

Western Extension of Nickol Bay Quarry

Readymix Holdings Pty Limited

**Report and recommendations
of the Environmental Protection Authority**

**Environmental Protection Authority
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Environmental Impact Assessment Process Timelines

Date	Progress stages	Time (weeks)
7 May 2001	Level of assessment set (following any appeals upheld)	0
5 Aug 2002	Proponent document released for public comment	63
2 Sept 2002	Public comment period closed	4
2 Dec 2003	Proponent response to issues raised in submissions	63
5 April 2005	Final proponent response to issues raised by EPA	70
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Summary and recommendations

Readymix Holdings Pty Limited proposes to extend its Nickol Bay quarry, located at the southern end of the Burrup Peninsula near Dampier, by an area of approximately 5.2 hectares. This report provides the Environmental Protection Authority's (EPA's) advice and recommendations to the Minister for the Environment on the environmental factors relevant to the proposal.

This report is on the assessment of the proposed extension, under Section 40 of the *Environmental Protection Act 1986* (the EP Act) as a change to a previously approved proposal (revised proposal) with the environmental conditions on the previously approved proposal being applicable unless amended following this assessment, as referred to in Section 45B(b) of the EP Act. The previously approved proposal was "Hard Rock Quarry –ML 47/306, 309,331 & 353 Burrup Peninsula (902)" Statement 440 issued on 12 February 1997.

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the revised proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

Relevant environmental factors

The EPA decided that the following environmental factors relevant to the proposal required detailed evaluation in the report:

- a) Visual amenity;
- b) Terrestrial flora and vegetation;
- c) Conservation planning for the Burrup Peninsula; and
- d) Decommissioning and rehabilitation.

Aboriginal heritage is not considered to be a relevant factor as several surveys of the area for the proposed western quarry extension failed to find any Aboriginal heritage sites.

Conclusion

The EPA has considered the proposal by Readymix Holdings Pty Limited for a western extension to the Nickol Bay Quarry in addition to the previously approved eastern extension.

The EPA considered that the environmental factors of visual amenity, terrestrial flora and vegetation, conservation planning for the Burrup Peninsula and decommissioning and rehabilitation required assessment.

After considering the information on the visual impacts of the proposal provided in the proponent's PER and response to submissions, the EPA has concluded that that it is unlikely that its objectives would be compromised provided that a progressive rehabilitation plan for the quarry is completed prior to commencement of the western extension and subsequently implemented.

The EPA has considered information provided in the proponent's response to submissions that the combined effect of the eastern and western extensions will result in a maximum of a 24% reduction in the current extent of any of the vegetation associations present on the site. The EPA considers that this level of loss of the affected associations is environmentally acceptable. Available information indicates that the proposal will not impact on any species listed as Declared Rare Flora under the *Wildlife Conservation Act 1950* or priority flora listed by CALM nor is any other uncommon species likely to be threatened by the proposed extension.

The EPA considers that, while there is an urgent need for resolution of the boundary of the Conservation, Heritage and Recreation (CHR) zone in order to properly plan and evaluate land use proposals, the current proposal may be the maximum appropriate extent of quarrying development for the Nickol Bay Quarry. The proponent has provided a formal commitment to withdraw from future quarrying proposals the areas shown in Figure 3 in this bulletin and to manage these areas so as to prevent quarry-related impacts on vegetation. This commitment is reflected in condition 6 of the recommended condition statement requiring a management plan for the vegetation. The proponent has also consented to a mining tenement condition preventing mining (quarrying) activities being undertaken in the areas which have been deemed to have high environmental significance as shown on Figure 3 and a second condition requiring any proposal for exploration activities in the areas which are deemed to have a high environmental significance as shown on Figure 3 to be referred to the EPA. It is recommended that the Minister for State Development place these tenement conditions on the relevant mining leases after approval of the Notice of Intent "Public Environmental Review, Western Extension to Nickol Bay Quarry (Mining Lease M47/333) Burrup Peninsula, Dampier" dated 2002. Due to these commitments the EPA has concluded that it is unlikely that its objectives for the CHR zone would be compromised.

It is the EPA's opinion that the proposed change to the Nickol Bay Quarry involving the proposed western extension can be managed to meet the EPA's environmental objective for decommissioning and rehabilitation provided that the EPA's recommended changes to the environmental conditions requiring the development of a quarry-wide Progressive Rehabilitation Programme prior to the commencement of quarrying in the proposed western extension, are implemented.

The EPA has therefore concluded that it is unlikely that its objectives would be compromised, provided there is satisfactory implementation by the proponent of its commitments and the recommended amended conditions set out in Appendix 3, and summarized in Section 4 and the provided tenement conditions are modified such that areas of high environmental significance are protected.

Recommendations

The EPA submits the following recommendations to the Minister for the Environment:

1. That the Minister notes that the proposal being assessed is for a western extension to the Nickol Bay Quarry in addition to the previously approved eastern extension;

2. That the Minister considers the report on the relevant environmental factors as set out in Section 3 of this report;
3. That the Minister notes that the EPA has concluded that it is unlikely that the EPA's objectives would be compromised, provided there is satisfactory implementation by the proponent of the recommended amended conditions set out in Appendix 3, and summarised in Section 4 of this report, including the proponent's commitments and provided tenement conditions are imposed on mining leases by the Minister for State Development as set out in Procedure 1 of the recommended amended conditions set out in Appendix 3.
4. That the Minister imposes the amended conditions and procedures recommended in Appendix 3 of this report.
5. That the Minister notes that the EPA has provided other advice regarding the need for the boundaries between the CHR and Industrial zones to be clearly identified and agreed between the Department of Conservation and Land Management and the Department of Industry and Resources.

Conditions

The EPA has developed a set of amended conditions that the EPA recommends be imposed if the revised proposal by Readymix Holdings Pty Ltd to develop a western extension at the Nickol Bay Quarry in addition to the approved eastern extension, is approved for implementation.

Matters addressed in the amended conditions include the following:

- a) that the proponent shall fulfil the commitments in the Consolidated Commitments statement set out as an attachment to the recommended conditions in Appendix 3, which include the commitments to withdraw four areas of the mining leases from future mining plans and manage these areas so as to prevent quarry related impacts on the vegetation;
- b) the requirement for a Management Plan to manage the areas to be withdrawn from future mining plans so as to prevent quarry related impacts on the vegetation;
- c) the requirement for the preparation of and subsequent implementation of a Progressive Rehabilitation Programme prior to commencement of quarrying in the western extension and within three years following the issuing of the notice to the decision making authorities under Section 45(7) of the *Environmental Protection Act 1986*;
- d) a procedure for the implementation of two tenement conditions on Mining Leases ML47/255, ML47/306, ML47/309, ML47/331, ML47/333 and ML47/353 which prevents mining and requires referral to the EPA of any exploration activities on designated areas of the leases.

It should be noted that the quarry is also subject to the conditions under the Mining Act for Mining Leases M47/26, M47/255, M47/306, M47/309, M47/331, M47/333 and M47/353 and requires an amended works approval and licence under Part V of the Environmental Protection Act 1986 (the EP Act).

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1. Introduction and background

This report provides the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for the Environment, on the environmental factors relevant to the proposal by Readymix Holdings Pty Limited to extend its Nickol Bay Quarry, located at the southern end of the Burrup Peninsula near Dampier in the Pilbara of Western Australia (Figure 1). The western extremity of the main quarry pit under the proposed extension would be located approximately 250 metres west of its current location. The area of the proposed extension is approximately 5 hectares (Figure 2).

Readymix Holdings Pty Ltd owns and operates a hard rock quarry which is located on Mining Leases M47/26, M47/255, M47/306, M47/309, M47/331 and M47/353 on the Burrup Peninsula, to produce aggregate suitable for roadbase and concrete. The quarry was originally established in the 1960s by Hamersley Iron Pty Ltd and became disused for a period in the early 1980s before the lease was acquired by the Readymix Group. The quarry has been run by several contractors and finally by Readymix Limited itself since that time.

In November 1996 the EPA assessed a proposal by Messrs G & P Rocca (contractors to Readymix) for an eastern extension to the quarry pit covering an additional area of approximately 16 hectares. The EPA recommended that, subject to the satisfactory implementation of the EPA's recommended conditions and procedures, the proposed extension could be managed to meet the EPA's objectives. The proposed eastern extension was subsequently approved by the Minister for the Environment in February 1997 subject to the environmental conditions set out in Appendix 5.

This report is on the assessment of the proposed western extension, under Section 40 of the *Environmental Protection Act 1986* (the EP Act) as a change to a previously approved proposal (revised proposal). Section 45B(b) of the EP Act provides for the environmental conditions on the previously approved proposal to be changed through this assessment.

Further details of the proposal are presented in Section 2 of this report. Section 3 discusses the environmental factors relevant to the proposal. The Conditions and Commitments to which the proposal should be subject, if the Minister determines that it may be implemented, are set out in Section 4. Section 5 provides Other Advice from the EPA, Section 6 presents the EPA's conclusions and Section 7, the EPA's Recommendations.

Appendix 4 contains a summary of submissions and the proponent's response to submissions and is included as a matter of information only and does not form part of the EPA's report and recommendations. Issues arising from this process, and which have been taken into account by the EPA, appear in the report itself.

2. The proposal

The proposal is to extend the western perimeter of the existing Nickol Bay hard rock quarry pit approximately 300 metres westward into mining lease M47/333 covering an additional pit area of approximately 5.2 hectares (Figure 2) in addition to the eastern extension which has previously been assessed and approved. The quarry will be established to a maximum depth of 60 metres and will primarily be used to source large dimension rock for the purposes of armour for marine developments such as breakwaters. About 4.1 million tones of rock will be extracted over the life of the proposed extension.

The main characteristics of the proposal are summarised in Table 1 below. A detailed description of the proposal is provided in Section 3.1 of the PER (Martinick McNulty Pty Ltd, 2002).

Table 1: Summary of key proposal characteristics –western extension only

Element	Description
Life of quarry	Up to 20 years
Size of hard rock reserve	4.1 million tones (upper limit)
Depth of mine pit	60 metres
Maximum area of disturbance	5.2 hectares
Quarrying times	Continuous operation on a project by project basis
Quarrying rate	Approximately 1 million tons per annum
Drainage	All surface runoff will be drained to the existing sump on adjoining mining lease M47/26
Quarry access	Via existing quarry access on adjoining mining lease M47/26

Since release of the PER a number of modifications to the proposal have been made by the proponent. These include:

- The proponent has committed to the preparation of a weed management plan for the quarry.
- Native vegetation will be established on the screening bund, initially via natural regeneration.
- The proponent has committed to annually reviewing the potential for relocation of quarry infrastructure to within the quarry pit.
- The proponent has agreed to withdraw four areas on M47/255, M47/306, M47/309, M47/331, M47/333 and M47/353 from future quarrying plans and manage the areas withdrawn from quarrying plans to prevent quarry-related impacts on vegetation (Figure 3).

The potential impacts of the proposal initially predicted by the proponent in the PER document and their proposed management are summarised in Table 1 of the PER.

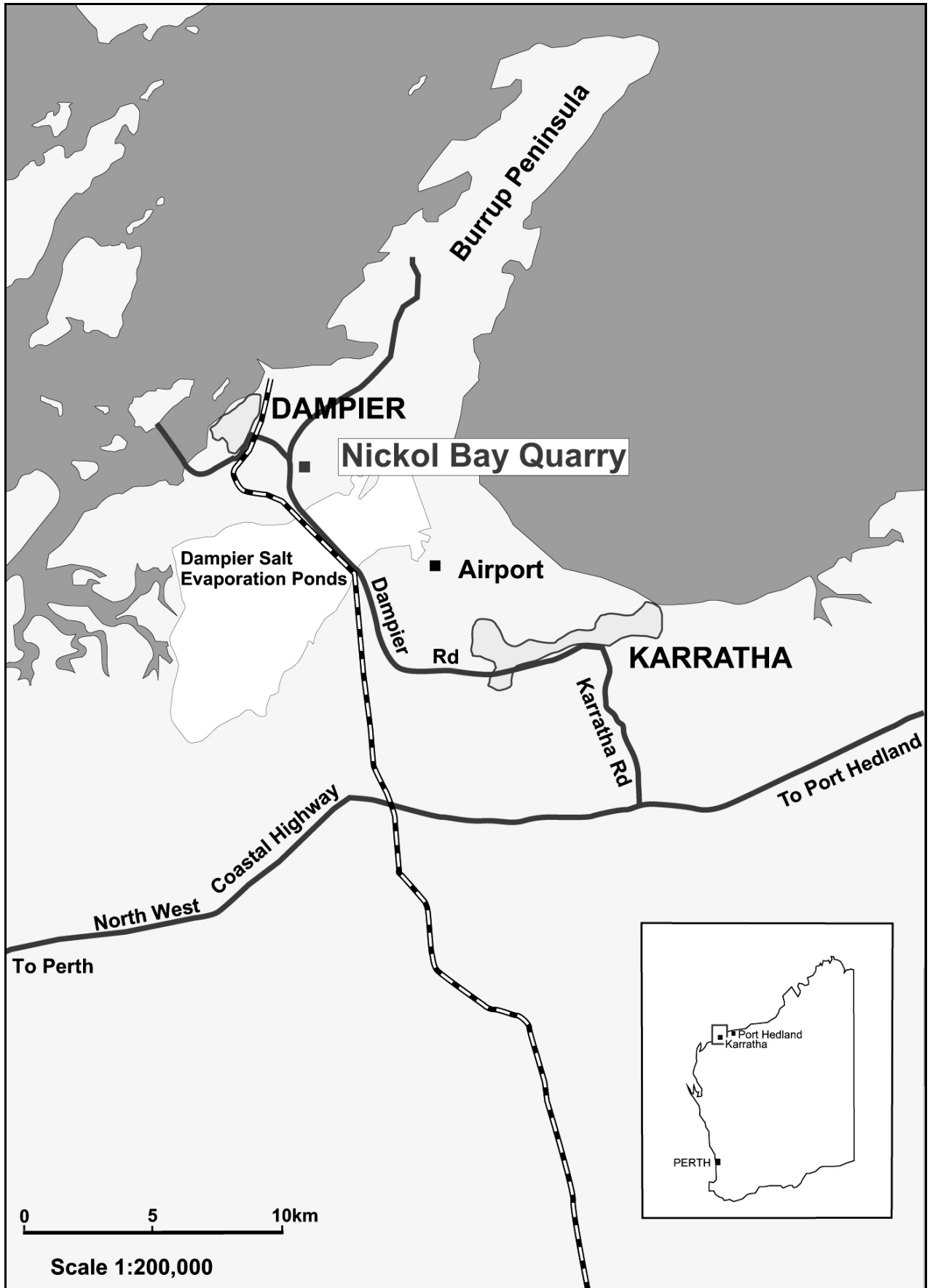


Figure 1 Location of the Nickol Bay Quarry

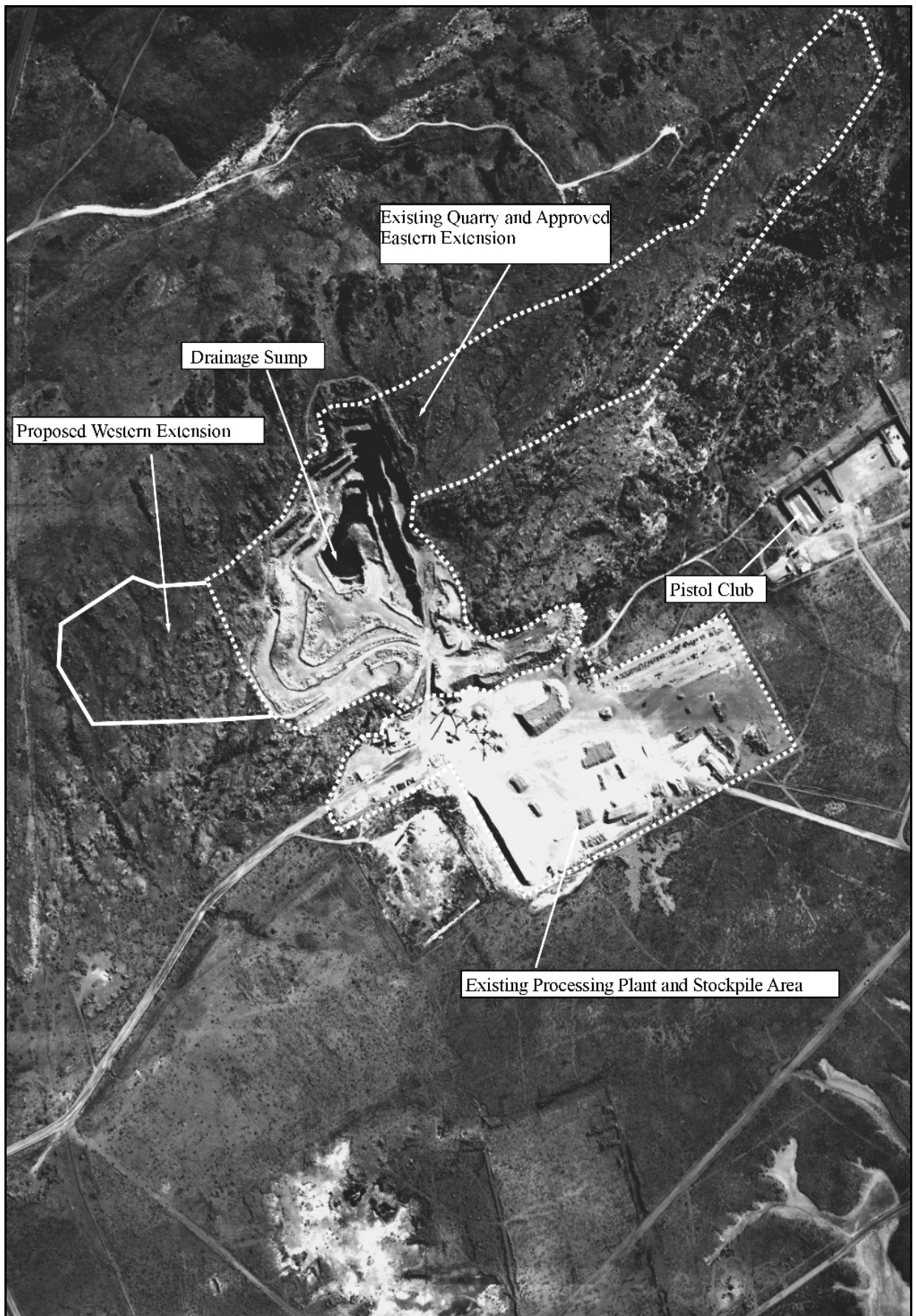


Figure 2 Location of the proposed western quarry extension

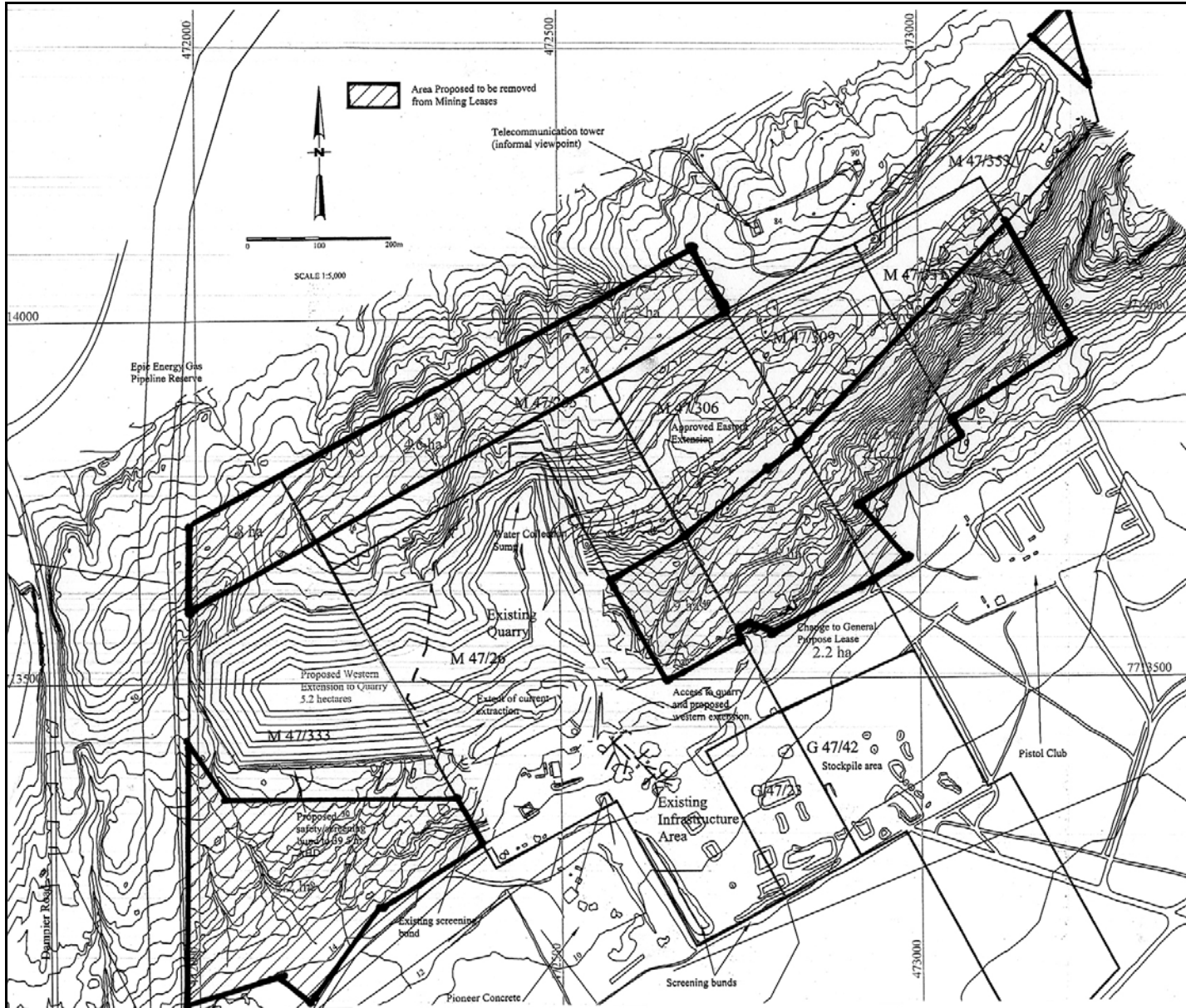


Figure 3 *Areas to be withdrawn from future quarrying plans*

3. Relevant environmental factors

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the proposal and the conditions and procedures, if any, to which the proposal should be subject. In addition, the EPA may make recommendations as it sees fit.

It is the EPA's opinion that the following environmental factors relevant to the proposal require detailed evaluation in this report:

- a) Visual amenity.
- b) Terrestrial flora and vegetation;
- c) Conservation planning for the Burrup Peninsula; and
- d) Decommissioning and rehabilitation.

The above relevant factors were identified from the EPA's consideration and review of all environmental factors generated from the PER document and the submissions received, in conjunction with the proposal characteristics.

Aboriginal heritage is not considered to be a relevant factor as several surveys of the area of disturbance for the proposed western quarry extension failed to find any Aboriginal heritage sites. The proposed extension was also discussed with the Nanga-Ngoona Moora-Joora Land Council and inspected by members of the Roebourne Aboriginal community in 1995 and no objections to the proposed extension have been raised.

Details on the relevant environmental factors and their assessment are contained in Sections 3.1 - 3.4. The description of each factor shows why it is relevant to the proposal and how it will be affected by the proposal. The assessment of each factor is where the EPA decides whether or not a proposal meets the environmental objective set for that factor.

3.1 Visual amenity

Description

The proposed western quarry extension involves quarrying (surface mining) of elevated land on the escarpment of the Pistol Range and has the potential to impact significantly on the scenic quality of the Range.

In the PER the proponent provided an assessment of the visual impact of the proposal including 'computer generated views' (simulated images) showing likely future views from key locations south of the Pistol Ranges. Viewing sites considered in the proponent's visual assessment include the Dampier-Karratha Road (1.5km from the quarry) the Karratha Airport (5km from the quarry) and the town of Karratha (9km from the quarry). Simulated views from these locations are shown in the PER document immediately before the appendices section.

The Pistol Range is considered to have a high scenic quality based on landform and natural landscapes and its role as a visual entry statement to the Burrup Peninsula

(Martinick McNulty, 2002). The high scenic quality has been impacted by previous and current quarrying operations, particularly as a result of the location of quarry infrastructure and ore stockpiles below the existing pits at the base of the range.

The proposed extension, with a length of approximately 300 metres, would be additional to the previously approved eastern quarry extension, which commenced in 2001 and has a total length of approximately 800 metres.

Submissions

Issues raised in submissions included:

- the potential negative impact of the proposal on visual amenity of the area when viewed from the plains area to the south;
- the need to consider the combined visual impact of the eastern and western extensions;
- the possibility of relocating quarry plant and stockpiles to within the existing quarry pits; and
- the need for the screening bund to be actively revegetated.

Assessment

The area considered for assessment of this factor is the quarry and ‘seen area’ to the south of the Pistol Range, because this is the area over which landforms and vegetation will be disturbed and visual amenity could be detrimentally impacted.

The EPA’s environmental objective for this factor is “to ensure visual amenity of the area adjacent to the project is not unduly affected by the proposal.”

Following its assessment of the eastern extension to the quarry in 1996, the EPA advised, in Bulletin 834, of its concern about the potential for cumulative impact on the landscape values of the Burrup Peninsula through possible future quarry developments. This advice was in particular reference to the area of the Pistol Range in the vicinity of the entry point to the Pistol Range, which was considered to be of particular importance as an “entry statement” for the Burrup Peninsula, and the view from the Dampier-Karratha Road.

The EPA’s position, in Bulletin 834, was that the quarry pit should not be permitted to extend further south-west (along the range) from the existing quarry, as this would impact the hill slopes that currently screen the quarry from the Dampier-Karratha Road.

The current proposal, while extending the western edge of the quarry pit further to the west, would preserve the lower terraces of the range by the retention of a 34 metre high terrace to the south (in front) of the quarry pit and the installation of a 1.5 metre high safety bund along the upper edge of this terrace. This will result in up to 14.5 metres of quarry face being visible from the area of entry to the range on the Dampier–Karratha Road (a distance of 1.5 km) during the operational phase of the quarry.

While it is proposed that the eastern and western quarry extensions be operated concurrently, the environmental conditions relating to the eastern extension include a condition requiring the development and implementation of a progressive

rehabilitation programme to meet the objective of the proponent's commitment to minimise the visual impacts of the extension.

The EPA's intention in recommending this condition was that the rehabilitation plan should address the relocation of rock dumps and project infrastructure into the pit area, include the existing quarry, and be progressively updated as the detailed development of the eastern extension progresses.

As part of the current assessment, the proponent has responded, in its response to submissions document, to the issue of the cumulative visual impact of the eastern and western extensions, by stating that the western extension will be completed prior to the completion of the eastern extension and that therefore the visual simulations presented in the PER are equivalent to a "worst case scenario" in terms of the visual impact of the overall quarry operation.

The EPA is concerned, however, that the proposal for the western extension has been submitted prior to initiating the development of the progressive rehabilitation plan for the eastern extension, and that no firm timeframe has been put forward in the PER for the relocation of quarry stockpiles and infrastructure into the quarry pit area, as proposed during the assessment of the eastern extension. The EPA therefore considers that it would be appropriate for the progressive rehabilitation plan for the Nickol Bay Quarry (incorporating the eastern and western extension areas) to be developed and approved prior to final approval for the commencement of mining of the western extension.

Development of the progressive rehabilitation plan prior to commencement of the western extension would ensure that extraction and rehabilitation phases for the existing and proposed quarry pit areas are coordinated with each other and with the planned relocation of quarry infrastructure into pit areas. The overall objective of the Plan should be to minimise the visual impacts of the quarry operation on the entry to the Range taking into account input on design options from key stakeholders. The EPA therefore recommends that the environmental conditions relating to the revised proposal be amended to require that the progressive rehabilitation plan for the overall Nickol Bay Quarry be developed, with stakeholder input, and approved prior to final approval being provided for the commencement of mining of the western extension.

The EPA's recommended revised conditions included in Appendix 3 of this report incorporate these requirements.

Summary

Having particular regard to:

- a) information on the visual impacts of the proposal provided in the proponent's PER and response to submissions;

it is the EPA's opinion that the proposed change to the Nickol Bay Quarry project involving the western extension can be managed to meet the EPA's environmental objective for this factor, provided that amended environmental conditions are imposed requiring:

- prior approval of a plan for progressive rehabilitation of the quarry pits; and
- relocation of quarry infrastructure.

3.2 Terrestrial flora and vegetation

Description

The vegetation of the proposal area is described in the PER as ‘Sparse hummock grassland of the soil covered terraces’ based on the vegetation description derived from a survey of the proposal area by Martinick in 1994 (Martinick & Associates, 2002).

As indicated in the PER, studies undertaken for the Burrup Peninsula Draft Land Use and Management Plan (BPDUMP, O’Brien Planning Consultants 1994) identified some significant vegetation communities requiring special consideration within the peninsula. These are:

- mangals, coastal marine community;
- communities consisting of tall dense stands of vegetation,
- coastal grassland communities;
- samphire communities; and
- rarely occurring communities
 - *Paspalidium* aff. *tabulatum*/*Acacia bivenosa*
 - *Eucalyptus* aff. *dichromophloia*/*Chrysopogon fallax*
 - *Sesuvium portulacastrum* Community.

None of these communities are found within the project area or its immediate environs.

Burrup Peninsula flora and vegetation survey

Following the public review period for the PER, a report and mapping from a detailed survey of the flora, vegetation and floristics of the Burrup Peninsula and other areas of the Dampier Archipelago and Pilbara (Trudgen, 2002) became available for use by the proponent. The detailed survey was undertaken for planning purposes on behalf of the Department of Mineral and Petroleum Resources (now Department of Industry & Resources). The survey (referred to in this report as the Burrup Flora and Vegetation Survey) identified and mapped approximately 240 vegetation units that occurred within the Burrup Peninsula survey area.

The overall conclusions on the conservation values of the area in the Burrup Flora and Vegetation Survey report were that the Burrup Peninsula area in general:

1. has a very diverse assemblage of vegetation associations with very restricted distributions;
2. provides the best example in the Pilbara region of the development of a mix of species and vegetation dominated by Northern (Kimberley) species and Eremaean species; and
3. is the habitat for a rich flora with many uncommon and geographically restricted plant species.

The report also proposed that the Burrup Peninsula, Dolphin Island, Angel Island and Gidley Island area has conservation value for vegetation and flora that provides a justifiable case for national heritage listing.

Vegetation

The mapping of vegetation associations within the Burrup Flora and Vegetation Survey report identifies nine associations within Mining Lease M47/333. These are listed in the proponent's response to issues raised in submissions (Appendix 4). Of these, five associations, referred to in abbreviated nomenclature form as *IcTsTh*, *TcThTe*, *ChAm*, *TcTeSg* and *TeTh*, will potentially be directly impacted by the proposed western quarry extension.

Table 2 in the proponent's response to submissions provides estimates of the area of each vegetation association impacted by the proposal and the previously approved eastern extension, and of the total current extent of these associations as mapped in the Burrup Flora and Vegetation Survey. The area estimates are based on measurements by the proponent's environmental consultant from a digital version of the maps provided in the survey report.

Impacts on flora

In relation to the impact of the proposal on flora, it is noted that none of the species listed in the species list in the PER for the quarry extension area is listed for protection as Declared Rare Flora under the *Wildlife Conservation Act 1950* or listed as priority flora by the Department of Conservation and Land Management (CALM). While several plant species listed as occurring within the western extension area were identified in the Burrup Flora and Vegetation Survey as 'significant' they are considered to be common on the Burrup Peninsula and are therefore unlikely to be threatened by development of the scale of the proposed extension.

The taxon *Brachychiton acuminatus* which is listed for the eastern and western extension areas and was previously listed as Priority 4, was removed from the priority list in 1999. The proposal is unlikely to significantly impact on the conservation status of this species.

Submissions

Key issues raised in submissions in relation to this factor include:

- the level of detail and quality of the flora and vegetation survey undertaken for the PER;
- lack of reference in the PER to the Burrup Flora and Vegetation Survey report;
- impacts on *Brachychiton acuminatus* (previously listed as Priority 4);
- the number of vegetation associations impacted by the proposal; and
- flora recorded in the survey for the PER that were not previously recorded for the Burrup Peninsula.

Assessment

The area considered for assessment of this factor is the area impacted by the proposed western quarry extension and the distribution of vegetation types impacted by the extension.

The EPA's environmental objective for this factor is: "to maintain the abundance, species diversity, geographic distribution and productivity of flora and vegetation types, consistent with the maintenance of biodiversity at the ecosystem, species and genetic level."

As indicated above, the mapping of vegetation associations within the Burrup Flora and Vegetation Survey report identifies five vegetation associations, that will be directly impacted by the proposed western quarry extension.

As with many of the vegetation associations of the Burrup Peninsula mapped in the Burrup Flora and Vegetation Survey report, the associations impacted by the proposed western extension are relatively localised in extent, and as such, are largely restricted to the locality of the Readymix mining leases. However, as indicated by Table 2 in the proponent's response to submissions, the combined effect of the eastern and western extensions will result in a maximum of a 24% reduction in the current extent of any of the associations. This is well below the threshold level of 70% reduction (from pre-European extent) above which the EPA considers further clearing should be avoided as far as practicable. While the total (current and remaining) area of each of the affected vegetation associations is low, this is likely to be a consequence of the high level of detail of vegetation mapping in the Burrup Flora and Vegetation Survey rather than a reflection of a conservation threat to vegetation types or constituent plant species.

Taking into account the detailed scale of vegetation mapping in the Burrup Flora and Vegetation Survey report, the relatively low total area of the proposed extension (5 hectares) the EPA considers that this level of loss of the affected associations is environmentally acceptable.

The next closest record for two species recorded in a survey of the proposed quarry extension area is north of Wiluna. The presence of the species on the Burrup Peninsula may represent a range extension for these species, or they may exist between Wiluna and Karratha and not have been recorded, or the species may have been misidentified. Other species recorded for the affected associations occur within other associations distributed across the Peninsula and/or in other parts of the Pilbara.

In relation to the impact of the proposal on flora it is noted that available information indicates that the proposal will not impact on any species listed as Declared Rare Flora under the *Wildlife Conservation Act 1950* or priority flora listed by CALM or any other uncommon species likely to be threatened by the proposed extension.

Summary

Having particular regard to:

- a) the location and scale of the proposed extension;
- b) the scale of vegetation mapping available for the proposal area and the Burrup Peninsula in the Burrup Flora and Vegetation Survey report;
- c) the fact that the majority of species recorded as occurring within the proposal area occur within other associations distributed across the Peninsula and/or in other parts of the Pilbara; and

- d) the apparent absence of species of particular conservation significance within the area impacted by the proposed extension,

it is the EPA's opinion that the proposed change to the Nickol Bay Quarry involving the western extension can be managed to meet the EPA's environmental objective for this factor.

3.3 Conservation planning for the Burrup Peninsula

Background

The Burrup Peninsula has been the location of significant industrial and port development since the 1960s and is potentially one of the most important industrial port sites in Western Australia (CALM, 1999).

Formal multiple land-use planning for the area incorporating natural and cultural heritage conservation commenced in the early 1990s and was advanced further in 1994 with the development of the Burrup Peninsula Draft Land Use and Management Plan (BPD Lump: O'Brien Planning Consultants, 1994). The plan was amended and published in 1996 as the Burrup Peninsula Land Use Plan and Management Strategy (BPLUPMS).

Description

The proposed western quarry extension, the approved eastern extension and the majority of the original quarry pit is located within the 'Burrup South' portion of the area identified in the BPLUPMS as the Conservation Heritage and Recreation (CHR) zone.

The BPLUPMS defines the management objectives for the CHR zone as:-

- "to maintain and enhance the conservation and Aboriginal heritage values of the land; and
- to manage the human interaction with the natural and cultural values of the area in a sustainable manner."

The PER and response to submissions indicates that the proponent's intention is for the long term condition of the quarry site to be made suitable for land use activities compatible with the CHR zone.

Submissions

During the public review period for the PER, the Department of Conservation and Land Management (CALM) expressed in-principle objection to the proposed western extension and has expressed concerns about the precedent that would be set by allowing incremental expansion of quarrying activity with the CHR zone.

In its response to submissions the proponent suggested that although the mining leases established for the quarry were created in the late 1960s, well prior to the BPLUPMS, long term compatibility of the extension proposal with the BPLUPMS zoning could be provided for through the process of effective decommissioning and site rehabilitation for this land use (see Section 3.4). However CALM's advice and some

public submissions expressed the view that if the project is approved it may be more appropriate that the disturbed site of the extension after decommissioning be exchanged for land currently zoned for industrial purposes within the BPLUPMS.

The proponent indicated in its response to submissions that it does not have any legal capacity to facilitate the exchange of land currently zoned for industrial purposes under the BPLUPMS for land impacted by the quarry.

Assessment

The area considered for assessment of this relevant environmental factor is the Burrup Peninsula and in particular, the 'Burrup South' portion of Conservation, Heritage and Recreation (CHR) zone areas identified in the Burrup Peninsula Land Use Plan and Management Strategy (BPLUPMS).

The EPA's objective in regard to this environmental factor is: "to ensure land use within the proposed Conservation Heritage and Recreation Zone is consistent with proposed land uses in this zone, (which include conservation, heritage and recreation)."

As indicated above, the proposed western quarry extension is located within the CHR zone, with management and development activities therein to be guided by the advice provided in the BPLUPMS. The specific rationale for the alignment of the CHR/Industrial zone boundary is, however, unclear. The draft BPLUPMS (BPD Lump) made reference to existing quarrying activity in the adjacent 'Industrial South' management area and since this is the only quarrying activity in this locality, this raises the possibility that the apparent location of the quarry area within the Strategy CHR zone may have been a drafting error in the zone boundary mapping or some other form of anomaly.

This possibility is supported by advice provided by the Department of Industry & Resources (DOIR) in 1996 (shortly before the final BPLUPMS was published) indicating that:

- The grant of mining leases for the Nickol Bay Quarry largely preceded the development of the BPLUPMS;
- The Burrup Plan relates only to Vacant (Unallocated) Crown Land on the Peninsula and not to land subject to Land Act or Mining Act leases; and
- The boundaries of the various land-use areas in the Burrup Plan are indicative only, being detailed at a scale of approximately 1:100 000.

However, as the final published BPLUPMS makes no mention of the exclusion of mining leases or other leasehold land, there is continuing ambiguity in relation to the precise management boundary of the conservation zone in the locality of the Readymix mining leases. There is also apparent disagreement between key stakeholders in relation to the compatibility of conservation and heritage protection and large scale quarry development within the CHR zone. The EPA is of the view that management of land within leases located within the CHR zone, as mapped in the BPLUPMS, should be compatible with the management objectives of the Strategy over the long term.

On this basis the EPA considers that the environmental impacts of the proposed western extension should be assessed taking into account the impact of the current and proposed area of the Nickol Bay Quarry on the conservation and visual amenity values of the conservation zone and the need, within the CHR zone, for conservation and recreational uses associated with rehabilitated quarry sites. There is also an urgent need for resolution of the boundary of the CHR zone in order to properly plan and evaluate land use proposals with respect to the long term management objectives for land within the 'South Burrup' mining lease areas.

Further discussion of the long term suitability of the rehabilitated Nickol Bay quarry site for inclusion in the CHR zone is provided in Section 3.4.

Taking into account the apparent uncertainty in relation to the management boundary between conservation and recreation zones in the South Burrup CHR zone and the need to conserve conservation, recreation and heritage values within this zone, the EPA considers that the current proposal may be the maximum appropriate extent of quarrying development for the Nickol Bay Quarry.

There should be no further quarry development (including quarry extensions) beyond the current proposal until the boundaries between the CHR and Industrial zones have been clearly identified and agreed between CALM and the Department of Industry & Resources. Any agreement on the appropriate boundary between the Industrial and CHR zones should take into account the level of need for the recreational and other values associated with rehabilitated quarry (and other industrial) sites within the CHR zone. Where it is judged that the further development of quarrying is necessary, but would not provide significant additional long term recreational or other values to the CHR zone, there should be an appropriate exchange of land within the current CHR zone that is allocated for industrial use, for other land of high conservation value within the current Industrial zone.

As referred to earlier in this report, the proponent has indicated in its response to submissions that it does not have any legal capacity to facilitate the exchange of land currently zoned for industrial purposes under the BPLUPMS for land impacted by the quarry.

The option of limiting the extent of future quarrying in the area to the approved quarry pit and western extension and seeking excision, relinquishment and cancellation of the remainder portions of Mining Leases M47/255, M47/333, M47/306, M47/309, M47/331 and M47/353 that are not required for access to and management of these operations was investigated. While the proponent was willing to commit to undertake excision and relinquishment of these areas, the option was not likely to be effective as it would potentially allow another mining company to take up the surrendered lease areas.

Advice obtained from the Department of Industry and Resources confirmed that in the event of tenement relinquishment other companies could apply for mining leases over the affected areas and that while mechanisms exist for preventing mining in specified areas of Western Australia, such provision are only invoked on a temporary basis under exceptional circumstances.

As an alternative, the proponent has provided a formal commitment to withdraw from future quarrying proposals the areas shown in Figure 3 in this bulletin and to manage

these areas so as to prevent quarry-related impacts on vegetation. The proponent has also consented to a mining tenement condition preventing mining (quarrying) activities being undertaken in the areas which have been deemed to have high environmental significance as shown on Figure 3 and a second condition requiring any proposal for exploration activities in the areas which are deemed to have a high environmental significance as shown on Figure 3 to be referred to the EPA. New proponent commitments addressing these matters have been added to the list of proponent commitments contained in Appendix 3.

The EPA has accepted the Readymix commitments as the most effective form of protection for the portions of the Readymix leases that will not be impacted by further mining.

In the longer term the EPA considers that the most appropriate mechanism for protection of the area not to be quarried would be incorporation of the area in a formal conservation reserve together with other areas currently located within the Burrup Conservation Recreation and Heritage (CHR) Zone.

Summary

Having particular regard to:

- a) the scale of development of the proposed extension and the broader Nickol Bay quarry in the context of the CHR zone;
- b) the effect of the proposed western extension on biodiversity and visual amenity as described in Sections 3.1 and 3.2 of this report; and
- c) the proponent's commitments to withdraw from future quarrying proposals the areas shown in Figure 3 in this bulletin and undertake management of these areas so as to prevent quarry-related impacts on vegetation,

it is the EPA's opinion that the proposed change to the Nickol Bay Quarry involving the proposed western extension can be managed to meet the EPA's environmental objective for this factor.

However the EPA's assessment of this proposal has identified issues, for future proposals in the area, of the future compatibility between ongoing incremental development of quarrying in the CHR zone and achievement of the management objectives for the zone. These issues are discussed further in Section 5 entitled 'Other Advice.'

3.4 Decommissioning and rehabilitation

Description

The PER proposes that progressive rehabilitation and decommissioning of the western extension quarry pit be addressed within a rehabilitation and decommissioning plan to be contained within the environmental management plan for the project.

While the proposed environmental outcome at this time is that the pit floors and quarry faces be rehabilitated to a standard suitable for the current proposed land use of public open space, recreation and conservation, the PER also proposes that the

proposed rehabilitation will provide flexibility with respect to future land use and indicates that, while recreation and conservation are the most likely future land uses, the quarry may have value for uses related to the industrial land use zone.

The PER also proposes that rehabilitation measures (including completion criteria) be reviewed nearer to the time of decommissioning when the decommissioning plan will be revised in line with the prevailing rehabilitation expectations, methods and requirements in keeping with the then end land use.

Submissions

Key issues raised in submissions in relation to this factor include:

- the value of establishing native vegetation on the proposed screening/safety bund for the purposes of visual amenity, dust control and weed management;
- relocation of stockpiles and infrastructure into the quarry pit;
- management of weeds during quarrying and rehabilitation/decommissioning; and
- the value of extensive rehabilitation to meet conservation objectives versus exchange of the quarry site for other land with higher conservation value located within the Industrial Zone.

Assessment

The area considered for assessment of this relevant environmental factor, rehabilitation, is the Pistol Range, within which the quarry is located. This is the area over which the landform and vegetation will be impacted, and must be rehabilitated.

The EPA's objective in regard to this environmental factor is: "to ensure that the impacted area is rehabilitated to an acceptable standard that is compatible with the intended land use."

The proponent is required by the environmental conditions relating to the eastern Nickol Bay Quarry extension to prepare a Progressive Rehabilitation Programme for the quarry, incorporating control of exotic weeds, within five years of commencement of the eastern extension. The EPA's intention in recommending this condition was that a timetable for rehabilitation be developed, linking the rehabilitation of specific areas to definite stages of the quarry plan, to ensure progressive rehabilitation is adequately planned and implemented and meets the management objectives of the proposed final land use.

While noting the general strategies for the rehabilitation plan outlined by the proponent in the PER, the EPA considers that, for a progressive rehabilitation plan to be successful and compatible with the land use objectives of the CHR zone, the intended land use needs to be agreed in early planning in consultation with key stakeholders, particularly the Department of Conservation and Land Management, Shire of Roebourne and Department of Industry & Resources.

Rehabilitation objectives also need to be defined and completion (closure) criteria developed in advance and reviewed as rehabilitation progresses. A closure business plan should be developed to ensure resources are available when required to implement the Rehabilitation and Closure Plan/s and, further that, a timetable for

rehabilitation, which links the rehabilitation of specific areas to definite stages of the quarry plan, is essential to ensure progressive rehabilitation is adequately planned and implemented. This approach is consistent with the Australian and New Zealand Minerals and Energy Council (ANZMEC) and Minerals Council of Australia (MCA) *Strategic Framework for Mine Closure* (ANZMEC / MCA, 2000).

As with the eastern extension, the EPA considers a quarry-wide Progressive Rehabilitation Programme for the Nickol Bay Quarry (existing quarry and western and eastern extensions) should be prepared within five years. This programme, which should incorporate input from key stakeholders, should include a plan to relocate the current rock dumps and project infrastructure into the pit area within 10 years and the rehabilitation of the resulting vacant area. As indicated in Section 3.1 of this report, the EPA considers that the quarry-wide Progressive Rehabilitation Programme should be developed prior to the commencement of quarrying operations in the western extension. It is expected that conditions under the *Mining Act, 1978* will complement this requirement.

In recognition of the difficulty of predicting the detailed development of the quarry, there should be the opportunity to review the Programme on a regular basis to accommodate changes to the quarry plan and to alter rehabilitation techniques based upon the monitored performance of previously rehabilitated areas (which would also be included in the review of the Programme). The EPA considers a review period of five years to be suitable for this project.

Summary

Having particular regard to the:

- a) location of the Nickol Bay quarry and the need to protect the visual amenity of the Pistol Ranges at this location;
- b) the rate at which quarrying appears likely to proceed within the Burrup area in future; and
- c) the requirement to ensure that rehabilitation of the Nickol Bay Quarry site is properly planned and consistent with the agreed land use for the quarry area;

it is the EPA's opinion that the proposed change to the Nickol Bay Quarry involving the proposed western extension can be managed to meet the EPA's environmental objective for this factor provided that the EPA's recommended changes to the environmental conditions requiring the development of a quarry-wide Progressive Rehabilitation Programme prior to the commencement of quarrying in the proposed western extension, are implemented.

4. Conditions and Commitments

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

In developing recommended conditions for each project, the EPA's preferred course of action is to have the proponent provide an array of commitments to ameliorate the

impacts of the proposal on the environment. The commitments are considered by the EPA as part of its assessment of the proposal and, following discussion with the proponent, the EPA may seek additional commitments.

The EPA recognises that not all of the commitments are written in a form which makes them readily enforceable, but they do provide a clear statement of the action to be taken as part of the proponent's responsibility for, and commitment to, continuous improvement in environmental performance. The commitments, modified if necessary to ensure enforceability, then form part of the conditions to which the proposal should be subject, if it is to be implemented.

4.1 Recommended conditions

Having considered the proponent's commitments and the information provided in this report, the EPA has developed a set of amended conditions that the EPA recommends be imposed if the revised proposal by Readymix Holdings Pty Ltd to develop a western extension at the Nickol Bay Quarry in addition to the approved eastern extension, is approved for implementation.

These conditions are presented in Appendix 3. Matters addressed in the amended conditions include the following:

- b) that the proponent shall fulfil the commitments in the Consolidated Commitments statement set out as an attachment to the recommended conditions in Appendix 3, which include the commitments to withdraw four areas of the mining leases from future mining plans and manage these areas so as to prevent quarry related impacts on the vegetation;
- c) the requirement for a Management Plan to manage the areas to be withdrawn from future mining plans so as to prevent quarry related impacts on the vegetation;
- d) the requirement for the preparation of and subsequent implementation of a Progressive Rehabilitation Programme prior to commencement of quarrying in the western extension and within three years following the issuing of the notice to the decision making authorities under Section 45(7) of the *Environmental Protection Act 1986*;
- e) a procedure for the implementation of two tenement conditions on Mining Leases ML47/255, ML47/306, ML47/309, ML47/331, ML47/333 and ML47/353 which prevents mining and requires referral to the EPA of any exploration activities on designated areas of the leases.

It should be noted that the quarry is also subject to the conditions under the Mining Act for Mining Leases M47/26, M47/255, M47/306, M47/309, M47/331, M47/333 and M47/353 and requires an amended works approval and licence under Part V of the Environmental Protection Act 1986 (the EP Act).

5. Other Advice

5.1 Quarry Development within the Conservation and Recreation Zone of the Burrup Peninsula

In its 1996 report in relation to the eastern extension of the Nickol Bay Quarry (EPA Bulletin 834) the EPA drew attention to the general issue of extractive industry proposals being located within the designated Conservation and Recreation (C & R) Zone set out in the BPD Lump. At that time, the EPA advised of its view that quarry development is not generally consistent with the objectives and preferred land use activities within the C & R (now CHR) Zone.

The EPA also recommended in Bulletin 834, that a raw materials strategy be developed for the Burrup Peninsula to identify opportunities for sourcing of raw materials required for industry, infrastructure and other off-site uses from future industry sites. The EPA is not aware of any progress being made in relation to the development of a basic raw materials strategy for the Burrup area. However, as part of its assessment of development proposals in the area, the EPA has promoted the use of basic raw materials from the sites of approved development where this does not conflict with the environmental management objectives for those areas.

In view of:

1. the apparent uncertainty surrounding the boundary between the CHR and Industrial zones within the South Burrup CHR zone,
2. the need to conserve conservation, recreation and heritage values within the zone and
3. the lack of a basic raw materials strategy for the Burrup area,

the EPA considers that there should be no further quarry development (including quarry extensions) within the South Burrup CHR zone beyond the proposal considered in this assessment until the boundaries between the CHR and Industrial zones have been clearly identified and agreed between CALM and the Department of Industry and Resources.

Any agreement on boundaries should focus on the level of need for the recreational and other values associated with rehabilitated quarry sites within and adjacent to the CHR zone and the opportunities for land exchanges between zones where the further development of quarrying would not provide significant additional recreational or other values.

Future proposals for quarry development within the 'Burrup South' CHR zone are unlikely be regarded by the EPA as environmentally acceptable unless the EPA is satisfied that issues relating to land use activities within this area have been satisfactorily resolved.

6. Conclusions

The EPA has considered the proposal by Readymix Holdings Pty Ltd for a western extension to the Nickol Bay Quarry in addition to the previously approved eastern extension.

The EPA considered that the environmental factors of visual amenity, terrestrial flora and vegetation, conservation planning for the Burrup Peninsula and decommissioning and rehabilitation required assessment.

After considering the information on the visual impacts of the proposal provided in the proponent's PER and response to submissions, the EPA has concluded that it is unlikely that its objectives would be compromised provided that a progressive rehabilitation plan for the quarry is completed prior to commencement of the western extension and subsequently implemented.

The EPA has considered information provided in the proponent's response to submissions that the combined effect of the eastern and western extensions will result in a maximum of a 24% reduction in the current extent of any of the vegetation associations present on the site. The EPA considers that this level of loss of the affected associations is environmentally acceptable. Available information indicates that the proposal will not impact on any species listed as Declared Rare Flora under the *Wildlife Conservation Act 1950* or priority flora listed by CALM nor is any other uncommon species likely to be threatened by the proposed extension.

The EPA considers that, while there is an urgent need for resolution of the boundary of the Conservation, Heritage and Recreation (CHR) zone in order to properly plan and evaluate land use proposals, the current proposal may be the maximum appropriate extent of quarrying development for the Nickol Bay Quarry. The proponent has provided a formal commitment to withdraw from future quarrying proposals the areas shown in Figure 3 in this bulletin and to manage these areas so as to prevent quarry-related impacts on vegetation. This commitment is reflected in condition 6 of the recommended condition statement requiring a management plan for the vegetation. The proponent has also consented to a mining tenement condition preventing mining (quarrying) activities being undertaken in the areas which have been deemed to have high environmental significance as shown on Figure 3 and a second condition requiring any proposal for exploration activities in the areas which are deemed to have a high environmental significance as shown on Figure 3 to be referred to the EPA. It is recommended that the Minister for State Development place these tenement conditions on the relevant mining leases after approval of the Notice of Intent "Public Environmental Review, Western Extension to Nickol Bay Quarry (Mining Lease M47/333) Burrup Peninsula, Dampier" dated 2002. Due to these commitments the EPA has concluded that it is unlikely that its objectives for the CHR zone would be compromised.

It is the EPA's opinion that the proposed change to the Nickol Bay Quarry involving the proposed western extension can be managed to meet the EPA's environmental objective for decommissioning and rehabilitation provided that the EPA's recommended changes to the environmental conditions requiring the development of

a quarry-wide Progressive Rehabilitation Programme prior to the commencement of quarrying in the proposed western extension, are implemented.

The EPA has therefore concluded that it is unlikely that the its objectives would be compromised, provided there is satisfactory implementation by the proponent of its commitments and the recommended amended conditions set out in Appendix 3, and summarized in Section 4 and the provided tenement conditions are modified such that areas of high environmental significance are protected.

7. Recommendations

The EPA submits the following recommendations to the Minister for the Environment:

1. That the Minister notes that the proposal being assessed is for a western extension to the Nickol Bay Quarry in addition to the previously approved eastern extension;
2. That the Minister considers the report on the relevant environmental factors as set out in Section 3 of this report;
3. That the Minister notes that the EPA has concluded that it is unlikely that the EPA's objectives would be compromised, provided there is satisfactory implementation by the proponent of the recommended amended conditions set out in Appendix 3, and summarised in Section 4 of this report, including the proponent's commitments and provided tenement conditions are imposed on mining leases by the Minister for State Development as set out in Procedure 1 of the recommended amended conditions set out in Appendix 3.
4. That the Minister imposes the amended conditions and procedures recommended in Appendix 3 of this report.
5. That the Minister notes that the EPA has provided other advice regarding the need for the boundaries between the CHR and Industrial zones to be clearly identified and agreed between the Department of Conservation and Land Management and the Department of Industry and Resources.

Appendix 1

List of submitters

Organisations:

Nickol Bay Naturalists Club

Department of Conservation and Land Management

Conservation Council of Western Australia

Department of Environment

Department of Indigenous Affairs

Appendix 2

References

References

ANZMECC / MCA, (2000). *Strategic Framework for Mine Closure*. Australian and New Zealand Minerals and Energy Council and Minerals Council of Australia Canberra ACT.

Blackwell & Cala (1979). *Vegetation and Floristics of the Burrup Peninsula* for Woodside Petroleum Developments Pty Ltd. North West Shelf Development Project.

EPA (1996). *Application for Hard Rock Quarry Operation ML 47/306, 331 & 353 – Messrs G & P Rocca: Report and Recommendations of the Environmental Protection Authority*. EPA Bulletin 834, November 1996.

Martinick McNulty Pty Ltd (2002). *Public Environmental Review Western Extension to Nickol Bay Quarry (Mining Lease M47/333) Burrup Peninsula, Dampier*. Prepared for CSR Readymix, July 2002

O'Brien Planning Consultants (1994). *Burrup Peninsula Draft Land Use and Management Plan*. Report prepared by Burrup Peninsula Management Advisory Board, May 1994.

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WG Martinick & Associates Pty Ltd (1994). *Shire of Roebourne Mining Leases M47/306 and M47/331 and Mining Lease Application M47/353: Consultative Environmental Review for Hard-Rock Quarrying Burrup Peninsula* for Guisepppe, Pamela Margaret and Steve Rocca, November 1994.

WG Martinick & Associates Pty Ltd (1996). *Shire of Roebourne Mining Leases M47/306 and M47/331 and Mining Lease Application M47/353: Supplement to Consultative Environmental Review for Hard-Rock Quarrying Burrup Peninsula November 1994* for The Readymix Group CSR Limited, February 1996.

Appendix 3

Recommended Environmental Conditions and Proponent's Consolidated Commitments

RECOMMENDED CONDITIONS AND PROCEDURES

STATEMENT OF REVISED CONDITIONS APPLYING TO A PROPOSAL (PURSUANT TO THE ENVIRONMENTAL PROTECTION ACT 1986)

HARD ROCK QUARRY BURRUP PENINSULA

Proposal: The Nickol Bay quarry is situated on Mining Leases M47/26, M47/255, M47/306, M47/309, M47/331, M47/333 and M47/353, and the infrastructure on General Purpose leases G47/23 and G47/42, located in the Pistol Range near Dampier approximately 13 kilometres west of Karratha in the Shire of Roebourne. The revised proposal is for the extension of the existing quarry westwards on Mining Lease M47/333 in addition to the previously approved eastern extension on Mining Leases M47/306, M47/309, M47/331 and M47/353. The proposal is documented in schedule 1 of this statement.

Proponent: Readymix Holdings Pty Limited

Proponent Address: 75 Canning Highway, Victoria Park WA 6979

Assessment Number: 1377

Previous Assessment Number: 902

Previous Statement Number: 440

Report of the Environmental Protection Authority: Bulletin 1170

Previous Report of the Environmental Protection Authority: Bulletin 834

The implementation of the proposal to which the above reports of the Environmental Protection Authority relate is subject to the following conditions and procedures, which replace all previous conditions and procedures:

Published on

1 Implementation

- 1-1 The proponent shall implement the proposal as documented in schedule 1 of this statement subject to the conditions of this statement.

2 Proponent Commitments

- 2-1 The proponent shall implement the environmental management commitments documented in schedule 2 of this statement, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

3 Proponent Nomination and Contact Details

- 3-1 The proponent for the time being nominated by the Minister for the Environment under section 38(6) or (7) of the *Environmental Protection Act 1986* is responsible for the implementation of the proposal until such time as the Minister for the Environment has exercised the Minister's power under section 38(7) of the Act to revoke the nomination of that proponent and nominate another person as the proponent for the proposal.
- 3-2 If the proponent wishes to relinquish the nomination, the proponent shall apply for the transfer of proponent and provide a letter with a copy of this statement endorsed by the proposed replacement proponent that the proposal will be carried out in accordance with this statement. Contact details and appropriate documentation on the capability of the proposed replacement proponent to carry out the proposal shall also be provided.
- 3-3 The nominated proponent shall notify the Department of Environment of any change of contact name and address within 60 days of such change.

4 Commencement and Time Limit of Approval

- 4-1 The proponent shall substantially commence mining in the western pit extension within five years of the date of this statement or the approval for that extension granted in this statement shall lapse and be void.

Note: The Minister for the Environment will determine any dispute as to whether the extension proposal has been substantially commenced.

- 4-2 The proponent shall make application for any extension of approval for the substantial commencement of the western pit extension beyond five years from the date of this statement to the Minister for the Environment, prior to the expiration of the five-year period referred to in condition 4-1.

The application shall demonstrate that:

1. the environmental factors of the proposal have not changed significantly;
2. new, significant, environmental issues have not arisen; and
3. all relevant government authorities have been consulted.

Note: The Minister for the Environment may consider the grant of an extension of the time limit of approval not exceeding five years for the substantial commencement of the western pit extension.

5 Compliance Audit and Performance Review

5-1 The proponent shall prepare an audit program and submit compliance reports to the Department of Environment which address:

1. the status of implementation of the proposal as defined in schedule 1 of this statement;
2. evidence of compliance with the conditions and commitments; and
3. the performance of the environmental management plans and programs.

Note: Under sections 48(1) and 47(2) of the *Environmental Protection Act 1986*, the Chief Executive Officer of the Department of Environment is empowered to monitor the compliance of the proponent with the statement and should directly receive the compliance documentation, including environmental management plans, related to the conditions, procedures and commitments contained in this statement.

5-2 The proponent shall submit a performance review report every five years after the start of operations, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority, which addresses:

1. the major environmental issues associated with the project; the targets for those issues; the methodologies used to achieve these; and the key indicators of environmental performance measured against those targets;
2. the level of progress in the achievement of sound environmental performance, including industry benchmarking, and the use of best available technology where practicable;
3. significant improvements gained in environmental management, including the use of external peer reviews;
4. stakeholder and community consultation about environmental performance and the outcomes of that consultation, including a report of any on-going concerns being expressed; and
5. the proposed environmental targets over the next five years, including improvements in technology and management processes.

6 Management of areas withdrawn from quarrying plans

6-1 Within six months following the issuing of the notice to the decision making authorities under Section 45(7) of the *Environmental Protection Act 1986*, the proponent shall prepare a Management Plan to prevent quarry-related impacts on vegetation in the areas

withdrawn from quarrying plans as shown in Figure 3 of Schedule 1, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

- 6-2 The proponent shall implement the Management Plan required by condition 6-1, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

7 Progressive Rehabilitation Programme

- 7-1 Within three years following the issuing of the notice to the decision making authorities under Section 45(7) of the *Environmental Protection Act 1986* and prior to the commencement of mining within Mining Lease M47/333, the proponent shall prepare a Progressive Rehabilitation Programme for the quarry and associated infrastructure located within Mining Leases M47/26, M47/255, M47/306, M47/309, M47/331, M47/333 and M47/353 and leases G47/23 & 47/42 incorporating:

1. proposed final land use, rehabilitation objectives and completion criteria;
2. progressive rehabilitation of mined pit faces, pit floors and other areas in order to protect visual amenity;
3. the sequence and indicative timetable for the rehabilitation of quarry pit floors, pit faces and other disturbed areas within the leases, and relocation of rock stock piles, waste dumps and other quarry infrastructure into disused quarry pits; and
4. control and management of the spread of non-indigenous plants and animals,

to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

- 7-2 In the development of the Progressive Rehabilitation Programme required by condition 7-1, the proponent shall prepare and implement a consultation plan to identify important stakeholders and the method/s of consultation to be employed in the development of the Programme, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

- 7-3 The proponent shall make copies of the Progressive Rehabilitation Programme required by condition 7-1 publicly available upon request by any person.

- 7-4 The proponent shall implement the Progressive Rehabilitation Programme required by condition 7-1, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

- 7-5 The proponent shall review the Progressive Rehabilitation Programme required by condition 7-1 at intervals not exceeding five years, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

8 Decommissioning

- 8-1 The proponent shall carry out the satisfactory decommissioning of the quarry, removal of the plant and installations and rehabilitation of the site and its environs, to the

requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

- 8-2 At least six months prior to decommissioning, and within six months following any four-year period of stoppage of quarrying activity, the proponent shall prepare a Final Decommissioning and Rehabilitation Plan to achieve the objectives of conditions 7-1 and 8-1, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.
- 8-3 The proponent shall implement the Final Decommissioning and Rehabilitation Plan required by condition 8-2, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

Procedures

1. Placement of tenement condition on mining leases

With the proponent's consent, the Minister for State Development will place the following two tenement conditions on mining leases ML47/255, ML47/306, ML47/309, ML47/331, ML47/333 and ML47/353.

Condition 1: No mining (quarrying) activities are to be undertaken in the areas which have been deemed to have high environmental significance as shown on Figure 1 in the letter titled "Re: Western Extension to Nickol Bay Quarry - M47/333" dated 15 February 2005 and signed by Sharron Sylvester and retained on Department of Industry and Resources File No. 2501-99.

Condition 2: Any proposal for exploration activities in the areas which are deemed to have a high environmental significance as shown on Figure 1 in the letter titled "Re: Western Extension to Nickol Bay Quarry - M47/333" dated 15 February 2005, signed by Sharron Sylvester and retained on Department of Industry and Resources File No. 2501-99, needs to be referred to the Environmental Protection Authority under Section 38 of the *Environmental Protection Act 1986*.

The conditions will be placed after approval of the Notice of Intent "Public Environmental Review, Western Extension to Nickol Bay Quarry (Mining Lease M47/333) Burrup Peninsula, Dampier" dated 2002.

- 2 Where a condition states "to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority", the Environmental Protection Authority will provide that advice to the Department of Environment for the preparation of written notice to the proponent.
- 3 The Environmental Protection Authority may seek advice from other agencies or organisations, as required, in order to provide its advice to the Department of Environment.
- 4 Where a condition lists advisory bodies, it is expected that the proponent will obtain the advice of those listed as part of its compliance reporting to the Department of Environment.

Notes

- 1 The Minister for the Environment will determine any dispute between the proponent and the Environmental Protection Authority or the Department of Environment over the fulfilment of the requirements of the conditions.
- 2 The proponent is required to apply for a Works Approval and Licence for this project under the provisions of Part V of the *Environmental Protection Act 1986*.

Schedule 1

The Proposal (Assessment Nos. 1377 and 902)

The Nickol Bay quarry is situated on Mining Leases M47/26, M47/255, M47/306, M47/309, M47/331, M47/353 and M47/333 and General Purpose leases G47/23 and G47/42 on the Burrup Peninsula, near Dampier (see Figure 1-Location). The revised proposal is for the extension of the existing quarry westwards on Mining Lease M47/333 in addition to the eastern extension on Mining Leases M47/306, M47/309, M47/331 and M47/353 over a period of approximately 20 years.

The proposal is described in the Public Environmental Review (Matinick McNulty Pty Ltd 2002), as modified during the assessment and by the proponent's letter of 15 February 2005 and also in the Consultative Environmental Review (WG Martinick and Associates Pty Ltd 1994) and Supplement to the Consultative Environmental Review of 1996 (WG Martinick and Associates Pty Ltd 1996), as modified by the proponent's letter of 24 October 1996, where the 1994 and 1996 documents are not inconsistent with the 2002 and 2005 documents.

Operations at the quarry include quarrying of rock suitable for crushing for aggregate, quarrying of armour rock and crushing of rock. Facilities include offices, laboratory, workshop, weighbridge, fuel and oil storage areas and stockpiles (see Figure 2-Site layout).

During the course of the assessment of the western extension to the quarry the proponent committed to removing four areas contained in mining leases 47/255, 47/306, 47/309, 47/331, 47/333 and 47/353 from future quarrying plans and managing these areas to prevent quarrying-related damage to vegetation. The areas are shown in Figure 3.

Table 1 – Key Proposal Characteristics

Element	Quantities/Description
Life of project (mine production)	At least 20 years
Size of total rock reserve (eastern and western extension)	In excess of 4.1 million tonnes
Maximum depth of quarry pits	Approximately 75 metres
Maximum area of disturbance (eastern and western extension)	Approximately 21.2 hectares
Quarrying times	Continuous operation on a project by project basis
Quarrying rate	Approximately 1 million tonnes per annum
Drainage	All surface runoff will be drained to the existing sump on adjoining mining lease M47/26
Quarry access	Via existing quarry access on adjoining mining lease M47/26
Major components – <ul style="list-style-type: none"> • Pits • processing plant, including stockpiles • infrastructure 	<p>The quarry comprises the original quarry area, the eastern extension area and the western extension area.</p> <p>Processing plant comprises crushing and screening equipment.</p> <p>Offices, laboratory, workshop, weighbridge, fuel and oil storage areas</p>

Figures (attached)

Figure 1 – Location plan

Figure 2 – Site layout plan

Figure 3 – Areas to be removed from quarrying plans

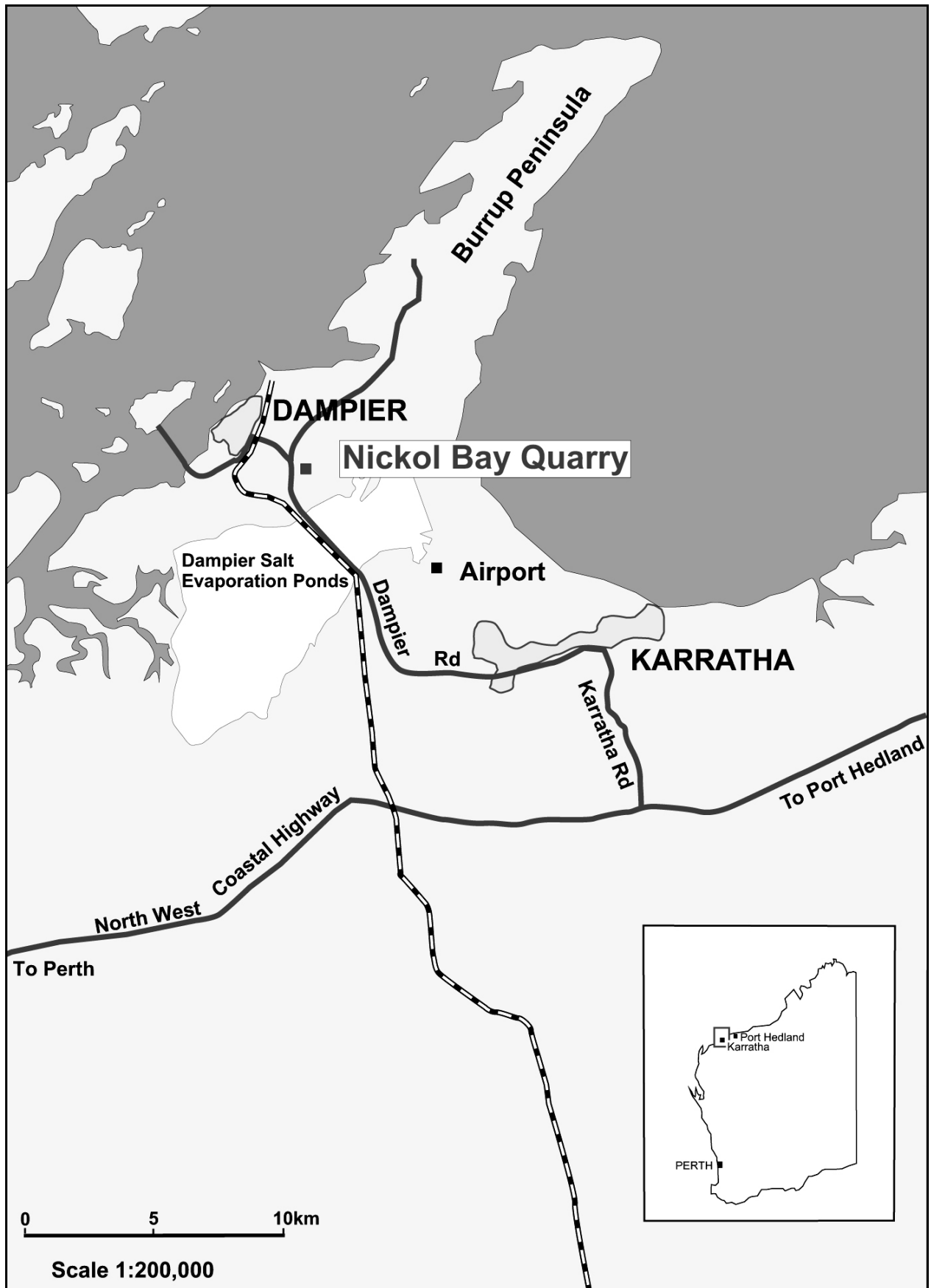


Figure 1: Location plan



Figure 2 – Site layout plan

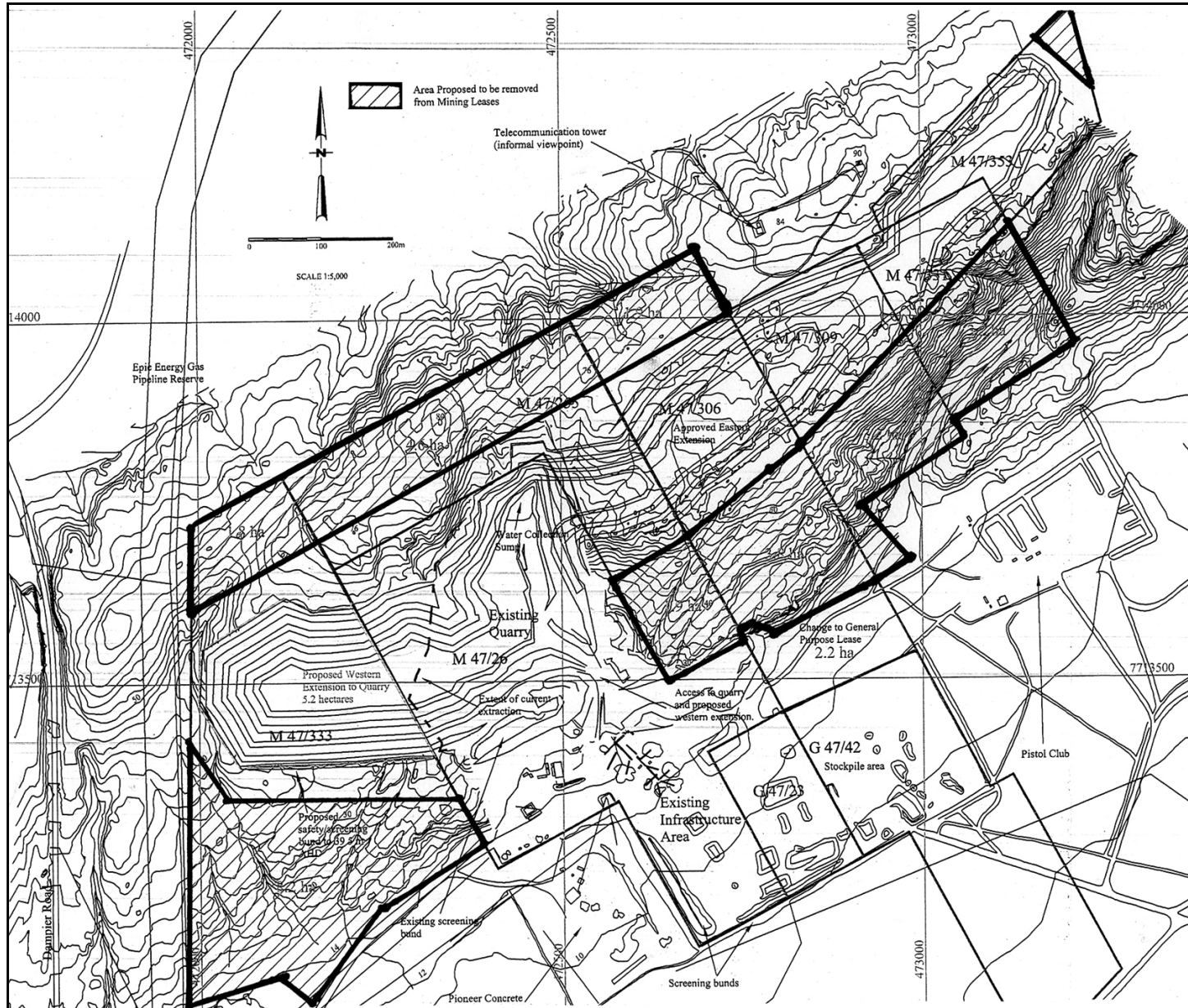


Figure 3: Areas to be removed from quarrying plans

Proponent's Environmental Management Commitments

of 1996, as revised in April 2005

**Nickol Bay Quarry
Shire of Roebourne**

(Assessments 1377, 902)

Readymix Holdings Pty Ltd

Readymix Holdings Pty Ltd: Nickol Bay Quarry

Environmental Commitments (revised April 2005)

Number	Topic	Actions	Objectives	Timing	Advice from
1	Future expansion	Withdraw areas shown in Figure 3 of Schedule 1 from potential future quarrying plans	To retain these areas for vegetation conservation	Prior to commencement of mining of western extension	
2	Areas reserved for conservation	Manage the areas withdrawn from quarrying plans shown in Figure 3 of Schedule 1	To prevent quarry-related impacts on vegetation	Prior to commencement of, during and post operations	Department of Conservation and Land Management
3	Environmental Management Plan	<p>Update the Nickol Bay Quarry Environmental Management Plan to include the western extension.</p> <p>Among other issues the EMP will address:</p> <ol style="list-style-type: none"> 1. Noise management. 2. Dust management in accordance with the Department of Environment (Draft) Pilbara Guidelines for Dust Management. 3. Site rehabilitation. 4. Decommissioning and closure. 5. Education of the workforce to protect native flora and fauna. 6. Weed Management. 7. Management of areas reserved for conservation. 	To provide a systematic framework with environmental performance objectives for environmental management of the western quarry extension consistent with the existing Nickol Bay quarrying operations and Readymix environmental policy.	Prior to commencement of operation	Department of Conservation and Land Management, Department of Industry and Resources
4	Environmental Management	Implement the Environmental Management Plan.	To achieve environmental performance objectives.	During operation	Department of Conservation and Land Management, Department of Industry and Resources
5	Visual Amenity	1. Rehabilitate the upper bench of the south-facing quarry slopes which are visible from	To reduce the visual impact of the western quarry extension.	During operation	

Number	Topic	Actions	Objectives	Timing	Advice from
		<p>the plain by:</p> <p>a) Reducing the finished visible faces to a maximum 1:1 slope.</p> <p>b) Covering the reduced slopes with reddish brown coloured rocks and topsoil.</p> <p>c) Encouraging establishment of vegetation (mainly <i>Triodia</i> (spinifex) species)).</p> <p>d) Seeding topsoiled areas with local seed if recolonisation is not progressing adequately within 18 months.</p> <p>e) Meeting with the Department of Conservation and Land Management annually for five years to assess rehabilitation progress and options.</p> <p>2. Construct the southern part of the quarry safety bund to heights of up to 2.5 metres</p> <p>3. Construct the visible part of the quarry safety bund with reddish brown coloured rocks and topsoil.</p> <p>4. Review annually the feasibility of relocating existing plant and stockpiles to within the quarry pit.</p>	<p>To reduce the extent of the quarry faces visible from the plain.</p> <p>To blend in with the existing landscape.</p> <p>To reduce visual impact of the quarry.</p>		
6	Rehabilitation and Decommissioning	Develop a detailed rehabilitation and decommissioning plan.	To progressively rehabilitate and decommission the quarry to a standard consistent with the long term land use.	Prior to commencement of operation	Shire of Roebourne Department of Industry and Resources
7	Rehabilitation and Decommissioning	Implement rehabilitation and decommissioning plan.	To achieve the objectives of the decommissioning plan.	During operation	Department of Industry and Resources

Appendix 4

Summary of Submissions and Proponent's Response to Submissions

EXTENSION TO NICKOL BAY QUARRY ML47/333, BURRUP PENINSULA, DAMPIER (1377)

Proponent's Response to Public Submissions (10/10/2003)

1. Responses to Comments received 8 October 2002

1.1 General

Comment 1(a):

The proposed western extension to the Nickol Bay Quarry is strongly opposed by DCLM on the basis that the area is zoned for conservation, which has been endorsed by a number of formal, statutory documents that have each been subject to a public consultation process. It is the Department's position that refusal of the proposed quarry extension is fundamental in order for the Government to retain its conservation commitments for the Burrup. (DCLM)

Response:

The land is zoned for Conservation, Heritage, and Recreation. Quarrying is not incompatible with a long term land use of recreation, which is a common use for decommissioned quarries. The approved eastern extension is also located within the same land use zone; this appears to indicate quarrying is not considered incompatible with this zoning.

This quarry proposal has been in progress prior to the conservation zoning being assigned and is on an existing mining lease, making it difficult for any future proposals commenced after conservation zoning of the land to claim that a precedent has been set by this project.

Comment 1(b):

A Net Conservation Benefit outcome that sees either additional areas set aside for conservation or better management resourcing or better protection for current areas. Any offset must clearly improve the existing conservation value of the Burrup. This could be achieved by removing an area of high conservation value from the existing industrial area on the Burrup. We recommend that the area known as Conzinc South in the Burrup Land Use Plan and Management Strategy be removed from the zoned industrial area (and hence excluded from further development) and added to the proposed conservation estate on the Burrup Peninsula. (DCLM)

Response:

The proponent is not in a position to re-zone any industrial land. The recommendation from the Department of Conservation and Land Management to offset areas of high conservation value, such as Conzinc South, with areas of low conservation value, such as the proposed western quarry extension area, is a matter to be considered by the relevant decision making authorities.

Comment 1(c):

The precedent set for future removal of areas currently zoned for conservation on the Burrup. A clear position is required from the EPA outlining the conditions and process required for converting conservation areas to industrial areas on the Burrup. (DCLM)

Response:

The proponent cannot presume the EPA's position; this will need to be determined by the EPA. However, the proponent believes the proposed extension merits special consideration as it is located on an existing mining lease and is an extension of a similar existing operation within the same zoning, particularly as it was proposed prior to the conservation zoning being formally approved. Future proposals not on existing approved mining leases would face the additional step of securing approval to get a mining lease within the conservation, heritage and recreation zone.

Comment 1(d):

The Environmental Management Plan for the project (Commitments 1 & 2, page 64) is developed and implemented according to agreed standards, on the advice of this Department and the Department of Mineral and Petroleum Resources. (DCLM)

Response:

Agreed. The Department of Conservation and Land Management and the Department of Mineral and Petroleum Resources has been included in the "Advice from" column of the revised table of Environmental Commitments (Table 5) attached to this submission.

1.2 Vegetation

Comment 2:

Photographs (Plates 1 & 2) clearly show a range of plant species on the site. Assurances that the site is only spinifex are misleading.

Response:

The proponent does not assert that spinifex is the only vegetation. Table 4 of the PER lists over 50 flora species occurring in the area. Spinifex is the dominant vegetation type in the area, which is why the vegetation community "spinifex covered terrace of the Pistol Range" is so named. It seems probable that the correspondent has mistaken the name of the vegetation community for a description of the vegetation. On re-reading of the executive summary it appears that this would be an easy mistake to make, and the proponent would like to clarify here that the words "Spinifex covered terrace of the Pistol Range" refer to the vegetation community in the area, which includes a large number of species besides spinifex as described fully in the relevant sections of the report, Sections 4.5 and 6.1.

Comment 3:

Seeding of rehabilitated areas should be undertaken if recolonisation of areas is unsuccessful. Rather than just provide 'suitable conditions' it would be better to plan to "Ensure all appropriate surfaces are topsoiled or soil covered to enable local plants to regenerate and colonise, and if recolonisation does not occur within 18 months local seeds will be used to ensure the bare areas are replanted."

Response:

The proponent has no objection to this; it is simply a more detailed explanation of "provide suitable conditions." The proponent would not, however, include bare rock faces inside the quarry in the definition of "suitable surfaces". The proponent has made additional rehabilitation commitments to seed topsoiled areas with local seed if recolonisation is not progressing adequately within 18 months of placement, and to meet with the Department of

Conservation and Land Management annually for five years to assess rehabilitation progress and options. These commitments are included in the revised table of commitments (Table 5) attached to this submission.

Comment 4:

*More information is needed regarding the possible impacts on the Priority 4 flora species, *Brachychiton acuminatus*. The Wildflower Society is concerned by the fact that the Pilbara Kurrajong *Brachychiton acuminatus* has been reported to grow in the location of the proposed Western Extension to the Nickol Bay Quarry and the species vulnerability has not been directly addressed in Section 4.5 of the Public Environmental Review. This species is classified as Priority 4 Flora by CALM and 3RC- by Briggs and Leigh in their book "Rare or Threatened Australian Plants". The classification 3RC- means the geographic range is greater than 100 km, that the species is rare in Australia but does not have any identifiable threat. Such species may be represented by a relatively large population in a very restricted area or by smaller populations spread over a wide range or some intermediate combination or distribution pattern. The PER does not make this clear. In addition, the PER fails to point out how much of the total population of this species is protected in reserves or in an area otherwise dedicated to the protection of flora.*

Response:

**Brachychiton acuminatus* has been listed as a Priority 4 flora species in the past, but was deleted from the priority fauna list in August 1999 (pers comm. J. Riley, Technical Officer, Rare Flora Database, Wildlife Branch, Department of Conservation and Land Management). The only reason a species may be removed from the lists is if the threat to that species no longer exists. The species is thus no longer considered threatened and has been discussed in the PER in the same detail as other non-threatened species.*

Note: See section 2 for responses to further comments on vegetation received 28/02/03.

1.3 Fauna

Comment 5:

The lack of fauna surveys since the initial surveys in 1991 or 1994 is disturbing. The Black Footed Rock Wallaby, the Pilbara Olive Python, and the Pebble Mound Mouse may occur in or nearby to the project area. Populations could have moved into the area during the past 10 years.

Response:

The impact on threatened species is discussed in Section 6.2.3 of the report. Enquiries were made to Department of Conservation and Land Management about the threatened species the Pilbara Olive Python and the Black Footed Rock Wallaby in 2002. It is acknowledged in the report that the Pilbara Olive Python has been recently observed in the immediate vicinity of the quarry (via radio tracking). Department of Conservation and Land Management Karratha Office (pers comm. Mr Stephen Van Leeuwin, 07/03/02, and Mr Geoff Kregor, 25/03/02) indicated that there have been no reports of Black Footed Rock Wallaby in the area, that there have been no reported road kill of that species in the area in 13 years, and that the terrain of the extension is not a preferred habitat for the species.

The proponent has found no indication that the Pebble Mound Mouse is likely to occur in the

vicinity of the proposed extension and has not been recorded elsewhere on the Burrup Peninsula.

It seems unlikely that populations would have moved into the area in the past 10 years, and if they did so in the environment of the operating quarry adjacent to the area it seems likely that they would not be adversely impacted by the activities within the proposed western extension.

Comment 6:

Consideration should be given to creating Black Footed Rock Wallaby habitats through rehabilitation. It seems possible that this could be achieved through provision of large rock piles at high points in the skyline. The purpose of creating habitat would be to permit re-introduction at a future time.

Response:

The proposed quarry extension is located on a terrace of the Pistol Range, not on the skyline. There are no high rock piles in the area to be disturbed, so no loss of this habitat will occur. There are already a considerable number of high rock piles near the proposed extension, which would provide suitable habitat for introduction of the wallaby if such a program were to be implemented in future. Provision of additional rock piles does not appear to be a productive use of resources.

1.4 Dust

Comment 7:

During all operations at the present site and extensions, the DEP would encourage the adoption of Best Practice Dust Suppression as set out in the (Draft) Pilbara Guidelines for Dust Management. A copy of this has been supplied to the proponent. Specific issues to highlight would be the continued and increased use of:

- i) water trucks and sprinklers and dust suppressing chemicals on haul roads, stockpiles and working faces;*
- ii) water sprays, shields and process control measures to control fugitive dust emissions from crushers, screens and conveyors; and*
- iii) varying work practices to minimise dust lift off during especially dry and windy periods.*

This is a significant issue since dust is already an existing problem at times when a very visible dust cloud/plume can be seen leaving the site and moving across the nearby road (main road leading to Dampier) or nearby Mangrove communities/Dampier Salt Ponds. (DEP)

Response:

The proponent is committed to best practice dust management and is already using and assessing the measures described. Dust control on the existing operations is regulated by the Department of Environment Environmental Licence 4741/7. Clauses A1 to A5 of the licence relate specifically to dust control and require all the above measures to be used to ensure visible dust does not cross the property boundary. Dust control is regularly reviewed and improvements sought as part of CSR Readymix's operating practices. As part of this regular review process operating practices will be brought in line with the (Draft) Pilbara Guidelines for Dust Management. The proponent commits to including a dust management plan in accordance with the (Draft) Pilbara Guidelines for Dust Management in the Environmental

Management Plan. The table of commitments (Table 5) attached to this submission has been amended to include this commitment.

There are to be no stockpiles or crushing activities in the proposed extension on mining lease M47/333. Continued improvement to dust management of the existing operations will be carried out as for the proposed extension.

Dust is currently produced during removal of overburden and blasting. Removal of overburden is typically undertaken only once per year and CSR Readymix endeavour to do this at the end of the wet season to minimise dust generation. The clay interstitial rock type in the proposed extension should make it less dusty than the existing quarry.

Comment 8:

As part of the dust management plan there should be consideration of water conservation issues, as Karratha has a growing water supply problem. (DEP)

Response:

Water for dust suppression is primarily sourced from runoff within the quarry. Water is currently recycled wherever possible and will continue to be. The proponent is aware of the importance of water supply in the area and is committed to efficient use of water.

1.5 Aboriginal Heritage

Comment 9:

There would seem to be the potential for sediment transport and erosion to affect the registered Aboriginal site down-slope of the quarry (Section 4.7, PER). In addition, it seems odd that the proponent has not checked the condition of the site as part of this assessment.

Response:

There is no potential for an increase in runoff downslope of the quarry. In fact, there will be a decrease in runoff, as 5.2 hectares of the catchment upslope of the Aboriginal site (Site No. PO3618, Site ID 8864) will be replaced by the quarry extension, which will capture the runoff in a sump within the existing quarry. Any runoff occurring upslope of the western extension will be diverted to the west into a well defined drainage line immediately adjacent to the western limit of the extension. Therefore there is no potential for sediment transport and erosion to affect the Aboriginal site downslope of the quarry.

Furthermore, subsequent Aboriginal Heritage surveys conducted by Mr Rory O'Connor in April and June 2003 failed to locate this site at the co-ordinates given in the Aboriginal Site Register.

Comment 10:

Insufficient information has been provided on consultation with the Aboriginal people. Exactly who inspected the site, when were the meetings, and where are the minutes of meetings or site inspections? Existence of these records could usefully have been indicated or included as appendices to the PER.

Response:

These issues are addressed by the recent consultations by Mr Rory O'Connor with the Aboriginal people as described in the response to Comment 11.

Comment 11:

The Wong-Goo-Tt-Oo native title group protests that an Aboriginal heritage survey of the project area has not yet been adequately carried out and therefore the relevant EPA Objective has not been fulfilled. It is unclear from the PER who exactly has looked at the area to determine the presence or absence of Aboriginal heritage sites. The proponent has relied on the results of past surveys and the Aboriginal Site Register. Past surveys either did not involve any Aboriginal people, or did not include the Wong-Goo-Tt-Oo people. It is a standard recommendation of the Department of Indigenous Affairs that the Aboriginal Site Register should not be used a final word on an area's Aboriginal heritage status and that all relevant Aboriginal groups should be consulted in advance of any major ground disturbance.

Response:

To address the above concerns CSR Readymix appointed Mr Rory O'Connor of R & E O'Connor Pty Ltd to undertake consultations with representatives of the Wong-Goo-Tt-Oo Native Title Claimant group in April 2003 and subsequently, following a further request, with representatives of the Ngarluma-Injibandi Native Title Claimant group in June 2003. The research brief included:

- Identify all significant Aboriginal sites known to the Wong-Goo-Tt-Oo and Ngarluma-Injibandi Native Title Claimant groups.
- Locate all Aboriginal heritage sites identified in the Aboriginal Site Register.
- To as great an extent as possible from a detailed inspection of those parts of the Project area which will be disturbed by the proposed development, identify any other Aboriginal heritage sites therein.

The outcome of these consultations is described by Mr O'Connor in separate reports for each of the Native Title Claimant groups (copies attached).

A search of the Register of Aboriginal sites of the Department of Indigenous Affairs records showed only the one Aboriginal Heritage site as previously described in the PER. The field surveys by Mr O'Connor failed to locate this site.

Ten Aboriginal Heritage sites were identified within Mining Lease M47/333 during Aboriginal Heritage surveys conducted by R & E O'Connor Pty Ltd in April 2003. These sites consist of two quarries, a reduction site, five boulder engravings sites, a man-made wall structure and a midden site. All these sites, with the exception of Site W9, are located outside and downslope of the quarry extension and will not be impacted by the development. Site W9 is a quarry site consisting of a rock pile of boulders and flakes and a single engraved boulder.

The representatives of both the Wong-Goo-Tt-Oo and Ngarluma-Injibandi Native Title Claimant groups were consulted and inspected the Aboriginal Heritage sites. The representatives for each group did not raise any objections to development of the western extension and requested that prior to disturbance of Site W9 that a sample of the quarry cores from the site and the boulder with a "No. 7 Boomerang" engraving be relocated to a location, still to be confirmed, outside the quarry extension.



A Notice under Section 18 of the *Aboriginal Heritage Act 1972* will be submitted to the Aboriginal Cultural Material Committee requesting permission from the Minister for Indigenous Affairs to destroy Site W9 following the salvage and relocation of a portion of the site.

Comment 12:

The Wong-Goo-Tt-Oo group requests that the proponent be directed to the Aboriginal Heritage Procedures Manual and requested to contact the group in order that an adequate survey of its heritage interests in the project area can be carried out. The Wong-Goo-Tt-Oo group includes descendents of the traditional owners of the Burrup Peninsula and so has knowledge of Aboriginal sites in the vicinity of the project, yet the group has not been consulted or visited the site with the proponent.

Response:

These issues are addressed by the recent consultations by Mr Rory O'Connor as described in the response to Comment 11.

1.6 Visual Amenity

Comment 13:

The proponent has avoided addressing the cumulative visual impacts of this quarry extension by requesting approval before the full impacts of developing currently approved areas have become apparent. The previously approved eastern extension is so huge it is possible CSR doubts it will be given approval for the western extension if it applies for the western extension later, after the eastern extension has already been laid bare and quarrying begun. Views 3a, 3b in the PER do not show the approved eastern extension.

Response:

The western extension is intended to operate concurrently with the eastern extension to allow quarrying of massive granites which are not available in commercial quantities within the eastern extension. The visual impact assessment was designed to simulate the greatest visual impact which will occur before rehabilitation is complete, which is expected to be before most of the eastern extension is quarried. The eastern extension will be even less visible than the western extension, with nothing visible from nearer than 500 to 700 metres. From 1,500 metres distance only eight metres of the top face would be visible. From nine kilometres up to 13 metres of the top face would be visible.

Progressive rehabilitation will be carried out to reduce potential cumulative impacts by ensuring old areas of the quarry are rehabilitated and blend into the landscape as new areas are exposed.

Comment 14:

Visual amenity assessments (Sections 7) indicate the quarry operations will be variously visible from Karratha and other (tourist) locations. The quarry locations are generally uphill of the existing processing plant. Has consideration been given to relocation of quarry plant and stockpiles within the existing quarry, thereby reducing the visual impact.

Response:

For safety reasons it is not possible to relocate the plant and stockpiles within the existing quarry. Location of stockpiles within the operating quarry would also make them subject to contamination from fly rock.

The proposed western extension will not be large enough to allow safe location of crushing plant and stockpiles inside it while it is operational. There is, however, some potential to relocate the plant and stockpiles into the pit created by the western extension once quarrying of it is complete and after active quarrying has progressed far enough to the east within the eastern extension. CSR Readymix is already committed to relocation of plant and stockpiles into the pit when space becomes available as part of the approval for the eastern extension of the quarry.

The linear layout of the eastern extension makes safe separation of quarry machinery and road traffic accessing the stockpiles and plant difficult and thus sufficient space is unlikely to be available for such relocation until late in the development of the eastern extension. It is likely that completion of the western extension would allow earlier relocation of the plant and stockpiles than would be possible with development of the eastern extension alone, as it will create additional space as a side branch with better separation from active quarrying in the eastern extension.

The proponent has made an additional commitment to annually review the potential to relocate stockpiles and plant into the quarry pit. This commitment has been added to the revised table of commitments (Table 5) attached to this submission. It is currently considered unlikely that significant relocation will be possible until the after the western extension is completed. This is not likely to occur for several years, and may take up to 20 years if demand for material is lower than expected.

Comment 15:

The Wildflower Society believes that the proposed Western Extension to the Nickol Bay Quarry will make an unacceptable scar on the Pistol Ranges, will be clearly visible from the surrounding plain and should not proceed.

Response:

The PER includes a detailed visual impact assessment (Section 7.1) which demonstrates that the quarry will be only marginally visible, and only from a considerable distance. The proposed rehabilitation of the upper south facing quarry slopes with reddish brown coloured rock to blend into the background of the Pistol Range will render the visible impact negligible.

Comment 16:

It is recommended that the proposed bund across the front of the extension, and the existing bund for the Eastern site, be vegetated to further address visual amenity. This will also stabilise the bund, preventing erosion, dust lift-off, and weed growth. As these bunds will be left in place after closure of the pits, this would also have the benefits associated with progressive rehabilitation. (DEP)

Response:

Agreed. Commitment 3 requires the proponent to construct the screening bund from reddish brown coloured rocks and topsoil. This is expected to create suitable conditions for

vegetation growth. As discussed in the response to Comment 3, if monitoring indicates vegetation growth is not occurring, additional seeding and planting with local seed will be carried out to ensure suitable vegetation cover is established.

1.7 Other

Comment 17:

In the PER, mention was made of the company's Environmental Management System being built in to the management plan for the extensions. Can a copy of this be provided to the Regional DEP office at some time during the assessment period process? (DEP)

Response:

The proponent will provide this.

Comment 18:

It is not clear whether drawing water for quarry operations from the sump in the present quarry could cause draw-down in local surface waters of this arid environment.

Response:

There are no local surface waters in the area of the quarry except ephemeral rock pools (puddles) which form after rain then evaporate quickly. The quarry sump is above the ground water table and does not interact with any other surface waters. Drawing water from the sump has no effect on any other surface water in the area as there is none.

Comment 19:

With regard to justification of the extension, more information is needed on the economic cost of developing alternative sites. There are alternative quarry sites in the Karratha area identified in the PER document (section 2.7.4, Alternative Sources). The main reason for not developing the alternatives is cost, however no assessment is made in the document to identify what this additional cost is. The document does indicate, however, that there are existing quarries already operating in these alternative areas. (DCLM)

Response:

Cost is not the only reason for CSR Readymix not developing an alternative site. Most of the alternative sites are within granted mining leases for purposes other than quarrying and are thus not available to CSR Readymix. Section 2.7.4 of the PER addresses a number of other reasons for selecting Mining Lease M47/333 as the preferred site.

With regard to higher costs for alternative sites these include:

- High infrastructure costs to establish a new quarry. A new quarry may cost upwards of \$20 million to establish.
- The rock type in the Mt Regal area is amphibolite, an exceptionally hard rock, resulting in higher associated drilling costs than the proposed western extension to the Nickol Bay quarry, which comprises basalt and granite.
- Transport is another major factor in increased costs of basic raw materials. The report Managing the Basic Raw Materials of Perth and the Outer Metropolitan Region (Landvision, April 1996) found that transporting rock an additional 25 kilometres would add \$250 to the cost of an average dwelling, or \$550 if associated infrastructure is included. The nearest alternative quarry sites are a further 30 to 40 kilometres from the

Burrup Peninsula and it is expected that the difference in transport costs for supply of armour rock and associated products to the Burrup Peninsula would be proportionately higher.

2. Response to Comments on Vegetation received 28/02/03

This section responds to comments received from the Department of Environment on 28 February after draft responses were given to the rest of the comments discussed in Section 1.

2.1 Overview

Through the public comment phase, a number of issues have been raised over the adequacy of the vegetation and flora sections of the PER. Several of the issues raised appear to arise from misinterpretation (due to differences in scale) of the maps in *A flora, vegetation and floristic survey of the Burrup Peninsula, some adjoining areas, and part of the Dampier Archipelago, with comparisons to the floristics of areas on the adjoining mainland (Trudgen, 2002)*. A map (Figure A) is attached showing the correct overlay of the vegetation association mapping from Trudgen (2002) in the vicinity of the proposed western extension of the Nickol Bay quarry.

Other issues raised may be due to the timing associated with Trudgen's study, which was only published after the PER document was essentially complete. Some additional information has been included here to supplement the heavily summarised material in the PER. Information on weed control was also omitted from the original report and has been included here. The issues associated with weed control are not particularly different from those experienced in the existing approved quarry area and therefore are unlikely to create a significant impact in comparison to the existing approved quarry.

The issues raised are addressed point by point in the following pages.

2.2 Regional Description

Comment 1:

The report includes only one paragraph on the findings of the 1979 report by Blackwell et al (1979) and the Burrup Peninsula Draft Land Use and Management Plan (1994). The only comprehensive study is Trudgen (2002) and only one brief paragraph relates to this study, there is no mention of the regional context in which the report was written, and there is no adequate summary of the findings of the report.

Response:

The first two studies were included as the only relevant studies completed at the time of the writing of this PER. Considerable extra work was involved in incorporating the findings of Trudgen's report which became available after completion of the initial PER. A meeting was held with Malcolm Trudgen to discuss his findings, and the content of the PER with respect to his report was based on that meeting. Trudgen, who was also a contributor to the earlier survey (Blackwell et al (1979)), indicated that the earlier work was valid, but conducted to a lower resolution than his 2002 report.

The field work for Trudgen's 2002 report was conducted between May and September 2000 and found that the survey area had a diverse flora with at least 390 species of vascular plants.

The results of the Trudgen survey indicate that the vegetation of the Burrup Peninsula and the surrounding islands are rich and varied and in many instances are restricted in distribution as the floristic vegetation zones are strongly modified by the local geology and microclimate. When mapped some 240 vegetation associations were described for the survey area.

Mining lease M47/333 contains nine of the 240 vegetation associations described in Trudgen 2002. The vegetation associations that occur on M47/333 are listed in Table 1 below.

Table 1
Vegetation Associations (as described by Trudgen) that occur on M47/333

Code	Vegetation Association Description	Recorded from
IcTsTh	<i>Ipomoea costata</i> scattered shrubs to open shrubland over <i>Triumfetta clementii</i> scattered shrubs to low open shrubland over <i>Themeda</i> sp. Burrup (B84), <i>Triodia epactia</i> (Burrup form) tussock/hummock grassland with <i>Tephrosia</i> aff. <i>supina</i> (MET 12,357) very open annual herbland.	Recorded on ridge tops and gentle slopes, surrounded by boulders.
TcThTe	<i>Terminalia canescens</i> , (<i>Corymbia hamersleyana</i> , <i>Eucalyptus victrix</i>) low woodland over <i>Dichrostachys spicata</i> , <i>Grevillea pyramidalis</i> subsp. <i>pyramidalis</i> , <i>Acacia tenuissima</i> , <i>Acacia coriacea</i> subsp. <i>coriacea</i> shrubland over <i>Themeda</i> sp. Burrup (B84) <i>Triodia epactia</i> (Burrup form) tussock/hummock grassland to closed grassland.	Recorded on rocky granite hill slopes that are densely scattered with boulders and small rockpiles.
ChAm	<i>Corymbia hamersleyana</i> low woodland over <i>Acacia maitlandii</i> open shrubland over <i>Cajanus cinereus</i> , <i>Cassia oligophylla</i> low open shrubland over <i>Triodia epactia</i> (Burrup form), (<i>Themeda</i> sp. Burrup (B84)) tussock/hummock grassland.	Recorded in unchannelled drainage area at the base of rocky hill slopes.
TcTeSg	<i>Terminalia canescens</i> low open woodland (to low woodland) over <i>Stemodia grossa</i> low open shrubland over <i>Triodia epactia</i> (Burrup form), <i>Eriachne tenuiculmis</i> grassland with <i>Dicliptera armata</i> .	Recorded in rocky flowlines or creek beds and gullies between rockpiles.
TeTh	<i>Triodia epactia</i> (Burrup form), <i>Themeda</i> sp. Burrup (B84) hummock/tussock grassland.	Recorded on upper slopes to crests and rocky plateaus of rocky hill ranges, including the undulating rocky uplands of the Pistol Ranges.
TcDsTh	<i>Terminalia canescens</i> , <i>Corymbia hamersleyana</i> low woodland over <i>Dichrostachys spicata</i> , <i>Acacia bivenosa</i> shrubland over <i>Stemodia grossa</i> herbland over <i>Themeda</i> sp. Burrup (B84) grassland with <i>Rhynchosia</i> sp. Burrup (82-1C) open lines.	Recorded from drainage lines in small valleys between rockpiles.
ChAcSg	<i>Corymbia hamersleyana</i> low open woodland over mixed high open shrubland of <i>Acacia coriacea</i> subsp. <i>coriacea</i> , <i>Dichrostachys spicata</i> , <i>Cassia oligophylla</i> , <i>Grevillea pyramidalis</i> subsp. <i>pyramidalis</i> over low open to closed heath of <i>Stemmodia grossa</i> over <i>Themeda</i> sp. Burrup (B84), <i>Triodia epactia</i> (Burrup form) tussock/hummock grassland.	Recorded on granite rocky shallow drainage areas.

Code	Vegetation Association Description	Recorded from
TcTrTa	<i>Terminalia canescens</i> , (<i>Eucalyptus victrix</i>) low open woodland over <i>Acacia coriacea</i> subsp. <i>coriacea</i> , <i>Acacia pyrifolia</i> tall scattered shrubs over <i>Tephrosia rosea</i> var. <i>clementii</i> scattered low shrubs to low open shrubland over <i>Triodia angusta</i> (Burrup form), <i>Triodia epactia</i> (Burrup form) hummock grassland.	Recorded in creeks in gentle sloping valley.
R	Rock outcrop, including rock pocket vegetation	

The vegetation associations mapped by Trudgen 2002, which will be disturbed by the western extension are IcTsTh, TcThTe, ChAm, TcTeSg and possibly a few square metres of TeTh. At least 76% of each of these vegetation associations will not be disturbed by the western extension.

2.3 Vegetation Associations Mapped by Trudgen

Comment 2a:

The report lists three vegetation associations mapped by Trudgen. Within the project area there are in fact six associations shown with a possible seventh depending on the boundary of the extension.

These include:

TcThTe, IcTsTh, ChAm, as indicated and detailed in the PER, and TcTaSg, HITH, TcTrTa and possibly TcDsTa, not mentioned in the PER.

Response:

Trudgen's mapping has been carefully overlaid on the project boundaries in Figure A. This shows that the area of the proposed quarry layout is dominated by the three associations included in the report.

The overlay of the site has been re-checked with Trudgen's mapping and it does appear that there is a very small impact on a fourth vegetation type, TcTeSg (approximately 800 square metres) which was missed in the previous assessment. A fifth vegetation association, TeTh occurs very close to the edge of the proposal and it is possible a few square metres of this common (50 to 99 occurrences) vegetation association might be impacted depending on the accuracy of Trudgen's mapping. The other vegetation associations suggested above occur close to the proposal area or within the mining lease M47/333 but do not lie within the area of proposed disturbance. The comments suggesting these will be disturbed have resulted from Trudgen's map being incorrectly overlaid on the proposal (note that our figures may have been prepared using the current standard MGA/GDA94 map grid, Trudgen's figures show the superseded AMG/AGD84 grid).

The vegetation association TcTeSg may have been misread as TcTaSg, given the extremely small printing on the Trudgen maps. A review of Trudgen's report indicates that TcTaSg has not been used by Trudgen as a code for any vegetation association.

It should be noted that while other vegetation associations occur within the mining lease, these vegetation associations will not be disturbed and therefore have not been included in the impact section.

The vegetation associations that occur on mining lease M47/333 that will not be disturbed by the proposed extension are TcDsTh, ChAcSg and TcTrTa. Areas of bare rock (R) also occur on the mining lease.

As mentioned above a small area of TeTh may be impacted depending on accuracy of Trudgen's mapping. The vegetation association HITH occurs adjacent to the western boundary of M47/333 and does not occur within the mining lease or area of proposed disturbance as highlighted on Figure A.

The TcTeSg vegetation association that may be marginally impacted was omitted in the initial mapping, indicating it would not be impacted. Subsequent refinement of the map overlay indicates it is likely that minor impacts will occur. Such impacts are discussed in the response to Comment 3e.

Comment 2b:

The description of the vegetation being "sparse hummock grassland of the soil covered terraces" and the description "the vegetation is very sparse and consists of isolated trees. Shrubs and grasses are also generally sparse" is quite incorrect according to the Trudgen (2002) descriptions and map.

Response:

While there is some room for differing definitions of the term "sparse" (the second edition of the Australian Oxford Paperback Dictionary defines sparse as "thinly scattered - not dense"), the descriptions above are considered correct and this is corroborated by the photographs of the site in Plates 1 and 2 of the PER. The descriptions by Trudgen of the vegetation associations on the site of the proposed extension range from low woodland to scattered open shrubland, tussock grassland and very open annual herbland, none of which is contradictory of the descriptions used in the PER.

Comment 2c:

If one looks at the contour map or the aerial photograph of the proposed extension site, it is obvious there are many gullies down the face of the slope (this is not mentioned in the report). The Trudgen vegetation association descriptions support this. The six associations containing Terminalia canescens (Eucalyptus victrix) woodland (in cases, open forest), and another with Corymbia hamersleyana woodland, indicate to anyone with knowledge of the Burrup, that drainage gullies are present. Drainage gullies will house many more species, both perennial and annual, than are listed in the flora list for the PER.

Response:

The proposed extent of the quarry is well defined in the PER and is limited to the terrace of the range; hence the drainage gullies will not be impacted by the proposal and were not included in the description of vegetation to be affected. That there is no woodland or open forest in the area of the proposed extension is immediately apparent on examination of the site. Only one of the vegetation associations on the proposed site (plus possibly a few square metres of the second) contains *Terminalia canescens*. The description in Trudgen of the association as "low woodland" refers to a scattering of small trees in these areas.

Comment 2d:

The Burrup Land Use Management Plan (BLUMP) lists tall woodland as having high conservation value. This includes trees such as T. canescens, Eucalyptus victrix, C. hamersleyana. To say that none of the five dominant vegetation communities regarded as significant in the BLUMP occur on the site is totally incorrect.

Response:

The area of the proposed extension categorically does not contain any tall woodland. It does contain some scattered specimens of some species which may also occur in tall woodlands. Therefore while some scattered species occur in the area, the vegetation associations regarded as significant do not. It is thus correct to say that the tall woodland vegetation association is entirely absent from the area of the proposed extension.

Comment 2e:

No mention is made of the frequency of occurrence of the Trudgen associations on the Burrup. It is the frequency of their occurrence, and whether in fact they are found outside the area zoned for industrial development, that provides the measure against which the value of the vegetation on a site, where it is going to be totally cleared, can be accurately assessed. In assessing this project it is important to know where else these associations occur, in particular the first four. It would appear from the Trudgen mapping that one could rightly say these associations are "threatened".

Response:

The total area and impacted areas of each of the three vegetation associations impacted by the proposed extension were clearly included in Section 6.1.3 of the PER. The areas of impact have been updated with more careful mapping, to include small areas that were overlooked in the initial assessment and the number of occurrences. Table 2 have been revised to include the impact of the approved eastern extension, and include the impact on the association TcTeSg.

Table 2
Occurrence and Extent of Vegetation Associations to be Disturbed

Vegetation association	Total Area in Trudgen (2002) (hectares)	Number of Occurrences	Area in Western Extension (hectares)	Area in Eastern Extension (hectares)	% of total disturbed by western extension	% of total disturbed by both extensions
TcThTe	13.3	6	3.1	0.1	23%	24%
IcTsTh	15.6	6	1.7	2	11%	24%
ChAm	2.4	7	0.3	0	13%	13%
TcTeSg	0.8	4	0.1	0	13%	13%
Total			5.2			

Table 2 indicates the occurrence and extent of each of the vegetation associations to be disturbed. Figure A shows the locations of the vegetation associations as determined by the Trudgen survey. The vegetation associations tend to be very localised thus the extent is restricted to within the area of the mining lease and adjacent areas.

TcThTe:

TcThTe occurs in six locations. The locations or part locations occur as follows:

- Two occur within M47/333, 2.9 hectares of which is outside the proposed quarry footprint and within conservation zoning.
- Two occur within M47/26, which will be cleared as part of the current quarry approval.
- One occurs within the conservation zoning of M47/225, outside of the proposed quarry.
- One occurs within the conservation zone of M47/306, outside of the proposed quarry.
- One occurs within M47/309, of which only 0.1 hectare will be affected by the eastern extension.
- Three occur outside the mining leases, two of which occur between the Dampier Road and the Epic Energy Gas pipeline to the south west of M47/333, this area is zoned as strategic industry. One occurs to the north of M47/333 within conservation zoning.
- 10.1 hectares (76%) of vegetation association TcThTe will not be disturbed by the approved quarry or proposed western extension.

IcTsTh:

IcTsTh occurs in six locations as shown in Figure A. The locations or part locations occur as follows:

- One occurs in M47/333 and one in M47/255 and M47/306 for which approximately half occurs within the approved or proposed quarry.
- There are five occurrences outside the mining leases, three in the area between the Dampier Road and Epic Energy gas pipeline which is zoned Strategic Industry, two to the west, north-west of M47/333 within conservation zones and one to the north of M47/255 within conservation zoning.
- 11.9 hectares (76%) of vegetation association IcTsTh, will not be disturbed by the approved quarry or proposed western extension.

ChAm:

There are seven locations of ChAm, as shown in Figure A. The locations or part locations occur as follows:

- Six occur within M47/333 of which 0.3 hectare will be disturbed by the proposed quarry.
- One occurs immediately to the west of M47/333 within conservation zone.
- One occurs between the Dampier Road and Epic Energy gas pipeline within Strategic Industry zoning.
- 2.1 hectares (87%) of vegetation association ChAm will not be disturbed by the proposed western extension.

TcTeSg:

There are four locations of TcTeSg as shown on Figure A. The locations or part locations occur as follows:

- Three occur within M47/333 of which 0.08 hectare occurs within the footprint of the proposed quarry.



- One occurs outside this lease between the Dampier Road and Epic Energy gas pipeline within Strategic Industry zoning.
- 0.7 hectare (87%) of vegetation association TcTeSg will not be disturbed by the proposed western extension.

The recent position of both the Commonwealth and the EPA on protecting biodiversity is as follows: “the ‘threshold level’ below which species loss appears to accelerate exponentially at an ecosystem level is regarded as being at a level of 30% of the pre-clearing extent of the vegetation type”. The table above refers to the percentage of each vegetation association mapped by Trudgen clearly demonstrates that at no stage will the proposal clear greater than 70% of any vegetation association mapped by Trudgen. It also demonstrates that the greatest percentage of clearing of any of the vegetation association mapped by Trudgen will be TcThTe and IcTsTh and only 24% of each of these vegetation associations will be cleared (in both the eastern and western extension).

The mapping conducted by Trudgen is very detailed and it must be remembered that the mapping codes are vegetation associations, the base unit of very detailed mapping. The exact significance of the vegetation associations is difficult to determine as no other mapping to this level of detail is available for comparison. The localised occurrence of the vegetation associations indicates the detail and scale of mapping.

While Trudgen’s report is considered to be a very valuable information source the report has limitations. As Trudgen states in his report, while the methodology used during the vegetation mapping was designed to minimise inaccuracy of mapping, due to the quality of photographic printouts many boundaries were estimates, reducing the accuracy of the placement of boundaries. Trudgen also states that as four people undertook the fieldwork for mapping there is bound to be inconsistencies between interpretations.

Additional limitations to Trudgen’s report include the size of the survey area. The Trudgen report states that there may be some flora that was not recorded. The report states that “some flora species recorded during the survey by Blackwell et al (1979) were not re-recorded during these surveys.” It is suggested in the Trudgen report that between 85% and 95% of the vascular flora occurring in the survey area was recorded by Trudgen.

2.4 Significance of Flora

Comment 3a:

The list of Priority species in the report fails to indicate the Priority rating.

Response:

Only one priority species was identified as likely to occur in the area, this is clearly identified (*Terminalia supranitifolia*) as a Priority 1 species in Sections 4.5.2 and 6.1.4. As there is only one priority species, there is no “list” as such.

Comment 3b:

The Priority 1 species, Terminalia supranitifolia, is listed in the flora list as a "shrub". It is in fact a stunted tree (perhaps that is why it was not found on the site).

Response:

Terminalia supranitifolia is variously described in literature as a tree, a shrub, or a tree/shrub. It was placed in the shrub category in the flora list as it was thought more likely to occur in a more stunted/shrublike form on the rocky terraces of the project area. Surveys in the field were not based on the flora table in the PER, which was created as a result of the surveys and as such would have no bearing on whether the species was found on site.

Comment 3c:

No mention is made of the 39 species listed by Trudgen as being "significant", yet there are species on the flora list in the PER that include these.

Response:

None of these 39 species mentioned by Trudgen are currently on rare or threatened species lists. All of those occurring in the area of proposed disturbance are common or even dominant species on the Burrup and although they are considered by Trudgen as being significant are unlikely to be threatened by a five hectare development.

The following species listed as significant by Trudgen (2002) have been found in the vicinity of the proposed extension:

- *Triodia angusta* (Burrup Form).
- *Triodia epactia* (Burrup Form).
- *Triodia wiseana* (Burrup form).
- *Corchorus walcottii*.
- *Themeda sp. Burrup*.

The first four species are identified as significant by Trudgen (2002) under the category "locally very common to abundant, moderately restricted, newly recognised taxa". All of them are common or abundant on the Burrup Peninsula, particularly *Triodia epactia*, which is the dominant species on the Burrup Peninsula. *Themeda sp. Burrup* has been classified by Trudgen (2002) as locally common, moderately restricted, newly recognised taxa. Their significance is based mainly on the fact they are newly recognised forms. Loss of less than five hectares of vegetation containing these species will not be a significant impact on them.

The following species identified as significant by Trudgen (2002) were not found in the area of the proposed western extension, but were identified within one kilometre of it:

- *Triumfetta appendiculata* (Burrup Form).
- *Amaranthus aff. pallidiflorus*.
- *Fimbristylis aff. dichotoma*.
- *Tephrosia aff. densa*.
- *Paspalidum tabulatum* (Burrup Form).

Triumfetta appendiculata is classified by Trudgen as locally very common to abundant, moderately restricted, newly recognised taxa. Both *Amaranthus aff. pallidiflorus* and *Tephrosia aff. densa* are classified by Trudgen (2002) as uncommon or rare, very restricted, newly recognised taxa. *Fimbristylis aff. dichotoma* is classified by Trudgen as not uncommon where occurs, fairly restricted, newly recognised taxa. *Paspalidum tabulatum* is classified by



Trudgen as being locally common, moderately restricted, newly recognised taxa. None of these five taxa will be disturbed by the proposal.

2.5 Flora List

Comment 4a:

The flora list would seem to be lacking for an area which contains as many niches as the extension site does (indicated by the topographical and aerial photos, supported by the Trudgen association types). It is outdated, species names have not been updated.

Response:

As discussed previously, the niches on the slopes of the range are not in the area proposed to be disturbed, as confirmed by the aerial photo, contour map, and Trudgen (2002) mapping of vegetation associations. It is acknowledged that species names from earlier surveys have been kept as identified at the time of the survey. These species are *Eucalyptus aff. terminalis* (now *Corymbia opaca*), *Hakea suberea* (now *Hakea lorea*), *Senna sturtii* (now *Senna artemisioides*) and *Cassia oligophylla* (now *Senna artemisioides*). Names of species as they were first identified are often retained in reports to show the correlations between studies, Trudgen's report also does this.

Comment 4b:

More importantly 11 species indicated on this list have not previously been recorded on the Burrup Peninsula, despite the "relatively detailed flora studies" indicated by Martinick. If these species were actually recorded, and if they were verified by the WA Herbarium (as stated), then one would assume they are in fact, very rarely occurring on the Burrup, and as such should be afforded some protection - at least a mention in the report. If in fact they are introduced species, then it is usual to indicate this in the flora list.

Response:

As stated above names of species as they were first identified are often retained in reports to show the correlations between studies. As a result of both the PER document and the Trudgen report following this process there are a number of discrepancies in species that have been recorded before - for instance the Trudgen report uses *Cassia* instead of *Senna* while the PER tends to use *Senna*.

There have been a number of taxonomic and nomenclatural changes since these species were first recorded. Table 3 lists names used in the PER, previously used and any current names.

Table 3
Changes to Flora Names

PER listing	Previous listing for Burrup	Current name
<i>Hakea suberea</i>	<i>Hakea lorea</i>	<i>Hakea lorea</i>
<i>Cassia oligophylla</i>	<i>Cassia oligophylla</i>	<i>Senna artemisioides</i> subsp. <i>artemisioides</i>
<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	<i>Cassia glutinosa</i>	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>
<i>Senna notabilis</i>	<i>Cassia notabilis</i>	<i>Senna notabilis</i>
<i>Senna pruinosa</i>	<i>Cassia pruinosa</i>	<i>Senna pruinosa</i>
<i>Senna sturtii</i>		<i>Senna artemisioides</i>
<i>Eucalyptus</i> aff. <i>terminalis</i>		<i>Corymbia opaca</i>
<i>Atalaya hemiglauca</i>		<i>Atalaya hemiglauca</i>
<i>Solanum terraneum</i>		<i>Solanum terraneum</i>
<i>Streptoglossa odora</i>		<i>Streptoglossa odora</i>
<i>Trachymene glaucifolia</i>		<i>Trachymene glaucifolia</i>

All these species were collected and pressed for subsequent verification in the Herbarium of Western Australia. The specimens were collected by Dr Wolf Martinick during a site visit in November 1995.

A search of the Department of Conservation and Land Management's Flora Base Map Distribution web site indicates that *Senna artemisioides* has been recorded in a number of areas around Karratha including north of Karratha near the Burrup Peninsula, *Corymbia opaca* has also been recorded north of Karratha, as has *Atalaya hemiglauca* and *Streptoglossa odora*. Neither *Solanum terraneum* or *Trachymene glaucifolia* have been recorded in the area previously with the closest recording for both these species being north of Wiluna some 800 kilometres to the south. Their occurrence between Wiluna and Karratha may be possible despite not being recorded before. As the Nickol Bay Quarry lies adjacent to the southern end of the Burrup Peninsula, and not on the actual peninsula itself it is likely that the site supports species that are common or known to occur within the Karratha region.

Atalaya hemiglauca, *Solanum terraneum*, *streptoglossa odora* and *Trachymene glaucifolia* were all identified by Dr Ray Cranfield in December 1995. These species were recorded in the document "Shire of Roebourne Mining Leases M47/306 and M47/331 and Mining lease application M47/353 Supplement to Consultative Environmental Review for Hard Rock Quarrying Burrup Peninsula November 1994".

As Trudgen's report states, there may be some flora that was not recorded. The report states that "some flora species recorded during the survey by Blackwell et al (1979) were not re-recorded during these surveys." It is suggested in the Trudgen report that between 85% and 95% of the vascular flora occurring in the survey area had been recorded by Trudgen. Given that these surveys did not cover the entire quarry area it is not unlikely that some species may not have been recorded.

Apart from the presence of *Solanum terraneum* and *Trachymene glaucifolia*, the species recorded at the quarry site are known to occur within the region and are not considered significant. The presence of *Solanum terraneum* and *Trachymene glaucifolia* has not been

recorded in subsequent surveys. They may occur elsewhere in the region, their presence may be an extension to their known population limits, or possibly they were misidentified during the 1995 surveys.

2.6 Weeds

Comment 5a:

A startling omission from the PER is the issue of weeds. The edges of the existing quarry site are infested with a variety of weeds. It is only reasonable to expect that they will spread, with the extension, along the hillslope. Furthermore, as they spread they will have the opportunity to infest surrounding gullies, drainage lines and crevices in rockpiles. The impacts section does not acknowledge the very real impact of weeds and no weed management strategy has been mentioned - let alone a weed management plan as most developers on the Burrup have to submit before project approval.

Response:

Over the years a number of weeds have become established on the Burrup Peninsula, with the potential for new introductions to continue to occur. Weeds known to occur on the Burrup include: *Aerva javanica*, *Bidens bipinnate*, *Cenchrus ciliaris*, *Cenchrus setigerus*, *Cenchrus enchinatus*, *Chloris barbata*, *Euphorbia hirsute*, *Malvastrum americanum*, *Passiflora foetida*, *Pennisetum setaceum*, *Rumex vesicarius*, *Slylosanthes hamata* and *Solanum nigrum*.

The issues associated with weed control are not particularly different from those experienced in the existing approved quarry area and therefore are unlikely to create a significant impact in comparison to the existing approved quarry. The proponent is committed to establishment of a weed management plan for the extension to ensure that weeds are minimised. This will be incorporated in the Environmental Management Plan. The table of commitments (Table 5) attached to this submission has been amended to include this commitment.

Table 5
Environmental Commitments
(Revised 10 October 2003 Following Public Comment)

Number	Topic	Actions	Objectives	Timing	Advice from
1	Environmental Management Plan	<p>Update the Nickol Bay Quarry Environmental Management Plan to include the western extension.</p> <p>Among other issues the EMP will address:</p> <ul style="list-style-type: none"> • Noise management. • Dust management in accordance with the Department of Environment (Draft) Pilbara Guidelines for Dust Management. • Site rehabilitation. • Decommissioning and closure. • Education of the workforce to protect native flora and fauna. • Weed Management. 	Provide a systematic framework with environmental performance objectives for environmental management of the western quarry extension consistent with the existing Nickol Bay quarrying operations and Readymix environmental policy.	Prior to commencement of operation	Department of Conservation and Land Management, Department of Industry and Resources
2	Environmental Management	Implement the Environmental Management Plan.	Achieve environmental performance objectives.	During operation	Department of Conservation and Land Management, Department of Industry and Resources
3	Visual Amenity	<p>Minimise the visual impact of the western quarry extension through:</p> <ol style="list-style-type: none"> 1. Rehabilitating the upper bench of the south facing quarry slopes which are visible from the plain by: <ol style="list-style-type: none"> a) Reducing the finished visible faces to a maximum 1:1 slope. b) Covering the reduced slopes with reddish brown coloured rocks and topsoil. c) Encouraging establishment of vegetation (mainly <i>Triodia</i> (spinifex) species)). d) Seed topsoiled areas with local seed if recolonisation is not progressing adequately within 18 months. 	To reduce the visual impact of the western quarry extension.	During operation	

Number	Topic	Actions	Objectives	Timing	Advice from
		<p>e) Meet with the Department of Conservation and Land Management annually for five years to assess rehabilitation progress and options.</p> <p>2. Constructing the southern part of the quarry safety bund to heights of up to 2.5 metres to reduce the extent of the quarry faces visible from the plain.</p> <p>3. Constructing the visible part of the quarry safety bund with reddish brown coloured rocks and topsoil to blend in with the existing landscape.</p> <p>4. Annually review the feasibility of relocating existing plant and stockpiles to within the quarry pit to reduce visual impact.</p>			
4	Rehabilitation and Decommissioning	Develop a detailed rehabilitation and decommissioning plan.	To progressively rehabilitate and decommission the quarry to a standard consistent with the long term land use requirements of Nickol Bay quarry.	Prior to commencement of operation	Shire of Roebourne Department of Industry and Resources
5	Rehabilitation and Decommissioning	Implement rehabilitation and decommissioning plan.	Achieve the objectives of the decommissioning plan.	During operation	Department of Industry and Resources

Appendix 5

**Ministerial Statement Containing Environmental Conditions Applicable to the
1996 Quarry Proposal**

Ass # 902

Bull # 834

State # 440



MINISTER FOR THE ENVIRONMENT;
EMPLOYMENT AND TRAINING

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

HARD ROCK QUARRY - ML 47/306, 309, 331 & 353
BURRUP PENINSULA (902)

G, P M & S J ROCCA

This proposal may be implemented subject to the following conditions:

1 Proponent Commitments

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

- 1-1 In implementing the proposal, the proponent shall fulfil the commitments made in the Consultative Environmental Review (WG Martinick and Associates Pty Ltd 1994), as modified in the proponent's letter of 24 October 1996, provided that the commitments are not inconsistent with the conditions or procedures contained in this statement.

A copy of the modified environmental management commitments of 24 October 1996 is attached.

2 Implementation

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

- 2-1 Subject to these conditions, the manner of detailed implementation of the proposal shall conform in substance with that set out in any designs, specifications, plans or other technical material submitted by the proponent to the Environmental Protection Authority with the proposal.

- 2-2 Where, in the course of the detailed implementation referred to in condition 2-1, the proponent seeks to change the designs, specifications, plans or other technical material submitted to the Environmental Protection Authority in any way that the Minister for the Environment determines, on the advice of the Environmental Protection Authority, is not substantial, those changes may be effected.

Published on

1 FEB 1997

3 Proponent

These conditions legally apply to the nominated proponent.

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

4 Progressive Rehabilitation Programme

- 4-1 Within five years following commencement of quarrying in the area covered by this proposal, the proponent shall prepare a progressive rehabilitation programme for the quarry, to the requirements of the Environmental Protection Authority on advice of the Department of Environmental Protection. This programme shall include exotic weed control.
- 4-2 The proponent shall implement the progressive rehabilitation programme required by condition 4-1.
- 4-3 The proponent shall review the progressive rehabilitation programme required by condition 4-1 at least every five years.

5 Decommissioning

- 5-1 The proponent shall carry out the satisfactory decommissioning of the project, removal of the plant and installations and rehabilitation of the site and its environs.
- 5-2 At least six months prior to decommissioning, the proponent shall prepare a final decommissioning and rehabilitation plan to achieve the objectives of condition 5-1.
- 5-3 The proponent shall implement the plan required by condition 5-2.

6 Environmental Management System

- 6-1 The proponent shall prepare an environmental management plan and environmental management procedures in order to implement the proposal and manage the relevant environmental factors to ensure that the environmental objectives (Environmental Protection Authority Bulletin 834, Section 3) are met.

The plan shall adopt quality assurance principles (such as those adopted in Australian Standards ISO 9000 series) and environmental management principles (such as those adopted in the voluntary Australian Standards ISO 14000 [draft] series), with appropriate monitoring and auditing to ensure compliance with this condition.

- 6-2 The proponent shall implement the environmental management plan and environmental management procedures required by condition 6-1.

7 Time Limit on Approval

The environmental approval for the proposal is limited.

- 7-1 If the proponent has not substantially commenced the project within five years of the date of this statement, then the approval to implement the proposal as granted in this statement shall lapse and be void. The Minister for the Environment shall determine any question as to whether the project has been substantially commenced.

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

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

8 Compliance Auditing

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

- 8-1 The proponent shall submit periodic Performance and Compliance Reports, in accordance with an audit programme prepared by the Department of Environmental Protection in consultation with the proponent.

Procedure

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

Note

- 1 The Minister for the Environment will request the Minister for Resources Development to prepare a raw materials strategy for the Burrup Peninsula region.
- 2 The proponent is required to apply for a Works Approval, Licence or Registration for this project under the provisions of Part V of the Environmental Protection Act.
- 3 The Environmental Protection Authority's report on this proposal is contained in Environmental Protection Authority Bulletin 834 (November 1996).

CHERYL EDWARDES (Mrs) MLA
MINISTER FOR THE ENVIRONMENT

17 FEB 1997

Proponent's Environmental Management Commitments

24 October 1996

**HARD ROCK QUARRY - ML 47/306, 309, 331 & 353
BURRUP PENINSULA (902)**

G, P M & S J ROCCA

General

- 1 Operate and manage the proposed operations as outlined in the Consultative Environmental Review Supplement with referral to the Consultative Environmental Review and to consult with officers of the Department of Minerals and Energy before undertaking any major deviations from the outlined operations.
- 2 Permit no cats as domestic pets on the Project Area.
- 3 Allow no firearms on the Project Area.
- 4 Use existing approved storage areas for fuel and oil so as to contain potential petrochemical spills.

Aesthetics, vegetation and flora

- 5 The quarrying operations will be undertaken so as to ensure that the visual impacts are kept to a minimum, especially from sensitive view areas and by confining quarry operations to below the crest of the Pistol Ranges as outlined in Figure 2 in the Consultative Environmental Review Supplement.
- 6 Relocate during the course of operations crushing and screening equipment and product material stockpiles to within the proposed larger pit as space is made available so as to minimize visual impacts of the quarry operation.
- 7 No waste rock and stockpiles will be placed against the base of the Pistol Range.
- 8 The clearing of vegetation will be restricted to an absolute minimum, and it will be confined to the actual quarry pits and to the access into the pit.
- 9 Establish the Priority 4 listed *Brachychiton acuminatus* tree and *Terminalia supranitifolia* shrub/tree on rehabilitated areas.
- 10 The height of replenished stockpiles on the plain in front of the Pistol Range will not exceed 10m, that is the height of the trees, and new stockpiles will be progressively established within the quarry as appropriate space becomes available during the development of the quarry extension.

Aboriginal heritage

- 11 Abide by the Aboriginal Heritage Act and inform the Department of Minerals and Energy and the Department of Aboriginal Affairs immediately if any additional Aboriginal heritage sites other than those sites identified within the survey by McDonald, Hales and Associates Pty Ltd are located on the Project area during the course of operations.
- 12 Abide by the decision of the Department of Aboriginal Affairs if no approval for clearance of existing Heritage sites is granted and amendments to the proposed quarry design are required.
- 13 Restrict quarrying operations and impacts to within the scope of the proposed design plans, as depicted in Figure 2 in the Consultative Environmental Review Supplement, subject to amendments required if approval is not granted from the Department of Aboriginal Affairs due to the location of identified Aboriginal Heritage sites.

Pit wall stability

- 14 To ensure that the design of the pit walls is approved by the Department of Minerals and Energy.

Blasting and noise

Conditions for blasting and noise are expected to be set by the Department of Minerals and Energy. The following management commitments will be implemented:

- 15 The operations will comply with the noise and blasting safety requirements stipulated by the relevant Authorities.
- 16 Procedures concerning air safety within the Karratha Airport circuit will be implemented. The airport will be advised during working hours and not less than 24 hours prior to any blast in order that a Notice to Airmen concerning the blast is issued by the Civil Aviation Authority.
- 17 The road to the existing installations belonging to the Water Corporation and Telstra on Katrin's Hill to the immediate north of the proposed quarry pits will not be affected by the proposed operations. As the project progresses, the need to warn the public using this road of blasting will be reviewed regularly, at least annually, with the Shire of Roebourne and the Department of Minerals and Energy. When deemed appropriate, warning signs will be erected on the road to the installations on Katrin's Hill warning the public of blasting. If necessary, the road will be closed temporarily during blasting. The method of protecting the public will always be undertaken in consultation with the Shire of Roebourne and the Department of Minerals and Energy.
- 18 Provide workers with appropriate ear protection.
- 19 Efficient noise suppression devices will be maintained on all equipment and plant used at the site.

Topsoil

- 20 All topsoil will be saved for future rehabilitation.

Dust

- 21 The operations will comply with the conditions set by the relevant Authorities.

Water run-off

- 22 All rainwater run-off in the pit will be contained within the pit, and will not be drained out of the pit. When available, this water will be used for dust suppression; the balance will be lost by evaporation.

Waste disposal

- 23 All materials suitable for recycling will be recycled.
- 24 All other wastes will be taken to the Karratha waste disposal site on a regular basis.

Rehabilitation

- 25 The rehabilitation of the pit will be undertaken progressively as outlined in the 'Supplement Progressive Rehabilitation Plan' dated July 1996 and to the satisfaction of the relevant Authorities.

- 26 The rehabilitation progress will be monitored and procedures will be modified when and if necessary.
- 27 Progressively use the waste rock and soil stockpiles at the base of the Pistol Ranges, outside the existing quarry, for rehabilitation purposes.

Safety

- 28 All relevant Acts and Regulations covering occupational health and safety, and the safety of the general public, will be complied with.
- 29 The infrastructure area and access into the pits will be fenced and sign posted, and the gates will be locked when the quarry is unattended.

Decommissioning

- 30 On decommissioning the rehabilitation of the pit will be completed as outlined in the 'Supplement Progressive Rehabilitation Plan' dated July 1996.
- 31 All of the equipment, buildings and machinery and all waste will be removed from the entire quarry site. The infrastructure area will be ripped and seeded as outlined in the 'Supplement Progressive Rehabilitation Plan' dated July 1996 and to the satisfaction of the relevant Authorities.