach to impact assessment adopted in this PER.

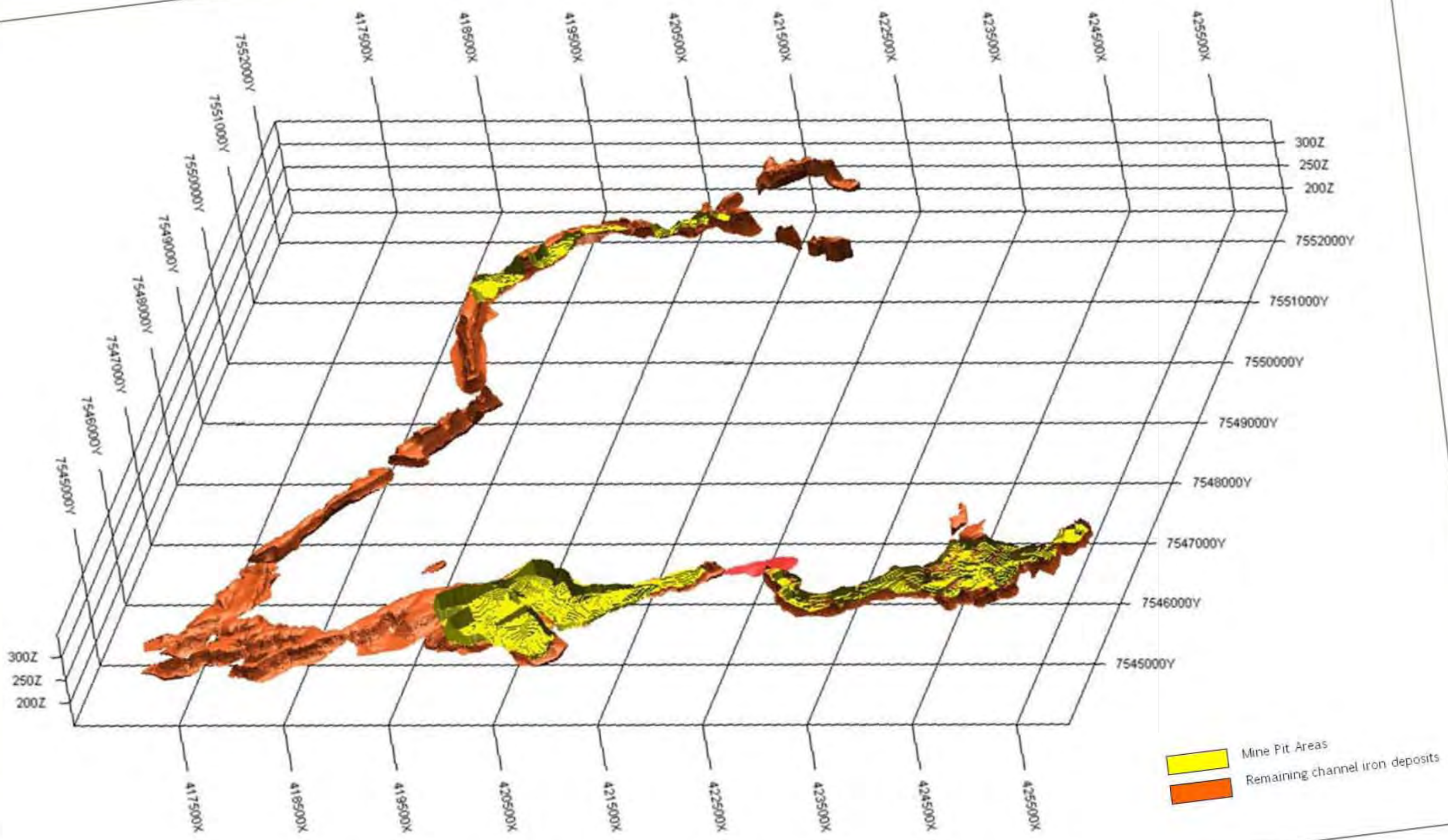


Figure 4.3 Three dimensional view of channel iron deposit habitat with the areas proposed to be mined in the Upper Cane, Cardo Bore North and Cardo Bore East habitat complex.

4.1.2 Estimations of habitat and risk

Submissions

Submission item 2.05: That the residual risk scores for troglofauna habitat and pit dimensions to address residual risk be revised on the basis of more realistic estimations of the troglofauna habitat based on known variations in habitat quality and potential edge effects.

Submission item 2.06: If the estimated extent of troglofauna habitat cannot be better justified based on empirical data, the proponent, in consultation with DEC, modifies the currently proposed pit boundaries at the Kens Bore and Upper Cane deposits to provide an appropriately conservative amount of comparable troglofauna habitat that will minimise the potential risk of species extinction.

Submission item 2.07: Following the initial provision for troglofauna conservation to address risk and uncertainty as recommended here, it may be possible to apply a staged mining approach at Kens Bore (with an emphasis on full profile habitat retention), with further mining being approved when there is additional information on troglofauna habitat distribution and potential risks associated with mining. It is recommended that the proposed methodology for obtaining this information be presented within a Troglofauna Monitoring and Management Plan which is agreed to by the OEPA and DEC.

Response

Residual risk scores (item 2.05)

As detailed in the response (Section 4.1.1 of this report) under item 2.01 above, the assessment of troglofauna habitat is as realistic as practicably possible and API considers any finer assessment beyond the limitations of available, or obtainable data would present an 'unreal assessment'. The limitations to the definition and quantification of troglofauna habitat are discussed within the PER. The assessment of risk to troglofauna was based on the proportional loss of habitat (PER Table 6.11, p 63 and Table 7.13, pp 97 to 98). The same errors that apply to the definition of the pre-mining troglofauna habitat also apply to the definition of remnant habitat. That is, while the absolute volumes of the estimated habitat may vary, the proportional loss of habitat is only marginally affected. Examples of this, based on internal studies, are discussed below.

Clay lens study:

A study of the influence of clay lenses on the proportional loss of troglofauna habitat at the Kens Bore resource area concluded that after the removal of the estimated clay lenses from within the pre-disturbed habitat and the post-mining habitat the proportional loss of habitat was unchanged.

Standing water level surface study:

An analysis was undertaken to determine how sensitive the estimated volume of troglofauna habitat was to fluctuating groundwater levels.

A standing water level (SWL) surface was created to calculate the volume of troglofauna habitat (i.e. volume of channel iron deposit above the water table). The SWL surface was based on data from water bores (both production and monitoring bores) installed by API and resource drill holes that intercepted groundwater.

The analysis used the Kens Bore resource area as a case study. Results broadly indicate a 2% change in the volume of troglofauna habitat can be expected for every 1m change in standing water level. API adopted a maximum SWL (based on a data set of limited duration) for the estimation of troglofauna habitat. To date API has recorded seasonal variations in groundwater levels in the order of 3m.

Edge effect study:

The effect of a dry margin at the external surface of the channel iron deposit was examined to provide guidance on the sensitivity of the risk assessment to 'edge effects'. The outer 3m of the landform of the Upper Cane deposit, which is part of the Upper Cane - Cardo Bore Habitat Unit, was assumed to be too dry (through evaporation and transpiration) to support troglofauna. In this instance the proportional loss of habitat (i.e. the measure by which the consequence of impact on troglofauna is rated) is unchanged (Table 4.3). This arises because the estimated volumes of pre-disturbance and remnant habitat reduce proportionately. The outcomes of this assessment for each habitat unit will depend, among other things on the geometry of the channel iron formation, the shape of the design mine pit and the assumed thickness of the dry margin. Overall the effect of these adjustments are within the margin of error and unlikely to make any material change to the risk assessment.

Table 4.3: Effect of assuming a 3m dry outer edge on proportional loss of troglofauna habitat

| | Upper Cane CID (million m ³) | Upper Cane deposit with a 3m dry upper margin (million m ³) | Difference (million m ³) |
|--------------------------------------|---------------------------------------------|-------------------------------------------------------------------------------|-----------------------------------------|
| 1. Mine pit volume (m ³) | 32.4 | 28.9 | 3.5 |
| 2. CID Volume (m ³) | 46.0 | 41.5 | 4.5 |
| 3. CID remaining (m ³) | 13.6 | 12.4 | 1.2 |
| 4. Proportion remaining (3÷2) | 30% | 30% | 0% |

Data used to estimate extent (item 2.06)

The estimated extent of troglofauna habitat is based on extensive empirical data (as discussed in Section 4.1.2). The nature and fine scale complexities of troglofauna habitat have not, and could not, be meaningfully incorporated into the analysis evaluating hundreds of millions of cubic metres of geological strata. The level of analysis and results is commensurate with the data sets and appropriate for a risk based environmental impact assessment.

A degree of conservatism (i.e. under estimation of the extent of pre-disturbance habitat) was applied to the analysis (PER, p 182). Subsequent to the publication of the PER additional troglofauna sampling and geological information has enabled extension of the Kens Bore Habitat Unit.

With at least 50% of estimated troglofauna habitat within each habitat unit retained, the risk of species extinction as a consequence of the proposal is low.

Troglofauna monitoring and management (item 2.07)

API applied a conservative approach to estimating the extent of troglofauna habitat (as discussed above). The most probable outcome of further monitoring and research, which API is committed to, is either confirmation of the adopted habitat extent or the identification of additional habitat beyond the boundaries adopted for the impact assessment. As a minimum of 50% of each habitat unit will be retained post mining, the EPA objective to “*maintain the abundance, diversity, geographic distribution and productivity of fauna at species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge*” will be met.

4.1.3 Risk treatment measures

Submission

Submission item 2.03: The effectiveness of proposed risk treatment measures for troglofauna has not been demonstrated and further protection measures need to be considered.

Response

API will implement a range of risk treatment measures to avoid, minimise, rectify and reduce potential impacts on troglofauna (PER, Section 7.3.3). The risk treatment measures described in the PER are consistent with industry standards, and in some instances surpass measures committed to at approved projects in Western Australia.

Many of the management measures, such as tight control of ground disturbance activities, blast management and hydrocarbon management are industry standard practices.

The undertaking by API to partially backfill mine pits and re-establish vegetation is a significant and genuine commitment to re-instate material in a manner that may provide for recolonisation by troglofauna, and will provide buffer material to protect undisturbed habitat. The effectiveness of these measures has not been demonstrated primarily because, to API’s knowledge, they have not been tested before. These are initiatives reasonably and responsibly proposed based on current limited understanding of troglofauna ecology. To improve understanding and knowledge, API has also committed to implement troglofauna research and monitoring programmes, which will contribute to evaluations of the effectiveness of mine pit backfilling and revegetation in re-establishing troglofauna habitat.

The assessment of risk of impact to troglofauna was based on the proportional loss of habitat (refer to the consequence measures PER Table 6.11). While listed as a risk treatment measure, the prospect of increasing post-mining troglofauna habitat through backfilling mine pits was not, due to the uncertainty, given any weight in the risk assessment (PER, p 98). As a minimum of 50% of each habitat unit will be retained post mining, the risk to troglofauna is low. Measures to re-instate habitat will not compromise the undisturbed habitat, but rather will protect the undisturbed habitat and may serve, if successful, to increase the overall habitat.

4.1.4 Avoidance of habitat

Submission

Submission item 2.04: That the proponent clarifies the degree to which avoidance of significant troglofauna habitat was considered and taken into account in mine planning and project design.

Response

API has sampled the channel iron deposits across the project area extensively. Interpreted in conjunction with an understanding of the geological characteristics of the pisolitic deposits, the sampling results suggest all the channel iron deposits are potential troglofauna habitat. Limitations to the distribution of troglofauna within the channel iron deposits include:

- outer exposed margins that may be too dry (though could be occupied during wet periods);
- channel iron deposit below the water table – recognising a natural seasonal variation in groundwater levels may also create a zone of channel iron formation that is seasonally inhabited; and
- strata with limited or no interconnected voids – such as clay bands. The moisture retaining properties of the clay may have a role in regulating microclimate conditions – in particular humidity levels in adjacent pisolitic material that are conducive to troglofauna habitation.

The mineable sections of the channel iron deposits are determined by numerous factors including iron grade, presence of deleterious elements and cost to extract. These factors are not determinants of the value or extent of troglofauna habitat. That is, there is no known correlation between troglofauna habitat and the economic ore within the channel iron deposits. As the proposed mining will remove less than 50% of the estimated volume of troglofauna habitat within each habitat complex and the volume of remaining habitat in each of the habitat units will range between 90 and 150 million cubic metres, no modification to mine pit design is considered warranted. API will continue to optimise pit design to minimise the volume of material mined to access the economic ore deposits.

4.1.5 Troglofauna sampling at the quarry

Submissions

Submission item 2.09: Survey for troglofauna has not been undertaken in the area identified for a quarry north of Cardo Bore East.

Submission item 2.10: That the proponent provides an assessment of the potential impact of the quarry on troglofauna using drill core information and troglofauna sampling where appropriate.

Response

Requirement for troglofauna surveys at the quarry and likelihood of the quarry supporting subterranean fauna (items 2.09 and 2.10)

The quarry will be used to provide competent rock material for construction aggregate and rail ballast. The site was selected on the basis of presence of a suitable rock type for this purpose.

The rock is dolerite (a basic sub-volcanic igneous rock) with the following characteristics: non-porous; fine-grained; holocrystalline; unweathered; hard; and strong (Geochempet Services, 2009).

All these characteristics indicate that the likelihood of the existence of interconnected void space that could support troglofauna is extremely low. In addition to the lack of voids, as the rock is non-porous, there is no ability for the downward percolation of water or nutrients into the formation, as is necessary to sustain troglofauna.

It is the very characteristics that render the rock suitable as a construction material, and therefore a nominated quarry site, that cause it to be highly unsuitable, if not impossible, for troglofauna to exist within it.

4.2 STYGOFUNA

4.2.1 Species found only within Kens Bore

Submissions

Submission item 2.20: The potential for wider distribution of the four stygofauna species found only within the Kens Bore impact area requires further clarification.

Submission item 2.21: That further information be provided regarding the potential for wider distribution of the single specimen stygofauna species recorded only within the impact area at Kens Bore.

Response

Four species of stygobitic fauna, *Hexabathynella* sp., *Pilbaracandona rosa*, *Guineaxonopsis* sp. (PSS) and *Pilbaraphreatoicus platyarthricus*, were recorded solely from the within the potential area of groundwater drawdown around the Kens Bore deposit during baseline surveys. The latter three species have been recorded outside of the Proposal area., and in the case of *P. rosa* (Karanovic 2007) and *P. platyarthricus* (Knott and Halse 1999), described from records outside of the proposal area. *P. rosa* and *Guineaxonopsis* sp. (PSS) were recorded during the Department of Environment and Conservation Pilbara Biological Surveys (Eberhard et al 2009). For example, the isopod species *P. platyarthricus* was originally recorded and described from Charlyarn (41 km north west of Kens Bore) and Nyeetberry (~ 36 km north east of Kens Bore) pools along the Fortescue River.

Taxonomy for the undescribed species *Hexabathynella* sp. is less well documented. Due to the current state of Bathynellacea taxonomy in Australia it is unlikely that this specimen will be resolved to species level in the near future. Within the north-west region of Australia, the genus has been recorded in the nearby Bungaroo Valley (~25 km north-east of Kens bore) and Barrow Island (~170 north-west) (J. Alexander, Biota, pers. comm. 13 September 2010).

The genus *Hexabathynella* displays few characteristics of short-range endemism usually associated with bathynellids (Camacho 2003). Indeed, this genus is the only bathynellacean taxon that occurs worldwide (Figure 4.5). The PER set out other reasons for considering that the taxon is not restricted to the Kens Bore area (PER, p137) including:

- 19 of the 20 species collected from the Kens Bore area have been recorded more widely within, or outside of the proposal area;
- three more widely distributed stygal taxa were recorded from the same sample bore; and
- overall patterns of stygofauna distribution do not indicate the presence of local small scale barriers or hydrogeological features that would limit this taxon to the Kens Bore area (this is consistent with the understanding of the local hydrogeology).

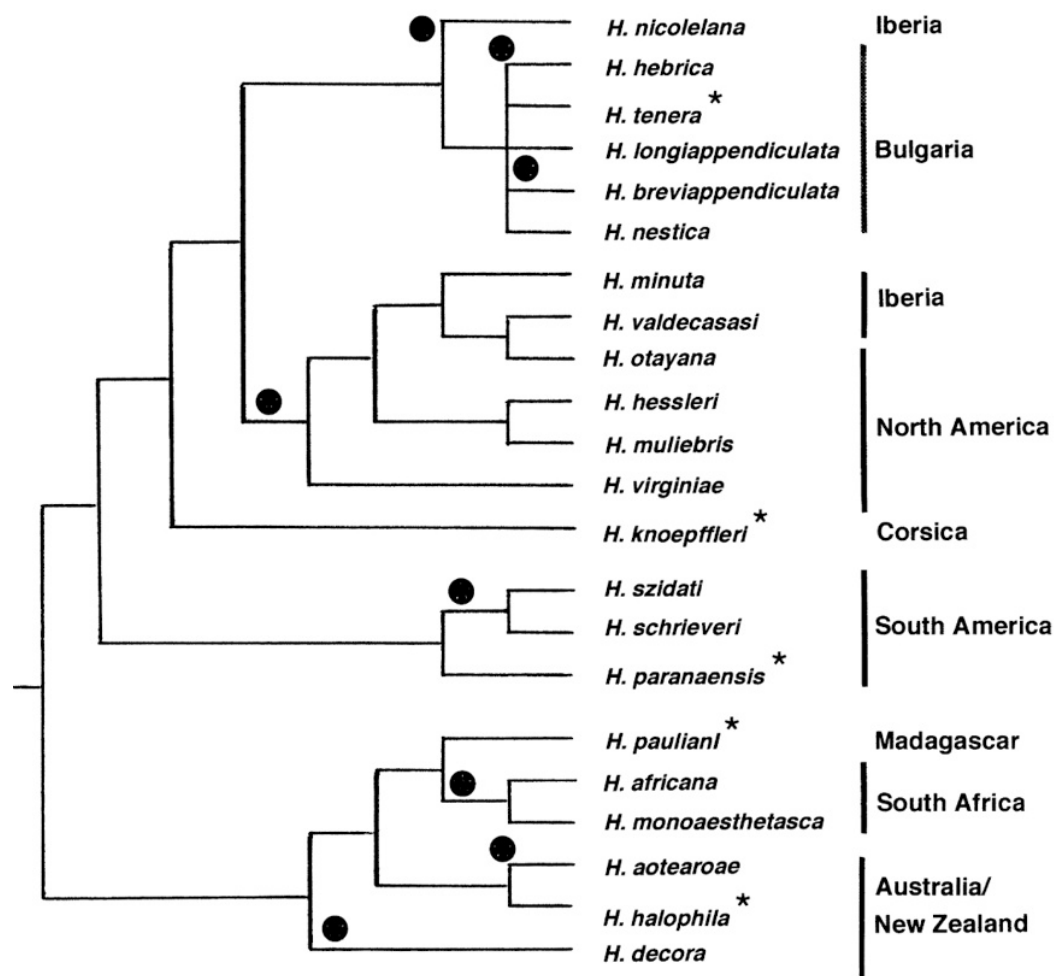


Figure 4.4 Relationship of the worldwide occurring genus of *Hexabathynella*. (source: Schram, 2008).

The hydrology at the Kens Bore area consists of a superficial aquifer (between 10 – 60m below ground level), chemically deposited aquifers as well as fractured rock aquifers (Aquaterra, 2009). These aquifers are recharged by direct percolation of rainfall, and by throughflow from the adjacent Red Hill Creek, with changes to groundwater levels of up to 3 m after seasonal cyclonic activity. Based on previous studies (Biota, 2004 and Biota, 2006), the superficial aquifer unit is the more likely core habitat for stygofauna in the study area due to:

- the availability of voids in which subterranean fauna are able to survive; and
- the ability of nutrients to permeate into the groundwater from upstream or the surface.

This aquifer connectivity and seasonal rainfall events help stygobitic fauna disperse within the catchment area.

Stygobitic fauna use a number of methods to disperse either locally within a catchment or regionally, including:

- Active movement (i.e. swimming) within or between aquifers;
- Passive movement by currents within the groundwater; and
- Seasonal rainfall/extreme flood events transporting fauna downstream.

Bathynellids are a free swimming (i.e. not confined to the benthos) taxon, which are likely to disperse to the catchment level in a superficial alluvial aquifer such as the one surrounding the Kens Bore deposit and connected to Red Hill Creek. It is unlikely that dewatering at the Kens Bore deposit will have long term detrimental effects on *Hexabathynella* sp. populations.

4.3 TERRESTRIAL AND AQUATIC FAUNA

4.3.1 Orange Leaf-nosed Bat sampling

Submission

Submission item 1.06: This species was recorded and the PER considers that maternity roosts may occur. As this species is difficult to record during conventional survey methods its presence may have been understated in the PER. Information in the fauna reports and summarised in the PER on this species should be reviewed by an appropriate DEC scientist (e.g. Norm McKenzie) familiar with survey of this species. Methodologies for the targeted survey proposed should also be peer reviewed.

Response

API engaged a competent and highly regarded specialist to undertake field investigations into the Orange Leaf-nosed Bat.

The standard methods utilised during the surveys between 2007 and 2009, included harp trapping and call recording using Anabat II detector units coupled to CF ZCaim recording units (Churchill 2009). These methods recorded six individual animals from both cave entrances and near water bodies. One site (AQMANA01) was located within the disturbance footprint at the Trinity Bore resource area. The balance were recorded within the general area of the proposal and, in some instances, areas exhibiting more favourable characteristics for Orange Leaf-nosed Bat habitat (i.e. such as on the edge of the Hamersley Ranges east of the Kens Bore deposit).

API has not proposed that the survey results for the Orange Leaf-nosed Bat are definitive, as no fauna survey is likely to be. Given the survey effort over multiple seasons, the results reflect reasonable sampling for the presence of the Orange Leaf-nosed Bat. As the survey methodologies have been employed consistently, and are capable of detecting bats (as the species was recorded) then on a relative basis it can be reliably concluded that the disturbance footprint constitutes a minor proportion of the potential bat habitat within and proximal to the proposal area. This is supported by the amount of similar channel iron landforms that will remain undisturbed within the proposal area (PER, Section 10, p 124), and the relatively large areas of prospective habitat within the Hamersley Ranges located immediately east of the Proposal area (more prospective by virtue of greater water availability, if not also roost sites).

As reported in the PER (p 279), the results of the Pilbara Biological Survey, where this species was recorded in 17 of 24 survey areas, indicates the Orange Leaf-nosed Bat is broadly distributed across the Pilbara region (McKenzie and Bullen, 2009).

On the basis of the broad distribution of the species and the relatively minor (on a spatial basis) impact on habitat of lower value, the proposal is unlikely to have a significant impact on the species and the risk posed by the proposal to the Orange Leaf-nosed Bat is low.

API has committed to and has engaged a bat specialist to develop and implement a significant bat species monitoring and management plan, and to undertaking further targeted surveys (PER, p 154 and Section 35.2, p 298). API will develop the survey methodologies in consultation with the Department of Environment and Conservation.

4.3.2 Trenching activities

Submissions

Submission item 2.22: Impacts on terrestrial fauna as a result of trenching activities for the mine and rail corridor are not clearly described in the PER, leading to uncertainty on whether they will be suitably addressed.

Submission item 2.23: That prescribed measures for managing impacts of trenching activities on fauna and preventing unacceptable levels of fauna mortalities are warranted for this proposal and be included in a project fauna management plan which should be developed to the requirements of DEC.

Response

Managing of trenching related impacts (items 2.22 and 2.23)

Trenches will be required at the mine area and central facilities areas to bury the gas pipeline, high voltage and medium voltage cables, optical fibre communication cables and potable water (PER Section 2.5.4, p 21). The gas pipeline may be as deep as 2m, whilst other trenches will not exceed 1m in depth.

The need to manage the risk of impact to fauna arising from open trenches is acknowledged and reflected in management measures referenced in Table 12.8 (p 154) and Table 26.3 (p 251) of the PER (and reiterated in Tables 37.1 (p 304) and 37.2 (p317)) for the mine area and transport corridor respectively. Management measures include inspecting trenches regularly, providing ramps to assist fauna to exit trenches and relocating trapped fauna using trained fauna handlers.

Trenching associated with the gas pipeline and associated fauna management requirements will also be controlled under the *Petroleum Pipelines Act 1969*, which requires an environmental management plan to be approved by the Department of Mines and Petroleum prior to commencement of construction.

API will consult with the Department of Environment and Conservation to finalise procedures for the management of potential fauna impacts associated with open trenches.

4.4 PEST CONTROL

4.4.1 Feral pest management

Submission

Submission item 5.08: The proposal indicates that feral pest control was recommended as a community initiative but no response to this has been included in the document. Should the proponent undertake any form of pest control using pesticides, it must comply with Health (Pesticides) Regulations 1956, including the adoption of a pest management plan, pesticide handling and management.

Response

API is committed to the implementation of feral animal control measures (PER, p 154) and weed control measures (PER, p 190) as part of the proposal. The detail of these measures will be developed in consultation with the Department of Agriculture and Food and the Department of Environment and Conservation. API will comply with all regulations regarding the use of pesticides.

4.4.2 Mosquito management

Submissions

Submission item 5.02: The proponents work with the Shire of Ashburton (prior to finalising location of accommodation facilities and other areas where workers will spend considerable periods of time) to identify natural breeding sites in the vicinity of the proposed development. This infrastructure should be located as far away as possible from natural breeding sites of mosquitoes and biting midge.

Submission item 5.03: An integrated program is developed to manage mosquitoes and other nuisance insects. This should include appropriate location, design and maintenance of project infrastructure, monitoring programme, control programme (such as chemical and other), and provision of advice.

Response

Consultation with the Shires (item 5.02)

API has, and will continue to work with both the Shire of Ashburton and the Shire of Roebourne on a wide range of aspects relating to the Proposal, including location and form of infrastructure, building and planning approvals (PER Section 4).

Integrated management programme (item 5.03)

Should the circumstances warrant, API will investigate and implement in consultation with the relevant regulatory authorities appropriate measures to control mosquitoes and the risk to employees from mosquito borne disease at the Proposal site.

5 Vegetation and flora

5.1 TRIODIA SPECIES ROBE RIVER

5.1.1 Impact on *Triodia* sp. Robe River Priority Ecological Community (PEC)

Submission

Submission item 1.01: There is sufficient information within the PER and supporting documents to assess the environmental impact of the proposal on flora and vegetation factors. However one of the key limitations of the PER document is that the regional floristic information provided in the flora and vegetation studies does not seem to be adequately translated into the PER document.

Submission item 1.04: Griffin & Trudgen (2009) (Appendix 9 – Western Botanical 2010) stated that many of the communities on the Robe Pisolites landform are restricted and concluded that “the vegetation on the Robe Pisolite is strongly confined to that geological type”. The statistical analysis found that the 42 floristic units described in the study area are restricted, uncommon or under sampled. Of the 154 local vegetation types described in the project area, 99 were identified as of conservation interest and 32 of these will have more than 50% of its known extent impacted by the proposal. In some cases this value is 100%.

Submission item 2.24: The proposed impacts on the *Triodia* sp. Robe River assemblages of mesas of the Robe Valley priority ecological community (PEC) are not adequately described or addressed in the PER.

Submission item 2.25: That the proponent identifies each of the vegetation assemblages forming part of the PEC and attempts to identify the extent and conservation significance of impacts on these units.

Submission item 2.26: That the proponent provides vegetation maps and descriptions of the areas of *Triodia* sp. Robe River units outside the project impact area to substantiate the proposition that additional areas of these units occur outside the project impact area.

Response

API has had surveyed over 38,000 ha across the mine area over three years. The vegetation surveys have been extensive and detailed, as evidenced by the fine scale vegetation mapping completed. This detailed mapping resulted in the delineation of 141 vegetation units, with many of these units occupying less than 10 ha in total and individual areas of one to five ha delineated on numerous occasions. Table 5.1 below summarises the size distribution of the mapped vegetation units and provides an insight into the fine scale of the vegetation mapping.

Table 5.1 Size distribution categories for mapped vegetation codes (units) at the mine area and along the transport corridor.

| Size category | No. of vegetation units | Total area (ha) | No of discrete polygons mapped |
|-----------------|-------------------------|-----------------|--------------------------------|
| Less than 10ha | 24 | 94 | 49 |
| 10 - 50ha | 37 | 1010 | 186 |
| 50 - 100ha | 21 | 1493 | 108 |
| More than 100ha | 59 | 36309 | 2946 |

API has undertaken considerable analysis to evaluate the impact of the proposal on native vegetation. This has included meetings with the Department of Environment and Conservation (29 January and 18 February 2010) which resulted in the identification of a number of vegetation units of interest, which are presented in Table 13.5 of the PER (p178). The majority of these units (i.e. 11 of 13) were identified partly or entirely by the presence of the Priority 3 species *Triodia* sp. Robe River and are therefore part of the Priority 3 Ecological Community described as “*Triodia* sp. Robe River assemblages of mesas of the Robe Valley”.

The fine scale vegetation mapping has generated many vegetation units that vary subtly from each other. In many instances the mapping has separately identified units that reflect ecotones that form a gradual transition from one vegetation assemblage to another. In other instances the variation may reflect various states of succession of what may be considered the one vegetation assemblage, as influenced by fire history.

Numerical, multivariate floristic analysis is used substantially to assist in the definition of vegetation units. The floristic analysis completed with the proposal data (Griffin and Trudgen 2009) indicates that the majority of the mapped vegetation units belong to more broadly distributed vegetation groups when analysed at the 600 group level. For example, vegetation code HBr31 was defined over 23 ha (PER, p178) on two mesas but relates to two floristic community types (groups 253 & 269) which occur on 6 mesas across the mine area (refer to Figure 5.1).

Vegetation code HBr35 was defined over 81 ha (PER, p178) on one mesa but relates to three floristic community types (groups 253, 255 & 268) which occur on 5 mesas across the mine area (refer to Figure 5.2). Similarly, vegetation code HBr49 was mapped over 8 ha on one mesa (Trinity Bore) yet was grouped into a floristic community type that occurs at 5 separate locations across the extent of the mine area (Figure 5.3). The circumstance whereby the vegetation units narrowly defined by mapping are associated with far more broadly distributed floristic community types occurs across the mine area.

In summary the diligent, fine scale mapping while providing for a thorough evaluation of the native vegetation, has defined vegetation units to a greater detail than what may be considered vegetation assemblages to which separate intrinsic conservation values or ecological function can be ascribed. The appropriate management units for assessment of impacts of the proposal on conservation values are at the level of species and ecological communities in accord with the *Wildlife Conservation Act 1950* and the Department of Environment and Conservation's definitions, categories and criteria for Threatened and Priority Ecological Communities and Species. Based on the extensive vegetation data set, implementation of the proposal is highly unlikely to affect the conservation status of any flora species or ecological community.

The impact of the proposal on *Triodia* sp. Robe River has been examined at length. At the time of the PER public release, vegetation surveys had mapped approximately 1,470 ha of vegetation identified within the definition of the *Triodia* sp. Robe River Priority Ecological Community (PEC), of which approximately 812 ha (55%) will be impacted by the proposal (PER, p187). A preliminary, conservative (i.e. underestimation of regional extent) assessment of known locations of *Triodia* sp. Robe River outside of the detailed surveyed area indicated that a further 1,100 ha of *Triodia* sp. Robe River PEC is present in close proximity to the Proposal, with an additional 2,000 ha occurring more broadly in the region. Based on this conservative estimate, approximately 17% of the PEC was to be impacted by the proposal (PER, p187).

API has recently completed additional surveys to improve understanding of the distribution of *Triodia* sp. Robe River and associated PEC outside of the proposal area. The survey was planned and implemented in accordance with the Environmental Protection Authority Guidance Statement 51 (EPA 2004). It included both a desktop study to identify potential occurrences based on habitat preferences, and a helicopter field survey conducted by qualified, experienced botanists. Within a study boundary that encompassed an area of 1,080,000 ha east of the proposal area, 91,700 ha were targeted for survey. Within this area (i.e. the 91,700 ha) 24 populations of *Triodia* sp. Robe River were mapped. These populations extend over 35,000 ha and are estimated to contain almost 60 million individuals of *Triodia* sp. Robe River. The report detailing this work – "West Pilbara Iron Ore Project, *Triodia* sp. Robe River Mapping and Targeted Search September 2010." (Astron 2010) is included at Appendix 3.

Figure 5.3 presents the current known distribution of the *Triodia* sp. Robe River PEC. Table 5.2 below presents an update on Table 13.8 of the PER (p 187).

Table 5.2 Impact on *Triodia* sp. Robe River PEC

| <i>Triodia</i> sp. Robe River PEC | Total Area (ha) | Proportional loss of PEC (%) |
|----------------------------------------------|-----------------|------------------------------|
| Proposed disturbance | 812 | |
| Area of PEC within surveyed PER area | 1,470 | |
| Area of PEC surveyed in detail in the region | 35,430* | |
| Total | 36,900 | 2.2% |

*surveys are ongoing and new sites continue to be found, mapped and surveyed.

On the basis of this additional information the predicted impact to the *Triodia* sp. Robe River PEC from the proposal is estimated to be a reduction in the areal extent of the PEC of 2.2%. It should also be noted that surveys are ongoing and new populations of *Triodia* sp. Robe River continue to be recorded.

Significantly, *Triodia* sp. Robe River and the vegetation assemblages within which it occurs is not restricted to the pisolitic channel iron landforms. The PEC has been recorded on a variety of landforms and geological substrates, as summarised in Table 5.3 below. There would appear grounds to review the Priority 3 conservation status of *Triodia* sp. Robe River and the *Triodia* sp. Robe River ecological community.

The additional information adds substantial support to the conclusion in the PER that on a sound risk based approach, the proposal can be implemented to meet the EPA objective to "maintain the abundance, diversity, geographic distribution and productivity of flora at species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge".

Table 5.3 Land features of *Triodia* sp. Robe River populations.

| Population | Geology | | | Land Systems | Site Characteristics | |
|------------|------------------------------------|----------------------|--------------------------------------|------------------------------------------------------|----------------------|--------|
| | Alluvium/ Colluvium Area (%) | Pisolite Area (%) | Banded Iron Formation Area (%) | | Elevation(m) | Aspect |
| TSS01 | 42ha(8%) | 121ha(23%) | 351ha(68%) | Newman/Robe | 350 | All |
| TSS02 | 10ha(4%) | 108ha(41%) | 143ha(55%) | Newman | 400 | All |
| TSS03 | 21ha(7%) | 62ha(20%) | 233ha(74%) | Newman | 629 | All |
| TSS04 | 4ha(<1%) | 173ha(23%) | 570ha(76%) | Newman | 498 | All |
| *TSS05 | 0ha(0%) | 76ha(36%) | 107ha(51%) | Newman | 550 | All |
| *TSS05b | 1918ha(26%) | 179ha(2%) | 1999ha(27%) | Newman/Platform/Robe/Capricorn/ Rocklea/Boolgeeda | 456 | All |
| TSS06 | 10ha(3%) | 157ha(42%) | 203ha(55%) | Newman | 502 | All |
| TSS07 | 176ha(43%) | 98ha(24%) | 138ha(33%) | Newman | 542 | All |
| TSS08 | 3ha(<1%) | 305ha(46%) | 357ha(54%) | Newman | 715 | All |
| **TSS08a | Unable to be determined | Rocklea | 526 | All | | |
| TSS09 | 162ha(36%) | 258ha(57%) | 36ha(8%) | Robe/Newman/Urandy/Boolgeeda | 237 | All |
| TSS10 | 62ha(64%) | 3ha(3%) | 32ha(33%) | Robe/Newman/Boolgeeda | 344 | All |
| TUS01 | <1ha(<1%) | 5ha(99%) | 0ha(0%) | Newman | 158 | All |
| TUS02 | 37ha(3%) | 798ha(68%) | 334ha(28%) | River/Urandy/Newman | 215 | All |
| TUS03 | 58ha(9%) | 590ha(88%) | 23ha(3%) | Robe/Urandy/River | 169 | All |
| TUS04 | 25ha(3%) | 286ha(35%) | 501ha(62%) | Robe/River/Rocklea/Newman | 189 | All |
| TUS05 | 122ha(3%) | 296ha(7%) | 4042ha(91%) | Newman | 268 | All |
| TUS06 | 473ha(3%) | 5940ha(39%) | 8936ha(58%) | Rocklea/River/Newman | 290 | All |
| TUS07 | 30ha(6%) | 299ha(58%) | 183ha(36%) | Newman/Robe/Boolgeeda | 337 | All |
| TUS08 | 65ha(12%) | 105ha(20%) | 350ha(67%) | Rocklea/River/Newman | 285 | All |
| TUS09 | 254ha(19%) | 242ha(18%) | 856ha(63%) | Newman | 357 | All |
| TUS10 | 13ha(39%) | 14ha(41%) | 7ha(20%) | Newman | 405 | All |
| TUS11 | 146ha(15%) | 218ha(22%) | 619ha(63%) | Newman | 332 | All |
| TUS12 | 162ha(81%) | 15ha(7%) | 22ha(11%) | Robe/Newman | | All |

*Partially covered by current fine scale geological mapping (Nick Lockett and Associates 2007).

**Outside extent of current fine scale geological mapping (Nick Lockett and Associates 2007).

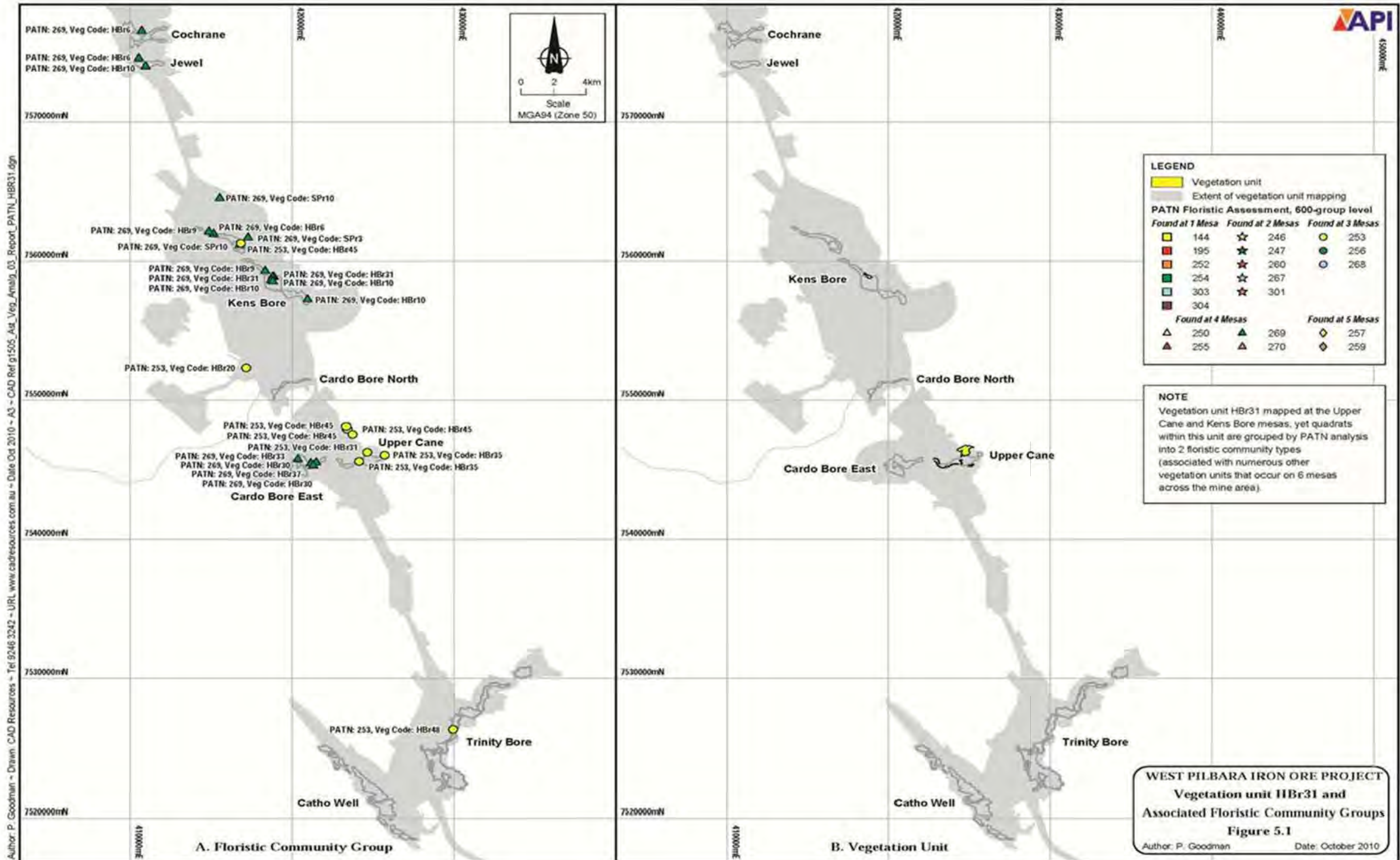


Figure 5.1 Vegetation code HBr31

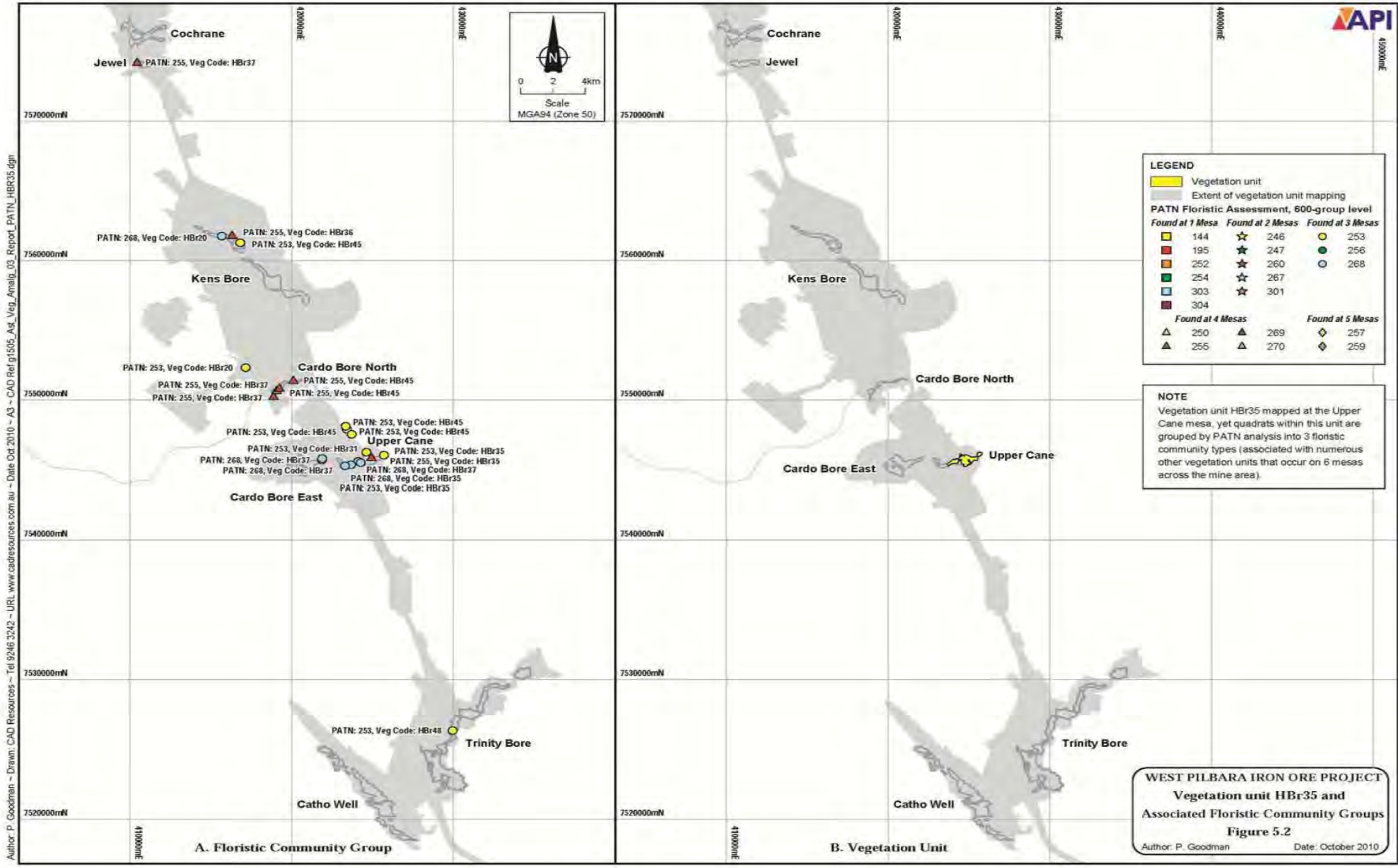


Figure 5.2 Vegetation code HBr35

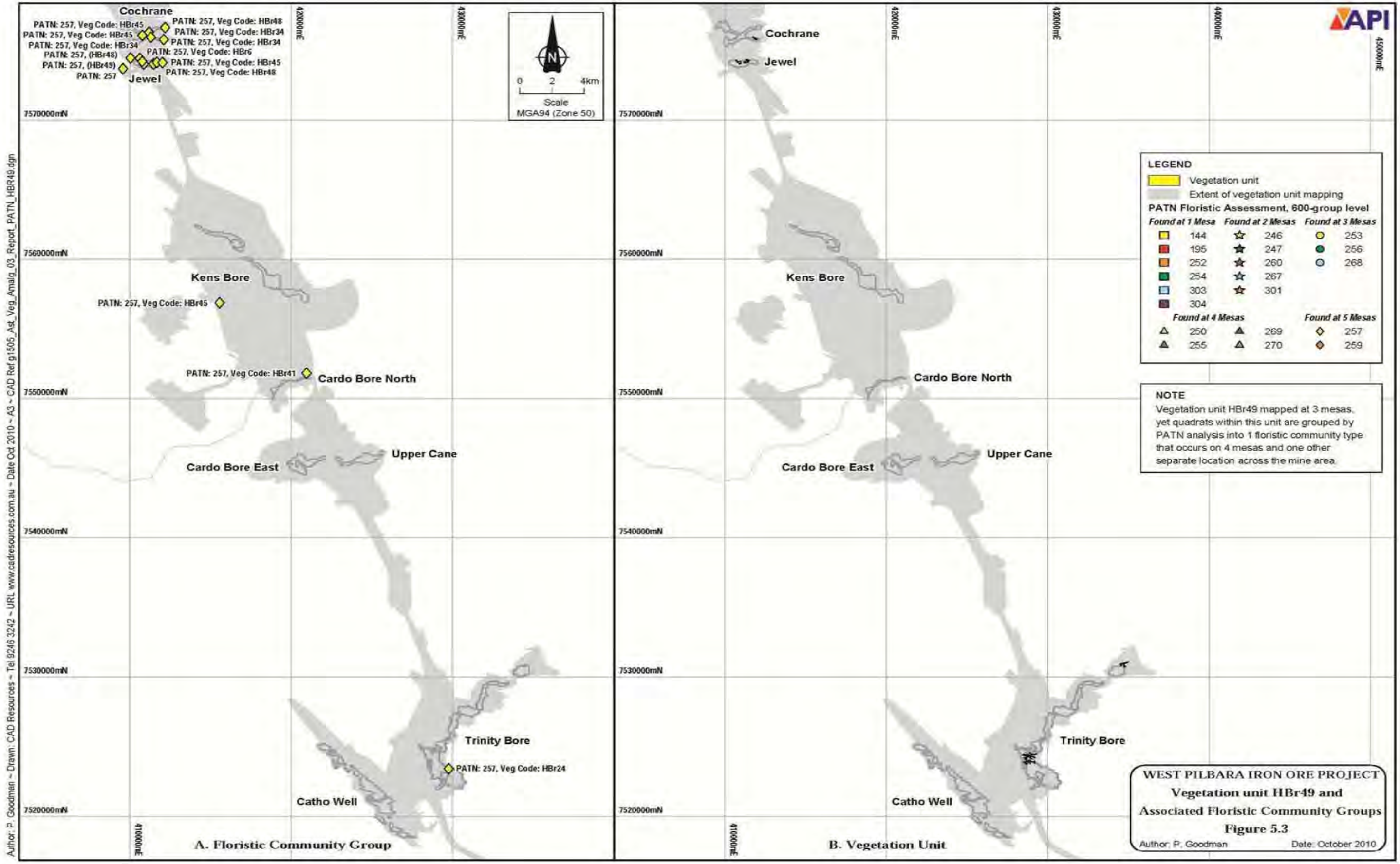


Figure 5.3 Vegetation code HBr49



Figure 5.4 Current known distribution of *Triodia* sp. Robe River PEC (following further detailed mapping during public review period of PER).

5.1.2 Protective measures for units of the *Triodia* sp. Robe River PEC

Submission

Submission item 2.27: That the proponent commits to pursuing protective measures for vegetation units that comprise the PEC and contributes to the establishment and/or management of conservation areas that contain these units (if these can be demonstrated to occur outside the impact area) within the reserve system.

Response

On the basis of the information obtained to date, and described under Section 5.1.1 of this report, the *Triodia* sp. Robe River PEC is not restricted to specific geology or landform and is broadly distributed across the West Pilbara region. Notwithstanding the minimal impact, API remains committed to design and implement the proposal to minimise impacts on the species *Triodia* sp. Robe River and associated PEC to the greatest extent practicable (PER, p 191). API has also committed to undertaking further studies into, amongst other things, the distribution and ecology of *Triodia* sp. Robe River (PER, p 191). API confirms its commitment to contribute to the identification of the biodiversity values of the west Hamersley Ranges which would assist in State planning of conservation estate (PER, p 212).

5.1.3 Propagation of *Triodia* sp. Robe River

Submissions

Submission item 2.28: Propagating *Triodia* sp. Robe River has limited value as a management strategy for mitigating impacts on communities that may be habitat dependent.

Submission item 2.29: Remove emphasis on propagating *Triodia* sp. Robe River as a primary management strategy for preserving this species and the associated community.

Response

***Triodia* sp. Robe River propagation as mitigation (item 2.28 and 2.29)**

Triodia sp. Robe River does not appear to be dependent on geology, having been recorded on pisolitic, banded iron and alluvial/colluvial substrates (Astron 2010). This indicates the species is not habitat restricted, has a capacity to inhabit a variety of ecological niches and, with proper planning, suggests good prospects for its establishment on reconstructed landscapes.

API has commenced research into the propagation and rehabilitation requirements of *Triodia* sp. Robe River. Work completed to date demonstrates the ability to propagate the species vegetatively and from seed.

API considers it appropriate to set objectives for rehabilitation at the outset of the project. The establishment of *Triodia* sp. Robe River on reconstructed landscapes is one such objective arising from the baseline studies and environmental impact assessment. API has not committed to the replication of existing vegetation assemblages in rehabilitation, which API considers unrealistic and unwarranted (given the minimal impact to *Triodia* sp. Robe River). With the information to hand API is confident about achieving an objective of establishing the species within a self-sustaining vegetation community which would contribute to mitigating the impact of the proposal on the species and associated PEC.

5.2 VEGETATION AND FLORA OF THE TRANSPORT CORRIDOR

5.2.1 Management of mesquite

Submissions

Submission item 2.32: There needs to be provision for management of mesquite along the transport corridor.

Submission item 2.33: It is recommended that the proponent consult with the Department of Agriculture and Food (DAF) and Pilbara Mesquite Management Committee (PMMC) regarding the development and implementation of specific weed management strategies for mesquite during both construction and operational phases of the transport corridor.

Submission item 2.34: It is recommended that borrow pits are only located in areas that are known to be free from mesquite.

Response

API has developed weed management procedures as part of its Environmental Management System (EMS). Provision within these procedures for the specific control of mesquite during the construction and operational phases of the project will be developed by API in consultation with the Department of Agriculture and Food (DAF), the Pilbara Mesquite Management Committee (PMMC), and relevant landholders.

Borrow pit locations will be selected using a number of criteria, including the presence/absence of mesquite. API would intend to avoid mesquite infested areas wherever possible. Subject to rigorous controls on the movement of material from infested areas to areas free of mesquite, it may be appropriate to use construction material sourced from borrow pits within infested areas in adjacent sections of railway also within mesquite infested areas.

5.2.2 Impacts on sheetflow dependent communities

Submissions

Submission item 2.35: Management of surface water along the transport corridor requires consideration and attention to detailed design for the rail formation and borrow pits to avoid impacts on dependent communities.

Submission item 2.36: That the location of culverts and other drainage management measures in areas of surface water dependent vegetation communities, particularly mulga, are developed in consultation with DEC. It is considered industry best practice to construct culverts every 50 metres where sensitive vegetation has been identified and could be impacted by changes in surface water flow.

Response

API has undertaken a robust risk assessment of the proposed construction of the railway on surface water dependent vegetation communities and is committed to appropriate rail design to minimise the risk to these communities (PER pp 230 to 231). API will consult with the Department of Environment and Conservation in the design of culverts and other drainage measures in areas of sheetflow dependent vegetation traversed by the railway.

5.2.3 Borrow pits

Submission

Submission item 2.37: Given the considerable borrow requirements for this development, it is recommended that a borrow pit management procedure be developed, in consultation with DEC, that explains the application of suitable strategies to be implemented to ensure environmental impacts are minimised due to the construction and management of borrow pits. The procedure should consider the location, design, management, ongoing use and rehabilitation of borrow pits.

Response

API has identified borrow target areas, within which borrow pits will be located. The target areas have been surveyed for flora and vegetation and will be refined and reduced in size following on-ground geotechnical investigations and heritage surveys (PER, p 19).

API has developed a procedure for the management of borrow pits as part of its Environmental Management System. Some of these principles are presented under Section 34.5.6 of the PER (p 290). API will review its procedures for the management of borrow pits in consultation with the Department of Environment and Conservation.

Given that material is extracted from borrow pits for construction purposes, there may be instances depending on the location of the borrow pit in the landscape, where it is very difficult to achieve a completely free draining final surface. The positioning within the landscape will be a consideration in borrow pit location, and the depth of excavation and rehabilitation techniques that can be employed to minimise the risk, and extent of any surface ponding.

6 Rehabilitation and closure

6.1 FINAL FOOTPRINT PLANNING

6.1.1 West Hamersley Range Conservation Park

Submissions

Submission item 2.30: The PER description of proposed rehabilitation does not recognise that areas disturbed may ultimately be included in the proposed West Hamersley Range Conservation Park.

Submission item 2.31: At the completion of mining, any areas disturbed within the proposed reserve be rehabilitated with the view that the land may be incorporated into a conservation reserve and managed by DEC. It is recommended that rehabilitation requirements and completion criteria for these areas be developed in consultation with, and to the requirements of, DEC.

Response

API understands that the previously proposed West Hamersley Range Conservation Park is not part of current government planning. Irrespective, the western boundary of the park, as previously proposed (which overlapped with part of the proposal footprint) appeared to be arbitrarily set based on land tenure (unallocated crown land) as opposed to the protection of biodiversity values (PER, pp 211 to 212). API has committed to environmental surveys that would assist in the identification of the biodiversity values of the west Hamersley Ranges and could inform the planning of conservation estate (PER, p 212).

API is committed to a high standard of rehabilitation and has documented rehabilitation objectives within the PER (p 285). Rehabilitation will be guided by post-mining land use and API has acknowledged the potential that some areas may, in time, be incorporated into conservation estate (PER, p 285). The high standard of rehabilitation to which API aspires will optimise compatibility with this potential land use. API will consult with the Department of Environment and Conservation and the Department of Mines and Petroleum, among others, in the development of rehabilitation plans and rehabilitation performance criteria.

6.1.2 Material characterisation

Submission

Submission item 4.02: It is noted within the document that preliminary estimates of the clay proportions within the overburden range from as little as 1% to as much as 40% across the project. Based on the information submitted within the document, the Department is satisfied with the level of detail regarding the chemical and physical properties provide at this stage of the project. It is noted however that more comprehensive information regarding the characterisation test work, as well as the management of overburden material will be required as part of the Mining Proposal assessment under the *Mining Act 1978*. This has been acknowledged by API Management Pty Ltd within Section 34.5.3, whereby it is stated that “these management requirements will be developed through more detailed mine planning and presented in mining proposals submitted under the Mining Act”.

Response

Material characterisation completed to date indicates there is a low risk of acid leachate generation or metal leaching from overburden dumps. Similarly the generally benign clay materials are able to be managed within the reconstructed landscapes without impacting on rehabilitation performance (PER, p 288). This work was reported in the PER to the level commensurate with the risk assessment. More comprehensive materials information and analysis, along with more detailed mine plans and rehabilitation plans will be incorporated into the Mining Proposal to be assessed by the Department of Mines and Petroleum under the *Mining Act 1978*.

6.2 CLOSURE

6.2.1 Closure commitments

Submissions

Submission item 4.01: The preliminary rehabilitation and closure commitments stated within the document provide sufficient information for this stage of the project, detailing the general approach towards rehabilitation for each proposed disturbance type. The commitment to design specific plans and schedule to ensure the appropriate placement of materials for each individual landform is acknowledged by the Department. Furthermore, it is noted that previous comments provided by this Department relating to rehabilitation trials have been considered and included within the document.

Submission item 4.03: Suggested amendment to proposed Condition No. 8-1 (Closure Plan) is noted to have occurred. The condition appears to have been amended to include consultation with the CEO of the DMP.

Response

Noted with thanks. API will continue to work with the Department of Mines and Petroleum in the development of relevant project plans, rehabilitation and closure strategies and a Mining Proposal.

6.2.2 Community planning

Submission

Submission item 5.13: The proponent has identified that it should ensure the cost of closure is adequately represented in company accounts, that the community is not left with a liability and that communities have involvement in community planning. The scope of community involvement has not been elaborated.

Response

As it has done to date, API will continue to engage with stakeholders during the design, construction, operation and closure phases of the proposal. This will include consultation with interested and relevant stakeholders in the development of closure plans (PER, p 285).

7 Indigenous cultural heritage

7.1 CONSULTATION AND ENGAGEMENT

7.1.1 Consultation

Submissions

Submission item 6.01: On p 40 of the PER document it states that consultation and heritage surveys with Native Title groups with interests in the area of the transport corridor, the Ngarluma Aboriginal Corporation and the Yaburara Mardudhunier are in progress. It also states that Wong – Goo – Tt – Oo were consulted prior to their Native Title Claim being dismissed by Federal Court. DIA recommends that in the process of undertaking consultation, that the lessee consult with all people who hold knowledge on the area's Aboriginal cultural values. Such people may include the registered native title holders for the area, known site informants for Aboriginal heritage sites in the nearby vicinity and anyone holding knowledge of the area's Aboriginal cultural values. This could arguably include the Wong – Goo – Tt – Oo group.

Submission item 6.05: The PER indicates that a Cultural Heritage Management Plan (CHMP) will be developed in consultation with Traditional Owners (p119). However, it may be that a number of CHMPs may be required to be negotiated with the different identified Traditional Owner groups.

Submission item 7.03: The PER sets out API's proposal to consult with the KM and other traditional owner groups to determine how to manage culturally sensitive areas (pp. 116 and 238 PER). On behalf of its clients, YMAC advises that a plan for salvage and culturally appropriate storage of artefacts may also be required.

Submission item 7.04: The PER states that API will consult with traditional owners to develop a Cultural Heritage Management Plan (p. 117 PER), and references to the Plan are found throughout the section on 'Indigenous Cultural Heritage'. YMAC appreciates this commitment, but notes that it is our clients' preference to have all heritage requirements contractually binding on the proponent. As a CHMP is intended as the 'primary tool for managing impacts on indigenous cultural heritage', it is important that the KM are able to mandate compliance with it. We therefore advise that it is appropriate that the Plan be incorporated into a comprehensive agreement with our clients. The PER also states that 'management of indigenous cultural heritage is primarily driven by API corporate-level policy and associated management plans and procedures' (p. 119 PER). Again, such policies are appreciated by YMAC and its clients; however, we note that commitments relating to heritage policy will need to be incorporated within a written agreement with the KM.

Submission item 7.07: The grant of approvals to damage or destroy Aboriginal heritage sites under section 18 of the Aboriginal Heritage Act 1972 (WA) is a serious concern for our clients. The KM note API's commitment to prepare its section 18 notice process 'in consultation with the Traditional Owners' (p. 117 PER), and advise that our clients' preferred method of s18 consultation is as follows: the company conducts a site-identification survey with KM participants; the company consult with the KM working group (or the community, is appropriate) before it makes its application, with the meeting funded by the company; KM members are given the opportunity for a site visit to the relevant area; after the consultation, the company sends the KM a copy of its application, including the KM's comments in it so their accuracy can be checked; and the KM reserve their legal right to object to the application.

Submission item 7.11: The PER states that 'agreements to be negotiated under the Native Title Act are anticipated to include compensatory provisions for impacts on Native Titles interests' (p. 121 PER). On behalf of its clients, YMAC welcomes this acknowledgment; we agree that compensation is appropriate and important. YMAC further suggests other provisions that could assist in alleviating the Project's impacts on our clients' native title rights and cultural heritage, including: comprehensive protection of our client's access to country the subject of Project operations (with entry only restricted for legitimate health and safety purposes); involvement of the KM in the planning; engagement of KM members as rangers and monitors within those area of the Project that affect the KM claim area; holistic protection regimes for particularly important sites and places.

Submission item 8.03: NAC notes that it is one of the stakeholders listed in the PER, but states that it has not been consulted. The response also asserts that The EPA has an expectation that the impact assessment is supported by a thorough public consultation process.

Submission item 8.04: NAC notes that relevant mining and infrastructure industry standards include those developed by the Minerals Council of Australia (Enduring Value: Guidance for Implementation, July 2005) and would like to see these adopted by API.

Response

Consultation with all relevant Traditional Owners (item 6.01)

API will continue to consult with all appropriate people, and is not confined to Native Title groups, as part of its programme to assess Indigenous Cultural Heritage values. API has sought further advice from the Department of Indigenous Affairs regarding consultation.

Consult to develop a Cultural Heritage Management Plan (CHMP) (items 6.05, 7.03 and 7.04)

API intends to develop and implement a CHMP in consultation with each of the native title groups. API will develop an overarching company strategy, taking into consideration the variations of each group's requirements regarding cultural heritage management.

API is committed to developing and implementing, in consultation with Kuruma Marthudunera, a detailed CHMP to manage the protection of Aboriginal heritage sites and which addresses the salvage and culturally appropriate storage of artefacts.

API anticipates that the CHMPs to be developed in consultation with Traditional Owners will be the subject of binding, comprehensive agreements to be negotiated under the processes of the *Native Title Act 1999*.

Preferred method of Section 18 consultation (item 7.07)

API supports the preferred method of the Kuruma Marthudunera for consultation regarding Section 18 (*Aboriginal Heritage Act 1972*) applications.

Agreements under the Native Title Act (item 7.11)

API welcomes the suggestions of the Kuruma Marthudunera as to the scope of negotiations for an agreement under the *Native Title Act 1990*.

Consultation with NAC (item 8.03)

API does not agree with the assertion that it has not consulted with the Ngarluma Aboriginal Corporation (NAC). Table 7.1 summarises main items of engagement with NAC in recent times.

Table 7.1 Summary of the main items of engagement with Ngarluma Aboriginal Corporation

| Date | Correspondence type | Comments |
|------------------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 23 April 2008 | Letter | Environmental Studies within Mt Welcome Pastoral Station |
| 13 March 2009 | Letter | Environmental Studies on Mt Welcome Station |
| 10 June 2009 | Letter | (1) Proposed scoping document; (2) conceptual layout for the proposed Anketell Point Port |
| 12 June 2009 | Letter | (1) Invitation to comment on the draft Environmental Scoping Document for the WPIOP Mine and Rail proposal; (2) Invitation to participate in an environmental risk management workshop; and (3) Invitation for separate discussions on the proposal and risk assessment |
| 25 November 2009 | Meeting | Project presentation to Ngarluma, Roebourne |
| 15 February 2010 | Letter | (1) Invitation to comment on the draft Mine and Rail PER (which was attached); (2) Invitation for comment/discussion generally regarding the proposal |
| 14 April 2010 | Letter | (1) Invitation to comment on the draft Port PER (which was attached); (2) Invitation for comment/discussion generally regarding the proposal |
| 17 May 2010 | Letter | Invitation to stakeholder workshop at Point Samson Saturday 29 May 2010 |
| 18 June 2010 | Letter | Letter inviting comments on the final Mine and Rail PER (which was attached) |
| 24 June 2010 | Meeting | Project briefing and presentation to the board of the Ngarluma Aboriginal Corporation. Discussion on Ngarluma proposed Ministerial conditions. |
| 29 June 2010 | Letter | Provided copy of 24 June presentation (hardcopy and disc) and confirmed provision of additional Mine and Rail PER (hardcopy) as requested by Ngarluma. |

This summary does not detail numerous email exchanges relating to the project that have occurred during and after this period, or other communications related predominantly to heritage and Native Title matters associated with the project.

Methods of engagement (item 8.04)

API is aware of various guidelines published to assist proponents engage effectively with Indigenous stakeholders. API maintains that it has demonstrated best practice in its engagement to date, as evidence by the positive comments submitted on behalf of another of the WPIOP's Indigenous stakeholder groups.

7.2 CULTURAL HERITAGE AND ENVIRONMENTAL IMPACT ASSESSMENT

7.2.1 Cultural heritage and the EP Act

Submissions

Submission item 7.02: The Environmental Protection Authority's stated goal regarding Aboriginal heritage is: 'to ensure that changes to the biophysical environment do not adversely affect historical and cultural associations and comply with relevant heritage legislation' (pp. 115 and 235 PER). YMAC appreciates the EPA's perspective, but respectfully suggests that this conceptualization of impact to heritage is more limited than the view held by our clients. Under our clients' traditional laws and customs, sites and places of significance can be impacted upon even if there is no change to the physical environment (i.e. the entry of unauthorised persons to such places is forbidden by KM law and custom).

Submission item 8.02: NAC highlights that cultural heritage is included within the broader definition of environment within the EP Act and asserts it is to be protected as such. NAC asserts that the EPA must consider Aboriginal heritage and ensure that the Proponent has properly addressed it.

Response

The EPA goal regarding Aboriginal heritage (item 7.02)

API acknowledges the views of the Kuruma Marthudunera and considers there is no substitute to consulting with Kuruma Marthudunera to address these and other matters. The commitment of API to consultation and the development of a CHMP to manage the protection of Aboriginal cultural heritage within and around the proposal area can occur under processes provided for under the *Aboriginal Heritage Act 1972* and *Native Title Act 1993*.

Cultural heritage within the broader definition of the EP Act (item 8.02)

The EPA Guidance Statement No 41 prescribes when Indigenous Cultural Heritage will constitute a relevant environmental factor when undertaking an assessment of a proposal. The Department of Indigenous Affairs has not raised any specific concerns that cannot be addressed by the ongoing heritage investigation process, development of appropriate Cultural Heritage Management Plans and applications for relevant statutory approvals.

7.2.2 Rights of Traditional Owners

Submission

Submission item 8.01: NAC describe its relationship with country and its rights as native title holder

Response

API accepts and acknowledges that the Ngarluma Aboriginal Corporation (NAC) is the holder of the Ngarluma People's native title rights and interests recognised by the Federal Court and that part of the proposal rail corridor crosses this area. API notes that the map attached as Annexure A to the NAC submission depicts the area put to the Federal Court for consideration but not the area over which native title rights were ultimately determined to exist. In particular, native title was not found to exist in the whole of the area enclosed by the seaward boundary of the application, the Burrup Peninsula, land within town sites and on various other land holdings. API has identified the NAC as a key stakeholder and its engagement with NAC is summarised in Section 6.1.1 of this report.

7.3 INDIGENOUS CULTURAL HERITAGE

7.3.1 Surveys and data management

Submissions

Submission item 6.02: The proposed transport corridor extends over more than 285 km and intersects numerous DIA registered sites (p235). It is also possible that there are sites that have not yet been reported to the DIA and entered on the Register. As you may be aware, the DIA is responsible for the administration of the AHA and all Aboriginal sites are protected under the AHA, whether they are registered with the DIA or not.

Submission item 6.03: Archaeological surveys to date focussing on areas associated with exploration and investigation identified isolated artefacts and artefact scatters within the Proposal area (p117). These do not appear to be identified in Figure 9.1, the map of Recorded indigenous heritage sites at the mine area (p118), The PER also identified ethnographic significance associated with some major watercourses in the Pilbara region as associated with cultural and ceremonial practices and that are registered as sites (p117). These are also not identified in maps in the PER.

Submission item 6.04: Further archaeological and ethnographic surveys of the project footprint, were to be completed, as well as surveys associated with the proposed mining and transport corridor operations. It was expected that more detailed survey work would identify potential sites within the orebody footprint areas, despite there being no DIA registered sites within the area. It was commented that there was limited flexibility to avoid sites located on or immediately adjacent to the orebodies, but API would endeavour to avoid sites in locating other mine infrastructure (p119). According to the summary of indigenous cultural heritage investigations, surveys were not expected to be completed until early 2011. No surveys appear to have been submitted to DIA. Therefore DIA cannot comment definitively on the effect that the proposal will have on sites. It is possible that the rail alignment may need to be routed outside the nominated transport corridor, so further survey work may be required (p236). If API wishes to obtain definitive comment from DIA regarding the impact on sites, shape files of the proposed impact areas should be sent to DIA.

Submission item 7.05: YMAC notes that API undertakes to 'establish a cultural heritage database system with GIS records of indigenous heritage site locations within the Proposal area' (p. 122 PER). On behalf of its clients, YMAC requests that any sections of the database that relate to the KM claim area be provided or made available to our clients.

Response

Surveys of the transport corridor (item 6.02)

API is currently conducting detailed ethnographic and archaeological surveys with Traditional Owners along the transport corridor which will provide for a full and comprehensive assessment of cultural heritage beyond the sites registered with the Department of Indigenous Affairs and enable compliance with the *Aboriginal Heritage Act 1972*.

Archaeological and ethnographic surveys (item 6.03 & item 6.04)

Detailed archaeological and ethnographic surveys are currently being conducted and the results of those surveys are being assessed. API intends to apply for Ministerial consent to use the land on which heritage sites are located under Section 18 of the *Aboriginal Heritage Act 1972* should disturbance of the sites be unavoidable. The final heritage survey reports will be submitted (with consent from Traditional Owners) as part of that process.

API respects the position of Traditional Owners in seeking their consent for the submission of final heritage survey reports and cultural information to the Department of Indigenous Affairs. API will consult with Traditional Owners regarding sites identified within the project footprint.

Cultural heritage database (item 7.05)

API will ensure that heritage sites recorded by Kuruma Marthudunera and API archaeologists and anthropologists within the Kuruma Marthudunera claim area will be made available. API's position is that all Kuruma Marthudunera cultural information remains the intellectual property of Kuruma Marthudunera.

7.3.2 Proposed management actions and risk treatment measures

Submissions

Submission item 6.06: The risk treatment measures (Table 9.3, Table 23.2) identified by API appear to be generally sound. For both the mining area and transport corridor, they clearly intend to survey the area with the Traditional Owners to identify potential sites, avoid significant sites where practicable and to seek approval to disturb sites under s18 of the Aboriginal Heritage Act 1972 (AHA) where an impact is unavoidable (p121, p238). It is our preference that any development plans are modified to avoid damaging or altering any site. If it is not possible and in order to avoid a breach of Section 17 of the AHA, the land owner should submit a Notice in writing under Section 18 of the AHA to the Aboriginal Cultural Material Committee, seeking the prior written consent of the Minister for Indigenous Affairs' to use the land. A form to lodge a Notice under Section 18 is available from the DIA.

Submission item 6.07: For the mining area, the CHMP will implement procedures if a new site is detected. Qualified heritage site monitors will monitor clearing and earthworks activities and Traditional Owners will be briefed about proposed works and work schedules and involved in heritage management throughout the life of the project (p121). It is not quite clear why the risk treatment Table for the Transport Corridor (on p121) contains less steps than the risk treatment table for the Mining Area (p238).

Submission item 6.08: It is noted that Table 9.3 states that there is to be a policy of no disturbance outside the footprint area unless authorised by the Project Manager or Mining Manager. However, there should be no disturbance outside an area nominated under a s18 application in order to avoid prosecution under the AHA. Table 9.4 discusses Mine pit dewatering and discharge of surplus water (p123). It is also stated that there may be some compromising of integrity (through possible contamination) of Aboriginal heritage sites associated with watercourses (p236) and it was noted that major watercourses have a level of ethnographic significance as they are a focus of camping, material and ceremonies. It should also be noted that if there were to be indirect impact of sites through modified water action within the area that a Section 18 may be required in order to avoid a breach of Section 17.

Submission item 7.06: YMAC notes API's undertaking to see to avoid significant sites where practicable (p. 122 PER), and asks that guidance be provided as to the meaning of 'practicable' in this context.

Response

Risk treatment measures (item 6.06)

In accord with the position of the Department of Indigenous Affairs, API confirms a preference to avoid disturbance to heritage sites through infrastructure design in the first instance. Where sites cannot be avoided, API will apply, following consultation with Traditional Owners, for Ministerial consent to use the land under s18 of the *Aboriginal Heritage Act 1972*.

Procedures through the CHMP (item 6.07)

This risk treatments detailed for the mine area (PER, p 121) and the transport corridor (PER, p 238) are consistent, though greater detail is provided for the mine area. To confirm, API proposes to manage the risks to Indigenous Cultural Heritage in consultation with Traditional Owners the same way for the mine area and transport corridor. It is possible Cultural Heritage Management Plans agreed with the separate Traditional Owner groups may vary slightly.

Disturbance outside the footprint area (item 6.08)

API notes the need for Ministerial consent under s18 of the *Aboriginal Heritage Act 1972* for any anticipated indirect impacts to heritage sites.

Avoidance of sites where practicable (item 7.06)

The term 'where practicable' in the context of seeking to avoid heritage sites needs to be applied on a case by case basis. For example, in some instances it may not be practicable to avoid heritage sites located on orebodies, though mine pits may be able to be redesigned to avoid heritage sites located near the edge of orebodies. There is some flexibility to locate infrastructure such as roads, laydown areas and buildings, so as to avoid heritage areas, though less flexibility with a railway which is subject to more stringent design criteria to ensure safety and operability. For example, depending on the required deviation, tens of kilometres of railway may need to be re-aligned, avoiding other heritage areas and topographical and environmental constraints, and continuing to meet engineering requirements for gradients and railway geometry (i.e. rail curvature). Depending on the particular circumstance there could be many factors involved when considering amendments to project design. API will genuinely examine each case in consultation with Traditional Owners.

7.4 CULTURAL AWARENESS TRAINING

7.4.1 Education programmes

Submission

Submission item 7.08: The PER commits API to ensuring that all its personnel are aware of obligations under the Aboriginal Heritage Act and understand the significance of indigenous cultural heritage. In particular, the company commits to provide cultural awareness training to all its personnel (p. 120 PER). On behalf of our clients, YMAC advises that it is important that any cultural awareness training or inductions that take place on, or relate to, the KM claim area be delivered by KM members. We also advise that contractors, as well as employees, will require such training.

Response

API confirms its intention to develop a programme of cultural awareness training and inductions applicable to the Kuruma Marthudunera claim area in consultation with Kuruma Marthudunera, and would welcome the involvement of Kuruma Marthudunera members in the delivery of the training to contractors and employees.

7.5 OTHER ENVIRONMENTAL FACTORS (WATERWAYS, FLORA AND FAUNA)

7.5.1 Waterways

Submission

Submission item 7.09: We advise that although all impacts on their country are of concern to our clients, the KM are particularly concerned to protect waterways and permanent pools.

Response

API will assess each major watercourse and any permanent pools intersected by the project with Kuruma Marthudunera and will minimise, if not avoid, impacts to these areas.

7.5.2 Terrestrial fauna

Submission

Submission item 7.10: YMAC notes the sections in the PER referring to terrestrial fauna (pp. 35-38 and 245-253) and advises that any impacts to fauna need to be considered in light of consequent effects on the KM native title claim group. YMAC advises that the right to hunt is among its clients' registered rights and interests, and that the KM also have cultural obligations to manage and protect flora and fauna within their claim area.

Response

API acknowledges the position of Kuruma Marthudunera with regard to vegetation and fauna. API will implement monitoring and management measures as part of the proposal aimed at minimising impacts on endemic fauna and native vegetation.

7.6 PROPOSED CONDITIONS

7.6.1 Proposed conditions

Submissions

Submission item 8.05: The submitter requests that the EPA include a number of recommended conditions for the Proposal. These are as follows: prior to the commencement of any works for the Project, the Proponent and NAC must have developed together a Cultural Heritage and Environmental Management Plan ("CHEMP") including, among other features; all subsidiary Proponent management plans and the creation and ongoing operation of a joint environmental management board comprising the Proponent; NAC environmental and heritage consultants and NAC and Ngarluma people representatives.

Submission item 8.09: The Proponent is to engage (as consultants) up to 4 Ngarluma people, as nominated by the NAC Board from time to time, to operate as Environmental Monitors attending environmental surveys, inspections and audits with respect to all of the socio – economic, marine and terrestrial aspects of the Project (during its construction, implementation, rehabilitation and closure).

Submission item 8.10: The Ngarluma Environmental Monitors and NAC Board (or nominee) must be included by the Proponent in the planning, consultation and Proponent's decision making process associated with all environmental surveys, management and protection, including all environmental audits and inspections and preparation of environmental reports to Government agencies.

Submission item 8.11: All reports and management plans arising out of these processes are to be provided by the Proponent and its consultants in draft to NAC for input and approval prior to finalisation by agreement between the Proponent and NAC.

Submission item 8.12: The Proponent must implement the CHEMP in partnership with NAC during the construction, operation, rehabilitation and closure of this Project. The Proponent must construct, operate, rehabilitate and close the Project carrying out any recommendations of NAC, through the NAC Board (or NAC Board nominee). The Proponent is to meet on a six monthly basis with the NAC Board (or the NAC Board's nominees) to review the construction, operation, rehabilitation and closure of the Project.

Submission item 8.13: The Proponent must resource the costs of compliance with, and operation and implementation of, these conditions including the cost for NAC and its cultural heritage, environmental, legal and other advisors and consultants.

Response

API has acknowledged that the Ngarluma People have an interest in parts of the land identified as the West Pilbara Iron Ore Project transport corridor. API considers that an agreement under the *Native Title Act 1993*, to facilitate grant of rail tenure is the appropriate vehicle to settle ways to protect this interest. This is referenced within the PER (p.238). This position is relevant to each of the more specific responses detailed below.

Conditions as proposed by NAC (item 8.05)

API considers that the conditions proposed by the Ngarluma Aboriginal Corporation deal with matters beyond the scope of the environmental impact assessment process, make compliance contingent upon the input of (in part unidentified) third parties, imposes unquantifiable additional costs on the project and requires API to agree to the outcomes of processes in which it may have limited input. API is also of the view that imposition of the proposed conditions may act to the detriment of other Indigenous stakeholders unless confined in operation to the Ngarluma determination area (which raises further question as to practical implementation). API has previously indicated to the Ngarluma Aboriginal Corporation's nominated legal representative that, in API's opinion, the imposition of the proposed conditions through the environmental impact assessment process is inappropriate and unacceptable.

Environmental monitors (item 8.09)

It is API's strongly held preference to undertake heritage surveys in consultation with Traditional Owners. The involvement of Ngarluma people can be provided for by agreements to be reached under heritage and *Native Title Act 1993* processes. API notes that the West Pilbara Iron Ore Project Stage 1 Public Environmental Review does not encompass any activities that will impact on marine ecosystems and the imposition of conditions relating to protecting the marine environment is outside the scope of the proposal, and inappropriate in any event.

Involvement in planning, review and Proponent decision making processes (item 8.10)

API does not accept that it is appropriate for the Ngarluma Aboriginal Corporation to be included in project environmental management and reporting processes in the manner proposed but has committed to ongoing consultation with all Traditional Owners. API is also of the view that imposition of the proposed condition may act to the detriment of other Indigenous stakeholders by focusing solely on NAC's preferred consultants and processes.

Review and approval of Proponent reports (item 8.11)

API does not accept that it is appropriate for the Ngarluma Aboriginal Corporation to be included in project environmental management and reporting processes in the manner proposed. API is also of the view that imposition of the proposed condition may act to the detriment of other Indigenous stakeholders by focusing solely on NAC's preferred consultants and processes.

Implementation of a Cultural Heritage Environmental Management Plan (CHEMP) (item 8.12)

API reiterates that as outlined in the PER (pp 236 to 238), it is committed to developing a CHMP in consultation with the Traditional Owners and seeking to enter into native title agreements. API does not accept that it is appropriate for the Ngarluma Aboriginal Corporation to have the level of control over project environmental management and reporting processes that the proposed condition would afford it. In particular, the proposed condition making compliance contingent upon the input of (in part unidentified) third parties imposes unquantifiable additional costs on the project and requires API to agree to the outcomes of processes in which it may have limited input. API is also of the view that imposition of the proposed condition may act to the detriment of other Indigenous stakeholders by focussing solely on NAC's preferred consultants and processes.

Costs of compliance (item 8.13)

API considers that the condition proposed by the Ngarluma Aboriginal Corporation deals with matters beyond the scope of the environmental impact assessment process and seeks to impose unquantifiable additional costs on the project.

API will fully resource its environmental management programmes.

7.7 STATUS OF HERITAGE SURVEYS

In commenting on a draft of this Response to Submissions document the Office of the Environmental Protection Authority (OEPA) requested (letter 2 December 2010) that API “ ... *provide all available reports for Aboriginal heritage surveys for the mine and rail corridor including a summary of outcomes.*”

This section (7.7) responds to this request.

Heritage Survey Reports.

As of February 2011, archaeological and ethnographic surveys have been conducted over a majority of the proposal footprint. Figures 7.1 and Figure 7.2 present the current coverage of archaeological and ethnographic surveys over the proposed project area. Surveys are ongoing.

It is important to recognise that the survey scopes undertaken extend beyond the immediate footprint of potential disturbance, thus providing additional information in relation to sites within adjacent areas.

Table 7.2 details the heritage survey reports completed to February 2011.

Heritage Survey Outcomes

As a consequence of confidentiality provisions in the heritage agreements entered into with the various native title groups, it is neither possible nor appropriate for more detail regarding the outcomes of the above surveys to be provided in this document. API is aware of the obligation under Section 15 of the *Aboriginal Heritage Act 1972* to report the location of identified Aboriginal sites and intends to ensure this occurs in accordance with terms of its heritage agreements with the respective Aboriginal groups and their heritage consultants.

However, it is appropriate to make the general statement that heritage sites have been identified and are located within the proposed footprint, API are currently in consultation with the Aboriginal representatives regarding the proposal and the potential impact of those sites, these sites are assessed with all options for avoidance being investigated. To date the sites are predominantly archaeological such as artefact scatters and several rock shelters with *in-situ* stone artefacts. Impact to a percentage of these sites will occur. Under such circumstances, API will

consult with the respective Aboriginal groups regarding Section 18 consent to disturb under the *Aboriginal Heritage Act 1972*. In addition to the detailed heritage surveys, the Section 18 consultation process includes conducting detailed field consultations with Aboriginal representatives to the proposed footprint to identify each heritage site that will potentially be impacted. The consultations also form the basis for developing overall mitigative strategies for salvage, storage and further research that will then be incorporated into an agreed cultural heritage management plan.

To date, API has conducted several Section 18 field consultations with the Kuruma Marthudunera people who support the above mentioned process. This has occurred in relation to the central processing facilities (including adjoining rail) and associated infrastructure areas. With this outcome API will be initiating a section 18 notice / application in respect of these areas in due course. Kuruma Marthudunera have also stated they do not object API applying to the Minister for Indigenous Affairs for consent under Section 18 of the *Aboriginal Heritage Act 1972* under these arrangements and circumstances and also support the consultation process for developing an overall cultural heritage management plan. This Section 18 consultation process will also apply to the other Aboriginal groups across the project, providing opportunity for the representatives to understand the details of the proposed project and to ensure that mitigative strategies to protect those sites within and around the project footprint are implemented by API.

API has regular and open dialogue with relevant native title groups and the Department of Indigenous Affairs regarding site evaluation work that may be required to support future applications for Ministerial consent.

Aboriginal heritage matters are most appropriately managed through the provisions of the *Aboriginal Heritage Act 1972* and binding agreements negotiated under *Native Title Act 1993* processes. API reiterates its commitment to long term relationships with the Aboriginal groups, ensuring open, respectful and transparent engagement is maintained. API also understand that the preparation of cultural heritage management plans is a key factor in protecting and managing heritage with the full participation of the native title groups. API also reiterates its commitment to embodying this approach to heritage management in the various native title agreements it is negotiating with the relevant native title groups.

Table 7.2 details the heritage survey reports completed to February 2011.

Table: 7.2 List of Current Cultural Heritage Reports undertaken by API to February 2011.

| No. | Native Title Representative Body/ Consultant | Survey Report Title | Native Title Claimant Group | Date |
|-----|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-----------|
| 1 | PNTS, G.Wright | Results of an Ethnographic Heritage Survey: API Management Pty Ltd. - Cardo Bore Outcamp - Red Hill Station E08/1283, E08/1341, E08/1227, Draft. | KM | 1/11/2005 |
| 2 | PNTS, Steve Corsini | Work Program Clearance Survey with KM NTCG for API Management Pty Ltd: Kens Bore Exploration Project - E08/1227 & E47/1280 | KM | 1/11/2009 |
| 3 | PNTS, G.Wright | Results of an Ethnographic Heritage Survey: API Management Pty Ltd. - Catho Well - Mt. Stuart Station E08/1330, E08/1283 | PKKP | 1/12/2005 |
| 4 | PNTS, Eureka, Ian Ryan | Results of an Archaeological Work Program Clearance Survey of Nominated Sections of API Management Pty Ltd - Catho Well Mining Lease E08/1330 on Mt. Stuart Station, Southern Pilbara, WA | PKKP | 1/01/2006 |
| 5 | PNTS, G.Wright | Results of Ethhnographic Heritage Survey: API Management Pty Ltd. - Red Hill - Cardo North (E08/1227) | KM | 1/01/2006 |
| 6 | PNTS, Eureka Ian Ryan & Annie Carson | Results of an Archaeological Work Area Clearance of Nominated Areas within API Management Pty Ltd's Cardo Bore Prospect, Exploration Lease Areas E08/1283, E08/1341 and E08/1227, Southern Pilbara, WA | KM | 1/02/2006 |
| 7 | PNTS, Eureka Ian Ryan, Annie Carson & Kate Morse | Aboriginal Archaeological Site on Mt. Stuart Station in the inland Pilbara, WA - Cane River AS05-01 (E08/1283 | KM | 1/03/2006 |

| No. | Native Title Representative Body/ Consultant | Survey Report Title | Native Title Claimant Group | Date |
|-----|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------------|
| 8 | PNTS, S. Smalldon | Preliminary Advice of an Aboriginal Cultural Heritage Survey: Areas of Kens Bore, Red Hill North & Cardo Bore within Red Hill Station (Tenement Nos: Kens Bore - E08/1227, E08/1294, E47/1280 & E47/1283; Red Hill North - E08/1289 & E08/1294 plus Cardo Bore - E08/1341, E08/1227, E08/1516 & E47/1141 & Red Hill E08/1135. | KM | 1/05/2006 |
| 9 | PNTS, R. Stevens | Preliminary Advice following KM Cultural Heritage Survey at Red Hill North, West Pilbara. | KM | 17/06/2006 |
| 10 | PNTS, S. Corsini | Work Program Clearance: Australian Premium Iron JV - Cardo East Prospect - E 08/1341. | KM | 1/07/2006 |
| 11 | PNTS, S. Corsini | Work Program Clearance Survey: API Management Pty Ltd - PKKP Group - Trinity Bore Prospect E47/1409 (1693), E47/1141 & E08/1227. | PKKP | 1/09/2006 |
| 12 | PNTS, S. Corsini | Work Program Clearance: API Management Pty Ltd. - Cochrane / Farnum; Cardo Bore North; and Red Hill (E08/1294, E08/1289, E08/1430, E08/1227). | KM | 1/10/2006 |
| 13 | PNTS, S. Corsini | Work Program Clearance: API Management Pty Ltd - Trinity Bore Prospect - E47/1409, E47/1141 & E08/1227 (E47/1409 & E08/1227 converting to E47/1693). | PKKP | 1/10/2006 |
| 14 | PNTS, S. Corsini | Work Program Clearance: API Management Pty Ltd. Upper - PKKP Group - Trinity Bore Prospect - E47/1409 (1693), E47/1141 and E08/1227 NB: <i>Tenement Change to E47/1693.</i> | PKKP | 1/10/2006 |
| 15 | PNTS, S. Corsini | Work Program Clearance: API Management Pty Ltd. Upper Cane Prospect (Tenements E47/1141 & E08/1227). | KM | 1/12/2006 |
| 16 | PNTS, S. Corsini | Work Program Clearance: API Management Pty Ltd: Red Hill North Prospect Tenement E08/1294 | KM | 1/12/2006 |
| 17 | PNTS, P. Haydock | Heritage Survey - Preliminary Advice: API Management Pty Ltd's Yalleen and Kens Bore Project Areas Kuruma Marthu Dunera Native Title Group. | KM | 1/06/2007 |
| 18 | PNTS, D. de Gand | Aboriginal Heritage Survey of a drilling program and access (Work Program Clearance) and bulk sample excavation area (Work Area Clearance) on the Upper Cane Prospect Project Areas (E08/1227 & E47/1141 located south of Pannawonica, in Western Australia | KM | 1/07/2007 |
| 19 | PNTS, P. Haydock | An Ethnographic Heritage Survey of a proposed Exporation Drilling Program on Yalleen Project Area, and Kens Bore Project Area near Pannawonica, West Pilbara Region, Western Australia. | KM | 1/07/2007 |
| 20 | PNTS, D. Howard | Results of an Ethnographic Heritage Survey of the Mt. Stuart & Catho Well Exploration Drilling Program - E08/1330, E08/1292, E47/1141. | PKKP | 1/08/2007 |
| 21 | PNTS, S. Smalldon | Results of an Aboriginal Cultural Heritage Survey: Catho Well North Exploration (E08/1283, E08/1330 & E47/1141), Catho Well Water Bores (E08/1283, E08/1330 & E47/1141) and Catho Well Bulk Sample Site (E08/1330) within Red Hill & Mt. Stuart Stations. | PKKP | 1/11/2007 |
| 22 | PNTS, S. Corsini | Work Program Clearance Survey: KM 168: API Management Pty Ltd: Upper Cane. | KM | 1/08/2008 |
| 23 | PNTS, S. Corsini | Results of an Indigenous Heritage Survey: Proposed Bulk Sample Area on E47/1141 Lay-down/Load-out area and access road E08/1227: Upper Cane Project. | KM | 1/09/2008 |
| 24 | PNTS, C. Macdonald | Results of an Ethnographic Heritage Survey: Trinity Bore (Tenements E47/1141 & E47/1693). | PKKP | 1/10/2008 |

| No. | Native Title Representative Body/ Consultant | Survey Report Title | Native Title Claimant Group | Date |
|-----|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------------|
| 25 | PNTS, C. Macdonald | Preliminary Advice following Stage 1 of a PKKP Ethnographic heritage survey of the API Management Pty Ltd Trinity Bore Prospect proposed exploration drilling program. (Tenements E47/1141 & E47/1693). | PKKP | 1/10/2008 |
| 26 | PNTS, C. Macdonald | Preliminary Advice following a KM Ethnographic Heritage Survey of the API Management Pty Ltd Kens Bore Prospect Proposed Exploration Drilling Program. | KM | 1/10/2008 |
| 27 | C. Macdonald | Results of an Ethnographic Heritage Survey: Kens Bore Prospect & Mulga Bore (Tenements E08/1294 & E08/1227). API Management Pty Ltd. | KM | 1/11/2008 |
| 28 | PNTS, P. Haydock | Ethnographic Heritage Survey - API Management Pty Ltd. A proposed work program on Trinity Bore, Catho Well & Catho Well South - E47/1693, E47/1141 & E08/1330 - PKKP. | PKKP | 1/11/2008 |
| 29 | PNTS, J. Borg / G. Wright of Big Island Res. | API Management Pty Ltd: Mulga Bore Area (E08/1289 & E08/1294). | KM | 11/11/2008 |
| 30 | PNTS, S. Nalder | Ethnographic Survey for a Work Clearance Program on API Management Pty Ltd's Mulga Bore Project (E08/1289 & E08/1294). | KM | 17/11/2008 |
| 31 | PNTS, P. Haydock | An Ethnographic Survey of the Proposed Work Program on Trinity Bore, Catho Well and Catho Well South, EL E47/1693, E 47/1141, E08/1330 Near Onslow West Pilbara Region, WA. | PKKP | 1/12/2008 |
| 32 | PNTS, S. Corsini | Work Program Clearance Indigenous Heritage Survey, Exploration Access and Drilling Upper Cane Project Tenements E08/1227 & E47/1141 ("Troglifauna Holes - Upper Cane North"). | KM | 1/06/2009 |
| 33 | PNTS, S. Corsini | Preliminary Advice KM - Work Program Clearance Indigenous Heritage Survey - API Management Pty Ltd - Red Hill Iron Ore JV Proposed Geotechnical Investigation Areas - preliminary. | KM | 1/07/2009 |
| 34 | PNTS, S. Corsini | Work Program Clearance: API Management Pty Ltd. Proposed Basalt Quarry Areas (Tenement E08/1227). | KM | 1/07/2009 |
| 35 | PNTS, S. Corsini | Work Program Clearance: API Management Pty Ltd. Proposed Geotechnical Investigation Areas: Air Field - E08/1295 Common Facilities Area - E08/1227 Kens Bore - E47/1280 Upper Cane - E08/1516 Work Program Clearance: Proposed Basalt Quarry Areas (Tenement E08/1227). | KM | 1/07/2009 |
| 36 | PNTS, G. Jackson | Preliminary Advice of an Aboriginal archaeological survey of the KM section of the Proposed API Management Pty Ltd Rail Corridor Project, Cardo Bore to Eramurra Creek, Pilbara, WA (Trip 1). | KM | 1/10/2009 |
| 37 | PNTS, G. Jackson | Preliminary Advice of an Aboriginal Archaeological Survey of the KM Section of the Proposed API Management Pty Ltd Rail Corridor Project, Pilbara WA, Trips 1-3. | KM | 1/11/2009 |
| 38 | PNTS, G. Jackson | Preliminary Advice of an Aboriginal Archaeological Survey of the PKKP Section of the Proposed API Management Pty Ltd Rail Corridor Project, Urandy Creek to Catho Well, Pilbara | PKKP | 1/11/2009 |
| 39 | PNTS, S. Morgan | Report on an Ethnographic Heritage Survey of Aboriginal sites along a proposed rail corridor crossing the Robe & Cane Rivers in Red Hill and Cardo Pastoral Leases (E08/01293, 08/01289, E08/01294, E08/01227, E47/01141 & E08/01341). | KM | 1/11/2009 |
| 40 | PNTS, S. Morgan | Preliminary Advice of an ethnographic Aboriginal Heritage Survey of a proposed rail corridor crossing the Cane and Robe Rivers in the Native Title Claim area of the KM people (E08/01293, E08/01289, | KM | 1/11/2009 |

| No. | Native Title Representative Body/ Consultant | Survey Report Title | Native Title Claimant Group | Date |
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| | | E08/01294, E08/01227, E47/01141 & E08/01341). | | |
| 41 | PNTS, S. Corsini | Work Program Clearance: Kens Bore Mesa Exploration Drilling Program: Tenements E08/1227 & E47/1280: API Management Pty Ltd. | KM | 1/12/2009 |
| 42 | PNTS, G. Jackson | Preliminary Advice of an Aboriginal Archaeological Survey of the Kuruma Marthundunera Section of the Proposed API Management Pty Ltd Rail Corridor Project, Pilbara, Western Australia, Trips 1-4. | KM | 1/02/2010 |
| 43 | PNTS, G. Jackson | Preliminary Advice of an Aboriginal Archaeological Survey of the KM Section of the Proposed API Management Pty Ltd Rail Corridor Project, Pilbara WA, Trips 1-5. | KM | 1/02/2010 |
| 44 | PNTS, G. Jackson CRM | Preliminary Advice of an Aboriginal Archaeological Survey of Proposed Resource & Infrastructure Areas within the KM Section of the API Management Pty Ltd Rail Project, Pilbara, WA (Trips 1 - 2) . (Refer to A080 for Trip 3 - Separate Scope). | KM | 1/02/2010 |
| 45 | API Management Pty Ltd | Heritage Survey for Proposed Water Bore Sites at Red Hill Creek. | KM | 1/03/2010 |
| 46 | PNTS, G. Jackson | Preliminary Advice of an Aboriginal Archaeological Survey of proposed microwave communications tower locations and associated access tracks within the KM section of the API Management Pty Ltd Rail Project, Pilbara, WA. | KM | 1/03/2010 |
| 47 | PNTS, G. Jackson, | Preliminary Advice of an Aboriginal Archaeological Survey of the Proposed Geological Interpretation Drilling Program near Kens Bore East Resource Area, Pilbara, Western Australia, Authors Warren Mitchell, John Marrell and Sharan Bhaskar of Gavin Jackson Pty Ltd. | KM | 1/04/2010 |
| 48 | PNTS, GJRM, S. Bhaskar, H. Worrell, P. Thom and G. Jackson | Preliminary Advice of an Aboriginal archaeological survey of the proposed airstrip and airstrip accommodation village Survey Areas within the Kuruma and Marthundunera section of the API Management Pty Ltd West Pilbara Iron Ore Project, Western Australia. | KM | 1/05/2010 |
| 49 | PNTS, S. Morgan | Addendum Report to November 2009 Report on an Ethnographic Survey of Aboriginal Sites between Robe River and Cane River. | KM | 21/05/2010 |
| 50 | PNTS, S. Morgan | Further Addendum to 2009 Report on an Ethnographic Heritage Survey of Proposed Railway Corridor and Temporary Camp from Peter's Creek to near Mackay Creek. | KM | 1/06/2010 |
| 51 | PNTS, G. Jackson, R. Coughlan, H. Worrell, S. Lewis | Preliminary Advice of an Aboriginal Archaeological Survey of the Proposed Kens Bore Survey Area within the Kuruma Marthudunera Section of the API Management Pty Ltd West Pilbara Iron Ore Project, Western Australia (Trips 1 - 5). | KM | 1/09/2010 |
| 52 | PNTS, G. Jackson, R. Coughlan and S. Lewis. | Preliminary Advice of an Aboriginal Archaeological Survey of the Proposed Airstrip and Airstrip Accommodation Village Survey Areas within the Kuruma Marthudunera Section of the API Management Pty Ltd West Pilbara Iron Ore Project, Western Australia. Trips 1-3. | KM | 1/09/2010 |
| 53 | PNTS, G. Jackson, S. Lewis, H. Worrell, S. Coughlan | Preliminary Advice of an Aboriginal Archaeological Survey of the proposed Common Facilities, Alternative Rail Corridor and Loop and Central Processing Facility Survey Areas within the KM section of the API Management Pty Ltd WPIOP. Trip 2. | KM | 1/10/2010 |
| 54 | PNTS, S. Corsini | Report of an Indigenous Heritage survey Work Program Clearance Catho Well Ore-Body Access Road. | PKKP | 1/09/2009 |
| 55 | PNTS, G. Jackson | Preliminary Advice of an Aboriginal Archaeological Survey of the Proposed Resource and Infrastructure Areas Within the K and M | KM | 30/04/2010 |

| No. | Native Title Representative Body/ Consultant | Survey Report Title | Native Title Claimant Group | Date |
|-----|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------------|
| | | Section of the API Management Pty Ltd Rail Project Pilbara, Western Australia. Trips 1-4 | | |
| 56 | PNTS, G. Jackson, S. Lewis, H. Worell, S. Coughlan, W. Mitchell | Preliminary Advice of an Aboriginal Archaeological survey of the proposed Common Facilities, Alternative Rail Corridor and Loop and Central Processing Facility Survey Areas within the KM section of the API Management Pty Ltd WPIOP. Trip 1-4. | KM | 1/11/2010 |
| 57 | PNTS, GJCRM R. Coughlan, S. Coughlan, W. Mitchell | Preliminary Advice of an Aboriginal Archaeological Survey of the KM and YM overlap section of the Proposed API Management Pty Ltd Rail Corridor Project, Pilbara, Western Australia Trip 1. | YM & KM | 1/11/2010 |
| 58 | YMAC | Preliminary Advice on an Ethnographic Survey for Central Processing Facility (CPF), Kens Bore, Accommodation Village, Rail Camps 2 and 3 and mt Stuart Access Road for the West Pilbara Iron Ore Project (WPIOP). | KM | 13/11/2010 |
| 59 | PNTS, GJCRM R. Coughlan, S. Lewis, G. Jackson | Preliminary Advice of an Aboriginal Archaeological Survey of the Proposed Airstrip Infrastructure Survey Areas within the Kuruma Marthudunera Section of the API Management Pty Ltd WPIOP. Trip 1-5 | KM | 1/12/2010 |
| 60 | PNTS, GJCRM R. Coughlan, S. Coughlan, W. Mitchell | Preliminary Advice of an Aboriginal Archaeological Survey of the KM and YM overlap section of the Proposed API Management Pty Ltd Rail Corridor Project, Pilbara, Western Australia. Trip 2. | YM & KM | 1/12/2010 |
| 61 | PNTS, GJCRM R. Coughlan, S. Coughlan, W. Mitchell | Preliminary Advice of an Aboriginal Archaeological Survey of the KM and YM overlap section of the Proposed API Management Pty Ltd Rail Corridor Project, Pilbara, Western Australia Trip 3. | YM & KM | 1/01/2011 |
| 62 | PNTS, GJCRM R. Coughlan, S. Coughlan, W. Mitchell | Preliminary Advice of an Aboriginal Archaeological Survey of the KM and YM overlap section of the Proposed API Management Pty Ltd Rail Corridor Project, Pilbara, Western Australia Trip 4. | YM & KM | 8/02/2011 |
| 63 | YACMAC, D. Lafrentz | YACMAC Work Area Clearance Survey report of proposed Geotechnical Investigations for the API Management Pty Ltd Railway Corridor, West Pilbara Iron Ore Project, Western Australia. | YM & KM | 1/02/2011 |
| 64 | YACMAC, D. Lafrentz | YACMAC Ethnographic Site Avoidance Survey Report of Rail Camp 2 - Construction Camp, for the API Management Pty Ltd West Pilbara Iron Ore Project, Western Australia. | YM & KM | 1/02/2011 |

Abbreviations used in the Table:

GJRM = Gavin Jackson Cultural Resource Management

KM = Kuruma Marthudunera

PKKP = Puutu Kunti Kurrama and Pinikura

PNTS = Pilbara Native Title Service

YACMAC = Yaburara Aboriginal Corporation and Mardudhunera Aboriginal Corporation

YM = Yaburara and Mardudhunera

YMAC = Yamaji Malpa Aboriginal Corporation

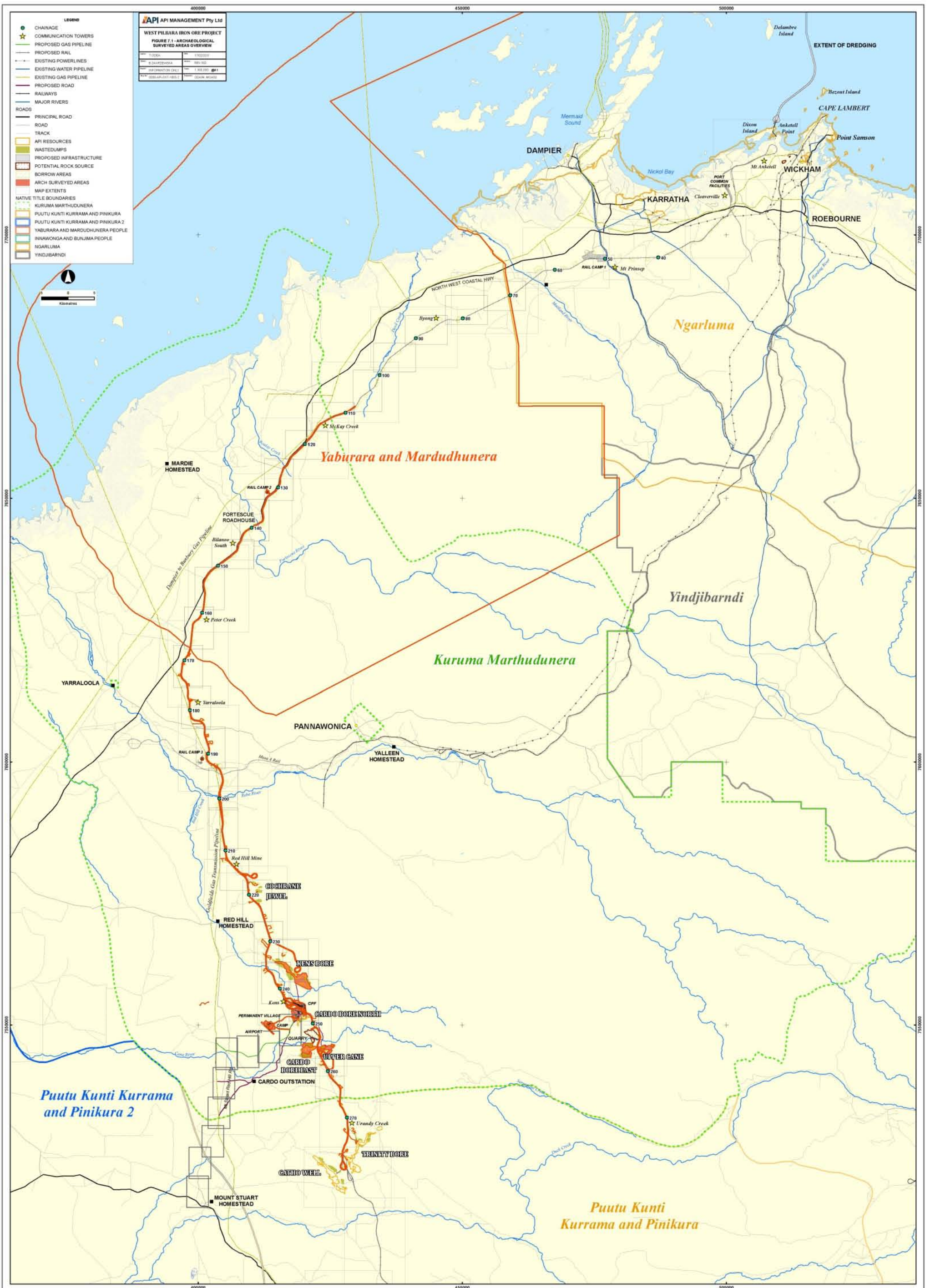


Figure 7.1 – Archaeological Surveyed Areas Overview

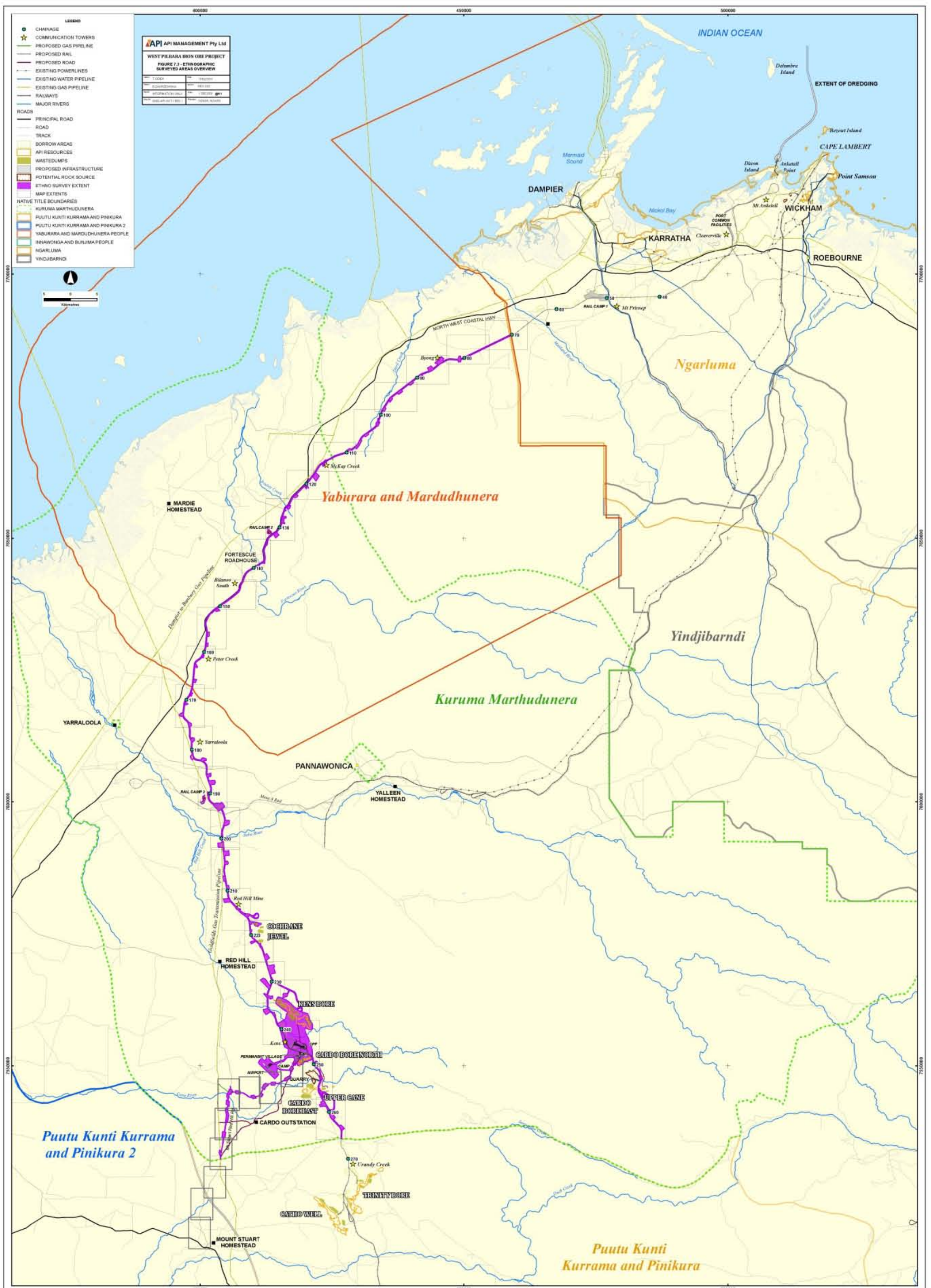


Figure 7.2 – Ethnographic Surveyed Areas Overview

8 Geodiversity

8.1 GEODIVERSITY ASSESSMENT

8.1.1 Impact to mesa landforms and geodiversity

Submission

Submission item 9.01: This is an enormous project and we are unable to comment in detail on the various aspects of the project. However there is one major area of concern. That is, the impact on the landform and geodiversity unique to the West Pilbara. The Society was represented at the Risk Assessment Workshop held on 16th June 2009. At this workshop we raised the issue of the impact of the proposal on the unique landforms of the West Pilbara. The residual risk to the landform and geodiversity of the area is rated at medium, page xvii of the PER.

Response

Implementation of the proposal will result in the removal of an estimated 2.6% of palaeochannel landform within the Pilbara region. This was considered a minor consequence, using the criteria (PER, p 63) applied at a stakeholder risk assessment workshop during the scoping phase of the impact assessment process (PER, p 55).

8.1.2 Assessment of Geodiversity and Geoheritage Values

Submission

Submission item 9.02: It is good to see the Blandford Report, An investigation into the Geodiversity of Palaeo Channel Systems August 2009, however we don't believe this goes far enough. It is our understanding that there is none of the "mesa type" landforms either in or proposed to be included in the conservation estate. If this proposal proceeds in the form proposed more than 2.6% of the estimated length of landform will be destroyed and it is estimated the total length impacted in the current mining boom is 8.3%. What is not certain is the accuracy of this assessment bearing in mind at least 5.7% has or will be lost.

Submission item 9.04: It seems to us that the EPA should be taking a lead in recommending a whole of government approach be made to assessing the values of the West Pilbara Region particularly with respect to biodiversity, geodiversity and landforms. If this does not take place we will continue to have the demolition of individual mesas and landforms as each project goes through the Environmental Impact Assessment Process.

Response

The work commissioned by API to assess impacts on landform and geodiversity has contributed substantially to the knowledge base and therefore evaluation of the potential impacts on this factor. The investigations comprised: discussions with geologists familiar with the area and definition of channel iron deposits; field studies of the presence and range of palaeochannel landforms within and around the proposed mine area, including helicopter surveys, observations and measurement of slope angles and landforms; a desktop review and census of palaeochannel landforms across the greater Pilbara area; and an assessment of the relative loss of palaeochannel landforms that will be caused by the proposed mining activities. The studies have documented the approximate ages, genesis and morphology of the key landforms in the Proposal area and enabled a sound understanding of the mesa-type landforms and channel iron deposits that host the resources that underpin the proposal.

This is an emerging field and there are likely to be refinements to the classification of landforms, the tools to categorise landforms and definitions of geoheritage values over time. The scope of the API commissioned work was extensive and ambitious, and there would be merit in continuing to develop and validate the palaeochannel inventory (and other landforms, for that matter) of the Pilbara region in light of ongoing resource development pressures.

The API commissioned study was confined to an assessment to mesa and mesa-type landforms of palaeochannel origins and did not consider the abundant mesa landforms that occur commonly throughout the Pilbara but are of a different geological origin (such as mesa-type landforms that originate from marine sediments).

Similar to its commitment to contribute to the identification of the biodiversity values of the west Hamersley Ranges (PER, p 212) API is open to extending this scope to other environmental/geoheritage values that would assist in State planning of conservation estate.

8.1.3 Assessment of tourism potential

Submissions

Submission item 9.03: Submitter noted that there has been no assessment of the values of the sites with respect to their tourism potential.

Submission item 9.05: It is apparent to our members that the mesas like those associated with the Catho Well, Upper Cane and Cochrane and Jewel proposed mines also have very high tourism appeal. It is recognised that it is not possible to incorporate all sites into say a National Park the first steps need to be taken before some of what may be regarded as the key assets are gone forever. We owe at least this small step to future generations.

Response

The mine area is located predominantly on pastoral leases, remote from public roads and access to the area is limited. API considers there are many varied factors that contribute to tourism appeal and some will value the landscape values present in sections of the mine area. These values are well represented across the Pilbara region. The proposal will result in the removal, or part removal, of mesa-type landforms, though as indicated through the geodiversity studies, these mesa-type landforms will continue to be represented within the mine area and across the West Pilbara region.

8.1.4 Available video footage

Submission

Submission item 9.06: The Company, API has available some hours of video footage of the landscapes of the region. This has been shot from a helicopter. A minute or so of footage representative of each proposed mine sites was shown at the Risk Assessment Workshop and following a request to the company made available to the Wildflower Society. We believe at least this amount of video should be shown to the EPA but preferably a more extensive viewing so they can see the potential impacts of the project.

Response

The footage referred to will be provided to the EPA.

Office of EPA assessment officers have visited the site and flown around the proposal area. API would welcome further visits by the OEPA or EPA to the proposal area and would be happy to distribute the video footage of the proposal area and surrounds more broadly if this would contribute to the assessment of the proposal.

9 References

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- Astron (2010c) *West Pilbara Iron Ore Project Risk Assessment of Rail Corridor and Southern Access Road Potential Impacts on Sheet Flow Dependent Vegetation July 2010*. Unpublished consultants report prepared for API Management Pty Ltd.
- Astron (in prep) *West Pilbara Iron Ore Project Fortescue Rail Realignment vegetation assessment*. Unpublished consultants report prepared for API Management Pty Ltd.
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