EXPLORATION AND MINING IN NATIONAL PARKS AND CONSERVATION RESERVES IN WESTERN AUSTRALIA[1]

by
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Abstract. Mining is of critical importance to the Western Australian economy, earning almost $A 10 billion in 1991. Mineral production is based on the principle of Crown ownership of minerals and either the concurrence of or consultation with the land manager. Through the 1970's and early 1980's public concern developed regarding the activities of mineral explorers within the State's national parks and other conservation reserves. A series of enquiries were held and policies developed between 1986 and 1992 resulting in a system that allows for both the protection of reserves and regulated mining access.

Key Words: environment,conservation reserves,mining, mineral exploration, multiple use, national parks, Western Australia.

Introduction

Mining has been of major importance to the Western Australian economy throughout this century. Accordingly the search for and exploitation of minerals has been encouraged by successive Governments. However during the 1970's and 1980's public concerns about the environmental implications of such activities increased , particularly in national parks and other conservation reserves. This paper discusses the evolution of the current approach to the provision of access to the State's national parks and other conservation reserves.

Exploration and Mining in Western Australia

Mining is of critical importance to the Western Australian economy, earning $A 9.5 billion in 1991/92 predominantly from iron ore, gold and alumina together with substantial contributions from heavy mineral sands, diamonds and nickel.

Until the mid 1960's, gold dominated mineral production. However from 1966 there was a major increase in overall production with the commencement of iron ore export from the Pilbara region in the north west of the State, and the discovery of nickel near Kalgoorlie and bauxite in the south west. The early 1970s saw sustained growth in the production of nickel, alumina and heavy mineral sands. Further encouragement to exploration was provided by discoveries of uranium at Yeelirrie in 1973 and diamonds at Ellendale and Argyle in the late

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1970s. Gold production dramatically rose from 10.8 tonne in 1980 to 148.4 tonne in 1989/90 due to improvements in the price and extraction technology. Active exploration lead to the discovery of further ore bodies.

Western Australia has now one of the most diversified mining industries of any country in the world. It is a major world source of iron ore, alumina, nickel, titanium minerals, diamonds, gold and salt.

The expansion in mineral production has been driven by the increasing world demand for minerals assisted by improvements in mining and transport technology. These improvements have allowed isolated deposits to be brought at competitive costs to world markets.

Although the improvements in demand and technology have paved the way for exploiting mineral deposits, it has been vital to foster the exploration industry to ensure that further ore bodies were identified to satisfy the demand. The experience in Western Australia is that exploration in particular areas of land may be repeated a number of times with improved techniques and knowledge and changing mineral prices resulting in discoveries in areas previously explored sometimes quite intensively only perhaps a decade before.

Exploration is based on concepts of geology and ore forming processes. It requires superficial access to extensive areas of land for broad scale and geophysical and geochemical survey. More intensive activity, which is usually only temporarily intrusive, is confined to relatively small areas identified from the broad scale surveys. Drill pads and survey lines are now rehabilitated to ensure that there is virtually no permanent damage to the environment. Historically, mining centres and cleared mineral exploration survey lines were left in a derelict, unrehabilitated condition. The general public's experience of these areas has resulted in major concerns about similar impacts from mineral exploration and production on nature conservation reserves. This perception remains despite radical improvements in the requirements for environmental management and the performance of explorers and producers. The public also believes that every exploration program will lead to an operating mine. However the Western Australian Chamber of Minerals and Energy has indicated that in approximate terms, out of 1000 broad scale exploration programs commenced only one ore deposit is defined.

Conservation Reserves in Western Australia

Of the State's 2.5 million km^2 area, or about a third of Australia's total land area, some 174 thousand km^2 or 7% is reserved as national park or one of a range of conservation reserves.

The process of reservation is ongoing as areas of particular ecological importance are progressively identified.

The main conservation reserve types include National Parks Nature Reserves and State Forest. Other forms of tenure include Timber Reserves, Conservation Parks and Marine Parks and Marine Nature Reserves. National Parks range in size from 56ha to 15 thousand km^2. They are widely distributed but tend to be smaller in the south west. A similar situation applies to Nature Reserves with the largest number being in the South West. State Forest is restricted to the south west corner of the State. The purposes of the various reserves are summarised in Table 1. Figure 1 summarises the land tenure in the State.

The type of reserve sets limits on the activities which may be permitted within that area. These are defined by legislation and in management plan and zoning processes.

The class of reserve is also important for management. A class reserves can only be

cancelled with the approval of both houses of Parliament, B class by a proclamation from the Governor with reasons reported to Parliament and C class by the Governor on advice from relevant ministers without reference to Parliament.

State Forest and Timber Reserves are vested in the Lands and Forest Commission (LFC). The others are vested in the National Parks and Native Conservation Authority (NPNCA). The Department of Conservation and Land Management (CALM) is the management agency for the NPNCA and LFC.

Additions to the Conservation Estate

Some 45% of the rare and threatened species of flora in Australia are from Western Australia and there is an exceptionally high degree of endemism in the State's wild life (eg 62% of the flora species in the South West of the State are endemic). Accordingly there is considerable pressure for active management and maintenance of these special values.

This preoccupation is reinforced by the aesthetic values of the areas and the threat caused by introduced predators, feral animals, weeds and plant diseases.

Soon after the Environmental Protection Authority (EPA) was established in 1971, it instituted a process of identifying areas of the State which should be reserved to secure the conservation of representative biological and geomorphic types occurring in Western Australia. In addition features of special scientific interest were identified. Further areas for national parks were specified to cater for growth in the State's population growth, and changes in mobility and population centres. This action culminated in a series of recommendations to Government between 1975 and 1983. These recommendations were contained in four reports that became known as the Red Books. The recommendations are progressively being implemented as conflicting land use issues are resolved. It was soon realised that a proportion of the recommendations had mining implications. Of the 454 localities under review, 123 had mining or petroleum interests. The majority of these could be resolved by changes to proposed reserve boundaries or the purpose or class of the proposal. Only eight are still outstanding. Because these recommendations were formulated some years ago the information on which they were based has in many cases been upgraded. CALM has been recommending under the Conservation and Land Management Act, increases to the conservation estate via individual reserve management plans or regional management plans. Again in particular cases potential mining conflicts occur.

Legislation

The principal Acts which affect exploration and mining in conservation areas are the Mining Act, the Wildlife Conservation Act, the Conservation and Land Management Act and the Environmental Protection Act.

Mining Act

The Mining Act 1978 covers both exploration and productive mining of minerals on all land in Western Australia, with the exception of the few areas of pre-1889 freehold land. The State was established in 1829 with minerals to owner title. The title system was changed in 1889 with the State retaining mineral rights. The Act is based on Crown ownership of minerals and seeks to encourage the discovery and development of mineral resources by granting the rights to exploration and mine minerals to individuals and companies. In return for the right to mine, developers pay a royalty to the State.

The Act includes a number of provisions relating to environmental matters which vary depending on the type of land tenure over which the tenement is granted. Rehabilitation conditions may be adjusted throughout the tenure of a mining lease to meet changing circumstances. Performance bonds are required for all productive mines and selected exploration programs. The liability of a tenement holder to meet conditions continues even after the surrender of a tenement. Also where an individual or company takes over a lease it becomes responsible for the lease and all environmentally unacceptable or unsafe aspects of that lease.

The Act has specific provisions for particular classes of land.

1. Crown Land, which is unvested land owned by the Crown. It includes vacant Crown Land as well as pastoral (grazing) leases and land reserved for mining, commons or public utility.

2. Public reserves, which are a vested subclass of Crown Land carrying special restrictions upon access for exploration and mining.

3. Private land, alienated from the Crown and held under freehold title.

4. Pre 1899 private land with minerals to owner rights

This paper concentrates upon Public Reserves for conservation purposes.

The Crown Land provisions of the Act cover mining in vacant crown land and on crown land leased for pastoral, Aboriginal or timber purposes. A specific range of requirements are applied to tenements on pastoral leases to protect leaseholders' interests as well as providing compensation for any damage to improvements.

On reserve land varying degrees of access control may be encountered. In general the Mining Act provides that before a tenement is granted either the concurrence or recommendation of the Minister responsible for the reserve is required. Concurrence of the Minister for the Environment is required in the case of Class A Nature Reserves, National Parks, Conservation Parks, State Forests and Timber Reserves.

Parliamentary approval is required before mining leases and general purposes leases can be granted in National Parks and class A reserves. For conservation reserves other than National Parks and Class A reserves the recommendation of the Minister for the Environment is required before the Minister for Mines can grant mining approval.

The referral procedures also enable the authority with management responsibilities for the reserved land to oppose exploration and mining or have specific conditions applied to any mining tenements granted on the reserved land. Such conditions can include restrictions on the type and manner of exploration or other mining activity as well as detailed environmental and rehabilitation requirements.

In addition to the specific conditions that may be recommended the Mining Act also provides for conditions to be imposed with respect to mining tenements in reserved land to ensure that "injury to the surface of the land" is made good if necessary, for the costs of such work to be recovered from the tenement holder and for the lodging of performance bonds with respect to mining. Fines or forfeiture for non compliance or breaches of the Act or conditions are provided for.

TABLE 1. Land Managed By The Department of Conservation and Land Management

LAND TENURE	AREA (ha)	PURPOSE
National Park	4 891 000	Wildlife and landscape conservation, scientific study, preservation of features of archaeological, historic or scientific interest, together with recreational enjoyment by the public.
Marine Park	1 012 000	Marine conservation and recreation. Areas may be zoned for commercial fishing, alternatively sanctuary zones can be created.
Nature Reserve (land and marine)	10 566 000	Wildlife and landscape conservation, scientific study and preservation of features of archaeological, historic or scientific interest.
Conservation Park	26 000	Wildlife and landscape conservation, scientific study, preservation of features of archaeological, historic or scientific interest, together with recreational enjoyment by the public. Mineral exploration is acceptable with conditions.
State Forest, Timber Reserve	2 150 000	For indigenous State Forest or Timber Reserve, multiple use for one or more of the following: conservation; recreation; timber production on a sustained basis; water catchment protection; or any other purpose prescribed by regulation. Timber Reserves are a transitional classification to other reserve types.
Section 5g Miscellaneous Reserves	190 000	These reserves have a wide variety of purposes, but normally are related to recreation, wildlife conservation and historical features. This classification is often transitional. It is often used when biological values are to be managed in areas of high mineral potential.

Wildlife Conservation Act

Under this Act all the State's native flora and fauna are protected with some endangered species given special protection. Premeditated damage to endangered species may only occur under special circumstances with the written permission of the Minister for the Environment.

Conservation and Land Management Act

This Act cannot derogate from the operations of the Mining Act. However it establishes the management required for conservation reserves and State Forest and that conditions for access by miners may be set. The agencies involved are the NPNCA, the LFC and CALM.

The Environmental Protection Act

This Act requires that a proposal which is likely to have a significant effect on the environment shall be referred to the EPA by a decision making authority (eg the Minister for Mines). Proposals may also be referred by third parties at any time. Following referral, the proposal cannot be approved until the EPA determines that the proposal does not require assessment or after the proposal has been assessed, its recommendations are made to the Minister for the Environment and he has set conditions.

The Act also forms the basis for pollution control in the State, requiring Works Approvals and Pollution Control Licences for designated projects including mining operations. Recently the Department of Minerals and Energy was delegated the responsibility for water pollution control associated with gold operations.

Environmental Protection Policies are also provided for under the Act. These may require that all projects within a particular environmentally sensitive area are referred to the EPA.

Development of Government Policies for Mining on Conservation Reserves

Geologically much of Western Australia is still not well known. Broad scale mapping of the State at a scale of 1:250 000 was only completed a few years ago and more detailed geological mapping as the basis for further mineral exploration within the State is now in progress. Over large areas geological features are concealed under deeply weathered terrain or sedimentary cover. Ongoing exploration is therefore required to adequately examine prospective areas using the results of improvements in technology and reflecting the economic value of particular mineral resources.

The Mining Act 1978 provides that mining tenements may be granted on national parks and nature reserves under certain conditions. This has essentially been the policy in the State for over 90 years until 1988. Mining has been a major employment generator since the 1890's, resulting in successive increases in the State's population.

The EPA shortly after its inception in 1971 considered the issue of mining access to reserved land. In the first place the Authority established the Conservation through Reserves Committee to review the adequacy of the existing national parks and nature reserves. This review was based on a 1962 study of conservation reserve requirements by the Australian Academy of Science. Subsequently in 1972 the EPA advised Government during the review of the Mining Act 1904 that subject to consultation with the Minister for the Environment regarding the setting of conditions, exploration could take place in A class nature reserves and national parks.

In 1971 the EPA recommended that the State undertake the detailed exploration needed to

explore for montan wax in the then C class Fitzgerald River Reserve on the South Coast. In addition it was recommended that the reserve became a National Park. The Government agreed to both recommendations. The exploration drilling program was conducted by the Geological Survey but the deposit was found to be uneconomic.

Similarly following EPA advice, boundary adjustments were made to Karijini National Park in 1972. The changes included bringing scenic attractions into the reserve, and the relinquishment of unviable iron ore tenements within the park.

Shortly after the Rudall River National Park was established in 1977 the Government decided to grant exploration tenements within the reserve. The EPA recommended a set of conditions on exploration to the then National Parks Authority and Western Australian Wildlife Authority and Mines Department. These conditions were jointly agreed. These conditions formed the basis for subsequent tenements within National Parks and Nature Reserves throughout the State.

In 1981 a committee of the upper house of the Western Australian State Parliament published a report concerning mining in national parks. This called for a ranking of national parks and other reserves based on their ecological importance.

In 1983 some gold mining leases were pegged and worked in a remote area of Karijini Range National Park. In 1984 the EPA released its report on a proposed alluvial gold mining venture on these leases. It found that "as a matter of principle mining on leases granted following the declaration of a national park should only be allowed if the following criteria are met:

(a) there is a strategic need for the mineral

or

(b) the mineral resource is rare and of high value, and its exploration would be of significant material benefit to the State, or the nation."

As a result of this finding, the mining proposal did not go ahead.

Balancing the Scales Policy

In October 1985 the Government established a committee to receive submissions and make recommendations on exploration and mining activities in National Parks and Nature Reserves. The review arose out of the dilemma as to whether to continue to approve mineral exploration and mining in the State's National Parks and nature reserves.

The Committee's major finding was that "exploration licences should not be granted over a National Park or Class A Nature Reserve unless that park or reserve has individually either been declared open for granting of exploration licences or reclassified in such a way as to accommodate exploration". In reviewing the Committee's report the EPA recommended that any exploration and mining in National Parks and Nature Reserves should be phased out by the year 2001.

In December 1988 the Government used the Committee findings as a basis for its policy "Mining and Environment. Balancing the Scales". The major feature of this policy was that National Parks and Class A Nature Reserves were closed to exploration and mining tenements. Under a complicated system of interdepartmental research, EPA assessment and Government and Parliamentary approval detailed in the policy it might have been possible to open a reserve for mining tenement applications.

In addition each Class B or C Nature Reserve was to be reviewed and either be reclassified as Class A National Park or Nature Reserves or

have its NPNCA vesting status removed. The conservation status of any Class B or C reserve would have to be reviewed before any exploration licence application could be granted.

The only way of gaining access for exploration was essentially by way of a geoscientific survey permit which allowed non ground disturbing exploration but gave no automatic right to proceed to an exploration tenement.

As a result of this policy exploration on Nature Reserves and National Parks was seriously curtailed apart from work on existing tenements and minor use of geoscientific survey permits. As a result during 1990 only 72 tenements were approved on reserved land.

A useful outcome of the policy was the major review of existing Class B and C reserves which is still continuing. Out of 936 reserves, 672 were found to have only low or negligible mineral resource potential. These were approved by the Department of Minerals and Energy for upgrading to A Class status. Between June 1989 and June 1990 some 794 000 ha were added to the conservation reserve system.

The policy resulted in a much more rigorous mineral resource assessment being required for any proposed National Park or Nature Reserve. However throughout this period the mining industry and the Department of Minerals and Energy were concerned at the major restriction on exploration activity resulting from the policy.

Resolution of Conflict Policy

The restrictions on mineral exploration and subsequent resistance to the creation of new conservation reserves due to the "Balancing the Scales" policy lead to an active process of discussion between a range of Government agencies as well as lobbying by industry and private conservation interests. Finally in November 1990 after two years experience with the "Balancing the Scales" policy, the Government announced a different approach. The "Resolution of Conflict. A Clear Policy for National Parks" policy was developed to maintain the philosophy of restricted access to important conservation reserves but without preventing new mineral exploration.

The policy for the first time stated that there would be no mining in National Parks. However in the recognition of high resource values in five of the 62 National Parks, special provisions would allow for continued exploration and excision of mining leases from these five. With the excision of small areas from two national parks (Watheroo and Neerabup), only three national parks are now subject to exploration and mining (D'Entrecasteaux, Rudall River and Karijini).

In addition the Government announced that all EPA Red Book recommendations held up because of mining interests would be implemented as C Class conservation reserves. Upgrading of these reserves to A Class and the review of B and C Class Nature Reserves would be considered by a Ministerial Council consisting of the Minister for Minerals and Energy, Minister for Industrial Development and Minister for the Environment. The Policy did not require that all B or C class reserves be upgraded. As a result major opportunities have been created for declaring conservation reserves on which mineral exploration could be carried out. A further 65 Class C conservation reserves have been created in recent years.

An integral component of the policy was the establishment of a Mining and Environment Liaison Committee to enable the community to provide advice to the Minister for Mines concerning environmental implications of the operation of the Mining Act.

No mineral exploration tenements occur in marine reserve areas at this stage, due to the

small number of such reserves and tenements in marine areas along the 12 500 km Western Australian coastline. However marine aspects of the Policy were clarified in May 1992. In Marine Parks and Marine Nature Reserves exploration drilling and mineral production are banned except from land areas. However, directional drilling beneath these reserves or sub sea floor mining from land areas or from outside the reserve would be permitted if found environmentally acceptable by the EPA. Seismic surveys and various infrastructure facilities would be permitted if found environmentally acceptable by the EPA. Any new proposals for Marine Parks and Marine Nature Reserves would be subject to sound assessment to ensure that areas of high mineral potential are not included. Of more concern to industry is access off the Western Australian coast for petroleum exploration and development. The policy has parallel provisions for petroleum exploration and production.

The Department of Minerals and Energy, in consultation with CALM, NPNCA, LFC and EPA has produced schedules which detail conditions for mineral exploration and development on reserved land. These schedules include existing and proposed CALM managed conservation reserves and forests and other environmentally sensitive areas including both exploration and mining permits. The conditions are detailed in Department of Minerals and Energy Western Australia, Geological Survey of Western Australia,Information Series No 11, 1992.

The conditions require approval of a clearly defined exploration program prior to any significant exploration or ground disturbing activity, with approval by the EPA for A Class reserves. No developmental or productive mining is allowed on mining leases without approval of a mining proposal that describes measures to safeguard the environment.

Between June 1990 and June 1991 over 1 140 000 ha were added to the conservation reserve system. In addition where 82 tenements on conservation reserves were granted in 1990, 193 were approved in 1992.

Current Policy

In February 1993 there was a change in government at the State election. As a consequence, a series of policy changes were introduced. The government is now of the opinion that exploration may be conducted within all national parks with the agreement of the Minister for the Environment and the Minister for Mines. If an important mineral deposit is discovered then mining would be permitted if both Houses of Parliament agree following environmental assessment by the Environmental Protection Authority. This is in keeping with the provisions of the Mining Act. It is recognised that some parts of National Parks are unique and will never be open to mining.

What has been achieved?

As a result of the cooperative approach engendered by the Resolution of Conflict Policy, a deadlock involving minimal access for mining and few new conservation reserves was overcome.

The way was cleared for the development of the following mining operations:

- A 50 Mt pa iron ore mine in Karijini National Park;
- A bentonite mine in Watheroo National Park;
- A small limestone mine in Neerabup National Park;
- Exploration within highly prospective sections of Rudall River National Park;

- Identification of major mineral sand ore mineralisation within D'Entrecasteaux National Park;
- The agreement by CALM to the grant of some 800 exploration and mining tenements on reserved land. Currently out of over 15500 granted Mining Act tenements, some 600 are on reserved land.

In addition the following gains have been made to the conservation reserve system:

- Agreement to the upgrade of 670 reserves to A class;
- Creation of a further 65 C class reserves;
- Agreement by Government on the addition of 15 000 ha to Rudall River National Park to compensate for an excision of a uranium orebody and adjacent highly prospective areas;
- Development of a strategy to rationalise tenements in Karijini National Park and add land to the park greater than that excised for the iron ore mine;
- Creation of the 225 000 ha Kennedy Range National Park with provision for ongoing petroleum exploration;
- Purchase of land with declared rare flora to compensate for that excised from Watheroo National Park;
- Additions to D'Entrecasteaux National Park;
- The application of sound environmental conditions on exploration tenements on reserves including performance bonds.

Some 264 B and C class conservation reserves are still being reviewed by the Department of Minerals and Energy because of high mineral or petroleum potential. In addition only 8 reserve recommendations by the EPA in its Red Books, about 2% of the total number of proposals, are still under review because of mineral or petroleum interests. A number of other proposals are not resolved because of Aboriginal, local authority or research funding constaints.

Resource assessments are in preparation for proposed extensions to Cape Range National Park and a new National Park for islands of the Dampier Archipelago off the north west coast. Assessment for Cape Range has involved detailed sampling of the Range's limestone to define a metallurgical limestone resource. The assessment for Dampier Archipelago has involved the compilation of detailed studies of limesand resources completed some years previously as well as using the results of seafloor studies for channel dredging and pipeline route selection. As further National Parks and A Class reserves are proposed, there will be a need to develop more sophisticated means of assessing mineral resources.

Conclusions

Mineral exploration and mining development is of major importance to the Western Australian economy. In addition conservation reserves are important in order to provide active and comprehensive management of the State's important native flora and fauna.

A series of mining proposals in National Parks during the 1970's and early 1980's lead to the development of first the "Balancing the Scales" policy and subsequently the "Resolution of Conlflict" policy. As a result of the cooperative approach engendered by the latter policy the way was cleared for mineral exploration and mining in conservation reserves and for major additions to the conservation reserve system. With a recent change in State Government the process of policy evolution will continue.

Literature Cited

Australian Academy of Science. Western Australian Sub Committee, Committee on National Parks and Nature Reserves, 1962. National Parks Report.

Australian Academy of Science. Western Australian Sub Committee, Committee on National Parks and Nature Reserves, 1965. National Parks and Nature Reserves in Western Australia.

Committee on Exploration and Mining in National Parks and Nature Reserves. Report to the Hon Minister for Conservation and Land Management, and the Environment and Minerals and Energy, December 1986.

Conservation Through Reserves Committee, 1974. Conservation Reserves in Western Australia. Report of the Conservation through Reserves Committee to the Environmental Protection Authority.

Departmant of Minerals and Energy Western Australia (Geological Survey of Western Australia), 1992. Mining Act 1978 Commonwealth Minerals (Submerged Lands) Act 1981, Guidelines for the Application of Environmental Conditions for Exploration and Mining. Information Series No. 11.

Department of Conservation and Environment, 1984. Armway Mining Pty. Ltd. Gold Project Hamersley Range National Park. Department of Conservation and Environment, Perth Western Australia, Bulletin 143.

Environmental Protection Authority, 1987. Committee on Exploration and Mining in National Parks and Nature Reserves December 1986. Environmental Protection Authority, Perth Western Australia, Bulletin 287.

Government of Western Australia, 1988. Mining and the Environment Balancing the Scales. A Western Australian Government Policy Report.

Government of Western Australia, 1990. Resolution of Conflict. A Clear Policy for National Parks.

Government of Western Australia, 1992. Marine Park Policy for Western Australia.

Legislative Council, Western Australia, 1981. Report of Select Committee on Mining in National Parks.

Western Australia, Mining Act 1978.

Western Australia, Conservation and Land Management Act 1984.

Western Australia, Wildlife Conservation Act 1950.

Western Australia, Environmental Protection Act 1986.

Figure 1. Land tenure and purpose in Western Australia