

GEOLOGICAL SKETCH MAP
OF
WESTERN AUSTRALIA

1894

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WESTERN AUSTRALIA

PERIODICAL PUBLICATION



DEPARTMENT OF
MINERALS & ENERGY

1894-1994

100 YEARS OF SERVICE

Annual Report *1994* Nineteen Ninety Four





Photograph taken in the historical mining warden's office on display in the foyer of Mineral House. The replica office was built as part of the Department's Centenary celebrations.

*From front left - Murray Meaton - Director Royalties, Economic Policy and Public Affairs Division
Kerry O'Neil Director - Corporate Development Division
Ken Price - Director Explosives and Dangerous Goods Division
John Hosking - Director Chemistry Centre (WA)
Pietro Guj - Director Geological Survey Division
Bill Phillips - Director Mining Registration Division
Colin Branch - Assistant Director General
(seated at desk) Lee Ranford - Acting Director General, Minerals and Energy and Accountable Officer
Les Annison - Director Surveys and Mapping
Jim Torlach - Director Mining Operations Division
Ian Fraser - Director Petroleum Division*

STATEMENT OF COMPLIANCE

The Honourable George Cash JP MLC
Minister for Mines
Parliament House
PERTH WA 6000

Dear Minister

In accordance with the Financial Administration and Audit Act 1985, I submit for your information and presentation to Parliament, the Annual Report of the Department of Minerals and Energy of the State of Western Australia, for the year ending June, 1994.

The Annual Report has been prepared in accordance with the provisions of the Financial Administration and Audit Act 1985. It uses the format established in previous years, with the Department's activities described under Corporate Programs. These are set against a background of the mining and petroleum industry in 1993-94.

Yours sincerely

Lee Ranford
Acting Director General

August 1994

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**Hon George Cash JP MLC
Minister for Mines**

The resources sector remains the foundation of the States' economy; providing over 70 per cent of exports, directly employing around 39 000 people and providing mineral royalties and rental contributions to State government revenue of over \$390 million.

I am pleased to present Parliament with this Report recording the activities and achievements of the Department of Minerals and Energy for the 1993-94 financial year.

Despite a patchy economic recovery in world markets, it was another good year for the mineral and petroleum resources sector in Western Australia. Although faced with continued petroleum and minerals recession in the State's major export markets, Japan and Europe, the gross value of production increased to a record level of an estimated \$12 600 million.

Western Australia continued to be a major player in the world resources sector. Over 300 projects produced 35 per cent of world production of all mineral sands, 40 per cent of diamonds, 21 per cent of alumina, 12 per cent of iron ore, eight per cent of gold, and six per cent of the world's nickel. Petroleum production came from 31 oil and gas fields including Australia's largest natural resource project, the North West Shelf. Western Australia produced about eight per cent of the world's Liquefied Natural Gas in 1993-94.

The resources sector remains the foundation of the States' economy; providing over 70 per cent of exports, directly employing around 39 000 people and providing mineral royalties and rental contributions to State government revenue of over \$390 million.

The Government recognises the importance of this industry to our State economy and has actively pursued policies which facilitate its development.

Since assuming Government in February 1993, we have moved systematically to put in place a number of important initiatives to promote growth and development. These initiatives have included changes to legislation and additional funding to promote exploration activity which is the lifeblood of the resources industry.

Legislative changes have included the introduction of Retention Licences which

will allow explorers to hold proven ore reserves which cannot be economically mined at present, fixed four year terms for prospecting licences, special gold prospecting licences on existing mining leases and legislation to allow continuous shift underground mining. The maximum size of new petroleum exploration permits has been increased and the Minister given discretion to reduce fees and charges for remote onshore exploration projects.

The exploration moratorium imposed on the Rudall River region by the previous government was removed and over \$2 million in additional funding was provided for the development of a computerised tenement system. This system will enable rapid identification of ground available for exploration and significantly reduce the time taken to record and approve applications for mining tenements. The system is to become operational in Kalgoorlie in August 1994.

The Government recognises that detailed geoscientific maps are vital to stimulate mineral exploration investment and allocated an additional \$2.5 million for regional geological, geochemical and airborne geophysical mapping projects in the 1993-94 budget. These funds were provided for projects in the Eastern Goldfields and the Murchison. Both areas were selected by industry as priority areas for further exploration work.

A further \$11 million was also provided to complete the new Mineral Research Centre in Bentley. The Centre will house the mineral processing laboratory of the Department's Chemistry Centre, as well as CSIRO's Mineral Products Division and Curtin University's School of Chemical Engineering. This facility will give Western Australia a research facility that will be among the best in the world and provide invaluable support to the mining industry.

During the year the Government passed the Western Australian Land (Titles and Traditional Usage) Act to resolve the difficulties raised by the High Court's Mabo decision. The Government

approach has four basic objectives. Firstly, to ensure that the policy and administration of land and natural resources management remains in the control of the State. Secondly, to provide for certainty of land title for existing and future land holders. Thirdly, to provide for timely and orderly project approvals and finally to be a part of a wider approach which includes strategies to improve Aboriginal standards of living in areas such as health, housing, education and employment.

While working with industry to ensure that exploration development processes are streamlined, the Government has not ignored its commitment to safety or the environment. The mining and petroleum sectors continue to demonstrate a sound safety record as they work towards even lower injuries and accident rates.

A tripartite Mines Occupational Health and Safety Advisory Board was established and given the task of developing new safety legislation covering mining activities. The Advisory Board also completed an examination of fatal accidents over the last two years and an action plan has been prepared for the Department to increase awareness of the risks associated with mining. About \$1 million was provided to complete the Petroleum Safety Branch to administer the implementation of safety case regimes by the petroleum industry, and

amendments were made to the Mining Act to provide for the appointment of Environmental Inspectors. These inspectors will work with companies to ensure environmentally acceptable mining practices are used throughout the State.

The industry has been very successful in this field as evidenced by the international recognition given to many operations in this State. Western Australia's Environmental Awards process is being documented for inclusion in the United Nations environmental program on good environmental practice in the mining industry. Of the 25 companies from around the world selected by the United Nations to illustrate good environmental management technique, a total of five are from Western Australia.

I commend this Annual Report to you as a summary of the Department's activity during the year.



George Cash JP MLC
Minister for Mines

"Western Australia's Environmental Awards process is being documented for inclusion in the United Nations environmental program on good environmental practice in the mining industry."



REPORT OF THE ACTING DIRECTOR GENERAL



Lee Ranford
Acting Director General

When the Department of Mines opened for business just after New Year in 1894, Western Australia's mining industry was in a state of rapid expansion as a result of the rush sparked by the discovery of gold in Coolgardie in 1892 and Kalgoorlie in 1893 respectively.

One hundred years later the industry is enjoying another period of rapid expansion largely as the result of gold discoveries in the Eastern Goldfields and the Department of Minerals and Energy, as it is now known, continues in its role of supporting the development of the State's mineral resources in the best interests of the community of Western Australia.

"One hundred years later, the Department is still improving the legislative framework and has just completed the development of an electronic public plan, the TENGRAPH system,"

In its first year of operation, the Department concentrated on developing a legislative framework for the mineral industry, producing maps of the existing mining centres, issuing 1400 Miners' Rights and approving 1284 lease applications.

One hundred years later, the Department is still improving the legislative framework and has just completed the development of an electronic public plan, the TENGRAPH system, which is to go "live" in Kalgoorlie and Perth in August 1994. During 1993-94, 5007 mineral tenements were issued in Western Australia, bringing the total number of tenements to 19 126 covering nearly 15 per cent of the State. The petroleum and mineral industry has grown to the point where the value of production in 1993-94 is estimated at \$12.6 billion, royalties and rentals collected by the Department amounted to \$393 million and the industry spent an estimated \$750 million on exploration for new petroleum and mineral deposits.

This high level of industry activity in 1993-94 placed considerable strain on Departmental staff, who worked

extremely hard to meet the increased demand for products and services. This situation was exacerbated by the lack of a permanent chief executive officer and the need to second a number of key senior staff to establish the Office of Traditional Land Use, which was set up to administer the new Land (Titles and Traditional Usage) Act.

The Department faced a number of other challenges during 1993-94. These included the introduction of the State's Freedom Of Information legislation, the complete rewrite of the safety legislation for the State's mining industry, the development of a draft enterprise agreement, a major expansion in the Department's geoscience mapping program, and negotiation of arrangements to establish the Chemistry Centre (WA) as a commercialised business unit operating on a net appropriation basis.

I am proud to say that these challenges were handled well by Departmental staff, who demonstrated a high degree of skill and a willingness to adapt to a rapidly changing environment.

Several special events and displays were arranged to mark the centenary of the Department. A commissioned history of mining entitled "A Rich Endowment - Government and Mining in Western Australia 1829-1994" written by Ken Spillman was published in December 1993, and a Centenary Ball to which participants wore period costumes was held in Government House Ballroom in March 1994. To create the appropriate atmosphere, a Warden's office as it would have been at the turn of the century, was re-constructed in the Foyer of Mineral House in East Perth. Arrangements were also made for each of the nine Divisions to put on an exposition during the year, to illustrate the range of Departmental functions, activities and responsibilities.

Departmental staff participated in technical exchange missions in China, Vietnam and the USA during the year and two senior officers, Dr Pietro Guj and Bill Phillips, undertook a consultancy

in Eritrea on behalf of the Australian International Development Assistance Bureau. Another senior officer, Murray Meaton, was awarded a Churchill Fellowship to undertake a six week study of mining and petroleum royalty systems in Canada.

I believe the dedicated professionalism which is the trademark of the Department of Minerals and Energy enabled it to achieve its major objectives in 1993-94 despite the increased workloads. Furthermore, I believe these same qualities will enable us to achieve the goals set by the Government and maintain this State's pre-eminent position in exploration and mining in Australia in 1994-95.



L C Ranford
Acting Director General

25 August 1994



Hay St. Early 1900s



Economic growth in the world economy was patchy in 1993-94. While recovery from the recession began in the United States, Canada, the United Kingdom, Australia and New Zealand, growth was very slow in Western Europe and Japan and probably negative in the Commonwealth of Independent States.

The irregular pattern meant that Western Australian resource producers, reliant on exports for most production, faced quite different market conditions. Commodities exported to the growing countries faced improving demand while exports to the slow or negative growth areas lagged significantly.

Australian economic growth was up on 1992-93 with consumer spending responding to more favourable conditions and the housing sector firming. Of particular value to export industries such as mining was continued low inflation and low interest rates. Combined with a weaker Australian dollar in the first half of the financial year, these factors overcame to an extent the adverse conditions in some of the traditional markets.

Recession in most world economies in the early 1990s culminated in a bottoming of commodity markets in September 1993. Since then, market focus has been on the dramatic rise in commodity prices in the second half of 1993-94. While this has been described as a boom, it was essentially a partial recovery of ground lost in recent years.

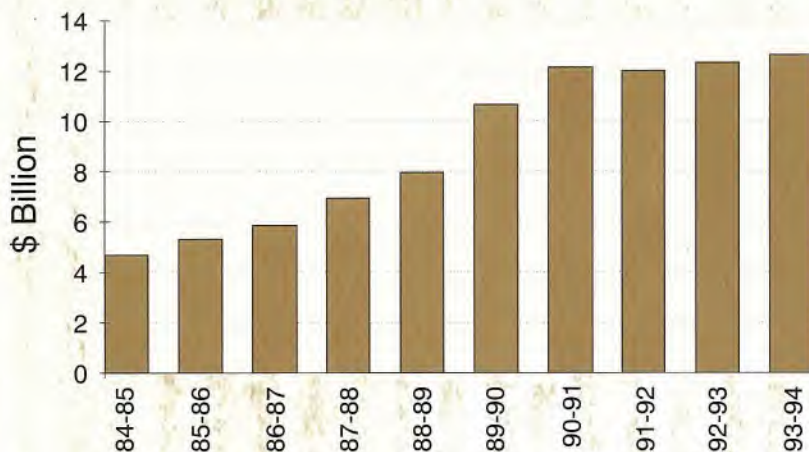
The Western Australian resources industry

Based on the latest estimated figures, the value of mining and petroleum production increased by a marginal two per cent in 1993-94 to reach \$12.6 billion (figures in this overview are estimates based on nine months' actual figures and an estimate for the last quarter of the year). The rise was mainly due to higher volumes of production, as prices for most commodities remained at historically low levels despite the strong rally in world commodity prices in the latter half of the year.

Both iron ore and oil prices fell, with oil reaching a five year low of around \$US15 per barrel in December 1993. Oil prices subsequently recovered slightly over the following months. By contrast, the gold price remained relatively high, after a dramatic rise in the first half of 1993 in response to strong world demand. Alumina prices recovered slightly, albeit from a very low base. Prices also rose for mineral sands in 1993-94. Again, however, the increase followed substantial declines in previous years.

Strong production increases occurred in the State for most mineral and

Figure 1. Value of Mineral and Petroleum Production in Western Australia



Asia (excluding Japan), with its rapidly growing economies, remained the fastest growing region in the world. With an increasing proportion of Western Australian exports selling into this region, this greatly helped the State's producers.

The conclusion of the Uruguay round of GATT negotiations represented an important development. The Agreement will see lower tariffs on manufactured goods and the increasing openness of major markets. This is crucial for the longer term growth of the Asian economies and the continued Australian mineral exporters' access to the fastest growing markets in the world.

petroleum commodities. This improvement partially reflected Western Australia's successful development of new trading links with Asia and the mining sector's competitiveness on world markets particularly through output increases to achieve economies of scale. Increases, in production levels were recorded for gold, iron ore, alumina, petroleum and nickel. Diamond sales also increased. There were, however, falls in the production of salt and certain mineral sands.

In 1994-95 the United States economy is expected to remain buoyant but only modest growth is expected in the Japanese and European economies. Japan aside, prospects for the Asian economies are very good. Economic growth is expected to strengthen in South Korea, Hong Kong and Taiwan and remain high in Singapore, Indonesia and Malaysia.

Continued improvement in world economic conditions is expected to lead to increased demand for most of Western Australia's major resources. This will sustain, if not improve, the higher prices for a number of mineral and energy commodities experienced in the latter half of 1993-94. Although this will be counteracted to some degree by an expected firm exchange rate, the outlook for Western Australia's resources industry in 1994-95 is favourable, with a further rise forecast in the value of Western Australia's mineral and energy production.

Gold

For only the second time in the last 20 years gold surpassed iron ore as the State's most valuable mineral commodity with the value increasing by over 20 per cent to \$3.4 billion. Western Australia now accounts for approximately eight per cent of the world's gold production.

The year saw investors and speculators in Europe and North America pushing the price of gold up to a peak of \$US406.70/oz in August 1993, the highest price since 1990. At that price the market was perceived to have

overheated and the price quickly dropped to a low of \$US342.05/oz in September. Gold prices subsequently recovered to trade in the narrow \$US370 to \$US395/oz range.

The combination of a higher price and the economic weakness in Europe and Japan caused the first fall in gold fabrication since 1987. Only the United States recorded a growth in jewellery consumption and fabrication. In addition the Chinese austerity program in the first half of 1993-94 caused the Chinese gold rush to slow down.

Figure 2. Estimated 1993-94 Value of Mineral and Petroleum Production Total \$12 638M.

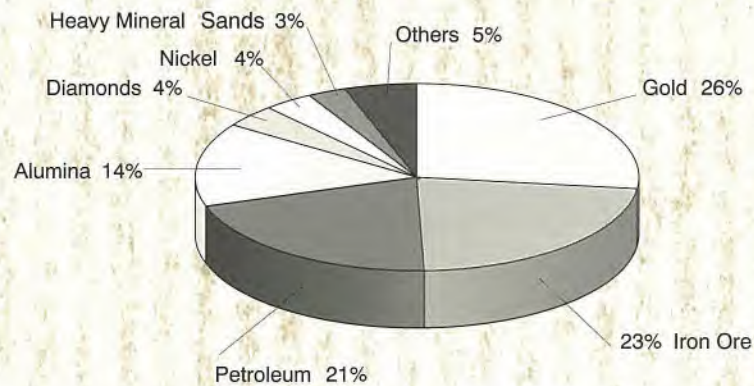
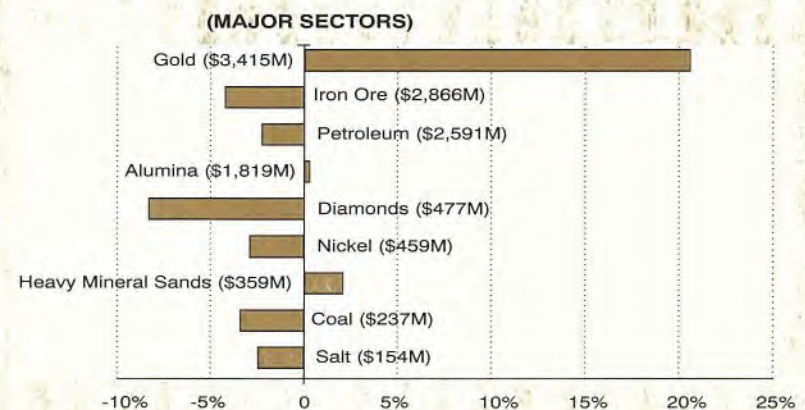


Figure 3. Percentage Change in Value of Production From Previous Year. Estimated Production Value 1993-94 Shown in Brackets.



The outlook for gold prices is uncertain. The fundamentals point to gold prices being firm at least over 1994-95 as demand, including that for jewellery fabrication in Asia, appeared to recover in early 1994 and is expected to strengthen further.

The growth in demand is anticipated to lead to higher production with gold output in Western Australia likely to rise to a record level in 1994-95. This will be facilitated by new mines coming into operation such as Bronzewing, Orient Well and Kathleen Valley, new underground extensions such as Big Bell and Youanmi and the first full year of production from Kanowna Belle. In addition, many of the State's existing producers are undertaking significant expansions.

industry which accounted for 44 per cent of Western Australia's iron ore exports in 1993-94. However, the overall effect of this on producers was offset to some degree by increased demand from steel producers in China, Korea and Taiwan. Iron ore exports to China increased during the year to account for 15 per cent of the State's sales. Western Australia currently supplies around 50 per cent of China's iron ore imports.

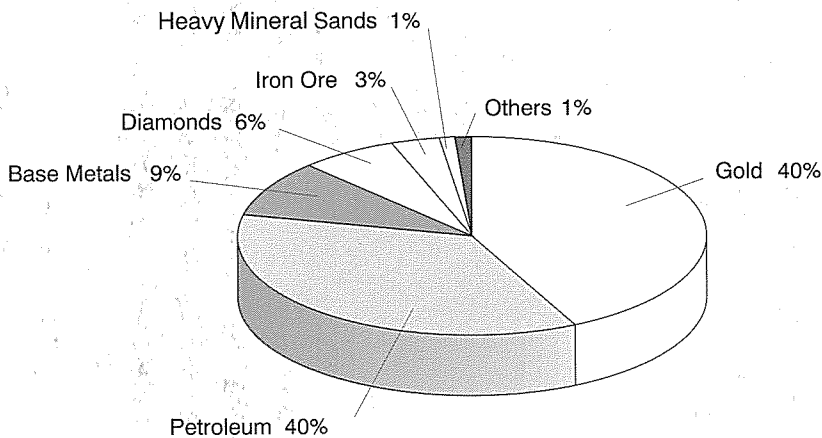
Thirteen per cent of Western Australia's iron ore sales went to Europe, where weakness in the Western European steel industry is expected to continue. However, major changes in steel production affecting demand for iron ore from Western Australia will occur in Asia. Japanese imports of iron ore are expected to remain subdued but this will be offset by growing demand from China, Korea and Taiwan where steel production is forecast to rise. Korea and Taiwan accounted for 15 per cent and six per cent respectively of Western Australia's sales.

Despite an average price reduction of over seven per cent accepted by producers in early 1994, the value of iron ore production could rise slightly in 1994-95. This forecast is critically dependent on movements in the exchange rate. Nevertheless, despite decreased prices, Western Australian producers are expected to raise production to record levels with the expansion of a number of existing mines and the commencement of new projects late in 1994.

After 25 years of Western Australia exporting iron ore in its primary form, 1993-94 was significant in heralding the start of a number of downstream processing evaluation studies and the commissioning of a pilot alternative iron production plant (HISMELT). Options under evaluation ranged from pelletising plants and direct reduced iron production, through to steel manufacturing.

In the immediate future, production will be enhanced with output from Hamersley Iron's new Marandoo mine,

Figure 4. 1993-94 W.A. Mineral and Petroleum Exploration Expenditure. Total \$750M.



Iron ore

The value of Western Australia's iron ore production fell by over four per cent to \$2.9 billion. This fall was due entirely to lower prices which fell in terms of the benchmark standard to Japan by an average 10 per cent in US\$ terms. These falls were partially offset by increased production which reached a record 120 million tonnes.

Lower iron ore prices resulted from weak demand in the Japanese steel

although the development is to a large degree designed to offset a reduction in output from Tom Price. 1994-95 will also see full year's production from the new Yarrie mine which will replace the exhausted deposits of Nimingarra and Shay Gap. On a smaller scale, production in 1994-95 will also commence from the Koolyanobbing mine and Cockatoo Island. In addition, production increases will be facilitated with the recent completion of the upgrade of Port Hedland's Nelson Point processing and shipping complex.

Petroleum

The overall value of petroleum production decreased by over two per cent to \$2.6 billion. This was despite output increases in all petroleum products.

Production values were down due to very low world oil prices in the second quarter. Prices remained depressed in the third quarter in a weak and oversupplied market. The situation was aggravated by unauthorised increases from some OPEC producers.

The volume of LNG production continued to rise during the year. However, the value of sales, at \$1 016 million, was down on last year's record. This was due to low oil prices, which are a major factor in the LNG price formula. Nevertheless, LNG production and commensurate exports from the North West Shelf are expected to further increase in 1994-95. This is based on the utilisation of additional capacity that will be available with the start up of the two billion dollar Goodwyn A offshore production platform and facilities scheduled for November 1994.

Western Australia is the only State producing LNG, with its output representing eight per cent of the world's production. Although the bulk of LNG continued to be exported to Japan (over 97 per cent), there were minor sales to Spain during the year. However, entry

into other markets may be limited by shipping constraints.

Despite closure of Talisman and decreased output from the Saladin and Harriet fields, the level of crude oil production in 1993-94 was up by over 17 per cent on the previous year due to the start of production from the Griffin and Wandoo fields. With the Griffin and Wandoo fields coming into full year's production, crude oil output should be up again in 1994-95. The production of condensate increased by almost 18 per cent in 1993-94. Again however, the value of production was down due to substantial falls in prices.

The value of production in 1994-95 will be affected by oil price and exchange rate movements. Oil prices in turn will be dominated by countervailing factors including strengthening world energy demand being offset by rising North Sea and Latin American production, return of Iraqi oil production to the market and excess OPEC capacity.

Western Australia currently contributes almost 30 per cent of the nation's petroleum products and is set to overtake Victoria as the largest petroleum producing State. In terms of sales by destination, aside from LNG, 28 per cent of crude oil, 42 per cent of condensate and all of Western Australia's natural gas production was sold domestically. The main overseas market for crude oil was Singapore which accounted for 20 per cent of sales. Another 30 per cent of crude oil sales was accounted for equally by Japan and Indonesia. Japan was also a significant customer for the State's condensate, with over 40 per cent of sales going to that country.

The start of production from Woodside's Goodwyn and WAPET's Roller/Skate oil and associated gas fields is expected to boost output of liquid petroleum products and gas in 1994-95. Future longer term production prospects are also good with \$750 million committed to the development of the Wanaea and Cossack oil and associated





gas fields, with oil and liquefied petroleum gas production expected to commence late in 1995.

Alumina

Western Australia produced 7.8 million tonnes of alumina in 1993-94. This was three per cent up on the previous year. However, the value of that production was stagnant, reflecting poor world prices for aluminium metal.

In the first six months of the financial year the ailing aluminium industry faced falling prices. Prices dropped to a historic low point in the last quarter of 1993. Factors responsible for this were recessions in key economies such as Japan and Germany and several years of overproduction causing an excess of aluminium supply over demand. Problems were compounded with the dissolution of the former Soviet Union and collapse in its domestic aluminium demand. This forced an export surge from the CIS to coincide with an excessive build up in global inventory levels.

The severity of the crisis afflicting the international aluminium industry materialised locally with Alcoa briefly cutting production from its three Western Australian alumina refineries in the final quarter of 1993. However, this was temporary and local production resumed full capacity in 1994. In summary, local producers were partially shielded from low aluminium prices through a combination of increased production, reduced raw material costs, higher productivity, a favourable exchange rate in the latter half of 1993 and the lag with which effects of price and quantity shifts are transmitted to the alumina industry.

The bleak aluminium metal outlook at the start of 1994 prompted a memorandum of understanding between major producer countries to cut back aluminium production over the ensuing 18 month period by 1.5 to 2 million tonnes. This was partially responsible for metal stocks stabilising in 1994. Stronger industrial activity signified by recovery in the US economy and signs of improvement in Europe also contributed to stabilising stocks.

Aluminium prices recovered strongly over the second half of 1993-94. Although much of the increase was due to speculative activity based on the memorandum of understanding, it would appear to have been at least partially substantiated by the stabilising stock levels. Ironically, local alumina producers faced lower prices, partly due to a stronger Australian currency in the second half of 1993-94 and earlier lower aluminium prices finally filtering through to alumina.

Although cut backs in aluminium production will depress world demand for alumina, this is not expected to apply to low cost producers such as those in Australia. Production capacity in Western Australia is therefore expected to increase in 1994-95, which will be assisted in the short term by the incremental expansion of Alcoa's Wagerup refinery. The longer term potential for alumina production in the State has been enhanced by Alcoa's announcement to study a doubling of capacity at Wagerup.

Diamonds

Diamond sales increased in 1993-94 to 29 million carats. However, the overall value of sales was down due to lower prices. Seventy five per cent of the sales were to the Central Selling Organisation (CSO) who are based in London. Remaining sales went to Belgium.

World demand for diamonds remained depressed, particularly for the lower quality and industrial grade stones. Demand for gem quality stones in

Europe was weak but the US market grew and demand from Japan and other Asian countries was strong. However, world supply exceeds current demand and inventories are high.

Inventories held by the CSO, merchants and producers continued to increase. A poor outlook for diamond prices is attributable to high stocks and the performance of Russia in the market place. While the marketing agreements between the CSO and Russian producers appear to be holding, there is the threat of break outs and sale leakages outside the agreement. The CSO also established agreements with Angola and Zaire, but illicit production from those and other smaller African producers remains rampant.

Western Australia's production came from two projects: the large Argyle operation producing from the lamproite pipe and surrounding alluvial mine sites, and the smaller Bow River alluvial operation. By extending plant capacity the Argyle operation continues to maintain production at approximately 40 million carats per annum. However, it is possible that output from Bow River will cease by the end of 1994-95. The 1993-94 year also saw the first evaluation sales from the pilot plant operation at the Phillips Range project.

Nickel

Despite production disruptions associated with the upgrading of smelter and refining operations, Western Australia's nickel production is estimated to have increased to 61 000 tonnes of contained nickel in matte, metal and concentrate products in 1993-94. However, the value of that production was down by almost three per cent, reflecting lower average prices during the year.

As for so many minerals, 1993-94 saw very low nickel prices in the first half of the year. This was due to sluggish world demand from steel producers, particularly Germany and Japan, excess supply with producers continuing to maintain capacity well in

excess of demand, and significant exports, including nickel bearing scrap from the CIS.

Although world nickel prices strengthened through the year, they remained volatile with investor uncertainty about future CIS nickel output. Certainly the strengthening of the world economy as characterised by the US and continued strong growth in South East Asia and China will increase the demand for nickel and support its price. However, any gains will be limited without a substantial decrease in the high level of world inventories.

Despite low world prices, Western Australia's nickel production is anticipated to rise further in 1994-95 with expanded facilities expected to make the State one of the world's lowest cost producers. Recent measures leading to this included an increase in concentrate production capacity at the Leinster operation, developments to sustain capacity at the Kambalda operation, expansion of the Kalgoorlie smelter and Kwinana refinery and the commissioning of the Mt Keith project in late 1994. On completion of these expansions and developments, Western Australia's output capacity will have risen to around 100 000 tonnes per annum of contained nickel.

Heavy mineral sands

The heavy mineral sands sector continued to face weak demand for its product and weak prices. Nevertheless, the total value of sales in 1993-94, estimated at over \$359 million, was up by over two per cent on the previous year.

Sales of synthetic rutile amounted to an estimated \$153 million and again accounted for the largest share of mineral sands by value. However, these sales were down by nine per cent compared with the previous year. Production cutbacks also caused tonnages to be down by a similar percentage. Rutile and monazite suffered similar fates, both being down in terms of production volume and sales.



As in previous years, ilmenite easily accounted for the bulk of mineral sands in terms of production volume. Production was over one million tonnes, eight per cent up on the previous year. Sales value also increased by 13 per cent to reach \$92 million.

Zircon producers, after struggling with excess capacity and low demand in the Western World, finally had some relief with significant increases in zircon prices during 1993-94. Firmer prices assisted in the value of sales reaching \$63 million, up 28 per cent on the previous year. The volume of production also increased. Western Australia is a major producer of zircon and the outlook for this mineral is highly favourable, with strong demand from China which is one of the world's largest consumers of this mineral. Although there is some uncertainty about the sustainability of the Chinese market, it is hoped that this uncertainty will be nullified by the continued recovery of the world economy and the increased use of zircon in the ceramics industry.

Although heavy mineral sands prices did improve through the year, the revival was not strong enough to prevent Tiwest's Chandala synthetic rutile plant from shutting down for six months in September 1993, and BHP placing the proposed Beenup project on hold.

The recovery in the world mineral sands market is expected to continue and the prices for all titanium minerals are forecast to rise in 1994-95. This reflects an anticipated increase in demand for titanium dioxide pigment as world economic growth improves. Commensurately, production of most mineral sands is expected to rise in 1994-95. This will occur through the higher utilisation of existing plant capacity in Western Australia and production from the new Cable Sands 'greenfields' development at the Jangardup deposit which began production in May 1994.

Other minerals

Coal output was down by over five per cent on 1992-93, and there was a

decrease in sales value to \$237 million. All coal now produced in the State comes from open cut operations following the closure of Western Collieries last underground operation. Future capacity will be enhanced with production from the new Premier Mine in Collie, the development of which is expected to start in mid 1995.

The State's salt industry suffered a small decrease in sales of two per cent to reach \$155 million with tonnages down by six per cent. Over half of salt production was exported to Japan. South Korea and Taiwan were also significant customers. Despite strong growth in Asian (excluding Japanese) demand, 1993-94 was characterised by an oversupplied world market and low prices. Tough trading conditions led to producers implementing cost reductions. Coupled with recovery in the world economy, this should lead to a more promising outlook for the industry in 1994-95.

The value of base metal production fell by 16 per cent to \$116 million. This reflected lower average prices which bottomed in the first half of 1993-94. Prices have since strengthened although the benefit to local producers has been reduced by the stronger local currency. Increased copper output occurred with the start of production from the Nifty project in the second quarter of 1993-94 and improvements in the Golden Grove operation. Horseshoe Lights however, ceased shipping copper. It is also expected that the Cadjebut zinc-lead resource will be exhausted in 1994-95. The feasibility of developing new mines at Twelve Mile Bore and Blendevale in the vicinity of Cadjebut is currently under consideration. Improvement in world economic growth and strengthening base metal prices presents a positive picture for the base metal industry in 1994-95.

Manganese output was up in 1993-94 but lower prices caused earnings to fall relative to the previous year. Poor prices also resulted in the closure of the Woodie Woodie operation which was placed on care and maintenance in late 1993-94. However, production is due to

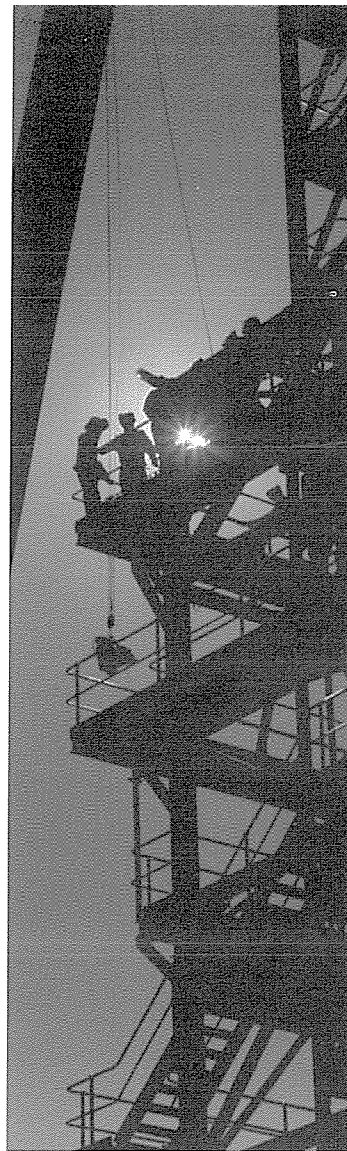
commence shortly at the nearby Mike deposit which although not likely to fully replace Woodie Woodie's output, will nevertheless continue manganese production in the State in 1994-95.

Although small in terms of overall value, Western Australia is the world's major supplier of tantalite and spodumene. Following expansion plans completed over the last year, an advanced stage proposal is in place to develop a lithium carbonate plant at Greenbushes.

Minerals and petroleum exploration

Western Australia recorded another year of strong exploration activity. The State managed to attract over half of all national exploration dollars, with total mineral industry exploration estimated to have increased by some \$100 million in 1993-94, to approximately \$450 million. Exploration expenditure for offshore petroleum is estimated to have decreased slightly over the period. Although onshore exploration expenditure increased marginally, it remains at low levels in comparison with offshore expenditure.

Gold exploration was again the main contributor to the increase in exploration expenditure. A number of recent 'greenfields' discoveries resulted in increased activity in what had previously been considered less prospective areas. In addition, recent exploration has been successful in increasing known gold resources around existing mines. Gold exploration attracted about \$300 million in exploration expenditure in 1993-94, representing about two thirds of total State mineral exploration expenditure. Improvements in techniques to find and exploit deposits below salt lakes and below old shallow open pit mines is leading to the development of viable new operations. Along with the long standing practice of searching for and developing satellite orebodies close to original mine sites, this will probably ensure continued high levels of exploration for gold in the near future.



At \$70 million, expenditure on base metals (including nickel) exploration was second to gold. This continues the upward trend in base metal exploration activity that has occurred in the last two years. Significant intersections of copper and zinc mineralisation were announced at the Panorama prospects in the Pilbara, whilst the Rudall and Nabberu Basins and Murchison Goldfield were other areas of significant activity for copper, lead and zinc. Exploration for nickel mineralisation in the Northeastern Goldfields continued to confirm large, low-grade deposits. Copper, lead, zinc and nickel exploration are particularly sensitive to the vagaries of the commodity markets. Improvements in these markets in recent months suggest levels of activity should at least be sustained.

During 1993-94 the diamond industry attracted the third largest level of mineral exploration expenditure at about



\$46 million. Over 80 per cent of all Australian diamond exploration was conducted in Western Australia. Whilst much of the exploration is of an early and speculative nature, there are some more advanced prospects on which more detailed assessment is proceeding. A significant degree of the exploration interest was generated by the increased profile of diamond investments in the Stock Exchange and some new analysis of diamond prospectivity in the State. A high level of diamond exploration effort is likely to continue into 1994-95, but will need to come forward with positive results relatively quickly to sustain the interest of the speculative investor. A significant level of interest should continue by the long term, established diamond explorers.

Exploration expenditure of \$23 million in the iron ore industry was slightly down on the previous two years. However, it remained high compared with the longer term trend of about \$10 million per year. Most exploration was carried out by the major iron ore mining companies in the Hamersley Basin. A similar level of exploration activity is expected to continue in the

near future to find orebodies that can replace depleting resources of high quality lump ore.

Following the trend of recent years, the offshore Carnarvon Basin was the focus of petroleum exploration activity with 32 of the 38 offshore wells drilled in that area. A relatively low level of onshore drilling was maintained with a total of 20 wells drilled. To encourage onshore exploration, amendments were made to the Western Australian Petroleum Act 1967.

Continued analysis and integration of recent seismic survey work, combined with considerable new drilling data, have enhanced and refined geological interpretation. Consequently, the drilling program scheduled for 1994-95 of up to 32 offshore and 28 onshore wells should result in a significant expansion of recoverable reserves and an increase in new field discoveries.



Origins

The Department was established on 1 January, 1894 as a regulatory body to ensure the safe and orderly development of mineral resources in this State and to ensure that the community benefits from these activities. Over the past 100 years, this role has been widened to include a number of other related responsibilities:

- promotion of responsible investment in exploration, and extraction of the State's petroleum resources;
- exploration for, and assessment of the State's groundwater resources;
- chemical and metallurgical research and investigative services; and
- public safety associated with the transport, storage and use of explosives and dangerous goods.

These responsibilities have been incorporated into a Mission Statement which summarises the Department's role.

Mission

The mission of the Department of Minerals and Energy is to:

- manage and support the sustainable development of the State's mineral, petroleum and groundwater resources in the best interests of the community of Western Australia; and
- ensure that the community is:
 - protected from hazards associated with dangerous goods
 - provided with high quality independent chemical research, consultancy and analytical services.

To achieve this mission the Department assists the Government in the development of policies and legislation and manages industry operations to ensure these policies and legislation are adhered to.

General operating environment

The exploration and development of mineral and petroleum resources in the State occurs within the following framework:

- The mineral and petroleum resources of the State are owned by the State, but are almost entirely explored for, and developed by, private enterprise. The mineral and petroleum industries play a major role in the economy of the State.
- A high level of exploration is essential to identify the mineral, petroleum and groundwater resources which are so important to sustain current levels of production and, hence, maintain our economy and our living standards. Exploration and development activities are undertaken in an organisational framework controlled and directed by Government so as to ensure an appropriate benefit is obtained for the community in the form of royalties which are paid for the right to extract non-renewable resources.
- Economic mineral and petroleum deposits are almost always difficult and expensive to find, small in size relative to the total land mass, finite, and non-renewable. They become assets only after they have been discovered and delineated, and the potential for an appropriate financial return provides investors with the incentive to engage in the high-risk exploration projects necessary to find them.
- Efficient and equitable titles systems, with appropriate dispute resolving mechanisms, are essential elements in ensuring the confidence of investors in these high-risk industries.
- The mineral and petroleum extraction industries are hazardous by their nature. The community expects that the risk to workers



and the public will be minimised through the adoption of the highest standards of occupational health and safety practices, at least equal to, if not better than, those in the rest of the world.

- Mineral and petroleum developments are a temporary land use and must be seen as an integral element in a strategy of multiple land use for present and future generations. The implementation of sound environmental protection and rehabilitation strategies is a fundamental requirement before developments will be permitted to proceed.
- Changes in economics, technology, and geological understanding will lead to the reappraisal of previously tested ground; thus the potential of any area can never be finally determined and there is a need to ensure that information is not lost and as much land as possible is available for exploration. Thus an up-to-date and accurate geoscientific database is essential for general land use planning and future mineral and petroleum resource assessment.

In addition to these factors, the resources industry is primarily export-based and operates in a highly competitive international marketplace. Many major competitors are located in developing countries with lower wage structures and hence if the industry is to remain competitive, it must maintain high productivity and efficiency levels. Access to land, labour, capital and infrastructure at competitive costs are thus key elements for a prosperous industry.

Current issues

Current issues which influence the nature of the Department's activities have been identified as:

- requirement for improved customer focus and service delivery;

- increased interest in environmental and Aboriginal issues and their impact on the availability of and access to land;
- limited availability of financial and staff resources resulting from Government expectations of increased productivity and reduced public sector expenditures; and
- demands for greater accountability for government and public sector expenditures and revenue collection.

Corporate programs and strategies

The Department operates under five Corporate programs which represent each major area of responsibility:

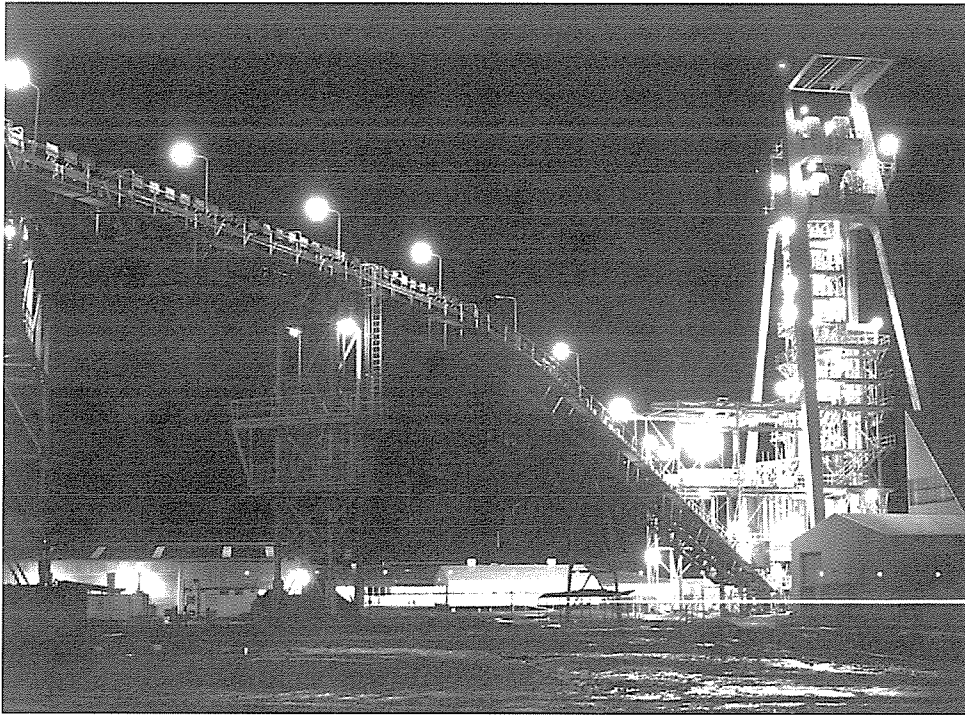
- Mineral Resources Management
- Petroleum Resources Management
- Geology and Resource Information
- Dangerous Goods Management
- Scientific Support

These programs are supported by a separate Corporate Services Program.

In the conduct of these programs, the Department adopts a number of general strategies that are designed to:

- focus on the needs of customers;
- improve internal and external communication;
- emphasise staff training and development; and
- develop a more responsive organisation.

More specific strategies have been developed to meet the objectives of the five corporate programs.



The objectives of each Corporate program and summary of activities undertaken during the year are described in the following section of this annual report. A full description of the Department's organisational structure, its staff and the way in which the professionally based Divisions contribute to each program is set out in Appendix 1.



Objective:

To ensure that the exploration for and mining of the State's mineral resources are managed for the benefit of the people of Western Australia.

Description

Mineral exploration and mining are generally conducted through numerous, relatively small operations. Most mineral deposits tend to be small in area and, as a result, exploration and mining activities are controlled through the issue of a relatively large number of small tenements. The mining process is essentially an earth-moving process, and large volumes of earth and rock may have to be moved and processed to extract the commodity sought.

This program seeks to ensure that explorers have access to land and past exploration data; explorers and miners have secure titles on which to base their investments; exploration and mining activities are conducted with high standards of worker and public safety, and with due care for their impact on the environment; and the community receives appropriate returns from the mining of its mineral resources.

The six sub programs which make up this program are described in the following pages along with a summary of the key activities from the year. A table of the planned achievements for the year and the outcomes for this program is included at the end of the description of sub program activities. The key performance indicators for this program can be found on pages 109-113.

The direct recurrent cost of this Program was \$17.041 million. This, together with associated corporate service costs of \$4.794 million, and capital expenditure of \$1.043 million resulted in total expenditure of \$22.878 million.



Coordination and economic advice

In addition to a wide range of briefing papers and advice to the Minister, a draft policy was prepared on *Assistance to Resource Projects Through the Royalties System*. This paper was reviewed by other Departments as a possible basis for the development of draft royalty system proposals. Guidelines for temporary assistance to producers through royalty relief were developed and approved by the Government.

Exploration and resource advice

A subcommittee of the Mining Industry Liaison Committee addressed a number of issues including copyright on exploration reports, trespass during aerial surveys, reporting on mining tenements, release of old exploration data to open file, and the need for a register of aerial photography. The new Commonwealth Offshore Minerals Act came into effect, incorporating many changes suggested by the Department.

Government endorsed a comprehensive set of procedures for gaining mineral exploration and mining access to conservation reserves and other environmentally sensitive areas. A revised set of guidelines was printed summarising this process.

In response to increased industry concern about heritage listing proposals, the Department instituted a process of plotting all National Estate natural areas on the public plans and produced a State-wide map of National Estate areas in digital format.

Resource assessment reports were prepared for proposed extensions to limesand mining in Cockburn Sound and for mineral exploration applications in the Karijini and Rudall River National Parks and several Class A Nature Reserves. Reports were also written on the mineral resources of the proposed Dampier Archipelago National Park and assessments made for extensions to Cape Range, Karijini, Purnululu and Yanchep National Parks.

Objective:

To provide Government with high quality, timely mineral industry and resource information, policy analysis and advice with a view to ensuring long term social and economic benefits to the community from the sustainable development of the State's mineral resources.

Description:

Issues include land use and access, mineral prospectivity, resource availability, mineral exploration, mining and metallurgical practice, economic and social factors (including Aboriginal issues), research and training, foreign ownership, Commonwealth and State issues and industry assistance.

Strategies:

Include the monitoring and evaluation of industry performance, compilation and maintenance of technical and economic data bases, and liaison with Government agencies, the mining industry and the public, as a basis for the preparation of information briefings and policy advice.

A series of submissions were made on wide ranging topics of concern to the Department including: the Resource Assessment Commission's report on the coastal zone, the State's study of coastal zone management; the Department of Conservation and Land Management's South Coast and South West Forest Management Plans; the Department of Planning and Urban Development's Central Coast Study, and amendments to the Metropolitan Region Scheme.

A new policy on access to Aboriginal Reserves by the mining industry was developed and adopted by Government in December 1993. As a result over 200 mining tenements were granted on these lands by the end of December. Analysis and advice were provided on: the High Court's common law native title decision; the formulation of the State Land (Titles and Traditional Usage) Act; the establishment of the Office of Traditional Land Use; and the Commonwealth's Native Title Act 1993.



Spatial information

Requests for digital mapping data increased dramatically during the year with both the private sector and other Government Departments being more aware of the Department's spatial products and the move towards electronic spatial systems. The production and dissemination of the digital data information brochure was a catalyst for increased demand.

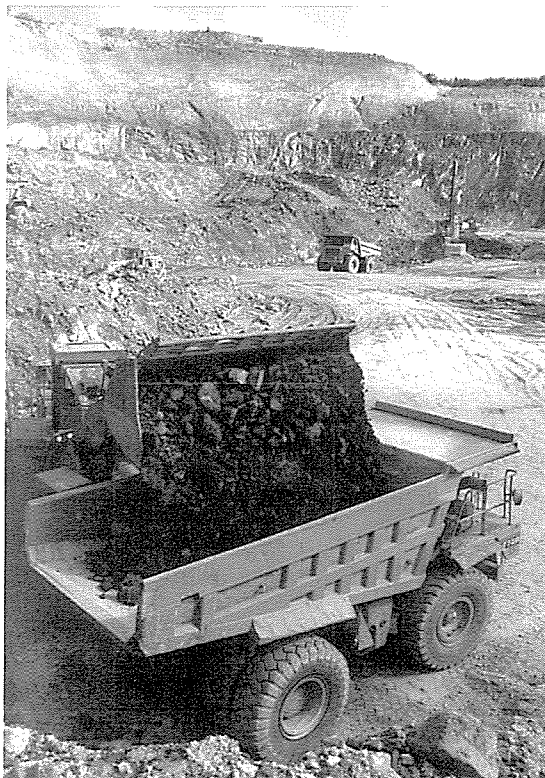
A mines and mineral deposits database (MINEDEX), was prepared and is constantly being updated, and a mines and mineral deposits gazetteer of Western Australia was produced using the data. Over 2 800 mines and mineral deposits have now been charted and the

co-ordinates entered into the system as information is being received from mining companies and geologists.

Mining and metallurgical advice

At the invitation of the respective governments, technical visits were made by officers from the Department to China, France, Malaysia and Indonesia. The visits covered metallurgical, radiation, mine safety and land-use topics.

Government delegations from China and Vietnam, and representatives of the National Union of Mine Workers of South Africa were provided with technical advice and accompanied to minesites for technical exchanges.





Titles

The rise in the gold price together with encouraging new discoveries such as Bronzewing and Jundee produced a noticeable increase in the level of exploration. The high levels of exploration and mining activity throughout the State were reflected in all mineral title related matters.

The area held under granted mining title increased 30 per cent over the previous year's historical high to reach 37 185 200 hectares at 30 June 1994. These figures were supported with increases in the number of applications received and granted throughout the year (Table 1).

The Department's measure of performance for this activity is the proportion of applications which have

Objective:

To provide the mineral industry with a timely, secure and equitable titles system, and accurate, up-to-date information about mineral and land tenure in order to encourage and facilitate responsible mineral exploration and development.

Description:

Accurate and up-to-date information on land status is provided, and systems are maintained to ensure the expeditious processing and determining of title applications. A Public Plans system and legal titles registry system are also maintained, and dealings creating legal interests are registered. A survey-based, title certification service is provided under a "user pays" survey system, and compliance with expenditure commitments and work obligations is monitored to ensure that land is being actively explored or made available to others.

Table 1: Mineral Titles

	1991-92	1992-93	1993-94
Mineral title applications			
Prospecting Licences	3 284	3 171	2 742
Exploration Licences	1 445	1 632	2 205
Mining Leases	689	759	947
Other	195	140	119
Total:	5 613	5 702	6 013
Area applied for (hectares)			
	17 371 776	21 062 893	26 569 000
Applications granted			
Prospecting Licences	2 746	2 870	2 584
Exploration Licences	955	1 104	1 498
Mining Leases	694	641	805
Other	177	105	105
Total:	4 572	4 720	5 007
Area granted (hectares)			
	11 126 345	12 335 075	17 514 990



	1991-92	1992-93	1993-94
Tenements in force (1978 Mining Act)			
Prospecting Licences	5 992	7 142	8 356
Exploration Licences	2 376	2 787	3 692
Mining Leases and others	6 531	6 320	6 659
(1904 Mining Act)			
Mineral claims & others	419	419	414
Total	15 318	16 668	19 126
<hr/>			
Area in force (hectares)	23 219 571	27 434 574	37 185 200
<hr/>			
Changes to public plans			
Additions	5 610	5 704	6 017
Removals	5 144	4 425	3 495

been determined within a three, five or seven month period from the date of application, depending on whether these are Prospecting Licences, Mining Leases or Exploration Licences respectively.

With a five per cent increase in the overall number of applications the outcome for determining applications within their respective time frame was 68 per cent for Prospecting Licences against an objective of 85 per cent and 73 per cent for Mining Leases and 70 per cent for Exploration Licences against an objective of 75 per cent.

During the year a start was made on the checking of tenement reports providing resource estimates to ensure that supporting information was provided. This will be needed for assessing applications for Retention Licences received during 1994-95.

Dealings such as transfers and caveats involving changes to the title register totalled 10 817 for the year. This figure was down from the 1992-93 period when 13 948 dealings were received.

The objective of registering 90 per cent of dealings received within one month of lodgement was exceeded throughout the year.

The Department continued to provide advice to the Department of Resources Development and the Collie Basin Management Committee on the acceptability of drilling programs carried out under State Agreement Acts. Inspections were made of the Hope Downs, Marillana Creek, Rhodes Ridge and Nifty projects to check progress on these ventures.

Advertising

New provisions for the advertising of applications for mining tenements were introduced in July 1993.

An application must now be advertised on a nominated day and in a nominated paper. Currently Wednesday is the nominated day and the West Australian and the Kalgoorlie Miner the nominated papers.



Table 2: Offshore Mineral Titles

	1991-92	1992-93	1993-94
Exploration Licences			
Applied for	-	3	14
Granted	-	-	1
In force	2	2	3
Mining Licences			
Applied for	-	-	7
Granted	-	-	-

Offshore minerals

The Commonwealth's Minerals (Submerged Lands) Act 1981 was repealed and replaced on 1 March 1994 by the Offshore Minerals Act 1994. Transitional provisions applied to existing applications and granted titles.

The announcement of diamond discoveries in the waters of Cambridge Gulf in the Kimberley in the latter part of 1993 resulted in a sudden upsurge in the number of applications in the region (Table 2).

Western Australia has responsibility for the drafting of complementary model State/Territory Offshore Minerals legislation to cover three nautical miles of the territorial sea from the baseline adjacent to the coast of the State/Territory. Significant progress in the drafting of a Bill was made during the latter part of the year.

Rights of traditional land use

The introduction of the Land (Titles and Traditional Usage) Act 1993 on 2 December 1993 involved changes to the processing of new title applications. The legislation amended the Mining Act 1978 to provide:

- a requirement that applicants for mining leases and general purpose leases serve a copy of the application and a map on the Commissioner for Aboriginal Affairs within 14 days of lodgement of the application; and

- a 70 day period for objections on traditional land use grounds.

In the seven months the legislation has been in place, 155 objections to mining tenements were lodged by Aboriginal groups.

The 70 day objection period caused the target of granting 85 per cent of Prospecting Licence applications within three months of application to drop from an average of 79 per cent for the first eight months to an average of 30 per cent for the final four months. A similar impact is predicted for determining applications for Mining Leases which are objected to on traditional land use grounds.

An examination of historical plans was undertaken in respect to traditional land use objections lodged against 155 applications for mining tenements, 35 Land Act proposals and four Fisheries Act proposals. Historical and current information on mining tenements granted under the Mining Act 1904 and the Mining Act 1978 was provided to the Office of Traditional Land Use for use in determining the objections.

Objections on environmental grounds

On 28 January 1994 the Full Court of the Supreme Court found in favour of the Serpentine-Jarrahdale Ratepayers' and Residents' Association in an action it had commenced in relation to a decision of the Perth Warden.



In 1992 the Warden had held that there was no power to consider objections brought on environmental grounds by objectors who did not have any direct interest in the land which was the subject of the application. The effect of the Supreme Court decision is that objections can be lodged on environmental grounds but the Warden is required to determine if the objector has standing.

Vietnamese training program

A six day training program was conducted for five Vietnamese Government officials on the mineral title system in Western Australia. The training was funded under a United Nations development program to assist Vietnam introduce new mining legislation and a mineral title management system.

Mining Amendment Bill 1993

An Amendment Bill to introduce Retention Licences as a sixth form of title under the Mining Act 1978 was passed in Parliament in December 1993. The Bill, which represented over two years' work, incorporated amendments to provide for the appointment of environmental inspectors and the granting of a special prospecting licence on a mining lease where the lessee consents. It was proclaimed and came into force on 1 July 1994.

Title monitoring

A computerised rental and expenditure monitoring system was operational throughout the year for the first time.

This system eliminated duplication of entries into the hard copy registers held in Perth and by the respective Mining Registrars. All rental, expenditure and exemption information was entered into the system. The system's capacity to generate notices of intention to forfeit where expenditure shortfalls are apparent or where reporting commitments were not met was utilised for the first time in September 1993. The success of this program is reflected by the 30 per cent increase in the number of exemption applications, which rose from 2 780 to 3 612, and in the number of exploration reports submitted, which also rose significantly from 9 877 to 12 678 (Table 3).

Savings achieved through the use of the computerised monitoring system allowed the Department to deal with the increased work levels.

Industry self regulation by way of third parties complaints alleging failure to comply with expenditure commitments increased from 132 in 1992-93 to 278 in 1993-94.

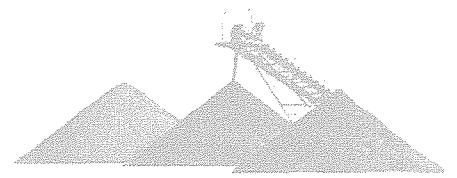
Overall there was a marked improvement in the level of compliance with expenditure and reporting obligations. This is reflected in the number of tenements forfeited, which fell from 511 in 1992-93 to 102 in 1993-94.

Customer and information services

There was an increase in the level of customer and telephone enquires in Perth and each of the 11 country offices.

Table 3: Title Monitoring

	1991-92	1992-93	1993-94
Reports received	9 350	9 877	12 678
Applications for exemption	2 338	2 780	3 612
Tenements forfeited	468	511	102



The daily average of customers at Mineral House increased by 20 per cent from 70 to 85 and telephone enquiries by 17 per cent from 115 to 135. During the year there were 28 700 mining tenement searches provided along with 20 746 map copies, 4 512 work orders and 1 539 research requests.

Credit card facilities were introduced in June 1994 in response to customer requests and a wider range of geological maps and publications will be available following the execution of a reciprocal sales agreement with the Australian Geological Survey Organisation.

A major initiative for the forthcoming year will be the development of a customer service charter. The charter, to be developed with customer input, will incorporate a statement of service commitment, details of products and services offered and a suggestion and complaint procedure to obtain ongoing feedback from customers on the range and quality of services and products provided.

Industry Liaison Committee

Regular meetings of the Mining Industry Liaison Committee were held through the year. Key issues dealt with were:

- review of the ballot system for competing applications;
- a reduced application fee for 'one block' Exploration Licences;
- review of the provisions for advertising mining tenement applications;
- review of the mineral reporting requirements;
- the provision of grant and transfer information to pastoralists; and
- review of the provisions for the registration of transfers and other dealings.

Spatial referencing

During the year planning and development of TENGRAPH, a computer

based graphical presentation of mining tenements, cadastral and topographical information, continued in preparation for its introduction in Kalgoorlie and Perth in August 1994. All applications, current mining tenements and dead surveyed mining tenements in the Kalgoorlie Mining Registrar's administrative region will be shown on the system.

Dual systems, the current analogue printed copy of the public plan and TENGRAPH will be maintained for three months. At the end of this period only TENGRAPH will be maintained, and it will become the public plan.

In a major initiative, the provision of additional funding by the State Government will see the system's five year implementation program reduced to two years. Data capture for Coolgardie is well advanced and its addition to the system is planned for November 1994 followed by Leonora in April 1995. Meekatharra and Mt Magnet will follow and the program will then move to the Pilbara and the Kimberley before coming back to the Dundas and Yilgarn mineral fields by mid 1996.

During the year, 159 surveys were lodged with the Department for examination and certification. The lodgement rate represents a 42 per cent increase over last year. This trend is expected to continue into 1994-95 as survey instructions were prepared for a further 274 surveys.

The committee met to liaise with survey and mapping clients met and examined the following issues:

- revision of survey directions and guidelines;
- geocentric datum and implications; and
- user pays surveys.



MINERAL INDUSTRY OCCUPATIONAL HEALTH AND SAFETY *Sub Program*

Objective:

To achieve a low and decreasing incidence of bodily injury, occupational disease and fatalities amongst those employed in the mineral industry.

Description:

Strategies include auditing and encouraging compliance with regulations and guidelines; promotion of and participation in safety education, training and research; and the provision of specific safety and occupational health advice to government, industry and the public.

Mining industry safety

During the year the tripartite interim Mines Occupational Health and Safety Advisory Board (MOHSAB) was established, with the Acting Director General appointed Chairman. The functions of the Board include liaison between industry management, the workforce and those with occupational health and safety regulatory responsibilities; and the provision of advice to the Minister for Mines and the Department of Minerals and Energy on occupational health and safety matters.

MOHSAB is a non-statutory board, and committee members are unpaid. The following five sub-groups have been established under the Board to carry out investigations into such matters as directed:

- Occupational Health Standing Committee;
- General Safety Standing Committee;
- Radiation Safety Sub-committee;
- Legislation Development Sub-committee; and
- Medical Advisory Panel.

Work commenced on a new Mine Safety and Inspection Act, incorporating both the Mines Regulation Act and the Coal Mines Regulation Act. The preparation of drafting instructions through MOHSAB was completed and the resulting Mines Safety and Inspection Bill 1994 was introduced to the Legislative Council in June 1994. Concurrently the preparation of drafting instructions for regulations to be made under the proposed Act was undertaken through specialist committees comprising industry and Departmental representatives. The Board is expected to submit drafting instructions for the regulations to the Minister during the third quarter of 1994, for approval to draft.

Significant amendments to the Mines Regulation Act and its Regulations were assented to and proclaimed during the year. These included the repeal of Divisions 5 and 6 of the Act which resulted in the removal of specific legislative control over working hours and Sunday labour and allowed the general duty of care provisions to prevail.

Fatalities

Seven fatalities (including three underground) occurred in the mining industry, with three in the gold sector and one each in the mineral sands, quarrying, iron and coal mining sectors. The fatality incidence rate of 0.2 per 1 000 employees, (0.18 in 1992-93)

Figure 5. Fatalities Per Thousand Employees.

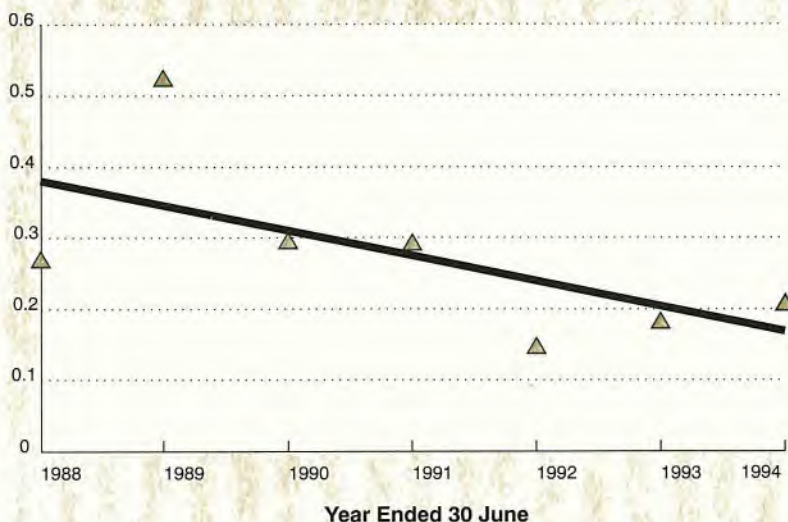




Table 4: Lost Time Injury Incidence And Frequency Rates (1)

	1992-93		1993-94		Change %	
	Incidence	Frequency	Incidence	Frequency	Incidence	Frequency
Metalliferous mines						
Surface	3.3	16	2.6	12	-21	-25
Underground	5.3	29	4.3	21	-19	-28
Total	3.5	17	2.7	13	-23	-24
Coal mines						
Surface	14.2	88	10.2	65	-28	-26
Underground	45.1	300	22.6	159	-50	-47
Total	20.6	130	12.1	78	-41	-39
Total mining	4.1	20	3.0	14	-27	-30

1: Under Australian Standard AS 1885.1, Incidence is the number of occurrences of injury/disease for each 100 workers employed. Frequency is the number of occurrences of injury/disease for each one million hours worked.

remains a serious concern to the Department (Figure 5).

Full details of mining industry accident statistics for 12 month periods to 30 June 1993 and 31 December 1993 were published during the year in the twelfth and thirteenth reports entitled Fatal and Lost Time Injuries in Western Australian Mines. These reports are available from the Department. Some details of accidents and fatalities during the year are presented in Appendix 5 of this report. A comparison of accident statistics is given in Table 4.

Following a request from the Minister for Mines a work party was established by MOHSAB to examine the incidence and circumstances of fatal accidents in the mining industry in Western Australia over the past two years. The work party was also required to make recommendations to the Minister on strategies and resource requirements for reducing or eliminating the incidence of fatal accidents.

The work group completed the study and report and an action plan was prepared for the inspectorate to implement the recommendations of the report.

The incidence and frequency figures in Table 4 indicate that the overall performance of the mining sector was sound, with an overall decrease in lost-time injury frequency of 30 per cent (13 per cent decrease in 1992-93).

The underground coal mining industry showed a reversal of last year's performance (+36 per cent) with a decrease in the lost-time injury frequency rate of 47 per cent. This was accompanied by a reduction in the incidence rate of 50 per cent (as against an increase of 44 per cent in 1992-93).

Figure 6. Recommended Compensation Premium Rates 1994-95.

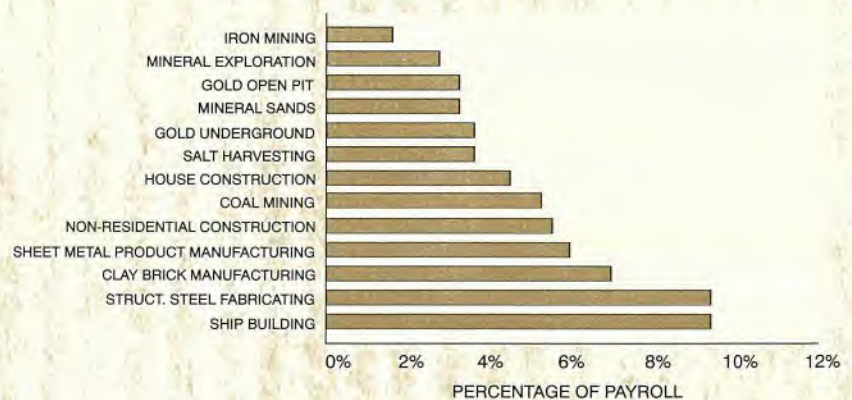
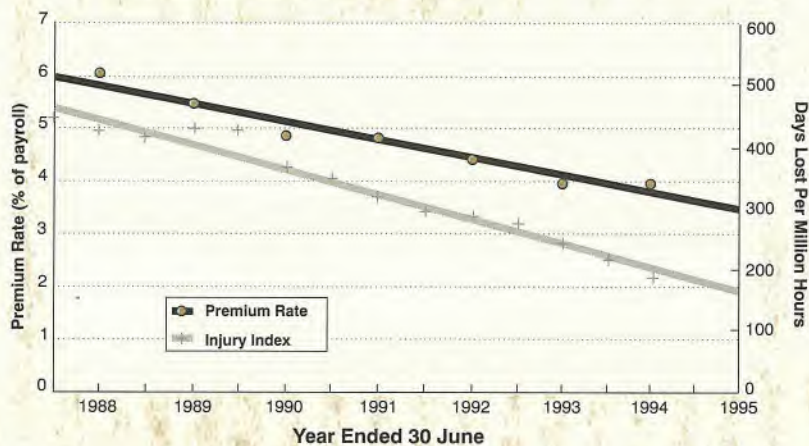


Figure 7. Western Australian Mines Comparison of Injury Index and Compensation premium rate.



The metalliferous industry continued a steepening downward trend with a reduction of 24 per cent (19 per cent in 1992-93) in the frequency rate, and 23 per cent (20 per cent in 1992-93) in the incidence rate. The notable improvement in the frequency and incidence rates for underground metalliferous mines (28 per cent and 19 per cent respectively) reflects the emphasis on safety in this sector by both industry and the inspectorate.

Table 5: Work Suspensions

		INSPECTORATE		SURFACE		UNDERGROUND	
				Safety reasons	Following accident	Safety reasons	Following accident
Number of items of equipment stood down	Kalgoorlie			102	3	33	1
	Perth			34	4	19	2
	Karratha			74	17	6	0
	Collie			2	2	0	1
sub-total				212	26	58	4
Number of times portions of mines were closed	Kalgoorlie			26	5	78	5
	Perth			51	0	16	1
	Karratha			14	6	15	1
	Collie			3	9	5	0
sub total				94	20	114	7
TOTALS				306	46	172	11

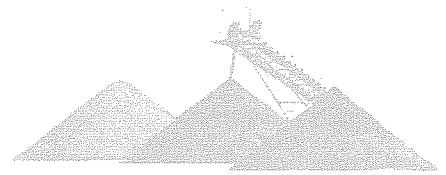
The workers compensation premium rates for 1994-95 (Figures 6 and 7) reflect the continuing improvement in safety standards of all sectors of the mining industry, except coal mining, where the premium has increased by 38 per cent from 3.83 to 5.28 as a percentage of payroll.

Operation of the computerised accident data base (AXTAT) and the workplace atmospheric contaminant data base (CONTAM) continued. AXTAT is currently undergoing a review of its user requirements to assess the extent to which it meets current needs and to provide for future expectations.

Safety inspections

During the year, District and Special Inspectors of Mines undertook nearly 3 300 safety inspections on Western Australian Minesites.

Whilst improvements and initiatives concerning emergency preparedness and response facilities at underground mines continued, the increase in reported underground fires from 32 in 1992-93 to 53 in 1993-94 is of concern to the inspectorate. Of particular concern are the dangers associated with the



generation of dense smoke and harmful gases which are circulated to working places by the underground ventilation system. On 24 June an underground fire at the Blair Decline forced 14 miners to seek refuge in purpose built refuge chambers. Work is continuing with the suppliers of underground diesel equipment and the mining companies to reduce the incidence of fires in the underground sector.

The Inspectorate identified a number of operating safety issues for early referral to the Board. These issues were referred to the General Safety Standing Committee which established working parties, comprising Departmental, mining industry, and equipment supplier representatives, to determine remedial strategies. The findings of the investigations were presented to the Board in July.

The topics were:

- access to heavy equipment;
- rollover protection and falling objects protection requirements for mine equipment;
- design and specification for engine and transmission layouts on diesel equipment to minimise fire risks;
- the use of enclosed cabins on underground load haul dump units;
- braking specifications for underground mobile equipment; and emergency preparedness; and
- inclusion of safety management programs in notices of intent to mine.

Eleven mines in the Kalgoorlie inspectorate sought and were granted exemptions from the provisions of regulations which require that stopes have two travelling ways. Many nickel ore bodies in the Goldfields region lend themselves to mechanised, single entry cut and fill stopping methods, and the introduction of such stopping methods has occurred progressively over the past five years.

A review of safety conditions imposed in association with these

exemptions has resulted in a major upgrading of safety standards imposed on those mines. In particular, conditions are imposed to minimise the risk of fires in underground vehicles, and for the provision of facilities and training designed to protect employees who may become trapped in the event of a fire or rock fall in a single entry stope.

During 1993-94, work was suspended on 235 occasions (69 in 1992-93) and 300 items of defective equipment (470 in 1992-93) were taken out of service by the Inspectorate. Underground portions of mines were closed on 114 occasions (Table 5), the majority of these being for inadequate ventilation at the workplace.

It is of concern to the Department that work suspensions have increased over the past year, notwithstanding the substantially reduced rate of injury incidence across the industry. Whereas this may reflect diligence on the part of the Inspectorate, it reflects adversely on the application of due diligence in the duty of care in some sectors and some enterprises in the industry. Mine managers need to audit the performance of their operations carefully in the light of these figures.

There were no prosecutions of the Mines Regulation Act and associated Regulations finalised during the year.

The quarterly publication Minesafe, now in its fifth year, is the Inspectorate's flagship for conveying Occupational Health and Safety messages to the mining industry workforce. Personally addressed copies are now distributed to elected health and safety representatives.

Significant Incident Reports continue to be prepared and distributed in accordance with the Worksafe guidelines. The nine issued from Western Australia during the year were:

- No 39 Uncontrolled movement of cherry picker;
- No 40 Near-miss underground blasting incident;



- No 41 Haul truck rear wheel fall off;
- No 42 Remotely operated machinery - fatal accident;
- No 43 Remote control loader fire in an open stope;
- No 44 Rockfall - fatal incident;
- No 45 Fatal agricultural tractor accident in quarry;
- No 46 Contact with overhead powerline - fatal accident; and
- No 47 Injuries sustained while working on drilling mast.

These significant incident reports are available from the Department.

The Department continued to conduct hazard awareness and accident prevention presentations on minesites across the State and also remained an active participant in seminars, briefings and training courses, particularly Health and Safety Representative training. Speakers also presented topics such as hazardous chemicals, alcohol and other drugs in the workplace, mine ventilation, dust control, and the role of the Inspectorate.

Mines rescue training programs and competitions have continued to gain status within the industry and with employees. The Mines Inspectorate, through assistance, sponsorship and encouragement, assisted the promotion of mine rescue.

On the Collie coalfield, the predicted laminar failure of the west wall of the Muja open cut occurred in June, with ample warning and minimal disruption to operations.

Western Collieries permanently closed its three underground mines for economic and productivity reasons. All shafts were sealed during June 1994. Surface installations will be sold and the land rehabilitated back to native forest.

Safety publication

During the year, a new, quarterly publication called RescueNet was commenced to advise the industry workforce on matters associated with mine rescue and emergency response activities.

RescueNet is prepared and produced on a voluntary basis with each edition sponsored by a mine rescue team. It is distributed to all minesites and is widely read by those interested in mine rescue activities. The publication contains a broad range of articles covering topics such as rescue competitions, training, new equipment and accounts of actual emergencies.

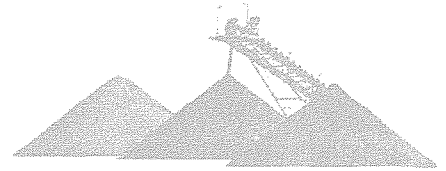
Radiation

Radiation inspections continued at mineral sands mining and processing sites and at Gwalia Ltd's tin plant at Greenbushes. The substantial reduction in airborne radioactivity levels achieved in mineral sands separation plants since 1990 was maintained. No mineral sands worker exceeded an annual radiation dose of 20 millisieverts (c.f. statutory limit of 50 millisieverts per year). The annual review of radiation doses and associated parameters in the Western Australian mineral sands industry was published and is available from the Department.

With occupational radiation exposures under control, the regulatory focus has shifted to the long term management of radioactive wastes arising from mineral sands processing. During the year all sites were requested to submit, for the approval of the State mining engineer, plans for the management of wastes, including decommissioning and rehabilitation of sites. These plans are currently being reviewed.

Occupational noise

Assistance continued to be provided to industry on the control of noise and vibration from blasting and a comprehensive blast monitoring program was completed at Greenbushes.



Occupational noise issues were afforded a high priority during the year and considerable resources were allocated to publicise regulatory requirements and to highlight to industry the need to adopt a hierarchical structure of noise management.

Whereas the industry generally has achieved a high level of compliance with noise regulations, there has been a substantive deficiency in the conduct of noise surveys. The Department has been notified that the compilation of these surveys needs to improve.

Follow up by the inspectorate and discussions at seminars across the State during the latter half of the year has improved the level of compliance. Some of the deficiencies were due to a lack of comprehension of the requirements.

Occupational hygiene

Six occupational hygiene research projects were initiated with the Chemistry Centre and they are noted in Appendix 3 under Mining Operations.

From January 1994 the Department assumed full responsibility for overseeing the biological monitoring (ie. blood and urine testing) of mine workers. A guideline on biological monitoring was developed. This includes flow charts with action levels for each of the principal chemical agents of concern: lead, arsenic, mercury and thallium. In the six month period January to June 1994 there were 58 blood lead, four urinary arsenic, 11 urinary mercury and 16 urinary thallium tests. Of 89 tests, only one result exceeded the relevant biological exposure index and a workplace investigation was initiated which highlighted the need for improved ventilation. A subsequent urine sample indicated that the control measures were effective in substantially reducing exposure.

Chemical management

An inspection emphasis on the handling and use of chemicals at mine sites was maintained as was the

implementation of Dangerous Goods (Storage) Regulations 1992. The inspections revealed that improvements in chemical management had occurred in relation to:

- stricter purchasing control on new chemical products entering site;
- utilisation of alternative, "safer" products wherever practicable;
- rationalisation of varieties of chemical products used on site; and
- lower inventories of chemical products held on site.

More attention is needed for the:

- correct labelling and storage of chemicals;
- disposal of redundant chemicals;
- provision of appropriate personal protective equipment (eg. respirators, gloves and eye protection);
- maintenance and storage of personal protective equipment;
- provision of safety and hazard information (eg. material safety data sheets); and
- maintenance of safety shower and eyewash stations.

With the storage of bulk chemicals, compliance difficulties are commonly encountered in relation to the bunding of tanks and segregation of incompatible chemicals. These issues are being addressed through on-site inspections and discussions and a guideline on the essential bulk chemical storage requirements was produced and distributed.

Boards of Examiners

The Boards of Examiners granted the following certificates during the year:

- | | |
|-----------------------------|----|
| • First Class Mine Managers | 31 |
| • Quarry Managers | 29 |
| • Underground Supervisors | 55 |



- Restricted Quarry Managers 63
- Authorised Mine Surveyors 9
- Open Cut Mine Managers (Coal) 1

Geotechnical and rock mechanics advice

Involvement continued with the safety related geotechnical aspects of open pit and underground mines during the year, with 62 individual geotechnical assessments being completed. As a result of these assessments significant changes were made to a number of mine design proposals and in some cases to operating practices.

Studies continued into methods of underground mine design and ground control being practiced in Western Australia, with the preparation of a report detailing the results of a limited survey of current practices in underground operations. A presentation on ground control in the workplace was prepared and given on 43 occasions to approximately 745 underground mine workers in the Kalgoorlie, Norseman, Yilgarn and Murchison regions.

Collaborative research continued with the Chemistry Centre and several mining companies on the assessment of the corrosion behaviour of various types of friction rock stabiliser as used for

ground support in underground mine openings. A preliminary report documenting the research was circulated within the mining inspectorates for comment and information. A set of guidelines for the assessment of corrosion of friction rock stabilisers in underground mines is in preparation.

A significant increase in Departmental input to the technical assessment of the design, management, and decommissioning of new and pre-existing tailings storage continued. Some 108 individual geotechnical assessments were completed.

Mine plan archives and records

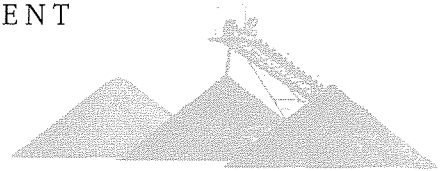
Presentations were also given at six workshops on aspects of safe and environmentally acceptable disposal of tailings and waste materials. A draft of the revised version of the Guidelines for the Safe Design and Operation of Tailings Storages was prepared.

Following the Mine Plan Review and subsequent requests for companies to comply with the Act, all mine plans that were outstanding for 1993 were submitted. A total of 3 541 plans representing 408 mine sites were indexed and placed in storage. Indexing of new submissions is progressing on target.



MINERAL INDUSTRY ENVIRONMENTAL MANAGEMENT

Sub Program



During the year 300 Notices of Intent (NOI) for new mining proposals and seven environmental management programs (for operating mines) were submitted. All 307 documents were assessed and reviewed by Departmental officers with 80 being referred to the Environmental Protection Authority.

Environmental Performance Bonds are now required for all new mining operations and at 30 June 1994 there were 1 261 bonds in place with a total value of \$37.37 million. During the year, 509 bonds totalling \$18.14 million were registered with the Department. With satisfactory completion of environmental commitments, 14 bonds for mining operations out of a total of 22 (total \$431 000) were retired for various reasons such as surrender of tenement. One bond was called in because of unsatisfactory environmental performance.

A system for recording and reporting on an annual progressive basis of areas disturbed by mining and rehabilitation to acceptable community standards was implemented to assist the monitoring of the environmental impact of mineral exploration and mining.

The need for annual environmental reporting and re-assessment of performance bonds has resulted in an increasing incidence of progressive rehabilitation at minesites. The industry continues to show a commitment to improving environmental performance.

The Department improved public access to NOI information by recording a copy of each summary in electronic form for access from all regional offices and at Mineral House.

A total of 116 Notifications of Intention to Clear Land were received by the State Mining Engineer through delegation from the Commissioner of Soil and Land Conservation under the Soil and Land Conservation Act.

Following inspections and investigations, two prosecutions were made for mining without authority. The

Objective:

To ensure that any adverse environmental impacts of mineral exploration and development activities are within acceptable community standards.

Description:

Strategies include the maintenance of a legislative framework, and worksite visits to monitor and audit compliance with legislation and conditions of title. A security bond system is maintained to indemnify the State in the event of failure by a proponent to comply with environmental conditions of title. Guidelines on environmental management of mining operations are prepared and published to assist industry meet Government requirements.

convictions resulted in fines of \$1 000 each plus \$1 293 costs imposed on two co-offenders and a fine of \$300 with \$193 costs imposed for the second conviction.

Kalgoorlie Environmental Officers organised two successful workshops on land rehabilitation in their region.

A total of 35 visits was made to 24 sites of major iron ore, mineral sands, coal, bauxite, vanadium, salt, silica, nickel, gold, copper and diamond projects. In addition, eight proposed large resource projects were assessed by the Department in association with the Department of Resource Development.

The Department, with assistance from the Building Management Authority, was involved in a project to assess the safety and environmental problems of the three abandoned asbestos mines at Wittenoom and to develop cost estimates for the various possible solutions to the problems.

Work on the old mining areas of Wittenoom and Galena highlighted the problems associated with abandoned mines and indicates the need for a State-wide survey and assessment of abandoned mine sites.

Forty five consultants were requested to respond to an "expression of interest"



for an investigation of engineering/rehabilitation/reprocessing treatments for copper tailings at Elverdton near Ravensthorpe. It is anticipated that the study program will be let to the successful tenderer during 1994-95.

Environmental Awards

The second Awards for Environmental Excellence in the mineral and petroleum industries were presented in August 1993. Awards were given to Kambalda Nickel Mines and Western Mining Corporation's Mount Magnet Operations. BHP Iron Ore received a special Minister's Award, whilst CSR Readymix was given a Certificate of Merit. The Awards selection committee comprised Professor Fay Gale AO, Mr Harry Butler CBE, Mr Brendan Nicholson of the West Australian newspaper and Mr Lee Ranford, Acting Director General of the Department of Minerals and Energy. The Awards are given to recognise excellence within the mining and petroleum industries.

The technical exchanges between the Department and the US Bureau of Land

Management continued with Mr Keith Lindbeck, Manager Environment and Rehabilitation, working at the Bureau's Reno Office in Nevada from July to November 1993.

Minerals Environmental Liaison Committee

The Minerals Environmental Liaison Committee held seven meetings to review Departmental policies and activities relevant to this program. The Committee comprised of representatives from the Department, Environmental Protection Authority, Conservation Council, Department of Resources Development, Agriculture Department, Chamber of Mines and Energy, Association of Mining and Exploration Companies, Australian Conservation Foundation, Conservation Council; and the Trades and Labour Council. The committee reviewed various guidelines and set up sub-committees to review rehabilitation performance in the gold and mineral sand industries. The final reports are expected to be presented to the Minister for Mines in 1994-95.

MINERAL EXPLORATION DATA

Sub Program



During the year 2 849 reports were received on exploration and prospecting activities carried out on 9 637 tenements. This compared with the 1992-93 total of 2 187 reports received on 7 625 tenements. The increased number of reports has resulted from electronic monitoring procedures that were introduced in May 1993 to monitor compliance with reporting conditions for Exploration Licences.

Gold continues to be the most commonly sought commodity in mineral exploration reports received, representing 65.6 per cent of the total (Figure 8).

During 1993-94, a total 984 reports were released to open-file. Gold was again the most common commodity in released reports, representing 64.1 per cent of the total (Figure 9).

Mineral exploration reports that are submitted to the Department by the mining industry in compliance with the reporting requirements of the Mining Act are included in the Department's Western Australian Mining Exploration Index (WAMEX).

A public access version of this index is available for open-file data searches to be made in the Library, 5th Floor, Mineral House, 100 Plain Street, East Perth.

Microfiche copies of reports may be viewed in the Library at Mineral House and at the Geological Survey Regional Office in Kalgoorlie. Microfiche copies may also be purchased from the Department.

Electronic monitoring of annual reports on Exploration Licences was introduced on 1 May 1993, allowing computer-generated letters to be sent to tenement holders when reports were overdue, resulting in a greater awareness by industry of the need to provide regular reports on tenements.

There was increased monitoring of industry requests to submit combined statutory reports. This was to ensure that all operators obtain prior agreement from the Department as to which group of tenements will constitute a reporting unit (or project) before submitting future combined reports.

There was also increased monitoring of the contents and standards of annual mineral exploration reports to ensure that activities described in these reports substantiate expenditures claimed by tenement holders in their expenditure reports.

Objective:

To provide the mineral industry with ready access to exploration, development and production data in order to encourage efficient and effective exploration and development.

Description:

This sub program seeks to encourage mineral exploration and development activities and prevent wasteful duplication of effort. The strategy is to maintain a complete archive of the exploration and mining reports lodged by the tenement holders, and to ensure that the reports are accessible when they are released to the public under the terms of the relevant legislation.

Figure 8. Mineral Exploration Reports received during 1993-94 (2 849 Reports).

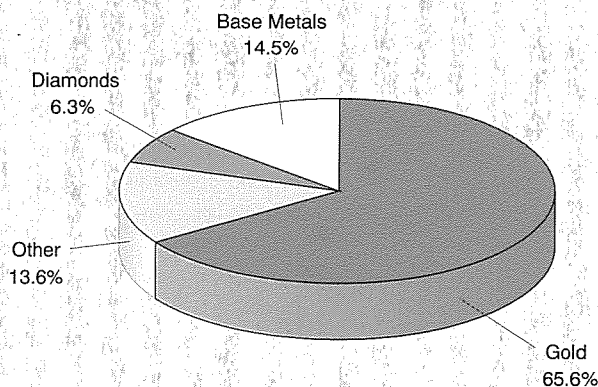
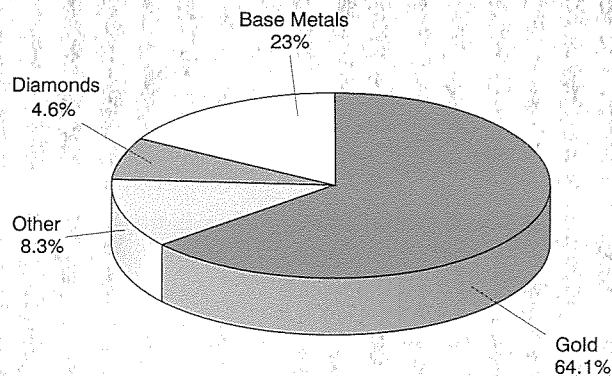


Figure 9. Mineral Exploration Reports released during 1993-94 (984 Reports).



Sub Program

Objective:

To collect, for the community, a fair return for the extraction of the State's mineral resources in a manner that is administratively and economically efficient.

Description:

Strategies include the development and implementation of royalty systems to collect and verify the royalty payment from mineral producers. The royalty system and verification arrangements are negotiated with producers within a common framework and are then formalised through legal means.

In Western Australia, most mineral resources belong to the community. Individuals and companies engaged in the extraction and sale of these resources provide benefits to the community by employing people, establishing new towns in remote areas, and contributing to the overall progress of the State through provisions of infrastructure and financial payments to the Government in the form of charges, rates and taxes.

One of the charges is a royalty which reflects the transfer price of mineral resources from the community to the miner.

The Department of Minerals and Energy is responsible for managing the implementation of royalty policy and the collection of royalties for the State. There are three systems used to determine the amount of royalty paid:

- based on the quantity of mineral produced (specific rate royalties). This system is generally applied to low value products such as sand or construction minerals. The rates vary from 30 to 50 cents per tonne;
- based on a percentage of the value of mineral produced and sold (*ad valorem* royalties). Most minerals such as iron ore, nickel, base metals, etc, have royalties that are based on the proportion of production value.

The percentages applied to the value of production vary in line with the level of processing that takes place to bring the ore to a saleable state. These rates range from 1.65 per cent for fully processed metals to 7.5 per cent for mineral ores that have been screened and crushed and for which no further processing is necessary at the point of sale; and

- based on a percentage of the net profits of the mining operation. Currently only one company has a profit based royalty system and this is levied at a rate of 22.5 per cent, although it has a floor payment of 7.5 per cent of the value of production.

The aim of the mineral royalties sub program is to ensure that the community receives a fair financial return for the loss of non-renewable resources. The establishment of a benchmark to determine what is considered a fair return is a complex issue. Variables such as differing production technologies, industrial infrastructure costs, and mineral types have an effect on the value of saleable production at the mine-head. The philosophy incorporated into the Mining Act reflects a 10 per cent mine head value benchmark. The average rate this year was 6.1 per cent compared with 7 per cent the previous year. The decrease was caused by an increase in the value of gold, for which no royalties are paid.

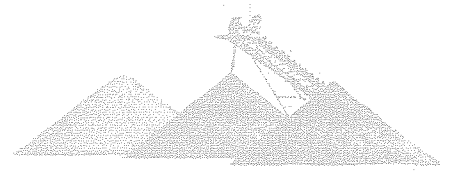
Royalty payments collected from the minerals industry totalled \$261.2 million.

Mineral royalty collection (\$M)

1993-94	261.2
1992-93	269.4
1991-92	258.4
1990-91	232.0

In addition to mineral royalties, the Department collected a further \$25.2 million through iron ore additional lease rentals which are levied in the form of a specific rate royalty on iron ore producers under State Agreement Acts.

Royalties were received on a timely basis and accurately reflected the



amounts due. This was achieved by carrying out internal reviews on 1 050 returns and auditing 484 returns, valued at \$164.8 million, at company premises.

During the year negotiations with companies resulted in royalty relief for two major companies.

Another significant issue was the ongoing work towards revising the specific rate royalties presently applying to many low value bulk minerals. A proposal is being developed and an implementation strategy will be considered in 1994-95. Work continued on the development of a hybrid royalty system for offshore minerals. This hybrid consists of a first tier payment based on the gross value of production and second tier payment based on a net income.



PLANNED ACHIEVEMENTS AND OUTCOMES

Planned Achievement

Outcome

To reduce the time taken to issue mineral titles to the target levels shown in the table below by improving statutory and administrative procedures, and by the introduction of a computer-based geographical information system (TENGRAPH).

The issue of mineral titles within targeted time frames was achieved to the levels shown below:

Tenement Type	Issue Time Frame	1992-93 Level	Target Level	Level Achieved ⁽¹⁾
	%	%	%	%
Prospecting Licence	< 3 months	82	85	68
Exploration Licence	< 7 months	62	75	73
Mining Lease	< 5 months	62	75	70

(1) The reduced achievement level for Prospecting Licences reflects additional time needed to comply with the statutory requirements of the Land (Titles and Traditional Usage) Act 1993.

To achieve a reduced incidence of accidents and lost time injuries in mining operations in line with the trend of the past five years.

A reduced frequency of accidents and lost time injuries in metalliferous mining operations was achieved. The minor increase in lost time injuries for coal mining in 1992 may have been the result of factors other than poor safety practices.

Frequency of lost-time injuries per million hours worked (calendar year):

	1988	1989	1990	1991	1992	1993
Metalliferous Mines	33	31	27	22	19	15
Coal Mines	175	130	116	104	122	107

To carry out a comprehensive review of existing mine safety legislation and develop, by mid 1994, a single new Act for safety in metalliferous and coal mines in Western Australia.

A comprehensive review of existing mine safety legislation and the development of a Bill for a single new Act for safety in metalliferous and coal mines was completed in 1993-94.

To develop and implement a system for recording and reporting, on an annual/progressive basis, areas disturbed by mining and rehabilitated to acceptable community standards in order to assist the monitoring of the environmental impact of mineral exploration and mining.

A system for recording and reporting on an annual/progressive basis of areas disturbed by mining and rehabilitated to acceptable community standards has been implemented to assist the monitoring of the environmental impact of mineral exploration and mining.

Planned Achievement

Outcome

To attain a higher level of compliance with exploration reporting requirements (current compliance level for exploration licenses is 83 per cent) by reviewing and improving existing monitoring systems in order to improve the availability of past mineral exploration data.

An electronic system has been installed to monitor submission of statutory mineral exploration reports from exploration licence holders and to request overdue reports where appropriate.

To complete a review of existing specific rate mineral royalties and develop a new royalty system which reflects the State's needs for predictable income to be collected via an administratively and economically efficient and equitable system.

A departmental review of existing specific rate royalties which apply to industrial minerals was completed.



Objective:

To ensure that the exploration, development and production of the State's petroleum resources are managed for the benefit of the people of Western Australia.

Description:

Petroleum exploration, development and production activities are generally large operations. Most petroleum deposits tend to have relatively large areal extent with oil or gas being produced through an array of deep drilled holes. As a general rule, the petroleum industry is more capital intensive than the mineral industry.

This program seeks to ensure that explorers have access to land and past exploration data; explorers and producers have secure titles on which to base their investments; exploration, development and production activities are conducted with high standards of worker and public safety, and with due care for their impact on the environment; and the community receives appropriate returns from the extraction of its petroleum resources.

These objectives are managed separately from the minerals sector activities because of the significant and inherent differences between the client organisations and the nature of the exploration, development and production processes.

The six sub programs which make up this program are described in the following pages along with a summary of the key activities for the year. A table of the planned achievements for the year and the outcomes for this program is included at the end of the description of sub program activities. The Key Performance Indicators for this program can be found on pages 114-117.

The direct recurrent cost of this Program was \$2.965 million. This, together with associated corporate service costs of \$1.525 million, and capital expenditure of \$.040 million resulted in total expenditure of \$4.530 million.

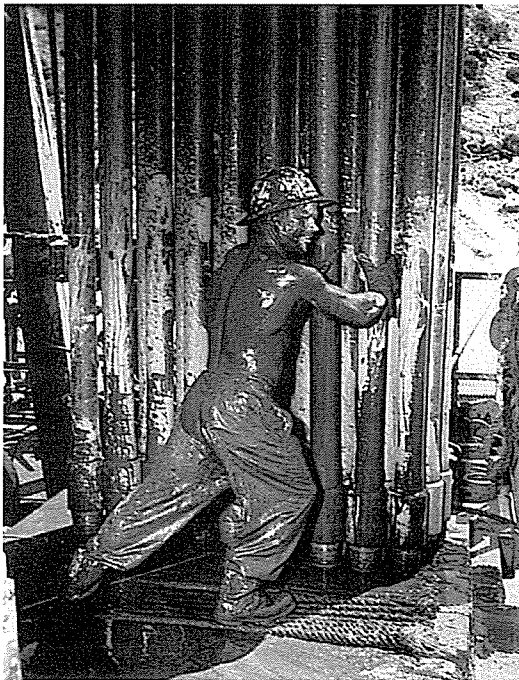


PHOTO COURTESY OF WEST AUSTRALIAN PETROLEUM PTY LIMITED

Learmonth 1954

Sub Program

The Department continued with its assessments of the State's oil and gas reserves and development proposals for the Wanaea/Cossack and Wandoo projects.

Legislation was drafted and approved by Parliament aimed at increasing the level of onshore exploration. The Bill incorporated a package of incentives to promote exploration particularly in remote onshore areas. It also provided for the maintenance of a common mining code with offshore areas. Development of processes to accommodate the amended legislation will be progressed in the coming year.

The Department continued to facilitate industry geophysical and drilling programs for the exploration and development of oil and gas accumulations. Officers were also involved in:

- reservoir engineering studies on the Griffin/Chinook/Scindian and Tubridgi fields and the Nebo and Maitland discoveries;
- technical evaluation of all drilling proposals;
- evaluation of production phases of the Griffin and Roller/Skate projects;
- the development phases of the Wanaea/Cossack project;
- appraisal drilling over the East Spar field and Petrel fields; and
- gas/condensate discoveries at Barrow Island and Dongara fields.

A discussion paper outlining a possible royalty system for new petroleum projects was released for comment. A workshop was held with industry to outline the proposed system.

The Department chaired a working party which developed a framework for the implementation of the Coalition's Environment Policy on Marine Parks encompassing an extensive system of marine reserves while allowing for hydrocarbon development in Marine

Objective:

To provide Government with high quality, timely petroleum industry and resource information, policy analysis and advice with a view to ensuring long term social and economic benefits to the community from the sustainable development of the State's petroleum resources.

Description:

Issues include land use and access, petroleum prospectivity, resource availability, petroleum exploration, development and production practices, economic and social factors (including Aboriginal issues) research and training, foreign ownership, Commonwealth and issues and industry assistance.

Strategies:

Include the monitoring and evaluation of industry performance, compilation and maintenance of technical and economic data bases, and liaison with Government agencies, the petroleum industry and the public, as a basis for the preparation of information briefings and policy advice.

Parks under a multiple use management system.

The Department, in conjunction with the Departments of Treasury and Resources Development, was involved in examining possible strategies for reviewing the Commonwealth State revenue sharing arrangement under the State Petroleum Resources Rent Tax regime.



Sub Program

Objective:

To provide the petroleum industry with a timely, secure and equitable titles system, and accurate, up-to-date information about petroleum land tenure in order to encourage and facilitate responsible petroleum exploration and development.

Description:

Accurate and up to date information on land status is provided, and systems are maintained to ensure the expeditious processing and determining of title applications. Compliance with expenditure commitments and work obligations is monitored to ensure that areas are being actively explored or made available to others. Work covered by this sub program also encompasses the day-to-day administration of petroleum activities in Commonwealth offshore areas on behalf of the Commonwealth Government.

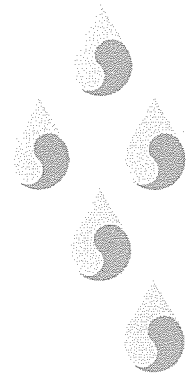
During the year the number of Production Licences in force increased to 29 and a further five pipelines were licensed to service new facilities (Table 6). Ten new exploration titles were granted including two drilling reservations. The total number of titles in operation increased marginally to 195.

Title approvals for the year included the renewal of eight Exploration Permits, the surrender of 14, and the grant of 61 Access Authorities, seven Scientific Investigations and nine Special Prospecting Authorities.

A total of 1 288 maintenance of title dealings was processed, of which 84 per cent were determined within three months. The decrease from the 90 per cent achieved the previous year was the result of a temporary staff shortage.

Table 6: Petroleum Titles

	1990-91	1991-92	1992-93	1993-94
Exploration Permits				
Granted	16	25	25	10
In force	96	114	131	124
Drilling Reservations				
Granted	-	-	2	2
In force	-	-	2	4
Production Licences				
Granted	1	3	1	3
In force	22	25	26	29
Pipeline Licences				
Granted	1	4	2	5
In force	22	25	27	31
Retention Leases				
Granted	-	4	0	1
In force	1	5	5	6
Petroleum Lease				
Granted	-	-	-	-
In force	1	1	1	1
Total	142	170	192	195



During the year the Government introduced its Land (Titles and Traditional Usage) Act 1993 which also amended the petroleum legislation. Processes to accommodate the traditional usage referrals were also developed and implemented. These processes and the traditional usage legislation recognised the unique nature of the petroleum exploration and development industry, and hence the point at which referrals are made is when an on-ground development operation is contemplated.

Referrals and referral procedures involving other Government agencies

such as the Environmental Protection Authority, Conservation and Land Management and Fisheries Departments continued to be refined in respect to land access matters so that increases in work levels can be accommodated from within existing resources.

Development work continued for the in-house electronic petroleum database system which is designed to assist with the day-to-day title approval and dealings matters. Other priorities meant the further development of a supporting database for petroleum developmental information was placed on hold.

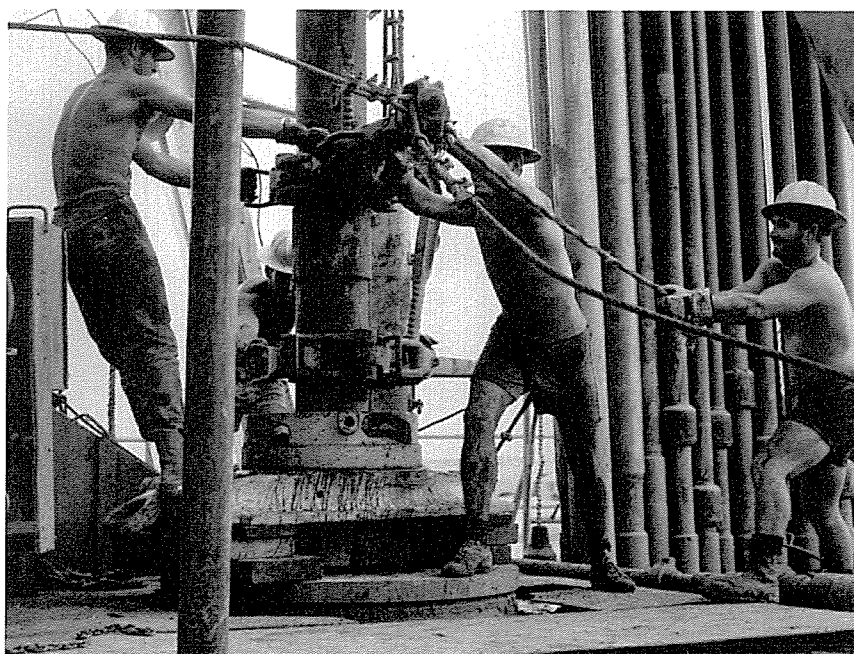


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Learmonth 1954



Sub Program

Objective:

To achieve a low and decreasing incidence of bodily injury, occupational disease and fatalities amongst those employed in the petroleum industry.

Description:

Strategies include auditing and enforcing compliance with petroleum legislation; promotion of, and participation in, safety education, training and research; and the provision of specific technical advice to government, industry and the public.

four drilling and two pipeline inspections were completed in the 1993-94 financial year. All these inspections revealed a high level of compliance with safety standards.

Safety

Recruitment of personnel for the Petroleum Safety Branch, established last year, was completed and a staff training program has been implemented.

The Department has taken a key role in the tripartite development of national guidelines for the preparation and assessment of Safety Cases and a program to replace existing prescriptive legislation has been put in place.

Safety Case legislation has been extended to include existing offshore operations and mobile offshore drilling units which are required to have Safety Cases in place by 1 July 1996. The regime will be extended to onshore production operations and pipelines.

Safety Cases for new offshore projects are being submitted prior to start-up of the facilities with subsequent auditing to identify any implementation problems.

As part of the upgrade of safe operating practices, the Department has adopted the role of lead combat authority for offshore petroleum emergencies. The aim is enhanced State emergency response plans developed on a tripartite basis with major exercises to test the plans.

Monitoring of the new Schedule of General Requirements for Occupational Health and Safety - 1993 took place during the year to inform workforce health and safety representatives of requirements. Discussions resumed with industry and unions to develop a new Petroleum Occupational Health and Safety Act to replace the Schedule and to bring all upstream petroleum safety matters under a single Act.

To ensure a consistent approach to petroleum safety issues, there was

Engineering

Engineering principles and standards were monitored to ensure that they were applied to the design and construction of exploration and production facilities. Factors such as the design, construction and alteration of platforms, pipelines, pressure vessels, cranes, lifting gear structures, and so on, were monitored. In total, 102 applications for design approval for existing facilities were processed along with 172 for new facilities.

A total of 69 drilling applications, consisting of 43 offshore and 26 onshore wells were reviewed for compliance with the directions and additional well engineering design criteria. Seventy one production operations reviews of procedures covering workovers, well completion operations, wellbore cleaning, perforation and logging were carried out. In addition, several field pressure testing programs were approved.

Five sets of offshore drilling company safety procedures manuals and seven safety and emergency response manuals were reviewed for exploration and appraisal drilling programs.

Forty four field inspections were carried out, of which 21 involved drilling and workovers. In addition, 11 production facilities, six construction,



continuing liaison by the Department with other agencies including State Transport, Civil Aviation Authority and the Australian Maritime Safety Authority. In addition, a number of joint accident investigations were conducted with other Government Departments.

New projects developed on the North West Shelf have seen an increase in offshore diving activity with a high general standard of safety performance.

Overall the annual performance of safety in the onshore and offshore upstream petroleum industry has shown significant improvement with a total lost time injury frequency rate of 12.7. The rate for both onshore and offshore operations fell in line with the overall trend of the past five years (Table 7). However there have been disappointing results in safety performance associated with maritime operations, with three fatal accidents involving marine crews on offshore petroleum sites.

Table 7: Frequency Of Lost-Time Injuries Per Million Hours Worked

	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
Onshore	64.5	35.4	44.7	20.7	21.0	17.1
Offshore	42.0	22.9	13.7	15.5	15.9	11.7



Sub Program

Objective:

To ensure that any adverse environmental impacts of petroleum exploration and development activities are within acceptable community standards.

Description:

Strategies include the maintenance of a legislative framework, and worksite visits to monitor and audit compliance with legislation and conditions of title, during operations and after project completion. A security bond system is maintained to facilitate administration and emergency response in the event of any mishap.

The Environmental Information for Petroleum Operations manual was revised and copies were distributed to the petroleum industry, consultants, government bodies, interested parties and the public.

Arrangements have been put in place to ensure that all onshore petroleum explorers are now submitting environmental management plans before drilling and seismic surveys start, and rehabilitation reports on completion.

Environmental management displays and input for the Western Australian Petroleum Club's course on the petroleum industry for high school teachers were provided.

An Environmental Monitoring Audit form was developed to assist the oil companies in compiling reports on their onshore activities. Thirty five environmental management plans and 23 post-operation environmental reports were received and reviewed. These reports indicated that all operators have adequately restored and rehabilitated drilling sites and seismic lines.

Thirty nine contingency plans and oil spill exercise reports were received and reviewed during the year.

Sixteen minor oil spill reports were reported to the Department, the largest being 220 barrels. No significant environmental impact on marine communities and biota was detected or observed, with all oil spilled dispersing naturally.

Co-ordination and liaison with companies, relevant government bodies (such as Department of Environmental Protection, Department of Conservation and Land Management, Fisheries Department), and interested groups, such as the Western Australian Fishing Industry Council, was undertaken to expedite environmental approvals.

The Memorandum of Understanding between the Department of Minerals and Energy and the Department of Environmental Protection for streamlining environmental approval procedures was revised during the year.

Woodside Offshore Petroleum was the recipient of the Department's 1993 Award for Environmental Excellence for its extensive environmental management program of its Northwest Shelf Gas Project.



The Western Australian Petroleum Exploration database (WAPEx) now includes 38 2612 registered items including reports, seismic sections, well logs and data tapes. A major contract was let during the year for storage of the 36 500 archived seismic data tapes, expected to grow at a rate of 5 000 tapes per year. The procedures manual for the database was completed, and will help to ensure that all data required to be submitted is included.

A map indicating new petroleum wells is now being produced by direct downloading of the data. The map will be upgraded twice a year. Upgrading of the exploration database has also been carried out to allow electronic transfer of survey data from industry. After processing and entering in the database, reports are distributed to industry by two private contractors. The reduced number of reports released by the contractors during the year largely reflects a diminished industry requirement.

Objective:

To provide the petroleum industry with ready access to petroleum exploration and production data in order to encourage efficient and effective petroleum exploration and development.

Description:

To encourage exploration and development activities and to ensure the previous activities are not necessarily duplicated, a library of core and sample material and technical reports on activities within petroleum tenements are maintained. Technical reports, lodged with the Department as a condition of tenure, are released to the public as required by legislation. Cores and samples may be viewed at the State core storage facility.

There were 553 reports received from industry and 411 released to industry.

The time taken to respond to requests from industry for company exploration reports and data was reduced from 1992-93 levels (Table 8).

Table 8: Release Of Exploration Reports

Cumulative percentage of requests filled	Edited ¹ reports			Unedited ¹ reports		
	1992-93	Target	Achieved 1993-94	1992-93	Target	Achieved 1993-94
On demand²	80	85	86	85	90	80
Within 1 week	89	92	89	91	92	86
Within 2 weeks	93	95	97	97	98	98
Within 4 weeks	95	100	100	99	100	99

¹ Edited reports: Moratorium period of two years, interpretative data excised. Unedited reports: Moratorium period of five years, all data available.

² Available through commercial agents or in the departmental library.



Sub Program

Objective:

To collect, for the community, a fair return for the extraction of the State's petroleum resources in a manner that is administratively and economically efficient.

Description:

Strategies involve the development and implementation of royalty systems to collect and verify the royalty payments from petroleum producers. The royalty systems and verification arrangements are negotiated with producers within a common framework and are then formalised through legal means.

The following two systems are used to determine the amount of royalty to be paid for petroleum production in the State:

- A royalty based on a percentage of the value of production at the well-head. This is known as the well-head value royalty system and applies to onshore areas, the Territorial Sea and the Woodside North West shelf project area. A royalty schedule is negotiated which defines the well-head value on which royalty is levied.

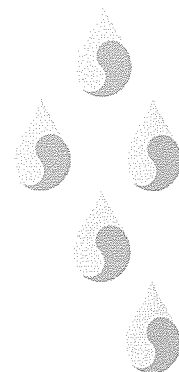
While well-head value is a commercial concept, the royalty agreements are complex and take a considerable amount of time to negotiate, with a rate of between five per cent and 12.5 per cent of the well-head value being applied. Royalty is collected on an interim basis until these agreements are finalised; and

- A royalty based on a percentage of the net cash flow or economic rent base. Currently, the Resource Rent Royalty (RRR) system applies a rate of 40 per cent to the net cash flow of economic rent base, with allowances for all production costs. By agreement between the Commonwealth and Western Australia, the State maintains full responsibility for the administration of the RRR regime and revenue is shared on a 75:25 basis between the Commonwealth and the State. The higher Commonwealth share reflects the higher proportion of Commonwealth entitlements under the prior royalty and excise regime.

Royalty payments collected from the petroleum industry during the year totalled \$110.7 million, of which \$72.9 million passed through the State Consolidated Fund (CF) (Table 9). Over

Table 9: Petroleum Royalty Collection (\$M)

Legislation	Revenue State	Revenue Commonwealth	Total	Paid CF
STATE				
Barrow Island	7.3	21.9	29.2	7.3
Other	20.3	11.5	31.8	31.8
State Total	27.6	33.4	61.0	39.1
COMMONWEALTH				
Total 1993-94	61.4	49.3	110.7	72.9
1992-93	58.2	48.4	106.6	79.7
1991-92	61.3	55.6	116.9	86.5



99 per cent of the value of royalties was collected on time.

Total payments by industry increased marginally above the previous year's payments but because of the distribution between the State and the Commonwealth the actual figure shown in the CF accounts (\$72.9 million) decreased (Table 9).

Negotiations carried out during the year included:

- the completion of a petroleum royalty schedule for an onshore gasfield;
- negotiations in varying stages for four other projects, including two major projects in the North West Shelf project area and one in the Territorial Sea;
- there were 408 returns checked internally by the Department and 248 returns audited at company premises; and
- audit manuals were completed for the Woodada, Dongara and Tubridgi projects.

These reviews and audits resulted in enhanced compliance by companies.



PLANNED ACHIEVEMENTS AND OUTCOMES

Planned Achievement

Outcome

To continue development and implementation of a comprehensive package of legislative amendments, administrative arrangements and promotional strategies in order to stimulate exploration and development activities in remote onshore areas.

A comprehensive package of legislative amendments, administrative arrangements and promotional strategies was developed with a view to stimulating petroleum exploration in remote onshore areas and reverse the trends evident in the following table:

Onshore exploration and development activity in remote onshore areas

(Canning, Officer, Eucla Basins)

	1982	1986-87	1992-93	1993-94
Titles granted	7	2	11	6
Area under title (1000km ²)	441	328	150	184
Seismic survey applications	22	11	2	1
Seismic acquisition (km)	16,924	2,304	730	387
Number of wells drilled (new field wildcat)	20	6	1	3

To achieve a reduced incidence of accidents and lost time injuries in petroleum operations in line with the trend of the past five years.

There was a reduced incidence of accidents and lost time injuries in petroleum operations in line with the overall trend of the past five years:

Frequency of lost-time injuries per million hours worked

	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
Onshore	69.5	35.4	44.7	20.7	21.0	17.1
Offshore	24.0	22.9	13.7	15.5	15.9	11.7

To increase the level of compliance with Departmental environmental guidelines, measured by the proportion of onshore seismic and drilling projects which receive an environmental audit rating of "satisfactory" or better.

Arrangements have been put in place to ensure that all onshore petroleum explorers are now submitting environmental management plans prior to commencement of drilling and seismic surveys, and rehabilitation reports on completion.

To reduce the time taken to respond to requests from industry for company exploration reports and data from current levels to the target levels.

The time taken to respond to requests from industry for company exploration reports and data was reduced from 1992-93 levels.

Planned Achievement

To finalise outstanding royalty deduction arrangements for projects in offshore waters and complete the development of a new royalty system suitable for application to onshore petroleum projects.

Outcome

A new hybrid royalty system was developed as a basis for discussion with petroleum producers and other governments.

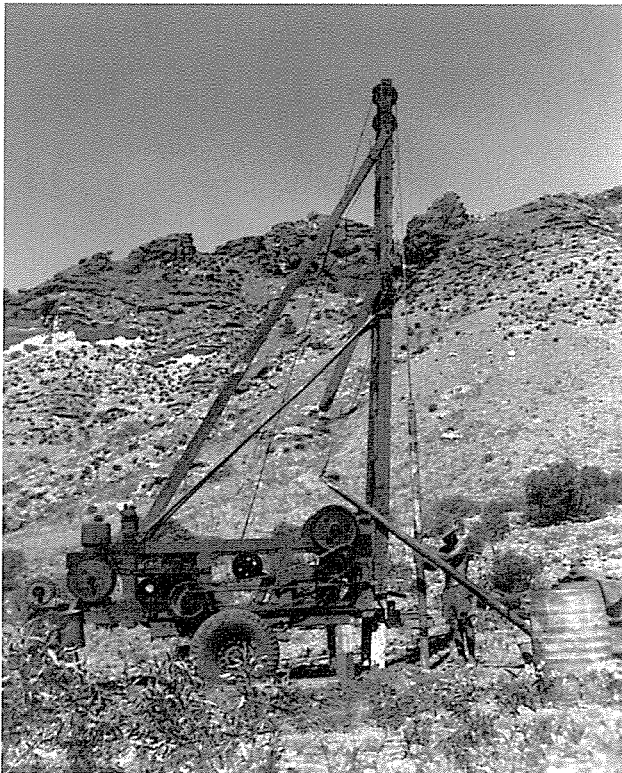


PHOTO COURTESY OF WEST AUSTRALIAN PETROLEUM PTY LIMITED

Learmonth 1954



Objective:

To improve the knowledge of the geology of Western Australia and the quality of the regional geological, geophysical and geochemical data and maps for use by industry, government and the public to support exploration, groundwater management, land-use planning and infrastructure development.

Description:

The program involves the collection of field data as well as the compilation of information from industry and other government sources. The information assembled facilitates policy analysis and advice to Government. It also enables the Department to meet the requirements of the State's mining and petroleum sectors and of State agencies charged with the responsibility for groundwater management, land-use assessment and planning, and major civil engineering and infrastructure developments.

The provision of timely and high-quality geoscientific information improves the chances of success in the exploration and development of mineral and hydrocarbon projects. The availability of such information encourages mineral and petroleum companies to invest in Western Australia. The information is also an essential element of Government decision-making in relation to land-use issues.

Effective management of the State's mineral, fossil fuel and groundwater resources and supporting road, rail and urban infrastructure is only possible when based on the best scientific information and advice available.

The three sub programs which make up this program are described in the following pages along with a summary of the key activities for the year. A table of the planned achievements for the year and outcomes for this program is included at the end of the description of sub program activities. The Key Performance Indicators for this program can be found on page 118.

The direct recurrent cost of this Program was \$7.641 million. This, together with associated corporate service costs of \$2.608 million, resulted in total expenditure of \$10.249 million.



A blaze in a tree trunk indicating the proximity of water. Thought to have been carved at the turn of the century.

Sub Program

The existing 1:250 000 geological map coverage of the State was improved by regional geoscientific investigations and mapping in project areas selected on the basis of the needs of the mineral and petroleum exploration industry and government.

Project areas were related to the major geological provinces, enabling the implementation of an integrated mapping strategy. In each area a specially constituted, multi-disciplinary team of geoscientists undertook investigations, including geology, geophysics, geochemistry and mineralisation studies, in the context of the regional geological structure of the province. The project teams used the services of centralised specialist scientific, technical, cartographic and administrative support staff.

This province-based project team strategy, which was initiated on a small scale in 1993-94, is considered to be a more effective means of addressing industry needs than the previous approach of dispersed, single-sheet mapping by individual geologists. Final products are made available in the form of maps and reports. There is an increasing use of digital information and GIS technology to ensure that maps and reports can be quickly updated with new information or changes in interpretation which can be made immediately available for dissemination.

Several new initiatives were introduced during 1993-94 aimed at providing additional geoscientific information to stimulate mineral exploration activity in Western Australia. These covered accelerated geological mapping programs in the Eastern Goldfields and Glengarry Basin (Northern Murchison) regions, additional acquisition of airborne geophysical data, as well as the start of a program of geochemical mapping.

Map coverage of the State was extended by the publication of 10 full-colour 1:100 000 scale geological maps and five other maps at various scales. Ninety per cent of maps and other

Objective:

To provide up-to-date regional geological, geophysical, geochemical and resources information to assist in the formulation of exploration and development strategies by the mining and petroleum industries, and for resource assessment and land use planning by Government and other organisations.

Description:

Geological and other geoscientific data are acquired and synthesised to compile reports and produce regional geoscientific and mineral deposit maps at a variety of scales. These range from maps of the whole State to detailed maps of special interest rates, such as environmental geology and resource maps in areas where they are necessary for land-use planning and development. Statewide collation of data on a single mineral commodity or commodity group is also carried out to facilitate the development of new mineral deposit models and exploration concepts.

Regional geophysical and geochemical data sets are most often used as a support for geological mapping, particularly in areas where rocks are not visible at the surface. As approximately 90 per cent of rock formations in Western Australia are concealed by soil cover, geophysical and geochemical techniques represent highly effective means for the identification of prospective exploration areas for mineral, petroleum and groundwater sources. They are also widely used for oil salinity studies, groundwater investigations, pollution control and ground stability studies.

graphic publications are now being produced using computer-assisted or automated techniques.

The new mapping initiatives were implemented with contract geoscientists to supplement existing Departmental staff.

The Eastern Goldfields mapping initiative is being undertaken with the Australian Geological Survey Organisation (AGSO) as part of a National Geoscience Mapping Accord (NGMA) project. Initial emphasis in this



project has been on accelerating the production of map sheets for which the fieldwork had been previously in progress or completed. As a result, five 1:100 000 map sheets covering part of the Eastern Goldfields were published in 1993-94 (See Appendix 7). Field mapping and airborne geophysical data were acquired over the Sir Samuel, Darlot and Duketon 1:250 000 sheets. This information will be used in the compilation of final geological map sheets along with information contained in exploration company reports, including mapping, drilling etc.

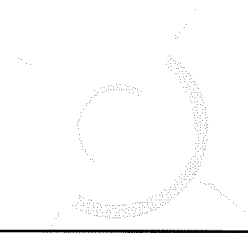
The Glengarry Basin mapping initiative completed initial field mapping of three 1:100 000 sheets in the Peak Hill - Glengarry area as the first stage in a series of maps covering the area of the Glengarry basin. A contract to complete airborne geophysical data acquisition over the Peak Hill - Glengarry area was tendered during the last quarter of 1993-94. This program of data acquisition will be completed during 1994-95.

The regolith and geochemical mapping initiative required the development, in conjunction with an industry advisory committee, of an appropriate methodology for this new series of geochemical and regolith maps produced by the Department. This necessitated the development of sampling methodologies and protocols, agreed sampling densities, as well as consideration of the scope of the geochemical analyses carried out as part of the mapping program. Sampling and geochemical analysis for the mapping programs is being conducted on contract, with project management undertaken by Departmental personnel. Sampling has been completed for the Menzies and Leonora sheets and was started for the Peak Hill sheet.

Progress on other mapping projects covering the NGMA Kimberley project and mapping of the Ravensthorpe greenstone belt proceeded on schedule. Field work was completed in the Rudall area, and compilation of new maps for the Mt Bruce and Roy Hill 1:250 000 map sheets in the Pilbara commenced.

Following commissioning of a sophisticated spectrometer known as the Sensitive High-Resolution Ion MicroProbe at Curtin University, the Department made increasing use of geochronology to improve the understanding of the timing of geological events. During 1993-94, fifteen age determinations were carried out to support the Department's mapping programs.

Studies of the State's sedimentary basins included completion of a study of the geological structure of the Northern Perth Basin and a review of the petroleum potential of this area. Mapping of the Devonian reef systems of the Lennard Shelf area of the Canning Basin proceeded on schedule.



The Department continued to explore for groundwater throughout the State. Special initiative funding for groundwater drilling enabled a program of 12 individual drilling projects covering eight geographic areas of the State to be completed. All drilling operations were conducted by private drilling companies, supervised by Departmental personnel. Approximately 150 boreholes were drilled comprising around 5 000 metres of drilling.

Hydrogeological mapping programs continued with the compilation of four maps of the Kalgoorlie area, and six maps in the Murchison and South Coast regions. The progress of the hydrogeological mapping program was aided by the development of a computerised database for groundwater data from boreholes, funded in part by the Federal Landcare program. Significant progress was also made in capturing data for this database with approximately 30 000 bore cards, representing one third of the Statewide data being captured.

A number of other groundwater studies and investigations were carried out, in conjunction with the Water Authority and other agencies. An average of three hydrogeologists was on secondment to the Water Authority. Other hydrogeologists have worked on Water Authority matters covering groundwater supplies for Carnarvon and Kununurra, as well as in the Statewide survey of radon in groundwater and the geophysical logging of over 100 groundwater bores. Studies were also completed for a rangelands study of the Eastern Goldfields being conducted by the Department of Agriculture, and an externally funded study of nutrient influx into Oyster Harbour in Albany in conjunction with the Waterways Commission.

Demand for hydrogeological investigations and advice in relation to groundwater contamination continued to increase. Submissions were prepared and presented to the Parliamentary Select Committee investigating the management of Perth's groundwater resources. A

Objective:

To explore for, map, and assess the State's groundwater resources to appropriate standards and levels of confidence as a basis for groundwater management and land-use planning by government, industry and the public.

Description:

Groundwater is the most readily available source of water in most of Western Australia. Knowledge of its availability is essential for State planning, environmental management, mining, urban and industrial development, and strategic purposes. As there is currently little economic incentive for private enterprise to systematically explore for groundwater, it falls upon the State to undertake this critical task.

Strategy:

The strategy adopted is based on hydrogeological mapping, drilling and borehole testing carried out or supervised by a specialist group of hydrogeologists and technical support staff. The group also conducts specialised investigations when requested by other Government agencies.

baseline study was completed covering representative selection of shallow bores across the Perth Basin to identify abnormal levels of pesticides or fertilisers.

Compilation of a major bulletin covering the hydrogeology of the Perth metropolitan area was started. This important publication will present the results of over 30 years of hydrogeological and groundwater studies.



Sub Program

Objective:

To provide high quality timely and independent geotechnical and rock mechanics advice and information to State Government agencies in accordance with their needs.

Description:

Specialised geotechnical and rock mechanics advice and services are provided to State Government agencies which are involved in civil engineering projects such as road building and dam construction. A small team of specialists carry out investigations and provide training and advice in accordance with the agencies' needs. Technical studies and research projects are planned and implemented to ensure that up-to-date and high quality technical advice is available.

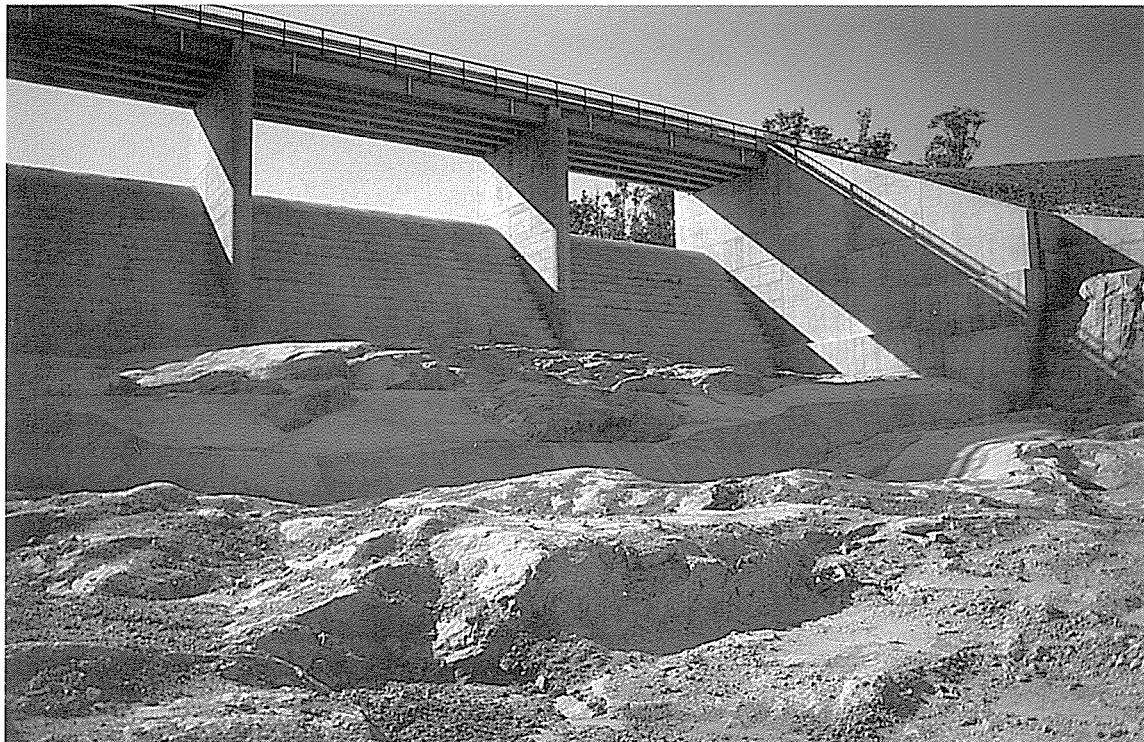
Geotechnical services and advice were provided to the Water Authority, Main Roads Department and Department of Transport.

Geotechnical services provided to the Water Authority included technical advice and engineering geology supervision during the construction of North Dandalup Dam as well as investigations for the proposed lower South Dandalup Dam site.

A Main Roads Department study was completed on foundation conditions for the Greenmount Hill section of the Great Eastern Highway. Advice was also given on foundation and stability conditions for a road near Tom Price.

Services provided to the Department of Transport included an assessment of materials for use in a breakwater for the proposed small boat harbour at Bremer Bay.

A draft procedures manual was compiled as part of a Quality Assurance program to ensure that services to clients are maintained.



PLANNED ACHIEVEMENTS AND OUTCOMES

Planned Achievements

Outcome

To address the demand for a greater degree of information in geologically complex areas by the release of 10 maps at 1:100 000 scale (approximately 50x50 km coverage) and five maps at other scales in the Goldfields, East Pilbara, Kimberley and North Perth Basin areas. The current and resulting degree of 1:100 000 scale coverage of these regions is shown below.

The Department's geological map coverage of the State was extended by the publication of 10 full-colour 1:100,000 scale geological maps and five other maps at various scales. Ninety per cent of maps and other graphic publications are now being produced using computer-assisted or automated techniques.

To develop a computerised database structure to enable greater accessibility to borehole data in order to facilitate groundwater management, land-use planning and infrastructure development.

A computerised database was developed to provide improved accessibility to groundwater borehole data.

To complete the compilation of regional hydrogeological maps (1:250 000 scale - 100km x 150 km approximately) as part of an objective to provide information in digital format that can be used for groundwater and land salinisation assessments, the preparation of catchment management strategies in key agricultural districts and groundwater supply assessments in mining and pastoral areas.

Four 1:250 000 scale hydrogeological maps of the Eastern Goldfields were completed. Six other maps of the South Coast and Murchison Regions were compiled.

To develop a comprehensive procedures manual relating to geotechnical advice and investigations as the initial stage in the introduction of a Quality Assurance program which will be required to maintain the present government client base for these services.

A draft procedures manual has been compiled and will be finalised in 1994-95.



Planned Achievements

Outcome

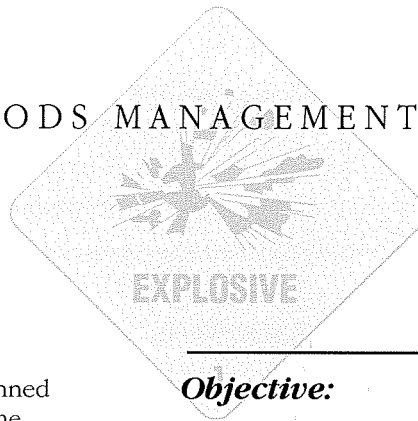
The Department also received funds in the 1993-94 budget for a series of new initiatives. The outcomes of this work are shown opposite.

Geological mapping was initiated on six 1:100 000 map sheets equally distributed between the Eastern Goldfields and the Northern Murchison. It is expected that at least half of these maps will be published before the end of the 1994-95 financial year, with the remainder the following year.

Airborne geophysical data was acquired for two 1:250 000 map sheets in the Eastern Goldfields and tenders were let for data acquisition from two 1:250 000 sheets in the Northern Murchison.

Systematic regolith and geochemical mapping at a scale of 1:250 000 commenced and the first of this new map series will be published before the end of the year.

DANGEROUS GOODS MANAGEMENT



A summary of the activities undertaken during the year, planned achievements for the year and the outcomes for this program follows. The Key Performance Indicators for this program can be found on pages 119-120.

The direct recurrent cost of this Program was \$1.568 million. This, together with associated corporate service costs of \$.708 million, and capital expenditure of \$.021 million resulted in total expenditure of \$2.297 million.

Dangerous Goods Management

Industrial development and activities in Western Australia are dependent upon the safe storage, handling and transport of explosives and dangerous goods. The Department of Minerals and Energy seeks to ensure that the hazards to the public that arise from these activities are maintained at an acceptably low level. It does this by the regulation of industry through the development, maintenance and enforcement of the Explosives and Dangerous Goods Act.

National safety codes

The Department is actively pursuing micro-economic reform in the area of public safety by working with its counterparts in other Australian states to facilitate the safe, unimpeded movement of explosives and dangerous goods and associated equipment and qualified people. The basis for reform is the development of common essential requirements for nationally uniform codes in all states. The goal of developing such requirements by 1993 was not attained.

In some specific areas a large degree of uniformity has been attained. However, in the areas of dangerous goods storage, major hazards facilities and explosives storage and use, the complexity of the task was underestimated and the planned schedules required some extensions. The Department is continuing to contribute to this progress and it is likely that uniformity in the major outstanding areas will be achieved in 1994-95.

Objective:

To achieve an acceptably low level of risk to the public as result of the storage, handling and transport of explosives and dangerous goods in Western Australia.

Description:

Industrial development and activities in Western Australia are dependent upon the safe storage, handling and transport of explosives and dangerous goods. The strategy adopted to achieve the objective is based on the regulation of industry by developing, maintaining and enforcing relevant legislation. A comprehensive database of the sites where dangerous goods are manufactured and stored is maintained to assist in monitoring and auditing compliance with the regulations, and to provide the information required when an emergency response is necessary. Educational material and technical advice are also provided on: compliance with the regulations; hazard control plans; and more general aspects of handling and storing explosives and dangerous goods.

Dangerous goods explosives information system

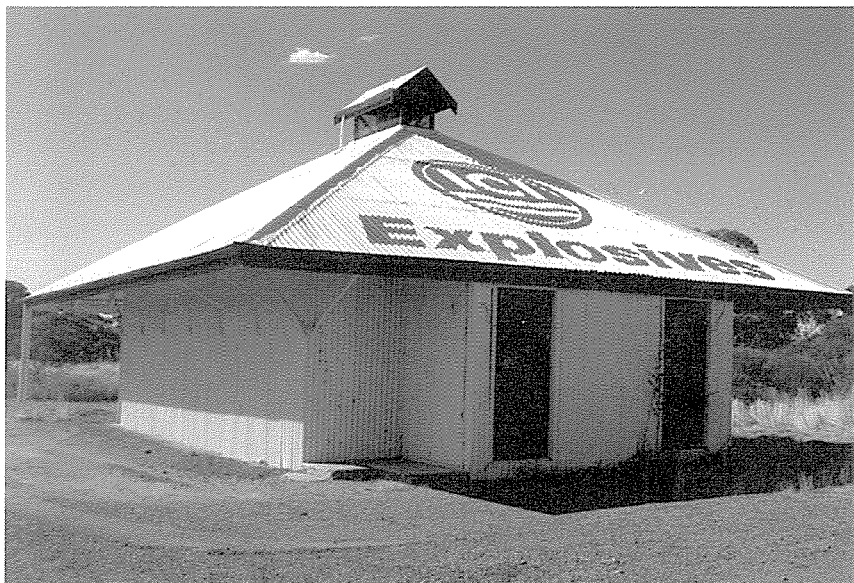
Work began on the development of a replacement electronic licensing and inspection management system. User requirements and system specifications for the system, to be known as DEXIS, were finalised by the Department. DEXIS will provide an electronic database for all licences and permits issued by the Department. It will facilitate the effective and efficient targeting of inspectoral resources, assist in the development and reporting of performance indicators and provide more timely and accurate advice to emergency service agencies regarding the storage of dangerous goods at premises throughout the State.

Explosives

The Explosives Regulations 1963 were amended to adopt the Australian Explosives Code for the transport of



explosives. Most of the other states have adopted or are in the process of adopting the Code, thereby ensuring consistency between state jurisdictions. It is expected that this consistency will enhance safety as a common Australia-wide understanding of the Code's requirements is developed and the learning cycles are simplified. Operating costs for industry should also be reduced by avoiding equipment and loading variations across State boundaries.



A successful explosives amnesty was conducted in the Eastern Goldfields area over a three month period from August 1993. Some 250 cartridges of explosives, almost 600 detonators and other assorted explosives were handed in for disposal. The event was well publicised by the media and the Department was able to raise public awareness on the dangers of explosives.

An automatic security access gate was installed at the Kalgoorlie Explosives Reserve enabling authorised explosives company personnel to have 24 hour access to the reserve. This and the installation of a concrete access driveway were measures taken to accommodate user needs at the Reserve. The major returns have been improved safety of

access and egress and reduced operating costs.

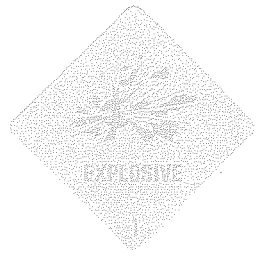
Dangerous goods

Implementation of the Dangerous Goods Regulations 1992 continued as a high priority throughout the year. The regulations, which were gazetted in October 1992, became fully effective in April 1993 and approximately 2 600 applications for license have been received since their introduction. The peak workload in 1993-94 caused a significant backlog to develop and a strategy to reduce the backlog was developed for implementation in the first half of 1994-95.

The Department introduced a new means of enforcement in the area of dangerous goods transport. Inspectors evaluated reports from Police and Department of Transport officers and identified operators who displayed a consistent indication of non-compliance with the Regulations. These operators were contacted and advised that they could consent to an audit conducted by the Branch to review their procedures or be subject to alternative enforcement actions such as prosecution, licence suspension or cancellation, or increased surveillance and intervention. Response to the voluntary audit was good, with most organisations taking the opportunity to discuss in detail their written operating procedures with a view to improving compliance.

Consultative audit is considered an effective and efficient means of maintaining acceptably low levels of risk to the public during the transport of dangerous goods by road and the use of external inspectors will continue.

The requirements for approval of training courses for bulk dangerous goods driver licensing were reviewed in accordance with advice received from the Road Transport Industry Employment Training Council. It was decided that all courses should be accredited in accordance with the requirements of the Skills Standards Accreditation Board (SSAB). Early in the year, all existing



approved course providers were advised that accreditation of their courses would be required to SSAB standards after June 1994 and only those courses so accredited would be considered to meet the requirements of the Dangerous Goods Regulations for the issue of a licence to drive a dangerous goods vehicle. By 30 June 1994, two courses had been accredited and another had been recommended for accreditation.

Major hazards

The Major Hazards Branch conducted regular inspections and meetings throughout the year with management of each of the eight designated chemical plants or "major hazards facilities" to ensure operations proceeded in accordance with their Hazards Control Plans. Assurance was demonstrated in this respect at all plants as an indicator to Government that public safety is being maintained.

A project to optimise land usage in the Kwinana area, whilst maintaining public safety, and to facilitate timely and accurate planning decisions by government and industry, was commissioned in May 1994. The \$250 000 project to assess the cumulative risks of all hazardous industries operating in the Kwinana industrial area is being managed by the Department.

Dangerous Goods Liaison Committee

The Dangerous Goods Liaison Committee continued to act as a community consultative group and reference point for the program during the year. The Committee considered a diverse group of subjects including:

- the routing of dangerous goods vehicles in the Perth metropolitan area;
- Memorandum of Understanding with the Department of Environmental Protection on public safety matters;
- an explosives security policy;
- amendments to the Explosives Dangerous Goods Act; and
- the training of drivers of dangerous goods vehicles.

The Committee, with its wide representation of all the program's key customers agreed in principle to accept the role of a Customer Service Council in line with the Government's policy of an enhanced focus on customer service in Western Australia. Delegates on the Committee are from the explosives industry, Western Australian Municipal Association, Western Australian Road Transport Association, Chamber of Commerce and Industry, Australian Institute of Petroleum, Trades and Labour Council, Department of Occupational Health Safety and Welfare, Department of Environmental Protection and the Western Australian Farmers Federation.

EXPLOSIVES ACT, 1895.
The attention of general carriers and others is drawn to the following regulations made under the provisions of "The Explosives Act, 1895" governing the carriage of Explosives.

CARRIAGE OF EXPLOSIVES.

1. No explosives shall be conveyed in any vehicle unless the same be conveyed in a suitable case or container, and the vehicle be constructed on all sides by the explosion of the explosive contained therein, and the case or container be of such material and of such thickness as to be sufficient to protect the explosive from any fire or other cause which may be applied to it.
 2. No such explosive shall be conveyed in any vehicle used for the conveyance of passengers or other persons, or in any vehicle used for any purpose other than that of conveying electric power.
 3. Nothing besides explosives shall be conveyed in any vehicle within the boundaries of any municipality or town, or in any vehicle used for the conveyance of passengers or other persons, or in any vehicle used for any purpose other than that of conveying electric power.
 4. No explosive shall be conveyed in any vehicle within the boundaries of any municipality or town, or in any vehicle used for the conveyance of passengers or other persons, or in any vehicle used for any purpose other than that of conveying electric power, unless the same be conveyed in a suitable case or container, and the vehicle be constructed on all sides by the explosion of the explosive contained therein, and the case or container be of such material and of such thickness as to be sufficient to protect the explosive from any fire or other cause which may be applied to it.
 5. The quantity of explosives conveyed in any vehicle within the boundaries of any municipality or town, or in any vehicle used for the conveyance of passengers or other persons, or in any vehicle used for any purpose other than that of conveying electric power, shall not exceed the quantity of explosives permitted by the regulations in that behalf made.
 6. No person in charge of any vehicle carrying explosives and unloading any explosive shall be liable for any damage or loss caused by the explosion of the explosive, unless he shall be proved to be guilty of some offence in respect of which he shall be liable.
 7. No explosives shall be conveyed on a motor truck or motor car without special written permission from the Inspector of Explosives.
 8. Every person who commits, or attempts to commit, any breach of the foregoing provisions shall be liable to a penalty not exceeding TWENTY POUNDS, or such other amount as may be determined by the Inspector of Explosives.
- By order,
T. N. HIRTON,
Chief Inspector of Explosives.

EXPLOSIVES ACT 1928. SPECIAL RULES

1. The licensee of this magazine, do hereby require all persons concerned to observe the following SPECIAL RULES:
1. **EMPTY YOUR POCKETS AND LEAVE AT A SAFE DISTANCE MATCHES, PIPES, TOBACCO, KNIVES, ETC., BEFORE OPENING THE MAGAZINE OR DETONATOR ANNEX.**
2. **PROVIDE AND WEAR OVER-SHOES IN MAGAZINE OR DETONATOR ANNEX WHERE IT IS NECESSARY TO GO INSIDE.**
3. **KEEP AT THE MAGAZINE FOR USE IN OPENING CASES, COPPER, BRASS OR WOODEN TOOLS AND A MAT. THE USE OF IRON OR STEEL TOOLS FOR THIS PURPOSE IS PROHIBITED.**
4. **TO OPEN CASES, REMOVE ONLY ONE AT A TIME, OPEN UPON THE MAT PLACED ON THE GROUND ABOUT 20 YARDS FROM THE MAGAZINE, AND USE ONLY THE TOOLS PROVIDED FOR THE PURPOSE.**
5. **KEEP ALL PACKAGES IN THE MAGAZINE AND DETONATOR ANNEX CLOSED AND KEEP INNER PACKAGES IN THE WOODEN CASES IN WHICH RECEIVED.**
6. **REMOVE ALL EMPTY PACKAGES FROM THE MAGAZINE AND DETONATOR ANNEX.**
7. **KEEP THE INSIDE OF THE MAGAZINE AND DETONATOR ANNEX CLEAN. KEEP A SUITABLE BROOM AT THE MAGAZINE FOR THAT PURPOSE.**
8. **KEEP THE SURROUNDINGS OF THE MAGAZINE AND DETONATOR ANNEX FREE FROM RUBBISH, DRY GRASS OR OTHER INFLAMMABLE MATERIAL.**
9. **KEEP MAGAZINE AND DETONATOR ANNEX SECURELY LOCKED EXCEPT WHEN EXPLOSIVES ARE BEING PLACED IN OR REMOVED FROM THEM.**

STATEMENT OF QUANTITIES.
Only the following explosives shall be stored, in quantities not exceeding at any one time:-

In the magazine	lb. of Gunpowder and/or Nitro-Compounds.
In the annex	Detonators.

Note.—These Rules must be signed by the Licensee and posted up on the inside of Magazine door.



PLANNED ACHIEVEMENTS AND OUTCOMES

Planned Achievements

Outcome

To achieve an increased level of compliance with safety standards in line with the trend of the past three years.

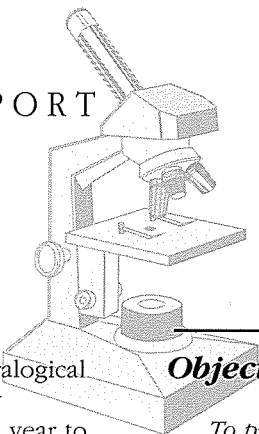
The Dangerous Goods Regulations were proclaimed to come into effect in various stages, the final stage being proclaimed in July 1993.

Benchmark compliance levels for dangerous goods storage were collected during the year. These will be reported more fully next year when program reports will be available.

To have in place regulations governing the transport of explosives (which are treated separately from other dangerous goods) to a standard which is consistent nationwide without being disadvantageous to the Western Australian public.

Regulations governing the transport of explosives by road or rail, in line with the relevant Australian code, were introduced during 1993-94.

SCIENTIFIC SUPPORT



The comprehensive range of chemical, metallurgical and mineralogical capabilities and associated quality systems was upgraded during the year to allow government agency clients to respond to community needs and to an increasing range of diverse and often one-off specialist investigations.

Scientific advice provided to Government and its agencies generally deals with use of chemicals, associated occupational or environment issues and material failure. Assistance was also provided to establish new standard test procedures and to assess laboratories for quality accreditation.

The Chemistry Centre generally does not compete with private industry and where possible, diverts routine analytical work to private laboratories. It exists principally to solve chemical problems which arise in government instrumentalities and industry.

The six sub programs which make up this program are described in the following pages along with a summary of the key activities for the year. A table of the planned achievements for the year and the outcomes of this program is included at the end of the description of sub program activities. The Key Performance Indicators for this program can be found on page 121.

The direct recurrent cost of this Program was \$9.096 million. This, together with associated corporate service costs of \$.220 million, and capital expenditure of \$10.660 million resulted in total expenditure of \$19.976 million.

Objective:

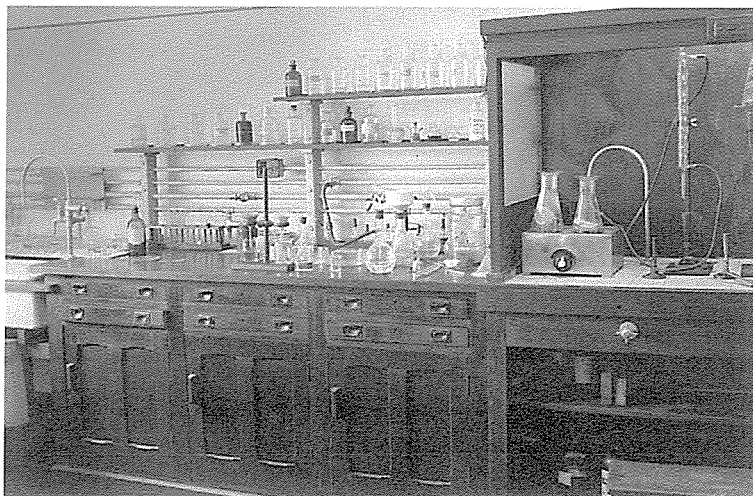
To provide high quality, independent chemical and scientific information and advice to government, industry and the public in order to enhance mineral, agricultural and industrial development, and the protection of community, consumer, environment and health standards.

Description:

This program, through the Chemistry Centre, provides information and advice to government agencies (including Police, Justice, Agriculture and Health) as well as industry and the public. The program contributes to the enhancement of the agricultural, mineral and industrial development and the protection of community, consumer, environmental and health standards in Western Australia. The Chemistry Centre also has statutory and advisory responsibilities dealing with the certification of analysts and analytical procedures.

Strategy:

To use professionally and technically qualified scientists who work with sophisticated equipment and use an extensive range of tests accredited by the National Association of Testing Authorities to acquire high quality, accurate analytical and scientific information.



Food and Drug Laboratory, 1950.



MINERAL SCIENCE *Sub Program*

Objective:

To provide efficient and effective chemical and mineralogical information and advice to the Department of Minerals and Energy for its geological mapping programs, and to the mineral industry for its metallurgical processing projects.

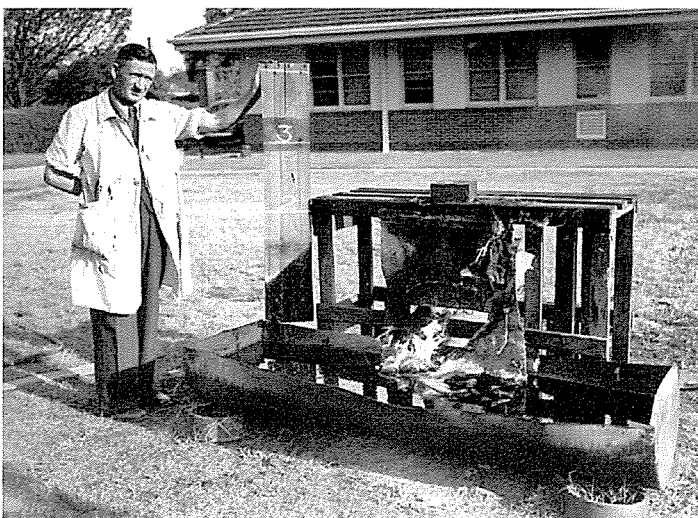
Description:

Advice is provided on the exploration for, and mining and processing of mineral resources through the use of specialist expertise to chemically and mineralogically characterise, identify and analyse rocks, minerals, mineral process samples and dust.

The Mineral Science Laboratory contributed to the detailed mapping of the State's mineral resources by providing comprehensive whole rock analyses to the Geological Survey. The Laboratory also provided analysis facilities for a very wide range of elements present at high through to ultra-trace concentrations. This capability is not matched by any similar laboratory in Australia, and is utilised in contributing to the generation of new Australian Standards under the auspices of the Standards Association of Australia. A diverse range of clients, especially those from the mineral processing sector, directed work of a specialised analytical nature to the Laboratory. The gold and precious metals industry, in particular, was well served with facilities ranging from fire assay with various collection procedures and finishes to utilising laser ablation-inductively coupled plasma-mass spectrometry for the identification of the provenance of gold using unique analytical signatures (fingerprinting).

The Laboratory has considerable expertise in the identification of dusts in the working environment, especially asbestiform fibres.

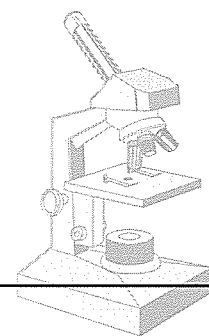
A number of clients, including the Health Department, Education Ministry, Building Management Authority and Department of Occupational Health, Safety and Welfare, made extensive use of this capability in resolving asbestos-related matters. In addition, members of the Laboratory provided expert advice to the Police Department on the comparative mineralogical analysis of scene-of-crime exhibits.



Test work on the flammability of floating oil, 1949.

MINERAL PROCESSING AND EXTRACTIVE METALLURGY

Sub Program



The Mineral Processing Laboratory conducted investigations associated with the physical beneficiation of ores, such as crushing, grinding, screening and flotation on a batch or continuous basis, as well as gravity, magnetic or electrostatic separation. The Laboratory also carried out roasting studies on a wide range of ores, using static, rotary or fluid bed systems. The pilot scale rotary kiln is a unique facility which was extensively used by industry for process evaluations. It was instrumental in the development by Laboratory staff in the 1960's of the Becher Process for the upgrading of ilmenite to synthetic rutile, a process widely adopted by the mineral sands industry in Western Australia.

The processing of high copper gold ores to recover copper values and the improved efficiency of the cyanide leaching step to reduce reagent consumption and leach time were two client-sponsored projects which are having significant success in the gold industry. The processing of base metal ores has received more attention and the Laboratory has increased its expertise with these systems.

The Kalgoorlie Metallurgical Laboratory provided broadly based metallurgical services and advice to the State's mining industry, in particular to gold producers in the Goldfields region. The Laboratory also conducted a range of chemical tests, including umpire fire assay and bullion analysis.

Objective:

To provide efficient and effective mineral processing and metallurgical laboratory facilities, expertise and advice to mineral industries.

Description:

Investigations are conducted into a variety of chemical and metallurgical techniques associated with the development of the State's mineral resources. The strategy which has been adopted to meet the objective is to perform work at laboratory and tonnage pilot scale. Activities include commercial consulting, internally funded and externally funded collaborative research with CSIRO and tertiary educational institutions. Staff have substantial expertise in the processing of mineral sands and gold ores.



Objective:

To provide efficient and effective chemical information and advice to government agencies which monitor and protect the environment, and to support programs which monitor and improve public and occupational health within industry and the community.

Description:

The sub program ensures that effective scientific support is available for government agencies in the areas of emergency services, occupational and public safety, disease prevention and health promotion, water resources, environmental protection and conservation. The strategy is to provide an effective and responsive capability to chemically monitor, evaluate and advise on the quality of the Western Australian environment. An effective emergency response capability is maintained to ensure adequate scientific support is available to cope with emergencies such as chemical spills and pollution incidents.

The Environmental Chemistry Laboratory continued to carry out chemical monitoring and evaluation of the Western Australian environment. Particular emphasis was directed towards the monitoring of air, waters, soils, sediments and biota for nutrients, pollutants, pesticides and trace organic contaminants. The Laboratory also assessed occupational exposure to chemicals and investigated odour and air pollution problems.

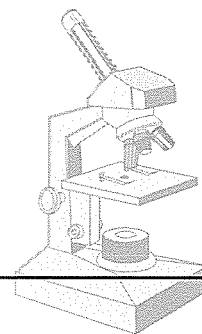
Significant support was given to the Health Department in a range of areas, including investigation of waste disposal problems and research and advice on technologies available for the destruction of hazardous wastes. The Laboratory also assisted with monitoring of the pest control industry and carried out pesticide residue surveys on fruit and vegetables to determine suitability for human consumption. Further services included analysis and advice on tip site leachates, and the inspection of hospitals to monitor the safety of operating theatres with respect to anaesthetic gases.

The Laboratory provided a scientific inspection and analytical service to investigate safety problems in occupational environments. Examples included studies on atmospheric levels of solvents and hazardous fumes resulting from spray painting and welding, the investigation of indoor air quality in multi-storey buildings following complaints of respiratory problems, and the health hazards incurred by dusts associated with the training of bricklayers, plasterers and tilers.

Investigative and analytical expertise was provided to assist the Department of Environmental Protection in its air and water pollution investigations. Baseline surveys of ecosystems with respect to man-made chemical pollutants was another area of involvement.

Within the Department of Minerals and Energy, the Laboratory provided chemical support to the Geological Survey Division in its program of surveying and mapping the State's water resources. It also assisted the Mining Operations Division in monitoring the health and safety of workers in the mining industry with respect to materials such as mercury, arsenic and toxic gases. This involved on-site and laboratory investigations.

There was heavy involvement in studies of mining sites where there are special problems associated with cyanide in tailings. The Laboratory also provided analysis and advice on the quality of water for a range of applications including human consumption, suitability for stock, plants and marine life and also for use in swimming pools.



The Soil Chemistry Section contributed to studies in the areas of soil conservation, rangeland management, resource inventory and land capability and is working closely with the Department of Agriculture's scientific officers to achieve these ends. Soil problems peculiar to Western Australia presented particular challenges to the application of science to agriculture. Studies included the influence of wind on soil erosion, investigations to determine the viability of applying treated "red mud", (the waste product from bauxite refining) to ameliorate the poor Western Australian soils to enable them to improve moisture and phosphorus retention, and the management of nutrients in turf applications.

The Plant Chemistry Section concentrated its efforts in supporting projects aimed at improving the efficiency of fertiliser application in cereal, pasture, horticulture and grape production. Work was also directed at minimising nutrient runoff and associated water pollution of the coastal plain in support of initiatives by the Department of Environmental Protection. The Section was also involved in investigating toxic problems in plants, such as the relatively high concentrations of cadmium in Western Australian cereals, by studying the relationship between cadmium uptake with plant species, varieties and environmental effects.

A major contribution of the Special Projects Section has been research into the development of new grain legumes for animal and human consumption. In previous years, research focussed on the narrow-leafed white lupin, *Lupinus angustifolius*, which has become the State's second largest crop. Current research is directed towards the development of alternative grain legumes that can be grown in areas that are not suited to these species. These alternative legumes invariably contain toxic, anti-palatable and anti-nutritional substances. They include alkaloids in alternative species of lupins, neurotoxic amino acids in *Vicia* and *Lathyrus* species and tannins in *Pisum* species (field peas). Rapid diagnostic tests for these

Objective:

To provide efficient and effective chemical information and advice to the Department of Agriculture, to Western Australian agricultural development and to the Health Department to ensure the safety of Western Australian food products.

Description:

This sub program provides support to government agencies in a number of areas including agriculture, disease prevention and health promotion, and environmental protection.

Strategy:

To provide chemical requirements for the Department of Agriculture's programs, especially those which are aimed at improving agricultural production in Western Australia and the development of efficient and internationally competitive export and domestic plant industries. Collaborative research is undertaken into various aspects of agricultural chemistry, and investigations of food products are conducted for compliance with relevant Health Department regulations as well as to support Western Australia's food processing industries.

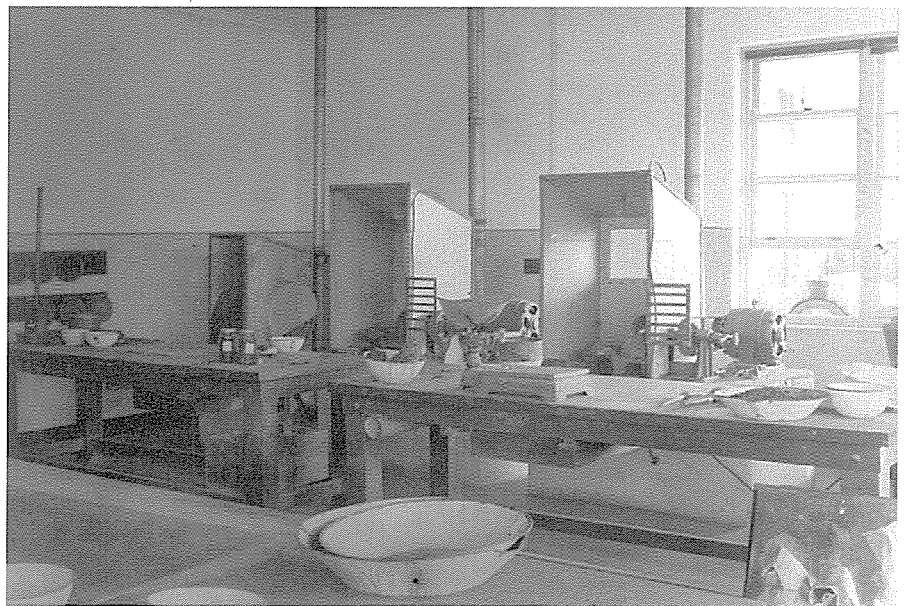
substances are being developed for use in breeding programs that will result in new cultivars containing very low concentrations of toxins.

The Section is also participating in a major research project with the Department of Conservation and Land Management in a search for new drugs from the State's diverse range of plant species. There is potential for the State to earn millions of dollars in royalties if promising plant compounds, such as concocurvone in a species of smokebush (genus *Conospermum*), develop into drugs for the treatment of diseases such as cancer or HIV.

The Food Science Section played a key role in supporting the Food Monitoring Program conducted by the Health Department. The Section

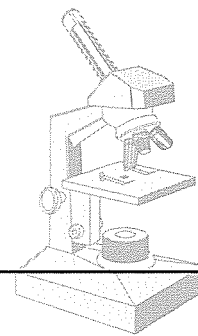


investigated food products for compliance with health regulations and provided support for the State's food processing industries. The Section also carried out investigations into factors which influence the production of glycoalkaloids, in particular solanine in potatoes. Studies of heavy metal residues in fish and crustacea for the Fisheries Department, the development of techniques for determining the toxicity of algal blooms and the accumulation of toxins by shellfish in the Peel Harvey Estuary are examples of the work of the Section which have played an important role in protecting the health of the community.



Mineral Sample Preparation Room, 1950.

FORENSIC SCIENCE *Sub Program*



The Forensic Toxicology Section absorbed the major portion of the Laboratory's resources and worked in close cooperation with forensic pathologists from the State Health Laboratories in providing information to the State's Coroners to enable them to establish the causes of sudden and unexplained deaths where drug or poison overdoses were involved. This Section was involved in the examination of post mortem exhibits for the presence of drugs and poisons and the subsequent quantitative analysis of the levels of the drugs or poisons detected. Reports were provided on the significance of the levels found. It was involved in the investigation of most sudden and suspicious deaths throughout the State including fatal traffic cases. This Section worked closely with the Police Traffic Branch, providing an analytical and advisory service as well as expert evidence to the courts, in relation to traffic offences involving alcohol and drugs. It also assessed evidential breath alcohol testing equipment and the competency of the Police operations of breath analysing equipment.

The Illicit Drugs Unit provided the scientific needs of the Police Drug Squad in their efforts to control illicit drugs in Western Australia. Drugs were identified and where required, additional assistance provided in establishing the source. Where clandestine drug laboratories were suspected, a chemist from the Laboratory accompanied the police to identify the drugs and chemicals found and provided information on the chemical process being used to manufacture the drugs. Chemists have been frequently called to provide expert evidence to the courts.

The Physical Evidence Section provided scientific support to the Police Forensic Branch and the CIB in the investigation of evidence at scenes of crime and in providing expert evidence in court. This was generally done through physical evidence submitted to the Laboratory but where it was considered necessary, a chemist attended the scene. Some of the more common types of material examined included

Objective:

To provide efficient and effective chemical and related scientific information and advice to government agencies involved in justice administration.

Description:

This sub program ensures that government agencies such as the Police, Emergency Services and the Ministry of Justice have access to adequate scientific expertise through the provision of comprehensive forensic chemistry and toxicology facilities.

glass, a smear or chip of paint in connection with a hit-and-run incident, or the identification of chemicals in a wilful damage charge. Generally, the Laboratory has dealt with trace evidence perhaps no bigger than a pinhead. Identification of natural or man-made fibres, from assault or murder cases also forms an important part of the Section's work as does the examination of gunshot residues to assist Police and Coroners in establishing the type of firearm used in a fatal shooting or to establish whether the death was the result of homicide or suicide. Laboratory and less frequently on-site investigations were carried out to determine if and what accelerants were used in cases of suspected arson. The Section has been a valuable contributor to the Police in terms of lectures to detective training schools. The chemists involved in this Section were also frequently called on to appear as expert witnesses in the courts.

The Laboratory continued to provide an analytical and advisory service to assist prison authorities control drug use through the analysis of urine samples or solid drugs.





Objective:

To provide efficient and effective scientific information and advice to the Building Management Authority, Ministry of Consumer Affairs, other government agencies and local industries on materials uses, specifications and failures.

Description:

The government provides significant expenditure on construction and property services. This and other programs on consumer assistance and economic trade and development require quality scientific support and advice on materials specification and the use and investigation of material failures. Expertise is provided for the evaluation and advice on building and polymeric materials, metals and corrosion and consumer products.

The Building Management Authority was advised on the suitability of materials such as surface coatings, metals and construction materials for use in buildings. The Laboratory gave advice on reasons for material failures such as defects in cement, mortars, renders, other building products and on the compatibility of new cement products with various types of bricks. The Laboratory also provided technical assistance for the restoration of historical buildings. In addition, graffiti removers and anti-graffiti coatings were areas where the Laboratory provided state-of-the-art technical assistance, not only in relation to removal of the graffiti itself and advice on the safety of the solvents used for its removal but also suitability of the many anti-graffiti coatings for the WA climate.

The Ministry of Fair Trading and Small Claims Tribunal were provided with frequent advice by the Laboratory on a range of topics. This took the form of oral advice or comprehensive written reports followed by personal attendance at hearings to submit expert evidence when needed. Such cases included the fretting of mortar and brickwork, problems with the painting of swimming pools, stains on floor coverings, and

whether ceramic tiles are manufactured and laid correctly.

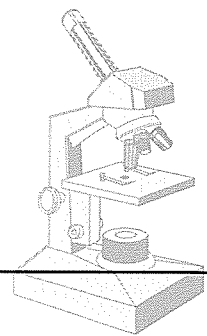
Corrosion problems present an enormous cost to the State, and the Laboratory has been frequently consulted on various failures due to corrosion. Examples of this work included exudate from concrete attacking surrounding aluminium windows, pipe lagging corroding of copper piping, corrosion of surgical instruments, and the premature corrosion of mining equipment.

The Laboratory worked in close cooperation with the Department's Mining Operations Division in relation to corrosion in mines. Research was carried out on the reasons for corrosion of friction rock stabilisers in mines and attempts were made to predict the longevity of the stabilisers in the interest of mine safety.

The State Tender Board was provided with assistance in writing tenders for a number of products. The Laboratory provided technical input and assessed Material Safety Data Sheets to ensure that the manufacturers supply technologically advanced and environmentally friendly products.

Apart from advice to government, the Laboratory assisted industry with telephone enquiries and a range of technical investigations. Examples include the evaluation of industrial grade detergents, assessment of the causes of paint failures on commercial buildings, assessing the failure of aluminium clad polystyrene foam ceiling panels at a major building site and investigating the safety of a concrete sealing compound used in the central city.

Another function of the Laboratory was the collection of *Scaevola spinescens* from east of Kalgoorlie and the preparation of an extract from the bush on a fortnightly basis for cancer sufferers. The supply of this extract is limited to those who were receiving the product as at 1 July 1991. The Government has decided that this product is to be phased out over five years and no new requests are being accommodated.



The Racing Chemistry Laboratory continued to provide drug monitoring and advisory and research services for the Western Australian Turf Club, the Western Australian Trotting Association and the Western Australian Greyhound Racing Association.

At city trotting meetings, an on-course service was provided which enabled blood carbon dioxide levels to be determined prior to racing. This was to detect the use of oral drenches of sodium bicarbonate or other alkalisating agents administered prior to racing.

Because the drugs used in racing tend to change as new drugs become available, ongoing research was carried out in an attempt to keep up with, or ahead of, those illicitly using drugs in racing. The Laboratory conducted research into new procedures for detecting highly potent low-dose drugs as well as investigations into the rates at which drugs are excreted by the animals, and in what form. This information is vital to the Laboratory in terms of knowing what to look for and also to the stipendiary stewards in being able to interpret when a detected drug was administered to the animal.

The Laboratory conducted testing of blood and urine samples in relation to the pre-purchase of horses and also some elective testing for a limited range of drugs to establish, for example, that horses were drug free prior to racing. Jockeys and reins persons were also subject to drug testing and during the year, the Laboratory undertook some employee drug checks.

The Chief of the Laboratory provided advice to the various racing codes on the rules of racing as they relate to drugs. This required regular meetings with his counterparts in other States to provide recommendations on rule changes and advice relating to the excretion rates of drugs. This advice was provided to the trainers and racing veterinarians to assist them to comply with the rule requiring trainers to present horses for racing free from drugs and prohibited substances.

Objective:

To provide efficient and effective chemical information and advice to the horse and greyhound racing industries to ensure an effective doping control program.

Description:

The racing industry in Western Australia is a major employer and a significant business activity. The provision of up-to-date, responsible and efficient analytical chemistry support is essential to ensure timely advice is available to the administration of the racing industry. This sub program makes available effective controls of the use and abuse of performance enhancing drugs in order to ensure that the public's confidence in the industry is maintained and that the industry's credibility and profitability are continued.

Chemistry Centre administrative issues

Application was made to the National Association of Testing Authorities (NATA) for quality systems accreditation to Australian Standards for the entire Chemistry Centre, and for a range of specific tests for the Agricultural Chemistry Laboratory. The accreditation should be confirmed during 1994. Accreditation of the Forensic Science Laboratory was delayed while NATA reached agreement with an American accreditation body. Accreditation should be completed by the end of 1994.

A client survey was conducted by the Institute for Research into International Competitiveness at Curtin University. The survey information will be taken into account in planning provision of services by the Chemistry Centre.

New building

Construction of stage one of the new Chemistry Centre complex on the site adjacent to Curtin University of Technology was mostly completed, with phased occupation by the Mineral Processing Laboratory expected to take place in 1994.



The facility will provide major input into mineral research in Western Australia and features equipment to support this effort. The laboratories and plant areas will allow projects with the mineral industry, CSIRO and Curtin to be fully developed on site. The cross-flow of information will greatly enhance research and development of significant mineral deposits and lead to value added products. A fully automated computerised building management system monitors the performance of all control mechanisms and maintains the security of the site.

The building has combined full functionality with pleasing aesthetics and becomes a significant feature which enhances the southern entrance to Curtin University. Planning for the subsequent stages of the project has been deferred.

Commercialisation

In January the Government announced that the Chemistry Centre would be fully commercialised from 1 July 1994. Sixteen government agencies will be provided with central funding based mainly on their historical requirements of the Centre, and they will not be bound to use the service of the Centre.

The Centre's move to commercialisation has resulted in the further upgrading of the computerised financial systems brought on-line last year. This has produced better information and reporting facilities of revenue and inventory to the Laboratories. Consultants assessed and reported on the systems in place and made recommendations for improvements. These improvements and the appointment of a Finance Manager were put into effect towards the end of the financial year.

The Executive and the Senior Management have been involved in intensive planning for the many changes required to be put into effect to ensure that the Chemistry Centre's services are enhanced by the commercialisation process.

Laboratory information management systems

The implementation of the Centre's three year information technology plan was completed. The main goal of implementing laboratory information management systems in the Laboratories has been met in all but one case. Implementation has not proceeded with the Kalgoorlie Metallurgical Laboratory as its future has not yet been determined.

The METRIX system is now operational in the Agricultural Chemistry, Environmental Chemistry and Mineral Science Laboratories. This system, in addition to laboratory management and work flow control, has facilities for connection to the wide range of analytical instruments in use in these Laboratories. Links with financial management systems in administration have also been implemented.

The Forensic Science and Racing Chemistry Laboratories use customised management packages that have been previously developed in-house to accommodate the unique styles of operation in these areas. Commercial packages were not found that could provide the extensive capabilities of these systems. Only small enhancements were required to allow connectivity to the Centre's financial systems.

The Materials Technology and Mineral Processing Laboratories use a management package developed by the Winthrop Technology group under contract. The majority of the work done by these two Laboratories is project oriented and of an investigative nature, and their systems have been customised to meet the management requirements for this type of work.

From 1 July 1994 work in the Centre will be managed using these systems accounting system within the administration area.

PLANNED ACHIEVEMENTS AND OUTCOMES

Planned Achievements

Outcome

To achieve national accreditation of the Agricultural Chemistry Laboratory for soils and plants investigations, and of the Forensic Science Laboratory for forensic investigations in order to meet the statutory, legal and investigative needs of clients.

Application was made to the National Association of Testing Authorities (NATA) for quality systems accreditation to Australian Standards for the Agricultural Chemistry Laboratory. The accreditation should be confirmed during 1994. Accreditation of the Forensic Science Laboratory was delayed while NATA reached agreement with an American accreditation body. Accreditation should be completed by the end of 1994.

To develop a database of environmental pesticide levels in Western Australian air, water, soil and foods to assist in the planning of future pesticide monitoring projects.

This project was not proceeded with because of a proposed national registration scheme for pesticides to be established in late 1994 and the wish to reduce any overlap of state and federal agency responsibilities.

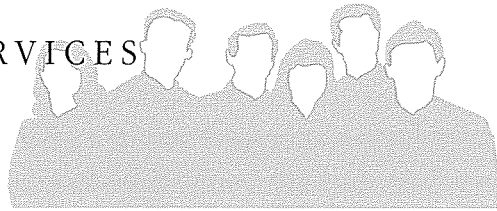
To respond to client demands for enhanced investigative services by extending the capacity of the Chemistry Centre in the areas of post harvest technology, mineralogical and metallurgical testing, corrosion technology, hazardous waste treatment, forensic science and drug testing for racing agencies.

A client survey was conducted by the Institute for Research into International Competitiveness at Curtin University. The survey information will be taken into account in planning provision of services by the Chemistry Centre which has been operating on a commercial basis from 1 July 1994.

To complete the implementation of laboratory information management systems in each Laboratory, in order to provide the data essential for improved management of workflows and costs, and for the assessment of performance.

Laboratory information management systems were implemented in all of the laboratories except the Kalgoorlie Metallurgical Laboratory, the future of which was under review. In 1994-95 all work in the Centre's other laboratories will be processed using these management systems, linking financial data to the central accounting system.





Objective:

To assist the Department in using its human, financial and other resources effectively and efficiently to provide a service responsive to the needs of the community, industry and Government.

The program provides administrative and technical support services to the Department's Corporate Executive and operating Divisions to assist in optimising the resources provided by Government.

The nature of these services is affected by the requirements of agencies such as the Department of Premier and Cabinet, Public Service Commission, Treasury, Department of Infrastructure and Government Accommodation, State Services and Building Management Authority.

The continuing trend towards greater Departmental accountability has seen a growing number of central agency functions devolved to the Department,

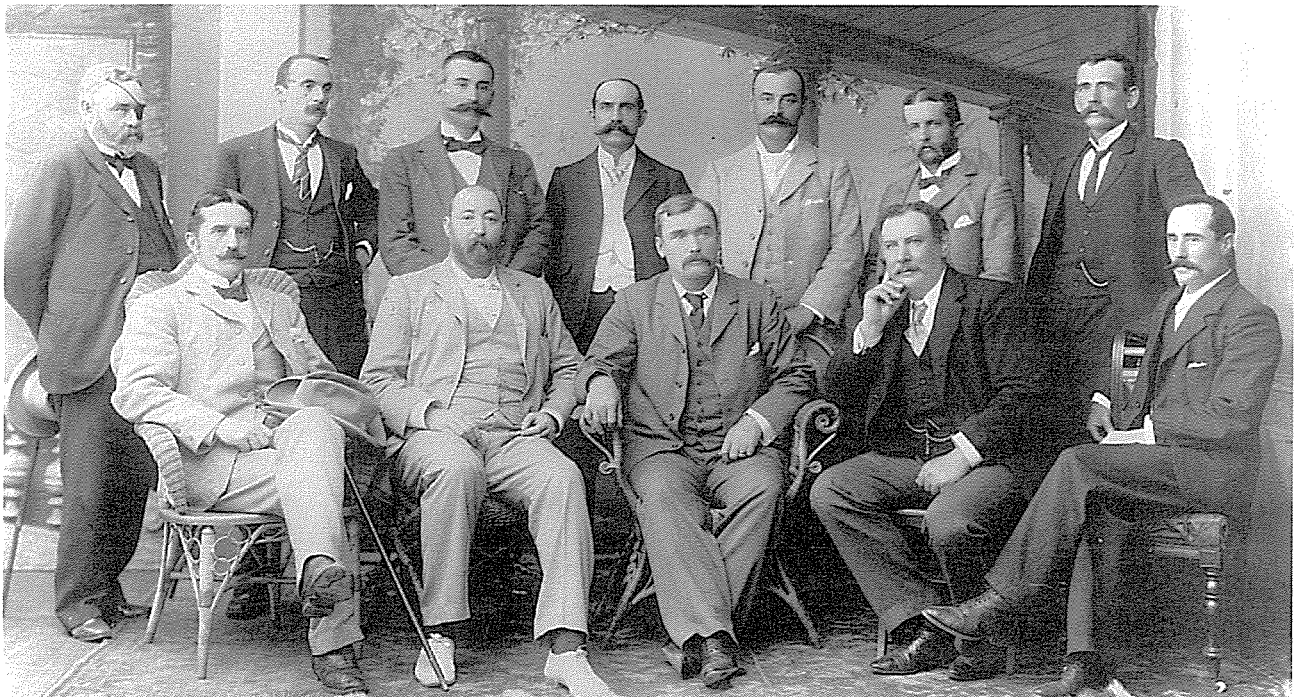
putting pressure on resources within this program. This has necessitated a continuous review of systems and procedures to make the best use of staff and other resources.

The resources utilised in providing these corporate services have been allocated to the programs previously described in this report.

Corporate planning

A new program structure came into effect on 1 July 1993. The structure was designed to improve the Department's focus on its customers, and to better align divisional activities with planned program achievements. Planning emphasis during the year has been to reinforce the Department's commitment to customer needs of all programs.

To establish benchmark performance indicators, the Institute for Research into International Competitiveness at Curtin University was contracted to conduct surveys to determine the level of customer satisfaction with the products and services provided by the Chemistry Centre, the Petroleum Tenure sub



Minister of Mines, Henry Bruce Lefroy (centre front) and Chief Officials of the Mines Department, 1898.

program and the Regional Geoscience Mapping sub program. The results of these surveys have been included in the program reports.

The Government's commitment to a Customer Service Charter added further impetus to the Department's moves. By the end of the year, sub program managers had begun to produce a draft charter which would have the involvement of their customers and the commitment of their staff. In many cases these charters are being developed as an integral part of a more general move towards the implementation of Total Quality Management principles and practices. Currently, six out of nine Divisions have either commenced work towards implementing quality systems or have initiated staff training.

Public affairs, displays and publications

During the year the Department developed and published *A Guide to Minerals and Petroleum in Western Australia*. Over 4 400 copies were distributed by year-end. Due to strong demand, the publication will be updated regularly.

As part of the Department's centenary celebrations, a series of special events and displays was organised. These included the re-creation of a historical mining office in the foyer of Mineral House; the launch of the book *A Rich Endowment* - a history of the Department by Ken Spillman; a centenary ball, and a compilation of photographs of all Ministers for Mines from 1894 to 1994.

An increase in promotional graphics reflected the significance placed on our centenary year, with 82 major displays being prepared. These included divisional expositions, the Gold Conference Kalgoorlie, WAMEX, Heritage Week and a 1900's replica mining warden's office.

The photographic competition to encourage professional and amateur photographers to illustrate the breadth of activities in Western Australia's mining

and petroleum industries drew 46 entrants, 16 more than the previous year. For the first time the competition included a section for students.

Considerable effort was devoted during the year to media relations. In addition to preparing more than 100 media releases, staff also prepared many special feature articles for publications ranging from resource journals to regional newspapers.

The Department assisted in sponsoring a visit to the State by a group of journalists from British publications. This resulted in a series of stories and features in these publications on Western Australia's mining and petroleum sectors.

The Department's annual report for 1992-93 received recognition with the presentation of a Bronze Lonnie Award, the seventh award in as many years.

As part of the State's High Court challenge to the Commonwealth Native Title Act, the Department assisted with the writing and production of two booklets *History of Mining in Western Australia* and *Mining in Western Australia*.

Interactive careers material was developed in conjunction with the Chamber of Mines and Energy, and the display was included in Sci-Tech's *Great Australian Treasure Hunt*. The Department was a sponsor for the *Great Australian Treasure Hunt* and provided input and advice for other aspects of this display.

Geoscientific graphic material for publication was 25 per cent above anticipated production levels. The production of figures, diagrams, slides and overhead films was carried out to meet the requirements of all programs.

Some prominent projects included the International Geological Conference in Kalgoorlie, the 12th Annual Analytical Chemistry Conference (Burswood), and the Youth ANZAAS '93 Congress in Perth.



Financial management

Training for staff with financial responsibilities continued throughout the organisation and a high level of liaison was maintained to ensure that accounting and reporting structures met staff needs, while also meeting the needs of the Executive and the State Treasury

Tenders were called for a fully integrated financial management information system to meet future needs including both accrual and cash accounting.

Corporate credit card facilities were installed in head office and at all regional and out station localities enabling officers to purchase goods and services of an urgent nature.

Capital works, building services and supplies

The Department was allocated \$13 404 million in the 1993-94 financial year, of which \$11 430 million was to complete works in progress and \$1 974 million was for new works. Of the works in progress, \$11 307 million was provided for construction of the Chemistry Centre complex at Bentley. The project is running a little behind schedule, but completion and occupation are expected to occur early in the new financial year.

Expansion in staffing led to a shortage of accommodation within Mineral House and a number of operational units have been provided with accommodation outside the complex.

The Department received approval from the State Supply Commission for stage two devolved purchasing. This enabled the Department to carry out its own purchasing up to a value of \$50 000. The Department is one of the first to have been provided with this authority.

Human resource management

The Department's approved average staffing level for the year was 736 full time equivalents. Of this number, 32

were utilised in special activities with funding being provided from external sources.

The rate of turnover was 13.87 per cent with 137 staff resigning or retiring and a total of 143 new staff recruited. The number of new staff increased significantly as a direct result of the engagement of a number of short term contract appointments for new Government initiatives.

Human resource management responsibility continues to be devolved from central government agencies. Total Quality Management, customer focus, customer service charters and new staff selection guidelines have been adopted to ensure that an effective service to clients is maintained.

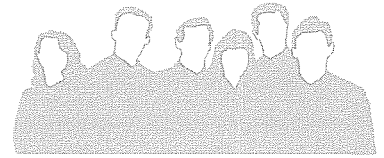
During the year the Department reviewed its Equal Employment Opportunity management plan and a demographic survey of employees was conducted.

Commercialisation of the Chemistry Centre resulted in the introduction of a voluntary severance scheme. The Human Resources Branch has worked closely with the Chemistry Centre in resolving personnel issues resulting from this commercialisation.

Training initiatives continued with 599 staff, or 56.8 per cent of the total, attending a variety of management, development and technical seminars, workshops and courses. The Department's commitment to the training guarantee levy came to 2.37 per cent against the Government specified minimum requirement of 1.5 per cent.

Enterprise bargaining

An Enterprise Bargaining Joint Consultative Committee, made up of elected delegates from departmental Workplace Committees, was established in July 1993. The Committee met at regular intervals throughout the year. Its main task was to consider the productivity and efficiency initiatives



proposed by the Workplace Committees for inclusion in the Department's enterprise bargaining agreement.

Changes to the Government's industrial relations legislation, proclaimed in December 1993, offered parties the choice of continuing with an industrial agreement or changing to a workplace agreement. Departmental employees and management were canvassed with the majority supporting an industrial agreement.

The Department's peak Negotiating Committee, made up of management, employee and union representatives, was formalised in February 1994. The Committee will be responsible for the development of an agreement for consideration by the Government. It is anticipated that a draft agreement will be drawn up and presented to the Department of Productivity and Labour Relations for comment early in the new financial year.

Worker's compensation

The emphasis on occupational health and safety education, awareness and case management continued and the number of workers' compensation claims lodged decreased again this year, with the actual cost of claims for the period also significantly reduced.

During the year there were 20 workers' compensation claims, of which 18 were accepted and one rejected, with one still pending a decision. A total of 274 person days were lost through claims lodged during 1993-94. A further 630 person days were lost due to long-term claims previously lodged.

The continued engagement of a part-time occupational therapist/counsellor ensured ongoing claims/case management, workplace assessments, confidential counselling, safety awareness and education. This contributed greatly to the reduction of claims, costs and the avoidance of many potential workers' compensation claims.

The Department had a workers' compensation premium for the year of 0.951 per cent, a frequency rate of 4.3

per cent while the estimated cost of claims was \$0.57 per \$100 payroll.

Information technology

An external review of computing and information systems effectiveness and efficiency was completed during the year. Key recommendations included the need for a more appropriate computing architecture, associated standards and procedures. Following consideration by staff, a plan for implementation was developed and approved.

Development and testing of the tenement graphics system (TENGRAPH) was completed with implementation to commence in August 1994. Approval was received from the Government to accelerate the data take-up and Statewide implementation of TENGRAPH thus reducing the implementation time from five to two years. The target date for completion has been brought forward to June 1996.

Modifications to the mining tenement index (TENDEX) system to provide an improved on-line interface to the TENGRAPH database were completed and implemented. Changes to the TENDEX system were completed to accommodate changes to the Mining Act.

Expanded functional/user requirements for inclusion in the new dangerous goods and explosives information system (DEXIS) emerged. These additional requirements were incorporated into the functional specification for the proposed system. Final acceptance of the expanded user requirements and system specification has been achieved.

Draft user requirements and business rules for the proposed petroleum tenement management system (PETMAN) were prepared. A working group was initiated to establish common system objectives and data boundaries/overlap within the Department.

Following Government approval, the Department began development of an on-line dial-in access system to a number



of Departmental databases. Design and development of the appropriate system software during 1994-95 will enable direct access by industry.

Following an extensive review of available packaged software to manage and provide access to a digital version of mining and petroleum legislation the product Folio Views was selected. The implementation of an electronic legislation system will significantly improve the ability of the Department to manage and access relevant mining and petroleum legislation.

The Department's telecommunications traffic between Perth and Kalgoorlie was integrated onto a single high speed communications line to handle data and voice. Further improvements will be incorporated to reduce telephone call costs and minimise delays on the communications line. The Mineral House based local area network was expanded. Further improvements were also made to the data communications equipment and software.

Extensive negotiations continued during the year between the Department, the Australian Universities Vice Chancellor's Association and the Department of State Services to arrange a direct connection to the Internet/AARNet Service. This is the world's largest computer network linking nearly 25 million users across the world through universities and provides unprecedented access to global information services. Agreement was reached for a high speed direct connection to be established between the Department, Bureau Services and INTERNET with plans to implement the service in the first quarter of next year.

A consolidated computing/office systems help desk was established as a flow on from the earlier external review of computing. In addition, approval was received to install an electronic mail system together with a scheduling system and document access system. Implementation of these services will proceed on a phased basis during the coming year.

Library and information services

Library software was installed and thoroughly tested during the year in anticipation of going into production mode in early 1994-95. This system will automate all library operations and provide an on-line search facility for patrons via personal computers installed in the library.

The continuing activity of the exploration and mining industries resulted in a 10 per cent increase in public users of the library during the year and interrogations of WAMEX open file exploration reports increased by 16 per cent.

The Departmental museum was visited by a number of school groups who were treated to one hour lessons in the museum gallery during the year. Contact has been established within the Secondary Schools Geology Syllabus Co-ordinator and lessons are being tailored to complement the school syllabus.

There was a 30 per cent increase in publication sales compared with last year. Educational fact sheets on nickel, tin/tantalum/lithium and on the geology of the Bungle Bungle Range, North West Cape and Kennedy Range were published while general enquiries from the public on geological matters remained steady at a rate of over 100 per month.

Internal audit

In addition to the traditional transaction based audits, 13 systems based audits were carried out in accordance with the strategic audit plan. Audits were also conducted at six of the Department's regional offices. A value for money audit was undertaken, and an efficiency review on the administration of petroleum titles. A new information technology audit position was created and filled on 23 May 1994 and a strategic audit plan was developed for 1994-95. This reflected greater emphasis on value for money audits and information technology reviews.

FINANCIAL REPORT

Accounting

The financial statements for the year ended 30 June 1994 have been prepared in accordance with the provisions of the Financial Administration and Audit Act, 1985 and the Treasurer's Instructions issued pursuant thereto. To assist in comparisons with other Government agencies they follow the format suggested in the appendices to the Treasurer's Instructions.

The Statements are prepared on a cash basis with only collections received and payments made included. The Department will implement accrual accounting and will report on that basis for 1994-95. For 1993-94, accrual statements have been prepared. However they have not been audited and thus appear as supplementary financial information in this report.

The Statement of Consolidated Fund Receipts (Table 1) provides details of actual revenue received and credited to the fund. This is compared with the Consolidated Fund receipts estimates under the headings Territorial, Taxes and Licences and Departmental Revenue. Territorial Revenue is revenue which has not been generated from fees and charges levied for services provided by the Department. Taxes and Licences Revenue is revenue from fees and charges for services rendered by the Department that are regulatory in nature. Details of actual revenue for the previous financial year have also been provided for comparison purposes.

Revenue

Consolidated Fund

During the financial year the Department was responsible for the collection of \$404 million through the Consolidated Fund (CF), (Table 1). Mineral and petroleum royalties collected from companies operating under State legislation comprised 83 per cent of this amount (Figure 10). Part of the revenue was also payments collected by the State on behalf of the Commonwealth for petroleum produced within Commonwealth waters. These receipts subsequently were paid to the Commonwealth by way of special purpose payments after payment into the CF.

In addition to royalties, the Department also collected lease and other rental charges, (representing approximately 14 per cent of revenue), taxes and licences (approximately 2 per cent) and Departmental revenue (approximately 1 per cent).

Expenditure

Consolidated Fund

Funds are appropriated by the Parliament through the Consolidated Fund to provide for recurrent services and capital expenditure.

Recurrent Services

This appropriation includes provisions for operating costs of the Department, refunds of revenue collected in previous years and payments to the Commonwealth (Figure 11). Payment to the Commonwealth are made under the provisions of the Petroleum (Submerged Lands) Act 1982 for the Commonwealth share of royalties received from offshore operations. The Commonwealth revenue has been collected by the State into the Consolidated Fund. Payments to the Commonwealth totalled \$11.413 million in the year, compared with \$21.537 million paid in the previous year (Table 2).

During the financial year, the Department's recurrent expenditure budget of \$68.722 million was underspent by \$3.315 million (4.82 per cent) mainly due to lower than anticipated payments to the Commonwealth.



Capital Expenditure

During the year, \$11.765 million was expended on capital projects funded from this source (Table 3), of which \$9.657 million related to Stage One of the Mineral Research Centre construction at Bentley.

Financial Management

The Department has continued to operate a financial management information system (FMIS) which provides the Accountable Officer and Corporate Executive with timely and comprehensive financial management reports to assist in resource allocation and management decisions. Tenders have been called for a new generation financial management information system which meets the future needs of the Department and provides both accrual and cash accounting data. It is anticipated that a new system will be implemented, during 1994-95.

Pricing Policy

The Department generally adopts a full cost recovery user pays approach in determining fees and charges for services provided to the public and industry. With some services, where there is considered to be an element of service to the general public, a nominal fee has been determined. However, this represents only a small fraction of services provided and has minimal impact on revenue. In other cases the data collected is considered to be a freely available resource for the public and for industry, but a charge is levied to cover the cost of supplying this data in user friendly formats.

The Chemistry Centre's fees and charges are based on full cost recovery. In addition to charging for services provided to non-Government clients and Government trading concerns, the system of notional charging for services provided to other Government agencies was further enhanced. This initiative is a precursor to the Chemistry Centre operating under the principles of a net appropriation in 1994-95 as a commercialised business unit.

Royalty Policy

The Department has a corporate objective of ensuring that the community receives a fair return for the extraction of non-renewable resources owned by the people of the State. The Department aims to ensure that these royalties are collected on time and in an economically and administratively efficient manner.

Figure 10: Revenue 1993-94
Total -\$404.2 Million

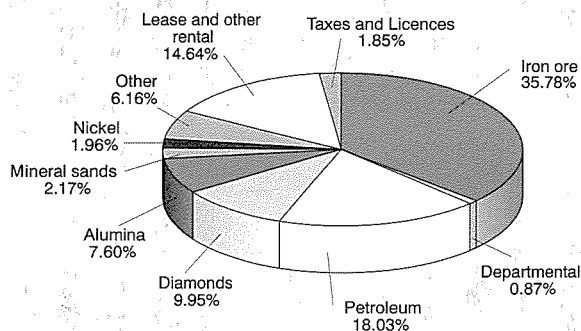
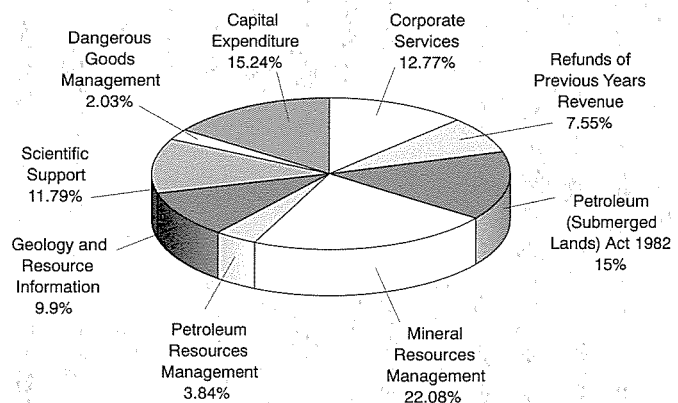


Figure 11: Departmental Expenditure 1993-94
Total -\$77.2 Million



FINANCIAL REPORT

Table 1: Statement of Consolidated Fund receipts

1992-93 Actual \$		Estimate \$	1993-94 Actual \$	Variation \$
Territorial				
152 674 073	Iron ore	151 500 000	148 674 163	(2 825 837)
79 728 050	Petroleum	106 000 000	72 886 319	(33 113 681)
40 819 425	Diamonds	30 500 000	40 201 662	9 701 662
28 715 040	Alumina	32 000 000	30 737 151	(1 262 849)
9 557 398	Mineral sands	9 500 000	8 773 220	(726 780)
9 242 491	Nickel	10 500 000	7 908 430	(2 591 570)
28 348 218	Other	26 000 000	24 897 765	(1 102 235)
53 816 536	Lease and other rental	54 565 000	59 185 189	4 620 189
402 901 231		420 565 000	393 263 899	(27 301 101)
Taxes and Licences				
2 899 167	Petroleum Permits and Licences	2 935 000	3 326 371	391 371
2 532 751	Prospecting Exploration and Other Mining Licences	2 460 000	3 244 505	784 505
140 087	Explosives Regulations	140 000	153 833	13 833
418 308	Flammable Liquids Regulation	418 000	546 719	128 719
185 125	Transport of Dangerous Goods	185 000	202 522	17 522
6 175 438		6 138 000	7 473 950	1 335 950
Departmental				
56 591	Registration	70 000	72 985	2 985
1 593 375	Chemistry Centre	1 400 000	1 386 542	(13 458)
524 728	Explosives	481 000	606 491	125 491
652 963	Sale of motor vehicles	-	-	-
455 937	Administration	206 000	679 738	473 738
412 890	Geological Survey	275 000	534 704	259 704
130 514	Surveys and Mapping	131 000	144 979	13 979
64 340	Mining Operations	21 000	48 855	27 855
45 324	Other	21 000	27 750	6 750
3 936 662		2 605 000	3 502 044	897 044
413 013 331	Total Receipts	429 308 000	404 239 893	(25 068 107)

Explanations of variations between the current year estimates and actual results, and the actual results compared with the preceding year, are set out in Note 2.



FINANCIAL REPORT

Table 2: Statement of Consolidated Fund payments

Division 31 - MINERALS AND ENERGY					
1992-93 Actual \$			Estimate \$	1993-94 Actual \$	Variation \$
44 863 569	Item 39	Amount provided for Recurrent Services for year	54 011 000	53 884 946	(126 054)
		Amount Authorised by Other Statutes			
106 049		- Salaries and Allowance Act 1975	111 000	109 407	(1 593)
21 536 625		- Petroleum (Submerged Lands) Act 1982	14 600 000	11 412 600	(3 187 400)
66 506 243		Total Recurrent Service....	68 722 000	65 406 953	(3 315 047)
3 375 335	Item 20	Amount provided for Capital Services for year	13 404 000	11 764 693	(1 639 307)
69 881 578		Grand Total	82 126 000	77 171 646	(4 954 354)
Description of Recurrent Expenditure					
9 628 114		Corporate Services	9 477 000	9 854 515	377 515
		Details :			
7 323 714		Corporate Development	7 553 000	7 701 957	148 957
974 152		Corporate Directorate	566 000	640 365	74 365
1 330 248		Public Relations/Corporate Publications	1 358 000	1 512 193	154 193
2 396 006		Refunds of Previous Years Revenue	6 279 000	5 828 219	(450 781)
21 536 625		Petroleum (Submerged Lands) Act 1982	14 600 000	11 412 600	(3 187 400)
PROGRAMS					
Program 1:					
15 245 688		Mineral Resources Management	16 579 000	17 040 997	461 997
Sub Programs					
1 733 970		Mineral Industry and Resources Policy	1 621 000	2 042 779	421 779
6 555 041		Mineral Tenure	7 843 000	7 569 104	(273 896)
5 228 150		Mineral Industry Occupational Health and Safety	5 248 000	5 913 432	665 432
1 008 903		Mineral Industry Environmental Management	1 103 000	856 636	(246 364)
491 777		Mineral Exploration Data	518 000	322 187	(195 813)
227 847		Mineral Royalties	246 000	336 859	90 859

FINANCIAL REPORT

Table 2: continued

Program 2:				
2 134 435	Petroleum Resources Management	3 190 000	2 964 897	(225 103)
<i>Sub Programs</i>				
521 292	Petroleum Industry and Resources Policy	540 000	547 580	7 580
491 309	Petroleum Tenure	520 000	586 685	66 685
320 056	Petroleum Industry Occupational Health and Safety	1 277 000	1 089 813	(187 187)
91 959	Petroleum Industry Environmental Management	109 000	85 879	(23 121)
550 776	Petroleum Exploration Data	575 000	475 787	(99 213)
159 043	Petroleum Royalties	169 000	179 153	10 153
Program 3:				
4 917 792	Geology and Resource Information	7 946 000	7 641 282	(304 718)
<i>Sub Programs</i>				
3 323 163	Regional Geoscience Mapping	5 882 000	5 709 974	(172 026)
1 291 917	Groundwater Resources	1 745 000	1 661 804	(83 196)
302 712	Geotechnical Services	319 000	269 504	(49 496)
Program 4:				
1 524 287	Dangerous Goods Management	1 538 000	1 567 972	29 972
Program 5:				
9 123 296	Scientific Support	9 113 000	9 096 471	(16 529)
<i>Sub Programs</i>				
1 842 478	Mineral Science	1 869 000	3 241 588	1 372 588
1 341 788	Mineral Processing and Extractive Metallurgy	1 657 000	838 722	(818 278)
1 649 438	Environmental and Health Chemistry	1 669 000	1 218 101	(450 899)
2 225 731	Agricultural Chemistry	1 988 000	1 884 059	(103 941)
1 033 281	Forensic Science	1 046 000	1 030 673	(15 327)
464 816	Materials Technology	466 000	425 330	(40 670)
565 764	Racing Chemistry	418 000	457 998	39 998
66 506 243	Recurrent Expenditure	68 722 000	65 406 953	(3 315 047)
CAPITAL				
3 375 335	*Capital Expenditure	13 404 000	11 764 693	(1 639 307)
69 881 578	Grand Total Consolidated Fund	82 126 000	77 171 646	(4 954 354)

* Details of Capital Expenditure provided on Table 3
 Explanations of variations between the current year estimates and actual results, and the actual results compared with the preceding year, are set out in Note 2.



Table 3: Statement of Capital Works Program payments

1992-93 Actual \$	Activity	Estimate \$	1993-94 Actual \$	Variation \$
	Completed works and works in progress			
439 574	Computer Equipment	-	-	-
25 106	General Office Equipment	-	-	-
655 254	Laboratory Apparatus	-	-	-
	New Chemistry Centre Complex Bentley			
594 212	Planning fees	307 000	124 673	(182 327)
	Chemistry Centre (WA) Complex Bentley			
1 279 647	Stage 1 Mineral Research Centre construction	11 000 000	9 657 132	(1 342 868)
	Chemistry Centre (WA) Computerised Laboratory			
381 542	Information Management System	123 000	123 000	0
	New works			
-	Computer Equipment	1 113 000	1 063 458	(49 542)
-	General Office Equipment	607 000	755 430	148 430
	Mineral House Complex South			
-	Airconditioning Refurbishment	220 000	23 000	(197 000)
-	Partitioning & Accommodation	34 000	18 000	(16 000)
3 375 335	Total	13 404 000	11 764 693	(1 639 307)
	Source of funds			
3 375 335	Consolidated Fund	13 404 000	11 764 693	(1 639 307)

Explanations of variations between the current year estimates and actual results, and the actual results compared with the preceding year, are set out in Note 2.

FINANCIAL REPORT

ACCOUNTS OF THE TRUST FUND

Survey of Leases Under the Mining Act Account

Survey fees collected under the Mining Act are paid into this account. The actual cost of surveys is charged to the Consolidated Fund, and fees previously collected are then transferred to Consolidated Revenue. If the applicant decides not to proceed with the survey, the fee collected is refunded. The balance of the Account is held at Treasury.

	1992-93 \$	1993-94 \$
Opening Balance July 1	4 987 416 CR	4 030 330 CR
<u>Add Receipts</u>		
· Survey Fees	504	-
	<u>4 987 920</u>	<u>4 030 330</u>
<u>Less Payments</u>		
· Transferred to Revenue	5 306	-
· Refunds	952 284	241 009
Total Payments	<u>957 590</u>	<u>241 009</u>
Closing Balance June 30	<u>4 030 330 CR</u>	<u>3 789 321 CR</u>

Chemistry Centre Trust Account

The account was created to hold monies received from industry and other organisations for the purpose of conducting specific projects. The balance of the Account is held at Treasury.

	1992-93 \$	1993-94 \$
Opening Balance July 1	208 682 CR	275 095 CR
<u>Add Receipts</u>		
· Contributions		
From:		
- Industry	214 790	366 273
- Government	380 035	431 332
Total Receipts	<u>594 825</u>	<u>797 605</u>
	<u>803 507</u>	<u>1 072 700</u>
<u>Less Payments</u>		
· Salaries	296 495	470 962
· Travel	5 056	4 232
· Equipment, Misc	226 861	295 258
Total Payments	<u>528 412</u>	<u>770 452</u>
Closing Balance June 30	<u>275 095 CR</u>	<u>302 248 CR</u>



FINANCIAL REPORT

Barrow Island Royalty Trust Account

The account was created under the Barrow Island Royalty Trust Account Act 1985 which provides for royalty payments received under the Barrow Island lease to be credited to the account and subsequently apportioned between the Commonwealth and the State. The balance of the Account is held at Treasury.

	1992-93 \$	1993-94 \$
Open Balance July 1	7 942 123 CR	7 851 851 CR
<u>Add Receipts</u>		
Royalties Received	25 930 203	29 259 120
Total Receipts	<u>25 930 203</u>	<u>29 259 120</u>
	<u>33 872 326</u>	<u>37 110 971</u>
<u>Less Payments</u>		
Transferred to Revenue	6 447 940	7 293 124
Remitted to Commonwealth	19 572 535	25 715 502
Total Payments	<u>26 020 475</u>	<u>33 008 626</u>
Closing Balance June 30	<u>7 851 851 CR</u>	<u>4 102 345 CR</u>

Note: The Commonwealth share of royalty payment payable in July 1994 was \$4 080 689 and the State's share of the refund of royalty payable in July 1994 \$21 656 was due to quarterly provisional receipts exceeding assessed royalty due.

Deposits: Mines Department Account

Funds held are received for the issue of temporary reserves and exploration permits pending finalisation of certain legal requirements. The balance of the Account is held at Treasury.

	1992-93 \$	1993-94 \$
Opening Balance July 1	346 165 CR	723 246 CR
<u>Add Receipts</u>		
Bonds, Securities	460 000	485 500
Interest	23 713	31 839
	<u>829 878</u>	<u>1 240 585</u>
<u>Less Payments</u>		
Refund of Bonds, Securities	89 650	202 500
Transfers to Revenue		
Interest	16 982	41 585
Total Payments	<u>106 632</u>	<u>244 085</u>
Closing Balance June 30	<u>723 246 CR</u>	<u>996 500 CR</u>

FINANCIAL REPORT

Transfers to Suspense Account

The account is maintained to hold funds to meet any relevant end of year commitment in respect of plant and equipment or land. The balance of the account is held at Treasury.

	1992-93	1993-94
	\$	\$
Opening Balance July 1	-	-
<u>Add Receipts</u>		
· Transfers ex CF - Plant & Equipment	-	422 429
	-	422 429
<u>Less Payments</u>		
· Purchase of Plant & Equipment or Land	-	-
Closing Balance June 30	-	422 429 CR

Special Projects Trust Fund Account

The account was created to hold funds for the purpose of participating in significant projects with other countries and the private sector to the mutual benefit of the other participants and the State of Western Australia.

	1992-93	1993-94
	\$	\$
Opening Balance July 1	-	-
<u>Add Receipts</u>		
Contribution from:		
Industry	-	64 641
Government	-	391 087
Total Receipts	-	455 728
<u>Less Payments</u>		
Salaries	-	48 825
Travel	-	11 692
Equipment, Misc.	-	166 828
Total Payments	-	227 345
Closing Balance June 30	-	228 383 CR

Departmental Receipts in Suspense

This account which is held at Treasury is used to hold moneys temporarily pending identification of the purpose for which the funds were received. The balance of the account as at 30 June 1994 was \$638.

Treasurer's Advance

Drilling

Recoverable drilling expenditure is initially charged to a Treasurer's Advance Account. The cost of work performed, together with overhead charges, are recovered and credited to this account. The amount of the advance outstanding as at 30 June 1994 was \$203 539.



NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 30 JUNE, 1994

1. Accounting Policy

- (a) The Financial Statements are prepared on a cash basis in that only collections received and payments made are reflected therein.
- (b) The financial statements included in this report have been prepared in accordance with the provisions of the Financial Administration and Audit Act, 1985.
- (c) Not all expenditures incurred by the Department of Minerals and Energy in the provision of services are appropriated to the Department. The employer's share of superannuation pensions is met by Treasury. The servicing of the Department's Capital Services debt also is met by Treasury.
- (d) Property disposals are effected through the State Tender Board and proceeds credited to Revenue Government Property Sales. Exceptions are:
 - (i) when the original acquisition was met from Capital Services the proceeds are credited to Loan Repayments.
 - (ii) when proceeds received from the disposal of Departmental vehicles originally purchased from Consolidated Revenue are credited to Treasury.
- (e) In order that meaningful comparisons can be made between 1993-94 actuals with the preceeding year, actual expenditure figures for 1992-93 have been recast to reflect the 1993-94 Program structure.

2. Explanatory Statement

- (a) Details of expenditure in advance of appropriation approved in accordance with Section 28 of the Financial Administration and Audit Act, 1985.

NIL

- (b) Significant variations (greater than 10%) between actual revenues and budget estimates for the financial year.

Territorial Revenue

- (i) Petroleum (- \$33 113 681))

Petroleum royalty receipts were lower than anticipated, principally due to lower than expected oil prices and the need to carry forward some North West Shelf project royalties to the next financial year because of delays in reaching agreement as to allowable deductions.

- (ii) Diamonds (+ \$9 701 662)

Diamond royalties were higher than forecast due to higher value Argyle sales and an increase in the profit component of the royalty.

- (iii) Nickel (- \$2 591 570)

Nickel receipts were affected by lower than expected prices and reduced shipments.

Taxes and Licences Revenue

- (i) Petroleum Permits and Licences (+ \$391 371)

Unbudgeted ad-valorem fees payable on the sale of an interest in a production/exploration field and greater than anticipated application fees.

FINANCIAL REPORT

(ii) Prospecting Exploration and Other Mining Licences (+ \$784 505)

Increased revenue resulted from an increase in the level of application and increased activity relevant to other Mining Act fees.

(iii) Explosives Regulations (+ \$13 833)

The increase is attributable to additional licensing activity under new regulations.

(iv) Flammable Liquids Regulations (+ \$128 719)

The amended Dangerous Goods Regulations have increased the category of premises to be licensed resulting in increased revenue.

Departmental Revenue

(i) Explosives (+ \$125 491)

Increased revenue is mainly attributable to a carryover of tonnage fee collections from the previous year.

(ii) Administration (+ \$473 738)

Revenue relating to a number of externally funded projects has resulted in collections being more than double the budget estimate. This situation occurs as no budget provision is made for special projects on either the revenue or expenditure side of the estimates. Supplementary funding is provided if necessary to cover the additional expenditure on the bases that a like amount of unbudgeted revenue has been collected to accommodate it.

(iii) Geological Survey (+ \$259 704)

The Geological Survey had several externally funded projects which resulted in collections being above the estimated figure. The principle is the same for these projects as described at (ii) above.

(iv) Surveys and Mapping (+ \$13 979)

The greater than expected collections resulted from an increased level of demand for products and services.

(v) Mining Operations (+ \$27 855)

The majority of this increased revenue occurred as a result of funds received for a special project relating to the health of workers in the mineral sands industry.

(vi) Other (+ \$6 750)

Additional sales of petroleum publication was mainly attributable to the increase.

(c) Significant variations (greater than 10%) between actual expenditure and budget estimates for the financial year.

Special Acts Expenditure

(i) Petroleum (Submerged Lands) Act 1982 (-\$3 187 400)

This lower than expected level of payments to the Commonwealth resulted from lower than expected oil prices which affected revenues for the Saladin, Harriet and Herald/Pepper oil fields.



Recurrent Expenditure

- (i) Sub Program variations within Program 5 Scientific Support are a result of all Corporate Service overheads being allocated to Sub Program 5.1 Mineral Science.

Capital Works Expenditure

- (i) New Chemistry Centre Complex Bentley

Stage 1 Mineral Research Centre - Planning Fees (-\$182 327)

Planning continued throughout 1993-94 but will not be finalised until 1994-95 due to the complexities of this project.

- (ii) Chemistry Centre Bentley

Stage 1 Mineral Research Centre - Construction (-\$1 342 868)

Underspending has occurred as a result of the project running a little behind schedule. However, completion and occupation should take place sometime early in the new financial year.

- (iii) General Office Equipment (+\$148 430)

Overspending is mainly attributable to the purchase of apparatus and equipment associated with the Chemistry Centre management system.

- (iv) Mineral House Complex Air conditioning Refurbishment (-\$197 000)

A comprehensive review was required to be undertaken to identify the requirements before work could commence. The underspendings will therefore be carried over and expended in 1994-95.

- (v) Partitioning and Accommodation (-\$16 000)

The area on which the work is to be carried out did not become available during 1993-94.

- (d) Significant variations (greater than 10%) between actual results for the financial year (1993-94) and results for the immediately preceding financial year (1992-93).

Consolidated Fund Receipts.

Territorial

- (i) Nickel

1992-93\$	1993-94\$	Variance \$
9 242 491	7 908 430	(1 334 061)

The lower royalty receipts for nickel resulted from a fall in nickel prices and lower production of this commodity.

- (ii) Other

1992-93\$	1993-94\$	Variance \$
28 348 218	24 897 765	(3 450 453)

Reduced production levels and lower prices for lead and manganese were the main reasons for the reduced receipts in this category.

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Taxes and Licences

(i) Petroleum Permits and Licences

1992-93\$	1993-94\$	Variance \$
2 899 167	3 326 371	427 204

General increased activity within the petroleum industry has resulted in additional ad-valorem fee collection.

(ii) Prospecting Exploration and Other Mining Licences

1992-93\$	1993-94\$	Variance \$
2 532 751	3 244 505	711 754

Increased revenue resulted from increased applications for Exploration Licences and Mining Leases and increased activity relevant to other Mining Act fees.

(iii) Flammable Liquids Regulations

1992-93\$	1993-94\$	Variance \$
418 308	546 719	128 411

The new Dangerous Goods Regulations has expanded the number of premises now required to be licensed for the storage of dangerous goods with a consequential increase in licence revenue collection.

Departmental

(i) Registration

1992-93\$	1993-94\$	Variance \$
56 591	72 985	16 394

Increased revenue resulted from increased search fee charges and usage of the Tendex system.

(ii) Chemistry Centre

1992-93\$	1993-94\$	Variance \$
1 593 375	1 386 542	(206 833)

The downturn in collections resulted from a lower level of revenue from the Mineral Processing Laboratory and a reduced number of externally funded projects.

(iii) Explosives

1992-93\$	1993-94\$	Variance \$
524 728	606 491	81 763

The increase is a result of a carryover of tonnage fees from 1992-93 paid in 1993-94.

(iv) Administration

1992-93\$	1993-94\$	Variance \$
455 937	679 738	223 801

The resultant increase is due to moneys received by way of special project funding.



FINANCIAL REPORT

(v) Geological Survey

1992-93\$	1993-94\$	Variance \$
412 890	534 704	121 814

Greater revenue resulted from an increase in externally funded projects and increased demand for services and products.

(vi) Surveys and Mapping

1992-93\$	1993-94\$	Variance \$
130 514	144 979	14 465

Increased revenue was a result of increased demand for services and products.

(vii) Mining Operations

1992-93\$	1993-94\$	Variance \$
64 340	48 855	(15 485)

The reduction in revenue resulted from a decrease in funding from externally funded special projects.

(viii) Other

1992-93\$	1993-94\$	Variance \$
45 324	27 750	(17 574)

The variation in revenue is mainly attributable to a once off collection in 1992-93 of a forfeited cash security following the cancellation of a petroleum permit.

Consolidated Fund Payments

Special Acts

(i) Petroleum (Submerged Lands) Act 1982

1992-93\$	1993-94\$	Variance \$
21 536 625	11 412 600	(10 124 025)

Payments to the Commonwealth were less than last year as a result of a combination of a drop in oil prices and a decrease in production from the Saladin, Harriet and Herald/Pepper oil fields.

Recurrent Fund Payments

(i) Refunds of Previous Year's Revenue

1992-93\$	1993-94\$	Variance \$
2 396 006	5 828 219	3 432 213

Refunds were above last year's level as a result of extraordinary payments for royalty refunds.

(ii) Mineral Resource Management

1992-93\$	1993-94\$	Variance \$
15 245 688	17 040 997	1 795 309

Expenditure was greater in 1993-94 due to funding being provided for the Tengraph Project.

FINANCIAL REPORT

(iii) Petroleum Resources Management

1992-93\$	1993-94\$	Variance \$
2 134 435	2 964 897	830 462

The increased expenditure reflects the costs associated with the establishment of the Petroleum Safety Branch.

(iv) Geology and Resource Information.

1992-93\$	1993-94\$	Variance \$
4 917 792	7 641 282	2 723 490

Increased expenditure resulted from additional funding provided for new initiatives for geoscientific mapping and groundwater projects.



FINANCIAL REPORT

3. Supplementary Financial Information

	1992-93 \$	1993-94 \$
Losses of public monies and public or other property through theft or default	160	82
Amount Recovered	-	82
Losses for write off	160	-
<hr/>		
Public and other property, revenue and debts due to the State, written off in accordance with section 45 of the Financial Administration and Audit Act by:		
	1992-93 \$	1993-94 \$
The Accountable Officer	10 287	4 975
The Minister	-	-
	10 287	4 975
Analysis of losses written off		
· Stock shortages	-	593
· Bad debts	10 287	4 382
	10 287	4 975
<hr/>		
	1992-93 \$	1993-94 \$
Consolidated Fund revenues due and uncollected *	538 253	298 449
Less considered to be irrecoverable	6 890	21 443
Amount considered to be recoverable	531 363	277 006
Unpaid expenditure claims as at 30 June - CF	39 888	55 896
<hr/>		
Gifts of Public Property	2 823	-

* Does not include Royalty Revenue which, although may relate to 1993-94 activity, is not due and payable until 1994-95.

Commitments - The Financial Management Information System being developed for use in 1994-95 will feature comprehensive commitment information. However, it is not possible at this stage to provide accurate data in this regard.

FINANCIAL REPORT

4. Events Occurring After Balance Date

No known event or events occurred after year end which materially affect the results reflected in this financial report.

5. Related Bodies

The Department had no related bodies as defined in the Financial Administration and Audit Act 1985 and Treasurer's Instruction 951.

6. Affiliated Bodies

The Department had no affiliated bodies as defined in Financial Administration and Audit Act 1985 and Treasurer's Instruction 951.

7. Expenditure by Standard Groups

1992-93 Actual \$		Estimate \$	1993-94 Actual \$		Variation \$
Recurrent:					
29 888 324	Salaries, Wages and Related Staff Costs	30 202 000	30 975 729		773 729
12 642 322	Other Operating Costs	17 598 000	17 150 521		(447 479)
23 975 597	Grants, Subsidies and Transfer Payments	20 922 000	17 280 703		(3 641 297)
66 506 243	Net Recurrent	68 722 000	65 406 953		(3 315 047)
Capital:					
3 375 335	Capital Expenditure	13 404 000	11 764 693		(1 639 307)
3 375 335	Net Capital	13 404 000	11 764 693		(1 639 307)
69 881 578	Total Net Expenditure	82 126 000	77 171 646		(4 954 354)

8. Remuneration of Senior Officers

	1992-93	1993-94
Total of salaries and other benefits received, or due and receivable, for the financial year by Senior Officers of the Department.	914 856	919 841

The number of Senior Officers whose total salaries and other benefits received, or due and receivable, for the financial year, falls within the following bands:

	1992-93	1993-94
\$50 000 to \$60 000	1	-
\$60 000 to \$70 000	2	1
\$70 000 to \$80 000	5	4
\$80 000 to \$90 000	3	5
\$90 000 to \$100 000	1	-
\$120 000 to \$130 000	-	1



FINANCIAL REPORT

9. Retirement Benefits

	1992-1993 \$	1993-1994 \$
In respect of Senior Officers the following amount became payable for the financial year.		
Notional contributions to the Government		
Employees Superannuation Act Scheme	99 994	99 142
Redundancy payments.	-	-
	99 994	99 142
The number of Senior Officers employed at 30 June who are members of the Superannuation and Family Benefits Act Scheme:		
	1992-1993	1993-1994
Senior Officers of the Department's Corporate Executive.	2	2

10. Remuneration of Auditor

As the Department is a Budget Sector agency, it does not pay fees for the annual audit, or for other services carried out by the Officer of the Auditor General.

FINANCIAL REPORT

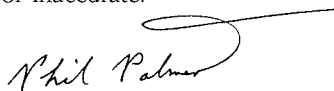
CERTIFICATION OF FINANCIAL STATEMENTS

The accompanying financial statements of the Department of Minerals and Energy have been prepared in compliance with the provisions of the Financial Administration and Audit Act 1985 from proper accounts and records to present fairly the financial transactions for the year ending 30 June 1994 and the state of affairs as at 30 June 1994.

At the date of signing we are not aware of any circumstances which would render the particulars included in the financial statements misleading or inaccurate.



L C Ranford
ACCOUNTABLE OFFICER
12 August, 1994



P H Palmer
PRINCIPAL ACCOUNTING OFFICER



Opinion of the Auditor General

To the Parliament of Western Australia

Department of Minerals and Energy Financial Statements for the Year Ended June 30, 1994

Scope

I have audited the accounts and financial statements of the Department of Minerals and Energy for the year ended June 30, 1994 under the provisions of the Financial Administration and Audit Act 1985.

The Director General is responsible for keeping proper accounts and maintaining adequate systems of internal control, preparing and presenting the financial statements, and complying with the Act and other relevant written law. The primary responsibility for the detection, investigation and prevention of irregularities rests with the Director General.

My audit was performed in accordance with section 79 of the Act to form an opinion based on a reasonable level of assurance. The audit procedures included examining, on a test basis, the controls exercised by the Department to ensure financial regularity in accordance with legislative provisions, and evidence to provide reasonable assurance that the amounts and other disclosures in the financial statements are free of material misstatement. Significant accounting estimates were evaluated and the accounting policies and principles used were assessed to determine that they are consistent with the Treasurer's Instructions and applicable accounting standards.

The audit opinion expressed below has been formed on the above basis.

Audit Opinion

In my opinion,

- (i) the controls exercised by the Department of Minerals and Energy provide reasonable assurance that the receipt and expenditure of moneys and the acquisition and disposal of property and the incurring of liabilities have been in accordance with legislative provisions; and
- (ii) the Statements of Receipts and Payments and the notes thereto are based on proper accounts and present fairly the transactions for the year ended June 30, 1994.



D D R Pearson
AUDITOR GENERAL

October 6, 1994



SUPPLEMENTARY FINANCIAL REPORT - Accrual accounts

Additional Financial Information: These statements represent the first financial report for the Department prepared on an accrual basis. They have not been subjected to any formal audit process.

Operating Statement

for the year ended 30 June 1994

	Note	1993-94 (\$'000)
Cost of Services		
Operating expenses		
Salaries	4	34 683
Superannuation	5	1 719
Administration expenses	6	22 139
Doubtful Debts	17	21
Total cost of services		<u>58 562</u>
Operating revenues		
User charges and fees	7	3,121
Other revenues	8	680
		<u>3 801</u>
Net cost of services		<u>54 761</u>
Revenue from Government		
Appropriations	9	65 759
Receipts paid into Consolidated Fund	10	(3 502)
Resources received free of charge	11	983
Liabilities assumed by the Treasurer	12	1 719
Total revenues from Government		<u>64 959</u>
CHANGE IN NET ASSETS RESULTING FROM OPERATIONS		<u><u>10 198</u></u>

Administered Expenses & Revenues	13	
Expenses		
Petroleum (Submerged Lands) Act 1982		11 413
Total Administered Expenses		<u>11 413</u>
Revenues		
Taxes & Fees		7 474
Royalties		393 264
Total Administered Revenues		<u>400 738</u>

Additional Financial Information: These statements represent the first financial report for the Department prepared on an accrual basis. They have not been subjected to any formal audit process.

Statement of Financial Position

as at 30 June 1994

	Note	1993-94 (\$'000)
CURRENT ASSETS		
Cash and amounts in suspense	14	646
Restricted cash	15	5 316
Inventories	16	331
Accounts receivable	17	277
Prepayments	18	514
Total current assets		<u>7 084</u>
NON-CURRENT ASSETS		
Property, plant, equipment and vehicles	19	30 192
Works in progress	20	12 200
Total non-current assets		<u>42 392</u>
Total assets		<u>49 476</u>
CURRENT LIABILITIES		
Accounts payable	21	178
Employee entitlements	23	4 142
Trust accounts	15	5 316
Treasurers advances	24	224
Total current liabilities		<u>9 860</u>
NON-CURRENT LIABILITIES		
Employee entitlements	23	3 059
Total non-current liabilities		<u>3 059</u>
Total liabilities		<u>12 919</u>
EQUITY		
Accumulated surplus	25	36 557
Total equity		<u>36 557</u>
Total liabilities and equity		<u>49 476</u>

Administered Assets and Liabilities	26	
ADMINISTERED CURRENT ASSETS		
Restricted Cash		4 102
Total administered current assets		<u>4 102</u>
Total administered assets		<u>4 102</u>
ADMINISTERED CURRENT LIABILITIES		
Trust Accounts		4 102
Total administered current liabilities		<u>4 102</u>
Total administered liabilities		<u>4 102</u>



Additional Financial Information: These statements represent the first financial report for the Department prepared on an accrual basis. They have not been subjected to any formal audit process.

Program Schedule of Expenses and Revenues and Administered Expenses and Revenues
for the year ended 30 June 1994

PROGRAM	Mineral Resources	Petroleum Resources	Geology & Resources	Dangerous Goods	Scientific Support	Corporate	Total
	Management	Management	Information	Management		Services	
	1993-94 \$'000	1993-94 \$'000	1993-94 \$'000	1993-94 \$'000	1993-94 \$'000	1993-94 \$'000	1993-94 \$'000
Operating expenses							
Salaries	13 567	2 330	4 861	1 324	7 528	5 073	34 683
Superannuation	698	117	213	72	348	271	1 719
Administration Expenses	10 374	874	3 123	401	2,378	4 989	22 139
Doubtful Debts					21		21
Total operating expenses	24 639	3 321	8 197	1 797	10 275	10,333	58 562
Revenues from services							
Users Fees & Charges & Other Revenues	301	27	591	611	1,591	680	3 801
Total revenue from services	301	27	591	611	1 591	680	3 801
Net cost of services	24 338	3 294	7 606	1 186	8 684	9 653	54 761
Revenues from Government							
Appropriations	23 871	3 005	7 641	1 590	19 757	9 895	65 759
Receipts paid to Consolidated Fund	(266)	(28)	(535)	(606)	(1 387)	(680)	(3 502)
Resources received free of charge	399	67	122	41	199	155	983
Liabilities assumed by the Treasurer	698	117	213	72	348	271	1 719
Total revenues from Government	24 702	3 161	7 441	1 097	18 917	9 641	64 959
CHANGE IN NET ASSETS RESULTING FROM OPERATIONS	364	(133)	(165)	(89)	10,233	(12)	10 198

ADMINISTERED EXPENSES AND REVENUES

**Expenses Administered for the
Crown**

Petroleum (Submerged Lands) Act 1982		11 413					11 413
Total administered expenses	-	11 413	-	-	-	-	11 413

**Revenues Administered for the
Crown**

Taxes, Fees & Royalties	323 623	76 212		903			400 738
Total administered revenues	323 623	76 212	-	903	-	-	400 738

Additional Financial Information: These statements represent the first financial report for the Department prepared on an accrual basis. They have not been subjected to any formal audit process.

Program Schedule of Assets and Liabilities and Administered Assets and Liabilities

as at 30 June 1994

PROGRAM	Mineral Resources	Petroleum Resources	Geology & Resources	Dangerous Goods	Scientific Support	Corporate	Total
	Management	Management	Information	Management		Services	
	1993-94	1993-94	1993-94	1993-94	1993-94	1993-94	1993-94
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Assets							
Current							
Cash & Amounts in Suspense	8	1	337	1	99	200	646
Restricted Cash	4 786		228		302		5 316
Inventories	116				215		331
Accounts Receivable	34		56	4	183		277
Prepayments	256	39	74	25	21	99	514
Total Current Assets	5 200	40	695	30	820	299	7 084
Non-current							
Property Plant & Equipment	10 896	1 822	3 316	1 130	8 800	4 228	30 192
Works in Progress					12 200		12 200
Total Non-Current Assets	10 896	1 822	3 316	1 130	21 000	4 228	42 392
Total assets	16 096	1 862	4 011	1 160	21 820	4 527	49 476
Liabilities							
Current							
Accounts Payable	25	1	5		122	25	178
Employee Entitlements	1 683	281	518	175	844	641	4 142
Trust Accounts	4 786		228		302		5 316
Treasurers Advances	8	1	207	1	4	3	224
Total Current Liabilities	6 502	283	958	176	1 272	669	9 860
Non-current							
Employee Entitlements	1 243	208	382	129	623	474	3 059
Total Non Current Liabilities	1 243	208	382	129	623	474	3 059
Total Liabilities	7 745	491	1 340	305	1 895	1 143	12 919
Net assets	8 351	1 371	2 671	855	19 925	3 384	36 557

ADMINISTERED ASSETS AND LIABILITIES

Assets							
Current							
Restricted Cash		4 102					4 102
Total administered assets	-	4 102	-	-	-	-	4 102
Liabilities							
Current							
Trust Accounts		4 102					4 102
Total administered liabilities	-	4 102	-	-	-	-	4 102



Additional Financial Information: These statements represent the first financial report for the Department prepared on an accrual basis. They have not been subjected to any formal audit process.

Summary of Appropriations

for the year ended 30 June 1994

	Estimate	1993-94 Actual	Variation	
	\$	\$	\$	
Details of Appropriation Items and Expenditures Authorised by Other Statutes				
Item 39	Amount provided for Recurrent Services for the year	54 011 000	53 884 946	(126 054)
	Sub-Total	54 011 000	53 884 946	(126 054)
	Amount Authorised by Other Statutes			
	Salaries and Allowances Act 1975	111 000	109 407	(1 593)
	Total Recurrent Services	54 122 000	53 994 353	(127 647)
Item 20	Amount provided for Capital Services for the year	13 404 000	11 764 693	(1 639 307)
	Grand Total	67 526 000	65 759 046	(1 766 954)
Details of Expenditure				
RECURRENT				
	Corporate Services	9 477 000	9 854 515	377 515
	Details:			
	Corporate Development	7 553 000	7701 957	148 957
	Corporate Directorate	566 000	640 365	74 365
	Public Relations/Corporate Publications	1358 000	1 512 193	154 193
	Refunds of Revenue	6 279 000	5 828 219	(450 781)
	Programs			
	Mineral Resources Management	16 579 000	17 040 997	461 997
	Sub-Program details:			
	Mineral Industry and Resources Policy	1 621 000	2 042 779	421 779
	Mineral Tenure	7 843 000	7 569 104	(273 896)
	Mineral Industry Occupational Health and Safety	5 248 000	5 913 432	665 432
	Mineral Industry Environmental Management	1 103 000	856 636	(246 364)
	Mineral Exploration Data	518 000	322 187	(195 813)
	Mineral Royalties	246 000	336 859	90 859
	Petroleum Resources Management	3 190 000	2 964 897	(225 103)
	Sub-Program details:			
	Petroleum Industry and Resources Policy	540 000	547 580	7 580
	Petroleum Tenure	520 000	586 685	66 685
	Petroleum Industry Occupational Health and Safety	1 277 000	1 089 813	(187 187)
	Petroleum Industry Environmental Management	109 000	85 879	(23 121)
	Petroleum Exploration Data	575 000	475 787	(99 213)
	Petroleum Royalties	169 000	179 153	10 153
	Geology and Resource Information	7 946 000	7 641 282	(304 718)
	Sub-Program details:			
	Regional Geoscience Mapping	5 882 000	5 709 974	(172 026)
	Groundwater Resources	1 745 000	1 661 804	(83 196)
	Geotechnical Services	319 000	269 504	(49 496)
	Dangerous Goods Management	1 538 000	1 567 972	29 972
	Scientific Support	9 113 000	9 096 471	(16 529)
	Sub-Program details:			
	Mineral Science	1 869 000	3 241 588	1 372 588
	Mineral Processing and Extractive Metallurgy	1 657 000	838 722	(818 278)
	Environmental and Health Chemistry	1 669 000	1 218 101	(450 899)
	Agricultural Chemistry	1 988 000	1 884 059	(103 941)
	Forensic Science	1 046 000	1 030 673	(15 327)
	Materials Technology	466 000	425 330	(40 670)
	Racing Chemistry	418 000	457 998	39 998
	Recurrent Expenditure	54 122 000	53 994 353	(127 647)
	CAPITAL			
	Capital Expenditure (Note 9)	13 404 000	11 764 693	(1 639 307)
	Appropriations per operating statement	67 526 000	65 759 046	(1 766 954)
	Appropriations for administered expenses	14 600 000	11 412 600	(3 187 400)
	GRAND TOTAL OF APPROPRIATIONS	82 126 000	77 171 646	(4 954 354)

Additional Financial Information: These statements represent the first financial report for the Department prepared on an accrual basis. They have not been subjected to any formal audit process.

Notes to the Financial Statements

1 Departmental objectives and funding

To manage and support the sustainable development of the State's mineral, petroleum and ground water resources in the best interest of the community of Western Australia; and

To ensure that the community is:

- protected from the hazards associated with dangerous goods, and
- provided with high-quality independent chemical research, consultancy and analytical services.

The Department is funded by Parliamentary appropriation.

2 Significant accounting policies

(a) Basis of accounting

The financial statements have been prepared in accordance with Treasurers' Instruction 1101A and are based on the provision of Australian Accounting Standard AAS 29. They have been prepared on the accrual basis of accounting using historical cost accounting, with the exception that certain non-current physical assets have been introduced at written down current cost as at 30 June 1994. Additions to non-current physical assets since valuation are stated at cost.

The totals of user charges (being fees for services rendered by the Department that are not regulatory in nature), recoups, reimbursements and proceeds from the sale of assets controlled by the Department are included as operating revenues of the Department notwithstanding that the amounts or parts thereof are required to be paid directly into the Consolidated Fund and are not controlled by the Department in the sense of being retained by the Department through a net appropriation or otherwise. Inclusion of these amounts in operating revenues discloses a more accurate net cost of services, which would not otherwise be disclosed.

The financial statements have been prepared consistent with the requirements of the Financial Administration and Audit Act 1985.

This is the first year in which financial statements have been prepared on the accrual basis. Closing balances at 30 June 1994 have been established from available records except for certain non-current physical assets which have been included at valuation. Land and some buildings have not been brought to account as valuations have not yet been provided by the Valuer General. Comparative figures are not available for the operating statement or statement of cash flows.

(b) Appropriations

Appropriations in the nature of revenue, whether recurrent or capital, are recognised as revenues in the period in which the Department gains control of the appropriated funds. The Department gains control of appropriated funds at the time those funds are drawn down by the Department. Appropriations which are repayable by the Department to the Treasurer are recognised as liabilities.

(c) Employee entitlements

Annual and long service leave

These entitlements are calculated at current remuneration rates. A liability for long service leave is recognised after an officer has completed four years of service.

Superannuation

Staff contribute to the Superannuation and Family Benefits Act Scheme (a pension scheme now closed), or the Government Employees Superannuation Act Scheme (a lump sum benefit scheme), which are both defined benefits schemes. If staff elect not to contribute to the lump sum benefits scheme they become non-contributory members of that scheme.

The employer's portion of liability under both Schemes is assumed by the Treasurer.

The superannuation expense comprises the following elements:

- change in the unfunded employer's liability in respect of current employees who are members of the Superannuation and Family Benefits Act Scheme and current employees who accrued a benefit on transfer from that Scheme to the Government Employees Superannuation Act Scheme; and
- notional employer contributions which would have been paid to the Government Employees Superannuation Act Scheme if the Department had made concurrent employer contributions to that Scheme.



Additional Financial Information: These statements represent the first financial report for the Department prepared on an accrual basis. They have not been subjected to any formal audit process.

The superannuation expense does not include payment of pensions to retirees as this does not constitute part of the cost of services provided by the Department in the current year.

(The notional expense for the year in respect of pensions paid to retirees from the Department and the change in the unfunded employer's liability for future payments of those pensions, which is not included in the financial statements, amounts to \$1.533m. The total unfunded liability for pensions and transfer benefits assumed by the Treasurer at 30 June 1994 in respect of current employees is \$17.184m, and for pensions payable to retirees is \$34.877m.)

(d) Depreciation of non-current assets

All non-current assets having a limited useful life are to be systematically depreciated over their useful lives in a manner which reflects the consumption of their service potential.

Depreciation is to be provided as follows:

Buildings	50 years	Straight Line Method
Furniture	10 Years	Straight Line Method
Office Equipment	5 Years	Straight Line Method
Computer Equipment	5 Years	Diminishing Value Method
Computer Software	7 Years	Straight Line Method

No assets have been depreciated in this first year. Buildings have been brought to account based on their current replacement cost and all other assets have been brought to account based on their assessed values. In line with this approach, whilst a number of non current assets were disposed of during the year, the resultant profit or loss has not been determined for inclusion in this report.

3 Programs of the Department

The programs of the Department and their objectives are:

Program 1 - Mineral Resources Management

Objective: To ensure that the exploration for and mining of the State's mineral resources are managed for the benefit of the people of Western Australia.

Program 2 - Petroleum Resources Management

Objective: To ensure that the exploration, development and production of the State's petroleum resources are managed for the benefit of the people of Western Australia.

Program 3 - Geology and Resources Information

Objective: To improve the knowledge of the geology of Western Australia and the quality of the regional geological, geophysical and geochemical data and maps for use by industry, government and the public to support exploration, groundwater management, land-use planning and infrastructure development.

Program 4 - Dangerous Goods Management

Objective: To achieve an acceptably low level of risk to the public as a result of the storage, handling and transport of explosives and dangerous goods in Western Australia.

Program 5 - Scientific Support

Objective: To provide high quality, independent chemical and scientific information and advice to government, industry and the public in order to enhance mineral, agricultural and industrial development, and the protection of community, consumer, environment and health standards.

In addition, the objective of the Corporate Services program is to assist the Department in using its human, financial and other resources effectively and efficiently to provide a service responsive to the needs of the community, industry and government.

Corporate support is provided from the following areas:

- Executive
- Finance and Administration
- Human Resources
- Internal Audit
- Record Services
- Computing Services
- Public Relations
- Publications and Design
- Library and Information Services
- Spatial Data Management

Additional Financial Information: These statements represent the first financial report for the Department prepared on an accrual basis. They have not been subjected to any formal audit process.

	1993-94 (\$'000)
4 Salaries	
Salaries	30 569
Change in annual and long service leave entitlements	4 114
	<hr/> 34 683 <hr/>
5 Superannuation	
Total expense for the year	<hr/> 1 719 <hr/>
6 Administration expenses	
Expenses incurred during the year	21 156
Resources received free of charge	983
	<hr/> 22 139 <hr/>
7 User charges and fees	
Explosives	611
Chemistry Centre	1 591
Registration	90
Geological Survey	591
Survey & Mapping	161
Engineering	49
Petroleum	28
	<hr/> 3 121 <hr/>
8 Other revenues	
Administration	<hr/> 680 <hr/>
All the above receipts form part of "Operating Revenues" as disclosed in the Operating Statement.	
9 Appropriations	
Consolidated fund	
Recurrent	53 885
Other Statutes - Salaries & Allowances	109
Capital	
Chemistry Centre	9 905
Computing Equipment	1 064
General Office Equipment	755
Airconditioning Refurbishment	23
Partitioning & Accommodation	18
	<hr/> 65 759 <hr/>
10 Receipts paid into Consolidated Fund	
Departmental revenue	
Explosives	606
Chemistry Centre	1 386
Registration	73
Geological Survey	535
Survey & Mapping	145
Engineering	49
Petroleum	28
Administration	680
	<hr/> 3 502 <hr/>
11 Resources received free of charge	
Administration Expenses	<hr/> 983 <hr/>
	<hr/> 983 <hr/>

Resources received free of charge have been determined on the basis of the following estimates provided by agencies.

	(\$'000)
Office of the Auditor General	
- audit services	50
Building Management Authority	
- property maintenance services	716



Additional Financial Information: These statements represent the first financial report for the Department prepared on an accrual basis. They have not been subjected to any formal audit process.

	(\$'000)	1993-94 (\$'000)
Government Property Office		
- property management services	3	
Department of Services		
- human resources, payroll and purchasing services	2	
Department of Land Administration	173	
Treasury Department		
- GAS processing and associated services	39	
	<u>983</u>	
12 Liabilities assumed by the Treasurer		
Superannuation		<u>1 719</u>
13 Administered expenses and revenues		
Expenses		
An appropriation is made under the provisions of the Petroleum (Submerged Lands) Act 1982 for the Commonwealths' share of royalties received from offshore operations. The Commonwealth revenue has been collected by the State into the Consolidated Fund receipts.		
Petroleum (Submerged lands) Act 1982		<u>11 413</u>
Revenue		
Taxes, Licences and royalties		
The Department is responsible for collection of certain taxes, licences and royalties. These are not classified as operating revenues and are paid directly to Consolidated Fund.		
Collections made during the year were:		
Royalties		
Iron Ore		148 674
Petroleum		72 886
Diamonds		40 202
Alumina		30 737
Mineral Sands		8 773
Nickel		7 908
Other		24 898
Lease and other rentals		59 185
		<u>393 264</u>
Taxes and Licences		
Petroleum Permits and Licences		3 326
Prospecting Exploration & Other Mining Licences		3 245
Explosives Regulations		154
Flammable Liquids Regulation		547
Transport of Dangerous Goods		203
		<u>7 474</u>
14 Cash and amounts in suspense		
Suspense Account		422
Cash on hand		224
		<u>646</u>
15 Restricted cash		
Controlled Trust Accounts:		
Survey of Leases Under the Mining Act Account		3 789
Chemistry Centre Trust Account		302
Deposits: Mines Department Account		997
Special Projects Trust Account		228
		<u>5 316</u>

Additional Financial Information: These statements represent the first financial report for the Department prepared on an accrual basis. They have not been subjected to any formal audit process.

	1993-94 (\$'000)
16 Inventories	
Estimated value of inventories held for resale at Mining Registration central counter	116
Unused consumable items - CCWA	215
	<u>331</u>
17 Accounts receivable	
Accounts receivable for goods and services supplied	298
Less: provision for doubtful debts	21
	<u>277</u>
18 Other current assets	
Prepayments	<u>514</u>
19 Property, furniture, equipment and vehicles	
Land	
At valuation	N/A
	<u>N/A</u>
Buildings - Industrial	
At cost	41
Accumulated depreciation	Nil
	<u>41</u>
At valuation	18 000
Accumulated depreciation	Nil
	<u>18 000</u>
Total Buildings - Industrial	<u>18 041</u>
Furniture	
At cost	27
Accumulated depreciation	Nil
	<u>27</u>
At valuation	1 576
Accumulated depreciation	Nil
	<u>1 576</u>
Total Furniture	<u>1 603</u>
Office equipment	
At valuation	1 134
Accumulated depreciation	Nil
	<u>1 134</u>
At cost	1 364
Accumulated depreciation	Nil
	<u>1 364</u>
Total Office Equipment	<u>2 498</u>
Computer equipment	
At cost	2 471
Accumulated depreciation	Nil
	<u>2 471</u>
At valuation	5 087
Accumulated Depreciation	Nil
	<u>5 087</u>
Total Computer Equipment	<u>7 557</u>
Total Equipment	<u>10 055</u>
Vehicles	
At cost	492
Total of property, Furniture, equipment and vehicles	<u>30 192</u>

The valuations of land and some buildings have not been brought to account as valuations have not been completed by the Valuer General's Office. Some valuations for buildings have been supplied by the Building Management Authority and are stated at replacement cost.

The valuations of furniture were undertaken internally and the valuations were based on Treasury's guidebook "Accrual Accounting for Government Departments: Valuation for Furniture and Fittings"

All the valuations are stated as at 30 June 1994.



Additional Financial Information: These statements represent the first financial report for the Department prepared on an accrual basis. They have not been subjected to any formal audit process.

	1993-94 (\$'000)
20 Works In Progress	
Chemistry Centre - Bentley (Construction)	12 200
21 Accounts payable	
Amounts payable for goods and services received	178
22 Accrued salaries	
Nil	Nil
23 Employee entitlements	
Current liabilities	
Liability for annual leave	2 217
Liability for long service leave	1 925
	<u>4 142</u>
Non-current liabilities	
Liability for long service leave	3 059
	<u>3 059</u>
24 Treasurers' Advances	
Cash Advances	20
Drilling Advance Account	204
	<u>224</u>
25 Equity	
Equity represents the residual interest in the net assets of the Department. The Government holds the equity interest in the Department on behalf of the community. The asset revaluation reserve represents that portion of equity resulting from the revaluation of non-current assets.	
Accumulated surplus	
Balance at the beginning of the year	26 359
Change in net assets resulting from operations	10 198
Balance at end of the year	<u>36 557</u>
Asset revaluation reserve	
Balance at the beginning of the year	Nil
Revaluations during the year	
Balance at end of the year	<u>Nil</u>
Total equity	<u>36 557</u>
26 Administered assets and liabilities	
Administered assets and liabilities are not controlled by the Department but are administered by it on behalf of the Government.	
Barrow Island Royalty Trust Account	4 102
The Account was created under the Barrow Island Royalty Trust Account Act 1985 which provides for royalty payments received under the Barrow Island lease to be credited to the account and subsequently apportioned between the Commonwealth and the State.	
27 Resources provided free of charge	
During the year the following resources were provided to other agencies free of charge for functions outside the normal operations of the Department:	
Health Department	
MERIWA	
(For building services, parking, security & use of conference rooms. No estimate of the total amount involved can be reliably calculated.)	
Office of Traditional Land Use (\$35 604)	36
	<u>36</u>

KEY PERFORMANCE INDICATORS

MINERAL RESOURCES MANAGEMENT

Objective: to ensure that the exploration for and mining of the State's mineral resources are managed for the benefit of the people of Western Australia.

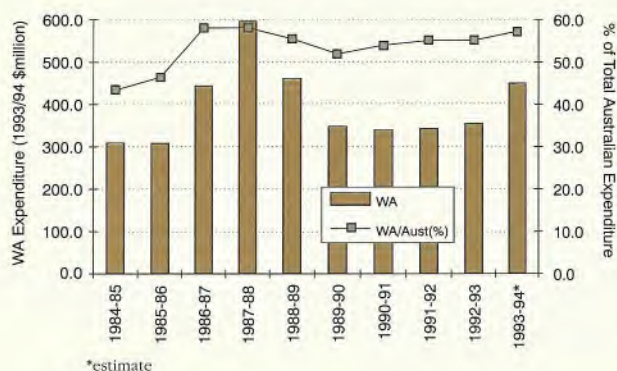
Measuring the Department's effectiveness in meeting this objective is difficult because the level of mineral exploration and development activity in the State is dependent on a number of factors, including world commodity prices and Federal and State fiscal and land access policies, which significantly outweigh the impact of any Departmental initiatives. It is not appropriate, therefore, to use the level of these activities as a measure of program effectiveness. However, they do provide an important indication of the context in which the Department operates, showing that the State cannot be complacent if it is to retain its pre-eminent position in terms of attracting mineral exploration and development investment.

Indicator

Result

Level of Mineral Exploration Activity

The rate of resource discoveries and the corresponding changes in the State's resource inventory are related to the level of exploration activity. The graph indicates the current and immediate past levels of aggregate exploration expenditure in Western Australia compared to the total expenditure in Australia.



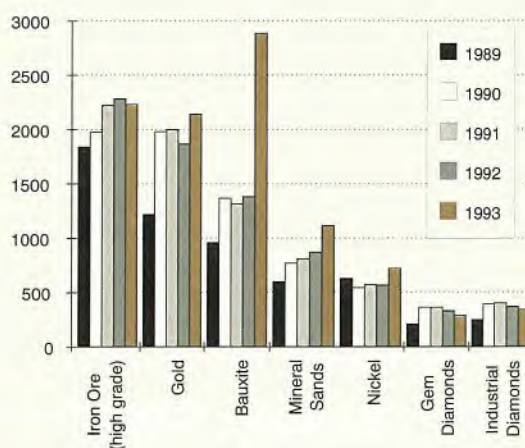
Major Minerals Resource Inventory

Changes in resource inventories for selected commodities (measured and indicated resources at 31 December).

Units of commodities shown are:

Iron ore (high grade)	ten million tonnes
Gold	tonnes
Bauxite*	million tonnes
Mineral sands	hundred kilotonnes
Nickel	ten kilotonnes
Diamonds	million carats

* Bauxite reserves have been increased following a major reappraisal carried out in 1993-94.



MINERAL TENURE SUB PROGRAM

Objective: To provide the mineral industry with a timely, secure and equitable titles system, and accurate, up-to-date information about mineral and land tenure in order to encourage and facilitate responsible mineral exploration and development.

Indicator	Result	
	1992-93 %	1993-94 %
Effectiveness		
The proportion of Prospecting Licence, Mining Lease and Exploration Licence applications which are finalised within three, five and seven months of receipt respectively.		
Prospecting Licences	82	68
Mining Leases	62	73
Exploration Licences	62	70

This indicator reflects the Department's ability to process title applications in a timely manner. The respective periods were chosen prior to the introduction of the Land (Titles and Traditional Usage) Act in December 1993 as a realistic duration for processing each title category.

Target levels are set at 75 per cent for exploration licence and mining leases and 85 per cent for prospecting licences. Remaining applications are subject to delays beyond the control of the Department, for example; where applications affect private land, Aboriginal or Conservation Reserves or legal dispute arises.

Explanatory Notes:

Prior to the introduction of the Land (Titles and Traditional Usage) Act the respective 75 per cent and 85 per cent target figures reflected applications not subjected to delays due to the type of land affected or legal disputes. Since December 1993 all applications have been subject to the longer 70 day objection period on traditional land use grounds. This impacted on the outcomes in 1993-94 and will cause a reassessment of the targets for 1994-95.

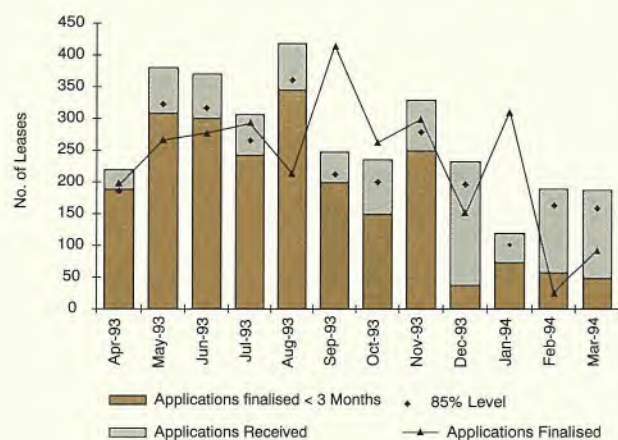
The criteria used to determine the processing time frames take into account:

- the 35 day public objection period for all title applications;
- the need for a Warden's Court hearing/ recommendation;
- Warden determines and imposes conditions on Prospecting and Miscellaneous Licences;
- additional processing is required for Exploration Licences;
- Mining Leases and General Purpose Leases which are determined by the Minister; and
- 30 day letter to the applicant for Exploration Licences to consider proposed conditions of grant.

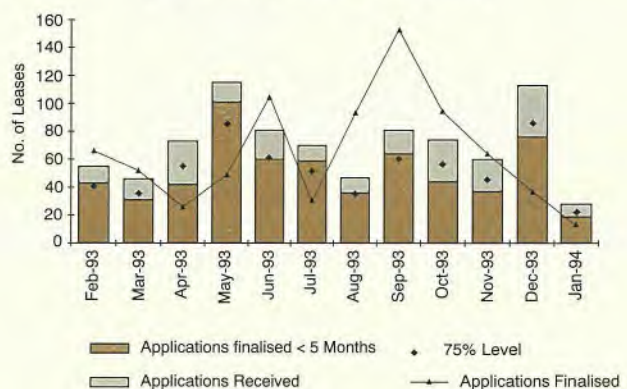
The results for mining leases and exploration licences at 73 per cent and 70 per cent respectively represent a 10 per cent improvement over the previous year's figures, in a year when the number of applications for mining leases and exploration licences granted increased by 27 per cent and 40 per cent respectively.

The out turn for prospecting licences fell to 68 per cent against a target of 85 per cent, due to the introduction of a 70 day objection period for objection on traditional land use grounds.

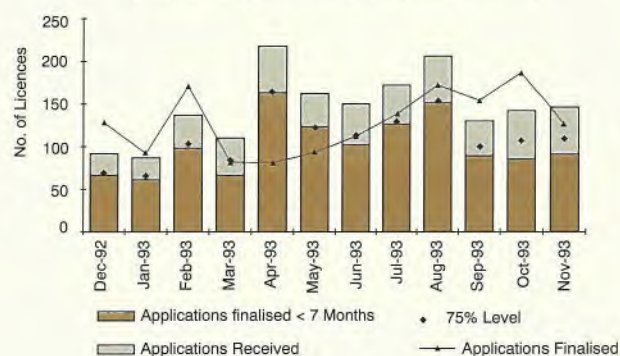
Performance Indicator - Prospecting Licences



Performance Indicator - Mining Leases



Performance Indicator - Exploration Licences



The average time taken to determine each major title category during the year.

1991-92 1992-93 1993-94
(months)

Time in months to process:

Prospecting Licences	2.0	2.6	3.7
Mining Leases	4.4	5.5	6.0
Exploration Licences	6.3	7.3	8.4

Efficiency

The administration cost for mineral titles.

1991-92 1992-93 1993-94

This indicator reflects the departmental cost of issuing and maintaining titles.

Mineral Titles (cents/ha) 32 29 24

The costs are calculated using average salary levels and allowances for overheads.

MINERAL INDUSTRY OCCUPATIONAL HEALTH AND SAFETY SUB PROGRAM

Objective: To achieve a low and decreasing incidence of bodily injury, occupational disease and fatalities amongst those employed in the mineral industry.

Indicator

Result

Effectiveness

The frequency of lost time injuries for mining operations.

1991-92 1992-93 1993-94

The frequency is the number of occurrences of injury or disease for each one million hours worked as defined in Australian Standard AS1885.1 - 1990.

Coal Mines	112	130	78
Metalliferous Mines	21	17	13

Workers' compensation premium rates for the mining as a proportion of the employer's payroll.

1991-92 1992-93 1993-94
% % %

These rates are published in the Government Gazette and are determined by the Premium Rates Committee on the basis of past performance.

Coal	3.33	3.00	4.02
Gold underground	7.51	6.76	5.50
Gold open-cut	3.93	3.54	3.72
Mineral sands	3.93	3.54	3.72
Iron ore	3.20	2.88	2.73

Indicator	Result
-----------	--------

The rates generally reflect an improved safety performance, bearing in mind that they are set on 1 July, based on the previous year's compensation data. The 33 per cent increase in the coal premium reflects the 36 per cent increase in the frequency rate recorded in 1992-93.

Efficiency

The total cost of salaries plus support services for the sub program's mining operations inspectorates per employee in the mineral sector.

	1991-92	1992-93	1993-94
	\$	\$	\$
All Mining (\$)	185	188	193

The costs have been determined using the sub program's salary level and a factor (0.7) for all overheads. Previous years' figures are historical.

MINERAL INDUSTRY ENVIRONMENTAL MANAGEMENT SUB PROGRAM

Objective: To ensure that environmental impacts of mineral exploration and development activities are within acceptable community standards.

Indicator	Result
-----------	--------

Effectiveness

The extent to which mineral operations comply with Departmental environmental completion criteria.

A security bond system is maintained to indemnify the State in the event of failure by a proponent of mining activity to comply with environmental conditions of title. Bonds are called on to rectify unsatisfactory environmental performance. Where rehabilitation work is completed to the satisfaction of the Department bonds are reduced or released.

	1992-93	1993-94
No. of Projects completed	5	12
Proportion meeting criteria (per cent)	100	92
(Bonds reduced or released)		

The extent to which there is acceptance by the community of the Department's role in environmental management of the mineral industry, measured by surveys of community groups.

The survey approach was not undertaken this year but will be a key performance indicator utilised for the next and subsequent years. Action is in hand to develop suitable postal and direct questionnaires for the community users of the Sub-program activities.

Efficiency

Appropriate indicators are being developed in consultation with the Public Sector Management Office.

MINERAL EXPLORATION DATA SUB PROGRAM

Objective: To provide the mineral industry with ready access to mineral exploration, development and production data in order to encourage efficient and effective mineral exploration and development.

Indicator	Result	
<i>Effectiveness</i>		
The proportion of mineral exploration reports on active mining tenements received from industry which have been accessioned in the WA Mineral Exploration database (WAMEX).	1992-93	1993-94
	No. of reports received	2187 2849
	Proportion accessioned (per cent)	100 100
The proportion of mineral exploration reports which become eligible for release that are placed on open file as microfiched items.	1992-93	1993-94
	No. of reports eligible	2298 984
	Proportion accessioned (per cent)	100 40

During 1993-94, geoscientific staff resources necessary for open file work were diverted to work in the accelerated mapping projects being undertaken in the Geology and Resource Information Program while new contract staff were being recruited. It is expected that the rate of release of data for open file access in 1994-95 will revert to the former high level.

MINERAL ROYALTIES SUB PROGRAM

Objective: To collect, for the community of Western Australia, in a manner that is administratively and economically efficient, a fair return for the extraction of the State's mineral resources.

Indicator	Result	
<i>Effectiveness</i>		
Total royalties collected as a proportion of mine-head value.	1992-93	1993-94
	%	%
	7.0	6.1
<p>The decrease in 1993-94 was caused by an increase in the value of gold for which no royalties are paid (see Report in the Mineral Royalties Sub Program section).</p>		
The proportion of royalties reported due which were paid by the required date.	1992-93	1993-94
	%	%
	99.9	99.9
<i>Efficiency</i>		
The administration cost per company paying royalty.	1992-93	1993-94
	\$	\$
	1826	2389

Previous years' costs were based on combined cost accounting for mineral and petroleum royalties. Reported separately for the first time in 1993-94.

PETROLEUM RESOURCES MANAGEMENT

Objective: To ensure that the exploration, development and production of the State's petroleum resources are managed for the benefit of the people of Western Australia.

Measuring the Department's effectiveness in meeting this objective is difficult because the level of petroleum exploration and development activity in the State is dependent on a number of factors, including world commodity prices and Commonwealth and State fiscal and land access policies, which significantly outweigh the impact of any Departmental initiatives. It is not appropriate, therefore, to use the level of these activities as a measure of the Department's effectiveness. However, they do provide an important indication of the context in which the Department operates, showing that the State cannot be complacent if it is to retain its pre-eminent position in terms of attracting petroleum exploration and development investment.

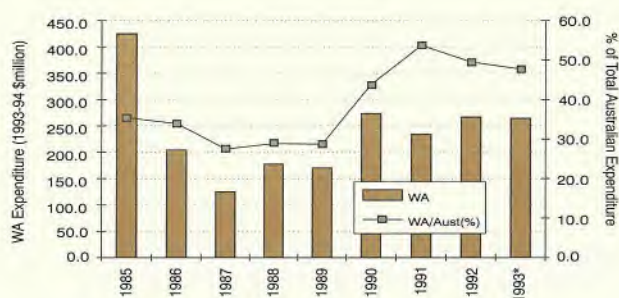
Indicator

Result

Level of Petroleum Exploration Activity

The rate of resource discoveries and the corresponding changes in the State's resource inventory are related to the level of exploration activity. The graph indicates the current and immediate past levels of aggregate exploration expenditure in Western Australia compared to the total expenditure in Australia. Australia.

Key Performance Indicators Petroleum Resources Management



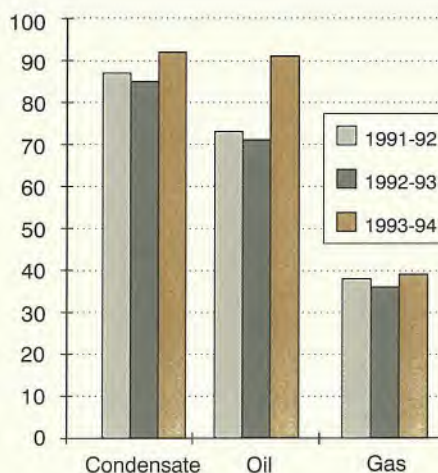
Petroleum Reserves Inventory

Reserves (at 30 June) from proved developed, proved undeveloped and probable fields at the 50 per cent probability level. Reserves are currently defined according to the Society of Petroleum Engineers standard which essentially defines reserves as the identified, unproduced volume that is technically and economically recoverable from the reservoir. Therefore, for reserves to remain static while fields are on production, the rate of discovery must keep pace with the annual rate of production.

Units of commodities shown are:

Oil and Condensate: million kilolitres
Gas: ten thousand million cubic metres

Current WA production rates (approximate):
Condensate and Oil: 32,000 kilolitres/day
Gas: 50 million cubic metres/day



PETROLEUM TENURE SUB PROGRAM

Objective: To provide the petroleum industry with a timely, secure and equitable titles system, and accurate, up-to-date information about petroleum land tenure in order to encourage and facilitate responsible exploration and development.

Indicator	Result
-----------	--------

Effectiveness

The degree of client satisfaction with the petroleum title process.

A client survey was conducted by the Institute for Research into International Competitiveness at Curtin University. Client satisfaction was measured on a five-point scale* for a variety of areas.

* 1 = highly dissatisfied - 5 = highly satisfied

The survey was largely inconclusive because of the very low response rate from clients (11 responses from 56 polled). However, average scores received were:

	1993-94
Quality of service	3.7
Accuracy of information	3.8
Completeness of information	3.5
Up-to-date information	3.6
Ease of obtaining information	3.6
Access to staff	3.5
Awareness of needs	2.9
Title registration turnaround time	3.1

Efficiency

The administration costs for petroleum titles.

This indicator reflects the cost of processing and issuing all titles.

	1992-93	1993-94
Number of titles processed	113	128
Average cost per title (\$)	4348	4583

PETROLEUM INDUSTRY OCCUPATIONAL HEALTH AND SAFETY SUB PROGRAM

Objective: To achieve a low and decreasing incidence of bodily injury, occupational disease and fatalities amongst those employed in the petroleum industry.

Indicator	Result		
-----------	--------	--	--

Effectiveness

The frequency of lost time injuries for petroleum operations.

The frequency is the number of occurrences of injury or disease for each one million hours worked in Australian Standard AS1885.1-1990.

	1991-92	1992-93	1993-94
Onshore petroleum	20.7	21.0	17.1
Offshore petroleum	15.5	15.9	11.7

The frequency rate for petroleum activities decreased significantly in the onshore and offshore sectors. The creation of a dedicated Safety Branch which is promoting a greater awareness of safety measures may have been a contributing factor.

Indicator	Result			
Workers' compensation premium rates for the petroleum industries as a proportion of the employer's payroll.	1991-92	1992-93	1993-94	
	%	%	%	
	Onshore petroleum	8.08	4.85	4.08
	Offshore petroleum	7.99	6.32	7.21

These rates are published in the Government Gazette and are determined by the Premium Rates Committee on the basis of past performance.

Premiums are set 1 July, based on the previous year's compensation data. Despite a decreased lost time injuries frequency rate for offshore operations in 1993-94, the premium was higher because of the increase in the frequency rate recorded in 1992-93 and the substantial increase in the number of employees in this sector.

Efficiency

The total cost of salaries plus support services for the engineering/ safety inspectorate per employee in the petroleum sectors.

1991-92	1992-93	1993-94
\$	\$	\$
359	296	413

The costs have been estimated using average salary levels and a factor for all Departmental overheads.

The increase in cost per employee has been occasioned by the creation of a dedicated Safety Branch.

PETROLEUM INDUSTRY ENVIRONMENTAL MANAGEMENT SUB PROGRAM

Objective: To ensure that any adverse environmental impacts of petroleum exploration and development activities are within acceptable community standards.

Indicator	Result	
Effectiveness		
	The extent to which petroleum operations comply with Departmental environmental criteria.	
	1992-93	1993-94
	%	%
Reporting compliance	100	100

Performance is assessed by field inspections and evaluation of completed environmental reports. The indicator measure used is based on companies' compliance with the Department's criteria on the reporting of their environmental management commitments.

More suitable indicators are being developed.

Efficiency

Appropriate indicators are being developed in consultation with the Department of Premier and Cabinet.

PETROLEUM EXPLORATION DATA SUB PROGRAM

Objective: To provide the petroleum industry with ready access to petroleum exploration and production data in order to encourage efficient petroleum exploration and development.

Indicator	Result	
Effectiveness		
<p>The proportion of industry requests for company exploration reports which can be met on demand and within two weeks.</p> <p>Reports which are available through commercial agents or are held in the Departmental library are considered to be available on demand.</p>	1992-93 %	1993-94 %
Edited Reports - on demand	80	86
Edited Reports - within two weeks	93	97
Unedited Reports - on demand	85	80
Unedited Reports - within two weeks	97	98
<p>Notes: Edited reports have interpretative data excised and are released after a two year moratorium period. Unedited reports contain all data and a five year moratorium period applies.</p>		

PETROLEUM ROYALTIES SUB PROGRAM

Objective: To collect, for the community of Western Australia, in a manner that is administratively and economically efficient, a fair return for the extraction of the State's petroleum resources.

Indicator	Result	
Effectiveness		
<p>Total royalties collected as a proportion of well-head value.</p>	1992-93 %	1993-94 %
	10.6	11.1
<p>The proportion of royalties reported due which are paid by the required date.</p>	99.9	99.9
Efficiency		
<p>The administration cost per company paying royalty.</p> <p>Previous years' costs were based on combined cost accounting for mineral and petroleum royalties. Reported separately for the first time in 1993-94.</p>	1993-94 \$	8524

GEOLOGY AND RESOURCE INFORMATION

Objective: To improve the knowledge of the geology of Western Australia and the quality of the regional geological, geophysical and geochemical data and maps for use by industry, government and the public to support exploration, groundwater management, land-use planning and infrastructure development.

Indicator	Result
-----------	--------

Effectiveness

The degree of client satisfaction with the Regional Geoscience Mapping sub-program.

A client survey was conducted by the Institute for Research into International Competitiveness at Curtin University. Client satisfaction was measured on a five-point scale* for a variety of areas.

* 1 = highly dissatisfied - 5 = highly satisfied

Average scores from 109 responses to questionnaires sent to 180 companies and 400 questionnaires distributed with the December newsletter of the Australian Institute of Geoscientists:

1993-94

Quality of products	3.9
Awareness of needs	3.3
Accuracy of information	3.6
Comprehensiveness of information	3.4
Up-to-date information	3.1
Ease of obtaining information	3.6
Access to staff	3.6
Rate of production	2.8
Rate of publication	2.7

The rate of geoscientific map production

Geoscientific maps are widely used by mineral and petroleum explorers and developers and by groundwater and land-use planners as a basic source of information on which to make resource allocation decisions. The indicator reflects the extent to which the Department is maintaining an adequate coverage of this information over the State.

1992-93 1993-94

Maps compiled	7	15
Maps issued	2	10
Cumulative coverage (maps)	12	23

The large increase in maps compiled and issued was the result of extraordinary funding provided by the Government towards a four-year, accelerated mapping program.

Note:

There is already 100 per cent coverage of the State by 1:250 000 geological maps (each of which covers an area approximately 100km x 150km). The Department ensures that these maps are updated regularly as required. In recent years there has been an increased demand for a greater degree of information in geologically complex areas, and this is being addressed by the issue of maps at 1:100 000 scale (each covering an area approximately 50km x 50km).

Efficiency

Appropriate indicators are being developed for use in the 1994-95 financial year.

DANGEROUS GOODS MANAGEMENT

Objective: To achieve an acceptably low level of risk to the public as a result of the storage, handling and transport of explosives and dangerous goods in Western Australia.

Indicator	Result
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Effectiveness

The public deems compliance with the relevant legislative controls as providing an “acceptably low level of risk”. Hence, the extent to which the explosives and dangerous goods industry is observed to be complying with the regulations is seen as a direct indicator to the effectiveness of the Division in achieving its objective.

Transport of Dangerous Goods: the proportion of vehicles complying with safety standards.

1991-92 1992-93 1993-94

% % %

Full vehicle	44	58	-
Documentation	84	81	90
Safety equipment	73	74	67
Emergency equipment	78	84	61
Vehicle load	93	96	96

Notes on Data Collection:

In 1993-94, data were collected on a trial basis from sources other than Divisional Inspectors to make use of the significant amount of data available. The collection method has not proved reliable and the collection of data will revert to the former method for the next reporting year.

The figure for full vehicle compliance has been omitted as the data collected in 1993-94 related only to vehicles for which an element of non-compliance was noted. In past years all dangerous goods vehicles inspected were included in the sample.

The figures for emergency and safety equipment suggest that compliance is declining. However, a large number of the vehicles in the sample were unattended trailers intended to be made up into road trains. Operators subsequently explained that fire extinguishers are frequently removed from these vehicles, being replaced before the vehicles venture onto roads.

Indicator	Result
-----------	--------

Storage of Dangerous Goods: The levels of compliance with the regulations observed at premises where dangerous goods are stored and handled.

1993-94
%

Placarding of Premises	47
Location of Stores	93
Secondary Containment	69
Fire Protection	80
Emergency Response Plans	28

Benchmark compliance levels were measured during 1993-94

The high compliance rate for "Location of Stores" is a reflection of the approval/licensing process which seeks assurance that facilities will be located correctly (i.e. with adequate safety distances) prior to the issue of a licence.

Slightly lower levels for "Secondary Containment" and "Fire Protection" are expected as these areas are subject to deterioration/damage during the life of the installation.

Significantly lower levels of compliance for "Placarding of Premises" and "Emergency Response Plans" are considered to be a result of these areas being new requirements under the Dangerous Goods Regulations 1992 which became fully effective in April 1993.

Efficiency

The system specifications for the Dangerous Goods and Explosives Information System (DEXIS) incorporate extensive recording and reporting tools to analyse performance and efficiency during the routine collection of data associated with the issue of licences and from inspection records.

It is anticipated that the ability to report on these indicators, especially effectiveness will be enhanced by the introduction of DEXIS in the 1995-96 reporting year.

SCIENTIFIC SUPPORT

Objective: To provide high quality, independent chemical and scientific information and advice to government, industry and the public in order to enhance mineral, agricultural and industrial development, and the protection of community, consumer, environment and health standards.

Indicator	Result			
-----------	--------	--	--	--

Effectiveness

The proportion of the Chemistry Centre's scientific areas covered by accreditation procedures which have achieved comprehensive external accreditation (per cent).

1990-91	1991-92	1992-93	1993-94
45	64	82	82

The degree of client satisfaction with the Chemistry Centre.

Average scores from 134 responses to questionnaires sent to 153 clients of the Chemistry Centre:

A client survey was conducted by the Institute for Research into International Competitiveness at Curtin University. Client satisfaction was measured on a five-point scale* for a variety of areas.

* 1 = highly dissatisfied - 5 = highly satisfied

	1993-94
Quality of service	4.1
Awareness of needs	4.2
Accuracy of information	4.4
Completeness of information	4.3
Up-to-date information	4.2
Ease of obtaining information	4.2
Sample turn-around time	3.2
Consultancy turn-around time	4.4
Response to an emergency	4.7
Access to staff	4.4
Quality of interpretation	4.3

Efficiency

Cost of services for a 'market basket' of tests

	1991-92	1992-93	1993-94
Cost Index	1.00	0.94	0.92

The market basket of tests includes over one hundred of the major chemical and related scientific tests undertaken in the Chemistry Centre's eight laboratories.

(Relative to costs in 1991-92).

CERTIFICATION OF PERFORMANCE INDICATORS

I hereby certify that these performance indicators are based on proper records and fairly represent the performance of the Department of Minerals and Energy for the year ending 30 June 1993.



L C Ranford
ACCOUNTABLE OFFICER

12 August, 1994



Opinion of the Auditor General

To the Parliament of Western Australia

**Department of Minerals and Energy
Performance Indicators for the Year Ended June 30, 1994**

Scope

The Financial Administration and Audit Act 1985 requires the accountable officer to prepare and submit performance indicators. Treasurer's Instruction 904 requires that key indicators of effectiveness and efficiency be reported for each program. I am required to audit these indicators and state whether in my opinion, they are relevant and appropriate having regard to their purpose and fairly represent the indicated performance.

As stated in my First General Report for 1994, when certain conditions are met, I will issue an opinion on performance indicators as required by the Act. I have reviewed the performance indicators reported by the Department of Minerals and Energy for the year ended June 30, 1994 in accordance with the approach outlined in my First General Report for 1994.

During my review, I have assessed the relevance of the reported indicators to the objectives submitted by the Department based on my knowledge of the Department and have assessed the appropriateness of the indicators for the purpose of assisting users external to the Department to assess performance. I have also assessed whether the Department is reporting on all key objectives required by the program statements. Where I have formed the view that the indicators are relevant and appropriate, I have also examined, on a test basis, the relevant information systems to determine whether the information reported in the indicators is verifiable and free from significant bias.

Audit Assessment

It is my view that the performance indicators reported are relevant to the stated objectives of the Department of Minerals and Energy. The indicators are appropriate for assisting users external to the Department to assess its performance, however, I am unable to determine if the information reported for the following indicators fairly represents the indicated performance:

- Program 2: Petroleum Tenure
 - The degree of client satisfaction with the petroleum title process.
- Program 4: Dangerous Goods Management
 - Transport of Dangerous Goods: the proportion of vehicles complying with safety standards.

In my view, except for those listed above, the indicators reported by the Department fairly represent the indicated performance.

I am aware that the Department is developing for the following programs, efficiency indicators which will show the relationship between resources used and the outputs produced which contributed to the desired outcomes:

- Program 1: Mineral Industry Environmental Management
- Program 2: Petroleum Industry Environmental Management
- Program 3: Geology and Resource Information
- Program 4: Dangerous Goods Management



**D D R Pearson
AUDITOR GENERAL**

October 6, 1994

APPENDIX 1: STRUCTURE OF THE DEPARTMENT OF MINERALS AND ENERGY

The Department is established by the Governor of Western Australia under Section 11 of the Mining Act 1978 which requires that there be a Department of the Public Service to assist the Minister in the administration of the Mining Act.

The Department of Minerals and Energy is structured into nine Divisions. Eight of these are operating Divisions while the Corporate Development Division provides the specialist support services needed to manage the organisation.

The organisational structure is set out in Figure 12 and the way in which each Division contributes to the Corporate Plan is shown in Figure 13. A Department directory listing the principal offices is included in Table 1.

A brief summary of the activities of each Division follows.

The **Geological Survey Division** systematically records and interprets the geology of the State and provides this information to Government, industry and the general public in order to assist the exploration, development and conservation of the State's mineral, petroleum and groundwater resources.

It evaluates mineral and petroleum resources as a basis for decision-making by Government and assists and advises on a variety of community needs, including urban planning, land-use matters and engineering developments.

The **Petroleum Division** facilitates the undertaking by industry of geophysical and drilling programs for the identification and exploitation of oil and gas accumulations. It ensures that sound engineering principles and standards are applied to the design and construction of exploration and production facilities and that safety management systems are in place to secure the occupational health, safety and welfare of the workforce. It also maintains an effective title allocation and registration system, and monitors, advises and interprets State and Commonwealth petroleum legislation.

The **Chemistry Centre (WA)** provides chemical, mineralogical, metallurgical and associated analytical, investigative and advisory services to Government, industry and the public in the following areas: the development of the State's mineral, water and agricultural resources; monitoring and improving public and occupational health, environmental and material standards within the community; and scientific support to law enforcement and racing agencies.

The **Royalties, Economic Policy and Public Affairs Division** develops mineral and petroleum royalty systems which are fair and equitable and administers the collection and audit of royalties paid on behalf of the State and Commonwealth. It also provides economic advice on mining and petroleum industry issues, collects and disseminates statistics and assists in the development and coordination of general Departmental policies. The Division informs staff, industry and the public about the role of the Department and the importance of the mining and petroleum industry.

The **Corporate Development Division** provides corporate services for the Corporate Executive and the divisions of the Department while responding to the requirements of Government and central agencies. These services include corporate planning, building and purchasing services, computing, typing, records, telecommunications, finance, human resource and auditing activities.

The **Mining Operations Division** administers mine safety of those working in the industry. It provides advice to the Government and to industry on mining engineering matters including deep mining, open-cut mining, quarrying, drilling, the environment and rehabilitation. It monitors exploration safety and administers contract drilling for the Department.

The **Explosives and Dangerous Goods** Division reviews, formulates and administers laws, regulations and policies aimed at the safe manufacture, storage, handling and transport of explosives and dangerous goods. It provides safety advice on these matters and major hazard control.

The Mining Registration Division receives applications and allocates titles that give legal rights for exploration and mining of minerals in Western Australia pursuant to the Mining Act. It maintains a mining tenement holders, condition and term of the grant and expenditure details from which the Division monitors compliance with the provisions of the Mining Act.

The Surveys and Mapping Division determines, documents and validates the boundaries of tenements and produces and updates all maps and plans necessary for the operations of the Department. All functions from the primary field surveys to final map production are embraced. The range of cartographic activities includes charting, field surveying, computations, mapping, reprographics, and maintenance of archival materials as an integral part of the tenement management process.

Figure 12. Organisational Structure

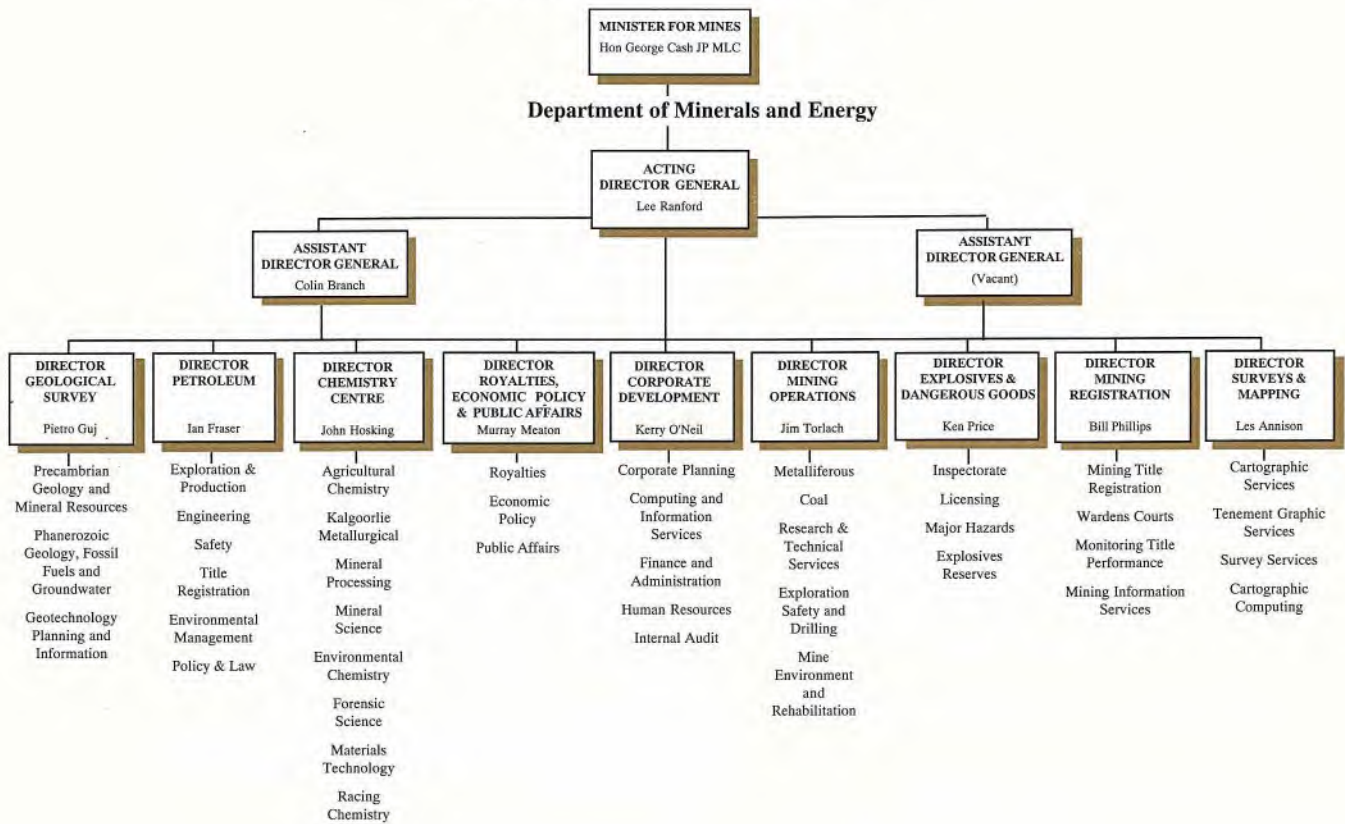


Figure 13. Contributions by Divisions to the Corporate Programs

PROGRAM		GSWA	MOD	PET	CCWA	MRD	EDG	S&M	REP	CDD
1. MINERAL RESOURCES MANAGEMENT	1.1 Mineral Industry and Resource Policy	•	•			•		•	•	•
	1.2 Mineral Tenure	•				•		•		•
	1.3 Mineral Industry Occupational Health & Safety	•	•					•		•
	1.4 Mineral Industry Environmental Management	•	•		•	•		•		•
	1.5 Mineral Exploration Data	•						•		•
	1.6 Mineral Royalties	•	•			•			•	•
2. PETROLEUM RESOURCES MANAGEMENT	2.1 Petroleum Industry and Resources Policy	•		•				•	•	•
	2.2 Petroleum Tenure			•				•		•
	2.3 Petroleum Industry Occupational Health & Safety			•				•		•
	2.4 Petroleum Industry Environmental Management	•		•	•			•		•
	2.5 Petroleum Exploration Data	•		•				•		•
	2.6 Petroleum Royalties			•				•	•	•
3. GEOLOGY & RESOURCE INFORMATION	3.1 Regional Geoscience Mapping	•			•			•		•
	3.2 Groundwater Resources	•	•		•			•		•
	3.3 Geotechnical Services	•	•					•		•
4. DANGEROUS GOODS MANAGEMENT							•	•		•
5. SCIENTIFIC SUPPORT	5.1 Mineral Science				•			•		•
	5.2 Mineral Processing & Extractive Metallurgy				•			•		•
	5.3 Environmental and Health Chemistry				•			•		•
	5.4 Agricultural Chemistry				•			•		•
	5.5 Forensic Science				•			•		•
	5.6 Materials Technology				•			•		•
	5.7 Racing Chemistry				•			•		•
6. CORPORATE SERVICES	6.1 Corporate Development							•		•
	6.2 Corporate Directorate							•		•
	6.3 Public Relations and Corporate Publications	•						•	•	•

• DIVISIONAL CONTRIBUTIONS TO SUB PROGRAMS
● DIVISION WITH SUB-PROGRAM MANAGEMENT RESPONSIBILITY

DEPARTMENT DIRECTORY

Head Office

Department of Minerals and Energy
Mineral House Complex
100 Plain Street (cnr Adelaide Terrace)

East Perth 6004
Telephone (09) 222 3333
Facsimile (09) 222 3430

Metropolitan Offices

Chemistry Centre (WA)
125 Hay Street

East Perth 6004
Telephone (09) 325 5544
Facsimile (09) 325 7767

Baldivis Explosives Reserve
Stakehill Road

Baldivis 6171
Telephone (09) 524 1301
Facsimile (09) 524 1792

Exploration Safety and Drilling
91 Briggs Street

Welshpool 6106
Telephone (09) 470 0300
Facsimile (09) 362 5694

Mineral Processing Laboratory
19 Catherine Street

Bentley 6102
Telephone (09) 351 5777
Facsimile (09) 351 8197

Regional Offices

Mining Registrar
Court House (Box 28)

Broome 6725
Telephone (091) 921 137
Facsimile (091) 921 878

Mining Registrar
Court House (Box 35)

Carnarvon 6701
Telephone (099) 411 082
Facsimile (099) 412 779

Regional Mining Engineer
66 Wittenoom Street

Collie 6225
Telephone (097) 341 222
Facsimile (097) 341 606

Mining Registrar
40 Bayley Street (Box 41)

Coolgardie 6429
Telephone (090) 266 066
Facsimile (090) 266 204

Regional Mining Engineer
Brookman Street (Box 671)

Kalgoorlie 6430
Telephone (090) 219 419
Facsimile (090) 213 612

Kalgoorlie Metallurgical Laboratory
95 Egan Street (Box 881)

Kalgoorlie 6430
Telephone (090) 805 120
Facsimile (090) 912 762

Regional Mining Registrar
Brookman Street (Box 364)

Kalgoorlie 6430
Telephone (090) 213 066
Facsimile (090) 912 428

Kalgoorlie Explosives Reserve
Piccadilly Street West

Kalgoorlie 6430
Telephone (090) 218 246
Facsimile (090) 913 222

Geological Survey Regional Office
Egan Street

Kalgoorlie 6430
Telephone (090) 219 425
Facsimile (090) 914 499

Regional Mining Engineer
Hedland Place (Box 518)

Karratha 6714
Telephone (091) 868 243
Facsimile (091) 868 251

Mining Registrar
Court House (Box 917)

Kununurra 6743
Telephone (091) 681 011
Facsimile (091) 681 103

Mining Registrar
Rochester Street (Box 4)

Leonora 6438
Telephone (090) 376 106
Facsimile (090) 376 248

Mining Registrar
Bohemia Road (Box 7)

Marble Bar 6760
Telephone (091) 761 044
Facsimile (091) 761 048

Mining Registrar
Main Street (Box 7)

Meekatharra 6642
Telephone (099) 811 008
Facsimile (099) 811 482

Mining Registrar
Richardson Street (Box 13)

Mount Magnet 6638
Telephone (099) 634 040
Facsimile (099) 634 488

Mining Registrar
Princep Street

Norseman 6443
Telephone (090) 391 082
Facsimile (090) 391 657

Mining Registrar
Great Eastern Highway

Southern Cross 6426
Telephone (090) 491 107
Facsimile (090) 491 431

LEGISLATION

The Department is responsible to the Minister for Mines for administering 14 Acts of Parliament:

- Mining Act
- Petroleum Act
- Explosives and Dangerous Goods Act
- Mines Regulation Act
- Coal Mines Regulation Act
- Coal Miners' Welfare Act
- Miners' Phthisis Act
- Mining on Private Property Act
- Mining (Validation and Amendment Act)
- Petroleum Pipelines Act
- Petroleum (Registration Fees) Act
- Petroleum (Submerged Lands) Act
- Petroleum (Submerged Lands) (Registration Fees) Act
- Western Australian Coal Industry Tribunal Act

The following Commonwealth legislation is administered by the State through the Commonwealth/Western Australian offshore Petroleum/Minerals Joint Authorities:

- Petroleum (Submerged Lands) Act
- Petroleum (Submerged Lands) (Registration Fees) Act
- Petroleum (Submerged Lands (Royalty) Act
- Petroleum (Submerged Lands) Fees Act
- Offshore Minerals Act
- Offshore Minerals (Registration Fees) Act
- Offshore Minerals (Mining Licence Fees) Act
- Offshore Minerals (Exploration Licence Fees) Act

- Offshore Mineral (Retention Licence Fees) Act
- Offshore Mineral (Works Licence Fees) Act
- Offshore Minerals (Royalty) Act

In addition to its responsibilities under the above Acts, the Department undertakes various functions in relation to the following special Agreement Acts:

- Barrow Island Royalty Trust Account Act
- Barrow Island Royalty Variation Agreement Act
- Alumina Refinery Agreement Act
- Alumina Refinery (Mitchell Plateau) Agreement Act
- Alumina Refinery (Muchea) Agreement Act
- Alumina Refinery (Pinjarra) Agreement Act
- Alumina Refinery (Wagerup) Agreement Act
- Alumina Refinery (Worsley) Agreement Act
- Cement Works (Cockburn Cement Limited) Agreement Act
- Collie Coal (Griffin) Agreement Act
- Collie Coal (Western Collieries) Agreement Act
- Diamond (Argyle Diamond Mines Joint Venture) Agreement Act
- Tailings Treatment (Kalgoorlie) Agreement Act
- Broken Hill Proprietary Company's Integrated Steel Works Agreement Act
- Broken Hill Proprietary Company Limited Agreements (Variation) Act
- Broken Hill Proprietary Company Steel Industry Agreement Act
- Iron and Steel Industry Act
- Iron Ore (Channar Joint Venture) Agreement Act

- Iron Ore (Dampier Mining Company Limited) Agreement Act
- Iron Ore (Goldsworthy-Nimingarra) Agreement Act
- Iron Ore (Hamersley Range) Agreement Act
- Iron Ore (Marillana Creek) Agreement Act
- Iron Ore (McCamey's Monster) Agreement Authorisation Act
- Iron Ore (Mount Bruce) Agreement Act
- Iron Ore (Mount Goldsworthy) Agreement Act
- Iron Ore (Mount Newman) Agreement Act
- Iron Ore (Murchison) Agreement Act
- Iron Ore (Rhodes Ridge) Agreement Authorisation Act
- Iron Ore (Robe River) Agreement Act
- Iron Ore (The Broken Hill Proprietary Company Ltd) Agreement Act
- Iron Ore (Wittenoom) Agreement Act
- The Broken Hill Proprietary Company Limited (Export of Iron Ore) Act
- Wundowie Charcoal Iron Industry Sale Agreement Act
- Mineral Sands (Beenup) Agreement Act
- Mineral Sands (Cooljarloo) Mining and Processing Agreement Act
- Mineral Sands (Eneabba) Agreement Act
- Nickel (Agnew) Agreement Act
- Nickel Refinery (Western Mining Corporation Limited) Agreement Act
- Poseidon Nickel Agreement Act
- Western Mining Corporation Limited (Throssell Range) Agreement Act
- North West Shelf Gas Development (Woodside) Agreement Act
- Oil Refinery (Kwinana) Agreement Act
- Barrow Island Royalty Trust Account Act
- Barrow Island Royalty Variation Agreement Act
- Dampier Solar Salt Industry Agreement Act
- Evaporites (Lake MacLeod) Agreement Act
- Leslie Solar Salt Industry Agreement Act
- Shark Bay Solar Salt Industry Agreement Act
- Uranium (Yeelirrie) Agreement Act

CHANGES TO LEGISLATION

Mining Act 1978.

Land (Titles and Traditional Usage) Act 1993. Received assent on 2 December 1993. Amended the Mining Act 1978 by introducing provision for Aboriginal groups claiming traditional usage rights to object to new mining tenement applications. Objections are determined by the Minister for Aboriginal Affairs who makes a recommendation to the Minister for Mines.

Mining Amendment Act (No. 3 of 1993) Received assent on 1 July 1994. Introduced amendments to provide for four-year terms for prospecting licences; special Prospecting Licences for gold on mining leases where the lessee consents; amalgamation of secondary tenements; Retention Licences where, for economic or other reasons, it is not possible to exploit a mineral deposit; no conversion of lease back to licence; protection for plaintiff where a surrender is lodged; introduction of environmental inspectors, and clarification of the ownership of tailings.

Mining Amendment Regulations

- **No.1, 1993**
Gazetted on 2 July 1993. Changed several provisions for marking out an application for a mining tenement and in particular, corner post and boundary requirements. Another significant change was a requirement to advertise an application for a mining tenement in a newspaper on a day of the week nominated by the Director General of Mines (Wednesday). Other amendments included increasing the period to lodge objections against an application for a mining tenement from 30 to 35 days from the date of application as well as procedural changes to carrying out mining surveys.
- **No.2, 1993**
Gazetted 30 July 1993. Provided for an increase in registration fee upon lodgement of certain dealings, from \$17.50 to \$25.

- **No.3, 1993**
Gazetted 19 November 1993. Provided for increases in Warden's Court and Bailiff fees.
- **No 4 , 1993**
Gazetted 26 November 1993. Varied the royalty rates payable by the Tiwest Joint Venture and RGC Mineral Sands Limited.
- **No.5, 1993**
Gazetted 24 December 1993. Removed the fee for objections and introduced a separate form of objection and lodgement procedure for objections based on grounds relating to rights of traditional usage.
- **No.6, 1993**
Gazetted 24 December 1993. Varied the royalty rates payable in respect to the Throssell Range Nifty Copper Project by Western Mining Corporation Limited.
- **No.1, 1994**
Gazetted on 24 June 1994 came into operation on 1 July 1994. Included amendments to support Retention Licences; formalisation of the user-pays survey system, refund of certain survey fees, and the introduction of environmental inspectors and their powers.

Mines Regulation Act 1946

Mines Regulation Amendment Act 1993 (No.30 of 1993). Received assent on 24 December 1993. Repealed outdated provisions concerning mine workers and sets up a new medical surveillance system consistent with the duty of care philosophy; with medical examination of workers being conducted by industry, and Government to carry out a monitoring role. It also removes unnecessary constraints placed on the employment of workers and allows mine operators to operate plants continuously to maximise production.

Mines Regulations Act Regulations - Amendments

- **No.1, 1993**
Gazetted on 27 August 1993. Provided authority for the State

mining engineer to grant exemptions from regulation requirements where there is substantial compliance or where compliance is unnecessary or impracticable.

- **No.2, 1993**
Gazetted on 29 October 1993.
Amended to Regulation 9.17 to make the action level for noise 90dB(A).
- **No.3, 1993**
Gazetted on 24 December 1993.
Provides consequential amendments to the regulations associated with the Mines Regulations Amendments Act 1993 (No.30 of 1993). The majority of the amendments relate to the repealing matters concerning mine workers' health certificates and the classification of mines. Some matters from the principal Act have been converted to regulations.

Dangerous Goods Act Regulations

- **No.1, 1994**
Gazetted on 11 February 1994.
Regulations to call up the latest revision (1993) of Australian Standard 1940 - The Storage and Handling of Flammable and Combustible Liquids.
- **No.2, 1994**
Gazetted on 3 June 1994. Repealed Regulation 4.31(6) in 1993 for a 12 month period due to possible unintended implications to industry as a result of ambiguity in the wording. The intent of the regulation was to ensure that consignors of dangerous goods did not supply such goods to unlicensed premises. A review resulted in the reinstatement of a suitable amendment regulation.

Explosives Amendment Regulations 1993. Gazetted on 11 January 1994. Applied the requirements of the Australian Explosives Code to the transport of explosives in Western Australia.

Petroleum Legislation

The **Acts Amendment Petroleum Act 1994** Received assent, 29 June 1994. Amended the Petroleum Act 1967, Petroleum (Submerged Lands) Act 1982, and the Petroleum Pipelines Act 1969 by providing various incentives for onshore exploration aligning the Acts with the common mining code and correcting minor inconsistencies.

The **Land (Titles and Traditional Usage) Act 1993.** Received assent on 2 December 1993. Amended the Petroleum Act 1967, Petroleum (Submerged Lands) Act 1982 and the Petroleum Pipeline Act 1969 by introducing provision for Aboriginal groups claiming traditional usage rights to object to new petroleum tenement applications. Objections are determined by the Minister for Aboriginal Affairs who makes a recommendation to the Minister for Mines.

Commonwealth Legislation administered by the State

The **Commonwealth Offshore Minerals Act 1994**, together with seven associated Acts covering exploration and mining activities, payment of royalties, annual fees and user charges for licences, came into effect on 1 March 1994. Replaced the former Minerals (Submerged Lands) Act 1981 which had been in force since 1 February 1990. The new Act provides the legal framework for the exploration and recovery of minerals, other than petroleum, in certain Commonwealth and State offshore areas. On behalf of the Commonwealth, the State will continue to administer the offshore area adjacent to Western Australia.

Explosives and Dangerous Goods Division

- Commissioning and management of a cumulative risk study for the Kwinana industrial area. The study will utilise leading-edge risk assessment techniques and ensure land use is optimised, timely advice is provided to industry and government regarding new developments, and sound emergency-response planning decisions are made;
- Investigation of a serious fire during the filling of an LPG cylinder by decanting. The results of the investigation will be considered in the current review of the Australian Standard for the Storage and Handling of LPG (AS1596);
- Study of the public safety aspects involved in the transport of bulk dangerous goods in Western Australia; and
- Assessment of risks from automotive LPG storage tanks for input into the development of guidelines for the storage of such tanks, typically at service stations. The guidelines have been published in the form of a supplement to Australian Standard AS1596.

Petroleum Division

- Implementation of the infrastructure to support administration of the new Safety Case regime for petroleum exploration and production operations;
- Technical input into the formulation of national guidelines for the preparation and assessment of Safety Cases;
- Assessment and auditing of Safety Cases for the Wandoo 'A' and Griffin projects;
- Formation of a joint industry/Government committee to review and upgrade State Emergency Response plans for the offshore petroleum industry;
- Quality management systems assessor/training of Petroleum Division safety inspectorate;
- Joint investigation with other State Commonwealth authorities into the loss of the anchor handling tug 'Boa Force';
- Technical impact and recommendations continued to be provided into the Working Party on Petroleum Exploration and Production in Marine Conservation Areas;
- Research into exploration incentive schemes culminated in recommendations to amend the petroleum legislation;
- Research and input was provided to the Department of Resources Development in co-ordinating the Special Agreements Act for the Goldfields Gas Transmission Pipeline;
- Technical evaluation of the Wandoo and Wanaea/Cossack field development plans;

- Technical review of Griffin and Roller field developments prior to commencement of production;
- Technical review of facilities for Wandoo extended production test prior to start-up.

Surveys and Mapping Division

Projects commenced and continuing include:

- Unix Map Publishing software of Computer Assistance Map Production (CAMP) is continuously researched to refine map production; and
- Geographic Information System (GIS) projects were completed on the Hamersley Range, Collie Basin, Kwinana Pipeline, the State Petroleum Tenement and Cowaramup Margaret River.

Chemistry Centre

- Evaluation of the compatibility of building materials for Western Australian climatic conditions;
- Assessment of the corrosion of underground mine supports to ensure mine safety;
- Development of a novel ball milling process for the destruction of hazardous wastes (in collaboration with researchers from the University of Western Australia and CRA Pty Ltd);
- Extraction and purification of a large quantity of conocurvone from smoke bush for biological testing against the AIDS virus;
- Development and protection of the Western Australian legume industry;
- Application of mineralogy and chemistry to the improved production and recovery process in the diamond industry;
- Development of a commercial process to upgrade silicon slag;
- Investigation of the upgrading of ilmenite as a continuing project in the A.J. Parker Cooperative Research Centre for Hydrometallurgy;
- Assessment of coal and char for use on reductants in ilmenite processing;
- Elemental "fingerprinting" of glass and metal specimens by laser ablation inductively coupled plasma mass spectrometry;
- Identification of trace quantities of synthetic fibres found as contact evidence; and
- Improvement and validation of drug detection methods for the racing industry.

Geological Survey

- Geological mapping in the eastern Goldfields,

- Peak Hill, Pilbara, Kimberley, Rudall River and Ravensthorpe areas;
- Regolith mapping in the eastern Goldfields and Peak Hill regions;
- Studies of the controls of gold mineralisation in the eastern Goldfields;
- Reviews of the State's lead-zinc, talc, magnesite, fluorite and barite resources;
- Geochemical surveys in the eastern Goldfields and Glengarry Basin;
- Geotechnical studies related to open-pit and underground mining;
- Hydrogeological studies relating to groundwater contamination;
- Investigations of the geology and petroleum potential of the State's onshore sedimentary basins; and
- Development of computer-based Geographic Information Systems (GIS) to assist in land use planning in mineralised areas.
- The identification and determination of respirable quartz by XRD and FTIR and the optimum technique as a function of mineral species;
- The identification of sources of mercury exposure during gold tailings retreatment operations;
- The determination of the suitability of plastics used in pipe and valve construction associated with acid storage tanks;
- Long distance commute - health, safety and lifestyle survey; and
- A survey of primary and secondary ventilation practices at underground mines.

Mining Operations

Projects completed include:

- Blast and environmental noise monitoring program in Kalgoorlie and Greenbushes;
- Investigation into underground diesel equipment fires;
- Investigation into the benefits and availability of low emission diesel fuel for underground diesel engines;
- Review of medical procedures following carbon monoxide poisoning;
- Review of atmospheric contaminant levels for extended workshifts; and
- Radiation in underground coal mines.

Projects commenced include:

- Emergency preparedness and response audits for underground mines;
- Guidelines for preparation of a Safety Management Plan (SMP) document for underground mines;
- Continuing investigations into methods of reducing particulates and hydrocarbons in underground working environment;
- Long term management of radioactive wastes arising from mineral sands processing;
- The determination of arsenic exposures in gold rooms, smelters and refineries;
- The identification of contaminants associated with distress flares used in mine rescue training;
- Study on the retention and excretion of thorium by mineral sands industry employees;

APPENDIX 4: PUBLICATIONS

The Department compiled or revised publications covering a variety of topics during the year. They included:

- Geological publications and maps
- Environmental issues affecting mining and petroleum exploration
- Chemical investigations covering the fields of agriculture, forensic science, environment, public health, the racing industry, materials science, metallurgy and mineral processing
- Mine site work and safety practices
- Office of Traditional Land Use publications
- Petroleum exploration, safety and environmental considerations
- Mineral exploration and land access
- Fact Sheet series on the mining of various commodities and general aspects of the mining industry
- Explosives and dangerous goods
- Departmental annual report
- Mineral tenement maps and various thematic maps relating to mining and other land-use applications in Western Australia

More details on Departmental publications can be obtained through the Head Office Library (090) 222 3165, the public counter on Level One, Mineral House, 100 Plain Street, East Perth, or at regional offices in the State.

Further information on the services provided by the Department, and the mining and petroleum industries in general, is available from the Public Affairs branch (09) 222 3589.

APPENDIX 5: MINING ACCIDENTS AND PROSECUTIONS

Mining accidents 1993-94					
Mineral	Employees	Fatal	Serious	Minor	Total
Gold and nickel	15 342	3	188	298	486
Iron Ore	7 350	1	38	149	187
Coal	1 030	1	35	89	124
Bauxite and alumina	5 755		30	51	81
Mineral sands	1 663	1	11	24	35
Diamonds	1 195		5	11	16
Base metals	521		13	8	21
Salt	456		5	7	12
Construction materials	279	1	2	10	12
Other	743		16	43	59
All mining	34 334	7	343	690	1 033

Fatal accidents 1993-94

Seven persons were killed in work-related mining accidents at work on mines in 1993-94. Three of the fatalities occurred underground and four on the surface. One of the underground accidents was in a coal mine. Details on these are:

- The operator of a bucket wheel reclaimer was killed in a catastrophic structural failure and collapse when the bucket wheel fell off after a shaft broke;
- An underground miner, was struck by a rock while watering down in a development heading;
- An underground truck driver, was crushed against the sidewall of a stope access drive by a remote controlled loader;
- A driver was towing a water tank up-hill on the main haul road with an agricultural tractor when the front wheels of the tractor left the ground. The cab of the tractor was partially crushed against the water tank;
- A passenger in a light vehicle sustained fatal

injuries when the vehicle slid over an embankment and came to rest in water on its passenger side;

- An underground coal miner was crushed between a continuous miner and the rib while the machine was being trammed;
- An electrician was working from a ladder repairing a broken cross arm on a power pole when he contacted a live 22 kV line and was thrown from the ladder.

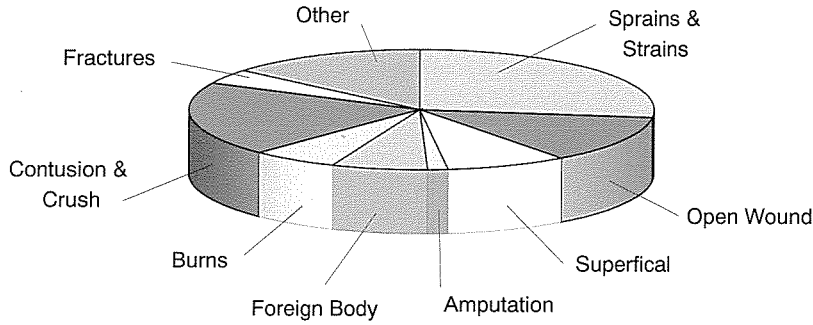
Prosecutions

There were no prosecutions finalised under the Mines Regulation Act or associated Regulations during the year. There are, however, three prosecutions that are either adjourned for hearing, or waiting response from Crown Law.

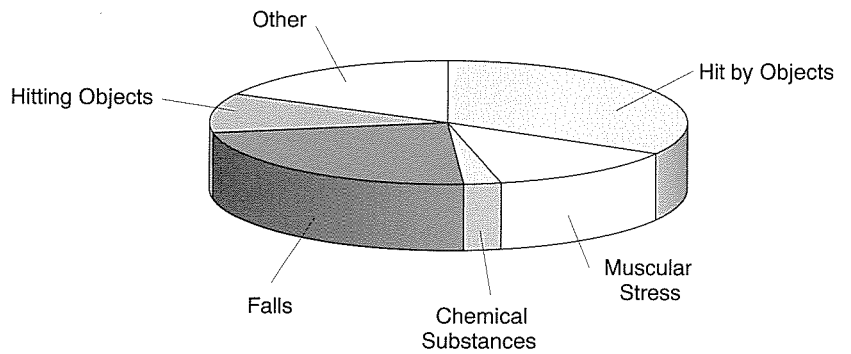
Two successful prosecutions were obtained for breaches of Section 155 of the Mining Act. Both were for the offence of mining without authority, and the convictions resulted in fines of \$1 000 each plus \$1 293 costs imposed on two co-offenders and a fine of \$300 with \$193 costs imposed for the second conviction.

APPENDIX 6: PETROLEUM INDUSTRY ACCIDENTS

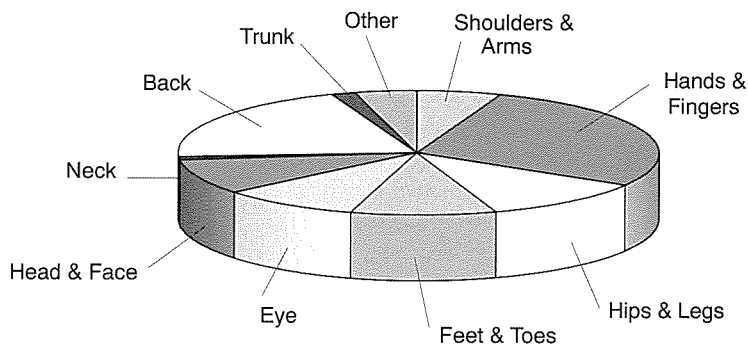
Nature of Injury



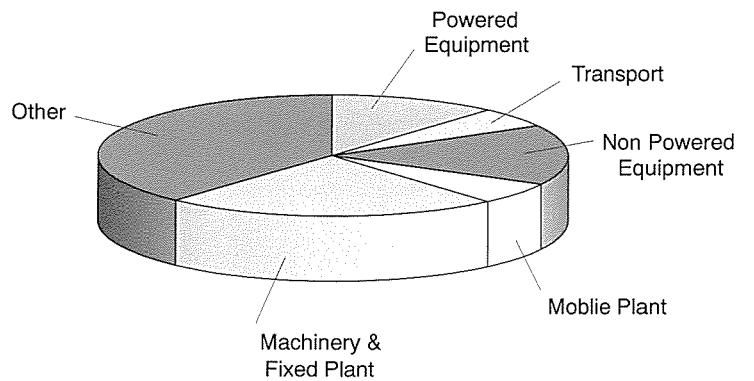
Type of Accident



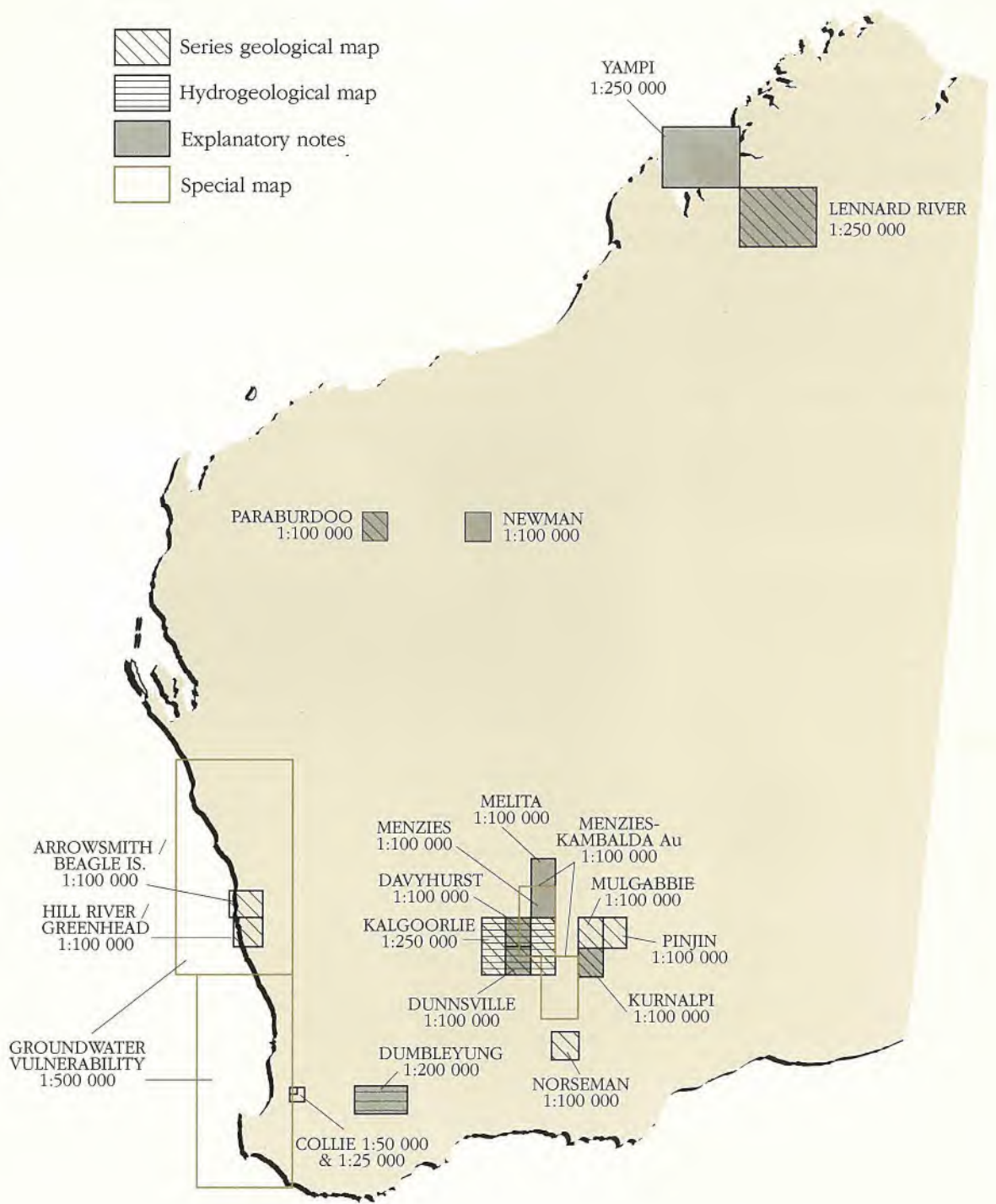
Part of Body



Breakdown Agency



APPENDIX 7: MAPS AND EXPLANATORY NOTES PUBLISHED IN 1993-94



MINING IN WESTERN AUSTRALIA MAKES HISTORY

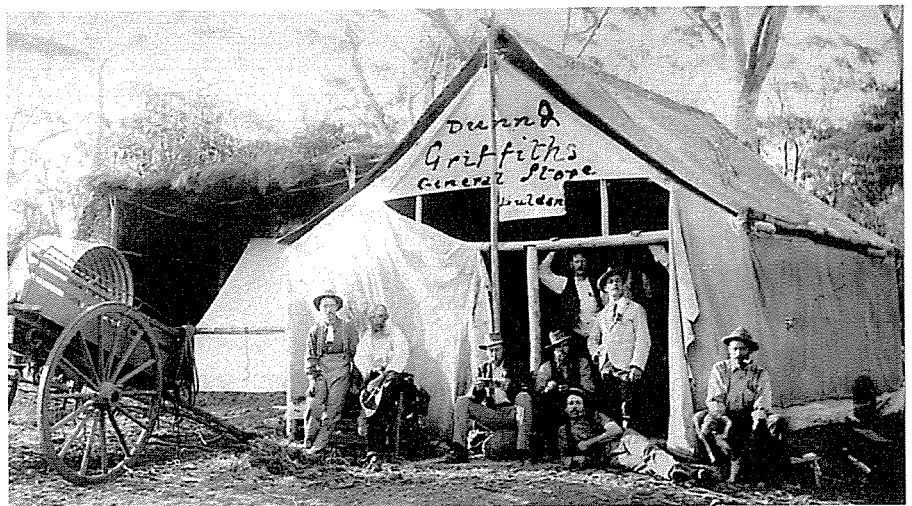
In 1846 the first signs of a promising mining industry in Western Australia began to emerge with the discovery of coal on the Irwin River, the discovery of lead and copper at Mundijong, and reports of copper being found near Toodyay and tin east of Guildford. Two years later, in 1848, the first significant mineral discovery in Western Australia came when James Walcott, a member of an expedition led by Western Australia's Assistant Surveyor General, Augustus Gregory, found lead in the Murchison River bed. By 1850 the Geraldine Mining Company was shipping lead from the mine. However, it was the discovery of payable gold at Halls Creek in 1885 that fuelled the first goldrush to the State.

Although the rush was short-lived, it inspired a widespread search for gold. Soon after, rich gold discoveries were made in the Murchison, Yilgarn and Pilbara regions. Then came the huge discoveries at Coolgardie and Kalgoorlie in 1892-93. News of the discoveries spread quickly, sparking a rush of hopeful prospectors from all over the world to Western Australia.

With the increased mining activity came the need to regulate and improve the industry, and as a result the Department of Mines was established to facilitate mining development throughout the State.

The Department of Mines came into being on January 1, 1894 when four men and a boy took up office in Perth. Those officers were Secretary for Mines Henry Prinsep, Chief Clerk Lionel Crockett, Assistant Clerk John Fredric Roe, Draftsman Alan Barlee and messenger boy Lewis Caporn. A few weeks after the Mines Department opened for business, the Lands Department's mining registration and survey divisions joined the Department together with the Government Geologist, cementing a relationship between mining and geology.

That year was a hectic one for the Department of Mines. Overall, 1,252 Miners Rights were issued, 1,284 lease applications were approved, and 13,841 acres were held under lease, most in the Coolgardie and East Coolgardie goldfields. Reports of substantial coal deposits were



Dunn & Griffiths' General Store Baldania. Paddy Hannan second left.

investigated along with a report of a tin field at Greenbushes.

Regulation of the growing industry changed with the Goldfields Act 1895 - an Act to make better provisions for the regulation of gold mining and management in the goldfields. This Act repealed all previous goldfields legislation, consolidated leasing arrangements and made it lawful to conduct alluvial operations to within 50 feet of a reef. The Mines Regulation Act was also passed, detailing the rules for mining operations where more than two people were employed. Both Acts came into force on January 1, 1896.

It seems 1898 was a record gold producing year for Western Australia, with 1,050,183 ounces being produced. Gold ore exported for treatment amounted to 8,706.25 tons. Lead, tin and copper ores were also

exported, diamonds were found at Nullagine and mining had started in Collie.

In 1895 the Explosives and Dangerous Goods Division came into being when Premier Sir John Forrest recruited Edward Mann from Melbourne to be Chief Inspector of Explosives and Government Analyst. In 1902, the Department enlarged its activities by adding the Government Analyst's Laboratory. Services included mineral assaying, the inspection of explosives, forensic work for the police, and analytical services for Customs and other government authorities. That same year the need to regulate mine safety was recognised and the Mining Operation Division was established.

Although the first oil prospecting licence was issued in 1901, it was not until 1974 that a specialist Petroleum Branch started up. Mineral royalties



Prospecting Party, Coolgardie 1894

were first collected by the Department in 1951 when BHP began mining iron ore at Yampi Sound in the Kimberley, and petroleum royalties began in 1967. More than 40 years after the introduction of royalties, over three thousand million dollars of mineral and petroleum royalties have been collected for the benefit of all Western Australians.

From about 1960 the State Government entered into agreements with a number of major mining companies to exchange long-term security of tenure for firm commitment to maintain the mining of iron ore and the construction of towns and ports. By 1966, the value of iron ore exports from Western Australia reached \$18 million and iron ore eclipsed gold as the State's most valuable mineral.

The discovery of oil at Rough Range in 1953 was the most exciting event in exploration since gold was found at Kalgoorlie, heralding the modern phase of exploration in Western Australia. A year later large mineral sand deposits were found near the southwest coast at Capel, bauxite mining began in the Darling Range and the first commercial oilfield was discovered at Barrow Island. With the discovery of new minerals, the modern mineral industry was firmly established.

Another major turning point occurred in 1966 with production from the giant iron ore deposits of the Pilbara, the discovery of the Kambalda nickel deposits and the Dongara gasfield. The early 1970's also saw a sustained growth in the production of nickel, alumina, and heavy mineral sands. In 1979 diamonds were discovered in the Kimberley region and diamond

mining began at Argyle in 1983, adding to the diversity of mineral production in Western Australia.

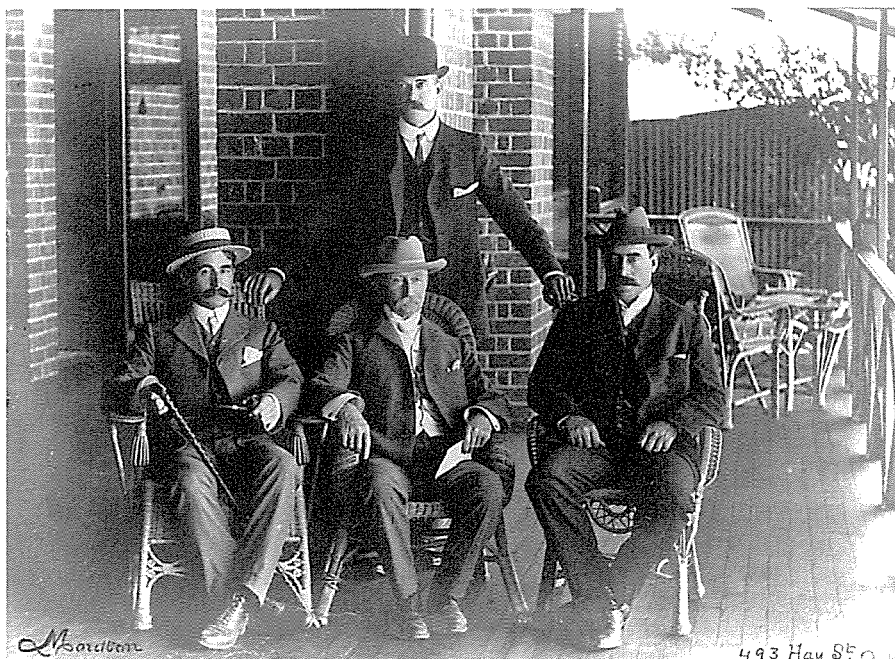
The impact of all these developments on the State was immense - the population increased dramatically. Perth, surrounding suburbs and country towns all expanded bringing much material wealth to the State. So much so that mining is still the mainstay of Western Australia's economy.

Since 1894, the Department has grown to play a central role in Western Australia's economic, social and political life by encouraging, regulating and administering the mining and petroleum industries. The Department is now the third highest revenue raiser for the State. Its activities and responsibilities have always been extensive and remarkably

diverse, and its history has been characterised by individualism, teamwork and dedication to serving the Western Australian people. In July 1992, the Department of Mines changed its name to the Department of Minerals and Energy.

Throughout its history, the Department has provided the necessary geological information for mining and petroleum companies to select their exploration targets. Without that information the booms of the past would not have been so prosperous.

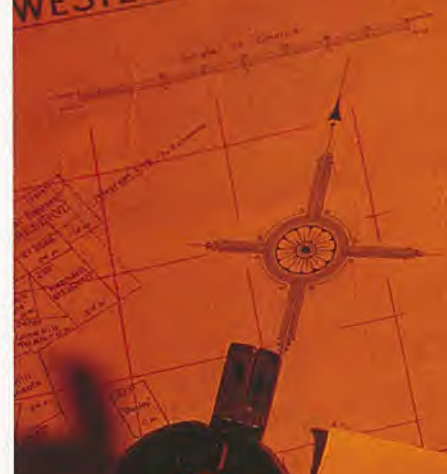
There is widespread belief in the minerals and petroleum industries that exploration in Western Australia has barely scratched the surface. If this is true then the Department of Minerals and Energy faces a future that will be as exciting as its past.



Senior Mines Department staff in January 1894. Secretary for Mines, Henry Princep (seated centre), Chief Draftsman, Alan Barlee (seated right), Principal Clerk, L.L. Crockett (seated left), Clerk and Accountant J.F. Roe (standing).

SCOTLAND
MINES DEPT.
COOLGARDIE GOLDFIELD.
WESTERN AUSTRALIA.

AUSTRALIAN MINING COMPANIES
 REGISTERED IN GREAT BRITAIN



Company Name	Capital	Reserves	Production	Notes
Western Australian Gold Mining Co.	£100,000	1,200,000	120,000	Operating in Coolgardie
Coolgardie Mining Co.	£50,000	600,000	60,000	Operating in Coolgardie
Adelaide Mining Co.	£200,000	2,000,000	200,000	Operating in Coolgardie
Southern Cross Gold Mines Ltd.	£300,000	3,000,000	300,000	Operating in Coolgardie
North Star Mining Co.	£150,000	1,500,000	150,000	Operating in Coolgardie
Star of the South Gold Mines	£400,000	4,000,000	400,000	Operating in Coolgardie
White Star Mining Co.	£250,000	2,500,000	250,000	Operating in Coolgardie
Blue Bird Gold Mining Co.	£180,000	1,800,000	180,000	Operating in Coolgardie
Red Rover Gold Mining Co.	£120,000	1,200,000	120,000	Operating in Coolgardie
Black Horse Gold Mining Co.	£90,000	900,000	90,000	Operating in Coolgardie
Greyhound Gold Mining Co.	£70,000	700,000	70,000	Operating in Coolgardie
White Horse Gold Mining Co.	£110,000	1,100,000	110,000	Operating in Coolgardie
Black & White Gold Mining Co.	£130,000	1,300,000	130,000	Operating in Coolgardie
Red & Black Gold Mining Co.	£140,000	1,400,000	140,000	Operating in Coolgardie
White & Black Gold Mining Co.	£160,000	1,600,000	160,000	Operating in Coolgardie
Black & Red Gold Mining Co.	£170,000	1,700,000	170,000	Operating in Coolgardie
White & Red Gold Mining Co.	£190,000	1,900,000	190,000	Operating in Coolgardie

Geological Survey of Western Australia
THE KIMBERLEY
WESTERN AUSTRALIA
 TO ACCOMPANY
REPORT ON THE PROSPECTS OF OBTAINING ARTESIAN WATER IN
 BY
R. LOGAN JACK, LL.D.
 1900

EXPLANATION OF COLOURS & SIGNS

[Red Box]	DEPOSITARY
[Green Box]	...
[Blue Box]	...
[Yellow Box]	...