Relocation of Herne Hill quarry operation

Pioneer Concrete (W.A) Pty Ltd

Report and recommendations of the
Environmental Protection Authority

Environmental Protection Authority
Bulletin 510
April 1991

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Assessment No.354
ISSN: 1030 - 0120
ISBN: 0 7309 3580 9

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Summary and recommendations

The proposal to relocate the existing Herne Hill quarry operation (Figure 1) has been assessed by the Environmental Protection Authority.

This proposal was referred to the Authority in January 1990 by the proponent, Pioneer Concrete (WA) Pty Ltd. A level of assessment of Public Environmental Review (PER) was set for the proposal owing to the location of the proposal in an area of natural bushland, close to urban population areas on a prominent landform.

Existing quarry operations (Pioneer No. 1) are located on freehold land owned by Pioneer at Lot 11, Neuman Road, Herne Hill in the Shire of Swan. It is proposed to relocate the operation to a new site (Pioneer No.2), within the freehold property, 1.5 kilometres east of the present site in a valley behind the main ridge of the Darling Scarp. Pioneer No.2 is expected to be operational within three years of the date that all necessary approvals have been obtained. The new site has at least 100 years of resource.

The Darling Scarp is the most prominent landform in the metropolitan area. It consists of granite outcrops, ridges, valleys supporting winter-flowing creeks, dolerite dykes, laterite screes and a lateritic crust on the western edge. Vegetation of the proposed site varies widely owing to changing soil type and depth. Vegetation types represented include heaths, woodlands of marri and wandoo, and open forests of jarrah and marri. The area contains populations of a significant proportion of the Darling Scarp flora. Owing to the good condition of much of the vegetation, the area of the proposed site has a high conservation value for flora and fauna particularly as much of the Darling Scarp outside the metropolitan area has been heavily modified through human activity.

It is intended that by moving the quarry operation deeper into the Pioneer landholding impacts on residential areas from dust, noise, and odours will be reduced, for both existing and future residential development. Pioneer proposes to remove all structures and equipment from Pioneer No.1 and to landscape and complete the rehabilitation of the quarry area. Rehabilitation of the Pioneer No.2 site will be carried out progressively and integrated into the quarry operations.

Emissions of dust, noise, odour, and vibration from the proposed Pioneer No.2 quarry will be required to conform to the parameters as specified in licences issued under the Environmental Protection Act.

A number of environmental issues were identified by the Environmental Protection Authority from its own assessment and as a result of submissions. This report makes recommendations for the mitigation of impacts and the adequate environmental management of the project.

Recommendation 1

The Environmental Protection Authority concludes that the proposal to relocate the hard rock quarrying operation at the Herne Hill site is environmentally acceptable.

In reaching this conclusion, the Environmental Protection Authority identified the main environmental factors requiring detailed consideration as:

- **drainage management to prevent sedimentation of streams;**
- **conservation value of the area of the proposed relocation;**
- **rehabilitation of the entire quarrying operation, including the existing quarry; and**
- **impacts associated with odour, dust and noise.**

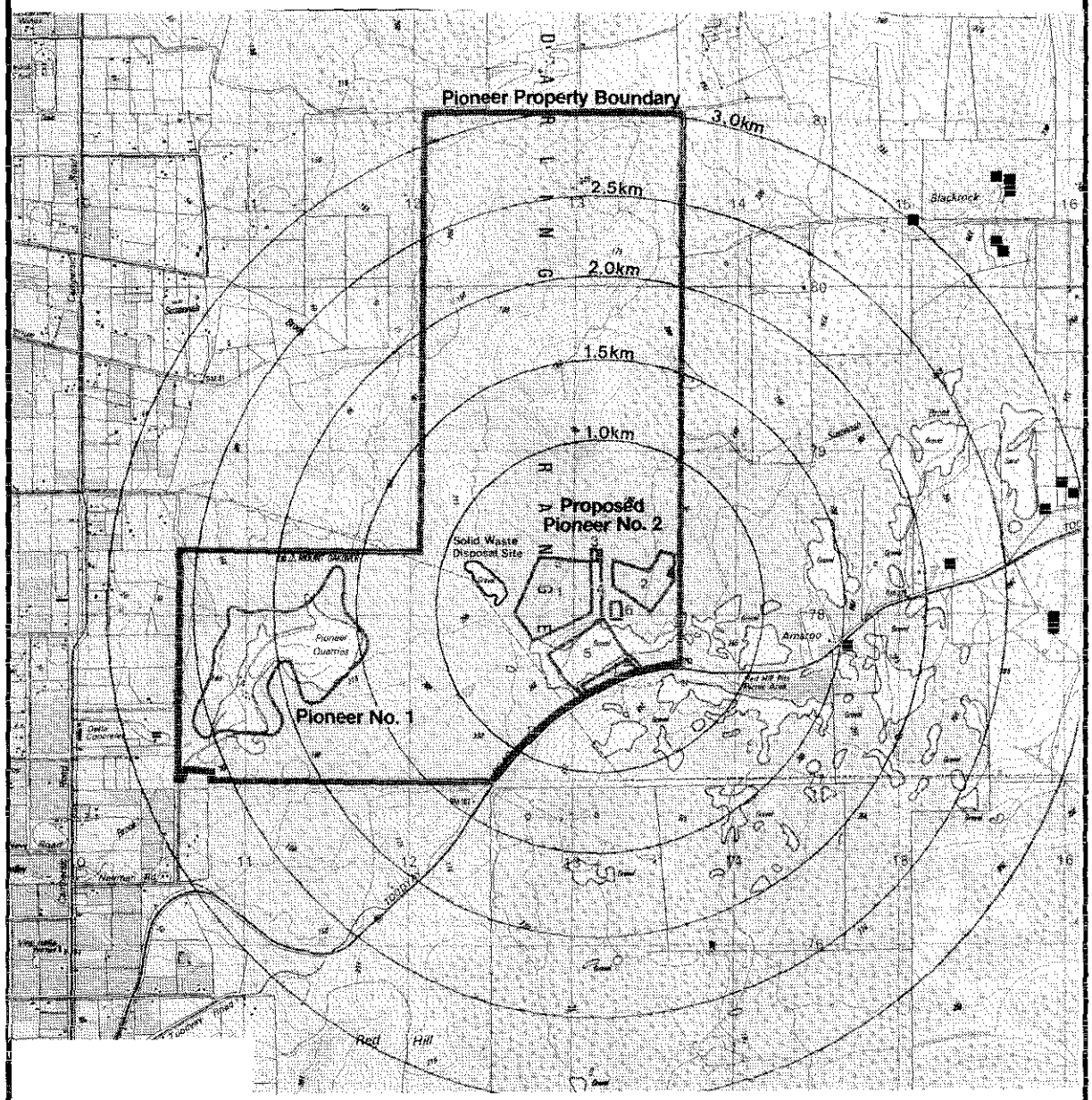

Figure 1: Project location

The Environmental Protection Authority concludes that the environmental factors mentioned above have been addressed adequately by either environmental management commitments given by the proponent or by the Environmental Protection Authority's recommendations in this report.

Accordingly, the Environmental Protection Authority recommends that the proposal as described in the Public Environmental Review could proceed subject to:

- **the Environmental Protection Authority's recommendations in this Assessment Report; and**
- **the proponent's commitments to environmental management (Appendix 1).**

Protection of Susannah Brook

The Water Authority of Western Australia has indicated that Susannah Brook is a possible site for a future pipehead dam to supplement Perth's water supply. This would place the site of the Pioneer No.2 quarry within the catchment area for the dam and renders the protection of the quality of runoff water into the brook an important consideration.

Recommendation 2

The Environmental Protection Authority recommends that the proponent ensure there be no unacceptable detrimental effects from drainage of the quarry site on the water quality of Susannah Brook, taking into account the status of Susannah Brook as a proposed source of public water supply. Accordingly, prior to the commencement of productive mining, the proponent should prepare and implement a drainage management programme for the quarry operations to the satisfaction of the Water Authority of Western Australia.

Rehabilitation plans

Rehabilitation of the quarry workings is regarded by the Environmental Protection Authority as an extremely important facet of the quarry operation and it is pleasing to note the proponent's commitment to rehabilitation (commitments in Appendix 1). The description of rehabilitation methods will need to be set out in greater detail by the proponent to allow constructive comment.

Recommendation 3

The Environmental Protection Authority recommends that within twelve months of the date of any environmental approval issued by the Minister for the Environment, the proponent submit and subsequently implement detailed ongoing rehabilitation plans for both, Pioneer No.1 and Pioneer No.2 quarry operations to the satisfaction of the Environmental Protection Authority on advice from the Shire of Swan. These plans should be reviewed initially on an annual basis for the first two years, and thereafter at five yearly intervals.

Recommendation 4

The Environmental Protection Authority recommends that the proponent should be responsible for final decommissioning and removal of the plant and installations and rehabilitating the site and its environs. Accordingly, at least twelve months prior to final decommissioning the proponent should prepare and subsequently implement, a decommissioning and rehabilitation plan to the satisfaction of the Environmental Protection Authority on advice from the Shire of Swan.

Social impact

A number of submissions raised the importance of monitoring information being made freely available to the general public. While the proponent has made a commitment to making the information available through the Environmental Protection Authority, it is considered that publicly reporting the results of the ongoing monitoring programmes will assist understanding and awareness of the quarry's operations and alleviate concern about the adequacy of the proposed management measures.

Recommendation 5

The Environmental Protection Authority notes the proponent's commitment to provide annual monitoring reports to the Authority and recommends that the proponent lodge a copy of each report with the Shire of Swan for perusal by interested parties.

The relocation of the Herne Hill quarry is partly in response to social pressures stemming from the proximity of Pioneer No.1 to urban areas. It is therefore recommended that planning authorities are aware of the need to ensure the Pioneer No. 2 site is given protection from further encroachment of urban areas in order to prevent incompatible land uses being in close proximity to one another.

The draft Basic Raw Materials Resource Protection Strategy, formulated by the State Planning Commission in 1988 to prevent the sterilisation of basic raw materials, recommended that the Pioneer No.2 site be designated a "priority resource area", which means it is regarded as an area of high resource potential from where the future supplies of raw materials will be sourced. The strategy was formulated to ..."protect sufficient quantities of basic raw materials to meet long term planning needs. The strategy was to recognise specific areas for extraction to avoid conflict with competing land uses, particularly with urban and special rural development, and the management of forests and water catchments."

Recommendation 6

The Environmental Protection Authority recommends that planning authorities are cognisant of the need to separate incompatible land uses and ensure that Pioneer No.2 quarry is afforded protection as befits its identification by planning authorities as a 'priority resource area '.

While the Authority can use its assessment processes to recommend against environmentally unacceptable land uses within the buffer area, such a reactive approach is not ideal. It is important that present and prospective landowners in the buffer area do not develop unrealistic expectations of allowable land uses in the buffer area.

It is highly desirable that the environmental constraints on land use in the buffer area, due to the need to protect residents from the impacts of quarrying and preserve access to the resource, is clearly conveyed to landowners through the planning process. The Authority has therefore drawn the matter to the attention of the Department of Planning and Urban Development and the Shire of Swan (see Appendix 3).

The Authority notes that during the detailed implementation of proposals, it is often necessary or desirable to make minor and non-substantial changes to the designs and specifications which have been examined as part of the Authority's assessment. The Authority believes that subsequent statutory approvals for this proposal could make provision for such changes, where it can be shown that the changes are not likely to have a significant effect on the environment.

The Authority considers that any approval for the proposal based on this assessment should be limited to five years. Accordingly, if the proposal has not been substantially commenced within five years of the date of this report, then such approval should lapse. After that time, further consideration of the proposal should only occur following a new referral to the Authority.

1. Introduction

The Environmental Protection Authority has assessed a proposal by Pioneer Concrete (WA) Pty Ltd to relocate its Herne Hill quarry operations to a new operational area 1.5 kilometres to the east of the present quarry workings. This relocation would take the quarry operations further into Pioneer freehold land and away from major urban areas. The new quarry has sufficient reserves for at least 100 years based upon current annual production.

The proposal was referred to the Environmental Protection Authority in January 1990. The level of assessment was set at Public Environmental Review owing to a number of factors including the location of the proposal within an area of natural bushland on the Darling Scarp and its proximity to urban population areas.

2. Project description

Pioneer Concrete (WA) Pty Ltd has for 30 years operated a hard rock quarry and associated crushing and screening plant at Lot 11 Neuman Road, Herne Hill, in the Shire of Swan (Figure 1).

The existing operation (Pioneer No.1) occupies an area of about 50 hectares. Lot 11 has a total area of 800 hectares, all owned freehold by Pioneer.

Changing population trends in the Swan Valley, and greater environmental awareness by the general public, the Shire of Swan and Pioneer, have caused Pioneer to review its operations. As a result Pioneer has formulated a proposal to relocate its works to another part of its property (Pioneer No.2) about 1.5km further east and located in a valley beyond the main ridge of the Darling Escarpment. This will involve the development of a new pit and the erection of a completely new crushing and screening plant with stockpiling and administrative facilities. The Pioneer asphalt plant will also be relocated to this area.

It is expected that Pioneer No.2 will be operational within three years of the date that all necessary approvals have been obtained. Once Pioneer No.2 is working, operations at Pioneer No.1 will cease.

Prior to quarrying, topsoil and overburden will be separately stripped. Overburden will initially be used to construct and extend screening and drainage bunds. Topsoil will be used in vegetating these bunds. In later years, overburden and topsoil will be stockpiled and grassed to be reclaimed for future use in rehabilitation works.

The drilling and blasting undertaken to establish the quarry face and to extract rock at Pioneer No.2 will be similar to techniques used at Pioneer No.1. Blasting will be undertaken approximately six to seven times per month, which is a similar frequency to that which occurs at the Pioneer No.1 quarry.

The drilling will be undertaken with modern drilling machinery equipped with efficient mufflers and dust extraction systems. Drilling and blasting will only occur during daylight hours.

The quarried rock will be loaded by front-end loader and hauled to the primary crusher in two 50 tonne capacity off-highway dump trucks. The internal haul roads will be watered in order to minimise dust generation. Any dust resulting from dumping into the crusher will be controlled by water sprays over the receiving hopper or chute. All vehicles will be equipped with efficient mufflers, and gradients on the haul roads will be as low as is practicable. Quarrying activities at Pioneer No.2 will follow a similar schedule to those at Pioneer No.1, and will generally be a daylight operation.

Quarried rock will be crushed in a crushing and screening plant. All screens and crushers will be fitted with dust suppression equipment, and conveyors carrying any fine-grained material will have side wind guards or covers to minimise dust.

Product from the final screens will be stored in stockpiles. A front-end loader will take product from the stockpiles and load it directly into trucks. Water sprays installed over the transfer points will suppress most of the dust and noise that arises from loading operations.

Trucks operating now from Pioneer No.1 traverse Neuman Road for about 300 metres before entering Toodyay Road. At Pioneer No.2 there will be two driveways directly connecting Pioneer property with Toodyay Road. These driveways, located about 2km east of Neuman Road, will be separate "in" and "out" points resulting in a one-way traffic system. The two driveways will be separated by about 500 metres. There will be no haulage traffic using Neuman Road.

The asphalt plant will also be relocated to Pioneer No.2. Raw materials for the asphalt process are aggregate, bitumen and hydrated lime. The aggregate is mined, crushed to less than 20mm diameter and stockpiled on site prior to utilisation. Bitumen is a residue from the distillation of crude oil and is stored in two 50 tonne kettles. Hydrated lime is occasionally used to improve the affinity between the aggregate and bitumen to produce a stiffer mix.

The asphalt plant will normally operate from Monday to Friday between the hours of 6am and 5pm. In some special circumstances, such as when the asphalt is being transported to distant markets in country towns, or when asphalt must be supplied for night time roadworks, the plant may be required to start early or to operate at night. Due to the nature of asphalt, it is not possible to stockpile the finished product for more than a few hours.

Pioneer currently obtains most of its process and dust suppression water for Pioneer No.1 from a storage basin in the quarry pit. This source is occasionally augmented by scheme water during prolonged dry periods. Pioneer proposes to continue to use the storage basin at Pioneer No.1 for water supply to Pioneer No.2, and to supplement this supply by enlarging an existing reservoir located on Pioneer land to the south-west of the proposed quarry. Other supplies will come from water recycled from the sedimentation basin and from the Pioneer No.2 quarry pit itself. No water supplies will be drawn from Susannah Brook.

It is proposed to remove all structures and equipment from the Pioneer No.1 area and to landscape and rehabilitate it using predominantly indigenous plants. The existing quarry area has been the subject of an extensive planting and rehabilitation programme over the last three years. This will continue until all visible areas are revegetated.

3. Existing environment

The proposed Pioneer No.2 quarry lies within the Shire of Swan on freehold, rural zoned land approximately 20km north-east of Perth city centre. The land is owned and managed by Pioneer Concrete Pty Ltd. The total land area is 800ha and supports mostly native vegetation typical of the Darling Scarp and Plateau.

The Swan Valley, an important area for agriculture, recreation and tourism, is located to the west of the site. Current land use elsewhere in the area includes hobby farming (especially vineyards and livestock grazing), rural "lifestyle" properties and parks and recreation (e.g. John Forrest National Park).

The geology of the Project Area is typical of the edge of the Darling Scarp. A lateritic plateau occurs on the ridges. The Scarp face is of granite-gneiss rock in various stages of erosion, ranging from boulder or massive outcrops to highly weathered gneiss or pallid-zone clay exposures. Bands of diorite rock strike across the granite-gneisses, generally varying from 2-30m wide.

The Darling Scarp and Plateau are characterised by three primary soil associations. The western part of the Darling Plateau contains lateritic gravels and block laterite. The chief soils are ironstone gravels with sandy and loamy matrices which overlie duricrusts comprising re-cemented ironstone gravels, vesicular laterite and/or mottled or pallid zone material. Gravelly yellow earths are found downslope from granite outcrops. Yellow sands and loams occupy the floors of shallow valleys in the west. Along the Darling Scarp and in deeply incised valleys massive rock outcrops are a feature and soils are mainly acid red earths. Soils associated with outcrops are frequently shallow and skeletal. This association dominates the Project Area.

The lateritic plateau, found above the proposed quarry, is least prone to erosion as the soils are very gravelly and have a high proportion of bedrock exposure or coarse rock which reduces

surface sheet flow of water. All of the remainder of the Project Area consists of highly erodible soils with erodibility at any given location dependent mostly on slope.

The majority of soils, even on the steepest slopes, are stable until disturbed. Any form of disturbance, but especially vehicles and site clearing, can rapidly destabilise the slopes and lead to sheet erosion, gully erosion or slumping. Under current management practices most of the Project Area is undisturbed, except where fire damage has removed substantial amounts of vegetation cover.

Development or operations of any type that may disturb the soil surface have potential to erode directly or to create erosion problems. The location of the proposed quarry is within the catchment of Susannah Brook and will require careful erosion control management to minimise potential impacts on Susannah Brook.

The quarry site occupies the southern side of a steep valley, through the centre of which flows Susannah Brook which is the major drainage unit of the Project Area. Susannah Brook flows into the Swan River near Herne Hill. The flow rate in Susannah Brook varies markedly in response to short-lived, high intensity rainfall events in its catchment.

The small, ephemeral streams which drain the project area are the primary means of transport of water and sediments from the project area to Susannah Brook. It is proposed to utilise these streams as part of the sediment trapping system by diverting their flow into a large sedimentation basin before releasing the runoff to Susannah Brook.

Pioneer intends to ensure that the concentration of suspended sediments in water entering Susannah Brook from the area of the proposed Pioneer No.2 quarry will be comparable to that of water already in the Brook.

The vegetation of the area of the proposed quarry is varied reflecting the variety of soil types and soil depths. It includes heaths, woodlands and open forest, with various vegetation types associated with granitic outcrops . The vegetation is in good condition despite fires, grazing and quarrying. Botanical studies have shown that the areas to be disturbed by the Pioneer No.2 quarry (40 ha in total) contain vegetation types which are mostly represented elsewhere on the Pioneer property. The few species which are present only in the Project Area are well-represented in other areas including John Forrest National Park, approximately 4 kilometres south of the Pioneer No.2 site.

The Pioneer landholding is a significant area of relatively undisturbed wildlife habitat in the Perth region, as are all remaining areas of native bushland on the Darling Scarp. It has local and regional conservation significance as it acts as a refuge for species which have disappeared from the Swan Coastal Plain or are under pressure in the Darling Range.

4. Environmental issues raised in submissions

There were 10 submissions made on the Public Environmental Review of the proposed relocation of the Herne Hill quarry.

A summary of the issues raised is provided in Table 1.

Table 1: Summary of submissions

Issue	Number of submissions
Drainage/sediment control	4
Protection of Susannah Brook	4
Rehabilitation of the quarry	4
Impact from dust and noise	4
Availability of monitoring information	4
Location of the quarry	2
Impacts on flora and fauna	2
Traffic impacts	2
Dieback disease	1

The predominant issues of concern raised in the submissions were related to; drainage/sediment control, protection of Susannah Brook, location of the quarry, rehabilitation, monitoring, and, dust and noise. The specific issues together with the proponent's responses are set out in Appendix 2 of this report.

5. Environmental impacts and their management

5.1 General

Following consideration of the Public Environmental Review, submissions from the public and government agencies and the proponent's response to them, the Environmental Protection Authority has determined that the proponent has addressed the relevant issues associated with the proposed quarry relocation satisfactorily and that the consequent impacts can be managed. This environmental management can be achieved by a combination of the proponent's original and supplementary commitments and the Authority's recommendations.

Recommendation 1

The Environmental Protection Authority concludes that the proposal to relocate the hard rock quarrying operation at the Herne Hill site is environmentally acceptable.

In reaching this conclusion, the Environmental Protection Authority identified the main environmental factors requiring detailed consideration as:

- **drainage management to prevent sedimentation of streams;**
- **conservation value of the area of the proposed relocation;**
- **rehabilitation of the entire quarrying operation, including the existing quarry; and**
- **impacts associated with odour, dust and noise.**

The Environmental Protection Authority concludes that the environmental factors mentioned above have been addressed adequately by either environmental management commitments given by the proponent or by the Environmental Protection Authority's recommendations in this report.

Accordingly, the Environmental Protection Authority recommends that the proposal as described in the Public Environmental Review could proceed subject to:

- **the Environmental Protection Authority's recommendations in this Assessment Report; and**
- **the proponent's commitments to environmental management (Appendix 1).**

5.2 Drainage and sediment control

Pioneer proposes to establish a fifty metre buffer zone either side of Susannah Brook to prevent any direct physical disturbance to the drainage line. Sedimentation basins will be constructed to collect run-off from the quarry site to allow suspended particles to settle out prior to discharge into Susannah Brook. These measures are regarded as appropriate to protect the ecological value of the brook.

The Water Authority of Western Australia has indicated that Susannah Brook is a possible site for a pipehead dam to supplement Perth's water supply. The location of the Pioneer No.2 site upstream of the preferred dam site means it would be within the proposed proclaimed catchment for the dam. In this case the quality of the water flowing from the Pioneer site would need to satisfy the high standards required of a proclaimed catchment.

Recommendation 2

The Environmental Protection Authority recommends that the proponent ensure there be no unacceptable detrimental effects from drainage of the quarry site on the water quality of Susannah Brook, taking into account the status of Susannah Brook as a proposed source of public water supply. Accordingly, prior to the commencement of productive mining, the proponent should prepare and implement a drainage management programme for the quarry operations to the satisfaction of the Water Authority of Western Australia.

5.3 Conservation value

Herne Hill quarry is located on the Darling Scarp which constitutes an open space area of regional significance owing to its high conservation, recreation and scenic values. The Herne Hill landholding has importance in that apart from the direct disturbance caused by the quarrying most of the area (95%) will remain undisturbed. Given the long term need for a buffer zone surrounding the quarry it is likely that the area will remain in its natural state for many years. It is therefore suggested that Pioneer manage the buffer area to protect its conservation value by ensuring that the area is protected from future disturbance and can remain as a valuable conservation area on the Darling Scarp. In this regard Pioneer do not permit unauthorised vehicle access to the buffer zone and use security guards to prevent such occurrences.

5.4 Rehabilitation

An important aspect of the proposal is the progressive rehabilitation of both Pioneer No.1 and No.2 quarries to minimise the visual impact of the operation, reduce the potential for erosion, minimise dust and noise impact, and to revegetate disturbed areas to provide stability and encourage the return of native fauna.

Rehabilitation will involve the following tasks:

1. Wherever possible, strip and store topsoil, including existing vegetation cover. Seed of geographically-restricted plant species will be collected at this stage for propagation.
2. Strip and separately store overburden. Most overburden will be utilised for construction of screening and drainage bunds within the Project Area. Excess overburden will be stockpiled for later use in rehabilitation. For both topsoil and overburden, storage will be in stockpiles not more than 1.5m deep. If storage is for longer than twelve months, a cover crop will be established over the surface of the stockpiles to prevent erosion and maintain biological activity within the stored material.
3. Twelve months prior to rehabilitation of each section of the quarry, orders will be placed for the propagation of the required nursery stock. Seed will be ordered three months prior to rehabilitation.
4. Where practicable, particularly on the upper levels, benching will be carried out in such a manner as to allow placement of a soil profile to cover the vertical face backing each bench. Blasting of the forward edge of each bench may be carried out to place a core of rock fill on the bench below, to fracture the rock of the blasted bench to encourage moisture and root penetration, and to "blur" the otherwise straight edge of the bench.
5. Tip, from bench above, stockpiled overburden followed by stockpiled topsoil. This phase of the work will be completed as close as possible to the commencement of winter rains (i.e. mid-May).
6. Commence planting and seeding when the soil profile has become saturated to a depth of 300mm (i.e. late May - early June). Complete planting and seeding by the end of June. Seedlings and plants will be fertilised at the time of planting. They will not receive any irrigation, relying on natural rainfall for establishment and survival.

The Pioneer No.1 Quarry has been undergoing progressive rehabilitation for several years with successful results. The immediate aim of the rehabilitation work has been to eliminate the visual impact of the quarry. To this end, work has concentrated on:

(a) The Eastern Face down to within 50m of the quarry floor;

(b) The Western Mound, which will close off the entrance to the quarry and screen the remainder of the Eastern Face from public view; and

(c) The Southern Face.

Only the Northern Face will be worked for the remaining period of operations at Pioneer No.1. When quarrying ceases, the Northern Face will be terraced and revegetated. The quarry floor will remain as a water catchment area for Pioneer No.2, with extra planting being done to achieve an aesthetically-pleasing landscape.

The areas currently occupied by stockpiles, plant and infrastructure below the quarry will be redeveloped and revegetated in a manner that is compatible with existing landscapes along the face of the Scarp.

Rehabilitation of the quarry workings is regarded by the Environmental Protection Authority as an extremely important facet of the quarry operation and it is pleasing to note the proponent's commitment to rehabilitation (commitments in Appendix 1). The description of rehabilitation methods will need to be set out in greater detail by the proponent to allow constructive comment.

Recommendation 3

The Environmental Protection Authority recommends that within twelve months of the date of any environmental approval issued by the Minister for the Environment, the proponent submit and subsequently implement detailed ongoing rehabilitation plans for both Pioneer No.1 and Pioneer No.2 quarry operations to the satisfaction of the Environmental Protection Authority on advice from the Shire of Swan. These plans should be reviewed initially on an annual basis for the first two years, and thereafter at five yearly intervals.

Recommendation 4

The Environmental Protection Authority recommends that the proponent should be responsible for final decommissioning and removal of the plant and installations and rehabilitating the site and its environs. Accordingly, at least twelve months prior to final decommissioning the proponent should prepare and subsequently implement, a decommissioning and rehabilitation plan to the satisfaction of the Environmental Protection Authority on advice from the Shire of Swan.

5.5 Dust noise and odour

As with all quarry operations dust, noise and odour have the potential to adversely affect the lifestyle of the nearby residents. The measures described in the Public Environmental Review to minimise the impact of dust, noise and odour are regarded as satisfactory and conform to the conditions generally specified in Environmental Protection Authority licences for control of emissions.

It is also recognised that the relocation of the operation a further 1.5 kilometres to the east will reduce the potential for impacts from these sources on the urban population.

5.6 Traffic impact

The proposal to relocate the quarry will mean that Neuman road will no longer be used for access, rather access would be directly onto Toodyay Road. This will not alter the Pioneer traffic on Toodyay Road which will remain at its current level and hence there will be no additional impact from this source.

5.7 Dieback

The vegetation and flora report that was carried out for the project found no evidence of dieback in the area of the quarry. Therefore, Pioneer do not believe it is appropriate to put forward a detailed management plan. Instead they propose to carry out preventative measures as outlined in the response to submissions. "As no dieback is believed to be present on the site (despite 30 years' occupation by Pioneer), control consists of the prevention of its entry by washing of vehicles and monitoring. Procedures for preventing its introduction will follow those laid down in the CALM dieback manual."

5.8 Social impact

The Pioneer PER was prepared without specific requirements relating to social impact and public participation and consultation being issued. Guidelines were issued before the Social Impact Unit was fully operational.

The proponent revised its documentation following discussion with the Unit and released an information brochure to the general public.

Submissions received during the public review period raised issues relating to dust, noise, traffic, road safety, odour associated with asphalt production and the availability of monitoring information. These, and other potential social impacts, both positive and negative, have been investigated and adequate management measures proposed.

However, a number of submissions raised the importance of monitoring information being made freely available to the general public. While the proponent has made a commitment to making the information available through the Environmental Protection Authority, it is considered that publicly reporting the results of the ongoing monitoring programmes will assist understanding and awareness of the quarry's operations and alleviate concern about the adequacy of the proposed management measures.

Recommendation 5

The Environmental Protection Authority notes the proponent's commitment to provide annual monitoring reports to the Authority and recommends that the proponent lodge a copy of each report with the Shire of Swan for perusal by interested parties.

The relocation of the Herne Hill quarry is partly in response to social pressures stemming from the proximity of Pioneer No.1 to urban areas. It is therefore recommended that planning authorities are aware of the need to ensure the Pioneer No. 2 site is given protection from further encroachment of urban areas in order to prevent incompatible land uses being in close proximity to one another.

The site of the proposed Pioneer No.2 quarry is designated as a "priority resource area"in the draft Basic Raw Materials Resource Protection Protection Strategy. This strategy was formulated by the State Planning Commission in 1988, as a means of identifying important sources of basic raw materials in the metropolitan area to allow their protection from encroaching development. A "priority resource area"is defined as an area of high resource potential from where the future supplies of raw materials will be sourced. The strategy was formulated to ..."protect sufficient quantities of basic raw materials to meet long term planning needs. The strategy was to recognise specific areas for extraction to avoid conflict with competing land uses, particularly with urban and special rural development, and the management of forests and water catchments."

Recommendation 6

The Environmental Protection Authority recommends that planning authorities are cognisant of the need to separate incompatible land uses and ensure that Pioneer No.2 quarry is afforded protection as befits its identification by planning authorities as a 'priority resource area '.

While the Authority can use its assessment processes to recommend against environmentally unacceptable land uses within the buffer area, such a reactive approach is not ideal. It is important that present and prospective landowners in the buffer area do not develop unrealistic expectations of allowable land uses in the buffer area.

It is highly desirable that the environmental constraints on land use in the buffer area, due to the need to protect residents from the impacts of quarrying and preserve access to the resource, is clearly conveyed to landowners through the planning process. The Authority has therefore drawn the matter to the attention of the Department of Planning and Urban Development and the Shire of Swan (see Appendix 3).

The Authority notes that during the detailed implementation of proposals, it is often necessary or desirable to make minor and non-substantial changes to the designs and specifications which have been examined as part of the Authority's assessment. The Authority believes that subsequent statutory approvals for this proposal could make provision for such changes, where it can be shown that the changes are not likely to have a significant effect on the environment.

The Authority considers that any approval for the proposal based on this assessment should be limited to five years. Accordingly, if the proposal has not been substantially commenced within five years of the date of this report, then such approval should lapse. After that time, further consideration of the proposal should only occur following a new referral to the Authority.

6. Conclusion

Following assessment of the of the Pioneer proposal for relocation of the Herne Hill quarry the Environmental Protection Authority has concluded that the proposal is environmentally acceptable subject to the operation being carried out in accordance with the commitments in the Public Environmental Review, the proponent's additional commitments and the recommendations of the Environmental Protection Authority.

Appendix 1

Summary of proponent's commitments

Pioneer Concrete (WA) Pty Ltd makes the following specific commitments regarding environmental protection and management at the proposed Pioneer No.2 Quarry.

Quarry development and operation

1(a) Access to the Pioneer No.2 site will be direct from Toodyay Road. Accessways will be designed to minimise noise generation and disruption to other traffic, and will be constructed to the satisfaction of the Main Roads Department.

1(b) Pioneer will take steps within its power to minimise usage of the local and rural roads by vehicles travelling to or from the Pioneer No.1 and No.2 quarries and promote the use of main roads (e.g. Toodyay Road, Great Northern Highway, Bishop Road) in order to avoid traffic conflict and ensure road safety.

2. Topsoil, vegetation and overburden will be stripped from areas to be developed. These will be used for the building of bunds and for rehabilitation purposes.

3. No physical interference with Susannah Brook will be permitted at any stage during the development or operation of the quarry. To this end, a minimum 50 metre buffer zone will be maintained each side between the Brook and any quarrying activity, and allowing a total 100 metre buffer zone around the Brook.

4. Regional water mains, power, gas and telephone services will not be adversely affected by the development of the Pioneer No.2 site.

5. Process water supplies will be drawn from the existing water storage in the Pioneer No.1 Quarry and from the other surface storages on Pioneer property, with possible occasional augmentation by Water Authority supplies. No water will be drawn from Susannah Brook. There is currently no planned use of groundwater in the proposed development, consequently there will be no effect on groundwater resources.

6. Drilling and blasting will be conducted only during daylight hours. Blast design will be aimed at achieving the required breakage of rock with minimum generation of noise, vibration and dirt.

7. Following the completion of development of Pioneer's No.2 pit and crushing plant, processing operations at Pioneer No.1 will cease and the plant will be dismantled.

Protection of vegetation

8. Site clearance and vegetation removal will be minimised by survey control and supervision of personnel engaged in clearing activities.

9. All vehicles entering the site from regions identified as potentially contaminated with dieback disease will be thoroughly washed to remove adhering soil and weed seeds. All fill or soil used on the site will be obtained from uncontaminated sources. Procedures for preventing its introduction will follow those laid down in the CALM Dieback Manual.

10. Where appropriate, seeds of geographically-restricted plant species will be collected from the site and propagated for later use in rehabilitation.

11. Fire prevention measures as per relevant Shire and Brigade regulations will be enforced within the project area and on the rest of Pioneer's land holding.

12. Unauthorised vehicular access to the Pioneer land holding will not be permitted and the current practice of using security guards to patrol the area will be continued.

13. Pioneer will monitor the vegetation on its property to detect any outbreaks of dieback disease. If any is detected, Pioneer will consult with the Department of Conservation and Land Management to determine a suitable treatment strategy.

14. The remainder of Pioneer's property outside the Project Area will be maintained as a buffer zone for the Quarry.

Noise, dust and odours

15. All emissions of noise, dust and odours from the operations will be within limits laid down in licence conditions by the Environmental Protection Authority or set out in the Environmental Protection Act 1986.

16. Pioneer will endeavour to further reduce emissions by a number of means including enclosure of crushing and screening plants, watering of roads, stockpiles and product transfer points, careful design of blasting, and the use of extraction systems and wet scrubbers in the asphalt plant.

17. Pioneer or its agents will monitor noise levels from blasting and processing, dust deposition, odours and occupational noise and dust. The results of this monitoring will be made available on an annual basis.

18. Occupational noise and dust levels will be monitored and the results reported to the Department of Mines. Pioneer will take any action necessary to ensure that the levels of occupational noise and dust comply with the provisions of the Mines Regulation Act 1946-1974.

Drainage and water quality

19. Pioneer will endeavour to minimise disruption to drainage patterns in areas outside those directly affected by quarrying activities. Rainfall runoff to disturbed areas will be prevented by the use of bunds and drains where necessary. Careful attention will be paid to the minimisation of erosion.

20. No untreated runoff from disturbed areas of the Project Area will be permitted to enter any watercourse. All such runoff will first be treated by means of sedimentation basins or silt traps to remove excess suspended sediments. Any runoff likely to contain oil contamination will be treated to remove such contaminants.

21. The quality of water leaving the Project Area will be monitored by regular sampling.

Visual impact

22. The Pioneer No.2 operations will not be visible from ground level outside Pioneer property once screening bunds and vegetation are established. Screening vegetation will be established around the Pioneer No.2 infrastructure site and north-west of the quarry pits to screen the operations from view.

Aboriginal interests

23. Discussions will be held with representatives of the local Nyungar Aboriginal community regarding the protection of Susannah Brook and the future of the white "ochre" deposit in the vicinity of the tertiary crusher/stockpile site. Pioneer will take steps to ensure that quantities of the "ochre" are made available to Aborigines for their use.

Waste disposal

24. Solid wastes, such as domestic waste, will be disposed of at an approved Council landfill site.

25. Oils and grease separated from contaminated runoff in the area of the workshops and asphalt plant will be collected and removed from the site, either for recycling or for disposal in a Council-approved liquid waste disposal site.

26. Inert slurry originating from dust suppression sprays in the crushing, screening and asphalt plants will be disposed of in the solid waste disposal site located on Pioneer property. This site is situated on a near-impermeable clay base and is bunded to prevent runoff.

27. Sewerage facilities will be designed so as to prevent impacts on ground or surface waters in the area, and will conform to Health Department regulations.

Rehabilitation

28. A programme currently underway at Pioneer No.1 will continue.

29. Pioneer will continue to take responsibility for rehabilitation and will investigate new developments in rehabilitation methods in order to optimise the rehabilitation of the Pioneer No.1 and No.2 Quarries.

30. The progress reports on rehabilitation works at the Pioneer Quarries will be made available to the Environmental Protection Authority as required.

Community liaison

31. Pioneer will continue to maintain a register of public complaints against its quarrying operations at Herne Hill and will respond promptly and individually to each complaint received.

Management, monitoring and reporting

32. Pioneer will continue to monitor meteorology, noise, dust, odours, water quality, vegetation and public opinion at the Pioneer No.2 quarry site. The results of this monitoring will be used by Pioneer to optimise its environmental management procedures at the Pioneer No.2 Quarry. These results will be available on an annual basis.

33. Pioneer will continue to monitor research, both within Australia and overseas, into new developments in blasting technology, noise, dust and odour control in the operations of the quarry and the asphalt plant.

Appendix 2

Proponent's response to submissions

Gidgegannup Progress Association

A. Susannah Brook

1. The quarry is inside the catchment of the Water Authority's proposed pipehead dam site.

During preparation of the PER, the limited information available from the Water Authority suggested that the proposed Proclaimed Catchment for a pipehead reservoir was located upstream of the Pioneer landholding. Further enquiries have confirmed that the preferred dam site is actually on Susannah Brook approximately 1.5km downstream of the Pioneer No.2 quarry site on Pioneer land, and that part of the Project Area including the quarry pits is inside the south-western boundary of the dam's catchment. However, the Water Authority advises (G. Mauger, 1990 pers.comm.) that the quarry is expected to have no adverse effect on the proposed pipehead dam, given proper control of runoff. The Water Authority did not consider it necessary to make a formal submission on the quarry proposal.

2. Emergency spillways on the sedimentation basins must be adequate for larger storms with a recurrence interval of greater than 10 years.

The sedimentation basins and spillways will be designed using standard conservative engineering principles. This design approach will ensure that large storms which cause the sedimentation basins to overflow will not cause erosion of the spillways or downstream area.

As the basins will also be used for dust suppression water supply, it is in Pioneer's own interest to ensure that heavy storms do not cause damage to the basins or spillways.

B. Dust emissions

1. Quarrying and crushing produces silica dust particles which are sharp and abrasive.

The quarrying operation does indeed produce dust containing silica, and all dust is abrasive. However, Pioneer intends to ensure that the level of dust produced by the proposed quarry will be so low as to pose no hazard or nuisance to anyone living outside Pioneer's property boundary. This will be achieved by the measures described in the PER, including careful blast design, watering of roads and stockpiles and the enclosure of all crushing plant and the main rock conveyor.

2. Dust may be carried long distances.

The location and dust suppression measures at Pioneer No.2 will ensure that dust concentrations at Pioneer's boundary do not exceed current background levels.

3. Silica dust can cause lung disorders similar to asbestosis.

The lung disorder Silicosis can occur after exposure to high dust concentrations for long periods, such as occurs in underground mines. The dust suppression measures proposed will ensure that dust levels within the Pioneer No.2 quarry are kept below health standards; boundary levels will be much lower still (refer to response B1) and will pose no health risk to anyone inside or outside Pioneer's property. Current dust levels at Pioneer No.1 do not show a health risk and levels at Pioneer No.2 are expected to be lower due to improved technology.

4. Boundary dust monitoring should be done by an independent body as well as Pioneer.

Pioneer has no objection to the EPA carrying out boundary dust monitoring at any time.

5. Pioneer should be required to produce dust data at any time.

Pioneer will make dust monitoring data available annually to the EPA. The EPA may view the data at any other time on request.

C. Collection and disposal of waste

1. Unburnt hydrocarbons in scrubbing water from the asphalt plant will contaminate the waste disposal site.

Hydrocarbons from the scrubbers, being lighter than water, will mostly remain on the surface of the water in the asphalt plant settling ponds and will not end up in the slurry. Water from the ponds will be recycled via an oil/water separator. The hydrocarbons will then be recycled or properly disposed of along with other waste oils.

2. Hydrocarbons should be removed before the water enters the settling ponds.

This is impractical, as any attempt to remove hydrocarbons by trapping would cause the traps to become blocked with sediment. Their removal after recycling from the asphalt plant ponds is a more practical option.

D. Revegetation of disturbed areas

1. All disturbed areas (not just visible ones) should be revegetated.

Pioneer intends to use the No.1 quarry floor as a water supply for the foreseeable future, so full revegetation is not possible at this point in time.

2. The "Interesting Geological Features" in the No.1 quarry should be made as attractive as possible by without destroying their scientific value.

The "interesting geological features" will only remain interesting as long as they are exposed and visible at close range. Full revegetation of these areas is undesirable.

E. Slow moving traffic on Toodyay Road

1. There will be an average of one Pioneer truck at any time on Toodyay Road.

Agreed. Many other trucks use Toodyay Road.

2. Toodyay Road at Red Hill is very dangerous.

Pioneer believes that the hazard of trucks using Toodyay Road at Red Hill is less than that of trucks entering on a bend at Neuman Road.

3. There will be more cars overtaking on a steep descent.

The westbound lane of Toodyay Road at Red Hill is mostly double-lined to prevent overtaking, while the eastbound direction is equipped with an overtaking lane for most of the steep part of the hill. Pioneer therefore does not see overtaking on the hill as being an issue.

4. The EPA should obtain an assurance from the Main Roads Department that the Orange Route will be finished before the quarry is moved.

Pioneer has no input into Main Roads Department plans but would welcome upgrading of Toodyay Road as soon as possible. Even in the absence of the Orange Route upgrading, traffic from Pioneer No.2 will not cause a significant increase in the heavy traffic on Toodyay Road.

Conservation Council

1.1.4 Timing of rehabilitation

1. Rehabilitation at Pioneer No.1 should continue until complete.

Rehabilitation at Pioneer No.1 will continue until all visible faces, plant ant stockpile areas are revegetated. Pioneer No.1 will continue to be used for water supply. The exact timetable depends upon the rate of establishment of vegetation, but work will continue until all areas are self-sustaining.

1.4.5 Water Authority of WA.

1. Public water supplies must be protected.

No existing water supplies will be affected. The Water Authority advises (G. Mauger, 1990 pers.comm.) that the quarry is expected to have no adverse effect on the proposed pipehead dam, given proper control of runoff.

2.2.1 Background

1. Table 1 in the PER shows that concerns about rehabilitation were given a high priority by the community. This is not reflected in the PER.

The aims and principles of rehabilitation are clearly set out in the PER. Detailed strategy and timing will depend on the results of ongoing trials.

NOTE: The high level of concern over rehabilitation (expressed in 1986) shown in Table 1 was related to Pioneer No.1, when the current extensive rehabilitation efforts were just beginning and the quarry had a large visual impact. Pioneer believes that the rehabilitation carried out since then, and which is still continuing, provides ample evidence of the extremely high priority being given to this work.

3.2 Alternative 1

1. The PER seems to imply that a location east of the Escarpment ridge, because it is out of sight, has no environmental problems; this would not be the case.

The PER does not claim that there are no environmental problems east of the Escarpment ridge. Rehabilitation, loss of vegetation and habitat, the proximity of Susannah Brook, erosion and sedimentation have been recognised as potential problems, and addressed by Pioneer.

B. The proposed fifty metre buffer around Susannah Brook is inadequate.

The fifty metre buffer was established during consultations with representatives of the local Aboriginal community, and was designed to protect the cultural values of Susannah Brook from interference. In terms of protection from erosion and sedimentation a fifty metre buffer, given the control measures described, is quite adequate. Fifty metres is twice the width of buffer required by the Department of Conservation and Land Management (CALM) for logging operations near streams.

6.2.3 Significant flora/8.5.1 Flora Impacts

1. Geographically restricted/priority plant species will be lost through quarrying.

Some loss of vegetation is inevitable in a development of this type. However, the Pioneer No.2 quarry will disturb less than 5% of the total Pioneer landholding over 40 years. All but two of the significant species likely to be disturbed are represented elsewhere on the Pioneer landholding. All are present in John Forrest National Park. Therefore the overall effect on flora is considered to be acceptable.

2. A small stand of Nuytsia floribunda needs special attention.

Nuytsia floribunda does not occur as "a small stand" in the project area but is common in Marri-Wandoo Low Woodland on the hilltops. Most quarrying is on the faces of slopes. Where practicable, all vegetation including Nuytsia will be preserved. Nuytsia is not regarded as rare or restricted so it will be afforded the same general protection as other vegetation in the Project Area.

6.3.2.1 Species present/8.6 Fauna Impacts

1. Four vertebrate fauna species which are classified as "rare or in need of special protection" are present in the area. The fauna management measures as detailed do not provide any "special protection".

Only two vertebrate fauna species are likely to be significantly disturbed by quarrying: these are the Chuditch and the Carpet Python. These will be protected in the short and long term by:

(a) the small area of disturbance (5% of total landholding);
(b) careful control and minimisation of clearing during establishment;
(c) protection of habitat by control of weeds and dieback; and
(d) progressive rehabilitation of native vegetation at Pioneer Nos 1 and 2.

2. A consultant should be employed to ensure protection of fauna, especially during the construction stage.

Consultants have been and will continue to be involved in the planning of the quarry. Procedures will be adopted which will ensure the minimum possible disturbance during establishment of the new quarry and infrastructure.

3. The Chuditch and Carpet Python will be adversely affected - no protection is given in the proposal.

Measures for minimising disturbance are clearly stated in the PER, and will include those discussed above.

4. The PER states that displaced fauna will move when disturbance begins. Niches are usually unavailable in surrounding areas and if they do succeed in establishing themselves in a territory it is usually at the expense of the existing fauna, which will in turn be displaced and die.

The rehabilitation of Pioneer No.1 will make additional habitat available. It is acknowledged that individuals of some territorial species may be unable to relocate successfully. Again, it must be stated that the area of disturbance will be less than 5% of the total Pioneer landholding and that the remaining area will be maintained as an undisturbed buffer zone.

5. Pollution of ephemeral streams through quarrying will adversely affect the fish in Susannah Brook.

The issue of the protection of Susannah Brook is the reason why so much attention was paid in the PER to drainage control and sediment removal. As stated in the PER, Pioneer is committed to maintaining the quality of Susannah Brook.

6.4 Dieback Disease/8.5.2 Management

1. More detailed measures are required to control dieback.

As no dieback is believed to be present on the site (despite 30 years' occupation by Pioneer), "control" consists of the prevention of its entry by washing of vehicles and monitoring. It is not appropriate to lay out a long-winded "management" programme when there is currently no dieback to manage. Procedures for preventing its introduction will follow those laid down in the CALM Dieback Manual.

8.2.2 Drainage and water quality - Management

1. Monitoring results should be submitted 3-monthly, not annually.

Monitoring results need to be compared to other results to have any real meaning. Comparison between different seasons is meaningless, so an annual summary, covering a full seasonal cycle, is more practical. The EPA will be able to view the most recent data on request at any time.

8.5.1 Flora impacts

1. Pioneer should monitor dieback and weeds, and submit results every 3 months.

Section 9.6 in the PER states that dieback and weed monitoring will be carried out and results reported (Section 9.9) every year. Due to seasonal changes in vegetation, reporting every 3 months would be meaningless.

8.10 Rehabilitation

1. The proposed rehabilitation strategy seems to concentrate on reducing visual impacts rather than on restoring indigenous species.

The PER states (Section 8.10.1) that rehabilitation aims to restore vegetation that is as close to the indigenous as practicable. It also states that this is not always possible, due to changed conditions of light, soil etc. In the early stages, the priority is to replace and stabilise the soil cover and prevent erosion. At all stages a high priority is given to the use of indigenous upper storey and lower storey species. In time, further indigenous species will recolonise rehabilitation areas. However, it is unrealistic to expect or attempt perfect recreation of the original vegetation.

2. Close monitoring of rehabilitation at Pioneer No.1 is required.

Rehabilitation is closely monitored in the early stages to assess success and correct deficiencies. This is in Pioneer's interest to optimise its rehabilitation strategy and to minimise wasted effort. The requirement for monitoring decreases as vegetation becomes established.

3. Indicator species should be studied to gauge the success of rehabilitation.

Indicator species (plant or animal) are a useful qualitative method of gauging the success of large-scale rehabilitation projects. For projects such as this one, where the area of rehabilitation is very small, they are less useful. Instead, the rehabilitated areas will be monitored by Pioneer and its consultants to gauge the establishment of local indigenous plant species and the colonisation of the area by fauna. It is expected that the close proximity of native bushland and availability of water will encourage the rapid recolonisation of the area by local flora and fauna.

8.10.6 Monitoring of rehabilitation

1. The public should have access to information on rehabilitation at Pioneer Nos 1 and 2.

The results of rehabilitation for Pioneer No.1 will be made available annually to the EPA. The EPA may make this information publicly available if it so desires. The same system will be applied at Pioneer No.2. In addition, tours of the quarry and rehabilitated areas will be available by arrangement with the quarry manager.

8.20 Post-Quarrying land use

1. The Pioneer No.1 site should be added to the proposed Darling Range National Park. This is compatible with its stated end use as a buffer and would provide a valuable linkage to the northern part of the proposed park.

Pioneer No.1 is on freehold land and will remain that way. It will be required as a source of water for Pioneer No.2. Its freehold status is still compatible with the above purposes, as Pioneer has no plans to develop it further, but requires the land to ensure a permanent buffer zone for its operations.

General comments

1. Rehabilitation should be incorporated into the initial proposal, not tagged on as an afterthought.

Rehabilitation has been a part of the proposal from its inception and is regarded as an important element. The PER is divided into headings for ease of reading and assessment. It makes sense to have matters dealing with rehabilitation grouped together in one section - this does not constitute "tagging on as an afterthought" (refer to response 2.2.1).

2. The PER should address rehabilitation and have a plan NOW to show ongoing rehabilitation.

The purpose of the PER in terms of rehabilitation is to describe the effects of the proposal and to propose overall an management and rehabilitation strategy, to a level which allows the acceptability of the proposal to be assessed by the EPA and the public. A more detailed rehabilitation plan will be drawn up as part of the final stage of project planning, when the areas of disturbance are more precisely delineated.

3. A seed orchard should be established to provide local seed forms for rehabilitation.

As stated in the PER (Sections 8.4.2, 10.10), seeds of geographically-restricted plants will be collected for propagation and planting. Whether the propagation will be done on site or somewhere else will be decided at a later date. Due to the slow-growing nature of many indigenous plants, the production of seed in an orchard-type situation is not feasible - it is more practical to collect as much seed as possible before development begins and use that seed directly for propagation.

4. Nursery stock should not be used for rehabilitation.

Nursery stock of some species (particularly trees) supplied from specialist horticulturalists will be of better quality and give better establishment results. The small area of revegetation will ensure that local genotypes will interbreed and colonise rehabilitation areas within a short time frame.

5. The cumulative effect of other proposals should be considered.

Section 8.13 examines cumulative impacts of other proposed quarries in terms of visual effects, noise, water quality and traffic. The cumulative impacts in terms of habitat would be proportional to the total area of land disturbed, but the fact remains that Pioneer, out of a total area of 800ha, will disturb less than 5%. Other operations mentioned (Midland Brick clay pits, Red Hill waste disposal site, ORV area) have already been established for some years and have no more relevance to cumulative impacts than do existing agricultural or residential areas around Herne Hill.

6. A rehabilitation bond should be required to ensure proper rehabilitation.

Pioneer has pursued a programme of progressive, high-quality rehabilitation at the Pioneer No.1 quarry for a number of years. This rehabilitation has been very successful and Pioneer is committed to continuing the programme at both the No.1 and No.2 quarries. The PER contains formal commitments (Sections 10.28-10.30) to that effect.

The Environmental Protection Authority has the power to impose rehabilitation bonds in cases where it doubts either the capacity or the willingness of a developer to undertake adequate rehabilitation.

Pioneer believes that its ability and commitment to rehabilitation has been well demonstrated at the No.1 quarry and therefore feels that there is no need for the EPA to enforce that commitment by the imposition of a rehabilitation bond.

Pioneer also notes that the EPA has the authority to impose a rehabilitation bond at any stage in the life of the project if it should feel that rehabilitation is not adequate.

Shire of Swan

1. The PER is generally acceptable and has addressed all pertinent areas of concern.

2. Shire of Swan Planning approval is required.

Pioneer notes that the Shire of Swan does not accept Pioneer's legal position with regard to development on the site but maintains that its position is legally and factually correct. Pioneer has in the past voluntarily complied with development requirements and intends to do so whilst this continues to be a convenient method of proceeding for both parties. It nonetheless reserves its position to insist on its rights and similarly respects the position of the Shire.

Private individuals

Introduction

1. Pioneer's operating licence should continue to be for five years.

Pioneer considers a five year licence to be unsatisfactory because it necessitates short-term financial and environmental planning, with the constant threat of imminent closure making any long-term planning difficult. A long licence (25 years or longer) will permit long-term financial, environmental and rehabilitation planning. Under a long licence, the EPA would still have the power to change conditions affecting the licence at any time. In any case, the EPA would continue to hold short-term licensing powers over Pioneer by way of the annual renewal of Pioneer's works permit, thus ensuring compliance with the conditions of the licence.

2. The quarry should be located somewhere else other than the Susannah Brook Valley.

The quarry can only be located where there is an economically-recoverable supply of rock. Most of Pioneer's land (including most of the valley) will not be quarried. Thus the flora and fauna will be preserved over the vast majority of the landholding. Only 5% of the total area will be disturbed; this is much less than would be disturbed by farming, housing developments etc.

Need for the proposal

3. Pioneer should re-evaluate the location of the quarry; There is little undisturbed land left on the Darling Scarp; Rock is not a scarce resource; The quarry should be put in a more remote site.

a) Pioneer has re-evaluated the location of the quarry in order to satisfy the wishes of the local community. That is why it is being moved.

b) True. Pioneer owns 800 hectares of mostly undisturbed land and will quarry 5% of it. The rest will be left undisturbed. That is very good preservation; much better than that afforded by other land uses such as residential development and agriculture.

c) Rock itself is not scarce but economically available, good quality rock close to Perth is.

d) A more remote site is likely to have ecological values at least as high as Herne Hill. This would merely put the impacts somewhere else.

4. Quarrying is not an appropriate land use at Herne Hill; The quarry will create a large hole; Either relocate the quarry away from the scarp or put a time limit on its operation.

a) The State Government considers that quarrying is the preferred land use in the Project Area and has seen fit to protect the area from competition from other land uses by designating it a "Priority Resource Area" for hard rock.

b) The hole will be visible only from the air or from Pioneer property.

c) A quarry can only be located where rock is available. The only economically-available sources of rock close to Perth are on the Darling Scarp, and that is where all the quarries close to Perth are located.

d) Once the quarry pits and infrastructure are established there will be no further significant impacts on the environment. To place a time limit for the quarry's operation would therefore serve no purpose.

Socio-economic environment

5. A commitment was given in the 1987 Environmental Management Report by Pioneer to minimise usage of local and rural roads by vehicles associated with their operation and to promote the use of the main roads. This commitment should be included in the list of current commitments in the PER.

Pioneer agrees with this statement and accordingly makes the following commitment, to be added to the other commitments made in the PER:

"Pioneer will take steps within its power to minimise usage of the local and rural roads by vehicles travelling to or from the Pioneer No.1 and No.2 quarries and promote the use of main roads (e.g. Toodyay Road, Great Northern Highway, Bishop Road) in order to avoid traffic conflict and ensure road safety."

It should be noted that there is expected to be no usage of any local roads by heavy vehicles en route to or from the Pioneer No.2 quarry as all access will be directly to and from Toodyay Road.

6. Increased traffic on Toodyay Road will increase the potential for accidents. Pioneer should construct a dedicated road on their own land to use as a route for their trucks to the valley floor.

a) Pioneer believes that the traffic hazard will be reduced by not using the Neuman Road exit. Toodyay Road is already used by many trucks without any particular danger.

b) The construction of a dedicated heavy haulage road on Pioneer property is seen as unviable as it would:

   (i) Continue to use the present exit on a bend at Neuman Road, with its attendant problems of safety and noise affecting nearby residents;
   (ii) Cause the loss of at least an additional 10 hectares of native vegetation;
   (iii) Increase the risks of erosion, dieback and weed infestation; and
   (iv) Appear as a significant scar on the face of the escarpment.

7. As the study area was burnt in late 1988 it is likely that the PER does not provide a comprehensive flora list. Further botanical surveys should be done to determine the full extent of species present, by carrying out surveys in spring and winter to monitor ephemeral species and those retarded by recent fires. The conservation status of significant species in nearby reserves should be more accurately determined.

a) The botanical surveys were undertaken in late January and late April, both periods far from the peak flowering period.

   Many species are difficult to identify when not flowering. Also, many annuals and species which die off over summer are not visible at these times. Hence there is a possibility that some species may not have been observed during the survey.

   If additional surveys were to be conducted in winter and spring, additional species would very likely be added to the species list. Whether or not any significant flora (as defined in Appendix B of the PER) would be added to the list is uncertain.

b) The succession of species following fire is a long-term process. It would take several years to show any significant changes in species composition. The greatest changes would mostly be manifest over the first few years. That period has passed, meaning that the species composition of the study area probably now closely represents the composition which occurred before the fire of 1988. It should be noted that fire has been a regular phenomenon in the study area for a very long time and that highly fire-sensitive species are unlikely to occur there.

c) The conservation status of significant species in the closest reserve, John Forrest National Park, is discussed in detail in Armstrong & Muir (1988). The implications of that work for the study area are discussed in the PER.

8. One species, Halgania corymbosa, which has been recorded in the flora survey and which is listed as geographically restricted by Rye (1982) has not been included in the section on significant flora. The extent to which this species occurs in the Project Area, and its regional conservation status, are unknown.

The distribution of Halgania corymbosa is described by Marchant et al (1987) as "from Gosnells northwards on or below the Darling Scarp or the Darling Range, extending north to Gidgegannup". This gives a north-south range of approximately 35km for the species.

Records held by the Perth Herbarium indicate that this species has been observed growing in Lesmurdie Falls National Park. The species is also listed from nine other locations, the nearest to the study area being Red Hill.

9. It is of concern that one species, Tetratheca pilifera, was found only within the Project Area and nowhere else on the Pioneer landholding. When clearing occurs the plant will be totally lost from the immediate area.

Tetratheca pilifera was observed within the Project Area growing in the Marri Low Woodland association. The species is likely to occur in other parts of the Pioneer landholding. For example other areas of Marri Low Woodland outside the Project Area and other areas of gravelly soil are likely to support this species.

Armstrong and Muir (1988) recorded Tetratheca pilifera as occurring in the northern part of John Forrest National Park. This is approximately 4km from its occurrence in the Project Area.

10. Topsoil if stored for any length of time loses its value for rehabilitation. Therefore the excess top soil should be utilised immediately on Pioneer No.1 to rehabilitate that site.

Most topsoil from the Pioneer No.2 site will be used immediately for vegetating bund walls and disturbed areas. Due to the paucity of topsoil in the Project Area, the amount of excess topsoil available is expected to be very small or nil. If a greater than expected quantity of fresh topsoil becomes available, the option to utilise it immediately at Pioneer No.1 will be considered.

11. The asphalt plant emits offensive odours which have been reported by residents at up to 3km from the plant. The PER claims that complaints have not been received at distances greater than 1km from the plant.

The PER does not in fact claim that no complaints have been received from greater than 1km from the plant. What it does say (Section 8.9.2) is that "...except on very rare occasions complaints of odour have not emanated from a distance greater than 1km from the asphalt plant." It is for this reason that Pioneer believes that the new site, more than 1.5km from the nearest residence, will further reduce the already very low incidence of odour detection by residents and may eliminate it entirely. It is worth noting that the only residence located closer than 2km from the proposed asphalt plant site is sited in the grounds of a rubbish tip.

12. The relocation of the asphalt plant will not eliminate the odour problem, and may create problems for residents west of the valley. The plant should be moved to an industrial area.

a) The concern over asphalt plant odours dates back to 1987-88, before new state-of-the-art gas scrubbers and odour control measures were installed. Only two odour complaints have been received by Pioneer since October 1988. The proposed new site is 1.5km further removed from residences to the west and much better ventilated. The closest houses will rarely if ever detect any odour. Meteorological monitoring records from the Project Area show evidence of strong mixing of air in the Susannah Brook valley, so the potential for odours to be detectable west of the valley is reduced.

b) Pioneer examined the option of relocating the asphalt plant to an industrial area during the early planning stages of this proposal. The studies showed that an industrial area location (Malaga) would result in many thousands of residents being potentially exposed to odours. For this and other reasons it was concluded that the new Herne Hill location was the better option.

13. There is no provision for collection of accidental discharges of pollutants into the sedimentation basin. Pollution traps should be added.

All areas where spills are likely to occur (such as workshops, fuel storage areas etc) will be bunded and drained through oil separators. Any accidental spills from other areas will be trapped in the sedimentation basin and can be easily removed by skimming or dredging.

14. The side of the bund wall facing the brook will require sealing to prevent erosion. Tracks and roads should be sited on the southern axis away from the slope of the valley.

a) The bund wall above Susannah Brook will be revegetated immediately following construction to minimise erosion.

b) All roads will be designed so as to minimise erosion and will mostly be within the catchment of the major sedimentation basin. Any roads outside this catchment will be drained through small sediment traps.

15. A rehabilitation fund should be established equal to the annual cost of rehabilitation of both quarries.

Pioneer is fully committed to progressive rehabilitation of both quarries and does not consider that a rehabilitation bond or fund is warranted (see response to Submission No. 6 by Conservation Council of W.A.).

16. The area has highly erodible soils and this development will significantly disturb these soils leading to increased erosion. The PER does not adequately cover this issue.

a) Agreed; the soils in the area are highly erodible.

b) Great care will be taken during construction and operation to minimise erosion. As stated in the PER, the area of disturbance will be limited to those areas required for the quarry pits, haul route and plant sites. All runoff from disturbed areas will be trapped and treated in the main or minor sedimentation basins.

17. The first order streams in the study area will be affected; this will lead to impacts on Susannah Brook; this issue was not adequately addressed; a fifty metre buffer is too small.

a) True. The first order streams will eventually form part of the quarry pits.

b) The precautions proposed are believed to be adequate to ensure that no significant impacts occur to Susannah Brook.

c) As discussed previously, the construction, operation and rehabilitation strategy for the Pioneer No.2 quarry was designed with the protection of streams including Susannah Brook as a primary objective.

d) The fifty metre buffer was adopted in order to protect Aboriginal cultural values. A fifty metre buffer is believed to be quite adequate to protect creek vegetation, and the bund wall will protect Susannah Brook from sediments.

18. The concentration of suspended solids in Susannah Brook is already high due to disturbance upstream of the quarry; runoff from the quarry "comparable to water already in the brook" will contribute to this poor water quality.

a) The suspended solids concentration in Susannah Brook varies from low to very high.

b) If the suspended solids concentration in quarry runoff is at least as good as the water already in the brook it cannot harm the water quality. Pioneer will ensure that water released from the sedimentation basin is always of as good a quality as water in the brook and will endeavour (Section 8.2.2) to maintain it at a standard similar to runoff from undisturbed areas. The quantity of runoff from the Project Area will be less than at present due to the recycling of runoff for dust control, so the sediment load entering the brook from the Project Area may actually decrease.

19. It is unclear as to whether the proclaimed catchment status of Susannah Brook will impact on the proposed relocation of the quarry. Has a decision been made on the possible use as a pipehead reservoir?

a) The proposed quarry is within the catchment of the proposed pipehead reservoir. The Water Authority advises that it has no concerns about impacts from the quarry.

b) It is understood that no decision has yet been made on the reservoir proposal but that it is unlikely to be built before the year 2015, if at all.

20. The impact on future residential proposals in the area has not been adequately addressed; it is likely that there will be a number of residences much closer to the proposed site in the near future.

a) The impact of the Pioneer No.2 quarry on future housing is expected to be very minimal, especially with the extensive buffer zone retained by Pioneer.

b) The nearest planned future housing development is the Stratton Estate, which will be more than 3km from the Pioneer No.2 quarry but only about 1.5km from the Pioneer No.1 site. Another possible housing area, owned by Heytesbury Holdings Ltd, is located approximately 1km north of Pioneer No.1 in the vicinity of the proposed "Scarp Quarry" (owned by Bell Resources Ltd). This estate, if developed, would be approximately 2km from the nearest part of the Pioneer No.2 quarry and separated from the quarry by several high ridges. This combination of distance and topography would be sufficient to ensure that any housing in that area received little or no impact from the Pioneer No.2 quarry.

21. The PER should show a clear plan of the visual impact of the whole quarry operation including bund walls and dams. This plan needs to show all the areas from where any part of the quarry operation will be visible.

The visual impacts plan shown in the PER (Figure 17) shows the areas from which the quarry pits will be visible. At the time of preparation of the PER it was not possible to include all bund walls, infrastructure and so on in the plan as the precise locations of these structures had not been finalised. However, Pioneer has given an undertaking that sufficient screening vegetation and bunds will be established to ensure that no part of the quarrying operation will be visible from outside Pioneer property, and the PER contains a formal commitment (Section 10.22) to that effect.

22. Despite the proposed actions to manage dust and noise it is felt the strength of the easterlies will mean that dust and noise will continue to be a problem for people living in this path.

a) Meteorological monitoring data collected at the Pioneer No.2 site during 1990 suggest that the air in the Susannah Brook valley is subject to strong mixing. This will ensure that dust from the quarry will be rapidly dispersed. In addition, it is anticipated that the improved dust control technology to be employed at the new plant will mean that dust emissions will be minimal and a considerable improvement over the existing plant.

b) The dust issue at the Pioneer No.1 quarry dates from prior to 1988, when measures for controlling dust were greatly improved. Only three complaints regarding dust at Pioneer No.1 have been received since September 1988. Dust control measures used at the No.2 quarry will include and improve on those measures currently in use at Pioneer No.1. Boundary dust levels will be within EPA limits at all times. Dust levels will be continuously monitored on Pioneer's property.

c) The results of a noise modelling study (Appendix H in PER) carried out during preparation of the PER show that processing noise levels from the quarry will be very low. Blast noise levels will be reduced by the greater distance of Pioneer No.2 from residences and by the steep topography. The levels of all kinds of noise will be kept within EPA limits at all times.

23. No amount of rehabilitation can compensate for the loss of the natural environment in this area.

Pioneer does not claim that rehabilitation will perfectly recreate the pre-existing environment. With time, however, the vegetation of the rehabilitated areas will closely resemble the natural vegetation and will provide habitats for most of the indigenous animal species. It is acknowledged that some habitats will not be replaced but the area lost will be very small compared to the total Pioneer landholding.

24. Access should be provided for the public to view the development during operation so interested persons can see the effect of the development.

Tours of the Pioneer No.1 quarry are conducted regularly by arrangement and this service will be continued at Pioneer No.2. Unrestricted public access is obviously not practicable for reasons of public safety and security.

Social Impact Unit

Aboriginal heritage

1. How was the decision to maintain a fifty metre buffer between Susannah Brook and the quarry arrived at?

The fifty metre buffer was incorporated into quarry planning at the request of representatives of the local Nyungar community following discussions between them and Mr E. McDonald, the ethnographer retained during preparation of the PER.

2. When will consultation with representatives of the Aboriginal community be undertaken to ensure access to the ochre deposit?

Some consultation with the Aboriginal community has already taken place. Final consultation will occur after all necessary approvals have been obtained for the quarry to proceed, but before any earthworks which affect the ochre deposit are undertaken.

Transport

3. Has the proponent examined alternative transport options, including the construction of a dedicated road on Pioneer land, to bring the trucks down to the valley floor?

Pioneer has examined alternative transport options and has concluded that direct truck access to the No.2 quarry site is the only viable option.

A dedicated road on Pioneer land is considered to be unviable due to:

(i) The loss of vegetation involved (at least 10ha);
(ii) The increased potential for erosion, dieback, weed invasion and dust generation;
(iii) The visual impact of such a road; and
(iv) Safety - access to Toodyay Road at Red Hill is regarded as being safer than at Neuman Road.

There are no viable alternatives seen to road transport due to the cost of alternatives such as rail, the necessity to deliver stone to many different locations, and the necessity to provide for pickups of stone by private individuals and contractors.

Asphalt production

4. What is the maximum distance at which odour will be detected by neighbours?

Asphalt plant odours have very rarely been detected at distances greater than 1km from Pioneer No.1. Very occasionally, odours have been reported from up to 3km away during exceptional weather conditions (early morning, atmospheric inversion, easterly winds). Odours from Pioneer No.2 will be even less detectable due to its better location at the top of the Scarp, so Pioneer expects the range of odour detection to very rarely exceed 1km.

5. How many houses are located in a radius using this maximum distance?

There are no residences within 1km of Pioneer No.2. The nearest house is more than 1.5km from Pioneer No.2, and is located in the grounds of the Red Hill rubbish tip. There are seven residences within 3km east-north-east of Pioneer No.2; most of these are unlikely ever to be able to detect any odours. No housing development is possible less than 2km to the west of Pioneer No.2. No significant housing developments are believed to be planned to the east.

6. Will different production methods be used at Pioneer No.2? How do these compare with those used today at Pioneer No.1?

Production methods at Pioneer No.2 will be similar to those presently used at Pioneer No.1, which have caused only two complaints regarding odour since October 1988. State-of-the-Art gas scrubbing and other odour control equipment were installed in 1988. The odour issue at Pioneer No.1 dates mostly from before the installation of those measures. Pioneer will monitor new developments in odour control with a view to further improving its systems at Pioneer No.2 where practicable.

Monitoring

7. Will the proponent make monitoring information available to the general public? In what form will the information be made available?

Monitoring information will be made available to the EPA in the form of a monitoring summary report. The EPA may then make the information publicly available if it so desires.

8. Will the proponent make monitoring information available to the public in addition to the annual reporting requirements?

Monitoring information will be available to the EPA on request at any time. The EPA may make it publicly available if it wishes, or may request the information in response to a request from members of the public. Due to the time involved and the limited usefulness of raw data, Pioneer has no plans at this stage to make data generally available on an ad-hoc basis.

References

Armstrong, P G, and Muir, B G, 1988. Visual perception of conservation value. The distribution of flora in John Forrest National Park. J. Env. Mgt 26, 221-228.

Marchant, N G,Wheeler, J R, Rye, B L, Bennett, E.M, Lander, N S, and McFarlane, T D, 1987. Flora of the Perth Region. Department of Agriculture, Perth, Western Australia.

Rye, B L, 1982. Geographically Restricted Plants of Southern Western Australia. Department of Fisheries and Wildlife, Perth, Western Australia, Report No. 49.

Appendix 3

Letters to Department of Planning and Urban Development and Shire of Swan regarding land use planning constraints on land in the buffer

Secretary
DEPARTMENT OF PLANNING AND URBAN DEVELOPMENT

Your ref:
Our ref: 6/73
Enquiries:

BUFFER AREA FOR THE RELOCATED PIONEER HERNE HILL QUARRY

During its assessment of the proposal by Pioneer to relocate its Herne Hill quarrying operations the Environmental Protection Authority gave some consideration to the need for a buffer area between the quarry and the nearest residential areas. By relocating the quarry to a point near the eastern edge of its property Pioneer has created such a buffer with regard to existing residential areas.

This buffer area is needed both to protect residents from the environmental impacts of quarrying and to preserve access to the resource, which the draft Basic Raw Materials Resource Protection Strategy recommended be designated a "priority resource area".

While the Authority can use its assessment processes to recommend against environmentally unacceptable land uses within the buffer area, such a reactive approach is not ideal. It is important that present and prospective landowners in the buffer area do not develop unrealistic expectations of allowable land uses in the buffer area.

It is highly desirable that the environmental constraints on land use in the buffer area, due to the need to protect residents from the impacts of quarrying and preserve access to the resource, is clearly conveyed to landowners through the planning process. I would urge you, therefore, in cooperation with the Shire of Swan to give consideration to the establishment of such a buffer area. I have sent a similar letter to the Shire of Swan to appraise it of the issue.

B A Carbon
CHAIRMAN

26 FEB 1991

Environmental
Protection Authority

Shire Clerk
Shire of Swan
P O Box 186
MIDLAND WA 6056

Your ref: P227110
Our ref: 6/73
Enquiries:

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CHAIRMAN

26 FEB 1991

Environmental Protection Authority