

**PROPOSED MOUNTAIN VIEW QUARRY
EXTENSION, POINT WILSON
ENVIRONMENTAL EFFECTS STATEMENT**

REPORT OF INQUIRY

NOVEMBER 2008

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ENVIRONMENTAL EFFECTS STATEMENT**

PANEL REPORT

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NOVEMBER 2008

MOUNTAIN VIEW QUARRY EXTENSION, POINT WILSON

ENVIRONMENTAL EFFECTS STATEMENT

This is the report of the Panel appointed pursuant to section 9 of the *Environmental Effects Act* to assess the proposed Mountain View Quarry Extension.

The Proposal	To extend an existing basalt quarry at Point Wilson on land adjoining the Spit Nature Conservation Reserve and Ramsar wetlands.
Proponent:	The Barro Group
EPBC Act Accreditation:	The Environment Effects Statement under the Environment Effects Act was accredited on 21 January 2005 under Section 87 of the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act) as the process for assessing the impacts of the action.
Exhibition:	17 March to 30 April 2008
EES Submissions:	<ul style="list-style-type: none">▪ Department of Sustainability & Environment (DSE)▪ Department of Primary Industries (DPI)▪ Birds Australia <p>Following the Directions Hearing the Panel invited the Environment Protection Authority (EPA) and Aboriginal Affairs Victoria (AAV) to provide advice on the proposal and to attend the hearing. The EPA lodged a submission (dated June 2008) and appeared at the hearing.</p>
The Panel:	The Panel was appointed on 25 July 2008 and comprises the following members: Cathie McRobert (Chair) Stephen Hancock Shane Dwyer

Inquiry Terms of Reference	<p>The Panel Terms of Reference are attached in Appendix A. The Inquiry is required:</p> <ol style="list-style-type: none"> i. to inquire into and make findings regarding the potential environmental effects (impacts) of the proposed project, including impacts on relevant matters under the EPBC Act. ii. to recommend any modifications to the project as well as environmental mitigation and management measures that are needed to achieve acceptable environmental outcomes within the applicable legislation and policy. iii. to recommend whether the project should proceed in light of its expected effects, assuming the measures recommended under (ii) were implemented.
Panel Hearings:	<p>Directions Hearing: 3 June 2008 at Planning Panels Victoria Main Hearing: 9, 10, 11 September 2008 at Planning Panels Victoria</p>
Site Inspections:	<p>The Panel inspected the site and surrounding area on 8 September 2008. It was accompanied on the inspection by representatives of the Proponent, the Department of Sustainability & Environment (DSE), the Department of Primary Industries (DPI) and the Department of Planning and Community Development (DPCD).</p>
Hearing Appearances:	<ul style="list-style-type: none"> ▪ Department of Planning and Community Development (DPCD) represented by Mr Geoff Ralphs ▪ Barro Group represented by Mr J Gobbo SC. Evidence called: <ul style="list-style-type: none"> - Mr Shayne Linke of Contour – town planning - Mr Basil Natoli of Bell Cochrane & Associates - resource development - Mr John Nolan of Hyder Consulting - hydrology, ground water and irrigation - Mr Anthony Lane of Piper Lane – peer review hydrology - Dr. Charles Meredith of Biosis - fauna and flora. - Mr Steve Mueck of Biosis - native vegetation ▪ Department of Sustainability & Environment (DSE) represented by Mr G Brookes ▪ Department of Primary Industries (DPI) represented by Mr I McLeod, Mr D Sceney and Mr Danny Suster ▪ Environment Protection Authority (EPA) represented by Mr Gavin Matheson and Dr Lyn Dennison
Date of this Report:	November 2008

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APPENDIX A. TERMS OF REFERENCE

APPENDIX B. SUMMARY OF THE INQUIRY PROCESS

ACRONYMS

The following is a list of acronyms used in this report.

Departments, Organisations and Businesses

CMA	Catchment Management Authority
CoGG	City of Greater Geelong
DEWHA	Department of Environment, Water, Heritage and Arts
DPI	Department of Primary Industries
DSE	Department of Sustainability and Environment
EPA	Environment Protection Authority
AAV	Aboriginal Affairs Victoria

Zones

IN2Z	Industrial 2 Zone
PCRZ	Public Conservation and Resource Zone
RCZ	Rural Conservation Zone
SUZ1	Special Use 1 Zone Schedule

Overlays

DPO	Development Plan Overlay
ESO	Environmental Significance Overlay

Other Terms

AHD	Australian Height Datum
AQM	Air Quality Management
CHMP	Cultural Heritage Management Plan
EDI Act	Extractive Industries Development Act 1995
EMP	Environmental Management Plan
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
ERC	Environment Review Committee
EREP	Environment Resource Efficiency Plan
LPPF	Local Planning Policy Framework
MOU	Memorandum of Understanding
MSS	Municipal Strategic Statement
NEPC	National Environment Protection Council
NVF	Native Vegetation Management: A Framework for Action 2002
OBP	Orange-bellied Parrot
PEM	Protocol for Environmental Management (Mining and Extractive Industries)
SEPP	State Environment Protection Policies
SEPP AAQ	SEPP (Ambient Air Quality)
SEPP AQM	SEPP (Air Quality Management)

SEPP N1	SEPP (Noise from Commerce Industry and Trade)
SEPP NC	Interim Guidelines for Control of Noise from Industry in Country Victoria (EPA 1989)
SIA	Social Impact Assessment
SPPF	State Planning Policy Framework
The Framework	Native Vegetation Management: A Framework for Action 2002
TRG	Technical Reference Group
TSP	Total Suspended Particles
TSS	Total Suspended Solids
VCS	Victorian Coastal Strategy 2002
VHCS	Very High Conservation Significance
VPP	Victorian Planning Provisions
WSRS	Western Shoreline Ramsar Site
WTP	Western Treatment Plant

EXECUTIVE SUMMARY & CONSOLIDATED RECOMMENDATIONS

EXECUTIVE SUMMARY

The proposal is to extend the Mountain View quarry at Point Wilson. In 2003/4 the existing quarry represented 62% of the Geelong region market, 25% of the Werribee region market and 11% of all Victorian basalt aggregate. The quarry contributes to the region's economy through direct employment of 36 people who live in the Geelong region, rates paid to the City of Greater Geelong, payments of \$8.4 million to regional suppliers, and the supply of quarry products to 70 local businesses. It is proposed to extend the currently approved extraction area of 238ha (referred to as Stage 1) by 324 ha (referred to as Stage 2). The existing output of materials, infrastructure, machinery, staffing, traffic generation and hours of operation are not expected to change.

The site adjoins the Port Phillip Bay (Western Shoreline) & Bellarine Peninsula Ramsar Site to the north, south and east. The adjoining land uses are Avalon Airport, Melbourne Water Western Treatment Plant, the Commonwealth owned East Coast Armaments Complex and Cheetham Saltworks. The site is a minimum of 2.7 kilometres from the nearest residence and the Stage 2 extension does not bring the extraction area closer to any houses.

An agency-based Technical Reference Group provided technical advice during the preparation of the EES and the EES was exhibited in January 2008. There were only three submissions lodged to the EES – from the Department of Sustainability and Environment, the Department of Primary Industry and Birds Australia. No submissions were lodged from adjoining landholders or residents in the locality. The Panel also invited advice from the Environment Protection Authority (which subsequently made a written submission and appeared at the hearing) and Aboriginal Affairs Victoria.

There was a strong focus in the EES, in submissions and in the Panel's assessment on two main issues:

1. The removal of native vegetation, particularly Plains Grassland patches which were assessed as being of Very High Conservation value in Site 9 (1.26 ha and 0.53 habitat hectares) and Site 15 (6.85 ha and 2.89 habitat hectares).
2. The implications of quarrying, particularly dewatering from deeper extraction in the northern part of Stage 2, on the habitat values of the dry saltmarsh which is important habitat for the critically endangered Orange-bellied Parrot. The dry saltmarsh is within the Site but outside the proposed extraction area.

Removal of Native Vegetation

The Panel is conscious of the importance of protecting Plains Grasslands. However, it considers the removal of the native vegetation as proposed is acceptable because a strongly positive overall environmental gain can be achieved from a combination of securing the Very High Value saltmarsh vegetation in Site 8 (plus a buffer) in public ownership, management gains on remnant vegetation outside the extraction perimeter, and the recommended adaptive management measures to protect the dry saltmarsh. In supporting a departure from the Native Vegetation Framework avoidance of clearing and 'like for like' offset principles the Panel has had regard to both the nature and extent of the conservation gain and the economic benefits to the community from extracting the resource.

Protection of Dry Saltmarsh Habitat Values

The Panel's assessment of the EES documentation and evidence indicates that it is very doubtful that the dewatering of deep extraction areas in the north of Stage 2 will impact upon the vegetation in the dry saltmarsh. If it exists at all, it will be as a consequence of capillary flow but the substrate is unlikely to permit significant capillary rise. Any management of soil moisture in and around the dry saltmarsh is likely only to be required for those areas above the level commonly inundated by tidal flows (about 0.4m with the upper level of the perimeter at about 0.7m). If soil moisture support is needed, either low pressure sprinklers or soaker lines over shallow crushed aggregate filled infiltration drains around the perimeter should act to sustain both an interflow and runoff analogous of the natural support system.

Nevertheless, an adaptive management system is proposed which will be informed by comprehensive monitoring and trialling of the hydrological impacts and the health of the dry saltmarsh vegetation. Trials, monitoring and adaptive management responses would be overseen by an Environmental Review Committee. The proposed buffer between the extraction area and the dry saltmarsh will reduce disturbance and also provides for inland migration of this habitat if sea and water tables rise as a result of Climate Change. Measures to minimise disturbance in ecologically sensitive areas are also recommended. With these safeguards the Panel is satisfied that any risks to the Orange-bellied Parrot's habitat will be effectively addressed and the capacity for adaptive responses to protect this habitat under changing environmental conditions will be enhanced.

Other Matters

The Panel is satisfied that, with the management measures proposed, the quarry extension will not have adverse effects on nearby land uses due to noise, air emissions or traffic and the visual impacts will be minimal.

Major issues for either Aboriginal or post-settlement heritage have not been identified in the surveys carried out. Appropriate processes are in place or in train to ensure that required processes are followed for any disturbance of sites that may be required.

The Panel believes that the flexible staged approach to rehabilitation proposed will best serve the planning objective of rendering the rehabilitated site suitable for major industrial development while also protecting the environmental values of the

surrounding ecologically sensitive land. The Panel has identified certain testing and monitoring, plus consideration by the Environmental Review Committee as being necessary to achieve an optimal approach to rehabilitation. Hydrological issues that should be taken into account in the planning for rehabilitation have also been noted.

A number of discrepancies have been identified in the zones and overlays applicable to parts of the site. The Panel also considers that Development Planning should guide the post rehabilitation phase development of what will be a large industrial precinct. An amendment to the Greater Geelong Planning Scheme would be required to address these issues.

The Panel finds that the proposal should proceed as, subject to the recommendations below, it would result in a net community benefit.

CONSOLIDATED RECOMMENDATIONS

Based on the reasons set out in this Report, the Panel recommends that the Stage 2 extension to the Mountain View quarry proceed on the basis of the documentation and commitments in the EES documentation, subject to the following recommended changes:

Clearing of Native Vegetation

1. Approve removal of native vegetation as outlined in the Stage 2 quarry extension proposal, including removal of two areas of Very High Conservation value, subject to offsetting losses to achieve the net gain objectives of the Native Vegetation Management Framework and the conditions outlined below.
2. The Work Authority or Work Plan under the EID Act should include a condition requiring the preparation of an offset plan, to the satisfaction of DSE, prior to the removal of native vegetation. The offset plan should be prepared on the following basis:
 - a. Revegetation of areas post quarrying as grasslands is a high risk strategy and should not be accepted as offsets (unless in the future it is demonstrated to DSE's satisfaction that there is a high level of confidence of revegetation success).
 - b. Given all the circumstances, while the objectives and principles of the Native Vegetation Framework offset provisions should generally apply, a flexible approach should be adopted, particularly in assessing the high value of adding Site 8 to the Public Land estate and also in applying the "like for like" provisions for Very High Conservation vegetation.
 - c. Offsets should comprise:
 - the transfer of Site 8 plus a buffer of not less than 100 metres to the Spit Nature Conservation Reserve; and
 - management gains (due to enhanced management including protection measures) of areas of native vegetation on the site but outside the extraction perimeter.

- d. When these options are exhausted, then offsite offsets can be utilised, if required.

Protection of Orange-bellied Parrot Dry Saltmarsh Habitat

3. Refine the groundwater monitoring and testing program coupled with vegetation surveys and soil moisture monitoring on the basis of advice from the Environmental Review Committee and specialist experts.
4. Schedule a groundwater monitoring and testing program coupled with vegetation surveys and soil moisture monitoring to take advantage of the time periods between the commencement of Stage 2 Quarrying and the need for the implementation of the adaptive management plan.
5. Monitor the health and levels of stress of flora in the eight quadrats of the dry saltmarsh. This monitoring should:
 - be undertaken by a suitable expert; and
 - supported by regular comparable photogrammetric records of vegetation health/stress in each quadrat.
6. Continue monitoring of existing functional groundwater monitoring bores for water level and salinity variations at intervals determined by the ERC.
7. Implement facilities for:
 - soil moisture monitoring of the surficial sediment sequence adjacent to the eight quadrats around the perimeter of the dry saltmarsh;
 - water level measurement within the Newer Volcanic aquifers beneath the surficial sediment sequence adjacent to the eight quadrats around the perimeter of the dry saltmarsh; and
 - tidal fluctuations and sea level in the Spit Reserve inlet.
8. Initiate the testing of the hydrological relationships between the dry saltmarsh environment and the Newer Volcanic aquifer when subject to drawdown as soon as practicable, having regard to the quarry development schedule and the expected increasing impacts of Climate Change.
9. Undertake Environment Resource Efficiency Plan studies considering the extent of beneficial groundwater diversions which can be implemented away from the licensed discharge point to produce the optimum outcomes for the dry saltmarsh and the environment of the Spit Reserve.
10. Review the adequacy of the buffer between the dry saltmarsh and the extraction area when extraction approaches this interface, and specifically at least one year before extraction in Stages 2C (northern portion) and 2D. This review should have regard to the planning policy relating to climate change that applies at that time.
11. Incorporate the following measures in the ecological element of the Environmental Management Plan to minimise disturbance to birds in sensitive habitat areas:

- maintain the buffer of at least 150 metres between the dry saltmarsh and the extraction limit (as shown in the EES documents);
- construct bunds and plant vegetation at the edge of the approved extraction area to screen views from sensitive habitat areas to the quarry and attenuate potential noise impacts;
- establish the perimeter bunds and screening vegetation within two years of approval of the works authority;
- the bunds should be constructed and vegetation should be planted in the season when migratory birds are not present;
- the screening vegetation should be maintained to achieve effective screening throughout the life of the quarry;
- vehicles/machinery should not operate during hours of darkness within 500 m of Ramsar wetlands to the south and north-east of the site during the times migratory birds use this habitat;
- design new stationary lighting to avoid light spill into sensitive avifauna habitat areas;
- monitor bird reactions to blasting when the quarry face reaches 500 metres from sensitive avifauna habitat areas;
- require controlled blasting during the season when migratory birds use the area when blasting occurs within 300 m or an alternative distance determined as a result of monitoring of avifauna responses to blasting in areas to the north-east, east and south of the site;
- unless monitoring satisfies DSE that alternative criteria should apply, blasting operations must not exceed:
 - airblast - 115 decibels on more than 5% of blasts in a 12 month period and 120 decibels at any time in sensitive avifauna habitat;
 - ground vibration - 5mm/s on more than 5% of blasts in a 12 month period, and 10mm/s at any time in sensitive avifauna habitat.

Environment Review Committee

12. Establish an Environmental Review Committee to advise on the formulation and implementation of the Environmental Management Plan and particularly to oversee appropriate adaptive management over the life of the quarry. The ERC membership should include DSE, DPI, Parks Victoria, EPA and City of Greater Geelong. It would also be desirable to invite Aboriginal representation, adjoining landholders (especially Melbourne Water, Avalon Airport, Department of Defence) and members of the Spit Nature Conservation Reserve Advisory Group to facilitate complementary management of land in the area.
13. Forward monitoring information via the Committee to adjoining land managers.

Environmental Management Plan

14. Require an Environmental Management Plan (EMP) as a condition of the planning permit for the proposal and the works authority/plan. Develop the

Environmental Management Plan to provide more specific guidance, particularly in relation to the protection of the dry saltmarsh, and to reflect this Panel's recommendations.

15. The EMP should be generally as proposed in the EES and should:
 - adopt an adaptive management approach to ensure that actions are appropriate to any changes in the environment; and
 - be developed and implemented with advice from the Environmental Review Committee and specialist experts.

Air Quality

16. Require the EMP to address air emissions to the satisfaction of the EPA and DPI through:
 - Implementation of reactive management responses that:
 - are informed by real time monitoring of PM10 at two locations (one in the south of the quarry site and one adjacent to dry saltmarsh) plus dust gauge monitoring close to sensitive locations.
 - are activated when hourly emission levels specified by the EPA occur.
 - Quarterly submission of air emission monitoring results to the Environmental Review Committee.
 - Annual assessment of the need for ongoing air emission monitoring.

Traffic

17. Require evening and night time traffic to use the Pousties-Beach Road route to minimise impacts on residential properties in the locality.
18. Formalise arrangements for a contribution to maintenance of roads used for access to the site through conditions of subsequent approvals.

Rehabilitation

19. Develop a full rehabilitation plan that incorporates an adaptive approach to accommodate any changes in the environment over the life of the quarry. The initial plan should essentially be a concept plan, generally as proposed, with designated levels, ponds, etc but the plan should be subject to revision as required and as works progress.
20. Revise the existing rehabilitation plan concept to acknowledge the relevance of and foreshadow the need to respond to:
 - data collected on capillary rise characteristics of the backfill sequence as currently proposed; and
 - sea and water table level variations consequent upon climate change.
21. Require regular review (at not more than 5 year intervals) of the rehabilitation plan provisions against the data from the recommended monitoring and testing.

22. Incorporate at the outset a requirement in the rehabilitation plan for the collection and diversion of surface runoff from the quarry drainage system to the dry saltmarsh. This requirement should only include those areas originally within catchment areas contributory to the dry saltmarsh where ever there is adequate elevation for gravity flow to the perimeter of the dry saltmarsh. This requirement shall not be required to be implemented if monitoring shows the impacts of lower salinity water on the perimeter has an adverse impact on the dry saltmarsh ecosystems.
23. Obtain Environment Review Committee advice on the refinement and implementation of the rehabilitation plan.
24. Manage revisions to the rehabilitation plan through amendments to the Development Plan and the works approvals.
25. Develop the rehabilitation plan on the basis of 0.8 metre sea level rise over the life of the quarry but periodically review the plan to reflect current knowledge and government policy. In particular the plan will need to reflect the fact that any increase in this figure may require modification of groundwater management measures and that saltmarsh and coastal vegetation may “migrate” to higher ground in response to a rise in sea level.
26. Utilise, as far as practicable, locally indigenous species in rehabilitation works.
27. Set the rehabilitation bond at an adequate level to permit full rehabilitation. The bond can operate on a rolling basis as areas are progressively rehabilitated and the level should be reviewed from time to time as appropriate.

Cultural Heritage

28. Prepare a Cultural Heritage Management Plan for the Stage 2 extension in accordance with the Aboriginal Heritage Act 2006.
29. Develop a Memorandum of Understanding with the Wathaurong community to formalise a protocol for a representative from the community to be present during overburden removal in possibly sensitive areas.
30. Invite a representative of the Aboriginal community to participate in the proposed Environmental Review Committee.
31. Amend the relevant applications for approvals if the Cultural Heritage Management Plan does not allow disturbance of an area or for any reason permits are not granted to disturb known sites.

Zones and Overlays

32. Rezone privately owned land in the Public Conservation and Recreation Zone after review by the Planning Authority regarding the appropriate alternative zoning.

-
33. Review the appropriateness of the SUZ1 and the proposed Work Authority boundaries having regard to both environmental constraints and the desirability of alignment of zone and ownership boundaries. Rezoning the land owned by the Proponent to Industrial 2 Zone should be considered if it is not subject to environmental constraints.
 34. Rezone land the currently in the Rural Conservation Zone that is within the exhibited extraction area to Industrial 2 Zone.
 35. Provide for two phases of development planning by specifically requiring a 'Post-rehabilitation Phase' development plan in Development Plan Overlay 1 (DPO1). The City of Greater Geelong should formulate the associated revision of the schedule to DPO1 which would need to specify a requirement for a second phase development plan, the timing of the preparation of such a plan and development plan requirements for the development of an industrial precinct.

RECOMMENDATION TO THE COMMONWEALTH MINISTER FOR ENVIRONMENT, WATER, HERITAGE AND THE ARTS

36. The Victorian Minister for Planning advise the Commonwealth Minister for Environment, Water, Heritage and the Arts that the Mountain View Quarry Point Wilson Extension project will not have a significant impact on any listed threatened species or communities under the EPBC Act provided the relevant mitigation and adaptive management measures identified in the EES and this report are implemented.

PART A BACKGROUND

1. BACKGROUND

1.1 APPROACH TO REPORT

The Panel report has three parts:

- **Part A: Background** provides information about the Panel processes, a description of the proposal and the relevant State and Commonwealth legislation and policies (Chapters 1).
- **Part B: Analysis of effects and impacts** considers the key issues addressed in the EES and discusses them in summary form. These chapters provide a description of the subject matter, the relevant issues, and the Panel response, findings and recommendations (where applicable - not all chapters have recommendations) (Chapters 2 to 10).
- **Part C: Evaluation and assessment** provides the Panel's response in terms of the EES objectives and its obligations under the EPBC Act. The Panel provides additional recommendations where warranted in this part of the report (Chapters 11 to 13).

1.2 WHAT IS PROPOSED?

The proposal is to extend the existing Mountain View quarry at Point Wilson which has operated since the early 1970's. The current WA41 work authority boundary approved an extraction area of 238ha (referred to as Stage 1) which is proposed to be extended by 324 ha (referred to as Stage 2)¹. The Stage 1 and Stage 2 extraction areas are to the west of 29 Mile Road and are shown in figure 1 below.

The existing average annual output of materials (between 1 and 1.4Mt/a) is not expected to change². Nor is it expected that infrastructure, machinery, staffing, traffic generation and hours of operation will change. The proposal³ would continue existing quarrying operations which include:

- **Fixed plant** comprising a site office and weighbridge, a crushing and screening plant, an integrated pugmill and blending plant for preparing wet-mix and stabilised products, and a workshop. The location of fixed plant would not change, except for relocation of the site office, amenities and

¹ See Figure 2.13, page 2.18 of the EES

² The rate of extraction is dependant upon demand for the products.

³ Chapter 2.1 of the EES and Mr Basil Natoli evidence to the Panel provided an overview of the current and proposed quarry operations. Sections 2.3.5 to 2.3.8 of the EES describe the process of winning rock from the preparation of the site, the blasting of in situ rock, its cartage by trucks and it's processing on site through primary, secondary, tertiary and quaternary crushing stages, followed by screening.

weighbridge to the west of existing locations and realignment of the access road.⁴;

- **Mobile plant** includes wheel loaders for primary production and sales, haul trucks to cart primary raw feed, a permanent water cart for dust suppression, excavators, rock breakers, dozers and hydraulic drill rigs. Additional machinery is brought on site as required for overburden removal and rehabilitation works;
- **Extraction** occurs concurrently at different quarry faces as the rock of differing quality sourced from each face is blended to achieve required specifications. It was emphasised that this approach is vital to achieve optimum utilisation of the resource;
- **New buffers and bunds** will need to be created as the quarrying operation moves;
- Most **working faces** are 5-12m high with faces between vertical and 25 degrees from the vertical and bench widths of at least 10m wide in deep excavation areas;
- **Blasting** is confined to between 10.00am and 4.00pm and occurs approximately fortnightly. Otherwise the quarry can operate 24 hours a day, 7 days a week; and
- **Processed rock** is stored to the south of the processing plant in stockpiles or overhead bins for direct loading into trucks.

The proposed staging of quarrying activities⁵ radiates outwards from the current operations to achieve the most viable and efficient method for realizing the resource. Quarrying in areas identified as having environmental sensitivities does not generally occur for some time. For example the expected timeframes for quarrying include:

- Area 2B1- Deeper quarrying with associated groundwater extraction in the north: approximate commencement 2035;
- Area 2D - closest to the saltmarsh in the northeast of the site: 2055-2060;
- Extraction in native vegetation Area 9: 2006-2016; and
- Extraction in native vegetation Area 15: 2045 – 2050.

⁴ See Figure 2.13 of the EES

⁵ See section 2.5 of the EES including Table 2.1 and Figure 2.16.

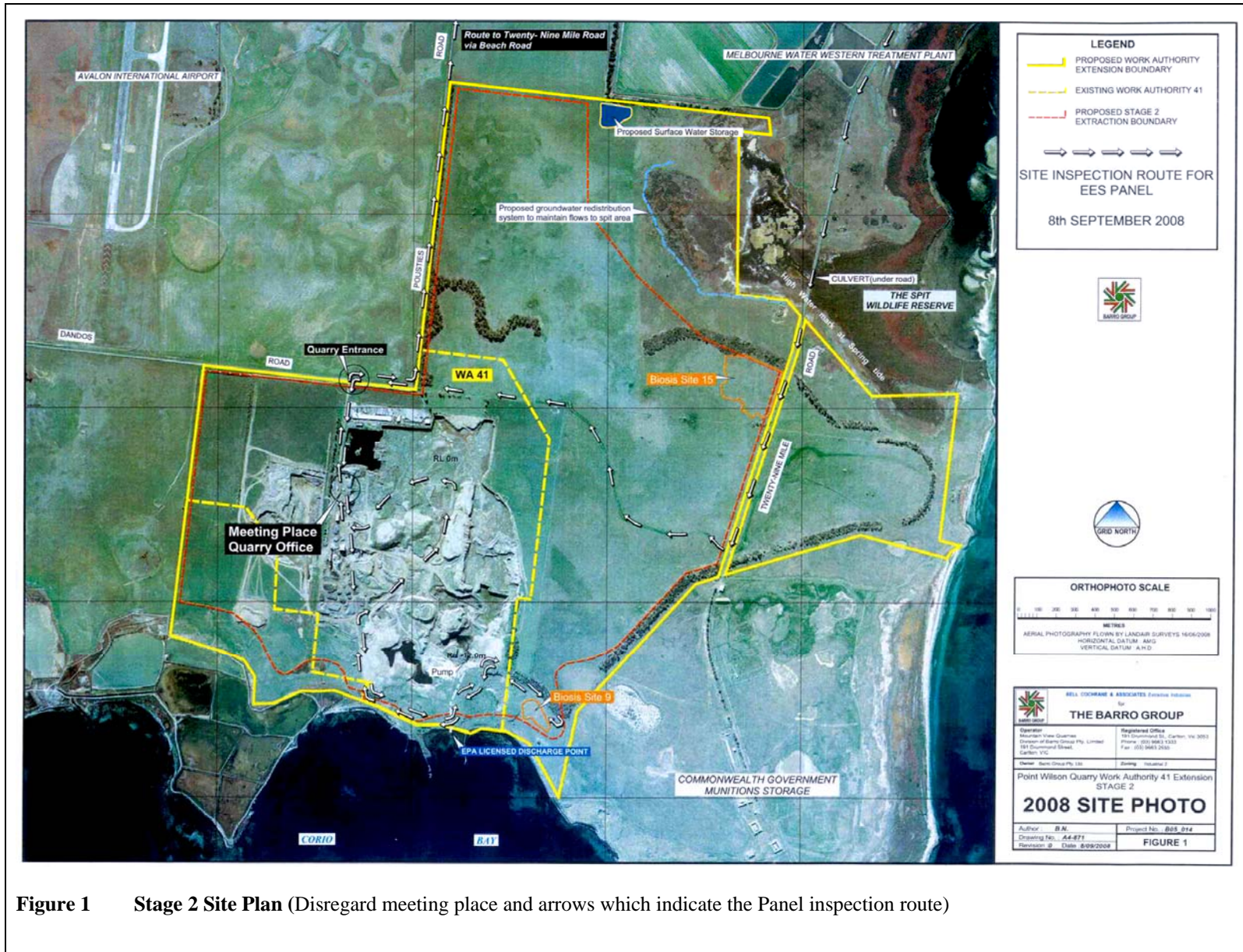


Figure 1 Stage 2 Site Plan (Disregard meeting place and arrows which indicate the Panel inspection route)

1.3 THE SITE AND SURROUNDS

The Site

The site is generally flat with a slope from a slight ridge adjoining Avalon airport in the north down to Port Phillip Bay (sea level) in the south and east.

Areas of remnant native coastal saltmarsh, grassland and aquatic herbland are identified and discussed in Chapter 3. There is an area of lower lying saltmarsh in the north-east of the site. The dry saltmarsh is to the west of 29 Mile Road and has to some degree been created by reduced tidal flux resultant from flow restrictions through culverts beneath 29 Mile Road. Towards Port Phillip Bay, east from 29 Mile Road, the coastal marshes are in natural condition.

The Area

The Port Phillip Bay (Western Shoreline) & Bellarine Peninsula Ramsar Site (WSRS) in the vicinity of the Site⁶ needs to be protected to sustain the habitat and feed stocks of migratory birds and endangered and threatened species such as the Orange-bellied Parrot and the Growling Grass Frog.

The site is in a rural area surrounded by the following uses:

- to the northwest: Avalon Airport;
- to the north: Melbourne Water Western Treatment Plant (WTP);
- to the northeast: Spit Nature Conservation Reserve;
- to the south: Corio Bay foreshore;
- to the south east: the Commonwealth owned East Coast Armaments Complex; and
- to the southwest: Cheetham Saltworks.

The influences of adjoining uses on the Point Wilson environment include noise emissions, particularly from the airport, effects on surface and ground water associated with the WTP and intermittent traffic movements associated with the various uses.

1.4 THE EES AND PANEL PROCESS

An agency-based Technical Reference Group (TRG) was established to provide technical advice to the Proponent and the Department of Planning and Community Development (DPCD) regarding:

- issues warranting investigation within the EES – i.e. the Assessment Guidelines;
- policies and statutory provisions applying to the assessment of the proposal;
- the methodology and scope for EES studies appropriate to investigate potential effects;

⁶ See Figure 8.8 at page 8.27 of the EES

- the Proponent's information and stakeholder consultation program for the EES; and
- the technical adequacy of draft specialist study reports and the draft EES.

The TRG met on eight occasions between October 2004 and February 2007. The TRG comprised a representative from each of the following agencies and departments:

- DPCD, Environmental Assessment (Chair);
- DPCD, Planning (South West Region);
- DSE, Biodiversity & Coastal Planning (South West Region);
- DPI, Development Facilitation & Regulation;
- EPA Victoria;
- City of Greater Geelong;
- Parks Victoria;
- Aboriginal Affairs Victoria;
- Southern Rural Water;
- Melbourne Water;
- Port Phillip CMA; and
- Commonwealth Environment Dept. (now DEWHA).

1.5 LEGISLATIVE AND POLICY FRAMEWORK

The following is an overview of the various State and Commonwealth legislation and policies affecting the project, the approval processes and planning controls.

1.5.1 COMMONWEALTH ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a framework for protecting specific nationally & internationally important flora, fauna, ecological communities and heritage places. The proposal is a 'controlled action' under the EPBC Act (EPBC 2004/1590) under the following relevant controlling provisions of the Act:

- Sections 16 and 17B (Wetlands of international importance);
- Sections 18 and 18A (Listed threatened species and communities); and
- Sections 20 and 20A (Listed migratory species).

Approval under Part 9 of the Act is required before the proposal proceeds. The EES process has been accredited as the required assessment process under the EPBC Act to assess the matters relevant to the Commonwealth Government's decision whether to approve the project.

After the hearing the Panel became aware that the Natural Temperate Grassland of the Victorian Volcanic Plain has been listed under the EPBC Act as a Critically Endangered Ecological Community. Section 158 of the Act establishes that a decision relating to a controlled action is not affected by a subsequent listing under the Act. Nevertheless, the Panel notes that the very high conservation value of the

grasslands under State legislation has been recognised in the EES and this Panel process.

1.5.2 RAMSAR

Extensive areas along the western side of Port Phillip Bay, including much of the area around the Barro land, were listed as a Wetland of International Importance under the Ramsar Convention in 1982. As a signatory to the Convention, Australia has an obligation to ensure that listed sites are managed to maintain their ecological values. The Government of Victoria is responsible for ensuring that the Australian Government's commitments are met for Ramsar wetlands in Victoria.

1.5.3 ENVIRONMENT EFFECTS ACT 1978

The *Environment Effects Act 1978* applies to works “*reasonably considered to have or be capable of having a significant effect on the environment*”. The then Minister for Planning required an EES for the proposed Mountain View Extension under section 4 of the Environment Effects Act 1978, due to the potential for significant environmental impacts. The key environmental impacts and basis for this decision included:

- the potential for significant impact on important flora and fauna habitats, particularly Ramsar-listed wetlands and areas utilised by threatened and migratory species, including the Orange-bellied Parrot and Growling Grass Frog; and
- potentially significant implications for coastal habitats and waters, both at the site and nearby, due to uncertain changes to local hydrology, hydrogeology, and water quality.

1.5.4 EXTRACTIVE INDUSTRIES DEVELOPMENT ACT 1995

The *Extractive Industries Development Act 1995* (EDI Act) purposes include:

- (a) *provide a co-ordinated assessment and approvals process for extractive industries*
- (b) *ensure that extractive industry operations are carried out with safe operating standards and in a manner that ensures the rehabilitation of quarried land to a safe and stable landform.*

A Memorandum of Understanding (4 January 2004) (MOU) between DPI and DSE identifies the EDI Act as the most directly relevant legislation for extractive industry proposals and the MPD Inspector as the key contact/co-ordinator of approvals and consultative processes. The MOU is intended to achieve an integrated, consistent approach to government decisions which co-ordinates and streamlines approval processes. The MOU identifies processes to apply to consideration of extractive industry proposals and states ‘*all relevant land use issues, which are the responsibility of DSE (now the responsibility of DPCD) must be integrated into the approvals process.*’ Of particular relevance to the current proposal is as the MOU explanatory notes suggest, that amongst other things, Victoria's Framework for native vegetation is taken into account. However, the MOU does not apply where an EES is required.

Work Authority & Work Plan

The Act requires approval of work authorities and work plans. The work authority may be granted by the Minister after all necessary consents under any other Act, including under a planning scheme, have been issued. The work authority may be subject to conditions including but not limited to rehabilitation of the land (including the payment of a bond); the protection of the environment; the protection of the amenity of the area; the protection of groundwater; and the safety of workers and the public.

A work plan must contain the information prescribed in Extractive Industries Development Regulations 1996 which includes:

- a rehabilitation plan for the land.
- an environment management program setting out:
 - (a) proposals for the disposal of any effluents, protection of groundwater, and drainage and erosion control;
 - (b) proposals for the suppression of noise, dust from any source, and vibration from blasting operation;
 - (c) proposals for the effective monitoring of the operation

A Draft variation to the existing Work Authority and Work Plan No 41 has been endorsed. It sets out the basis for operations, safety and environmental controls and a rehabilitation plan.

1.5.5 PLANNING AND ENVIRONMENT ACT 1987 AND GREATER GEELONG PLANNING SCHEME

The *Planning and Environment Act 1987* provides a system of control for the use and development of land in Victoria. The Act is administered via planning schemes created under this Act, and which set out specific detail on the types of uses and development that are permitted within each municipal area.

State Planning Policy Framework (SPPF)

It should be noted that the requirement for a planning permit effectively brings a number of other matters into consideration by virtue of the fact that the SPPF requires consideration of:

- Government policies including State Environment Protection Policies and Victoria's Native Vegetation Management – A Framework for Action;
- Various guidelines and protocols issued by government authorities, such as the EPA, and government departments; and
- Other government legislation and/or regulation.

The following SPPF policy directions are directly relevant to the proposal and indicate planning is to:

- Contribute to the protection of air, land and water quality and the conservation of natural ecosystems, resources, energy and cultural heritage. In particular, planning should adopt a best practice environmental and risk management

approach and help to protect the health of ecological systems and the biodiversity they support (Clause 11.03-2 Environment);

- Protect areas and sites with significant historic, architectural, aesthetic, scientific and cultural values (Clause 11.03-2 Environment);
- Assist in the conservation and wise use of natural resource (including energy, water, land, flora, fauna and minerals) to support both environmental quality and sustainable development over the long term (Clause 11.03-3 Management of resources);
- Contribute to the economic well-being by supporting and fostering economic growth and development by providing land, facilitating decisions, and resolving land use conflicts. (Clause 11.03-5 Economic well-being);
- Assist in the protection and, where possible, restoration of catchments, waterways, water bodies, groundwater, and the marine environment. Planning decision-making must be consistent with any relevant requirements of SEPP (Waters of Victoria) and Construction Techniques for Sediment Pollution Control (EPA 1991) (Clause 15.01);
- Assist in the protection and improvement of air quality and planning decision-making must be consistent with relevant requirements of the SEPP (Air Quality Management) and should have regard to Recommended Buffer Distances for Industrial Residual Air Emissions (EPA 1990) (Clause 15.04 Air Quality);
- Assist the control of noise effects on sensitive land uses and planning decision-making must be consistent with SEPP (Control of Noise from Commerce, Industry and Trade) No N-1 and Interim Guidelines for Control of Noise from Industry in Country Victoria (EPA 1989) (Clause 15.05 Noise Abatement);
- Protect and enhance the natural coastal ecosystems and landscapes, ensure sustainable use of natural coastal resources and achieve development that provides an environmental, social and economic balance. Planning decision-making must be consistent with the principles for coastal planning and management as set out in the Victorian Coastal Strategy 2002;
- Protect and conserve biodiversity, including native vegetation retention and provision of habitats for native plants and animals. Planning decision-making must assist:
 - The protection of conservation values of conservation reserves and habitats of threatened and endangered species/communities as identified under the Flora and Fauna Guarantee Act 1988, including communities under-represented in conservation reserves such as native grasslands, grassy woodlands and wetlands;
 - Address potentially threatening processes identified under the Flora and Fauna Guarantee Act 1988; and
 - Have regard to Victoria's Native Vegetation Management – A Framework for Action 2002 (the Framework). If native vegetation is proposed to be removed as part of a land use or development proposal, planning and responsible authorities should ensure a Net Gain outcome, as defined in the Framework. (Clause 15.09 Conservation of native flora and fauna).
- Assist in the conservation of places of natural, environmental, aesthetic, historic, cultural, scientific or social significance as a means of understanding

our past, as well as maintaining and contributing to the economic and cultural growth of the State. Planning decision-making must take account of the findings and recommendations of the Victorian Heritage Council and the provisions of the *Heritage Act 1995* and the *Aboriginal Heritage Act 2006* (Clause 15.11 Heritage); and

- Protect stone resources accessible to major markets and provide a consistent planning approval process for extraction in accordance with acceptable environmental standards. Relevant legislation and policies should be applied to extractive industry activities in a timely and coordinated manner. Provision for buffer areas between new extractive industries and sensitive land uses should be determined on the basis of specified principles (Clause 17.09 Extractive industry).

Local Planning Policy Framework (LPPF)

The directly relevant provisions of the LPPF include:

- **Clause 21.11 Protection of Catchments, Waterways and Groundwater** recognises and aims to conserve internationally significant wetlands for current and future generations. This Clause includes strategies to prevent the loss of wetlands within the municipality; use zoning buffers and permit processes to minimise land use conflicts in the vicinity of wetlands; and identify buffer zones adjacent to wetlands which incorporate complementary indigenous vegetation and ensure the protection of inputs from surface water;
- **Clause 21.14 Conservation of Native Flora and Fauna** aims to ensure that there is no further preventable decline in the viability of any rare or threatened species and associated habitats;
- These policy directions in Clauses 21.11 and 21.14 are reinforced in the *City of Greater Geelong Environment Management Strategy 2006-2011* which, like State level environmental strategies, advocates adoption of the Precautionary Principle;
- **Clause 21.25 Extractive Industry** aims to ensure that stone resources are available for long term extraction and references the Geelong Supply Area – Extractive Industry Interest Areas 1999;
- **Clause 21.22 Industry** notes proposals since the early 1980s to develop a petrochemical chlorine alkali manufacturing plant on Orica's land (this includes the subject site) at Avalon. Although the proposal has been deferred, the MSS expresses Council's continuing commitment to the suitability of the site for a future major industrial development which is recognised by the zoning development overlays applied to the land. This Clause suggests DPO5 is applied to ensure that development responds to the Orica Land Development local policy and results in an integrated and environmentally sensitive single industrial development. However, it is unclear to the Panel what policy is being referred to as there is no such policy in the Planning Scheme; and
- **Clause 22.15 Industrial Development - Design and Siting** is a generic policy relating to industrial development but provides little specific guidance.

Amendment C129, which proposes to introduce a new LPPF, has been exhibited and considered by a Panel. It proposes a more succinct LPPF with content that currently duplicates SPPF provisions being deleted, eg references to Ramsar wetlands. The

reference to the subject land in the exhibited LPPF is limited to identifying it as existing industrial land on the framework plan but application of a new Design and Development Overlay to the IN2Z part of the land is proposed. This overlay is proposed for industrial zones throughout the municipality and provides additional matters to be addressed in development applications.

Planning Scheme Particular Provisions

Clause 52.17 Native Vegetation

Clause 52.17, which aims to protect and conserve native vegetation, reinforces the approach advocated in the SPPF and the *Native Vegetation Management: A Framework for Action*:

- to avoid the removal of native vegetation;
- if the removal of native vegetation cannot be avoided, to minimise the removal of native vegetation through appropriate planning and design; and
- to appropriately offset the loss of native vegetation.

A permit is required under Clause 52.17 to remove, destroy or lop native vegetation, however Extractive Industry in accordance with an approved work plan/work authority under the EID Act is exempt from requirements for permits under this clause (see discussion in Chapter 3).

Clause 52.09 (Extractive industry and extractive industry interest areas)

Clause 52.09 sets out the requirements and decision guidelines for the use and development of land for extractive industry. The purpose of the clause is:

- *To ensure that use and development of land for extractive industry does not adversely affect the environment or amenity of the area during or after extraction.*
- *To ensure that excavated areas can be appropriately rehabilitated.*
- *To ensure that sand and stone resources, which may be required by the community for future use, are protected from inappropriate development.*

This Clause does not allow permits for extractive industry to include conditions which require the use to cease by a specified date or alterations to the natural condition or topography of the land within 20 metres of the boundary other than for driveways, drains, bund walls or landscaping or where a permit is granted. Screen planting and the provision of parking for employees' cars and all vehicles used on the site are required.

Zoning

The zoning of the Site and the implications of these zones are briefly summarised below.

Industrial 2 Zone (IN2Z)

Most of the site is in the IN2Z which is the VPP zone where manufacturing industries and storage facilities that require substantial threshold distances (buffers) are promoted. In the IN2Z, Extractive Industry is an unspecified section 2 (permit

required) use. As quarrying can have off-site amenity impacts, this zone is appropriate for the proposal, provided that rehabilitation takes account of the intended industrial after-use (see discussion in Chapter 10).

Rural Conservation Zone -Schedule 15 (RCZ15)

The proposed Work Authority boundary includes the whole of the RCZ15 land but only a portion of land in the south west corner of the RCZ15 land is included within the proposed extraction boundary. The conservation values to be protected in the site specific schedule to the zone are stated as:

The land along the north-eastern boundary of the Industrial 2 Zoned Land at Point Wilson includes key areas of secluded important habitat for a variety of wader and migratory birds including the Orange-bellied Parrot. It is used as a feeding and a roosting area during bad weather and very high tides. This land also forms an extensive buffer between the industrial land and the public conservation land of The Spit. This Rural Conservation Zone has been applied to protect the area from development and maintain its environmental values.

In this zone a permit is required for Extractive industry use and associated buildings and works. The key concern highlighted by RCZ15 is buffering to the ecologically sensitive areas to the north-east of the proposed quarry.

Special Use Zone – Schedule 1 Environmental Wetlands, Salt Production and Land-Based Aquaculture Activities

SUZ1 applies to a portion of the south-western area of the proposed Stage 2 extension, including a small part of the proposed extraction area. At the hearing the Proponent advised the proposed extension will not be pursued in this area. This zone provides for natural systems, passive recreation, aquaculture, and salt production and prohibits other unrelated uses. The appropriateness of the SUZ1 and/or the proposed Work Authority boundaries should be reviewed by the Planning Authority having regard to both environmental constraints and the desirability of alignment of zone and ownership boundaries.

Public Conservation and Recreation Zone (PCRZ)

A small portion of the south-western area of the proposed extension boundary and the proposed extraction area extends into land zoned PCRZ. At the hearing the Proponent advised the proposed extension will not be pursued in this area.

The PCRZ is within the suite of public land zones (Clause 36) and the VPP Practice Note 'Applying Public Land Zones' clearly states 'The public land zones can only be applied to public land.' The PCRZ is directed at public purposes and requires all uses (other than wind energy facilities) to be conducted by or on behalf of a public land manager such as Parks Victoria.

It appears to the Panel that the application of the PCRZ to this private land was an error when the new format planning scheme was introduced and should be rectified in the short term. The IN2Z which applies to the adjoining private land or the RCZ may well be suitable zones. The appropriate planning framework for this land should be reviewed by the Planning Authority (CoGG) and could be introduced with limited notice given that this EES process has provided for extensive public consultation

(section 20 of the Act) or a combined Amendment and permit process under Division 5 in Part 4 of the Act.

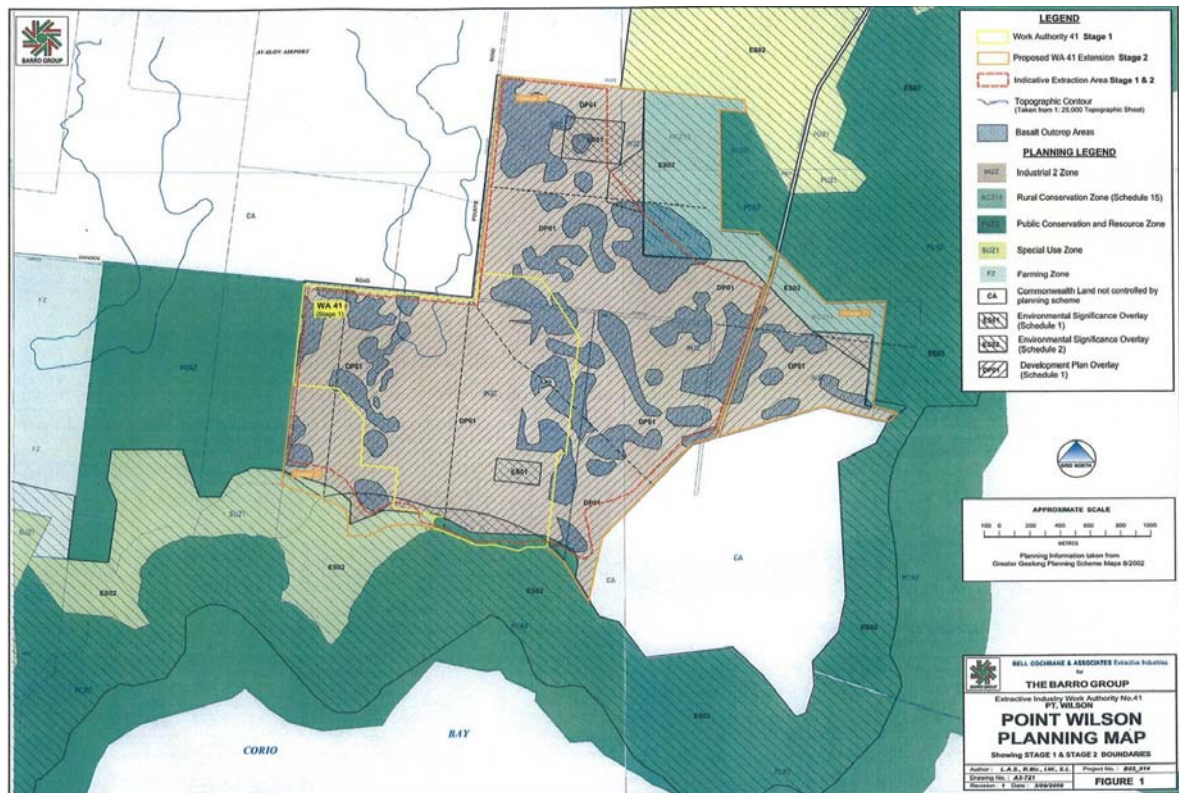


Figure 2 Zones and Overlays (Source Mr Linke's Evidence)

Overlays

The following overlays apply to the site or parts of it (see Figure 2).

Development Plan Overlay -Schedule 1 (DPO 1)

DPO 1 applies to the land in the IN1Z which represents most of the Site. The schedule to the DPO states ‘... *the zoning of the land recognises its potential as a site for a large scale industrial development requiring substantial buffer distances. A development plan is required to ensure that the area’s environmentally significant flora and fauna is protected and that all planning issues are fully addressed prior to the issue of a permit for the development of the land.*’

A permit must not be granted to use or subdivide land, construct a building or construct or carry out works until a development plan has been prepared to the satisfaction of the responsible authority.

The EES indicates that a development plan formed part of the documentation associated with the planning permit for Stage 1 (Permit No. 1051/2004) and that the Work Authority was prepared to address the development plan criteria. The Panel could not explore this issue with the CoGG as it did not submit to the EES or attend the hearing.

The Panel endorses the need for development planning for this large future industrial precinct but has a number of reservations about the DPO1 requirements. These are discussed in Chapter 11.1.

Environmental Significance Overlay Schedule 1

ESO1 aims to protect areas of significant flora and habitat in various locations throughout the municipality. ESO1 applies to land in the north east of the Stage 2 area. The overlay requires a permit for works (which includes quarrying activities) and the removal of native vegetation (irrespective of the exemption from the separate permit requirement under Clause 52.17).

Enquiries to Council on behalf of the Proponent did not establish the specific flora/habitat values this particular ESO was intended to protect. At the hearing it was noted that ESO1 does not correspond with any of the areas of native vegetation/habitat identified in EES investigations. It appears to the Panel that there may well have been a mapping error as the most likely reason for the overlay in this general area would be to protect native vegetation at Sites 2, 17, 18 and 19. Site 2 represents the largest component of what may have been the intended ESO area. It was originally identified as a potential patch of plains grassy wetland but assessment has since determined that it does not qualify as a patch under the Framework. The consideration of the other areas, which have been identified as being of very high conservation value, is provided in Chapter 3 and should inform the future assessment of any application to remove this vegetation.

Environmental Significance Overlay Schedule 2

ESO2 aims to ensure high value wetlands and associated habitat are protected. It covers that part of the land which is zoned RCZ15. The overlay requires a permit for carrying out works (which includes quarrying activities) and the removal of native vegetation (irrespective of the exemption from the separate permit requirement under Clause 52.17). The proposal does not involve the removal of native vegetation in the area affected by ESO2 and buffering to protect the ecologically sensitive areas to the east is discussed in Chapter 3.

PANEL RECOMMENDATIONS

Rezone privately owned land in the Public Conservation and Recreation Zone after review by the Planning Authority regarding the appropriate alternative zoning.

Review the appropriateness of the SUZ1 and the proposed Work Authority boundaries having regard to both environmental constraints and the desirability of alignment of zone and ownership boundaries. Rezoning the land owned by the Proponent to Industrial 2 Zone should be considered if it is not subject to environmental constraints.

Rezone land currently in the Rural Conservation Zone that is within the exhibited extraction area to Industrial 2 Zone.

1.5.6 ENVIRONMENT PROTECTION ACT 1970

The *Environment Protection Act 1970* has the purpose of “*creating a legislative framework for the protection of the environment in Victoria having regard to the principles of environment protection*” which include:

- integration of economic, social and environmental considerations;
- the precautionary principle;
- intergenerational equity;
- conservation of biological diversity and ecological integrity;
- improved valuation, pricing and incentive mechanisms;
- shared responsibility;
- product stewardship;
- wastes hierarchy;
- integrated environmental management;
- enforcement; and
- accountability.

The Act is administered by the EPA, and includes a range of instruments for protecting the environment. Principal among these are State Environment Protection Policies (SEPPs), which incorporate environmental sustainability principles and provide the broad framework for protecting the environment.

SEPPs

The following SEPPs are directly relevant to the assessment of the proposal:

- **SEPP (Groundwaters of Victoria), 1997** aims to maintain and, where necessary, improve groundwater quality to a standard that protects existing and potential beneficial uses of groundwaters. The SEPP provides objectives for groundwater protection throughout Victoria. Water indicators and objectives are nominated in the Australian Water Quality Guidelines 1992. Exceeding objectives for a nominated indicator in effect defines pollution.
- **SEPP (Waters of Victoria), 2003** applies to all surface waters in the State. The purpose of the Policy is to help achieve sustainable surface waters by:
 - setting out the environmental values and beneficial uses of water that Victorians want, and the environmental quality required to protect them; and
 - setting, within a 10 year timeframe, goals for protection agencies, businesses and communities, and means by which they can be met.

The SEPP defines environmental quality objectives and indicators that must be met to protect beneficial uses. It also outlines actions to manage activities that impact on water environments.

- **SEPP (Ambient Air Quality) (SEPP AAQ), SEPP (Air Quality Management) (SEPP AQM), the Protocol for Environmental Management (Mining and Extractive Industries) (PEM)** which was gazetted February 2008 and is an incorporated document to SEPP (AQM) and **the Protocol for Environmental Management (Greenhouse Gas Emission and Energy Efficiency in Industry)** gazetted in 2002 is an incorporated

document to SEPP (AQM). These SEPPs establish amongst other things, air emission intervention levels. The Extractive Industries PEM provides further interpretation and guidance and establishes a procedure for conducting an air quality assessment for regulatory processes, including EES processes, applications for EPA Works Approvals, Planning Permits and DPI Work Authorities.

- **State Environment Protection Policy (Noise from Commerce Industry and Trade) (SEPP N1)** and the more stringent **Interim Guidelines for Control of Noise from Industry in Country Victoria N3/89**. These SEPPs establish methodologies for measuring noise and noise limits for day, evening and night periods.

EPA Discharge License

The proposal does not propose to vary the existing EPA Discharge License EW 26848 for discharge into Corio Bay. That license:

- nominates the location of the discharge point in the south east of Stage 1 area;
- states that the discharge limit is unspecified but only ground water and storm water collected from the quarry floor may be discharged;
- sets maximum water quality parameters for water discharged comprising: 60mg/L suspended solids, pH between 6.0 to 9.0 units, 50 NTU turbidity;
- stipulates the discharge must contain no visible floating oil, grease scum, litter etc; and
- requires specified monitoring.

1.5.7 FLORA AND FAUNA GUARANTEE ACT 1988

The main objectives of the *Flora and Fauna Guarantee Act 1988* (FFG Act) are to conserve the State of Victoria's flora and fauna, to manage potential threats, to ensure that any human use of flora and fauna is sustainable and to make certain that the diversity of Victoria's flora and fauna is maintained at its present level. The Act highlights its key role as the main piece of Victorian legislation that deals with the conservation of threatened species.

A number of strategies and policies apply under the FFG Act, including the State Biodiversity Strategy and the Victorian Native Vegetation Management Framework:

Victoria's Biodiversity Strategy 1999

The National Strategy for Biodiversity Conservation is implemented at a State level by the *Victorian Biodiversity Strategy 1999*. The emphasis of the strategy is on:

- *Systematic prevention or reduction of the causes of biodiversity decline or loss;*
- *Ecologically sustainable management of public lands and waters by government agencies, in association with resource-based industries;*
- *Co-operative management of biodiversity on private land, in partnership with landholders, the community, Catchment Management Authorities and local government;*
- *Community involvement; and*

- *The reporting framework for monitoring progress.*

Native Vegetation Management Framework, 2002

The *Native Vegetation Management: A Framework for Action 2002* was developed to implement Victoria's Biodiversity Strategy and the National Strategy for the Conservation of Australia's Biological Diversity. The Framework's main goal is "to achieve a reversal, across the entire landscape of the long-term decline in the extent and quality of native vegetation, leading to a net gain."

The Framework provides an approach to valuing native vegetation and accounting for progress towards the Net Gain result by striking a balance between the following:

- active improvement of the quality of existing native vegetation;
- avoidance or minimisation of further permanent vegetation losses;
- strategic increase through revegetation with high biodiversity value; and
- providing flexibility to support the adoption of more sustainable land use.

1.5.8 HERITAGE ACT 1995

This Act establishes a framework for heritage protection in Victoria. It provides protection for a wide range of cultural heritage places and objects. Three previously identified European archaeological sites have been identified within the proposed Stage 2 extraction area. Heritage Victoria consent is required to disturb these sites.

1.5.9 ABORIGINAL HERITAGE ACT 2006

The *Aboriginal Heritage Act 2006* replaced the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (Commonwealth) and the *Archaeological and Aboriginal Relics Preservation Act 1972* (Victoria). Six Aboriginal heritage sites have been identified within the proposed Stage 2 extraction area.

The Act requires consents to excavate or disturb Aboriginal archaeological sites and cultural heritage management plans for certain development plans or activities. Registered Aboriginal parties or Aboriginal Affairs Victoria (AAV) evaluate management plans, advise on permit applications, enter into cultural heritage agreements and negotiate the repatriation of Aboriginal human remains.

1.5.10 WATER ACT 1989

The *Water Act 1989* regulates surface and ground water allocations. The Proponent currently holds Ground Water Licence No 4002210 to extract ground water that seeps into the quarry pit and extraction of up to 1.5 megalitres/day from each of two bores (234 megalitres/year).

1.5.11 OTHER STATE GOVERNMENT POLICIES

Promoting Victoria's Prospects (Ministerial Statement 2004) – The Challenge for the Mining, Extractive and Petroleum Industries

This document builds on *Pillars for Balanced Growth – Minerals and Petroleum for the 21st Century*. It is a clear statement of the value of extractive industry to the State and the importance of supporting the mining, petroleum and extractive industries. The key theme of the Statement is that proposals for development of these industries must be considered in terms of their economic viability, the contribution they make to the prosperity of the State, their environmental impacts both in terms of site operation and rehabilitation, and whether community concerns are addressed.

Victorian Coastal Strategy, 2002 (and revisions)

The Victorian Coastal Strategy 2002 (VCS) provides an overall vision for the Victorian coast. It recognises the competing pressures for the use of coastal areas and aims amongst other things, to ensure the protection of significant environmental features, to identify suitable development areas and opportunities on the coast and to ensure the sustainable use of natural resources. It is underpinned by the following principles:

- ecologically sustainable development (ESD) that ‘meets the needs of the present without compromising the ability of future generations to meet their own needs’ (Bruntland, 1987);
- integrated coastal zone planning and management of the land/sea and the private/public land interfaces;
- ecosystem-based management which recognises that humans and their needs are an integral part of the system. It aims to protect the environment and manage human impacts in an ecosystem; and
- adopting adaptive management which involves systematic learning from management actions and continuous improvement of planning and management approaches. The Strategy is currently subject to review and a revised draft strategy was released for public comment in 2007.

The draft VCS acknowledges a number of new challenges for coastal planning - notably climate change – and advocates a precautionary approach to the issue. It indicates that a sea level rise of approximately 0.4 to 0.8 m by the end of the century should be assumed for planning purposes and notes that the extreme sea level or storm event currently assumed to occur as one-in-100 year event could occur around every five years by 2070. The first principle in the VCS hierarchy involves protecting and enhancing the physical diversity and ecological integrity of environmentally significant features of coastal areas.

At the time of submission of this report, the final strategy has not been released.

Victorian Greenhouse Strategy, 2002

The *Victorian Greenhouse Strategy* 2002 details the actions to: reduce greenhouse gas emissions; enhance greenhouse sinks to sequester carbon; and adapt to climate change.

Victoria's Environmental Sustainability Framework, 2005

Victoria's *Environmental Sustainability Framework 2005* aims to make environmental sustainability a consideration in everything Victorians do by taking “*a long term perspective and holistic approach to improving the environment.*” It sets out a vision for Victoria to become a sustainable state within one generation by setting three strategic directions, including:

- Maintaining and restoring our natural assets;
- Using our resources more efficiently; and
- Reducing our everyday environmental impacts.

1.5.12 SUMMARY OF CONSENTS REQUIRED FOR EXTRACTIVE INDUSTRY

As demonstrated by the forgoing summary of the regulatory framework for extractive industry there is a multiplicity of legislation, policies and consents that require co-ordination. The recommendations of this Panel will be implemented via the subsequent consents for the proposed Stage 2 extension of the quarry required under the various legislation briefly set out above. They include:

- approval of a ‘Controlled Action’ under the Commonwealth EPBC Act (Commonwealth Minister for Environment);
- approval of a Development Plan pursuant to DPO1 of the Greater Geelong Planning Scheme before any planning permits issue (CoGG);
- planning permits required for use and development by the following provisions of the Greater Geelong Planning Scheme:
 - IN2Z, RCZ; and
 - ESO1 and ESO2 (CoGG)
- planning permits required for removal of native vegetation pursuant to ESO1 of the Greater Geelong Planning Scheme (CoGG);
- approval of Cultural Heritage Management Plan and consent to disturb Aboriginal archaeological sites (AAV) and European archaeological sites (Heritage Victoria);
- amendment of the Water Discharge License (EPA), Ground Water Licence (Southern Rural Water), Licenses under the Dangerous Goods Explosives regulations, if required; and
- amendment of Work Authorities (By Minister) and Work Plans (by Department Head) under the EID Act after a rehabilitation bond has been entered into and the issue of other necessary permits and consents.

1.6 THE ISSUES

There was a strong focus in the EES and submissions on two main issues:

- the removal of native vegetation of Very High Conservation value; and
- protection of the habitat values of the dry saltmarsh, which is within the Site but outside the proposed extraction area.

These issues have also been the focus of the Panel's assessment but the other matters addressed in the EES assessment are also recorded and briefly considered.

PART B: ANALYSIS OF EFFECTS AND IMPACTS

2. IMPACTS ON RESIDENTS IN THE LOCALITY

2.1 AIR QUALITY

The Issues

- Was the assessment of air emissions adequate?
- Will air emissions have unacceptable impacts on nearby residential uses?
- Will air emissions have unacceptable impacts on ecologically sensitive areas?
- Is the proposed management of air emissions appropriate?
- Have Greenhouse emissions been adequately considered?

What is proposed?

The EES addresses air emission impacts in Chapter 10 and Technical Appendix 7. The Environmental Management Framework in Chapter 18⁷ sets out proposed mitigation measures.

Stage 2 of the quarry adopts the same mode of operation and uses the same fixed plant as the Stage 1 quarry. However, the area of the quarry is increased and the location of working faces and some mobile plant would change. The extension of the quarry brings the working faces closer to sensitive avifauna areas but no closer to sensitive residential uses than the quarry area approved under the Stage 1 Works Authority.

The EES management commitments to avoid and suppress dust emissions include:

- enclosed processing plant;
- operation of water sprays on screening plant, crushers, internal direction change points, and conveyor discharge points;
- use of water cart sprays around stockpiles, ground bins, roads and stripping areas;
- selection of appropriate meteorological conditions for significant dust producing activities, including blasting;
- siting dust generating activities away from ecologically sensitive areas
- Extension of landscaping of embankments and buffer zones;
- wetting or covering truck loads where appropriate; and
- monitoring of air emissions was not considered necessary in view of the layout of the extension, proposed dust suppressions measures and separation distances (particularly) from human occupancy.

⁷ See EES page 18-12

The Regulatory Framework

State Planning Policy on Air Quality (Clause 15.04) aims to protect and improve air quality and requires responsible and planning authorities to:

- ensure there is suitable separation between sensitive land uses and developments;
- consider EPA's recommended buffer distances where uses have the potential to reduce amenity;
- have regard to potential conflicts between uses due to air emission impacts; and
- ensure planning decisions are consistent with relevant requirements of the State Environment Protection Policies (SEPPs) aimed at protecting air quality.

The EPA identified the following air quality SEPPs and protocol:

- *State Environment Protection Policy (Ambient Air Quality) (SEPP AAQ)*.
- *State Environment Protection Policy (Air Quality Management) (SEPP AQM)*.
- *Protocol for Environmental Management (Mining and Extractive Industries) (PEM)* which was gazetted February 2008 and is an incorporated document to SEPP (AQM).
- *Protocol for Environmental Management (Greenhouse Gas Emission and Energy Efficiency in Industry)* gazetted in 2002 is an incorporated document to SEPP (AQM).

Protocol for Environmental Management (Mining and Extractive Industries)

The PEM is a statutory document with the same power as a SEPP. It provides further interpretation and guidance and establishes a procedure for conducting an air quality assessment for regulatory processes, including EES processes, applications for EPA Works Approvals, Planning Permits and DPI Work Authorities. Due to the size of the proposed quarry and its separation from residences, the PEM requires a Level 2 assessment. The assessment is directed at the protection of sensitive uses which include residences. The EPA advised that it treated the coastal reserves as sensitive recreation areas because they are used by bird watchers who may be there for some time.

The PEM assessment requirements include Ausplume modelling of residual emissions at sensitive locations (after the application of best practice⁸) for both construction and operational phases. The model should utilise background data constituting continuous 24-hour PM10 and PM2.5 for a 12-month period, analysis of crystalline silica (PM2.5 fraction), deposited dust and heavy metal content (PM10) (where applicable). The EPA advised the 70th percentile value for PM10 could be used as background for the EES air quality assessment and data from the Geelong South air monitoring station was provided.

⁸ The PEM adopts the main guiding principle that best practice must be adopted in controlling air emissions and meeting the PEM requirements. SEPP (AQM) defines best practice as: *the best combination of eco-efficient techniques, methods, processes or technology used in an industry sector or activity that demonstrably minimises the environmental impact of a generator of emissions in that industry sector or activity.*

The PEM establishes assessment criteria for residual emissions to ensure management to protect beneficial uses of the air environment. DSE noted that the relevant SEPPs and the PEM identify protection of ecosystems and biodiversity as beneficial uses.

Recommended Buffers

The EPA's *Recommended Buffer Distances for Industrial Residual Air Emissions (July 1990)* recommend a buffer of 500 metres from sensitive uses for quarrying of hard rock with blasting and 300 metres from a concrete batching plant. Clause 52.10 of the planning scheme also specifies a threshold distance for concrete batching plant of 300 metres. The buffer is to protect sensitive uses from unintended or accidental air emissions rather than from routine operations.

2.1.1 EVIDENCE AND SUBMISSIONS

DPI's submission identified the need for a detailed strategy in the environmental management plan (EMP) that includes best practice measures for avoidance, mitigation and management of air emissions to the satisfaction of EPA and DPI.

The EPA's written submissions and presentation to the Panel hearing raised a number of air quality issues. DPI and DSE deferred to the EPA on air quality impacts. Mr Peter Ramsay, who is the principal of the firm that prepared the EES air quality modelling, prepared an evidence statement but did not present at the Panel hearing. His statement responded to the air quality issues raised in the EPA's written submission and expressed the opinion that modelling performed was representative of the proposed extension and shows compliance with the PEM.

Although the EPA's written submissions had raised a number of concerns about air quality modelling, at the Panel hearing it advised that further modelling is not required if the Proponent commits to a reactive management model that is informed by real time monitoring of PM10. Although the Proponent's agreement to incorporate these additional measures addressed the air quality issues raised by the EPA, a summary of Mr Ramsay's response to these issues is recorded in the Table below.

EPA Submission	Ramsay Response
Without further modelling EPA is unable to advise on the potential impact in sensitive receptors.	Air quality assessments were provided to EPA for review in December 2006 and May 2007 but major concerns regarding the approach to the modelling raised in the EPA submission were not raised. Further air dispersion modelling to account for uncovered truck loads, off-site truck movements and a different background concentration for particulates was undertaken on EPA request in March 2007. After this further work there was tacit approval of the approach to the modelling as the basis for assessment of impacts.
Modelling was for the current operations (246 ha), not the extended area including Stage 2 (780ha). The extended area is closer to sensitive uses and	The entire quarry extension cannot be worked at the same time and it was necessary to select a representative extraction working area for the modelling. The western Stage 1 area is not a Stage 2 extension area but was selected as the worst case work area as it is closest to the residence to the west. Operations at the closest work area to the nearest sensitive

EPA Submission	Ramsay Response
increases the area exposed. Without further modelling that includes the Stage 2 area EPA is unable to advise on the potential impact in sensitive areas.	receptor with all quarry activities occurring at the same time were modelled. The maximum predicted concentrations of PM10 and PM2.5 are therefore the maximum worst case dust emissions from the site at a sensitive receptor.
The extended area increases the distance for vehicle movements on site (and associated dust generated).	Truck movements were more than sufficiently accounted for in modelling. Dust emissions from truck movements on-site were included in the initial modelling (December 2006) and at EPA's request, dust emissions from off-site truck movements, emissions from uncovered loads (on and off-site) and from off-site wheel generated dust from unsealed roads, were included (May 2007). The increased distance from the nearest residence will negate any potential increased impacts due to greater on-site truck travel distances.
No background data was included therefore assessment against criteria in PEM could not be undertaken.	Background PM10 at a 70% percentile value provided by EPA was included in the modelling. During consultation with EPA regarding the draft EES there was no discussion regarding the use of any other background values nor does the PEM specify the need for such a value.
Modelling needs to consider impact on recreational areas as well as residences.	There are no nearby recreational areas/sensitive receptors for the purposes of the air quality assessment. The restricted access to and nature of the Spit Nature Conservation Reserve and Ramsar wetlands mean the human health exposure scenario is not the same as residences, kindergartens, schools and standard recreational areas.

Table 1 Responses to EPA Air Quality Modelling Issues

The EPA also highlighted that an assessment of Greenhouse Gas Emissions has not been undertaken.

2.1.2 DISCUSSION AND CONCLUSIONS

Was The Assessment Of Air Emissions Adequate?

The Panel accepts that the modelling did adopt the appropriate background data and truck movements were adequately addressed.

With regard to the extent of the quarry area assumed in the modelling, the Panel understands that the operation will maintain the practice of working a variety of faces to ensure access to rock of different quality. The area exposed to erosion that contributes to air emissions will vary over time as areas are progressively opened up and rehabilitated and they may be greater than the area currently exposed. However, the Panel accepts that further modelling is not warranted as:

- the assumption that active quarry faces are in the location closest to the nearest residence is appropriately conservative;
- there is a substantial margin of compliance between the PEM criteria and predicted emissions; and

- while assessments at the planning stage must rely on predicted emissions, it is the actual emissions that are important. This has been recognised by the EPA's acceptance of the modelling, despite reservations, if real time monitoring and reactive management processes are in place.

Will air emissions have unacceptable impacts on nearby residential uses?

The Stage 2 quarry extension does not bring the quarry activities closer to houses and the separation of at least 2.7 kilometres easily satisfies the EPA recommended buffer and the planning scheme threshold distances. The absence of objecting submissions to this proposal and air quality complaints relating to existing operations from residents in the locality suggests that air quality impacts from the current operation are not adversely affecting residential amenity and, given the extent of the separation, the proposed quarry is likely to result in a similar outcome.

Modelling of residual air emissions indicates that the proposal will not have unacceptable impacts on residents' health and amenity. The table below sets out predicted residual emissions of both fine particles and nuisance dust (TSP) at the nearest residence which are well within the PEM criteria.

Relevant Indicators ⁹	Criteria	Predicted Emissions
PM10	60 µg/m ³ (24 hour average)	25 µg/m ³
PM2.5	36 µg/m ³ (24 hour average)	25 µg/m ³
Total Suspended Solids (TSP)	4g/m ² (Monthly)	2.2g/m ²

Table 2 PEM Residual Air Emission Criteria & Predicted Levels at the Nearest Residence

Is the proposed management of air emissions appropriate?

The EES commitments relating to air emissions were set out at the beginning of this chapter and these operational procedures would be included in the EMP and the approved work plan.

The EES suggestion that monitoring of fine dust emissions (beyond OH&S obligations) was not warranted was the main issue in contention. The EPA's submission highlighted the requirement in PEM for both compliance monitoring and monitoring for reactive management purposes for Level 2 sites. During the course of the hearing the Proponent agreed to implement the following monitoring which satisfied EPA and DPI concerns:

⁹ The assessment criteria for PM10 and PM2.5 are the intervention levels from the SEPP (AQM). The EES included advice from Bell Cochrane that photographic studies of basalt from the quarry over the last 29 years indicate there is no free silica and there is no risk of crystalline silica as the basalt contains mineral olivine which is chemically incompatible with crystalline silica. The EPA agreed crystalline silica is not a concern and also advised the Panel that the results of air quality assessments of current operations indicate NO₂ and CO are unlikely to exceed the PEM assessment criteria.

-
- incorporation of a reactive management model in the EMP, to be approved by the EPA and DPI;
 - reactive management that is informed by real time monitoring of PM10 at two locations (one in the south and one adjacent to dry saltmarsh) plus dust gauge monitoring close to sensitive locations;
 - the EPA will provide hourly emission levels that would trigger a management response; and
 - results monitoring to be provided to the Environmental Review Committee quarterly and would inform the review of plans. The need for ongoing monitoring would be assessed annually.

Greenhouse Gas Emissions

The EPA highlighted that greenhouse gas emissions and energy use were not assessed in the EES and an Environment and Resource Efficiency Plans must be developed for the site if the trigger values of 100TJ/year energy use and 120 ML/year water use are reached.

It is noted that the proposal does not change the scale of operations, including the volume of resource extracted and processed. Changes in energy use have not been foreshadowed.

PANEL RECOMMENDATIONS

Require the EMP to address air emissions to the satisfaction of the EPA and DPI through:

- **Implementation of reactive management responses that:**
 - **are informed by real time monitoring of PM10 at two locations (one in the south of the quarry site and one adjacent to dry saltmarsh) plus dust gauge monitoring close to sensitive locations.**
 - **are activated when hourly emission levels specified by the EPA occur.**
- **Quarterly submission of air emission monitoring results to the Environmental Review Committee.**
- **Annual assessment of the need for ongoing air emission monitoring.**

2.2 DISTURBANCE FROM NOISE AND VIBRATION

The Issue

- Will nearby sensitive uses be adversely affected by noise or vibration emanating from the proposal?

What is proposed?

Stage 2 of the quarry adopts the same mode of operation, including blasting approximately fortnightly, and uses the same fixed plant as the Stage 1 quarry. However, the location of working faces and therefore some mobile plant would change but are no closer to sensitive residential uses than quarrying approved under the Stage 1 Works Authority.

2.2.1 EES Assessment - Noise and Vibration

Noise and vibration impacts are addressed Chapter 11 and Technical Appendices 8 and 9 of the EES. Mitigation measures are set out in the proposed Ecological Management Plan in Technical Appendix 6. The Marshall Day Acoustics' assessment of noise and vibration impacts from the proposal is set out in Technical Appendix 8 and an assessment of the effects of blasting by Terrock Consulting Engineers is provided in Technical Appendix 9.

Both assessments focussed on the potential impacts on seven residential properties in Dandos and Avalon Roads, which would be at least 2.7 kilometres from the proposed extraction limit.

Noise and vibration evidence was not presented at the Panel hearing.

Operating Noise

The Marshall Day Acoustics assessment modelled predicted noise levels based on measured background noise levels and existing noise emissions from the quarry operations.

The Marshall Day assessment concluded that:

- the existing Point Wilson environment includes noise emissions from the Avalon airport, Austrak concrete railway sleeper plant, the Commonwealth government munitions storage, the Melbourne Water waste treatment plant and intermittent traffic movements. At the nearest residential property operational noise from the quarry under the current permit is not audible;
- the existing measured and predicted noise levels satisfy both *State Environment Protection Policy (Noise from Commerce Industry and Trade)* (SEPP N1) and the more stringent *Interim Guidelines for Control of Noise from Industry in Country Victoria N3/89* noise limits for day, evening and night periods even under weather conditions that maximise noise propagation towards the residential receptors; and
- continuation of the current practice of directing truck traffic along Dandos and Pousties Roads during the night-time period (10pm-7am) will ensure that sleep disturbance criteria are not breached at the residential properties in the locality.

Blasting

The Terrock assessment of the effects of blasting noted *Extractive Industry Development Regulations 1996*, *Extractive Industry Regulations 1989*, the *Dangerous Goods (Explosives) Regulations 2000* and the DPI Environmental Guidelines apply to blasting. The *Standards Australia Explosives Code AS2187-1993* recommends limits for ground vibration from blasting of 10 mm/second at houses and 25 mm/ second at commercial/industrial buildings. Terrock indicated that air vibration from blasting is barely noticed by humans up to 100 dBL and DPI enforces a limit of 120 dBL at existing quarries to control blasting nuisance to a level acceptable to the community. It was noted that Australian Standard 2187-1993 states:

J3 .3 Airblast. Airblast can cause discomfort to persons and in some cases damage to structures..... a limit of the 120 dB for human discomfort is commonly used and 130 dB to avoid structural long term damage is generally appropriate.

Terrock recommended that the limits of 10 mm/ second and 120 dBL applicable to the current license area should also apply to the extension area, noting that this is well below the level where minor damage to buildings occurs.

Terrock undertook regression analysis based on blasting data from this quarry to predict vibration levels, having regard to the attenuation associated with distance.

Marshall Day concluded that vibration levels at 300 m from the blast site will be barely perceptible by humans according to AS187.2 – 1993. Blast overpressure reduces to levels comparable with moderate thunder at a distance of 180m.

Terrock concluded that:

- blasting at the quarry can occur safely. They recommended a safety exclusion zone to protect the public when blasting approaches the roads adjacent to the Site; and
- the vibration from blasting will normally be imperceptible in sensitive location but on rare occasions blasts may be perceptible on the southern side of Corio Bay due to weather conditions.

2.2.2 Submissions

DPI deferred to the EPA view on noise issues as it is lead agency in this area. It reported there have only been two instances (January 2002 and February 2003) where complaints were made about air blast impact and in both cases complaints were from residents of Clifton Springs which is remote from the site but can be affected in certain weather conditions.

The EPA's written submission raised the following concerns relating to noise and vibration:

- the impact of enhanced low frequency noise at residential receivers should be further examined in accordance with N3/89; and
- the assessment was carried out using A-weighted values instead of octave band exceedance values. This should be reassessed.

However, the EPA's written submission acknowledged that further analysis may not be warranted given the large distances to residential receivers and the assessment report finding that quarry noise at receivers is currently inaudible. At the hearing the EPA accepted Mr Fernside's view in his written evidence statement that further analysis of noise impacts on residential receptors is not warranted as quarry noise is inaudible at these locations and even under worst case conditions noise levels would be at least 10 dBA below permitted noise limits. The EPA accepted that noise problems would be apparent from the operation of the existing quarry and was reassured by the absence of complaints and submissions from nearby residents which provides a further level of confidence that noise issues are adequately addressed.

DPI is responsible for regulating blasting. Their submission noted that the air blast and ground vibration limits quoted in the EES (Section 11.3) were derived from AS2187-1993 and ANZEC 1990 but DPI now applies the more stringent criteria in

the draft work plan conditions¹⁰ that impacts from blasting operations must not exceed:

- airblast - 115 decibels¹¹ on more than 5% of blasts in a 12 month period and 120 decibels at any time in the vicinity of any sensitive location (eg. residence);
- ground vibration - 5mm/s¹² on more than 5% of blasts in a 12 month period, and 10mm/s at any time in the vicinity of any sensitive location (eg. residence).

2.2.3 DISCUSSION AND CONCLUSIONS

Noise from the proposal will not significantly change existing noise conditions for sensitive residential uses in the locality. These seven houses are at least 2.7 kilometres from the quarry and there is no record of complaints about noise or vibration from these properties. The Panel notes that substantial separation between houses and the extraction area limit means that the proposal would comply with the more stringent criteria for blasting referred to in DPI's submission.

While there are records of complaints from residents in Clifton Springs on two occasions after blasting, this residential area is at least 10 kilometres from Stage 2, there have been no complaints recorded in the last five years, blasting is highly regulated and the impact on amenity from infrequent blasting (fortnightly for a duration of 4 seconds) is limited.

The Panel accepts the EES assessment that the residents in the locality will not be subjected to unacceptable noise and vibration impacts from the proposal.

¹⁰ EES Appendix 17

¹¹ measured by an instrument with an accuracy of +/-3 decibel down to a frequency of 3 hertz

¹² measured by a geophone with a natural frequency of not more than 5 hertz

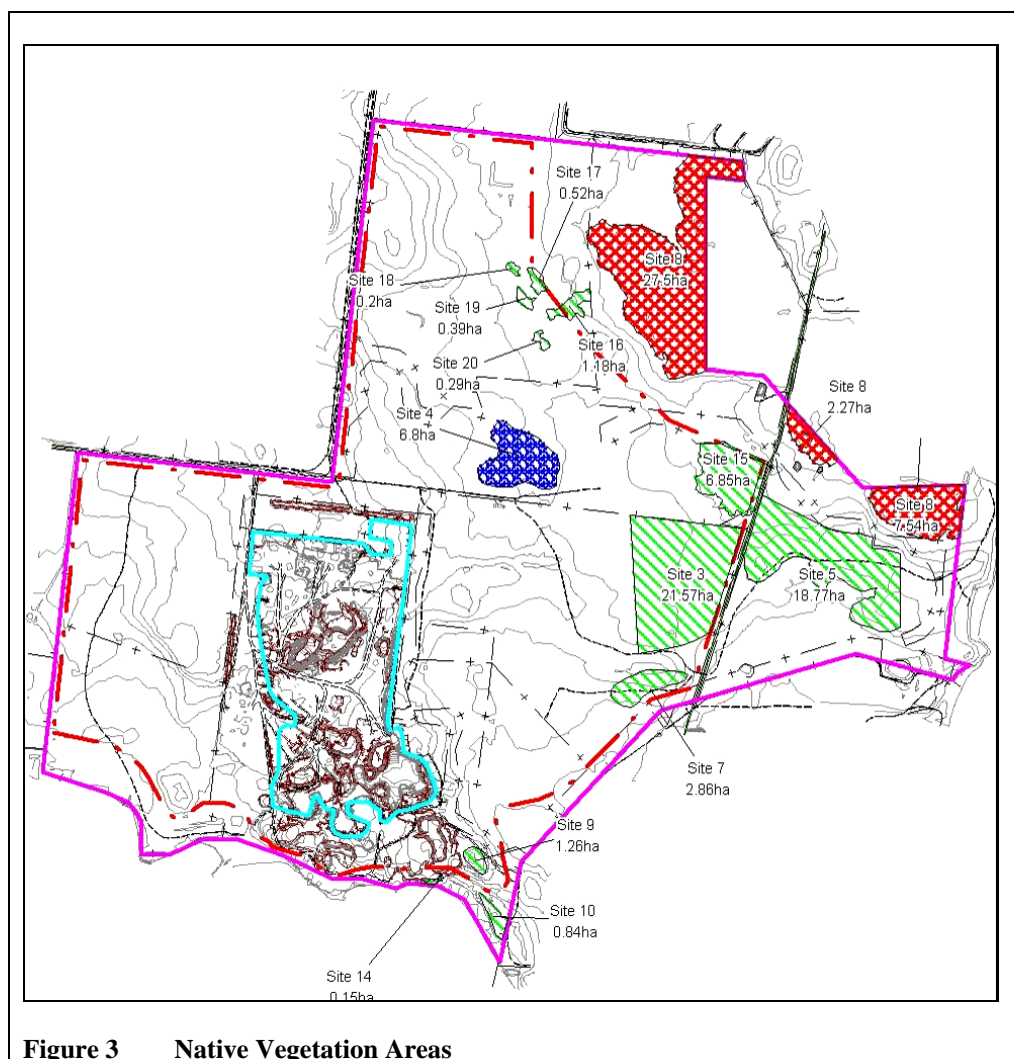
3. REMOVAL OF NATIVE VEGETATION

The Issues

- Does the Native Vegetation Management Framework Apply to this proposal?
- Have requirements under the Native Vegetation Management Framework (the Framework) been followed and in particular have appropriate efforts been made to avoid, and failing this, minimise clearing of native vegetation?
- Where clearing is still proposed, are any required offsets available either on or off site under the Framework?

What is Proposed

Stage 2 of the quarry operation proposes clearing of a number of areas of native vegetation. The areas proposed to be cleared are detailed in full in Chapter 8 of the EES. Figure 3 shows the areas of native vegetation identified in the EES.



In summary the areas proposed for clearing (in whole or part) are:

- Sites 1, 2, 6, 11, 12 and 13 which did not support a cover of native vegetation that satisfies the requirements in the Framework to be defined as a patch of native vegetation (i.e. 25% of the benchmark cover of understorey species);
- Sites 3 and 7 which have been confirmed by the Department of Sustainability and Environment (DSE) as ‘degraded treeless vegetation’;
- Sites 4 and 16-20 which have been classified as of High Conservation Significance (HCS); and
- Sites 9 and 15 which have been classified as of Very High Conservation Significance (VHCS).

3.1 SUBMISSIONS AND EVIDENCE

Mr Gobbo questioned whether DPI has the power to implement the Native Vegetation Framework and argued there is considerable flexibility in the application of the three steps in the Framework (i.e. avoid, minimize and offset). He submitted that the Panel is not bound to give effect to the prescriptive provisions of the Framework but should have regard to the “ambitions and principles” of the Framework in balancing the social, economic and environmental effects to achieve a net community benefit.

Mr Mueck provided expert evidence on Flora and Net Gain issues related to native vegetation clearing.

There are 28 species of regional significance, mostly from the coastal fringe and saltmarsh rather than within the Stage 2 extraction zone. The proposed extraction area would result in the loss of:

- Plains Grassy Wetland - 1.87 hha of High Conservation Significance; and
- Plains Grassland 3.84 hha (3.42 hha of VHCS and 0.42 hha of HCS).

Prescribed offsets would be required of 7.47 hha of Plains Grassland (6.84 hha of VHCS and 0.63 hha of HCS) and 2.81 hha of HCS Plains Grassy Wetland.

Theoretically, the prescribed offsets (10.28 hha) from revegetation works could be generated from 86ha of Plains Grassland revegetation. However, Mr Mueck considered that onsite regeneration of Plains Grassland is *‘largely experimental at this stage and a relatively high risk operation’* as regeneration of this ecosystem is not proven. Mr Mueck indicated that even getting seed for such an area would be difficult and he suggested the alternative of looking outside the site. DSE concurred with the view that regeneration of the Plains Grassland is “very risky”. Mr Gobbo also highlighted that offset areas must be protected into the future and this would preclude the industrial development of the land envisaged by the current zoning.

The alternative offset strategy is to look for offsets outside the extraction area. DSE concurred with Mr Mueck’s view that a credible offset plan could be developed (which could comprise a mix of on-site and off-site offsets) and that it could be expected that off-site offsets could be secured in the region.

Mr Mueck’s view was that DSE have a measure of flexibility regarding the Framework requirement for ‘like for like’ offsets for the Very High Conservation

areas and can recommend variations if there is a net good conservation outcome. In response to questioning at the hearing he indicated that, while loss of the area of grassland was not a good outcome for the grassland, the offsets provided by protecting Site 8 would be good for the endangered Orange-bellied Parrot and that it was definitely not a bad conservation outcome overall.

Mr Natoli's evidence highlighted the value of the resource of basalt rock under Sites 9 and 15 which amounted to approximately 300,000 and 1.2 million tonnes respectively. At market rates of \$20 per tonne for the very high quality rock under Site 9 and \$15 for the high quality rock under Site 15 the resources were valued at \$6 million and \$18 million respectively. Mr Gobbo suggested if all offsets for these sites were required to be offsite, the cost would be of the order of \$4 million and this would "*cast a long shadow over the economic viability of the quarry extension*".

Mr Gobbo also submitted that the benefits of accessing Sites 9 and 15 were:

- Site 9 contains very high quality and Site 15 contains high quality ridge top basalt rock;
- while the rock has a value in itself, its more critical value is in being able to be mixed with lower quality rock to provide product to required specifications. Access to the high quality rock on these sites is important to the economic viability of the quarry as a whole; and
- the resource in these areas will extend the life of the quarry by more than a year.

In summary on this issue Mr Gobbo advised that the Proponent was willing to provide such offsets as are available on its land.

There was some discussion at the hearing regarding Site 5. This is an area of 18.77 ha Plains Grassland on Barro land outside the Stage 2 extraction area. The rock resource at Site 5 had not been defined in detail but the quarry operator indicated during the site inspection that that it almost certainly contained good quality ridge basalt. This site could possibly have provided a partial offset against other areas but is now accepted by DSE as degraded treeless vegetation and hence provides little value as offset. The Panel notes that, given that it will be many years before an offset will be required for clearing of Site 15 it could be a useful option for the Proponents to monitor the condition of the area and actively manage it to allow for the possibility that it could (at least in theory) provide an offset if required. Alternatively, it may be that this site could provide an alternative resource if Site 15 is unavailable for any reason (including the possibility that the Proponents decide that required offsets would make accessing the site uneconomic).

DSE's submission emphasised that under the Framework's overarching principles the first step is that clearing should be avoided and failing this minimised. Where clearing is still required, an offset which results in a net gain for native vegetation must be provided.

For Very High Conservation significance vegetation the Framework (Appendix 4) requires that "*clearing not (be) permitted unless exceptional circumstances apply (i.e. impacts are an unavoidable part of a development project, with approval of the Minister for Environment and Conservation (or delegate) based on considerations of environmental, social and economic values from a statewide perspective)*".

DSE was not satisfied that the EES has adequately presented the reasons why the areas of native vegetation with very high conservation values could not be avoided. In addition the Department indicated that if Sites 9 and 15 were to be cleared they would be required to brief the Minister and would require more information from the Proponent regarding the impact of the loss of stone resource from these areas on the overall viability of the project and the impact on regional stone supplies.

The Department did however note that the vegetation losses associated with the Stage 2 extension are consistent with the references in the Framework which provide for losses of vegetation associated with extractive industry to be treated as temporary. While the concept of temporary losses could in principle allow revegetation as a component of rehabilitation to be regarded as an offset even for Very High Conservation Significance native vegetation, this possibility was negated by expert evidence from Mr Mueck (supported by DSE itself) that revegetation of Plains Grassland is unproven and is a “high risk” strategy.

DSE noted that the EES canvasses a number of options but did not propose any specific combination of those options or include a draft offset plan. Nevertheless the Department believed that it was feasible for the Proponent to provide adequate offsets consistent with the Framework by using at least some of the proposed strategies. A specific offset plan with secure offsets would need to be incorporated in the approved works plan prior to removal of vegetation.

3.2 DISCUSSION AND CONCLUSIONS

Does the Native Vegetation Management Framework Apply to this Proposal?

In this section the Panel addresses Mr Gobbo’s submission that *‘The Panel should have regard to its (the Framework’s) “ambitions and principles” but is not bound to give effect to the prescriptive provisions, particularly those regarding clearing of Very High Conservation Significance vegetation or the provision of offsets for such clearing.’* He argued that:

- the exemption from planning scheme requirements for a permit to remove native vegetation raises a question as to the nature and scope of the enquiry of this Panel into the removal of native vegetation;
- while DPI has a degree of statutory function, it is far from clear whether DPI has the power to implement the Native Vegetation Framework and this is a matter that could be tested at VCAT;
- the Framework has some status given that it has been formally adopted by Government. However, in the absence of a requirement under clause 52.17 the Framework is a relevant consideration but there is no requirement for strict compliance with it;
- VCAT decisions relating to applications where exemptions from C52.17 permit requirements apply indicate the capacity to require the provision of offsets is limited. In particular he cited *Urban Alliance Corporation v Hume CC*¹³ which noted that SPPF Clause 15.09 indicates that the Tribunal should have regard to the Framework and Clause 65 requires consideration of the

¹³ Urban Alliance Corporation v Hume CC [2008] VCAT 1328

extent and character of native vegetation and whether it can be retained. However, the Tribunal commented *‘There is an obligation to have regard to the Native Vegetation Framework but that cannot elevate the removal of native vegetation to something that requires a permit. Nor can it be used to require a net gain assessment and offset plan. The extent to which the Native Vegetation Framework can have a bearing on this case is limited to its ambitions and principles.’*; and

- even where a permit is required under Clause 52.17, various VCAT decisions¹⁴ have been on the basis that the Framework is a guidance document rather than a statutory rule and net gain policy is not pre-eminent. A range of competing policy objectives need to be balanced in planning decisions to achieve a net community benefit and sustainable development.

The Panel agrees with Mr Gobbo that a planning permit is not required for the removal of native vegetation in those areas outside the ESO1 and ESO2 overlays. Clause 52.17 states

‘No permit is required to remove, destroy or lop native vegetation if any of the following apply:

...

The removal, destruction or lopping of native vegetation is necessary for carrying on an extractive industry, including an extractive industry authorized by a work authority under the (EIDA)...’¹⁵

DSE’s submission acknowledged that the exemption applies and indicated that *“the work plan (under the EIDA) provides the mechanism to consider the approval of native vegetation removal for the proposed works”*.

A Memorandum of Understanding (4 January 2004) (MOU) between DPI and DSE is intended to achieve an integrated, consistent approach to government decisions which co-ordinates and streamlines approval processes. The MOU explanatory notes imply that, amongst other things, Victoria’s Framework for Native Vegetation is taken into account. The MOU indicates that consultation early in the process should:

- establish major issues, including the need to prepare a flora and fauna survey and identification of native vegetation where the Native Vegetation Management Framework requires action; and
- identification of the implications of the Net Gain approach under the Framework.

Where agreement is not reached between DSE and DPI at officer or local level about suitable conditions, the MOU indicates the matter is referred to the relevant Executive Directors for resolution.

¹⁴ Lorne Country Club v Avirio Pty Ltd [2004] VCAT 260, Salta Constructions Pty Ltd v Hobsons Bay CC [2008] VCAT 1253, Adams v Mornington Peninsula SC [2007] VCAT 167,

¹⁵ Mr Gobbo noted that *The reference to the extractive industry authorized by a work authority is inclusive (...necessary for carrying on an extractive industry, including an extractive industry authorized by a work authority). As such, the example given enhances or expands the words preceding it, rather than narrowing them. The operative words are “extractive industry” not “an extractive industry authorized by a work authority”*.

DPI's submission to the EES indicated that draft work plans and associated conditions will typically cover removal and restoration of native vegetation through the Framework. The submission highlighted that extractive industry benefits from exemptions requirements for planning permits to remove native vegetation and commented that the exemption is considered reasonable in view of the need for approval of a work plan under the EID Act. DPI's submission stated '*Native vegetation removal is assessed by DPI in consultation with the DSE and offset requirements determined in accordance with the Native Vegetation Framework. Requirements are then imposed through the work plan or Work Authority conditions. The resolution of these issues through the work plan process means there is no need to address native vegetation again through a planning permit.*'

DPI advised that stakeholder concerns about the complexity of the Framework requirements and the fact that some provisions do not take into account the unique attributes of earth resource industries have led to the development of specific guidelines on native vegetation management for the earth resource industries. A copy of the draft Guidelines, which were expected to be released for consultation shortly after the completion of the hearing, was tabled for the Panel's information.

As Mr Gobbo highlighted, it is clear that the MOU does not apply where an EES is required and, while the MOU assumes that the Framework applies, it does not discuss how it should be applied.

The Advisory Committee, Review of Exemptions In Native Vegetation Retention Provisions, addressed the issue of exemptions for the removal of native vegetation associated with extractive industry as follows:

The Advisory Committee also considers that there should be some assurance that the MEIWA-MOU process, or any alternative mechanism such as legislation or a code of practice, adequately addresses native vegetation issues. Where DSE and DPI or the applicant disagree on appropriate native vegetation management issues then the exemption should effectively cease. Any extractive industry proposal in dispute would therefore become subject to a planning permit process regarding native vegetation destruction or removal with recourse to VCAT. Compliance with planning scheme policies including the Native Vegetation Framework would then clearly be a matter for determination by VCAT, rather than relying on less explicit requirements to comply with planning policy under the works approval process.

The Advisory Committee recommended that the Clause 52.17 exemption should be revised to be subject to a condition that 'the proposal has been endorsed as satisfying the objectives of the Native Vegetation Framework by the Department of Sustainability and Environment.'

The week after the hearing for this EES, the above Advisory Committee report was released and VC49 revised some Clause 52.17 exemptions but did not modify the exemption relating to extractive industry to include a condition relating to the Framework. The VPP Extractive Industry practice note, the Framework and the associated practice notes all state without qualification that extractive industry authorised by a work authority under the EID Act 1995 is exempt from the Clause 52.17 requirement for a planning permit to remove, destroy or lop native vegetation. Unfortunately, arguments about the relevance of the Framework consideration in the assessment of Extractive Industry proposals have not been explicitly resolved.

Nevertheless, this Panel has taken the view that:

- the Framework is adopted Government policy. While it is explicitly referenced in the planning scheme (Clause 15.09) the Framework is also intended to apply to other government decisions outside the planning scheme;
- the EES Guidelines¹⁶ requirement for an integrated assessment of the implications of proposals anticipates evaluation against objectives under statutory provisions and policy. It is noted that the EES Guidelines indicate *'The EES will need to document the project's consistency with applicable legislation, regulations, statutory policies, strategies, plans, guidelines and agreements'* and the Framework is nominated as the mechanism for establishing the conservation value of vegetation;
- this Panel is required to advise on the potential environmental impacts of the proposal and recommend any mitigation measures needed to achieve acceptable environmental outcomes within the applicable legislation and policy. The EES Guidelines anticipate that assessment will utilise established criteria (where available) and the Panel endorses this practice. The Framework has established a consistent approach to the protection of native vegetation and provides an accounting system to improve the transparency and consistency of decision making for native vegetation actions;
- the Work Authority and Work Plan under the EID Act is the primary mechanism to address the native vegetation implications of extractive industry proposals. While there is no explicit reference to the Framework in the EID Act or associated guideline documents, Section 20 of the EID Act provides for conditions on work authorities to protect the environment. The Panel considers this extends to the protection of native vegetation, particularly vegetation identified as having high or very high conservation values. As government policy, the Framework is relevant to decisions under the EID Act. The Draft Guidelines tabled at the hearing would make explicit the role of the Framework in the assessment of extractive industry applications involving removal of native vegetation;
- the Framework, including the associated policies relating to avoidance and offsets, is relevant to the Panel's assessment but the prescriptions for offsets in the Framework are not mandatory requirements. Like most planning decisions, a balancing of the range of objectives will be required.

In his closing submissions Mr Gobbo suggested that offsets, if any, can be provided and should be left to the next part of the approval process. The Panel does not agree. While it may be appropriate to leave the identification of the specific location of offsets to subsequent processes, the acceptability of removal of vegetation with provision of offsets per se, and then the acceptability of offset options in the form that can reasonably expected to be available, are clearly relevant to the Panel's consideration of native vegetation issues.

¹⁶ *Ministerial Guidelines For Assessment Of Environmental Effects Under The Environment Effects Act 1978*
Department of Sustainability and Environment June 2006

Have requirements under the Native Vegetation Management Framework been followed?

In particular have appropriate efforts been made to avoid, and failing this, minimise clearing of native vegetation?

Where clearing is still proposed, are any required offsets available either on or off site under the Framework?

The proposed extension of the quarry will entail clearing of areas of native vegetation. The areas proposed for clearing were discussed in detail in submissions and presentations to the Panel.

It is proposed to clear:

- **Sites 3 and 7.** As these areas are “degraded treeless vegetation” there are no major issues related to clearing these areas. Although they would not be assessed in habitat hectares the EES suggested that the loss of this vegetation would still need to be offset in consultation with DSE. The rationale for requiring offsets for this vegetation was not provided and the extent of offsets expected for the loss of this vegetation was not specified.
- **Sites 4 and 16-20** which are classified as of High Conservation Significance. A number of these areas are well within the proposed extraction area and hence would be difficult to avoid without a major reduction of the area to be quarried. Some areas are closer to the edge of proposed clearing and could potentially be avoided albeit with the loss of significant areas or resource. It is evident however that if any of these areas were to be retained they would be relatively small isolated remnants and their long term survival as High Conservation areas would be doubtful. On this basis and given that off-sets will be required under the Framework, a net gain to overall conservation should be achievable.
- **Sites 9 and 15** which are areas of Very High Conservation significance. Clearing of areas of Very High Conservation significance is not permitted unless exceptional circumstances apply (i.e. impacts are an unavoidable part of a development project). Approval of the Minister for Environment and Conservation (or delegate) is required based on considerations of environmental, social and economic values from a Statewide perspective. Clearing of these sites was most contentious and was the focus of much of DSE’s submission to the Panel.

Site 9

Site 9 is Plains Grassland and has an area of 1.26 ha and 0.53 habitat hectares. From the site inspection and Mr Mueck’s evidence it is apparent that, while the original classification was presumably correct, Site 9 has since deteriorated and is almost certainly no longer of Very High Conservation status. It appears, based on submission from DSE (quoting from Biosis Research report), that the deterioration was due to “over-zealous” weed control and drilling disturbance combined with the current drought conditions. It is noted that DSE in a letter to the City of Greater

Geelong (15 June 2007)¹⁷ sought advice on what action the Council proposed in response to the destruction of the vegetation on this site. DSE advised at the hearing that this matter remained unresolved as documentation of any action taken by the Council's compliance officer at the time (who has since left the Council) was minimal and as a result the Council had deferred action until completion of the EES process. While it was not suggested that the degradation was deliberately caused by the Proponents, the deterioration has occurred in recent times and it is at least possible that with different management the site may have retained its high conservation values. These factors notwithstanding, the current classification remains although the site has clearly degraded.

This Site 9 vegetation is on the periphery of the quarry and could therefore be retained without a major change to the overall extraction plan. It would however involve the loss of a resource of very high quality stone with a market value of some \$6 million. If retained as native vegetation however it would be a small vulnerable remnant of just over one hectare that could be expected to deteriorate further, rather than recovering its former conservation values. Therefore the benefit to conservation values in retaining the site would be limited. If a full offset for the site is provided on the basis of the original assessment of the vegetation on the site, there should be an overall net gain in conservation values and accordingly the Panel recommends that approval be granted to clear Site 9.

Site 15

Site 15 is also Plains Grassland and has an area of 6.85 ha and 2.89 habitat hectares. It is not proposed that this area be quarried until at least 2045. This site is on the edge of the proposed quarry area and the retention of the vegetation would not automatically create major issues for the overall proposal, although it would involve the loss of a significant volume of high quality rock worth some \$18 million or a little over the annual extraction volume.

The issue is - what is the best overall outcome in terms of protection of conservation values and access to the resource?

If the area was to be retained, it would be adjacent to another area of Plains Grassland (Site 5) which, although of relatively low conservation significance (classified as degraded treeless vegetation), is not in the area currently proposed for quarrying.

Notwithstanding the above, any retained vegetation on the site would be very vulnerable. It would still be essentially surrounded by grassland with a mix of native and introduced species and would therefore be subject to ongoing weed invasion problems. Buffers (possibly of the order of 50 to 100 metres) would also be required to provide for rehabilitation of the extraction area and provide a measure of protection for retained grassland – this would add significantly to the actual area of 6.85 ha (and of course the volume of basalt resource that would be lost). In addition, active management of the area would be required to avoid further degradation. For example, non-intensive grazing could be beneficial but intensive grazing could degrade the site

¹⁷ Tabled in submission from DSE

and any application of fertilizers would be likely to significantly benefit non-native species in competition with natives.

In summary, retention of the site is possible but there is a significant chance that this would be only a short term “win” for environmental protection and in the medium to longer term could be a net loss. The Panel emphasises that this line of argument should not be seen as setting a precedent for remnant grasslands in general. The application in this particular case is on the basis that the area is isolated from other substantial grasslands and is relatively small with no logical boundaries to define it or provide a measure of protection.

Given the Very High Conservation status of the site, exceptional circumstances must be demonstrated to justify clearing and it is particularly important that there be a clear net gain for the environment. Certainly DSE’s expressed view was that the “exceptional circumstances” case made by the Proponent was not strong. This was countered by Mr Gobbo who argued there should be some flexibility in approach and a range of other matters should also be balanced to ensure an overall net community benefit.

On balance the Panel considers the best outcome is that approval to clear be granted but that full off-sets be provided under the Native Vegetation Management Framework. Such offsets can be on or off-site but must be fully in place before clearing commences. While most if not all offsets could be obtained on the site (especially with enhanced protection of Site 8 even though this is outside the like for like rule) it may be that some off-site offsets will be required and these would be subject to approval by DSE.

The Panel accepts submissions and evidence that offsets relying on on-site post quarry regeneration of Plains Grassland is an unproven, high risk strategy that is unacceptable. DSE did acknowledge that there is a reference in the Framework to treatment of losses due to mining/extractive industry followed by revegetation as a “temporary loss”. The Draft Native Vegetation Management Guidelines for the Earth Resources Industries tabled at the hearing addresses the issue of temporary loss of native vegetation associated with extractive industry (Sec 2.2.6) where successful regeneration of vegetation on the site can be achieved. The Panel does not consider vegetation losses associated with extractive industry should automatically be treated as temporary, particularly where there is a high probability regeneration will not succeed, as is the case here.

Of the possible offset strategies proposed in the EES the following should be noted:

- Post extraction revegetation (according to DSE revegetation guidelines) of existing and future areas rehabilitated after extraction.
Panel comment: On the basis of all of the above, successful regeneration of Plains Grassland for use as offsets should not be relied on. There is a possibility that with improved techniques regeneration of grasslands could become a viable option in the future but it would be incumbent on the Proponents to demonstrate this to the satisfaction of DSE. Given that Site 15 (which is the larger site) will not be quarried until at least 2045, there is ample time and the area available on already quarried areas to demonstrate successful regeneration. This option should only be contemplated if a high level of

confidence regarding the success of grassland regeneration has been established before the vegetation is removed.

- Off-site offsets.
Panel comment: Options for offsets under the two following strategies should be exhausted before off-site offsets are considered. While it may well be that no off-site offsets are required, evidence from Mr Mueck and DSE indicated that off-site offsets were likely to be available if required.
- Management gains on remnant vegetation outside the extraction perimeter.
Panel comment: There is significant scope for this and the strategy should be utilized as part of offset provisions.
- Transfer of Site 8 into the Spit Nature Conservation Reserve.
Panel comment: Site 8 comprises three areas of coastal saltmarsh with a total area of 37.34 ha (24.64 hha). It is classified as Very High Conservation significance and has a particularly high habitat score of 66 (compared with 42 for Sites 9 and 15).

The offset calculations in the EES indicate that a total of 10.28 hha are required as offset for the areas of native vegetation to be cleared (this includes all High Conservation and the two Very High Conservation Value areas). Transferring Site 8 into secure public ownership gives a habitat hectare value of 11.8 hha of Very High Conservation Value or 15.7 hha of High Conservation vegetation. The Panel also considers that transfer of a buffer in the order of 100m along the periphery of area 8 would be important to provide for inland migration as a response to rising sea and ground water levels and to minimise edge effects. This would leave a minimum of 60 metres from the proposed extraction area for perimeter treatments such as bunds.

The Panel notes however that while the improvement in habitat hectares more than covers the habitat hectares lost, the like for like rule for the removal of Very High value vegetation is not satisfied. The Panel is conscious that the like for like principle is central to the Framework for good reason and there must be strong justification in terms of conservation gains to justify a departure from the rule.

The Panel strongly supports acceptance of the proposed transfer of Site 8 with appropriate buffers as an offset for the vegetation losses associated with the project. The very high value of adding this land to the public estate should be fully taken into account in assessing its value as an offset against clearing of other areas. Such an offset represents a significant conservation gain for the following reasons:

- it protects native vegetation which is also recognised as having very high conservation value;
- this action would secure the dry saltmarsh which is an important element of the saltmarsh and the associated habitat values. As emphasised throughout the EES process, the dry saltmarsh is recognised potential habitat for the endangered Orange-bellied Parrot and its protection and effective management is a central conservation concern;

- rather than creating an isolated reserve, the land would extend the adjacent conservation reserve with established management arrangements and this facilitates effective ongoing management;
- in addition to gains associated with securing the land in a conservation reserve, it is also recommended that approval of the quarry be subject to adaptive management arrangements to mitigate potential quarry impacts. The associated monitoring regime will contribute valuable data to enhance the understanding and long term management of the salt marsh in an environment that is expected to change due to climate change; and
- Site 8 plus the 'buffer' have an important role in managing critical habitat as any sea level rise occurs by providing for inland retreat of saltmarsh communities. Further, irrespective of the quarry proposal, the dry saltmarsh will almost certainly need active long term management to adjust water flows through the culverts under 29 Mile Road with the possibility of increasing culvert capacity under the road if required. Part of active long term management of this area could include either increase or decrease in the tidal flows in and out of the area. It is also important to note that tidal flow into this site through the culverts means that there is considerable flexibility in managing the site.

The Panel's view is that even if the like for like rule cannot be met there is sufficient flexibility in the Framework for a result that can be a net overall benefit to the environment. The Panel considers that the opportunity to add the Very High Value vegetation in Site 8 to the Public Land Estate gives a strongly positive overall conservation gain. A departure from the like for like principle in this instance is justified by the substantial gains (in excess of requirements of offset formulae) derived from the combination of the transfer of Area 8 to public ownership, adaptive management measures to protect the dry saltmarsh recommended elsewhere in this report (see Chapter 4), and management gains on remnant vegetation outside the extraction perimeter.

PANEL RECOMMENDATIONS

Clearing of native vegetation

Approve removal of native vegetation as outlined in the Stage 2 quarry extension proposal, including removal of two areas of Very High Conservation value, subject to offsetting losses to achieve the net gain objectives of the Native Vegetation Management Framework and the conditions outlined below.

Offsets for removal of native vegetation

The Work Authority or Work Plan under the EID Act should include a condition requiring the preparation of an offset plan, to the satisfaction of DSE, prior to the removal of native vegetation. The offset plan should be prepared on the following basis:

- 1. Revegetation of areas post quarrying as grasslands is a high risk strategy and should not be accepted as offsets (unless in the future it is**

demonstrated to DSE's satisfaction that there is a high level of confidence of revegetation success).

2. **Given all the circumstances, while the NVF offset provisions should apply, a flexible approach should be adopted, particularly in assessing the high value of adding Site 8 to the Public Land estate and also in applying the "like for like" provisions for Very High Conservation vegetation.**
3. **Offsets should comprise:**
 - **the transfer of Site 8 plus a buffer of not less than 100 metres to the Spit Nature Conservation Reserve; and**
 - **management gains (due to enhanced management including protection measures) of areas of native vegetation on the site but outside the extraction perimeter.**
4. **When these options are exhausted, then offsite offsets can be utilised if required.**

4. FAUNA - PROTECTION OF LISTED SPECIES AND THEIR HABITAT

The Issues

- Have issues related to Ramsar designated wetlands been adequately considered?
- Are issues related to any endangered or otherwise listed species been adequately dealt with?
- Can impacts of the proposed Stage 2 quarry extension on ground and surface water be managed to ensure the dry saltmarsh habitat values are sustained in the long term?
- What are the implications of climate change for the hydrology of the dry saltmarsh and can effective responses be incorporated into the water management regime?
- What should an adaptive management system comprise?

Significant Fauna on the Site and in the Surrounds

Flora and fauna are addressed in Chapter 8 and Technical Appendices 4, 5 and 6 of the EES. Ground and surface water issues, which could impact on habitat values are addressed in Chapters 6 and 7 and Technical Appendices 1, 2, 3 and 4 of the EES.

Expert evidence related to fauna issues was provided by Dr Charles Meredith from Biosis Research. Evidence was provided in relation to the protection of the dry saltmarsh habitat values by Mr Mueck (flora), Mr Natoli (relating to the quarry geology and the quarry operations), Mr Nolan (relating to geology and hydrogeology), and Mr Lane (peer review relating to geology and hydrogeology).

The EES assessment and expert evidence identified:

- five nationally threatened species that have been recorded within a five kilometre radius of the site. Of these, the Plains Wanderer and Australian Painted Snipe are unlikely to occur on the site and a third, the Humpback Whale, clearly has no suitable habitat on site;
- two of the nationally threatened species, the Orange-bellied Parrot and the Growling Grass Frog, utilise habitats adjacent to the study area but the Stage 2 extraction area does not contain important habitat for either species. Neither species has been known to use the quarry site at least in recent years;
- there is no habitat suited to the Growling Grass Frog on the site. However, the proposed rehabilitation plan provides a number of water storage areas and the EES includes a commitment to develop at least part of the wetland to specifically provide habitat for this species. There is a reasonable expectation that the frog may in time colonise suitable habitat from known populations on the adjoining Melbourne Water site;
- the adjoining Spit Nature Conservation Reserve is one of three key winter sites around Port Phillip Bay and the Bellarine Peninsula for the Orange-bellied

Parrot. There is suitable feeding habitat for the Orange-bellied Parrot in the dry saltmarsh area on site (but outside the proposed extraction area), which adjoins the Spit Nature Conservation Reserve but there is no record of the birds being present on the dry saltmarsh for several years. It is common for suitable sites to be used for a period of time and then for other areas to be preferred and for the species to then return to use the site at a later time but the reasons for use or non-use of particular sites are not known. The dry saltmarsh does remain as an important area that requires protection; and

- sixteen species of state conservation significance were recorded from the study area during field surveys. Most of these field survey records related to adjacent coastal and saltmarsh habitats and all were avian species that may occasionally forage in the area or fly over when moving between areas of suitable habitat. In addition a further 35 species of state conservation significance have been recorded within 5 km of the study area and recorded in the Atlas of Victorian Wildlife. Of these, one marsupial (a dunnart) and four avian species could occur within the extraction area.

The Panel accepts the EES assessment and evidence that:

- the Stage 2 extraction area currently provides very limited habitat values for fauna and the direct impacts within the extraction area are likely to be minor; and
- the proposal poses no discernible risk to the Growling Grass Frog and may actually provide a long term benefit.

Since the saltmarshes are part of the Port Phillip Bay (Western Shoreline) & Bellarine Peninsula Ramsar Site (WSRS)¹⁸ they need to be protected to sustain the habitat and feed stocks of migratory birds, including EPBC and Victorian endangered and threatened species, such as the Orange-bellied Parrot. The EES and the Panel assessments had a particular focus on the protection of the dry saltmarsh, which is on the Site adjacent to the Stage 2 extraction area, as it is of national significance due primarily to its use by the critically endangered Orange-bellied Parrot and migratory birds.

The subsequent sections of this chapter address the three aspects of the proposed quarrying operations with potential impacts on significant avifauna, and the Orange-bellied Parrot in particular. They address:

- hydrological changes to adjacent saltmarsh;
- impacts from dust on saltmarsh vegetation; and
- disturbance due to quarrying activities.

¹⁸ See Figure 8.8 at page 8.27 of the EES

4.1 GROUND AND SURFACE WATER MANAGEMENT TO PROTECT DRY SALTMARSH HABITAT

Of the saltmarshes adjacent to Stage 2, the most environmentally sensitive is the dry saltmarsh west of 29 Mile Road to the east and north of Stage 2. The dry saltmarsh has to some degree been created by reduced tidal flux resultant from flow restrictions through culverts beneath 29 Mile Road, whereas the coastal marshes are in natural condition east from 29 Mile Road towards Port Phillip Bay.

Because the dominant water source for the saltmarsh is from the daily tidal flow, the impacts of dewatering and surface water diversion associated with the Stage 2 quarry extension are not expected to have any significant effect. However, to the west of 29 Mile Road it is possible that the diversions of both surface runoff and groundwater up flow may extend the periods of saltmarsh desiccation with implications for both the vegetation assemblages which will survive and the density of those assemblages. These changes could reduce the seed stocks and the habitat values of the dry saltmarsh.

It should be noted that the dry saltmarsh lies in a highly modified environment. Specifically, the frequency and extent of tidal inundation has been altered by restricted flow through the culverts beneath 29 Mile Road. It has also suffered in the past from nutrient rich leakage of water from treatment ponds to the north on the Melbourne Water treatment complex land and from runoff water from Melbourne Water land used for grass filtration treatment of sewage effluent. The latter influences have now been reduced (use of the ponds for sewage treatment has ceased and drainage works now intercept nutrient rich run off) but there is evidence of these effects in the subsurface regime. The dry saltmarsh also receives run off from grazing land to the west which is estimated to carry significant Nitrogen and Phosphorus loads and it may also have already suffered some loss of groundwater up flow due to the Stage 1 quarrying.

The EES process is directed at evaluation of impacts from the proposed Stage 2 extension. Nevertheless, the Proponent, the regulators and the Panel recognise that, irrespective of quarrying activities, significant changes to the dry saltmarsh may occur as a consequence of Climate Change. Although the scale of impacts due to Climate Change are uncertain, there is a statutory obligation to protect and conserve the Ramsar wetlands, and in particular the dry saltmarsh areas, potentially at risk from both the quarry extension and Climate Change.

4.1.1 EES Assessment and Expert Evidence

Quarrying in the Stage 1 area has operated within Newer Volcanic basaltic rock which formed low hills extending in height to about 12m AHD. The quarry floor, at around 0 to -1m AHD, has been developed on the basis of rock quality and blending opportunities.

Stage 2 will continue extraction of the same resources as Stage 1 but to the south-west, east and north of Stage 1. In these areas the surface elevation of the rock reserves are at lower elevation, varying from an upper surface at about 9m AHD which falls to the north to less than 3m AHD towards the south west and south.

While the majority of the floor of the quarry will remain close to 0m AHD, resource investigations have identified valued rock reserve pockets extending to about –12m AHD to the east and north of the Stage 1 area. The Stage 2 proposal involves winning rock from these patches, in addition to the shallower rock, in order to provide the range of rock products currently available. These areas of deeper quarrying are shown in Chapter 2.16 at page 2.23 of the EES.

Geology and Groundwater

Dewatering pumping will be needed to permit dry quarrying operations in the deep rock patches. This is expected to reduce the water table levels beneath the saltmarshes and may represent a further water diversion from the saltmarsh water balance.

Mr Natoli's evidence relating to the quarry geology and the proposed quarry operations was consistent with the material presented in the EES but provided further description of the fractured nature of the rock and the rock mineralogy. Groundwater evidence was provided by Mr Nolan, and Mr Lane provided an independent peer review of the Hyder (Nolan) groundwater modelling and the practicability of the adaptive management alternatives put forward by Mr Nolan.

Mr Nolan referenced earlier geological and hydrogeological work describing the pre-quarrying condition of the water table¹⁹ and described the data base used to define the present conditions²⁰ resultant from the Stage 1 area quarrying. He presented the geology as being essentially Newer Volcanics basalts overlying Moorabool Viaduct sandy clay, silty clays and sand, in turn overlying Fyansford Formation clay sediment which are effectively the base of permeability in the area. Mr Nolan also presented the work of Coffey Partners (1979) relating to the hydrological properties of surficial (soil) geology of the Spit Nature Conservation Reserve²¹. Their map covered both the dry saltmarsh and the wet saltmarsh east of 29 Mile Road. The surficial sediments mapped overlie the Newer Volcanics and, to the extent that there is groundwater upflow from the basalts to the saltmarshes, this must traverse these sediments in order to maintain soil moisture in the vegetation rooted within the surficial sediments.

Most importantly, Mr Nolan presented the results of groundwater modelling based on a data base of drilling and hydrogeological testing around and across the site²². This modelling was used to evaluate the order of impacts that dewatering associated with representative deeper quarry locations would have on water tables extending out to and across the dry saltmarsh and the wet saltmarsh²³.

The modelling showed declines in water table beneath the dry saltmarsh to between –1 and –4m AHD depending upon the area being quarried and whether it is summer or winter. The reduced water table levels have to be compared with water tables

¹⁹ Figure 3.2 at page 22 in Appendix 1 in Volume 1 of the EES.

²⁰ Figure 3.1 of Volume 1 at page 19 of Appendix 1 of the EES

²¹ Figure 2.2 at page 14 of Appendix 1 of the EES

²² This testing was conducted in part under his supervision.

²³ Figures 7.2 to 7.5 inclusive, pages 76 – 79 in Appendix 1 of EES, Volume 1

evaluated at December 2002 of between -0.5 and 0.5m AHD. These data were approximately consistent with data collected in 2007 by Lane Piper²⁴.

Mr Nolan indicated that it would be possible to minimise water table decline effects by quarrying the deeper section on a campaign basis. This process would involve the deeper areas being opened up for only limited periods of time to establish stock piles of rock reserves which would be used to support the quarry product range production over subsequent extended periods. During periods between active quarrying of these areas, the deeper pits would be allowed to flood, thereby allowing water levels in the adjacent areas to largely recover. This, it was postulated, would reduce the extent of ground water upflow reduction to the dry saltmarsh.

Mr Nolan suggested²⁵ that an adaptive management framework could be implemented involving groundwater re-injection via "tile drains" (infiltration galleries) constructed around the perimeter of the dry saltmarsh to a depth of about 0.8m AHD. The operation of this system would be based around the results of a comprehensive monitoring program of this area and would use water from the quarry's groundwater interception system to maintain the groundwater levels in this area as necessary.

An alternative to the tile drains to sustain the water table levels beneath the dry saltmarsh was proposed in work Hyder undertook with Biosis²⁶. This involved the re-injection of groundwater collected in the quarry through about 20 spear points drilled to depths of about 6 to 8m below ground level into the Newer Volcanics on Barro land about 50m from the edge of the dry saltmarsh.

Mr Lane's peer review generally endorsed the analysis in the EES. However, he considered:

- the drawdown beneath the dry saltmarsh consequent upon the dewatering of the deeper rock areas would be at least 1-2 m during the active deeper quarrying periods and that these levels would not recover fully in the interim periods of no deeper dewatering. He referred to the broad scale decline in water tables across the whole of the Stage 1 and 2 areas as a consequence of the shallow quarrying conducted to date and considered that similar conditions in respect to the future quarrying should be expected;
- the number of spear points modelled for injection (12) was likely to prove inadequate because of the anisotropic distribution of the permeability (hydraulic conductivity) of the Newer Volcanic basalts. He indicated that a larger number of spear points (20) would be required. He further commented that treating the large quantities of collected groundwater (500 cu.metres/ day) to render the water suitable for injection may not be practical and would be expensive;
- soil moisture support was likely to be needed for much of the life of the quarry and would not be intermittent as suggested in the EES²⁷. He did not comment

²⁴ Presented in Table 4.5 at page 16 of Appendix 4 of the EES, Volume 1

²⁵ Section 8.2.1 of EES Appendix 1 page 90

²⁶ EES Appendix 4 Section 7.2.1.2 at page 40

²⁷ See Hyder material of Appendix 2 and the Hyder /Biosis material in Appendix 4.

on whether sprinklers should be the preferred method of soil moisture support, as this was not within his area of expertise; and

- criteria should be determined for the activation of measures to support soil moisture.

Mr Lane and Mr Nolan's comments relating to rehabilitation and the management of groundwater are discussed in Chapter 10.

Surface Water

Surface water diversion evaluations presented by Mr Nolan indicated that approximately 50% of the surface water flow to the dry saltmarsh (118ML/a on average) would be permanently diverted from the dry saltmarsh due to the lowering of the land surface consequent on the rock extraction²⁸. Most of subcatchments A, C, D and E will be quarried and on completion of quarrying the ongoing drainage of both surface and shallow groundwater from these catchments will be drained south and pumped to Corio Bay²⁹.

The salinity of the surface water runoff is estimated³⁰ at < 200mg/L Total Suspended Solids (TSS). This contrasts starkly with the salinity of the present quarry pumpage water which exhibits a TSS of between 14000 and 22000mg/L³¹. This water is a mixture of surface runoff within the quarry and groundwater intercepted by the present quarry depth at around 0m AHD. Mr Nolan considers this water to be indicative of the likely groundwater which would be available for use in an adaptive management system to sustain the habitat and environmental condition of the dry saltmarsh.

Saltmarsh Management

The principal issue which arises from the ground and surface water management around the proposed Stage 2 quarry extension is the reliability of practicable management systems to offset the potential impacts of water diversion from quarrying on the dry saltmarsh vegetation assemblages which provide fauna habitat.

Mr Mueck presented the findings of evaluations³² around the saltmarsh areas. This work involved the establishment of eight vegetation quadrats around the perimeter of the dry and wet saltmarshes³³ close to the Barro land. At each quadrat shallow hand auger holes were drilled to 2.5m depth or to refusal. These were logged for lithology in detail³⁴ and soil samples were evaluated in a laboratory for soil water salinity and

²⁸ Shown in Figure 4.1 at page 33 of the EES Appendix 1

²⁹ As shown on Figure 2.22 at page 2-37 of the EES

³⁰ Table 4.4

³¹ Tables 4.6 to 4.8, pages 44 and 45 of Appendix 1

³² Undertaken by Biosis and by Hyder Consultants

³³ Figure 3, page 84 of Appendix 4

³⁴ Sub Appendix 4, page 69 to 77 of Appendix 4

soil moisture³⁵. The holes were then completed as properly constructed observation holes from which water table levels could be measured and samples of the water collected for chemical evaluations³⁶. Finally, hydrological evaluations were carried out on three of the wells (HA 1, 3 and 4) using standard techniques to determine the hydraulic conductivity of the saturated sediment³⁷.

Mr Mueck concluded that the maintenance of the vitality and diversity of dry saltmarsh vegetation species is dependant on a hydrological regime which includes regular tidal inundation and periods of water deficit. The latter acts to create space for new species to establish. He noted that the extent and frequency of tidal inundation of the dry saltmarsh is restricted by the 29 Mile Road culverts.

Mr. Mueck and Dr Meredith did not consider there are 'canary' species that would provide an early signal of unacceptable levels of dry saltmarsh stress. However, the dry saltmarsh has a limited number of species of flora and monitoring of them all is feasible. It was emphasised that the specification of specific quantitative triggers for action are unlikely to produce good guidelines for sound management inputs. Rather, monitoring that has regard to the judgment of a suitable expert about the overall health of the ecological community will produce the best basis for decisions under the adaptive management system. Continuity in the personnel responsible for monitoring is desirable. However, repeated comparable photogrammetric records of vegetation health/stress is feasible, would establish a sound basis for ongoing assessment and would minimise consequences from any changes in personnel.

Mr Mueck also noted that in the past there had been evidence of an inflow of nutrient rich water from the Melbourne Water treatment ponds to the north-east of the dry saltmarsh but that these were now taken out of the waste water treatment system. He understands that the dry saltmarsh is a groundwater sink (discharge area) with the rate of discharge influenced by recharge events, the tidal water level, evapotranspiration and quarry dewatering. Citing the work of Kinhill (1982), the daily flows were estimated at 110ML/annum but Hyder modelling indicates that this is now in the order of 49ML/annum.

The water quality in the dry saltmarsh varies seasonally between 25,000 and 50,000mg/L dependant upon groundwater and runoff inflow, and tidal influence. By comparison, much of the wet saltmarsh to the east of 29 Mile Road is flooded daily by tidal flows operating via a number of well established channels. The salinity of the saturated areas in this segment of the saltmarshes is likely to be around 35,000mg/L which is the salinity of the water in Port Phillip Bay. Kinhill (1982) concluded that groundwater flow occurred into the wet saltmarsh but was restricted by the daily tidal regime. Any influence of groundwater upflow on soil moisture salinity is restricted to those areas which lie above the level of extreme tidal inundation. This level is stated to be about 0.41m AHD on an annual basis and 0.56m AHD once every three years. Soil moisture salinity below, certainly, 0.41m AHD would be dominated by the sea water salinity which would be likely to be more uniformly pervasive of the soil strata

³⁵ Sub Appendix 3 , pages 55 to 68 of Appendix 4

³⁶ Tables 4.5 and 4.4 , pages 16 and 15 respectively of Appendix 4

³⁷ Table 4.6 at page 17 of Appendix 4

due to being applied at the surface and because the sea water is more dense than the groundwater.

Mr Mueck noted that Lee and Burgman (1997)³⁸ found water salinities in the range 10,000 and 70,000ppm with no significant correlation between soil salinity and measured salinity of perched water or groundwater. This observation Mueck notes “*confirms our view that the direct influence of groundwater on the soil moisture and salinity at the site is relatively minor compared to tidal influences and precipitation and evaporation effects.*”³⁹

Mr Mueck continues, however to state that “*Saltmarsh communities, including their composite flora and fauna, are dependant upon soil salinity, and moisture within relatively narrow tolerances. Growth form and species composition may alter according to gradients in these elements of their environment. The Spit dry saltmarsh may be impacted by modifications to groundwater regimes. However, the heavy clay soils which underlie the saltmarsh mean that the groundwater is relatively isolated from the surface soil, being only connected by capillary action. This isolation combined with the broad range of salinities to which the saltmarsh plants are tolerant, strongly suggests that any impact of altered groundwater tables on the saltmarsh will be minor.*”⁴⁰

The EES⁴¹ states that the consequence of lowering the water table is that the soil moisture required to maintain vegetation around the fringe of the dry saltmarsh would be soil moisture present prior to dewatering events, tidal exchanges and minor salt water inflows. However, the scale of any impact would be suppressed by the low permeability of the underlying soils.

During the periods of deeper dewatering in the quarry, groundwater beneath the dry saltmarsh would be drawn away to the west and south to be replaced in part by nutrient rich water and other water leaked from the ponds to the north east of the dry saltmarsh. This leakage would further act to limit the extent of water table decline and consequential effects on vegetation.

Notwithstanding the foregoing, Mueck’s report states “*If reduced groundwater flow reduced the availability of water to the plants in the dry saltmarsh, then this could cause drought stress, reducing growth and seed production in the short term, and potentially the death and decline of plants in the longer term.*”⁴² The report goes on to state that this is only likely to be an issue during periods of low rainfall and/or high evaporation.

Thus, the goal for ecological management should be to maintain a soil moisture and salinity regime for the dry saltmarsh soil profile within the perimeter area between 0.4 and 0.7m AHD during the periods of deeper dewatering stress. This, Mr Mueck

³⁸ Cited in section 4 of Appendix 4

³⁹ Section 5.4, pages 29 to 30, Appendix 4

⁴⁰ Appendix 4 ,Section 6.1 (page 32)

⁴¹ Section 6.1.2.2 of Appendix 4 at page 34

⁴² Section 6.1.3

believes, can be best achieved using low pressure sprinklers fed by groundwater from the quarry. The system could be automatically controlled by soil moisture meter monitoring in the area where any soil moisture stress could develop. This system is the preferred means of meeting the ultimate objective of ecological management which is stated as:

“To maintain a soil moisture and salinity regime for the dry saltmarsh soil profile during periods of quarry dewatering at the levels that would have been provided by ground water seepage in the absence of quarrying”⁴³

4.1.2 Submissions

DSE and DPI submissions relevant to ground and surface water management were limited to recognition and concern that the adaptive management plan should be subjected to field testing and data gathering to ensure that it would be effective in achieving the objective of preserving the adjacent environment, particularly of the dry saltmarsh. No Work Plan can be approved or quarrying carried out without regulator approval and for this they wish to see convincing evidence that the proposed groundwater management plans will work.

DSE’s original written submission advocated trialling the proposed water management methods on a comparable site elsewhere. However, at the hearing DSE and DPI accepted that trials elsewhere would also require statutory approvals with the potential for substantial costs/delays and the risk that the alternative site may not replicate conditions on this site. Both agencies accepted that the best location for a representative trial to prove the system would be on Barro land close to the dry saltmarsh.

The EPA deferred to DSE and DPI in respect to water issues associated with quarrying but noted that relevant SEPPs such as Groundwaters of Victoria, Waters of Victoria and Waters of Port Phillip Bay apply. In addition, where more than 120ML/year (and/or 100 terajoules of energy) is used, the preparation of an Environment and Resource Efficiency Plan (EREP) is required under the *Environment Protection Act 1970*. An EREP addresses both energy and water utilisation levels and planning for cost effective reductions. EREPs and emissions licenses are administered by the EPA and are subject to monitoring reporting.

Birds Australia did not appear before the Panel but its written submission raised concerns about the effectiveness of the active hydrological management system envisaged in the EES, the level of risk of the proposed active hydrological management for the saltmarsh, how long mitigation measures would be in place. They sought confirmation of the effectiveness of the system. Birds Australia submitted that the works approval should be contingent on agreed monitoring criteria and clear actions to be undertaken if these criteria are not met.

⁴³ Section 7.1 , page 39 of Appendix 4

4.1.3 Discussion and Conclusions

The Panel recognises that the quarry extension proposal and any peripheral impacts it may have are in an area already modified by adjacent land uses and by infrastructure engineering (29 Mile Road culverts and the Melbourne Water treatment ponds and drainage works). Further, it is recognised that the area is likely to be affected by Climate Change issues, especially sea level rise with consequential water table rise, reduced rainfall and an increased frequency of extreme weather events. The Panel does not disregard the influence of these factors on the dry saltmarsh, but this Panel's primary concern is whether the surface and groundwater impacts associated with the quarry extension will be detrimental to the habitat values of the dry saltmarsh. The focus then is on the nature of impacts from quarrying that should be anticipated and whether the proposed adaptive management plan can effectively mitigate impacts in a changing environment.

The thesis presented in the EES and in evidence from Mr Nolan and Mr Mueck is that:

- the groundwater flow modelling indicates that during the deeper rock extraction periods (areas 2B1 and 2) the decline in the water table beneath the dry saltmarsh will cause the capillary upward flow from below to be eliminated or reduced;
- the area of the dry saltmarsh which might be affected is likely to be the perimeter at elevations of between 0.4 and 0.7m AHD;
- the actual magnitude of the decline in water table is uncertain as is the actuality of the postulated impacts. The Panel notes that while the calibration of groundwater modelling against the December 2002 water levels base gave a good reflection of subsequent water level changes in bore D02 – 21A and 24A, the model remains simplistic. This is a consequence of:
 - the basalt aquifers being observed to be marked by anisotropy of permeability in both a vertical and horizontal sense. Mr Natoli commented on the change in mineralogy of the rock from fresh fractured iddingsite basalt above the water table to chlorite/smectite basalt below the water table. Across the fluctuation zone of the water table the rock is further altered to a ferruginized smectite basalt which exhibits some clogging of the fractures with limonite and clays and by the precipitation of some anomalous zeolite minerals. He also pointed out residual lava flow texture features (pressure ridges and interposed flow). These, when coupled with the common flow direction fracture orientation preference, can give rise to significant variations in both the vertical and lateral permeability. Consequently, significant variations is likely to occur in the magnitude of water table declines resultant from dewatering pumping applied at different locations;
 - the lack of recognition of the impacts of varying salinity within the calibration process of the model. This is evident in Figure 3.6 of Appendix 1 which shows the salinity within the Newer Volcanic basalts to vary widely (6,800 to 83,000mg/L) which has impacts upon both the density (and therefore the water level measured when compared to other sites with different salinity) and the kinematic viscosity which impacts upon the hydraulic conductivity which applies;

- Limited recognition of the impacts of vertical leakage from both the saturated sections of the saltmarshes and from the underlying Moorabool Viaduct Formation. These will act to limit the extent of water table decline away from the deep quarry areas and especially close to the saltmarshes; and
- Limited if any consideration of the specific hydrogeology of the saltmarshes.

The above issues are evident in the comparison of the pre quarrying water tables which were measured (1979) and modelled⁴⁴. Variations of water level of greater than 0.5 m are common and, since the measured data is not corrected for density variations, it seems likely that the real variations may be much greater and more material than is apparent, especially when capillary rise issues associated with the dry saltmarsh are considered.

It is noted that the modelling has not included any allowance for interflow water (ephemeral perched soil water movement) supporting the dry saltmarsh substrate soil moisture and yet the shallow zone investigations around the saltmarshes clearly indicate the vertical distribution pattern of soil water salinity which is highly indicative of there being a significant interflow component in the water balance of the dry saltmarsh perimeter area.

The significance of these variations is, in the Panel's view, that while modelling is useful, it is not a reliable guide to the probability of effects of deeper dewatering pumping on the dry saltmarsh. This is especially so when one considers that the deeper dewatering pumping is not scheduled to begin before 2035⁴⁵.

All of these issues mean that the likelihood of the dewatering of 2B1 and 2 having an impact upon the vegetation in the dry saltmarsh is very doubtful. If it exists at all, it will simply be as a consequence of reduced capillary flow as postulated by Mueck. Even then the measured permeabilities of the substrate and the moisture contents of the deeper soils (>30%⁴⁶), the latter measured after a period of prolonged drought, suggest that the substrate is unlikely to permit significant capillary rise. Certainly, shallower samples showed soil moisture below 20 % in the upper (< 0.2m depth below ground surface) sequence. But even these soil moistures do not seem unusual or even close to wilting points for the soils as described. Consequently soil moisture suction pressures would be low to effectively non-existent.

It follows from the above evaluations that any management of soil moisture in and around the dry saltmarsh is likely only to be required for those areas above the level commonly inundated by tidal flows. This is stated to be about 0.4m with the upper level of the perimeter at about 0.7m. Mr Nolan reported that the highest tides recorded in the dry saltmarsh extend up to about 0.56m which occurs on average about once every 3 years. The water balance in the dry saltmarsh will also be

⁴⁴ Figures 3.3 and 3.2 respectively, at pages 23 and 22 of Appendix 1

⁴⁵ 2B1 in the north east area – Figure 6.1 page 56 Appendix 1

⁴⁶ Sub Appendix 3 in Appendix 4

maintained by rainfall and intermittent runoff from those portions of the catchment which have not been diverted to reduce excess nutrient load.

The extent to which significant vegetation stress will develop around the perimeter of the dry saltmarsh depends upon:

- the rate at which the largely prostrate halophyte vegetation depletes the available moisture; or
- salinity is altered to such an extent that it precludes the growth and vitality of some or all of the species within the floral assemblage.

It is clear from the studies done of the eight quadrats and their substrates that the existing vegetation is capable of tolerating soil moisture salinities in a range extending from <3,000 to >20,000mg/L⁴⁷. Thus, applying water exhibiting salinity in this range would be a basis for rational management, if evidence of plant stress due to quarrying activities becomes apparent.

It remains then to determine a basis for triggering action and determining the best means of applying water when and if it is required.

Taking the application method first, the Panel is of the opinion that there is no need to artificially sustain the water table levels beneath the dry saltmarsh by injecting water via spear points into the fresh basalt simply to sustain capillary rise support for soil moisture around the perimeter of the dry saltmarsh. This is not seen as productive and is likely to be quite expensive in terms of the treatment of the water required in order to avoid borehole fouling and clogging. Rather, if and when a need for soil moisture support becomes evident, either low pressure sprinklers or soaker lines over shallow crushed aggregate filled infiltration drains around the perimeter should act to sustain both an interflow and runoff analogue of the natural support system.

It is noted that the perimeter soils of the saltmarshes⁴⁸ are:

- *Soil Type 4 – Soils Associated with Sarcocornia- This soil type is a peat to 4 cm , underlain by sandy clay to 10cm, shells to 40cm, medium clay to 6 5cm and heavy clay to 100cm.*
- *Soil Type 5 – Soils Associated with Stripa and Distichlis – This soil type is a fine sandy loam to 2cm , clay loam to 15cm and sandy clay to 66cm.*

The lithology descriptions presented by Hyder of the saltmarsh quadrat hand auger evaluations are not sufficiently detailed to relate them to the above soil types. It is noteworthy however that all the shallow silty clays are described as highly fissured. This characteristic is likely to give them some permeability and, since they will have been sourced as erosion products from the basalts, these clays can be expected to be smectites and perhaps illites (due to sea water saturation induced changes). Clays of these types are unlikely to suffer fissure closure when wet up with brackish to saline water.

⁴⁷ Table 4.4 at page 15, Appendix 4

⁴⁸ As described by Kinhill (1982) and presented in the Hyder Report and by Nolan in his evidence before the Panel

The soil types described above seem likely to be amenable to slow infiltration within the root zone of the plant assemblage through low head brackish water infiltration systems such as are described above without suffering clogging. The potential for infiltration face clogging should be minimised by the filtration across the crushed rock surface and by drying and oxidative degradation over the period when dry out occurs between periods of soil moisture support. It would be desirable however to remove gross solids from the applied water before release. This could be readily achieved using a slow sand filter bed between the source dam and the off take pump sump.

The Panel considers it is not appropriate to specify criteria for adaptive management responses to protect the dry saltmarsh from impacts due to quarrying at this point. Rather these criteria should be determined on the basis of information from the recommended monitoring, which will occur for an extended period prior to extraction in areas that may impact on dry saltmarsh vegetation. The Panel accepts the expert evidence that the monitoring of dry saltmarsh stress will be most effective if it incorporates qualitative assessment by a relevant expert, supported by comparable photogrammetric records of vegetation health/stress and monitoring of ground and soil moisture conditions over an extended period. The Environment Review Committee, with advice from technical experts in relevant disciplines as required, will have an important role in the formulation of the monitoring/testing program as well as the adaptive management regime and this contributes to the Panel's acceptance of the determination of criteria for responses at a later date.

Surface Water

The Panel accepts the EES assessment and evidence presented that approximately 50% of the surface water flow to the dry saltmarsh (118ML/a on average) would be permanently diverted from the dry saltmarsh and on completion of quarrying the ongoing drainage of both surface and shallow groundwater from these catchments will be drained south and pumped to Corio Bay.

The Panel raised an issue related to the proposal that the rehabilitated quarry area would permanently divert a significant amount of the surface water catchment from the dry saltmarsh. While this runoff is likely to be of lower salinity water than the tidal water and the groundwater contributions to the dry saltmarsh, it is part of the natural water and salinity balance of the dry saltmarsh.

Mr Mueck responded that the dry saltmarsh vegetation is quite tolerant of varying water salinities. He added that saline conditions predominate across most of the dry saltmarsh all the time except around the perimeter where some lower salinity inputs have had minor effects on occasions. He was not concerned that this water was to be diverted from the dry saltmarsh for the period of quarry operation as this would reduce the potential for exotic vegetation to become established in this area. This area will be sustained by the addition of compensatory brackish to saline water, if found necessary, by techniques as set out later in this Chapter. This will have applied for decades over the operational life of the quarry, but post quarrying the dry saltmarsh would have to depend upon the conditions established in the rehabilitation plan, including any diversion of surface water catchments previously contributory to the dry saltmarsh (see discussion in Chapter 10).

The Panel considers that a firm decision on the need for such action should be made on the basis of the monitoring and testing results derived from the dry saltmarsh. Should that data prove inconclusive in respect to the desirability of directing lower salinity runoff to the dry saltmarsh perimeter area, then diversion of runoff from those areas of the quarry with sufficient floor elevation to drain under gravity to the dry saltmarsh should be made part of the rehabilitation plan.

The Panel has concluded that the proposed quarry extension will reduce the frequency and magnitude of surface water discharges to the dry saltmarsh both during the quarry operational period and to a lesser extent post closure but the adaptive management proposals provide an appropriate mechanism for supplementing soil moisture during the operation of the quarry and the rehabilitation plan will also address the issue.

Little if any discernible effect on the water quality, aquatic or environmental health of this area is anticipated as it is largely dominated by tidal flushing which is likely to increase due to Climate Change influences.

Groundwater Effects Monitoring and Management System Testing

A program of vegetation and soil moisture monitoring and a trial of the preferred management system are needed to demonstrate the effectiveness of the proposed system to mitigate any potential adverse impacts due to dewatering induced soil moisture stress from quarry.

Monitoring

The Panel understands that eight quadrats with adjacent shallow observation bores have been established at locations around the Site perimeter towards the proposed quarry⁴⁹. The Panel believes that these should form the basic elements of a saltmarsh monitoring program network. Of the eight sites, the critical sites are located over the Soil types 4 and 5 which appear to include all but Site 8.

The parameters and phenomena which need to be monitored include:

- the trend in tidal levels measured against AHD as a consequence of sea level changes;
- variations in the water table levels, water salinity and nutrient levels exhibited by the Newer Volcanic basalt aquifers;
- variations in the water table levels and water salinity in the shallow quadrat observation wells;
- variations in soil moisture at three levels above the initial water table level, these being determined on the basis of the soil sequence description and root penetration evidence from shallow soil cores, but generally at depths around 0.15, 0.4 and 0.75m below ground level;
- variations in vegetation assemblage and stress within the quadrats;
- rainfall, pan evaporation, temperature, relative humidity range and solar insolation hours (these may be adequately available from nearby synoptic

⁴⁹ Shown on Figure 3 of Appendix 4 of the EES

weather stations at locations such as Lara Salt works, Laverton , Avalon Airport or perhaps Point Wilson).

The above monitoring set would require:

- a) new deep penetrating bores to be established adjacent to each quadrat for measuring the water table variations in the Newer Volcanics;
- b) permanent bores for soil moisture monitoring equipment installation. The nature of these will be dependant upon the nature of the measurement instruments to be installed;
- c) a tide gauge station tied into a fixed datum for measuring tidal variations;
- d) appropriate completion of existing facilities to ensure that they are not disturbed or destroyed by intruders or vehicles moving in the area; and
- e) the establishment of fixed photo stations around each quadrat to allow collection of repeated comparable photogrammetric records for monitoring of stress and vegetation assemblage variation (false colour IR photography may be applicable for this purpose).

The periods for monitoring of the parameters should be determined by the ERC but the Panel is of the opinion that, at a minimum, it should be biannually and, since much of the data can be collected electronically and telemetered to a central data station, more frequently during early years. This practice may be beneficial in gaining a better understanding of the saltmarsh water and vegetative interactions, especially if this does not add significantly to the cost of data collection.

Management System Testing

1. Basalt to Saltmarsh Soil Moisture Interaction

Soil moisture support around the perimeter of the dry saltmarsh is only needed if it is established that the impacts of quarry dewatering can be correlated with adverse conditions within the vegetation assemblages which underpin the habitat value of the dry saltmarsh. This requires that a test be undertaken in which the water table is lowered below the capillary rise limit over a selected segment of the perimeter for a period. This should be at a location where the water table level and the soil moisture in the shallow system can also be measured.

It is not for the Panel to design the specifics of the management system testing. Rather it is a matter for agreement between the Proponent's consultants and the Environmental Review Committee. However, the following advice is provided to inform the design of testing:

- such a test might need to run for about 12 to a maximum of 18 months. This is a period which corresponds with the probable time of effects from dewatering of the deeper rock reserves, if they are quarried as intended on a campaign basis;
- the test could be conducted adjacent to quadrats 1, 2 and/or 3, which are areas where modelling indicated significant water table decline; and
- the drawdown that the test would need to generate by localised pumping would only be about 3 to 4 metres, such that the basalt water table is lowered below the capillary rise potential within the fractured rock. This extent of

basalt dewatering would however need to extend laterally across an area sufficient to register on adjacent shallow water table monitoring facilities. To confirm that the latter is achieved there would need to be several closely spaced observation wells in the basalt adjacent to any pumping well. All the wells should be of a depth such that they are capable of being pumped to create the drawdown necessary in the upper layers of the basalt overtime.

It should be recognised that close monitoring of this test would be important. If it becomes apparent that there is no discernible effect through lowering of the water table on the soil moisture or shallow saltmarsh water table over a period equivalent to the quarry dewatering period effect, then there would be no need for any management support to maintain the dry saltmarsh vegetation in its natural state and therefore its habitat values.

In the event that an interaction is observed between the water table in the basalt, and that in the saltmarsh soils, then the soil moisture support system using the soaker infiltration system would need to be trialled.

2. Soil Moisture Support Trial

The Panel believes, on the basis of the evidence presented, that the preferred method of soil moisture support would be to use soaker hoses/dripper lines placed over a shallow gravel filled trench located at the outer margin of the dry saltmarsh perimeter. Such a system would involve minimal cost and should not give rise to significant environmental damage or disturbance. If necessary, low pressure sprinklers could also be used as a supplementary measure or alternative method to deliver water to areas of the dry saltmarsh. These would need to operate in response data from soil moisture and vegetation monitoring. The actual determinants, the Panel believes, will derive from a multiplicity of parameters analysed by the ERC.

Trialling of this system should be straight forward and would be done by establishing a short length of trench adjacent to a quadrat such as Site 4 operated over a period of one or two summers. During the trial, the applied water volume would be recorded and the usual parameters as set out above would continue to be monitored to determine the extent of difference resultant from the operation of the system. It should be noted that if the system is found to be ineffective, it would probably reflect losses by vertical leakage to the deeper Newer Volcanics. This should be overcome by ensuring that the trench depth is quite shallow (dependant upon soil sequence not greater than 0.2m).

The timing of such a trial would be determined by the ERC after the testing of impacts of quarry dewatering to establish whether soil moisture support is needed (discussed above) and collection of background data over a sufficient period (unlikely to be less than about 10 years).

In the event that shallow application soil moisture support systems as set out above are found to be ineffective, other alternatives could be trialled within the time frame before the commencement of deep rock quarrying (after about 2030). The alternative systems could include direct irrigation using low pressure sprinklers or deep injection to sustain the water table as it is at present, during and for a period after the cessation of each deep quarrying campaign.

Environmental Efficiency and Energy Resources Planning

It is highly likely that the licenses necessary for water discharges from the Stage 2 area of the quarry in time will trigger an EREP. While the volume of the licences may be able to be reduced by the use of some of the water as support within the dry saltmarsh adaptive water management plan on the land owned by Barro Group; the inability to distinguish between and separate groundwater extractions and stormwater runoff will tend to push the licensed discharges higher than the 120ML/a trigger.

The Proponent will need to consider how best to achieve the EREP objectives, but the Panel considers that the approach to water use within the adaptive management regime envisaged is consistent with principles to ensure efficient use of the resource.

4.1.4 Implications of Climate Change for Dry Saltmarsh Habitat

Climate change is likely to have an impact on native vegetation in several ways. There are the general issues of raised temperatures and the likelihood of changes in rain patterns and more prolonged droughts. These effects could be positive or negative and benefit some species (of plants and animals) while disadvantaging others. In this particular area there is also the critical issue of likely sea level rises and the changes this will bring about particularly on the wet and dry saltmarsh areas.

The EES provided only cursory discussion of the implications of Climate Change. However, Dr Meredith responded to questions from the Panel that:

- the 'buffer' between the dry saltmarsh and the extraction area accommodates retreat of the saltmarsh habitat in the event of sea level rise of 1 metre, which he noted was particularly conservative at the time the EES was prepared and remains conservative when compared to more recent planning documents such as the Draft Coastal Strategy; and
- the dry saltmarsh, if not artificially protected would be "squashed" against the rising land surface to the north.

Impacts on the dry saltmarsh can be summarised as functions of the proposed boundaries of the quarry in respect to surface water; and functions of the geology, hydrogeology, water salinity and timing of operations in so far as groundwater is concerned.

Over the period extending up to the cessation of quarrying in about 2060 it seems highly probable that the implications of climate change will become clearer. At present the Coastal Strategy is being reviewed and this includes consideration of the extent of sea level rises that should be anticipated. The Draft Coast Strategy, which is currently in the consultative phase, suggests a sea level rise of 0.8 metres should be adopted for planning purposes. In particular, over the next 52 years it is expected that sea level rises of significance to the dry saltmarsh water levels will occur and be accompanied by proportionate rises in water table levels even though rainfall and recharge may decline quite significantly. The latter can also be expected to reduce any runoff or interflow (soil water movement) into the dry saltmarsh.

What ever the rise in sea level turns out to be, a similar rise in water table levels must be expected, at least close to the coast, since the discharge level for the groundwater is to a major extent related to sea level.

The implications will be that the dry saltmarsh will migrate inland to an extent governed by the land surface profile. The Panel believes that it is likely that the extent of the dry saltmarsh will transgress across the full extent of the dry saltmarsh perimeter sediments at least to the north-west where the land rises quite substantially from 1.0 to 2.0m within less than 100m. The mapping which is presented and/or which can be interpreted from aerial photography shows the extent of the surficial sediments to disappear across this area. The exposed substrate is then the weathered surface soil of the Newer Volcanics. This change in substrate exposure may substantially alter the manner in which groundwater discharges occurs to the dry saltmarsh. This may possibly impact upon the vegetative assemblages which predominate.

The expert evidence suggests that, compared to current planning criteria relating to sea level rises due to Climate change, the proposal has incorporated measures that are more than adequate to provide space for inland colonisation of the dry saltmarsh.

It is clear that the changes and therefore the actions it is appropriate to take are currently not certain. The Panel is conscious that these planning criteria are being reviewed and further policy responses to Climate Change are likely before extraction in the north-east of Stage 2 occurs. It will be at the time extraction occurs and rehabilitation plans are being finalised that there will be more certainty as to how, whatever changes are evident, should be managed in the short and longer terms respectively. The Panel is also conscious that the geology and topography of this part of Stage 2 will constrain the retreat of the dry saltmarsh irrespective of the extent of the buffer. The adequacy of the buffer between the dry saltmarsh and the extraction area should be reviewed on the basis of current planning policy when extraction approaches this interface, and specifically at least one year before extraction in areas 2C (northern portion) and 2D.

The management options known to exist might include protecting the dry saltmarsh by the use of the barrier boards. These can be raised on the culverts beneath 29 Mile Road to prevent short term adverse tidal flooding. Similarly the diversion of water from the rehabilitated quarry area to the dry saltmarsh could be practiced as this source of water will be available, but the desirability of such action is simply speculative. Certainly responsibility for the changes to the dry saltmarsh due to Climate Change do not lie with the quarry operations, but the way in which the adaptive water management and rehabilitation plans are implemented can seek to minimise and delay the extent of the changes. This can however only be done within the constraints which arise naturally as a result of sea and water table rise around the rehabilitated quarry area and the dry saltmarsh. Decisions on these matters will have to be taken on the basis of advice from the ERC when they have had the benefit of the data deriving from the monitoring and testing programs outlined above.

The EES appropriately does not attempt to address exactly what the changes are likely to be and how they will be dealt with – rather, an adaptive management approach is proposed which will be flexible and deal with the situation as it changes. A critical part of the adaptive management approach will be the establishment of an Environmental Review Committee to oversee the management and provide technical advice – this is proposed in the EES document. The Panel believes this is a reasonable and practical approach to ensure potential risks are addressed and strongly supports it.

The adaptive management approach will also be critical if vegetation “migrates” in response to rising sea levels. There are two particular areas where this is likely to be an issue:

- **Coastal Saltmarsh (Site 8).** This could be expected to spread and move to higher elevations in response to any sea level rise. For the area west of 29 Mile Road there will be at least some ability to manage this by controlling water movement through the culvert gates under the road. For almost all of Site 8 there is a buffer of at least 200 metres between the edge of the current saltmarsh and the proposed extraction boundary – this buffer also includes a vertical rise of generally at least two metres with a minimum of about one metre in one small area. This horizontal and vertical buffer would appear to be sufficient to enable adaptive management for any likely movement with predicted sea level rises of 0.8 metres; and
- **Coastal Fringe Vegetation.** The major part of the coastal frontage area is within completed parts of the Stage 1 extraction area. The limited areas of the Stage 2 extraction area are generally at least three metres above sea level datum which should provide sufficient buffer for any inland movement of vegetation and area for the required rehabilitation works.

The issue of Climate Change was not addressed in any detail in the EES, knowledge of the implications of Climate change is developing, policy responses are evolving, and the consequences of quarrying on the dry saltmarsh are expected to be limited. Nevertheless, the Panel is satisfied that the proposal includes three important features that could actually enhance the capacity for the dry saltmarsh to adapt to changing environmental conditions – provision for a buffer that allows the dry saltmarsh to migrate inland, monitoring of conditions and health of the dry saltmarsh and an adaptive management regime that responds to altered conditions.

The implications of Climate Change for Rehabilitation Planning are discussed in Chapter 9.

4.1.5 Conclusions on Ground and Surface Water Management

On the basis of the evidence presented, the Panel concludes that:

- an adaptive management plan as outlined above can confidently be expected to avoid/ mitigate any impacts of the periods of deeper rock quarry dewatering on the dry saltmarsh to ensure the habitat value is not degraded by quarrying on the adjacent land;
- the adaptive management plan will need to include comprehensive monitoring and, if necessary, soil moisture support system trialling;
- the Proponent should ensure appropriate specialist expertise informs the formulation and implementation of the adaptive management plan and associated processes; and
- the ERC should advise on the formulation and implementation of the adaptive management plan by the proponent.

Further, the Panel considers that there is ample time for the monitoring and trialling to be conducted before quarrying of the deeper rock resources in the north-east of Stage 2 becomes necessary.

It is further concluded that the dry saltmarsh is at risk from a variety of other factors which include:

- climate change issues such as sea level rise , declining rainfall, more extreme weather events and water table rises in consequence of sea level rise; and
- increases in low salinity and nutrient rich leakage from the adjacent rural land.

These other factors may represent greater risks to the dry saltmarsh ecology than the impacts of the Stage 2 quarry development. The buffers, data generated by the proposal and adaptive management responses may actually enhance the capacity for the dry saltmarsh to adapt to changing environmental conditions.

PANEL RECOMMENDATIONS – GROUND & SURFACE WATER MANAGEMENT

Require an EMP as a condition of the planning permit for the proposal and the works authority/plan. The EMP should be generally as proposed in the EES and should:

- **adopt an adaptive management approach to ensure that actions are appropriate to any changes in the environment.**
- **be developed and implemented with advice from the Environmental Review Committee and specialist experts.**

Refine the groundwater monitoring and testing program coupled with vegetation surveys and soil moisture monitoring on the basis of advice from the Environmental Review Committee and specialist experts.

Schedule a groundwater monitoring and testing program coupled with vegetation surveys and soil moisture monitoring to take advantage of the time periods between the commencement of Stage 2 quarrying and the need for the implementation of the adaptive management plan.

Monitor the health and levels of stress of flora in the eight quadrats of the dry saltmarsh. This monitoring should:

- **be undertaken by a suitable expert; and**
- **be supported by regular comparable photogrammetric records of vegetation health/stress in each quadrat.**

Continue monitoring of existing functional groundwater monitoring bores for water level and salinity variations at intervals determined by the ERC.

Implement facilities for:

- **soil moisture monitoring of the surficial sediment sequence adjacent to the eight quadrats around the perimeter of the dry saltmarsh;**
- **water level measurement within the Newer Volcanic aquifers beneath the surficial sediment sequence adjacent to the eight quadrats around the perimeter of the dry saltmarsh; and**
- **monitoring of tidal fluctuations and sea level in the Spit Reserve inlet.**

Initiate the testing of the hydrological relationships between the dry saltmarsh environment and the Newer Volcanic aquifer when subject to drawdown as soon

as practicable, having regard to the quarry development schedule and the expected increasing impacts of Climate Change.

Undertake Environment Resource Efficiency Plan studies considering the extent of beneficial groundwater diversions which can be implemented away from the licensed discharge point to produce the optimum outcomes for the dry saltmarsh and the environment of the Spit Nature Conservation Reserve.

Review the adequacy of the buffer between the dry saltmarsh and the extraction area when extraction approaches this interface, and specifically at least one year before extraction in Stages 2C (northern portion) and 2D. This review should have regard to the planning policy relating to climate change that applies at that time.

4.2 DISTURBANCE – NOISE, VIBRATION AND LIGHT

The Issue

- Will noise or vibration from the proposal have an adverse effect on birds, particularly the Orange-bellied Parrot and other migratory birds in Ramsar wetlands?

What is proposed?

Stage 2 of the quarry adopts the same mode of operation, including blasting approximately fortnightly, and uses the same fixed plant as the Stage 1 quarry. However, the location of working faces and therefore some mobile plant would change. The extension of the quarry brings the working face closer to sensitive avifauna areas, particularly to the north- east of the Stage 2 area, than the quarrying approved under the Stage 1 Works Authority.

4.2.1 EES ASSESSMENT - NOISE AND VIBRATION

Noise and vibration impacts are addressed in Chapter 11 and Technical Appendices 8 and 9 of the EES. Mitigation measures are set out in the proposed Ecological Management Plan in Technical Appendix 6. The Marshall Day Acoustics' assessment of noise and vibration impacts from the proposal is set out in Technical Appendix 8 and an assessment of the effects of blasting by Terrock Consulting Engineers is provided in Technical Appendix 9.

Noise and vibration evidence was not presented at the Panel hearing, however Dr Meredith's evidence did relate the findings of the of noise and vibration assessments to impacts on avifauna.

Both assessments addressed potential impacts on sensitive avifauna areas along Corio Bay foreshore to the south, the eastern wetlands to the East and the dry saltmarsh to the North-East. Parts of these areas are within 300m of the proposed Stage 2 extraction limit.

The Ecological Management Plan proposes to mitigate potential disturbance by establishing a buffer to the sensitive avifauna habitat areas, constructing bunds around the quarry, planting vegetation to screen quarry activities, and shielding of stationary lighting (if necessary) to ensure light-spill into ecologically sensitive areas is minimal.

Operating Noise

The Marshall Day Acoustics assessment modelled predicted noise levels based on measured background noise levels and existing noise emissions from the quarry operations. The assessment noted that the existing Point Wilson environment includes noise emissions from the Avalon airport, Austrak concrete railway sleeper plant, the Commonwealth government munitions storage, the Melbourne Water waste treatment plant and intermittent traffic movements.

Blasting

The Terrock assessment of the effects of blasting noted that blasting would be closer to the dry saltmarsh than under the approved Stage 1 of the quarry. Worst case vibration contour maps indicate that around the periphery of the dry saltmarsh predicted ground vibration from blasting is 5-10m/second⁵⁰ and predicted air vibration is generally 110- 120 dBL but areas closest to the working face would exceed 120 dBL⁵¹.

Marshall Day concluded that:

- vibration levels at 300m from the blast site will be barely perceptible by humans according to AS187.2 – 1993. Blast overpressure reduces to levels comparable with moderate thunder at a distance of 180m; and
- the peak vibration within the sensitive avifauna areas is estimated to be 2 mm/second and 115 dBL.

The regulatory limits for noise and vibration are based on human response criteria and there are no equivalent criteria for domestic animals or wild fauna.

The EES acknowledges the potential for disturbance to birds⁵², cites relevant research and proposes measures to mitigate potential impacts.

The EES reports that:

- Brett Lane and Kinhill planner's observations in 1979 along Point Wilson Road indicated OBP flushing occurred between 85 and 250 metres as a result of traffic along the road and at no time did parrots feed within 85 metres of the road. During increased traffic conditions, areas used by parrots within 250 metres of the road became undesirable and birds were not observed feeding closer than 420 metres (the road was out of visual range at this distance). They concluded 420 metres should be the minimum distance at which roads should be placed from any area used by the parrots.
- a further experiment conducted in 1997 (Bezuijen and Lane) showed no significant behavioural change in OBPs in the Split Nature Conservation

⁵⁰ Ground vibration contours are shown on Figure 11.6 at page 11-19 of the EES and in Appendix 2B of Technical Appendix 9

⁵¹ Air vibration contours are shown on Figure 11.5 at page 11-16 of the EES and in Appendix 3B of Technical Appendix 9

⁵² Pages 37- 43 of Technical Appendix 6

Reserve in response to regular truck passes (5-10 minute intervals) within 70 - 100 m or the more constant noise from a generator running through much of the trial;

- research into responses of birds to noise from the Avalon air show (eg Weston et al) recorded generally high tolerance to aircraft noise with wading bird flight responses only occurring above Lmax 80 dB(A)⁵³;
- Terrock⁵⁴ noted that peregrine falcons at two Victorian quarries nest on ledges within 100 metres of working faces and are not concerned by blasting;
- research at an Oregon Zoo was cited which indicated that by the eighth blast animals that were initially nervous paid little or no attention; and
- in the Hunter Valley horses were not concerned by vibration levels of 1-3 mm/second and 110-115 dBA.

The EES suggested that where noise is predictable or regular and is not associated with actual danger, many birds, including shorebirds, tend to habituate to the noise regime. Although, sudden sharp noises associated with unusual movements resulted in noticeable behaviour changes, including flying, it was suggested that the effect of blasting on wild fauna is less than the effects of natural events such as thunder. Birds quickly become accustomed to the peaks of blasting once they see that it presents no immediate danger. Further, the gradual encroachment of the quarry with associated vibration and noise levels will mean wildlife will gradually habituate to the noise and vibration effects.

These views were reaffirmed in the evidence Dr Meredith presented at the hearing. It was his overall conclusion that proposed mitigation measures to address potential disturbance to fauna make it unlikely that the proposed Stage 2 expansion of the quarry would have significant impacts on fauna. He noted that:

- the area is already affected by noise from traffic, quarry operations, and the airport. However, even during the Avalon air show bird responses were limited to stopping feeding for a few seconds. The highest disturbance is probably from bird watchers;
- the route by which trucks will enter and leave the quarry will not change;
- disturbance impacts will be minimised as the quarry will not generally be visible to fauna in significant habitats off-site and noise will be reduced as a result of: the location of infrastructure; quarrying activity at the pit floor below surface ground level; the adoption of a buffer zone of at least 100 m at its narrowest point; and perimeter bunding; and
- construction of bunding can occur in summer when significant bird species are not present.

Marshall Day's estimated blast vibration levels of 2mm/second at 280m which is barely perceptible and complies with ANZEC criteria⁵⁵. It was also noted that Australian Standard AS2187.2 indicates techniques that can be used to reduce blast

⁵³ Pages 41 of Technical Appendix 6

⁵⁴ Pages 13 and 14 Technical Appendix 9

⁵⁵ See table 7, Page 8 Technical Appendix 8

noise and vibration. Marshal Day recommended that controlled blasting should be considered when blasting occurs within 300m of any avifauna area, with vibration limits established once a correlation has been developed between induced ground vibration, overpressure noise and bird reactions.

Terrock recommended that:

- investigations be conducted so that by the time extraction approaches within 300m of the extraction limit (i.e. “the controlled blasting zone’), an appropriate blasting practice can be implemented to limit vibration to levels determined to be non- alarming to Orange-bellied Parrots; and
- alternatively, blasting in the controlled blasting zone could be limited to periods when Orange-bellied Parrots are not present in the Spit Nature Conservation Reserve, as determined by historic and current surveys.

4.2.2 SUBMISSIONS

DPI deferred to the EPA view on noise issues as it is lead agency in this area. It reported there have only been two instances (January 2002 and February 2003) where complaints were made about air blast impact and in both cases complaints were from residents of Clifton Springs which is remote from the site but can be affected in certain weather conditions.

The EPA and DPI advised they would defer to the DSE view on noise implications for fauna.

4.2.3 DISCUSSION AND CONCLUSIONS

The Panel is conscious that the locality and significant habitat areas are subject to a level of disturbance from exiting activities at the quarry and in the broader locality. It is not proposed to change existing traffic volumes or routes, therefore our evaluation of disturbance impacts focuses on lighting and noise and vibration from quarry operations and blasting in particular.

The EES and Dr. Meredith’s evidence indicated that birds are particularly sensitive to disturbance from sources they can see and screening of views is an important element of strategies to minimise disturbance impacts. The Panel agrees that bunding with screen planting should be established at the eventual extraction limit. These perimeter bunds and screening vegetation should be established soon (say within two years of approval of the works authority) to achieve effective screening in advance of extraction occurring. These works should be programmed for the period when significant migratory birds do not use the area.

With regard to lighting, Biosis recommended that vehicles/machinery should not operate during hours of darkness within 500m of Ramsar wetlands to the south and north-east of the site⁵⁶ but this was not reflected in the proposed management strategies. The Panel considers a cautious approach should be adopted and this limitation should apply during the times significant migratory birds use the locality. Activities at the crushing facility could continue after sunset but would need to use

⁵⁶ Page 43 Technical Appendix 6

stockpiled material. The Panel accepts that stationary lighting to facilitate night time quarry operations can be designed to ensure light does not spill onto sensitive avifauna habitat areas.

The Panel is also conscious that noise and vibration criteria have been developed to address human rather than bird responses. Nevertheless, unlike many areas, given the ecological significance of the habitat and the nature of activities (such as the Avalon Airport and Air Show) there has been some research into bird reactions to disturbance in this locality.

The research and evidence given indicates that birds habituate to regular, predictable noise levels (provided it is not at very high levels), especially where the noise is not associated with a threat. It is peak noise events, and blasting in particular, that are most likely to illicit responses. Even then, it appears that wildlife generally tolerates the events. Given that blast pressure at 180m is comparable to moderate thunder noise (122-133 dBL(peak)) this is perhaps not surprising.

Nevertheless, the Panel considers a conservative approach should be adopted. In addition to the mitigations measures already discussed, an approach should be adopted which involves monitoring of bird responses during blasting as the quarry approaches the Ramsar areas and adoption of controlled blasting within 300 metres of the extraction limit. This threshold distance appears to be derived from the Marshall Day estimate that at a distance of 280m the vibration level would be 2mm/second which is barely perceptible to humans and complies with the ANZEC criterion. Although Marshall Day considered vibration criteria based on human perceptions will be conservative, the Panel think the criteria applicable to blasting in the Draft Work Permit for residences should apply in relation to the significant habitat areas unless monitoring satisfies DSE that alternative criteria should apply. It is understood that techniques are available to reduce vibration levels, although the blasting period is extended somewhat.

PANEL RECOMMENDATIONS

Incorporate the following measures in the ecological element of the Environmental Management Plan to minimise disturbance to birds in sensitive habitat areas:

- **the maintenance of the buffer of at least 150 metres between the dry saltmarsh and the extraction limit (as shown in EES documents);**
- **the construction of bunds and planting of vegetation at the edge of the approved extraction area to screen views from sensitive habitat areas to the quarry and attenuate potential noise impacts;**
- **establish the perimeter bunds and screening vegetation within two years of approval of the works authority;**
- **the bunds should be constructed and vegetation should be planted in the season when migratory birds are not present;**
- **the screening vegetation should be maintained to achieve effective screening throughout the life of the quarry;**
- **vehicles/machinery should not operate during hours of darkness within 500 metres of Ramsar wetlands to the south and north-east of the site during the times migratory birds use this habitat;**

- **design new stationary lighting to avoid light spill into sensitive avifauna habitat areas;**
- **monitor bird reactions to blasting when the quarry face reaches 500 metres from sensitive avifauna habitat areas;**
- **require controlled blasting during the season when migratory birds use the area when blasting occurs within 300 metres or an alternative distance determined as a result of monitoring of avifauna responses to blasting in areas to the north-east, east and south of the site; and**
- **unless monitoring satisfies DSE that alternative criteria should apply, blasting operations must not exceed:**
 - **airblast - 115 decibels on more than 5% of blasts in a 12 month period and 120 decibels at any time in sensitive avifauna habitat;**
 - **ground vibration - 5mm/s on more than 5% of blasts in a 12 month period, and 10mm/s at any time in sensitive avifauna habitat.**

4.3 IMPACTS FROM AIR EMISSIONS ON ECOLOGICALLY SENSITIVE AREAS

DPI's submission noted possible impacts of dust on nearby vegetation and that little evidence was provided to support statements in the EES. However, DSE did not highlight dust as a concern.

The modelling of air emissions (discussed in Chapter 2.1) was directed at impacts on residential uses but it can be inferred that PEM criteria, at least for fine particles (PM10 and PM2.5), would be exceeded in some parts of the ecologically sensitive areas.

The PEM and NEPC air emission criteria have been developed on the basis of human health hazards and perceptions of amenity, although NEPC is exploring whether standards should be set to protect flora and fauna.⁵⁷ The relevance of the criteria for fine particles for avifauna is questionable as they relate to inhalable/respirable particle size for humans but, to state the obvious, the respiratory system of birds is very different. Further, it is understood that the development of the criteria had regard to epidemiological studies of hazards to human health which often take account of long term exposure to elevated levels - there is not the same knowledge of health implications for birds, particularly migratory birds that are in the area intermittently.

The EES and expert evidence presented to the Panel:

- identified the most deleterious effect of dust emissions on flora and fauna as the potential to smother significant flora communities that provide habitat for avifauna⁵⁸;
- indicated that the propensity to generate dust was reduced as the quarry operates at around water table level and the basalt has a high moisture content (5-6%); and

⁵⁷ EES page 10-14

⁵⁸ EES Chapter 8 page 8-37

- considered mitigation measures will assist in preventing negative impacts on significant communities. The mitigation measures identified in the EES included:
 - maintaining crushing/stockpiling activities (which are key dust sources) in the current location approximately 1 kilometre from the Spit Reserve;
 - dust suppression measures during quarry operations;
 - the establishment of buffers and the construction of bunds well in advance of quarrying near sensitive ecological areas; and
 - if necessary, curtailing dust generating activities when strong winds blow towards sensitive locations⁵⁹.

There was no evidence relating to adverse impacts due to dust deposition on wetlands to the south and east and the proposal is not likely to increase existing impacts in these areas.

Quarrying activities will move closer to the sensitive saltmarsh habitat area to the north-east but active management measures are proposed to suppress dust and minimise the potential for fugitive dust to be deposited. The vertical and horizontal separation between the dust sources and the sensitive ecological areas is important in minimising impacts on vegetation. A significant proportion of the dust generated is likely to be intercepted by the pit walls/vegetated bunds and coarser dust settles in relatively short distances. Recommendations elsewhere in this report relating to the monitoring of both dust fall at the site boundary and the health of saltmarsh vegetation provides further comfort that important habitat values will be protected.

The Panel is satisfied that the proposal adequately addresses the potential for adverse impacts on significant habitat due to dust.

4.3.1 HAVE IMPLICATIONS FOR RAMSAR WETLANDS BEEN ADEQUATELY CONSIDERED?

None of the land owned by the Proponent is within the designated Ramsar wetland area. Any effects on the Ramsar area are therefore likely to be indirect effects due to changes in hydrology or other factors such as noise and vibration. The management of these effects on individual species (mainly birds) that use the Ramsar wetlands are covered in this chapter of the report. Issues related to hydrology are addressed in Chapter 4.1 and disturbance due to noise and vibration are addressed in Chapter 4.2.

On the documentation in the EES and evidence presented, the Panel is satisfied that, subject to recommendations in this report, the potential offsite effects on Ramsar wetlands and the birds that rely on these wetlands have been adequately addressed.

⁵⁹ Technical Appendix 6 page 41

5. ECONOMIC ASSESSMENT

The Issues

- Do economic benefits from the project outweigh adverse environmental impacts?

Planning Policy Context

Overarching planning principles include the wise use of natural resources, including minerals, and contributing to the economic well-being of the State by facilitating economic growth and resolving land use conflicts. State planning policy relating to extractive industry aims *'To protect identified mineral resources, to encourage mineral exploration and mining in accordance with acceptable environmental standards and to provide a consistent planning approval process.'* Likewise, it is local policy to protect stone resource to ensure an adequate supply of stone within the Geelong supply area in the future.⁶⁰

5.1 EES ASSESSMENT - ECONOMIC IMPACTS

Economic impacts are addressed in Chapter 16 and Technical Appendix 16 of the EES. Evidence from Mr Natoli highlighted economic benefits from the proposal and advised on alternative resources in the region.

In 2003/4 the existing quarry produced 1.271 million tonnes of basalt aggregate and associated products which generated sales revenue of \$12.5 million plus \$6.1 million in cartage costs. This represented 62% of the Geelong region market, 25% of the Werribee region market, 12% of the Western and Port Melbourne region and 11% of all Victorian basalt aggregate. The quarry contributes to the region's economy through direct employment of 36 people who live in the Geelong region, rates paid to the CoGG, payments of \$8.4 million to regional suppliers, and the supply of quarry products to 70 local businesses. A comparable contribution in 2007 was anticipated.

The existing quarry has a remaining life of approximately 3-5 years based on existing resources and current market demand. Mr Natoli's evidence confirmed there are no other quarries in this region capable of expansion.

The most significant economic impact if the quarry extension does not proceed was identified as the marked reduction in supply from within the region, reduced competition and an increase in the cost of 'replacement supply' by 50-100% (largely due to increased transport costs). The Access Economics Impact assessment in 2005⁶¹ estimated the total economic cost of rejecting the proposal at \$52.8 million (at a

⁶⁰ See Clause 11.03, 17.09 and 21.25.

⁶¹ Appendix 16

discount rate of 5%) taking account of factors such as additional transport costs, bringing forward costs of closing the quarry and upfront investment in a new quarry.

At the hearing Mr Natoli advised that there are no sites with comparable resources in the region to offset Stage 2. While DPI no longer assesses the adequacy of the supply of resources, it confirmed there is concern that Melbourne's supply is perilous and may need to rely on more distant resources. DPI assumed that a small loss of potential supply could be met elsewhere but could not comment on the cost implications.

5.2 SUBMISSIONS

DSE questioned whether the EES had adequately addressed the option of avoiding the removal of native vegetation of very high conservation significance, namely areas 9 and 15 (see discussion in Chapter 3 of this report).

5.3 DISCUSSION

The Panel accepts that there is clear policy support for facilitating extraction close to markets to reduce transport costs and that the Mountain View quarry makes positive contributions to the economy generally and of the Geelong region in particular.

Extraction of much of the Stage 2 area resource was not contentious and the overall economic benefit from the extension of the quarry was not challenged. However, environmental risks for important saltmarsh habitat associated deep extraction in the north of Stage 2 and loss of high conservation value native vegetation were key issues in this Inquiry which warrant evaluation of whether the economic benefits to the community from extraction of the resources in these areas outweigh the risk of environmental impacts.

As discussed in Chapter 4, the Panel is satisfied that the impacts, if any, on saltmarsh habitat areas can be effectively mitigated through a reactive management strategy. Therefore the focus of the Panel's assessment here is on the marginal benefit gained from extraction of the resource that requires removal of native vegetation, in particular the Site 9 and Site 15 vegetation which is of very high conservation value.

Unfortunately, the analysis in the EES presented an 'all or nothing' economic assessment. It did not address the economic implications if the areas with very high conservation value native vegetation were excluded from the extraction area.

At the hearing Mr Natoli advised Sites 9 and 15 represent 4% of the overall value of the Stage 2 stone resource. High quality rock at Site 15 has a value of \$18 million and the very high quality of the rock at Site 9 has a value of \$6 million. He emphasised that these values understate the importance of this high quality rock in blending rock of various qualities to meet customer specifications and that the blending process enhances the value of lower quality rock.

Mr Gobbo submitted that extraction in Sites 9 and 15 would add one or two years to the quarry life. Further, these areas would contribute \$1.5 million dollars profit (respectively of the order of \$0.23 million and \$1.27 million from sites 9 and 15) - and this is significant to the viability of the project and therefore the community

benefit from the project. He noted that the costs of off-site offsets for removal of native vegetation could be in the order of \$4 million - Based on habitat hectares the cost would be respectively \$0.62 million and \$3.38 million for Sites 9 and 15.

The assessment in the EES and the information presented at the hearing has not presented a convincing case that avoidance of native vegetation in Sites 9 and 15 would compromise the viability of the project as a whole, which would result in a much greater loss of economic benefits than the marginal losses being considered here. The impact on the life of the quarry if areas 9 and 15 are excluded is not a sufficient justification for the loss of vegetation of very high conservation value, although the contribution of the high quality rock to the value and utility of the overall resource is more significant. The Panel's assessment focuses on costs and benefits to the community rather than private interests. The implications for company profits are relevant only to the extent that project viability undermined and the realisation of the associated benefits to the community are placed in jeopardy.

The Native Vegetation Framework establishes a consistent basis for determining offsets required for the loss of native vegetation. As discussed in Chapter 3, the Panel has formed the view that a requirement for offsets for losses is justified and offsets in the form of transferring native vegetation Site 8 and management improvement for other areas of native vegetation on the site would support the key policy objective to achieve a substantial net gain for the environment.

The Panel recognises that measures to mitigate environmental impacts through offsets can incur substantial costs. However it notes that the transfer of the saltmarsh, which secures very significant environmental benefits, is a substantial element of the offsets recommended and the financial cost is limited due the negligible productive value of this land. While the costs incurred are not dismissed, they are the result of a commercial decision to extract the resource in areas with native vegetation with high and very high conservation value. It is for the company to determine whether the project costs, including the mitigation of environmental impacts, justify their investment.

The Panel finds that the proposal:

- will result in significant economic benefits to the community; and
- offsets for vegetation losses are justified, and it is a matter for the proponent to determine whether the associated costs mean it is in their interests to avoid removal of vegetation.

6. SOCIAL IMPACTS

Submissions did not raise any issues relating to social impacts.

6.1 EES ASSESSMENT - SOCIAL IMPACTS

Social impact assessment (SIA) is addressed Chapter 15 and Technical Appendix 15 of the EES. Evidence relating to social impacts was not presented to the Panel.

The SIA developed a social profile of the area south-east of the Princes Freeway and drew on responses to face-to-face and telephone interviews with stakeholders⁶² to identify issues of concern and assess potential social impacts. Impacts on local residents, adjacent landowners, the City of Greater Geelong and recreational and environmental users such as bird watchers, anglers, boating enthusiasts and aircraft spotters were considered.

The assessment took account of the limited population currently in the immediate environment of the site and that the planning framework does not provide for development of sensitive uses as an extensive area is zoned IN2Z (a zone intended to provide for uses requiring extensive buffers).

Residents' concerns focussed on traffic and protection of wildlife (notably the OBP) and environmental values. The end use of the quarry, noise, air emissions, health impacts, visual impacts and odour were also mentioned. The SIA assessment was that the social impact was low to moderate positive impact for employment/business and in all adverse impact categories that low or negligible impacts on the local area were anticipated. Water based groups raised no concerns about the proposal. The land based groups were concerned about the consequences of dust, noise and pollution on birds from quarrying closer to important habitat.

Three groups identified the need for more information about the proposal, including the end use and the EES process. The Proponent's approach to consultation was characterised as '*placation rather than community engagement*'.

The SIA recommended:

- the implementation of a community engagement program with residents and recreational users. Engagement commencing with traffic issues to address mitigation measures along Avalon Road was suggested and open days and sponsoring local community initiatives were also identified;

⁶² This involved:

- Face to face interviews with City of Greater Geelong Social planner/recreation officers and 21 residents, telephone interviews with 2 members of Avalon Landcare and 11 recreational/environmental groups.
- Telephone discussions with staff from Parks Victoria, Otway Geelong Tourism and Melbourne Water, Avalon College and Avalon Airport staff.

- consultation with recreational users should be formalised using one of the established formats, such Avalon Landcare or the Melbourne Water Wildlife Consultative Committee; and
- implementation of a periodic (five year) monitoring program to assess cumulative social impacts arising from the extension of the quarry.

The EES included a commitment to operate an Environmental Review Panel (ERP) to review and report the outcomes of environmental monitoring, together with continued involvement in Avalon Landcare or the Melbourne Water Wildlife Consultative Committee (see discussion in Chapter 11.2 of this report).

While a community engagement process focussing on traffic management may be a positive initiative, there is not the necessary nexus between the Stage 2 proposal and additional traffic management measures along Avalon Road to include such a process in conditions of approvals for the quarry extension. Further, Council and other road users would need to be involved in such a process and would need to share in the costs of resulting initiatives.

The Panel evaluation of the other issues raised in the SIA is provided in other chapters of this report.

7. CULTURAL HERITAGE

The Issues

- Has the Stage 2 area been adequately surveyed for both Aboriginal and post-settlement artefacts?
- Are measures in place to appropriately manage already known artefacts or any discovered during future operations?
- Has approval to disturb heritage sites been obtained?
- Is there a process in train to prepare a Cultural Heritage Management Plan (CHMP) under the *Aboriginal Heritage Act 2006*?

7.1 EES ASSESSMENT AND SUBMISSIONS

Issues related to both European and Aboriginal heritage are covered in detail in Chapter 14 of the EES.

The EES gives details on the consultation undertaken and the survey work carried out by Biosis Research as part of the EES investigation. This work was done in accordance with the *Victorian Archaeological and Aboriginal Relics Preservation Act 1972* and the *Commonwealth Aboriginal and Torres Strait Islander Heritage Protection Act 1984*. Post 27 May 2007 all work was done under the *Victorian Aboriginal Heritage Act 2006* which came into operation on that date. The survey work recorded six Aboriginal and three European heritage sites.

DPI noted that the identification and assessment of both European and Aboriginal heritage sites has been conducted thoroughly for the proposed Stage 2 area. The results of the surveys are documented in the EES. No major issues were raised relating to heritage sites and the sites that have been detected are of relatively low significance. The Aboriginal sites are mostly isolated or scattered artefacts such as quartz flakes. There is a very early (1872) recording of a burial and midden site within the proposed extraction area but this is believed to have been destroyed in the late 19th century. The European sites are mostly the remains of dry stone walls.

Permits have been obtained to disturb two identified Aboriginal heritage sites and major issues have not been foreshadowed regarding permits required to disturb further sites. Permits from Heritage Victoria will be required to disturb the known European heritage sites but again no major issues were raised.

DPI indicated that there is no Registered Aboriginal Party identified for this area and therefore Aboriginal Affairs Victoria is the appropriate body where formal agreements are required. This notwithstanding, the local Wathaurong Aboriginal community is regarded as having a connection with the area and the Proponent has consulted with representatives of this community and indicated a willingness to continue this process in the future.

Under the *Aboriginal Heritage Act 2006* there is a requirement to prepare the CHMP before works approval for the project can be granted. Accordingly, Mr Gobbo advised that the Biosis has been instructed to prepare a CHMP in accordance with the relevant guidelines.

The EES documentation proposes that a Wathaurong representative be present during removal of overburden in sensitive areas to monitor for potential sites and that it is intended to establish a Memorandum of Understanding to formalise a protocol for this process.

7.2 DISCUSSION

Has the Stage 2 area been adequately surveyed for both Aboriginal and post-settlement artefacts?

Appropriate surveys have been conducted for Aboriginal and post-settlement heritage artefacts and the work have been covered thoroughly in the EES documentation.

Are measures in place to appropriately manage already known artefacts or any discovered during future operations?

The appropriate measures appear to be in place to manage known or new sites and to obtain permits for disturbance as required. The proposal in the EES to develop a Memorandum of Understanding with the Wathaurong community to formalise a protocol for the presence of a representative during overburden removal from sensitive areas should ensure that ongoing management of this issue is satisfactory.

Has approval to disturb heritage sites been obtained?

Permits to disturb two known Aboriginal heritage sites have been granted under the superseded *Archaeological and Relics Aboriginal Preservation Act 1972*. Permits will be required under the *Aboriginal Heritage Act 2006* to disturb known remaining sites or any new sites that may be discovered. While it is possible that further sites will be found the investigations to date do not indicate that there will be any major issues.

Is there a process in train to prepare a Cultural Heritage Management Plan under the *Aboriginal Heritage Act 2006*?

There is a clear commitment from the Proponents to prepare a CHMP in consultation with the local Wathaurong Aboriginal community and Aboriginal Affairs Victoria (AAV) with the Plan to be approved by AAV and then incorporated into the planning permit and works approval processes. This will ensure that the CHMP is in place before the authorisations of the Stage 2 extension are approved.

PANEL RECOMMENDATIONS

Prepare a Cultural Heritage Management Plan for the Stage 2 extension in accordance with the *Aboriginal Heritage Act 2006*.

Develop a Memorandum of Understanding with the Wathaurong community to formalise a protocol for a representative from the community to be present during overburden removal in possibly sensitive areas.

Invite a representative of the Aboriginal community to participate in the proposed Environmental Review Committee.

Amend the relevant applications for approvals if the Cultural Heritage Management Plan does not allow disturbance of an area or for any reason permits are not granted to disturb known sites.

8. VISUAL AND LANDSCAPE CHARACTER

The Issues

- Are Impacts on coastal and hinterland landscape values acceptable?

Planning Policy

It is State and Local planning policy⁶³ to protect the visual quality and landscape character of coastal areas. Local policy highlights the importance of views to and from the coast/bay, seeks visual integration of foreshore and hinterland areas and promotes the planting of indigenous coastal species on private land, particularly adjacent to foreshore reserves. Clause 52.09 requires planting of shrubs and trees to screen activity on quarry sites and the consideration of alterations to the topography (other than for driveways, drains, bund walls or landscaping) within 20 metres of the boundary.

8.1 EES ASSESSMENT - VISUAL AND LANDSCAPE CHARACTER

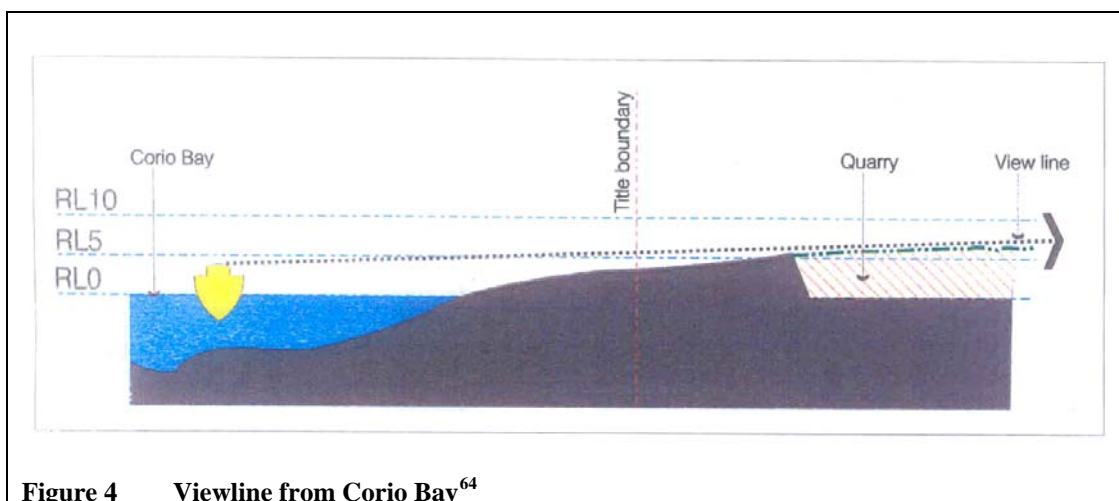
The EES addresses visual impacts in Chapter 12 and Technical Appendix 10.

The site is in a flat area with few visitors and no elevated view points. It slopes from 10 AHD in the north-west down to the coast (0 AHD) with the majority of Stage 2 lying between 5-10m AHD. Along the north eastern edge of the quarry the existing ground level is 4-5 metres and at the western edge the ground level rises to 10 AHD, leaving a 5-6 metre potentially visually exposed face. Indigenous vegetation (grassland, saltmarsh and aquatic herbland) and pasture is all very low in height but some trees have been introduced, for example on bunds and along roadsides. The major visual elements of the quarry are earth mounds around the perimeter of the site, the exposed faces and crushing plant/structures.

Opportunities to view the quarry from inland locations are restricted due to roadside vegetation/mounds and the site's location relative to the Cheetham Salt Works, Avalon Airport, the Western Waste Treatment Plant and the Point Wilson Munitions area. The quarry would also be an insignificant element in the viewsheds of dispersed houses in the locality which are more than 2 kilometres from the site.

Earth bunds planted with vegetation will screen most views to the quarry from the bay and land along the coast to the east. There may be some potential for water based views of a thin band of quarry face that would be difficult to differentiate from the background landscape.

⁶³ See Clauses 15.08, 21.13



8.2 DISCUSSION

Visual impacts associated with Stage 2 were not contentious and were not raised in submissions to the Panel. The Panel accepts the EES visual assessment that, with the proposed establishment of vegetated bunds, the proposal will have minimal visual impacts. It is the site's interface with coastal areas that is most sensitive from a visual perspective, as well as ecologically. Planning policy seeks visual integration of coastal areas with their hinterlands and the recommendations relating to the planting of indigenous vegetation from relevant EVCs for ecological purposes will also support objectives to protect landscape values. The Panel discusses the timing of the establishment of vegetated bunds in Chapter 4, noting that they should be established well in advance of quarrying activities in nearby stages.

⁶⁴ Source EES page 12-14

9. TRAFFIC

The EES addresses traffic impacts in Chapter 13 and Technical Appendix 12.

Stage 2 maintains existing traffic conditions and was not contentious. The proposal will not increase the quarry traffic generation of approximately 300 trips per day, most of which occur during the daytime with up to 20 b-double truck movements in the evening/night. Existing access routes are to be maintained, with daytime traffic using Avalon-Dandos Roads and evening/night traffic using Pousties-Beach Roads to minimise impacts on residential properties in the locality.

The assessment showed that the proposal will not have an adverse effect on the local road network and road works to mitigate impacts are not required. It was noted that trucks are not causing road structure problems and the EES includes a commitment by the Proponent to continue routine maintenance of access roads. Conditions of subsequent approvals should formalise the arrangements for contribution to maintenance of roads used for access to the site.

Provided the existing arrangements for evening/night traffic are maintained, the Panel are satisfied that traffic management is adequately addressed.

PANEL RECOMMENDATIONS

Require evening and night time traffic to use the Pousties-Beach Road route to minimise impacts on residential properties in the locality.

Formalise arrangements for a contribution to maintenance of roads used for access to the site through conditions of subsequent approvals.

10. REHABILITATION AND AFTER USE

The Issues`

- The degree to which a sustainably usable environment can be created without excessive ongoing maintenance.
- The extent to which the rehabilitated area may have adverse impacts on adjoining valued habitats and ecological systems.
- The capacity of the rehabilitated area to cope with changing conditions resultant from climate change.

What is Proposed

As noted in Part A the proposed Stage 2 extraction area is currently largely in the Industrial 2 Zone with a small portion of the extension area immediately to the south and west of the dry saltmarsh within a Rural Conservation Zone 15. A Development Plan Overlay applies to the IN2Z land and requires approval of a development plan before a planning permit (and amendment of the work authority) can be issued. The zoning of the land and the DPO establish this land's future for large scale industrial development, especially for industries requiring substantial buffer distances around them (see Chapter 1.5.5).

To facilitate redevelopment of the land it is proposed to stage the quarry development⁶⁵ to permit progressive rehabilitation in preparation for future industrial uses⁶⁶. The final ground level for most of the developable land is lower than the natural ground as the extracted area would not be fully backfilled under the proposed rehabilitation plan.

The EES indicates that the objectives of the progressive and final rehabilitation of the site (Stage 1 and 2) are to:

- leave the worked out areas (and presumably buffer areas) in a safe and stable form suitable for industrial development;
- effectively manage run off;
- create ecologically beneficial wetland systems;
- manage water quality for flora and fauna; and
- effectively manage flows to Corio Bay.

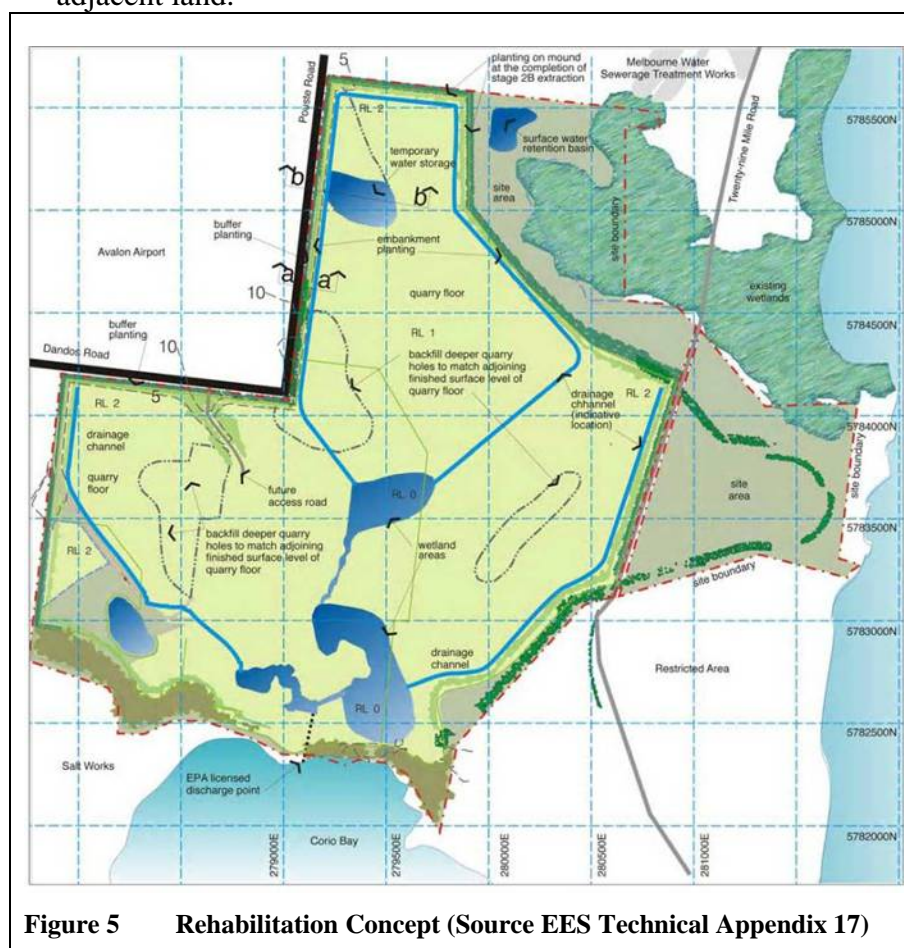
The rehabilitation is to be carried out in accord with the concept⁶⁷ (see figure 5) and guidelines⁶⁸ presented in the EES which cover issues such as:

⁶⁵ Figure 2.16, page 2.23 of EES

⁶⁶ Bell Cochrane & Associates, (Variation to Work Authority and Work Plan) for an Extension to Extractive Industry Work Authority No 41 Point Wilson Quarry. Project No B05_014, 28th November 2005

⁶⁷ Figure 2.22, page 2-37 of the EES

- slope angles for backfilling of areas that will eventually be both above and below water;
- a series of ephemeral perched and permanent wetlands linked together by drains to collect surface run off with inline sediment settling traps to ensure that the water in the wetlands is largely free of suspended matter;
- drains created to be able to pass the one in 100 year storm event through the area without creating flooding;
- a down gradient pondage to act as the collector for all excess water prior to discharge to Corio Bay by pumping when water levels rise to within 0.2m of the adjacent land surface;
- elevated grassland and wetland vegetation to create sustainable habitats with low maintenance;
- coastal, quarry face rehabilitation, quarry to beach and quarry floor treatments; and
- the whole area is proposed to continue to be surrounded by low grassed and possibly treed bunds which separate the former quarried area from the adjacent land.



The process proposed involves:

- rehabilitating all terminal quarry faces with quarry waste and overburden to nominated slopes within two years of their completion;

- backfilling the worked out quarry floor progressively with quarry waste and overburden graded to achieve a slope from the north to the south at elevations ranging from 2.0m AHD to 0.5m AHD at the south;
- backfilling deeper sections of the quarry floor to at least 0.5m AHD and incorporating these areas within a surface and ground water management and water table control system. The finished surface level would be underlain by compacted, graded quarry waste with a surface soil layer;
- a groundwater interception system based upon drains, bores and other structures found to be effective in controlling the water table across the area;
- ongoing pumping to ensure water tables are held at a minimum of 1.0m below the rehabilitated ground surface level at all times; and
- collection of surface run off, including storm water flows, by a series of double profile deep drains excavated into the Newer Volcanic substrate.

10.1 SUBMISSIONS AND EVIDENCE

Rehabilitation plans in the EES for the entire Mountain View Quarry site (both Stage 1 and 2) were supplemented by verbal evidence and presentations from:

- Mr Natoli who set out the rehabilitation plan objectives, proposed end uses and the processes by which these would be achieved;
- Mr Nolan who set out the rehabilitated site drainage and water table control measures;
- Mr Lane who identified issues which might arise as a consequence of the depth to water table post completion being inadequate to avoid soil salination;
- Mr Mueck who addressed the practicality of incorporating native vegetation offsets by utilizing the revegetation of the rehabilitated quarry and the bunds created around the pit margin. This concept was directed in particular to the loss of *Plains Grassland*. Consideration was also given to the possibility of achieving native vegetation offsets through the transfer of the Barro section of the dry saltmarsh into public ownership; and
- Mr Link who noted that the quarry proposal and the rehabilitation plan is consistent with the Greater Geelong Planning Scheme and appropriately provides for the transition of the land to an industrial precinct with large scale industrial development.

Mr Lane believed that managing the water table to be at a depth of only 1.0m below the rehabilitated land surface would lead to soil salinisation problems due to capillary rise. He considered that either the land surface would need to be higher than 1.0m above the surface level or that a capillary break layer would be needed to keep the water table down. Mr Nolan, responded that it would be possible to keep the water table at greater depth below the rehabilitated land surface by extending the depths of the proposed drains. These would act to hold the water table down quite effectively so long as sump pumping was maintained. Mr Lane noted that if the ground water table rises due to climate change, deepening of the drains may be necessary to accommodate the increased groundwater flows and to accommodate the storm water runoff events then necessary.

DSE responded to rehabilitation matters only specifically relating to the issues of native vegetation offsets which are discussed in Chapter 3. DSE set out the principles which need to be met and the standards which apply. Issues relating to the use of rehabilitated perimeter land for creating offsets for native vegetation losses were also discussed.

DPI set out the Department's role in relation to rehabilitation noting that the lodgement of a rehabilitation bond is required and is based on the current liability of the site as defined by the rehabilitation plan. The adequacy of bond levels is reviewed on a regular basis. The present bond, which covers Stage 1, would be reviewed prior to the approval of Stage 2.

At this stage DPI considers the rehabilitation plan is conceptual only and further information is required prior to approval. DPI highlighted that the rehabilitation plan does not currently show progressive rehabilitation of worked areas but noted that the central location of the plant with extraction radiating outwards limits the opportunities for progressive redevelopment. Nevertheless, DPI is concerned to ensure extensive bare surfaces are not on the site for an extended time prior to rehabilitation taking place. They also require a final landscape plan to be developed complete with details of the contours and surface treatments proposed so that they can move through the approvals process set out in the endorsed Work Plan.

10.2 DISCUSSION AND CONCLUSION

It was generally recognised that the rehabilitation plan is conceptual at this time and is subject to a further approval process under the requirements of the planning scheme (permit and Development Plan Processes) and the endorsed Work Plan. This will be undertaken in concert between the CoGG, DPI and DSE⁶⁹. The Panel agrees that given the timeframe before final rehabilitation it is entirely appropriate that rehabilitation plans are of a conceptual nature supported by indicative guidelines. What is important is that a sound framework is in place to guide both rehabilitation and the subsequent development for industrial purposes.

Rehabilitation Plan Sustainability

It is recognised that there is a long timeframe before final rehabilitation and the conceptual rehabilitation plans will be refined in the interim period. However, a number of factors that should be taken into account in rehabilitation planning that were apparent from the Panel process are recorded here.

The Panel accepts Mr Lane's evidence that the shallow water tables proposed beneath the eventual rehabilitated surface could be drawn up by evapotranspiration of vegetation. Since the groundwater is brackish to saline, capillary rise could render the surface soils salinated and infertile after dry periods. The Panel recognises that capillary rise is related to the character of the soils and the suction pressures which they can generate when subject to drying stress. At this time the predominant soil type to be used in rehabilitation is stated to be compacted mine waste and overburden. Much of this material is clayey or would have a clayey matrix after compaction. It

⁶⁹ Under the MOU between the two departments dated 4 January 2003

would be likely to exhibit a significant potential for capillary rise causing soil salinisation. To avoid this issue, either the thickness of the backfill required for vegetation would have to be substantially increased; or a coarse grained capillary break layer would need to be placed above the highest likely level of the water table post rehabilitation. The latter was put forward by Mr Lane as a potential solution. Alternatively, the water table would have to be permanently maintained at a level much lower than the one metre below ground surface currently proposed.

The Panel accepts that all of these alternatives could work, but the last may not be desirable without further evidence, in that it might continue a groundwater level moisture stress around the adjacent perimeter of the dry saltmarsh (see Section 2.2 hereof). The capillary break would appear to be the most reliable solution and should be able to be implemented using selected quarry waste.

The issue to be resolved with such an approach is the ultimate height to which the water table may rise given Climate Change influences on both sea level and water table levels across the site. It would seem probable that both a capillary break and groundwater pumping to control water table levels will need to be included in the post quarrying closure of the site.

Determining the extent to which capillary rise occurs within compacted mine waste and overburden backfill can be achieved quite simply. Areas of Stage 1 of the quarry have already been backfilled in much the same manner as proposed for Stage 2. Some of this activity has probably occurred in areas where the water table is only about 1 to 2 m below the surface. In these areas, it would be possible to drill in shallow monitoring wells in which water table variation and capillary rise can be measured using appropriate moisture sensors. These systems can be used to track changes as the moisture values change with the seasons and weather patterns and as selective vegetation grows, matures and dies back. It would seem entirely achievable to gain the necessary data on which to define the water table control approaches required to ensure that the quarry rehabilitation plans are sustainable.

The Panel concludes that soil moisture and capillary rise measurements across an area of Stage 1 representative of the proposed rehabilitation process is desirable. The objective of this is to provide a design basis for determining the best means of mitigating potential soil salinisation issues arising from the shallow depth of the water table below the final rehabilitated soil surface currently proposed for revegetation within the Rehabilitation Concept Plan in the endorsed Work Plan for Stage 2.

Irrespective of how the water table is managed in order to avoid soil saturation or salinisation of the rehabilitated surface created, the rehabilitation plan will need to address responsibility for ongoing pumping or discharge of groundwater at least. This is because the sump which will collect the site drainage will be at a level below the present sea level. For this responsibility to be avoided in the future, it would be necessary to create a siphon drainage from the sump with the capacity to handle the entire maximum flow from the site and for the site to be backfilled to a significantly higher surface level than is currently proposed with or without a capillary break layer being included.

Impact on Adjoining Land

The EES and material provided to the Panel only raised issues regarding rehabilitation plan impacts on the dry saltmarsh (Site 8) to the east and did not highlight concerns relating to other adjoining land. The Panel has focussed on implications for the dry saltmarsh but has also briefly considered impacts on other adjoining areas.

Increased pumping to control water tables below the rehabilitated quarry area should not exacerbate the condition of the dry saltmarsh long term, since this will be subject to increased tidal and groundwater inundation due to Climate Change influences. Indeed, as Dr Meredith commented in answer to a question from the Panel, the dry saltmarsh will be moved inland by rising sea levels and would be “squashed” against the rising land surface. These are not phenomena for which the quarry is responsible. Dr Meredith said that he felt that an allowance for sea level change of 1.0 m would be necessary and that this would cause the dry saltmarsh to migrate inland by about 20m.

The Panel raised an issue related to the proposal that the rehabilitated quarry area would permanently divert a significant amount of the surface water catchment from the dry saltmarsh. While this runoff is likely to be of lower salinity water than the tidal water and the groundwater contributions to the dry saltmarsh, it is part of the natural water and salinity balance of the dry saltmarsh.

Mr Mueck responded that the dry saltmarsh vegetation is quite tolerant of varying water salinities. He added that saline conditions predominate across most of the dry saltmarsh all the time except around the perimeter where some lower salinity inputs have had minor effects on occasions. He was not concerned that this water was to be diverted from the dry saltmarsh for the period of quarry operation as this would reduce the potential for exotic vegetation to become established in this area. This area will be sustained by the addition of compensatory brackish to saline water, if found necessary, by techniques as set out in Chapter 4.1 hereof. This will have to be applied for decades over the operational life of the quarry, but post quarrying the dry saltmarsh would have to depend upon the conditions established in the rehabilitation plan, including any diversion of surface water catchments previously contributory to the dry saltmarsh.

Mr Nolan indicated that on present plans it would be possible to divert much of the natural runoff into the northern end of the quarry by excavating a channel across the eastern quarry boundary to allow runoff to be released into the dry saltmarsh. Such a plan could be made part of the rehabilitation program as there would be adequate head available for flow diversion. The Panel considers that a firm decision on the need or otherwise for such action should be made on the basis of the monitoring and testing results derived from the dry saltmarsh (see discussion in Chapter 4.1). Should that data prove inconclusive in respect to the desirability of directing lower salinity runoff to the dry saltmarsh perimeter area, then diversion of runoff from those areas of the quarry with sufficient floor elevation to drain under gravity to the dry saltmarsh should be made part of the rehabilitation plan.

The Panel concludes that any impact of the quarry rehabilitation on the adjoining land and in particular on the dry saltmarsh cannot be determined at this stage because of the lack of data on the effect of hydrological/salinity relationships on the dry saltmarsh vegetation diversity. In addition, the impacts of climate change on sea

levels and water table elevation are yet to become clear. Decisions on rehabilitation actions should then be made progressively as data clarifies the actions necessary. These decisions should be made on the basis of advice from the Environment Review Committee closer to the time of quarry closure and final implementation of the rehabilitation plan. Notwithstanding this conclusion, the Panel is confident that, if the skills and funding of the Environment Review Committee are adequate, the process proposed will ensure that the habitat values of the dry saltmarsh will not be compromised.

In so far as the land to the west and south is of concern, the topography of the land, in the Panel's opinion, makes it very unlikely that the changed water table conditions beneath the rehabilitated quarry will have any discernible impact. This is because the water table in these areas will be largely stabilised by proximity to the groundwater exchange interface with the sea level in Port Phillip Bay.

The land to the north and south east of the quarried area may suffer some water table decline below natural levels consequent upon any ongoing pumping required to maintain low water tables beneath the rehabilitated quarry. This seems unlikely to have any impact upon the ecological values of the natural environment. This interpretation is based upon the maps of water table prior to quarrying⁷⁰ when compared to the surface topography maps⁷¹. These show that the water table beneath these areas has generally been over 3 to 7.5m below land surface. Such a depth would render the groundwater unavailable to the shallow rooting vegetation typical of these landforms. The Panel would expect this condition to persist.

Rehabilitation to Enhance Ecological Benefits

The Panel records a number of factors that were raised in the EES and/or during the Panel process that should be taken into account in the further development of the Rehabilitation Plan. They include:

- the EES includes a commitment to specifically develop at least one of the proposed wetlands to provide additional habitat for the Growling Frog;
- as far as practicable locally indigenous species should be utilised in rehabilitation works but this may not always be possible especially with ground cover plants⁷². The use of indigenous plants, which are low in height and do not include trees, is particularly desirable at the interface with the coastal areas. While the inclusion of trees for screening purposes is desirable at other interfaces, careful consideration should be given to the composition of revegetation of areas adjoining the coastal zone to balance both visual and environmental objectives;
- buffer treatments, including the creation of bunds, in the vicinity of coastal zones should be established well in advance of extraction (and rehabilitation) at a time when migratory birds are not present;

⁷⁰ Figure 3.2, page 22, Appendix 1

⁷¹ Bell Cochrane Stage 2 Development Plan, 28th November 2005

⁷² The issue was addressed in a letter of 21 August 2002 from Biosis Research to the Barro Group (Letter attached to Appendix 2 of Bell Cochrane & Associates – Stage 2 Development Plan (Variation to Work Authority & Work Plan))

- the Rehabilitation Plan should maintain the opportunity for the inland migration of coastal vegetation, having regard to the topographical and hydrogeological characteristics;
- offsets anticipated should include long term management of remnant native vegetation outside the extraction area to enhance its conservation values; and
- it is understood that the CoGG has raised the possibility of retaining exposed quarry faces rather than the proposed treatment of using quarry waste and overburden to achieve nominated slopes. The treatment of these faces is a matter that can be addressed in the future, having regard to factors such as the aesthetic contribution of these faces, safety implications and whether it is desirable in terms of fauna habitat and the provision of roosting sites for raptors.

Again the Environmental Review Committee will have an important role in advising on appropriate responses to these issues.

Providing for Impacts of Climate Change

The issue of Climate Change will remain an area of uncertainty for some years. While the quarry operator is not responsible for the rises in sea and water table levels due to Climate Change, there are implications for the rehabilitated land, which will be below natural ground level, and the rehabilitation plan will need to incorporate appropriate responses. This uncertainty demands that the ultimate rehabilitation plan accepted by DPI and DSE incorporates flexibility to respond to changing conditions over time. In particular, the Proponent will need to ensure the rehabilitated surface is at an elevation (not in excess of the original surface level) sufficient to ensure that soil salinisation does not occur as a consequence of rising sea and water table levels.

Until more reliable data is to hand from future monitoring the bench mark level should be the sea level rise adopted by the Coastal Strategy when it is announced. Mr Brookes (DSE) and Mr McLeod (DPI) submissions considered that flexible rehabilitation plans could be agreed against sub-stages of the quarry development within the overall scope of both Stages 1 and 2. This approach would also benefit from the increasing database deriving from the monitoring and testing undertaken as part of the adaptive management plan for the dry saltmarsh. Flexibility in rehabilitation was also sought by Mr Gobbo in his closing submission. He suggested that a rolling plan could be developed and costed as the basis for determining the rehabilitation bond. This bond could then be released progressively as the plan sub stages are completed.

The Panel concludes that a rolling staged rehabilitation plan would be a sensible and desirable means of achieving the best outcome for the area. This approach should be agreed between the Proponent, the DPI and the referral authorities, taking into account the impacts of climate change becoming apparent in the monitoring programs associated with the adaptive management plan implementation over the 50 years quarry life currently projected.

It is recognised that there is a long timeframe before final rehabilitation and the conceptual rehabilitation plans will be refined in the interim period. However, there

are a number of factors that should be taken into account in rehabilitation planning that were apparent from the Panel process are recorded here.

The Panel accepts Mr Lane's evidence that the shallow water tables proposed could be drawn up by evapotranspiration of vegetation. Since the groundwater is brackish to saline, capillary rise could render the surface soils salinated and infertile after dry periods. The Panel recognises that capillary rise is related to the character of the soils and the suction pressures which they can generate when subject to drying stress. At this time the predominant soil type to be used in rehabilitation is stated to be compacted mine waste and overburden. Much of this material is clayey or would have a clayey matrix after compaction. It would be likely to exhibit a significant potential for capillary rise causing soil salinisation. To avoid this issue, either the thickness of the backfill required for vegetation would have to be substantially increased; or a coarse grained capillary break layer would need to be placed above the highest likely level of the water table post rehabilitation. The latter was put forward by Mr Lane as a potential solution. Alternatively, the water table would have to be permanently maintained at a level much lower than the one metre below ground surface currently proposed.

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The issue to be resolved with such an approach is the ultimate height to which the water table may rise given Climate Change influences on both sea level and water table levels across the site. It would seem probable that both a capillary break and groundwater pumping to control water table levels will need to be included in the post quarrying closure of the site.

Determining the extent to which capillary rise occurs within compacted mine waste and overburden backfill can be achieved quite simply. Areas of Stage 1 of the quarry have already been backfilled in much the same manner as proposed for Stage 2. Some of this activity has probably occurred in areas where the water table is only about 1 to 2 m below the surface. In these areas, it would be possible to drill in shallow monitoring wells in which water table variation and capillary rise can be measured using appropriate moisture sensors. These systems can be used to track changes as the moisture values change with the seasons and weather patterns and as selective vegetation grows, matures and dies back. It would seem entirely achievable to gain the necessary data on which to define the water table control approaches required to ensure that the quarry rehabilitation plans are sustainable.

The Panel concludes that soil moisture and capillary rise measurements across an area of Stage 1 representative of the proposed rehabilitation process is desirable. The objective of this is to provide a design basis for determining the best means of mitigating potential soil salinisation issues arising from the shallow depth of the water table below the final rehabilitated soil surface currently proposed for revegetation within the Rehabilitation Concept Plan in the endorsed Work Plan for Stage 2.

Progressive Rehabilitation and Redevelopment

DPI noted that the rehabilitation plan provides limited progressive rehabilitation of the quarry, acknowledging constraint imposed by staging radiating outwards and operational requirements to maintain access to rock of various quality at various quarry faces.

The Panel accepts that opportunities for progressive rehabilitation and redevelopment may be limited and notes that this may actually preserve the opportunities offered by a very large site with extensive separation from sensitive uses. However, the Panel also agrees with DPI that post-extraction areas need to be maintained in a safe condition that does not cause adverse impacts such as causing a source of dust. The inclusion of interim measures prior to final rehabilitation in the rehabilitation plan may be required.

The sequence of proposed rehabilitation can only begin once areas are fully quarried. In particular, areas 2A and 2B to the south west of Stage 1 (Figure 2.16 of the EES) would need to be completed before the Stage 1 area could be rationally filled and revegetated. This completion is not scheduled until about 2016. Quarry perimeter development will concentrate to the north and east with limited opportunities for finalising rehabilitation in these areas before the ultimate completion of quarrying in 2060. This means that a large area will be left exposed but the Panel is not of the opinion that this area will be a significant source of dust generation provided that completed perimeter slopes are progressively backfilled as proposed and revegetated.

Partial backfilling of the quarry floor may or may not be beneficial in terms of avoiding dust generation. This will depend upon whether the floor area can be partly filled and revegetated when the water table will be shallow and the extent to which the floor area is still required to be trafficked for resource harvesting. An unfilled floor may be wet much of the time which will inhibit dust generation. It will only be in areas that are not frequently wet that progressive backfilling/revegetation may be desirable. It should be noted that the use of a capillary break layer to prevent water table rise into partially filled areas is not practical as this layer has to be designed to be above the eventual water table. This will be indicated by the pre-quarrying water table (figure 3.2, Appendix 1) plus any rise resultant from climate change induced sea level rises. These will be matters for the operator and the ERC to consider and act upon.

Industrial After-Use – Development Planning

DPO1 applies to the site and requires approval of a development plan before a planning permit or works authority issue.

The Proponent advised that the EES indicates that a development plan has been submitted to the responsible authority and that the endorsed Work Plan forms the basis of that development plan. The Panel did not see a copy of the 'proposed Development Plan' and the matter could not be explored with the CoGG as it did not submit to the EES or attend the hearing. The Panel has assumed that Figure 1 above presents the conceptual basis for rehabilitation.

The Panel endorses the need for development planning to manage the distinct phases of use and development of the site during:

- the rehabilitation phase; and
- then the development of a substantial industrial precinct.

Planning for both phases will require responses to specific site environmental conditions/constraints and the consequences of extraction activities. The Panel also endorses the DPO1 requirements that development plans protect the potential for large scale industrial development and the inclusion of measures to protect existing wildlife habitats by prevent accidental leakages into the surrounding environment.

Submissions to the EES did not challenge the rehabilitation concept presented and, subject to issues raised in the foregoing discussion and the results of the monitoring that has been recommended, the Panel accepts that the broad concept put forward in the EES is a reasonable starting point for development planning. As noted above, the development plan will be an evolving document that will need to take account of new data, changing environmental conditions, new technology and changing market conditions. The conceptual nature of the proposed plan, together with the capacity for the responsible authority (CoGG) approval of revisions provide appropriate flexibility for Phase 1 of the rehabilitation process.

However, the Panel notes that DPO1 does not address the key issues associated with the second phase of development of this site (ie the post extraction development of a substantial industrial precinct). This is commonly the focus of development planning processes.

Given the extended timeframe involved, it is neither practicable nor appropriate to address issues such as the future road network and anticipated urban design frameworks at this point. Nevertheless, it would be appropriate to revise the schedule to DPO1 to recognise the two distinct development phases and the distinctive development issues associated with each phase. The Panel suggests that this issue could be addressed by modifying the schedule to DPO1 to foreshadow the need for a further 'Phase 2' post-rehabilitation development plan for the development of the industrial precinct. Subdivision could be the trigger for such a further development plan but this issue and Phase 2 development plan requirements have not been canvassed with the planning authority.

PANEL RECOMMENDATIONS

Develop a full rehabilitation plan that incorporates an adaptive approach to accommodate any changes in the environment over the life of the quarry. The initial plan should essentially be a concept plan, generally as proposed, with designated surface levels, ponds, etc but the plan should be subject to revision as required and as works progress.

Revise the existing rehabilitation plan concept to acknowledge the relevance of and foreshadow the need to respond to:

- **data collected on capillary rise characteristics of the backfill sequence as currently proposed; and**
- **sea level and water table level variations consequent upon climate change.**

Require regular review (at not more than 5 year intervals) of the rehabilitation plan provisions against the data deriving from the recommended monitoring and testing.

Incorporate at the outset a requirement in the rehabilitation plan for the collection and diversion of surface runoff from the quarry drainage system to the dry saltmarsh. This requirement should only include those areas originally within catchment areas contributory to the dry saltmarsh wherever there is adequate elevation for gravity flow to the perimeter of the dry saltmarsh. This requirement shall not be required to be implemented if monitoring shows the impacts of lower salinity water on the perimeter has an adverse impact on the dry saltmarsh ecosystems.

Obtain Environment Review Committee advice on the refinement and implementation of the rehabilitation plan.

Manage revisions to the rehabilitation plan through amendments to Development Plan and the works approvals.

Developed the rehabilitation plan on the basis of 0.8 metre sea level rise over the life of the quarry but periodically review the plan to reflect current knowledge and government policy (particularly the figure adopted in the Coastal Strategy). In particular the plan will need to reflect the fact that any increase in this figure may require modification of groundwater management measures and that saltmarsh and coastal vegetation may “migrate” to higher ground in response to a rise in sea level.

Utilise, as far as practicable, locally indigenous species in rehabilitation works.

Set the rehabilitation bond at an adequate level to permit full rehabilitation. The bond can operate on a rolling basis as areas are progressively rehabilitated and the level should be reviewed from time to time as appropriate.

Provide for two phases of development planning by specifically requiring a ‘Post-rehabilitation Phase’ development plan in DPO1. The City of Greater Geelong should formulate the associated revision of the schedule to DPO1 which would need to specify a requirement for a second phase development plan, the timing of the preparation of such a plan and development plan requirements for the development of an industrial precinct.

11. THE REGULATORY FRAMEWORK

Part A of this report briefly summarised the multiplicity of legislation, policy and approval requirements that are relevant to decisions about the proposal. This Chapter does not repeat that summary but does highlight a number of matters relating to the regulatory framework that should be addressed.

There is a clear government intention to avoid duplication and inconsistency in assessment and decision making affecting extractive industry proposals. In August 1999 DPI released a document entitled *Guidelines to Planning Reforms associated with the Extractive Industries Development Act 1995* which indicated:

The planning permit should be concerned with off-site effects and the relationship of the site with surrounding land uses, while the work authority should cover operational matters of the quarrying proposal.

This Panel, like other Panels, considers this is sound advice and considers the principle should generally apply in the implementation of Panel recommendations. However, in some instances, such as in relation to the Environmental Management Plan, the inclusion of conditions in both the development plan/planning permit and the work authority will be appropriate to provide for specific consideration and actions by the Responsible Authority (CoGG) and DPI.

11.1 THE GREATER GEELONG PLANNING SCHEME

Discussion in preceding Chapters has highlighted some flaws in the planning framework provided by zones and overlays applied to the subject land. In summary they are:

- the PCRZ should not be applied to privately owned land and the SUZ1 in the south of the Barro land should be reviewed. The planning authority should identify the appropriate alternative zoning for this land;
- the proposed 'buffer' between the Stage 2 extraction area and the coastal zone (notably the dry saltmarsh) is appropriate and this should be reflected in the zoning of the land. The part of the RCZ15 within the proposed extraction area should be rezoned IN2Z;
- the environmental values to be protected via ESO1 were unclear. Part the overlay applies within the Stage 1 extraction area and the ESO within the northern portion of the proposed Stage 2 extraction areas may have been intended to relate to vegetation that no longer qualifies as a patch although the extent of the ESO does not correspond with this vegetation. The overlays do not appear to have a sound basis, do not assist decision making and should be deleted; and
- DPO1 should be revised to also address development planning for the industrial precinct post- rehabilitation.

These suggested revisions to rationalise the zones and overlays applicable to the area are not substantial but an amendment to the planning scheme would be required.

11.2 THE ENVIRONMENTAL MANAGEMENT FRAMEWORK

What is Proposed?

The Environmental Management Framework is set out in Chapter 18 of the EES. The various commitments made in the EES are set out in Table 18-1 of the EES, which is a valuable summary of measures identified throughout the EES.

The Environmental Management Plan (EMP) will be the primary mechanism for implementing environmental commitments. It envisaged that the planning permit and works plan would both be conditional on the preparation and implementation of an approved EMP. The EMP is envisaged as a dynamic, working document that will be reviewed and updated as new information becomes available and initiatives are implemented. The Panel endorses this approach as the most effective way to achieve positive environmental outcomes particularly given the extended timeframe over which the EMP will operate and the likelihood of changing environmental conditions.

The Panel does not intend to repeat the content of the draft EMP in the endorsed Stage 2 variation work authority and work plan but it is noted that the key elements of the EMP will be:

- Site Management Plans and Systems;
- Operational Procedures and plans;
- Ecological management plans;
- Rehabilitation plans;
- Contingency plans; and
- Monitoring programs.

The Draft EMP will require further development to fully reflect commitments within the EES and the further measures recommended by this Panel. For example, the Draft EMP indicates that Net Gain Policy will be adhered to but does not articulate how this will be achieved. Similarly, management of blasting to reduce disturbance in sensitive ecological areas is foreshadowed but criteria are not included. Panel recommendations also anticipate a more specific framework for matters such as monitoring, testing and minimising disturbance to ensure the dry saltmarsh habitat values are protected and these should be reflected in the EMP.

Environmental Review Committee

It is proposed to establish an Environmental Review Committee (ERC) to review the outcomes of environmental monitoring. The ERC would be established when Stage 2 commences and would meet annually for three years and then as required. It would comprise at least the key regulatory agencies, namely, CoGG, DSE, DPI, Parks Victoria and Southern Rural Water and preferably other representatives as outlined below.

DPI advocated that the work plan include a condition requiring an ERC:

- which would commence meeting two years prior to the extraction in Stage 2 and meet a minimum of three times a year; and
- with membership to be extended to include Avalon Airport and a maximum of two community representatives.

The Panel considers the ERP is an important element of the environmental management framework that will be vital to the formulation of effective responses. The Panel has recommended that adjacent landholders (Melbourne Water, Department of Defence and Avalon Airport Management), Aboriginal representation and community groups (such as Birds Australia and the Spit Nature Conservation Reserve Advisory Group) be invited to join the committee.

It will also be important that the ERC is adequately resourced. The Proponent should ensure appropriate specialist expertise is available to the ERC and that ERC advice informs the formulation and implementation of the adaptive management plan, particularly in relation to the ecology of saltmarshes and hydrology/soil science.

PANEL RECOMMENDATIONS

Develop the Environmental Management Plan to provide more specific guidance, particularly in relation to the protection of the dry saltmarsh, and to reflect this Panel's recommendations.

Establish an Environmental Review Committee to advise on the formulation and implementation of the Environmental Management Plan and particularly to oversee appropriate adaptive management over the life of the quarry. The ERC membership should include DSE, DPI, Parks Victoria, EPA and City of Greater Geelong. It would also be desirable to invite Aboriginal representation, adjoining landholders (esp Melbourne Water, Avalon Airport, Department of Defence) and members of the Spit Nature Conservation Reserve Advisory Group to facilitate complementary management of land in the area.

Forward monitoring information to other adjoining land managers.

PART C: EVALUATION AND ASSESSMENT

12. RESPONSE TO TERMS OF REFERENCE

The key tasks in the Panel Terms of Reference are:

- i) to inquire into and make findings regarding the potential environment effects (impacts) of the proposed project, including impacts on relevant matters under the EPBC Act.*
- ii) to recommend any modifications to the project as well as environmental mitigation and management measures that are needed to achieve acceptable environmental outcomes, within the context of applicable legislation and policy.*
- iii) to recommend whether the project should proceed in light of its expected effects, assuming the measures recommended under (ii) were implemented.*

The Panel findings on the environmental effects of the proposal address the objectives of the EES and have regard to mitigation and management measures proposed. The EES objectives are:

- *To avoid or minimise impacts on species and communities listed under the FFG Act and EPBC Act, to the greatest extent practicable.*
- *To avoid or minimise impacts on other indigenous species and communities to the greatest extent practicable and comply with net gain requirements for biodiversity outcomes.*
- *To protect Aboriginal and post-settlement heritage to the greatest extent practicable.*
- *To protect catchment values, including surface water quality, streamflow, aquatic health and groundwater values to the greatest extent practicable.*
- *To avoid or minimise impacts on potential beneficial uses of surface and ground water quality and water flow to the greatest extent practicable.*
- *To avoid or minimise noise, traffic and other impacts on neighbouring landuse or activities and local amenity to the greatest extent practicable.*
- *To establish an environmentally acceptable and sustainable basis for rehabilitation plans and reuse concept(s) for the project area.*

Are impacts on species and communities listed under the FFG Act and EPBC Act avoided or minimised?

With respect to the loss of native vegetation listed as High or Very High Conservation value, the highest value area (Site 8 - 37.34ha) will be protected completely but two areas classified as of Very High Conservation Value are proposed to be cleared. The Panel has concluded that the case for protecting one of these sites (Site 9 – 1.26ha) is not strong as it has been degraded since the original assessment and recovery of its former values is doubtful. The other site (Site 15 – 6.85ha) is more an ‘on balance

decision'. The Panel's view is that the economic benefits combined with the substantial environmental benefits from the transfer of Site 8 plus a buffer into the Public Land estate and management to enhance the remaining native vegetation should result in a net gain in terms of conservation values and an overall community benefit.

The Commonwealth has accredited the Victorian EES process as the required assessment approach for impacts relevant to the EPBC Act.

The most important species where possible impacts from the Stage 2 expansion of the quarry are identified is the Orange-bellied Parrot which potentially utilises the habitat provided by the dry saltmarsh on the site (but outside the extraction area) and habitat on adjoining land.

The principal concern is the effect of dewatering from deeper areas of extraction on groundwater inflows to the dry saltmarsh and therefore the health and viability of this important habitat. The Panel's review of EES documentation and the evidence presented indicates that any impacts on the dry saltmarsh hydrology are likely to be very minor. Nevertheless, an adaptive management system is proposed which will be informed by comprehensive monitoring and trialling of the hydrological impacts and the health of the vegetation community. Trials, monitoring and adaptive management responses would be overseen by an Environmental Review Committee. The proposed buffer between the extraction area and the dry saltmarsh has a function to reduce disturbance but also provides for inland migration of this habitat if sea level and water tables rise as a result of Climate Change. Measures to minimise disturbance in ecologically sensitive areas are also recommended. With these safeguards the Panel is satisfied that any risks to the parrot's habitat will be effectively addressed and the capacity for adaptive responses to protect this habitat under changing environmental conditions will be enhanced.

Issues relating to other listed species were not identified.

Are impacts on other indigenous species and communities avoided or minimised to the greatest extent practicable and would there be a net gain in biodiversity outcomes?

The proposed Stage 2 expansion of the quarrying operations will of necessity entail removal of native vegetation. The Panel's view is that, having regard to policy support for extraction of stone resources close to markets, economic benefits to the community, the location and characteristics of the resource, and quarry operational requirements the extent of native vegetation lost has been minimised. With offset provisions there is the capacity to ensure an overall net gain in biodiversity and enhanced protection of some particularly valuable vegetation communities.

Is Aboriginal and post-settlement heritage protected to the greatest extent practicable?

Major issues for either Aboriginal or post-settlement heritage have not been identified. Thorough surveys have been carried out on heritage values and appropriate processes are in place or in train to ensure that required processes are followed for any disturbance of sites that may be required.

Are catchment values, including surface water quality, streamflow, aquatic health and groundwater values, protected to the greatest extent practicable?

The proposed quarry extension will intersect the upstream end of some minor ephemeral runoff areas and will impact upon the water table of the Newer Volcanic basalt aquifers which underlie the area. Of these, the runoff would normally discharge after catchment soaking rainfall periods only to the dry saltmarsh. The groundwater would also discharge to the dry saltmarsh but probably only by way of minor capillary upflow around the perimeter of the dry saltmarsh.

The dry saltmarsh represents the upstream end of the Spit Nature Conservation Reserve west of 29 Mile Road. This area is part of the Western Port Phillip Coastline RAMSAR area and is a valued habitat for migratory birds.

The Panel has concluded that the proposed quarry extension will reduce the frequency and magnitude of surface water discharges to the dry saltmarsh both during the quarry operational period and to a lesser extent post closure but this will have little if any discernible effect on the water quality or the aquatic or environmental health of this area as it is largely dominated by tidal flushing which is likely to increase due to Climate Change influences.

Similarly, the Panel has concluded that quarry dewatering and water management plans, informed by ongoing monitoring and testing recommended herein, are protective of the groundwater values in the environment to the greatest extent practicable.

Any changes to the wet saltmarsh are insignificant within the water/salt balance due to the effect of regular tidal flushing.

The existing EPA Licence (EW 26848) for discharge into Corio Bay nominates the location of the discharge point limits discharge to ground water and storm water collected from the quarry floor, addresses the quality of water discharged (maximum suspended solids, pH and turbidity are specified). It is not proposed to change this license.

Are impacts on potential beneficial uses of surface and ground water quality and water flow avoided or minimised to the greatest extent practicable?

The highest beneficial use category for the surface and groundwater of this area is for ecosystem support, with the most sensitive ecosystem being the dry saltmarsh. The Panel concludes that the tidally flushed nature of this ecosystem substantially limits the ecosystem sensitivity to variations in the discharge quality or quantity. Notwithstanding this conclusion, a monitoring and testing program to inform water management and the design of rehabilitation work is recommended to ensure that the beneficial use of the water is protected to the greatest extent practicable.

Are noise, traffic and other impacts on neighbouring landuse or activities and local amenity avoided or minimised to the greatest extent practicable?

The site is remote from sensitive uses and adverse impacts on neighbours due to noise or air emissions have not been identified.

The proposal does not change the generation of traffic associated with the existing quarry or its management. The current arrangements of directing evening and night traffic to and from the site via the Pousties-Beach Road and contributions to the maintenance of access routes address traffic issues and should be formalised in the conditions of subsequent approvals.

Is there an environmentally acceptable and sustainable basis for rehabilitation plans and reuse concept(s) for the project area?

Rehabilitation is recommended to be undertaken using a flexible staged approach. The Panel believes that this approach will best serve the planning objective of rendering the rehabilitated site suitable for major industrial development while also protecting and supporting the environmental values of the surrounding RAMSAR land.

The Panel has identified certain testing, monitoring and consideration by the Environmental Review Committee as being necessary to achieve an optimal approach to rehabilitation. With this work done, the Panel concludes that environmentally acceptable and sustainable rehabilitation of the site will be achievable.

13. MATTERS OF COMMONWEALTH INTEREST

Under the EPBC Act an action which will have, or is likely to have, a significant impact on a matter of national environmental significance must be referred to the Commonwealth Environment Minister for a decision on whether the action is a 'controlled action' requiring assessment and/or approval under the EPBC Act.

The Minister's delegate determined on 1 July 2004 that the project was a 'controlled action' on the basis that the project could have a potential to impact on listed species and communities. This proposed project (EPBC 2004/1590) is a 'controlled action pursuant to Sections 18 & 18A, (listed threatened species & communities), 16 & 17B (wetlands of international importance) and 20 & 20A (Listed migratory species).

On 21 January 2005 the Minister accredited⁷³ the EES as the assessment process for this project under the EPBC Act. Therefore the EPBC Act decision will be informed by the EES process assessment and the subsequent Minister for Planning's Assessment of any impacts relevant to the EPBC Act 'controlling provisions'.

The species and communities identified in the EPBC Act relevant to the project include:

- threatened flora species. None of the five nationally significant flora species potentially within 5 kilometres of the study area were recorded on the site and all were identified as having a low likelihood of occurring on the site⁷⁴.
- EPBC Listed fauna species. Of the 25 species of listed fauna⁷⁵:
 - 23 are unlikely to occur in the extraction area; many are marine or pelagic species for which there is no habitat within the study area. and
 - the Growling Grass Frog is known to occur in the immediate area but the extraction area does not provide suitable habitat
 - the Orange-bellied Parrot has been known to use the dry saltmarsh on the site but outside the extraction area and to also use nearby salt marshes.
- listed Migratory species. There is no important habitat on the site for these species although they may overfly the area and occasionally forage on the site.

⁷³ Under section 87 of the EPBC Act

⁷⁴ See EES table 17-3, Appendix 2 of Technical Appendix 6

⁷⁵ See EES table 17-4 and Technical Appendix 6 Appendix 2.

Have issues related to the Commonwealth *Environment Protection Biodiversity Conservation Act 1999* been adequately addressed?

The Panel's view is that all issues related to the "trigger provisions" of the EPBC Act have been thoroughly covered by the EES process and are addressed in the relevant sections of this report. Specifically:

- **Wetlands of International importance:** the extraction site does not include any Ramsar wetland areas. Possible offsite effects from changes to hydrology are addressed in Chapter 4.1.
- **Listed threatened species and communities:** Two listed species of fauna (Orange-bellied Parrot and Growling Grass Frog) have been recorded from adjacent areas. This is addressed in detail in Chapter 4. The Panel has found that:
 - Orange-bellied Parrot: It is very doubtful whether dewatering due to quarrying will have an impact upon the vegetation in the dry saltmarsh which is a potential habitat for the parrot. Nevertheless, trialling of water management measures and monitoring of both water and vegetation conditions in the dry saltmarsh are recommended to inform an adaptive management system overseen by an Environmental Review Committee. Other measures also recommended to protect Orange-bellied Parrot habitat include: measures to address potential disturbance from quarry operations; the maintenance of a buffer which would allow inland migration if sea/water table level rises due climate change as well as limiting disturbance; and transfer of Site 8 plus the buffer area to the Public Land estate as offsets for removal of native vegetation.
 - Growling Grass Frog: Rehabilitation plans include the creation of suitable habitat for the Growling Grass Frog.
 - Other listed species from the general area are unlikely to be affected by the proposal.
- **Listed migratory species:** There is no important habitat within the extraction area. Most occurrences are likely to be fly over or occasional foraging. Addressed in more detail in this Chapter 4.

The Panel considers that the project will not have a significant impact on any listed threatened species or communities under the EPBC Act. With the safeguards recommended, the Panel is satisfied that any risks to the Orange-bellied Parrot's habitat will be effectively addressed and the capacity for adaptive responses to protect this habitat under changing environmental conditions will be enhanced.

PANEL RECOMMENDATION

The Victorian Minister for Planning advise the Commonwealth Minister for Environment, Water, Heritage and the Arts that the Mountain View Quarry Point Wilson Extension project will not have a significant impact on any listed threatened species or communities under the EPBC Act or on Ramsar listed wetlands provided the relevant mitigation and adaptive management measures identified in the EES and this report are implemented.

APPENDIX A TERMS OF REFERENCE

TERMS OF REFERENCE
INQUIRY UNDER *ENVIRONMENT EFFECTS ACT 1978*
MOUNTAIN VIEW QUARRY EXTENSION

1. BACKGROUND

The Barro Group Pty Ltd is proposing to expand its current Mountain View Quarry operations at Point Wilson, 20km northeast of Geelong. The proposed extension involves a continuation of current quarrying activities in an extended area for a further 40 to 50 years, to source approximately 55 million tonnes of unweathered basalt. The quarried basalt would be used for the production of crushed rock, concrete, asphalt and sealing aggregates.

On 5 July 2004, the Minister for Planning decided that an Environment Effects Statement (EES) was required under the *Environment Effects Act 1978* to assess the potentially significant impacts of proposed Mountain View Quarry Extension. The EES documents were placed on public exhibition from 17 March until the 30 April 2008.

Under Victorian law, the project requires the following approvals:

- An 'Authority to Commence Work' and an amended Work Plan under the *Extractive Industries Development Act 1995* (EIDA), administered by the Minister for Energy and Resources. The Authority and Work Plan can be approved after the project has been assessed under the *Environment Effects Act 1978* by the Minister for Planning.
- A planning permit application and approval of a Development Plan under the Greater Geelong Planning Scheme, both of which will be considered by the City of Greater Geelong following the EES process.
- A groundwater extraction licence under the *Water Act 1989*, to enable pumping of groundwater to dewater the quarry where extraction is occurring in deeper areas.

The project also requires approval under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The Commonwealth Government decided to accredit this Victorian EES process as the required assessment approach for impacts relevant to the following EPBC Act controlling provisions:

- Sections 16 and 17B (Wetlands of international importance);
- Sections 18 and 18A (Listed threatened species and communities); and
- Sections 20 and 20A (Listed migratory species).

The Minister for Planning has appointed an Inquiry for Mountain View Quarry Extension the under section 9(1) of the *Environment Effects Act 1978*. After the Inquiry provides its report to the Minister for Planning, the Minister will prepare an Assessment of the environmental effects⁷⁶ of the project under the *Environment Effects Act 1978* to inform the relevant Victorian statutory decisions as well as the decision under the EPBC Act.

2 TASK

The Inquiry is required:

- i. To inquire into and make findings regarding the potential environmental effects (impacts) of the proposed project, including impacts on relevant matters under the EPBC Act.

⁷⁶ Under the seventh edition of the *Ministerial guidelines for assessment of environmental effects* (June 2006), environment for the purposes of assessment includes the physical, biological, heritage, cultural, social, health, safety and economic aspects of human surroundings, including the wider ecological and physical systems within which humans live.

- ii. To recommend any modifications to the project as well as environmental mitigation and management measures that are needed to achieve acceptable environmental outcomes, within the context of applicable legislation and policy.
- iii. To recommend whether the project should proceed in light of its expected effects, assuming the measures recommended under (ii) were implemented.

3 METHOD

The Inquiry must consider the exhibited EES, any submissions received in response to the exhibited EES, the proponent's response to submissions and other relevant information provided to or obtained by the Inquiry.

The Inquiry must conduct a public hearing and make other such enquiries as are relevant to its consideration of the potential environmental effects of the proposed Mountain View Quarry Extension. The Inquiry must be conducted in accordance with the following principles:

- The inquiry hearings will be conducted in an open, orderly and equitable manner, in accordance with the rules of natural justice, with a minimum of formality and without the necessity for legal representation.
- The inquiry process will aim to be exploratory and constructive, where adversarial behaviour is minimised
- Parties without legal representation will not be disadvantaged – cross-examination will be strictly controlled and prohibited where not relevant by the inquiry chair.

The Inquiry will meet and conduct hearings when there is a quorum of at least two of its members present including the Inquiry Chair.

4 OUTCOMES

To prepare a report for the Minister for Planning presenting:

- The Inquiry's response to the matters detailed in section 2.
- Relevant information and analysis in support of the Inquiry's recommendations.
- A description of the proceedings conducted by the Inquiry and a list of those consulted and heard by the Inquiry.

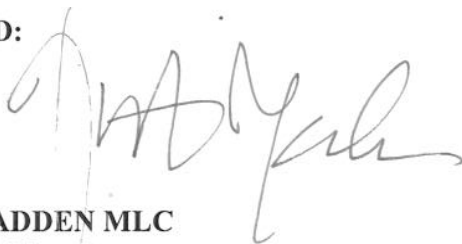
5 TIMING

The Inquiry is required to report to the Minister for Planning in writing within eight weeks of its last hearing date.

6 FEES

The members of the Inquiry will receive the same fees and allowances as a panel appointed under Division 1 of Part 8 of the *Planning and Environment Act 1987*.

APPROVED:



JUSTIN MADDEN MLC
Minister for Planning

DATE: 17 APR 2008

APPENDIX B SUMMARY OF THE INQUIRY PROCESS

The following are the key elements of the Inquiry process leading up to exhibition and the Panel hearing (derived from the DPCD submission at the Panel hearing):

29 December 2003 The City of Greater Geelong wrote to the Minister for Planning requesting a decision on whether an EES was required for the Barro Group's proposal to extend Mountain View Quarry (i.e. Stage 2).

Proponent reconfiguring the project (in consultation with CoGG & DSE/DPCD) for consideration as two stages. Stage 1 entailed a preliminary extension of the quarry involving works that did not have the potential for significant effect and therefore did not require an EES.

5 July 2004 Minister Delahunty (then Minister for Planning) decided that an EES was required.

17 June 2004 the Proponent referred the proposal to the Commonwealth under the EPBC Act.

1 July 2004, the delegate of the Australian Minister for the Environment and Heritage decided that the proposal was a "controlled action" under the EPBC Act, requiring assessment and approval.

October 2004 Technical Reference Group provided with an overview of the proposal and the assessment & approvals process.

December 2004 EPBC Preliminary Information provided to the Commonwealth which advised DSE/DPCD on the 'level of assessment' required.

December 2004 Proponent's EES study program, Draft Consultation Program & project schedule provided, including a gap analysis of previous environmental studies. Draft Assessment Guidelines advertised.

January 2005 DSE/DPCD responded (11 January 2005) and the Commonwealth accredited the Victorian EES process for this project under section 87 of the EPBC Act (21 January 2005).

February 2005 Assessment Guidelines (EES scope) finalised, Consultation Program finalised, Draft Work Plan under preparation, water study scoped.

March 2005 1st batch of draft study outcomes presented to TRG - Hydrology, Flora & Fauna and Cultural Heritage.

April 2005 2nd batch of draft study outcomes presented to TRG - Planning & Land Use, Social Impacts, Traffic Assessment.

May 2005 3rd batch of draft study outcomes presented to TRG - Noise, Air, Economics, and update on Hydrological assessment.

June 2005 Update on Flora & Fauna, Hydrological assessment, overview of EMP Framework & Draft Work Plan.

October 2005 - Dec 2006 Email distribution of draft EES chapters and revised EES study reports for TRG review.

February 2007 Presentation of new work on Flora & Fauna and Hydrological Modelling to TRG. Overview of status of all other studies & corresponding EES chapters.

April - May 2007 Draft report on saltmarsh wetland impacts provided to DPCD, DSE & DEWHA for review.

October 2007 Final reports on saltmarsh wetland, Groundwater and Net Gain provided to TRG for review.

November 2007 Final draft EES provided to DPCD review - DPCD comments/advice follow.

December 2007 Final EES provided to DPCD for authorisation to exhibit.

January 2008 the Minister for Planning authorised public exhibition of the EES as well as the request for public submissions under section 9(2) of the Act.