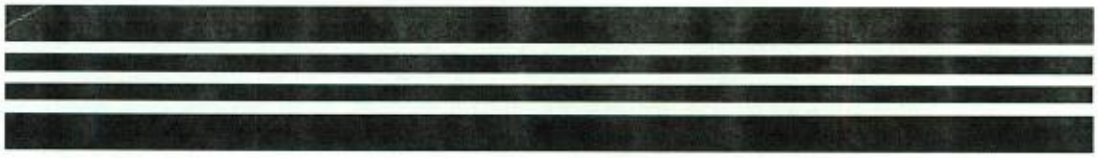

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Proposed Saxonvale coal mine : environmental impact assessment

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ENVIRONMENTAL IMPACT ASSESSMENT

Department of Environment & Planning
Sydney Office
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PROPOSED SAXONVALE COAL MINE
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Contents

INTRODUCTION

The Dampier Mining Company, a wholly owned subsidiary of the Broken Hill Proprietary Co. Ltd., proposes to develop an open pit coal mine to be known as Saxonvale situated on Authorisation Area 213, some 4 km north of Broke and about 20 km south of Singleton in the Upper Hunter Valley. The pit is planned to a depth of 300 metres, by which time some 200 million cubic metes of overburden and interburden material will be permanently emplaced over adjacent terrain to form an extension to an existing ridge.

The development is defined over a nominal 20 years and this assessment is limited to the works proposed in the impact statement for that period only.

In situ coal reserves are estimated at 1000 million tonnes comprising some twenty seams of varying quality and thickness. Underground mining methods would be difficult, and leave about 70% of the available coal in the ground and lost to future extraction. The preferred method involves a multi seam multi bench concept, with a planned initial production at 1.0 million tonnes per annum of cleaned coal, increasing to a designed production of 4.4 m.t.p.a. Most of the coal will, after treatment to reduce ash, be suitable for the high quality steaming coal export market.

All coal mine facilities for handling, treatment, storage and loading onto rail, are sited adjacent to the north-eastern corner of the authorisation area off coal bearing land, and within the Nine Mile Creek Valley all as detailed on drawings SE.1 and SE.2.

Raw coal storage and blending facilities, a coal preparation and washing plant, clean coal stockpiles and rail loading installations, a new rail line to join the Mt. Thorley-Wittingham spur railway, plus services buildings and amenities will all be part of the total project. Cleaned product will be taken by rail to the Newcastle coal ship loaders.

The environmental impact statement was submitted in draft-form in August 1980, and subsequent to comment from the Department, Singleton Shire Council and Department of Mineral Resources, the document was amended and accepted as being adequate for public exhibition and assessment.

Dampier Mining Co. Ltd. as owners of the land submitted a valid complete development application to Singleton Shire Council on 26 August 1980. In terms of the prescribed planning scheme gazetted on 7 January 1966, the proposed use is permitted under the non-urban zoning. Council notified the adjacent affected landowners of the proposal and arranged by advertising in the local press to invite written submissions from interested parties. It nominated that the development application, supporting documents and environmental impact statement were on display for one month commencing 12 September 1980.

Concurrently the Department of Environment and Planning resolved to undertake an environmental impact assessment of the proposal. The company submitted on 1 September, 1980 a copy of an environmental impact statement which was accepted as being adequate for public display. The Department placed the two volume document on display between the 10 September and 24 October, 1980 and through advertisements in national and local press invited written submissions from interested persons and organisations for lodgement with the Secretary on or before 31 October 1980.

On 10 October 1980 the gazettal of a regulation under the Miscellaneous Acts (Planning) Repeal and Amendment Act 1979, provided under the Environmental Planning and Assessment Act for Section 101 directions to be made in connection with a development application lodged but not determined before 1 September 1980. The Minister signed a Section 101 direction for coal mining proposals within the Singleton Shire on 5 November 1980 requiring the Council to forward all development applications relating to coal mining to the Department of Environment and Planning for determination by the Minister for Planning and Environment.

Copies of all submissions received by the Department have been forwarded to Council to assist it formulate its response. This Assessment Report and the recommendations contained herein constitutes the Department's consideration of the development application and associated Environmental Impact Statement. This Report will be forwarded to both the Council and the applicant - if either the Council or the applicant request a hearing in accordance with Section 101 of the Environmental Planning and Assessment Act, 1979, this report and the recommendations contained herein constitute the Department's submission to the Commission of Inquiry. If neither the Council nor the applicant request a hearing, this report and its recommendations will be forwarded to the Minister for Planning and Environment for his consideration in determining the development application. In addition, recommendations contained herein support advice submitted for consideration by the Minister for Planning and Environment in his determination. Recommendations are also included for consideration by the Department of Mineral Resources and the State Pollution Control Commission in any determination of applications under legislation administered by those authorities.

2. PROPOSED OPERATIONS

2.1 Open Pit Mining

As a consequence of a major exploration effort, the assessment and feasibility of mining the resource favoured the benched open pit concept. Overburden and interburden strata are typical consolidated Permian sandstone, shales and mudstones the majority of which will require conventional drilling and blasting. Using computer programme resources, the optimum size and best starting point have been established and involve a total depth of 300 m using up to 20 benches.

Operations are intended during 3 shifts per day, 5 days a week. Topsoil and subgrade materials are to be placed in stockpile windrows for early reuse in progressive revegetation. Overburden will be drilled, blasted, shovel loaded into large off-highway rear dump trucks and hauled for disposal. Coal and interburden will be similarly processed except raw coal will be taken to the coal preparation plant.

If development continues to programme, the pit will achieve its maximum 300 m depth and size by about production year 9, exposing all coal down to and including the Vaux seam with an estimated 30 million tonnes of raw coal and 200 million of waste materials extracted for disposal on the out-of-pit emplacement area.

The pit will then migrate in a north westerly direction with waste materials from the advancing face being placed on to the worked out benches within the pit, and overspill due to the swell factor spread as a continuation of the out of pit emplacement, raising the elevation over the disturbed area by an average 10 metres.

2.2 Emplacement of Overburden plus Interburden Materials and Revegetation

Disposal will commence along the Broke-Singleton road to establish a visual screen behind which further emplacement can take place. As the working area fills, the initial screen will be extended up the designed grade and provide a new area screened from view for continuation of the disposal process. Successive stepping up towards the ridge will develop an additional spur to the existing ridge which is the main topographical feature of the area.

2.3 Raw Coal Handling

Initially for target production of 1.0 mtpa cleaned coal, about 1.75 million tonnes of run of mine coal will need to be extracted. For designed capacity of 4.4 mtpa, some 7.0 million tonnes of r.o.m. coal will be handled.

Coal will be transported from the pit in trucks with payloads between 77 and 109 tonnes running on an unsealed private company haul road. At the dump area, the material can be directly fed to the rotary breaker or placed in holding stockpiles to overcome mismatch in processing rates. Oversize refuse will be carted to disposal areas. Raw coal delivered beyond the preparation plant capacity or requiring blending, will be diverted to a 300,000 tonnes stockpile stacked in two rows. Slewing, luffing stackers and bucket wheel reclaimers will enable these stockpiles to act as a rough blending facility for coal recovered from the several seams.

2.4 Coal Preparation Plant and Handling Facilities

Very few coals are sold as mined because of sediment contamination and mineral traces within the seam. Processing in preparation plants reduces the ash content and sometimes improves the carbonising properties. The preparation plant, which will include facilities for washing coal, will be installed in modules having rated capacities of 400 tonnes per hour, commencing with one for the initial stage and increasing up to four.

Raw coal will be passed along a 1200 tph conveyor into a 500 tonnes bin and then into a jig where it will be separated into three fractions, the upper layer of coal to product, the lower layer of stone to refuse and the middlings for recirculation. The second stage will separate intermediate sizes using cyclones. Coarse coal will be crushed and discharged, and the medium sized stream will be de-watered in centrifuges and discharged on to an outloading conveyor. Fine coal ranges will be further refined using froth flotation processes and vacuum filters to separate the coal for discharge to the outloading conveyor.

Coarse refuse will be loaded into rear dump trucks and returned to the waste emplacement. Tailings will be pumped to dams prepared in the overburden emplacement or returned for mixing with pit waste in later years.

2.5 Cleaned Coal Handling Facilities

Initially, all cleaned coal will pass via a transfer station along an 850 tph conveyor discharging on to a conical stockpile of nominal 20,000 tonnes capacity. Mobile equipment will temporarily extend this capacity as necessary up to 250,000 tonnes, and will be used for reclaiming product via an underground tunnel. In Stage II, four permanent rows of stockpiles are proposed with a total capacity at 750,000 tonnes. Each pair of stockpile rows will be served by a single 1500 tph capacity travelling slewing and luffing stacker. Each stockpile is to be returned by a 3000 tph conveyor loaded by bucket wheel reclaimers. The system of conveyors and transfer stations are designed to supply the 3000 tph overland conveyor which feeds twin 1500 tonnes train loading bins located over a new railway track loop. A retractable chute design provides for continuous train loading rate of up to 5,000 tph into CHS rail wagons coupled into unit trains.

2.6 Spur Railway

Unit trains comprising 42CHS wagons drawn by 3 locomotives are scheduled to serve the mine from commissioning using a new single track line approximately 8 km long, joining the new Mt. Thorley-Wittingham spur line about 1 km east of Mr. Thorley loading loop. For the first stage, about 8 trains will run per week increasing to 32 at target production rates.

The new works, including balloon loop, will be designed and constructed to the State Rail Authority standards and are detailed in the impact statement. Provision will be made for future electrification of the system.

The existing Singleton to Broke Road will be diverted over a 2 km length where it coincides with the proposed rail route.

2.7 Associated Facilities, Amenities and Utility Services

General offices, stores, workshops, laboratory and computer facilities will be provided. Shower and change rooms, first aid, car parking areas and amenities building are included.

A sewage treatment plant will be installed, capable of extensions to meet later increases in requirements.

Hunter River water will be available via the Mt. Thorley Water Supply Scheme. Extensive arrangements for storage and recycling effluents will be incorporated into designs to ensure the considerable water demands at the mine can be met.

Maximum use of electricity is planned, utilising up to 30MVA on a bulk industrial basis for normal target production. The Shortland County Council distribution system can support such forecasted demands, and a 66 kv supply will be arranged from a location approximately 3.5 km north of the coal preparation area, carried on 18 m high wooden poles at 125 m intervals.

Road deviations and transmission line realignments will be necessary later during the project to overcome sterilization of a portion of the coal resource.

2.8 Staged Developments

Although the mining methods proposed will be the largest yet contemplated in this State, they are designed to be sufficiently flexible to respond to variations in the energy market. The normal target production of 4.4 million tonnes per annum of cleaned coal could be required within 3 years, and development of the open pit within 8 years. This open pit proposal is expected to operate for a nominal 20 year period.

With development of technology, it is possible that the mine could be operating for up to 50 years using these methods, and these extraction methods do not preclude recovery of lower seams by underground mining later.

3. EXISTING ENVIRONMENT

3.1 Site Environs

Mine development is based upon prospecting over Authorisation No.32, a substantial portion of the coal lease area reserved for the steel industry. The Company sought amendment to some 2000 hectares known as Authorisation No. 213 which excludes the more western areas of the previous lease.

The Company has stood in the market and purchased freehold in excess of 2500 hectares within and beyond the lease boundaries and has applied for Mining Purpose Lease rights for coal handling facilities as advertised by Department of Mineral Resources.

Situated some 5 km north of Broke, each side of the Broke-Singleton Main Road 181, the area almost straddles the wide flat valley of Wollombi Brook and approaches the prominent ridge rising to 356 m ASL in the south-east. The elevation decreases northwards forming the Loders Creek catchment, with some 80% of the lease with slopes less than 5 degrees. Singleton Army Land abuts the company holdings in the east and in the west the Wollombi Brook hugs the escarpment remnants of the Hunter range.

The road network gives access to Newcastle via Cessnock and via the Putty Road to Singleton or Windsor and over the ranges to Sydney via Mangrove and Calga. A new rail spur line dedicated for coal unit trains loaded at Mt. Thorley loop, joins the Main Northern Line at Wittingham, and passes a few kilometres to the north of the lease.

The scenic quality of the district and features of historical interest still forms a tourist attraction augumented by vineyards around Fordwich in the alluvial flood plain near Bulga.

European settlement has denuded most of the natural environment through large scale clearing of natural vegetation, introduction of exotic plant species and fauna, rearrangement of surface underground water regions and through grazing and agriculture put pressures that arrest the natural regenerative successional processes. In spite of these impacts, some scattered trees cluster in patches over the area, with local depressions filled by swamps or saltpans. The authorisation and mining purposes areas do include some portions that are considered ecologically valuable.

3.2 Geology

The Company commenced its exploration effort in 1972 and included geophysical surveys, and covered and open hole drilling. These were followed by excavation of a 1.5 km long exploration trench. In situ reserves are in excess of 1000 million tonnes of which approximately 40% can be reached by open cut methods. Bulk sample and laboratory analysis show the reserves to be

predominantly high quality steaming coal after benefication to remove ash and impurities. Metallurgical quality coal may be found in sufficient quantities at depth later in the mine development.

Known as the Singleton Coal Measures, the seams intensively studied are the Jerry's Plains Sub Group of the Wittingham Measures, from the Whybrow down to the numbered seams of the Foybrook formation. Seam thickness and quality are variable along and across the strike, separate and abruptly shift which complicate mining and vary the coal to overburden/interburden ratios. The Wollombi Measures, which outcrop in the south western sector, have been found to be inferior in quality and have not been considered in detail.

Overburden and interburden rocks include conglomerates, siltstone, and mudstone bands with sandstones predominating. The first and last classes are competent, require blasting and are stable for slopes as steep as 70 degrees. The latter two classes undergo reasonably rapid breakdown due to clay inclusions. Rocks demonstrate alkaline pH, a deficiency in nitrogen and phosphorus, and apart from arsenic, contain traces of metals low enough to remain fixed. They are considered unlikely to separate into leachates.

Outcrop zones are expected to be oxidised, and although the pH range is wide over the seams, salinity is high throughout reflecting the tendency to act as groundwater aquifers. The steep dip at outcrop along the north eastern sector flattens to 4 degrees, west of the main road. No igneous intrusions nor fault zones have been located.

3.3 Soils and Erosion

The varied composition of the parent rocks have resulted in several duplex classified soils with isolated patches of uniform profile materials, such as sands and clays. The duplex are the texture contrast soils with a sharply differentiated class (B) horizon underlying a coarser textured surface (A) horizon. If disruption occurs to the upper horizon, the clays of the lower horizon, which are readily dispersed in water, rapidly scour by tunnel erosion into gullies. Upper horizon depths in 50% samples were 150 mm or less and maximum depth profile extended to 4 metres. Soils have generally low fertility status, are generally acidic, and heavy fertilizer applications are necessary.

Physiographic units and potential for erosion are influenced by slope vegetation and soil type and were charted from air photo studies. Though slopes are low, the extensive clearing of native vegetation and continuous grazing pressure have marked watercourses by gully erosion, while changes of groundwater levels and salinity have still further extended damage. The vegetation cover has not been so severely denuded over areas of steeper slope.

The salinity of the soils has great significance for surface water quality. The trace element and heavy metal contents were found to be similar to those recorded from parent rocks.

3.4 Climate and Air Quality

Meteorological records available for Broke, Bulga, Jerry's Plains, Cessnock and Singleton Army Base were used. A warm temperature climate is characteristic of the region with heaviest precipitation from thunderstorms during summer. Heat wave days between 21 and 33 and frost days between 14 and 19 are equated with temperature and humidity values. Observations of fogs in this valley indicate that the topography around the authorisation favours development of temperature inversions. Since meteorological conditions favouring the formation of inversions in the coastal zone influence the regions immediately in-land, the incidence for this site based on Williamstown records would probably be at a minimum occurrence level of 70% in any one year rated for all heights up to 500 metres.

The data on winds show predominance in autumn and winter from the west and northwest directions. In Spring the predominance is shared north-west and south-east. Strong winds are rare with values over 11 km/hr occuring only 11% of the time and most often from the west and north west.

The annual average rainfall is estimated between 647-713 mm. Two major droughts and twenty major floods occurred since 1947. Rainfall is spread throughout the year and its effectiveness is assessed from water balance for soils, after allowance for evapotranspiration. The water deficit is highest for January wax and wane during hot months between October through to April.

The limited results for atmospheric particulates from only three deposit gauges show values generally above the average rate for undisturbed sites in the Upper Hunter region. Although adverse metereological conditions can introduce impacts from power station stack emissions, the local air quality is influenced primarily from agricultural operations, fires and Singleton Army firing range.

3.5 Hydrology and Water Quality

The authorisation covers a small portion of the Wollombi Brook catchment via contributing creeks, much of Nine Mile Creek and some of Loders Creek. Because of gentle grades, the creeks have very low flow rates and flash peak flows, although local flooding is limited. Surface water contains sulphate and chloride levels well above acceptable values.

Subsurface waters are confined to coal seam aquifers, principally Redbank, Blakefield and Bayswater. The open structures tighten with depth due to overburden pressures and almost cease to flow below 100 m. Overburden and interburden rock strata have poor permeability. Flow rates from exposed surfaces in the proposed

pit are expected to reduce as the aquifer is drained by mining. Inflows from alluvial sources are prevented by intervening impermeable layers. Total ingress into the pit is likely to reduce with increasing depth but is expected to show marked fluctuations as the major aquifers are intersected by the excavation. Groundwaters are all highly saline and other parametres for water quality exceed statutory limits for discharge to waters.

3.6 Flora, Fauna and Archaelogy

Eucalypt species dominate but woodland lacks shrub understorey. Over pasture land where coal exploration operations have displaced cattle grazing recolonising and regeneration has occurred. No rare or endangered plant or animal species were recorded.

No archaeological relics have been found although historically the valley was known to belong to the Wonarua Aboriginal tribe.

3.7 Land Use

Coal mining is a development permissible with consent over the land included in the Authorisation and is zoned under the prescribed planning scheme for Singleton-Patrick Plains Shire gazetted 7 January 1966 as Rural 1(a) or 1(b).

Sheep farming has been discontinued in favour of cattle grazing and dairying. Viticulture, stockhorse breeding and hobby farming are augmented with some arable crops. Fertilizer application and weedicides are essential.

The Company has provided a detailed drawing on which it has defined the extent of its present freehold land. There are very few portions on or adjacent to the Authorisation which have not yet been purchased. Of these, four are occupied and affected by the early stages of the emplacement to the south of the lease. At the north eastern corner lies the Remo Vineyard which is within 500 metres of the mine establishment and almost adjacent

to the new access road. The only other occupied establishments that have voiced concern are the vineyards at Fordwich some 0.5 km west of the Authorisation, owned by Saxonvale Wines Ltd and by Lindeman Holdings Ltd. These and other existing residences are beyond the nominated buffer zones.

Coal mining is already a significant land use in the Upper Hunter Valley and two major leases are currently in final planning stages to the north of this authorisation. Unimproved land costs average $450 per hectare, with demand for hobby or intensive farming lifting land prices to three times this value.

Broke and Bulga villages are service centres for the immediate local needs, though lack of assured water supplies and continuing urban development in Cessnock and Singleton have limited their expansion. Active recreational facilities to match rural needs and natural passive recreation are available.

3.8 Demography

In the local villages the resident population, though growing, is less than 300. High School age children travel to Singleton. Farming, traditionally the main employment, is progressively giving way to mining, although employment opportunities especially for youth are extremely limited.

This local pattern is amplified in the regional centres of Singleton, Muswellbrook and Cessnock. Educational, health and social services are currently strained, while recreational facilities for most sports and aquatic past-times are unsatisfactory.

Population growth forecasts are difficult in view of uncertainties in timing of other coal mining, heavy industrial and power generation developments. In the last two years, the most optimistic forecasts, for coal mining in particular, now appear to be well founded and that industry is expected to become the most important generator of employment for the district.

The twin utilities of adequate sewerage and guaranteed water supply are currently in need of augmentation. The Mt. Thorley Water Supply scheme to be managed and maintained by Singleton Shire Council is currently under construction. Its design includes for the demand projections for this development.

Housing has not been addressed in this impact statement though it is known that Singleton Shire Council possesses a substantial land bank and given funds for sub-division development could be expected to release building blocks to match demand.

The power supply authority Shortland County Council has confirmed that its system is adequate for the estimated total requirements. The state supply grid system includes two 330 KV transmission lines between Liddell power station switchyard and Newcastle substation. These lines may need to be relocated to free sterilised coal underneath, although it is possible that the mine development proposals will not intersect for at least the next fifteen years.

4. REVIEW OF SUBMISSIONS

4.1 From Private Interests

Singleton Shire Council has forwarded copies of eleven submissions it received from local landowners, R.W. Miller & Co. and viticulture interests as tabulated in Appendix 1. Of prime concern was dust pollution followed by noise and dust from blasting, destruction of visual amenity, pollution of local water sources, disruption to property access and reduction of property values.

Submissions received from and on behalf of Saxonvale Wines Ltd. registered strong objection, sought an extension of time and if unable to lodge appeals, requested a Commission of Inquiry before determination. Primary concern arose from dust fallout especially coal dust which reduced photosynthesis, interfered with pollination, limited effectiveness of insect and disease chemical control spraying, introduced contaminants, influenced colour and flavour, quickened rate of acid respiration and increased risk of hail damage. Wind data presented was disputed, and performance predictions were considered to be inadequately substantiated. Doubts were expressed on the reliability of the Mt. Thorley Water Supply Scheme and the degree of risk to structures, equipment and irrigation pipes from blasting vibration. Finally, the Company believed that its substantial investment in development, employment and reputation would be at risk.

Lindemans (Holdings) Ltd. wholly endorsed the submissions made by Saxonvale Wines Ltd. and in addition noted deposition rates bore no discernible relationship to the scale of operations proposed, was concerned about potential contamination of surface water sources especially by arsenic, and believed a loss of reputation and sales turnover would occur. If co-existence was inevitable, it welcomed any opportunity to co-operate in research and monitoring. The Company confirmed a substantial investment in irreplaceable viticultural land and estimated compensation in the order of several million dollars.

4.2 From the Consent Authority

The submission by Singleton Shire Council is reproduced in full in Appendix 2. Council has provided advice on its current negotiations with the Company and on matters it would wish to have included in conditions attached to any approval of the proposal.

4.3 From Government Authorities

The Department sought from other Government agencies their comments upon the environmental impact statement and their views on those areas for which they had special concern.

The Department of Science and Environment expressed concern that if the operations were scheduled on a 24 hour per day basis noise disturbance may be significant. Monitoring and emission controls could be necessary. Care should be taken during overburden emplacement to provide a continuity of the existing quality of vegetation along the ridge. Additional details were sought of the water management during construction, the means to be adopted for maximisation of the water resouces, impact upon the existing water courses, and treatment and disposal of mining wastes. An opinion was given that the Company should take a positive role providing community facilities and housing not only locally but in the region, and include needs of single construction workers. Details of potential land use conflicts, and the means whereby the Company plans to overcome them should be indicated. Finally, the problems of cumulative impact of numerous large developments programmed for the upper Hunter will require consideration by State and possibly Federal Authorities in some other way outside this single commercial project.

The Department of Administrative Services described the fire and bombing range, its importance to both Army and RAAF services and the three issues currently under negotiation with the Company, a) to purchase a portion of land, b) the right to place overburden on Commonwealth land, c) agreement to the diversion of the Broke-Rockley Rd. through the Training Area. The Department went on to list factors needing to be addressed:-

i) possible land exchange

ii) fencing on new boundaries

iii) establishment of tree screens alongside haulage roads and coal handling facilities

iv) attenuation of light and noise along haulage roads

v) contouring of overburden emplacement to preserve usefulness as training area

vi) revegetation programme to minimise erosion of filled areas

Issues a) and b) are negotiable but c) would be opposed.

The Joint Coal Board confirmed that it had directed that the mining plan be aimed towards maximum recovery of the resource and supported the claim that by using an open pit operation about 90% return could be achieved. The open pit principle is a well known metalliferous technique which can be expected to be

successfully applied in coal mining. The measures proposed to minimise the disturbance and adverse environmental effects are to be commended and the Board supported the project as enumerated in the statement.

The Department of Agriculture noted that the Company proposed to maintain agricultural productivity upon its freehold land and to ensure by careful water management that the effects of mining operations upon Wollombi Brook would be insignificant. While alternative methods of water treatment including ion exchange were mentioned, more detailed information on the above and especially on the elements of water management would be reassuring. The Department had serious doubts that the Company has accepted the possibility of a restricted water supply noting that any limitations could affect other user rights or cause inadequate dust suppression. A close study of the water budget was recommended. The Department believed that the potential dust pollution problem would be enormous, and was unimpressed by the suggestion that the contribution predicted from the proposed mine would be of no significance given the existing air quality and the level of discharges from Liddell Power Station, other coal mining, Singleton Army activities, fires and agriculture. The Company assumptions for dust deposition rates could not be reconciled with the limited data presented in the impact statement. Although the Department concurred with statements relating to rehabilitation techniques for mine sites, it considered that the Company should have made specific firm commitments to ensure successfull research and implementation of revegetation of pasture as well as tree and shrub species. In view of the Company's responsibilities for occupational health and environmental monitoring, details of facilities to be provided for same would have been reassuring. Finally, the Department made the point that individual project studies were predicted from an isolationist point of view, while it believed that any new development would not only bring an individual impact upon the area but, in addition, produce a cumulative effect upon on all aspects of developments already in existence.

The Department of Main Roads expressed the view that the proposal would have a major adverse impact on the existing system affecting not only Main Road No. 181 but other roads providing the transport network for the region. The Company would be expected to meet the full cost of all roadworks necessary as a result of the mine development and would have to negotiate with Council and the Department to reach an agreement affecting all permanent road closures, deviation, restoration and improvements to existing public roads.

The Department of Mineral Resources confirmed that Saxonvale Mine would be the first open pit coal development and the largest proposed in N.S.W. with an estimated 500 million tonnes that could be ultimately recovered. The multi seam, multi bench proposal was considered the only practical method. In view of the 8-10 year period of exposure to the elements, the stability of the walls and benches was considered important and more conservative limits to the physical dimensions within the pit would be necessary. The Department nominated that the wall height should not exceed 30-36 metres with the batter angle between 62 degrees to 65 degrees. The broad concept of overburden emplacement was suported but attention was drawn to available research into the progressive changes of slope angles descending hills found in natural topography, and to the possible reworking of established revegetation to blend into the emplacement during the second half of the project. Information was not provided on any trials for native species revegetation nor criteria to be adopted for topsoil selection. It had been presumed that the final void would be the one left in approximately 75 years time, and while options for it needed to remain flexible, these were unlikely to include garbage dumps or lakes. A contingency plan was needed to cover premature closing of the mine. The possibility of spontaneous combustion in any or all heaps of coal need to be considered. The visual intrusion from coal stockpiles, associated plant and conveyors was not adequately addressed. The suggested recovery of in-situ coal as 'better than 90%' will be misleading as the proportion of marketable clean coal product would be approximately 61%, and would entail disposal of about 2.5 m.t.p.a. of carbonaceous materials, the use of which on haul roads had been avoided in the past because of the unfortunate colour contrast. Departmental policy required that the resource value of coal washery reject be taken into account as while it may have no present commercial value, its possible recovery during the life of the mine should be provided for. Proposals for tailings transport and disposal could introduce conflicts within the programmed development of the overburden emplacement and the question of the safety and stability of the dams needs to be considered. Water make within the open pit must be prevented from affecting the stability of the walls and benches and adequate pumping provided to remove it as necessary to surface storage from which any discharges to natural watercourses must first be treated to an acceptable standard. All surface waters should be prevented from entering the open pit operations. The Department's main concern was the potential sterilization of the Bayswater, Broonie and numbered seams beneath, although it accepted that some sterilization of the coal reserves would occur. Any lease granted to the Company would restrict operations down to and including the Vaux seam. The Department stated that any consent granted by the Minister would contain specific conditions and safeguards and include rectification of the nominated deficiencies in the impact statement.

The Department of Public Works confirmed that existing water supply and sewerage schemes in the area already need augmentation and that insufficient detail was included in the EIS to judge the adequacy of the temporary/permanent domestic water supplies to satisfy the projects needs. There are inconsistencies in the water balance summaries and the water usage rate at about 700 litres/tonne of marketable coal is greatly in excess of the average rate assessed at about 400 litres/tonne normally associated with such operations.

The Electricity Commission of N.S.W. recognised that the two 330 KV transmission lines between Liddell Power Station and Newcastle Sub Station at Killingworth could be affected by the proposal. Since these lines are important system connectors and are going to be affected by both Warkworth and Mt. Thorley Mines further north, relocation of one or both of them is possible to enable recovery of coal. Accordingly, while no objection was raised in principle the Commission would require that:-

i) The Commission's easement rights will not be affected.

ii) The Company consults with the Commission to ensure adequate clearance to the transmission line conductors and structures.

iii) The Company liases with the Commission to ensure that insulation levels of its equipment are not affected by air borne pollutants from the proposed mine.

iv) The Company meets all extra costs incurred.

The Energy Authority of New South Wales raised no comments.

The National Parks and Wildlife Service noted that as the proposal affected cleared agricultural grazing land there did not appear to be any significant impact on flora and fauna values. There was no evidence that an archaeological survey had been undertaken and claims that there are no remains of Aboriginal presence are not supported. The Service required a survey conducted by an acceptable qualified archaeologist to cover all affected lands involved in this project.

The Soil Conservation Service indicated:-

i) Overburden/Interburden Emplacement - The proposal to blend the out of pit material to integrate with the natural landscape has merit, but detailed planning and controls in close consultation with the Service are required for such a complex operation to succeed. To achieve "natural" reinstatement, special attention would be needed for, selection of the right combination of slopes, breaks of slope and stable drainage lines, vegetation associations based upon the right mix of fill materials to ensure progressive rehabilitation rising up the natural gradient, a detailed post mining landscape plan and controls for

ultimate contouring. Climate would be a major constraint, and source and quality of water for irrigation proposed would need early investigation. Similar planning would be required for in-pit emplacement to ensure blend with both rehabilitated and original vegetation. Possible problems involving toxicity from emplacement materials and various wastes have been recognised and could be handled using properly monitored and controlled mining and rehabilitation operations.

ii) Control of Erosion and Runoff - The Company should seek advice of the Service in the preparation and implemention of comprehensive erosion control plans for the whole area affected by mining including ancillary roads and new railway. For the spur railway, the batter gradients should be at least 1:3 and flatter where possible on embankments, so that the necessary vegetation cover can provide surface stability. Batters should be topsoiled, fertilised and seeded.

iii) Topsoil - The Company should consult the Service when preparing standards and plans for identification of suitable "topsoils" which should include chemical as well as physical characteristics. For out of pit emplacement, topsoil stripping ahead of the operation could be replaced on shaped areas although suitable material may become scarce as the works proceed up the slope to the ridge. Materials from the pit area could result in introduction of unsuitable vegetation in the new location. Reuse of topsoil should be possible for inpit emplacement.

iv) Residual Open Pit - The Company proposal covers a 20 year production but it was presumed that the pit would continue to migrate when mining the remaining reserves. End use as a recreational lake did not appear practical in view of the paucity of surface and underground water in the area. Negative impact would occur from accelerated watercourse erosion to a new base level and reduced stability of sides and benches. No alternative mining plans have been mentioned to eliminate or reduce the dimensions of the void.

v) Past consultations - Whereas written advice originating from the Service has been freely used in the EIS, only the emplacement proposal concept meets with its approval. This proposal differs from current mining operations in this area only in magnitude and complexity. The Service considered that sufficient knowledge is available to ensure the problems within its area of concern can be resolved provided the specialised inputs are made to the planning and control of the emplacement operations, and the Company seek the advice and assistance of the Service. The costs of rehabilitation would be expected to be higher than similar operations in the region.

vi) Protected Lands; Loders Creek catchment - The Company should make early application to the Catchment Areas Protection Board through the Service Area Director-Scone for approval.

The State Rail Authority supported the proposal and confirmed, that the spurline proposed had a rated capacity in excess of 5.0 million tonnes per annum, a possible need to duplicate the Mt. Thorley line if tonneages from the total area increase, and the main northern line in this section had an adequate coal carrying capacity of 23.5 m.t.pa. The track would be designed and built to S.R.A's class I siding requirements involving 53 kg. rail, and would be built, owned and maintained by the Company. Train movements on the spur line would be controlled by S.R.A. signalling except for the balloon loop where they would be controlled by the loader operator. Electrification of the main northern line between Newcastle and Muswellbrook could on current planning commence in 1985. Extensions to the Mt. Thorley rail spur are currently under investigation.

The State Pollution Control Commission identified the following as the major considerations relevant to its responsibilities:

i) Noise - Although the measured background noise levels are for a rural area, the acquisition of land to act as a buffer is an effective measure to minimise impact. Other suitable measures (to control noise emissions) can be implemented under the provisions of the Noise Control Act.

ii) Water Quality - The water management principles contained in the EIS were considered to be sound, and the Commission will set the limits on the quality of water to be released from the site and the Company will be required to provide for adequate settling times and suitable treatment of waters. Ponding is the preferred method for disinfection in lieu of chlorination which could be undesirable for irrigation of rehabilitated areas. The Commission differed on the most appropriate research techniques for prediction of natural weathering and identification of soluble components from overburden materials, noting that the data in the EIS presents inconsistent results and serious errors in interpretation. The potential problems highlighted by its own assessment of the data suggests that detailed research on leachate characteristics and stability of spoil using the saturation-extract technique should be commenced without delay in conjunction with the Commission and the Soil Conservation Service. Studies should include analysis of unconsolidated material for total salts, electrical conductivity, concentrations of sodium, calcium and magnesium in water saturated extracts, and a top soil depth map. The Commission supported the proposed review of arsenic distribution in overburden and a programme of overburden monitoring over the life of the mine. The Commission would seek details of the proposals for handling acidic oxidised coal and of acidic interburden material beneath the Bayswater seam if it will be disturbed. Should

the end use of the final pit be a recreation lake, the Company should investigate the potential of this water as well as the likely effects on groundwater and surface water quality, including an estimate of effects upon any future underground mining.

iii) Air Quality - The Commission would insist upon a more elaborate programme of monitoring to assess the existing and future dust loading around the mine area, including the use of dust deposit gauges, high volume samplers, suspended matter paper tape sampler and recording anemometers. There is a need to include dry weather and high wind conditions in any assessment of dust burden rather than rely solely on average values. It is possible that in addition to the use of water to control dust on unsealed roads and working areas, suppression agents may be found to be necessary for adequate safeguards. Provided proper disposal of the collected dust from drill rigs is arranged, the system proposed is considered satisfactory but there appears to be no further practicable controls on dust from blasting operations apart from restricting operations during periods of high wind. The Commission is confident that it will be possible to reduce emissions from coal handling equipment and stockpiles by application of control measures under the Clean Air Act. It is concerned, however, that the actual coal recovery area and disposal areas which cannot be easily controlled may need to be isolated by buffer zones. Even though it is difficult to predict dust fallout rates around the mine, information from two existing open cut mines within the Hunter Region indicate levels at least an order of magnitude higher than those here predicted. This monitoring indicates that levels of dust deposition will rise significantly over a wide area as a consequence of the mine operations and preliminary calculations indicate long term deposition rate in Broke Village may double. There is a recent precedent at the Eraring open cut mine where the Electricity Commission had proposed a 1000 metre wide buffer zone. The Commission noted that short term problems would occur during high wind conditions and following blasting operations. When taken in conjunction with two other coal mines to the north their aggregated dust emissions could be expected to significantly further increase levels in the area. The Commission considered that buffer zones, 500 metres wide around the overburden disposal areas and 1000 metres wide around the coal recovery operations, were necessary in addition to controls that may be applied under the Clean Air Act. It was not yet satisfied, on the basis of information presently available to it, that acceptable air quality could be achieved within those zones. Outside same, dust deposition rates would exceed the existing levels, but would be comparable to levels considered acceptable in city residential areas such as Sydney. However short term problems could be expected during high winds and after blasting operations.

iv) Other Matters - The Commission noted that although the Company hoped to minimise any adverse visual impact for residents of Broke and Bulga, earth banks, revegetation and landscaping would be necessary to reduce adverse visual impacts from the Broke Singleton road. As the existing ecosystem would be completely lost in the areas stripped for mining and emplacement of overburden, safequards would be necessary to confine impact to only that immediate area required to conduct the operation. The reference to the grey box association having a high conservation status is at variance with the claims that this association is well represented in the Newcastle region. The Commission favoured the revegetation of batter slopes along the proposed new railway spur line including the use of plant species of the area as far as practicable. Investigation should be made into the difficulties encountered on the steep north facing embankment along the spur line to Mt. Thorley. The impact statement should have considered in more detail the options for final usage of the open pit.

The Commission concluded that it was satisfied it could impose conditions such that the emission of noise, or the discharge of pollutants to waters would not be sufficient to warrant witholding development consent on those grounds. However, unless the Company could acquire the appropriate buffer zone or could demonstrate that acceptable air quality could be achieved within 500 m of the emplacement areas and within 1000 m of the pit, the Commission was unable at this time to indicate that its approval under the Clean Air Act would be forthcoming. The proponent will be required to make application for the necessary statutory approvals under Section 16 of the Clean Air Act, Section 19 of the Clean Waters Act and Section 27 of the Noise Control Act.

The Water Resources Commission noted that while management of stormwater and contaminated waters from the coal handling and offices areas appeared satisfactory, the provisions for drainage from the overburden disposal and the water balance were inadequate. It considered that further detailed studies would be required to assess potential for leachates and may entail arrangement for their collection and special treatment. The rainfull design criteria used is acceptable and no licensed bores are likely to be affected by the project. After further discussion with the Company, the Commission subsequently accepted the design criteria adopted for the water balance and supported any proposal to maximise use of water collected on site from the local catchment. Spillway design from any such surplus should be designed to safely discharge water generated by rainfall events up to a 1 in 100 year recurrence interval. To meet possible water supply delays from the Commission's headwater storages, the minimum storage held on site should be not less than 5 days demand. The Commission suggested that spillway discharges from site storages should not be permitted for rainfall events less than 1 in 10 year recurrence interval.

5. ENVIRONMENTAL PROBLEMS AND NOMINATED SAFEGUARDS

This section outlines the safeguards proposed by the proponent as nominated in the impact statement or in subsequent correspondence. These are commented upon in Sections 6 and 7 and are not regarded as the only measures that will be recommended by this assessment of environmental impact.

The major issues as submitted by the Company include:-

- Removal of overburden and interburden materials and emplacement out of the pit.
- Water resources management.
- Dust
- Socio-economic impacts.

5.1 Overburden/Interburden

The Company has developed a computer mine planning system which can process some hundreds of options for development of a coal resource. To maximise the recovery of the available coal resource, and utilise all coal seams intersected as the excavation approaches the depth currently believed to be feasible, a multi-bench open pit proposal was considered the most cost effective. The optimum scheme developed entails an out-of-pit disposal off coal bearing land, of some 200 million cubic metres of overburden and interburden materials.

To get access to the advantages of open pit mining a suitable disposal location needs to be available. Site options were few and in a scenic area past solutions of grassed mounds were clearly unacceptable. The nominated solution is to create an extension to a natural existing topographical feature.

To overcome the visual disamenity of the emplacement as much as possible, revegetation of the new graded surface is to be of top priority. Each new berm will be followed by emplacement of a larger area behind, until the free standing height needs to be again established by a successive berm and so on until the completion of the new contours merge into the existing ridge.

Once the pit floor is reached and subsequent mining develops in a north west direction, overburden/interburden disposal will take place in-pit upon benches behind. With allowance for swell factor of replaced materials, the final pit contours are likely to be raised by approximately 10 metres above original ground levels. Similar procedures will be adopted to ensure a blend with the established out-of-pit emplacement and extend the ridge profile in that direction.

Based on drill hole data, the majority of these materials will need to be blasted, and the large bloc fragments will be loaded into large rear dump trucks for haulage to the emplacement area. In addition, waste carbonaceous materials including rock impurities, oxidised coal, coarse rejects and washery refuse will be carted for disposal in the emplacement zone. Special provisions will be incorporated for the washery tailings slurry piped to a holding lagoon or series of dams to be sited within the area.

Detailed investigations were conducted to assess the chemical composition of the rock strata to review the rate of weathering and its residues, predict behaviour when exposed to erosive forces, and to estimate the potential of self-sustaining revegetation. Similar analysis of the "topsoil" was conducted concurrently.

Safeguards nominated in the impact statement include:-

* Clearing of vegetation and mulching for either direct revegetation or reinforcement of topsoil.

* Stripping of topsoil for replacement as soon as feasible over new surfaces.

* Placing of carbonaceous wastes and materials which have potential to create saline or other problems in thin layers at depths not less than 5 metres from finished surface and where possible deliberately mixed in with other selected materials. All disposal materials spread to achieve sufficient density to prevent slumping.

* Contouring of slopes between 5 degrees and 10 degrees with each berm protected by a narrow bench contoured to act as rain run off channels into drainage lines.

* Grading, harrowing, topsoiling, fertilising and seeding plus appropriate watering and maintenance of the new surface.

* Dust suppression over haul roads and emplacement working areas, plus collection of excess for reuse.

* Monitoring of stormwater runoff and collection and treatment as necessary for recycle uses.

* Construction of a 10 metres high graded and revegetated embankment along the western boundary of the full length of haul roads.

5.2 Water Resources Management

The Company having set production targets for coal product and estimated water demands inherent in extracting and washing, investigated the available sources and potential development of water resources to meet its needs. Of prime concern was the security of supply, followed by its quality and environmental consequences of action to develop the resource.

In spite of retention and treatment of all surface waters falling upon its freehold in addition to reuse of all groundwaters flowing into the pit, these resources do not possess adequate reliability. For environmental reasons and high sediment loadings flowing down Wollombi Brook, development of water storages across this catchment were unacceptable. The Hunter River is the only viable source. In conjunction with other major coal developers in this region and with Singleton Shire Council the Company is a partner in the Mt. Thorley Water Supply scheme.

The application to the Water Resources Commission for a licence to divert from the Hunter River is still under consideration for ultimate requirements, and is thought to depend upon the implementation of the Glennies Creek storage which has a construction completion date scheduled in 1983. In the short term, it appears diversion needs could be met from the river on a minimum requirement basis and security of supply could be guaranteed for post 1985.

Safequards proposed in the impact statement are a reflection of the Company's philosophy that:-

* Stormwaters off contaminated or disturbed areas will be collected, treated and recycled with excess discharged subject to meeting quality standards set under the Clean Waters Act.

* Underground waters intercepted by mining will be collected treated and recycled or recirculated into contaminated stormwater system as appropriate.

* Uncontaminated stormwaters will be diverted around the mine operations and leave the authorisation undiminished in quality or quantity.

* Drainage and ponding provisions are designed to cater for a 100 year return storm.

* Treatment could include desalination, ion exchange, as well as settlement by ponding.

* Coal preparation plant is designed for closed circuit water system, with make up for losses from cleaned coal stockpiles, tailings slurry and refuse.

* Any releases other than during wet weather high stream flow conditions, would meet all quality and quantity limitations determined under the Clean Waters Act.

5.3 Dust Pollution

The Company, in recognising that mining and movement of huge masses of materials will inevitably create dust emission, pointed out that from the inception of this project it has regarded this as a major design factor. Dust generation potential exists throughout all sections of the proposal and the Company has based its control strategy in relationship to the existing quality. The Company considers the impact of dust emissions from the mine on the vineyards will be minimal. It has furthermore recognised that over and above its own dust control procedures it will need to comply with any requirements of the S.P.C.C.

The Company has already established three dust deposition gauges, one near to the exploration trench, one 2 km approximately to the west nearly mid way E-W of the authorisation and one 1200 m to the north in the north east corner of the lease area, each providing rates in mg/m^2/month during the period August 1978 to May 1979. The Company has suggested that from other monitoring data for Upper Hunter Valley locations, an average fallout rate would apply. Further, it has claimed that the very high values recorded during the above period were the consequence of poorly controlled trench excavation work concurrent with hot dry summer conditions.

Safeguards nominated in the impact statement include:-

. Watering of haul roads almost continuously.

. Fixed water sprays at the run of mine dump station and conveyor, at the feed and discharge chutes to the rotary breaker and to the conveyor feeding the surge bin at the coal preparation plant.

. Wind shields for dumping, elevated conveyors and the rotary breaker.

. Installation of a permanent automatically controlled water spray system incorporating surface tension reducing chemicals for transfer points and over surfaces of raw coal stockpiles. Use of stackers and wheel reclaimers for loading out and reclaiming.

. Water sprays on conveyors, discharge points, and over clean coal stockpiling. Loading out and reclaiming as above.

. Enclosure of elevated conveyors and at train loading chute.

. Wash down facilities off concrete aprons for all locations at which there is a change of transport mode.

- Water spray dust suppression over emplacement working areas and, if necessary, over newly-placed graded external slopes to assist revegetation.

- Use of dust collection equipment for drilling operations.

- One blast per day using A.N.F.O. Anzomex boosters or similar equipment with delay elements to reduce over-blast and flyrock.

5.4 Socio-Economic

The Company has justified this coal mining development as part of a shift in the upper Hunter Valley from a rural economy towards an industrial and energy-generation economy. It has further suggested that little local recruiting will be made either for construction or for mine operations because of lack of suitable personnel. The total estimated infrastructure demands for housing, education, active recreation open space and medical care have been nominated by the Company. However, based upon experience of similar major projects, the Company reviewed three housing strategies but declared its intention of following the minimal level of involvement to allow private enterprise to operate.

The discerned impacts that a notional percentage increase on existing area population between 35-40 percent have been declared to be matters for resolution by State Government and Local Government agencies. The Company has intimated that it will contribute to studies and assist wherever possible with providing data.

The Company has nominated that its construction contractors will be responsible for providing support services for its transient workforce.

The Company has subsequently amended its views following negotiations with the Singleton Shire Council.

6. ASSESSMENT OF ENVIRONMENTAL IMPACT

6.1 Land Surface Status

Scenically, the region is attractive, has high tourism potential and certain parts of the valley have been nominated by the National Trust for appropriate dedication. However, in general, the land is average grade for grazing, but poor for arable and intensive agriculture unless heavily irrigated. It has suffered from earlier clearing and grazing agricultural practices.

Locally, over 2500 hectares are owned freehold by the Company whose declared policy is to maintain agricultural activities until the time the land is to be mined, and after extraction of coal resources, to reinstate it to at least its former condition. The Company's economic appraisal of the proposal has been based on a 20 years term and there is no doubt that it has adequate financial resources and time to make good its assurances.

6.2 Air Quality

6.2.1 General

The impact statement states that the average dust fallout value over the Upper Hunter Valley region is 340 mg/m²/month, and that the existing quality in this locality should be similar by virtue of the influence of stack emissions from Liddell Power Station, existing coal mining, agricultural activities and regular use of the Singleton Army Range for high explosive ordinance. This claim needs to be substantiated.

The relevant data are based on the results of only three dust deposit gauges, and it is not considered that the Company has demonstrated why the proposed scale of mining operations both in the pit and at the emplacement will not create a large increase in dust emissions.

There is little evidence to support the claim that the average dust fallout levels of 340 mg/m²/month in fact exist at this location. There is evidence to show that open cut coal mines within the Hunter Region producing about 50% of the production targets for Saxonvale, create dust levels at least an order of magnitude higher than the value predicted for Saxonvale in the impact statement of an average less than 440 mg/m²/month. However, such data refer to open cut trench excavations, with reliance upon massive dragline excavation and poorly controlled overburden heaps. Clearly, there is a need to establish several additional stations or appropriate monitoring equipment immediately, with the goals not only to provide a means of assessing the performance of the Saxonvale operations but a basis for comparing the air quality before any coal mining commences.

The S.P.C.C. has advised that a more elaborate programme of monitoring including in addition to deposit gauges, high volume samplers suspended matter tape samplers and a recording anemoneter, with data generated being analysed, interpreted and summarized, would be required for assessment of the dust burden around the perimeter, near to residences and at Broke. The Company will need to account for dry weather and high wind conditions in conjunction with average values. The Commission, noting that much of the actual coal recovery areas and overburden emplacement are not easily controlled, has indicated that these operations may need to be isolated by buffer zones, nominated as 1000 metres from the open pit and 500 metres from emplacement areas.

There are insufficient grounds to believe that any other air quality parameters attributable to coal mining would give cause for concern.

The S.P.C.C. has indicated that provided the nominated buffer zones are established, and with appropriate pollution control measures, it can mitigate dust emissions to an acceptable degree.

6.2.2 Vegetation and Topsoil Stripping

Both of these activities are analogous to agricultural activities. Provided the Company meets its undertakings that it will mulch vegetation and strip topsoil only over areas necessary for mining and immediate emplacement of overburden, any adverse impact that could arise is considered to be inclusive in above.

6.2.3 Blasting

The Company has estimated approximately 68% of overburden/interburden material will require blasting and of the drill holes approximately 80% will be dry. The specialist Explosives, Technical Services Section of I.C.I. has recommended drilling pattern, hole size, stemming, charge, initiation and delaying practices to meet noise and vibration criteria and safe working conditions. The large rotary blast hole drills will be fitted with dust collection equipment which will be disposed of as directed by S.P.C.C. Blasting dust is usually difficult and impractical to control apart from requiring coarse rock or similar materials for stemming, and the wetting of the working area prior to the blast. Advice from I.C.I. indicates that no discernible improvement in the dust cloud results until the blast section approaches saturation. The current cost for water gel explosive is about $450/tonne more expensive than for A.N.F.O. Thus for an average consumption say of 100 tonnes per week the costs would mean that an unreasonably high penalty would be imposed. The high cost of explosives has already enforced economies and charge wt/hole volume ratios have become more scientifically controlled. Because of the noise/vibration criteria noted elsewhere, it is considered unlikely that "excessive" blasting will occur. The Company proposes one blast per 24 hour day, and it is possible that if necessary, the licence conditions under the Clean Air Act will stipulate no firing during winds in excess of a minimum wind velocity as measured by the anemometer station.

Coal seams will vary although it is intended to maximise ripping techniques. Wherever the material has to be drilled and blasted, charges will be designed to lightly "fluff" the coal with minimal dust emissions. Furthermore, as with most of the interburden materials and harder coal seams, their position would likely be several metres below natural ground level and impact from dust

emissions could be limited to the confines of the open pit and at the least be considerably reduced above ground level. Investigations are continuing to determine the extent of coal seam blasting.

6.2.4 Loading and Haulage

The Company believes that the top layers of overburden that have weathered may be loaded by open bowl scrapers, but for the remainder, the blasted pieces will be loaded by front end loaders into large off-high way bulk rear dump trucks.

Water spraying will be used to suppress dust within the open pit. For coal, specially equipped front end loaders will load from seam or stockpile into coal bodies fitted to dump trucks.

Dust from all trucks moving along haul roads and benches within the open pit will be suppressed using water spray tankers to the limits compatible with safety. The pit design has included for a maximum 7% grade on the haul access road and adequate bench width and passing sections for safe working are incorporated for the initial pit development.

Once the pit has reached the designed floor level it will migrate to the north-west. The entry from the haul roads into the advancing pit will need to be relocated as will the access route to the floor. By this time or sooner if necessary, substitution of the coal trucks by conveyors will have been evaluated. Transfer of the overburden materials by conveyors would require variation to the blasting techniques, and the need to regularly reposition loading as well as delivery hoppers. Substitution of dump trucks by conveyors may not be feasible.

Three haul roads will be built: one between the pit and the dumping station 25 m wide and 2.1 km long, the second of similar dimensions serving the emplacement zone, and the third serving the haulage of washery rejects from the coal preparation plant to the emplacement zone. All roads will be watered continuously and regularly graded to ensure adequate dust suppression and maintenence of an even "minimum tyre wear" surface. In addition, the Company proposes to build 10 m high noise barriers which when revegetated could help to reduce the dispersal of dust into the area west of the haul roads.

The use of a low surface tension chemical water mix for haulage roads has been suggested, but bearing in mind the heavy trafficking and regular regrading of the surfaces, its usefulness as a crusting agent is considered to be too short lived to make a significant contribution. It may be worthwhile to require that all truck loads be flash wetted as the vehicles emerge from the pit. Excess water at this point cannot interfere with any subsequent processing and may contribute to reduction of wind blown dust off these vehicles during the short time taken to transfer loads to the dumping areas. In special circumstances covering of coal loads by sheets may be appropriate.

6.2.5 Emplacement

Special studies have been commissioned by the Company as well as soliciting the expertise of the Soil Conservation Service in the preparation of an emplacement plan. In addition, chemical and physical analyses of overburden strata have been utilisied for determining the sequence of operations and the final profile. The outline has been discussed in chapter 5 and the various comments received are now reviewed.

The essential features are dust suppression by water spray tanker over compaction areas and the use of water canon for either crusting the finished graded slope profile or augmentation of irrigation to vegetated areas.

The S.P.C.C. has expressed the view that it is not yet satisfied that the Company has demonstrated that acceptable air quality can be achieved within 500 metres of the overburden areas. It has further noted that preliminary calculations indicate that the long term deposition rate at Broke Village may double and that short term problems will occur under high wind conditions.

The Company has submitted an updated property holdings plan on which the 500 metre buffer zone has been plotted. There are about ten properties south of the authorisation which will be affected for a little over 12 months by which time the limit of disturbance will have moved up hill in excess of 500 m. On the east the army firing range is uninhabited and negotiations are in hand with the Federal Department of Administrative Services.

The S.P.C.C. has expressed the opinion that, with pollution controls specified under the Clean Air Act, satisfactory dust deposition rates similar to levels considered acceptable in residential urban areas of Sydney can be achieved outside the 500 m buffer zone. Dust deposition results from the S.P.C.C. annual reports indicate levels for Sydney of less than 300 mg/m^2/month average values. Bearing in mind the extent of known coal resources in this area, the prompt establishment by the Company of adequate base line air quality data is regarded as vital. The S.P.C.C. in supporting this suggestion pointed out that any results obtained from such a programme should be correlated with local and regional factors and activities and be supported by comprehensive meteorological data and inventories of local and regional dust sources.

6.2.6 Coal Handling and Stockpiling

The Company having demonstrated that the coal resource will require to be blended to meet specifications for feed to the preparation plant, and that even at depth the mined coal would be a borderline economic proposition to convert to metallurgical use, has proposed the well proven beneficiation processes for the

run of mine extract. Since the Department of Mineral Resources and the Joint Coal Board endorse the details proposed in this development, only those factors which might influence air quality are here considered.

The S.P.C.C. has drawn attention to a precedent of requiring a 5 metre height wind barrier at the dump location. It did not comment upon the 4,000 tonne surge stockpile immediately adjacent to the hopper nor to the 100,000 tonne emergency stockpile a short distance away. The Company has indicated that this run of mine coal would be well fragmented, rough graded material less than 300 mm size, and the rotary breaker and reject stone screens would reduce feed to less than 100 mm for blending in stockpiles. For the r.o.m. surge, earth bunds at least to the same maximum height as the stockpile and encircling the hopper screen and storage area, the installation and operation of automated water spray system, with provision for excluding trucks from tracking over the coal surface, would ensure satisfactory protection. The suggestion of the 100,000 tonne emergency r.o.m. stockpile is in quite a different category and unless the Company can redefine its needs and undertake similar controls to the above, then a portion of the stage II raw coal stockpile concept progressively extended to match increases in demand up to 7.0 M.t.p.a. is regarded as the more appropriate alternative from the commencement of operations.

There is only one further feature which prompts question and this involves proposals for an unblended clean coal stockpile of 250,000 tonnes. When the following section for Stage II Clean Coal Stockpiles nominates the system used with such singular success at the Port Waratah coal loader in Newcastle, it is beyond understanding why the use of a conical stockpile plus benching out by mobile equipment, irrespective of pollution control measures, should even be contemplated. The Company should note that the attention of the S.P.C.C. will be specifically drawn to this aspect.

The assurances from the S.P.C.C. that emissions to air from coal handling and loading can be reduced to a satisfactory level is noted, and this is taken to include transportation in trains comprising up to 42 CHS wagons. The reference to the possibility of electrification of the line in the foreseeable future while an improvement in terms of air pollution would not be a pre-condition for approval to this development.

6.2.7 Metereological Effects

The impact statement has referred to two aspects relevant to dust deposition, the first being surface inversions predicted to occur 70% of the time in any year. It is possible that this phenomenon enhances settlement rates nearer the source of emission though any benefit is considered negligible by comparison to wind distribution effects. The second is a reference to enhancement

of thunderstorm activity triggered by additional dust particles forming condensation nuclei. The search for authoritative data on this point has been inconclusive but such is the scale of natural energy requirments for such phenomena, that it is of some doubt that the impact from this development could influence their generation one way or another. It is pertinent to note that this item was included in Appendix 'L' in deference to an aspect of specific concern nominated by vineyards interests.

The S.P.C.C. commented that the influence of dust would be related to regional not local dust sources and any seeding effect upon a rain bearing cloud would cause rain before the formation of hail.

6.2.8 Impact on Viticulture

There are two areas under viticulture. Remo Vineyard is a short distance from the mine establishment and clean coal stockpiles, and negotiations are proceeding for the continuance of operations at this location. The Company has indicated that it hopes to reach agreement with the owners, but in recent advice it appears the latter now wishes to be relocated. Although discussions began over 12 months ago, the Company only made its first written offer a month ago. Furthermore, the construction of the access road begun this month has created levels of dust and noise which are totally unacceptable. During the construction of the mine establishment, development of the vines and wine making would not appear possible. However once production commences the pollution control measures operating at the coal handling facilities should provide adequate protection. In addition, the S.P.C.C. has indicated that information available from dust monitoring generally around the perimeter of a large coal handling plant in Newcastle shows that coal represents only 20% of the insoluble solids fallout monitored.

The second area lies at Fordwich, where both Saxonvale Wines Ltd and Lindeman Holdings Ltd own much larger vineyards. Both companies lodged submission objecting to the mine development and these are summarised in Section 4.1. Both were at pains to show how even temporary increases in dust fallout during critical seasons of the growing cycle and harvest significantly affect viticulture. During discussions it became clear that whereas dust would be a problem, coal dust was particularly objectionable. Nevertheless, since the ratio of overburden materials to run of mine coal varies between 4.5 to approx 5.5, this form of contamination should be correspondingly lessened. Saxonvale Wines suggested that an alternative solution to compensate for the increase in environmental stress upon the vines it feared would result from dust, would be to assure adequate watering. Even if the Company is disposed to assist, two factors should first be considered notwithstanding that the water entitlement for the mine attracts extra charges. When resources are scarce, the mine will probably need its maximum entitlement as well as being under pressure to ensure adequate

suppression of dust. A conflict of interest would be inevitable especially since the needs of the vineyards would probably be at a maximum during the same period. In addition it should be noted that the allocation for industrial use is weighed against the forecasted needs of other uses, and any diversion irrespective of payment might compromise the terms under which the Water Resources Commission approved the diversion. The provision of on site pump storages for uncontaminated stormwater would appreciably reduce the risk of a conflict of interest and avoid any breach of the policies governing allocation of water resources.

The S.P.C.C. was requested to comment upon the submission received from Saxonvale Wines Ltd. In its reply, it noted that at present there is little information on the levels of dust generated by mining and disposal of overburden, and research is currently underway particularly in respect of weathering and rehabilitation characteristics of such materials. Recent research in the U.S.A. on fugitive dust sources showed that mineral extraction contributes less than 1%, unpaved roads being 75%, wind erosion off crop lands 10%, construction activities 8% and other sources 6%. The minimum distance between the Saxonvale winery and the mine would be 2.5 kms and to the overburden emplacement about 4.0 kms, but there is also a substantial hill in between that rises up to 70 metres above the general level of the mine workings. In addition to the dust pollution controls that will be required, these factors should ensure that any increase in dust deposition rates at the vineyard will be minimal. In the Commission's opinion, the Saxonvale Wines' submission did not present any evidence to support its claims on the effects of dust on vineyards. Furthermore, the potential problems were not of the magnitude that the Company had presented. However, the Commission considered it would be desirable if research was directed towards the effects of dust on agriculture and for the Company to support such research, and suggested the NSW Department of Agriculture was the appropriate organisation to determine the effects of dust on grape leaves and fruit.

6.3 Water Quality

6.3.1 General

The impact statement has recognised that the surface waters flowing across the authorisation are of poor quality and very likely to deteriorate if they pass over disturbed ground or areas contaminated by mining. It has also concluded that groundwaters available by intersection with mining excavations are even worse. Investigations by the Company indicate that the impervious nature of the overburden strata isolates the groundwater; and in the areas to be disturbed by mining, groundwaters are not important sources of stream recharge.

The Company, recognising that it will be a nett user of water, has joined with others to secure a supply under licence from the Hunter River. The Company has acknowledged that any discharge to waters must meet the standards set by the S.P.C.C. under the Clean Waters Act. The goals adopted by the Company have been accepted by the S.P.C.C. and Water Resources Commission subject to the provision of more detailed data.

It is considered that the Company should optimise uncontaminated storm water storage on site. Furthermore there should be no discharge of waters from the site, other than uncontaminated natural run-off, except during periods of heavy rainfall or prolonged wet weather. Overflows should be sized for all water storage on a 1 in 100 year return storm.

6.3.2 Supply

The Water Resources Commission has brought forward the construction of Glennies Creek Dam in response to major demand increases from power generation and industry. Included in these estimates are the maximum forecast demands for Mt. Thorley Water Supply. While the maximum diversion needs can be easily accommodated post 1985, the present drought conditions will enforce restriction to minimum needs.

Development of major water resources is likely to be funded by an amended pricing system which accounts for the high levels of security in supply required by industrial enterprise as well as a component based upon that proportion of the entitlement actually used.

The gross maximum diversion is compared to that licensed to a small number of irrigators who provided the water is available pay only the rate for quantity used.

The Mt. Thorley water supply scheme serves the new industrial area as well as coal mining developments by R.W. Millers & Co., Warkworth Mining and at Saxonvale. Provisions in the design have been included for Peko Wallsend and supply to Broke Village. Further the scheme includes only for storage sufficient to smooth out demands against constraints of the rising main, and restricts pumping to a total based on 20 hours per day 220 days in any year. On site demand at each mine is to be met from additional storages, which at Saxonvale has been assessed at 60 Ml. The Saxonvale demand is required to secure water supply for the washery, dust suppression, amenities and irrigation.

Traditionally costs of water for mining account for a very low percentage of production costs but this development, is unusual in that it may be a nett user. Coupled with the substantial price increase needed for the security of supply, and its commitment to dust suppression using water, there is every incentive for management to ensure efficient use of all available water resources.

Construction is scheduled to commence early 1981.

6.3.3 Rainfall and Evaporation

All drainage works have been designed for a once in 100 year return storm rated at 150 mm of rainfall in a 6 hour period. The run off coefficients have been chosen as for normal surfaces and for disturbed areas. Catchments and intercepted areas have been calculated, while absorption and evaporation coefficients from various surfaces assumed.

Rates of evaporation escalate during the summer and although precipitation increases during the same period there is a water deficit from October to April.

The Water Resources Commission does not consider the size of intercepted catchments as significant, and as a policy supports retention of stormwater passing across a freehold if by so doing it lessens demand from elsewhere in the same system. The Company has suggested that the water quality of surface water is poor, that the water deficit tends to make emergency storages ineffective and of low cost benefit, and finally to provide storage of adequate capacity, substantial disturbance and or excavation would be necessary. Nevertheless, with the surfeit of overburden materials available, the Company should be required to construct above ground pump storages, such that all stormwater catchment ponds are managed using an extra freeboard depth so that there will be no overflow, except under a nominated minimum storm flow condition.

Accordingly, it is considered that the Company should be required to operate a contaminated water system which can be supplemented from on site uncontaminated water storage.

Although the Department of Science and Environment has suggested that the mine life warranted storm design based upon a 100 year decile, the Company's proposals are already more extensive than similar major developments and are acceptable to the Water Resources Commission.

6.3.4 Water Balance

The impact statement includes a water balance diagram for 7.0 million tonnes per annum run of mine processing under normal and extreme weather conditions. While recognising the limitations upon accuracy possible at this stage of design, there were several features which needed explanation and or amplification. The Company has subsequently prepared an amended diagram which includes:

- reduction to 530 litres per tonne of marketable coal
- utilisation of surplus storage
- criteria and water surface areas at catchment dams
- water management at clean and raw coal stockpiles, conveyors, transfer stations, dump station and washery refuse
- mine groundwater passed via water treatment plant before use
- water management for overburden emplacement

The Water Resouces Commission has confirmed that no licensed bores are likely to be affected by mining and suggests that more detailed studies are required to define the capacity needed for surplus storage. It considers the proposed water management principles are satisfactory and if discharges from clean stormwater storages do not occur except during storm conditions, concern for surface water quality especially in Wollombi Brook should be abated.

6.3.5 Impurities and Treatment Processes

The Company has offered in the E.I.S. a comprehensive and detailed analysis of the existing water quality, the ground strata and topsoils. It should be commended for its effort to explain the potential problem, nominate measures under consideration and undertake to meet prescribed limits under the Clean Waters Act. The concurrence from agencies at interest raised the following queries:

S.P.C.C.

- which prefered effluent polishing ponds in lieu of chlorination for treating sewage effluent;
- considered that more meaningful results for overburden/interburden analysis can be obtained using saturation extract techniques and that the Company's results indicate that the materials could pose critical stability and water infiltration problems and suggested extension of the analysis in conjunction with it and the Soil Conservation Service;
- sought details upon proposals for handling acidic oxidised coal and other wastes to be buried within the emplacement;

Water Resources Commission

- which believed further experiments are needed to assess the behaviour of materials in the emplacement and the means for special treatment as necessary of any leachates;

Department of Agriculture

- which sought more information relating to the ion exchange treatment proposed and questioned suitability of settlement processes as sufficiently adequate treatment before discharge to surface streams;

Department of Science and Environment

- which believed more details of treatment processes, water usage and recycling, disposal of mining residuals, should have been provided.

The Company in its reply confirmed that discussions with the S.P.C.C. and Soil Conservation Service are continuing and investigations are in hand. The Company is considering the installation of both an ion exchange plant and a desalinisation plant but has still to find a suitable waste disposal site. It envisages no difficulties with a package sewage treatment plant and believes the effluent may be totally committed for irrigation of revegetation areas. Chlorination was suggested in case the health authorities believed it necessary, although in fact it would prefer effluent polishing in catchment storages.

The Company recognises the complexity of the emplacement proposed but believes that such is the scale of the operations that wastes can be spread and mixed to the extent that any potential problems will be too diffused to be significant. It has reviewed the tailings dams proposal on the grounds of potential instability. It accepts that the final design will need to meet all requirements of the Water Resources Commission and the limitation that the dam walls never be overtopped will be secured by appropriate safety measures.

The Company had not provided for any compaction equipment believing the pounding by the rubber tyred dump trucks to be sufficient. As doubt exists that the emplaced materials can become unstable when wet, every effort should be made to minimise infiltration to no greater depth than is necessary for self sustaining vegetation.

The Company does not consider there is a trace impurities problem although it will extend studies to determine the possible extent of arsenic contamination. So that the leachates potential can be accounted for as well as monitored, it may be appropriate to incorporate agricultural tile drainage lines set to grades to collection pits where quantity can be detected and liquid subsequently pumped out and processed via treatment systems as appropriate.

The closed water budget for coal beneficiation plant processing is a well proven system and not regarded as a potential problem.

Part of the dust emission control measures include the use of low surface tension chemicals. Although rigorous tests have already been done, they have been based upon a once through use upon clean coal stockpiles. If so required by the S.P.C.C., their use may extend to suppressing dust over haul roads and emplacement areas. Before these chemicals are used, it should first be verified that there is no potential adverse interaction with the overburden material being treated.

6.4 Noise Quality

6.4.1 General

The Company has nominated the machinery and noise factors for both stationary and mobile sources. Noise level surveys were conducted on two days approximately one month apart, and the predicted noise contours were provided in the impact statement. The goals based upon the survey were not exceeding 40dB(A) at residential areas at night. If as implied by the acoustical consultant, the nightime background level be accepted at 40dB(A) because of cicadas, this is absurd. While it may reflect the ambient level at 50% of the measuring stations on two nights in 365 of the year, it in no way truly represents the rural character of the areas. The Company should provide more respresentative data and be prepared to design to more stringent goals, to secure the amenity at the existing residential premises. In the knowledge that the area is to suffer cumulative effects from mining, it would be desirable to have no increase in background noise levels if practicable measures are available.

The Company has now acquired freehold most residences within the 40dB(A) contour. It has in discussions with the S.P.C.C. demonstrated its capacity to attenuate noise emissions and the latter has noted that the acquisition of land is an effective technique, as well as confirmed there are other suitable measures which will be considered when assessing the application under the Noise Control Act.

6.4.2 Machinery

Items nominated in the Appendix to the impact statement involved in loading, haulage and emplacement, pose a problem. The proposals to construct a 10 metre bund along the western edge of all haul roads will assist to reduce noise disturbance. Stationary sources at and around the coal handling area are amenable to the usual acoustic attenuation measures.

The blasting noise will become less noticeable with depth into the pit. If it is practicable the blast noise would be more readily accepted if it took place at the same time each day say mid-day. Nightime and weekend blasting should be prohibited.

6.4.3 Vibration

The Company has nominated all appropriate criteria and there are no further comments.

6.4.4 Railway

The Mt. Thorley spurline and loop were evaluated prior to its construction. The works here proposed are similar and the conditions of approval are likely to be similar. Electrification sometime in the future will make marginal improvements.

6.4.5 Meterology

The tendency to form surface inversions discussed earlier, may enhance transmission over gap distances but as long as the emission is continuous without impulsive or tonal overtones the impact is not expected to create nuisance.

6.5 Transportation

6.5.1 Road

The deviation proposed is to be paid for by the Company and is a benefit.

There are no provisions for the transport of washed coal by road although sample loads of run-of mine materials may go by road for laboratory testing by potential buyers on rare occasions.

6.5.2 Remedial Roadworks

The Department of Main Roads requires that negotiations be completed to the satisfaction of it and Council on all matters affecting temporary or permanent road closures, traffic diversion and improvements or restoration to existing roads, all at cost of the developer. The Department of Administrative Services has opposed the Company's suggestion that the traffic using MR 181 divert along the Broke to Rockley Road through the Training Area.

6.5.3 Rail Line

The Company will be responsible for all construction of the rail line from the Mt. Thorley line to the coal loading area, and will maintain it to the standards and satisfaction of the State Rail Authority, which will supply and operate coal unit trains to freight product for export via Port of Newcastle's coal loaders.

6.5.4 System Failure

Breakdown of the transportation system will enforce cessation of mining operations although the size of coal stockpiles are conservative and would provide limited buffer storage. Road transport is not considered feasible and no provisions have been incorporated into the design of coal handling facilities.

6.6 Flora and Fauna

The Department of Science and Environment sought more detail on the levels of risk to the flora and fauna affected, as it believed plans should be made to protect the uncommon species described in the impact statement. The S.P.C.C. has sought safeguards which will minimise the loss of the existing ecosystem. It is in the Company's best interests to minimise at any one moment the total area exposed to the weather. Its undertakings in respect to revegetation appear reasonable, but some loss appears inevitable.

6.7 Visual

6.7.1 Amenity

The scale and duration of this development will introduce impacts in varying degree for distant views and nearby sightings over the short and long term. Intrusion will be inevitable. The Company has taken great care, admittedly for other more technical reasons, to minimise impact to travellers using MR 181 or Broke-Bulga road. Earth banks and tree screens will serve to interrupt sight lines while progressive rehabilitation will modify the impact from the overburden emplacement. The Company proposes to use architectural advice on building outlines, surface texture and colour. It will also ensure that landscaping enhances the environment of the mine facilities for the benefit of its employees. There is little the Company can do to mitigate the impact from a distance. However, the coal stockpiles are sited within shallow valleys to minimise their potential visual intrusion, although major structures comprising coal handling/preparation facilities may introduce minor impact against the higher ground behind. A lookout and picnic area is proposed to compensate for any adverse effects on tourism.

The Company has indicated that minimal night work will occur during establishment and night work lighting for all mining operations will be directional and hence its impact off site is unlikely to be significant.

The suggestion by the Company for the end use of the final open pit has produced comment from the S.P.C.C. which considered the options should be given greater attention, and from the Soil Conservation Service which rightly presumes that if the remaining reserves are to be mined in the authorisation, the pit would have started to migrate. More significantly however, the Service has stated that such a proposed end use could have serious

negative implications; surface stability over the long term of the pit sides and environs could be a problem, and a new lower elevation for natural drainage lines in the area, could induce accelerated watercourse erosion. The Department of Mineral Resoures will require the end use to be covered by a contingency plan and has confirmed that neither of the suggested options are likely to be accepted.

6.7.2 Rehabilitation

The comments received from the Soil Conversation Service are considered most important. "If the necessity to place the first 10 years production of the overburden permanently outside the pit is established, then the proposal to blend it into the natural landscape has merit. This will be a complex operation requiring detailed planning and control if it is to succeed. If a natural appearance is to result, it will be necessary to ensure that the right combination of slopes is achieved and breaks of slope occur in a natural manner. Special attention will need to be given to drainage lines to ensure they are stable but not artificial in appearance." The observations that followed regarding erosion, matching of vegetation associations, location of materials within the emplacement, climate restraints, irrigation problems, identification and placement of topsoil and the expense of achieving the desired end result are each particularly pertinent. The Service concluded that sufficient knowledge is available to ensure that problems in its area of concern can be satisfactorily resolved if the necessary inputs are made to the planning and control of the operation.

The Department of Mineral Resources supported these views and added that research data on the development of hillslopes is available.

The Department of Agriculture called for a firm commitment to ensure successful research into and implementation of rehabilitation measures, and noted that procedures for pasture vegetation on restructured mine sites are much better developed than for regrowth of tree and shrub species.

The Department of Administrative Services advised that in the overall national interest it is prepared to permit the overburden emplacement on Commonwealth land, provided agreement is reached on grading to contours acceptable for future training activities and the avoidance of problems with ecology and erosion of the filled area.

6.7.3 Revegetation of Batter Slopes

Both the Soil Conservation Service and the S.P.C.C. drew attention to the need for greater care on batters, particularly those for the railway which meet the minimum grades necessary for internal stability. Experience on the Mt. Thorley line, especially the north facing side, confirm that these grades are too steep for an adequate vegetative cover to secure surface

stability. Batter gradients of at least 1:3, and flatter where possible along embankments, have been recommended. The State Rail Authority would not permit any tree growth which could by mischance foul the safe operation of any of its rolling stock, thus pasture and shrub revegetation appears to be the only alternative. Such constraints would not apply to the main access road.

6.8 Socio-Economic

6.8.1 Benefits and Disbenefits

The Company has demonstrated the existence of mineable coal, but has accepted that at best no more than 20% could be utilised for metallurgical purposes. It has nevertheless proceeded to develop plans which will maximise the recovery of the in situ resource and aims to produce for the export market a high quality steaming coal to be rail freighted to Newcastle and shipped via the proposed third coal loader at Kooragang Island. In conjunction with other investment for power generation and processing industries, this development will help to justify substantial development of permanent State assets, will generate financial returns to State and Federal treasuries from taxation and royalties, as well as improve the nation's trade balance. Apart from the suggestion that the resource is non-renewable there are no socio-economic disbenefits at the level of the general community at large.

The Department of Mineral Resources has supported the proposed mining as the only practical method that could be safely employed although it has observed that in fact the ratio of marketable coal to in situ resource is approximately 61% after allowances for wastage, oxidation and beneficiation. It has further noted that some 50 million tonnes of high ash coal and other carbonaceous materials could be dumped during the 20 year life of the mine proposal.

The resource value of the washery reject and the possible disposal in discrete bodies for recovery at a later date may need to be considered. For such a requirement for out-of-pit emplacement, serious potential pollution problems could occur in addition to the risk of stability and prevention of spontaneous combustion. In-pit emplacement does not appear to pose these problems. If the requirement is also to be applied to oxidised coal, the method for its storage needs to be speedily resolved and the implications for pollution considered by both the S.P.C.C. and the Soil Conservation Service before implementation. The scale of the operations and heavy preinvestment appear to be the basis for a coal recovery rate higher than anything so far achieved in N.S.W. It would be unfortunate if this project was delayed by any lack of decision on possible future recovery of waste carbonaceous materials.

The Upper Hunter Region has rapidly become a new centre and this project will further generate decentralised employment opportunities which through multiplier effects will spread to most sectors of the regional community. At the regional level there will be tangible disbenefits, in the short term arising from the increased stress upon the environment arising from disturbance caused by the project. The capacity to restore the balance by natural regeneration could only occur in the long term if the human population and/or agriculture pursuits be substantially reduced.

The Department of Mineral Resources has advised of its concern that coal in the Bayswater, Broonie and numbered seams beneath are not sterilised by the mining proposal and intends to limit operations to the Vaux seam and those above. The Company has nominated that its open pit will give access to those seams down to and including the Vaux seam with access to the lower seams still a feasible proposition using underground methods. Clearly coal mining will be a very long term activity.

There are no known archaealogical sites or historical buildings of significance to be affected and apart from agriculture the area has little development potential. The area between the Wollemi National Park and the authorisation has been proposed as a Scenic Preserve and the mine operations will not have a significant effect if this use is formalised. The degree of impact upon the fringe activities especially viticulture and dairy farming has been discussed earlier in this Section which lead to the conclusion that the degree of impact would be amenable to pollution control measures and that verification of predictions would be available using full monitoring techniques. The provision of a water supply and proposed construction of a power supply by Shortland County Council could assist development of the rural amenities.

6.8.2 Construction Workforce

The Company has expressed the view that the traditionally transient nature of the construction industry infers that local recruitment for this stage will be minor. Further that its workforce will have expectations more directly related to the works and recreational amenities provided than to local facilities. Had the location been more isolated, this latter claim may have been acceptable but in this instance conflicts with the existing community could arise. Furthermore, while it is conceded that the shift from a rural to a heavy industry economy has begun it has not yet become noticeable in the Wollombi Brook Valley. The Company has reassessed the local situation especially noting the rapid escalation in rental costs. It has advised that it has prepared an invitation to tender list of those contractors with whom it has had previous satisfactory experience and who have demonstrated the management expertise to provide full hostel/caravan park accomodation, plus

canteen and recreational facilities for the construction workforce. The location of this construction camp would be outside the urban boundaries and be convenient for development to suit other contracts in the region. Such provisions will in addition serve to give a little longer period for phasing in planned infrastructure designed to absorb the operational workforce.

6.8.3 Operation Workforce

Once again the Company predicts recruitment largely from outside the region based upon previous experience of the industry and the very high mobility factor in the workforce. The impression that there is at this time a shortage of experienced operators and that there will be competition between companies for the available pool, is noted. As each mining company will seek to retain his workforce, there appears to be a good case for either the Colliery Proprietors' Association or the individual Company to sponsor training and apprenticeship schemes preferably restricted to intake from school leavers and residents from Singleton or Upper Hunter Region.

The notional distribution for housing needs suggested in the impact statement recognises a substantial housing need in Singleton and a minor increase for neighbouring villages and Cessnock. The Company has recognised that while it has favoured a strategy which does not dictate the provision of housing by the development company, it has by agreement committed substantial funds as pre-purchase of land to be developed by Council and thereby ensured that the rate of housing subdivision blocks are progressively brought onto the market in phase with its mining operational demands. As funds are recouped by sale to employees these are re-invested for further development by Council. This approach is similar to that adopted by other companies for the appropriate release of land.

The Company has drawn attention to the forecast need for education facilities and additional hospital beds. No doubt studies would verify these but there are already indications that both the State Education Department and the Health Commission are programming for extensions based on the Upper Hunter Regional needs recognised through planning initiatives in house, by this Department and via the Regional Co-ordinator for the Hunter by the Premier's Department.

6.8.4 Infrastructure Strategies

The provision of adequate infrastructure to meet the industrialisation of the Hunter Valley is currently being considered by the Government. The Company initially adopted the stance of "free enterprise and market adjustment", but has nevertheless recognised that it is in its long term interest to assist a smooth transition. It has put on record the extent of negotiations with Singleton Shire Council which cover extensions of the Mt. Thorley Water Supply Scheme, the Singleton to Broke

road realignments and reinforcements, and has noted the attitude of the Department of Main Roads in regard to costs for additional maintenance and restoration of all public roads affected by this mine development. It has confirmed that Council has determined the new rates to double the existing rate by 1982. With the prospect of a consent to mine, its freehold land valuation could also double. Such funds it would expect to be used by Council to augment services normally expected of Local Government such as garbage collection, Parks, Libraries, Senior Citizens and Community Services. With increased resident population, Council will extend its rating base.

It appears reasonable that the Company should seek to ensure as with its advertising and public relations budgets, that funds allocated produce a reasonable return if not directly to the profitability of the Saxonvale development then to the reputation of the Dampier Mining Co. Ltd.

The Company-Council negotiations reflect the appreciation by the parties to the need to account for infrastructure facilities. There has been no mechanism in the past, nor is there yet, for a neighbouring local government Council to obtain assistance for a lesser infrastructure need arising from the same development. The implications for the City of Greater Cessnock are noted.

Mention has already been made of the proposal to establish a tourist attraction to overlook the development. The Company has indicated that medium term plans for the emplacement include the establishment of a golf course and other active recreational facilities. It should be possible to reach agreement between Council and Company on these matters as well.

6.8.5 Powers of Council

The decision by the Minister to direct that the determination be taken under Section 101 of the Environmental Planning and Assessment Act should not reflect in any way upon the Council's ability. All the coal mining developments in the Hunter Valley will be determined under the same procedures. Nevertheless while Council has been able to appraise the proposal with the support of government agencies at interest, it has had less opportunity to reach heads of agreement with the developer for assistance in the provision of goods and services, housing blocks, and utility services to outlying communities. It may be appropriate to seek in the conditions of approval a requirement that such negotiations be continued for the life of the mine and when agreement cannot be reached the matter be referred for arbitration either by the Minister or his appointed representative having delegated authority.

Council will be responsible for all building approvals, and have a concurrence role in the provision and maintenance of services such as water, sewerage, surface water drainage, roads and so on.

6.9 Reassessment

6.9.1 Assessment Procedures

The present assessment has been based upon the information included in the environmental impact statement and data subsequently provided by the company and government agencies at interest. Some of the public submissions pointed out with justification that there are aspects of this proposal which are unclear, and that some of the predictions are based upon imperfect data. It is reasonable to accept the independent judgements of those having expertise and experience. If as now appears likely, the development is to proceed then conditions to any approval need to account for any appropriate adjustments on the basis of better data and in addition provide for regular review procedures.

The development is defined over a nominal 20 years. It has an intermediate stage at approximately year 9, when the pit is scheduled to have reached a floor depth - 300 m below ground level and when about 200 million cubic metres of spoil materials have been emplaced off site.

The Company has nominated an annual production of 4.4 mtpa. It is quite possible that this target will be adjusted to suit market sales. This approval is therefore relevant to whatever period elapses for the open pit mining to reach that position nominated on the Plan of Overburden Emplacement at Fig 5. in Appendices. A mining lease is reviewed when negotiated for renewal after 20 years, licences under the pollution control acts are renewable annually, while provisions are available in exceptional circumstances to halt operations.

The Company has indicated that the mining proposals will enable a continuance of coal recovery beyond 20 years, and has inferred that underground extraction methods would be practicable once open pit recovery has been exhausted. It has however, pointed out that any review procedure involving the risk of reversing planning approval as distinct from an operational limitation due to environmental pollution factors would present unacceptable financial risk to the whole development.

The current environmental impact statement presents the modus operandi for open pit mining for coal recovery, but there are sufficient basic differences involving depth of mine and distances to affected land owners which would warrant a full reappraisal after the nominal year 20 position is reached. It would be expected that evidence of performance during the first 20 years would form an important contribution to any new environmental impact statement required for subsequent operations.

6.9.2 Monitoring

A fundamental tool for assessment of performance is an effective monitoring programme. It is confidently anticipated that the Department of Mineral Resources, Water Resources Commission, State Pollution Control Commission and Joint Coal Board will ensure that monitoring is arranged and the Company commitment to the production of an annual report on mine performance is an acceptance of its value.

6.9.3 Cumulative Impacts

There is much concern about cumulative impacts or perhaps more accurately the Company's attitudes to both the existing situation and its assessment of the contribution from Saxonvale. This assessment has concluded that this operation has the potential to create quite significant environmental impacts which by the imposition of stringent control measures can be mitigated to an acceptable degree. It is inevitable that coal mining operations in the area will each contribute to the load no matter how acceptable each successive impact is perceived.

A major contribution to the mitigation of impact from this project will be the success of rehabilitation achieved over the emplacement areas. Residuals from this development which affect the local environment could include water management dams which could be used for better farming activities, expanded transport and service utilities, additional active recreation facilities and an extension of natural vegetation areas capable of natural regeneration.

The decision to create a major industralised region in the Upper Hunter has brought in its wake a risk to the environmental quality. However, it is considered that properly controlled coal mining, as here proposed, would have far less significant long term impacts than those from power generation or the concentration of problems that will follow urban expansion.

7. CONCLUSIONS AND RECOMMENDATIONS

7.1 General

The mine is a major development and represents a very large investment spread over two decades. An all encompassing statement could not be expected, yet the Company has demonstrated a responsible attitude to the environment, has instigated several specialist studies, discusses the issues imaginatively and has provided a clearly written description of its proposals. On aspects wholly within its own control especially in regard to engineering and mining, the Company has endeavoured to establish parameters within which details of processes and precautions can be firmed at a later date. It will need to be acknowledged that even the year 3 target production figures are to a very large extent dependent upon the Company's success in securing contracts on the international export market.

It is considered from the foregoing assessment of the environmental impact of the proposal by Dampier Mining Co. Ltd., to mine using a multi/seam/multi/bench open pit operation on its Authorisation 213, that coal can be won in an environmentally acceptable manner. While in general the impact statement is adequate to meet the requirements of the Environmental Planning and Assessment Act 1979, and its Regulations, it is evident that there is a need for the Company to supply further information on a number of aspects.

7.2 Recommendations for Development Approval

Accordingly, the Department of Environment and Planning agrees in principle to the proposed development of the Saxonvale Coal Mine by Dampier Mining Co. Ltd. generally as described in the two volumed environmental impact statement submitted under covering letter dated 1.9.80 subject to confirmation of certain data and the incorporation of environmental safeguards in the proposal provided the Company:

a) meets the requirements of all public authorities having statutory responsibilities in respect of the proposed operations, and shall negotiate with all authorities having an interest in the project with a view to meeting any reasonable requirements relative to the development and referring any disputed environmental matters to the Director of Environment and Planning for determination. The Company shall note that before commencing construction or excavation, it shall first obtain from the State Pollution Control Commission all statutory approvals for the works required under the Clean Air, Clean Waters and Noise Control Acts.

b) supplies all data necessary to satisfy the Water Resources Commission that the water management proposals will ensure that mine waters can never be discharged direct to surface waters, and it shall obtain the written concurrence from that authority as to its criteria, design, management and use of all water resources affected by this development.

c) reconsiders whether it is practicable to use all uncontaminated stormwater collected in on site storages thereby lessening diversion demands on the Hunter River, and shall ensure that any existing water use rights from Nine Mile Creek, Loders Creek and Wollombi Brook are not adversely affected by such retention proposals, all to the satisfaction of the Water Resources Commission. On site storage dams for uncontaminated stormwaters will be first source of make up to the contaminated water system. The on site pump storages of uncontaminated stormwaters are to be of such size and operated with sufficient freeboard that overflow will not occur except during a period following a 1 in 10 year return storm. Any discharge under these conditions should be such as to not impair the quality of the surface waters whether by way of salinity or any other measure as determined by the S.P.C.C.

d) takes steps to ensure that as far as is practicable, no overflow will be permitted from the Tailings Dam or from contaminated stormwater Catchment Dams 1, 2, 3, 4 & 5. These dams are to be so operated with sufficient minimum depth of freeboard such that a 1 in 100 year return storm will not cause overflow.

e) submits for the concurrence of the Water Resources Commission prior to the construction of the rail spur line, design details for all creek crossings and waterway provisions. Similarly the Water Resources Commission's concurrence shall also be sought for all structures affecting waterways including localised road realignments around the mine facilities and which should have incorporated the recommendations for erosion controls nominated by the Soil Conservation Service.

f) ensures that the Soil Conservation Service is accorded every opportunity to make inputs to both the planning and operational supervision of the out-of-pit overburden emplacement proposals. In particular, the Company's final proposals for the extension of investigations and classifications of topsoil, limitation of strip areas, re-establishment of vegetation continuity, mulch of vegetation, stripping storage and reuse of topsoil graded materials, surface profiles, drainage lines and the measures for containment of erosion, preparation fertilisation and revegetation, shall all require the prior concurrence of that Service.

g) establishes a nursery or similar seedling growth research facilities for rearing of native trees and shrubs found in this region, all to the satisfaction of the Soil Conservation Service. Such facilities shall be operational within six months of receipt of development approval.

h) includes in its out-of-pit emplacement proposals for compaction of the waste materials to a degree sufficient to reduce water infiltration and secure longterm stability. Should experience show it to be desirable then such compaction would probably require standard road construction machinery in addition to using the dumptrucks and dozers as presently envisaged. The degree of compaction in layers to within a specified distance beneath the finished surface, shall meet any requirements of the S.P.C.C. and be to the approval of the Soil Conservation Service.

i) re-evaluates its investigations into the properties of overburden/interburden strata and waste mining residuals for disposal both in the emplacement and in the pit, all to the satisfaction of the S.P.C.C. and the Soil Conservation Service. It shall provide details of the final agreed procedures to the Department, the Singleton Shire Council, the Department of Mineral Resources and to the Federal Department of Administrative Services.

j) flattens the batters for all access roads and the railway as far as practical and within SRA approvals to 3 horizontal for 1 vertical in cuttings and embankments so that self sustaining revegetated cover can ensure surface stability.

k) in respect to the emergency stockpile the Company shall take whatever steps are necessary to ensure that all run of mine handling facilities are to the nominated standards required by the S.P.C.C. or be generally in accordance with raw coal handling details in the impact statement on drawings SE-2 and SV165 for 7.0 Mt pa.

l) ensures that all adjoining property owners, especially those within the buffer zones nominated in Section 6.2.1 of this report, do not suffer loss of amenity as a consequence of the operation of the mine, all to the satisfaction of Singleton Shire Council. In particular, the Company shall continue its consultations with the owners of the vineyards nominated in Section 6.2.8 of this report with a view to satisfying concern regarding the impact of dust emissions on wine production. In addition, the Company shall consult with the Department of Environment and Planning concerning participation in research into the effects of dust on grape production.

m) submits to Singleton Shire Council and the S.P.C.C. and the Department of Environment and Planning within 3 months of development approval its proposals for water, air and noise/vibration monitoring and the relevant pollution control measures for the Saxonvale Mine project including for the transport of coal along the rail spur.

n) provides within 6 months of development approval a survey of all land areas affected by the mine for purposes of verifying that there are no archaeological or aboriginal sites worthy of preservation. The survey is to be carried out by an expert acknowledged by the National Parks and Wildlife Service to whom the report should be submitted for approval.

o) takes all appropriate care to protect from damage or interference the twin 330 kv transmission lines owned and operated by the Electricity Commission of NSW, and take all appropriate steps to satisfy that Authority's conditions should it prove necessary to relocate the route, all as per Appendix 3 of this report.

p) obtains the prior agreement of both the Singleton Shire Council and the Department of Main Roads before closing M.R. 181. Since any deviation is likely to be required for several years, consideration shall be given to a permanent realignment around the coal bearing land in lieu of ultimate reinstatement along its present corridor.

q) satisfies the Department of Main Roads, and Singleton Shire Council concerning design standards for entrance to the mine establishment from M.R.181., which shall be the sole access to a public road other than for emergency use.

r) negotiates with the Singleton Shire Council an appropriate formula for the annual reimbursement of funds necessarily incurred in the extra maintenance to M.R. 181, and shall provide at the earliest opportunity an adequate survey of mine associated traffic using public roads. This formula shall not have affect when the transport of coal is entirely by rail. Any dispute therein shall be referred to the Minister or his appointee for arbitration.

s) takes steps to ensure that reasonable speed limits are enforced upon its private haul or access roads, not only for the benefits of minimising noise and dust emissions, but for safety and reduced hazards to all authorised users.

t) undertakes to appoint as its Main Contractor a Company which has demonstrated an ability to successfully mobilise and establish a construction workforce over which it will be responsible at all times on and off the construction area for discipline. Further such Contractor shall provide and operate hostel and caravan park type accommodation coupled with appropriate recreational facilities in a location which has the concurrence of the Company, the Singleton Shire Council and the Department.

u) informs Council as soon as it is able and thereafter at regular intervals, the accommodation and potential infrastructure requirements for the operation of the mine so that appropriate action can be taken to plan and provide for the necessary facilities. The Company shall negotiate with

the Singleton Shire Council the level of pre-investment appropriate to the mine expansion, such funds to be accountable for land subdivision and development of housing blocks and infrastructure facilities. Any dispute shall be referred to the Minister or his appointee for arbitration.

v) negotiates with the Singleton Shire Council for an easement off coal bearing land for the extension of the Mt. Thorley water supply to Broke Village.

w) seeks approval from Singleton Shire Council (and the Department where appropriate) for all necessary building approvals, for the Saxonvale Mine development, and shall also ensure:

- the mineworks and buildings are aesthetically pleasing and environmentally compatible and for such purpose shall secure the services of a qualified architect for design of buildings, the quality and finished texture of exterior surfaces, colour, outline and interrelationship with other buildings and with the surroundings such that these blend in with the rural terrain and present a neat orderly appearance.

- the provision of a full landscaping plan incorporating a programme for rehabilitation of disturbed land as early as possible and include for earthworks, tree screens and massed plantings, grassed areas, car parking and pedestrian areas. Such plan shall include the use of trees of suitably advanced growth shall be used wherever appropriate, planted prior to commencement of mining operations. Where native species of the area are too slow maturing before providing effective screens, consideration shall be given to the substitution first by hardy native alternatives and finally by exotics to create a scenic feature.

- the services of a senior Company employee who shall be qualified and made responsible for implementation of landscaping and rehabilitation works and its care and maintenance.

- the presentation of proposals for the use of rehabilitated land in categories for (1) natural area, (2) agricultural, grazing arable or intensive, (3) active recreational and (4) other purposes as agreed with Council. It shall in addition to the emplacement proposals, include for landscaping and revegetation of all land affected by mining, and shall nominate the several progressive stages of the various sections of the work and the provisions for the care and maintenance as appropriate.

x) provides the Singleton Shire Council and the Department of Environment and Planning an annual report covering the performance of the Saxonvale Mine particularly the effectiveness of the environmental controls. The report shall include a plan of areas mined, the original contours plus an overlay detailing post mining contours, description extent and type of rehabilitation carried out, an estimate of the percentage attainment toward the goal of self sustaining vegetation and fauna . It shall include an assessment of noise and water pollution based on the results of its monitoring programme and which shall include specifically for the impact of the project on the adjoining vineyards. Such report shall be for the period ending 31st December and should be presented to the Council and the Department by 1st April in the subsequent year. In addition the Company will provide a draft public statement summarising the report for Council to release.

y) reports to both Singleton Shire Council and the Department on an annual basis on its estimated job opportunity requirements and training needs. To the extent that is practicable, the Company shall follow a policy of recruitment utilising locally available labour including unemployed men and women, and give proper consideration to training schemes and or apprenticeships to applicants from the region. To the extent that it is practical the Company shall provide the following details related to employment on an annual basis or as agreed by the Director to the Department and Council:

(i) total employment for exploration, operation and construction activities;

(ii) occupational breakdown and sex of those employed;

(iii) current residential location (by suburb, town, village or rural district) of existing workforce;

(iv) origin of the employees recruited in the previous 12 months of operation, with respect to location of former residence (by suburb, town, village or rural district) and fields of employment;

(v) details of staff training programmes initiated by the company.

The timing for such reports should be the same as the reports provided for in (x) above, or as varied by the Department.

z) notes that this approval is for the mining plan as proposed in the environmental impact statement for an estimated initial 20 years period only, and that any extension of mining will require a further application. The evidence of performance of the first 20 years operations shall form an important contribution to that application. The Company shall submit to the responsible authority proposals at not

later than ten years or other period by agreement with the Department of Mineral Resources prior to any intention to cease mining or before reaching this location to ensure that appropriate measures can be implemented to the satisfaction of the Authority and to the Department of Mineral Resources to ensure a satisfactory cessation of mining operations.

7.3 Recommendations to State Pollution Control Commission

The Department of Environment and Planning recommends that in considering the applications lodged by Dampier Mining Co. Ltd., for the proposed open pit coal mine at Saxonvale with respect to the provisions of the Clean Air, Clean Waters and Noise Control Acts, the S.P.C.C. has regard for the Department's assessment and advice in Section 6 and 7 above and for the need for the following safeguards to be incorporated in any approvals it may give under that legislation. The Company should:

a) submit details of its proposal for treatment of waste waters and effluent disposal from the amenities, for containing run off from the mine establishment areas and for mine water treatment plant.

b) extend its testing programme to evaluate the properties of overburden/interburden strata for release of salts on weathering and in particular any potential for the release of acid drainage arsenic compounds or other trace metals into ground waters as a leachate from the out-of-pit emplacement areas.

c) be prepared to nominate the monitoring of leachates from the out-of-pit emplacement and, depending on the quality and quantity collected, agree upon appropriate treatment processes as well as have a disposal method of last resort.

d) extend the study of the properties of oxidised coal and other carbonaceous wastes scheduled for disposal within the out-of-pit emplacement area, and prepare proposals for mixing and positioning within the fill.

e) meet any quality limits for those discharges to waters during 1 in 10 year return storm flow conditions, once it has met any requirements of the Water Resources Commission as to utilisation of water resources. It should be required to immediately install monitoring stations at suitable points on streams traversing and exiting the mine affected area and institute a programme for recording any changes in salinity of all surface and groundwater drainage with results to be made available, if sought, to the Water Resources Commission.

f) immediately install monitoring stations at suitable locations to provide for existing air quality parameters and to enable additional pollution attributable to this development to be estimated.

g) conduct tests on the effectiveness of dust emission controls for blasting including use of coarse stemming materials, wetting the working area prior to blasting and use of delay detonation, pre-splitting or other techniques.

h) cease those mining operations such as blasting, overburden loading and emplacement when the results of the monitoring programme determine both the velocities and the direction of winds creating unacceptably adverse dust conditions.

i) redesign its proposed emergency run-of-mine coal dumping facilities and as a miminum requirement shall provide for an enclosing bund, the separation of dump trucks from stock piles and the protection of all areas by appropriate water sprays. The nominal size of this stockpile should be compatible with reasonable surge capacity needs.

j) be asked to justify why the stage I clean coal conical stockpile be permitted in lieu of the system proposed for stage II.

k) demonstrate, should there be any intent for extended use of suppression agents or saline waters over haul roads or at the emplacement operations, that there will be no adverse interaction with the materials being filled or with the evaporation of pond areas within the emplacement or located at intervals along the haul roads.

l) take whatever steps are necessary to ensure that there is minimum increase in the background nightime noise level typical for rural areas or as determined from acceptable surveys. Special arrangements may have to be made for premises where an existing resident suffers short term nuisance.

m) not be permitted to blast outside daylight hours nor during weekends and should be persuaded to make every endeavour to restrict the daily shot firing to a narrow time band width each side of midday.

n) demonstrate that it has acquired sufficient freehold to satisfy the nominated buffer zones.

7.4 Recommendation to the Department of Mineral Resources

The Department of Environment and Planning recommends the Department of Mineral Resources has regard for the conditions of development consent nominated in Section 7.2 and advice to the State Pollution Control Commission in Section 7.3 and for the need for the following particular safeguards in any lease it may subsequently give. The Company should be required to:

a) investigate the substitution of conveyors for coal haul between the face and the processing plant in lieu of rear dump trucks.

b) investigate the maximum use of ripping machinery for all materials and thereby reduce the use of blasting. All blasting should be prohibited at night and during weekends, and wherever practicable confined to a time band width between say 1100 to 1400 hrs.

c) conduct test trials for its proposed blasting patterns, and carry out monitoring to satisfy criteria nominated in AS CA23 or as determined by the Department of Mineral Resources.

d) periodically survey any structures, buildings and foundations on adjacent land holdings to ensure that the blasting operations are not causing damage.

e) cover the tailings dam by at least 5 metres of compacted overburden materials to any surface, and the profile merged into the remainder of the emplacement. Disposal of tailings within the inpit emplacement if approved should be isolated from any potential aquifer to an equivalent degree.

f) prepare with the assistance of the Soil Conservation Service, a fully detailed rehabilitation programme covering both the major out of pit emplacement and all other areas affected by mining. This plan which is to have the approval of Singleton Shire Council is to be commenced without delay, keep pace with the progress of the overburden/interburden disposal and the effectiveness of rehabilitation assessed in annual reports. Should the agreed plan for out-of-pit emplacement need to be amended to accommodate the requirements in regard to the disposal in discrete bodies of oxidised coal and washery reject within the overburden or elsewhere, then any dispute between parties is to be referred for arbitration by the Minister for Planning and Environment or his appointee. Any requirement to stack the material separately is to be referred to the S.P.C.C. for its approval and be subject to any requirements under the provision of the pollution control acts.

APPENDIX I

SAXONVALE OPEN PIT COAL MINE

SUMMARY OF PUBLIC SUBMISSIONS RECEIVED

AUTHOR AND ADDRESS	SUMMARY OF ISSUES
Baker & McKenzie Solicitors - Bridge St, Sydney.	Claimed Saxonvale Wines Ltd is one of the largest producers in Hunter Valley with vineyards and a modern winery close to proposed development. Sought objector status plus Inquiry before any approval. Particular concern for contamination effects on grapevines by coal and dust. Disputed conclusions in E.I.S. on winds and noted strong winds do occur during spring and summer which are the critical seasons for viticulture. Climatic advantages of Hunter Valley are long hot dry summers with infrequent rain and hence minimal washing effect. E.I.S. places heavy reliance on water spraying for dust suppression without explaining security of supply especially during drought periods. E.I.S. deals inadequately with impact of mine proposal upon vineyards nor does it compare effects of coal dust fallout from previous similar developments. Further studies are necessary. Request for confirmation of receipt of Saxonvale Wines submission, that the proposal be treated as a designated development under the Environmental Planning and Assessment Act and for the status of the development application lodged by the Company.
******	******
Baker & McKenzie Solicitors on behalf of Saxonvale Wines.	Approval should be deferred until E.I.S. shortcomings remedied and adequate safeguards agreed. E.I.S. does not address pollution impact upon vineyards, and has failed to account for overseas or local past experience especially dairying. Main concern is dust, believing local climatic factors will accentuate problems. Revegetation will be prolonged, difficult and expensive. Effects on wine industry includes reduction of photosynthesis which

impedes sugar production and decreases acid levels in the grape. Fine coal dust could strip colour and create off flavours by reaction with nutrients during fermentation. Dust forms a barrier to pollination and impedes chemical controls against insects and leaf diseases. Particles could act as condensation nuclei introducing more frequent hail damage by summer thunderstorms. Concerned that blasting may damage dam and irrigation system or to fragile wine testing equipment. Believed that an independent organisation such as the C.S.I.R.O. should research the degree of risk to viticulture and that the incoming industry should be required to establish that its proposed development can co-exist.

****** *******

Saxonvale Wines Ltd
Botany Road,
Alexandria. 2015

Claimed insufficiency of time and sought extension of deadline for a detailed submission. Layer of dust over grape leaves interferes with photosynthesis causing reduction of crop and juice quality, stunts vine growth, increases stress and disease risks. Coal dust absorbs heat, enhances acid respiration and affects wine quality. Dust interferes with pollination, reduces insect and leaf disease controls. Dust as condensation nuclei increases risk of thunderstorm activity. Experience of fruit growers in the region suggests damage due to mine activities. No local comparable experience to the overseas projects nominated in E.I.S. nor are any comments given of the environmental effects experienced. Concern that adverse publicity would influence market sales. Concluded dust from coal mining has caused severe damage to viticulture, which as an industry has been given scant attention in the E.I.S. E.I.S. considered to be inadequate as adverse effects need to researched. Development should be deferred until issues have been researched, discussed and all measures to reduce risk have been implemented. $6m investment almost irreplaceable.

AUTHOR AND ADDRESS	SUMMARY OF ISSUES
Lindeman (Holdings) Ltd. Lidcombe. 2141	Insufficiency of time - Extension of the deadline sought for detailed objections. Inadequate justification in E.I.S. for dust fallout predictions, which are unrelated to data provided or to proposed scale of works, unsupported by nominated safeguards and exclusive of meteorological factors. Presented impact of dust and particularly carbonaceous materials upon wine leaf and wine making processes. Risk of water contamination especially arsenic. Loss of reputation. Irreplaceable viticultural land, compensation for losses. Would co-operate in monitoring programme.
******	******
N.B. Grosser Lot 1 Wollombi Rd, Broke. 2330	No objections provided all possible measures taken to eliminate dust. Quoted experience of coal dust on German vineyards.
******	******
On behalf of: 1 P. & M. Kannelleas Portion 56 - Vere	Objections without nominating grounds.
2 A. & A. Efthimiadis and A. & C. Lisbona Portion 33 - Vere	Objections without nominating grounds.
******	******
A.E. Heuston 24 Barton Avenue, Singleton. 2330	Visual impact from overburden emplacement. Dust during adverse weather would damage grazing lands. Loss of property value from noise. Available for purchase by Dampier Mining Co. Ltd.
******	******
R.W. Miller & Co. Pty Ltd, King Street, Newcastle. 2300	Supports development. E.I.S. provides insufficient information. Agree to necessary easement for Mt. Thorley Water Supply providing own mine proposals are not prejudiced. M.R. 181 Singleton-Broke Road deviation traverses Company freehold without confirmation

	of approval. Conditions required include - Exchange of land parcel as discussed at no cost to Company and without interference to the approval procedures to coal mining lease at Mt. Thorley Coal Mine.
******	******
L.J. & V. Bodiam Lucernedale Stud, Broke. 2330	Loss of property value. Blasting and heavy machinery noise plus dust fallout would affect children's health. Disturbed environment complicates horse stud breeding. Concern for restoration of historical buildings and potential for blasting vibration damage.
******	******
On behalf of Estate W.J. Sheridan Portion 30 and 44 Wittingham, Portion 42 - Vere.	Rail spur line would sever existing access. Dust fallout and coal dust emissions from handling facilities would pollute surface waters in dams and creeks.
******	******
P. Myers Lot 13 Warkworth Road, Broke. 2330	Dust fallout from Saxonvale would increase cumulative impact from all other coal mine proposals. Large immigration to Shire. Blasting operations should be restricted to daylight hours and any other operation creating undue noise. Concern for potential repeat of Ravensworth Mine.
*****	******
C.R. Shearer Maison Dieu, Singleton. 2330	Proposed wastes dump would create visual and ecologic destruction of landscape, potential for dust and noise pollution and increase traffic congestion. Request advice of safeguards nominated to remedy and/or prevent environmental impact.
******	******
D.M. Rowen Address not provided.	Rail spur line would sever existing access. Full reinstatement demanded. Dust fallout based upon exploration trench cut, would be serious. Existing environment free from dust and clean water, should be preserved to maintain land use for grazing. Nature of soils

tend to dust once topsoil cover is broken, creating hazard up to 5 kms away. Overburden emplacement underestimated and destruction of vegetation creates vast scar, and erosion pollutes watercourses without hope of adequate rehabilitation. Plan of area claimed incorrect, both for land ownership and watercourse alignments. Singleton township could divert polluted water discharged into Hunter River from Loders Creek system. Feared blasting damage to property, soil, water storage dams and pipes; and risk from blast fly-rock. 1600m. buffer zone sought. Queried the risk of spontaneous combustion of carbonaceous wastes buried in emplacement and its consequential risks to public health and fauna. Questioned whether approval has been obtained for interference with gazetted watercourses at Nine Mile and Loders Creeks.

APPENDIX 2

SAXONVALE OPEN PIT COAL MINE

COPY OF SUBMISSION DATED 19/12/80 FROM CONSENT AUTHORITY

SINGLETON SHIRE COUNCIL

Shire Office
74 George Street,
SINGLETON, N.S.W. 2330

Ref: DA 80/90

19th December, 1980.

The Secretary,
N.S.W. Department of Environment & Planning,
DX 15,
SYDNEY.

SUBJECT: Development Application for Saxonvale Coal Mine
YOUR REF: 80/919Z IAP:CGG
ATTENTION: MR. J. Whitehouse

Dear Sir,

I refer to your letter dated 12th November, 1980 and hereby present Council's submission on the proposed Saxonvale Coal Mine Project as described in the Environmental Impact Statement prepared by The Dampier Mining Company Limited.

SUBMISSION ON THE PROPOSAL:

I would advise that consideration of the Environmental Impact Statement is at the following stage:-

A) Discussion and negotiation is almost complete between the Company and Council on the general upgrading of Main Road No. 181, which involves:

(i) The removal of an S bend section of the Main Road No. 181 located 2 kilometres south of its intersection with Main Road No. 503 by the realignment and construction of a new section of road to Council's usual requirements.

(ii) The replacement of low-level and narrow bridge located 1 kilometre south of Main Road No. 503, by the construction of an elevated and widened section of roadway to Council's usual requirements.

(iii) The ripping, widening and resealing of Main Road No. 181 from Main Road No. 503 intersection to the entrance of the proposed Saxonvale Mine to Council's usual requirements.

(iv) The ripping, widening and resealing of Main Road No. 181 from the entrance to the proposed Saxonvale Mine to Monkey Place Creek to Council's usual requirements.

Council is of the opinion that the replacement of Monkey Place Creek Bridge and Nine Mile Creek Bridge and the associated road alignment/reconstruction of the bridge approaches should be sought in the late 1980's or early 1990's in conjunction with other users at that point in time.

B) Council accepts the concept that Main Road No. 181 will need to be deviated as a result of the operations of the proposed Saxonvale Coal Mine. However, over the forthcoming period Council will seek discussions with the Company on appropriate solutions to this problem taking into account the wishes of Broke residents and the adjoining community.

C) Council would require the Company to satisfactorily reply to and resolve all private objections prior to development approval being granted to the Project.

D) Council is currently discussing with the Company, firstly, the arrangements for the provision of water supply to Broke and, secondly, the planning aspects associated with the expansion of Broke Village.

E) The Company has co-operated with Council in achieving an agreement to pre-purchase land within Council's Residential Land Development at Singleton Heights for the purposes of housing the Company's permanent workforce.

F) The Company has agreed to provide construction workforce accommodation and facilities in the general vicinity of the Mine Site.

G) The Company has assisted and co-operated with Council and other mining companies in the provision of an area water supply scheme for the provision of raw and potable water.

H) Council is most concerned about the apparent lack of higher level planning of the overall impact of industrialisation in the Upper Hunter, in particular the provision of adequate social and recreational facilities for the general workforce.

I) In any approval Council would request the inclusion of the following specific conditions:

(i) The Company consult with the adjoining landowners on the methods of being advised of blasting times.

(ii) The operation of the mine and ancillary activities in the manner that does not cause loss of amenity to occupiers of adjoining properties in the locality, including the mitigation of dust and noise during operation, the Council's satisfaction and the retention of as many trees in good condition as is practical.

(iii) The design of Company's access road at the Main Road No. 181 junction to Council's usual requirements.

(iv) No vehicular access (other than emergency access) to any public roads other than the Main Road No. 181 junction, without the further consent of Council.

Yours faithfully,

(J.A. FLANNERY)
SHIRE CLERK

APPENDIX 3

SAXONVALE OPEN PIT COAL MINE

CONDITIONS REQUIRED BY ELECTRICITY COMMISSION OF N.S.W.

EXTRACT OF LETTER DATED 30/10/80 TO D.E.P.

Accordingly while no objection is raised in principle to the proposal the Commission will require the following provisions to be incorporated in any approval which may be given by the Department:

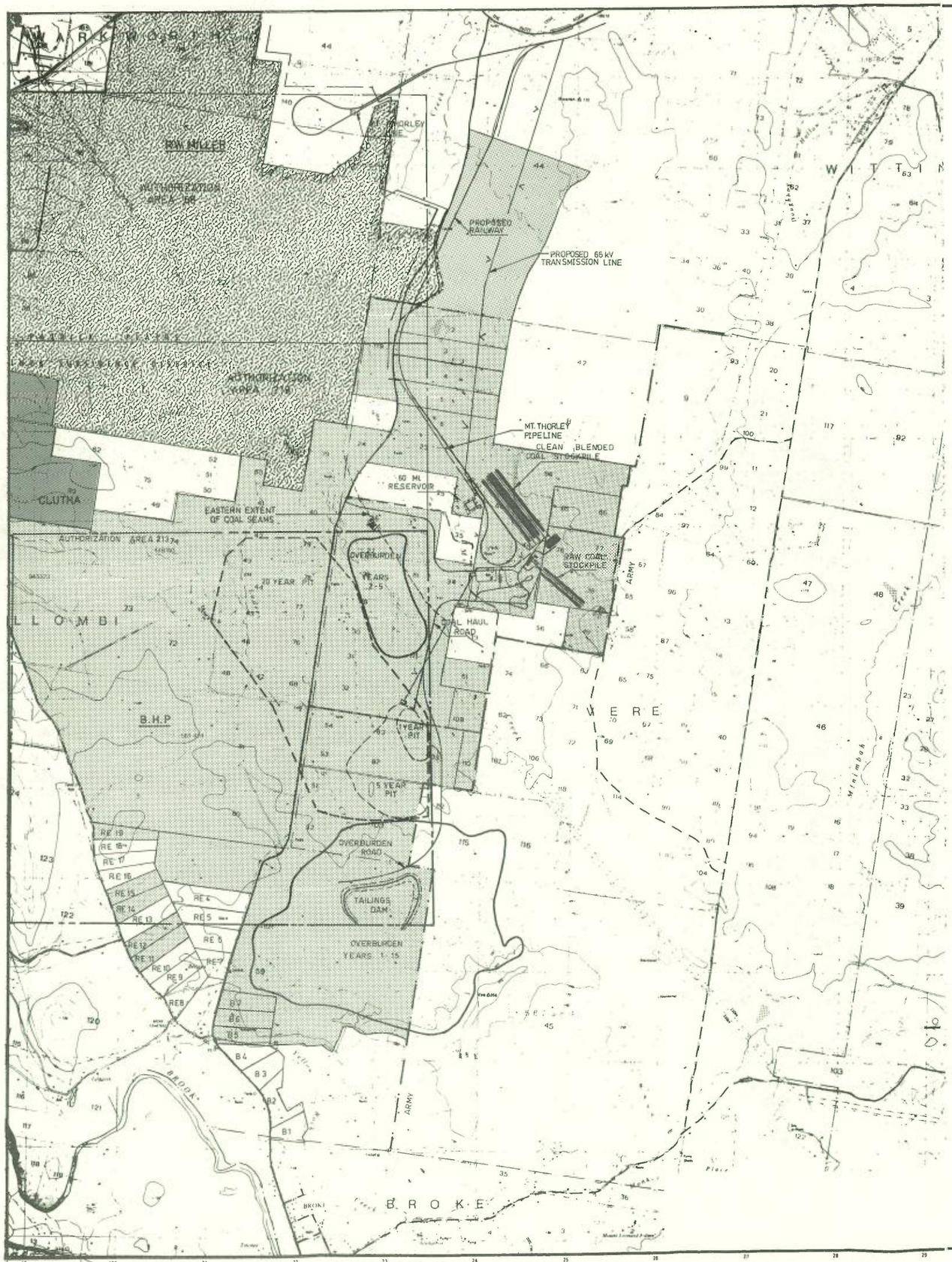
(a) The Commission's easements rights will not be affected by the proposal;

(b) The Company is to consult with the Commission to ensure that in the planning and construction of roads, railways, buildings, and other installations including the placement of surplus material (overburden) adequate clearances to the Commission's transmission line structures and conductors are provided.

(c) The Company is to consult with the Commission with regard to the effect of air borne pollutants arising from the proposal which may affect the insulation levels of the transmission lines during the initial construction activities and later production activities.

(d) The Company is to meet any extra costs incurred by the Commission as a result of the proposal.

D. West, Government Printer, New South Wales – 1981



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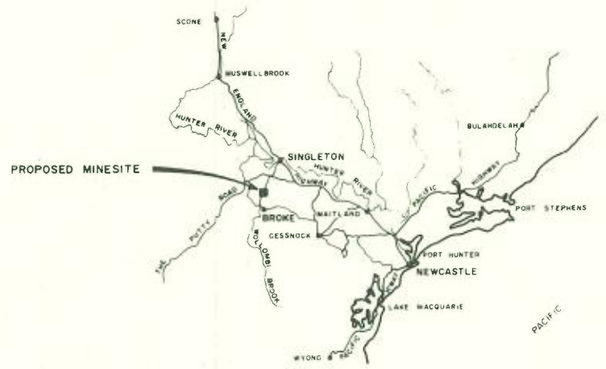
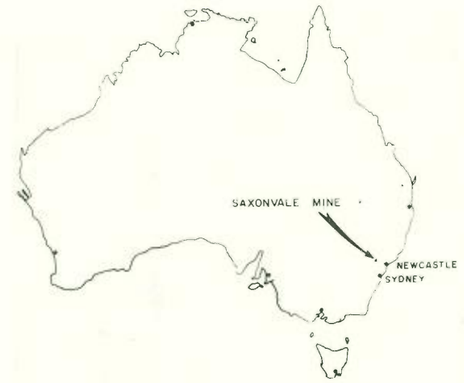


GENERAL PLAN OF THE HUNTER VALLEY



LEGEND

- R.W.Miller
- Clutha
- B.H.P.

LOCATION PLAN
B.H.P. LANDHOLDINGS

FIG 1

REV

DRG. No.

E311 000

E312 000

E313 000

RENO VINEYARDS

MINE ACCESS ROAD

LIMIT OF LEASE

WATER RESERVOIR

60 ML

R400

R200

FUTURE CREEK DIVERSION

CATCHMENT AREA No4

BLENDED COAL STOCKPILES 750 000 t

CATCHMENT DAM No 4

15000 t TRAIN LOADING BINS

FUTURE CREEK DIVERSIONS

CATCHMENT AREA No 3A

UNBLENDED WASHED COAL 250000t

LAB

THICKENER

PREPARATION PLANT

CATCHMENT AREA No 3B

CREEK DIVERSIONS

CATCHMENT DAM 5

CATCHMENT DAM 3

CARPARK

AMENITIES

WORKSHOPS

CATCHMENT DAM 2

350t REFUSE BIN

WASH DOWN

GEN. OFFICE

CATCHMENT DAM 1

RAW COAL STOCKPILES 300 000 t

CATCHMENT AREA No 1

BREAKERS

HAUL ROAD

DUMP STN

ARMY PROPERTY

ARMY PROPERTY

LIMIT OF LEASE

0 200 400 600 800 m

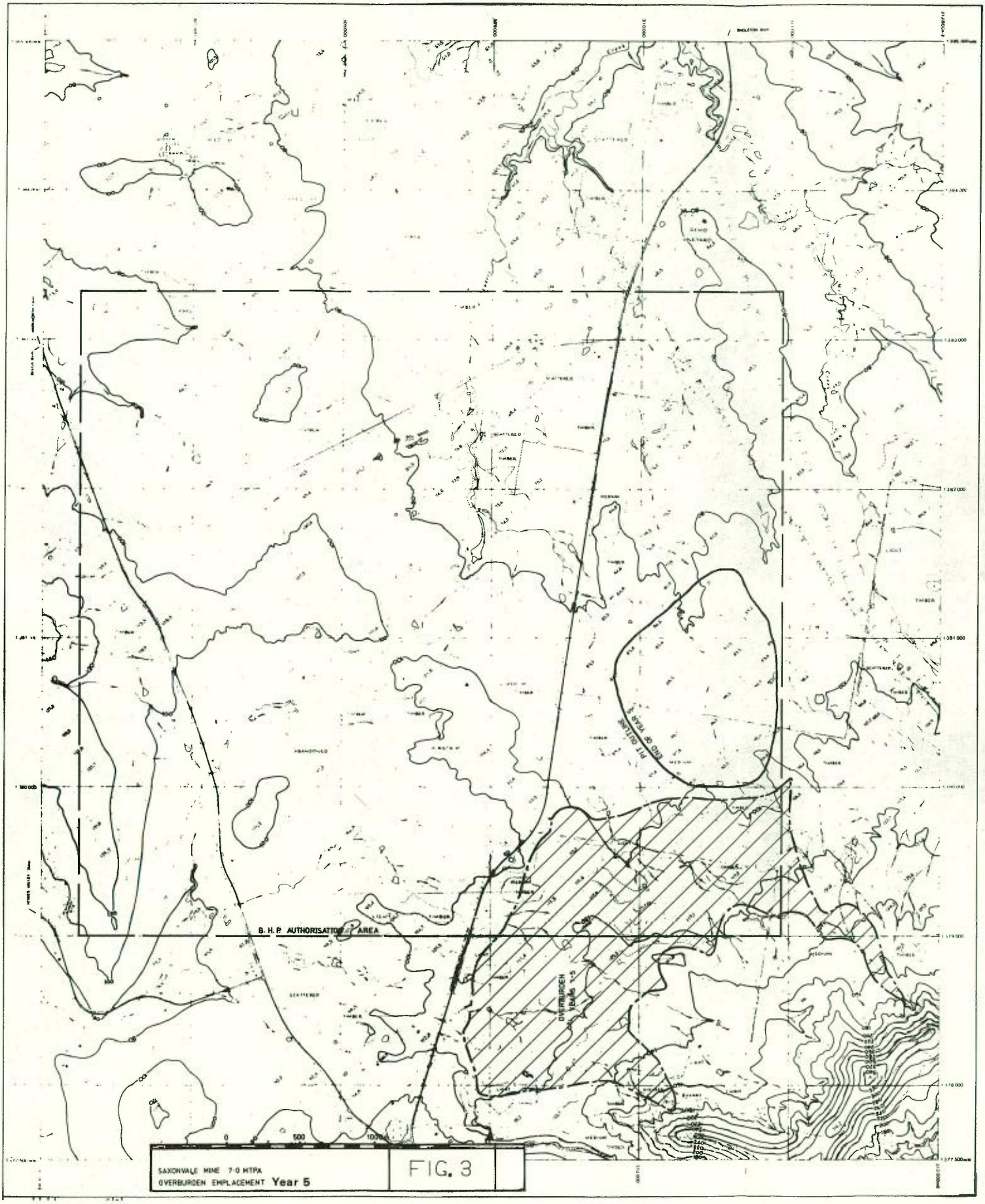
NOTES

SAXONVALE MINE - 7·0 MTPA

LOCATION OF PROPOSED PLANT ROADS AND DRAINAGE

FIG. 2

REV.


B. H. P. AUTHORISATION AREA
END OF YEAR 5 PIT OUTLINE
OVERBURDEN Year 5
0
500
1000
SAXONVALE MINE 7·0 MTPA
OVERBURDEN EMPLACEMENT Year 5
FIG. 3

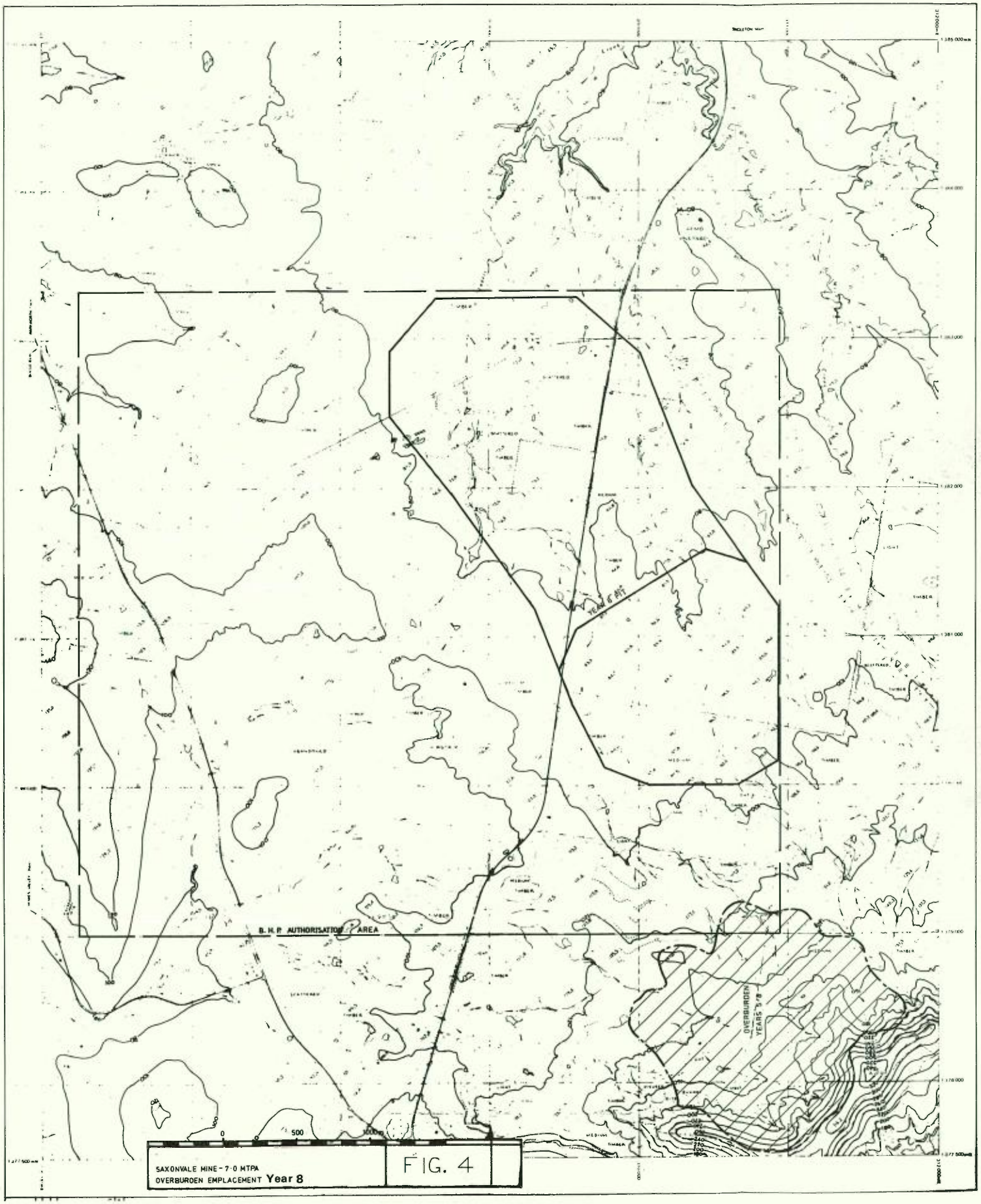
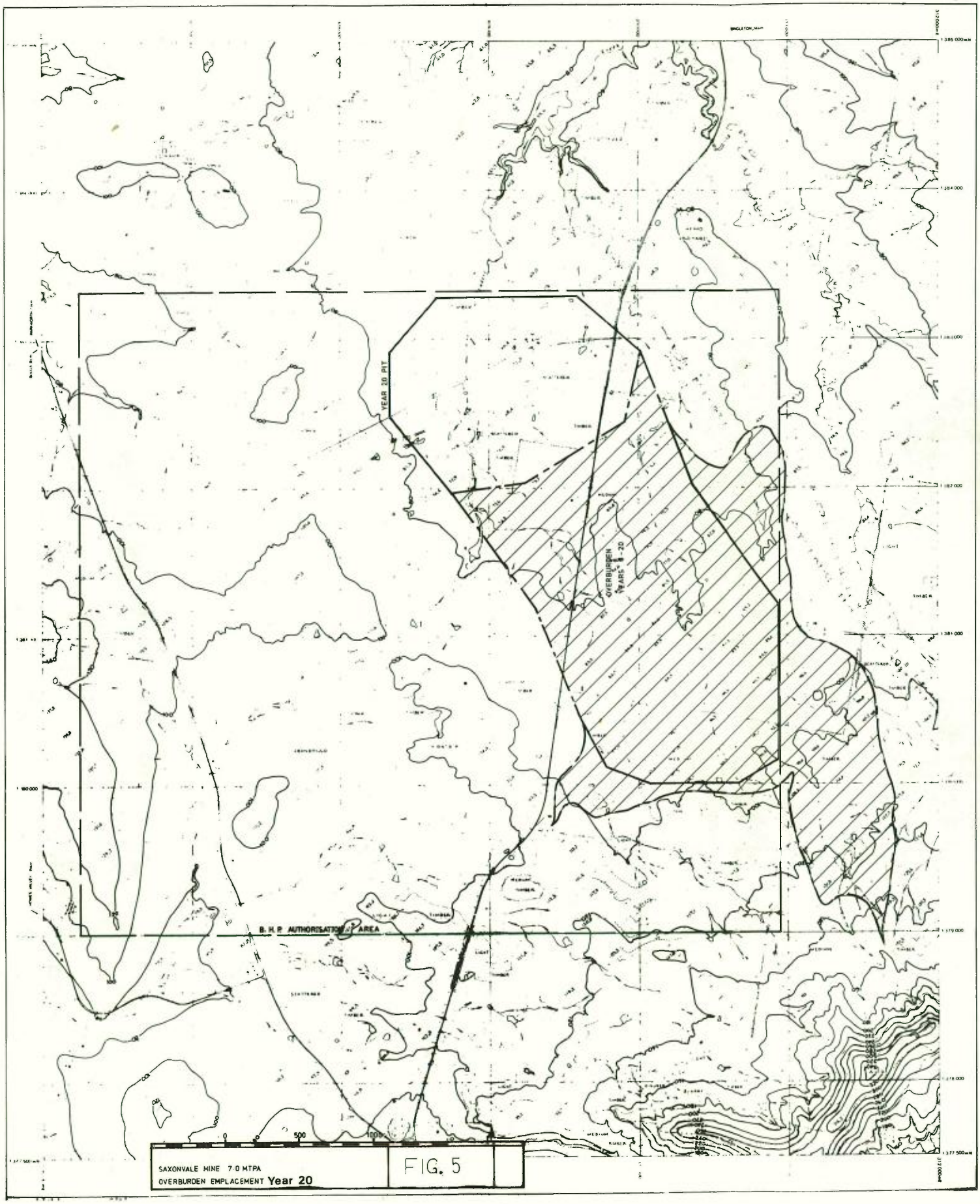

B. H. P. AUTHORISATION AREA
YEAR 6 PIT
OVERBURDEN YEARS 5 & 8
0
500
1000
SAXONVALE MINE - 7·0 MTPA
OVERBURDEN EMPLACEMENT Year 8

FIG. 4


YEAR 20 PIT
OVERBURDEN YEARS 1 - 20
B. H. P. AUTHORISATION AREA
0
500
1000
SAXONVALE MINE 7.0 MTPA
OVERBURDEN EMPLACEMENT Year 20
FIG. 5

NEW SOUTH WALES DEPARTMENT OF

EIS
454

Proposed Saxonvale coal mine

Borrower's name	Date	Ext

RAECO

NEW SOUTH WALES DEPARTMENT OF

EIS
454

Proposed Saxonvale coal mine